



# **End Treatments and Their Use**

Purdue Road School 2012

March 6, 2012

# Key Terms

1. NCHRP350
2. Gating
3. Non-Gating
4. Re-directive
5. Bi-Directional
6. Clear Zone
7. Beginning Length of Need
8. Self Restoring



## What are End Treatments?

Attached to Guardrail to prevent impalement

Selected from the INDOT list of approved products

Certified installers

24 h of completion of the guardrail



# What are Impact Attenuators?

Used as crash cushions in high speed environments

Bridge piers, overhead signs, Barrier wall...

Selected from the INDOT list of approved Impact Attenuators

Certified installers



## INDOT Categories, **49-8.04(01) Types**

1. Type ED – Energy Dissipation. This is an energy dissipation device.
2. Type R1 – Re-directive 1 side. Has re-directive capability on one side.
3. Type R2 – Re-directive 2 sides. Has re-directive capability on two sides.
4. Type CR – Clearance Restriction. Has re-directive capability on two sides. Used where there are lateral clearance restrictions that make installation and maintenance of the attenuator difficult.
  - Type CR1 should be specified unless CR2 conditions exist
  - Type CR2 largely self-restoring after a typical impact, and has the ability to partially absorb additional impacts that can occur before the unit can be serviced.
5. Type SD – vertical Sight Distance limitation. Has re-directive capability on two sides.



# IMPACT ATTENUATORS

December 16, 2011

Specification  
Reference:  
601.07.1

- BARRIER SYSTEM, INC
  - TAU-II ED, R1, R2, AND SD
- ENERGY ABSORPTION SYSTEM, INC
  - ENERGITE III MODULE ED, and Gravel Barrels
- ENERGY ABSORPTION SYSTEM, INC
  - QUADGUARD II ED, R1, R2, LS and SD
- ENERGY ABSORPTION SYSTEM, INC
  - REACT 350 or REACT 350 II MODELS ED, R1, R2, CR1 and CR2
- PLASTIC SAFETY SYSTEMS, INC
  - CRASHGARD BARREL SYSTEM ED, and Gravel Barrels
- TRAFFIX DEVICES, INC
  - Big Sandy ED, and Gravel Barrels
- TRINITY INDUSTRIES, INC
  - CAT-350 ED (alternate with guardrail transition)
- TRINITY INDUSTRIES, INC
  - TRACC ED, R1, R2, and SD
- SCI PRODUCTS, INC
  - SCIGM ED, R1, R2, SD and CR1



Re-directive  
Non-gating  
Bi-directional

NCHRP Report 350,  
Test Levels 2 and 3.

Low and high speed  
applications  
30-70 mph

The system can  
protect hazards of  
various widths

ED, R1, R2, SD



# Barrier Systems, Inc

## TAU-II



NON Re-directive  
Gating

NCHRP Report 350,  
Test Levels 2 and 3.

ED



# Energy Absorption Systems

Energite III





Re-directive,  
Non-gating  
Bi-directional

NCHRP Report 350,  
Test Levels 1, 2 and  
3.

Low and high speed  
applications  
25-70 mph

The system can  
protect hazards of  
various widths

ED, R1, R2, LS, SD



# Energy Absorption Systems Quadguard II



Self Restoring  
Re-directive  
Non-gating  
Bi-directional

NCHRP Report 350,  
Test Levels 2 and 3.

Low and high speed  
applications  
30-62 mph

The system can  
protect hazards of  
various widths

ED, R1, R2, CR1, CR2



# Energy Absorption Systems

REACT 350, REACT 350 II



NON Re-directive  
Gating

NCHRP Report 350,  
Test Levels 2 and 3.

ED



# Plastic Safety Systems, Inc

## CrashGard



NON Re-directive,  
Gating

NCHRP Report 350,  
Test Levels 2 and 3.

ED



**Traffix Devices, Inc.**

Big Sandy



Non re-directive,  
Gating

Alternate ED with  
guardrail transition

NCHRP Report 350,  
Test Levels 3

ED



**Trinity Industries,  
Inc.**  
CAT-350



Re-directive,  
Non-gating  
Bi-directional

NCHRP Report 350,  
Test Levels 2 and 3.

Low and high speed  
applications  
30-70 mph

The system can  
protect hazards of  
various widths

ED, R1, R2, SD



# Trinity Industries, Inc. TRACC



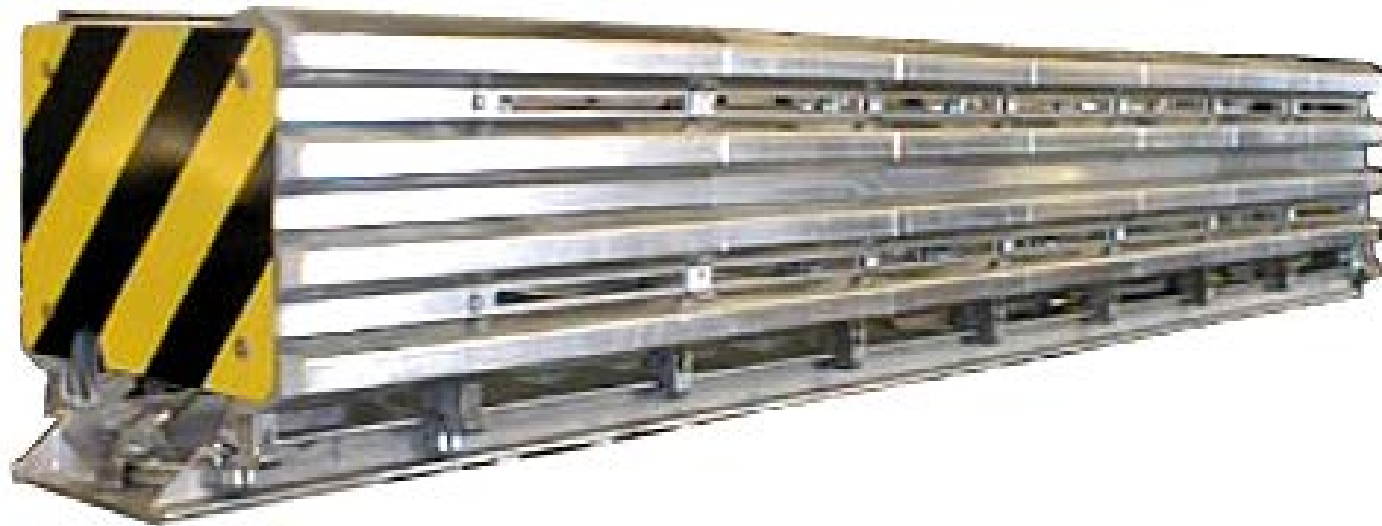
Re-directive,  
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NCHRP Report 350,  
Test Levels 2 and 3.

Low and high speed  
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The system can  
protect hazards of  
various widths

ED, R1, R2, SD, CR1



# SCI Products

## SCIGM



# Any Questions?

