

SUPERSEDED BY
EI 11-018
EFFECTIVE **9/21/11**

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EI 11-016
EFFECTIVE **1/12/12**

New York State
Department of
Transportation
**ENGINEERING
INSTRUCTION**

EI
08-036

Title: **TRUCK MOUNTED AND TRAILER MOUNTED IMPACT ATTENUATORS**

Distribution:

- ☒ Manufacturers (18)
☒ Local Govt. (31)
☒ Agencies (32)

- ☐ Surveyors (33)
☒ Consultants (34)
☒ Contractors (39)
☐ _____

Approved

James F. Tynan, P.E.
Deputy Chief Engineer (Construction)

9-12-08
Date

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of 01/08/09.
- This EI does not supersede any other issuances.
- These revisions will be incorporated into a future update of the Standard Specifications.

PURPOSE: This EI issues revisions to §619-2.01, §619-2.02G, §619-3.02G and §729-12 of the Standard Specifications.

TECHNICAL INFORMATION:

- This revision enables barrier and shadow vehicles to use either truck mounted impact attenuators or trailer mounted impact attenuators meeting NCHRP 350 approval.
- This revision enables the use of expanding technology of mobile impact attenuators.
- This revision should have no significant cost impact.

IMPLEMENTATION:

- Main Office Design Quality Assurance Bureau will insert the standard specification shelf note beginning with projects submitted for the letting of 01/08/09.
- Engineers-in-Charge of ongoing contracts and those contracts let prior to the inclusion of the shelf note in the contract proposal should provide a copy of this EI to the contractor and file a copy of this EI in the contract records as documentation of the change in accordance with the Contract Administration Manual (CAM) §104-02.

TRANSMITTED MATERIALS:

This EI transmits standard specification shelf notes *Barrier/Shadow Vehicles* and *Truck Mounted And Trailer Mounted Impact Attenuators*. Both Metric and U.S. Customary shelf notes are attached.

CONTACT: Direct questions regarding this issuance to Tom Melander of the Office of Construction at (518) 457-6472 or via e-mail at TMelander@dot.state.ny.us.

BARRIER/SHADOW VEHICLES

Make the following changes to the Standard Specifications of May 4, 2006 as modified by EI-07-006:

Page 6 of 46, §619-2.01 **Delete** Truck Mounted Impact Attenuator from the list and **Replace** it with the following:

Truck Mounted And Trailer Mounted Impact Attenuators 729-12

Page 7 of 46, **Delete** §619-2.02G Barrier/Shadow Vehicles and **Replace** it with the following:

- G. Barrier/Shadow Vehicles.** Barrier/Shadow vehicles shall weigh a minimum of 8,200 kg and shall be equipped with a Type B or Type C Arrow Panel. Ballast may be used to bring a lighter vehicle up to the indicated weight provided the ballast is securely contained within an enclosed body or otherwise securely fastened to the vehicle such that the ballast will not separate from the vehicle upon impact. Where the preconstruction posted speed limit is 55 mph or less, barrier/shadow vehicles shall be equipped with a Test Level-2 truck mounted or trailer mounted impact attenuator. Where the preconstruction posted speed limit is more than 55 mph, barrier/shadow vehicles shall be equipped with a Test Level-3 truck mounted or trailer mounted impact attenuator. Impact attenuators meeting the requirements of NCHRP 350 Test Level 3 are also acceptable as Test Level 2 devices.

Where a barrier vehicle remains stationary for extended periods of time, the Contractor may utilize a barrier trailer in lieu of a barrier vehicle. A barrier trailer is a tandem-axle trailer that may be detached from the tow vehicle and that meets barrier vehicle weight, arrow board, attenuator and placement distance requirements.

Page 16 of 46, **Delete** §619-3.02G Barrier/Shadow Vehicles and **Replace** it with the following:

G. Barrier Vehicles/Barrier Trailers/Shadow Vehicles.

1. Barrier Vehicles. The Contractor shall provide barrier vehicles to guide traffic and protect workers within stationary shoulder closures, lane closures and other stationary work zones in accordance with the contract documents.

When located in the taper of a lane closure and another arrow panel is not present, arrow panels on barrier vehicles shall be operated in the appropriate flashing arrow mode. For all other applications, arrow panels shall either display the four-corner flashing caution mode, or shall be turned off. Barrier vehicles should normally be unoccupied, with transmission in gear, parking brakes set and wheels straight, except when being moved. Barrier trailers should have parking brakes set and arrow panels shall be operated in the appropriate flashing arrow mode.

Barrier vehicles and barrier trailers shall be moved if necessary as the work progresses. The placement distance (distance a barrier vehicle or barrier trailer is located in advance of the first workers or hazard) shall be based on Table 619-2 *Placement Distance for Barrier/Shadow Vehicles*.

BARRIER/SHADOW VEHICLES

Table 619-2 PLACEMENT DISTANCE FOR BARRIER/SHADOW VEHICLES				
Posted Speed Limit (mph)	Placement Distance (m)			
	Barrier Vehicles			
	8,200 kg		10,900 kg	
	Minimum	Maximum	Minimum	Maximum
> 55	30	60	30	60
45- 55	30	60	25	50
<45	25	50	15	30
Shadow Vehicles				
> 55	70	100	55	85
50 - 55	55	85	45	75
≤ 45	30	60	30	60

2. Shadow Vehicles. For posted speed limits of 30 mph or higher, the Contractor shall provide shadow vehicles to guide traffic and protect workers conducting mobile or short duration work operations except where the travel lane is closed to traffic by traffic barriers or by channelizing devices., including, but not limited to, pavement marking application, pavement marking removal and sweeping

When located in an open travel lane of a multilane roadway, the shadow vehicle shall display the flashing arrow panel in the appropriate mode. When located in a travel lane closed by barrier or channelizing devices, on a shoulder, otherwise not in an open travel lane, or on a two-lane, two-way roadway, the arrow panel shall either display the four-corner flashing caution mode or be turned off.

The shadow vehicle shall be moved as necessary to keep pace with the work operations. The placement distance (distance the shadow vehicle is in advance of the first workers or hazard) shall be as shown in Table 619-2 *Placement Distance for Barrier/Shadow Vehicles*.

When slowly moving operations occupy a long distance of a travel lane not closed to traffic by barrier or channelizing devices, such that traffic may reenter the lane between work operations, the Contractor shall provide additional shadow vehicles for any gaps in the operation of 150 m or more.

TRUCK MOUNTED AND TRAILER MOUNTED IMPACT ATTENUATORS

Make the following changes to the Standard Specifications of May 4, 2006 as modified by EI 07-001:

Page 6 of 10 **Delete** §729-12 *Truck-Mounted Impact Attenuators* and **Replace** it with the following:

729-12 TRUCK MOUNTED AND TRAILER MOUNTED IMPACT ATTENUATORS

SCOPE. This specification covers the material and performance requirements for truck mounted impact attenuators or trailer mounted impact attenuators (TMIA's) mounted on the rear of work vehicles and barrier trailers. Impact attenuators are defined by NCHRP 350 as a Category III device.

MATERIALS REQUIREMENTS. TMIA's shall be NCHRP 350 approved. TMIA's meeting the requirements of NCHRP 350 Test Level 3 are also acceptable as a Test Level 2 device. TMIA's meeting the requirements of NCHRP 350 Test Level 2 are acceptable only as Test Level 2 devices. Approach ends of TMIA's shall have impact attenuator markings in accordance with the MUTCD.

BASIS OF APPROVAL. Manufacturers or material suppliers desiring to have products considered for inclusion on the Approved List shall prepare and submit copies of drawings, specifications, test reports, and Federal Acceptance Letters to the Director of the Materials Bureau. The review process requires a minimum of 30 calendar days. Upon approval, the name of the manufacturer and the product will be placed on the Approved List.

BASIS OF ACCEPTANCE. Test Level 2 or Test Level 3 TMIA's will be accepted on the basis of the product appearing on the Approved List and a material certification that the product is the same as the one appearing on the Approved List and that it conforms to this specification.

BARRIER/SHADOW VEHICLES

Make the following changes to the Standard Specifications of May 1, 2008:

Page 563, §619-2.01 **Delete** Truck Mounted Impact Attenuator from the list and **Replace** it with the following:

Truck Mounted And Trailer Mounted Impact Attenuators 729-12

Page 564, **Delete** §619-2.02G Barrier/Shadow Vehicles and **Replace** it with the following:

- G. Barrier/Shadow Vehicles.** Barrier/Shadow vehicles shall weigh a minimum of 18,000 lb and shall be equipped with a Type B or Type C Arrow Panel. Ballast may be used to bring a lighter vehicle up to the indicated weight provided the ballast is securely contained within an enclosed body or otherwise securely fastened to the vehicle such that the ballast will not separate from the vehicle upon impact. Where the preconstruction posted speed limit is 55 mph or less, barrier/shadow vehicles shall be equipped with a Test Level-2 truck mounted or trailer mounted impact attenuator. Where the preconstruction posted speed limit is more than 55 mph, barrier/shadow vehicles shall be equipped with a Test Level-3 truck mounted or trailer mounted impact attenuator. Impact attenuators meeting the requirements of NCHRP 350 Test Level 3 are also acceptable as Test Level 2 devices.

Where a barrier vehicle remains stationary for extended periods of time, the Contractor may utilize a barrier trailer in lieu of a barrier vehicle. A barrier trailer is a tandem-axle trailer that may be detached from the tow vehicle and that meets barrier vehicle weight, arrow board, attenuator and placement distance requirements.

Page 573, **Delete** §619-3.02G Barrier/Shadow Vehicles and **Replace** it with the following:

G. Barrier Vehicles/Barrier Trailers/Shadow Vehicles.

1. Barrier Vehicles. The Contractor shall provide barrier vehicles to guide traffic and protect workers within stationary shoulder closures, lane closures and other stationary work zones in accordance with the contract documents.

When located in the taper of a lane closure and another arrow panel is not present, arrow panels on barrier vehicles shall be operated in the appropriate flashing arrow mode. For all other applications, arrow panels shall either display the four-corner flashing caution mode, or shall be turned off. Barrier vehicles should normally be unoccupied, with transmission in gear, parking brakes set and wheels straight, except when being moved. Barrier trailers should have parking brakes set and arrow panels shall be operated in the appropriate flashing arrow mode.

Barrier vehicles and barrier trailers shall be moved if necessary as the work progresses. The placement distance (distance a barrier vehicle or barrier trailer is located in advance of the first workers or hazard) shall be based on Table 619-2 *Placement Distance for Barrier/Shadow Vehicles*.

BARRIER/SHADOW VEHICLES

Table 619-2 PLACEMENT DISTANCE FOR BARRIER/SHADOW VEHICLES				
Posted Speed Limit (mph)	Placement Distance (ft)			
	Barrier Vehicles			
	18,000 lb		24,000 lb	
	Minimum	Maximum	Minimum	Maximum
> 55	100	200	100	200
45- 55	100	200	80	160
<45	80	160	50	100
Shadow Vehicles				
> 55	230	325	180	280
50 - 55	180	280	150	250
≤ 45	100	200	100	200

2. Shadow Vehicles. For posted speed limits of 30 mph or higher, the Contractor shall provide shadow vehicles to guide traffic and protect workers conducting mobile or short duration work operations except where the travel lane is closed to traffic by traffic barriers or by channelizing devices., including, but not limited to, pavement marking application, pavement marking removal and sweeping

When located in an open travel lane of a multilane roadway, the shadow vehicle shall display the flashing arrow panel in the appropriate mode. When located in a travel lane closed by barrier or channelizing devices, on a shoulder, otherwise not in an open travel lane, or on a two-lane, two-way roadway, the arrow panel shall either display the four-corner flashing caution mode or be turned off.

The shadow vehicle shall be moved as necessary to keep pace with the work operations. The placement distance (distance the shadow vehicle is in advance of the first workers or hazard) shall be as shown in Table 619-2 *Placement Distance for Barrier/Shadow Vehicles*.

When slowly moving operations occupy a long distance of a travel lane not closed to traffic by barrier or channelizing devices, such that traffic may reenter the lane between work operations, the Contractor shall provide additional shadow vehicles for any gaps in the operation of 500 ft or more.

TRUCK MOUNTED AND TRAILER MOUNTED IMPACT ATTENUATORS

Make the following changes to the Standard Specifications of May 1, 2008:

Page 1026 **Delete** §729-12 *Truck-Mounted Impact Attenuators* and **Replace** it with the following:

729-12 TRUCK MOUNTED AND TRAILER MOUNTED IMPACT ATTENUATORS

SCOPE. This specification covers the material and performance requirements for truck mounted impact attenuators or trailer mounted impact attenuators (TMIA's) mounted on the rear of work vehicles and barrier trailers. Impact attenuators are defined by NCHRP 350 as a Category III device.

MATERIALS REQUIREMENTS. TMIA's shall be NCHRP 350 approved. TMIA's meeting the requirements of NCHRP 350 Test Level 3 are also acceptable as a Test Level 2 device. TMIA's meeting the requirements of NCHRP 350 Test Level 2 are acceptable only as Test Level 2 devices. Approach ends of TMIA's shall have impact attenuator markings in accordance with the MUTCD.

BASIS OF APPROVAL. Manufacturers or material suppliers desiring to have products considered for inclusion on the Approved List shall prepare and submit copies of drawings, specifications, test reports, and Federal Acceptance Letters to the Director of the Materials Bureau. The review process requires a minimum of 30 calendar days. Upon approval, the name of the manufacturer and the product will be placed on the Approved List.

BASIS OF ACCEPTANCE. Test Level 2 or Test Level 3 TMIA's will be accepted on the basis of the product appearing on the Approved List and a material certification that the product is the same as the one appearing on the Approved List and that it conforms to this specification.