



U.S. Department
of Transportation
**Federal Highway
Administration**

1200 New Jersey Avenue, SE.
Washington, DC 20590

June 5, 2008

In Reply Refer To: HSSD/B-178

Mr. Kevin K. Groeneweg
Mobile Barriers LLC
24918 Genesee Trail Road
Golden, CO 80401

Dear Mr. Groeneweg:

This letter is in response to your request for Federal Highway Administration (FHWA) acceptance of a roadside safety device for use on the National Highway System (NHS).

Name of device: Mobile Barrier Trailer
Type of device: Portable Work Zone Barrier
Test Level: NCHRP Report 350 Test Level 2 (TL-2) or TL-3
Testing conducted by: Southwest Research Institute
Date of request: April 28, 2008
Dates of follow-up: May 28, 2008 and June 3, 2008.

You requested that we find this device acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features" and the proposed American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware – 2008 (MASH-08).

Requirements

Roadside safety devices should meet the guidelines contained in the NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features". FHWA Memorandum "ACTION: Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing requirements of longitudinal barriers. You have also chosen to anticipate the adoption of MASH-08, an option that FHWA has offered with the understanding that additional testing may need to be done if changes to the test criteria are made before MASH-08 is formally adopted.

Description

The Mobile Barrier Trailer (MBT) is an integrated, rigid wall, semi-trailer that is used in conjunction with standard semi-tractors to provide mobile, improved, safety, and work environments for personnel at applicable maintenance, construction, and security sites. It is an extended, mobile, longitudinal barrier that provides a physical and visual wall between passing

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traffic and the maintenance and construction personnel. With an integrated crash attenuator at the rear, a semi-tractor at the front, and a rigid wall on the side toward passing traffic, the MBT will provide approximately 30.5 m (100 ft) of barrier and protected work area.

The basic trailer is comprised of two platforms and up to three wall sections. The platforms are each 6.4 m (21 ft) in overall length, 2.54 m (100 in) wide and 1.22 m (4 ft) high (riding approximately 1.52 m (5 ft) high with 305 mm (12 in) of ground clearance). The wall sections are each 6.10 m (20 ft) long, 610 mm (24 in) wide, and 1.22 m (4 ft) high (riding approximately 1.52 m (5 ft) high with 305 mm (12 in) of ground clearance). A homogenous 6.4 mm (0.25 in) steel plate is welded to cover the outer side of each wall section. Each wall section abuts up against another of the platforms and is built the same to take an impact from either direction. There are no snag points at the seams. The outer 6.4 mm (0.25 in) plate and associated welds are ground beveled to transition from one to the other.

Dimensioned illustrations of the trailer are enclosed for reference as "Appendix A."

Crash Testing

One full-scale crash test was conducted using a 2329 kg Dodge Ram quad cab pickup truck impacting at 23.5 degrees at 102.3 km/hr. The MBT deflected 0.61m (2 ft) during the impact. As seen in the enclosed test data summary sheet the evaluation criteria were within the limits specified in MASH-08.

Findings

Therefore, the MBT described above and detailed in the enclosed dimensioned photographs is acceptable for use on the NHS under the range of conditions tested, when allowed by a highway agency. It will be acceptable for TL-2 or TL-3 usage depending on the test level of the Truck Mounted Attenuator that is affixed to the rear.

You subsequently requested that FHWA accept the MASH-08 Test 3-11 as indicative of the NCHRP Report 350 acceptance as well. Because the nature of the MBT device and the impact performance of the MASH-08 pickup truck we can conclude that the MASH-08 Test 10 and the NCHRP Report 350 Tests 10 and 11 can be waived. (The MBT is a semi-rigid vertical wall with relatively low friction characteristics that can be favorably compared to vertical concrete barrier walls that passed prior full-scale testing).

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- This acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, we reserve the right to modify or revoke our acceptance.

- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that it will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance is designated as number B-178 and shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed at our office upon request.
- The MBT is a patented product and considered proprietary. If proprietary devices are specified by a highway agency for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,



David A. Nicol, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures

APPENDIX A

Test Article

(Contents of Appendix A submitted by Mobile Barriers LLC)

Overview

View as assembled with three wall sections



Shortened configuration prepared for transport w/ wall sections atop combined platforms.



Overall trailer length (with 3 wall sections): 102'

Overall length (with platforms only as shown above – no wall sections installed): 42'
(lengths exclusive of tractor & TMA assembly, not shown)

Width: 100"

Approx Weight: 65,000 lbs with tractor and misc accompaniments

Breakdown:

Platforms and rear axel assembly (“caboose”) – 20,000 lbs

Wall sections – 5,000 lbs (ea)

Counterweight – 5,000 lbs per wall section

Tractor and accompaniments – 20,000 lbs

Clearance: 9-12” (+/- 1”) depending on configuration

Height to top of platforms (as taped): approx. 5' (58” with 12” of clearance)

Height to top of visual barrier (netting) or wall sections as stored above: approx 9'

Overview (cont)...

Length of platforms (2 shown attached): 21' ea

("caboose" or rear axel assembly under platform opposite tractor)

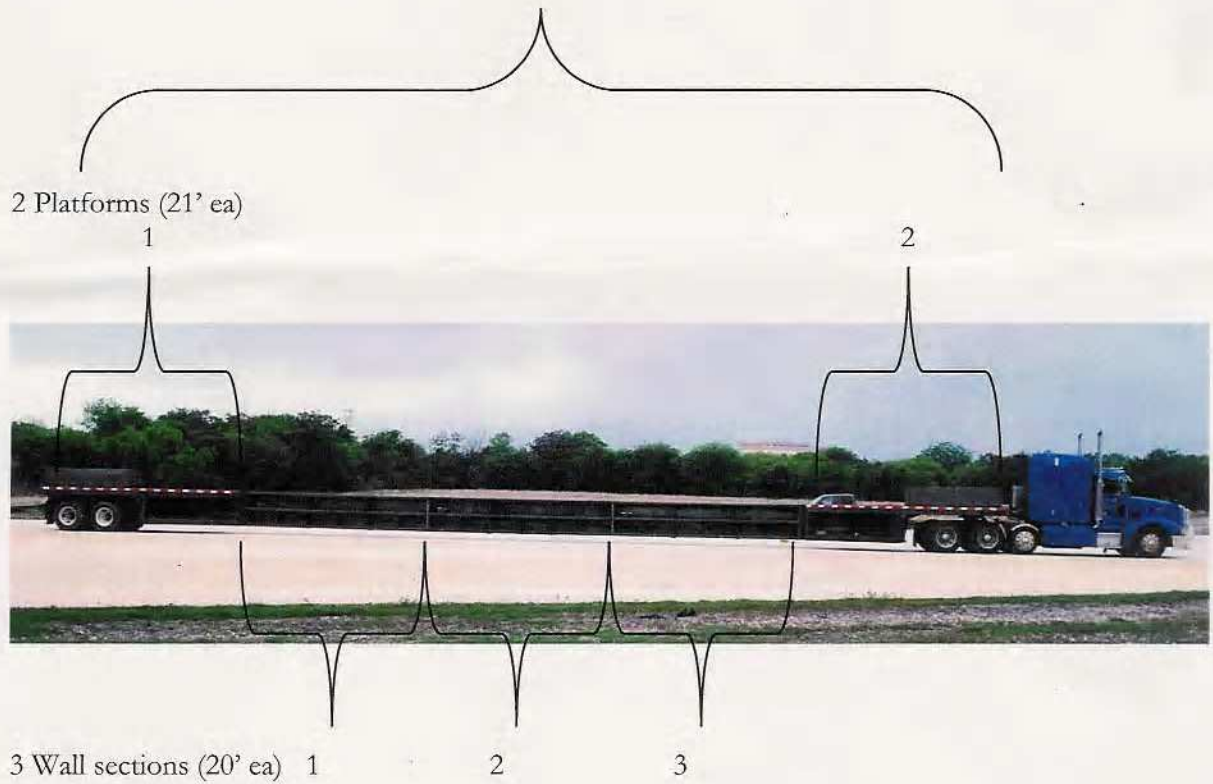
Length of wall sections (2 shown facing/1 on opposite side): 20' ea.

Configuration options: Platform and caboose with 0-3 wall sections

Must be used with an NCHRP Report 350 compliant TMA that has been tested and accepted at TL-3 or such other level as appropriate for applicable traffic speeds and deployment conditions (TMA not shown).

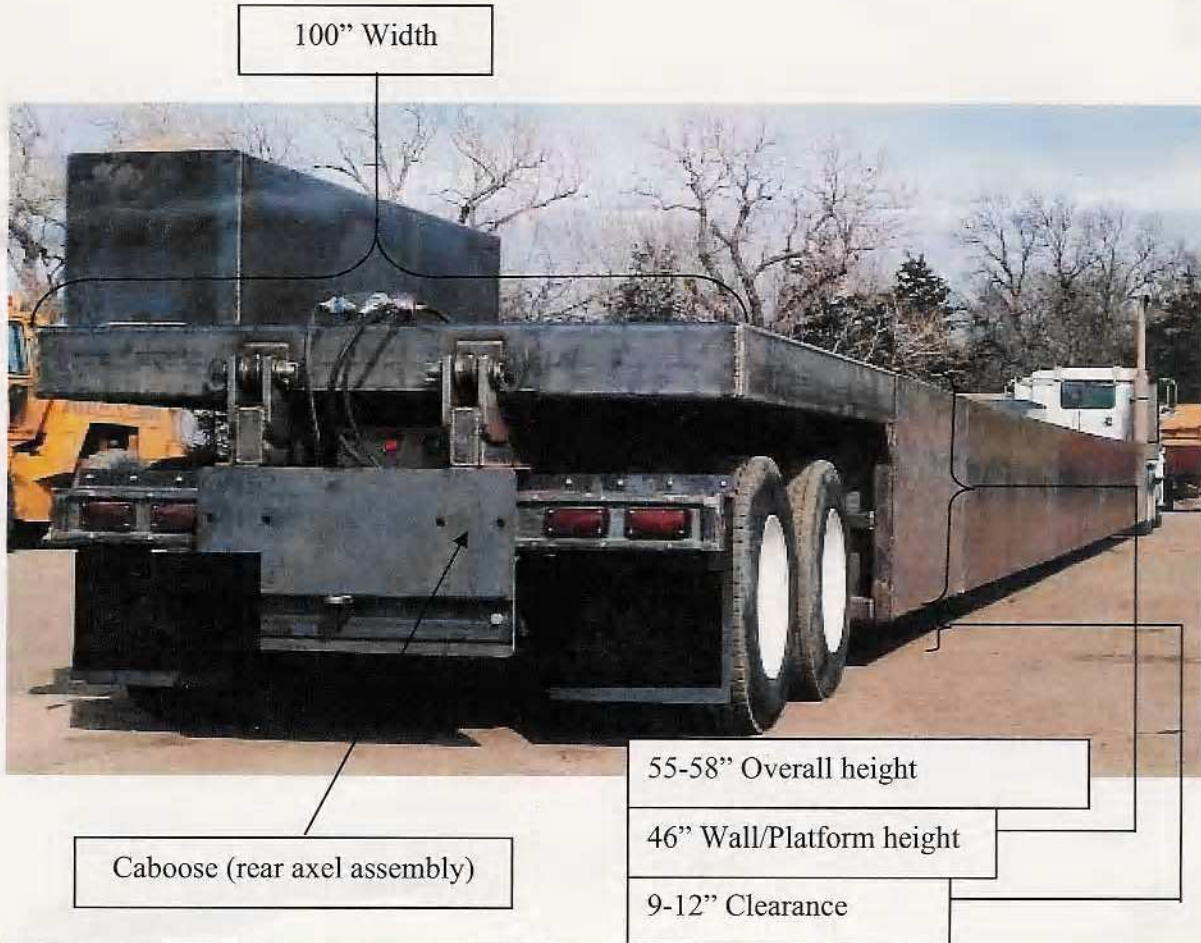
Dimensions...

Overall length with 3 wall sections: 102'



Dimensions (cont)...

Trailer & Caboose (rear axel assembly) as seen from rear traffic side - wheel cover panel and TMA not shown. (license plate and splashguards blacked out)



Wall construction...



Wall sections
1, 2, 3



Top, mid, and lower
beams with lower
channel – 46" height
(55-58" overall height
w/ 9-12" clearance)



Assembled

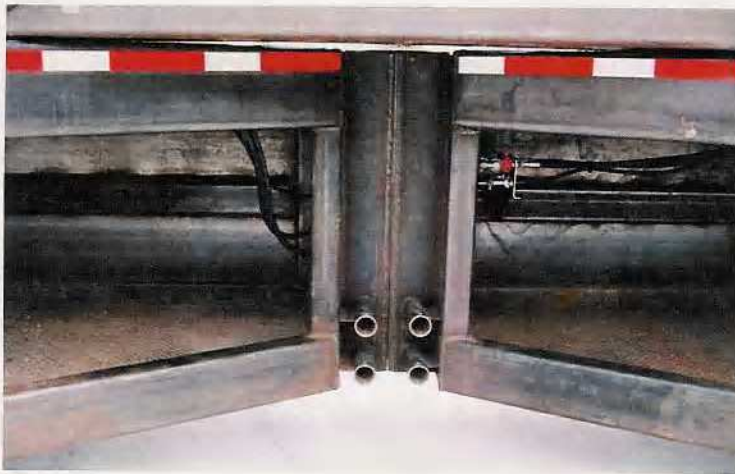


Preassembly as seen on end

Platform Construction...



Platforms connected and loaded for transport, shown open from work side.



Skeletal view.



Table 4.1 – Summary of Test Results and Conditions



General Information

Test Agency Southwest Research Institute
 Test Number MBT-1
 Test Date 04/03/2008
 Test Category 3-11 "Update"
Test Article
 Type Longitudinal Barrier
 Installation Length 30.5 m (100 ft)
 Top-of-Barrier Height 1.52 m (5 ft)
 Type of Primary Barrier Mobile longitudinal barrier
 Soil Mobile longitudinal barrier
 Test performed on concrete
Test Vehicle
 Type 1/2 Ton Quad Cab Pickup
 Designation 2270P
 Model 2002 Dodge Ram 1500 Quad Cab
 Mass (kg) 2329
 Inertial Mass(kg) 2329
 Dummy Mass (kg) NA
 Gross Static Mass (kg) 2329

Impact Conditions

Speed (km/hr) 102.3
 Angle (degrees) 23.5
Exit Conditions
 Speed (km/hr) 80 (calculated)
 Angle (degrees) 0
Occupant Risk Values
 Impact Velocity (m/s)
 x-direction 4.0
 y-direction -6.4
 Ridedown Accelerations (g's)
 x-direction -7.9
 y-direction 11.1

Test Article Deflection

Dynamic 0.61 m (2.0 ft)
 Static 9.5 cm (3.8 in)

Vehicle Damage

Exterior
 CDC 11LFEW5
 VDS 11-LFQ-4
 Interior
 OCCL LF0000000
 Max. Deform. (mm) 0

Post Impact Vehicular Behavior (limited to events <1.000 seconds)

Maximum Roll Angle (degrees) 7.8 @ 0.107 sec.
 Maximum Pitch Angle (degrees) 2.3 @ 0.447 sec.
 Maximum Yaw Angle (degrees) 29.3 @ 0.374 sec.

