



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

1200 New Jersey Ave., SE
Washington, D.C. 20590

September 6, 2018

In Reply Refer To:
HSST-1/WZ-359

Mr. Charles Mettler
Plastic Safety Systems, Inc.
2444 Baldwin Road
Cleveland, Ohio 44104

Dear Mr. Mettler:

This letter is in response to your June 26, 2018 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number WZ-359 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following device is eligible within the length-of-need, with details provided in the form which is attached as an integral part of this letter:

- SafetyRail

Scope of this Letter

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' (AASHTO) Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

Eligibility for Reimbursement

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the AASHTO's MASH. Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

- Name of system: SafetyRail
Type of system: Channelizer
Test Level: MASH Test Level 3 (TL3)
Testing conducted by: Texas A&M Transportation Institute
Date of request: June 26, 2018
Date initially acknowledged: June 29, 2018

FHWA concurs with the recommendation of the accredited crash testing laboratory on the attached form.

Full Description of the Eligible Device

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

Notice

This eligibility letter is issued for the subject device as tested. Modifications made to the device are not covered by this letter. Any modifications to this device should be submitted to the user (i.e., state DOT) as per their requirements.

You are expected to supply potential users with sufficient information on design, installation and maintenance requirements to ensure proper performance.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of AASHTO's MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.

Standard Provisions

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number WZ-359 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 upon request.
- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.
- This FHWA eligibility letter is not an expression of any Agency view, position, or determination of validity, scope, or ownership of any intellectual property rights to a specific device or design. Further, this letter does not impute any distribution or licensing rights to the requester. This FHWA eligibility letter determination is made based solely on the crash-testing information submitted by the requester. The FHWA reserves the right to review and revoke an earlier eligibility determination after receipt of subsequent information related to crash testing.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they 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.

Sincerely,



Michael S. Griffith
Director, Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	June 27, 2018	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Chuck Mettler	
	Company:	PSS (Plastic Safety Systems) Inc.	
	Address:	2444 Baldwin Road, Cleveland, Ohio 44104	
	Country:	USA	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

I request the following devices be considered eligible for reimbursement under the Federal-aid highway program.

Device & Testing Criterion - Enter from right to left starting with Test Level

!-!-!

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zone Traffic Control Devices	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	SafetyRail	AASHTO MASH	TL3

By submitting this request for review and evaluation by the Federal Highway Administration, I certify that the product(s) was (were) tested in conformity with the AASHTO Manual for Assessing Safety Hardware and that the evaluation results meet the appropriate evaluation criteria in the MASH.

Individual or Organization responsible for the product:

Contact Name:	Chuck Mettler	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	PSS (Plastic Safety Systems) Inc.	Same as Submitter <input checked="" type="checkbox"/>
Address:	2444 Baldwin Road, Cleveland, Ohio 44104	Same as Submitter <input checked="" type="checkbox"/>
Country:	USA	Same as Submitter <input checked="" type="checkbox"/>

Enter below all disclosures of financial interests as required by the FHWA 'Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.

None

PRODUCT DESCRIPTION

<input checked="" type="radio"/> New Hardware or Significant Modification	<input type="radio"/> Modification to Existing Hardware	
<p>The SafetyRail channelizer was comprised of upper and lower notched wave boards, each measuring 48 inches long x 8¼ inches wide x 13/16 inches thick, supported by right-triangle shaped, hollow up-rights, each 38 inches tall x 24 inches wide at the base x 3¼ inches thick. Each up-right was weighted to the apron with one 45-to-50 lb sandbag. There were no bolts, pins, or adhesives that secured the up-rights to the concrete apron. The notched wave boards were attached to the up-rights with proprietary break-away bushings. The up-rights and wave boards were constructed of high density polyethylene (HDPE) material.</p> <p>Up-rights No. 6 through 25 (see attached report) were fitted with Type A-C beacon lights (Dicke Safety Products TrafILITE, with batteries). The upper wave boards between up-rights No. 10 and 11, and 11 and 12 (see attached report) were fitted with aluminum "SIDEWALK CLOSED" signs that measured 24 inches long x 18 inches tall x 0.100 inch thick.</p>		
<h3>CRASH TESTING</h3>		
<p>By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that all of the critical and relevant crash tests for this device listed above were conducted to meet the MASH test criteria. The Engineer has determined that no other crash tests are necessary to determine the device meets the MASH criteria.</p>		
Engineer Name:	D. Lance Bullard, Jr.	
Engineer Signature:	D. Lance Bullard, Jr. Digitally signed by D. Lance Bullard, Jr. Date: 2018.06.04 08:20:48 -05'00'	
Address:	TTI, TAMU 3135, College Station, TX 77843-3135	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-90(1100C)	<p>Test 3-90 involves an 1100C vehicle impacting the test article at a target speed of 62 mph and at a target angle of 0-to-25 degrees. The results of the test conducted on October 16, 2017 are found in TTI Test Report number 690900-PSS9&10. The test vehicle contacted the channelizer at a barricade support at the joint between barricade 9 and 10 at an impact angle of 9.7° while traveling at an impact speed of 61.7 mi/h. The vehicle penetrated through the channelizer and the brakes on the vehicle were applied 1.7 s after impact. The vehicle subsequently came to rest 223 ft downstream of impact and 16 ft behind the installation. The wave boards and sand/sand bags were strewn over an area 250 ft long, 53 ft behind the field side, and 35 ft forward of the traffic side. The channelizer opening created from the impact extended from supports 10 through 21. One of the wave boards lodged under the vehicle, but did not penetrate or show potential to penetrate the occupant compartment. The front bumper, hood, right front fender, and front part of the roof received slight denting and scuffing, and the headlight was dislodged. There was slight denting, but no measurable deformation of the exterior of the vehicle. No occupant compartment deformation or intrusion occurred. Occupant risk factors were all within the preferred MASH limits. The device performed acceptably for MASH test 3-90.</p>	PASS

Required Test Number	Narrative Description	Evaluation Results
3-91(2270P)	<p>Test 3-91 involves a 2270P vehicle impacting the test article at a target speed of 62 mph and at a target angle of 0-to-25 degrees. The test vehicle contacted the channelizer at barricade support 10 at an impact angle of 9.9° while traveling at an impact speed of 64.0 mi/h. The vehicle penetrated the channelizer and the brakes on the vehicle were applied at 1.7 s. The vehicle subsequently came to rest 307 ft downstream of the impact and 15 ft toward the field side. The wave boards and sand/sand bags were strewn over an area 327 ft long, 45 ft behind the field side, and 48 ft forward of the traffic side. The channelizer opening created by the impact extended from supports 10 through 22. The front bumper, grill, hood, and right front fender were slightly deformed. No occupant compartment deformation or intrusion occurred. Occupant risk factors were all within the preferred MASH limits. The device performed acceptably for MASH test 3-91.</p>	PASS
		Non-Critical, not conducted

Full Scale Crash Testing was done in compliance with MASH by the following accredited crash test laboratory (cite the laboratory's accreditation status as noted in the crash test reports.):

Laboratory Name:	Texas A&M Transportation Institute	
Laboratory Signature:	Darrell L. Kuhn	Digitally signed by Darrell L. Kuhn Date: 2018.06.01 17:08:30 -05'00'
Address:	TTI, TAMU 3135, College Station, TX 77843-3135	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	ISO 17025 Laboratory Certificate Number: 2821.01 Valid To: April 30, 2019	

Submitter Signature*:

Submit Form

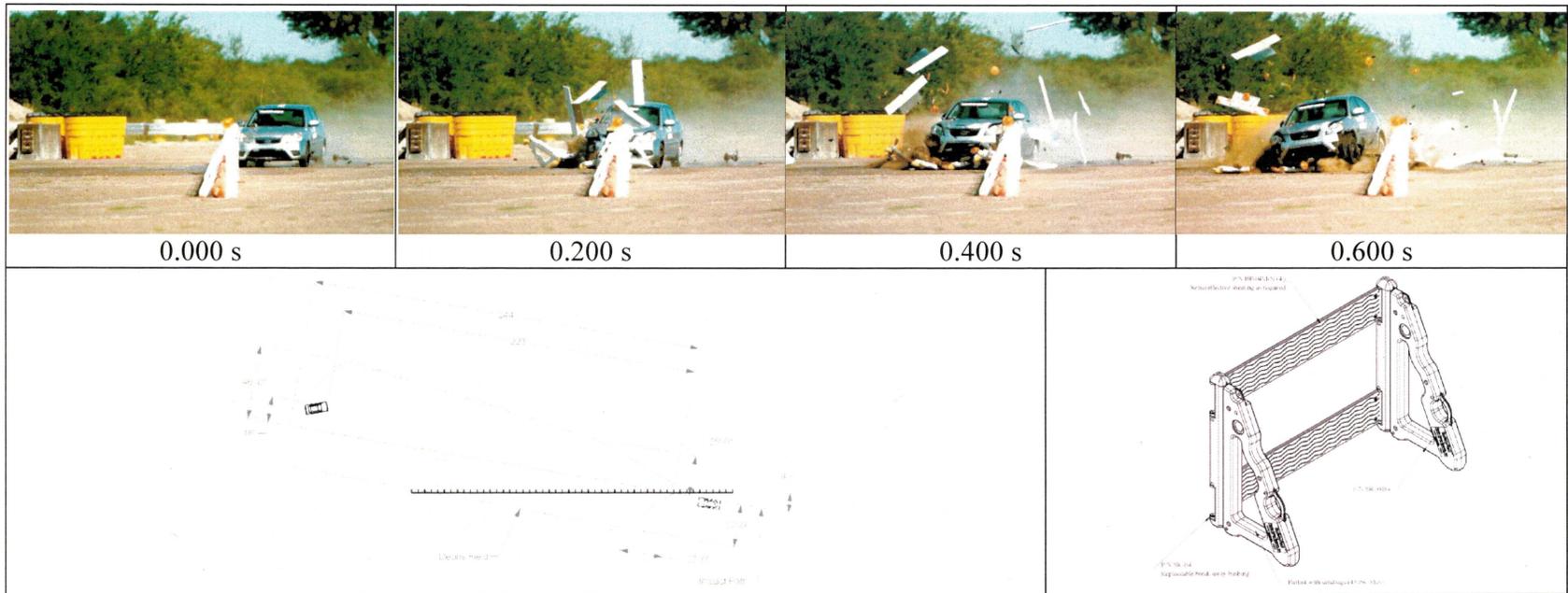
ATTACHMENTS

Attach to this form:

- 1) Additional disclosures of related financial interest as indicated above.
- 2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
- 3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [[Hardware Guide Drawing Standards](#)]. For proprietary products, a single isometric line drawing is usually acceptable to illustrate the product, with detailed specifications, intended use, and contact information provided on the reverse. Additional drawings (not in TF-13 format) showing details that are relevant to understanding the dimensions and performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		
Number	Date	Key Words



General Information

Test Agency..... Texas A&M Transportation Institute (TTI)
 Test Standard Test No..... MASH Test 3-90
 TTI Test No. 690900-PSS9
 Test Date 2017-10-16

Test Article

Type Longitudinal Channelizer
 Name..... PSS SafetyRail™
 Installation Length..... 201 ft
 Material or Key Elements ... 50 4-ft long proprietary, repositionable, high density polyethylene (HDPE) pedestrian barrier segments

Soil Type and Condition

Concrete Surface, Dry

Test Vehicle

Type/Designation 1100C
 Make and Model 2011 Kia Rio
 Curb 2460 lb
 Test Inertial 2429 lb
 Dummy 165 lb
 Gross Static 2594 lb

Impact Conditions

Speed 61.7 mi/h
 Angle 9.7°
 Location/Orientation Support 10

Kinetic Energy

311 kip-ft

Exit Conditions

Speed 55.3 mi/h
 Angle 13.8°

Occupant Risk Values

Longitudinal OIV 13.8 ft/s
 Lateral OIV NA
 Longitudinal Ridedown 2.4 g
 Lateral Ridedown NA
 THIV Not obtainable
 PHD Not obtainable
 ASI Not obtainable

Max. 0.050-s Average

Longitudinal Not obtainable
 Lateral Not obtainable
 Vertical Not obtainable

Post-Impact Trajectory

Stopping Distance 223 ft downstream
 16 ft twd field side

Vehicle Stability

Maximum Yaw Angle Not obtainable
 Maximum Pitch Angle Not obtainable
 Maximum Roll Angle Not obtainable

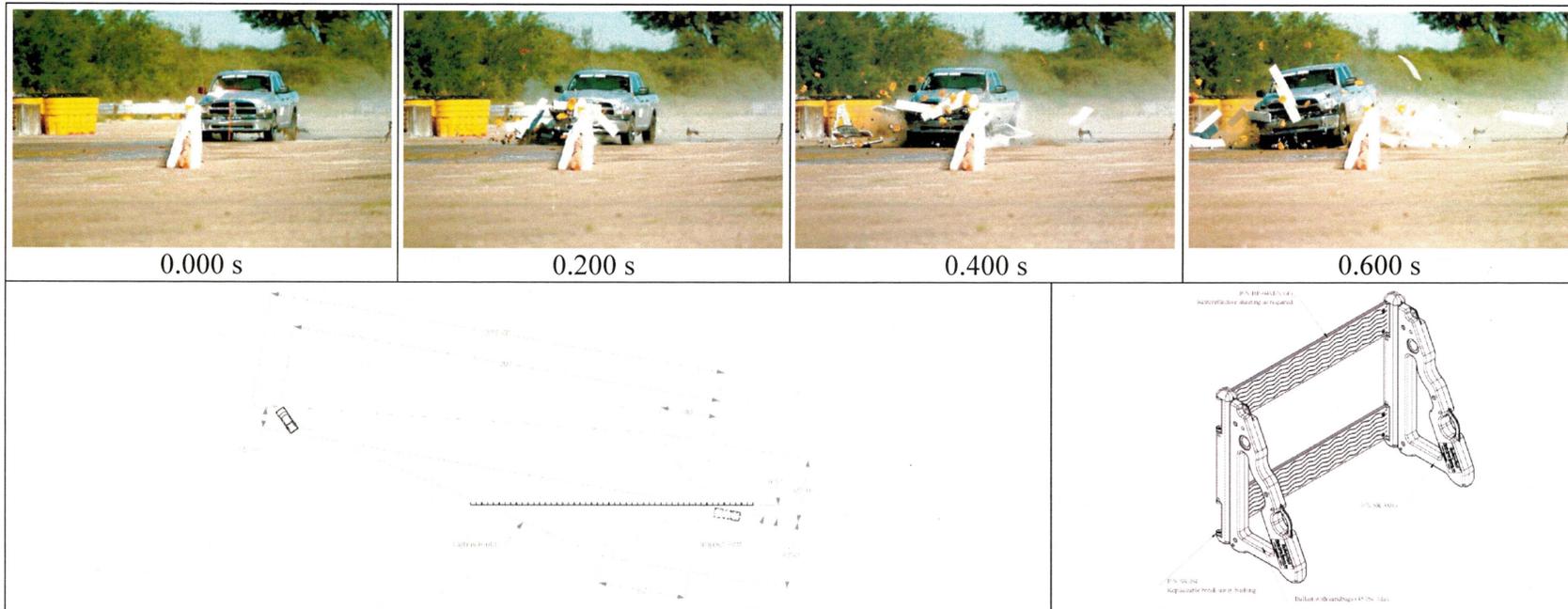
Test Article Debris Field

Longitudinal 250 ft
 Toward Traffic Side 53 ft
 Toward Field Side 35 ft

Vehicle Damage

VDS 01RFQ1
 CDC 01FREW1
 Max. Exterior Deformation Negligible
 OCDI FS0000000
 Max. Occupant Compartment Deformation None

Figure 5.8. Summary of Results for MASH Test 3-90 on PSS SafetyRail™ Channelizer.



General Information

Test Agency..... Texas A&M Transportation Institute (TTI)
 Test Standard Test No..... MASH Test 3-91
 TTI Test No. 690900-PSS10
 Test Date..... 2017-10-17

Test Article

Type Longitudinal Channelizer
 Name..... PSS SafetyRail™
 Installation Length..... 201 ft
 Material or Key Elements ... 50 4-ft long proprietary, repositionable, high density polyethylene (HDPE) pedestrian barrier segments

Soil Type and Condition

Test Vehicle

Type/Designation..... 2270P
 Make and Model 2012 Dodge RAM 1500 Pickup
 Curb..... 5005 lb
 Test Inertial..... 5054 lb
 Dummy No dummy
 Gross Static..... 5054 lb

Impact Conditions

Speed 64.0 mi/h
 Angle 9.9°
 Location/Orientation Support 10

Kinetic Energy

Exit Conditions

Speed 59.4 mi/h
 Angle 11.1°

Occupant Risk Values

Longitudinal OIV 7.2 ft/s
 Lateral OIV..... 1.6 ft/s
 Longitudinal Ridedown 0.8 g
 Lateral Ridedown 0.6 g
 THIV 8.5 km/h
 PHD 0.8 g
 ASI..... 0.11

Max. 0.050-s Average

Longitudinal -0.7 g
 Lateral..... 0.6 g
 Vertical..... 1.0 g

Post-Impact Trajectory

Stopping Distance..... 307 ft downstream
 15 ft twd field side

Vehicle Stability

Maximum Yaw Angle 3°
 Maximum Pitch Angle 3°
 Maximum Roll Angle 10°

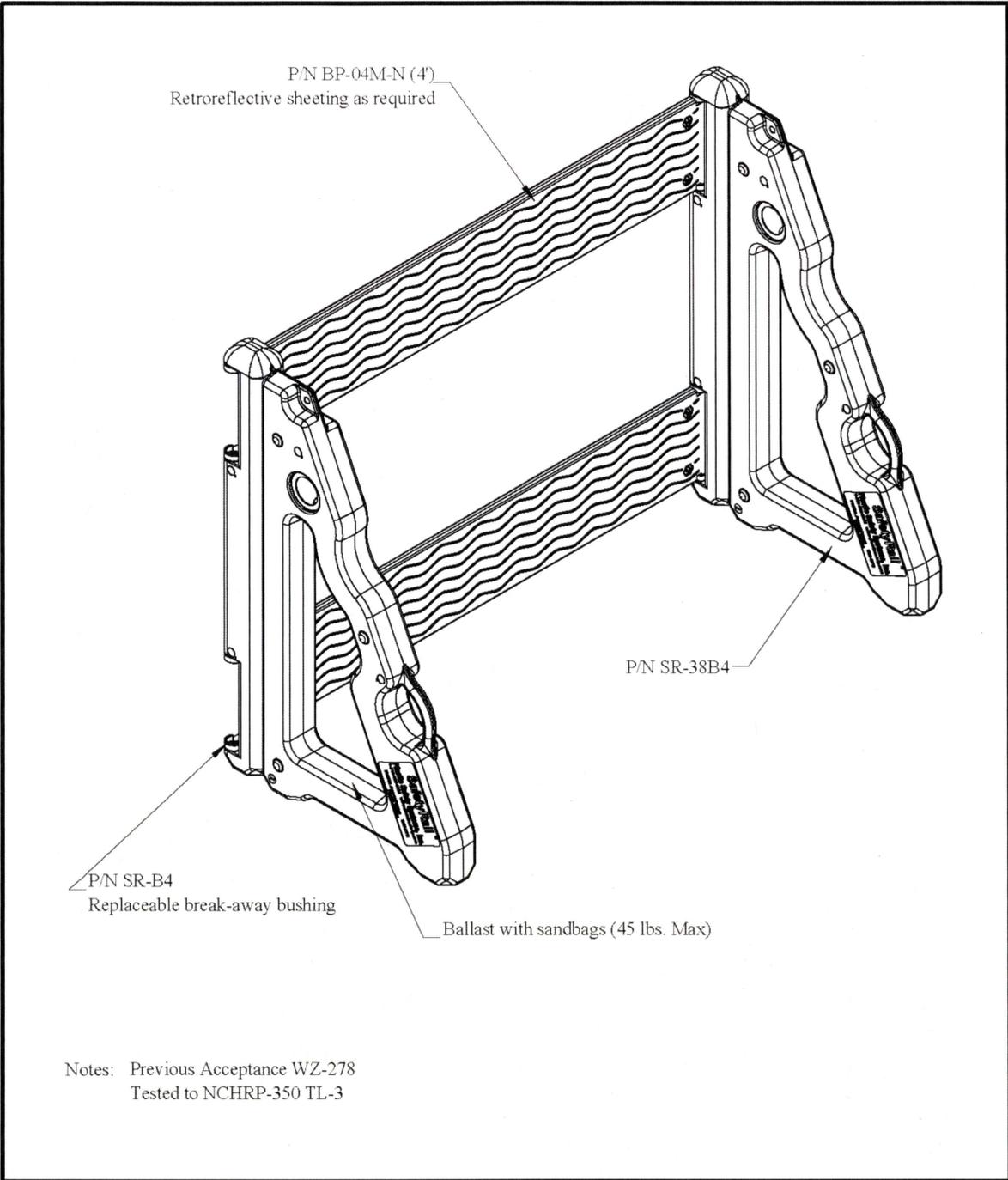
Test Article Debris Field

Longitudinal 327 ft
 Toward Traffic Side 48 ft
 Toward Field Side 45 ft

Vehicle Damage

VDS 01RFQ1
 CDC..... 01FREW1
 Max. Exterior Deformation..... Negligible
 OCDI..... FS0000000
 Max. Occupant Compartment Deformation None

Figure 6.8. Summary of Results for MASH Test 3-91 on PSS SafetyRail™ Channelizer.



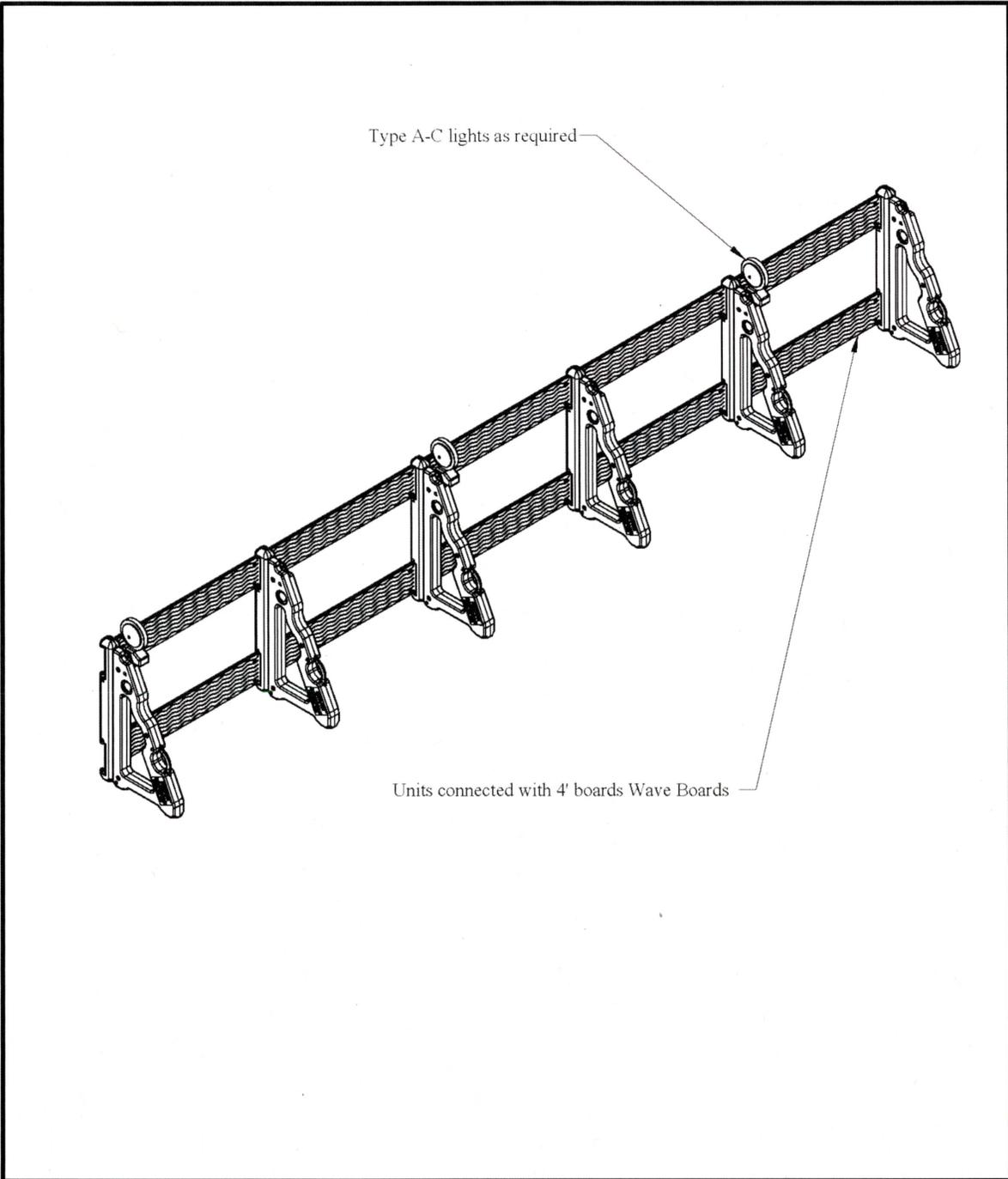
Notes: Previous Acceptance WZ-278
Tested to NCHRP-350 TL-3

Safety Rail

PSS

XXXXX

Sheet No.	Date
1 of 4	5/30/17



SafetyRail

PSS

XXXXX	
Sheet No.	Date
2 of 4	5/30/17