



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

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

December 4, 2020

In Reply Refer To:  
HSST-1/ B-292A

Stephan Flapper  
Laura Metaal Road Safety  
Rimburgerweg 40, 647 XX Kerkrade  
Netherlands

Dear Mr. Flapper:

This letter is in response to your August 24, 2017 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. On May 29, 2020, you requested that this submittal be modified by substituting updated testing information for test 3-11. Specifically, you requested that the results for original test 3-11 (Test Report 18664 conducted 4/19/17) be replaced by updated results for test 3-11 (Test Report 18933 conducted 5/23/18). Test 18664 was conducted at a higher (above the maximum MASH tolerance limit) impact speed but considered acceptable and test 18933 was conducted within MASH tolerances for impact speed. This modified letter supersedes the original letter B-292 for the SafeZone MASH TL-3 Limited Deflection Barrier and is assigned FHWA control number B-292A and is valid until a subsequent letter is issued by FHWA that expressly references this device.

### **Decision**

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:

- SafeZone MASH TL-3 Limited Deflection

### **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 American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (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: SafeZone MASH TL-3 Limited Deflection  
Type of system: Rigid/Semi-Rigid Barriers  
Test Level: MASH Test Level 3  
Testing conducted by: Crashtest-service.com GmbH  
Date of request: April 29, 2020

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within 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 and will need to be tested in accordance with all recommended tests in AASHTO's MASH as part of a new and separate submittal.

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 B-292A 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.

Sincerely,

A handwritten signature in blue ink that reads "Michael Griffith". The signature is written in a cursive style with a large initial "M" and "G".

Michael Griffith  
Director, Office of Safety Technologies  
Office of Safety

Enclosures

## Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

<b>Submitter</b>	Date of Request:	April 29, 2020	<input type="radio"/> New <input checked="" type="radio"/> Resubmission
	Name:	Stephan Flapper	
	Company:	Laura Metaal Road Safety	
	Address:	Rimburgerweg 40, 6471 XX Kerkrade	
	Country:	The Netherlands	
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
'B': Rigid/Semi-Rigid Barriers	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	SafeZone MASH TL-3 Limited Deflection	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:	Stephan Flapper	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	Laura Metaal Road Safety	Same as Submitter <input checked="" type="checkbox"/>
Address:	Rimburgerweg 40, 6471 XX Kerkrade	Same as Submitter <input checked="" type="checkbox"/>
Country:	The Netherlands	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.

With respect to Laura Metaal Road Safety, Crashtest-service.com GmbH does not hold any financial interests. Laura Metaal Road Safety contracted Crashtest-service.com GmbH for the services of crash testing our product SafeZone according to specifications of AASHTO Manual for Assessing Safety Hardware (MASH) Tests 3-10 and 3-11. Crashtest-service.com GmbH was compensated for the cost of the crash tests. No consulting relationship, research funding or other forms of research support, patents, copyrights, other intellectual property interests, licenses, contractual relationships, business ownership or investments interests are retained for Crashtest-service.com GmbH

## PRODUCT DESCRIPTION

<a href="#">Help</a>	<p> <input checked="" type="radio"/> New Hardware or Significant Modification                  <input type="radio"/> Modification to Existing Hardware         </p> <p>             SafeZone system is a proprietary modular high containment and low deflection steel barrier developed by Laura Metaal Road Safety. It is designed for both permanent and temporary use in construction and roadwork applications. The system is typically deployed in 5.8 m (19') standard sections that can quickly be connected together to form the desired total length of barrier wall.         </p> <p>             Joining of the sections is done by linking them together and applying one security bolt per section to keep the sections securely fastened. If desired, two or three sections can remain connected permanently to form 11.6 m (38') or 17.4 m (54') combined sections for quicker placement on the road.         </p> <p>             SafeZone is 0.81 m (32") high and 0.45 m (18") wide without anchor units or 0.64 m (25") with anchor units. The weight is approximately 93 kg/m or 62 lbs/ft. For the MASH TL-3 Limited Deflection setup, 7 standard sections were lined up on asphalt, forming a 40.6 m (133 ft) string. The anchor positions used were the two outer positions, the second position on element one and the second position on every second element thereafter. Threaded rods 0.30 m (11.8") long and 0.030 m (1.18") diameter were used. All anchors were epoxied in asphalt. The dynamic deflection of the MASH TL-3-11 test was 0.61 m (23.8") and the permanent deflection was 0.25 m (9.8"). The dynamic working width was 1.06 m (41.8") and the permanent working width was 0.65 m (25.6").         </p> <h3 style="text-align: center;">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> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Engineer Name:</td> <td colspan="2">Peter Schimmelpfennig</td> </tr> <tr> <td>Engineer Signature:</td> <td style="text-align: center; vertical-align: middle;"><b>Peter Schimmelpfennig</b></td> <td style="font-size: small; vertical-align: middle;">Digital unterschrieben von Peter Schimmelpfennig Datum: 2020.05.08 15:06:00 +02'00'</td> </tr> <tr> <td>Address:</td> <td>Amelunxenstraße 30, 48167 Münster</td> <td>Same as Submitter <input type="checkbox"/></td> </tr> <tr> <td>Country:</td> <td>Germany</td> <td>Same as Submitter <input type="checkbox"/></td> </tr> </table>		Engineer Name:	Peter Schimmelpfennig		Engineer Signature:	<b>Peter Schimmelpfennig</b>	Digital unterschrieben von Peter Schimmelpfennig Datum: 2020.05.08 15:06:00 +02'00'	Address:	Amelunxenstraße 30, 48167 Münster	Same as Submitter <input type="checkbox"/>	Country:	Germany	Same as Submitter <input type="checkbox"/>
Engineer Name:	Peter Schimmelpfennig													
Engineer Signature:	<b>Peter Schimmelpfennig</b>	Digital unterschrieben von Peter Schimmelpfennig Datum: 2020.05.08 15:06:00 +02'00'												
Address:	Amelunxenstraße 30, 48167 Münster	Same as Submitter <input type="checkbox"/>												
Country:	Germany	Same as Submitter <input type="checkbox"/>												

A brief description of each crash test and its result: [Help](#)

Required Test Number	Narrative Description	Evaluation Results
3-10 (1100C)	Test nr. 18648. Test report nr. 11775-2887/18648 performed 20 April 2017 by Crashtest-Service.com. The 32" high longitudinal barrier contained and redirected the 1100C vehicle. The vehicle did not penetrate, underide or override the installation. Maximum dynamic deflection during the test was 13.8". No significant parts separated from either vehicle or barrier. No occupant compartment deformation or intrusion occurred. The vehicle remained upright during and after the impact.	PASS

Required Test Number	Narrative Description	Evaluation Results
3-11 (2270P)	Test nr. 18933. Test report nr. 11717-3157/18933 performed 23 May 2018 by Crashtest-service.com The 32" high longitudinal barrier contained and redirected the 2270P vehicle. The vehicle did not penetrate, underide or override the installation. Maximum dynamic deflection during the test was 23.8". No significant parts separated from either vehicle or barrier. No occupant compartment deformation or intrusion occurred. The vehicle remained upright during and after the impact.	PASS
3-20 (1100C)	Device is stand alone. 3-20 now not relevant.	Non-Relevant Test, not conducted
3-21 (2270P)	Device is stand alone. 3-20 now not relevant.	Non-Relevant Test, 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:	Crashtest-service.com GmbH	
Laboratory Signature:	Peter Schimmelpfennig <small>Digital unterschrieben von Peter Schimmelpfennig Datum: 2020.05.08 15:06:14 +02'00'</small>	
Address:	Amelunxenstraße 30, 48167 Münster	Same as Submitter <input type="checkbox"/>
Country:	Germany	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	D-PL-17359-01-00 07.05.2013 - 06.05.2018	

Submitter Signature\*: Stephan Flapper Digitaal ondertekend door  
Stephan Flapper  
Datum: 2020.05.11 15:08:13  
+02'00'

Submit Form

ATTACHMENTS


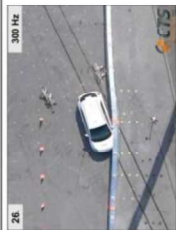
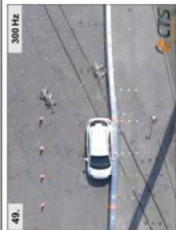

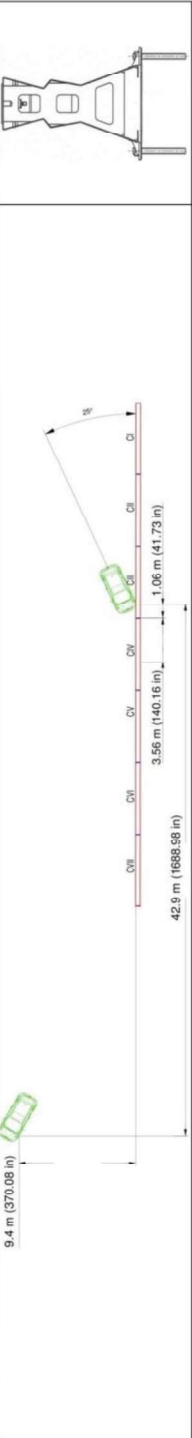
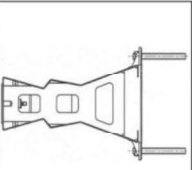
Attach to this form:

- 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

## Summary of Crash Test Results

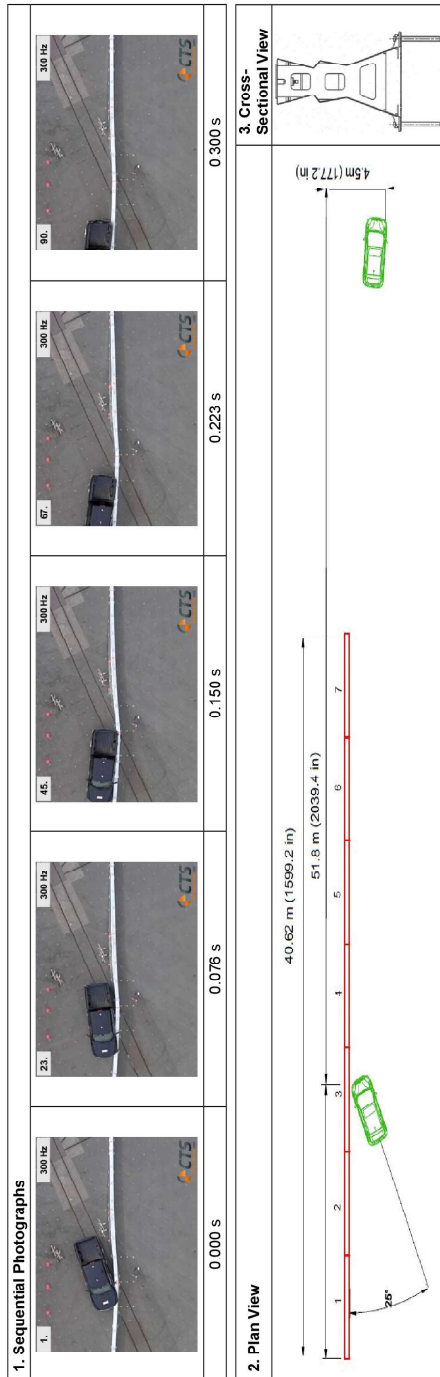
1. Sequential Photographs		3. Cross-Sectional View	
 3. 0.000 s	 26. 0.077 s	 49. 0.153 s	 72. 0.240 s
			

4. General Information			8. Impact Conditions			12. Test Article Damage			14. Vehicle Damage			
Test Agency (CTS)	crashtest-service.com GmbH		Speed	102.1 km/h (63.4 mph)		Classification	Moderate		Dynamic Deflection	0.35 m (13.8 in)		
Test Standard	MASH Test TL3-10		Angle	25 degrees		particularities	None		Permanent Deflection	0.24 m (9.4 in)		
CTS-Test No.	18648		Location/Orientation	1.06 m (41.7 in) before transition of elements III & IV		<b>13. Test Article Deflections</b>		Permanent Working Width	0.89 m (35.0 in)			
Date	April 20, 2017		<b>9. Exit Conditions</b>					Permanent Working Width	0.63 m (26.8 in)			
<b>5. Test Article</b>			Speed	84 km/h (52 mph)				<b>14. Vehicle Damage</b>				
Type	Barrier		Angle	12 degrees				Classification	Moderate			
Name	SafeZone		<b>10. Post-Impact Trajectory</b>			VDS	11LFQ3		CDC	11FDEW3		
Installation Length	40.62 m (1599.2 in)		Vehicle Stability	Satisfactory				Max. Exterior Deformation		74 mm (2.91 in)		
Key Elements - Barrier	Length: 5.80 m (228.3 in)		Stopping Distance	42.90 m (1689 in) downstream				Max. Interior Deformation		68 mm (2.68 in)		
	Base Width: 0.45 m (17.7 in)		Vehicle Snagging	9.40 m (370 in) laterally in front				OCDI		LF0000011		
			Vehicle Pockeiling	None								
<b>6. Soil Type and Condition</b>			<b>11. Occupant Risk</b>									
Type of Soil	Asphalt		Impact Velocity									
Soil strength	/		Longitudinal	4.72 m/s ( 15.49 ft/s)								
Condition	sunny, dry, 15.2° C ( 59.36° F)		Lateral	7.22 m/s ( 23.69 ft/s)								
<b>7. Test Vehicle</b>			Ridedown Accelerations (10 msec avg.)									
Type/Designation	1100C		Longitudinal	-5.37 g								
Make and Model	2014 KIA Rio		Lateral	-1.73 g								
Curb	1140 kg (2513 lb)											
Test Interial	1123 kg (2476 lb)											
Dummy	75 kg (165 lb)											
Gross Static	1198 kg (2641 lb)											



## Summary of Crash Test Results



THIV	6.2	m/s (20.3 ft/s)
PHD	10.98	g
ASI	0.94	
<b>12. Test Article Damage</b>		
Classification	Moderate	
Particularities	None	
<b>13. Test Article Deflections</b>		
Dynamic Deflection	0.605	m (23.8 in)
Permanent Deflection	0.250	m (9.8 in)
Dynamic Working Width	1.062	m (41.8 in)
Permanent Working Width	0.650	m (25.6 in)
<b>14. Vehicle Damage</b>		
Classification	Moderate	
VDS	11-LFQ-3	
CDC	11FDEW3	
Max. Exterior Deformation	174 mm (6.9 in)	
Max. Interior Deformation	48 mm (1.89 in)	
OCDI	LF0000000	

<b>8. Impact Conditions</b>		
Speed	93.3	km/h (61.1 mph)
Angle	25	degrees
Location/Orientation	1.56 m (5.12 ft) before transition of elements 3 & 4	
<b>9. Exit Conditions</b>		
Speed	80.4	km/h (49.99 mph)
Angle	6	degrees
<b>10. Post-Impact Trajectory</b>		
Vehicle Stability	Satisfactory	
Stopping Distance	51.8	m (170 ft) downstream
	4.5	m (14.8 ft) laterally in front
Vehicle Snagging	None	
Vehicle Pocketing	None	
<b>11. Occupant Risk</b>		
Impact Velocity		
Longitudinal	3.47	m/s (11.4 ft/s)
Lateral	5.78	m/s (19 ft/s)
Riddown Accelerations (10 msec avg.)		
Longitudinal	-3.59	g
Lateral	8.29	g

<b>4. General Information</b>	
Test Agency (CTS)	crashtest-service.com GmbH
Test Standard	MASH Test TL 3-11
CTS-Test No	18933
Date	May 23, 2018
<b>5. Test Article</b>	
Type	Barrier
Name	H51 barrier
Installation Length	40.62 m (1599.2 in)
Key Elements - Barrier	Length: 5.80 m (228.3 in) Base Width: 0.45 m (17.7 in) Height: 0.81 m (31.9 in)
<b>6. Soil Type and Condition</b>	
Type of Soil	Asphalt
Soil Strength	/
Condition	Dry, sunny, 26.8° C (80.2° F)
<b>7. Test Vehicle</b>	
Type/Designation	2270P
Make and Model	2013 Dodge Ram 1500 Pickup
Curb	2242 kg (4942 lb)
Test Inertial	2280 kg (5027 lb)
Dummy	/
Gross Static	2280 kg (5027 lb)

A.1 Maker's drawings of the item to be tested

