



U.S. Department
of Transportation

**Federal Highway
Administration**

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

February 15, 2018

In Reply Refer To:
HSST-1/B-301

Mr. Mathias Redlberger
REBLOC GmbH
Weiner Straße 662
3571 Gars am Kamp
Austria

Dear Mr. Redlberger:

This letter is in response to your November 27, 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. This FHWA letter of eligibility is assigned FHWA control number B-301 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:

- RB80S_12

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: RB80S_8
Type of system: Longitudinal Barrier
Test Level: MASH Test Level 3 (TL3)
Testing conducted by: MIRA, Ltd.
Date of request: December 6, 2017
Date initially acknowledged: December 6, 2017

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 B-301 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.
- 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:	November 27, 2017	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Mathias Redlberger	
	Company:	REBLOC GmbH	
	Address:	Wiener Straße 662, 3571 Gars am Kamp	
	Country:	Austria	
	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

1-1-1

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'B': Rigid/Semi-Rigid Barriers (Roadside, Median, Bridge Railings)	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	RB805_12	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:

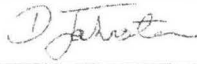
Contact Name:	Mathias Redlberger	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	REBLOC GmbH	Same as Submitter <input checked="" type="checkbox"/>
Address:	Wiener Straße 662, 3571 Gars am Kamp	Same as Submitter <input checked="" type="checkbox"/>
Country:	Austria	Same as Submitter <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.

Patents, copyrights, and other intellectual property interests;
Licenses or contractual relationships;
Business ownership and investment interests



PRODUCT DESCRIPTION

<input checked="" type="radio"/> New Hardware or Significant Modification	<input type="radio"/> Modification to Existing Hardware	
<p>The vehicle restraint system with the system name REBLOC RB80S_12 consists of factory produced precast elements, each element is 12.00m long, 0.30m wide and 0.80m high. The precast concrete elements have a cross section similar to an I-beam profile.</p> <p>The safety barriers are free standing, i.e. there is no anchorage to the ground, and only the two terminal elements have to be anchored to the asphalt surface by using anchor bolts.</p> <p>The restraining function is achieved by connecting the individual elements to form a continuous chain. The connection between the elements is by the integrated tension bars, whose couplings, situated on the face side of each element, interlock. Steel shoes which are part of the element, have mating projections and indentations that formed a double tongue/groove system. The concrete barriers stand on four support feet with elastomer pads on the underside. Situated at the top side of each element there are two galvanized lifting anchors.</p>		
CRASH TESTING		
<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:	Dave Johnstone	
Engineer Signature:		Digitally signed by Dave Johnstone Date: 2017.11.08 09:22:51 Z
Address:	Watling Street · Nuneaton · Warwickshire · CV10 0TU	Same as Submitter <input type="checkbox"/>
Country:	England	Same as Submitter <input type="checkbox"/>


A brief description of each crash test and its result:




Required Test Number	Narrative Description	Evaluation Results
3-10 (1100C)	<p>T0231, 31st May 2017, 1214221-001-01: The critical impact point was designated as being the first point of contact of the vehicle with the barrier which was at the mid-point of barrier unit #3 of the 7 units installed. Since the barrier was a continuous solid unit there was minimal risk of under-riding, over-riding or pocketing/wheel snag and so CIP was chosen to be with the vehicle impacting the most resistive part of the barrier and thus generating the highest occupant severity indices. The vehicle made contact with the barrier causing it to move away from the original traffic face line. The vehicle was redirected and ran along in contact with the barrier traffic face for the remaining length of system. The remote braking system brought the vehicle to halt 73m downstream of impact point and 4m in front of the traffic face.</p>	PASS
3-11 (2270P)	<p>T0232, 1st Jun 2017, 1214221-002-01: The critical impact point was designated as being the first point of contact of the vehicle with the barrier was at point 1.3m upstream of the joint between units #3 and #4. Since the barrier was a continuous solid unit there was minimal risk of under-riding, over-riding or pocketing/wheel snag and so CIP was chosen to be with the vehicle impacting the most flexible part of the barrier (joint) and thus generate the greatest barrier deflection. The vehicle made contact with the barrier causing it to move away from the original traffic face line and roll slightly backwards, lifting the front foot of the units. The vehicle was redirected away from the traffic face, the rear end rising up in the air, and when it left the barrier, the system returned to almost vertical. The remote braking system brought the vehicle to halt 199ft. (61m) downstream of impact point and 8.5ft. (2.6m) in front of the traffic face.</p>	PASS
3-20 (1100C)		Non-Relevant Test, not conducted
3-21 (2270P)		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:	MIRA, Ltd.		
Laboratory Signature:		Digitally signed by Rachael Kennedy Date: 2017.11.08 09:28:47 Z	
Address:	Watling Street · Nuneaton · Warwickshire · CV10 0TU	Same as Submitter <input type="checkbox"/>	
Country:	England	Same as Submitter <input type="checkbox"/>	
Accreditation Certificate Number and Dates of current Accreditation period :	UKAS testing laboratory 1105, Issue No:053 Issue Date:24/01/2017		


27.11.2017

Submitter Signature*:

Submit Form

ATTACHMENTS

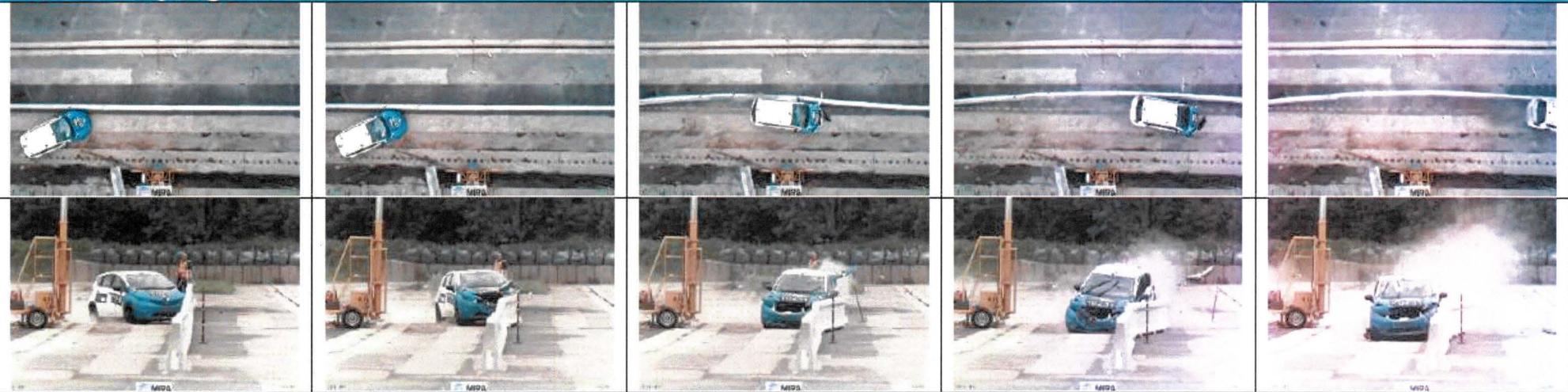
Attach to this form:

- 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		Key Words
Number	Date	

Test Summary Page



4. General Information		10. Post-Impact Trajectory	
Test Agency	HORIBA MIRA Ltd	Vehicle Stability	Acceptable
Test no.	T0231	Stopping distance ft. (m)	300 (73) downstream 13 (4) in front of traffic face
Test Date	31 st May 2017	11. Occupant Risk Values	
5. Test Article		Impact Velocity ft./s (m/s)	X-direction 15.1 (4.6) at 82ms Y-direction -20.7 (-6.3) at 80ms
Type	Surface mounted Pre-cast reinforced concrete barrier	THIV (optional), mph (km/h)	15.6 (25) @ 90ms
Installation Length, ft. (m)	302 (92.04)	Occupant Ride down Acceleration (g)	X-direction 4 @ 309ms Y-direction -6 @ 210ms
Size and/or dimension and material key elements, in. (mm)	Width at top 7.3 (0.185m), Width at base 11.8 (0.3m), height 31.5 (0.8m), length 472.4 (12m). Each end unit was pinned by 4off M16x150mm screw-bolts into tarmac surface	PHD (g) (optional)	7 @ 210ms
6. Ground Conditions		ASI (optional)	1.6 @ 36ms
Test surface/Ground	Tarmacadam surface approx. 3.9in. (100mm) thick	12. Test Article Damage	
7. Test Vehicle		Joint between #3 and #4 pushed back by 33.5in. (0.85m). Series of small cracks showing on rear face of #3, large crack showing on traffic face of #3 small pieces broken off traffic face of #3	
Designation	1100C (Passenger Car)	13. Test Article Deflections	
Make / Model	Nissan Note	Dynamic, in. (m)	40.6 (1.00)
Mass, lb (kg)	Kerb 2285 (1036.5)	Permanent Set, in. (m)	35.2 (0.9)
	Test Inertial 2438 (1106)	Working Width, in. (m)	48.1 (1.2)
	Gross Static 2610 (1184)	14. Vehicle Damage	
8. Impact Conditions		LHF wheel pushed back into sill and deflated. LHF wing crushed, front bumper part detached, both headlamps displaced. LH side SRS deployed	
Speed, mile/h (km/h)	62.4 (100.4)		
Angle (deg)	25.3		
Location	Vehicle first contact point at the middle of unit 3.		
9. Exit Conditions			
Speed, mile/h (km/h)	55.7 (89.7)		

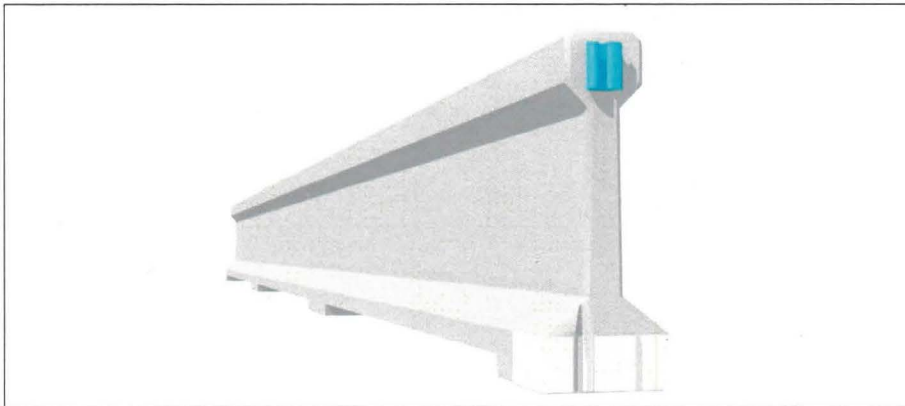
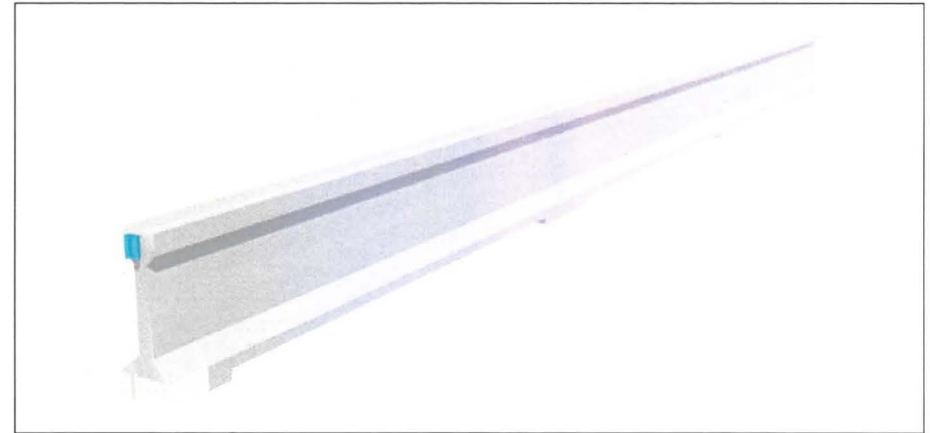
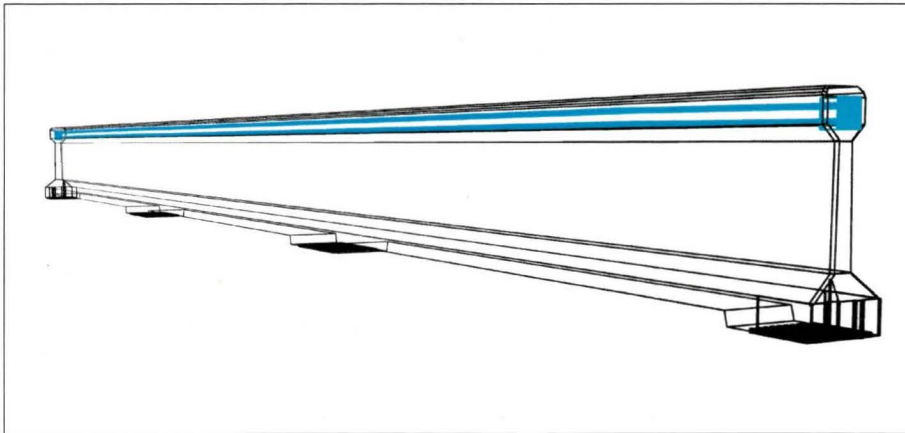
Test Summary Page



4. General Information		10. Post-Impact Trajectory		
Test Agency	HORIBA MIRA Ltd	Vehicle Stability	Acceptable	
Test no.	T0232	Stopping distance ft. (m)	199 (61) downstream 8.5 (2.6) in front of traffic face	
Test Date	1 st Jun 2017	11. Occupant Risk Values		
5. Test Article		Impact Velocity ft./s (m/s)	X-direction 19.7 (6.0) @ 118ms Y-direction 16.7 (-5.1) @ 118ms	
Type	Surface mounted Pre-cast reinforced concrete barrier	THIV (optional), mph (km/h)	16.8 (27) @ 112ms	
Installation Length, ft. (m)	302 (92.04)	Occupant Ride down Acceleration (g)	X-direction 5 @ 120ms Y-direction -6 @ 315ms	
Size and/or dimension and material key elements, in. (mm)	Width at top 7.3 (0.185m), Width at base 11.8 (0.3m), height 31.5 (0.8m), length 472.4 (12m). Each end unit was pinned by 4off M16x150mm screw-bolts into tarmacadam surface	PHD (g) (optional)	6 @ 287ms	
6. Ground Conditions		ASI (optional)	1.0 @ 49ms	
Test surface/Ground	Tarmacadam surface approx. 3.9in. (100mm) thick	12. Test Article Damage		
7. Test Vehicle		Joining ends of units #3 & #4 shattered w/concrete detached. Reinforcing bars exposed, joint remained intact. Middle of unit #4 cracked.		
Designation	22700C (Pick-up)	13. Test Article Deflections		
Make / Model	Dodge Ram 1500	Dynamic, in. (m)	44.4 (1.1)	
Mass, lb (kg)	Kerb	5082 (2305)	Permanent Set, in. (m)	41.6 (1.1)
	Test Inertial	5004 (2270)	Working Width, in. (m)	63.0 (1.6)
	Gross Static	5004 (2270)	14. Vehicle Damage	
8. Impact Conditions		Damage to LH corner of front bumper. LHF wing moved back & panels scratched. LHF wheel partly detached & tyre pulled from wheel. LHR wheel damaged & tyre deflated. LHS & both front airbags deployed.		
Speed, mile/h (km/h)	62.1 (99.9)			
Angle (deg)	24.0			
Location	1.3m upstream of a joint between two barrier units			
9. Exit Conditions				
Speed, mile/h (km/h)	42.6 (68.6)			

REBLOC[®] RB80S_12

Temporary System - standard element



The element is connected by the integrated coupling, located at the face of the element.

all dimensions in cm

Element	RB80S_12
Dimensions	315" x 12" x 31 1/2" (800 x 30 x 80 cm)
Weight/element	6,614 lb (3,000 kg)
Material	Concrete 5,000 psi
Drawing no.	6.0044
Date	2017-10-20

REBLOC GmbH

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