



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 12

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.

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

Wichael S. Freffett

Office of Safety

Enclosures

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

	Date of Request:	November 27, 2017	<ul><li>New</li></ul>	○ Resubmission
	Name:	Mathias Rediberger	***************************************	
itter	Company:	REBLOC GmbH		
	Address:	Wiener Straße 662, 3571 Gars am Kamp		
Subm	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

		ting with rest Level		[-1-1
System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'B': Rigid/Semi-Rigid Barriers (Roadside, Median, Bridge Railings)	<ul><li>Physical Crash Testing</li><li>Engineering Analysis</li></ul>	RB80S_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 🔀							
Company Name:	REBLOC GmbH	Same as Submitter 🖂							
Address:	Wiener Straße 662, 3571 Gars am Kamp	Same as Submitter 🖂							
Country: Austria Same as Submitter  Enter below all disclosures of financial interests as required by the FHWA `Federal-Aid Reimbursement									
Eligibility Process	for Safety Hardware Devices' document.								
Patents, copyright Licenses or contrac	s, and other intellectual property interests; ctual relationships; o and investment interests								



### PRODUCT DESCRIPTION

all of the Critical and relevant cracriteria. The Engineer has determined the MASH criteria.  Engineer Name:  Engineer Signature:  Address:  Country:  A brief description of each cracriteria.	Dave Johnstone  Digitally sign Date: 2017.1  Watling Street · Nuneaton · Warwickshire · CV10 0TU  England	ned by Dave Johnstone 1.08 09:22:51 Z  Same as Submitter
criteria. The Engineer has deteri the MASH criteria. Engineer Name: Engineer Signature:	Dave Johnstone  Digitally sign Date: 2017.1	ned by Dave Johnstone 1.08 09:22:51 Z
criteria. The Engineer has deteri the MASH criteria. Engineer Name:	Dave Johnstone  Digitally sign	ned by Dave Johnstone
criteria. The Engineer has deteri the MASH criteria.		nine the device meets
criteria. The Engineer has deteri	inned that no other crash tests are necessary to determ	nine the device meets
By signature below, the Enginee	CRASH TESTING  er affiliated with the testing laboratory, agrees in supposes tests for this device listed above were conducted to	meet the MASH test
arrenors.		
connection between the eleme of each element, interlock. Stee indentations that formed a dou	eved by connecting the individual elements to form a context of the integrated tension bars, whose couplings, I shoes which are part of the element, have mating proble tongue/groove system. The concrete barriers standarders is the top side of each element there are standarders.	situated on the face side ejections and on four support feet
	ding, i.e. there is no anchorage to the ground, and only to the asphalt surface by using anchor bolts.	the two terminal
elements, each element is 12.00 cross section similar to an I-bea	Existing Hardware the system name REBLOC RB80S_12 consists of factor and long, 0.30m wide and 0.80m high. The precast conditions of the process to the proce	ory produced precast crete elements have a
The vehicle restraint system wit		

h

		Page 3 of 4
Required Test Number	Narrative Description	Evaluation Results
3-10 (1100C)	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 7units installed. Since the barrier was a continuous solid unit there was minimal risk of underriding, 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.	PASS
*	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.	PASS
1	(7 6 m) in front of the to-ffi - f	
1	(2.6m) in front of the traffic face.	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.):

Version 10.0 (05/16) Page 4 of 4

Laboratory Name:	MIRA, Ltd.	-
Laboratory Signature:		ned by Rachael Kennedy 1.08 09:28:47 Z
Address:	Watling Street · Nuneaton · Warwickshire · CV10 0TU	Same as Submitter
Country:	England	Same as Submitter
Accreditation Certificate Number and Dates of current Accreditation period :	UKAS testing laboratory 1105, Issue No:053 Issue Date:24/01/2017	

Submitter Signature\*:

27.11.2017

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:

Eligibili	ty Letter	
Number	Date	Key Words

In and length 472 4 (12m). Each end unit was pinned by 40ff Mf8x150mm screw-bolts into tarmac surface approx. 3.9in. (100mm) thick  1100C (Passenger Car)  Validation 1.285 (1036.5)  t Inertial 2438 (1106)  85 Static 2610 (1184)  62.4 (100.4)  Vehicle first contact point at the middle of unit 3.	bumper part detached, both headlamps displaced. LH side SRS deployed	irt detached, both headlamps	bumper pa		55.7 (89.7)	Speed, mile/h (km/h)
Internation  HORIBA MIRA Ltd T0231 31**May 2017  Immension and elements, in. Screw-bolts into tarmac surface onditions Ground Tarmacadam surface approx 3 9in. (100mm) thick  Kerb 2285 (1036) Gross Static 2610 (1184) Inditions  Fest inertial 2438 (1106) Gross Static 2610 (1184) Vehicle first contact point at the middle of unit 3.	eflated. LHF wing crushed, front	pushed back into sill and de	LHF wheel			
Internation  Internation  Internation  HORIBA MIRA Ltd T10231 T10331 T10		e Damage	14. Vehick	of unit 3.	Vehicle first contact point at the middle	cation
Inditions   Indi	48.1 (1.2)		Working W		25.3	
Internation  HORIBA MIRA Ltd  10231  10231  10231  10231  10231  10231  1032 (92.04)  Width at top 7.2 4 (12m). Each end unit was pinned by 4off M16x150mm screw-bolts into tarmac surface  Ground  Ground  Tarmacadam surface approx. 3.9in. (100mm) thick  1 100C (Passenger Car)  Kerb  1 2438 (1106)  Test Inertial  2438 (1106)  Gross Static  2610 (1184)	35.2 (0.9)		Permanen		62.4 (100.4)	
Iformation HORIBA MIRA Ltd T0231 31** May 2017  Surface mounted Pre-cast reinforced concrete barrier angth, ft. (m) Surface mounted Pre-cast reinforced concrete barrier since the strip of	40.6 (1.00)		Dynamic, i			Impact Conditions
Intermation  HORIBA MIRA Ltd T0231 T		rticle Deflections	13. Test A		2610 (1184)	Static
Internation  HORIBA MIRA Ltd  T0231  T0231  Surface mounted Pre-cast reinforced concrete barrier angth, ft. (m)  Surface mounted Pre-cast reinforced concrete barrier angth, ft. (m)  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 acrew-bolts into tarmac surface  Internation  Internation  HORIBA MIRA Ltd  T0231  T02331  T0231  T0231  T0231  T0231  T0231  T0231  T0231  T0231  T02331  T0231  T0231  T0231  T0231  T0231  T0231  T0231  T0231  T02331  T03331  T03	of #3	wing on rear face of #3, large leces broken off traffic face o	#3 small pi	۸	2438 (1106)	
formation  HORIBA MIRA Ltd  10231  Surface mounted Pre-cast reinforced concrete barrier Indit f. (m) Indit at top 7.3 (0.185m), Width at base 11.8 (0.3m), height 31.5 (0.8m), Horight 472.4 (12m). Each end unit was pinned by 4off M16x150mm Inditions Indication Indic	by 33.5in. (0.85m). Series of small	een #3 and #4 pushed back t	Joint betwe		2285 (1036.5)	Kerb
HORIBA MIRA Ltd  HORIBA MIRA Ltd  10. Post-Impact Trajectory  Vehicle Stability  10.231  31st May 2017  Surface mounted Pre-cast reinforced concrete barrier  Surface mounted Pre-cast reinforced concrete barrier  302 (92.04)  Width at top 7.3 (0.185m), Width at base 11.8 (0.3m), height 31.5 (0.8m), eight 472.4 (12m). Each end unit was pinned by 4off M16x150mm  screw-bolts into tarmac surface  Tarmacadam surface approx. 3.9in. (100mm) thick  Tarmacadam surface approx. 3.9in. (100mm) thick  ASI (optional)  ASI (optional)		rticle Damage	12. Test A		Nissan Note	
HORIBA MIRA Ltd  T0231  T0231  Surface mounted Pre-cast reinforced concrete barrier Inpact Velocity It./s Inpact Velocity It./s Vehicle Stability Vehicle Stability Vehicle Stability Inpact Velocity It./s Vehicle Stability Vehicle Stability Vehicle Stability Vehicle Stability Inpact Velocity It./s Vehicle Stability Vehicle Stability Inpact Velocity It./s Vehicle Stability Vehicle Stability Inpact Velocity It./s Vehicle Stability Inpact Velocity It./s Vehicle Stability Vehicle Stability Inpact Velocity It./s Vehicle Stability Inpact Velocity It./s Vehicle Stability Vehicle Stability Inpact Velocity It./s Vehicle Stability Vehicle S	1.6 @ 36ms		ASI (option		1100C (Passenger Car)	esignation
HORIBA MIRA Ltd T0231 T02017 Vehicle Stability T1. Occupant Risk Values North 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 Stopping distance ft. (m) T1. Occupant Risk Values T1.8 (0.3m), height 31.5 (0.8m), mph (km/h) Screw-bolts into tarmac surface THIV (optional), mph (km/h) Acceleration (g) V-direction V-direction V-direction	7 @ 210ms		PHD (g) (o			Test Vehicle
HORIBA MIRA Ltd T0231 31st May 2017  Surface mounted Pre-cast reinforced concrete barrier 302 (92.04)  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 M16x150nnn Increw-bolts into tarmac surface  Screw-bolts into tarmac surface  Occupant Ride down  X-direction  Azelirection  Azelirection  Occupant Ride down  X-direction	-6 @ 210ms	Y-direction	Acceleration	00mm) thick		
HORIBA MIRA Ltd T0231 31st May 2017  HORIBA MIRA Ltd T0231 30 (92.04)  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-botts into tarmac surface  THIV (optional), mph (km/h)	4 @ 309ms	X-direction	Occupant			Ground Conditions
HORIBA MIRA Ltd  T0231  T0231  T0231  T0231  Stopping distance ft. (m)  Surface mounted Pre-cast reinforced concrete barrier  Surface mounted Pre-cast reinforced concrete barrier  Midth 1 to 2 (1.85m), Width 1 to 2 (1.8 (0.9 m)), beints 21.5 (0.9 m)  Width 1 to 2 (1.8 (0.9 m)), beints 21.5 (0.9 m), beints 21.5 (0.9 m)  Width 1 to 2 (1.8 (0.9 m)), beints 21.5 (0.9 m), beints 21.5 (0.9	15.6 (25) @ 90ms	000	THIV (option	as pinned by 4off M16x150mm	length 472.4 (12m). Each end unit v screw-bolts into tarmac surface	
HORIBA MIRA Ltd  T0231  31s May 2017  Surface mounted Pre-cast reinforced concrete barrier Indicators (mpact Velocity ft./s (mpact Velocity ft./s (Adirection Velocity ft./s (Maction Indicators))	-20.7 (-0.3) dt 60m5	I-dilection	(111/5)	0 11 0 (0 2m) boight 21 E (0 0m)	Width at top 7 2 (0.105m) Width at has	
HORIBA MIRA Ltd T0231 T0231 Stopping distance ft. (m) T1. Occupant Risk Values Incompared to the first of the	4	V direction	impact ver	officiete patrici	202 (02 04)	
HORIBA MIRA Ltd T0231 T0231 31st May 2017  Total		Y-direction	impact Val	oncrete harrier	Surface mounted Pre-cast reinforced of	
HORIBA MIRA Ltd  HORIBA MIRA Ltd  Togar  Togar  Stopping distance ft. (m)	HOLL OF BRILL PACE				OT INICH ZOTT	
HORIBA MIRA Ltd  HORIBA MIRA Ltd  Vehicle Stability  Vehicle Stability	front of traffic face		Stopping d		31st May 2017	
HORIBA MIRA Ltd  10. Post-impact Trajectory Vehicle Stability	300 (73) downstream 13 (4) in			2	T0231	-
TI ACCURATE AND AC	Acceptable		Vehicle Sta	20	HORIBA MIRA Ltd	
		npact Trajectory	10. Post-Ir			General Information
	CONT.	Total Control of the		The state of the s	Active Control of the	T MICH.

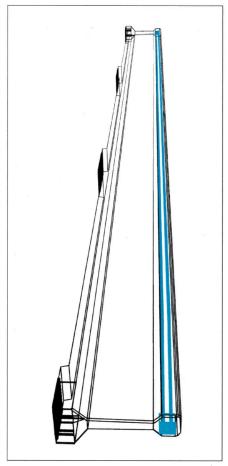
5. Test Article	Ф		Test Agency	4. General Information	Test Summary Page
	1st Jun 2017	T0232	HORIBA MIRA Ltd		
				-	
1 Occupant Bick Values	Stopping distance ft. (m)		Vehicle Stability	10. Post-Impact Trajectory	
	front of traffic face	199 (61) downstream 8.5 (2.6) in	Acceptable		

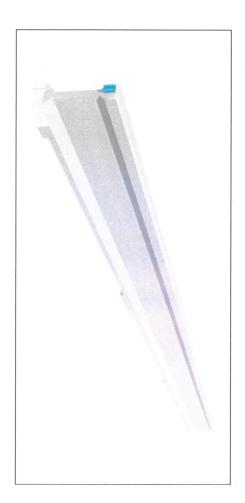
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4. General Information		10. Post-Impact Trajectory	
Test Agency	HORIBA MIRA Ltd	Vehicle Stability	Acceptable
Test no.	T0232	?	199 (61) downstream 8.5 (2.6) in
Test Date	1st Jun 2017	Stopping distance ft. (m)	front of traffic face
5. Test Article		11. Occupant Risk Values	
Type	Surface mounted Pre-cast reinforced concrete barrier	Impact Velocity ft./s X-direction	19.7 (6.0) @ 118ms
Installation Length, ft. (m)	302 (92.04)		16.7 (-5.1) @ 118ms
Size and/or dimension and	Width at top 7.3 (0.185m), Width at base 11.8 (0.3m), height 31.5 (0.8m),		
material key elements, in.	length 472.4 (12m). Each end unit was pinned by 4off M16x150mm	THIV (optional), mph (km/h)	16.8 (27) @ 112ms
(mm)	screw-bolts into tarmacadam surface		(0
6. Ground Conditions		Occupant Ride down X-direction	5 @ 120ms
Test surface/Ground	Tarmacadam surface approx. 3.9in. (100mm) thick	_	-6 @ 315ms
7. Test Vehicle		al)	6 @ 287ms
Designation	22700C (Pick-up)	ASI (optional)	1.0 @ 49ms
Make / Model	Dodge Ram 1500	12. Test Article Damage	
Kerb	5082 (2305)	Joining ends of units #3 & #4 shattered w/concrete detached Reinforcing	ed w/concrete detached Reinforcing
Mass, lb (kg) Test Inertial	5004 (2270)	bars exposed, joint remained intact. Middle of unit #4 cracked	Middle of unit #4 cracked.
Gross Static	5004 (2270)	13. Test Article Deflections	
8. Impact Conditions		Dynamic, in. (m)	44.4 (1.1)
Speed, mile/h (km/h)	62.1 (99.9)	Permanent Set, in. (m)	41.6 (1.1)
Angle (deg)	24.0	Working Width, in. (m)	63.0 (1.6)
Location	1.3m upstream of a joint between two barrier units	14. Vehicle Damage	
9. Exit Conditions		Damage to LH comer of front bumper. LHF wing moved back & panels	r. LHF wing moved back & panels
Speed, mile/h (km/h)	42.6 (68.6)	scratched. LHF wheel partly detached & tyre pulled from wheel. LHR	d & tyre pulled from wheel. LHR
		wheel damaged & tyre deflated. LHS & both front airbags deployed.	& both front airbags deployed.

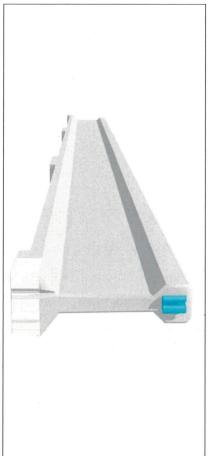


# REBLOC® RB80S\_12

Temporary System - standard element







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

REBLOC GmbH
Wiener Straße 662 · 3571 Gars/Kamp · Austria
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Fax: +43 (0) 2985 30528 2901
office@rebloc.com

### all dimensions in cm

	Drawing no. 6.	Material	Weight/element 6,	Dimensions 3:	<b>Element</b> R
2017-10-20	6.0044	Concrete 5,000 psi	6,614 lb (3.000 kg)	315" x 12" x 31 1/2" (800 x 30 x 80 cm)	RB80S_12

## www.rebloc.com