U.S. Department of Transportation
Federal Highway Administration

June 14, 2023

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

In Reply Refer To:
HSST-1/B-370

Adrian Bullock
Highway Care Ltd
Denne Court, First Floor South Wing
Hengist Field, Oad Street
Borden, Sittingbourne, Kent ME9 8HF
UK

Dear Mr. Bullock:

We received your correspondence of July 12, 2022 requesting issuance of a reimbursement eligibility letter under the Federal-aid highway program for the roadside safety system, device, design, product, or hardware (collectively "device") described below. This letter is assigned Federal Highway Administration (FHWA) control number B-370.

ELIGIBILITY LETTERS

The FHWA issues Federal-aid reimbursement eligibility letters for new roadside safety devices that are crash tested in accordance with the industry standard of the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).

FHWA, the Department of Transportation, and the United States (government) do not regulate roadside safety devices, crash test facilities, or the manufacturing industry. Issuance of eligibility letters is discretionary and provided only as a service to the states. FHWA may, at its discretion, decline to issue, revise, or rescind an eligibility letter. Eligibility letters are only issued by the FHWA headquarters Office of Safety.

Eligibility letters are issued only as notice to the states that a device is eligible for reimbursement under the Federal-aid highway program. They do not establish approval or certification for any other purpose. Issuance of an eligibility letter is not a prerequisite or requirement for state transportation agencies seeking to use Federal-aid funds for roadside safety devices. State agencies may use a device for which an eligibility letter has not been issued and seek Federal-aid reimbursement.

FEDERAL-AID REIMBURSEMENT

The request for issuance of this letter certified the device was crash tested in accordance with the industry standard of AASHTO's MASH. This eligibility letter is based on that certification and the material offered in support of its issuance. The device described below is eligible for reimbursement under the Federal-aid highway program.

Name of system: HighwayGuard MDS
Type of system: Longitudinal Barrier
Test Level: Test Level 3
Testing conducted by: Holmes Solutions LP
Date of request: July 12, 2022

Information about the device, including material such as the eligibility request, crash test reports, drawings, or images are included in one or more attachment(s) to this letter.

Eligibility letter B-370 is inapplicable to devices, optional equipment, alternate materials, or other features that were not crash tested in accordance with AASHTO's MASH.

This letter is issued only for the subject device as crash tested under AASHTO's MASH. Later modification(s) of the device are not eligible for Federal-aid reimbursement under this letter. Notice of later modification(s) should be given to transportation agencies, facility owners, and operators (collectively "agencies").

Agencies should be provided appropriate information about the device's design, installation, maintenance, materials, and mechanical properties.

Issuance of this letter is discretionary, and it may be revised or rescinded at FHWA's discretion. This letter is not a determination of compliance with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) or ownership of any intellectual property rights.

This eligibility letter is not a determination by the government that a crash involving the subject device will result in any particular outcome. It is limited to only the device's eligibility for Federal-aid reimbursement.

INTELLECTUAL PROPERTY

Issuance of this eligibility letter does not convey property rights of any sort nor any exclusive privilege. This letter is not authorization or consent by the government for the use, manufacture, or sale of any patented or proprietary system, device, design, product, or hardware for which the requester is not the patent owner. Eligibility letters are not an expression of any view, position, or determination by the government as to the validity, scope, or ownership of any intellectual property rights to a specific device. These letters do not grant, impute, suggest, or otherwise establish any ownership, distribution, or licensing rights to the requester. The government expresses no opinion about the intellectual property rights relating to any device for which this or any other eligibility letter is issued.

PUBLIC DISCLOSURE

To prevent any misunderstanding, and as discussed above, this eligibility letter is assigned FHWA control number B-370. It should only be reproduced in full with its attachment(s). This letter and the material offered by the requester supporting its issuance is public information. All

eligibility letters and supporting material are subject to public disclosure under the Freedom of Information Act (FOIA). Eligibility letters are available to the public at https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/.

If you have any questions please contact Aimee Zhang at Aimee.Zhang@dot.gov.

Sincerely,

Louisa M. Ward
Acting Director,
Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	12th July 2022	◉ New ○ Resubmission
	Name:	Adrian Bullock	
	Company:	Highway Care Ltd	
	Address:	Denne Court, First Floor South Wing, Hengist Field, Oad Street, Borden, Sittingbourne. Kent ME9 8FH.	
	Country:	UK	
	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

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System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'B': Rigid/Semi-Rigid Barriers (Roadside, Median, Bridge Railings)	◉ Physical Crash Testing ○ Engineering Analysis	HighwayGuard MDS	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:	Adrian Bullock	Same as Submitter ☒
Company Name:	Highway Care Ltd	Same as Submitter ☒
Address:	Denne Court, First Floor South Wing, Hengist Field, Oad Street, Borden, Sittingbourne, Kent ME9 8FH	Same as Submitter ☒
Country:	UK	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.

Holmes Solutions LP completed all of the documented test activities under a commercial contract with Highway Care. In accordance with the requirements of of ISO 17025, all testing activities carried out by Holmes Solutions LP were undertaken free from any undue commercial influence. For the Completion of this testing service Holmes Solutions received payment in the form of professional fees. The fees received for the testing activities were not linked to the technical performance of the product nor the outcome of the tests.
Holmes Solutions LP does not have, nor ever had, any financial interest in Highway Care, and has no ownership of any of the products IP. Holmes Solutions does not receive any research funding (or other forms of research support from Highway Care.

PRODUCT DESCRIPTION

(●) New Hardware or Significant Modification ( ) Modification to Existing Hardware

HighwayGuard is a steel barrier formed from two profiled, thin gauge sheets being welded together along the join at the top, and to feet at the base, to form a long hollow section, the over all dimensions of each barrier section is 540mm wide at the base, 250mm wide at the top, 800mm high and 6,000mm long. Each longitudinal section can be connected to an adjoining section using a unique T-connector which engages with vertical pins located at the end of each section. These barrier sections are all joined together and laid out in along the road surface to create a longitudinal barrier system (wall). The barrier system can be installed with multiple ground anchor configurations. This barrier system incorporates ground anchors at a maximum of 2.0m between ground anchors on traffic face of the barrier only in this MDS configuration.

CRASH TESTING

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.

Engineer Name:	Emerson Ryder	
Engineer Signature:	Emerson Ryder — Digitally signed by Emerson Ryder Date: 2023.05.22 10:27:18 +12'00'	
Address:	7 Canterbury Street Hornby, Christchurch	Same as Submitter ☐
Country:	New Zealand	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-10 (1100C)	The test vehicle impacted the test installation approximately 1.1 m upstream of the ground anchor (P20) at an angle of 24.7 degrees and at a velocity of 101.6 km/h. • After the initial impact with the barrier, the front left quarter of the test vehicle begins to deform. • At approximately 0.05 seconds the test vehicle hood is over the top of the barrier and deforming the A Pillar area. The top of the impacting door briefly opens. • At approximately 0.06 seconds the test vehicle began to rotate and redirect along the face of the barrier. At this time the barrier is at maximum deflection of 124 mm. • At 0.07 seconds the test vehicle's A Pillar, Windscreen and Roof can be seen deforming further from the impact. • The test vehicle continues to redirect and is parallel with the test article at approximately 0.18 seconds. • The rear of the vehicle impacts the test article at 0.22 seconds. • At approximately 0.33 seconds after initial impact the test vehicle leaves the barrier system and came to rest approximately 46 meters from the CIP. Prior to stopping, the test vehicle impacted a perimeter safety stop which protects recording equipment. This secondary impact caused moderate damage to the righthand front quarter of the test vehicle which is unrelated to the actual test. • The exit trajectory of the vehicle remained fully within the designated exit-box of MASH, indicating that the vehicle would not have presented a hazard to other road users. The test vehicle reached a maximum vehicle roll angle of -14.3 degrees, and a pitch angle of -8.4 degrees. The test vehicle had approximately 4.0 m of contact with the barrier system. The maximum working width of the system was recorded as 540 mm, with this being the width of the footing of the barrier. Dynamic deflection was recorded as 124 mm (4.88 ") measured at the top of the barrier. Maximum exterior crush of the vehicle from the impact with the test article was recorded as 135 mm, this being located in the designated crumple-zone of the vehicle, namely the left front corner. The Footwell on the impact side of the test vehicle had 45 mm of crush. The Floor Pan had 42 mm of crush located on the impact side	PASS

Required Test Number	Narrative Description	Evaluation Results
3-11 (2270P)	A 2270P test vehicle impacted the test installation 331 mm upstream of barrier joint 3B & 4A and 1.33 m upstream of anchor P10 at an angle of 25.1 degrees and a velocity of 99.9 km/h (62.1 mph). The CIP was chosen to maximize the load on the joint of the barriers, and also to examine potential of test vehicle roll over due to the positioning of the ground anchors as per Table 2-7 of MASH 16. The test vehicle had an approximate contact length of 4.0 meters (13.12 ft) The maximum roll of the vehicle was recorded as 24.7 degrees during the impact. The maximum working width of the system was recorded as 0.52 m (1.71 ft.). The maximum dynamic deflection of the system was recorded as 0.17 m (0.56 ft) and the maximum permanent deflection was recorded as 0.08 m (0.26 ft.). All impact criteria as per MASH Table 5-1 was met. Maximum exterior crush of the vehicle from the impact with the test article was recorded as 160 mm, this being located in the designated crumple-zone of the vehicle, namely the left front corner. The Footwell on the impact side of the test vehicle had 75 mm of crush.	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:	Holmes Solutions LP	
Laboratory Signature:	Emerson Ryder Digitally signed by Emerson Ryder Date: 2023.05.22 10:28:41 +12'00'	
Address:	7 Canterbury Street Hornby Christchurch	Same as Submitter ☐
Country:	New Zealand	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	Certificate of Accreditation # 1022 Client number 7559 18 April 2023 to 18 April 2024	

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