



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

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

July 7, 2017

In Reply Refer To:  
HSST-1 / CC-136

Gerrit C. Verwijs  
Verdegro Holding BV  
Munnikenheiweg 59, 4879 NE  
Netherlands

Dear Mr. Verwijs:

This letter is in response to your March 7, 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 CC-136 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:

- Verdegro BLADE TMA

### **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: Verdegro BLADE TMA  
Type of system: Truck and Trailer Mounted Attenuator (TMA)  
Test Level: MASH Test Level 3  
Testing conducted by: Texas A&M Transportation Institute Proving Ground  
Date of request: March 7, 2017

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 CC-136 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,

A handwritten signature in blue ink that reads "Robert Ritter". The signature is fluid and cursive, with the first and last names being clearly legible.

Robert Ritter  
Acting 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:	March 03, 2017	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Gerrit C. Verwijs / Sjoerd de Groot	
	Company:	Verdegro Holding BV	
	Address:	Munnikenheiweg 59, 4879 NE	
	Country:	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
'CC': Truck-Mounted Attenuators (TMA)	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	BLADE TMA	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:	Gerrit C. Verwijs / Sjoerd de Groot	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	Verdegro Holding BV	Same as Submitter <input checked="" type="checkbox"/>
Address:	Munnikenheiweg 59, 4879 NE	Same as Submitter <input checked="" type="checkbox"/>
Country:	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.

Verdegro Holding BV is the sole and full sponsor of the tests performed on the BLADE TMA. All costs for development and testing at Texas A&M Transportation Institute (TTI) were borne by Verdegro Holding BV.  
TTI was compensated by Verdegro Holding BV for the crash testing services performed.  
No other financial interests exist between Verdegro Holding BV and TTI nor its employees.

## PRODUCT DESCRIPTION

New Hardware or Significant Modification
  Modification to Existing Hardware

The BLADE Truck Mounted Attenuator is a proprietary product manufactured by Verdegro Holding BV. It is constructed primarily of aluminum alloy with steel components and measures 2284 mm (89.9 inches) wide, 5995 mm (236 inches) long in the deployed configuration, and 4195 mm (165 inches) long in the retracted position. It weighs approximately 1550 kg (3417 lbs) including the arrow board. Its design allows for the controlled attenuation of a vehicle.

## 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:	D. Lance Bullard, Jr.	
Engineer Signature:	<b>D. Lance Bullard, Jr.</b>	Digitally signed by D. Lance Bullard, Jr. DN: cn=D. Lance Bullard, Jr., o=Texas A&M Transportation Institute, ou=Roadside Safety and Physical Security, email=L.bullard@tamu.edu, c=US Date: 2017.03.06 10:30:31 -0600
Address:	3135 TAMU College Station, Texas 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
3-50 (1100C)	Test 690902-VER1 The Verdegro BLADE TMA brought the 1100C test vehicle to a controlled stop. Maximum dynamic displacement of the rear of the TMA during the test was 4023 mm (158.4 inches). No detached elements, fragments, or other debris were present to penetrate or show potential for penetrating the occupant compartment, or to present hazard to others in the area. The support vehicle rolled forward 1168 mm (46.0 inches). No occupant compartment deformation or intrusion occurred. The 1100C test vehicle remained upright during and after the collision sequence. Maximum roll and pitch angles were 5 degrees and 12 degrees, respectively. Longitudinal OIV was 11.2 m/s (36.7 ft/s), and lateral OIV was 0.6 m/s (2.0 ft/s). Maximum longitudinal ridedown acceleration was 12.0 g, and maximum lateral ridedown acceleration was 5.9 g.	PASS

Required Test Number	Narrative Description	Evaluation Results
3-51 (2270P)	<p>Test 690902-VER2</p> <p>The Verdegro BLADE TMA brought the 2270P test vehicle to a controlled stop. Maximum dynamic displacement of the rear of the TMA during the test was 7536 mm (296.7 inches). No detached elements, fragments, or other debris were present to penetrate or show potential for penetrating the occupant compartment, or to present hazard to others in the area. The support vehicle rolled forward 3404 mm (134 inches). No occupant compartment deformation or intrusion occurred. The 2270P test vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 6 degrees and 7 degrees, respectively. Longitudinal OIV was 8.5 m/s (27.9 ft/s), and lateral OIV was 0.1 m/s (0.3 ft/s). Maximum longitudinal ridedown acceleration was 15.0 g, and maximum lateral ridedown acceleration was 1.4 g.</p>	PASS
3-52 (2270P)	<p>Test 690902-VER3</p> <p>The Verdegro BLADE TMA brought the 2270P test vehicle to a controlled stop. Maximum dynamic displacement of the rear of the TMA during the test was 6769 mm (266.5 inches). No detached elements, fragments, or other debris were present to penetrate or show potential for penetrating the occupant compartment, or to present hazard to others in the area. The support vehicle rolled forward 3454 mm (136 inches). No occupant compartment deformation or intrusion occurred. The 2270P test vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 8 degrees and 6 degrees, respectively. Longitudinal OIV was 8.7 m/s (28.5 ft/s), and lateral OIV was 2.0 m/s (6.6 ft/s). Maximum longitudinal ridedown acceleration was 13.8 g, and maximum lateral ridedown acceleration was 4.0 g.</p>	PASS

3-53 (2270P)	<p>Test 690902-VER4</p> <p>The Verdegro BLADE TMA brought the 2270P test vehicle to a controlled stop. Maximum dynamic displacement of the rear of the TMA during the test was 8199 mm (322.8 inches). No detached elements, fragments, or other debris were present to penetrate or show potential for penetrating the occupant compartment, or to present hazard to others in the area. The support vehicle rolled forward 4420 mm (174 inches). No occupant compartment deformation or intrusion occurred. The 2270P test vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 7 degrees and 4 degrees, respectively. Longitudinal OIV was 8.5 m/s (27.9 ft/s), and lateral OIV was 1.2 m/s (3.9 ft/s). Maximum longitudinal ridedown acceleration was 11.5 g, and maximum lateral ridedown acceleration was 3.5 g.</p>	PASS
3-54 (1500A)	This test is designated "Optional" by MASH.	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:	Texas AM Transportation Institute	
Laboratory Signature:	<b>Darrell L. Kuhn</b>	Darrell L. Kuhn 2017.03.06 10:48:49 -06'00'
Address:	3135 TAMU College Station, Texas 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 :	A2LA Certificate No. 2821.01 ISO/IEC 17025:2005 Through April 30, 2017	

Submitter Signature\*: Gerrit C. Verwijs

Digitaal ondertekend door Gerrit  
 C. Verwijs  
 Datum: 2017.03.07 07:04:43  
 +01'00'

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		Key Words
Number	Date	