



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

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

February 21, 2013

In Reply Refer To:  
HSST/ CC-65H

Mr. Geoff Maus  
Director of Engineering  
TrafFix Devices, Inc.  
160 Ave. La Pata  
San Clemente, California 93673

Dear Mr. Maus:

This letter is in response to your request for the Federal Highway Administration (FHWA) to review a roadside safety system for eligibility for reimbursement under the Federal-aid highway program.

Name of system:	Scorpion Trailer Attenuator with Arrow/Display Panel
Type of system:	Truck Mounted Attenuator (TMA)
Test Level:	NCHRP Report 350 Test Level 3
Testing conducted by:	KARCO
Date of request:	December 6, 2012
Date initially acknowledged:	December 12, 2012
Date of completed package:	December 6, 2012

**Decision:**

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

- Scorpion Trailer TMA with integral Arrow/Display Panel

Based on a review of crash test results submitted by the manufacturer certifying the device described herein meets the crash test and evaluation criteria of the National Cooperative Highway Research Program (NCHRP) Report 350, the device is eligible for reimbursement under the Federal-aid highway program. Eligibility for reimbursement under the Federal-aid highway program does not establish approval or endorsement by the FHWA for any particular purpose or use.

The FHWA, the Department of Transportation, and the United States Government do not endorse products or services and the issuance of a reimbursement eligibility letter is not an endorsement of any product or service.

FHWA:HSST:NArtimovich:sfs:x61331:2/14/13  
File: s://directory folder/HSST/CC65H\_Scorpion\_ArrowBoard.docx  
cc: HSST: NArtimovich

## Requirements

Roadside safety devices should meet the guidelines contained in the NCHRP Report 350 or the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH).

## Findings

Full-scale crash testing according to NCHRP Report 350 was conducted on the Scorpion TMA and TMA Trailer and documented in these FHWA letters:

Number	Date	Test Level	Description
CC-65	07/14/00	TL-2	Scorpion A 10,000 TMA
		TL-3	Scorpion C 10,000 Truck Mounted Attenuator
CC-65A	12/08/00	TL-3	Design change (to steel diaphragms and hinges)
CC-65B	03/16/07	TL-3	Scorpion Trailer Attenuator
CC-65C	03/03/08	TL-3	Scorpion TMA & Trailer – infinite weight truck
CC-65D	03/03/08	TL-2	Scorpion TL-2 Trailer TMA
CC-65E	02/13/09	TL-3	Modified Scorpion – reduced weight
CC-65F	04/20/11	TL-2	TMA on lightweight shadow vehicle
CC-65G	04/20/11	TL-2	Full acceptance of Trailer TMA via crash testing

In order to evaluate the performance of the Scorpion Trailer TMA with the arrow/display panel attached, you conducted a developmental test with a device using production aluminum tube frames, but without the internal aluminum honeycomb filled cartridges. The arrow panel and frame was in place during the test, and the video shows that the arrow panel remained rigidly attached to the trailer frame and showed no potential for impacting the test vehicle or penetrating the occupant compartment.

Therefore, the system described and detailed in the attached form is eligible for reimbursement and may be installed under the range of conditions tested.

Please note the following standard provisions that apply to FHWA eligibility letters:

- This finding of eligibility is limited to crash characteristics and does not cover the structural features of the systems, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may influence the crash characteristics of the system will require a new reimbursement eligibility letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals safety problems, or that the system is significantly different from the version that was crash tested, we reserve the right to modify or revoke this letter.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.

- You will be 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 crash test requirements of the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of eligibility is designated as number CC-65H and 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 at our office 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. The FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.
- The Scorpion TMAs are patented products and considered 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 yours,

Michael S. Griffith  
Director, Office of Safety Technologies  
Office of Safety

Enclosures



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

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Washington, D.C. 20590

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Sincerely yours,

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

Michael S. 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:	November 30, 2012	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Geoff Maus <i>Geoff Maus</i>	
	Company:	TraFFix Devices Inc.	
	Address:	160 Avenida la Pata, San Clemente, CA 92673	
	Country:	USA	
	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.

[Help](#)

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'CC': Crash Cushions, Attenu:	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> FEA & V&V Analysis	Scorpion Trailer Attenuator	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.

Identification of the individual or organization responsible for the product:

Contact Name:	Geoff Maus	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	TraFFix Devices Inc.	Same as Submitter <input checked="" type="checkbox"/>
Address:	160 Avenida la Pata, San Clemente, CA 92673	Same as Submitter <input checked="" type="checkbox"/>
Country:	USA	Same as Submitter <input checked="" type="checkbox"/>

### PRODUCT DESCRIPTION

Modification to Existing Hardware Non-Significant - Effect is positive or Inconsequential
TraFFix Devices Inc, Scorpion Trailer Attenuator with arrowboard frame and arrowboard.

### CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-30 (1100C)		WAIVER REQUES
3-31 (2270P)		WAIVER REQUES
3-32 (1100C)		WAIVER REQUES
3-33 (2270P)		WAIVER REQUES
3-34 (1100C)		WAIVER REQUES

Required Test Number	Narrative Description	Evaluation Results
3-35 (2270P)		WAIVER REQUES
3-36 (2270P)		WAIVER REQUES
3-37 (2270P)		WAIVER REQUES
3-38 (1500A)		WAIVER REQUES
3-40 (1100C)		WAIVER REQUES
3-41 (2270P)		WAIVER REQUES
3-42 (1100C)		WAIVER REQUES
3-43 (2270P)		WAIVER REQUES
3-44 (2270P)		WAIVER REQUES
3-45 (1500A)		WAIVER REQUES

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:	KARCO Engineering, INC	
Laboratory Contact:	Kelsey Chiu	Same as Submitter <input type="checkbox"/>
Address:	9270 Holly Road, Adelanto, CA 92301	Same as Submitter <input type="checkbox"/>
Country:	U.S.A.	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Date:	International Accreditation Service, Inc TL-371 July 1, 2008	

## ATTACHMENTS

Attach to this form:

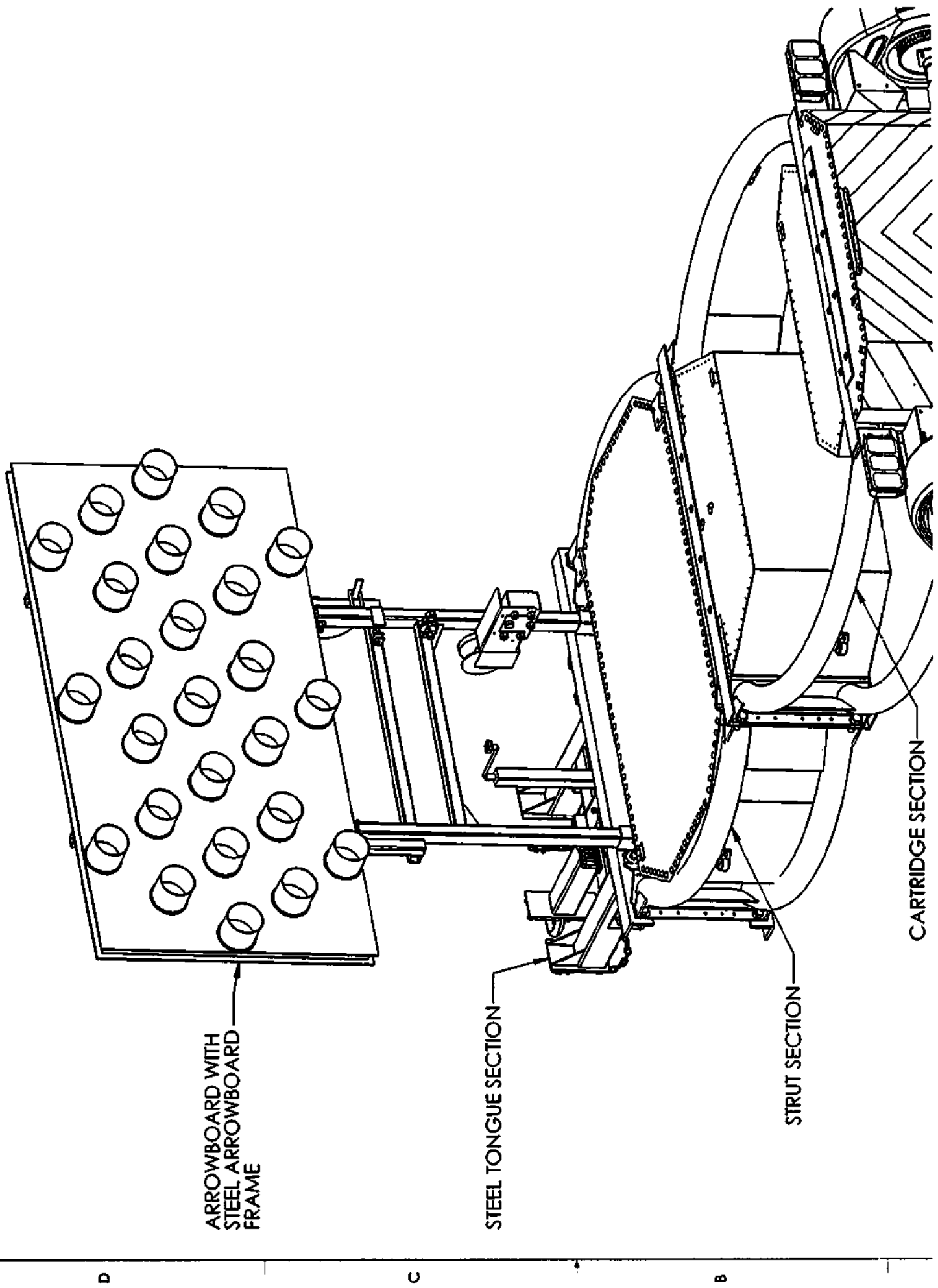
- 1) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
- 2) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [Hardware Guide Drawing Standards]. For proprietary products, a single isometric 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 key to understanding the performance of the device should also be submitted to facilitate our review.

**FHWA Official Business Only:**

Eligibility Letter		AASHTO TF13	
Number	Date	Designator	Key Words



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B

Nickolas A. Artimovich, II  
Federal Highway Administration  
Office of Safety  
HSSD, Room E71-322  
1200 New Jersey Avenue, SE  
Washington, DC 20590

December 6, 2012

Mr. Artimovich,

I am respectfully requesting that the FHWA acknowledge the presence of an arrowboard and arrowboard frame structure on production Scorpion Trailer Attenuators. I have attached a copy of a single MASH test of a Scorpion Trailer Attenuator tube variant. This test was run as a research and development test. The test article used a standard production Scorpion Trailer Attenuator tongue, arrowboard frame, and arrowboard. The test article used production aluminum tube frames, but did not have internal aluminum honeycomb filled cartridges.

As evidenced by the attached report for MASH 3-51 test, the arrowboard frame and arrowboard remained intact, and showed no propensity for failure. Please accept this test as a "worst case" test submission, as the ridedown levels as defined by MASH were exceeded. Real world impacts would most likely be less severe as a production trailer attenuator would have a complete attenuation set.

Scorpion Trailer Attenuators equipped with arrowboards in real world impacts show safe performance similar to this test attached.

Please understand that this request is for acknowledgement of an arrowboard frame and arrowboard on our current model Scorpion Trailer Attenuators, FHWA letters CC-65B, C, D, E, F, and G.

If you have any questions about this request, or the supporting test, please do not hesitate to contact me.

Sincerely,

Geoff Maus  
Director of Engineering  
TraFFix Devices Inc.



Geoff Maus  
*Director of Engineering*

TraFFix Devices, Inc.  
160 Ave. La Pata, San Clemente, CA 92673  
Ph: (949) 361-5663 Fax: (949) 573-9261  
[gmaus@traffixdevices.com](mailto:gmaus@traffixdevices.com) [www.traffixdevices.com](http://www.traffixdevices.com)

**DATA SHEET 1**  
**SUMMARY OF RESULTS**

Test Article: Traffix Devices Scorpion Tube Trailer  
 Test Program: MASH 3-51  
 Test Vehicle: 2007 Dodge Ram 1500 Quad Cab Pickup Truck

Project No.: P30109-01  
 Test Date: 09/30/10



GENERAL INFORMATION		EXIT CONDITIONS	
TEST AGENCY	KARCO Engineering, LLC	VELOCITY (km/h)	
TEST DESIGNATION	3-51	ANGLE (°)	
DATE	9/30/10	POST-IMPACT TRAJECTORY	
TEST ARTICLE		VEHICLE STABILITY	Satisfactory
NAME / MODEL	Scorpion Tube Trailer	STOPPING DISTANCE	
TYPE	Trailer-Attenuator	OCCUPANT RISK VALUES	
INSTALLATION DETAILS		FLAIL SPACE VELOCITY (ft/sec)	
DESCRIPTION	Freewheeling 25,000 lb Support Vehicle	X DIRECTION	30.5
LENGTH (Individual)	16.7 ft. (5.1 m)	Y DIRECTION	0.3
LENGTH (Total)	16.7 ft. (5.1 m)	THIV (Optional)	
BASE WIDTH	8.0 ft. (2.4 m)	PHD (Optional)	
MASS (Individual)	1850 lb (839.0 kg)		
ROAD SURFACE	Concrete	RIDEDOWN ACCELERATION (g's)	
TEST VEHICLE		X DIRECTION	26.0
TYPE / DESIGNATION	2270P	Y DIRECTION	2.1
YEAR, MAKE AND MODEL	2007 Dodge Ram 1500 Quad Cab Pickup Truck		
CURB MASS	4810 lbs (2181.5 kg)	TEST ARTICLE DEFLECTIONS	
TEST INERTIAL MASS	4975 lbs (2256.0 kg)	DYNAMIC	
GROSS STATIC MASS	4975 lbs (2256.0 kg)	PERMANENT	
IMPACT CONDITIONS		VEHICLE DAMAGE	
VELOCITY	62.5 mph (100.6 km/h)	VDS	12-FC-4
ANGLE (°)	0.9°	CDC	12FDEW1
LOCATION	1.7 in. (42 mm) Right	Maximum Crush	5.2 in. (133 mm)
IMPACT SEVERITY (kJ)	1194.5 kip-ft (881 kJ)		