



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

June 3, 2020

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

In Reply Refer To:
HSST-1/WZ-414

John M. Sandy
Traffic Safety Service
601 Hadley Road
South Plainfield, NJ 07080
USA

Dear Mr. Sandy:

This letter is in response to your April 21, 2020 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 WZ-414 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:

- Six-Foot A-Frame Barricade

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: Six-Foot A-Frame Barricade
Type of system: Work Zone
Test Level: MASH Test Level 2 (TL2)
Testing conducted by: KARCO
Date of request: April 21, 2020

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 WZ-414 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.
- This FHWA eligibility letter is not an expression of any Agency view, position, or determination of validity, scope, or ownership of any intellectual property rights to a specific device or design. Further, this letter does not impute any distribution or licensing rights to the requester. This FHWA eligibility letter determination is made based solely on the crash-testing information submitted by the requester. The FHWA reserves the right to review and revoke an earlier eligibility determination after receipt of subsequent information related to crash testing.

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:	April 20, 2020	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Bruno Haesbaert	
	Company:	Applus IDIADA KARCOEngineering. LLC.	
	Address:	9270 Holly Rd, Adelanto, CA 92301	
	Country:	United States of America	
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
'WZ':CrashWorthyWork Zone	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	6' A-Frame Barricade	AASHTO MASH	TL2

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:	John M.Sandy	Same as Submitter <input type="checkbox"/>
Company Name:	Traffic Safety Service	Same as Submitter <input type="checkbox"/>
Address:	601 Hadley Road, South Plainfield, NJ 07080	Same as Submitter <input type="checkbox"/>
Country:	United States of America	Same as Submitter <input type="checkbox"/>

Enter below all disclosures of financial interests as required by the FHWA 'Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.

Traffic Safety Service is the manufacturer and marketer of device.

Applus IDIADA KARCOEngineering, LLC (IDIADA KARCO) is an independent research and testing laboratory having no affiliation with any other entity. IDIADA KARCO is actively involved in data acquisition and compliance/certification testing for a variety of government agencies and equipment manufacturers. The principals and staff of IDIADA KARCO have no past or present financial, contractual or organizational interest in any company or entity directly or indirectly related to the products that KARCO tests. If any financial interest should arise, other than receiving fees for testing, reporting, etc., with respect to any project, the company will provide, in writing, a full and immediate disclosure to the FHWA.

PRODUCT DESCRIPTION

Help

- New Hardware or Significant Modification
 Modification to Existing Hardware

The Traffic Safety Service 6' A-Frame Barricade is a work-zone traffic control device consisting of one (1) 6.0 ft. (1.8 m) long plastic rail and two (2) A-Frame plastic legs. The as-tested device was a type I and weighed approximately 24.0 lbs (10.9 kg).

The A-Frame legs are molded from solid plastic and have an overall height of 41.0 in. (1041 mm). The A-Frame has double pockets to allow for type I or type II assembly. The pockets allow the 6.0 ft. (1.8 m) rail to be inserted until reaching the stoppers located on both ends of the rail. These stoppers are 10.5 in. (267 mm) offset from the rail ends and secure the rail in position.

The 6.0 ft. (1.8 m) long plastic rail are molded from solid plastic and are 10.5 in. (267 mm) wide by 1.5 in. (38 mm) thick. The rails have traffic graphic sheeting on both sides and the barricade is easily stacked for transportation.

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:	Bruno Haesbaert	
Engineer Signature:	Bruno Haesbaert	Digitally signed by Bruno Haesbaert Date: 2020.04.21 12:40:54 -07'00'
Address:	9270 Holly Rd, Adelanto, CA 92301	Same as Submitter <input checked="" type="checkbox"/>
Country:	United States of America	Same as Submitter <input checked="" type="checkbox"/>

A brief description of each crash test and its result:

Help

Required Test Number	Narrative Description	Evaluation Results
2-70 (1100C)	Designed to evaluate the ability of a small vehicle to activate any breakaway, fracture, or yielding mechanism. Is considered optional for work-zone traffic control devices weighing less than 220 lb (100 kg). The 6' A-Frame Barricade weighed approximately 24.0 lbs (10.9 kg) and therefore the test was non-relevant and not conducted.	Non-Relevant Test, not conducted

Required Test Number	Narrative Description	Evaluation Results
2-71 (1100C)	<p>Applus IDIADA KARCO Test No. P40071-01. Test Date March 3, 2020. Crash Test Report No. TR-P40071-01-01-NC for MASHTest 2-71 of Traffic Safety Service 6' A-Frame Barricade.</p> <p>Two (2) 6' A-Frame Barricades were impacted on the same test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 0° and 90°. The 1100C small car used for this test was a 2014 Kia Rio 4-door sedan with a test inertial weight of 2,432.8 lbs (1,103.5 kg).</p> <p>The test vehicle impacted the 0° test sign at a speed of 43.71 mph (70.35 km/h) and proceeded to impacted the 90° test sign at a speed of 42.13 mph (67.80 km/h). Upon impact the 6' A-Frame Barricade broke away in a predictable manner. The occupant compartment was not penetrated and the deformation limits were not exceeded.</p> <p>Debris from the test articles did not cause a hazard to the driver's vision. The vehicle remained stable and upright throughout the test. The 6' A-Frame Barricade met all the requirements for MASHTest 2-71.</p>	PASS
2-72 (2270P)	<p>Applus IDIADA KARCO Test No. P40072-01. Test Date March 3, 2020. Crash Test Report No. TR-P40072-01-01-NC for MASHTest 2-72 of Traffic Safety Service 6' A-Frame Barricade.</p> <p>Two (2) 6' A-Frame Barricades were impacted on the same test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 0° and 90°. The 2270P vehicle used for this test was a 2014 RAM 1500 4-door pick-up truck with a test inertial weight of 5,009.9 lbs (2,272.5 kg).</p> <p>The test vehicle impacted the 0° test sign at a speed of 44.24 mph (71.20 km/h) and proceeded to impacted the 90° test sign at a speed of 43.50 mph (70.00 km/h). Upon impact the 6' A-Frame Barricade broke away in a predictable manner. The occupant compartment was not penetrated and the deformation limits were not exceeded.</p> <p>Debris from the test articles did not cause a hazard to the driver's vision. The vehicle remained stable and upright throughout the test. The 6' A-Frame Barricade met all the requirements for MASHTest 2-72.</p>	PASS

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:	Applus IDIADA KARCOEngineering, LLC.	
Laboratory Signature:	Bruno Haesbaert Digitally signed by Bruno Haesbaert Date: 2020.04.21 12:41:07 -07'00'	
Address:	9270 Holly Rd, Adelanto, CA 92301	Same as Submitter <input checked="" type="checkbox"/>
Country:	United States of America	Same as Submitter <input checked="" type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	TL 371: July 1, 2019 - July 1, 2022	

Submitter Signature*: Bruno Haesbaert Digitally signed by Bruno Haesbaert
Date: 2020.04.21 12:41:17 -07'00'

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		
Number	Date	Key Words

MASH 2016 Test 2-71 Summary



GENERAL INFORMATION	
Test Agency.....	Applus.IDIADA KARCO
Test No.....	P40071-01
Test Designation.....	2-71.....
Test Date.....	3/3/20.....
TEST ARTICLE	
Name / Model.....	6' A-Frame Barricade
Type.....	Figure 2. Summary of Test 2-71
Device Height.....	3.4 ft. (1. m).
Key Elements.....	Plastic, sign sheeting
Road Surface.....	Smooth, clean concrete
TEST VEHICLE	
Type / Designation.....	1100C.....
Year, Make, and Model.....	2014 Kia Rio.....
Curb Mass.....	2,398.6 lbs (1,088.0 kg)
Test Inertial Mass.....	2,432.8 lbs (1,103.5 kg)
Gross Static Mass.....	2,595.9 lbs (1,177.5 kg)

Impact Conditions	
Impact Velocity Device 1.....	43.71 mph (70.35 km/h)
Impact Velocity Device 2.....	42.13 mph (67.80 km/h)
Device 1 Angle.....	0.0°.....
Device 2 Angle.....	90.0°.....
Device 1 Kinetic Energy.....	155.4 kip-ft (210.7 kJ)
Device 2 Kinetic Energy.....	144.3 kip-ft (195.7 kJ)
Exit Conditions	
Device 1 Exit Velocity.....	42.9 mph (69.0 km/h)
Device 2 Exit Velocity.....	41.6 mph (67.0 km/h)
Vehicle Resting Position.....	278.2 ft. (84.8 m) Downstream
	0.1 ft. (2.8 m) Right
Vehicle Stability.....	Satisfactory.....
Maximum Roll Angle.....	N/A*.....12
Maximum Pitch Angle.....	N/A*
Maximum Yaw Angle.....	N/A*

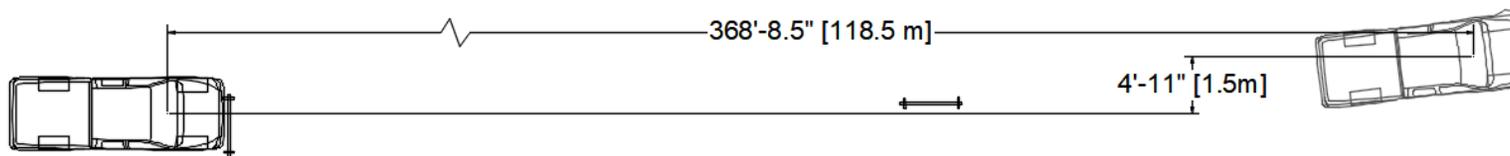
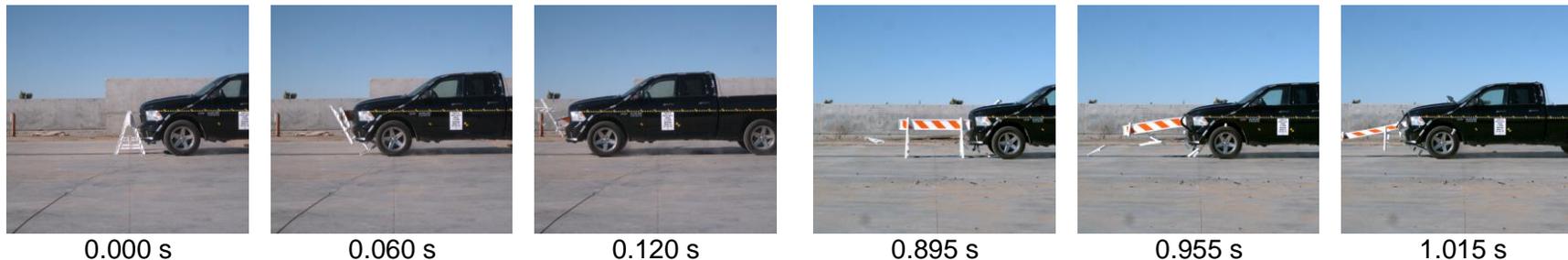
Occupant Risk	
Longitudinal OIV.....	N/A*.....
Lateral OIV.....	N/A*.....
Longitudinal RA.....	N/A*.....
Lateral RA.....	N/A*.....
THIV.....	N/A*.....
PHD.....	N/A*.....
ASI.....	N/A*.....
Test Article Deflections	
0° Sign Debris Field (longitudinal) ..	121.9 ft. (37.1 m)
0° Sign Debris Field (lateral)...	22.2 ft. (6.8 m)
90° Sign Debris Field (longitudinal)...	122.0 ft. (37.2 m)
90° Sign Debris Field (lateral).....	8.9 ft. (2.7 m)
Vehicle Damage TR-P40071-01-NC	
Vehicle Damage Scale.....	12:FD-1
CDC.....	12FDAW 1
Maximum Deformation.....	No measurable deformation

* Not Applicable, device weighs less than 220 lbs (100 kg)

MASH 2016 Test 2-72 Summary

0° CIA

90° CIA



GENERAL INFORMATION	
Test Agency.....	Applus.IDIADA KARCO
Test No.....	P40072-01
Test Designation.....	2-72
Test Date.....	3/3/20.....
TEST ARTICLE	
Name / Model.....	6' A-Frame Barricade
Type.....	Figure 2. Summary of Test 2-72
Device Height.....	3.4 ft. (1. m)
Key Elements.....	Plastic, sign sheeting
Road Surface.....	Smooth, clean concrete
TEST VEHICLE	
Type / Designation.....	2270P.....
Year, Make, and Model.....	2014 RAM.1500....
Curb Mass.....	4,933.9.lbs (2,238.0 kg)
Test Inertial Mass.....	5,009.9.lbs (2,272.5 kg)
Gross Static Mass.....	5,009.9.lbs (2,272.5 kg)

Impact Conditions	
Impact Velocity Device 1.....	44.24.mph (71.20 km/h)
Impact Velocity Device 2.....	43.50.mph (70.00 km/h)
Device 1 Angle.....	0.0°.....
Device 2 Angle.....	90.0°.....
Device 1 Kinetic Energy.....	327.8.kip-ft (444.5 kJ)
Device 2 Kinetic Energy.....	316.9.kip-ft (429.6 kJ)
Exit Conditions	
Device 1 Exit Velocity.....	43.93.mph (70.7 km/h)
Device 2 Exit Velocity.....	43.25.mph (69.6 km/h)
Vehicle Resting Position.....	388.7.ft. (118.5 m) Downstream
	4.0 ft. (1.5 m) Left
Vehicle Stability.....	Satisfactory.....
Maximum Roll Angle.....	N/A*.....12
Maximum Pitch Angle.....	N/A*
Maximum Yaw Angle.....	N/A*

Occupant Risk	
Longitudinal OIV.....	N/A*.....
Lateral OIV.....	N/A*.....
Longitudinal RA.....	N/A*.....
Lateral RA.....	N/A*.....
THIV.....	N/A*.....
PHD.....	N/A*.....
ASI.....	N/A*.....
Test Article Deflections	
0° Sign Debris Field (longitudinal) ..	56.3 ft. (17.1 m)
0° Sign Debris Field (lateral)...	29.9 ft. (9.1 m)
90° Sign Debris Field (longitudinal)...	146.0 ft. (44.6 m)
90° Sign Debris Field (lateral).....	4.0 ft. (1.2 m)
Vehicle Damage	
Vehicle Damage Scale.....	12:FD-1
CDC.....	12FDAW 1
Maximum Deformation.....	No measurable deformation

TR-P40072-01-NC

* Not Applicable, device weighs less than 220 lbs (100 kg)



6' A-Frame BARRICADES

Easy Set up
Easy Take down
Efficient Storage!



Overall Height as Shown

41" To Top of "A"

39.25" to Top Of Rail

Rail Weight 11 LBS

A Frame Weight 6.5 LBS

Total Weight 24 LBS

1.5"



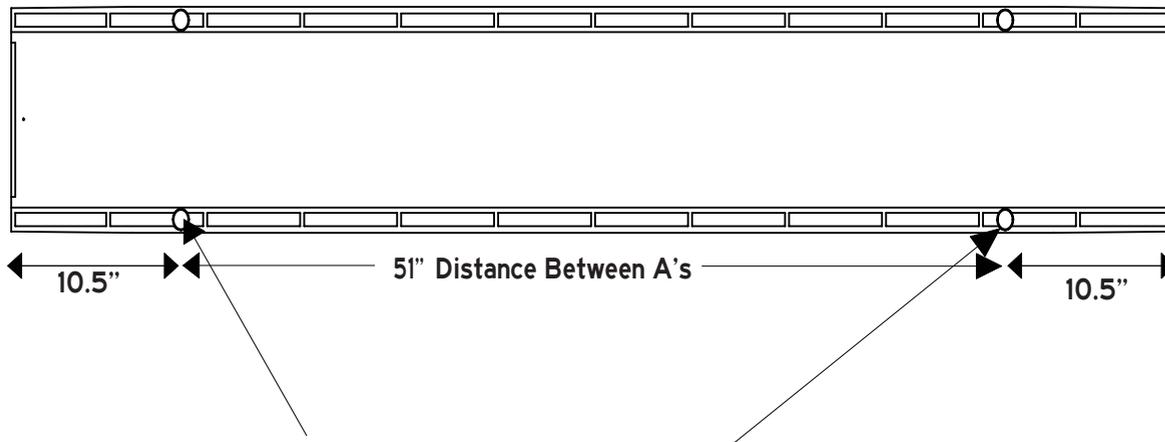
10.5"



END VIEW OF RAIL

OUR RAILS ARE SOLID PLASTIC, HIGH QUALITY!

72" Rail



The circles in this drawing represent a "stop" to keep the A's in a fixed position

Double Pockets for Type I or Type II



NCHRP 350 Tested and Approved!

601 Hadley Road, South Plainfield, Nj 07080 908-561-4800

Drawing is NOT to scale