



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

July 24, 2023

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

In Reply Refer To:
HSST-1/WZ-450

Kevin Harrison
Eastern Metal of Elmira, Inc.
1430 Sullivan Street
Elmira NY 14901
USA

Dear Mr. Harrison:

We received your correspondence of March 22, 2021 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 WZ-450.

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: Apex Summit w/ Aluminum Sign
Type of system: Work Zone
Test Level: Test Level 3
Testing conducted by: Calspan Corporation
Date of request: March 22, 2021

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 WZ-450 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 WZ-450. 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,

A handwritten signature in black ink that reads "Robert Ritter". The signature is written in a cursive style with a large initial "R".

Robert Ritter
Director, Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

| | | | |
|------------------|--|---------------------------------------|---|
| Submitter | Date of Request: | March 22, 2021 | <input checked="" type="radio"/> New <input type="radio"/> Resubmission |
| | Name: | Kevin Harrison | |
| | Company: | Eastern Metal of Elmira, Inc. | |
| | Address: | 1430 Sullivan Street Elmira, NY 14901 | |
| | 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.

Device & Testing Criterion - Enter from right to left starting with Test Level

!-!-

| System Type | Submission Type | Device Name / Variant | Testing Criterion | Test Level |
|---|---|---------------------------------|-------------------|------------|
| 'WZ': Crash Worthy Work Zone Traffic Control Devices | <input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis | Apex Summit w/ Aluminum Sign | 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: | Kevin Harrison | Same as Submitter <input checked="" type="checkbox"/> |
| Company Name: | Eastern Metal of Elmira, Inc. | Same as Submitter <input checked="" type="checkbox"/> |
| Address: | 1430 Sullivan Street Elmira, NY 14901 | Same as Submitter <input checked="" type="checkbox"/> |
| Country: | USA | 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. | | |
| Eastern Metal of Elmira, Inc. and Calspan Corporation share no financial interests between the two organizations. This includes no shared financial interest but not limited to: i. Compensation including wages, salaries, commissions, professional fees, or fees for business referrals iii. Research funding or other forms of research support; iv. Patents, copyrights, licenses, and other intellectual property interests; vi. Business ownership and investment interest s; | | |

PRODUCT DESCRIPTION

- New Hardware or Significant Modification
 Modification to Existing Hardware

The Eastern Metal of Elmira, Inc. Apex Summit sign stand was tested with a 48" x 48" aluminum sign set at the maximum bottom height of 84". The Apex Summit sign stand consists of dual fiberglass leaf-springs which can be disassembled and folded-up into a compact package for storage and transport. The telescoping legs are made of aluminum and assembled to the steel sign stand base via standard nuts and bolts. The legs have pull-pins for quick and efficient releasing from the foldup position. A square tube connects the sign, via a rigid sign bracket, to the base. The folded dimensions are 10" x 11" x 81" (W x L x H) and weighs 44 lbs without the aluminum sign attached. Open dimensions are 48" x 149" x 150".

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: | Mark Parisi | |
| Engineer Signature: | Mark J. Parisi | Digitally signed by Mark J. Parisi Date: 2021.08.16 13:44:23 -04'00' |
| Address: | 4455 Genesee Street, Cheektowaga, NY 14225 | 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 |
|----------------------|---|----------------------------------|
| 3-70 (1100C) | Designated to evaluate the ability of a small vehicle to activate any breakaway, fracture, or yielding mechanism. Is considered optional for work zone traffic control weighting less than 220 lb. (100 kg) | Non-Relevant Test, not conducted |

| Required Test Number | Narrative Description | Evaluation Results |
|----------------------|--|--------------------|
| 3-71 (1100C) | <p>For this test, two Eastern Metal of Elmira, Inc. Apex Summit sign stands with aluminum signs were impacted. The first test article was aligned at 0° and the second test article was aligned at 90° to the impacting test vehicle's direction of travel. OIV and RA are not factors studied since Test Articles are well below 220 lb per MASH 2016.</p> <p>The test was conducted using a commercially available 2014 Hyundai Accent 4 door sedan with a test inertia mass of 2392 lbs. (1085 kg).</p> <p>The test vehicle impacted the first sign stand (oriented at 0°) at a velocity of 64.2 mph (103.3 km/h). Upon impact the upper portion of the sign stand separated from the base of the stand and flipped over the test vehicle, impacting only the bumper and the front edge of the hood.</p> <p>The test vehicle continued on its path and impacted the second sign stand (oriented at 90°) at a velocity of 63.5 mph (102.2 km/h). Upon impact the upper portion of the sign stand separated from the base of the stand and flipped over the test vehicle, impacting and damaging the bumper and lower hood and headlight on the passenger side of the test vehicle.</p> <p>Impact points for both tests were within the +/- 6" tolerance around the 1/4 point of the vehicle.</p> <p>There was NO penetration relevant tear into the test vehicle or occupant compartment from either article.</p> <p>Debris from the test article did not cause a hazard to the driver's vision. The vehicle remained upright and did not have any roll and pitch throughout the test. The vehicle did not leave its lane and its trajectory was stable after both sign stands were impacted. There was no damage to the vehicle's fuel tank or oil pan as a result of the crash test.</p> <p>TEST RESULT = PASS</p> | |

| | | |
|--------------|---|--|
| 3-72 (2270P) | <p>For this test, two Apex Summit sign stands with aluminum signs were impacted. The first test article was aligned at 0° and the second test article was aligned at 90° to the impacting test vehicle's direction of travel OIV and RA are not factors studied since Test Articles are well below 220 lb per MASH 2016.</p> <p>The test was conducted using a commercially available 2010 Dodge Ram 1500 pickup truck with a test inertia mass of 5066 lbs. (2298 kg).</p> <p>The test vehicle impacted the first sign stand (oriented at 0°) at a velocity of 62.2 mph (100.1 km/h). Upon impact with the bumper and hood of the test vehicle, the upper portion of the sign stand separated from the base of the stand. The sign and the upper portion of the stand went over the top of the test vehicle and the aluminum sign separated from the upper portion of the stand.</p> <p>The test vehicle continued along its path and impacted the second sign stand at a velocity of 61.3 mph (98.7 km/h). Upon impact the upper portion of the stand and the sign again separated from the base which was run over by the test vehicle. The upper part of the stand impacted the bumper, hood, and headlight on the passenger side. The upper portion of the stand impacted the roof of the test vehicle without hitting the windshield.</p> <p>Impact points for both tests were within the +/- 6" tolerance around the 1/4 point of the vehicle.</p> <p>There was NO penetration relevant tear into the test vehicle or occupant compartment from either article.</p> <p>Debris from the test article did not cause a hazard to the driver's vision. The vehicle remained upright and did not have any roll and pitch throughout the test. The vehicle did not leave its lane and its trajectory was stable after both sign stands were impacted. There was no damage to the vehicle's fuel tank or oil pan as a result of the crash test.</p> <p>TEST RESULT = PASS</p> | |
|--------------|---|--|

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: | Calspan Corporation | |
| Laboratory Signature: | Mark J. Parisi | Digitally signed by Mark J. Parisi Date: 2021.08.16 13:45:18 -04'00' |
| Address: | 4455 Genesee Street Cheektowaga, NY 14225 | Same as Submitter <input type="checkbox"/> |
| Country: | USA | Same as Submitter <input type="checkbox"/> |
| Accreditation Certificate Number and Dates of current Accreditation period : | L20-602 December 31, 2022 | |

Submitter Signature*: **Kevin Harrison** Digitally signed by Kevin Harrison
Date: 2021.08.16 13:39:31 -04'00'

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 |
| | | |

SECTION 4

MASH TEST 3-71 SUMMARY

Test Article: Eastern Metal Apex Summit

Project No. BR0078

Test Program: MASH 3-71

Test Date: 07/09/2021

SEQUENTIAL PHOTOGRAPHS

0° Orientation



0.000s



0.030s



0.094s

90° Orientation



0.000s



0.030s



0.092s

PLAN VIEW

-15 ft 0 ft 15 ft 30 ft 45 ft 60 ft 75 ft 90 ft 105 ft 120 ft 135 ft 150 ft 165 ft 180 ft 195 ft 210 ft 225 ft 240 ft 255 ft 270 ft 285 ft



Vehicle is at 64 MPH when it contacts first sign and it is 5 feet from the point it is released from the Tow System (which occurs at 0 feet on scale)



Vehicle is Stopped at 185 feet from the point of initial release from the Two Systems (which occurs at 0 feet on scale)

SECTION 4... (CONTINUED)
MASHTEST 3-71SUMMARY

Test Article: Eastern Metal Apex Summit

Project No. BR0078

Test Program: MASH 3-71

Test Date: 07/09/2021

SUMMARY TABLE

| GENERAL INFORMATION | | IMPACT CONDITIONS | | |
|---------------------|---------------------------------------|---------------------------------------|---|--|
| TEST AGENCY | Calspan Corporation | IMPACT VELOCITY (0°) | 64.2 mph (103.3 km/h) | |
| TEST NUMBER | BR0078 | IMPACT VELOCITY (90°) | 63.5 mph (102.2 km/h) | |
| TEST DESIGNATION | 3-71 | IMPACT SEVERITY (0°) | 330 kip-ft (447 kJ) | |
| | | IMPACT SEVERITY (90°) | 322 kip-ft (437 kJ) | |
| TEST DATE | 07/09/2021 | IMPACT LOCATION (0°) | 16.4 In. from Centerline of vehicle toward driver | |
| | | IMPACT LOCATION (90°) | 18.3 In. from Centerline of vehicle toward psgr. | |
| TEST ARTICLE | | EXIT CONDITIONS | | |
| NAME / MODEL | Apex Summit | EXIT VELOCITY (0°) | 64.2 mph (103.3 km/h) | |
| TYPE | Work-Zone Traffic Control Device | EXIT VELOCITY (90°) | 63.5 mph (102.2 km/h) | |
| KEY ELEMENTS | Sign Stand, Metal Base, Aluminum Sign | FINAL RESTING POSITION | 185 ft. downstream | |
| OVERALL HEIGHT | 150 in. (3810 mm) | VEHICLE STABILITY | Satisfactory | |
| OVERALL WIDTH | 48 in. (1219 mm) | VEHICLE SNAGGING | None | |
| | | VEHICLE POCKETING | None | |
| ROAD SURFACE | Asphalt | OCCUPANT RISK VALUES | | |
| TEST VEHICLE | 1100C | OCCUPANT IMPACT VELOCITY ¹ | Longitudinal | |
| | | | Lateral | |
| | | RIDEDOWN ACCELERATION ¹ | Longitudinal | |
| | | | Lateral | |
| CURB MASS | 2363 lbs. (1072 kg) | TEST ARTICLE POST-IMPACT | | |
| | | ARTICLE DAMAGE | Base Deformation/Upper separation | |
| TEST INERTIAL MASS | 2392 lbs. (1085 kg) | VEHICLE DAMAGE | | |
| | | VEHICLE DAMAGE SCALE | 12-FL-1 ; 12-FR-2 | |
| GROSS STATIC MASS | 2392 lbs. (1085 kg) | COLLISION DAMAGE CLASSIFICATION | 12FLEW01 12FREW02 | |
| | | MAXIMUM DEFORMATION | 0.0 in. | |

¹Values not calculated due to test article weight being less than 220 lbs. (100 kg)

SECTION 4

MASH TEST 3-72 SUMMARY

Test Article: Eastern Metal Apex Summit
Test Program: MASH 3-72

Project No. BR0079
Test Date: 06/28/2021

SEQUENTIAL PHOTOGRAPHS

0° Orientation

90° Orientation



0.000s

0.030s

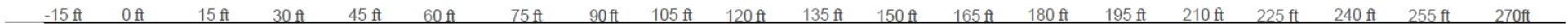
0.098s

0.000s

0.030s

0.116s

PLAN VIEW



Vehicle is at 62 MPH when it contacts first sign and it is 5 feet from the point it is released from the Tow System (which occurs at 0 feet on scale)

Vehicle is Stopped at 187 feet from the point of initial release from the Two Systems (which occurs at 0 feet on scale)

SECTION 4... (CONTINUED)
MASHTEST 3-72 SUMMARY

Test Article: Eastern Metal Apex Summit
Test Program: MASH 3-72

Project No. BR0079
Test Date: 06/28/2021

SUMMARY TABLE

| GENERAL INFORMATION | | IMPACT CONDITIONS | |
|---------------------|---------------------------------------|---------------------------------------|---|
| TEST AGENCY | Calspan Corporation | IMPACT VELOCITY (0°) | 62.2 mph (100.1 km/h) |
| TEST NUMBER | BR0079 | IMPACT VELOCITY (90°) | 61.3 mph (98.7 km/h) |
| TEST DESIGNATION | 3-72 | KINETIC ENERGY (0°) | 655 kip-ft (888 kJ) |
| | | KINETIC ENERGY (90°) | 636 kip-ft (863 kJ) |
| TEST DATE | 06/28/2021 | IMPACT LOCATION (0°) | 18.9 In. from Centerline of vehicle toward driver |
| | | IMPACT LOCATION (90°) | 21 In. from Centerline of vehicle toward psgr. |
| TEST ARTICLE | | EXIT CONDITIONS | |
| NAME / MODEL | Apex Summit | EXIT VELOCITY (0°) | 62.2 mph (100.1 km/h) |
| TYPE | Work-Zone Traffic Control Device | EXIT VELOCITY (90°) | 61.3 mph (98.7 km/h) |
| KEY ELEMENTS | Sign Stand, Metal Base, Aluminum Sign | FINAL RESTING POSITION | 187 ft. downstream |
| OVERALL HEIGHT | 150 in. (3810 mm) | VEHICLE STABILITY | Satisfactory |
| OVERALL WIDTH | 48 in. (1219 mm) | VEHICLE SNAGGING | None |
| | | VEHICLE POCKETING | None |
| ROAD SURFACE | Asphalt | OCCUPANT RISK VALUES | |
| TEST VEHICLE | 2270P | OCCUPANT IMPACT VELOCITY ¹ | Longitudinal |
| | | | Lateral |
| | | RIDEDOWN ACCELERATION ¹ | Longitudinal |
| | | | Lateral |
| CURB MASS | 5106 lbs. (2316 kg) | TEST ARTICLE POST-IMPACT | |
| | | ARTICLE DAMAGE | Base Deformation/Upper separation |
| TEST INERTIAL MASS | 5066 lbs. (2298 kg) | VEHICLE DAMAGE | |
| GROSS STATIC MASS | 5066 lbs. (2298 kg) | VEHICLE DAMAGE SCALE | 12-FL-1 ; 12-FR-2 |
| | | COLLISION DAMAGE CLASSIFICATION | 12FLLN01 12FREW01 |
| | | MAXIMUM DEFORMATION | 0.0 in. |

¹Values not calculated due to test article weight being less than 220 lbs. (100 kg)

JPEG of TEST ARTICLE DRAWINGS: APEX SUMMIT

 Model No. Apex Summit

