



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

October 5, 2022

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

In Reply Refer To:
HSST-1/SS-188

Bret R. Eckert
Trinity Highway Products, LLC
15601 Dallas Parkway, Suite 525
Addison, TX 75001
USA

Dear Mr. Eckert:

We received your correspondence of December 8, 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 SS-188.

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: SQR-LOC Perforated Dual Post Sign Support System
Type of system: Sign Support
Test Level: Test Level 3
Testing conducted by: Applus IDIADA KARCO Engineering, LLC
Date of request: December 8, 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 SS-188 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 SS-188. 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,

Michael S. Griffith

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:	December 08, 2021	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Bret R. Eckert, P.E.	
	Company:	Trinity Highway Products, LLC	
	Address:	15601 Dallas Parkway, Suite 525, Addison, TX 75001	
	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
'SS': Breakaway Sign Supports, Mailboxes, & other small sign supports	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	SQR-LOC® Perforated, Dual Post Sign Support System	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:	Jim Crowley	Same as Submitter <input type="checkbox"/>
Company Name:	Trinity Highway Products, LLC	Same as Submitter <input type="checkbox"/>
Address:	15601 Dallas Parkway, Suite 525, Addison, TX 75001	Same as Submitter <input type="checkbox"/>
Country:	USA	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.

The SQR-LOC® Perforated Dual Post Sign Support System technology is the commercial embodiment of intellectual property that is owned by Trinity Highway Products, LLC ("THP"). THP does not pay royalties for sales of the SQR-LOC® Perforated Dual Post Sign Support System. The SQR-LOC® Perforated Dual Post Sign Support System was designed and developed by engineers at THP.

Applus IDIADA KARCO Engineering, LLC (KARCO) conducted the certification tests of the SQR-LOC® Perforated Dual Post Sign Support System. KARCO is an internationally accredited third party crash testing laboratory. Physical crash testing of the SQR-LOC® Perforated Dual Post Sign Support System was performed in accordance with testing criteria, as set forth by the American Association of State Highway and Transportation Officials (AASHTO) in the Manual for Assessing Safety Hardware ("MASH") (2016). Other than fees paid to KARCO to conduct the tests and then analyze and report the test results, KARCO and THP do not share financial interests. The fees paid to KARCO were not dependent or contingent on the results of the tests.

PRODUCT DESCRIPTION

- New Hardware or Significant Modification
 Modification to Existing Hardware

The SQR-LOC® Perforated, Dual Post Sign Support system consists of two, 2 inch x 12 gauge perforated square steel tube signposts inserted 13 inches into 2-1/4 inch x 12 gauge square steel tube anchor sleeves. The signposts and anchor sleeves are punched with Ø7/16 inch holes spaced on one inch centers along the length on all four sides. The signposts are secured to the anchor sleeves using Ø5/16 inch corner bolts and nuts. The anchor sleeves are 36 inches long and embedded in soil with the top 1 inch above grade. A 36 inch tall x 84 inch wide x 0.080 inch thick aluminum sign panel is secured to the signposts with a U-channel and clamp system. The sign is secured to two U-channel sections using Ø3/8 inch bolts and nuts. The sign is mounted at a height of 7 ft. above grade to the bottom of the sign. The steel for the anchor sleeves and signposts conforms to ASTM A653.

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:	Antonio Reyes	
Engineer Signature:	<h2 style="margin: 0;">Antonio Reyes</h2>	Digitally signed by Antonio Reyes DN: cn=Antonio Reyes, o=Applus Idiada, ou, email=Antonio.Reyes@idiada.com, c=US Date: 2022.10.04 10:50:36 -07'00'
Address:	9270 Holly Road, Adelanto, CA 92301	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
3-60 (1100C)	<p>Applus IDIADA KARCO Test No. P40157-01. Test Date December 17, 2020. Crash Test Report No. TR-P40157-01-B for MASH 2016 Test 3-60 Crash Test of Trinity Highway Products SQR-LOC® Perforated, Dual Post Sign Support, TL-3.</p> <p>The SQR-LOC® Perforated, Dual Post Sign Support system (P40157-01) was impacted by a 2016 Kia Rio 4-door sedan at a velocity of 18.89 mph (30.40 km/h) and a CIA of 0°. Upon impact, the support structure broke away. The occupant compartment was not penetrated and the deformation limits were not exceeded. The vehicle experienced a maximum occupant impact velocity (OIV) of 13.5 ft/s (4.1 m/s) and a maximum ridedown acceleration (RA) of 1.7 g.</p> <p>The Trinity Highway Products SQR-LOC® Perforated, Dual Post Sign Support, TL-3 Support Structure met all the requirements for MASH 2016 Test 3-60.</p>	PASS

Required Test Number	Narrative Description	Evaluation Results
3-61 (1100C)	<p>Applus IDIADA KARCO Test No. P40158-01. Test Date December 17, 2020. Crash Test Report No. TR-P40158-01-B for MASH 2016 Test 3-61 Crash Test of Trinity Highway Products SQR-LOC® Perforated, Dual Post Sign Support, TL-3.</p> <p>The SQR-LOC® Perforated, Dual Post Sign Support system (P40158-01) was impacted by a 2015 Kia Rio 4-door sedan at a velocity of 64.41 mph (103.65 km/h) and a CIA of 0°. Upon impact, the sign support yielded and broke away. The occupant compartment was not penetrated and the deformation limits were not exceeded. The vehicle experienced a maximum occupant impact velocity (OIV) of 10.2 ft/s (3.1 m/s) and a maximum ridedown acceleration (RA) of 0.5 g.</p> <p>The Trinity Highway Products SQR-LOC® Perforated, Dual Post Sign Support, TL-3 Support Structure met all the requirements for MASH 2016 Test 3-61.</p>	PASS
3-62 (2270P)	<p>Applus IDIADA KARCO Test No. P40159-01. Test Date December 30, 2020. Crash Test Report No. TR-P40159-01-B for MASH 2016 Test 3-62 Crash Test of Trinity Highway Products SQR-LOC® Perforated, Dual Post Sign Support, TL-3.</p> <p>The SQR-LOC® Perforated, Dual Post Sign Support system (P40159-01) was impacted by a 2014 Ram 1500 4-door pickup truck at a velocity of 61.29 mph (98.64 km/h) and a CIA of 0°. Upon impact, the support structure yielded and maintained contact with the vehicle as the vehicle came to rest downstream of the impact site. The occupant compartment was not penetrated and the deformation limits were not exceeded.</p> <p>The Trinity Highway Products SQR-LOC® Perforated, Dual Post Sign Support, TL-3 Support Structure met all the requirements for MASH 2016 Test 3-62.</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:	KARCO Engineering, INC	
Laboratory Signature:	Antonio Reyes	<small>Digitally signed by Antonio Reyes DN: cn=Antonio Reyes, o=Applus Idiada, ou, email=Antonio.Reyes@idiada.com, c=US Date: 2022.10.04 10:51:01 -07'00'</small>
Address:	9270 Holly Road, Adelanto, CA 92301	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	International Accreditation Services (IAS) ISO 17025 Accreditation Certificate #TL-371 Expires July 1, 2023	

Submitter Signature*: **Bret Eckert** Digitally signed by Bret Eckert
Date: 2022.10.04 11:15:03
-07'00'

Submit Form

ATTACHMENTS

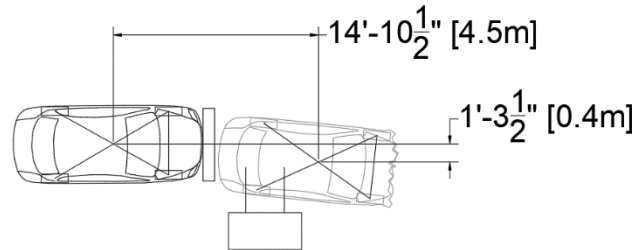
Attach to this form:

- 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		Key Words
Number	Date	

MASH 2016 Test 3-60 Summary



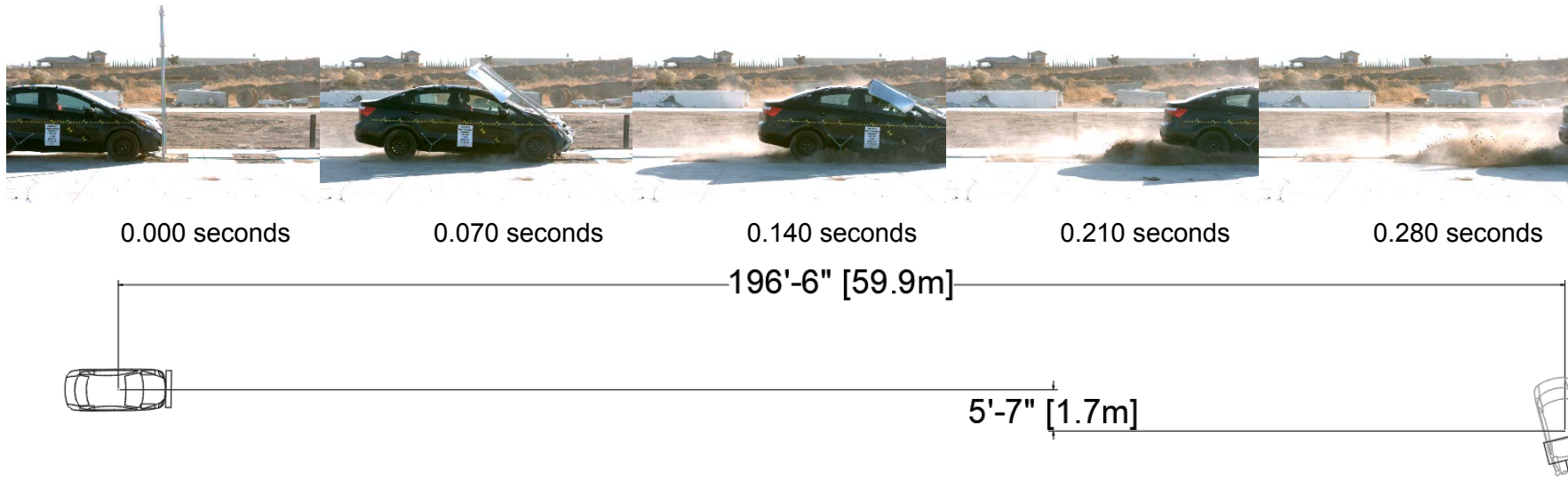
GENERAL INFORMATION	
Test Agency.....	Applus IDIADA KARCO
Test Number.....	P40157-01
Test Designation.....	3-60
Test Date.....	12/17/20
TEST ARTICLE	
Name / Model.....	SQR-LOC@Perforated Dual Sign Support TL-3
Type.....	Support Structure
Mounting Height	7.0 ft. (2.1 m)
Key Elements.....	2.00" 12 GA Signposts 2.25" 12GA Anchor Sleeves 36" x 84" Aluminum Sign
Road Surface.....	Smooth, clean concrete
TEST VEHICLE	
Type / Designation.....	1100C
Year, Make, and Model.....	2016 Kia Rio
Curb Mass.....	2,559.5 lbs (1,161.0 kg)
Test Inertial Mass.....	2,449.3 lbs (1,111.0 kg)
Gross Static Mass.....	2,620.1 lbs (1,188.5 kg)

Impact Conditions	
Impact Velocity	18.89 mph (30.40 km/h)
Impact Angle.....	0.0°
Kinetic Energy.....	29.2 kip-feet (39.6 Kilojoules)
Maximum KE Allowed.....	34.0 kip-feet (46.0 Kilojoules)
Location / Orientation.....	0.0 in.(0 mm) Offset from Centerline
Exit Conditions	
Exit Velocity.....	6.03 mph (9.70 km/h)
Final Resting Position.....	14.8 ft. (4.5 m) Downstream
	1.3 ft. (0.4 m) Right
Vehicle Stability	Satisfactory
Maximum Roll Angle.....	2.2°
Maximum Pitch Angle.....	6.8°
Maximum Yaw Angle.....	4.1°

Occupant Risk	
Longitudinal OIV.....	13.5 ft/s (4.1 m/s)
Lateral OIV.....	-0.3 ft/s (-0.1 m/s)
Longitudinal RA.....	-1.7 g
Lateral RA.....	-0.9 g
THIV.....	13.5 ft/s (4.1 m/s)
PHD.....	1.7 g
ASI.....	0.30
Test Article Deflections	
Debris Field (longitudinal).....	Not Applicable
Debris Field (lateral).....	Not Applicable
Vehicle Damage	
Vehicle Damage Scale.....	12-FD-1
CDC.....	12FDEW1
Maximum Deformation.....	None

Figure 2 MASH 2016 Test 3-60 Summary

MASH 2016 Test 3-61 Summary



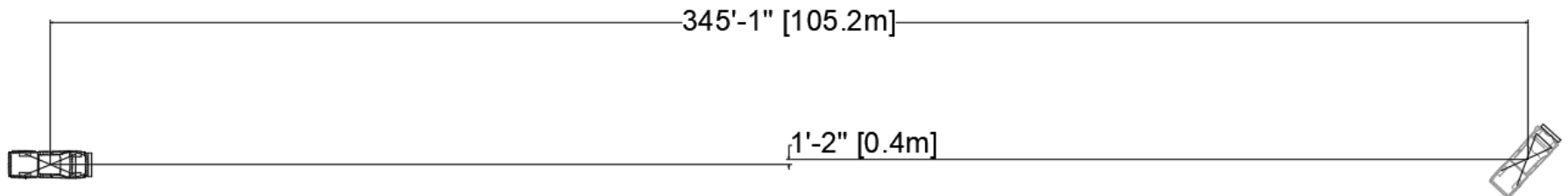
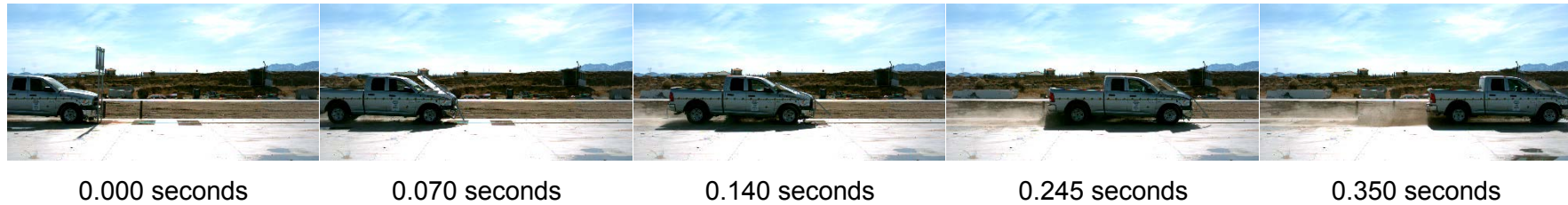
GENERAL INFORMATION	
Test Agency.....	Applus IDIADA KARCO
Test Number.....	P40158-01
Test Designation.....	3-61
Test Date.....	12/17/20
TEST ARTICLE	
Name / Model.....	SQR-LOC®Perforated Dual Sign Support TL-3
Type.....	Support Structure
Mounting Height	7.0 ft. (2.1 m)
Key Elements.....	2.00" 12 GA Signposts 2.25" 12GA Anchor Sleeves 36" x 84" Aluminum Sign
Road Surface.....	Smooth, clean concrete
TEST VEHICLE	
Type / Designation.....	1100C
Year, Make, and Model.....	2015 Kia Rio
Curb Mass.....	2,552.9 lbs (1,158.0 kg)
Test Inertial Mass.....	2,451.5 lbs (1,112.0 kg)
Gross Static Mass.....	2,620.1 lbs (1,188.5 kg)

Impact Conditions	
Impact Velocity	64.41 mph (103.65 km/h)
Impact Angle.....	0.0°
Kinetic Energy.....	339.9 kip-feet (460.9 Kilojoules)
Minimum KE Required.....	288.0 kip-feet (309.1 Kilojoules)
Location / Orientation.....	0.0 in.(0 mm) Offset from Centerline
Exit Conditions	
Exit Velocity.....	57.99 mph (93.33 km/h)
Final Resting Position.....	196.5 ft. (59.9 m) Downstream 5.6 ft. (1.7 m) Right
Vehicle Stability	Satisfactory
Maximum Roll Angle.....	1.3°
Maximum Pitch Angle.....	-1.7°
Maximum Yaw Angle.....	-1.0°

Occupant Risk	
Longitudinal OIV.....	10.2 ft/s (3.1 m/s)
Lateral OIV.....	-1.0 ft/s (-0.3 m/s)
Longitudinal RA.....	0.3 g
Lateral RA.....	0.5 g
THIV.....	10.2 ft/s (3.1 m/s)
PHD.....	0.5 g
ASI.....	0.38
Test Article Deflections	
Debris Field (longitudinal).....	Not Applicable
Debris Field (lateral).....	Not Applicable
Vehicle Damage	
Vehicle Damage Scale.....	12-FR-1
CDC.....	12FDEW1
Maximum Deformation.....	2.5 in.(64 mm) Windshield

Figure 2 MASH 2016 Test 3-61 Summary

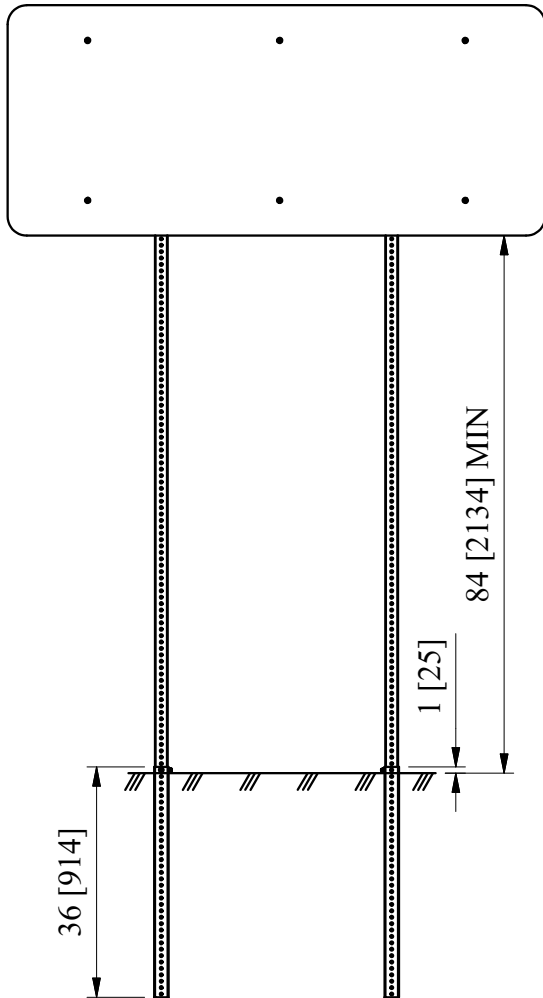
MASH 2016 Test 3-62 Summary



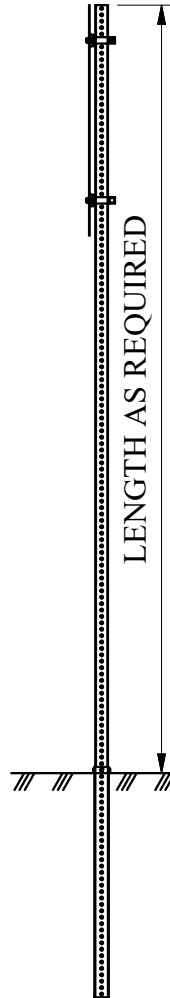
GENERAL INFORMATION	
Test Agency.....	Applus IDIADA KARCO
Test Number.....	P40159-01
Test Designation.....	3-62
Test Date.....	12/30/20
TEST ARTICLE	
Name / Model.....	SQR-LOC®Perforated Dual Sign Support TL-3
Type.....	Support Structure
Mounting Height	7.0 ft. (2.1 m)
Key Elements.....	2.00" 12 GA Signposts 2.25" 12GA Anchor Sleeves 36" x 84" Aluminum Sign
Road Surface.....	Smooth, clean concrete
TEST VEHICLE	
Type / Designation.....	2270P
Year, Make, and Model.....	2014 Dodge Ram 1500
Curb Mass.....	4,961.4 lbs (2,250.5 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	61.29 mph (98.64 km/h)
Impact Angle.....	0.0°
Kinetic Energy.....	629.2 kip-feet (853.1 Kilojoules)
Minimum KE Required.....	594.0 kip-feet (805.3 Kilojoules)
Location / Orientation.....	0.0 in.(0 mm) Offset from Centerline
Exit Conditions	
Exit Velocity.....	56.30 mph (90.61 km/h)
Final Resting Position.....	345.1 ft. (105.2 m) Downstream 1.2 ft. (0.4 m) Left
Vehicle Stability	Satisfactory
Maximum Roll Angle.....	-1.8°
Maximum Pitch Angle.....	2.0°
Maximum Yaw Angle.....	0.4

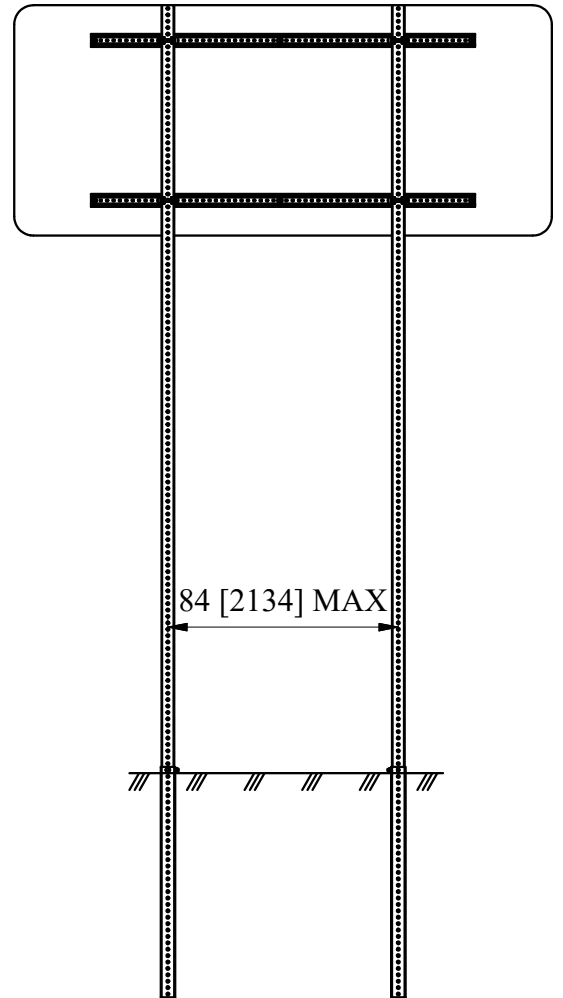
Occupant Risk	
Longitudinal OIV.....	3.9 ft/s (1.2 m/s)
Lateral OIV.....	0.98 ft/s (0.3 m/s)
Longitudinal RA.....	0.0 g
Lateral RA.....	0.0 g
THIV.....	Not Applicable
PHD.....	Not Applicable
ASI.....	0.25
Test Article Deflections	
Debris Field (longitudinal).....	345.1 ft. (105.2 m)
Debris Field (lateral).....	1.2 ft. (0.4 m)
Vehicle Damage	
Vehicle Damage Scale.....	12-FR-1
CDC.....	12FDEW1
Maximum Deformation.....	None



FRONT



SIDE



BACK

2023

SQR-LOC® YIELDING SIGN SUPPORT SYSTEM - DUAL POST



SSFXXa

SHEET NO.

DATE

1 of 4

1/31/2023

INTENDED USE

The SQR-LOC® perforated steel tubular sign support system is a dual post sign support system. The system utilizes drivable perforated anchor sleeves in standard soil. The sign support system was successfully crash tested to TL-3 in accordance with MASH 2016 guidelines. This system meets the requirements of the AASHTO *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 1st Edition*.

FEATURES

The SQR-LOC® perforated steel tubular sign support system consists of two (2) 2.00 inch 12 GA square perforated steel signposts and two (2) 2.25 12 GA square perforated steel anchor sleeves (sheet 3 of 4). The signposts slide into the anchor sleeves and are secured in place by a 5/16" corner bolt and nut. The material for the pre-coated steel for both, anchor sleeves and signposts conforms to ASTM A653. The exterior surface is coated with minimum 0.5 mils clear acrylic polymer.

ELIGIBILITY

The SQR-LOC® dual post, perforated steel tubular sign support system has been tested to MASH 2016 Test Level 3 and is eligible for Federal reimbursement by FHWA.

FHWA Eligibility Letter(s): XX-XXX dated _____ for MASH 2016 Test Level 3.

REFERENCES

Manual for Assessing Safety Hardware (MASH), American Association of State Highway and Transportation Officials (AASHTO), 2016.

CONTACT INFORMATION

15601 Dallas Parkway, Suite 525 Addison, TX 75001
Telephone: (888) 323-6374
www.valtir.com

SQR-LOC® YIELDING SIGN SUPPORT SYSTEM - DUAL POST

SSFXXa

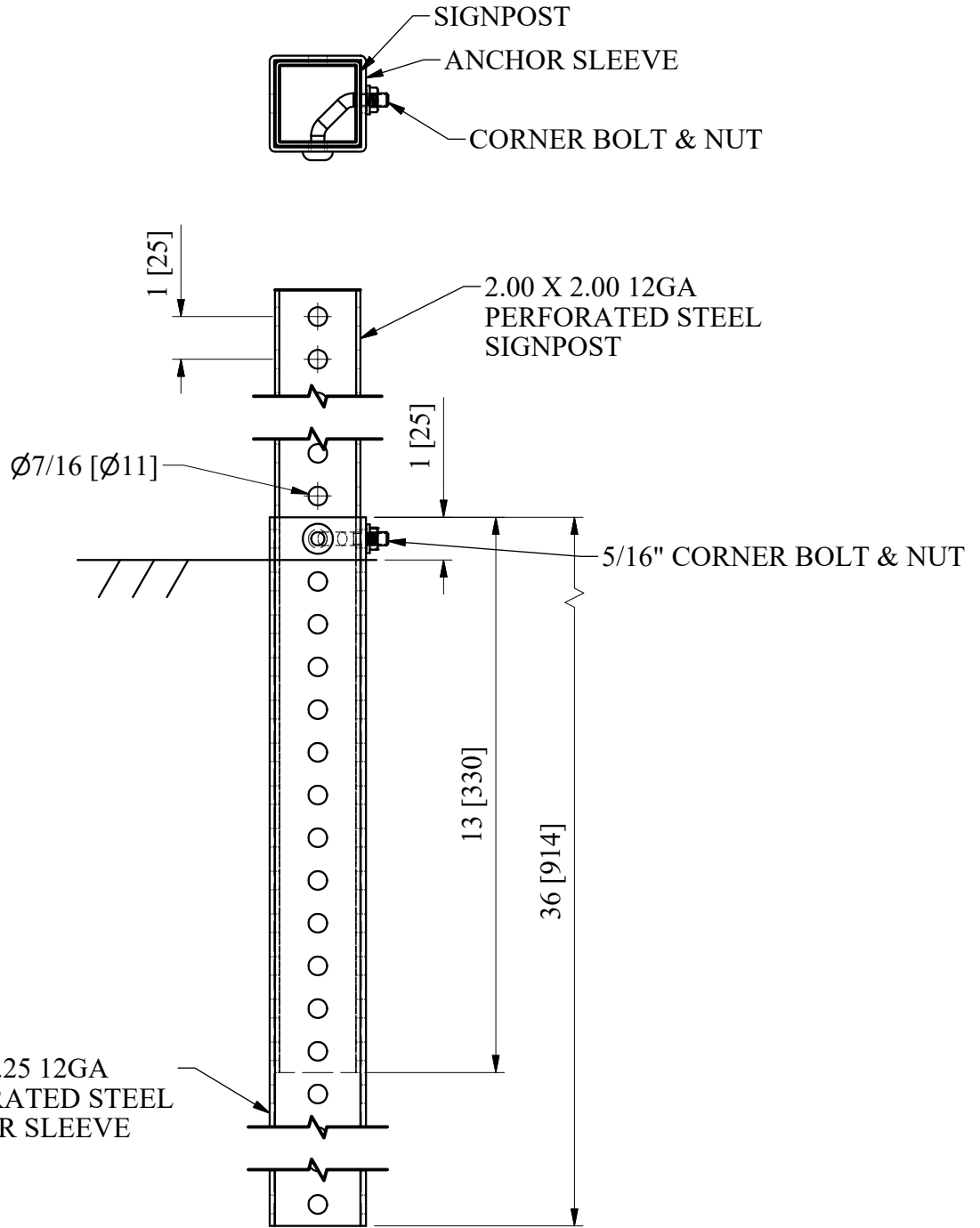
SHEET NO.

DATE

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1/31/2023





DETAIL A: SIGNPOST/ANCHOR SLEEVE CONNECTION

2023

SQR-LOC® YIELDING SIGN SUPPORT SYSTEM - DUAL POST



SSFXXa

SHEET NO.

DATE

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1/31/2023

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SQR-LOC® YIELDING SIGN SUPPORT SYSTEM - DUAL POST

SSFXXa

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DATE

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