

December 9, 2020



U.S. Department  
of Transportation

Federal Highway  
Administration

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

In Reply Refer To:  
HSST-1/WZ-420

Mr. Bret R. Eckert  
Trinity Highway Products, LLC  
2525 N. Stemmons Freeway  
Dallas, TX 75207  
USA

Dear Mr. Eckert:

This letter is in response to your June 22, 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-420 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:

- SiteGuide® LCD

### **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: SiteGuide® LCD

Type of system: Longitudinal Channelizer

Test Level: MASH Test Level 3 (TL3)

Testing conducted by: E-Tech Testing Services

Date of request: June 22, 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-420 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,

A handwritten signature in blue ink that reads "Michael S. Griffith". The signature is fluid and cursive, with "Michael" on the top line and "S. Griffith" on the bottom line.

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:	June 22, 2020	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Bret R.Eckert, P.E.	
	Company:	Trinity Highway Products, LLC	
	Address:	2525 N.Stemmons Freeway, Dallas, TX 75207	
	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.

<b>Device &amp; Testing Criterion - Enter from right to left starting with Test Level</b>				
System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ':CrashWorthy Work Zone	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	SiteGuide®LCD	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:	Bret R.Eckert, P.E.	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	Trinity Highway Products, LLC	Same as Submitter <input checked="" type="checkbox"/>
Address:	2525 N.Stemmons Freeway, Dallas, TX 75207	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.

The SiteGuide® Longitudinal Channelizer Device ("LCD") system technology is the commercial embodiment of intellectual property that is protected by patents that are owned by Trinity Highway Products, LLC ("THP"). THP does not pay royalties for sales of the SiteGuide®LCD. The SiteGuide®LCD system was designed and developed by engineers and employees at THP. The patent holders of record for the SiteGuide®LCD system are James B. Welch and Don C. Pyde, and Mr. Welch and Mr. Pyde were employed by THP. The associated United States Patent Office patent number is 9,677,233 (Dated Jun. 13, 2017) is assigned to Trinity Highway Products LLC.

E-Tech Testing Services, a subsidiary of THP, conducted the certification tests of the SiteGuide®. E-Tech Testing Services is an International Standards Organization ("ISO") 17025 accredited laboratory with American Association for Laboratory Accreditation (A2LA) Mechanical Testing certificate 989.01. Full-scale crash testing on the SiteGuide®LCD 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") (2009).

## PRODUCT DESCRIPTION

Help

- New Hardware or  
 Modification to  
 Significant Modification       Existing Hardware

The SiteGuide®LCD system is a new highly portable, water filled, American with Disabilities Act ("ADA") compliant, longitudinal channelizing device especially suited for use as a temporary barricade, delineator, or to provide a means of visual direction in highway construction zones. The SiteGuide®LCD is normally provided in alternating highly visible work zone safety orange and white (natural) colored sections.

The SiteGuide®LCD barricade sections are constructed of linear low density polyethylene plastic and have approximate physical dimensions and capacities of length (pin to pin) 1524 mm [60 in.]; width: 406.4 mm [16 in.]; height: 841 mm [33 1/8 in.]; empty weight: 22.2 kg [49 lb.]; full weight: 303.0 kg [668 lb.]; water ballast: 281.1 liters [74.4 gallons]. The ends of each barricade section are constructed with one downward pin and a facing up receiver pocket which interlock with those of adjacent sections. The barricade sections have vertical sidewalls to interact with an impacting vehicle. They also provide an ADA hand rail and feature a flat top and bottom geometry such that a second and third section can neatly stack on top of the first for efficient transport and storage. The barricade sections also have elevated forklift openings to allow for mechanical lifting when empty or full, and incorporate two 114 mm [4.5 in.] diameter quick fill openings with covers, and two 38 mm [1 1/2 in.] diameter HDPE drain plugs to allow quick draining of the water ballast.

## 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:	Paul L. Kruse, P.E.	
Engineer Signature:	 Date: 2020.05.22T1100:28-07'00' Digitally signed by Paul Kruse DN: cn=Paul Kruse, o=Trinity Highway, ou=Compliance Department, email=paul.kruse@trin.net, c=US	
Address:	3617BCincinnati Ave., Rocklin, CA 95765	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input checked="" type="checkbox"/>

A brief description of each crash test and its result:

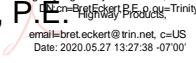
Help

Required Test Number	Narrative Description	Evaluation Results
3-90 (1100C)	<p>E-Tech Test No's. 78-0299-001 and 78-0299-003, Test Dates June 23, 2016 and June 28, 2016, Test Report titled, "MASH TL-3 Crash Test Results for the SiteGuide® Longitudinal Channelizing Device".</p> <p>Two MASH Test Number 3-90's were conducted on the SiteGuide®LCD, the first test with the vehicle impact into the non-ADA face side of the barriers, and the second test with the vehicle impact into the ADA face side of the ninth barriers. Both tests used vehicle impact angles of 15 degrees.</p> <p>The results of both MASH Test 3-90's conducted on the ADA and non-ADA faced sides of the SiteGuide®LCD barriers met all testing requirements. The longitudinal channelizers allowed the vehicles to pass smoothly through the system. The occupant risk values were below preferred limits with Occupant Impact Velocities of 8.4 m/s and 8.9 m/s, respectively and Occupant Ridedown Accelerations of 9.7 g and 8.0 g, respectively. Vehicle damage for both tests was within MASH test specifications with damage limited to the vehicle grille, bumper, hood, and fenders. The windshield was cracked in the lower driver side from contact of the hood, but with no windshield deformation into the occupant compartment. There was no damage to the vehicle interior.</p>	PASS

Required Test Number	Narrative Description	Evaluation Results
3-91 (1100C)	<p>E-Tech Test No's. 78-0299-002 and 78-0299-004, Test Dates June 30, 2016 and July 6, 2016, Test Report titled, "MASHTL-3 Crash Test Results for the SiteGuide® Longitudinal Channelizing Device".</p> <p>Two MASH Test Number 3-91's were conducted on the SiteGuide®LCD, the first test with the vehicle impact into the non-ADA face side of the barriers, and the second test with the vehicle impact into the ADA face side of the ninth barriers. Both tests used vehicle impact angles of 25 degrees.</p> <p>The results of both MASH Test 3-91's conducted on the ADA and non-ADA faced sides of the SiteGuide®LCD barriers met all testing requirements. The longitudinal channelizers allowed the vehicles to pass smoothly through the system. The occupant risk values were below preferred limits with Occupant Impact Velocities of 7.9 m/s and 7.2 m/s, respectively and Occupant Ridedown Accelerations of 5.8 g and 2.3 g, respectively. Vehicle damage for both tests was within MASH test specifications with damage limited to the vehicle grille, bumper, and driver fender; and no damage to the windshield or vehicle interior.</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:	E-Tech Testing Services, Inc.	
Laboratory Signature:	Timothy Mortensen	Digitally signed by Timothy Mortensen Date: 2020.05.27 12:55:07 -07'00'
Address:	3617BCincinnati Ave., Rocklin, CA 95765	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input checked="" type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	A2LA Certificate #989.01, Accreditation Date Current to November 30, 2021	

Submitter Signature\*: Bret Eckert, P.E.  
  
Digitally signed by Bret Eckert, P.E.  
on Behalf of Project Trinity  
email:bret.eckert@trin.net c-US  
Date: 2020.05.27 13:27:38 -07'00'

**Submit Form**

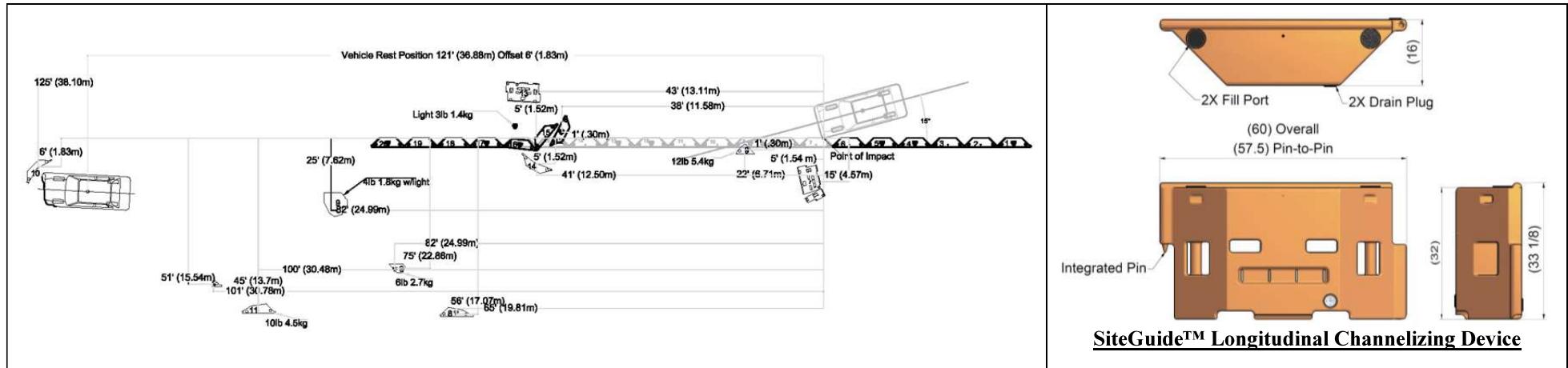
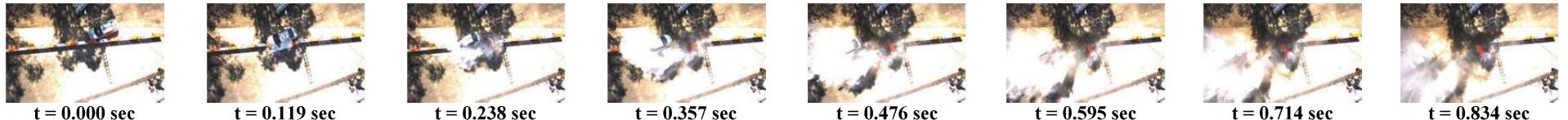
## ATTACHMENTS

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



#### General Information

Test Agency ..... E-TECH Testing Services, Inc.  
 Test Designation ..... MASH Test 3-90  
 Test No. .... 78-0299-001  
 Date ..... 6/23/16

#### Test Article

Type ..... Trinity Highway, LLC  
 SiteGuide™ Longitudinal Channelizing Device  
 Installation Details ..... (20) 6ft sections in a straight array freestanding on concrete

Material and Key Elements ..... 33 1/8 in tall x 60 in wide linear low density polyethylene (LLDPE) sections

Foundation Type and Condition ..... Concrete, clean and dry

#### Test Vehicle

Type ..... Production Model  
 Designation ..... 1100C  
 Model ..... 2010 Hyundai Accent  
 Curb ..... 1115 kg  
 Test Inertial ..... 1125 kg  
 Dummy ..... 75 kg  
 Gross Static ..... 1200 kg

#### Impact Conditions

Speed ..... 104.3 kph  
 Angle (deg) ..... 15  
 Impact Severity ..... 473 kJ

#### Occupant Risk Values (absolute values)

Impact Velocity  
 Longitudinal ..... 8.4 m/s  
 Lateral ..... 2.6 m/s  
 Ridedown Acceleration  
 Longitudinal ..... 9.7 g  
 Lateral ..... 3.3 g

#### EN Values

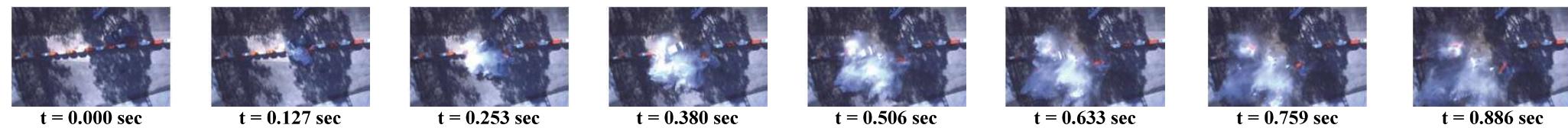
THIV ..... 31.7 km/h  
 PHD ..... 9.8 g  
 ASI ..... 0.8

#### Vehicle Stability

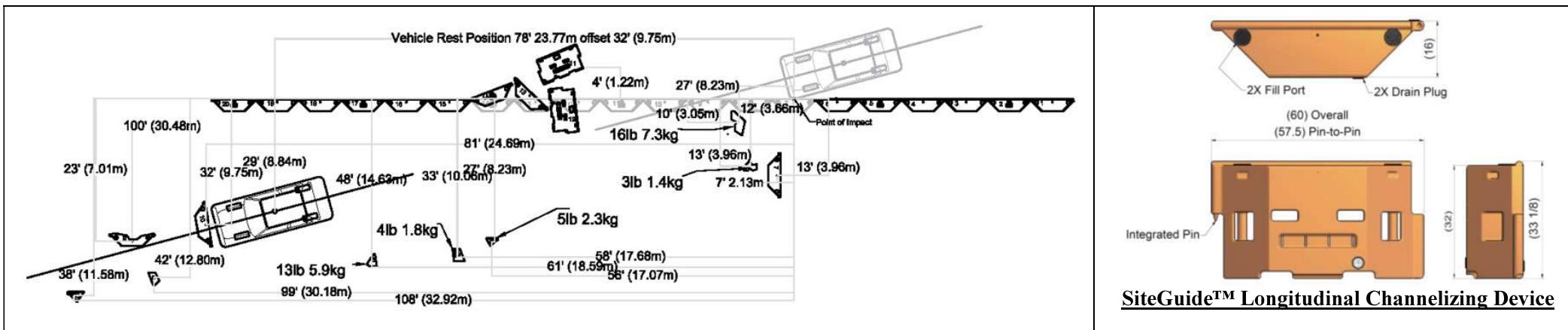
Max. Roll ..... 7 deg  
 Max. Pitch ..... 4 deg  
 Max. Yaw ..... -9 deg

#### Vehicle Damage

Exterior	VDS	LFQ-4 and FD-4
	CDC	11FYEW2
Interior	VCDI	AS0000000
	Maximum Deformation	Negligible



**t = 0.000 sec      t = 0.127 sec      t = 0.253 sec      t = 0.380 sec      t = 0.506 sec      t = 0.633 sec      t = 0.759 sec      t = 0.886 sec**



**SiteGuide™ Longitudinal Channelizing Device**

#### General Information

Test Agency ..... E-TECH Testing Services, Inc.

Test Designation ..... MASH Test 3-90

Test No..... 78-0299-003

Date..... 6/28/16

#### Test Article

Type ..... Trinity Highway, LLC  
SiteGuide™ Longitudinal Channelizing Device

Installation Details..... (20) 6ft sections in a straight array freestanding on concrete

Material and Key Elements ..... 33 1/8 in tall x 60 in wide linear low density polyethylene (LLDPE) sections

Foundation Type..... Concrete, clean and dry and Condition

#### Test Vehicle

Type ..... Production Model  
Designation..... 1100C  
Model..... 2011 Kia Rio  
Curb ..... 1100.5 kg  
Test Inertial..... 1109.5 kg  
Dummy..... 75 kg  
Gross Static..... 1184.5 kg

#### Impact Conditions

Speed ..... 98.9 kph  
Angle (deg)..... 15  
Impact Severity ..... 419 kJ

#### Occupant Risk Values (absolute values)

Impact Velocity  
Longitudinal ..... 8.9 m/s  
Lateral ..... 1.1 m/s  
Ridedown Acceleration  
Longitudinal ..... 8.0 g  
Lateral ..... 3.3 g

#### EN Values

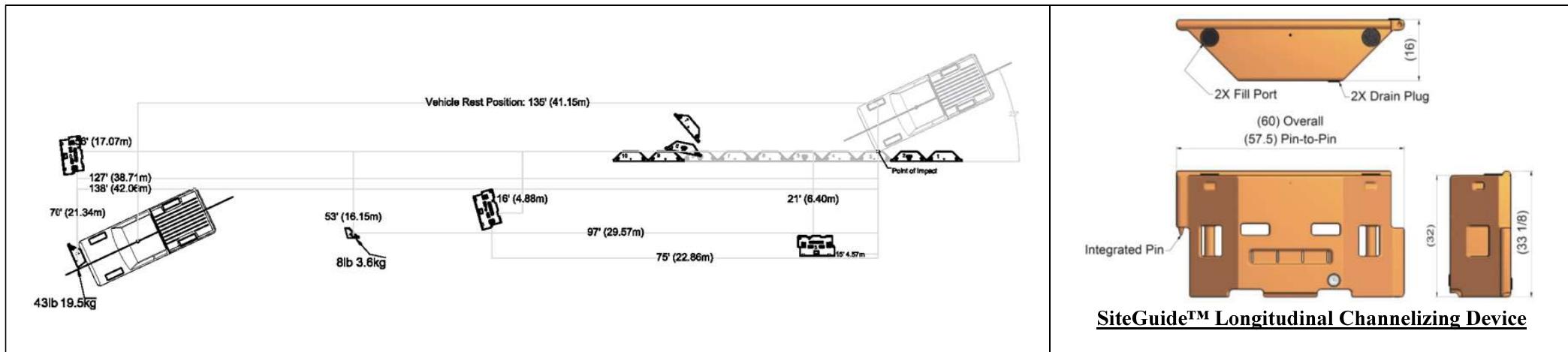
THIV ..... 32.2 km/h  
PHD ..... 8.0 g  
ASI ..... 0.6

#### Vehicle Stability

Max. Roll ..... 20 deg  
Max. Pitch ..... 4 deg  
Max. Yaw ..... -7 deg

#### Vehicle Damage

Exterior	VDS	LFQ-4, RFQ-2 and FD-4
	CDC	11FDEW2
Interior	VCDI	AS0000000
	Maximum Deformation	Negligible



#### General Information

Test Agency ..... E-TECH Testing Services, Inc.  
 Test Designation ..... MASH Test 3-91  
 Test No. .... 78-0299-002  
 Date ..... 6/30/16

#### Test Article

Type ..... Trinity Highway, LLC  
 SiteGuide™ Longitudinal Channelizing Device

Installation Details ..... (10) 6ft sections in a straight array freestanding on concrete

Material and Key ..... 33 1/8 in tall x 60 in wide linear low density polyethylene (LLDPE) sections

Foundation Type ..... Concrete, clean and dry and Condition

#### Test Vehicle

Type ..... Production Model  
 Designation ..... 2270P  
 Model ..... 2009 Dodge Ram 1500  
 Curb ..... 2187.0 kg  
 Test Inertial ..... 2223.5 kg  
 Dummy ..... N/A  
 Gross Static ..... 2223.5 kg

#### Impact Conditions

Speed ..... 100.6 kph  
 Angle (deg) ..... 25  
 Impact Severity ..... 867 kJ

#### Occupant Risk Values (absolute values)

Impact Velocity  
 Longitudinal ..... 7.9 m/s  
 Lateral ..... 0.8 m/s  
 Ridedown Acceleration  
 Longitudinal ..... 5.8 g  
 Lateral ..... 3.2 g

#### EN Values

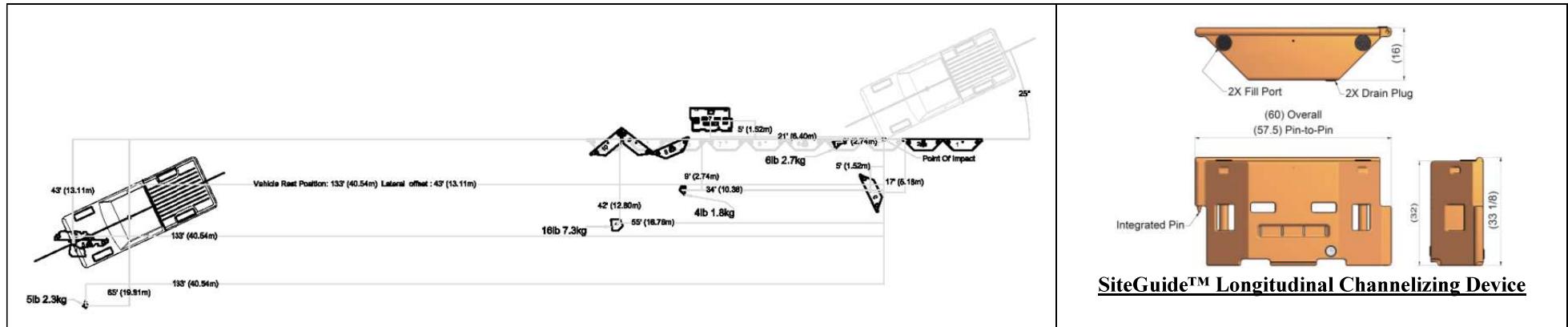
THIV ..... 28.5 km/h  
 PHD ..... 6.5 g  
 ASI ..... 0.6

#### Vehicle Stability

Max. Roll ..... 13 deg  
 Max. Pitch ..... -5 deg  
 Max. Yaw ..... -7 deg

#### Vehicle Damage

Exterior	VDS	LFQ-3 and FD-3
	CDC	11FYEW2
Interior	VCDI	AS0000000
	Maximum Deformation	Negligible



#### General Information

Test Agency ..... E-TECH Testing Services, Inc.  
 Test Designation ..... MASH Test 3-91  
 Test No. .... 78-0299-004  
 Date ..... 7/6/16

#### Test Article

Type ..... Trinity Highway, LLC  
 SiteGuide™ Longitudinal Channelizing Device

Installation Details ..... (10) 6ft sections in a straight array freestanding on concrete

Material and Key ..... 33 1/8 in tall x 60 in wide linear low density polyethylene (LLDPE) sections

Foundation Type ..... Concrete, clean and dry and Condition

#### Test Vehicle

Type ..... Production Model  
 Designation ..... 2270P  
 Model ..... 2010 Dodge Ram 1500  
 Curb ..... 2256.0 kg  
 Test Inertial ..... 2309.0 kg  
 Dummy ..... N/A  
 Gross Static ..... 2309.0 kg

#### Impact Conditions

Speed ..... 98.9 kph  
 Angle (deg) ..... 25  
 Impact Severity ..... 871 kJ

#### Occupant Risk Values (absolute values)

Impact Velocity  
 Longitudinal ..... 7.2 m/s  
 Lateral ..... 0.2 m/s  
 Ridedown Acceleration  
 Longitudinal ..... 2.3 g  
 Lateral ..... 1.7 g

#### EN Values

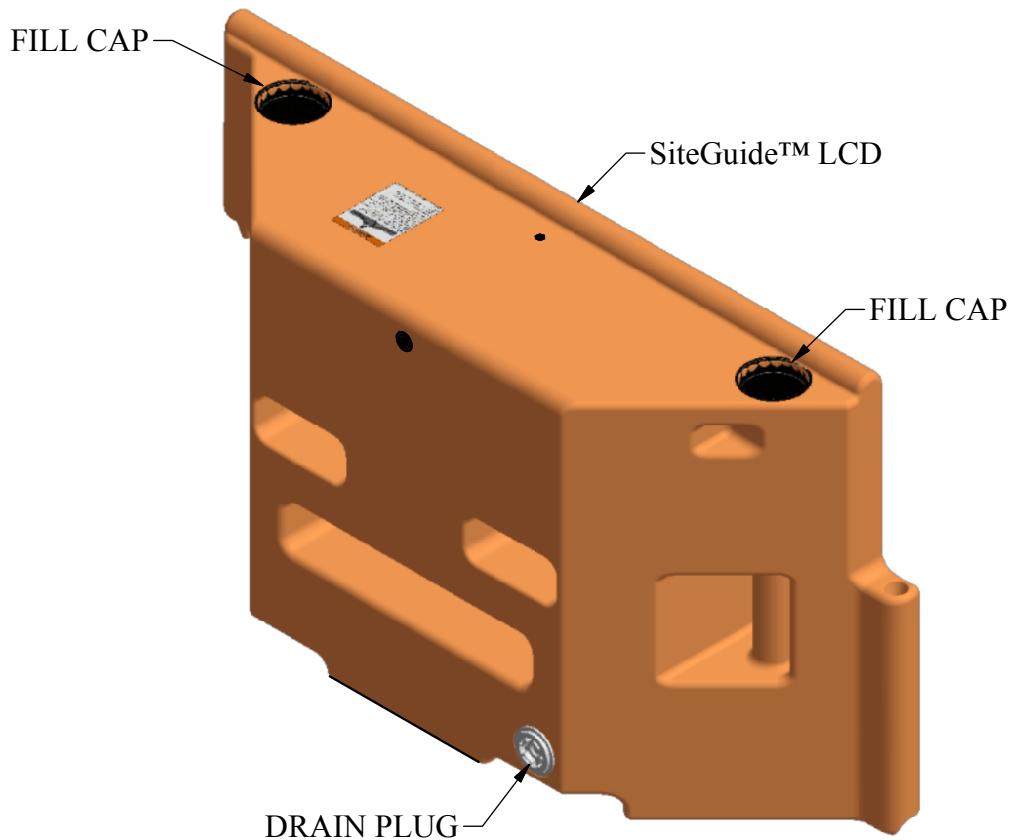
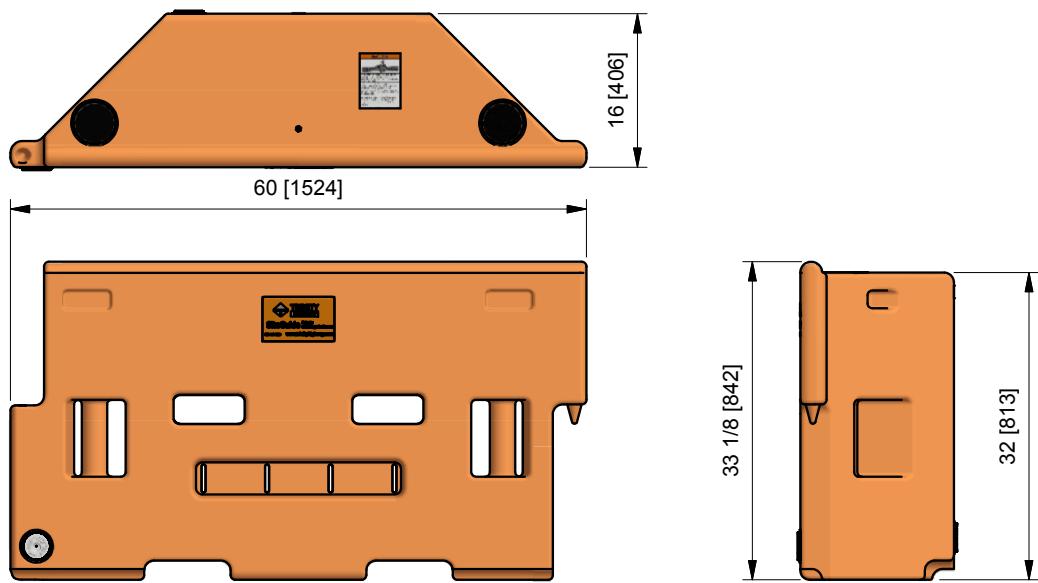
THIV ..... 25.8 km/h  
 PHD ..... 2.8 g  
 ASI ..... 0.5

#### Vehicle Stability

Max. Roll ..... -7 deg  
 Max. Pitch ..... 3 deg  
 Max. Yaw ..... 3 deg

#### Vehicle Damage

Exterior	VDS	LFQ-4 and FD-3
	CDC	11FYEW4
Interior	VCDI	AS0000000
	Maximum Deformation	Negligible



## SITEGUIDE™ LONGITUDINAL CHANNELIZING DEVICE



**TRINITY**  
HIGHWAY

SHEET NO.	DATE
1 of 2	11/8/2016

## INTENDED USE

The SiteGuide™ Longitudinal Channelizing Device (LCD) is a portable, tested, and American with Disabilities Act (ADA) compliant, temporary barricade or delineator used to provide pedestrian channelization and portable traffic control in highway construction zones. The SiteGuide™ LCD is composed of individual lightweight, orange and white (natural) colored, plastic barricade sections with the following physical dimensions and capacities; Length (pin to pin): 1524 mm [60 in.], width: 406.4 mm [16 in.], height: 813 mm [32 in.], empty weight: 22.2 kg [49 lb.], full weight: 280.8 kg [619 lb.] and water ballast: 258.5 liters [68.3 gallons]. The barricade sections are constructed with an interlocking downward-facing pin on one end and an up-facing receiver on the other end for connection of adjacent sections.

The SiteGuide™ LCD was tested as a Longitudinal Channelizing Device in accordance with the AASHTO MASH TL-3 evaluation criteria. The SiteGuide™ LCD met all requirements for Tests 3-90 and 3-91 when impacted on both the traffic side of the barricade, and on the non-traffic, ADA compliant, side of the barricade.

## APPROVALS

The SiteGuide™ LCD meets MASH criteria for TL3 applications.

FHWA Eligibility Letters:

## REFERENCES

*Manual for Assessing Safety Hardware (MASH)*, American Association of State Highway and Transportation Officials (AASHTO), 2009

**CONTACT INFORMATION**  
2525 North Stemmons Freeway  
Dallas, TX 75207  
Telephone: (888) 323-6374  
Fax: (800) 770-6755  
<http://www.highwayguardrail.com/>

## SITEGUIDE™ LONGITUDINAL CHANNELIZING DEVICE

		 <b>TRINITY</b> <b>HIGHWAY</b>
SHEET NO.	DATE	
2 of 2	11/8/2016	