



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

January 6, 2020

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

In Reply Refer To:  
HSST-1/WZ-383

Mr. Felipe Almanza  
TraFFix Devices Inc.  
160 Avenida La Pata  
San Clemente California 92673

Dear Mr. Almanza:

This letter is in response to your March 28, 2019 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-383 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:

- Little Buster Sign Stand w/Roll-Up Sign

### **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: Little Buster Sign Stand w/Roll-Up Sign  
Type of system: Work Zone  
Test Level: MASH Test Level 3 (TL3)  
Testing conducted by: KARCO  
Date of request: March 28, 2019

FHWA concurs with the recommendation of the accredited crash testing laboratory per the attached form for the above device using one (1) 4.0ft. x 4.0ft. roll-up sign supported by a fiberglass flexible frame consisting of two (2) crossbeams that are 5.5ft long pinned together at their centers.

### **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-383 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

<b>Submitter</b>	Date of Request:	March 19, 2019	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Robert Ramirez	
	Company:	Traffix Devices, Inc.	
	Address:	160 Ave La Pata, San Clemente, CA 92673	
	Country:	United States	
	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	Little Buster Sign Stand w/ Roll-Up	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:	Robert Ramirez	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	Traffix Devices, Inc.	Same as Submitter <input checked="" type="checkbox"/>
Address:	160 Ave La Pata, San Clemente, CA 92673	Same as Submitter <input checked="" type="checkbox"/>
Country:	United States	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.		
<p>Traffix Devices Inc. and Applus IDIADA Karco Engineering LLC share no financial interests between the two organizations. This includes no shared financial interest but not limited to:</p> <ul style="list-style-type: none"> <li>i. Compensation including wages, salaries, commissions, professional fees, or fees for business referrals</li> <li>iii. Research funding or other forms of research support;</li> <li>iv. Patents, copyrights, licenses, and other intellectual property interests;</li> <li>vi. Business ownership and investment interests;</li> </ul>		

## PRODUCT DESCRIPTION

<input checked="" type="radio"/> New Hardware or Significant Modification	<input type="radio"/> Modification to Existing Hardware
<p>The Traffix Devices Little Buster Sign Stand is a temporary work-zone device consisting of five main components: one steel base assembly, one outer steel mast, one inner steel telescoping mast, one roll-up sign bracket, and one roll-up sign.</p> <p>The steel base consists of a dual spring assembly at the base of the outer mast. When deployed, the legs form an X-footprint that has overall dimensions of 38.50 in. [978 mm] x 79.50 in. [2019 mm].</p> <p>The inner mast telescopes through the outer mast and locks into place when fully extended using a push button.</p> <p>The roll-up sign bracket is designed hold the roll-up sign in place. The sign is removed by disengaging the latch for the sign to be lifted and removed from the sign stand.</p> <p>The Little Buster Sign Stand can be used on concrete, asphalt, gravel, or dirt surfaces. The test was conducted on a concrete surface. The Little Buster Sign Stand can be used with or without flags.</p> <p>The overall dimensions of the Little Buster Sign Stand is approx. 38.50 in. [978 mm] x 79.50 in. [2019 mm] x 92.0 in. [2336 mm]. Sand bags can be placed on the legs as needed for ballast.</p> <p>The MASH tested and passed Little Buster Stand, described above, is based on the previously tested and passed NCHRP-350 Little Buster Sign Stand (Reference WZ-24).</p>	

### 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:	Steven Matsusaka	
Engineer Signature:	<b>Steven Matsusaka</b>	Digitally signed by Steven Matsusaka DN: cn=Steven Matsusaka, o=Applus IDIADA KARCO Engineering, LLC., ou, email=Steven.Matsusaka@idiada.com, c=US Date: 2019.03.29 10:26:24 -0700
Address:	9270 Holly Rd., Adelanto, CA 92301	Same as Submitter <input type="checkbox"/>
Country:	United States of America	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)	Designed to evaluate the ability of a small car to activate any breakaway, fracture or yielding mechanism. Test 3-70 is considered optional for work-zone traffic control devices weighing less than 220 lbs (100 kg). The as-tested Little Buster weighted approximately 42 lbs (19 kg) therefore the test was non-relevant and was not conducted.	Non-Relevant Test, not conducted

Required Test Number	Narrative Description	Evaluation Results
3-71 (1100C)	<p>For this test, two Little Buster Sign Stands were impacted. The first test article was aligned at 0° and the second test article was aligned at 90° to the impacting vehicle's direction of travel. This test is intended to evaluate the sign stand's behavior when impacted by an 1100C test vehicle. The primary evaluation is based on intrusion into the occupant compartment, windshield damage, and vehicle stability. According to MASH lightweight devices under 220 lbs (100 kg), such as the Little Buster Sign Stand cannot cause sufficient velocity change that would result in exceeding occupant risk criteria limits. The as-tested devices weighed approximately 42 lbs (19 kg), therefore Test 3-71 was conducted without instrumentation for evaluating occupant risk values.</p> <p>The test was conducted using a commercially available 2014 Hyundai Accent 4 door sedan with a test inertia mass of 2,415.1 lbs. (1,095.5 kg). The test vehicle impacted the first sign stand (oriented at 0°) at a velocity of 62.94 mph (101.29 km/h). Upon impact the mast deflected around the front of the vehicle and separated at its telescoping point. The contact with the base of the first device caused the vehicle to miss the intended impact point of the second device. As a result of the interference, the second sign had to be re-tested.</p> <p>The test vehicle impacted the sign stand (oriented at 90°) at a velocity of 62.59 mph (100.73 km/h). Upon impact the springs were activated and the mast deflected over the front of the vehicle. The sign detached from the mast. The mast remained attached to the base throughout the impact.</p> <p>The vehicle's occupant compartment was not penetrated by the test articles and there was negligible cab deformation. Debris from the test articles did not block the driver's vision. The vehicle remained upright and the roll angle did not exceed 75°. The vehicle cleared both devices in a controlled and stable manner. The Little Buster Sign Stand met all the requirements for MASH Test 3-71.</p>	PASS

3-72 (2270P)	<p>For this test, two Little Buster Sign Stands were impacted. The first test article was aligned at 0° and the second test article was aligned at 90° to the impacting vehicle's direction of travel. This test is intended to evaluate the sign stand's behavior when impacted by a 2270P test vehicle. The primary evaluation is based on intrusion into the occupant compartment, windshield damage, and vehicle stability. According to MASH lightweight devices under 220 lbs (100 kg), such as the Little Buster Sign Stand cannot cause sufficient velocity change that would result in exceeding occupant risk criteria limits. The as-tested devices weighed approximately 42 lbs (19 kg), therefore Test 3-72 was conducted without instrumentation for evaluating occupant risk values.</p> <p>The test was conducted using a commercially available 2015 RAM 1500 4 door pickup with a test inertial mass of 5,005.5 lbs. (2,270.5 kg). The test vehicle impacted the first sign stand (oriented at 0°) at a velocity of 60.11 mph (96.74 km/h). Upon impact the spring were activated, and the mast separated at its telescoping point. The sign and upper mast section rotated over the top of the vehicle. The vehicle cleared the sign stand in a controlled manner.</p> <p>The test vehicle continued along its path and impacted the second sign stand (oriented at 90°) at a velocity of 59.71 mph (96.10 km/h). Upon impact the springs were activated. The mast deflected around the front of the vehicle and pulled the base forward. The sign released from the mast and passed over the top of the vehicle. The base assembly and mast dragged beneath the vehicle but did not cause instability to the vehicle.</p> <p>The vehicle's occupant compartment was not penetrated by the test articles and there was negligible cab deformation. Debris from the test articles did not block the driver's vision. The vehicle remained upright and the roll angle did not exceed 75°. The vehicle cleared both devices in a controlled and stable manner. The Little Buster Sign Stand met all the requirements for MASH Test 3-72.</p>	PASS
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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 KARCO Engineering, LLC.	
Laboratory Signature:	<b>Steven Matsusaka</b> <small>Digitally signed by Steven Matsusaka  DN: cn=Steven Matsusaka, o=Applus IDIADA KARCO Engineering, LLC, ou,  email=Steven.Matsusaka@idiada.com, c=US  Date: 2019.03.29 10:35:23 -0700</small>	
Address:	9270 Holly Rd., Adelanto, CA 92301	Same as Submitter <input type="checkbox"/>
Country:	United States of America	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	September 14, 2018 - July 1, 2019	

Submitter Signature\*: Robert Ramirez Digitally signed by Robert Ramirez  
Date: 2019.03.29 15:34:49 -0700

**Submit Form**

### ATTACHMENTS

Attach to this form:

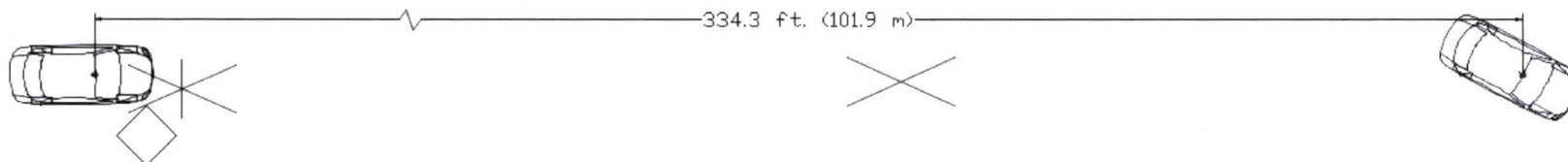
- 1) Additional disclosures of related financial interest as indicated above.
- 2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
- 3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [[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 3-71 0° Orientation Summary

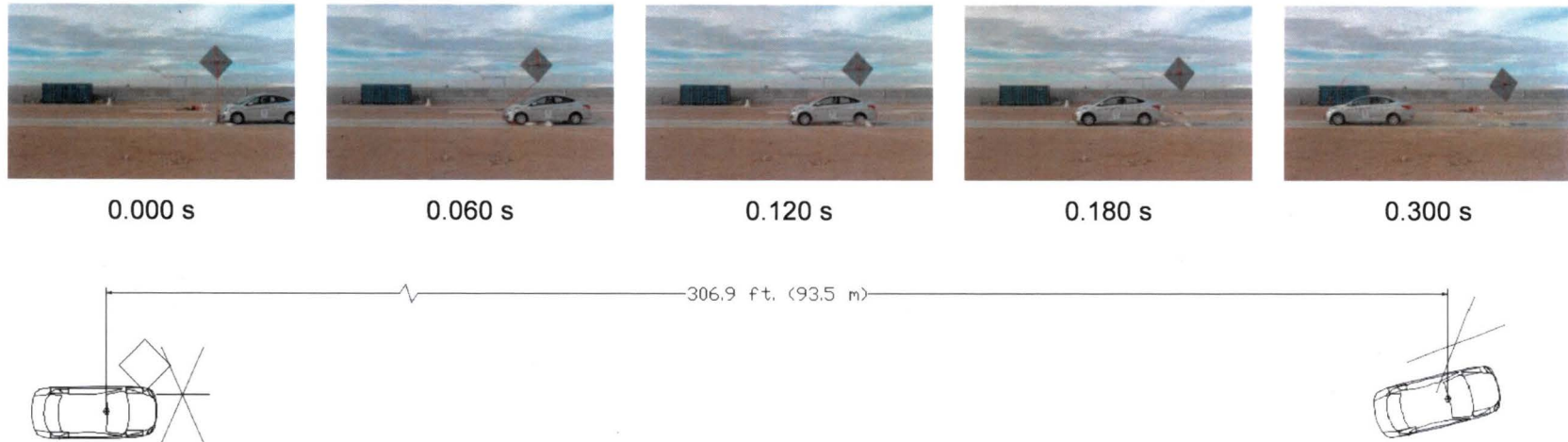


<p><b>GENERAL INFORMATION</b></p> <p>Test Agency..... KARCO Engineering, LLC.          KARCO Test No..... P38101-01          Test Designation..... 3-71          Test Date..... 03/07/18</p> <p><b>TEST ARTICLE</b></p> <p>Name / Model..... Little Buster          Type..... Work Zone Device          Height from Ground ..... 7.0 ft. (2.1 m)          Key Elements..... Roll-up Sign          Road Surface..... Concrete</p> <p><b>TEST VEHICLE</b></p> <p>Type / Designation..... 1100C          Year, Make, and Model.... 2014 Hyundai Accent          Curb Mass..... 2,484.6 lbs (1,127.0 kg)          Test Inertial Mass..... 2,415.1 lbs (1,095.5 kg)          Gross Static Mass..... 2,580.5 lbs (1,170.5 kg)</p>	<p><b>Impact Conditions</b></p> <p>Impact Velocity..... 62.94 mph (101.29 km/h)          Device Angle..... 0°          Location / Orientation..... 16.7 in. (425 mm) Offset          Kinetic Energy..... 319.8 kip-ft (433.6 kJ)</p> <p><b>Exit Conditions</b></p> <p>Exit Velocity..... 61.98 mph (99.75 km/h)          Exit Angle..... 0°          Final Vehicle Position..... 334.3 ft. (101.9 m) Downstream          1.1 ft. (0.3 m) Right          Exit Box Criteria Met..... N/A          Vehicle Snagging..... None          Vehicle Pocketing..... None          Maximum Roll Angle..... N/A*          Maximum Pitch Angle..... N/A*          Maximum Yaw Angle..... N/A*</p>	<p><b>Occupant Risk*</b></p> <p>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</p> <p><b>Test Article Deflections</b></p> <p>Debris Field (longitudinal) ..... 106.1 ft. (32.2 m)          Debris Field (lateral)..... 24.8 ft. (7.6 m)</p> <p><b>Vehicle Damage</b></p> <p>Vehicle Damage Scale..... 12FR1          CDC..... 12FREN1          Maximum Intrusion..... Negligible</p>
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*\* Not Applicable, device weighs less than 220 lbs (100 kg)*

**Figure 3 Summary of Test 3-71 0° Orientation**

## MASH 2016 Test 3-71 90° Orientation Summary



<b>General Information</b>	
Test Agency.....	KARCO Engineering, LLC.
KARCO Test No.....	P38101-02
Test Designation.....	3-71
Test Date.....	03/07/18
<b>Test Article</b>	
Name / Model.....	Little Buster
Type.....	Work Zone Device
Height from Ground .....	7.0 ft. (2.1 m)
Key Elements.....	Roll-up Sign
Road Surface.....	Concrete
<b>Test Vehicle</b>	
Type / Designation.....	1100C
Year, Make, and Model....	2014 Hyundai Accent
Curb Mass.....	2,419.5 lbs (1,097.5 kg)
Test Inertial Mass.....	2,420.6 lbs (1,098.0 kg)
Gross Static Mass.....	2,597.0 lbs (1,178.0 kg)

<b>Impact Conditions</b>	
Impact Velocity.....	62.59 mph (100.73 km/h)
Device Angle.....	90°
Location / Orientation.....	16.7 in. (425 mm) Offset
Kinetic Energy.....	317.1 kip-ft (430.0 kJ)
<b>Exit Conditions</b>	
Exit Velocity.....	61.64 mph (99.20 km/h)
Exit Angle.....	0°
Final Vehicle Position.....	306.9 ft. (93.5 m ) Downstream
	1.5 ft. (0.5 m) Left
Exit Box Criteria Met.....	N/A
Vehicle Snagging.....	None
Vehicle Pocketing.....	None
Maximum Roll Angle.....	N/A*
Maximum Pitch Angle.....	N/A*
Maximum Yaw Angle.....	N/A*

<b>Occupant Risk*</b>	
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
<b>Test Article Deflections</b>	
Debris Field (longitudinal) .....	297.3 ft. (90.6 m)
Debris Field (lateral).....	1.8 ft. (0.5 m)
<b>Vehicle Damage</b>	
Vehicle Damage Scale.....	12FL1
CDC.....	12FLEN1
Maximum Intrusion.....	Negligible

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

Figure 4 Summary of Test 3-71 90° Orientation

## MASH 2016 Test 3-72 Summary

90° CIA

0° CIA



0.000 s

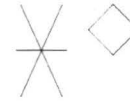
0.100

0.150 s

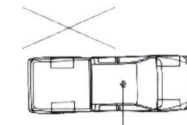
0.000 s

0.100 s

0.150 s



286.8 ft. (94.8 m)



### GENERAL INFORMATION

Test Agency..... KARCO Engineering, LLC.  
 KARCO Test No..... P38102-01  
 Test Designation..... 3-72  
 Test Date..... 03/07/18

### TEST ARTICLE

Name / Model..... Little Buster  
 Type..... Work Zone Device  
 Device Height ..... 7.7 ft. (2.3 m)  
 Key Elements..... Roll-up sign  
 Road Surface..... Concrete

### TEST VEHICLE

Type / Designation..... 2270P  
 Year, Make, and Model..... 2015 RAM 1500  
 Curb Mass..... 4,990.1 lbs (2,263.5 kg)  
 Test Inertial Mass..... 5,005.5 lbs (2,270.5 kg)  
 Gross Static Mass..... 5,005.5 lbs (2,270.5 kg)

### Impact Conditions

Impact Velocity Device 1..... 60.11 mph (96.74 km/h)  
 Impact Velocity Device 2..... 59.71 mph (96.10 km/h)  
 Device 1 Angle..... 90°  
 Device 2 Angle..... 0°  
 Device 1 Kinetic Energy..... 604.6 kip-ft (819.8 kJ)  
 Device 2 Kinetic Energy..... 596.7 kip-ft (809.0 kJ)

### Exit Conditions

Device 1 Exit Velocity..... 59.9 mph (96.4 km/h)  
 Device 2 Exit Velocity..... 58.9 mph (94.8 km/h)  
 Vehicle Resting Position..... 286.8 ft. (87.4 m) Downstream

Vehicle Stability ..... Satisfactory  
 Maximum Roll Angle..... N/A\*  
 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

Debris Field (longitudinal) ..... 272.9 ft. (83.2 m)  
 Debris Field (lateral)..... 21.7 ft. (6.6 m)

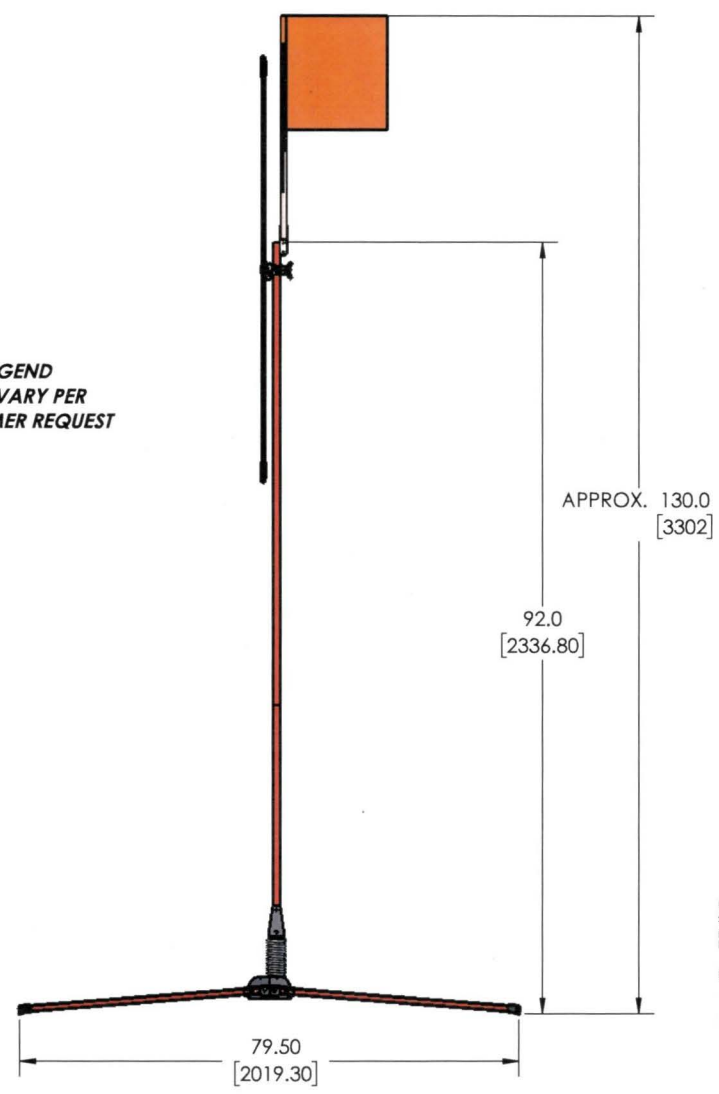
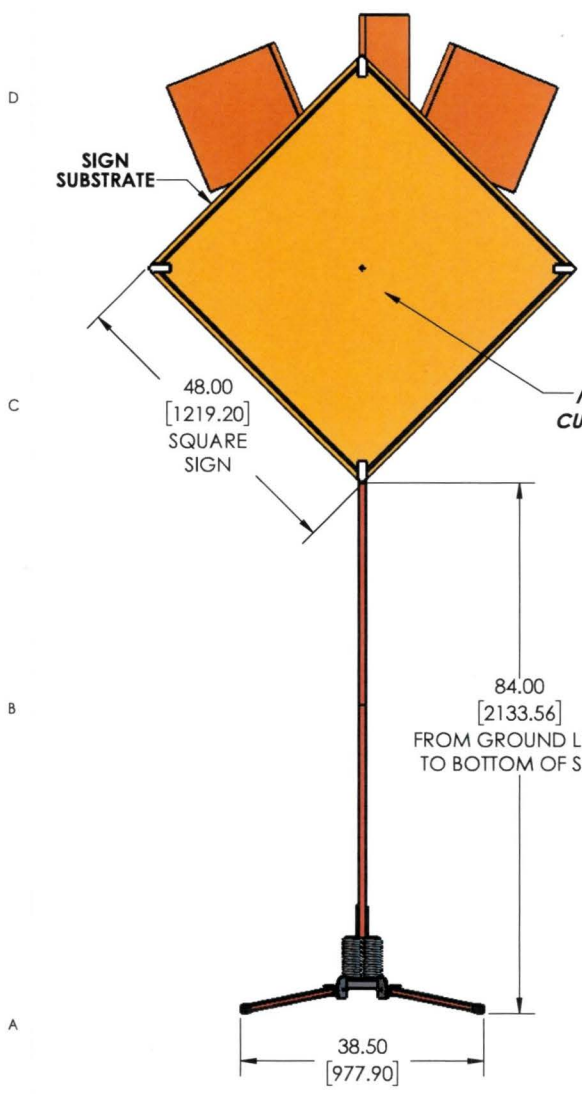
### Vehicle Damage

Vehicle Damage Scale..... 12-FC-0  
 CDC..... N/A  
 Maximum Intrusion..... None

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

Figure 3 Summary of Test 3-72

8 7 6 5 4 3 2 1



UNLESS OTHERWISE SPECIFIED:  
ALL DIMENSIONS ARE IN INCHES (mm).  
TOLERANCES:  
FRACTIONAL: XX ± 1/16" (1.6mm)  
DECIMAL: XX ± .0425"  
X.XX ± .032"  
X.XXX ± .015"  
DEGREES: ± 0.5°



160 Avenida La Pata  
Sunny Glen, CA 92673  
(949) 361-5663  
FAX (949) 361-9205  
www.traffixdevices.com

TITLE:  
**Little Buster Sign Stand  
w/ 48" x 48" Roll-Up Sign**

DRAWN BY:  
Christopher Jalme  
CHECKED BY:  
FA  
APPROVED BY:  
FA

DATE:  
3/1/18  
DATE:  
3/1/18  
DATE:  
3/1/18

SIZE **B** DWG. NO. **500-207** REV **A**

1. Units: Inches [mm]  
**NOTES: UNLESS OTHERWISE SPECIFIED**

8 7 6 5 4 3 2 1

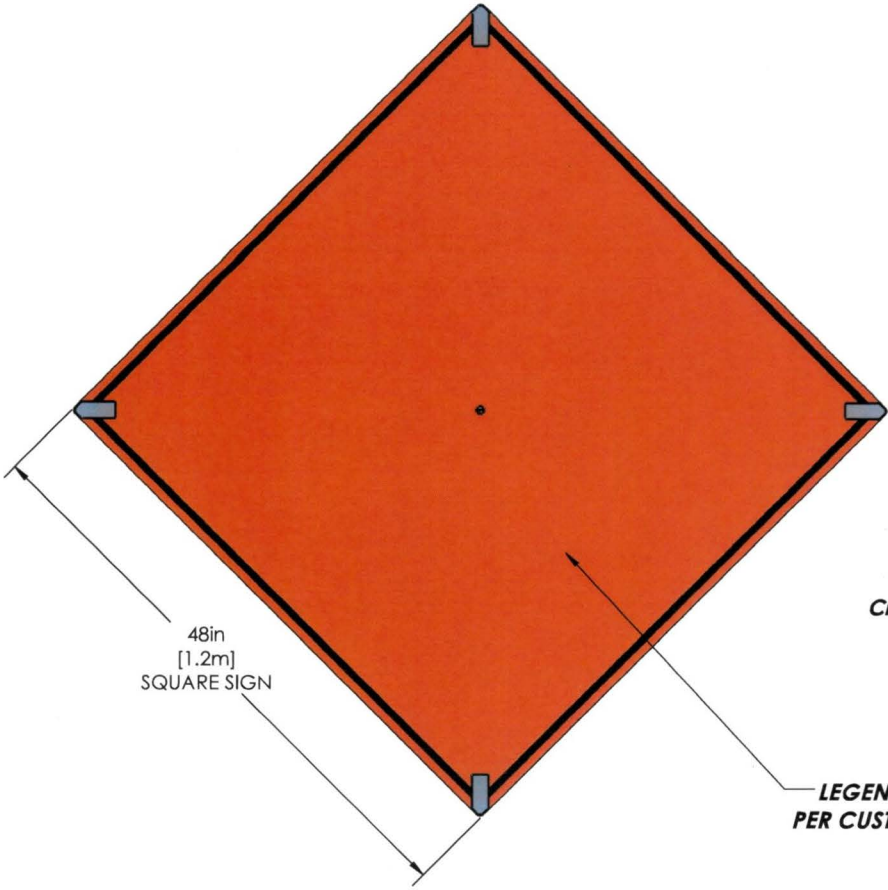
8 7 6 5 4 3 2 1

D

C

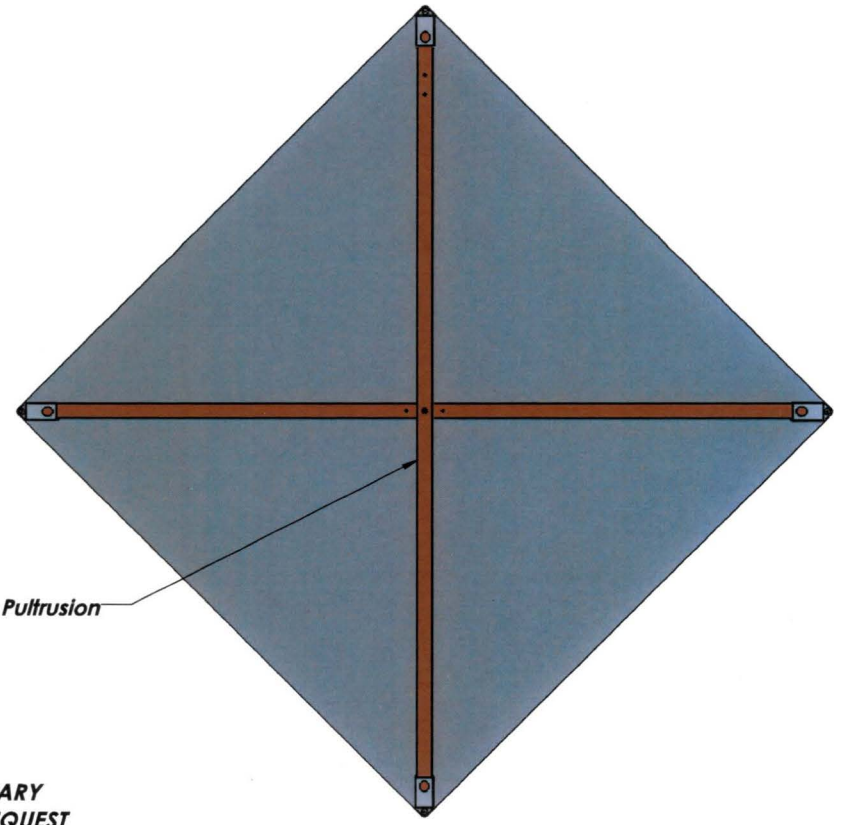
B

A



Crossbeam Pultrusion

LEGEND MAY VARY  
PER CUSTOMER REQUEST



D

C

B

A

**Roll-Up Sign**  
 2. Overall Weight: 5.8 lbs. [2.6 kg.]  
 1. Overall Sign Dimensions: 48" [1.2m] x 48" [1.2m]  
**NOTES: UNLESS OTHERWISE SPECIFIED**

8 7 6 5 4 3 2 1

UNLESS OTHERWISE SPECIFIED:  
ALL DIMENSIONS ARE IN INCHES[mm].



160 Avenida La Pata  
 San Clemente, CA 92673  
 (949) 361-5663  
 FAX (949) 361-9205  
 www.traffixdevices.com

TITLE:  
**Roll-Up Sign Substrate**

DRAWN BY:  
 Christopher Jaime  
 CHECKED BY:  
 FA  
 APPROVED BY:  
 FA

DATE:  
 3/1/18  
 DATE:  
 3/1/18  
 DATE:  
 3/1/18

SIZE  
**B**

DWG. NO.  
**500-210**

REV  
**A**

SHEET 1 OF 1