



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

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

July 17, 2025

In Reply Refer To:
HSST-1/WZ-469

Henry A. Ross
Plasticade
100 Howard Avenue
Des Plaines, IL 60018

Dear Mr. Ross:

We received your initial correspondence on June 18, 2024, requesting issuance of a Federal-aid reimbursement eligibility letter under the Federal-aid highway program for the roadside safety system, device, design, product, or hardware (collectively “device”) described below. On January 27, 2025, we received a complete set of files needed to complete our review. We write to inform you that the device 4336 Crosscade Vertical Panel with Type A Light is eligible for Federal-aid reimbursement. This letter is assigned Federal Highway Administration (FHWA) control number WZ-469.

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: 4336 Crosscade Vertical Panel with Type A Light

Type of system: Work Zone

Test Level: Test Level 3

Testing conducted by: Applus IDIADA KARCO Engineering

Date of request: June 18, 2024

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-469 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.

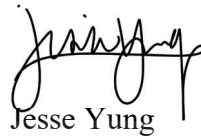
PUBLIC DISCLOSURE

To prevent any misunderstanding, and as discussed above, this Federal-aid eligibility letter is assigned FHWA control number WZ-469. It should only be reproduced in full with its attachment(s). This Federal-aid eligibility 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 Paul LaFleur at Paul.LaFleur@dot.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jesse Yung', with a stylized flourish at the end.

Jesse Yung
Director, Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	June 18, 2024	☒ New ☐ Resubmission
	Name:	Henry Ross	
	Company:	Plasticade	
	Address:	100 Howard Avenue, Des Plaines, IL 60018	
	Country:	United States of America	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

I request the following devices be considered eligible for reimbursement under the Federal-aid highway program.

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

!-!-!

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zone Traffic Control Devices	☒ Physical Crash Testing ☐ Engineering Analysis	4336 Crosscade Vertical Panel with Type A Light	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:	Henry Ross	Same as Submitter ☒
Company Name:	Plasticade	Same as Submitter ☒
Address:	100 Howard Avenue, Des Plaines, IL 60018	Same as Submitter ☒
Country:	United States of America	Same as Submitter ☒
Enter below all disclosures of financial interests as required by the FHWA 'Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.		
Plasticade is the manufacturer and marketer of device. Applus IDIADA KARCO Engineering, LLC (IDIADA KARCO) is an independent research and testing laboratory having no affiliation with any other entity. IDIADA KARCO is actively Involved In data acquisition and compliance/certification testing for a variety of government agencies and equipment manufacturers. The principals and staff of IDIADA KARCO have no past or present financial, contractual or organizational interest in any company or entity directly or indirectly related to the products that KARCO tests. If any financial interest should arise, other than receiving fees for testing, reporting, etc., with respect to any project, the company will provide, In writing, a full and immediate disclosure to the FHWA.		

PRODUCT DESCRIPTION

☒ New Hardware or Significant Modification

☐ Modification to Existing Hardware

The Plasticade 4336 Crosscade Vertical Panel with Type A Light is a work-zone traffic control device. The astested device has a total height of 56.55 in. (1.44 m), a total width of 17.63 in. (0.45 m), and a total length of 27.59 in. (0.70 m). The device consists of one (1) rubber base, one (1) blow-molded vertical panel, and one (1) Type A light mounted on the top of the vertical panel. The device has a total weight of 48.0 lbs (21.8 kg). The 4336 Crosscade Vertical Panel's base is an octagon-shaped black rubber base that is 27.55 in. (0.69m) long, 17.63 in. (0.44 m) wide, and 3.16 in. (0.08 m) tall. The rubber base has two (2) oval cutouts on opposite sides of each other and a center cutout where the vertical panel gets inserted into the base. The base weighs 43 lbs. (19.5 kg).

The vertical panel of the device from the topmost portion of the panel to the ground is 50.42 in. (1.28 m) tall, 14.2 in. (360 mm) wide, and 2.91 in. (70 mm) thick. The vertical panel has a section at the bottom that is friction fit into the base to hold it in place. There are two large holes at the top of the panel with a middle section of plastic that separates the two holes. This middle section contains a small hole where the Type A light can be bolted to the vertical panel. The Type A light is attached using a security bolt and a washer. The thickness of the device, including the vertical panel and the light, is 4.93 in. (0.12 m).

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:	Dominick Dieterle	
Engineer Signature:	Dominick Dieterle Digitally signed by Dominick Dieterle DN: cn=Dominick Dieterle, o=Applus IDIADA, ou=Engineering, email=dominick.dieterle@idiada.com, c=US Date: 2024.06.18 12:16:00 -07'00'	
Address:	9270 Holly Road, Adelanto, CA,92301	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☐

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-70 (1100C)	Per MASH 2016, Test 70 is designed to evaluate the ability of small vehicles to activate any breakaway, fracture, or yielding mechanism associated with the work zone feature during low-speed impacts. For freestanding, lightweight features, velocity changes during low-speed impacts will be within acceptable limits, even when a breakaway, fracture, or yielding feature is not incorporated. Therefore, Test 70 is considered optional for work-zone traffic control devices weighing less than 220 lbs (100 kg). The as-tested device weight was 48 lbs (21.8 kg) and therefore Test 70 was not performed.	Non-Relevant Test, not conducted

Required Test Number	Narrative Description	Evaluation Results
3-71 (1100C)	Applus IDIADA Test No. P44019-01. Test Date January 8, 2024. Crash Test Report No. TR-P44019-01-NC for MASH 2016 Test 3-71 Crash Test of the Plasticade 4336 Crosscade Vertical Panel with Type A Light. Two (2) 4336 Crosscade Vertical Panel with Type A Light signs were impacted in a single test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 90° and 0°. The first device was positioned at a CIA of 90° and was aligned 17.7 in. (450 mm) to the passenger side of the vehicle's centerline. The second device was positioned at a CIA of 0° and was aligned 13.8 in. (350 mm) to the driver side of the vehicle's centerline. An 1100C test vehicle approached the first sign oriented at 90° at a nominal speed of 62.00 mph (100.00 km/h). The first sign was impacted at a velocity of 61.45 mph (98.89 km/h). The impact location was 17.9 in. (455 mm) from the vehicle centerline on the passenger side. The test vehicle then impacted the 0° CIA device at a velocity of 60.41 mph (97.22 km/h). The impact location was 13.7 in. (348 mm) from the vehicle centerline on the driver side. The 4336 Crosscade Vertical Panel with Type A Light yielded and broke away in a predictable manner. There was no penetration into the occupant compartment and the deformation limits were not exceeded. The 4336 Crosscade Vertical Panel with Type A Light met all the requirements for MASH Test 3-71.	PASS

3-72 (2270P)	Applus IDIADA Test No. P44019-01. Test Date January 8, 2024. Crash Test Report No. TR-P44019-01-NC for MASH 2016 Test 3-72 Crash Test of Plasticade 4336 Crosscade Vertical Panel with Type A Light. Two (2) 4336 Crosscade Vertical Panel with Type A Light signs were impacted in a single test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 90° and 0°. The first device was positioned at a CIA of 90° and was aligned 19.7 in. (500 mm) to the passenger side of the vehicle's centerline. The second device was positioned at a CIA of 0° and was aligned 15.7 in. (400 mm) to the driver side of the vehicle's centerline. An 2270P test vehicle approached the first sign oriented at 90° at a nominal speed of 62.00 mph (100.00 km/h). The first sign was impacted at a velocity of 64.00 mph (103.0 km/h). The impact location was 20.5 in. (520.7 mm) from the vehicle centerline on the passenger side. The test vehicle then impacted the 0° CIA device at a velocity of 63.13 mph (101.6 km/h). The impact location was 17.1 in. (435.0 mm) from the vehicle centerline on the driver side. The 4336 Crosscade Vertical Panel with Type A Light yielded and broke away in a predictable manner. There was no penetration or deformation into the occupant compartment. The 4336 Crosscade Vertical Panel with Type A Light met all the requirements for MASH Test 3-72.	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:	Dominick Dieterle	
Address:	9270 Holly Road, Adelanto, CA,92301	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	TL 371: April 27, 2022 - April 27, 2025	

Digitally signed by Dominick Dieterle
 DN: cn=Dominick Dieterle, o=Applus IDIADA, ou=Engineering,
 email=dominick.dieterle@idiada.com, c=US
 Date: 2024.06.18 13:51:09 -07'00'

Submitter Signature*: Henry A. Ross

Digitally signed by Henry A. Ross
Date: 2024.06.18 18:53:17 -05'00'

Submit Form

ATTACHMENTS

Attach to this form:

- 1) Additional disclosures of related financial interest as indicated above.
- 2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
- 3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [[Hardware Guide Drawing Standards](#)]. For proprietary products, a single isometric line drawing is usually acceptable to illustrate the product, with detailed specifications, intended use, and contact information provided on the reverse. Additional drawings (not in TF-13 format) showing details that are relevant to understanding the dimensions and performance of the device should also be submitted to facilitate our review.

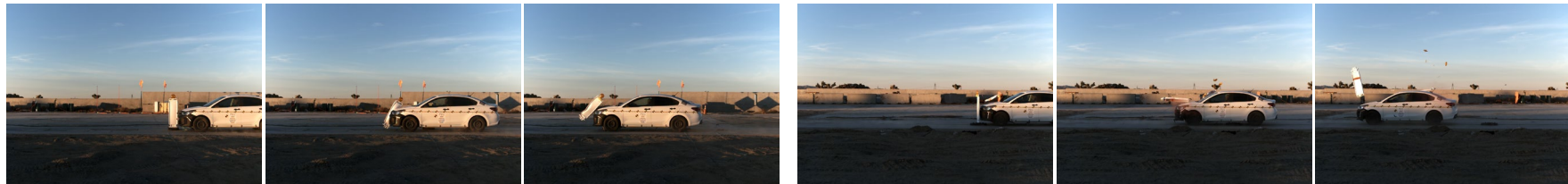
FHWA Official Business Only:

Eligibility Letter		
Number	Date	Key Words

MASH 2016 Test 3-71 Summary

90° CIA

0° CIA



0.000 seconds

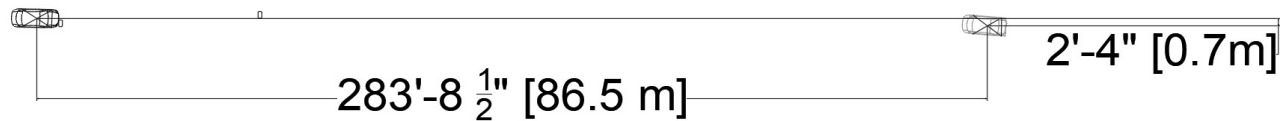
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0.900 seconds



General Information

Test Agency..... Applus IDIADA KARCO
Test No..... P44019-01
Test Designation..... 3-71
Test Date..... 1/8/24

Test Article

Name / Model..... 4336 Crosscade Vertical Panel With Type A Light
Type..... Work-Zone Device
Device Height 4.7 ft. (1.4 m)
Key Elements..... Type A Light, Vertical Panel, Rubber base
Road Surface..... Smooth, clean concrete

Test Vehicle

Type / Designation..... 1100C
Year, Make, and Model..... 2018 Kia Rio
Curb Mass..... 2,552.9 lbs (1,158.0 kg)
Test Inertial Mass..... 2,440.5 lbs (1,107.0 kg)
Gross Static Mass..... 2,597.0 lbs (1,178.0 kg)

Impact Conditions

Impact Velocity Device 1..... 61.45 mph (98.89 km/h)
Impact Velocity Device 2..... 60.41 mph (97.22 km/h)
Device 1 Angle..... 90.0°
Device 2 Angle..... 0.0°
Location / Orientation (Target) D1... 17.7 in. (450 mm) From veh. CL on Pass.
Location / Orientation (Target) D2... 13.8 in. (350 mm) From veh. CL on Driv.
Location / Orientation (Actual) D1... 17.9 in. (455 mm) From veh. CL on Pass.
Location / Orientation (Actual) D2... 13.7 in. (348 mm) From veh. CL on Driv.
Device 1 Kinetic Energy..... 308.0 kip-ft (417.7 kJ)
Device 2 Kinetic Energy..... 297.7 kip-ft (403.7 kJ)
Minimum KE Required..... 288 kip-ft (390 kJ)

Exit Conditions

Device 1 Exit Velocity..... 61.43 mph (98.9 km/h)
Device 2 Exit Velocity..... 59.25 mph (95.4 km/h)
Vehicle Resting Position..... 283.7 ft. (86.5 m) Downstream
2.3 ft. (0.7 m) Passenger
Vehicle Stability Satisfactory
Maximum Roll Angle..... N/A*
Maximum Pitch Angle..... N/A*
Maximum Yaw Angle..... N/A*

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

Occupant Risk

Longitudinal OIV..... Not Applicable*
Lateral OIV..... Not Applicable*
Longitudinal RA..... Not Applicable*
Lateral RA..... Not Applicable*
THIV..... Not Applicable*
PHD..... Not Applicable*
ASI..... Not Applicable*

Test Article Deflections

0° Sign Debris Field (longitudinal) ... 132.5 ft. (40.4 m)
0° Sign Debris Field (lateral)... 36.4 ft. (11.1 m)
90° Sign Debris Field (longitudinal).. 113.2 ft. (34.5 m)
90° Sign Debris Field (lateral)..... 18.7 ft. (5.7 m)

Vehicle Damage

Vehicle Damage Scale..... 12-FR-1
CDC..... 12FLEE1
Maximum Deformation..... 0.8 in. (21 mm) Windshield

Figure 3: Summary of Test 3-71

MASH 2016 Test 3-72 Summary

90° CIA

0° CIA



0.000 seconds

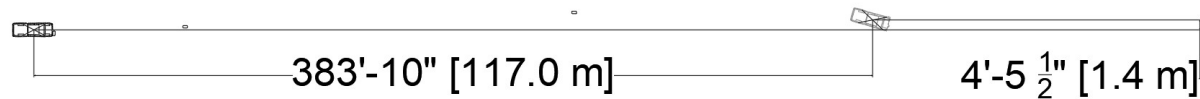
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General Information

Test Agency.....Applus IDIADA KARCO
Test No.....P44018-01
Test Designation.....3-72
Test Date.....1/8/24

Test Article

Name / Model.....4336 Crosscade Vertical Panel With Type A Light
Type.....Work-Zone Device
Device Height4.7 ft. (1.4 m)
Key Elements.....Type A light, Vertical Panel, Rubber base
Road Surface.....Smooth, clean concrete

Test Vehicle

Type / Designation.....2270P
Year, Make, and Model.....2018 Ram 1500
Curb Mass.....5,112.4 lbs (2,319.0 kg)
Test Inertial Mass.....5,024.3 lbs (2,279.0 kg)
Gross Static Mass.....5,024.3 lbs (2,279.0 kg)

Impact Conditions

Impact Velocity Device 1.....64.00 mph (103.00 km/h)
Impact Velocity Device 2.....63.13 mph (101.60 km/h)
Device 1 Angle.....90.0°
Device 2 Angle.....0.0°
Location / Orientation (Target) D1...19.7 in. (500 mm) From veh. CL on Pass.
Location / Orientation (Target) D2...15.7 in. (400 mm) From veh. CL on Driv.
Location / Orientation (Actual) D1...20.5 in. (520 mm) From veh. CL on Pass.
Location / Orientation (Actual) D2...17.1 in. (435 mm) From veh. CL on Driv.
Device 1 Kinetic Energy.....688.0 kip-ft (932.8 kJ)
Device 2 Kinetic Energy.....669.4 kip-ft (907.6 kJ)
Minimum KE Required.....594.0 kip-ft (806.0 kJ)

Exit Conditions

Device 1 Exit Velocity.....63.32 mph (101.9 km/h)
Device 2 Exit Velocity.....61.98 mph (99.7 km/h)
Vehicle Resting Position.....383.9 ft. (117.0 m) Downstream
4.6 ft. (1.4 m) Driver
Vehicle StabilitySatisfactory
Maximum Roll Angle.....N/A*
Maximum Pitch Angle.....N/A*
Maximum Yaw Angle.....N/A*

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

Occupant Risk

Longitudinal OIV.....Not Applicable*
Lateral OIV.....Not Applicable*
Longitudinal RA.....Not Applicable*
Lateral RA.....Not Applicable*
THIV.....Not Applicable*
PHD.....Not Applicable*
ASI.....Not Applicable*

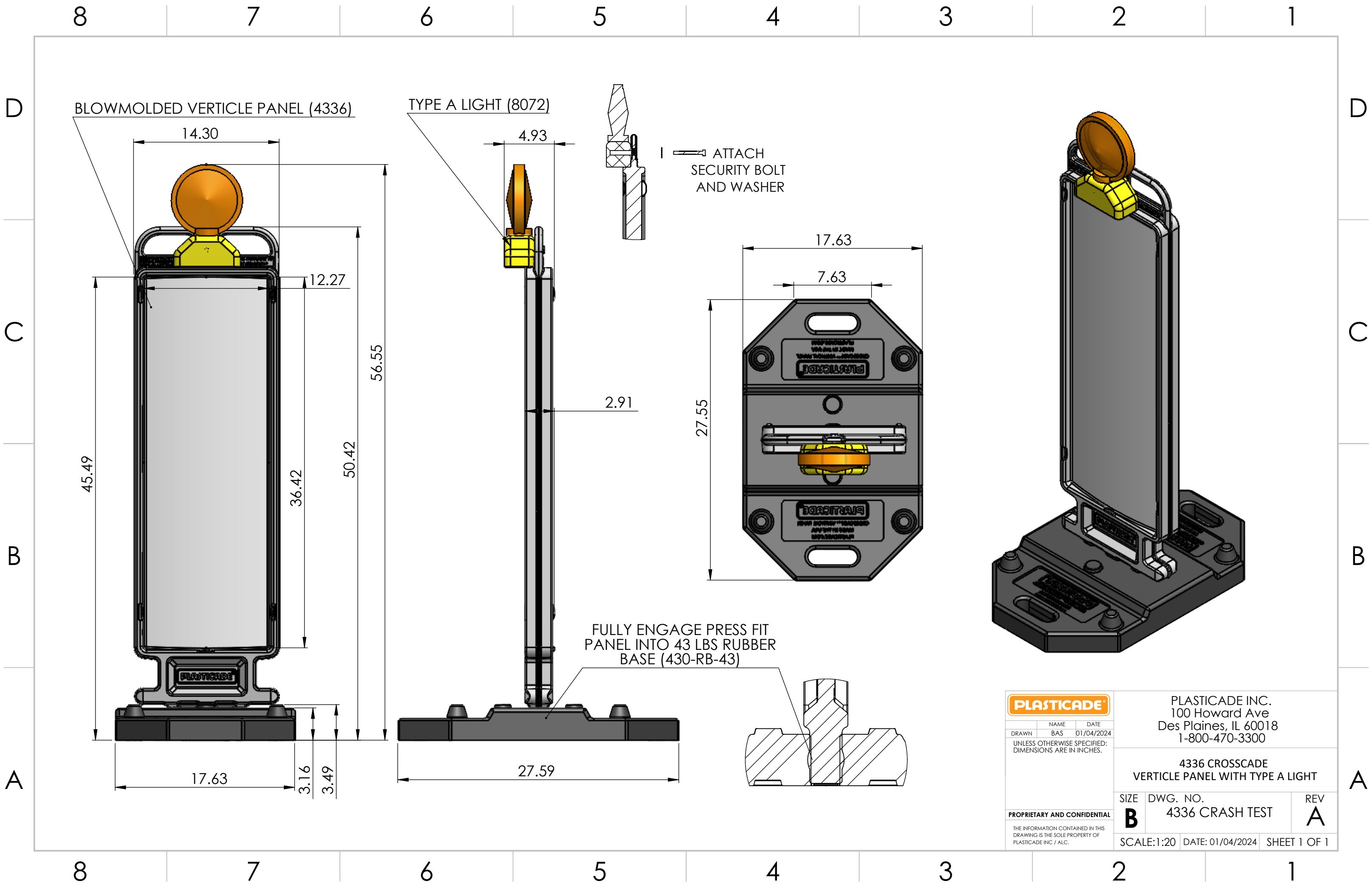
Test Article Deflections

0° Sign Debris Field (longitudinal) ...154.9 ft. (47.2 m)
0° Sign Debris Field (lateral)....36.1 ft. (11.0 m)
90° Sign Debris Field (longitudinal)..178.2 ft. (54.3 m)
90° Sign Debris Field (lateral).....6.6 ft. (2.0 m)

Vehicle Damage

Vehicle Damage Scale.....12-FC-1
CDC.....12FLGN1
Maximum Deformation.....0.0 in. (0 mm)

Figure 4: Summary of Test 3-72



BLOWMOLDED VERTICLE PANEL (4336)

TYPE A LIGHT (8072)

ATTACH
SECURITY BOLT
AND WASHER

FULLY ENGAGE PRESS FIT
PANEL INTO 43 LBS RUBBER
BASE (430-RB-43)

PLASTICADE		PLASTICADE INC. 100 Howard Ave Des Plaines, IL 60018 1-800-470-3300	
DRAWN BAS	NAME BAS	DATE 01/04/2024	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES.			
PROPRIETARY AND CONFIDENTIAL		4336 CROSSCADE VERTICLE PANEL WITH TYPE A LIGHT	
SIZE B	DWG. NO. 4336 CRASH TEST	REV A	
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF PLASTICADE INC. / ALC.		SCALE: 1:20	DATE: 01/04/2024
		SHEET 1 OF 1	