



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

August 15, 2022

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

In Reply Refer To:
HSST-1/WZ-442

Greg Spear
The Cortina Companies, Cortina Safety Products
10706 West Grand Ave,
Franklin Park, IL 60131
United States of America

Dear Mr. Spear:

We received your correspondence of September 20, 2021 requesting issuance of a reimbursement eligibility letter under the Federal-aid highway program for the roadside safety system, device, design, product, or hardware (collectively “device”) described below. This letter is assigned Federal Highway Administration (FHWA) control number WZ-442.

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: Cortina M-Cade Universal Modular Barricade
Type of system: Work Zone
Test Level: Test Level 3
Testing conducted by: Applus IDIADA KARCO Engineering, LLC
Date of request: September 20, 2021

Information about the device, including material such as the eligibility request, crash test reports, drawings, or images are included in one or more attachment(s) to this letter.

Eligibility letter WZ-442 is inapplicable to devices, optional equipment, alternate materials, or other features that were not crash tested in accordance with AASHTO's MASH.

This letter is issued only for the subject device as crash tested under AASHTO's MASH. Later modification(s) of the device are not eligible for Federal-aid reimbursement under this letter. Notice of later modification(s) should be given to transportation agencies, facility owners, and operators (collectively "agencies").

Agencies should be provided appropriate information about the device's design, installation, maintenance, materials, and mechanical properties.

Issuance of this letter is discretionary, and it may be revised or rescinded at FHWA's discretion. This letter is not a determination of compliance with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) or ownership of any intellectual property rights.

This eligibility letter is not a determination by the government that a crash involving the subject device will result in any particular outcome. It is limited to only the device's eligibility for Federal-aid reimbursement.

INTELLECTUAL PROPERTY

Issuance of this eligibility letter does not convey property rights of any sort nor any exclusive privilege. This letter is not authorization or consent by the government for the use, manufacture, or sale of any patented or proprietary system, device, design, product, or hardware for which the requester is not the patent owner. Eligibility letters are not an expression of any view, position, or determination by the government as to the validity, scope, or ownership of any intellectual property rights to a specific device. These letters do not grant, impute, suggest, or otherwise establish any ownership, distribution, or licensing rights to the requester. The government expresses no opinion about the intellectual property rights relating to any device for which this or any other eligibility letter is issued.

PUBLIC DISCLOSURE

To prevent any misunderstanding, and as discussed above, this eligibility letter is assigned FHWA control number WZ-442. It should only be reproduced in full with its attachment(s). This letter and the material offered by the requester supporting its issuance is public information. All eligibility letters and supporting material are subject to public disclosure under the Freedom

of Information Act (FOIA). Eligibility letters are available to the public at https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/.

If you have any questions please contact Aimee Zhang at Aimee.Zhang@dot.gov.

Sincerely,

A handwritten signature in black ink that reads "Michael S. Griffith". The signature is written in a cursive style with a large, stylized initial "M".

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:	09/20/2021	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Greg Spear	
	Company:	The Cortina Companies, Cortina Safety Products	
	Address:	10706 West Grand Ave, Franklin Park, IL 60131	
	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	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	Cortina M-Cade Universal Modular Barricade	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:	Greg Spear	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	The Cortina Companies, Cortina Safety Products	Same as Submitter <input checked="" type="checkbox"/>
Address:	10706 West Grand Ave, Franklin Park, IL 60131	Same as Submitter <input checked="" type="checkbox"/>
Country:	United States of America	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 Cortina Companies, Cortina Safety Products is the manufacturer and marketer of device.		
<p>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.</p>		

PRODUCT DESCRIPTION

- New Hardware or Significant Modification
 Modification to Existing Hardware

Product Description of M-Cade Universal Modular Barricade
(Reference Drawing M-Cade Barricade Drawing_031321)

The M-Cade Universal Modular Barricade is a work-zone traffic control device.

Further Description:

The Cortina Companies M-Cade Universal Modular Barricade is a work-zone traffic control device. The as-tested device consisted of four (4) posts, four (4) panels, two (2) lower sand bag bar boards, and one (1) optional standard D-Cell barricade light. The as-tested device had a total assembled weight of 13.1 lbs (5.9 kg). The M-Cade Universal Modular Barricade was tested with one (1) 35 lb (15.9 kg) sand bag.

The M-Cade Universal Modular Barricade is mainly constructed of copolymer polypropylene. The four (4) posts are 43.5 in. (1105 mm) long and 2.4 in. (61 mm) wide. Two (2) posts are installed on each side of the barricade with each pair being hinged at the top to allow the device to collapse flat when not deployed. Four (4) panels and two (2) sand bag bar boards are attached to the posts. The panels measure 24.0 in. (610 mm) long by 8.0 in. (203 mm) wide. The sand bag bar boards measure 24.0 in. (610 mm) long by 3.25 in. (83 mm) wide. In its deployed state, the barricade has overall dimensions of 41.0 in. (1041 mm) tall by 24.0 in. (610 mm) wide by 30.0 in. (762 mm) long. For this test, a D-Cell Barricade Light was bolted to the top of the barricade.

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:	Noah Partida	
Engineer Signature:	Noah Partida	Digitally signed by Noah Partida DN: cn=Noah Partida, o, ou, email=noah.partida@idiada.com, c=US Date: 2022.05.12 17:44:05 -07'00'
Address:	9270 Holly Road, Adelanto, CA 92301	Same as Submitter <input type="checkbox"/>
Country:	United States of America	Same as Submitter <input checked="" 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 vehicle to activate any breakaway, fracture, or yielding mechanism. Is considered optional for work-zone traffic control devices weighing less than 220 lbs (100 kg). The as-tested device weighed 13.1 lbs (5.94 kg) and therefore Test 70 was not performed.	Non-Relevant Test, not conducted

Required Test Number	Narrative Description	Evaluation Results
3-71 (1100C)	<p>An 1100C test vehicle approached the test article at a nominal speed of 62 mph. The M-Cade Universal Modular Barricade impacted was oriented at 0° and at 90°. The test vehicle impacted the 0° CIA device at a speed of 63.42 mph (102.06 km/h). The vehicle's front bumper first made contact with the lower reflective copolymer polypropylene panel. Upon impact, the panel and collapsible posts deformed around the vehicle's front end. The barricade light detached from the post and the device broke into pieces. The occupant compartment was not penetrated and the MASH deformation limits were not exceeded. The test vehicle impacted the 90° CIA device at a velocity of 62.03 mph (99.83 km/h). The vehicle's front bumper made contact with the copolymer polypropylene collapsible posts. The posts deformed around the vehicle's front end and broke apart. The occupant compartment was not penetrated and the MASH deformation limits were not exceeded. The barricade light detached from the post. The M-Cade Universal Modular Barricade met all the requirements for MASH Test 3-71.</p>	PASS
3-72 (2270P)	<p>A 2270P test vehicle approached the test article at a nominal speed of 62 mph. The M-Cade Universal Modular Barricade impacted was oriented at 0° and at 90°. The test vehicle impacted the 0° CIA device at a speed of 63.32 mph (101.91 km/h). The vehicle's front bumper first made contact with the lower panel. Upon impact, the panel and collapsible posts deformed around the vehicle's front end and broke into pieces. The occupant compartment was not penetrated and the MASH deformation limits were not exceeded. The test vehicle impacted the 90° CIA device at a velocity of 61.04 mph (98.23 km/h). The vehicle's front bumper first made contact with the posts. Upon impact, the device deformed around the vehicle's front end and broke apart. The occupant compartment was not penetrated and the MASH deformation limits were not exceeded. The M-Cade Universal Modular Barricade met all the requirements for MASH Test 3-72.</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:	Applus IDIADA KARCO Engineering, LLC.	
Laboratory Signature:	Noah Partida <small>Digitally signed by Noah Partida DN: cn=Noah Partida, o, ou, email=noah.partida@idiada.com, c=US Date: 2022.05.12 17:06:47 -07'00'</small>	
Address:	9270 Holly Road, Adelanto, CA 92301	Same as Submitter <input type="checkbox"/>
Country:	United States of America	Same as Submitter <input checked="" type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	TL 371: July 1, 2019 - July 1, 2022	

Submitter Signature*: **Greg Spear**
Digitally signed by Greg Spear
Date: 2022.05.13 06:29:33 -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		Key Words
Number	Date	

MASH 2016 Test 3-71 Summary

0° CIA

90° CIA



0.000 seconds

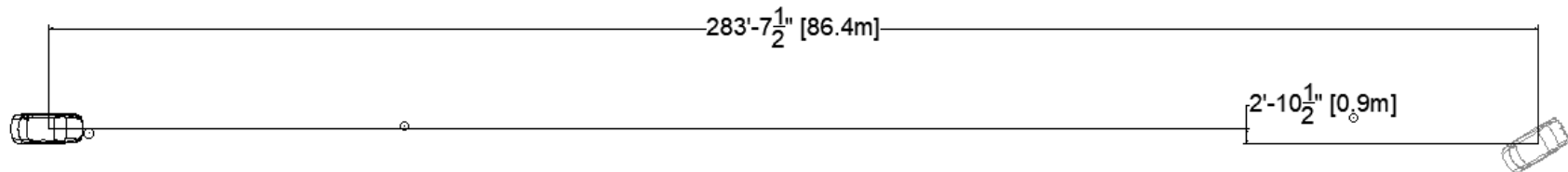
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GENERAL INFORMATION

Test Agency..... Applus IDIADA KARCO Engineering
 Test Number..... P40325-01
 Test Designation..... 3-71
 Test Date..... 1/18/21

TEST ARTICLE

Name / Model..... Cortina M-Cade Universal Modular Barricade
 Type..... Work-Zone Traffic Control Device
 Device Height 3.4 ft. (1.0 m)
 Key Elements..... panels, sand bad bar boards, posts
 Road Surface..... Smooth, Clean Concrete

TEST VEHICLE

Type / Designation..... 1100C
 Year, Make, and Model..... 2016 Kia Rio
 Curb Mass..... 2,528.5 lbs (1,147.0 kg)
 Test Inertial Mass..... 2,449.3 lbs (1,111.0 kg)
 Gross Static Mass..... 2,622.4 lbs (1,189.5 kg)

Impact Conditions

Impact Velocity Device 1..... 63.42 mph (102.06 km/h)
 Impact Velocity Device 2..... 62.03 mph (99.83 km/h)
 Device 1 Location/ Orientation..... 17.4 in. (441 mm) From Vehicle
 Centerline on Passenger Side
 Device 2 Location/ Orientation..... 18.0 in. (458 mm) From Vehicle
 Centerline on Driver Side
 Device 1 Angle..... 0.0°
 Device 2 Angle..... 90.0°
 Device 1 Kinetic Energy..... 329.3 kip-feet (446.5 Kilojoules)
 Device 2 Kinetic Energy..... 315.1 kip-feet (427.2 Kilojoules)
 Minimum KE Required..... 288 kip-feet (390 Kilojoules)

Exit Conditions

Device 1 Exit Velocity..... 62.94 mph (101.3 km/h)
 Device 2 Exit Velocity..... 61.51 mph (99.0 km/h)
 Vehicle Resting Position..... 283.6 ft. (86.4 m) Downstream
 2.9 ft. (0.9 m) Right
 Vehicle Stability Satisfactory
 0° - Maximum Roll Angle..... Did Not Exceed 75°
 0° - Maximum Pitch Angle..... Did Not Exceed 75°
 90° - Maximum Roll Angle..... Did Not Exceed 75°
 90° - Maximum Pitch Angle..... Did Not Exceed 75°

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° Device Debris Field (longitudinal)..... 99.3 ft. (30.3 m)
 0° Device Debris Field (lateral)..... 22.3 ft. (6.8 m)
 90° Device Debris Field (longitudinal)..... 101.3 ft. (30.9 m)
 90° Device Debris Field (lateral)..... 12.9 ft. (3.9 m)

Vehicle Damage

Vehicle Damage Scale..... 12-FC-1
 CDC..... 12FDEN1
 Maximum Deformation..... MASH Deformation Limits Not Exceeded 0.0 in. (0.0 mm)

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

Figure 2 Summary of Test 3-71

MASH 2016 Test 3-72 Summary

0° CIA

90° CIA



0.000 seconds

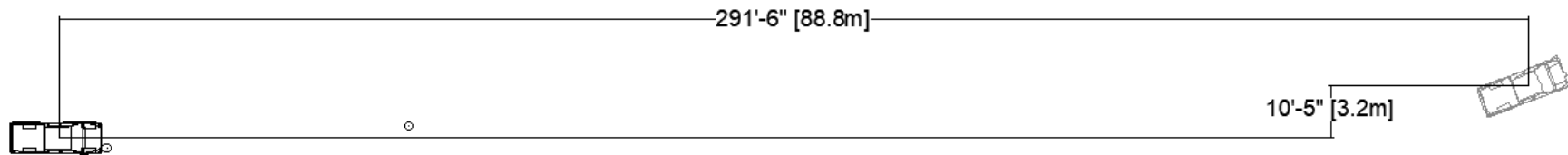
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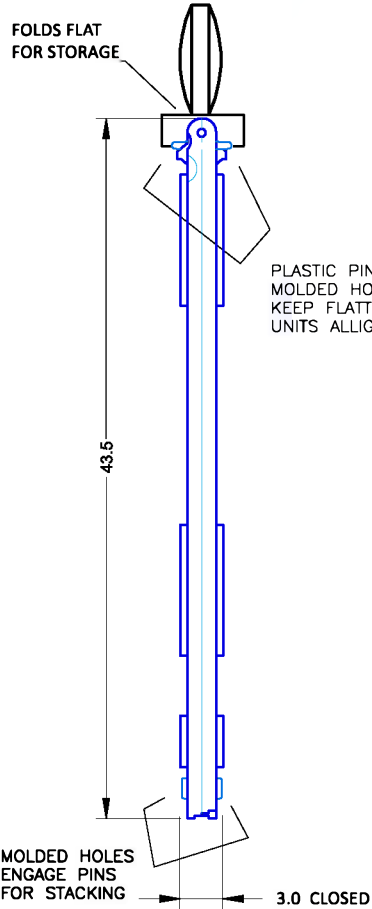
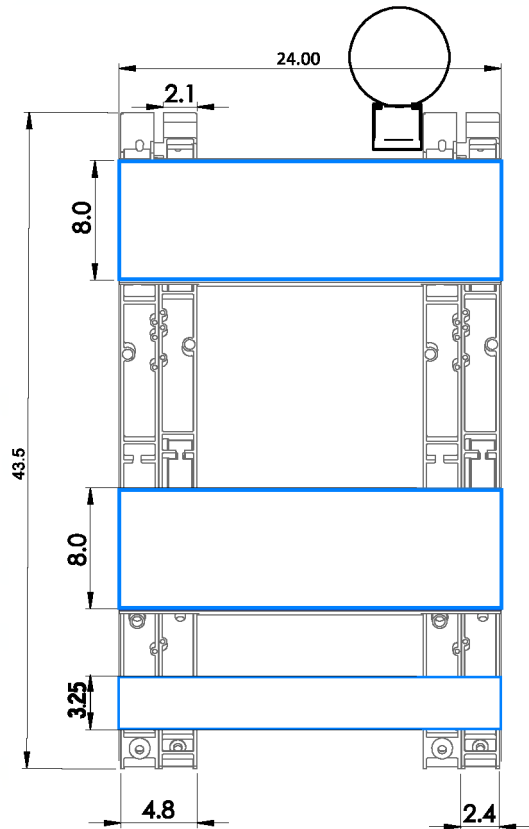
GENERAL INFORMATION	
Test Agency.....	Applus IDIADA KARCO Engineering
Test Number.....	P40326-01
Test Designation.....	3-72
Test Date.....	1/18/21
TEST ARTICLE	
Name / Model.....	Çortina M-Cade Universal Modular Barricade
Type.....	Work-Zone Traffic Control Device
Device Height	3.4 ft. (1 m)
Key Elements.....	Panels, sand bag bar boards, posts
Road Surface.....	Smooth, clean concrete
TEST VEHICLE	
Type / Designation.....	2270P
Year, Make, and Model.....	2015 RAM 1500
Curb Mass.....	5,044.2 lbs (2,288.0 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 Device 1.....	63.32 mph (101.91 km/h)
Impact Velocity Device 2.....	61.04 mph (98.23 km/h)
Device 1 Location/ Orientation.....	20.8 in. (527 mm) From Vehicle Centerline on Passenger Side
Device 2 Location/ Orientation.....	19.0 in. (482 mm) From Vehicle Centerline on Driver Side
Device 1 Angle.....	0.0°
Device 2 Angle.....	90.0°
Device 1 Kinetic Energy.....	671.6 kip-feet (910.5 Kilojoules)
Device 2 Kinetic Energy.....	623.9 kip-feet (846.0 Kilojoules)
Minimum KE Required.....	594 kip-feet (806 Kilojoules)
Exit Conditions	
Device 1 Exit Velocity.....	61.84 mph (99.5 km/h)
Device 2 Exit Velocity.....	60.84 mph (97.9 km/h)
Vehicle Resting Position.....	291.5 ft. (88.8 m) Downstream 10.4 ft. (3.2 m) Left
Vehicle Stability	Satisfactory
0° - Maximum Roll Angle.....	Did Not Exceed 75°
0° - Maximum Pitch Angle.....	Did Not Exceed 75°
90° - Maximum Roll Angle.....	Did Not Exceed 75°
90° - Maximum Pitch Angle.....	Did Not Exceed 75°

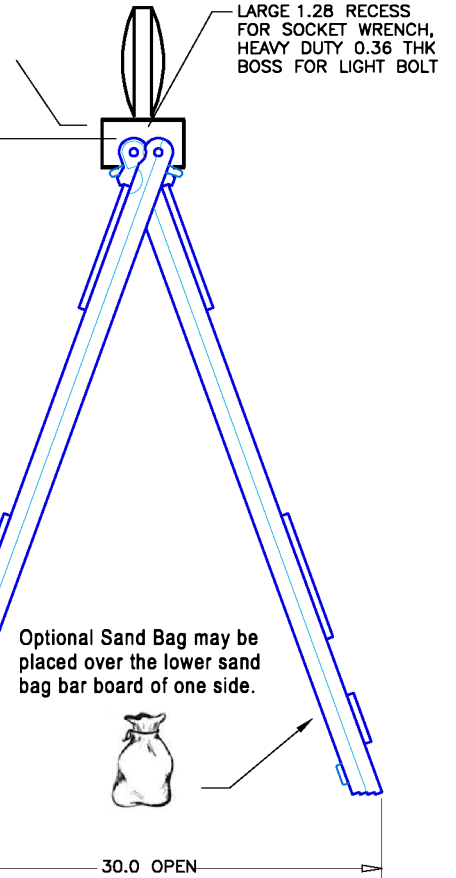
Occupant Risk	
Longitudinal OIV.....	Not Applicable*
Lateral OIV.....	Not Applicable*
Longitudinal RA.....	Not Applicable*
Lateral RA.....	Not Applicable*
THIV.....	Not Applicable*
PHD.....	Not Applicable*
ASI.....	Not Applicable*
Test Article Deflections	
0° Device Debris Field (longitudinal)...	152.7 ft. (46.5 m)
0° Device Debris Field (lateral)...	3.4 ft. (1.0 m)
90° Device Debris Field (longitudinal).....	104.8 ft. (32.0 m)
90° Device Debris Field (lateral)...	8.0 ft. (2.5 m)
Vehicle Damage	
Vehicle Damage Scale.....	12-FC-1
CDC.....	12FDEN1
Maximum Deformation.....	MASH Deformation Limits Not Exceeded (0.0 in.) 0 mm

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

Figure 2 Summary of Test 3-72



An optional standard D-Cell Barricade light attaches here by inserting the lights bolt thru the frame hole securing the light in place.



Specifications

- 1.) Composition Copolymer Polypropylene
- 2.) Color - White
- 3.) Type II
- 4.) Available in all grades of Reflective Sheeting
- 5.) Weight 13.1 lbs.
- 6.) Dimensions 41"H X 30"W in open position

REV	REF	REVISION DESCRIPTION	BY	DATE
02	---			
01	---			

MATERIAL	COLOR AND FINISH	THIRD ANGLE PROJECTION
WEIGHT = 13.1 LBS		
TOLERANCES UNLESS OTHERWISE SPECIFIED		
2 PLACE DECIMALS ± N/A		
3 PLACE DECIMALS ± N/A		
ANGULAR DIMENSIONS ± N/A		

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Cortina Company
Safety Products Group
 ISO 9002
 www.cortinaco.com
 10706 WEST GRAND AVENUE, FRANKLIN PARK, IL 60131

M-Cade Type II Barricades
"M-CADE" UNIVERSAL MODULAR BARRICADE

SCALE AT B SIZE 1 = 8	DRAWING NUMBER	REVISION
DRAFTER	DATE	02
CHECKER	DATE	