



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

November 13, 2018

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

In Reply Refer To:
HSST-1/WZ-360

Mr. Peter Connors
Remcon Plastics Inc.
208 Chestnut Street
Reading PA 19602-1809

Dear Mr. Connors:

This letter is in response to your October 23, 2018 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-360 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:

- Remcon Guardsafe 36 Longitudinal Channelizing Device

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: Remcon Guardsafe 36 Longitudinal Channelizing Device

Type of system: Channelizer

Test Level: MASH Test Level 1 (TL1)

Testing conducted by: E-TECH Testing Services Inc

Date of request: October 23, 2018

Date initially acknowledged: October 23, 2018

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-360 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.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely,



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:	October 23, 2018	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Peter Connors	
	Company:	Remcon Plastics Inc.	
	Address:	208 Chestnut Street Reading PA 19602-1809	
	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	Remcon Guardsafe 36 Longitudinal Channelizing Device	AASHTO MASH	TL1

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:	Peter Connors	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	Remcon Plastics Inc.	Same as Submitter <input checked="" type="checkbox"/>
Address:	208 Chestnut Street Reading PA 19602-1809	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.

There are no financial interests in the Guardsafe 36 Longitudinal Channelizing Device between Remcon Plastics, Inc. and E-Tech Testing Services, Inc., other than the costs associated with the actual crash tests and reports for this submission to FHWA.

PRODUCT DESCRIPTION

New Hardware or Significant Modification

 Modification to Existing Hardware

Remcon's Guardsafe 36 Longitudnal Channelizing device

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 Kruse	
Engineer Signature:	Paul Kruse	Digitally signed by Paul Kruse Date: 2018.05.04 13:58:35 -07'00'
Address:	3617 Cincinnati Ave. Rocklin, CA 95765	Same as Submitter <input type="checkbox"/>
Country:	United States	Same as Submitter <input type="checkbox"/>

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
1-90 (1100C)	<p>E-TECH Crash test report number: 463 E-TECH Test number: 82-0463-001 Test date: 9/19/2017 Vehicle: Black 2011 Kia Rio Sedan.</p> <p>A straight array of 20, Guardsafe 36® sections filled with 5 gallons of water each, were placed together in a straight array at the critical impact angle. Per MASH, the test article is to be impacted on the critical impact point (CIP) at the critical impact angle (CIA) with an impacting 1100C vehicle at 50 km/hr. The orientation chosen was to impact the 7th of 20 sections at an impact angle of 25 degrees. The actual impact velocity was 50.7 km/hr.</p> <p>The 1100C vehicle's driver-side front bumper impacted the installation at the midpoint of the 7th section. Sections 7 and 8 immediately separated. The impacted 7th section was pushed aside with minimal deformation. The 8th Section was caught by the front of the vehicle and pushed over 100 feet until it came to rest to the side and slightly behind the resting position of the vehicle. Sections 9, 10 and 11 were pushed downstream to the right and left of the system. The downstream units were moved slightly further downstream along the original centerline of system array. No sections rolled or flipped and only minimal marking occurred to any section. At no point during the impact event did any portion of the test article engage the undercarriage of the test vehicle (i.e. floor pan, foot well, oil pan, gas tank, trunk, etc.), nor were there any direct interactions with the occupant compartment (i.e. windshield, roof, side windows, etc.). The vehicle's headlights were broken during the impact and the passenger side fender was slightly deformed and pushed slightly back. The vehicle brakes were applied and the vehicle came to rest 40.8 m downstream and 1 m offset to the right of the initial line of travel. All six sections prior to the point of impact exhibited no damage, all sections from the point of impact forward exhibited minor scuffing to no visible damage observed.</p>	PASS

Required Test Number	Narrative Description	Evaluation Results
1-91 (2270P)	<p>E-TECH Crash Test Report Number: 463 E-TECH Test number: 82-0463-002 Date of Test: 9/20/2017 Vehicle: black 2011 Dodge 1500 Pickup painted with primer gray.</p> <p>A straight array of 20, water-ballasted, Guardsafe 36[®] sections was placed together in a straight line at the critical impact angle. Per MASH, the test article is to be impacted on the critical impact point (CIP) at the critical impact angle (CIA) with an impacting 2270P vehicle at 50 km/hr. The orientation chosen was to impact the 7th of 20 sections at an impact angle of 25 degrees. The actual impact velocity was 50.5 km/hr.</p> <p>The purpose of this test was to analyze the Guardsafe 36[®] longitudinal channelizing device's interaction with a MASH specified 2270P test vehicle and report the interactions between the test article and test vehicle. The test was run on September 20, 2017 using a black 2011 Dodge 1500 Pickup painted with primer gray. The curb mass of the vehicle was 2189.5 kg and the final test inertial mass was 2267.0 kg. The actual impact conditions were 50.5 km/h at a 25 deg. impact angle. The impact severity was 222.9 kJ.</p> <p>The Vehicle impacted the Guardsafe 36[®] LCD array just beyond the center of section 7 and immediately section 7 and 8 were pushed out of the way. Section 9 was caught by the bumper and pushed a significant distance in front of the truck then out of the way and came to rest behind the truck. Sections 10,11 and 12 were pushed downstream into the other sections resulting in sections 10 and 12 toppled over to the impact side of the array and section 11 upright just downstream of the array. The rest of the sections downstream were moved slightly along their line of install and sections 1 through 6 were not visibly moved. Brakes were applied to the vehicle which came to rest 102 ft downstream and 3ft to the left of the original line of travel. The truck showed no signs of visible damage, and the test article sections displayed only minor visible scuffing and no significant damage. There was no discernible damage to the vehicle during the test. The test article readily yielded to the vehicle in a predictable manner. As intended, the vehicle penetrated the longitudinal channelizing device array. There were no detached elements, fragments, or other debris from the test article that penetrated</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:	E-TECH Testing Services Inc.	
Laboratory Signature:	Timothy Mortensen Digitally signed by Timothy Mortensen Date: 2018.05.09 11:07:54 -07'00'	
Address:	3617-B Cincinnati Dr. Rocklin, Ca 95765	Same as Submitter <input type="checkbox"/>
Country:	United States	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	A2LA Certificate 0989.01 (1/12/2018 - 11/30/2019)	

Submitter Signature*: **Peter Connors** Digitally signed by Peter Connors
Date: 2018.10.15 10:40:41 -04'00'

Submit Form

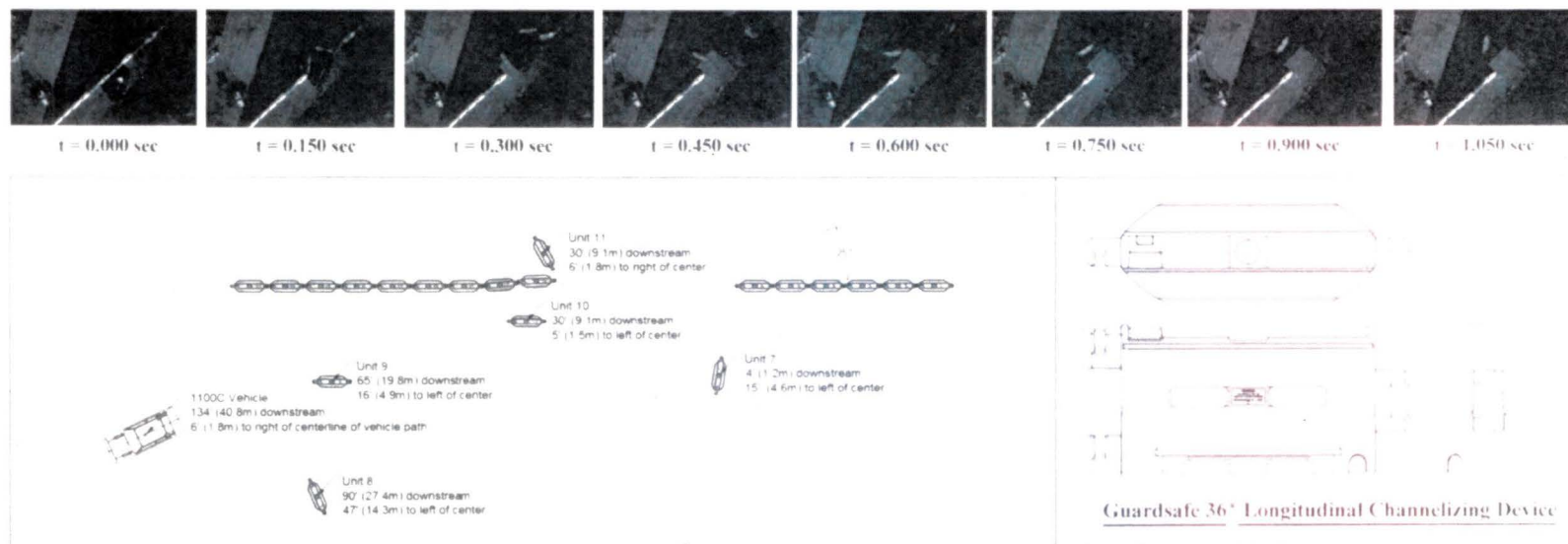
ATTACHMENTS

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 1-90
 Test No. 82-0463-001
 Date 9/19/17

Test Article

Type RI-MICON Plastics Inc.
 Guardsafe 36® Longitudinal Channelizing Device

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

Material and Key Elements 37 in tall x 75 in wide medium-density polyethylene (MDPE) sections

Foundation Type and Condition Concrete, clean and dry

Test Vehicle

Type Production Model
 Designation 1100C
 Model 2011 Kia Rio
 Curb 1036.0 kg
 Test Inertial 1076.0 kg
 Dummy 75 kg
 Gross Static 1151.0 kg

Impact Conditions

Speed 50.7 kph
 Angle (deg) 25
 Impact Severity 106.9 kJ

Occupant Risk Values (absolute values)

Impact Velocity
 Longitudinal 2.6 m/s
 Lateral 5 m/s
 Ridedown Acceleration
 Longitudinal 8 g
 Lateral 1.6 g

FN Values

THIV 9.5 cm/h
 PHD 1.7 g
 ASI 0.36

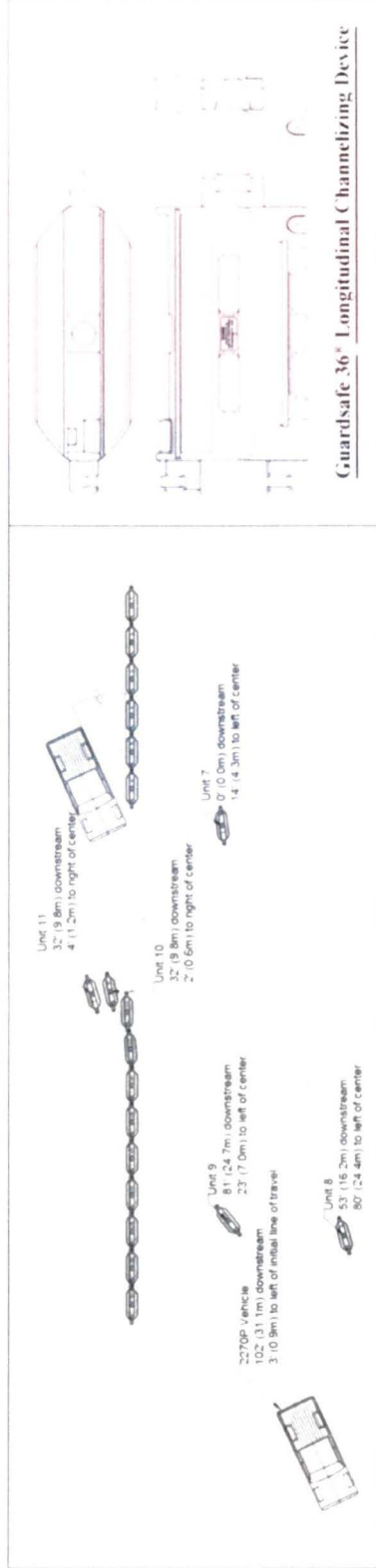
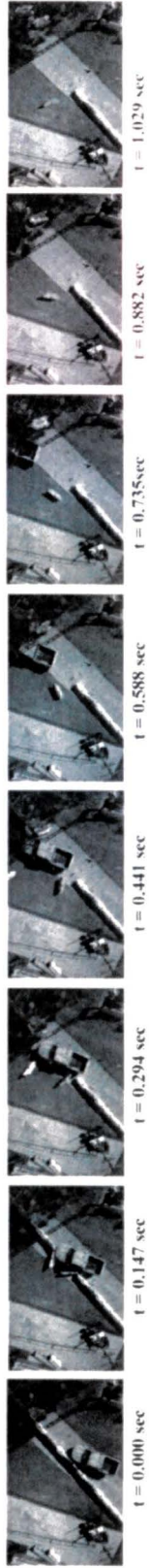
Vehicle Stability

Max Roll 7.6 deg
 Max Pitch 2.8 deg
 Max Yaw 0.8 deg

Vehicle Damage

Exterior
 VDS (1) L, (0) and (1) D
 C/D (1) D, (0) W
 Interior
 V/C/D A (0) and (0) D
 Maximum Deformation Negligible

Figure 4 - Summary of Results – Guardsafe 36® Test 82-0463-001



Guardsafe 36° Longitudinal Channelizing Device

General Information	
Test Agency	E-TECH Testing Services, Inc.
Test Designation	MIASH Test 1-91
Test No.	82-0463-002
Date	9/20/17
Test Article	
Type	RIMCON Plastics Inc.
Installation Details	Guardsafe 36° Longitudinal Channelizing Device (20'6ft) sections in a straight array, freestanding on concrete
Material and Key Elements	37 in tall x 75 in wide medium-density polyethylene (MDPE) sections
Foundation Type and Condition	Concrete, clean and dry
Test Vehicle	
Type	Production Model
Designation	2270P
Model	2011 Dodge Ram
Curb Weight	2189.5 kg
Test Inertial	2267.0 kg
Dummy	75 kg
Gross Static	2267.0 kg
Impact Conditions	
Speed	50.5 kph
Angle (deg)	25
Impact Severity	222.9 kJ
Occupant Risk Values (absolute values)	
Impact Velocity	1.6 m/s
Longitudinal	1.6 m/s
Lateral	2 m/s
Ridedown Acceleration	40.2 g
Longitudinal	40.3 g
Lateral	40.3 g
EN Values	
THIV	5.8 km/h
PHD	0.3 g
ASL	0.13
Vehicle Stability	
Max Roll	1.2 deg
Max Pitch	-0.7 deg
Max Yaw	-1.4 deg
Vehicle Damage	
Exterior	RICO (and HIC)
Interior	HERF I
VCDI	AS0000000
Maximum Deformation	Negligible

Figure 9 - Summary of Results – Guardsafe 36° LCD Test 82-0463-002

B

A

B

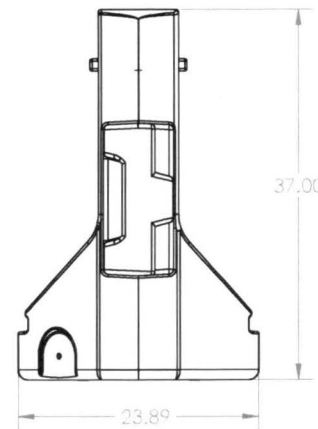
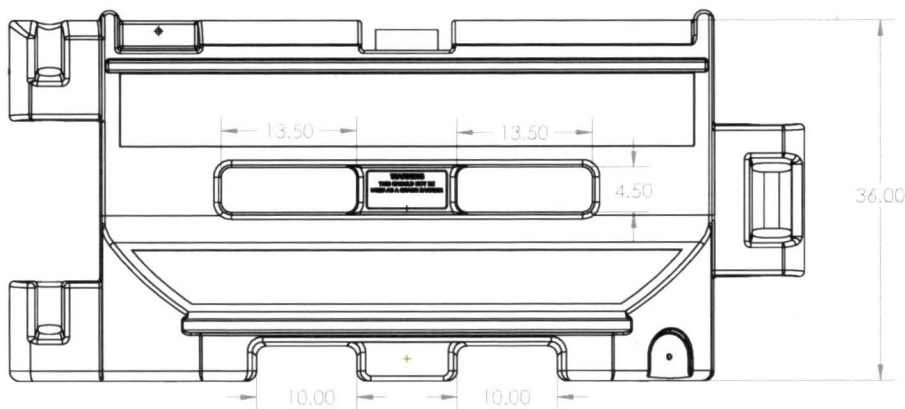
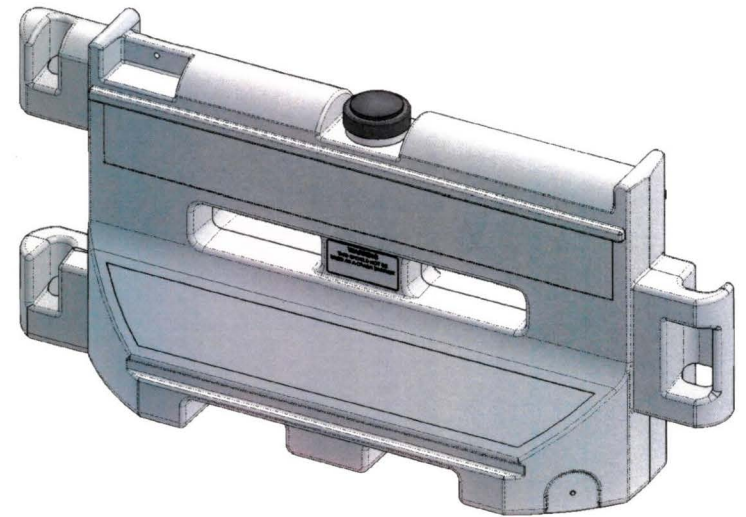
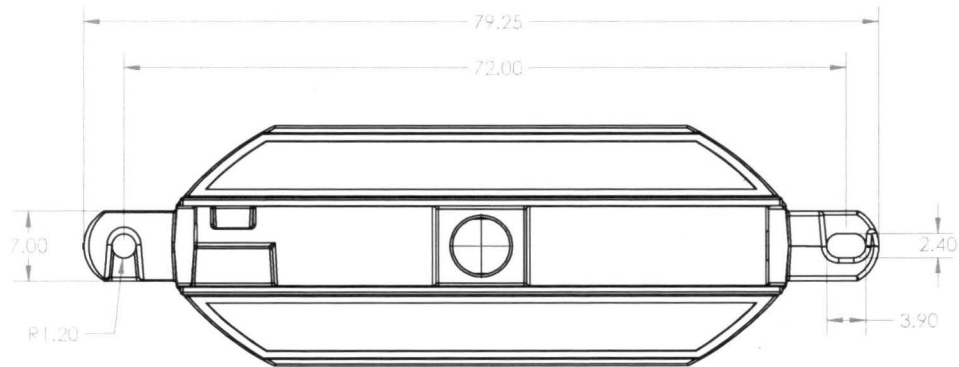
A

4

3

2

1



Inches of Water in Barricade	US LBS.	US GAL.	CU FT
16.6 (max)	600	63.47	8.48
15	574	60.4	8.07
12	508	52.4	7.00
9	410	40.72	5.44
6	282	25.38	3.39
3	156	10.29	1.38
0	71	n/a	n/a

NOTES:
 1) THE WARNING LABEL READS: "WARNING, THIS SHOULD NOT BE USED AS A CRASH BARRIER."

PROPRIETARY AND CONFIDENTIAL
 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF REMCON PLASTICS, INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF REMCON PLASTICS, INC IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED: MATERIAL Polyethylene
 DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL ±1/64
 ANGULAR: ±1/2 DEG
 TWO PLACE DECIMAL ±.01
 THREE PLACE DECIMAL ±.005
 FINISH SHOT PEENED
 DO NOT SCALE DRAWING

NAME DATE TITLE:
 DRAWN BY: BRS 9-22-17
 APPROVED BY:

2661 Remcon Guardsafe 36 Barricade

REMCON PLASTICS, INCORPORATED
 208 Chestnut Street
 Reading Pa. 19602
 DWG. NO. 017003672001xxx
 SIZE B SHEET 1 OF 1 REV B

4

3

2

1