August 12, 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-418

Mr. Craig Schulz
Pexco, LLC
3110 70th Ave. East,
Tacoma, WA 98424
USA

Dear Mr. Schulz:

This letter is in response to your May 14, 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-418 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:

- TPAR Longitudinal Channelizer

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: TPAR Longitudinal Channelizer
Type of system: Longitudinal Channelizer
Test Level: MASH Test Level 3 (TL3)
Testing conducted by: Texas A&M Transportation Institute (TTI)
Date of request: May 14, 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-418 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

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:	May 14, 2020	◉ New ○ Resubmission
	Name:	Craig Schulz	
	Company:	Pexco, LLC	
	Address:	3110 70th Ave. East, Tacoma, WA 98424	
	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.

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

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zon Zone Traffic Control Devices	◉ Physical Crash Testing ○ Engineering Analysis	TPAR Longitudinal Channelizer	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:	Craig Schulz	Same as Submitter ☒
Company Name:	Pexco, LLC	Same as Submitter ☒
Address:	3110 70th Ave. East, Tacoma, WA 98424	Same as Submitter ☒
Country:	USA	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.		
Texas A&M Transportation Institute (TTI) was contracted by Pexco, LLC - Corporate Office, 6470 E Johns Crossing, Duluth, GA 30097 - with manufacturing sites across the country ("PEXCO") to perform full-scale crash testing of the TPAR Longitudinal Channelizer. There are no shared financial interests in the TPAR Longitudinal Channelizer by TTI, or between PEXCO and TTI, other than costs involved in the actual crash tests of the TPAR Longitudinal Channelizer to established MASH protocols and reports for this submission to FHWA.		

PRODUCT DESCRIPTION

Help

(•) New Hardware or Significant Modification ( ) Modification to Existing Hardware

The Pexco Temporary Pedestrian Access Route (TPAR) longitudinal channelizer was designed and developed to use standard barricade components that are readily available for standard Type III barricades. The design is compliant with ADA standards and the MUTCD for a device to guide or channelize pedestrians safely through a work zone.

The test installation consisted of 198 ft long (33 assembled) barricades. Each barricade measured 72 inches long, 36 inches tall, and 14 inches wide x 14 inches wide, with one 30 pound sand bag places on each foot.

The TPAR is comprised of three major components:

- The barricade boards are Pexco's standard 1 inch x 8.2 inch x 72 inch long (HDPE) High Density Polyethylene panels - two are needed for each assembly. Panels are pre-drilled for easy assembly.

- The uprights for the assembly are 1.75 inch x 1.75 inch hollow X-Tubes made from (RPVC) Rigid Polyvinyl Chloride, pre-drilled for easy assembly.

Each Assembled Barricade system weighs around 10 pounds when fully assembled, without the foot.

- The steel foot is shared by two assembled barricades, it is 14" square made from 1/4" plate steel, with two sockets welded to the foot to receive the uprights. Each foot weighs approximately 15.2 pounds.

Steel hardware is used to secure the boards to the posts and a quick release pin is used to secure the posts in the steel feet.

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:	Nathan D. Schulz	
Engineer Signature:	Nathan D. Schulz Digitally signed by Nathan D. Schulz Date: 2020.05.12 14:55:42 -05'00'	
Address:	TTI, TAMU 3135, College Station, TX 77843-3135	Same as Submitter ☐
Country:	USA	Same as Submitter ☐

~~A brief description of each crash test and its result:~~

Required Test Number	Narrative Description	Evaluation Results
3-90 (1100C)	Test 3-90 involves an 1100C vehicle impacting the TPAR longitudinal channelizer at a target impact speed of 62 mi/h and target impact angle between 0° and 25°. The selected critical impact angle was 10°. The results of the test conducted on November 8, 2019, are found in TTI Test Report No. 690900-PEX-17&18 dated February 2020. The test vehicle was traveling at an impact speed of 61.5 mi/h when it contacted the TPAR longitudinal channelizer at an impact angle of 10.4°. The TPAR longitudinal channelizer allowed the 1100C vehicle to penetrate the channelizer installation in a controlled manner. The vehicle came to rest 418 ft downstream of the impact and 70 ft toward the field side of the channelizer. The debris from the channelizer did not penetrate or show potential for penetrating the occupant compartment, or to present undue hazard to others in the area. No occupant compartment deformation or intrusion was observed. The 1100C vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 5° and 4°. Longitudinal OIV was 6.6 ft/s, and lateral OIV was 0.0 ft/s. Maximum longitudinal occupant ridedown acceleration was 0.7 g, and maximum lateral occupant ridedown acceleration was 0.8 g. Occupant risk factors were within the preferred limits in MASH. The Pexco TPAR longitudinal channelizer performed acceptably for MASH Test 3-90.	PASS

Required Test Number	Narrative Description	Evaluation Results
3-91 (2270P)	Test 3-91 involves an 2270P vehicle impacting the TPAR longitudinal channelizer at a target impact speed of 62 mi/h and target impact angle between 0° and 25°. The selected critical impact angle was 10°. The results of the test conducted on November 8, 2019, are found in TTI Test Report No. 690900-PEX-17&18 dated February 2020. The test vehicle was traveling at an impact speed of 62.5 mi/h when it contacted the TPAR longitudinal channelizer at an impact angle of 9.9°. The TPAR longitudinal channelizer allowed the 2270P vehicle to penetrate the channelizer installation in a controlled manner. The vehicle came to rest 435 ft downstream of the impact and 69 ft toward the field side of the channelizer. The debris from the channelizer did not penetrate or show potential for penetrating the occupant compartment, or to present undue hazard to others in the area. No occupant compartment deformation or intrusion was observed. The 2270P vehicle remained upright during and after the collision event. Maximum roll and pitch angles were 7° and 2°. Longitudinal OIV was 5.2 ft/s, and lateral OIV was 4.6 ft/s. Maximum longitudinal occupant ridedown acceleration was 0.5 g, and maximum lateral occupant ridedown acceleration was 1.8 g. Occupant risk factors were within the preferred limits in MASH. The Pexco TPAR longitudinal channelizer performed acceptably for MASH Test 3-91.	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:	Texas A&M Transportation Institute	
Laboratory Signature:	Digitally signed by Darrell L. Kuhn 'Date: 2020.05.13 18:47:52 -05'00	
Address:	TTI, TAMU 3135, College Station, TX 77843-3135	Same asSubmitter☐
Country:	USA	Same asSubmitter☐
Accreditation Certificate Number and Dates of current Accreditation period :	ISO 17025-2017 Laboratory A2LA Certificate Number 2821.01 Valid To: April 30, 2021	

Submitter Signature*: Craig Schulz Digitally signed by Craig Schulz Date: 2020.05.14 06:27:04 -07'00'

Submit Form

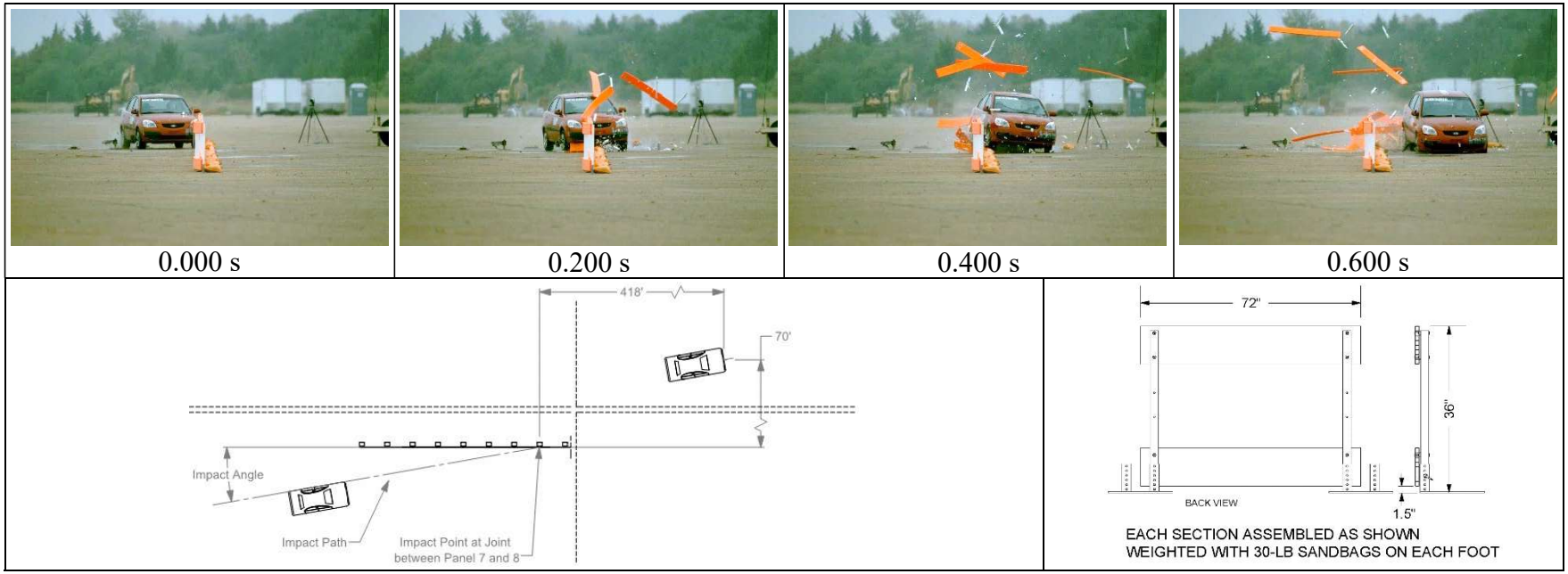
ATTACHMENTS

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 ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-90
- TTI Test No. 690900-PEX17
- Test Date 2019-11-08

Test Article
- Type ..... Longitudinal Channelizer, 36 inches tall
- Name ..... TPAR Barricade System
- Installation Length ..... 198 ft
- Material or Key Elements ... Two 72-inch × 8.2- inch ×0.85 inch thk plastic planks supported by two RPVC posts inserted into two, fabricated steel bases with 14 gauge perforated steel square tube sockets

Soil Type and Condition ..... Concrete Pavement, Damp

Test Vehicle
- Type/Designation 1100C
- Make and Model ..... 2007 Kia Rio
- Curb ..... 2450 lb
- Test Inertial ..... 2450 lb
- Dummy ..... 165 lb
- Gross Static ..... 2615 lb

Impact Conditions
- Speed ..... 61.5 mi/h
- Angle ..... 10.4°
- Location/Orientation ..... Center of joint 7-8

Kinetic Energy ..... 310 kip-ft

Exit Conditions
- Speed ..... undeterminable
- Angle ..... undeterminable

Occupant Risk Values
- Longitudinal OIV ..... 6.6 ft/s
- Lateral OIV ..... 0.0 ft/s
- Longitudinal Ridedown ..... 0.7 g
- Lateral Ridedown ..... 0.8 g
- THIV ..... 2.1 m/s
- ASI 0.09

Max. 0.050-s Average
- Longitudinal ..... -1.0 g
- Lateral ..... 0.5 g
- Vertical ..... 1.0 g

Post-Impact Trajectory
- Stopping Distance ..... 418 ft downstream
  70 ft twd field side

Vehicle Stability
- Maximum Yaw Angle ..... 5°
- Maximum Pitch Angle ..... 4°
- Maximum Roll Angle ..... 5°

Test Article Debris Field
- Longitudinal ..... 125 ft
- Toward Traffic Side ..... 21 ft
- Toward Field Side ..... 30 ft

Vehicle Damage
- VDS 12FD1
- CDC 12FDEW1
- Max. Exterior Deformation ..... 0.75 inch
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

Figure 5.6. Summary of Results for *MASH* Test 3-90 on TPAR Longitudinal Channelizer.

General Information
- Test Agency ..... Texas A&M Transportation Institute (TTI)
- Test Standard Test No. ..... MASH Test 3-91
- TTI Test No. 690900-PEX18
- Test Date 2019-11-08

Test Article
- Type ..... Longitudinal Channelizer, 36 inches tall
- Name ..... TPAR Barricade System
- Installation Length ..... 198 ft
- Material or Key Elements ... Two 72-inch ×8.2- inch ×0.85 inch thk plastic planks supported by two RPVC posts inserted into two, fabricated steel bases with 14 gauge perforated steel square tube sockets

Soil Type and Condition ..... Concrete Pavement, Damp

Test Vehicle
- Type/Designation 2270P
- Make and Model ..... 2013 RAM 1500 Pickup
- Curb ..... 4988 lb
- Test Inertial ..... 5030 lb
- Dummy ..... No dummy
- Gross Static ..... 5030 lb

Impact Conditions
- Speed ..... 62.5 mi/h
- Angle ..... 9.9°
- Location/Orientation ..... 22.7 inches upstream of joint 7-8

Kinetic Energy ..... 657 kip-ft

Exit Conditions
- Speed ..... undeterminable
- Angle ..... undeterminable

Occupant Risk Values
- Longitudinal OIV ..... 5.2 ft/s
- Lateral OIV ..... 4.6 ft/s
- Longitudinal Ridedown ..... 0.5 g
- Lateral Ridedown ..... 1.8 g
- THIV ..... 2.0 m/s
- ASI 0.17

Max. 0.050-s Average
- Longitudinal ..... -0.7 g
- Lateral ..... -1.2 g
- Vertical ..... 1.7 g

Post-Impact Trajectory
- Stopping Distance ..... 435 ft downstream 69 ft twd field side

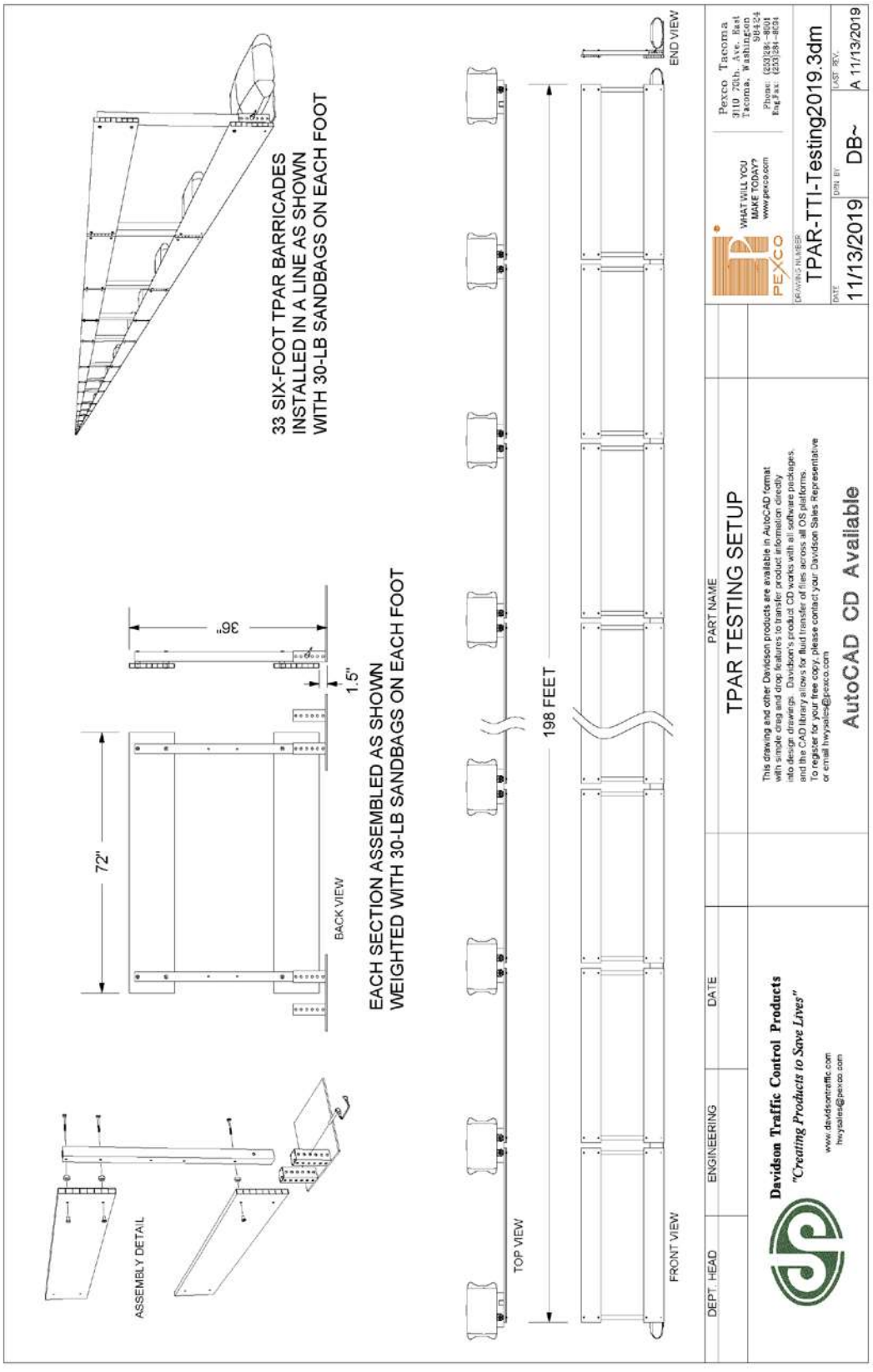
Vehicle Stability
- Maximum Yaw Angle ..... 10°
- Maximum Pitch Angle ..... 2°
- Maximum Roll Angle ..... 7°

Test Article Debris Field
- Longitudinal ..... 261 ft
- Toward Traffic Side ..... 36 ft
- Toward Field Side ..... 60 ft

Vehicle Damage
- VDS 12FD1
- CDC 12FDEW1
- Max. Exterior Deformation ..... None
- OCDI FS0000000
- Max. Occupant Compartment Deformation ..... None

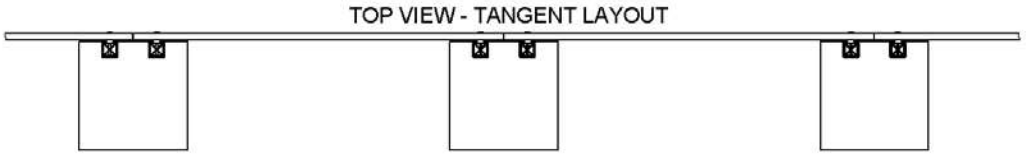
Figure 6.6. Summary of Results for *MASH* Test 3-91 on TPAR Longitudinal Channelizer.

APPENDIX A. DETAILS OF PEXCO TPAR

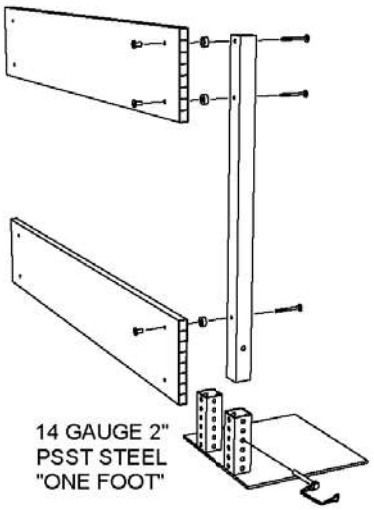


PER BARRICADE:
2 TPAR PANELS
1 TPAR ANTI-THEFT HARDWARE KIT
8ADAHDWE2
2 QUICK-RELEASE PINS - 800HDWE101
ONE FOOT - 80BARLG1ADA
2 X-TUBE UPRIGHTS - 8007821402

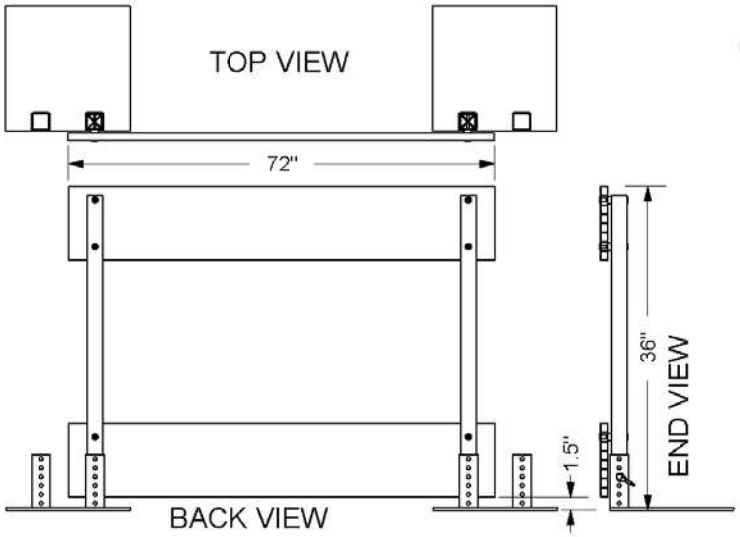
TOP VIEW - TANGENT LAYOUT

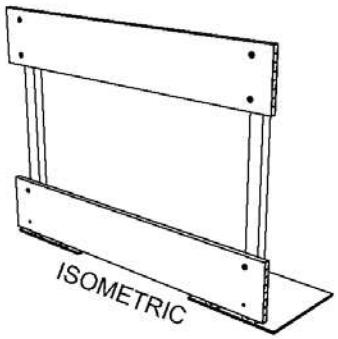


ASSEMBLY DETAIL



14 GAUGE 2"
PSST STEEL
"ONE FOOT"





TPAR PANEL P/N:
8T3B06ADAORG - 72"
8T3B06ADAWHT - 72"

TPAR ADA BARRICADE TANGENT RUN

DEPT. HEAD	ENGINEERING MANAGER	DATE

Davidson Traffic Control Products

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www.davidsontraffic.com
hwysales@pexco.com

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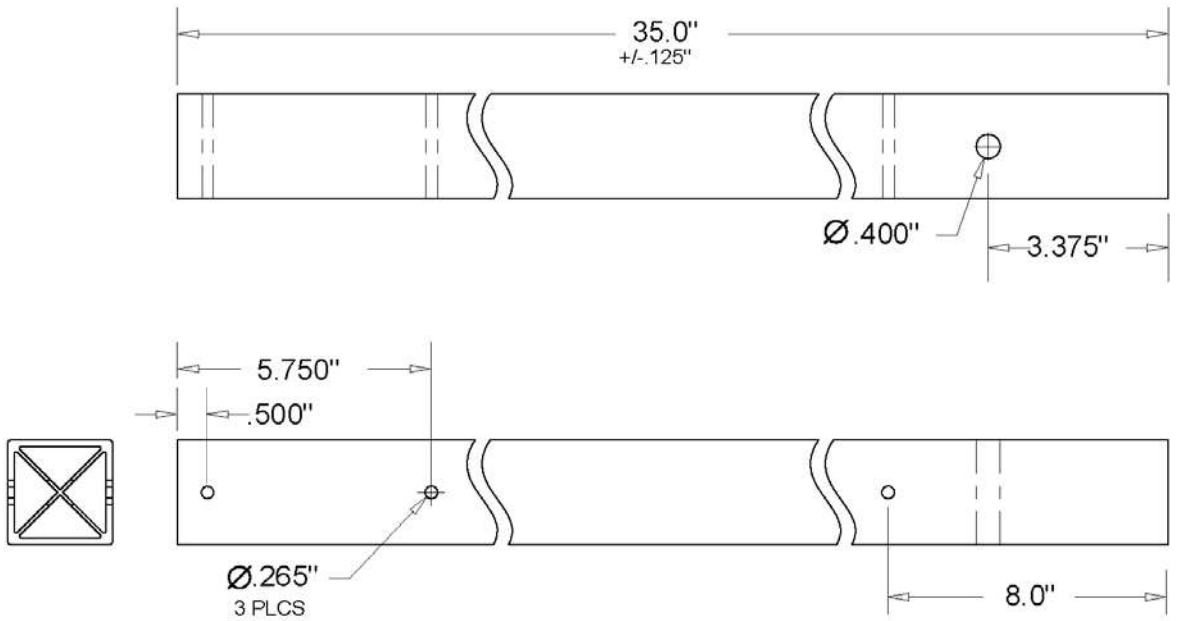
98424
Phone: (253)284-8021
Eng.Fax: (253)284-8091

TPAR BARRICADE ASSEMBLY

DATE	DRN BY	LAST REV.
05/17/2012	DB~	09/30/2015

X-TUBE FAB PRINT



CUT LENGTH	TYP. WALL	BOW TOLERANCE	⚠ WEIGHT PER FOOT ⚠
35" +/-.125"	AVG .170"	1/16" PER FOOT	TARGET: 250 GRAMS

REV.	DATE	DESCRIPTION	REV. BY:
G			
F			
E			
D			
C	09/30/2015	REMOVED HOLES FOR CENTER PANEL	DB~
B	10/16/2013	ADDED 2" TO CUT LENGTH	DB~
A	10/08/2013	ADDED HOLES FOR CENTER PANEL	DB~

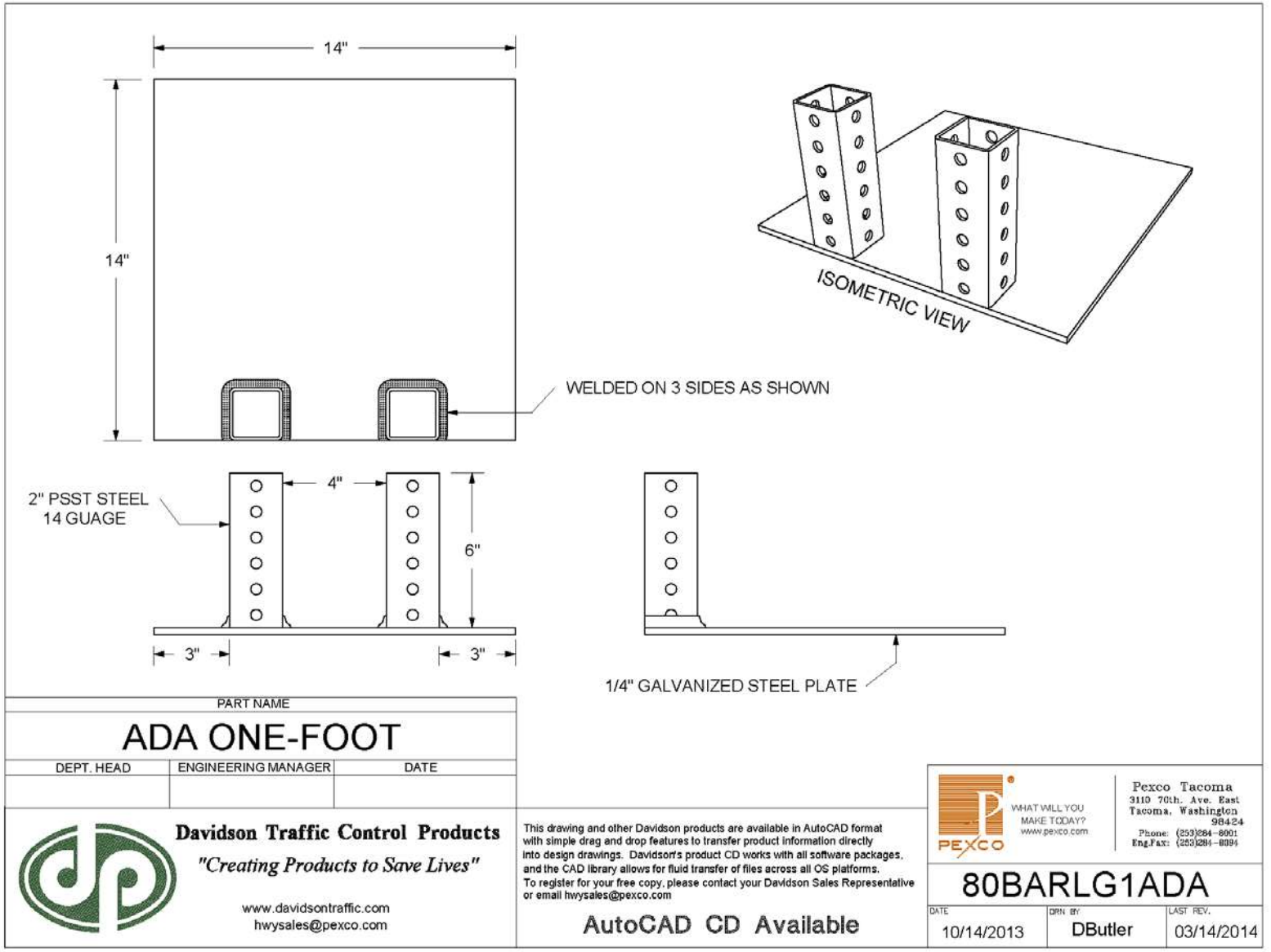
SCALE	
MATERIAL	RPVC
DATE	05/02/11
DRAWN BY	DB~
CHECKED BY	

PEXCO
WHAT WILL YOU MAKE TODAY?

Pexco Tacoma
3110 70th Avenue East
Tacoma, WA 98424
Tel 253-284-8000 Fax 253-284-8094
www.pexco.com

PART NAME	DIE NUMBER
ADA - PAR UPRIGHT	7821

CUSTOMER PART NO. 8007821402



PART NAME

ADA ONE-FOOT

DEPT. HEAD	ENGINEERING MANAGER	DATE

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This drawing and other Davidson products are available in AutoCAD format with simple drag and drop features to transfer product information directly into design drawings. Davidson's product CD works with all software packages, and the CAD library allows for fluid transfer of files across all OS platforms. To register for your free copy, please contact your Davidson Sales Representative or email hwysales@pexco.com

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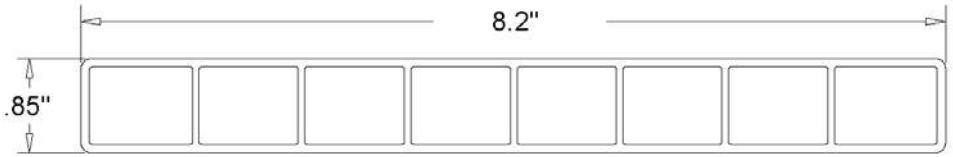
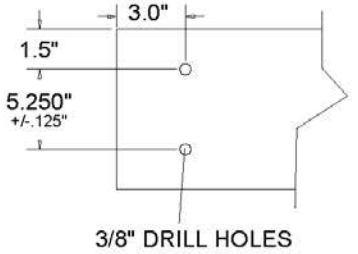
80BARLG1ADA

DATE	DRN BY	LAST REV.
10/14/2013	DButler	03/14/2014

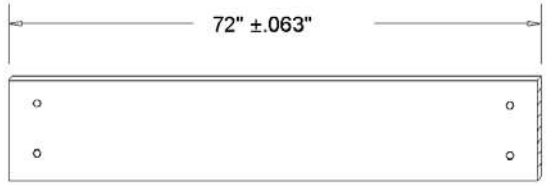
8T3B06ADAWHT - WHITE BARRICADE
8T3B06ADAORG - ORANGE BARRICADE



AS COOLED
TYPICAL - ALL LENGTHS



CUT TO LENGTH &
DRILL IN FAB



8T3B06ADAxxx

CUT LENGTH	BOW TOLERANCE
SEE ABOVE	1/16" PER FOOT

DEPT. HEAD	ENGINEERING MANAGER	DATE

REV	DESCRIPTION	DATE
E		
D		
C		
B	REMOVED COLOR DESIGNATIONS REDUCED C/L TOLERANCE	06/09/2016
A	FROM 2" TO 3" ON HOLE-TO-END DIMENSION	10/10/2013

REVISIONS

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Tacoma, Washington
98424
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Eng.Fax: (253)284-8094

DIE NUMBER	PART NAME
7624	T3B ADA PANEL

MATERIAL	DATE	DRN BY	LAST REV
HDPE	05/02/11	DB~	

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