



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

November 19, 2019

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

In Reply Refer To:  
HSST-1/ WZ-362

Mr. Craig Schultz  
Pexco, LLC  
3110 70<sup>th</sup> Ave East  
Tacoma, WA 98424

Dear Mr. Schulz:

This letter is in response to your May 11, 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 - 362 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

### **Decision**

The following devices are eligible within the length-of-need, with details provided in the form which is attached as an integral part of this letter:

- Turnpike Grade Curb

### **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 American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (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: Turnpike Grade Curb  
Type of system: Work Zone  
Test Level: MASH Test Level 3  
Testing conducted by: Texas A & M Transportation Institute  
Date of request: May 11, 2018

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within 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-362 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,

A handwritten signature in blue ink that reads "Michael S. Griffith". The signature is written in a cursive style with a large initial "M" and "G".

Michael 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:	May 11, 2018	<input checked="" type="radio"/> New <input type="radio"/> 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 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	Turnpike Grade Curb	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 <input checked="" type="checkbox"/>
Company Name:	Pexco, LLC	Same as Submitter <input checked="" type="checkbox"/>
Address:	3110 70th Ave East Tacoma, WA 98424	Same as Submitter <input checked="" type="checkbox"/>
Country:	USA	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.

Pexco, LLC is a manufacturer of plastic roadway devices used both in the work-zone and also in permanent applications around the world. The Turnpike Grade (TP) Curb System was developed by the engineering department of Pexco, it is a design owned by Pexco with no patents issued or applied for. Pexco sponsored testing of the TP Curb to MASH TL3 at Texas A&M Transportation Institute (TTI) an independent, accredited ISO 17025 testing laboratory and facility. The TP Curb was previously tested at TTI in 2009 and was issued WZ-282, under NCHRP 350 test procedures. This product has since provided years of safe applications and use around the world. The full scale crash testing was completed by TTI in accordance with MASH 3-90 and 3-91, with both the 1100C and 2270P vehicles in the Fall of 2016.

## PRODUCT DESCRIPTION

New Hardware or Significant Modification
     
  Modification to Existing Hardware

The Turnpike Curb System is a 36" long x 8" wide by 2.15" high thermoplastic molded plastic longitudinal channelizing device. The Turnpike Curb is intended to be used as a dis continuous application developed for high speed applications were spacing up to 15' between curbs due to higher speeds would be appropriate. The Turnpike Grade Curb is designed to be used with the FG300 Flexible Channelizing Tubular Markers to enhance the delineation of the system.

### 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:	Dusty Arrington	
Engineer Signature:	<b>Dusty Arrington</b>	Digitally signed by Dusty Arrington DN: cn=Dusty Arrington, o=Texas A&M Transportation Institute, ou=Roadside Safety and Physical Security Division, email=d.arrington@ttt.tamu.edu, c=US Date: 2018.05.10 13:09:43 -05'00'
Address:	2427 Earl Rudder Freeway South, College Station, TX	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-90 & 3-91	3-90 involves the use of 1100C small car 3-91 involves the use of 2270P light truck Both vehicles impacted the longitudinal channelizer at a nominal speed of 62 mi/h at the critical angles (CIA) between 0-25 degrees as determined to maximize the risk of rollover and/or excessive vehicle deceleration. 36" flexible delineator posts were installed in the curb systems throughout the test, no delineators ever failed.	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:	<b>Darrell L. Kuhn</b>	Digitally signed by Darrell L. Kuhn Date: 2018.05.11 10:38:45 -05'00'
Address:	3135 TAMU, College Station, TX 77843	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	ISO 17025 A2LA Laboratory Testing Certificate #2821.01 Accreditation Valid Through April 30, 2019	

Submitter Signature\*: **Craig Schulz** Digitally signed by Craig Schulz  
Date: 2018.04.26 10:51:44 -07'00'

Submit Form

## ATTACHMENTS

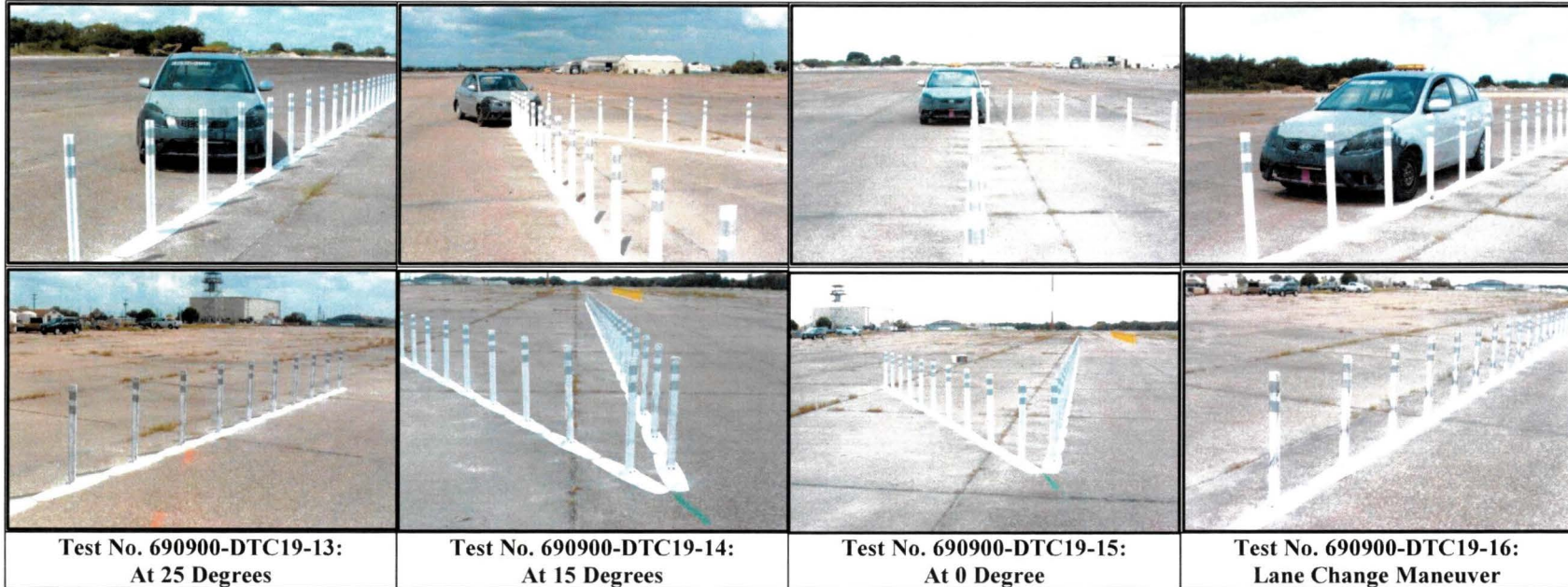
Attach to this form:

- 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-DTC19-13 through 16  
 Test Date ..... 2016-10-07

**Test Article**

Type ..... Channelizer  
 Name ..... Turnpike Curb System  
 Installation Length ..... 120 ft-3 inches and 27 ft-9 inches  
 Material or Key Elements .... 50 sections of FG300 Curb with 4 coil anchors with FG336 Model EFX Post and two 3-inch x 9-inch AR1000 Wraps

**Soil Type and Condition**..... Concrete Surface, Dry

**Test Vehicle**

Type/Designation ..... 1100C  
 Make and Model..... 2006 Kia Rio  
 Curb ..... 2472 lb  
 Test Inertial ..... 2420 lb  
 Driver ..... 220 lb  
 Gross Static ..... 2640 lb

**Impact Conditions**

Speed.....62 mi/h  
 Angle.....25, 15, 0 degrees  
 Plus lane change

**Kinetic Energy** .....

**Occupant Risk Values** .....Data not recorded

**Post-Impact Trajectory** .....N.A.

**Vehicle Stability**

Vehicle Snagging .....No  
 Vehicle Pocketing.....No  
 Vehicle Roll .....No

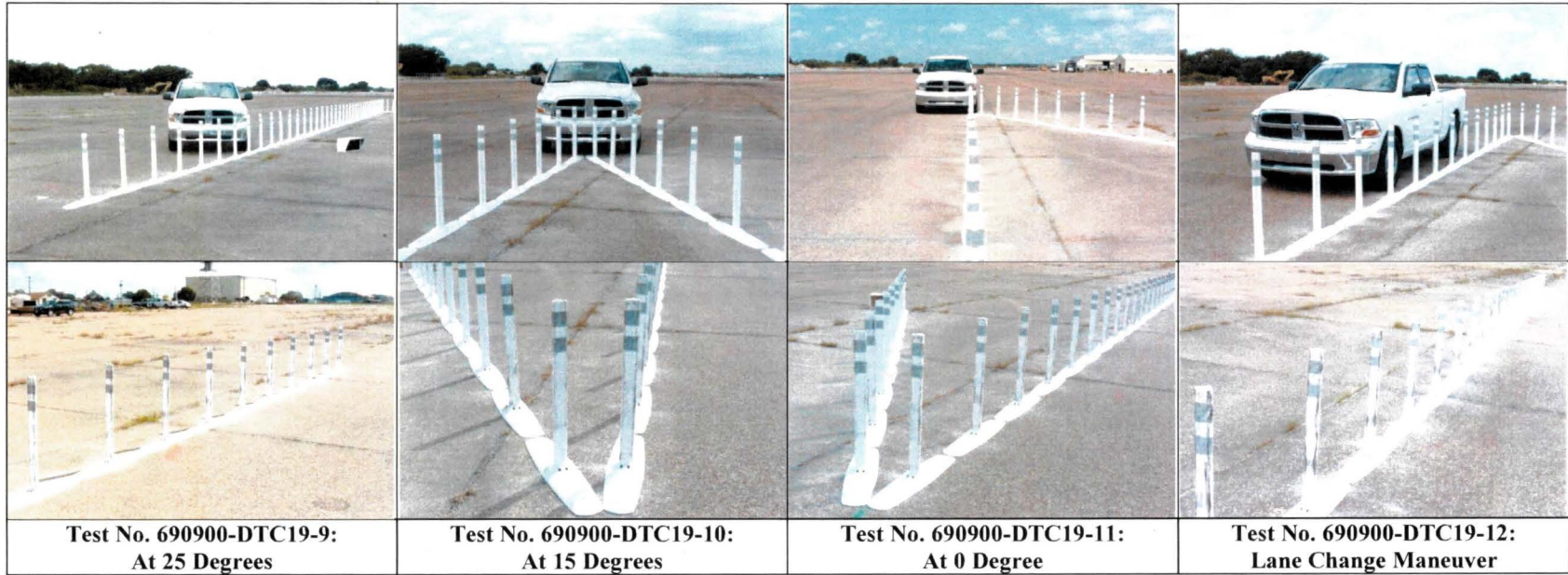
**Vehicle Damage**

VDS .....12FD0  
 CDC .....12FDEW0  
 Max. Exterior Deformation.....None  
 OCDI .....LF0000000  
 Maximum Occupant  
 Compartment Deformation ..None



Damage to vehicle after  
 Test Nos. 690900-DTC19-13 through 16.

**Figure 6.11. Summary of Results for MASH Test 3-90 on Turnpike Curb System.**



**General Information**

Test Agency..... Texas A&M Transportation Institute (TTI)  
 Test Standard Test No..... MASH Test 3-90  
 TTI Test No. .... 690900-DTC19-9 through 12  
 Test Date ..... 2016-10-07

**Test Article**

Type ..... Channelizer  
 Name..... Turnpike Curb System  
 Installation Length..... 120 ft-3 inches and 27 ft-9 inches  
 Material or Key Elements .... 50 sections of FG300 Curb with 4 coil anchors with FG300 Model EFX Post and two 3-inch x 9-inch AR1000 Wraps

**Soil Type and Condition**

..... Concrete Surface, Dry

**Test Vehicle**  
 Type/Designation..... 2270P  
 Make and Model ..... 2011 Dodge RAM 1500  
 Curb..... 4954 lb  
 Test Inertial..... 5018 lb  
 Driver ..... 220 lb  
 Gross Static ..... 5238 lb

**Impact Conditions**

Speed ..... 62 mi/h  
 Angle ..... 25, 15, 0 degrees  
 Plus lane change

**Kinetic Energy**

.....

**Occupant Risk Values**

.....Data not recorded

**Post-Impact Trajectory**

Stopping Distance .....N.A.

**Vehicle Stability**

Vehicle Snagging .....No

Vehicle Pocketing.....No

Vehicle Roll .....No

**Vehicle Damage**

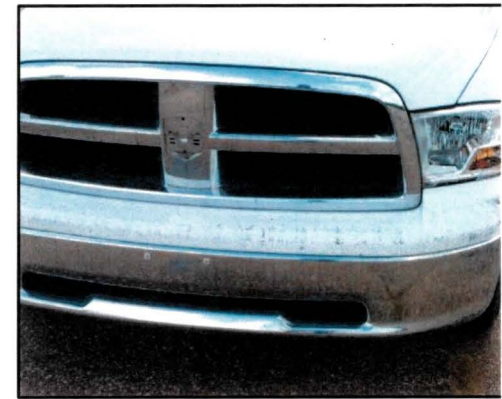
VDS .....12FD0

CDC .....12FDEW0

Max. Exterior Deformation.....None

OCDI.....LF0000000

Maximum Occupant  
 Compartment Deformation..None



Damage to vehicle after  
 Test Nos. 690900-DTC19-9 through 12.

**Figure 5.11. Summary of Results for MASH Test 3-91 on the Turnpike Curb System.**



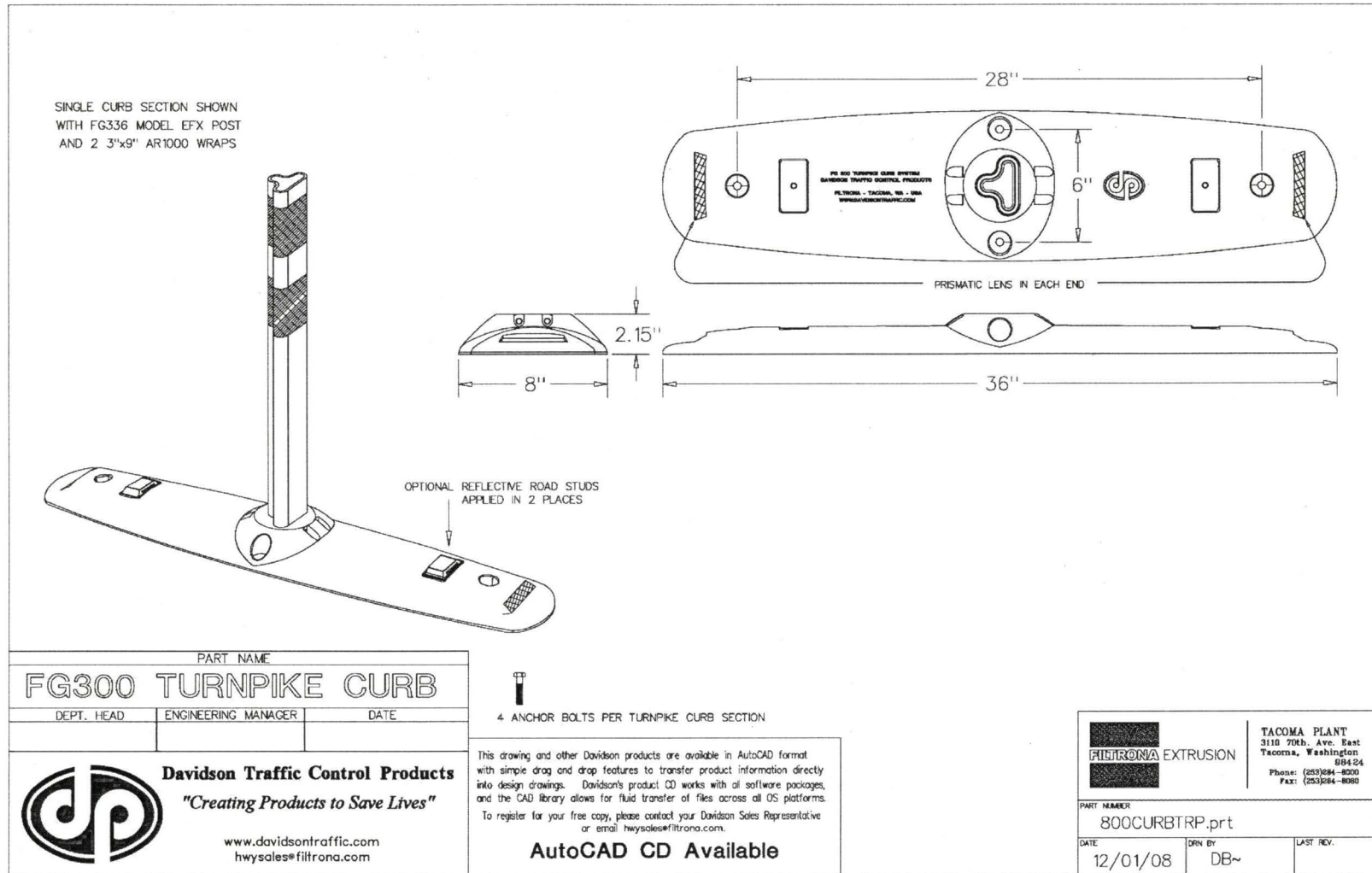


Figure 2.1. Details of the Turnpike Curb System with 36-inch Tall Model EFX.