Mr. Craig Schultz
Pexco, LLC
3110 70th 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,

Michael Griffith
Director, Office of Safety Technologies
Office of Safety

Enclosures
Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Date of Request: May 11, 2018

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

<table>
<thead>
<tr>
<th>System Type</th>
<th>Submission Type</th>
<th>Device Name / Variant</th>
<th>Testing Criterion</th>
<th>Test Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>'WZ': Crash Worthy Work Zone Traffic Control Devices</td>
<td>Physical Crash Testing</td>
<td>Turnpike Grade Curb</td>
<td>AASHTO MASH</td>
<td>TL3</td>
</tr>
</tbody>
</table>

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

Company Name: Pexco, LLC

Address: 3110 70th Ave East
Tacoma, WA 98424

Country: USA

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

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 discontinuous application developed for high speed applications where 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

Address: 2427 Earl Rudder Freeway South, College Station, TX

Country: USA

A brief description of each crash test and its result:

<table>
<thead>
<tr>
<th>Required Test Number</th>
<th>Narrative Description</th>
<th>Evaluation Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-90 &amp; 3-91</td>
<td>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&quot; flexible delineator posts were installed in the curb systems throughout the test, no delineators ever failed.</td>
<td>PASS</td>
</tr>
</tbody>
</table>

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):
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:

<table>
<thead>
<tr>
<th>Eligibility Letter</th>
<th>Number</th>
<th>Date</th>
<th>Key Words</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**General Information**

<table>
<thead>
<tr>
<th>Test Agency</th>
<th>Texas A&amp;M Transportation Institute (TTI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Standard Test No.</td>
<td>MASH Test 3-90</td>
</tr>
<tr>
<td>TTI Test No.</td>
<td>690900-DTC19-13 through 16</td>
</tr>
<tr>
<td>Test Date</td>
<td>2016-10-07</td>
</tr>
</tbody>
</table>

**Test Article**

<table>
<thead>
<tr>
<th>Type</th>
<th>Channelizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Turnpike Curb System</td>
</tr>
<tr>
<td>Installation Length</td>
<td>120 ft-3 inches and 27 ft-9 inches</td>
</tr>
<tr>
<td>Material or Key Elements</td>
<td>50 sections of FG300 Curb with 4 coil anchors with FG336 Model EFX Post and two 3-inch x 9-inch AR1000 Wraps</td>
</tr>
</tbody>
</table>

**Soil Type and Condition**

| Type/Designation | Concrete Surface, Dry |

**Test Vehicle**

<table>
<thead>
<tr>
<th>Type/Designation</th>
<th>1100C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make and Model</td>
<td>2006 Kia Rio</td>
</tr>
<tr>
<td>Curb</td>
<td>2472 lb</td>
</tr>
<tr>
<td>Test Inertial</td>
<td>2420 lb</td>
</tr>
<tr>
<td>Driver</td>
<td>220 lb</td>
</tr>
<tr>
<td>Gross Static</td>
<td>2640 lb</td>
</tr>
</tbody>
</table>

**Impact Conditions**

| Speed | 62 mi/h |
| Angle | 25, 15, 0 degrees |
| Kinetic Energy | Plus lane change |

**Occupant Risk Values**

| Data not recorded |

**Post-impact Trajectory**

| N.A. |

**Vehicle Stability**

| Vehicle Snagging | No |
| Vehicle Pocketing | No |
| Vehicle Roll | No |

**Vehicle Damage**

| VOS | 12FD0 |
| CDC | 12FDEW0 |
| Max. Exterior Deformation | None |
| OCDI | LF000000 |
| Maximum Occupant | None |

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

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**Figure 6.11. Summary of Results for MASH Test 3-90 on Turnpike Curb System.**
<table>
<thead>
<tr>
<th>Test No. 690900-DTC19-9: At 25 Degrees</th>
<th>Test No. 690900-DTC19-10: At 15 Degrees</th>
<th>Test No. 690900-DTC19-11: At 0 Degree</th>
<th>Test No. 690900-DTC19-12: Lane Change Maneuver</th>
</tr>
</thead>
</table>

**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
- **Kinetic Energy:** Plus lane change
- **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**
- **VOS:** 12FDO
- **CDC:** LFO00000
- **Max. Exterior Deformation:** None
- **OCDF:** None
- **Maximum Occupant Compartment Deformation:** None

**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.