



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

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

July 11, 2014

In Reply Refer To:
HSST/B-251

Mr. Forrest Schultz
Strongstown's B&K Enterprises, Inc.
260 Route 403 South
Strongstown, PA 15957

Dear Mr. Schultz:

This letter is in response to your request for the Federal Highway Administration (FHWA) to review a roadside safety system for eligibility for reimbursement under the Federal-aid highway program.

Name of system: Portable Concrete Barrier (PCB) Deflection Reducing Retrofit
Type of system: Longitudinal Barrier
Test Level: AASHTO MASH TL3
Testing conducted by: Texas A&M Transportation Institute (TTI)
Task Force 13 Designator: SWC19
Date of request: May 22, 2014

Decision:

The following device is eligible, with details provided in the form which is attached as an integral part of this letter:

- Portable Concrete Barrier (PCB) Deflection Reducing Retrofit

Based on a review of crash test results you submitted certifying 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), the device is eligible for reimbursement under the Federal-aid highway program. Eligibility for reimbursement under the Federal-aid highway program does not establish approval or endorsement by the FHWA for any particular purpose or use.

The FHWA, the Department of Transportation, and the United States Government do not endorse products or services and the issuance of a reimbursement eligibility letter is not an endorsement of any product or service.

FHWA: HSST: WLongstreet: sf.x60087: WLongstreet: 6/23/14

File: h://directory folder/HSST/B-251 Portable Concrete Barrier (PCB) Deflection Reducing Retrofit.docx

cc: HSST Will Longstreet

Requirements

To be found eligible for Federal-aid funding, roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH).

Description

The device and supporting documentation are described in the attached form.

Summary and Standard Provisions

Therefore, the system described and detailed in the attached form is eligible for reimbursement and may be installed under the range of conditions tested. Please note the following standard provisions that apply to FHWA eligibility letters:

- This letter provides a AASHTO/ARTBA/AGC Task Force 13 designator that should be used for the purpose of the creation of a new and/or the update of existing Task Force 13 drawing for posting on the on-line 'Guide to Standardized Highway Barrier Hardware' currently referenced in AASHTO Roadside Design Guide.
- This finding of eligibility does not cover other structural features of the systems, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may influence system conformance with MASH will require a new reimbursement eligibility letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals safety problems, or that the system is significantly different from the version that was crash tested, we reserve the right to modify or revoke this letter.
- You are expected to supply potential users with sufficient information on design and installation 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 the MASH.
- To prevent misunderstanding by others, this letter of eligibility is designated as number B-251 and 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 at our office 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. The FHWA does not become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

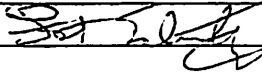
Sincerely yours,



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:	June 16, 2014	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Forrest Schultz	Signature: 
	Company:	Strongstown's B%K Enterprises, Inc.	
	Address:	260 Route 403 South, Strongstown, PA 15957	
	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.

[Help](#)

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'B': Barriers (Roadside, Median, Bridge Railings)	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> FEA & V&V Analysis	JJ-Hook F-Shape Deflection Resistant Retrofit	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.

Identification of the individual or organization responsible for the product:

Contact Name:	Forrest Schultz	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	Strongstown's B%K Enterprises, Inc.	Same as Submitter <input checked="" type="checkbox"/>
Address:	260 Route 403 South, Strongstown, PA 15957	Same as Submitter <input checked="" type="checkbox"/>
Country:	United States	Same as Submitter <input checked="" type="checkbox"/>

PRODUCT DESCRIPTION

The barrier used in this testing was previously accepted for use on the National Highway System under the FHWA eligibility letter B52 as a free standing NJ and F shaped barrier under NCHRP Report 350. This barrier has minimal reinforcement and pinning of this barrier without additional structural support was deemed unfeasible.

Strongstown's B&K Enterprises, Inc. produced a series of components that when added to an existing JJ-Hook F-Shape Barrier, will limit the amount of deflection to under 24" when tested under MASH Test 3-11. The retrofit design is made up of three (3) main components:

A. Quantity one (1) - 6" wide x 22" long x 1/2" thick metal plate that has a rectangular hole at the top (1 3/8" wide and approximately 2" long) and a hole located near the bottom of the plate that is 1 5/8" in diameter. This plate is also bent into a contoured shape that follows the shape of the barrier.

B. Quantity one (1) - 26" long drop in pin that is 1 1/2" in diameter with a 4" plate washer welded to the top 1/2" thick.

C. Quantity one (1) - 1 1/4" hex headed bolt with 4" x 10" x 1/2" thick plate washer and hex nut.

All of the components are installed on the F-Shape JJ-Hook barrier as follows:

The contoured plate (A) is anchored to the barrier at the top by drilling a hole through the barrier and bolting with (C). The Barrier and Plate is then anchored to the roadway surface by drilling through the bottom hole of the barrier into the roadway surface and inserting (B). These components and anchoring procedure are required to be installed on each end of the barrier so two (2) sets of retrofit components are needed for each section of 12' barrier that is being installed.

This system was anchored into concrete to produce the greatest stresses in the pinned connection. If a successful test was achieved, it is believed the system will perform adequately when anchored in less rigid materials, i.e. asphalt. A pinned 12.5' long pin and loop F-Shaped barrier anchored in concrete with two (2) 18.375" long pins was tested for Louisiana DOT to NCHRP Report 350 under the Roadside Safety Pooled Fund housed at TTI. In that test, the working width was 2.83', maximum dynamic deflection was 12" and permanent deformation was 6". The barrier was granted eligibility from the FHWA under letter B206. Subsequently, the same barrier was retested with the 12.5' long F-Shape barrier pinned in a 4" thick asphalt pad with compacted road base underneath. There were three (3) 48" long pins in each barrier segment. In this test, the working width was 29.9", the maximum dynamic deflection was 17.8" and the permanent deflection was 17.0". This test was accepted by the FHWA under MASH test conditions and issued an eligibility letter under letter B206A.

CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-10 (1100C)	No testing of the 1100C vehicle was conducted as part of the MASH testing of the SBK F-Shape PCB (Portable Concrete Barrier) because the small car test is considered less critical due to lower impact energy and deflection. Additionally, previous testing of safety shapes with small cars has historically proven successful.	WAIVER REQUESTED
3-11 (2270P)	Test Number 690900-SBK1 / Conducted on January 27, 2014 / By the Texas Transportation Institute	PASS
3-20 (1100C)	N/A	
3-21 (2270P)	N/A	

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.):

Testing Laboratory's signature concurs that these modifications are considered Non-Significant and the effect is positive or inconsequential.		
Laboratory Contact Signature:	Alberson, Dean C	<small>Digitally signed by Alberson, Dean C DN: postalCode=77843, cn=Dean Alberson, email=Dean.Alberson@ttti.tamu.edu, o=Texas Transportation Institute, ou=TTI, st=College Station, c=US, serial=Alberson, Dean C, email=alalberson@ttti.tamu.edu Date: 2014.06.16 14:43:01 -0400</small>
Laboratory Name:	Texas Transportation Institute	
Laboratory Contact:	Dean Alberson	Same as Submitter <input type="checkbox"/>
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 Date:	TTI A2LA ISO 17025 Certification # 2821.01 Accreditation valid through April 30, 2015.	

Submitter Signature*:Forrest Schultz

Digitally signed by Forrest Schultz
DN: cn=Forrest Schultz, o=Strongstown's
BS&K Enterprises, Inc., ou,
email=fjschultz@1010&k.com, c=US
Date: 2014.06.16 14:43:01 -0400

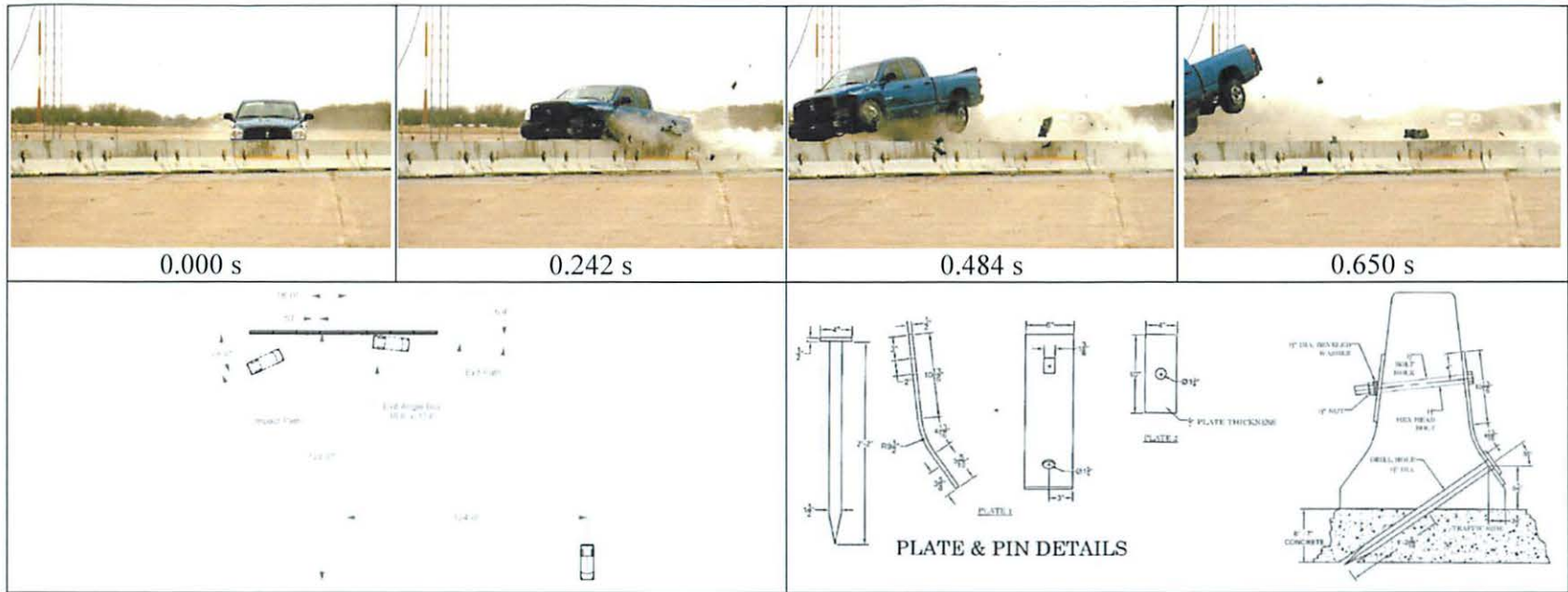
ATTACHMENTS

Attach to this form:

- 1) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
- 2) 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 key to understanding the performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		AASHTO TF13	
Number	Date	Designator	Key Words
B-251	June 17, 2014	SWC19	F-Shape barrier, JJ-Hook, concrete, asphalt



General Information

Test Agency Texas A&M Transportation Institute (TTI)
 Test Standard Test No. MASH Test 3-11
 TTI Test No. 690900-SBK1
 Date 2014-01-27

Test Article

Type Temporary Concrete Median Barrier
 Name J-J Hook Temp Concrete Barrier w/Retrofit
 Installation Length 96.75 ft
 Material or Key Elements Concrete Safety Shape pinned to concrete with 1/2-inch plate and 1 1/2-inch OD pin

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

Test Vehicle

Type/Designation 2270P
 Make and Model..... 2008 Dodge Ram 1500
 Curb 4880 lb
 Test Inertial 5034 lb
 Dummy..... No dummy
 Gross Static..... 5034 lb

Impact Conditions

Speed 63.3 mi/h
 Angle 24.9 degrees
 Location/Orientation 56 inches upstream 3-4

Impact Severity..... 117.7 kip-ft

Exit Conditions

Speed 52.0 mi/h
 Angle 6.4 degrees

Occupant Risk Values

Impact Velocity
 Longitudinal..... 17.4 ft/s
 Lateral..... 20.7 ft/s
 Ridedown Accelerations
 Longitudinal..... 16.3 G
 Lateral..... 12.1 G
 THIV 28.9 km/h
 PHD 17.9 G
 ASI 1.24
 Max. 0.050-s Average
 Longitudinal..... -7.3 G
 Lateral..... 9.4 G
 Vertical..... -4.0 G

Post-Impact Trajectory

Stopping Distance 142 ft dwnstrm
 128 ft twd traffic

Vehicle Stability

Maximum Yaw Angle 66 degrees
 Maximum Pitch Angle..... 18 degrees
 Maximum Roll Angle..... 40 degrees
 Vehicle Snagging..... No
 Vehicle Pocketing..... No

Test Article Deflections

Dynamic 18.9 inches
 Permanent..... 9.5 inches
 Working Width..... 26.8 inches
 Vehicle Intrusion..... 22.4 inches

Vehicle Damage

VDS..... 11LFQ5
 CDC 11FLEW4
 Max. Exterior Deformation 16.0 inches
 OCDI LF0001010
 Max. Occupant Compartment Deformation..... 0.5 inches

Figure 5.7. Summary of Results for MASH Test 3-11 on J-J Hook Temp Concrete Barrier with Retrofit.