



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

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

March 27, 2014

In Reply Refer To:
HSST/B-248

Mr. Barry Stephens
Trinity Highway Products, LLC
3617 Cincinnati Avenue.
Rocklin, CA. 95765

Dear Mr. Stephens:

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: Modified Thrie Beam Blockout
Type of system: Longitudinal Barrier
Test Level: NCHRP Report 350, TL4
Testing conducted by: Texas A&M Transportation Institute
Task Force 13 Designator: PWB03
Date of request: November 8, 2013
Date of completed package: November 30, 2013

Decision:

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

- Modified Thrie Beam Blockout

Based on a review of crash test results submitted by the manufacturer certifying the device described herein meets the crash test and evaluation criteria of the National Cooperative Highway Research Program (NCHRP) Report 350, 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.

Requirements

To be found eligible for Federal-aid funding, roadside safety devices should meet the crash test and evaluation criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350 or 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 NCHRP Report 350 criteria 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 crash test and evaluation criteria of the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of eligibility is designated as number B-248 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.

- Because it is a steel product, the Modified Thrie Beam Blockout is subject to Section 635.410 (Buy America) of Title 23, U.S. Code of Federal Regulations, and cannot be permanently incorporated into any federally funded project unless it is made in the U.S. from U.S. steel.

Sincerely yours,

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 a stylized "G".

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:	March 17, 2014	<input type="radio"/> New <input checked="" type="radio"/> Resubmission
	Name:	Bret R. Eckert, P.E.	Signature: <i>Bret Eckert</i>
	Company:	Trinity Highway	
	Address:	3617 Cincinnati Ave., Rocklin, CA 95765	
	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.

[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	Modified Thrie Beam Steel Blockout	NCHRP Report 350	TL4

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 NCHRP Report 350 (Report 350) and that the evaluation results meet the appropriate evaluation criteria in the Report 350.

Identification of the individual or organization responsible for the product:

Contact Name:	Barry D. Stephens, P.E.	Same as Submitter <input type="checkbox"/>
Company Name:	Trinity Highway	Same as Submitter <input checked="" type="checkbox"/>
Address:	3617 Cincinnati Ave., Rocklin, CA 95765	Same as Submitter <input checked="" type="checkbox"/>
Country:	USA	Same as Submitter <input checked="" type="checkbox"/>

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	Company:	Trinity Highway	
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To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies		

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Company Name:	Trinity Highway	Same as Submitter <input checked="" type="checkbox"/>
Address:	3617 Cincinnati Ave., Rocklin, CA 95765	Same as Submitter <input checked="" type="checkbox"/>
Country:	USA	Same as Submitter <input checked="" type="checkbox"/>
Modification to Existing Hardware Non-Significant - Effect is positive or Inconsequential		

PRODUCT DESCRIPTION

The Task Force 13 designator for this blackout is PWB03. As currently documented, there are no tolerances for the triangular cutout or a defined amount of web material that may remain after the removal process. Typical manufacturing methods leave some amount of web material depending on the process and equipment used.

This component modification defines the maximum amount of web that may be retained and maintain successful crash testing results. Trinity Highway Products, LLC. contracted with Texas A&M Transportation Institute (TTI) to crash test the modified steel thrie beam blackout with a maximum web cutout. Crash testing found that the blackout successfully meet NCHRP 350 Test Level 4 impact criteria.

The tested modified thrie beam blackout was manufactured from standard W14X22 Wide Flange Steel W-Beam that conforms to ASTM A36 specifications. A triangular section seven inches (7") high by six inches (6") deep with a one quarter inch radius (1/4"R) was removed from the web. The triangular cutout begins one and one quarter inches (1-1/4") from the outer edge of the beam flange.

Crash testing confirmed that the manufacturing tolerances of the triangular cutouts that begin flush with the outer flange or any range up to and including this tested distance (1-1/4" from outer flange edge) will behave similarly and provide consistent, successful NCHRP 350 Test Level 4 results. This component modification (defined tolerances associated with the location of the triangular cutouts) for an improved modified steel thrie beam blackout is considered Non-Significant and will have an inconsequential effect.

CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
4-10 (820C)	Test 4-12 is the most severe test on the guardrail system with the modified thrie beam blackout.	WAIVER REQUESTED
S4-10 (700C)	Optional Test.	
4-11 (2000P)	Test 4-12 establishes the structural adequacy for the guardrail system with the modified thrie beam blackout	WAIVER REQUESTED
4-12 (8000S)	Laboratory Test No 510602-MTB1. Test Date 2013-07-31. Crash Test Report No. 510602-MTB1. The modified thrie beam guardrail contained and redirected the 8000S vehicle. The vehicle did not penetrate, underide, or override the installation. Maximum dynamic deflection during the test was 663 mm (26.1 inches). No detached elements, fragments, or other debris from the test article were present to penetrate or show potential for penetrating the occupant compartment, or to present a hazard to others in the area. No occupant compartment deformation or intrusion occurred. The modified thrie beam guardrail system performed acceptably according to required specifications for NCHRP Report 350 Test 4-12. These test results were very similar to the original testing conducted by TTI in 1998 and reported (404211) and published as FHWA-RD-01-043 (NCHRP Report 350 Assessment of Existing Roadside Safety Hardware), pages 163-174.	PASS
4-20 (820C)	Not Applicable.	
S4-20 (700C)	Not Applicable.	
4-21 (2000P)	Not Applicable.	
4-22 (8000S)	Not Applicable.	

Full Scale Crash Testing was done in compliance with Report 350 by the following accredited crash test laboratory (cite the laboratory's accreditation status as noted in the crash test reports.):

Laboratory Name:	Texas Transportation Institute	
Laboratory Contact:	Dean C. Alberson, Ph.D., P.E.	Same as Submitter <input type="checkbox"/>
Address:	Texas A&M Transportation Institute Proving Ground Roadside Safety & Physical Security Texas A&M University System 3135 TAMU College Station, TX 77843-3135	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Date:	A2LA Certificate Number 2821.01 April 30, 2015	

ATTACHMENTS

Attach to this form:

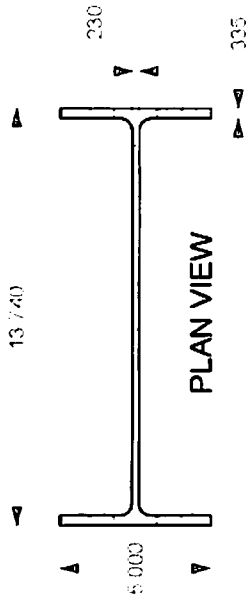
- 1) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
- 2) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [[Hardware Guide Drawing Standards](#)]. For proprietary products, a single 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:

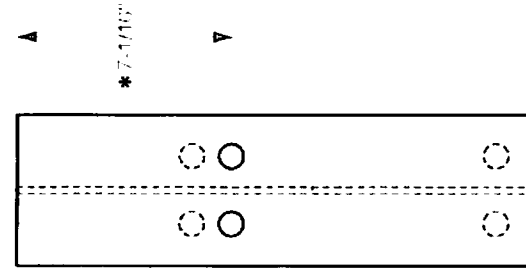
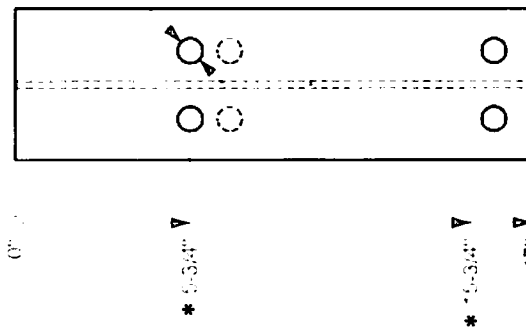
Eligibility Letter		AASHTO TF13	
Number	Date	Designator	Key Words
B248	March 20, 2014	PWB03	modified thrie beam blockout; NCHRP350 TL4

Modified Thrie-Beam Blockout

W14x22



* 1.13/16"
TYP ALL HOLES
BOTH FLANGES



ELEVATION VIEWS



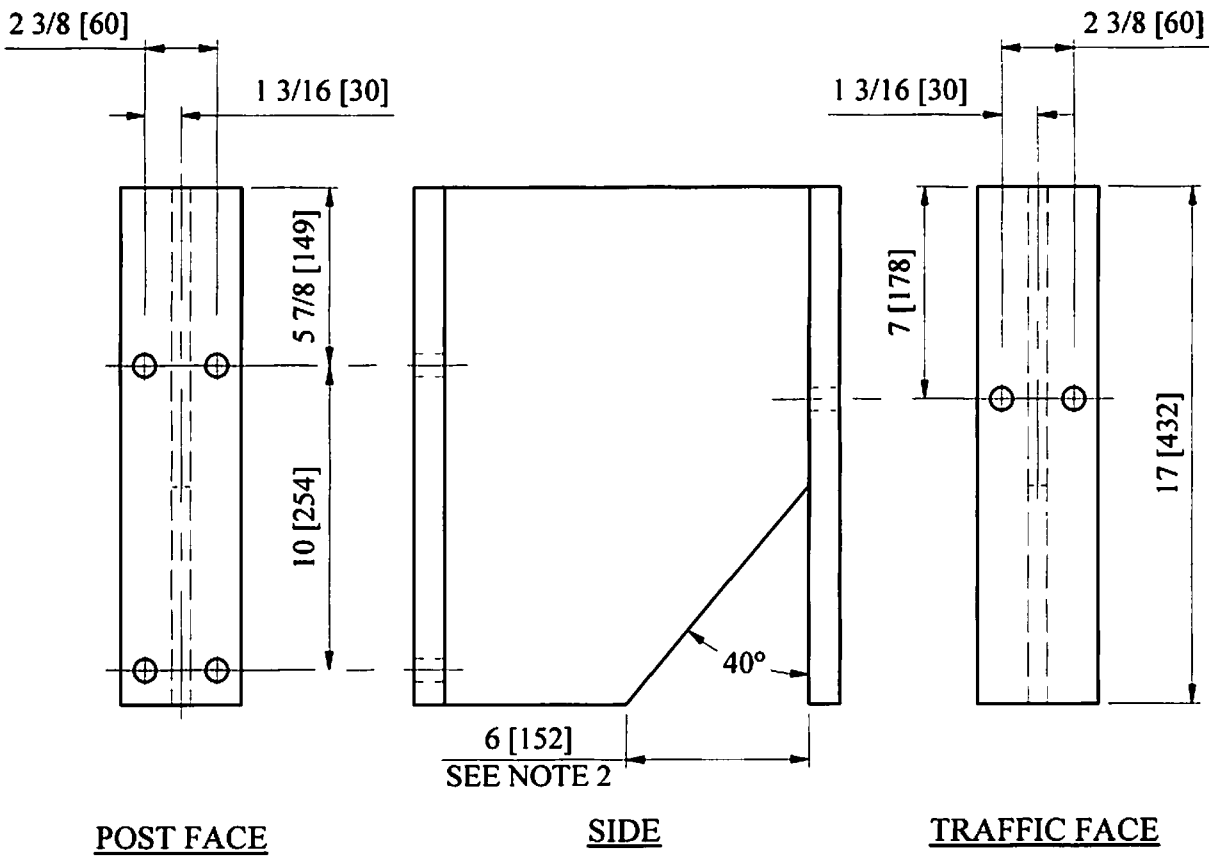
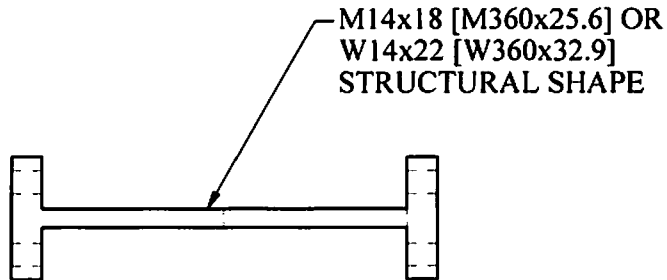
Roadside Safety and
Physical Security Division -
Proving Ground

Project 510602-MTB Modified Thrie-Beam 2014-03-17
Drawn By GES Scale 1:5 Sheet 5 of 5 Modified Blockout

T:\2012-2013\510602\MTB - Modified Thrie-Beam\Drawing\2013-09-26\510602-MTB Drawing

NOTES:

1. ALL HOLES ARE $\text{Ø}3/4$ [20].
2. TRIANGULAR CUTOUT MAY BE FLUSH AS SHOWN OR OFFSET UP TO $1\ 1/4$ [32] AWAY FROM OUTSIDE SURFACE OF FLANGE AND INCLUDE UP TO A $1/4$ [6] RADIUS AT UPPER INTERSECTION.



2014

MODIFIED THRIE BEAM BLOCKOUT

PWB03

SHEET NO.

DATE

1 of 2

3/13/2014

SPECIFICATIONS

Modified Thrie-Beam guardrail blockouts shall be manufactured using AASHTO M 270 / M 270M (ASTM A 709 / A 709M) Grade 36[250] steel, unless corrosion-resistant steel is required, in which case the blockout shall be manufactured from AASHTO M 270 / M 270M (ASTM A 709 / A09M) Grade 50W [345W] steel. The dimensions of the structural shapes, M14x18 [M360x25.6] and W6x9 [W150x13.5], are defined in AASHTO M 160 / M 160M (ASTM A 6 / A 6M).

After the section is cut and all holes are drilled or punched, the component should be zinc-coated according to AASHTO M 111 (ASTM A 123) unless corrosion-resistant steel is used, in which case it should not be zinc-coated, painted or otherwise treated.

Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its' appearance and accepted manufacturing practices.

INTENDED USE

This blockout is used in the SGR09b and SGM09b strong-post modified Thrie-Beam guardrail and median barrier. Each blockout is attached to PWE04 posts with at least two 1.5-inch [40 MM] long zinc-coated FBX16a bolts and nuts. The Thrie-Beam is attached to the blockout using an FBB02 guardrail bolt and nut.

APPROVALS

Strong-Post Modified Thrie-Beam Guardrail and Median Barrier (SGR09b and SGM09b)

FHWA Eligibility letters [HMHS-B64](#), February 14, 2000
[HSST/B-248](#), March, 2014

REFERENCES

H.E. Ross Jr., D.L. Sicking, R.A. Zimmer and J.D. Michie, Recommended Procedure for the Safety Performance Evaluation of Highway Features, National Cooperative Highway Research Program (NCHRP) Report Number 350, Transportation Research Board, Washington, D.C. 1993.

CONTACT INFORMATION

FHWA Office of Safety
1200 New Jersey Avenue, SE
Washington, D.C. 20590
<http://www.fhwa.dot.gov/>

MODIFIED THRIE BEAM BLOCKOUT

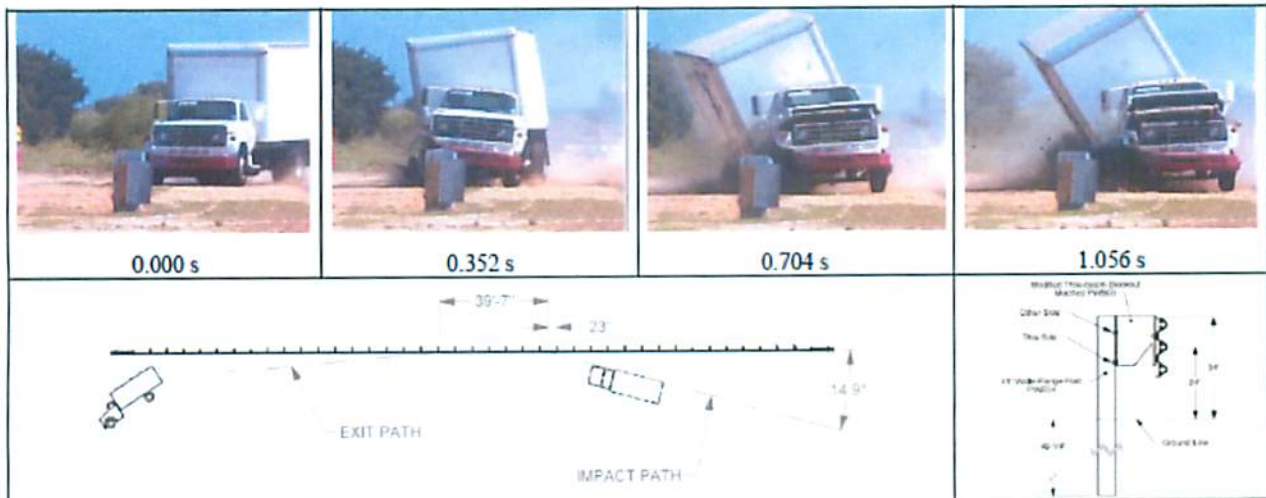
PWB03

SHEET NO.

DATE

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3/13/2014



General Information		Impact Conditions	Post-Impact Trajectory
Test Agency	Texas A&M Transportation Institute (TTI)	Speed	80.8 km/h (50.2 mi/h)
Test Standard Test No.	NCHRP Report 350 Test 4-12	Angle	14.9 degrees
TTI Test No.	510602-MTB1	Location/Orientation	23 inches downstream of post 17
Date	2013-07-31		
			Stopping Distance
			49.5 m (162.5 ft)
			6.1 m (20 ft) toward traffic
Test Article		Exit Conditions	Vehicle Stability
Type	Longitudinal Barrier	Speed	Out of view
Name	Modified Three Beam Guardrail	Angle	~8 degrees
Installation Length	80.0 m (262.5 ft)	Occupant Risk Values	Maximum Yaw Angle
Material or Key Elements	12 gauge Three beam on 2.06 m (6 ft-9 1/4 inches) long W150x14 (W6x9) steel posts with W360x33 (W14x22) blockouts	Impact Velocity	70 degrees
		Longitudinal	Maximum Pitch Angle
		Lateral	4 degrees
		Ridedown Accelerations	Maximum Roll Angle
		Longitudinal	92 degrees
		Lateral	Vehicle Snagging
		THIV	No
		PHD	Vehicle Pooketing
		ASI	No
		Max. 0.050-s Average	Test Article Deflections
		Longitudinal	Dynamic
		Lateral	663 mm (26.1 inches)
		Vertical	Permanent
			572 mm (22.5 inches)
			Working Width
			762 mm (33.0 inches)
			Vehicle Intrusion
			2197 mm (86.5 inches)
Soil Type and Condition	Standard Soil, Dry		
			Vehicle Damage
			VDS
			NA
			CDC
			01RFEW4
			Max. Exterior Deformation
			305 mm (12.0 inches)
			OCDI
			NA
			Max. Occupant Compartment Deformation
			None
Test Vehicle			
Type/Designation	8000S		
Make and Model	1983 GMC 7000		
Curb	5518 kg (12160 lb)		
Test Inertial	7883 kg (17390 lb)		

Figure 8. Summary of results for NCHRP Report 350 test 3-11 on modified three beam guardrail.