



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

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

May 21, 2014

In Reply Refer To:
HSST/CC-100C

Mr. Brian Smith
Trinity Highway Products, LLC
2525 North Stemmons Freeway
Dallas, Texas 75207

Dear Mr. Smith:

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: Slotted Rail Terminal 31-inch (SRT-31) Wood Post
Type of system: Terminal End Section
Test Level: NCHRP Report 350 Test Level 3 (TL-3)
Testing conducted by: Texas Transportation Institute
Task Force 13 Designator: SEW12c
Date of request: February 13, 2014
Date of completed package: May 9, 2014

Decision:

The following device is eligible, with details provided:

- SRT-31 Wood Post

This correspondence is in conjunction with the existing eligibility letter CC-100B dated December 5, 2012 for the above described system. Based on a comparison to both SRT-27 Wood Post (SRT-27W) Eligibility Letter CC-72 dated December 18, 2000 and SRT-31 Steel Post system Eligibility Letter CC-100 dated August 30, 2007, the accredited crash test house identified within the attached eligibility form has determined 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.

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 previously 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 CC-100C 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,

A handwritten signature in blue ink that reads "Michael S. Griffith". The signature is written in a cursive style with a large, stylized "M" and "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:	April 4, 2014	<input type="radio"/> New <input checked="" type="radio"/> Resubmission
	Name:	Don Gripne	
	Company:	Trinity Highway Products, LLC	
	Address:	5216 Brassfield Dr. SE, Olympia, WA 98501	
	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.

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'CC': Crash Cushions, Attenuators, & Terminals	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> FEA & V&V Analysis	SRT-31WP	NCHRP Report 350	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 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:	Greg Neece	Same as Submitter <input type="checkbox"/>
Company Name:	Trinity Highway Products, LLC	Same as Submitter <input type="checkbox"/>
Address:	2525 Stemmons, Freeway, Dallas, TX 75207	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>
Modification to Existing Hardware Non-Significant - Effect is positive or Inconsequential		

PRODUCT DESCRIPTION

The Slotted Rail Terminal (SRT) 6 Post straight flare for W-beam Guardrail @ TL-3 (herein referred to as SRT-27 Wood Post or SRT-27WP) was accepted by FHWA on December 18, 2000, FHWA letter CC-72. The system consisted of slotted rails, two Hinge Breakaway Posts at post locations 1 and 2, followed by 5 Controlled Release Posts (CRT). It was 37.5 feet long with a straight flare and a four foot end offset.

On August 30, 2007, FHWA letter CC-100 was issued for the SRT-31. The SRT-31 is an all steel post system, with a 4 foot offset over 37.5 feet with a straight flare. A steel Cable Release Post (CRP) is used at Post 1 and Steel Yielding Terminal Posts (SYTP) are used at posts 2 through 6. The rail is detached from the support posts 2 through 5. A shelf angle at Post 2 provides rail support. The SRT-31 and SRT-27SP systems are similar other than for the difference in height, and the rail splices being on the posts for the SRT-27SP.

On June 3, 2008, FHWA letter CC-101 was issued for the SRT-27 Steel Post (SP) terminal. The SRT-27SP is an all steel post system, 37.5 feet long with a straight flare and a 4 foot end offset. A steel Cable Release Post (CRP) is used at Post 1 and Steel Yielding Terminal Posts (SYTP) 2 through 6. The rail is detached from the support posts 2 through 5. A shelf angle at Post 2 provides rail support.

This request is to accept a wood post version of the SRT-31 (SRT-31 WP) with the following details:

1. Straight flare with 4-ft end offset over the 37.5-ft terminal length (similar to SRT-27WP, SRT-27SP, and SRT-31).
- 2(a). Wood BCT posts in 6 foot soil tubes or 4 ft-6 inch soil tubes with soil plates at post locations 1 and 2
- 2(b). Cable Release Post (CRP) at post location 1 and 6-ft long Steel Yielding Terminal Post (SYTP) at post location 2 (similar to SRT-27SP and SRT-31).
3. Four (4) 6-ft long Controlled Release Terminal (CRT) Posts connected to rail at post locations 3 through 6 with post spacing of 6 ft-3 inches (similar to SRT-27WP).
4. No blockouts between rail and post at post locations 1 and 2 (similar to SRT-27WP, SRT-27SP, and SRT-31).
5. 8 inch or 12 inch wood or composite blockout at post locations 3 through 6.
6. Two 12.5 ft (3.8 m) slotted W-beam panels between posts 1 and 5 (similar to SRT-27WP, SRT-27SP, and SRT-31).
7. Special 9.375 ft (2.86 m) or 15.625 ft (4.76 m) long W-beam panel beginning at post 5 to provide mid-span rail splices for connected 31-inch guardrail system (similar to SRT-31).
8. Shelf angle is used at post location 2 (similar to SRT-27SP and SRT-31).
9. Standard line post at post location 7 and beyond (similar to SRT-27WP, SRT-27SP, and SRT-31).

This modification is considered Non-significant, Effect is Positive or Inconsequential. The Testing Laboratory's signature concurs that these modifications are considered Non-significant and the effect is Positive and inconsequential.

Required Test Number	Narrative Description	Evaluation Results
3-30 (820C)	This test has been conducted on 27-inch (SRT-27WP) and 31-inch (SRT-31) systems. Equivalent or improved behavior is expected for the proposed SRT-31WP compared to the tested SRT-27WP. The SRT-27WP incorporated similar wood Controlled Release Terminal (CRT) posts, and the increased rail height will reduce the probability of rail climbing or override during the gating process.	WAIVER REQUESTED
S3-30 (700C)	N/A	WAIVER REQUESTED

Required Test Number	Narrative Description	Evaluation Results
3-31 (2000P)	This test has been conducted on 27-inch (SRT-27WP) and 31-inch (SRT-31) systems. Equivalent or improved behavior is expected for the proposed SRT-31WP compared to the tested SRT-27WP. The SRT-27WP incorporated similar wood Controlled Release Terminal (CRT) posts, and the increased rail height will reduce the probability of rail climbing or override during the gating process.	WAIVER REQUESTED
3-32 (820C)	This test is considered less severe than test 3-30.	WAIVER REQUESTED
S3-32 (700C)	N/A	
3-33 (2000P)	This test is considered less severe than test 3-31	WAIVER REQUESTED
3-34 (820C)	This test was conducted on previous wood post versions of the SRT with a parabolic (rather than linear) flare. The parabolic flare creates a more critical effective impact angle at post 2 than the straight flare of the proposed SRT-31WP. Further, Test 3-34 was performed on the 31-inch tall SRT-MASH system, which is considered to be more critical from a snagging perspective than the proposed SRT-31 WP. The SRT-MASH incorporates steel posts at a reduced post spacing. Steel posts are generally considered to be more critical from a snagging perspective than wood posts due to interaction of the vehicle wheel with the flanges of the post, and the reduced post spacing puts more posts in the path of the vehicle, thereby increasing snagging potential. Further, post snagging at 31 inch rail height is no longer considered a significant concern given the successful testing of 31-inch guardrail systems (Trinity Guardrail System and MGS) with standard steel posts and no blockouts under more severe impact conditions (i.e., 20 degrees with 820C vehicle and 25 degrees with 1100C vehicle under test 3-10 compared to a 15-degree impact angle under test 3-34).	WAIVER REQUESTED
S3-34 (700C)	N/A	
3-35 (2000P)	This test has been conducted on both 27-inch (SRT-27WP) and 31-inch (SRT-31) systems. The anchorage demand on the Cable Release Post (CRP) was more critical in the SRT-31 than the proposed SRT-31WP, because the rail was not attached to the steel yielding terminal posts and thus more load was transferred to the anchorage system. Further, equivalent or improved redirection performance is expected with the Controlled Release Terminal (CRT) posts at 31 inches compared to the same CRT posts tested at 27 inches in the SRT-27WP.	WAIVER REQUESTED
3-36 (820C)	N/A	
S3-36 (700C)	N/A	
3-37 (2000P)	N/A	
3-38 (2000P)	N/A	

CRASH TESTING

A brief description of each crash test and its result:

3-39 (2000P)	This test (2000P, reverse hit, 20 degrees) will be a non-discerning test for the straight flared SRT system as the impact angle of the 2000P relative to the rail will occur at 14 degrees(20 degrees minus 6 degrees flare rate) and therefore will be of relatively low severity. Some additional factors further justify the waiver request for this test. The Controlled Release Terminal (CRT) posts used in the system perform similarly in both the downstream and reverse direction. Further, the post bolt slot in the rail at the post location 1 is slotted out the upstream end to the free edge of the rail. Therefore, in a reverse hit the rail offers no resistance to the release of the CRP or fracture of the wood BCT post at Post location 1. Also, the activation of the CRP in the reverse direction has been demonstrated in both pendulum tests and in crash testing of cable guardrail terminals.	WAIVER REQUESTED
3-40 (2000P)	N/A	
S3-40 (700C)	N/A	
3-41 (2000P)	N/A	
3-42 (820C)	N/A	
S3-42 (700C)	N/A	
3-43 (2000P)	N/A	
3-44 (2000P)	N/A	

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.):

Testing Laboratory's signature concurs that these modifications are considered Non-Significant and the effect is positive or inconsequential.		
Laboratory Contact Signature:	Bligh, Roger P	<small>Digitally signed by Roger P Bligh DN: cn=Roger P Bligh, o=Trinity Highway Products, LLC, email=roger@trinityhighway.com, c=US Date: 2014.05.09 16:01:03 -07'00'</small>
Laboratory Name:	Texas Transportation Institute	
Laboratory Contact:	Roger Bligh	Same as Submitter <input type="checkbox"/>
Address:	3135 TAMU, College Station, TX 778543-3135	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Date:	ISO 17025-2005; A2LA Certificate 2821.01	

Submitter Signature*: Don Jay Gripne

Digitally signed by Don Jay Gripne
DN: cn=Don Jay Gripne, o=Trinity Highway Products, LLC,
email=rgripne@trinityhighway.com, c=US
Date: 2014.05.09 16:01:03 -07'00'

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
CC-100C	May 19, 2014	SEW12c	Slotted Rail Terminal, NCHRP Report 350, TL3, Wood Post