



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

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

April 25, 2016

In Reply Refer To:  
HSST/CC12T

Mr. Bret Eckert P.E.  
Engineering Applications Manager  
Trinity Highway Products  
3617 Cincinnati Avenue  
Rocklin, CA. 95677

Dear Mr. Eckert:

This letter is in response to your December 16, 2015 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 CC-12T and is valid until a subsequent letter is issued by FHWA that expressly references this device.

### **Decision**

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

- ET-Plus Modification

### **Scope of this Letter**

To be found eligible for Federal-aid funding, modified roadside safety devices should meet the crash test and evaluation criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350. 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**

FHWA previously issued an eligibility letter for the roadside safety system described in your pending request. Your pending request now identifies a modification to that roadside safety system.

The original roadside safety device information is:

Name of system: ET-Plus  
Type of system: W-Beam Guardrail Terminal  
Date of original request: September 13, 1999  
Date of original FHWA eligibility letter: January 12, 2000  
FHWA Control number: CC-12G

The pending modification(s) consists of the following changes:

1. Steel embossed serial number tag attached to the ET-Plus® Head. The tag will be used for product tracking and replaces a decal attached to the ET-Plus® Head that contains only patent information with a product decal that contains both product and patent information.

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**

If a manufacturer makes any modification to any of their roadside safety hardware that has an existing eligibility letter from FHWA, the manufacturer must notify FHWA of such modification with a request for continued eligibility for reimbursement. The notice of all modifications to a device must be accompanied by:

- Significant modifications – For these modifications, crash test results must be submitted with accompanying documentation and videos.
- Non-signification modifications – For these modifications, a statement from the crash test laboratory on the potential effect of the modification on the ability of the device to meet the relevant crash test criteria.

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.

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 the NCHRP Report 350.

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 CC-12T 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.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely yours,



Michael S. 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:	March 29, 2016	<input type="radio"/> New <input checked="" type="radio"/> Resubmission
	Name:	Bret R. Eckert, P.E.	
	Company:	Trinity Highway Products, LLC	
	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.

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'CC': Crash Cushions, Attenuators, & Terminals	<input type="radio"/> Physical Crash Testing <input checked="" type="radio"/> Engineering Analysis	ET-Plus <sup>®</sup>	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:	Michael Bennett	Same as Submitter <input type="checkbox"/>
Company Name:	Trinity Highway Products, LLC	Same as Submitter <input checked="" type="checkbox"/>
Address:	2525 Stemmons, Freeway, Dallas, TX 75207	Same as Submitter <input 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.

The ET-Plus<sup>®</sup> system technology is covered by patents that were applied for by Texas A&M University System (TAMUS) and Exodyne Technologies, Inc. Trinity Highway Products, LLC (THP) has a license agreement to make and sell the ET-Plus<sup>®</sup> system which is a commercial embodiment of those patents.

THP sponsored crash tests of the ET-Plus<sup>®</sup> system conducted by the Texas A&M Transportation Institute ("TTI") Proving Ground. TTI Proving Ground is an International Standards Organization ("ISO") 17025 accredited laboratory with American Association for Laboratory Accreditation (A2LA) Mechanical Testing certificate 2821.01. Full-scale crash testing on the ET-Plus<sup>®</sup> system was performed in accordance with testing criteria, as set forth by the National Cooperative Highway Research Program ("NCHRP") in the NCHRP Report 350 (1993).

THP pays royalties to TAMUS and Exodyne for sales of the ET-Plus<sup>®</sup> system and parts, pursuant to an executed license agreement. THP is willing to discuss confidential treatment of the content of the license agreement with the FHWA, in a manner that does not cause a breach of the license agreement.

## PRODUCT DESCRIPTION

New Hardware or Significant Modification	Modification to Existing Hardware	Non-Significant
<p>Original submission date December 22, 2015. The ET-Plus<sup>®</sup> was originally accepted on January 18, 2000 with FHWA eligibility letter HMHS-CC12G as a NCHRP 350 TL 3 Guardrail Extruder Terminal. It was subsequently accepted with as a TL-2 device on February 18, 2000 with FHWA eligibility letter HMHS-CC12H and again with various post combinations in subsequent FHWA letters HSA/CC-12I dated April 10, 2000, HSA-10/CC-12J dated June 24, 2002, HSA-10/CC-12K dated August 28, 2002, HSA-10/CC-12L dated April 11, 2003, and HSA-10/CC-12M dated June 16, 2004. The ET-Plus<sup>®</sup> is a energy absorbing guardrail end treatment used for termination of w-beam barriers on the shoulder or median of a roadway.</p> <p>This request is for continued eligibility of the ET-Plus<sup>®</sup> utilizing an steel embossed serial number tag attached to the ET-Plus<sup>®</sup> Head. The tag will be used for product tracking. This request is also to replace a decal attached to the ET-Plus<sup>®</sup> Head that contains only patent information with a product decal that contains both product and patent information.</p> <p>These modifications are not part of the structural elements of the ET-Plus<sup>®</sup> and have been reviewed and justified through engineering analysis and judgment to be non-significant and will have no bearing on the as-tested performance of the system. The Testing Laboratory's signature concurs that these modifications are considered Non-Significant.</p>		

## CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-30 (820C)	Test 3-30 was waived for the ET-Plus <sup>®</sup> as stated in FHWA Eligibility letter CC-12G; Test 3-31 with a 2000-kg pickup truck is most critical to demonstrate acceptable performance of the modified extruder head. The non-significant modifications described in the Product Description will have no bearing on the as-tested performance of the system.	Non-Critical, not conducted
S3-30 (700C)	Not Applicable. Test S3-30 is an optional test not required for the ET-Plus <sup>®</sup> system eligibility.	
3-31 (2000P)	Test 3-31 was conducted and documented in Laboratory Test TTI No. 400001-LET1, test date October 5, 1999, in Test Report entitled NCHRP Report 350 Test 3-31 of the ET-2000 PLUS. The non-significant modifications described in the Product Description will have no bearing on the as-tested performance of the system.	PASS
3-32 (820C)	Test 3-32 was waived for the ET-Plus <sup>®</sup> as stated in FHWA Eligibility letter CC-12G; Test 3-31 with a 2000-kg pickup truck is most critical to demonstrate acceptable performance of the modified extruder head. The non-significant modifications described in the Product Description will have no bearing on the as-tested performance of the system.	Non-Critical, not conducted
S3-32 (700C)	Not Applicable. Test S3-32 is an optional test not required for the ET-Plus <sup>®</sup> system eligibility.	

Required Test Number	Narrative Description	Evaluation Results
3-33 (2000P)	Test 3-33 was waived for the ET-Plus <sup>®</sup> as stated in FHWA Eligibility letter CC-12G; Test 3-31 with a 2000-kg pickup truck is most critical to demonstrate acceptable performance of the modified extruder head. The non-significant modifications described in the Product Description will have no bearing on the as-tested performance of the system.	Non-Critical, not conducted
3-34 (820C)	Test 3-34 was waived for the ET-Plus <sup>®</sup> as stated in FHWA Eligibility letter CC-12G; As no other changes were made in the terminal anchor design, none of the side impacts in the Report 350 test matrix were necessary. The non-significant modifications described in the Product Description will have no bearing on the as-tested performance of the system.	Non-Critical, not conducted
S3-34 (700C)	Not Applicable. Test S3-34 is an optional test not required for the ET-Plus <sup>®</sup> system eligibility.	
3-35 (2000P)	Test 3-35 was waived for the ET-Plus <sup>®</sup> as stated in FHWA Eligibility letter CC-12G; As no other changes were made in the terminal anchor design, none of the side impacts in the Report 350 test matrix were necessary. The non-significant modifications described in the Product Description will have no bearing on the as-tested performance of the system.	Non-Critical, not conducted
3-36 (820C)	Not Applicable. Test 3-36 is required for nongating devices and not applicable for a gating redirective terminals such as the ET-Plus <sup>®</sup> system.	
S3-36 (700C)	Not Applicable. Test S3-36 is an optional test not required for the ET-Plus <sup>®</sup> system eligibility.	
3-37 (2000P)	Not Applicable. Test 3-37 is required for nongating devices and not applicable for a gating redirective terminals such as the ET-Plus <sup>®</sup> system.	
3-38 (2000P)	Not Applicable. Test 3-38 is required for nongating devices and not applicable for a gating redirective terminals such as the ET-Plus <sup>®</sup> system.	
3-39 (2000P)	Test 3-39 was waived for the ET-Plus <sup>®</sup> as stated in FHWA Eligibility letter CC-12G; As no other changes were made in the terminal anchor design, none of the side impacts in the Report 350 test matrix were necessary. The non-significant modifications described in the Product Description will have no bearing on the as-tested performance of the system.	Non-Critical, not conducted
3-40 (2000P)	Not Applicable. Test 3-40 is for nonredirective, gating devices and not applicable for the ET Plus <sup>®</sup> system eligibility.	
S3-40 (700C)	Not Applicable. Test S3-40 is an optional test for nonredirective, gating devices not required for the ET Plus <sup>®</sup> system eligibility.	
3-41 (2000P)	Not Applicable. Test 3-40 is for nonredirective, gating devices and not applicable for the ET Plus <sup>®</sup> system eligibility.	
3-42 (820C)	Not Applicable. Test 3-40 is for nonredirective, gating devices and not applicable for the ET Plus <sup>®</sup> system eligibility.	
S3-42 (700C)	Not Applicable. Test S3-34 is an optional test for nonredirective, gating devices not required for the ET Plus <sup>®</sup> system eligibility.	
3-43 (2000P)	Not Applicable. Test 3-40 is for nonredirective, gating devices and not applicable for the ET Plus <sup>®</sup> system eligibility.	
3-44 (2000P)	Not Applicable. Test 3-40 is for nonredirective, gating devices and not applicable for the ET Plus <sup>®</sup> system eligibility.	

Full Scale Crash Testing was done in compliance with NCHRP Report 350 by the following accredited crash test Laboratory. By signature below, the Laboratory agrees in support of this submission that all critical and relevant crash tests for the device listed above were conducted. (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.		
Laboratory Name:	Texas Transportation Institute	
Laboratory Signature:	Dean C. Alberson	<small>Digitally signed by Dean C. Alberson DN: cn=Dean C. Alberson, o=Texas AM Transportation Institute, ou=Roadway Safety and Physical Security Division, email=d-alberson@tti.tamu.edu, c=US Date: 2016.03.25 10:29:52 -0500</small>
Address:	3135 TAMU, College Station, TX 77843	Same as Submitter <input type="checkbox"/>
Country:	USA	Same as Submitter <input checked="" type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	A2LA Certificate# 2821.01, Valid to April 30, 2017	

Submitter Signature\*: Bret Eckert P.E. Digitally signed by  
bret.eckert@ttin.net  
DN: cn=bret.eckert@ttin.net  
Date: 2016.03.29 07:24:30 -0700

Submit Form

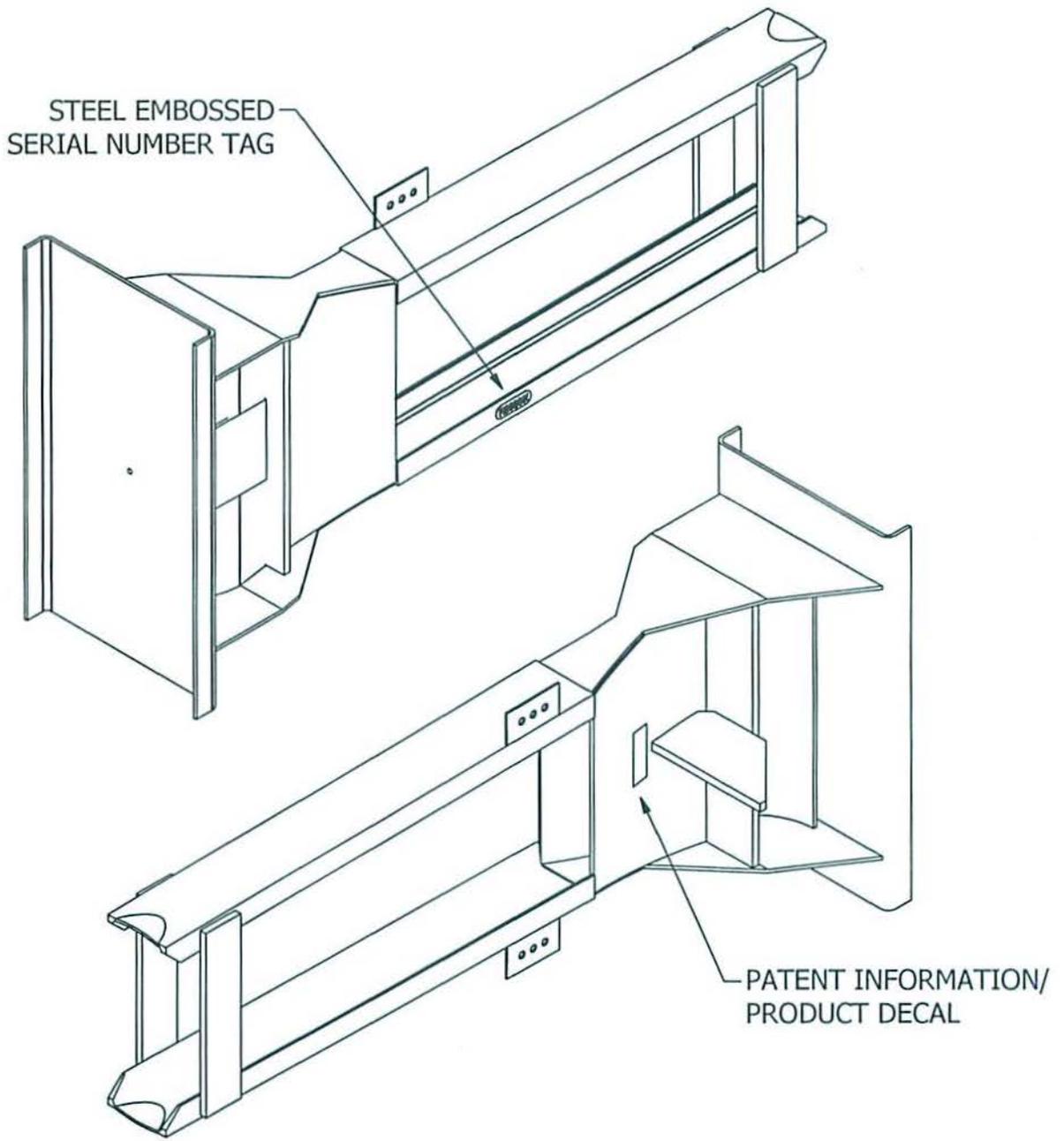
## ATTACHMENTS

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		AASHTO TF13	
Number	Date	Designator	Key Words



ET PLUS<sup>®</sup>  
SN TAG AND  
PRODUCT/PATENT DECAL

