U.S. Department of Transportation
Federal Highway Administration

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

March 29, 2013

In Reply Refer To:
HSST/CC-120A

Mr. Gerrit A. Dyke, P.E.
Barrier Systems, Inc.
3333 Vaca Valley Parkway, Suite 800
Vacaville, CA 95688

Dear Mr. Dyke:

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: X-Lite Tangent (TX) and X-Lite Flared (FX) - Modified
Type of system: W-Beam Guardrail Terminal
Test Level: NCHRP 350 Test Level 3 (TL-3)
Testing conducted by: Safe Technologies, Inc.
Task Force 13 Designator: SEW23B Tangent; SEW24B Flared
Date of request: March 6, 2013
Date initially acknowledged: March 6, 2013

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

- X-Lite Flared (FX) and Tangent (TX), both modified with aluminum clip

Based on a review of crash test results submitted by the manufacturer certifying the device described herein meets the crashworthiness 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
Roadside safety devices should meet the guidelines contained in NCHRP Report 350 (Report 350) if tested prior to January 1, 2011, or the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH) if tested after that date. The FHWA Memorandum "Identifying Acceptable Highway Safety Features", dated July 25, 1997, provides further guidance on crash testing requirements of longitudinal barriers.

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 CC-120A 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.

- The X-Lite Tangent (TX) Modified, X-Lite Flared (FX) Modified Terminals are patented products and considered 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

Michael S. Griffith
Director, Office of Safety Technologies
Office of Safety

Enclosure

Request for Federal Aid Reimbursement Eligibility Of Highway Safety Hardware

Submitter	Date of Request:	March 6, 2013	◉ New ○ Resubmission
	Name:	Gerrit Dyke, P.E. 3/27/13	
	Company:	Lindsay Transportation Solutions, Inc.	
	Address:	3333 Vaca Valley Pkwy, Suite 800, Vacaville, CA 95688	
	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
'CC': Crash Cushions, Attenu	◉ Physical Crash Testing ○ FEA & V&V Analysis	X-Lite Tangent (TX), X-Lite Flared (FX)	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:	Gerrit Dyke, P.E.	Same as Submitter ☒
Company Name:	Lindsay Transportation Solutions, Inc.	Same as Submitter ☒
Address:	3333 Vaca Valley Pkwy, Suite 800, Vacaville, CA 95688	Same as Submitter ☒
Country:	United States	Same as Submitter ☒

PRODUCT DESCRIPTION

Modification to Existing Hardware Non-Significant - Effect is positive or Inconsequential

The X-Lite system utilizes a cable connected between post 2 and the front of the second rail to provide tension to the system for lateral impacts. Upon frontal impacts, the cable releases, permitting the system to telescope rearward.

The proposed modification to the X-Lite (FX/TX) system is to incorporate a lightweight aluminum clip to the cable attachment at post number 2. The retaining clip ensures positive engagement of the cable at post 2 in the case that tension in the cable is lost. During a frontal impact, the clip easily yields and permits the cable to release.

The retaining clip is a safety measure designed to reduce risk of improper installation and construction creep. The modification does not effect the impact performance of the system. To demonstrate the proper function of the retaining clip, a full scale impact test was performed by Safe Technologies, Inc. on the cable release mechanism. A surrogate vehicle (bogie) was used to impact post 2 and trigger the cable release with the retaining clip installed. The bogie weight is 2000kg and was traveling at approximately 30km/hr with no offset or angle.

As demonstrated in the attached video, the retaining clip does not effect the release of the cable during an impact and therefore does not adversely effect the performance of the X-Lite (FX/TX) system. A drawing of the proposed retaining clip and application is included with this submittal.

CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-30 (820C)	SEE FHWA Letter HSST/CC-120 - Flared and Tangent	PASS
S3-30 (700C	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-31 (2000P)	SEE FHWA Letter HSST/CC-120 - Flared and Tangent	PASS
3-32 (820C)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
S3-32 (700C)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-33 (2000P)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-34 (820C)	SEE FHWA Letter HSST/CC-120 - Flared	PASS
S3-34 (700C)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-35 (2000P)	SEE FHWA Letter HSST/CC-120 - Flared	PASS
3-36 (820C)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
S3-36 (700C)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-37 (2000P)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-38 (2000P)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-39 (2000P)	SEE FHWA Letter HSST/CC-120	WAIVER REQUES
3-40 (2000P)	NA	
S3-40 (700C)	NA	
3-41 (2000P)	NA	
3-42 (820C)	NA	
S3-42 (700C)	NA	
3-43 (2000P)	NA	
3-44 (2000P)	NA	

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.):

Laboratory Name:	Safe Technologies, Inc.	
Laboratory Contact:	Joseph Nagy	Same as Submitter ☐
Address:	170 River Rd, Rio Vista, CA 94571	Same as Submitter ☐
Country:	United States	Same as Submitter ☐
Accreditation Certificate Number and Date:	1851.01, Valid Through 3/31/2014	

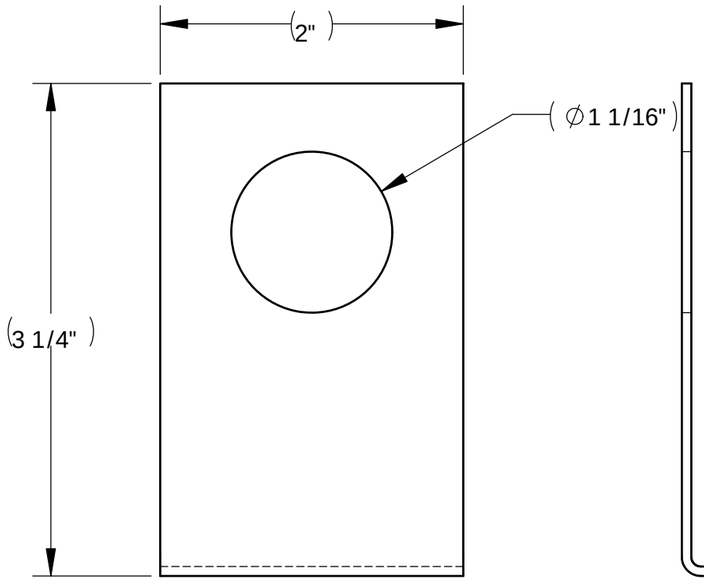
ATTACHMENTS

Attach to this form:

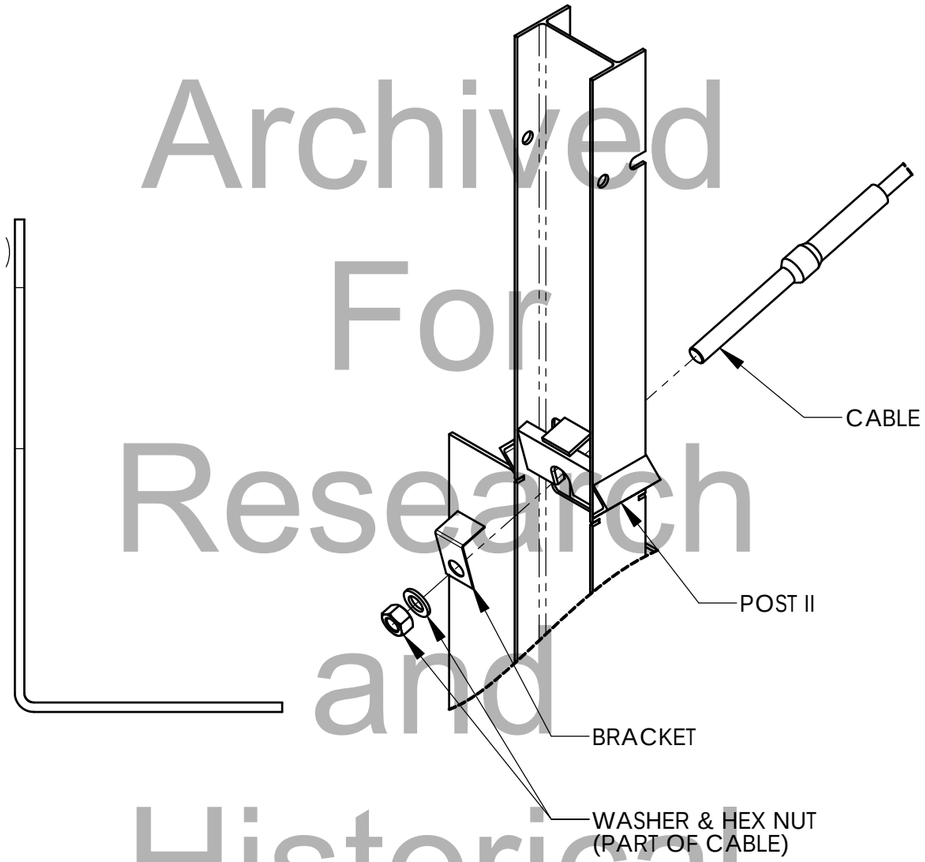
1) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
2) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [Hardware Guide Drawing Standards]. For proprietary products, a single isometric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

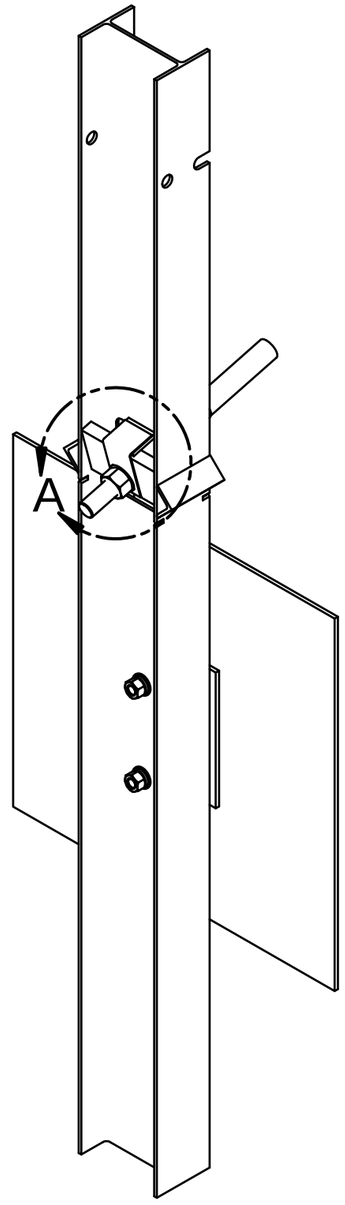
FHWA Official Business Only:

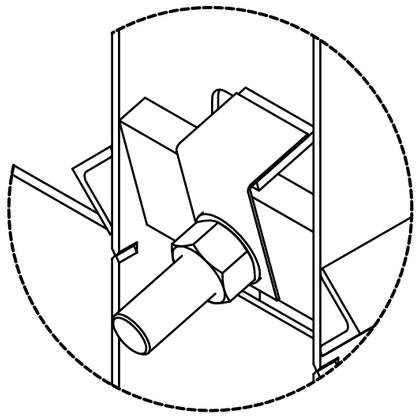
Eligibility Letter		AASHTO TF13	
Number	Date	Designator	Key Words
CC-120A	March 27, 2013	SEW23B Tan & SEW24B Flare	End Terminal Tangent, End Terminal Flared, Cable Connection, tension, aluminum clip release



CABLE RETENSION BRACKET, P/N: BSI-1303005-00
(SCALE 1:1)







DETAIL A
SCALE 1 : 3

APPROVALS

DRAWN BY: JMT

DRAWN DATE: 02/27/13

APPR'D BY:

APPR'D DATE:

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES ARE:

FRACTIONS ±1/16 DECIMAL .XX = ±.03 .XXX = ±.010 ANGLES ±1/2°

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-1994

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

REV	ECN#	DATE

LINDSAY™ TRANSPORTATION SOLUTIONS

BARRIER SYSTEMS INC.
3333 Vaca Valley Parkway Ste 800
Vacaville, CA 95688
Tel: 888-800-3691
www.barriersystemsinc.com

TITLE

CABLE RETENSION BRACKET X-LITE

SIZE	DWG NO.	REV.
B	BSI-1303008-US	X

SCALE 1:8 SHEET 1 OF 1

Doc. B100108