Mr. Brian Smith  
Trinity Highway Products, LLC  
P.O. Box 568887  
Dallas, TX 75356-8887  

Dear Mr. Smith:

This letter is in response to your request for the Federal Highway Administration (FHWA) acceptance of a roadside safety system for use on the National Highway System (NHS).

Name of system: Trinity CASS  
Type of system: Cable Barrier  
Test Level: NCHRP Report 350 TL-3  
Testing conducted by: Texas Transportation Institute  
Date of request: November 25, 2008  
Date of completed package: February 26, 2009

You requested that we find this system acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 “Recommended Procedures for the Safety Performance Evaluation of Highway Features.”

Requirements
Roadside safety systems should meet the guidelines contained in the NCHRP Report 350. The FHWA Memorandum “Identifying Acceptable Highway Safety Features” of July 25, 1997, provides further guidance on crash testing requirements of longitudinal barriers.

Description
In our FHWA Acceptance Letters B-119 dated May 13, 2003, and B-119B dated August 28, 2003, we accepted Trinity Highway Products’ 3-cable CASS Cable Safety System with c-channel posts at 2.0m (6’6”), 3.0m (10’0”) and 5.0m (16’5”) post spacing for use on the NHS under the NCHRP Report 350 Test Level 3 (TL-3) criteria.

Your present request is for acceptance of a modified, 4-cable CASS system with c-channel posts. The original 3 cables of the CASS system with c-channel posts remain at the same heights. The modification is the addition of a fourth cable located at a height of 585mm (23”), midway between the bottom and middle cables of the 3-cable CASS system with c-channel posts, and separated by plastic spacers as shown in the enclosed drawings.
You correctly noted that terminating the fourth cable must be properly addressed, and you did so by modifying the NCHRP TL-3 compliant terminal that was accepted in the FHWA letter CC-76 dated July 29, 2002. The modification includes increasing the length of the CASS Cable Terminal through the addition of a fourth Cable Release Post as shown in the enclosed drawing. The fourth cable remains at the 585mm (23") height on the traffic side of the terminal from Post #9 through Post #4, at which point it begins its descent towards its termination at Cable Release Post #1X.

Findings
Because the spread of the four cables is within the limits of the 3-cable system tested with c-channel posts, we consider this system to be similarly crashworthy. In addition, the modified, 4-cable CASS system with c-channel posts are acceptable for use on the NHS under the NCHRP Report 350 TL-3 conditions at all previously accepted post spacing and embedment types (driven post, post set in driven tube sleeve, and post set in tube sleeve encased in a concrete footing) under the range of conditions tested and discussed above, when such use is acceptable to a highway agency.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- This acceptance is limited to the crashworthiness characteristics of the systems and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the system will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the system being marketed is significantly different from the version that was crash tested, we reserve the right to modify or revoke our acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that it will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance is designated as number B-141E 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.
- The Trinity CASS barriers are patented products and considered proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects, except exempt, non-NHS 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.
This acceptance 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 acceptance letter is limited to the crashworthiness characteristics of the candidate system, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

David A. Nicol, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures
CASS-STD 4-CABLE GUARDRAIL SAFETY SYSTEM

NOTES:
1. CASS HAS BEEN SUCCESSFULLY TESTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 TEST LEVEL 3 (NCHRP 350 TL3) AND ACCEPTED BY FHWA FOR VARIOUS POST SPACINGS. CASS CABLE TERMINAL (CCT) HAS BEEN SUCCESSFULLY TESTED AND APPROVED TO NCHRP TL3.

2. WHERE APPROVED TERMINAL (CCT) OR CASS TRANSITION (VARIOUS) SHALL BE USED ON APPROACH AND DEPARTURE TERMINATIONS WHEN CASS IS INSTALLED ON THE NATIONAL HIGHWAY SYSTEM (NHS) AT THE TERMINATION POINT. FOR INSTALLATIONS ON OTHER HIGHWAYS OR IN NON-CONFORMING AREAS, THE INSTALLATION MAY BE APPROVED ON A CASE-BY-CASE BASIS. INSTALLATION IN NON-CONFORMING AREAS IS PERMITTED FOR THE ABBREVIATION OF THE CABLES.

3. CASS SHALL BE INSTALLED ON SHOULDER OR MEDIAN USING CPR OR FLATTER THAN OBSTRUCTIONS, DEPRESSIONS, ETC. THAT MAY SIGNIFICANTLY AFFECT THE PATH OF THE TRAFFIC. A BRANCH OR AXLE OF A HIGHWAY OR INTERSTATE SYSTEM MAY BEzell THE WAY OF THE CABLE INSTALLATION. INSTALLATION IN THESE AREAS MAY BE APPROVED ON A CASE-BY-CASE BASIS.

4. CASS POST SPACING MAY BE MODIFIED TO AVOID OBSTRUCTIONS THAT CONFLICT WITH THE INSTALLATION OF CASS LINE POSTS. NO POST SPACE CAN EXCEED THE MAXIMUM POST SPACING LIMIT OF 16'-6" OR MAXIMUM POST SPACING ALLOWED BY PROJECT ENGINEER - WHICHEVER IS LESS. REDUCING OR INCREASING POST SPACING MAY BE MODIFIED TO AVOID OBSTRUCTIONS THAT CONFLICT WITH THE INSTALLATION OF CASS LINE POSTS. NO POST SPACE CAN EXCEED THE MAXIMUM POST SPACING LIMIT OF 16'-6" OR MAXIMUM POST SPACING ALLOWED BY PROJECT ENGINEER - WHICHEVER IS LESS.

5. POST FOUNDATIONS MAY BE DRILLED THROUGH EXISTING PAVEMENT. TRINITY RECOMMENDS INSTALLATION OF CASS POSTS WITH A MINIMUM 1'-0" MIN. CONCRETE FOOTING CAST IN PLACE OR PRE-CAST (BY OTHERS). TRINITY RECOMMENDS INSTALLATION OF CASS POSTS WITH A MINIMUM 1'-0" MIN. CONCRETE FOOTING OR WITH A MINIMUM 1'-0" MIN. CONCRETE FOOTING CAST IN PLACE OR PRE-CAST (BY OTHERS).

6. FOR AESTHETIC PURPOSES, TRINITY RECOMMENDS ALL SLEEVES, DRIVEN POSTS, AND LOWER CABLE RELEASE POSTS TO BE INSTALLED REASONABLY PLUMB (APPROXIMATELY 1/8" PER FOOT). TRINITY RECOMMENDS ALL SLEEVES, DRIVEN POSTS, AND LOWER CABLE RELEASE POSTS TO BE INSTALLED REASONABLY PLUMB (APPROXIMATELY 1/8" PER FOOT).

7. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI PRIOR TO TENSIONING THE CABLE. TRINITY RECOMMENDS THE CONCRETE TO BE VIBRATED IN ACCORDANCE WITH THE LATEST APPLICABLE AGENCY SPECIFICATION.

8. CASS SHALL BE INSTALLED IN WELL-DENDED, COMPACTED, NO REPORT 300 STANDARDS GRADES OR SOIL (IF SOIL) MEETS THIS CLASSIFICATION. SOIL GRADES OR SOIL (IF SOIL) MEETS THIS CLASSIFICATION. SOIL GRADES OR SOIL (IF SOIL) MEETS THIS CLASSIFICATION. SOIL GRADES OR SOIL (IF SOIL) MEETS THIS CLASSIFICATION. SOIL GRADES OR SOIL (IF SOIL) MEETS THIS CLASSIFICATION. SOIL GRADES OR SOIL (IF SOIL) MEETS THIS CLASSIFICATION. SOIL GRADES OR SOIL (IF SOIL) MEETS THIS CLASSIFICATION.

9. PLEASE CONSIDER SPECIFYING (NCHRP 350) OR (FOR USE ON CONCRETE) FOR INSTALLATION IN CONCRETE. TRINITY RECOMMENDS THE CONCRETE TO BE VIBRATED IN ACCORDANCE WITH THE LATEST APPLICABLE AGENCY SPECIFICATION.

10. PLEASE CONTACT TRINITY FOR ADDITIONAL INFORMATION.

TRINITY HIGHWAY PRODUCTS, LLC.

PROJ.

SS-720-4

file: SS-720-4-Cable.idw