



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

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

November 18, 2010

In Reply Refer To:
HSSI/B-203

Mr. John Williams
President
GSI High Tension Cable LP
720 W. Wintergreen
Hutchins, Texas 75141

Dear Mr. Williams:

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:	Four Cable Transition to W-Beam Guardrail
Type of system:	High Tension Flexible to Semi Rigid Barrier Transition
Test Level:	NCHRP Report 350 TL-3
Testing conducted by:	N/A
Task Force 13 Designator:	STC02
Date of request:	October 6, 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."

Decision:

The following device was found acceptable, with details provided below:

- GSI Four Cable Transition to W-Beam Guardrail

Requirements

Roadside safety devices should meet the guidelines contained in the NCHRP Report 350 or the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). The FHWA Memorandum "Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing requirements of longitudinal barriers.



Description

On October 19, 2005, we accepted a transition design for a high-tension 3-cable barrier to strong-post w-beam barriers. This letter (copy enclosed for reference), was addressed to Mr. Rick Mauer of Nucor Steel Marion, was for a system where all three cables were attached to the same panel of the w-beam barrier. Our acceptance was based on full-scale crash testing of a low-tension cable barrier transition, and the knowledge that a high-tension cable barrier would deflect less under impact and likely provide smoother redirection than the tested system.

Your present request is to modify the three-cable transition to accommodate four cables. As seen in the drawing enclosed for reference, the cables attach to the w-beam rail at two separate locations. The two bottom cables attach to one panel, and the two top cables attach 6 feet, 3 inches downstream from that point. The attachments use the same mitered 1 1/4-inch standard pipes to bolt the end of the swaged cable end assemblies.

Findings

We concur that the system described above and detailed in the enclosed drawings is acceptable for use on the NHS under the range of conditions that the low-tension cable transition was tested, 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-203 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 GSI Cable to W-Beam Transitions 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,

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

FHWA:HSSI:NArtimovich:ms:x61331:11/17/10

File: s://directory folder/nartimovich/B203_GSI_Cable_Transition.doc

cc: HSSI (Reader, HSA; Chron File, HSSI; NArtimovich, HSSI; JDewar, HSSI)



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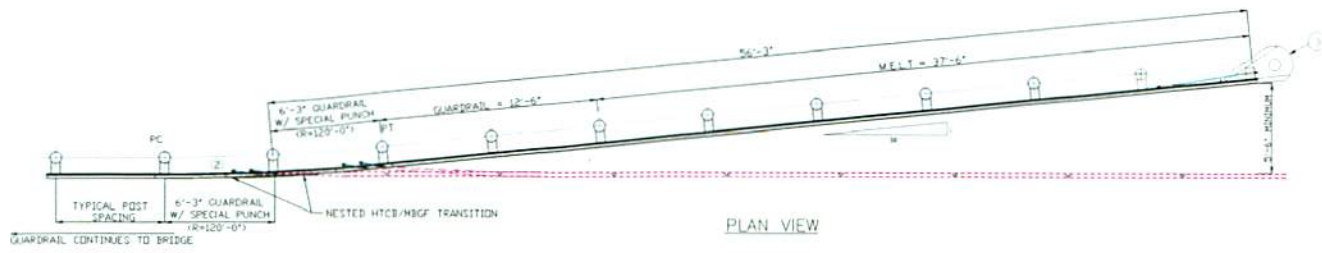
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Sincerely yours,



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



NOTES:

- 1 POST SPACING REDUCED PER CABLE MANUFACTURER'S SPECIFICATION TO ACHIEVE DEFLECTIONS SIMILAR TO MBGF. 1ST POST HOLDS 2 EXTENDED CABLES.
- 2 INSTALL CABLE END ASSEMBLIES, PASS THREADED RODS THROUGH NESTED PLATE. SEE TABLE 1 FOR CABLE END ASSEMBLY PLACEMENTS FOR 3 & 4 CABLE SYSTEMS.
- 3 M.E.L.T. OR OTHER APPROVED ANCHORING END TERMINAL.
- 4 CONSULT INSTALLATION MANUALS FOR CABLE HEIGHTS IN TRANSITION ZONE.

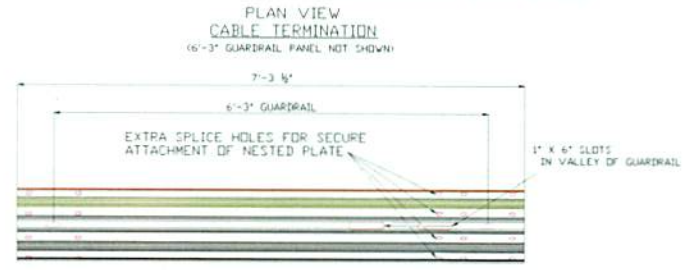
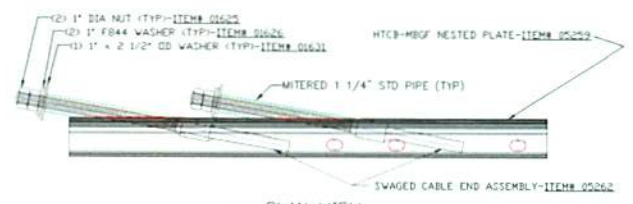
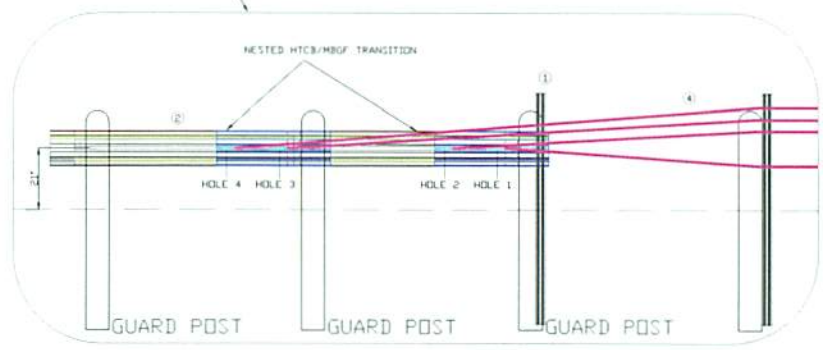
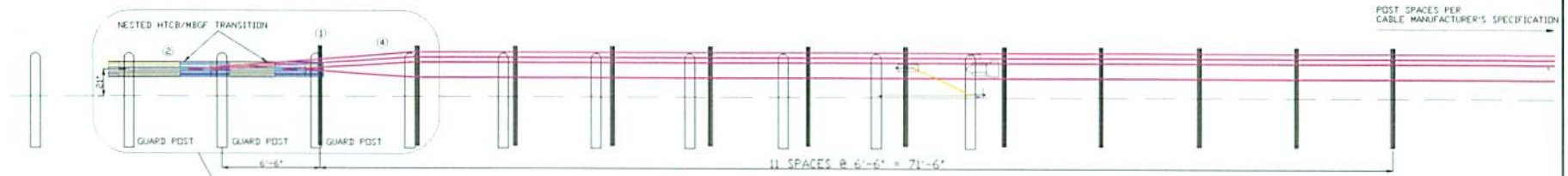


TABLE 1

Cable End Assembly Installation - 4 Cable	
Cable End	Hole Location
Lower Cable End Assembly	Hole 1
Lower-Mid Cable End Assembly	Hole 2
Upper-Mid Cable End Assembly	Hole 3
Top Cable End Assembly	Hole 4

TABLE 2

Cable End Assembly Installation - 4 Cable		
Part #	Qty	Description
05258	2 Ea.	6'-3" Cable Transition Panel
05259	2 Ea.	Cable Transition Nested Plate
05262	4 Ea.	Swaged Cable End Assembly
		with 4' of 3/4" X 3 X 7 Cable
01015	24 Ea.	5/8" X 2" Splice Bolt
01055	24 Ea.	5/8" Dbl. Recess Splice Nut
01625	8 Ea.	1" Hex Nut
01626	8 Ea.	1" Standard Washer
01631	4 Ea.	1" X 2-1/2" OD Standard Washer

GSI CABLE TO W-BEAM TRANSITION
 PATENT# 7,556,243 B2 4 CABLE SYSTEM

FILE:	DN:	CK:	DW:	CK:
	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	COUNTY	CONTROL	SECT	JOB
				HIGHWAY



US Department
of Transportation
**Federal Highway
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

October 19, 2005

In Reply Refer To: HSA-10

Mr. Rick Mauer
Outside Sales National Representative
Nucor Steel Marion, Inc.
912 Chaney Avenue
Marion, Ohio 43302

Dear Mr. Mauer:

In your September 2 letter to Mr. Richard Powers of my staff, you requested formal Federal Highway Administration acceptance of a design concept by which your high-tension cable rail could be transitioned and connected to a strong-post W-beam guardrail.

Your transition design is intended for use in conjunction with a W-beam installation that has a standard, crashworthy terminal with a minimum 4'-0" offset from the cable. A unique gusset plate is nested behind and bolted to the back of a special 6 foot-3 inch W-beam panel at the splice located at the first line post. Each cable is threaded through 1-in by 2-in slots in the W-beam panel and connected to the bracket. The first U-channel cable post is placed in line with the barrier proper and 6.5 feet upstream from the first W-beam line post. The transition then consists of 11 additional line posts also set on 6.5 foot centers, at which point your standard post spacing begins. Details for the transition design are shown in the enclosed drawings.

Previous full-scale crash testing has shown that high-tension cable barriers result in lower deflections than those seen in the lesser-tensioned generic cable barrier. In earlier cable-to-W-beam transition testing with the lower-tensioned generic cable rail, the cable deflection allowed the W-beam terminals to be impacted, resulting in significant vehicle instability. With your high-tension design, it is less likely that the nose of the terminal will be impacted in a typical impact. Even so, the use of a lightweight, non-energy absorbing W-beam terminal is suggested to minimize vehicle instability if the terminal is hit.

Based on the specific design details noted above, your proposed transition design is acceptable for use on the National Highway System at National Cooperative Highway Research Program Report 350 test level 3 when used in conjunction with a crashworthy terminal having a



minimum 4-foot offset from the cables. Since this transition design has not been physically tested, field installations should be monitored to verify their presumed crashworthiness.

Sincerely yours,

/original signed by George Ed Rice, Jr./

~for~

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosure