



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

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

October 4, 2005

In Reply Refer To: HSA-10

Mr. Jerry Emerson, P.E.
BrifenUSA, Inc.
P.O. Box 94220
Oklahoma City, Oklahoma 73143

Dear Mr. Emerson:

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 Brifen Wire Rope Safety Fence (WRSF) could be transitioned and connected to a strong-post W-beam or Thrie-beam guardrail.

The Brifen WRSF to W-Beam Transition was submitted for acceptance for use in front of standard W-beam terminals having a 4'-0" minimum offset behind the 4-cable pre-stretched and tensioned Brifen system. The 4-cable transition requires four 12-gauge W-beam rail elements 12'-6" long, beginning at the first standard line post in the barrier installation. A unique Brifen attachment bracket is bolted to the rail at each of the first four W-beam rail splice locations and one cable is anchored at each of these brackets. For your 3-cable WRSF, three 12.5' W-beam rail elements and attachment brackets are used. The first WRSF post is placed 10.5' upstream from the first standard guardrail line post at which the lowest cable is connected to the W-beam. The upstream WRSF transition then consists of 16 additional line posts set on 5.25' centers, at which point the standard WRSF post spacing (10.5' or other) begins. Details for the 4-cable, 10.5' post spacing WRSF transition are shown in the enclosed drawing.

Attachment to Thrie-beam guardrail is similar to that shown for W-beam except that, for your 4-cable system, two attachment brackets are located at the first splice and two are located at the second splice. The top and second cables are connected to the brackets in the upper valley (top cable at second splice) and the third and bottom cables are attached to the brackets in the lower valley (bottom cable at first splice). For your 3-cable WRSF the top two cables are attached to the two upper valley brackets (top cable at second splice) and the bottom cable is attached in the lower valley at the first splice location. As with W-beam, all attachments must be at a splice.



Previous full-scale crash testing has shown that the high tension and pre-stretched cables of the Brifen WRSF 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 the Brifen WRSF design, it is less likely that the nose of the terminal will be impacted in a typical design 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.

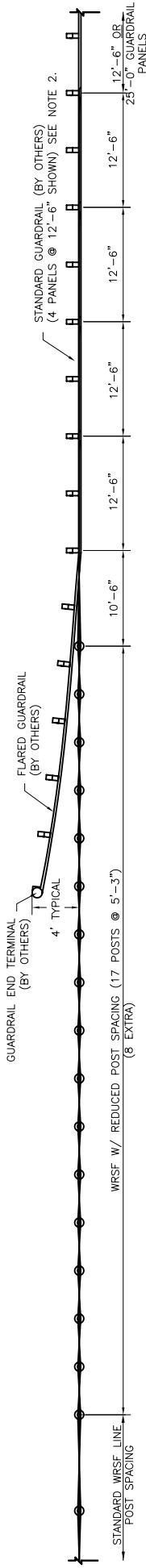
Based on the specific design details noted above, the Brifen WRSF to W-Beam or Thrie Beam Transitions may be considered acceptable for use on the National Highway System at National Cooperative Highway Research Program Report 350 test level 3 when used in conjunction with a crashworthy terminal having a minimum 4-foot offset from the cables. The design may also be used to connect the WRSF to a weak post W-beam installation when the W-beam is adequately anchored with a crashworthy terminal. Since these transition designs have not been physically tested, field installations should be monitored to verify their presumed crashworthiness.

Sincerely yours,

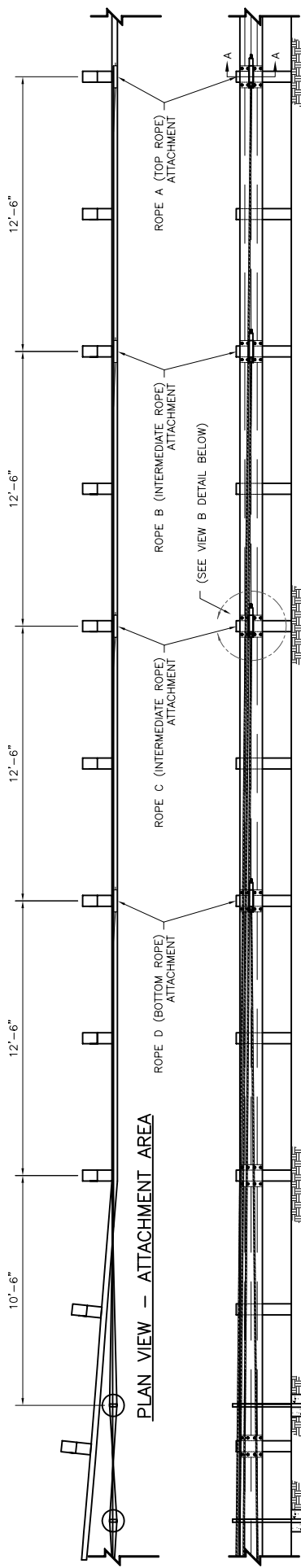
/original signed by/

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

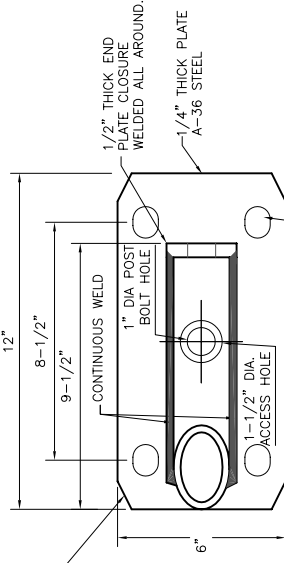
Enclosure



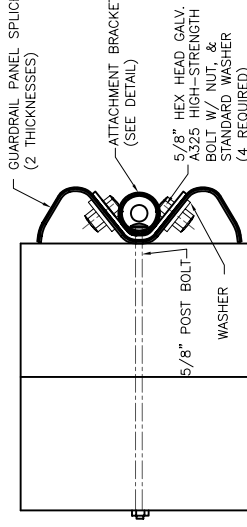
PLAN VIEW



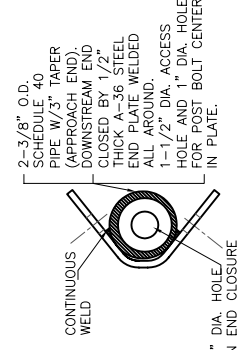
FRONT ELEVATION VIEW - ATTACHMENT AREA
(4-ROPE SHOWN; 3-ROPE SIMILAR)



ATTACHMENT BRACKET DETAIL
SIDE VIEW



SECTION A-A (WOOD POST SHOWN)



ATTACHMENT BRACKET DETAIL
END VIEW

The information herein is proprietary to BRIFEN USA, and shall not be disclosed, duplicated or used otherwise without the express written consent of BRIFEN USA, Inc.

BRIFEN USA INC.

Revisions		WRSF ATTACHMENT TO GUARDRAIL	
No.	Date	By	Scale
1.	8.04.05	MW	None
2.	8.31.05	MW	Manita Workman
3.			VERSION 8.6
4.			Sheet No.
5.			10 of 11

Dwg. No. wrsf-05-210a

- NOTES:
- GUARDRAIL END TERMINAL TO BE CRASHWORTHY (MELT, ELT OR OTHER).
 - GUARDRAIL PANELS IN WRSF ATTACHMENT AREA TO BE STANDARD 12CA (MIN). CONNECTIONS TO BE MADE AT GUARDRAIL PANEL SPlice POINTS ONLY.
 - SLACK IN GUARDRAIL SPICES MUST BE REMOVED BY LOOSENING DOWNSTREAM GUARDRAIL SPICE BOLTS, PULLING GUARDRAIL TOWARD THE WRSF ATTACHMENT AREA & RE-TIGHTENING THE SPICE BOLTS.
 - ATTACHMENT BRACKET GALVANIZED TO A-123 AFTER FABRICATION.
 - FACTORY SWAGED-ON 3/4" THREADED ENDS, TOGETHER WITH HEX NUT AND 2" DIA. FLAT WASHER MAY BE USED IN LIEU OF MECHANICAL FITTING.

WIRE ROPE ATTACHMENT DETAILS
(SEE MANUFACTURER'S SHOP DRAWING FOR MORE DETAIL)