

April 10, 2001

HSA-10/B-82

Mr. Graham Sharp  
Director, Brifen Limited  
Ratcher Way – Crown Farm Industrial Park  
Mansfield Nottinghamshire NG19 0FS  
United Kingdom

Dear Mr. Sharp:

In your March 9 letter to Mr. Richard Powers of my staff, you requested formal acceptance our your Brifen Wire Rope Safety Fence as an National Cooperative Highway Research Program (NCHRP) Report 350 test level 3 (TL-3) traffic barrier. To support this request, you also sent copies of two test reports prepared by the Motor Industry Research Association (MIRA) under the direction of Mr. Rex Hedges and video tapes of the two tests that were conducted. The test reports were entitled “Vehicle Impact into the Length of Need (LON) Of A Wire Rope Fence To NCHRP 350, Test Designation(s) 3-10 and 3-11 (MIRA-99-436008 and MIRA-99-436009). Additional information (installation manual) was sent to Mr. Powers on March 16.

The Brifen Wire Rope Safety Fence test installation was approximately 109 meters long. Its four steel cables were supported on 1525-mm long S-shaped line posts with soil plates set on 3.2 meter centers. The posts were made from 6-mm thick galvanized steel (ASTM A709 Grade 36) and set in a compacted AASHTO Type M 147-65 soil. The top cable was set in a slot on the top of the posts at a height of 720 mm above the ground. The middle two cables were placed on either side of the posts at a height of 675 mm and crossed between each post spacing. The bottom cable was placed at a nominal height of 510 mm and was also intertwined between each post spacing. This cable positioning results in a symmetrical barrier that can be installed in a median for opposite direction traffic as well as on either side of a road as a roadside barrier. Once installed, the cables are tensioned to a specified degree, depending on the ambient temperature. This tension varies from 14.0 kN at 30 degrees Celsius to 36.0 kN at –10 degrees Celsius. This amount of tensioning is 4 to 5 times greater than that specified for the U.S. 3-strand cable barrier and accounts for the significantly reduced dynamic deflection noted in the Brifen crash tests as well as the reduced length of barrier damaged in a crash. Enclosure 1 is a drawing of the Wire Rope Safety Fence as tested.

For test 3-10, an 898-kg vehicle impacted the wire rope at 101 km/h and an impact angle of 20 degrees. Maximum occupant impact velocity was 4.6 m/sec and maximum ridedown acceleration was reported as 4.0 g's. Dynamic deflection was 1.04 meters. For test 3-11, a 1999-kg pickup truck impacted the barrier at 99.4 km/h at 26 degrees. Maximum occupant impact velocity was 3.4 m/sec and maximum ridedown acceleration was 2.8 g's. Dynamic deflection was 2.4 meters.

Based on staff review of the information you provided, I concur that the 4-strand Brifen Wire Rope Safety Fence, as tested, meets all evaluation criteria for an NCHRP Report 350 barrier at test level 3 (TL-3) and it may be used on the National Highway System (NHS) when such use is proposed by the contracting agency. Since this product is made from steel and is proprietary, the provisions of Sections 635.410 and 635.411 of Title 23 Code of Federal Regulations are both applicable. Copies of each are enclosed for your ready reference (Enclosures 2 and 3, respectively). I am aware that one experimental installation of the Brifen system has been installed in Oklahoma and is currently being evaluated by the State.

I understand that testing is currently underway to develop a crashworthy end terminal for this system. Until then, the current terminal design may be used if it is located beyond the minimum clear zone or shielded with an accepted device such as a sand barrel array. I have also been informed that you intend to test this barrier to test level 4 (TL-4) with the 9000-kg single unit truck and look forward to seeing the results of these two endeavors.

Sincerely Yours,

(original signed by Rudolph M. Umbs)

*for* Frederick G. Wright, Jr.  
Program Manager, Safety

3 Enclosures



Sec. 635.410 Buy America requirements.

(a) The provisions of this section shall prevail and be given precedence over any requirements of this subpart which are contrary to this section. However, nothing in this section shall be construed to be contrary to the requirements of Sec. 635.409(a) of this subpart.

(b) No Federal-aid highway construction project is to be authorized for advertisement or otherwise authorized to proceed unless at least one of the following requirements is met:

(1) The project either: (i) Includes no permanently incorporated steel or iron materials, or (ii) if steel or iron materials are to be used, all manufacturing processes, including application of a coating, for these materials must occur in the United States. Coating includes all processes which protect or enhance the value of the material to which the coating is applied.

(2) The State has standard contract provisions that require the use of domestic materials and products, including steel and iron materials, to the same or greater extent as the provisions set forth in this section.

(3) The State elects to include alternate bid provisions for foreign and domestic steel and iron materials which comply with the following requirements. Any procedure for obtaining alternate bids based on furnishing foreign steel and iron materials which is acceptable to the Division Administrator may be used. The contract provisions must (i) require all bidders to submit a bid based on furnishing domestic steel and iron materials, and (ii) clearly state that the contract will be awarded to the bidder who submits the lowest total bid based on furnishing domestic steel and iron materials unless such total bid exceeds the lowest total bid based on furnishing foreign steel and iron materials by more than 25 percent.

(4) When steel and iron materials are used in a project, the requirements of this section do not prevent a minimal use of foreign steel and iron materials, if the cost of such materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2,500, whichever is greater. For purposes of this paragraph, the cost is that shown to be the value of the steel and iron products as they are delivered to the project.

(c)(1) A State may request a waiver of the provisions of this section if;

(i) The application of those provisions would be inconsistent with the public interest; or

(ii) Steel and iron materials/products are not produced in the United States in sufficient and reasonably available quantities which are of a satisfactory quality.

(2) A request for waiver, accompanied by supporting information, must be submitted in writing to the Regional Federal Highway Administrator (RFHWA) through the FHWA

Division Administrator. A request must be submitted sufficiently in advance of the need for the waiver in order to allow time for proper review and action on the request. The RFHWA will have approval authority on the request.

(3) Requests for waivers may be made for specific projects, or for certain materials or products in specific geographic areas, or for combinations of both, depending on the circumstances.

(4) The denial of the request by the RFHWA may be appealed by the State to the Federal Highway Administrator (Administrator), whose action on the request shall be considered administratively final.

(5) A request for a waiver which involves nationwide public interest or availability issues or more than one FHWA region may be submitted by the RFHWA to the Administrator for action.

(6) A request for waiver and an appeal from a denial of a request must include facts and justification to support the granting of the waiver. The FHWA response to a request or appeal will be in writing and made available to the public upon request. Any request for a nationwide waiver and FHWA's action on such a request may be published in the Federal Register for public comment.

(7) In determining whether the waivers described in paragraph (c)(1) of this section will be granted, the FHWA will consider all appropriate factors including, but not limited to, cost, administrative burden, and delay that would be imposed if the provision were not waived.

(d) Standard State and Federal-aid contract procedures may be used to assure compliance with the requirements of this section.

(23 U.S.C. 315, sec. 10 of Pub. L. 98-229, 98 Stat. 55, sec. 165 of Pub. L. 97-424, 96 Stat. 2136 and 49 CFR 1.48(b))

[48 FR 53104, Nov. 25, 1983, as amended at 49 FR 18821, May 3, 1984; 58 FR 38973, July 21, 1993]

Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

ENCLOSURE 3