

April 10, 2001

HSA-10/B-82

Mr. Graham Sharp
Director, Brifen Limited
Ratcher Way – Crown Farm Industrial Park
Mansfield Nottinghamshire NG19 OFS
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