U.S. Department
of Transportation
Federal Highway Administration

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

March 27, 2005

In Reply Refer To: HSA-10/B-82B

Mr. Derek W. Muir
Group Managing Director
Hill & Smith Ltd.
Springvale Business and Industrial Park
Bilston, Wolverhampton, West Midlands, WV14 0QL

Dear Mr. Muir:

In your March 7 letter, you requested formal Federal Highway Administration's acceptance of your Brifen Wire Rope Safety Fence (WRSF) as an National Cooperative Highway Research Program (NCHRP) Report 350 test level 4 (TL-4) traffic barrier. To support this request, you also submitted reports detailing two tests conducted by MIRA test laboratory, entitled "Vehicle Impact into the Standard Length of a Brifen Safety Fence to the NCHRP Report 350 Test 4-10" and "Vehicle Impact into the Standard Length of a Brifen Safety Fence to the NCHRP Report 350 Level 4-12," and digital videos of the tests themselves.

The TL-4 Brifen design consists of four separate cables, the bottom three of which are interwoven between posts with the top cable set in a 101-mm deep x 22-mm wide slot cut into the top of each post. Cable heights measured from ground level are 480 mm, 630 mm, 780 mm, and 930 mm, respectively. The posts, shown in enclosure 1a, are S-shape posts, 100-mm x 55-mm x 4.55-mm thick, manufactured from ASTM A-36 steel that is galvanized after fabrication. Post spacing is 3.2-m. For the tests, 1420-mm long posts were set approximately 400 mm into tubular steel sockets contained in cylindrical concrete footings. Your recommended transition design from the TL-3 system (or from the cable Brifen anchor) to the TL-4 design is shown in enclosure 1b, and consists of transition posts "A" and "B" at which points the two bottom cables are gradually lowered and the two top cables are raised over a 6.4-m distance to match the tested TL-4 cable heights. Since no test was conducted at this location with the single-unit truck, the transition itself can be considered only a TL-3 design.

Test summary sheets for the two tests you conducted are shown in enclosure 2. In the small car test, although successful, several of the concrete footings pulled out of the ground, negating the supposed maintenance benefit of using socketed posts. To reduce the likelihood of this occurrence, you recommended increasing the footing size from its tested 250-mm diameter to a 300-mm diameter, with its depth remaining at 750 mm. Deeper footings can be used in soft or saturated soils to improve system maintainability, the use of which would not need any

additional approval action. If you use driven posts with soil plates with the TL-4 design, these posts must have the same cross-section noted above for the TL-4 system and have the same below-ground geometry as is now specified for the TL-3 barrier, shown for convenience as enclosure 3. If you wish also to utilize steel sockets driven directly into the ground, you will first need to specify the size and depth you recommend, and provide an analysis showing equivalency with the approved designs. Design deflection with the small car was 1.35 m. With the single unit truck, it was reported to be 2.21 m. Presumably, deflection with the pickup truck would be similar to that noted in your earlier TL-3 test and thus may be assumed to be approximately 2.4 m.

In summary, your Brifen WRSF, as described above, is acceptable as a TL-4 traffic barrier and may be used on the National Highway System when such use is specified by the contracting agency. I understand that all steel components of the TL-4 design, as with the TL-3 WRSF, are manufactured in the United States (U.S.) with U.S. steel and are not subject the Buy America provisions of Title 23, U.S. Code (USC), Section 635.410. However, both designs are proprietary and, as such, their use on Federally-funded projects remains subject to the conditions listed in Title 23 USC, Section 635.411.

Sincerely yours,

/original signed by/

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

3 Enclosures