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

April 13, 2006

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

In Reply Refer To:
HSA-10/B82-C1

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 my May 26, 2005, letter to you (acceptance letter B-82C), the Federal Highway Administration accepted a three-cable version of your original 4-strand Brifen Wire Rope Safety Fence (WRSF) as an National Cooperative Highway Research Program (NCHRP) Report 350 test level 3 (TL-3) traffic barrier. The tests referenced in that letter were run on a WRSF installation that was 278-m (912-ft) long with the bottom two cables interwoven between adjacent posts and the top cable set in a slot cut into the top of each post. Cable heights measured from ground level were 460 mm (18 in), 600 mm (23.5 in), and 720 mm (28.4 in), respectively and the cable tension for the two pickup truck tests averaged 24.5 kN (5500 lb). The posts were S-shape posts made from ASTM A36 steel galvanized after fabrication. For both tests, the posts were set into tubular steel sockets formed in 305-mm (12-in) diameter concrete footings 760-mm (30-in) deep. Test 3-11 was run twice, with support post spacings of 2.4 meters (7.9 ft) and the standard 3.2 meters (10.5 ft). The reported dynamic deflections for these two tests were 2.7 m (8.9 ft) and 2.6 m (8.5 ft), respectively.

On April 11, 2006, your representatives, Dr. Richard McGinnis and Mr. Jerry Emerson, met with Messrs. Artimovich and Powers of my staff and provided them a copy of a test report prepared by the Southwest Research Institute (SwRI) entitled "NCHRP Report 350, Test 3-11 Full-Scale Crash Evaluation of a 111-Meter TL-3 (3-Rope) Wire Rope Safety Fence (SwRI Test Nos. BCR-1)." This report detailed a test conducted by personnel from the SwRI at a temporary site in Ardmore, Oklahoma. The test installation was identical to that described above, but was only 111-meters (364-feet) long with the cables tensioned to 22.2 kN (5000 lb). The purposes of this test were to ascertain the dynamic deflection of a shorter Brifen installation and to allow a direct comparison with other designs of comparable lengths. When impacted at 24.5 degrees and 97.2 km/h with a 2139-kg pickup truck, the dynamic deflection of the 111-meter (364-foot) long installation was reported to be 2.1 meters (7.0 feet). All NCHRP Report 350 evaluation criteria for this test were satisfactorily met.

Based on the test results summarized above, one can conclude that the dynamic deflection of a cable barrier is dependent on several factors, including the specific barrier design (i.e., post type, post spacing, cable connection to/at the posts, cable tension, and length of barrier between anchorages), impact location, and the size, speed and encroachment angle of any impacting vehicle. In general, the closer the post spacing and the shorter the length of an installation, the less its dynamic deflection will be, but direct comparisons of dynamic deflection between dissimilar cable barrier designs (and lengths) are not particularly valid. As I have stated in earlier acceptance letters for cable barriers, the design deflection distance is based on a single standard test conducted under carefully controlled conditions. It should not be considered an exact distance, but rather as a single point within the range of deflections that can be expected under actual field conditions. The current draft update of the NCHRP Report 350 recommends that a standard length of cable barrier be used for future tests so transportation agencies can effectively compare the crash performance of the several different systems available for use. The FHWA will actively support this recommendation.

Sincerely yours,

/original signed by George E. Rice, Jr./

~for~

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