



U.S. Department
of Transportation

**Federal Highway
Administration**

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

February 10, 1995

Refer to: HNG-14

J. M. Essex, P.E.
Vice President, Sales
Energy Absorption Systems, Inc.
One East Wacker Drive
Chicago, Illinois 60601

Dear Mr. Essex:

On February 8 you met with Messrs. James Hatton and Richard Powers of my staff to provide information on a new impact attenuator developed and tested by your company. A follow-up letter on February 9 to Mr. William Weseman formally requested Federal Highway Administration's (FHWA) acceptance of this device for use on Federally-funded highway projects.

The new device is a narrow, non-redirective, energy absorbing terminal called the NEAT. It is intended to shield the approach end of standard portable concrete safety shaped barrier or the moveable QUICK-CHANGE barrier system. The NEAT is made from aluminum sheet and evolved from the technology used in the design of your ALPHA truck mounted attenuator (TMA). The NEAT cartridge is 570 mm wide by 810 mm tall by 2957 mm long. It weighs 130 kg and can be installed and relocated manually. Back-up attachments have been designed to attach the NEAT to the concrete safety shape or to the QUICK-CHANGE barrier. Drawings of the system components are attached as Enclosure 1.

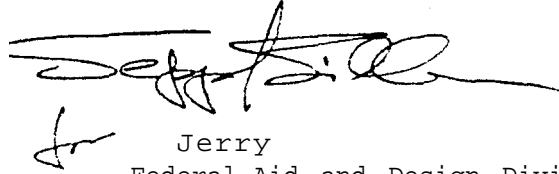
The NEAT was successfully tested as a test level 2 (TL-2) non-redirective crash cushion following the guidelines in the National Cooperative Highway Research Program (NCHRP) Report 350. The actual tests run are shown on Figure 1 in Enclosure 2, and summary data for each individual test are shown in Figures 2, 7, 12, 17, and 22 of that enclosure.

We have noted that the occupant impact velocities range from 8.0 m/s to 10.5 m/s, well within the 9 m/s to 12 m/s recommended by the NCHRP Report 350. Similarly, the occupant ridedown accelerations range from 7.4 g's to 15.6 g's for all tests except 2-44, where this value exceeded 28 g's. The first four tests again fell well within the NCHRP Report 350 range of 15 to 20 g's. Test 2-44, which is intended to evaluate the ability of the cushion to safely stop a large passenger vehicle prior to a life-threatening impact with the corner of the shielded hazard, does not require that the occupant impact velocities and subsequent ridedown accelerations be met. We noted that the former criteria were met and that the ridedown accelerations were a "worst case" scenario since the concrete barrier was anchored for the test. In practice, temporary concrete barrier would seldom be anchored and would be expected to produce significantly lower accelerations.

Based on our review of the data presented, we consider the NEAT to be acceptable for use as a test level 2 attenuator on the National Highway System when such use is requested by a highway agency. Since the NEAT is a proprietary item, its usage is governed by Title 23, Code of Federal Regulations, Section 635.411. Because the NEAT was tested at 70 km/h, its use should be limited to locations where operating speeds are expected to be within this limit. Users must also be aware that controlled penetration behind the attenuator will occur under some impacts (as seen in test 2-43) and the positioning of the barrier itself and of the NEAT must consider this factor.

A copy of this letter and enclosures will be sent to FHWA field offices for their information.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Jerry", is written over a horizontal line. Below the signature, there is a small handwritten mark that looks like a stylized "J" or "JR".

Jerry
Federal-Aid and Design Division

2 Enclosures