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

AUG 24 2001

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

Refer to: HSA-10/CC46D

Mr. Kaddo Kothmann
President, Road Systems, Inc.
1507 E 4th Street
Big Spring, TX 79720

Dear Mr. Kothmann:

In your May 18 letter, you described a FLEAT guardrail terminal modified for use with a strong post, w-beam guardrail median barrier and provided preliminary summary information on the tests that were run at Southwest Research Institute to verify its compliance with current evaluation criteria. You also included a videotape of the tests that were conducted. Mr. Richard Powers of my staff received single copies of the final reports, entitled "FULL-SCALE CRASH EVALUATION of a FLEAT MEDIAN TERMINAL SYSTEM," TESTS FMT-1, FMT-2, and FMT-3M on August 22.

As seen in Enclosure 1, the FLEAT-MT is nearly identical to the previously accepted FLEAT roadside terminal. Since its intended use is to terminate a double-faced, strong post w-beam median barrier, two impact heads are required. One of these is at the fourth post in from the end of the barrier and fits over the backside w-beam rail element. The other impact head fits over the end of the traffic-side rail element 5717 mm ahead of the first and is offset 610 mm from the face of the median barrier proper in a straight flare. Minor modifications were made to the design to obtain satisfactory results in the reverse direction impact described below.

Based on the similarity of the FLEAT-MT to the roadside FLEAT design and layout, you reviewed the tests upon which acceptance of the FLEAT was based and concluded that only three additional tests would be required to certify the median terminal under NCHRP Report 350. My staff concurred with your analysis. The first test conducted was NCHRP Report 350 test 3-35, the 2000-kg pickup truck redirection test. The truck impacted the terminal at post 3, the beginning of the length of need, at 100.4 km/h and 20.8 degrees. Although all evaluation criteria were satisfied, the test vehicle snagged on post 7, which was a standard steel line post. This result was discussed with your consultant, Dr. Dean Sicking, and it was decided to make post 7 a breakaway design to improve test performance. This change is not reflected in the test reports, but is shown in Enclosure 1.

The second test was NCHRP Report 350 test 3-31 where the pickup truck impacted the FLEAT-MT head-on at 99.8 km/h. The truck was brought to a controlled stop in approximately 10 m, with 6.8 m of the front rail and 1.9 m of the back rail being extruded. Occupant impact velocity was 5.6 m/sec and the subsequent ridedown acceleration was 12.9 g's.

The final test was NCHRP Report 350 test 3-39, the reverse-direction impact that is required for devices such as median barrier terminals that are likely to be struck from either direction. When this test was first run, the pickup truck snagged on the downstream cable anchor and subsequently overturned. When a deflector bracket was added to the downstream end of the cable anchor, the vehicle was successfully redirected and all evaluation criteria were satisfied.

Based on the information you presented, I agree that the FLEAT-MT, as shown in Enclosure 1, meets the NCHRP Report 350 evaluation criteria for a test level 3 (TL-3) terminal and may be used on the National Highway System (NHS) to terminate a w-beam median barrier when such use is accepted or specified by the appropriate contracting agency. As a proprietary product, the conditions listed in Title 23, Code of Federal Regulations, Section 435.411 apply to its use on Federal-aid projects located on the NHS.

Sincerely yours,

Rudolph M. Umbs

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

Enclosure