



U.S. Department
of Transportation

**Federal Highway
Administration**

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

August 27, 1998

Refer to: HNG-14

Mr. Kaddo Kothmann
President
Road Systems, Inc.
P.O. Box 2163
Big Spring, Texas 79721

Dear Mr. Kothmann:

In your July 23 letter to Mr. Henry H. Rentz, you requested the Federal Highway Administration's (FHWA) acceptance of your Flared Energy Absorbing Terminal (FLEAT) with the end offset reduced to 762 mm. My original acceptance letter, dated April 2, 1998, was based on a layout with a 1219 mm offset at the end of the terminal. To support your request, you sent us a copy of a July 15, 1998, test report prepared by the Midwest Roadside Safety Facility entitled "Full-Scale Crash Evaluation of a Flared Energy Absorbing Terminal (FLEAT-350) NCHRP TEST 3-31," a video tape of the test, and detailed drawings of the modified terminal layout.

Only one test was run to confirm the acceptability of the reduced offset and that was test 3-31, a 2000-kg pickup truck impacting the end head-on at 100 km/h. Test results are summarized in Enclosure 1. You stated that test 3-30, an 820-kg car impacting end-on, would be less severe with the reduced offset than the same test which was run successfully with the original 1219-mm offset because of the reduced eccentricity. You also stated that the side redirection tests (3-34 and 3-35) need not be repeated because the effective impact angles would be less with the reduced offset design than they were with the 1219-mm offset which, again, was successfully tested. Based on previous reverse-direction hits on similar terminal designs, test 3-39 was waived earlier for the FLEAT with the 1219-mm offset and was not believed to be needed for the reduced offset option either. The FHWA concurs with your analysis in each case.

Members of my staff have reviewed the information you presented and agree that the FLEAT is acceptable for use on the National Highway System as an NCHRP Report 350 terminal at test level 3 (TL-3) with the reduced offset of 762 mm. We note that the flare on the terminal remains a straight taper over its entire 11.4 m length and that standard line posts start at the beginning of this flare at post number 8. The layout is shown in Enclosure 2. Since the FLEAT is now considered acceptable with either a 762 mm or 1219 mm offset, it is

reasonable to conclude that any offset that falls between the two tested layouts would likewise be acceptable. For this reason, offsets for the intermediate posts are not shown. However, it is critical to the proper performance of the FLEAT that it be installed with a straight taper (not parabolic) that extends back to post number eight and that, as with all gating end treatments, a reasonably traversable runout area is available immediately behind and beyond the terminal.

Any questions you may have should be addressed to Mr. Richard Powers at (202) 366-1320.

Sincerely yours,



Dwight A. Horne
Chief, Federal-Aid and Design Division

2 Enclosures