



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

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

February 18, 2000

Refer to: HMHS-CC12H

Mr. Don Johnson
Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, Texas 75207

Dear Mr. Johnson:

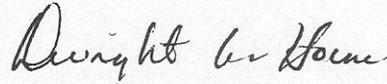
In your February 15 letter to Mr. Richard Powers of my staff, you requested a formal Federal Highway Administration (FHWA) acceptance of a modified ET-2000 Plus guardrail terminal at NCHRP Report 350 test level 2 (TL-2). The original ET-2000 Plus design was accepted as a test level 3 (TL-3) w-beam terminal in my January 18 letter to Dr. Hayes E. Ross, Jr.

As stated in your request, the difference between the proposed TL-2 design and the current TL-3 design is the total number of breakaway posts used in the terminal. Whereas the TL-3 terminal had a total of six breakaway posts, the TL-2 design has only four, the last two breakaway posts in the original design being replaced with standard line posts. The post spacing for all posts remains the same for both designs at 1905 mm (6' 3"). When the ET-2000 Plus was impacted head-on at 100 km/h with the 2000-kg pickup truck, 11.6 m (38 feet) of rail was extruded. The modified design will allow approximately 7.6 m (25 feet) of rail to extrude in advance of the first standard line post (wood or steel). Since the kinetic energy of a vehicle impacting at 70 km/h is less than half of the TL-3 impact speed of 100 km/h and the expected amount of system stroke is proportional to impact severity, less than 6 m (20 feet) of rail can be expected to be forced through the extruder head in a 70 km/h impact. Therefore, a vehicle will be stopped before reaching the first non-breakaway post. In the 820-kg vehicle head-on test of the original ET-2000 at 100 km/h, approximately 4 m (13 feet) of rail was extruded. Thus, for a small car impacting head-on with at a 38-mm (1.5 inch) lateral offset, the TL-2 design would be expected to satisfy even the TL-3 evaluation criteria. Since there are no changes in your anchorage design, and the angle tests required on the nose would be unaffected by the reduced number of breakaway posts, we agree that no additional tests are needed to verify acceptable TL-2 performance.

Based on the above, we consider the modified ET-2000 Plus as described herein to be acceptable for use on the National Highway System as a TL-2 terminal when such use is requested by a transportation agency. This acceptance includes the use of any of the current breakaway post options, i.e., breakaway wood posts in 1.8 m (6 foot) tube sleeves without soil

plates or in 1.37 m (4.5 foot) tube sleeves with soil plates, or steel hinged breakaway posts; (HBA posts). Users should be advised that, as with all TL-2 terminals, the TL-2 ET-2000 Plus should be used only at locations where impact speeds are expected to be at or below the TL-2 speed of 70km/h (approximately 45 mph).

Sincerely yours,

A handwritten signature in cursive script that reads "Dwight A. Horne".

Dwight A. Horne
Director, Office of Highway Safety Infrastructure