



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

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

March 9, 2005

In Reply Refer To: HSA-10/CC-54G

Mr. Rodney A. Boyd
Trinity Industries
2525 Stemmons Freeway
Dallas, Texas 75207

Dear Mr. Boyd:

In their February 2 presentation to members of my staff, Mr. Brian Smith and your consultant Mr. James Albritton, discussed several modifications made to the original TRACC crash cushion and requested Federal Highway Administration (FHWA) acceptance of these specific design changes with your current TRACC family of crash cushions. Mr. Albritton's February 22 letter transmitted a final copy of the Texas Transportation Institute's (TTI) February 2005 report, entitled "NCHRP Report 350 Testing of the 2005 TRACC", and a videotape copy of the tests that were conducted.

The most significant design changes were the following:

- The energy-absorbing perforated steel rip plates that were installed vertically in the original design at four locations were replaced with two horizontally-oriented rip plates set over steel studs bolted to the TRACC base and secured by steel doubler plates. Each doubler plate, which serves to hold the rip plates in place, was bolted to the base with only three bolts, thereby facilitating removal and replacement of damaged rip plates after a crash. Enclosure 1A shows these general design features on a ShorTRACC. The first stage, full-length rip plates have been replaced with a short segment that serves to hold the sled assembly in place during shipping and need not be replaced after an impact, assuming the sled can be repositioned properly and remain in place.
- Since the orientation of the rip plates was changed, the shredder assembly/sled has also been redesigned, making the shredding edges vertical, i.e., at right angles to the rip plates. The new sled design is shown as Enclosure 1B.
- To facilitate nesting of the W-beam side panels with the TRACC frames, the slots which guide the panels as the TRACC telescopes in an end-on hit were flared to allow release of the panels, thereby reducing binding and simplifying disassembly and repair.

To confirm that these design changes did not adversely affect crash performance, crash tests were conducted at TTI and described in the report noted above. Since changes to the impact sled/rip plate design should have no measurable effect on side-impact performance, tests 3-31 and 3-32 were selected as being the most critical and were conducted. However, to verify the continued redirection capability of the redesigned TRACC base, test 3-38 was also conducted. Enclosure 2 contains the summary sheets for all three tests.



Based on staff review of the design changes and certification test results, I consider the modified TRACC design as described above and shown in the enclosures acceptable for use on the National Highway System (NHS) as a substitute for any of the previously-accepted versions of the TRACC, the ShorTRACC and the WideTRACC, at the same test levels at which they were previously accepted.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- Any additional changes that may adversely affect the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the devices being marketed are significantly different from the versions that were accepted, this acceptance letter may be modified or revoked.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance.
- To prevent misunderstanding by others, this letter of acceptance, designated as number CC54G shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- All TRACC crash cushions are patented and considered proprietary. When proprietary devices are *specified by a highway agency* for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411. However, the use of proprietary hardware in a work zone on Federal-aid projects is generally of a temporary nature and these features are usually *selected by the contractor* for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement (a) above.

Sincerely yours,

/Original Signed by/

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