

February 1, 2002

HSA-10/CC64B

Mr. Albert W. Unrath Sr.
ALBERT W. UNRATH, INC.
PO Box 631
Colmar, PA 18915-0631

Dear Mr. Unrath:

In your November 14, 2001 letter, you requested the Federal Highway Administration's (FHWA) acceptance of your U-MAD 70K truck mounted attenuator (TMA) at the National Cooperative Highway Research Program (NCHRP) Report 350 test level 2 (TL-2). To support your request, you included copies of test reports prepared by the Transportation Research Center (TRC) in East Liberty, Ohio, and videotapes of the tests that were conducted. After reviewing the material, Mr. Richard Powers of my staff requested additional information on the TMA and on the test results. Information on the U-MAD 70K was mailed on November 23, 2001, and a later follow-up question was answered via e-mail on January 17.

The U-MAD 70K TMA consists of an aluminum box with internal compartments filled with variable density energy-dissipating material. The unit is square, measuring 2286-mm (90-in) long by 2286-mm (90 inches) wide. It is 711-mm (28-in) deep and is 317 mm (12.5 in) above the roadway surface when deployed. A drawing of the U-MAD 70K is enclosed.

Two NCHRP Report 350 tests were conducted: Test 2-50 (into the longer U-MAD 100K TMA) and Test 2-51. Test 2-50 is a 70 km/h head-on impact with the 820-kg car. The TMA support vehicle was blocked to prevent any forward movement in this test. Occupant impact velocity was reported as 11.1 m/s and the subsequent 10-ms ridedown acceleration was 9.2 G's. It was later estimated that the total crush of the attenuator, including 200 mm (8 in) of disturbed material beyond the actual crush zone, was approximately 1880 mm (74 in). Since the 70K and 100K units are identical in composition for the first 2057 mm (81 in), we can agree that test 2-50 would likely have been successful if the 70K U-MAD had been tested with the small car. Test 2-51, a 2000-kg pickup truck impacting the U-MAD 70K TMA head-on at a nominal speed of 70 km/h, was conducted on September 26, 2001. Occupant impact velocity was reported to be 11.4 m/s and the 10-ms ridedown acceleration was 12.4 g's. The support vehicle was an International S-1600 weighing 8595 kg (18,950 lb). The support vehicle roll-ahead distance was not reported.

Based on staff review of the information you provided, I agree that the U-MAD 70K, as tested and described above, meets the performance requirements for an NCHRP

Report 350 TMA at test level 2 (TL-2) and that it may be used on the National Highway System (NHS) when such use is deemed appropriate by the contracting authority. This acceptance is based on the reported crash performance of the U-MAD 70K and is not intended to address the long-term durability of the unit. Further, it assumes that production models will be identical to the tested units. Since the U-MAD 70K is a proprietary product, its use on the NHS is subject to the provisions of Title 23, Code of Federal Regulations, Section 635.411 if its use is specified by the contracting agency. A copy of these provisions was provided to you with Mr. Frederick Wright's March 30, 2000 letter accepting the U-MAD 100K as an NCHRP Report 350 TL-3 device.

Sincerely yours,

(original signed by Michael L. Halladay)

**Michael L. Halladay
Acting Program Manager, Safety**

Enclosure

Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

ENCLOSURE 2