



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

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

July 28, 2003

Refer to: HSA-10/CC64D

Mr. Albert W. Unrath Sr.  
ALBERT W. UNRATH, INC.  
PO Box 317  
Line Lexington, PA 18932-0317

Dear Mr. Unrath:

In your July 16 letter to Mr. Richard Powers of my staff, you requested the Federal Highway Administration's (FHWA) acknowledgement that your U-MAD 100K truck mounted attenuator (TMA) successfully passed the two optional TMA tests recommended by the National Cooperative Highway Research Program (NCHRP) Report 350 at test level 3 (TL-3). Both of these tests, designated as tests 3-52 and 3-53, had been run in late 2001 and satisfied Report 350 evaluation criteria, but the test vehicles used did not meet Report 350 specifications because they did not have conventional pickup truck beds, but rather were fitted with post-production cargo flatbeds. You were subsequently advised by Mr. Powers that if the more demanding test were re-run successfully with a standard pickup truck, the results of the second test with the flatbed truck might be considered acceptable and a second re-test could be waived. It was mutually agreed that test 3-52 would be re-run since that test had reported significantly higher ridedown accelerations than test 3-53 (17.1 g's vs. 11.2 g's) when conducted with the flatbed pickup truck. Occupant impact velocities (OIV) were similar in both earlier tests (10.7 m/s in test 3-52 and 10.0 m/s in test 3-53).

To support your new request, you included copies of the original optional test reports prepared by the Transportation Research Center in East Liberty, Ohio, and a new report entitled, "NCHRP Report 350 Test 3-52 of the U-MAD 100K Truck-Mounted Attenuator," dated March 2003, plus digital videos for all three tests. The U-MAD 100K TMA that was tested was identical to the design that was previously accepted for use on the National Highway System (NHS) based on successful completion of the two required TMA tests (3-50 and 3-51). This TMA consists of an aluminum box containing eight separate internal compartments filled with variable density energy-dissipating material. The unit is 3277-mm (129 inches) long, 2286-mm (90 inches) wide and weighs approximately 413 kg (910 pounds), excluding the weight of the mounting bracket and lift mechanism, which is 157 kg (346 pounds).



Your new test 3-52 used a 2012-kg standard pickup truck impacting the U-MAD at zero degrees, but offset (to the left) 1/3 of the truck width. Impact speed was reported to be 97.9 km/h. The occupant impact velocity was 9.7 m/s and the ridedown acceleration was 16.6 g's. Both values were below those reported in the earlier test with the flatbed pickup. The roll ahead distance for the 8577-kg support vehicle was 7.5 m. Based on the results of this test compared to the first 3-52 test, I am willing to waive a re-test of 3-53 and will accept the results of the earlier 3-53 test in which a flatbed pickup truck was used. Therefore, the U-MAD 100K TMA meets all Report 350 evaluation criteria for both the mandatory and optimal TMA tests and can continue to be used on the NHS as a TL-3 TMA.

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

- This acceptance is based solely on the expected impact performance of the U-MAD 100K TMA and is not intended to address the long-term performance or durability of the product. Any design 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 device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- 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, and that it meets the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number CC64D 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.
- The U-MAD 100K TMA is considered to be a proprietary product. The use of proprietary devices in work zones on Federal-aid projects is generally of a temporary nature. These devices are 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" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are specified 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.

Sincerely yours,

(original signed by Harry W. Taylor)

*for:*

Michael S. Griffith  
Acting Director, Safety Design