

Refer to: HSA-10/WZ-142

Mr. Matt Reeder  
RTM, LLC  
PO Box 4205  
Ventura, California 93007

Dear Mr. Reeder:

This is in response to your letter of December 13, 2002, requesting Federal Highway Administration (FHWA) acceptance of your company's Weight Strip as a component of crashworthy traffic control barricades for use in work zones on the National Highway System (NHS). Accompanying your letter were reports of crash testing conducted by E-Tech Testing Services and video of the tests. You requested that we find these devices acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

### **Introduction**

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled "INFORMATION: Identifying Acceptable Highway Safety Features," established four categories of work zone devices: Category I devices were those lightweight devices which could be self-certified by the vendor, Category II devices were other lightweight devices which needed individual crash testing, Category III devices were barriers and other fixed or massive devices also needing crash testing, and Category IV devices were trailer mounted lighted signs, arrow panels, etc. The second guidance memorandum was issued on August 28, 1998, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This later memorandum lists devices that are acceptable under Categories I, II, and III.

A brief description of the devices follows:

The RTM, LLC Weight Strip is a collection of stamped rubber pads made from recycled tires that vary in thickness up to 13 mm. The pads are bound together loosely with cable to form a flexible string. It is used to weight down barricades and the like to prevent them from being easily blown over in gusts of wind. The Weight Strip is a reusable alternative to sand bags. The overall dimensions and description are shown in the enclosures for reference.

## Testing

For the purposes of testing, one Weight Strip was draped over the bottom rail of a Bent Type II Plywood Panel Barricade as representative of products the Weight Strip might be used on. The design of this barricade, which has been distributed by the FHWA as a “generic” design, is also shown in the enclosures for reference. The lightest 610 mm wide barricade was specified as “worst case” for testing since it is reasoned that it would more likely be thrown up during the impact and represent a greater potential for contact with the windshield. The barricade was also equipped with a ToughLite 2000 warning light. The overall mass of the barricade with the light was 8.8 kg. The mass of the Weight Strip was an additional 7.2 kg.

Full-scale automobile testing was conducted on the barricades with the Weight Strip in place. Two stand-alone examples of the devices were tested in tandem, one head-on and the next placed 6 meters downstream turned at 90 degrees, as called for in our guidance memoranda.

The test impacts are summarized in the table below.

RTM, LLC Weight Strip	Normal Orientation	Perpendicular Orientation
Test Number	48-0201-001	
Weight of Tested Device	16 kg, including Weight Strip ballast	
Mounting heights	Draped on top of bottom rail at approx. 40 mm (16 inches)	
Flags? Lights?	One ToughLite 2000 on each barricade	
Mass of Test Vehicle	840 kg	
Impact Speed	101.7 km/hr	99.0 km/hr
Velocity Change	0.9 m/s	0.8 m/s
Extent of contact	Bumper, Grill, Hood	Bumper, Grill, Hood
Windshield Damage	No contact	No contact

## Findings

Damage was limited to cosmetic damage to the bumper, grill, and hood of the test vehicle. Neither the barricade nor the Weight Strip had any contact with the windshield. In the normal orientation test, the warning light lens shattered upon impact with the hood and small pieces of the lens may have come in contact with the windshield, but neither marks nor damage resulted.

The results of the testing met the FHWA requirements and, therefore, the devices described in the various requests above and detailed in the enclosed drawings are acceptable for use on the NHS under the range of conditions tested, when proposed by a State.

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

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, or conformity with the Manual on Uniform Traffic Control Devices.

- Any changes that may adversely influence 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 they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-142 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 RTM, LLC weight strip is a proprietary product. The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They 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, a copy of which is enclosed.

Sincerely yours,

Michael S. Griffith  
Acting Director, Office of Safety Design  
Office of Safety

2 Enclosures

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.



C. Illustrations

MODEL 3532 IHLA  
 Drawing date 10/16/2002

RTM,LLC  
 P.O. Box 4205 Ventura CA 93007  
 (805) 647-2174

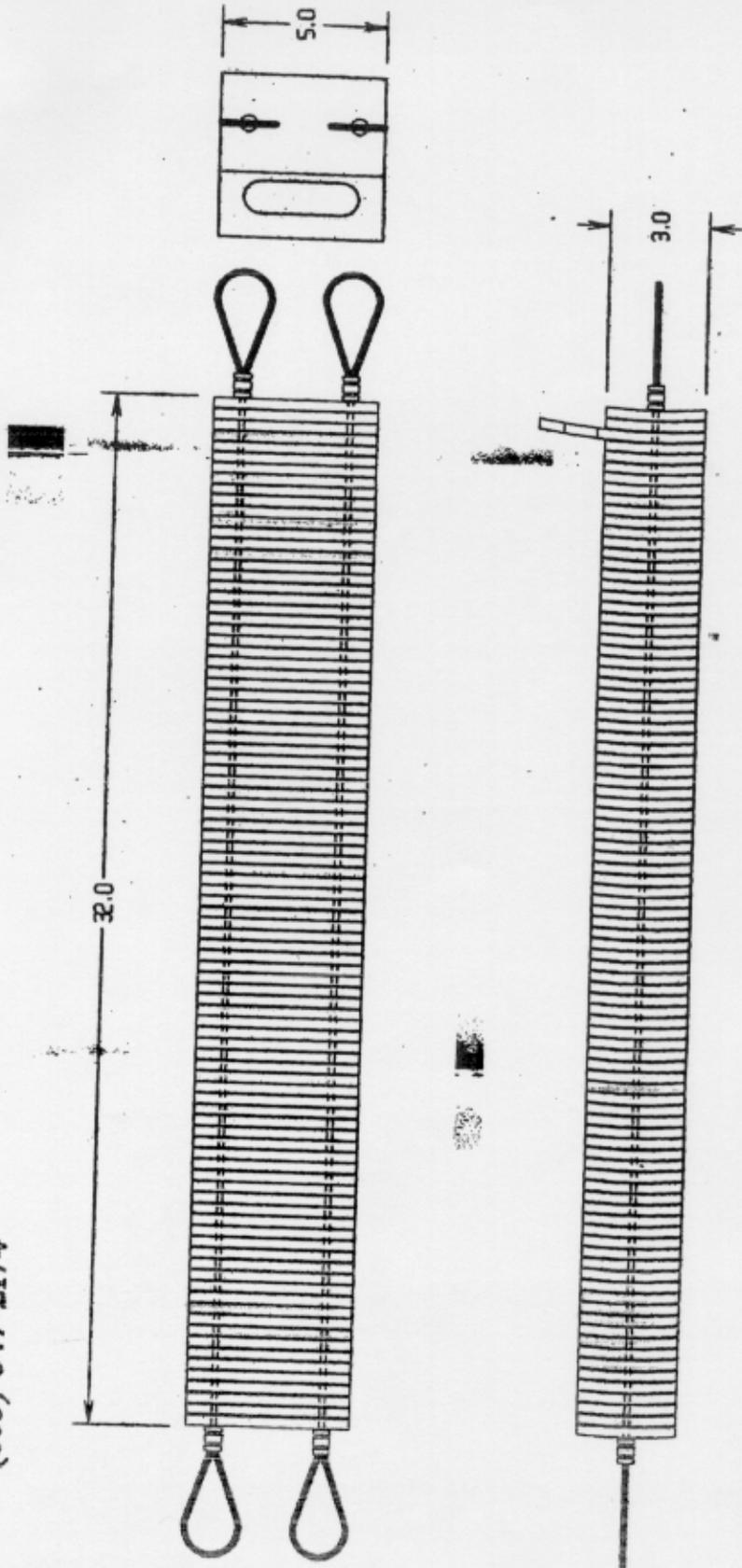


Illustration 1. RTM, LLC Weight Strip (1 of 1)