



U.S. Department  
of Transportation

**Federal Highway  
Administration**

September 9, 2005

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

In Reply Refer To: HSA-10/WZ-214

Mr. Marc Christensen  
Managing Member  
Off the Wall Products, LLC  
P.O. Box 1461  
Salt Lake City, Utah 84110

Dear Mr. Christensen:

Thank you for your letter of May 2, 2005, requesting the Federal Highway Administration (FHWA) acceptance of the Off-the-Wall MB-42 x 45 Longitudinal Channelizing Barricade (LCB) as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter was the report of crash testing conducted by the Transportation Research Center, Inc., and video of the tests. You requested that we find this LCB acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features." You provided additional information in response to our request on August 4, 2005.

### **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 are those lightweight devices which are to be self-certified by the vendor, Category II devices are other lightweight devices which need individual crash testing but with reduced instrumentation, Category III devices are barriers and other fixed or heavy devices also needing crash testing with normal instrumentation, and Category IV devices are trailer mounted lighted signs, arrow panels, etc. for which crash testing requirements have not yet been established. 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 Multi-Barrier Model MB-42 x 45 LCB system consists of multiple interconnected polyethylene units that may be ballasted with water. Each unit is blow molded of HLMI/HDPE (high molecular weight high density polyethylene) and weighs 35 pounds empty. For this test, a line of 27 units were linked, each unit ballasted with approximately 8 gallons of water.

### Testing

Full-scale automobile testing was conducted on your company's device. As the LCB are not covered in the NCHRP Report 350 the FHWA has established that the NCHRP Test 3-10 be used with all evaluation criteria being required with the exception that controlled penetration of the test article is acceptable. Twenty-seven units were linked and placed at an angle of 20 degrees with respect to the line of travel of the test vehicle. The vehicle impacted the LCB at the joint between barricades number 13 and 14. The test vehicle penetrated the line of interconnected LCB units, displacing units 13 through 20. The vehicle remained stable, coming to rest approximately 210 feet downstream from the point of impact and approximately 10 feet behind the LCB.

Units 12-15 had warning lights, retro reflective striping, 6 x 8 inch delineator panels, and an impact plate attached to the front face (impact side) of the LCB. This 1/8 inch thick HDPE impact plate permits the units to carry retroreflective striping, and is not expected to have a significant effect on the crashworthiness of the LCB.

The test is summarized in the table below.

Test Number	NCHRP Report 350 Test 3-10 TRC Test No. 050408
Device Tested	Off-the-Wall MB-42 x 45 LCB
Weight of Empty Units	35 pounds
Water Ballast?	8 gallons/66 pounds
Flags? Lights?	Warning lights, Impact Plates, and Delineator Panels on units #12, 13, 14, 15
Mass of Test Vehicle	836.7 kg
Impact Speed	99.8 km/hr
Velocity Change	4.9 m/sec
Extent of contact	Bumper, hood, and left front side
Windshield Damage	No contact
Other notes	No measurable crush to the vehicle exterior

### Findings

Damage was limited to cosmetic scrapes to the front and left side of the test vehicle. There was no significant impact from exposed units once the vehicle had penetrated the line of the LCB. The warning lights remained attached to the barricades.

The results of the testing met the FHWA requirements and, therefore, the device described in above and detailed in the enclosed drawings is acceptable for use as a LCB on the NHS under the range of conditions tested, when proposed by a State. The Off the-Wall MB-42 x 45 HMLI/HDPE LCB is acceptable with or without warning lights, impact plates, delineator panels and with up to approximately 8 gallons of water in each unit.

As the quantity of water used for ballast may substantially affect the performance of longitudinal channelizing barricades, a permanent indication shall be applied to each unit notifying users of this limitation.

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

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor 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 the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-214 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 Off-the-Wall MB-42 x 45 LCB is a patented device and is considered "proprietary." 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 by a highway agency* for use on Federal-aid 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. These provisions do not apply to exempt non-NHS projects. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,



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

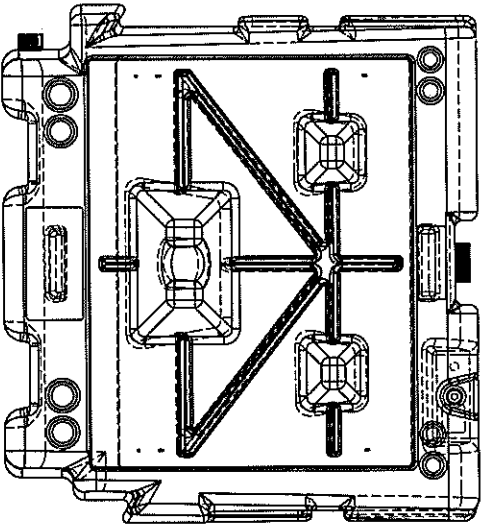
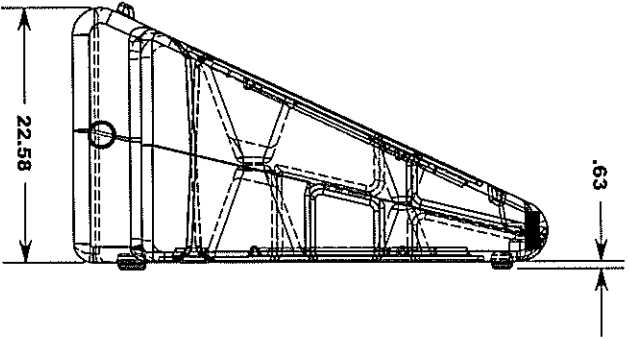
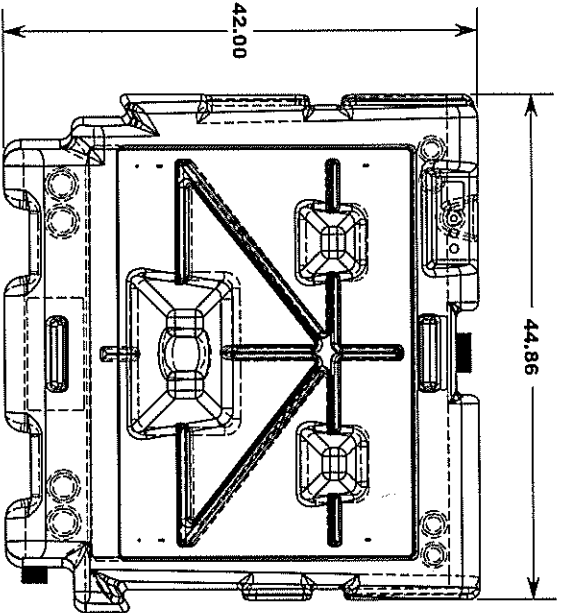
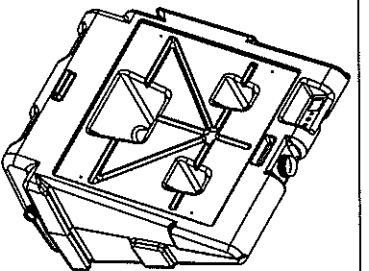
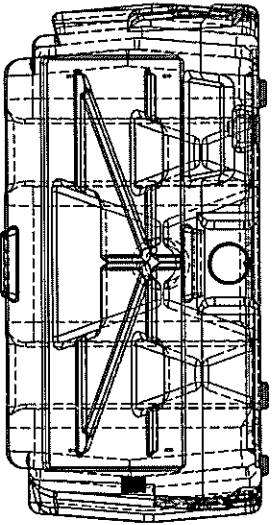
(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(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.



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UNLESS OTHERWISE SPECIFIED:	DRAWN	NAME	DATE
TOLERANCES:	CMM		1/13/05
FRACTIONAL: ±	CHECKED		
ANGULAR: MACH ± BEND ±	ENG APPR.		
TWO PLACE DECIMAL ±	MFG APPR.		
THREE PLACE DECIMAL ±	Q.A.		
INTERPRET GEOMETRIC	COMMENTS:		
TOLERANCING PER:			
MATERIAL			
FINISH			
DO NOT SCALE DRAWING			
APPLICATION	USED ON		
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<b>Off The Wall Products</b>		SIZE	DWG. NO.	REV
TITLE:		<b>A</b>	<b>barrier</b>	
<b>Water filled Barrier</b>		SCALE: 1:16	WEIGHT:	SHEET 1 OF 1

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