

Refer to: HSA-10/WZ-160

Mr. Michael McCarty
Services & Materials Company
Div. Jackson Products, Incorporated
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St. Charles, MO 63304-8685

Dear Mr. McCarty:

This is in response to Dr. Ron Faller's letter of May 6, 2003, requesting Federal Highway Administration (FHWA) acceptance of Jackson Products TrailBlazer Vertical Panel with warning light, and the TrailBlazer Plus Directional Panel with warning light as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). Accompanying the letter were reports of crash testing conducted by the Midwest Roadside Safety Facility (MwRSF) and footage of the tests on CD-Rom. It was 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 TrailBlazer Vertical Panel is blow-molded of high density polyethylene (HDPE) with a density of 0.950 g/cm^3 . The overall dimensions are 997 mm (39.25 inches) tall, 373 mm x 227 mm (14.69 x 8.93 inches) wide at the base, and 216 mm x 84 mm (8.5 x

3.29 inches) wide at the top with a nominal thickness of 2.0 mm (0.08 inches.) The overall height to the top of the warning light is 1245 mm (49 inches). The unit is ballasted with a recycled fitted rubber base.

One Flex-O-Lite Night Flasher was attached to the top center of the vertical panel. The 2 lantern battery light was attached with one standard 12.7 mm (0.5 inch) diameter x 95 mm (3.75 inch) long vandal resistant fastener.

The TrailBlazer Plus is blow-molded of the same HDPE material. The overall dimensions are 1003 mm (39.5 inches) tall, 833 mm x 299 mm (32.78 x 11.79 inches) wide at the base, and 673 mm x 136 mm (26.5 x 5.34 inches) wide at the top with a nominal thickness of 2.0 mm (0.08 inches). The overall height to the top of the warning light is 1257 mm (49.5 inches). The unit is ballasted with a recycled fitted rubber base. One Flex-O-Lite Night Flasher was attached to the top center of the vertical panel. The 2 lantern battery light was attached with one standard 12.7 mm (0.5 inch) diameter x 95 mm (3.75 inch) long vandal resistant fastener.

Testing

Individual bogie testing was conducted on the two Jackson Products devices. The tests are summarized in the table below.

Test Number	VP-1	VP-2	VP-3	VP-4
Device	TrailBlazer		TrailBlazer Plus	
Orientation	Head On	90 Degrees	Head On	90 Degrees
Mass, in kg (pounds)	18.2 (40.16)	18.3 (40.3)	18.6 (41.1)	18.2 (40.2)
Flags? Lights?	Each device had a light attached as noted above			
Mass of Test Vehicle	929 kg (2049 pounds)			
Impact Speed	101.8 km/hr	100.7 km/hr	104.0 km/hr	102.5 km/hr
Velocity Change	0.28 m/s	0.97 m/s	1.6 m/s	1.6 m/s
Extent of contact	See discussion below			
Windshield Contact	See discussion below			

This crash-testing program used a hard-nosed bogie vehicle of a mass larger than the standard 820C test vehicle. There are significant constraints involved in using such a non-standard testing device, some of which are:

1. The potential vehicle velocity change must be considered insignificant.
2. The crush characteristics of an automobile bumper must not be expected to have a significant affect on the trajectory of the test article.
3. The profile of the bogie vehicle must be configured to replicate the outline of a production vehicle. The MwRSF bogie was configured to replicate the outline of a Geo Metro, a vehicle commonly used in testing of work zone devices.
4. No part of the test article may intrude into the windshield area of the vehicle after impact.

In each impact, the device immediately flexed toward the hood of the bogie. Either the entire light/battery assembly detached, or the lens itself detached from the battery case upon impact with the hood. The loose debris remained airborne with no direct contact with the "windshield" of the bogie. In one case, the debris contacted the "roof line" and passed over the bogie. In none of the cases did it appear that the debris would contact the windshield glass had a real vehicle been used.

Findings

We concur that 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. They may also be used without the warning lights attached.

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, 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 FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-160 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 TrailBlazer and TrailBlazer Plus are patented devices and 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 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.

- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device. Patent issues are to be resolved by the applicant and the patent owner.

Sincerely yours,

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

Enclosure

FHWA:HSA-10:NArtimovich:tb:x61331:7/28/03

File: h://directory folder/nartimovich/WZ160-JacksonFIN1

cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N. Artimovich, HSA-10)