

Refer to: HSA-10/WZ-122

Mr. Jan Miller  
1430 Sullivan Street  
Elmira, New York 14901-1698

Dear Mr. Miller:

Thank you for your letter of March 4, 2002, requesting Federal Highway Administration (FHWA) acceptance of your company's crashworthy sign stands using additional sign substrates for use in work zones on the National Highway System (NHS). You requested that we find 3 mm and 4 mm Alpolic, Dibond, Reynolite or equal aluminum laminate signs acceptable for use with certain crash tested sign stands 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.

**Request 1. X-600 Series Hi-level Spring Stand with frangible coupling**, for use with 48x60 inch diamond and smaller signs of 3 mm and 4 mm Alpolic, Dibond, Reynolite or equal aluminum laminate signs mounted at the tested height of 60 inches above grade.

The X-602 stand was accepted in our letter WZ-78A dated June 15, 2001. It was tested with 48x48 diamond signs of 0.080 aluminum and 5/8 inch plywood mounted at 60 inches. The tested signs weighed 18 pounds and 30 pounds respectively. This range exceeds the weights of the signs you are presently requesting for use with this stand. Because this stand performed in an acceptable manner due in large part to the frangible coupling, and that the aluminum laminate signs generally perform better than the solid substrates tested, we concur that the requested signs will also be acceptable for use.

**Request 2. E-350 Heavy Duty Tripod Stand** with 48x48 diamond and smaller signs of 3 mm and 4 mm Alpolic, Dibond, Reynolite or equal aluminum laminate signs.

The E-350 was accepted in our letter WZ-78A with various substrates, mounted at 15 inches above the pavement, the heaviest of which was the hinged ABS at 23.25 pounds. Based on this test series as well as others conducted on various portable sign stands with the full range of sign substrates, we observed that the weight and erratic performance of the hinged solid ABS material qualifies this item as the “worst case” substrate. Your request is to use 3 mm and 4 mm Alpolic, Dibond, Reynolite or equal aluminum laminate signs. We concur with your request for acceptance of additional substrates based on the successful crash testing of the “worst case” impact performance hinged 0.250 inch hinged solid ABS plastic in addition to various rigid and semi-rigid substrates.

**Request 3. X-550 series mid-size stands** with 3 mm and 4 mm Alpolic, Dibond, Reynolite or equal aluminum laminate 48x60 inch, 48 inch diamond signs.

The X-550 stands (Model X-552, Model X-553) have been crash tested with various substrates that bracket the weight and rigidity properties of the aluminum laminate substrates, therefore it will be acceptable for use under the same conditions and mounting heights (15 inches) as the other substrates were tested.

### **Findings**

Aluminum laminate sign substrates have been successfully crash tested on portable stands made by a number of manufacturers. Various thicknesses of laminates, namely 2 mm and 3 mm Reynolite, Dibond, and Alpolic, have been tested and are limited to use on the tested stands. Because your company has tested substrates that are both more and less rigid than the aluminum laminate substrates you are requesting, we consider them to be within the envelope that has been demonstrated to perform in an acceptable manner. Therefore, the portable sign stands described above and modified by their use of 3mm and 4mm aluminum laminate signs 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, 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.
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- 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-122 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 signs and stands covered in this letter may include patented components and if so are 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.

Sincerely yours,

Carol H. Jacoby, P.E.  
Director, Office of Safety Design

Enclosure