



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

January 13, 2006

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

In Reply Refer To:
HSA-10/WZ-223

Mr. Ken Russell
3D Specialties
1110 25th Avenue North
Fargo, North Dakota 58102

Dear Mr. Russell:

Thank you for your letter of December 9, 2005, requesting the Federal Highway Administration (FHWA) acceptance of your company's modification to the Minnesota Portable Sign Support as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter was a drawing of the support that was found acceptable in the FHWA letter WZ-133 dated November 26, 2002. You requested that we find a modification to this portable sign stand 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 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. Our new acceptance process was outlined in our memorandum "FHWA Hardware Acceptance Procedures – Category 2 Work Zone Devices" dated November 11, 2005.

The Minnesota Department of Transportation (Mn/DOT) rigid panel portable sign support is a stiffened perforated square steel tube "H-Footprint" device. You requested that a substitution for the 38.1 mm (1.5 inch) horizontal legs be allowed, using 50.8 mm (2.0 inch) perforated square steel tube in either 12 gage or 14 gage steel.



A description of the modified device follows:

- Vertical upright masts are 44.5 mm (1.75 inch) square galvanized Telespar ASTM A-653 Grade 50 steel tubing with 2.67 mm (0.105 inch) wall thickness and a length of 1524 mm (60 inches.)
- Outside vertical upright tubing is 50.8 mm (2 inch) square galvanized Telespar ASTM A-653 Grade 50 steel tubing with 2.74 mm (0.108 inch) wall thickness and a length of 911 mm (33.875 inches.)
- Horizontal legs are 50.8 mm (2.0 inch) square galvanized Telespar ASTM A-653 Grade 50 steel tubing with 12 gage or 14 gage wall thickness and a length of 1524 mm (60 inches.)
- Vertical stubs from the legs are 38.1 mm (1.5 inch) square galvanized Telespar ASTM A-653 Grade 50 steel tubing with 2.74 mm (0.108 inch) wall thickness and a length 305 mm (12 inches.) It is welded to the horizontal leg on all four sides.
- The outside vertical upright tubes slide over the vertical uprights and the vertical portion of the legs slide into the vertical upright masts with 7.9 mm (0.3125 inch) diameter x 63.5 mm (2.5 inch) long hex head S30400 threaded bolts used to fasten the masts and legs.
- The solid, 2.74 mm (0.108 inch) aluminum sign panel was 1219 mm (48 inch) diamond shaped and fastened to the stand with four 7.9 mm (0.3125 inch) x 63.5 mm (2.5 inch) long hex head S30400 threaded bolts.
- Height to bottom of sign: 335 mm (13.1875 inches) Height to top of outer tube 959 mm (37.74 inches). Height to the Warning Light bolt, 1,481 mm (58.3125 inches).
- The legs have a mass of 10.7 kg (23.5 pounds) when 14 gage material is used, and 12.5 kg (27.6 pounds) when 12 gage material is used. The panel, masts, outside tubes, and light have a mass of 36.75 kg (81 pounds.) One 20 kg (45 pound) sandbag may be placed at the end of each leg.

Testing and Findings

The results of the Mn/DOT testing met the FHWA requirements and the FHWA acceptance letter WZ-133 was issued. We concur that your proposed modification increases the strength of the legs without significantly increasing the weight and would not adversely affect the performance of this sign stand. Therefore, the modified sign stand described above is 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 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-223 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.
- 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,

/original signed by/

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

FHWA:HSA-10:NArtimovich:tb:x61331:1/11/06

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