

Refer to: HSA-10/WZ-101

Mr. Norman L. Hawkins, Jr.
President
Hawkins Traffic Safety Supply
1255 Eastshore Highway
Berkeley, CA 94710-1095

Dear Mr. Hawkins, Jr.:

Thank you for your letter of October 12, 2001, requesting Federal Highway Administration (FHWA) acceptance of your company's Warning Scope portable sign stand as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter was a report of crash testing conducted by E-Tech Testing Services and a video of the test. You requested that we find this device 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." You followed up with additional information in response to our request on January 6, 2002, however that letter was never received. We received a fax of this letter on March 12, 2002.

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 device follows:

The Warning Scope is a lightweight portable sign system featuring a rigid (unsprung) upright support. The four-legged "Quad Pod" Warning Scope sign support was selected as the worst case model for testing. The support has four 863.6 mm long legs made of 25.4 mm square 2.11 mm wall steel tubing. The legs are braced with 381.0 mm long tubes of the same construction. All tubing is ASTM A500/A513 steel.

Each leg is hinged to a “slide spider” assembly with a replaceable rivet allowing the support to fold. The telescoping mast consists of three 6063 - T832 round aluminum tubes. The lower tube is 31.75 mm in diameter, and the top is 19.05 mm diameter. The bottom and middle tubes have an integral clamping device permanently attached. The tubes can be locked in an extended position using only average manual strength on the clamping device’s knurled thumbscrew. A flag yoke, made of die cast aluminum, completes the top of the mast. The sign support was equipped with a 1219 mm square fabric rollup sign in a diamond orientation secured by fiberglass bracing. Three 457.2 mm square vinyl flags with 22.22 mm diameter wood dowels were slipped into the flag yoke on top of the support.

The height of the bottom of the sign was nominally 686 mm above the ground. The test article mass was 7.5 kg. Each sign stand was placed on a flat, clean, and dry asphalt surface and ballasted with two 15.9 kg sandbags.

Testing

Full-scale automobile testing was conducted on your company’s device. Two stand-alone examples of the device were tested in tandem, one head-on and the next placed six meters downstream turned at 90 degrees, as called for in our guidance memoranda. The complete device as tested is shown in the Enclosure. The crash test is summarized in the table below:

Test Number	37-6201-001
Test Article	Hawkins Traffic Safety Warning Scope Quad Pod
Height to Bottom of Sign	686 mm
Height to Top of Flag Bracket	2515 mm
Flags or lights	Three flags
Test Article Mass (each)	7.5 kg
Vehicle Inertial Mass	818 kg
Impact Speed, Head-on	101.1
Impact Speed, 90 Deg.	97.0
Velocity Change, Head-on	1.14 m/sec
Velocity Change, 90 deg.	1.14 m/sec
Vehicle crush	Slight denting to bumper, hood, and roof
Occupant Compart. Intrusion	None
Windshield Damage	None

Findings

Damage was limited to minor dents. There was contact with the windshield during both impacts but no damage to the glass was observable. The results of the testing met the FHWA requirements and, therefore, the devices described above and shown in the enclosed drawings for reference are acceptable for use on the NHS under the range of conditions tested, when proposed by a State.

Please note the following standard provisions, which 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-101 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.

Sincerely yours,

A. George Ostensen
Program Manager, Safety

Enclosure

FHWA:HSA-10:NArtimovich:tb:x61331:3/20/02

File: WZ101HawkinsFin.wpd

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



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