U.S. Department of Transportation
Federal Highway Administration

Memorandum

SENT VIA ELECTRONIC MAIL

Subject: INFORMATION: FHWA Hardware Acceptance Procedures – Category 2 Work Zone Devices

Date: NOV 18 2005

From: George E. Rice Jr. for John R. Baxter, P.E.
Director, Office of Safety Design

Reply to Attn. of: HSA-20

To: Directors of Field Services
Resource Center Managers
Division Administrators
Federal Land Highway Division Engineers

In the July 25, 1997, memorandum from the Director, Office of Engineering, titled, "Identifying Acceptable Highway Safety Features," the FHWA instituted simplified test requirements for acceptance of crashworthy Category 2 work zone traffic control devices. We are now modifying those acceptance procedures to provide a simplified process.

Introduction

Category 2 work zone devices include devices that are not expected to produce significant vehicular velocity change, but may otherwise be hazardous. Examples of Category 2 devices are portable sign stands, type I, type II and type III barricades, cones and vertical panels with lights, certain automated flagger devices, and intrusion detectors. All or parts or these devices may be substantial enough to penetrate a windshield, injure a worker, or cause vehicle instability when struck or lodged under a vehicle.

Testing of devices in this category is still required. However, they may qualify for the reduced testing requirements cited in Section 3.2.3.2 of the NCHRP Report 350. [Report 350 set a limit of 45 kg (100 pounds) on free-standing devices in order to qualify for reduced testing and instrumentation. The FHWA will generally consider free-standing devices up to 100 kg (220 pounds) eligible for reduced testing provided they are comparable to other crash tested Category 2 devices.] Depending on the device videotaping may be substituted for high-speed film photography in recording test results, and instrumentation in the vehicle may be omitted. A means of establishing the velocity before and after impact independent of the vehicle's speedometer is necessary.

Many existing crash test laboratories have gained significant experience in testing and evaluating work zone devices over the last eight years. Because of our confidence in the ability of these laboratories to evaluate the results of the simplified crash test requirements for Category 2 work zone devices the FHWA believes that public safety can still be ensured with a more targeted sampling review of the test results by the FHWA. The new procedure will speed the acceptance process.

New Procedure

For crash test projects begun after January 1, 2006, the petitioner and/or the crash test house must submit the request for acceptance on the form "**Category 2 Work Zone Device acceptance letter**" a copy of which is attached to this memorandum, and which will be posted on our website in downloadable PDF format.

Under the new process, both the crash test house and the petitioner/developer must sign the application as a certification document. The crash test house will certify that:

- The crash tests were conducted in conformance with the NCHRP Report 350 guidelines.
- The results of the crash test met the appropriate evaluation criteria in Report 350 and the FHWA guidance on windshield damage assessment, and that the device meets the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- The tested device is accurately described in the test report.

And the petitioner/developer will certify that:

- The product to be marketed will be identical in materials, dimensions, finish, temper, etc., as those used in the crash tests, and therefore is crashworthy.

The form also requires the following information to be provided by the petitioner/developer and/or the test house:

- A written description of the device, including materials, sizes, fasteners, substrates, foundations, auxiliary features, ballast, etc., as applicable.
- Selection from a list of "keywords" that relate to the device to aid users in locating the acceptance letter from the FHWA Web site. The eligible keywords are listed on the form.
- Test data summary page for each crash test (as detailed in Report 350, Section6.1)
- PDF drawings of the test article(s) that are detailed enough to allow an engineer in the field to distinguish between this and other similar devices. The format will be that approved by the FHWA and the AASHTO/AGC/ARTBA Task Force 13 – Standardization of Highway and Bridge Hardware. See http://www.aashtotf13.org
- A checklist of all required items (copy enclosed).

When the FHWA receives the form and its attachments, a CD or DVD of the crash testing, and the test report, we will review the submission to ensure its completeness. We will then log it in with a "WZ-number" and a date, and have it posted to our website.

Developers who are currently in the process of having their hardware evaluated through crash testing may also use the new enclosed form if they wish, but crash testing beginning after January 1, 2006, must be submitted under the new procedures.

Submissions should be sent via private courier* to the following address:

Office of Safety Design, HSA-10
Federal Highway Administration
400 Seventh Street, SW
Room 3407
Washington, DC 20590

*Currently mail sent via the U.S. Postal Service to the DOT Headquarters is irradiated to decontaminate it. This process generates heat that melts plastics and fuses color photocopy pages together in addition to delaying the submission.

If you have the capability to prepare your submission entirely in digital format, please email it to nick.artimovich@fhwa.dot.gov.

Laboratory Qualifications

Only crash test laboratories that have been accepted by the FHWA are eligible to submit test results. As of the date of this memorandum there are two criteria for crash test laboratories to be considered acceptable: 1) those laboratories that have previously submitted acceptable crash test results leading to an FHWA acceptance letter, and 2) have been involved in an acceptable inter laboratory comparisons (such as those conducted by Task Force 13). The labs meeting both criteria, along with others we have dealt with in the past, are listed on our web site at: http://safety.fhwa.dot.gov/roadway_dept/road_hardware/crashtst.htm.
Crash test laboratories that wish to be accepted must meet the FHWA acceptance criteria before their test results will be considered. Please contact Mr. Nicholas Artimovich, (nick.artimovich@fhwa.dot.gov) about crash test laboratory criteria.

In order to assist laboratories in evaluating the results of windshield damage, please see the following three attachments:

- Windshield Damage for Category II Work Zone Traffic Control Devices: GUIDANCE FOR PASS/FAIL
- Mid-West Roadside Safety Facility – Windshield Damage Index Procedures
- E-TECH Testing Services – Windshield Deformation Assessment

The first one is the FHWA evaluation criteria to be followed. The second is the MwRSF method for measuring deflection; Table 1 is excluded as it contained an evaluation criteria no longer followed. The E-TECH document is also a deformation measurement process. Test houses may use either measurement procedure while the FHWA and our partners work toward uniform criteria.

Modifications to Previously Tested Category 2 Devices

The attached form and procedure will also be used for those proposing revisions to previously crash tested devices. If the testing laboratory that conducted the test(s) on the device is of the opinion that the modification is not likely to have adverse effects on the results of testing, they may certify to that effect and additional testing will not be required. Otherwise the laboratory

may propose finite element modeling, static testing of component parts, bogie testing, additional full-scale crash testing, or a combination of methods to verify the performance of the modified device. Because it is the responsibility of the developer to provide evidence of crashworthiness, the FHWA expects certification to that effect for both newly developed devices and for modified devices. Additional guidance on modifications and variations that the FHWA believes do not require additional crash testing may be found in the "Frequently Asked Questions" on our website: http://safety.fhwa.dot.gov/roadway_dept/road_hardware/qanda.htm.

FHWA Review

The FHWA will review submittals on a sampling basis. If upon review the FHWA determines that the certification of the device is in error, the FHWA will rescind the certification and post a letter indicating the reason for the removal. Depending on the reason for the removal of the device it may jeopardize continued acceptance of the test laboratory that submitted it.

3 Attachments

cc: FHWA Web site
AASHTO/ACG/ARTBA Task Force 13 Members
AASHTO Technical Committee on Roadside Safety Members
All Crash Test Laboratories of Record
American Traffic Safety Services Association