

Refer to: HSA-10/SS-113

Mr. Frank Hurt
Intellistrobe Safety System
1315 East Montclair
Springfield, Missouri 65804

Dear Mr. Hurt:

Thank you for your recent letter requesting Federal Highway Administration (FHWA) acceptance of your company's Intellistrobe signal system as a breakaway sign support system for use on the National Highway System (NHS). Accompanying your letter was a report from Karco Engineering and videos of the crash tests. You requested that we find the Intellistrobe system 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." On September 19 we received additions and corrections to your original submission.

Introduction

Except for the mass of the test vehicle, testing of the breakaway signal system was in compliance with the guidelines contained in the NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. Requirements for breakaway supports are those in the American Association of State Highway and Transportation Officials' (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. The vehicle mass is discussed in the following section.

Testing

The test article was a 4 x 4 inch treated wood post supporting a 36 x 36 inch reflective aluminum sign. Behind the sign was a 6 x 10 x 4 inch electronic module that powered a 12 inch diameter flashing yellow light. Atop the installation was a solar collector panel measuring 11 inches x 18 inches. The enclosed drawings show the Intellistrobe assembly as tested. The weight of the receiver/light assembly was 36 pounds.

Full-scale automobile testing was conducted on your company's device. The mass of the test vehicle was 887 kg in the test. Although this mass exceeds the tolerance (820 kg +/- 25 kg) contained in NCHRP Report 350, the resulting velocity changes were so low as to indicate that the system would have passed the test had a vehicle conforming to the 820C specifications been used.

The test vehicle's speed at impact was 35.3 km/hr. The vehicle velocity change during the impact was 1.8 km/hr, or 0.5 m/s. The occupant ridedown acceleration was 0.2 g's, and there was no occupant impact speed. At impact, the wood support fractured at two places – at the groundline and approximately 32 inches above ground. The support and the signal assembly rotated over the vehicle, lightly contacting the roof. There was no deformation of the roof, and no intrusion into the vehicle occupant compartment.

Findings

Damage was limited to contact marks on the rear of the roof, with no windshield contact occurring. Velocity changes were all within acceptable limits, and the only stub remaining was broken off just below the ground. The results of testing met the FHWA requirements and, therefore, the devices described above and shown in the enclosed drawings for reference are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State.

You also requested that the Intellistrobe be acceptable when mounted on a 4 x 6 inch wood post in addition to the 4 x 4 it was tested on. Breakaway 4 x 6 wood posts are typically weakened with 1.5 inch holes drilled in the center of the 6-inch wide face, located at 4 inches and 18 inches above the groundline to facilitate fracture. The Intellistrobe hardware may be mounted on a 4 x 6 wood post when these holes are drilled as specified.

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 SS-113 shall not be reproduced except in full. As this letter and the supporting documentation which support it become public information, it will be available for inspection at our office by interested parties.
- The “Intellistrobe” is or will be a patented product and is considered "proprietary." The use of proprietary devices specified on Federal-aid projects, except exempt, non-NHS projects: (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

Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

ENCLOSURE 2