

Refer to: HSA-10/SS-105

Mr. Alden Rehnquist
Metro Sign and Engraving
53D South Jefferson Road
Whippany, NJ 07981

Dear Mr. Rehnquist:

Thank you for your facsimile transmission of February 25 requesting Federal Highway Administration (FHWA) acceptance of your company's square aluminum tube post as a breakaway small sign support for use on internal building site roads in Parsippany, New Jersey. Accompanying your letter were drawings and specifications for the support and its foundation. You requested that we find the system acceptable by comparison to other breakaway supports under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

The FHWA has limited its review of crashworthy hardware to those devices proposed for use on the National Highway System (NHS). We have followed this limitation because, by law, FHWA standards can only be required for roads and highways on the NHS. Your client, the City of Parsippany has decided to require Report 350 compliant breakaway supports on a project. Therefore, you have requested that FHWA provide a Letter of Acceptance indicating that your proposed sign support will meet Report 350 guidelines.

Introduction

Requirements and warrants 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. Testing of breakaway supports is subject to the guidelines contained in NCHRP Report 350.

A brief description of the sign support system is as follows:

A 28 inch long stub of 2 Pound Per Foot Marion Steel Rib-Bak U-channel post is embedded in a 6 inch diameter, 24 inch deep concrete footing. The footing is recessed two inches below the surrounding earth, and the u-channel stub projects six inches above the concrete. The sign post is a 2 inch square extruded aluminum tube (6063 T52 aluminum, maximum yield strength 25 ksi) with a 1/8 inch thick wall. This post is bolted to the u-channel stub using two aluminum bolts (diameter 5/16 inches) spaced 4 inches on center.

No crash testing of this support has been conducted. However, successful crash tests have been run on 3 Pound-Per-Foot Rib Back U-channel post supports with a lap splice at the ground line. The tested U-channel support is more substantial than your proposed design, and has a lap splice that is significantly stronger than the one you propose using aluminum bolts. It is apparent that, in the event of an impact, the vehicle velocity change caused by your proposed design will be substantially less than that of the tested support. Testing has also been successfully conducted on 3 inch diameter round aluminum tubes having a cross-section area of approximately 1.16 square inches. The wall of the proposed square aluminum tube has a cross section area of 0.94 square inches. The significantly smaller cross section of your post is likely to enhance the breakaway performance of this system.

Because square aluminum supports of this type have not been crash tested, is it not known what is the potential, if any, for the support or sign to penetrate the occupant compartment. In order to reduce that potential we recommend that the mounting height of the signs be, as a minimum, 7 feet to the bottom of the sign.

Because the support described above and shown in the enclosed drawings for reference can be expected to meet NCHRP Report 350 requirements it may be considered acceptable for use as a Test Level 3 device in the City of Parsippany, New Jersey, when placed in NCHRP Report 350 Standard soil.

You also requested the following variations:

- A. Two posts within a seven-foot path to be used to support a sign. We concur with this request as the 3 pound-per-foot u-channel supports were also tested in a dual post configuration.
- B. Use of square steel tube (0.090 inch thick wall) to be used in lieu of aluminum post. The steel tube is a substantially stronger support and its performance is not as easy to predict. We recommend that you use the successfully tested perforated square steel tube systems, such as those offered by Allied Tube (Telespar), S-Square Tube Products, or Western Highway Products (Ulti-Mate system).

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 SS-105 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.

Sincerely yours,

A. George Ostensen
Program Manager, Safety

Enclosure

FHWA:HSA-10:NArtimovich:tb:x61331:3/08/02

File: SS105Parsippany.wpd

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