



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

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

Refer to: HSA-10/SS-103

Mr. Rick Mauer
Marion Steel Company
P.O. Box 837
Greenland, NH 03840-0837

Dear Mr. Mauer:

Thank you for your letter of August 30 requesting Federal Highway Administration (FHWA) acceptance of your company's Slip-Safe breakaway coupling for use with square tubular posts on the National Highway System (NHS). Accompanying your letter were detailed drawings of the Slip-Safe device fitted for use with square steel tube posts. You requested that we find 12 gage square steel posts measuring 2 1/4 inch x 2 1/4 inch on a side affixed with the Slip Safe breakaway coupling acceptable for use on the National Highway System under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

Guidance for the testing of sign supports is contained in the NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. Performance and design 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.

Testing and Findings

Full-scale automobile testing was conducted on your company's Slip-Safe breakaway coupling using 4 PPF rib-backed U-Channel sign supports. They were found acceptable under the 1985 edition of the AASHTO specification mentioned above in FHWA Acceptance Letter SS-69A dated April 4, 1997. Subsequent editions of the AASHTO specification have been revised to correspond with NCHRP Report 350. Any device successfully tested under the 1985 AASHTO specification is considered acceptable under later editions, as well as under Report 350.

The crash testing conducted in support of SS-69A used 4 PPF U-Channel posts. Small scale slip bases are subject to failure if the signpost begins to bend before the slip bolts have broken or are knocked out. Therefore it is important for proper operation of your breakaway system that the square steel tube posts have a comparable strength, or section modulus. Four Pound-Per-Foot U-Channel posts have a section modulus of 0.467 inches cubed. Therefore the square steel posts used with the slip safe should be at least 12 gage, 2 1/4 inch square posts which have a section

modulus of 0.489 inches cubed. If that condition is met, the use of square steel tube sign posts with Slip Safe breakaway couplings will be acceptable for use as Test Level 3 devices on the NHS under the range of conditions covered in Acceptance Letter SS-69A, when proposed by a State. Note that Acceptance Letter SS-69A found single, dual, and triple post supports acceptable when used in standard soil, and acceptable in “weak” soil with a 30 inch embedment depth and with a soil plate attached.

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-103 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,

Michael L. Halladay
Acting Program Manager, Safety