

April 1, 2004

Refer to: HSA-10/SS-124

Mr. Nick Calvi
Ultimate Highway Products, Inc.
P.O. Box 7
Stanton, California 90680

Dear Mr. Calvi:

Thank you for your letter of March 22, 2004, requesting a revision to the Federal Highway Administration (FHWA) acceptance of your company's Slip-Mate slip base for use with breakaway small sign supports on the National Highway System (NHS) under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features." The Slip-Mate was found acceptable in our letter SS-100 to Western Highway Products, dated November 21, 2001. Your present request is for acceptance of a 18-inch diameter, 42-inch deep concrete base in weak soil. Both Western Highway Products and Ultimate Highway Products, Inc., are divisions of Couch and Phillippi.

Introduction

Testing of the supports 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' Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

The Slip-Mate is a three-bolt omni-directional slip base system. The ½-inch triangular plates measure 6 inches on each side of the triangle. A ½-inch thick polypropylene ball bearing housing is placed between the two plates to provide reduced friction. (This is necessary for a smaller system to avoid the problem of the signpost bending before the slip base can separate.) To either slip plate is welded a 2x2 inch by 1/4 inch square steel tube. The upper tube is 18 inches long and is welded to the top slip plate to receive the 12 gage, 2 1/4 x 2 1/4 inch square perforated square steel sign support. This tube is extended so as to contact the vehicle's bumper with a significant cross-section of steel. The lower tube is 6 inches long and is welded to the bottom plate and is inserted in and fastened to the tube and sleeve combination in the foundation. The slip base bolts are ½ inch diameter x 2 ½ -inch long hex head steel bolts with nuts and washers. They are torqued to 40 foot-pounds. The anchor for the system consisted of a

2 1/4 -inch square, 36-inch long 12 gage perforated square steel tube with a 2 1/2-inch square, 18-inch long 12 gage perforated strengthening sleeve with a soil stabilize bracket measuring 13 inches by 10 inches attached with two 5/16 inch corner bolts. The system was installed in the NCHRP Report 350 "Standard" soil. The Sign used in the test was a 36 x 60 inch rectangular sign attached to the support post with four 3/8 inch drive rivets. It was mounted 5 inches below the top of the 144-inch tall post. The weight of the sign and the post was 60 pounds above the slip plane.

Testing

Pendulum testing was conducted on a single sign support with the Slip-Mate system. The mass of the pendulum, which was affixed with a crushable honeycomb nose simulating a 1979 Volkswagen Rabbit, was 820 kg. The complete device as tested is shown in the Enclosure.

Test #	Speed	Article	Occup. Speed	Delta V
259-1	34.5 km/hr	Uni-Mate breakaway support system	None	0.37 m/s

Occup. Speed: Occupant Impact Speed: Speed at which a theoretical front seat occupant will contact the windshield. In meters per second

Delta V: Speed change of the test vehicle. In meters per second.

Findings

Velocity change was within acceptable limits. The stub remaining was 100 mm high as designed and within the acceptable limit. The results of the test met the FHWA requirements and the device was found acceptable.

Your present request was for acceptance of the Slip-Mate breakaway support system in an 18-inch diameter, 42-inch deep concrete foundation when used in weak soil. A concrete base of this size has been shown to provide adequate support for slip bases in weak soil areas. Because the velocity change in the test noted above was so low, we concur in your request, and find this base and foundation acceptable for use as a Test Level 3 breakaway device on the NHS under the range of conditions tested, as modified, when proposed by a State.

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 the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number SS-124 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 Slip-Mate is a patented device and is considered "proprietary." When proprietary devices are *specified by a highway agency* for use on Federal-aid projects they: (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. These provisions do not apply to exempt non-NHS projects. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device. Patent issues are to be resolved by the applicant and the patent owner.

Sincerely yours,

/Original Signed By Harry Taylor/

for: John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures

FHWA:HSA-10:NArtimovich:tb:x61331:3/31/04
File: h://directory folder/nartimovich/SS124-SlipMate
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N. Artimovich, HSA-10)

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.