U.S. Department
Of Transportation
Federal Highway
Administration

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

November 10, 1993

Refer to: HNG-14/SS-42

Mr. Rick Mauer
District Sales Manager
Marion Steel Company
58 Suzanne Drive
Portsmouth, New Hampshire 03801

Dear Mr. Mauer:

Thank you for your October 28 letter to Mr. Nicholas Artimovich requesting Federal Highway Administration's (FHWA) acceptance of the 1.67-kg/m (1.12-pound/foot) and the 2-kg/m (1.33-pound/foot) U-channel delineator posts, made of ASTM A-36 steel, as breakaway. You also sent a videotape of informal crash testing that you conducted to demonstrate the support's performance. The State of New Hampshire requested the ductile A-36 delineator posts because they consider them to be easier to maintain.

The ASTM A-36 steel used in your 1.67-kg/m delineator posts is usually not acceptable for breakaway sign supports because of poor performance observed in full-scale crash testing done in the past. Typically, breakaway U-channel sign supports are made of high-carbon "rail steel" or an equivalent formulation new billet steel. The posts made from the rail steel are stronger but more brittle than A-36 posts. Therefore, then tend to break when struck rather than wrapping around the front of the errant vehicle, which may then be stopped or unacceptably slowed by the continuously reshaping of the post as the vehicle passes over it. The State of New Hampshire considers the brittleness of lightweight rail-steel delineator posts to be a disadvantage, precisely because the posts break when hit. They prefer the lightweight A-36 posts, which bend over when struck and can be straightened in place.

The delineator posts you tested were 2.13 meters long with 0.91 meters of that length embedded in the soil. The tests on these 1.67-kg/m delineator posts showed that the ductile posts do tend to wrap around the front of the vehicle at high speed. Because of the post's low height and mass, however, there did not appear to be any significant potential for the vehicle to become unstable, nor for the post to penetrate the passenger compartment. Indeed, the post pulled out of the ground quickly and cause very little velocity change. The low speed tests that you then ran showed that the delineator could be hit and straightened at least a half-dozen times with little difficulty.

Therefore, your company's 1.67-kg/m A-36 steel delineator posts are acceptable for use in projects on the National Highway system, if requested by a State. The height of the post may not exceed 1.25 m (4 feet) nor the embedment 1.0 m (3 feet). Because the 2-kg/m posts is very similar in size to the tested post, and the reaction from the 1.67-kg/m post so slight, the 2-kg/m post is also acceptable for use, subject to the same limitations as the 1.67-kg/m post.

Sincerely yours,

Lawrence A. Staron, Chief
Federal-Aid and Design Division

Geometric and Roadside Design Acceptance Letter Number SS-42