



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

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

Refer to: HSA-1\SS-94

Mr. Mark Granger
President
Granger and Associates
285 Longfellow Avenue
Worthington, OH 43085-3020

Dear Mr. Granger:

Thank you for your March 28, 2000, letter to Mr. Nicholas Artimovich requesting the use of partially threaded spacers in breakaway u-channel splice designs. We had resisted the use of unthreaded or partially threaded spacers when, in 1995 we wrote to you:

We believe the use of the threaded spacer may have been a factor in the improved performance of the supports using the Lap-Splice. The threads on the spacer constrain part of the splice bolts and serve to concentrate the strain. Those parts of the bolt that are not within the area of the spacer must absorb nearly all of the strain of the bolt. This concentration of the strain may cause the bolts to break earlier in the crash event.

Upon further review and discussion with you and with representatives of Franklin Industries, we note that there have been crash tests conducted with successful results on lapped u-channel splices using unthreaded spacers. A table summarizing the acceptable supports using unthreaded spacers is shown here:

GARDAL # and Date (a)	Max Post Sizes (b)	Breakaway Feature (c)	Max Number of Posts (d)	Soils (e)
SS-9 3/16/89	6.0 kg/m	EZE-Erect	1	Strong/Weak
SS-28 5/26/92	6.0 kg/m	Florida Splice	1	Strong/Weak
SS-59 3/7/96	6.0 kg/m	Franklin Splice	3	Strong/Weak*

Notes:

- (a) GARDAL: Geometric And Roadside Design Acceptance Letter.
- (b) Maximum size of post permitted: 4.5 kg/m = 3 lb/ft. 6.0 kg/m = 4 lb/ft.
- (c) EZE-Erect is the strap and spacer system historically used by Franklin Steel Company. Florida Splice is a 200-mm overlap splice with two A307, 9.5-mm x 50-mm (3/8-inch by 2-inch) bolts spaced 150-mm center to center. A spacer is used to separate the webs. The top of the stub is to be 100-mm or less above the ground. Franklin Splice uses unthreaded spacers. Grade 9 bolts, spaced at 100-mm, are needed for multiple post installations. The top of the stub is to be 100-mm or less above the ground.
- (d) This is the maximum number of breakaway posts permitted within a 2.1-m path.

* Soil plates measuring 360-mm square and 6.3-mm thick are required on each stub when used in weak soil.

Although we still consider that a fully-threaded spacer is preferable, based on the crash test history we conclude that a partially threaded spacer bar is also acceptable for use in breakaway u-channel supports on the National Highway Safety (NHS).

Please note the following standard provisions which apply to Federal Highway Administration (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 National Cooperative Highway Research Program Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number SS-94 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.
- If your partially threaded spacer bar is or will be a patented product it will be 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,

Frederick G. Wright, Jr.
Program Manager, Safety

Enclosure

FHWA:HSA-1:NARTIMOVICH:TM:x61331:02/21/01

File: GrangerNoThread.wpd

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