SS-60A

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

OCT 21 1996

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

Refer to: HNG-14

Mr. Clifford M. Dent
P.O. Box 1119
Mile 16.5 North Road
Kenai, Alaska 99611

Dear Mr. Dent:

This is in response to your facsimile letter to Mr. Nicholas Artimovich requesting Federal Highway Administration's (FHWA) acceptance of a modification to your breakaway sign support couplings. Our Geometric and Safety Design Acceptance Letter SS-60, dated October 27, 1995, found 12.7-mm (½-inch) and 15.9-mm (5/8-inch) couplings acceptable in a square (4-bolt) or a triangular (3-bolt) pattern. Your current request is to use increased diameter bolts, namely 3/4-inch, 7/8-inch, and 1-inch (19.1-mm, 22.2-mm, and 25.4-mm, respectively).

In our October 27, 1995, letter we conditioned our acceptance to sign installations "within the range of conditions tested." This means that sign supports that are substantially weaker in bending or more massive than the tested installation, which had a 127 x 127 x 4.76 steel tube support and a mass of 70.8 kg, would not be acceptable without further testing. The larger bolt sizes you wish to use are typically used with larger supports than those tested. The 4.5-m/s velocity change of the support tested with the 15.9-mm (5/8-inch) bolt is close to the acceptance limit, and a more massive installation may fail to meet the 5.0 m/s maximum allowable velocity change.

You have stated to Mr. Artimovich that some States have "over designed" their breakaway bases and use larger diameter bolts than are necessary to adequately support their sign installations. Some of these States wish to use your company's necked-down bolt in bases that were made for bolts larger than the two sizes of your bolt already found acceptable. We further understand that the larger bolts you wish to sell are only intended for use on sign installations of similar mass to those that were tested. With this understanding, we are willing to accept the use of the necked-down 3/4-inch, 7/8-inch, and 1-inch (19.1-mm, 22.2-mm, and 25.4-mm) bolts, for three- or four-bolt, horizontal matched-plate bases subject to the following conditions:

1. Maximum mass per foot of sign post shall not exceed 30 kg/m (20 pounds per foot.)

2. Maximum mass of sign and support shall not exceed 100 kg (220 pounds).

3. Maximum perpendicular distance from a line connecting any two adjacent bolts to a parallel line through a third does not exceed 155 mm. (This will yield various maximum bolt circle diameters, depending on the bolt pattern (triangular, square, or rectangular) used.)

4. Maximum diameter at the grooved section shall not exceed 9.65 mm.

5. The mated plates are at least as stiff as the tested plates.

Because the material specifications of your galvanized, ASTM A325-type-material, steel bolts and the diameter of the critical necked-down section will not be changed, we concur in the use of the 19.1-mm, 22.2-mm, and 25.4-mm necked-down bolts on the National Highway System if requested by a State. All other conditions in our October 27, 1995, letter remain in effect. Dimensions of all seven acceptable necked-down bolts are given in the enclosed table and shown in the enclosed drawings.

Sincerely yours,

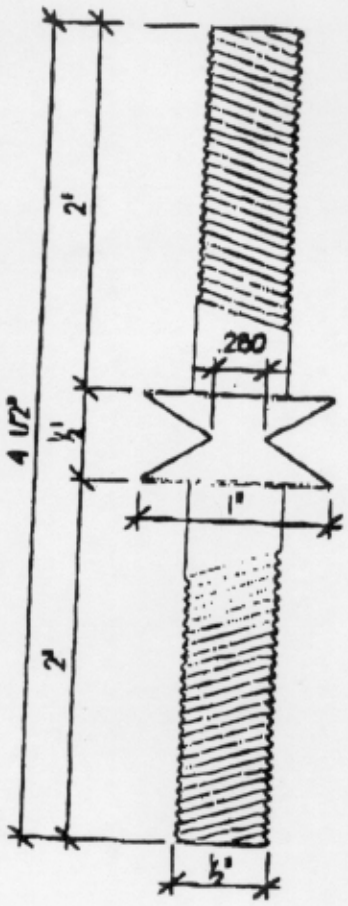
Seppo I. Sillan, Acting Chief
Federal-Aid and Design Division

Enclosures

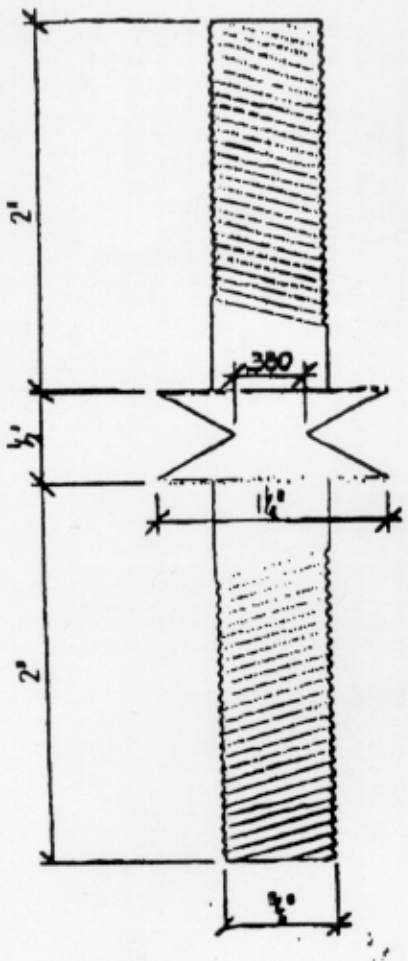
Attachment to letter dated October 21, 1996
Dimensions of Dent Breakaway Bolts.
Material: Conforms to the physical requirements of steel in finished ASTM A325 bolts
Finish: Galvanized

Dimensions in millimeters (dimensions in inches in parentheses)

Nominal Diameter	12.7 (0.50)	15.9 (0.625)	19.1 (0.750)	22.2 (0.875)	25.4 (1.00)	25.4 (1.00)	25.4 (1.00)
Diam. @ Neck Between Cones	7.11 (0.280)	9.65 (0.380)	9.65 (0.380)	9.65 (0.380)	9.65 (0.380)	7.11 (0.280)	9.65 (0.380)
Radius of Groove Between Cones	1.6 (0.0625)	1.6 (0.0625)	1.6 (0.0625)	1.6 (0.0625)	1.6 (0.0625)	1.6 (0.0625)	1.6 (0.0625)
Radius of Cone Bases	25.4 (1.00)	31.8 (1.25)	44.5 (1.75)	47.6 (1.875)	51 (2.00)	51 (2.00)	51 (2.00)
Distance Between Cone Bases	12.7 (0.50)	12.7 (0.50)	12.7 (0.50)	12.7 (0.50)	12.7 (0.50)	38.1 (1.50)	38.1 (1.50)
Height of Flats @ Cone Bases	1.6 (0.0625) minimum	1.6 (0.0625) minimum	1.6 (0.0625) minimum	1.6 (0.0625) minimum	1.6 (0.0625) minimum	1.6 (0.0625) minimum	1.6 (0.0625) minimum
Length of Bolt	115 (4.5)	115 (4.5)	133 (5.25)	133 (5.25)	133 (5.25)	178 (7.0)	178 (7.0)



½" DIAMETER BOLT

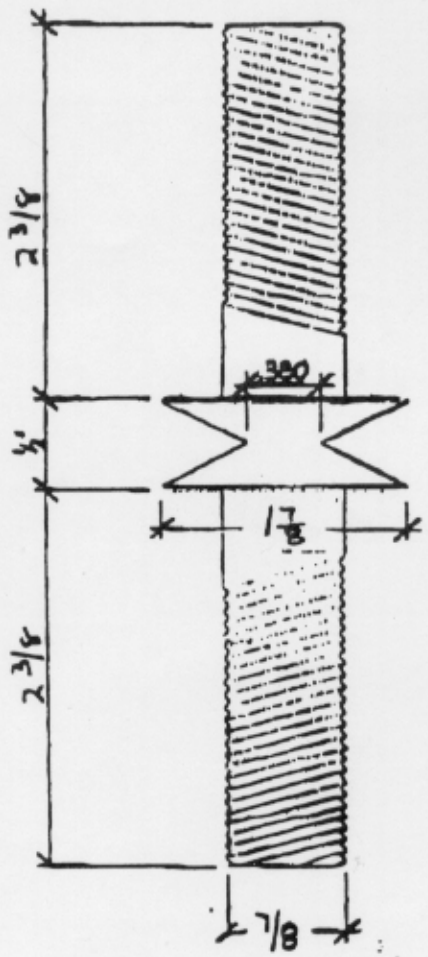


5/8" DIAMETER BOLT

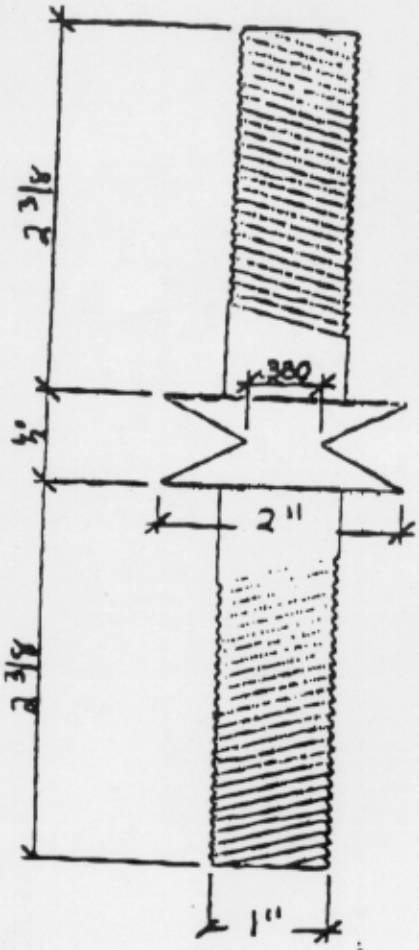
3/4" DIAMETER BOLT

(sign post)

9/9/96

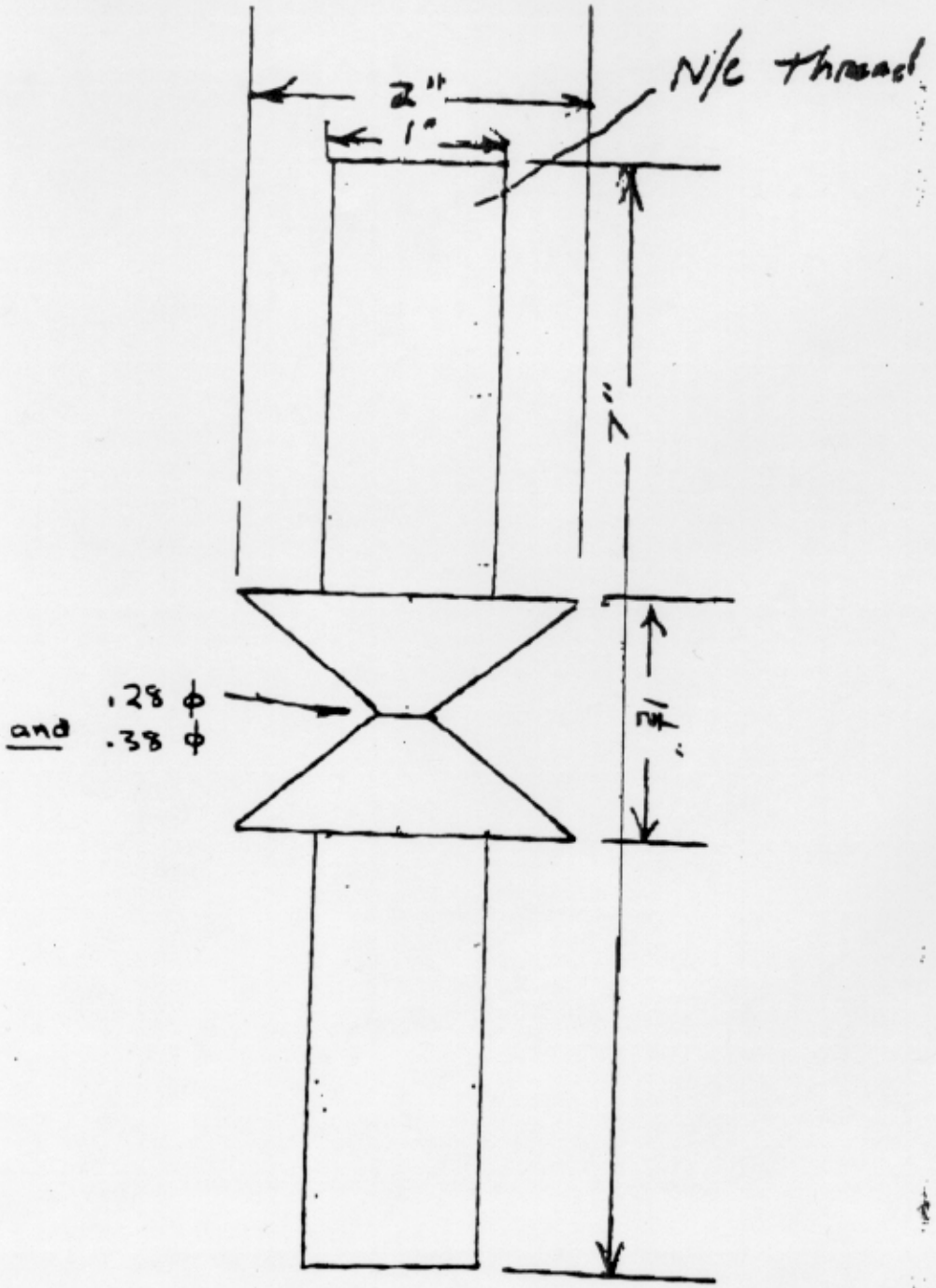


7/8" DIAMETER BOLT
(Sign Post)



1000 pcs

1" DIAMETER BOLT
(Sign Post)



321,000 pcs

1" DIAMETER BOLT