

**Commonwealth of Pennsylvania
Department of Transportation**

SPECIFICATION FOR SIGN STIFFENERS AND ACCESSORIES

January 7, 2016

1. DESCRIPTION

This material is for use in conjunction with flat sheet aluminum for the fabrication of large flat sheet aluminum stiffened signs. The flat sheet aluminum is riveted to the stiffeners which, in turn, are clamped, banded or bolted to posts or sign structures. All items shall work as components of a system.

2. REQUIREMENTS

2.1 Stiffeners and Splice Bars.

2.1.1 Option 1: The stiffeners and splice bars shall be extruded aluminum conforming to ASTM-B209, Alloy 6061-T6 and shall be free of stampings, labels and other commercial advertising. The length shall be as specified for each item, and the cross-sections shall conform to Attachment No. 1. All stiffeners to be banded 10 per bundle. All splice bars to be bundled 10 per bundle.

2.1.2 Option 2: The stiffeners and splice bars shall be extruded aluminum conforming to ASTM-B209, Alloy 6061-T6, and shall be free of stampings, labels and other commercial advertising. The length shall be as specified for each item, and shall conform to Attachment No. 2. All stiffeners to be banded 10 per bundle. All splice bars to be bundled 10 per bundle.

2.2 Bolts, Nuts, and Lock Washers.

2.2.1 For use with 2.1.1 Option 1. Stainless steel, Type 304, 5/16"x1", 5/16"x2" or 5/16"x 3" as specified with hex nuts. Standard bolts shall have a 1/2-inch square head with a 1/8-inch thickness. Twist-in bolts shall have parallelogram head 0.3125"x1.000", with a 0.130" thickness, designed to fit into the continuous slot of any of the stiffener sections. Twist-in bolts, nuts, and lock washers bought as a separate item shall be packaged 50 units per box (all orders for twist-in bolts will be in multiples of 50).

2.2.2 For use with 2.1.2 Option 2. 3/8" dia. x 1 3/4" T-head Galvanized Steel Bolt - ASTM A307; 7/16" galvanized steel lock-washer - ASTM A307; 3/8" galvanized steel hex nut - ASTM A307

2.3 Bucklestraps. Each bucklestrap shall consist of two bright annealed Type 201

stainless steel straps, 0.750"x0.030", with a Type 304 stainless steel toggle attached to one end of each strap by at least two projection welds, and a Type 304 stainless steel buckle attached to the other end of the shorter strap by at least two projection welds.

The buckle shall be formed from 0.0625-inch thick stock with the foot bent at 90° and designed to be inserted into the continuous slot of any of the stiffener sections identified under 2.1.1 Option 1. The strap shall be attached to the toggle at the end opposite the foot. The buckle shall be 0.0625-inch thick, 1.6 inches wide by a minimum 1.75 inch long including "U-shaped" locking tabs and a buckle slot on the face of the buckle.

When the buckles are inserted in the slot of a stiffener identified under 2.1.1 Option 1 and the straps are normal to the back of the stiffener, the longer strap shall be of sufficient length so that the end of the strap is 12, 16, or 20 inches from the back of the stiffener as specified, while the shorter strap shall be of sufficient length so that the slot in the buckle is 6, 8, or 10 inches, respectively, from the back of the stiffener.

2.4 Post Clips.

2.4.1 For use with 2.1.1 Option 1: Type 304 stainless steel, 14 gage, with 5/16"x2" bolt, nut, and lockwasher as specified in Section 2.2.1. The heel of the post clip shall be designed to fit into the continuous slot of the stiffeners and the opposite end shall be capable of clamping the flange of a W-beam post, so as to firmly attach the stiffener to the post. The post clip shall conform to Attachment 3. Post clips shall be packaged 50 per box (all orders will be multiples of 50).

2.4.2 For use with 2.1.2 Option 2: Aluminum alloy cast 380; cast 356 or wrought 6061-T6 with hardware as specified in Section 2.2.2. The post clip shall conform to Attachment 4. Post clips shall be packaged 50 per box (all orders will be multiples of 50).

2.5 Butting Plates.

2.5.1 For use with 2.1.1 Option 1. Type 304 stainless steel, 14 gage plate 1.000"x2.275" with three 3/8- inch holes in longitudinal centerline. The center of the three holes shall be 0.405, 1.395, and 1.885 inches from the one end. Each butting plate shall have two 5/16"x1" twist-in bolts, nuts, and lockwashers as per Section 2.2.1. Complete units to be packaged 50 per box (all orders will be multiples of 50).

2.5.2 For use with 2.1.2 Option 2. Type 304 stainless steel, 11 gage plate 1.000"x2.5" with two 7/16-inch holes in longitudinal centerline. The center of the two holes shall be 1/2" from each end. Each butting plate shall have two bolts, nuts and lockwashers as per Section 2.2.2. Complete units to be packaged 50 per box (all orders will be multiples of 50).

2.6 Pop Rivets.

2.6.1 For use with 2.1.1 Option 1. Aluminum rivets, Alloy 5056, shall have a 3/16-inch diameter and a 1/2-inch length, with a coated carbon steel mandrel. Rivets to be packaged 1,000 per box.

2.6.2 For use with 2.1.2 Option 2. Aluminum rivets, Alloy 5056, shall have a 3/16-inch diameter and a 5/8 inch length, with a coated carbon steel mandrel. Rivets to be packaged 1,000 per box.

2.7 Clamps for 1.0” Stiffeners. Type 304 stainless steel, 11 gage. Clamps for use with the 1.0” stiffener identified under 2.1.2 Option 2 will be dimensioned as identified in Attachment No. 5. Complete units to be packaged 50 per box (all orders will be multiples of 50).

3. PACKAGING

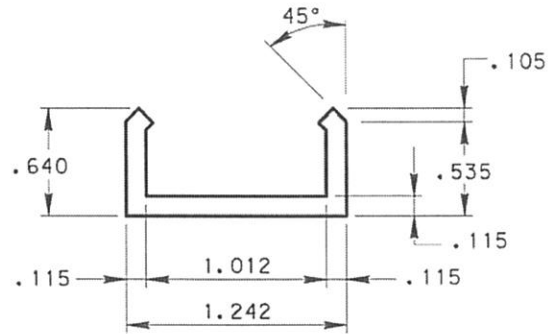
All boxes shall be labeled with item name and quantity for each box and banded to pallets and all stiffeners shall be shipped on open-bodied trucks. Spacer blocks shall be used beneath the stiffeners. All items to be positioned so that they can be unloaded from the side with a forklift.



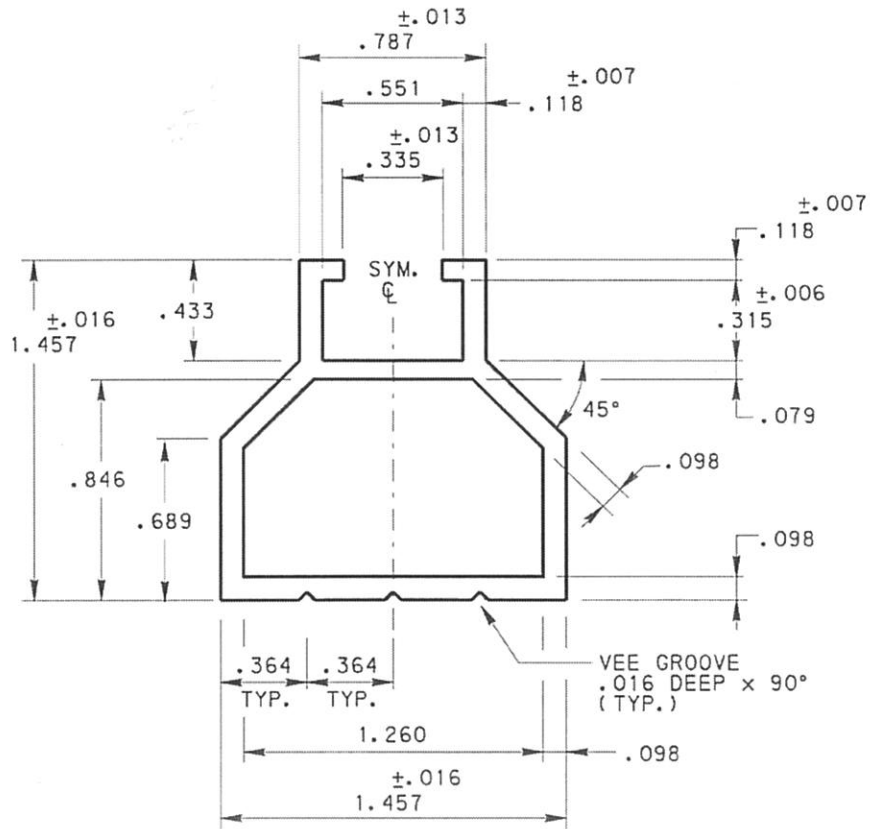
Robert J. Pento, P.E., Chief
Traffic Engineering & Permits Section

Attachments

ATTACHMENT NO. 1

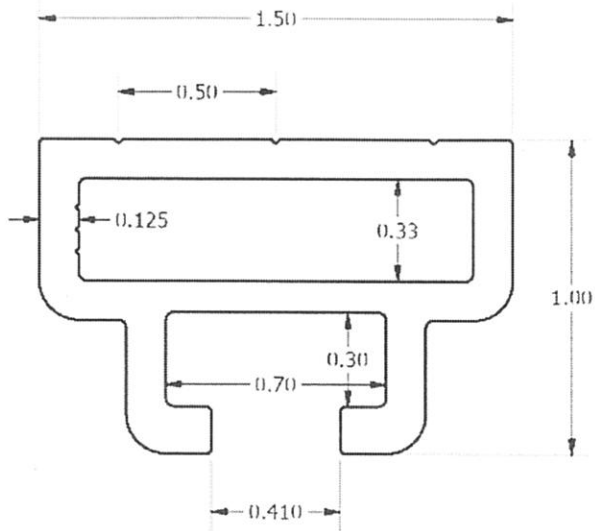


SPLICE BAR

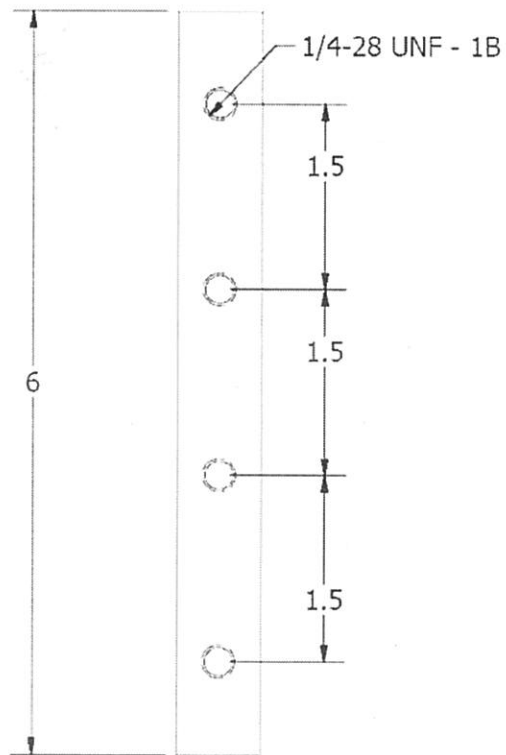


STIFFENER

ATTACHMENT NO. 2

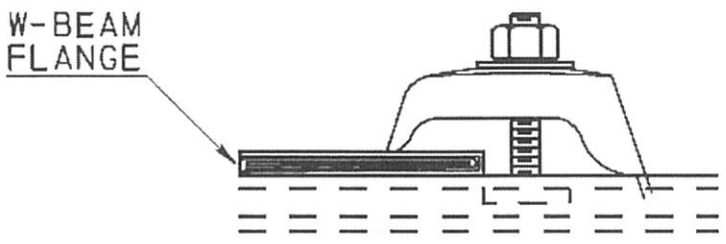


STIFFENER



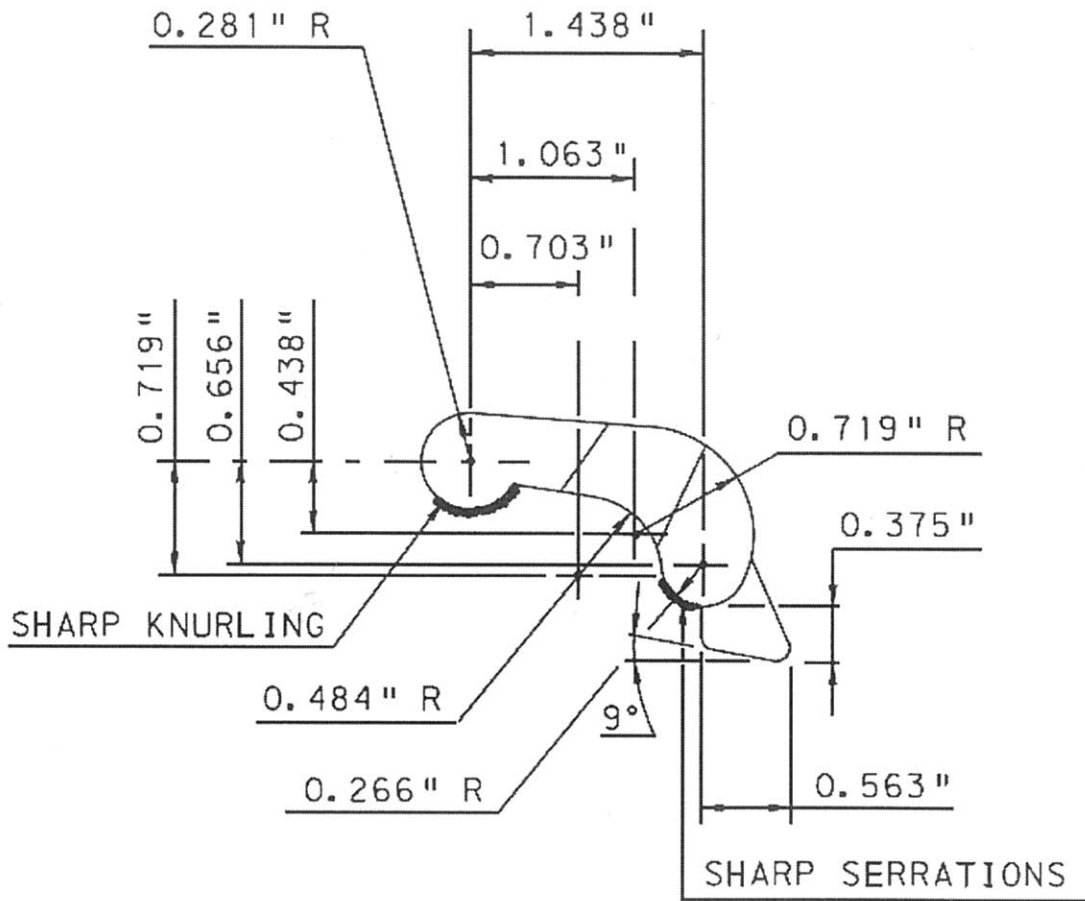
SPLICE BAR

ATTACHMENT NO. 3



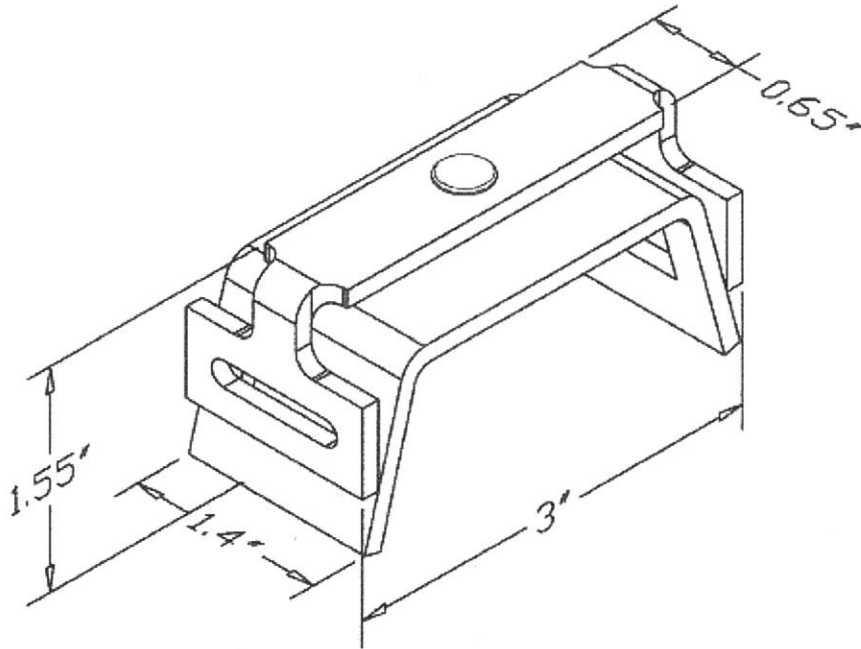
STANLESS STEEL POST CLIP

ATTACHMENT NO. 4



ALUMINUM POST CLIP

ATTACHMENT NO. 5



Clamp for 1.0" Sign Stiffener