C10.2 Sign Support Structures

C10.2.5 Detailing

Procedure for tightening anchor-bolt (anchor-rod) nuts for SOST-11 overhead bridge-type trusses and RDMS-13 roadside dynamic message sign supports

1) This work shall be performed only on days with winds less than 15 mph. All tightening of the nuts is to be done in the presence of the inspector. Once the tightening procedure is started it must be completed on all of the base plate nuts without pause or delay.
2) Properly sized wrenches designed for tightening nuts and/or bolts shall be used to avoid rounding or other damage to the nuts. Adjustable end wrenches or pipe wrenches shall not be used.
3) Base plate, anchor bolts, and nuts are to be free of any dirt or debris.
4) Apply stick wax or bees wax to the threads and bearing surfaces of the anchor bolts, nuts, and washers.
5) Tighten top nuts so they fully contact the base plate. Tighten leveling nuts to snug tight condition. Snug tight is defined as the full effort of one person on a wrench with a length equal to 21 inches. Apply force as close to the end of the wrench as possible. Pull firmly by leaning back and using entire body weight on the end of the wrench until the nut stops rotating. Use a minimum of two separate passes of tightening. Sequence the tightening in each pass so that the nut on the opposite side, to the extent possible, will be subsequently tightened until all of the nuts in that pass have been tightened.
6) Tighten top nuts to snug tight as described for the leveling nuts.
7) Match-mark the top nuts and base plate using paint, crayon, or other approved means to provide a reference for determining the relative rotation of the nut and base plate during tightening. Using a striking or hydraulic wrench, further tighten the top nuts in two passes as listed in the following table. Sequence the tightening in each pass so that the nut on the opposite side, to the extent possible, will be subsequently tightened until all nuts in that pass have been turned. Do not rotate the leveling nut during the top nut tightening.

Anchor-bolt size	First pass	Second pass	Total rotation
1½-inch diameter	1/6 turn	1/6 turn	1/3 turn

8) Lubricate, place, and tighten the jam nuts to snug tight.

Procedure for tightening anchor-bolt (anchor-rod) nuts for SCST-17 overhead cantilever-type trusses

Use the same notes as above with the following modifications:

- In Step 5, snug tight is defined as the full effort of one person on a wrench with a length equal to 42 inches
- In Step 7, replace the table for 1½-inch diameter anchor bolts with the table below for 3-inch diameter anchor bolts.

Anchor-bolt size	First pass	Second pass	Total rotation
3-inch diameter	1/12 turn	1/12 turn	1/6 turn

Erection tolerances for SOST-11 overhead bridge-type trusses

Foundations and anchor bolts

1) Each foundation shall be accurately located, with the center of the two anchor bolt groups not more than 1 inch from the plan location in the direction parallel with the truss and not more than 1 inch from the plan location in the direction perpendicular to the truss.

2) The two foundations shall be parallel. The distance (along the overhead truss) between the centers of front anchor bolt groups and the distance (along the overhead truss) between centers of rear anchor bolt groups shall not differ by more than 1 inch.
3) Elevations of the top of each foundation shall be within 1 inch of plan elevation.
4) Anchor bolt groups shall be located accurately with centers of adjacent anchor bolt groups within 3/16 inch of the plan distance apart.
5) Anchor bolts shall be plumb within 1/4 inch per foot from vertical.
6) Anchor bolts shall project above top of foundation within 1/4 inch of the plan dimension.
7) Welding of anchor bolts shall not be allowed. The contractor shall obtain a template from the manufacturer/fabricator for proper placement of the anchor bolts.

Completed structure

1) Each truss support post shall be plumb within 1/16 inch per foot of vertical in two perpendicular directions.
2) Stick-out of each truss lower chord shall be within 3 and 5½ inches measured from outer U-bolt to inside of chord stop ring.
3) The overhead truss shall be square within support posts. The horizontal lines between chords shall be level within 1/16 inch per foot of horizontal, and the vertical lines between chords shall be plumb within 1/16 inch per foot of vertical.

Erection tolerances for SCST-17 overhead cantilever-type trusses and and RDMS-13 roadside dynamic message sign supports

Foundations and anchor bolts

1) The foundation shall be accurately located, with the center of the anchor bolt group not more than 1 inch from the plan location in the direction parallel with the truss (mast arms for RDMS-13) and not more than 1 inch from the plan location in the direction perpendicular to the truss (mast arms for RDMS-13).
2) The elevation of the top of the foundation shall be within 1 inch of plan elevation.
3) Anchor bolts shall be plumb within 1/4 inch per foot from vertical.
4) Anchor bolts shall project above top of foundation within 1/4 inch of the plan dimension.
5) Welding of anchor bolts shall not be allowed. The contractor shall obtain a template from the manufacturer/fabricator for proper placement of the anchor bolts.

Completed structure

1) The post shall be plumb within 1/16 inch per foot of vertical in two perpendicular directions.
2) For the SCST-17 truss, the horizontal lines between chords shall be level within 1/16 inch per foot of horizontal, and the vertical lines between chords shall be plumb within 1/16 inch per foot of vertical.