ANCHOR-BOLT`NUT`TIGHTENING`PROCEDURE:
1) This work shall be performed only on days with winds less than 15 mph.
2) 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.
3) Properly sized wrenches designed for tightening nuts. Anchor bolts shall be used to avoid rounding or other damage to the nuts. Adjustable end wrenches or pipe wrenches may not be used.
4) Apply stock wrench 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 with a wrench with a length equal to 14 times the bolt diameter but not less than 10 inches. Apply force as close as possible to the end of the wrench as possible. FULLY, by leaning back and using the body weight on the wrench. After the nut steps rotating, use a minimum of two separate passes of tightening. Sequence the tightening in each pass so that the nut on the opposite side of the correct distance apart.
6) Tighten top nuts to snug tight as described for the leveling nuts.
7) Matchmark 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. (Note: The two separate passes are not necessary for leveling bolts and nuts. The tightening shall be performed by turn-of-nut method, which is the most accurate method for the leveling bolts and nuts.)
8) Lubricate, place and tighten the jam nuts to snug tight.

SPECIFICATIONS:
- Design stresses are based on AASHTO Standard Specifications for Highway Bridges, Series of 2013, Section 2.05.1 and 4.02.
- Design stresses for materials are in accordance with AASHTO Standard Specifications for Highway Bridges, Series of 2013, Section 2.05.1 and 4.02.

GENERAL NOTES:
- All roadside dynamic message sign (DMS) supports are designed for 40 lb/ft² wind pressure on members and CMS panel.
- Shop drawings shall be submitted by the contractor in accordance with Article 4.05.1 of the standard specifications.
- Clear distance from edge of concrete to the nearest reinforcing bar shall be 3" unless otherwise shown.
- Unless otherwise noted on the plans, keyways shown on the plans are based on normal dimensions. In addition, the level used in the keyway shall be limited to a maximum of 0.5 degrees from vertical.
- Roadside CMS supports shall not be used on bridges.
- The foundation shall be braced prior to erecting the DMS support frame. The foundation design is based on an allowable soil bearing of 675 lbs/ft² for locations within 20 feet of the edge of pavement. For locations more than 30 feet from the edge of pavement, the engineer shall inspect the soil in consultation with Iowa DOT soils design section to make sure the soil is meeting the 675 lbs/ft² allowable soil bearing capacity.

STRUCTURAL ALIGNMENT/TOLERANCE NOTES:
- The precise installation and alignment of all components of the roadside dynamic message sign support shall be considered essential. The contractor shall submit documentation to the engineer showing that the various components have been measured and are located within the tolerances listed below.
  1) The elevation of the top of the foundation shall be within 1 inch of plan elevation.
  2) Anchor bolt groups shall be located accurately by template or other approved means to provide a reference for determining the relative rotation of the anchor bolts and the base plate during tightening.
  3) Anchor bolts shall be spaced equally on the edge of the foundation.
  4) Anchor bolts shall be located at a distance no less than 1 inch from the edge of the foundation.
  5) Welding or bending of anchor bolts shall not be allowed. The contractor shall obtain a template from the manufacturer's fabrication shop prior to welding or bending of the anchor bolts.
  6) The support post shall be located within 3 inches of the vertical in two perpendicular directions in the completed structure.
  7) A horizontal line along each mast arm shall be level within 3 inches of the vertical in the completed structure.

U-BOLT NOTES:
- U-bolts may be made of galvanized steel or stainless steel and shall be in accordance with Article 4.05.1 of the standard specifications. Worn, regular nuts and washers may be used, but the length of the U-bolts specified regular nuts may be substituted for jam nuts. Lock washers shall not be substituted for jam nuts.

INDEX FOR ROADSIDE DMS SUPPORT STANDARDS
- INDEX AND NOTES FOR DMS SUPPORT
- SUPPORT POST DETAILS
- WORK PLATFORM DETAILS
- FOUNDATION DETAILS
- 3D PDF ROTATIONAL VIEW