

CHAPTER 17 – SIGNAL AND LIGHT POLES

SIGNAL AND LIGHT POLES

The standards and requirements for traffic control signal and light poles are presented in this chapter.

17.1 Traffic Control Signal Poles

17.1.1 MAST ARM POLES AND PEDESTALS

Mast Arm Poles

A PA traffic control signal pole consists of a transformer base, a vertical pole shaft, a mast arm truss, and where applicable, a luminaire shaft extension.

The PA pole is a 21-foot high tapered octagonal pole shaft. There are three pole types: the PA 85, PA 90, and the PA 100.

The tapered octagonal mast arm truss is attached to the top of the shaft. The mast arm consists of an upper and lower chord braced together to form a truss. The length of the mast arm trusses ranges from 15 – 55 feet depending on the PA pole type.



Figure 17-1: Type PA Mast Arm Pole

A BA traffic control signal pole consists of a vertical pole shaft, a mast arm truss, and where applicable, a luminaire extension shaft. The BA pole does not use a transformer base. Instead, a 10-inch by 12-inch access opening is provided in the pole shaft to access the wiring.

The BA pole is a 21-foot 10-inch high round shaft. There are five pole types; the BA 60, BA 65, BA 70, BA 75, and the BA 80.

The round tapered mast arm truss is attached to the top of the shaft. The mast arm consists of an upper and lower chord braced together to form a truss. The length of the mast arm trusses ranges from 60 - 80 feet depending on the BA pole type.

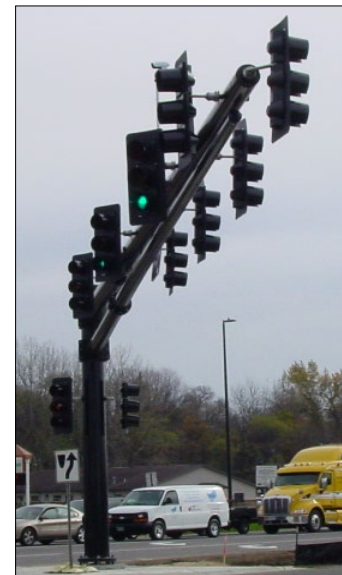


Figure 17-2: Type BA Mast Arm Pole

If required in the contract documents, a luminaire shaft extension is installed atop the signal pole shaft. Luminaires mounted on the shaft extension tenons are typically 40 feet above the roadway.

If required by the contract documents, swing away hinges must be installed on the mast arm. The hinges must be installed in such a manner that the mast arm swings away from the intersection.

Swing away hinges are used for traffic control signal systems that are located on house moving routes.



Figure 17-3: Swing Away Hinges

Before the project begins, the contractor must furnish to the engineer, for approval, four complete sets of shop drawings as specified in the contract documents.

The drawings must indicate all member materials and dimensions, section modules of the main component parts, and other pertinent data and calculations.

If approved by the engineer, one set of drawings must be distributed as specified in the contract documents.

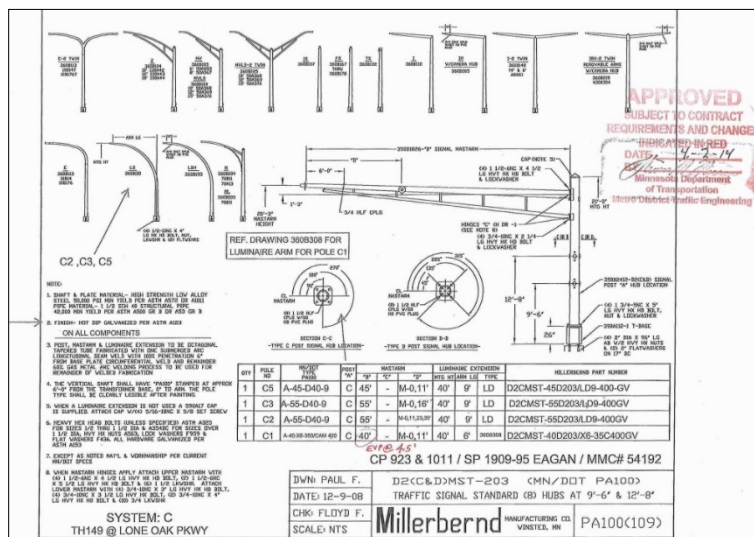


Figure 17-4: Shop Drawings

Mast Arm Pole Installation

Mast arm poles are plumbed by using the leveling nuts on the foundation anchor rods.

Poles must be carefully hoisted into position to avoid damage to the finish. Damaged areas must be repaired as specified in the contract documents.

The access door of the transformer base must be oriented away from the traffic, as specified in the contract documents, to allow service personnel to see the intersection while servicing the base.



Figure 17-5: Signal Mast Arm Pole Installation

The mast arm pole standard must be installed and tightened on the concrete foundation anchor rods as specified in the installation procedure as detailed in the contract documents.

After all mast arm pole standard wiring is complete, the access opening covers (see Figure 17-5) must be sealed with 100% clear silicone sealant at final installation.

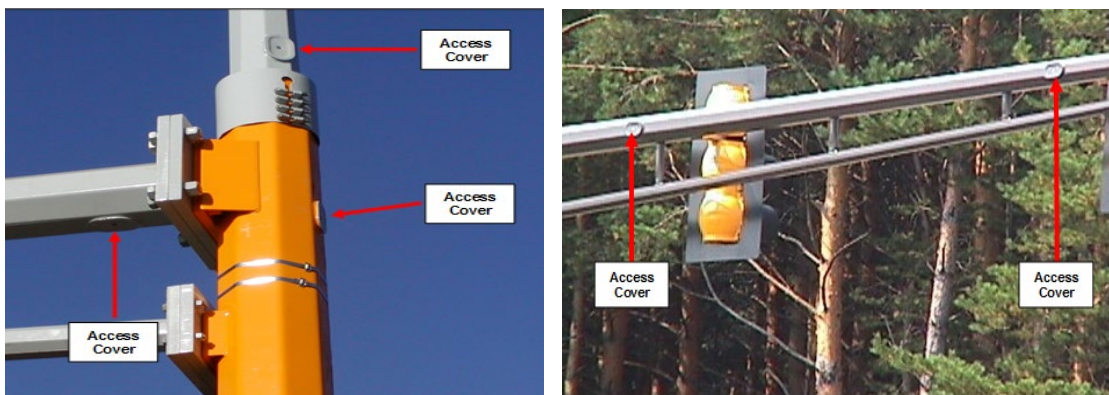


Figure 17-6: Access Opening Covers

Signal Mast Arm Structural Bolting (Bolts) Torque Values

For structural bolting connection mast arms and the pole to the pole base ensure the bolts are lubricated and tighten using a calibrated torque wrench in steps of 20%, 60% and 100% of the required torque value respectively and in a cross tightening pattern. Allow the bolts to relax for 10 minutes and retighten to 100% of the torque value in a cross tightening pattern.

BOLT DIAMETER	20% TORQUE	60% TORQUE	100% TORQUE
¾ inch	40 ft. lbs.	100 ft. lbs.	200 ft. lbs.
1 ½ inch	300 ft. lbs.	900 ft. lbs.	1500 ft lbs.
1 ¾ inch	550 ft. lbs.	1650 ft. lbs.	2800 ft. lbs.

17.2 Light Poles

MnDOT light poles:

1. Must be in accordance with MnDOT 3811 and the current edition of AASHTO Standard Specifications of Structural Supports for Highway Signs, Luminaires, and Traffic Signals.
2. If providing breakaway poles, the poles must be certified from the manufacturer that the pole meets specifications as specified in the current edition of AASHTO Standard Specifications of Structural Supports for Highway Signs, Luminaires, and Traffic Signals.
3. Must have a nominal 2 3/8-inch schedule 40 tenon for slip fit luminaire installation.
4. Davit or mast arm must have an upward angle from horizontal of 3 degrees +/- 2 degrees.

There are several of types of light poles MnDOT uses. The most common types of poles used on MnDOT lighting systems are:

- Stainless steel 40-foot and 49-foot breakaway
- Aluminum alloy 40-foot and 49-foot breakaway
- Coated (galvanized) steel bridge and barrier 40-foot and 49-foot nominal height non-breakaway
- High mast light towers

UPDATE:

Except for high mast light towers, light poles will soon be placed on MnDOT's Approved/Qualified Products List for Lighting. See special provisions for the project. Once light poles are placed on MnDOT's APL, this means they are pre-approved for use on construction projects. Therefore, shop drawings for light poles will not longer be required to submit and be signed off for approval by the district traffic office or the project engineer.

17.2.1 DEFINITION AND OVERVIEW

A lighting unit is defined as follows:

A lighting unit includes the light pole, internal wiring with fuse holder and fuse to the luminaire, above ground splices, wire holder, stainless steel woven wire cloth, and luminaire. Underpass luminaires are lighting units even though they do not include some of these components. The foundation is not considered as part of this definition.

The type of light pole required for each project will be shown in contract documents.

Light poles that are specified by MnDOT are fabricated from stainless steel, high strength steel, or aluminum.

Light poles fabricated from aluminum must have a factory installed vibration dampener.

Light poles must be fabricated in accordance with MnDOT 3811.

Within 15 days after the contract approval notice mailing date, the contractor must furnish evidence to the engineer, in writing, that orders have been placed for all components of the lighting units required for the project.

The contractor must submit to the engineer, for approval by the district's traffic engineer, sets of prints of required shop detail drawings of the light poles and anchor rods, in accordance with 2471.3.B. For high mast lighting installations, the contractor must submit final reproducible drawings in accordance with 2471.3.B. The drawings must be distributed after approval, to the following:

1. Contractor's fabricator
2. Contractor
3. Engineer
4. District traffic engineer

All light poles must be approved before installation.

The Engineer's acceptance of shop drawings will not relieve the contractor of full responsibility for submission of complete and accurate drawings and for the accurate assembly and fitting of all structural members.

17.2.2 TYPES OF LIGHT POLES

Stainless Steel 40-Foot and 50-Foot Breakaway

Stainless Steel Pole:

- Slip fit high base
- 16 sided
- Typically, single davit (6 feet - 12 feet)
- Mounts on Design E and H foundations
- Can be double davit in areas such as gores

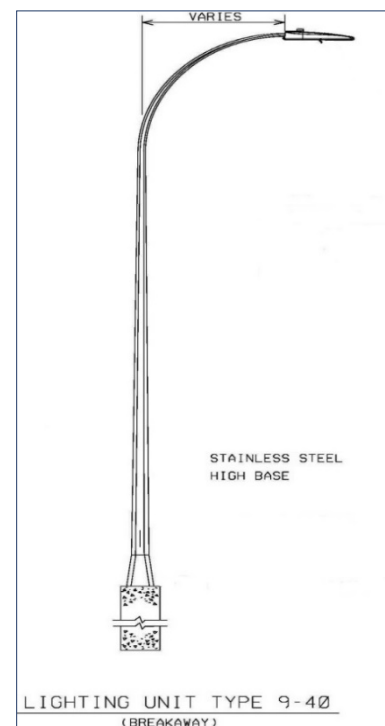


Figure 17-14: Stainless Steel Breakaway

Aluminum Alloy 40-Foot and 49-Foot Breakaway

Aluminum Alloy Pole:

- Transformer base (bolt on)
- Typically, single davit (6 feet - 12 feet)
- Mounts on Design E and H foundations
- Can be double davit in areas such as gores

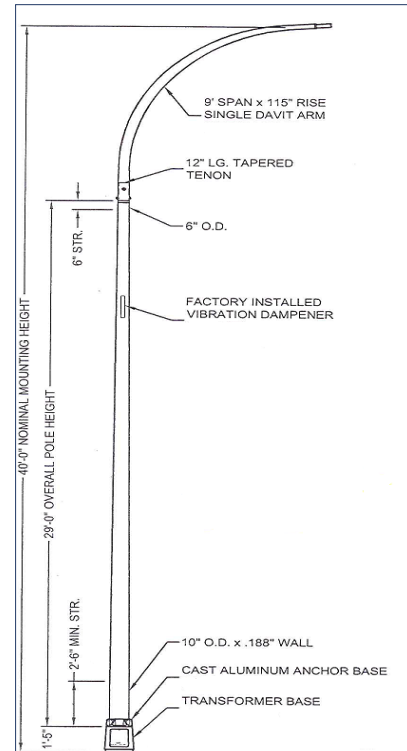


Figure 17-15: Aluminum Alloy Breakaway

Bridge and Barrier Poles 40-Foot and 49-Foot

- Galvanized steel
- Non-breakaway
- High base
- 6-bolt base plate
- Two access door assembly
- Single and double davit
- Mounted on barrier (center median and bridge barrier foundations)

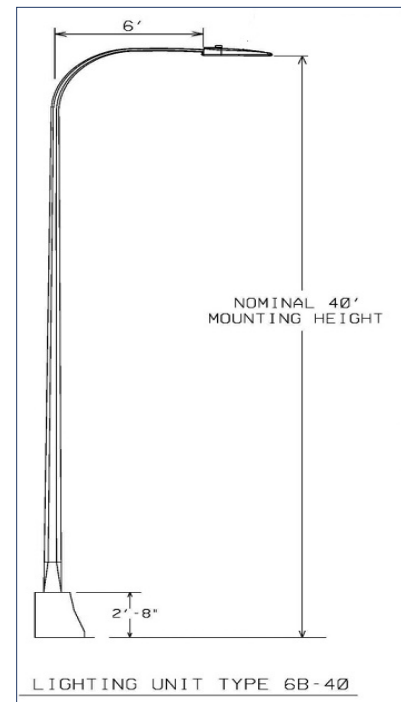


Figure 17-16: Bridge and Barrier Poles

High Mast Light Towers

- COR-TEN steel (weathering steel) or Galvanized
- High base design
- Typically, 100 feet to 140 feet
- Typically ring assembly holds 3 to 4 luminaires

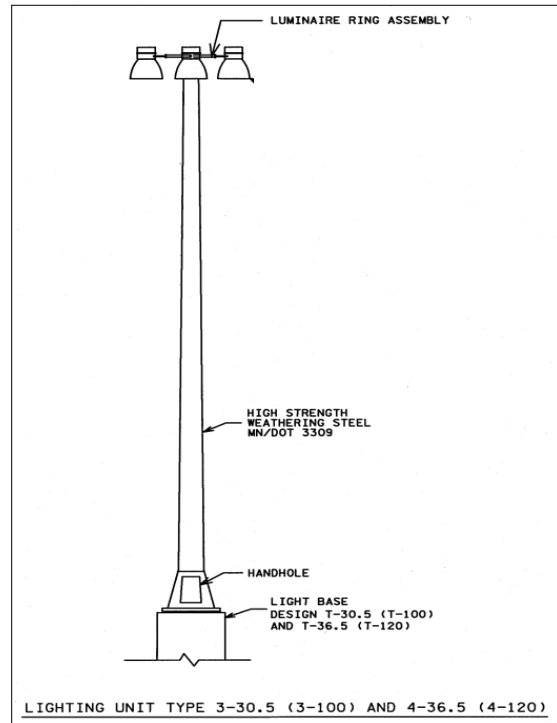


Figure 17-17: High Mast Tower

17.3 Installing Signal and Light Poles

The anchor rod connection is a critical component of foundations and pole structures. The primary functions of anchor rod connections are to attach a pole to a foundation and safely transmit loads from the pole into the foundation. For example, any applied force on the pole, like wind for instance, is transferred to the foundation via the anchor rods. This makes the anchor rods a critical part of the structure. Failure of anchor rod connections could lead to collapse of the pole. Therefore, it is imperative to follow the installation instructions and requirements in accordance with the pole manufacturer, the MnDOT Anchor Rod Tightening Handbook, and MnDOT contract documents.

MnDOT requires a hardened steel F436 structural washer between the nut and the baseplate unless the manufacturer requires a special washer to be used. Do not use lock washers in the anchor rod connection joint.

17.3.1 ANCHOR ROD CONNECTION TYPES

MnDOT requires two types of anchor rod connections depending on the pole structure. The anchor rod connection type used is based on the pole design and in some cases how the pole was tested during breakaway evaluation. Contractors must know which type of anchor rod connection to use that is required by the pole manufacturer. If you are uncertain of which type of anchor connection is required for the pole, then consult with the pole manufacturer or refer to contract documents.

Single Nut Connection

In a single nut connection, the base rests directly on the foundation and top nuts with washers are used to secure the base to the foundation as shown in *Figure 17-1 Single-nut Connection*. With some installations a special washer may be required by the manufacturer. Contractors must be aware of when these special washers are required to be installed. In addition, with any single nut connection, when leveling the pole or pole base is necessary, only use leveling shims in accordance with MnDOT Standard Plate 8129. Do not use washers or other hardware to level the pole base.

MnDOT pole structures that require a single nut connection includes the following:

- Aluminum light poles with transformer bases
- Traffic signal pedestal poles
- APS push button station (base)

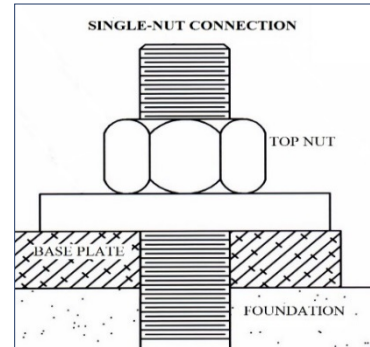


Figure 17-18: Single-nut Connection

When tightening single nut connection anchor rods, use a calibrated torque wrench to tighten, in a cross tightening pattern, three passes of 20%, 60%, and 100% of the required torque values respectively. Apply an approved anti-seize lubricant from MnDOT’s APL to the top threads of the anchor rods and the threads and the face of the nut that turns into the washers. Let the anchor rods relax for 10 minutes and retighten in a cross tightening pattern to 100% torque. Use the following torque values based on the poles base type.

BASE TYPE	20% TORQUE	60% TORQUE	100% TORQUE
Akron TB1-17	30 ft. lbs.	90 ft. lbs.	150 ft. lbs.
Signal Pedestal	18 ft. lbs.	54 ft. lbs.	90 ft. lbs.
Frey CP6	12 ft. lbs.	36 ft. lbs.	60 ft. lbs.

Double Nut Connection

A double nut connection means the baseplate of the pole is clamped or sandwiched between two nuts as shown in *Figure 17-2 Double Nut Connection*. The area between the two nuts is called the grip length. The grip length typically includes the baseplate and two hardened steel washers unless otherwise specified by the manufacturer.

The length of rod below the leveling nut is called the standoff distance. Standoff distance is defined as the clear space between the bottom of the leveling nut and the top of the concrete. The installer should be aware that standoff distances are required for a couple of reasons. One reason is an excessive standoff distance can put undue bending stresses on the anchor rods. The bending below the baseplate can permanently damage the anchor rods and cause pretension loss in the double nut connection. The other reason is, with some pole base designs specific standoff distances are required by the pole manufacturer to access the leveling nuts with a wrench and still have enough anchor rod left to install the top nuts.

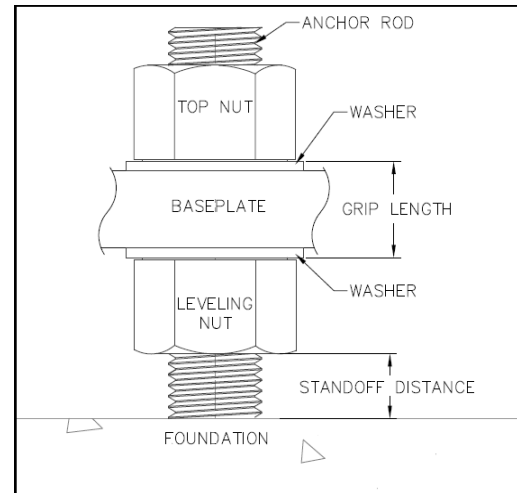


Figure 17-19: Double-nut Connection

Follow the standoff distances required by the pole manufacturer when installing double-nut connections. If no standoff distance is provided by the manufacturer, use the AASHTO recommended standoff distance of less than one bolt diameter.

Lift and safely move poles without damage. Avoid abrasion during lifting operations. Do not drag the poles on the ground and use natural or synthetic fiber slings and chokers for lifting. Protect the pole finish from coming in direct contact with the ground surface and metal hardware used for lifting and rigging. Repair any finish surface damage in accordance with the manufacturer's requirements.

Before standing poles on foundations:

1. Verify the anchor rod pattern matches the base plate hole pattern.
2. Verify the required anchor rod grade by locating the steel die stamped grade identification on the end of the anchor rod projecting above the concrete.
3. Verify anchor rods meet projections for a properly secured pole and meet AASHTO stub height requirements when breakaway is required.
4. Verify anchor rods are clean, not damaged, and plumb.
5. Verify nuts can be turned down on the anchor rods to the foundation and backed off by hand or by one worker using an ordinary wrench without a cheater bar.
6. Verify the base plate opening accommodates conduits and ground rod electrodes.
7. Ensure the pole is free of dirt or other foreign material, and
8. Inspect poles for damage.

Ensure the top of the anchor rod extends at least one thread beyond the top surface of the top nut. An anchor rod end inside the top nut where no threads extend beyond the top surface of the nut and the top nut is not fully engaged on the anchor rod after tightening is not acceptable.

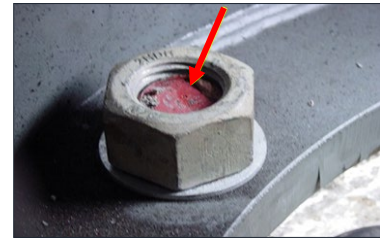


Figure 17-20: Insufficient Anchor Rod Projection

Place nuts, washers, and pole base plate on the anchor rods in the installation order required by the manufacturer and contract documents. Do not remove required nuts or washers from the connection. Do not add extra washers or additional hardware to the anchor rod connection.

MnDOT anchor rod connections used to attach stainless steel light poles and signal poles to foundations are a typical double-nut connection. In this connection, there are top nuts and leveling nuts that sandwich the base plate.

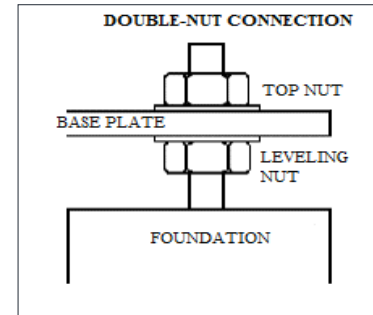


Figure 17-21: Double-nut Connection

Use the anchor rod connection required by the pole manufacturer.

Follow the standoff distances required by the pole manufacturer when installing double-nut connections. If no standoff distance is provided by the manufacturer, use the AASHTO recommended standoff distance of less than one bolt diameter. Standoff distance is defined as the clear distance between the bottom of the leveling nut and the top of the concrete for double-nut anchor rod connections.

Use hardened flat washers under the nuts being turned for tightening in the anchor rod connection unless the manufacturer does not specify it in their installation instructions. For example, the manufacturer for the cast aluminum frangible transformer base does not require a hardened flat washer under the top nut being turned.

See Chapter 18 “Anchor Rod Tightening” for anchor rod tightening requirements of double nut anchor rod connections.

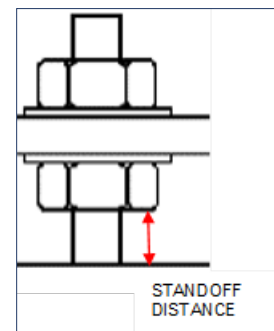


Figure 17-22: Standoff Distance

17.3.2 TRAFFIC CONTROL SIGNAL MAST ARM POLE INSTALLATION

Install traffic control signal mast arm poles in accordance with the pole manufacturer requirements and the contract.

There is a 1 inch lip or flange that overhangs on the mast arm transformer base. This 1 inch lip partially covers the leveling nuts. If the leveling nuts are set too low on the anchor rods a wrench head will not fit between the top of the foundation and the bottom edge of the 1 inch lip for access to the leveling nut. A wrench must be applied to both the top nuts and the leveling nuts to ensure proper tightening of the anchor rod connections.

The manufacturer recommends a standoff distance of $3/8"$ to $1/2"$. If a wrench cannot be applied onto the leveling nuts set the leveling nuts to the recommended standoff distance. Standoff distance is defined as the clear distance between the bottom of the leveling nut and the top of the concrete for double-nut anchor rod connections.

A recommended anchor rod tightening procedure for the PA 90 and PA 100 traffic signal mast arm poles is as follows:

The recommended hydraulic torque wrench is the "Stealth Series" low clearance (profile) hydraulic tool with digital pendant to tighten the top nuts to the required torque values.

The torque wrench can be purchased or leased. See MnDOT's APL under Lighting products "Low profile hydraulic torque wrenches", for more information on approved hydraulic torque wrenches and where they can be acquired.

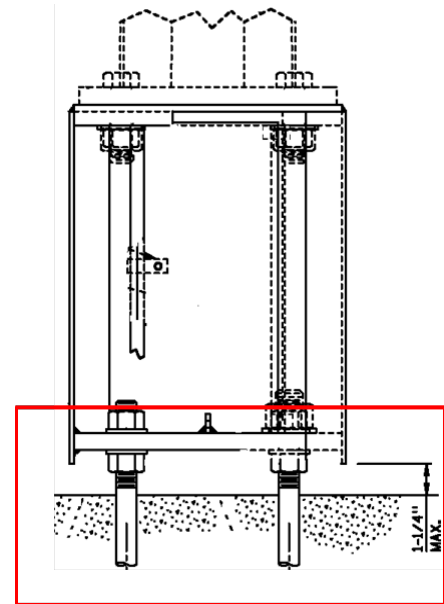


Figure 17-23: Flange Overhang on Base

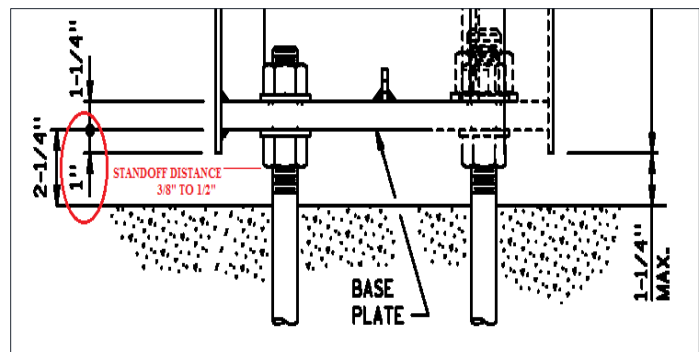


Figure 17-24: Recommended Standoff Distance Mast Arm Pole Transformer Base



Figure 17-25: Recommended Hydraulic Torque Wrench

17.3.4 ALUMINUM LIGHT POLE AND CAST ALUMINUM FRANGIBLE TRANSFORMER BASE INSTALLATION

Install aluminum light poles with cast aluminum frangible transformer bases in accordance with the pole and base manufacturer's installation instructions and MnDOT Specification 2545.3.H.

Use shims in accordance with Standard Plate 8129 under the base if leveling is required. Do not use leveling nuts. The top nuts with the required 1/2-inch-thick washers sometimes called "holddown washers" are used to secure the base tightly to the foundation, bringing all the plies of the connection together. This is called a single-nut connection as required by the pole manufacturer.

As shown in Figure 17-4, this particular manufacturer posts the installation instructions on a yellow caution sticker affixed to the back inside wall of every base that is AASHTO approved for breakaway.

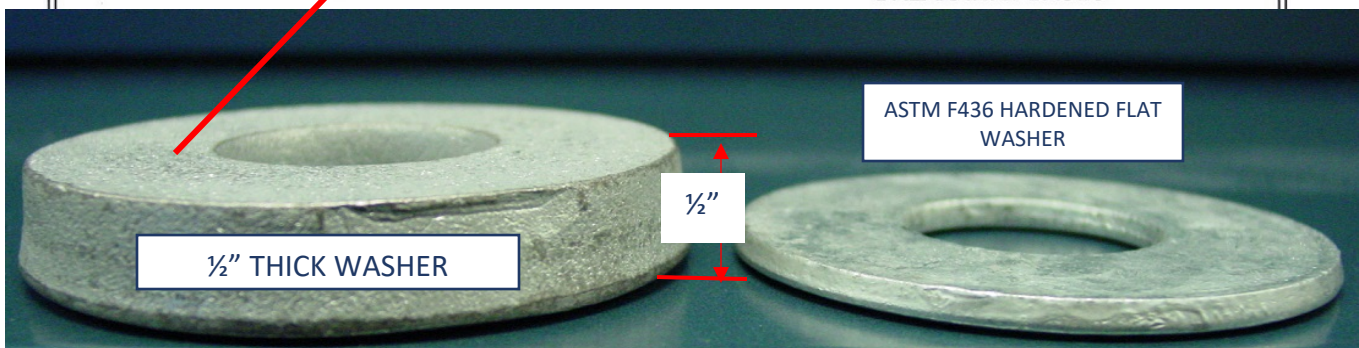
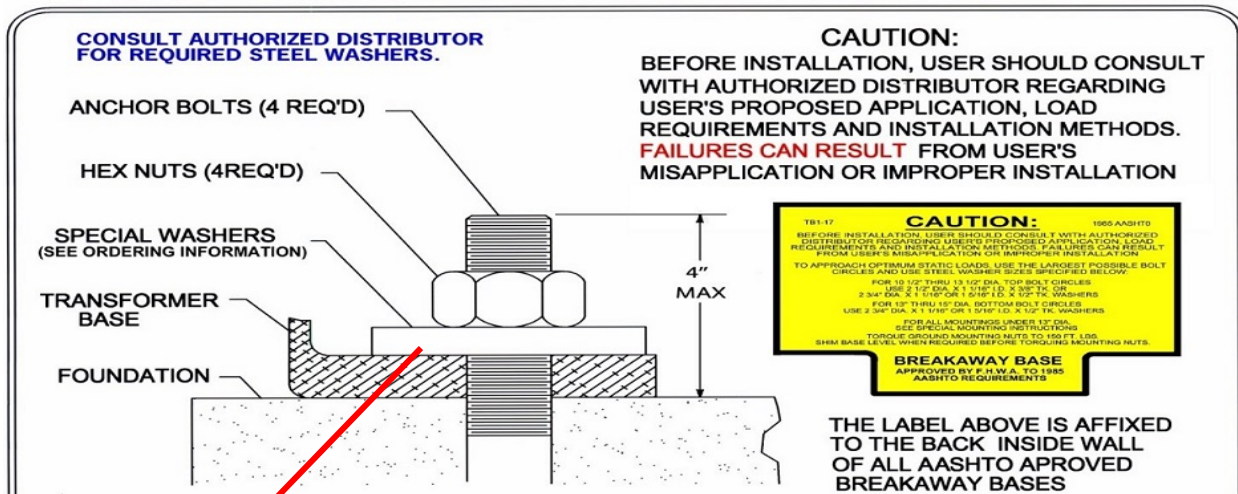
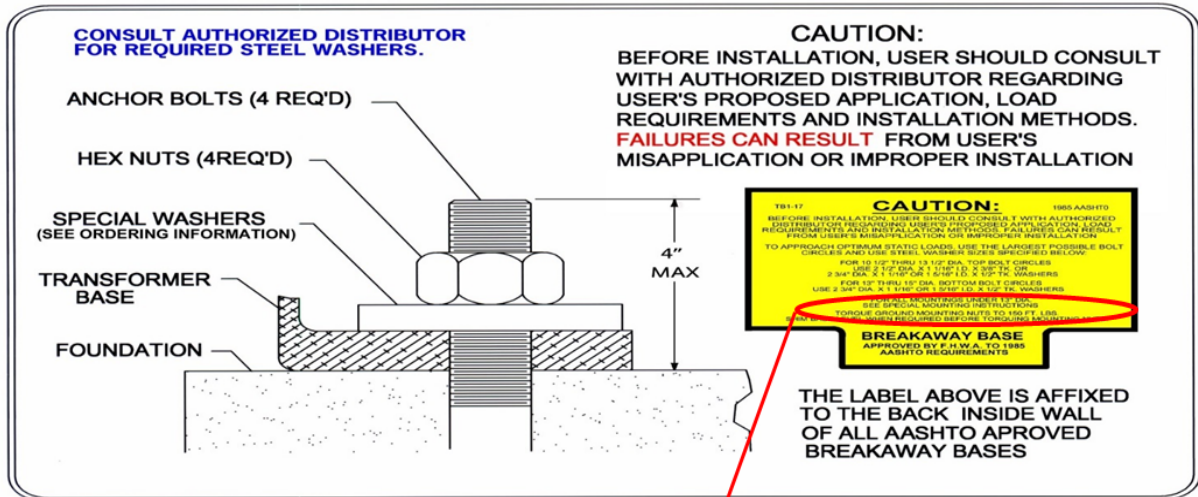


Figure 17-28: Installation Instructions

Torque the top nuts (ground mounting nuts) to the proper tightening level specified by the manufacturer. This manufacturer requires a torque value of 150 foot-lbs.

Use a torque wrench that has been recently calibrated to measure torque level and to verify that the manufacturer's specified torque value has been met.



TB1-17 AKRON FOUNDRY COMPANY AKRON, OHIO 1985 AASHTO

CAUTION

BEFORE THE INSTALLATION OF THIS BASE IN SERVICE, USER SHOULD ALWAYS CONSULT WITH AUTHORIZED DISTRIBUTOR REGARDING PROPOSED APPLICATION, LOADING TO BE SUSTAINED AND INSTALLATION INSTRUCTIONS. FAILURE(S) CAN RESULT FROM MISAPPLICATION, OVERLOADING/IMPROPER LOADING OR INCORRECT INSTALLATION.

TO APPROACH OPTIMUM STATIC LOADS, USE THE LARGEST POSSIBLE BOLT CIRCLES AND USE STEEL WASHER SIZES SPECIFIED BELOW:

FOR 10 1/2" THRU 13 1/2" DIA. TOP BOLT CIRCLES
USE 2 1/2" DIA. X 1 1/16" I.D. X 3/8" TK. OR
2 3/4" DIA. X 1 1/16" OR 1 5/16" I.D. X 1/2" TK. WASHERS

FOR 13" THRU 15" DIA. BOTTOM BOLT CIRCLES
USE 2 3/4" DIA. X 1 1/16" OR 1 5/16" I.D. X 1/2" TK. WASHERS

FOR ALL MOUNTINGS UNDER 13" DIA.
SEE SPECIAL MOUNTING INSTRUCTIONS

FOR OPTIMUM PERFORMANCE, MOUNT TRANSFORMER BASE ON A FLAT AND LEVEL FOUNDATION SURFACE. SHIM BASE WHEN REQUIRED, IF GAPS ARE PRESENT, THOROUGHLY FILL VOIDS WITH A NON-SHRINK GROUT. TORQUE GROUND MOUNTING NUTS TO 150 FT. LBS.

BREAKAWAY BASE
APPROVED BY F.H.W.A. TO 1985
AASHTO REQUIREMENTS

Figure 17-29: Torque Requirements

17.3.4 STAINLESS STEEL LIGHT POLE –HIGH BASE DESIGN “H” & “E” INSTALLATION

Stainless steel light poles are typically designed with a 15 inch diameter bolt circle for the 40 foot poles and 17 inch diameter bolt circle for the 49 foot poles. The high base design is called an “H” base but some refer to the 40 foot height poles as a Design “E” because they are installed on MnDOT Design “E” foundations, and 50 foot poles as Design “H” because they are installed on MnDOT Design “H” foundations.

Stainless steel light poles are installed on the foundations using double-nut anchor rod connections. Install stainless steel light poles in accordance with the pole manufacturer’s installation instructions. Contact the pole manufacturer for their installation instructions sheet.

MnDOT is finding a faster rate of dissimilar metals corrosion with stainless steel light poles and galvanized steel anchor rods. To slow down this rate of corrosion caused from dissimilar metals, MnDOT is exploring ways to help mitigate the issue. New installation requirements for stainless steel light poles now require Teflon or xylan coated washers be used to help isolate the galvanized steel anchor rod hardware and stainless steel base plate. The coated washers will be supplied by the pole manufacturer with poles. In conjunction with employing the coated washers a corrosion inhibitor anti-seize compound will be used. The anti-seize compound can be found on MnDOT’s Approved/Qualified list for Lighting Products called “Electrolytic Corrosion Inhibitor Lubricant”.



Figure 17-30: Base Plate Design Change Inner Lip Turned Downward

To help control corrosion of anchor rods in stainless steel poles, the pole base plate inner lip has now been turned downward or inverted. This change is to help prevent debris from collecting around the anchor rod connections inside the base.

Design “H” 50 Foot Light Pole Installation

A copy of the manufacturer’s Design “H” 50 foot pole installation sheet can be found in the Appendix.

Use the anchor rod assembly standoff distances specified in the manufacturer’s installation instructions sheet when installing the leveling nuts. Use the minimum standoff distance when possible. “Standoff” means the distance measured from the bottom of the leveling nut to the top of the foundation.

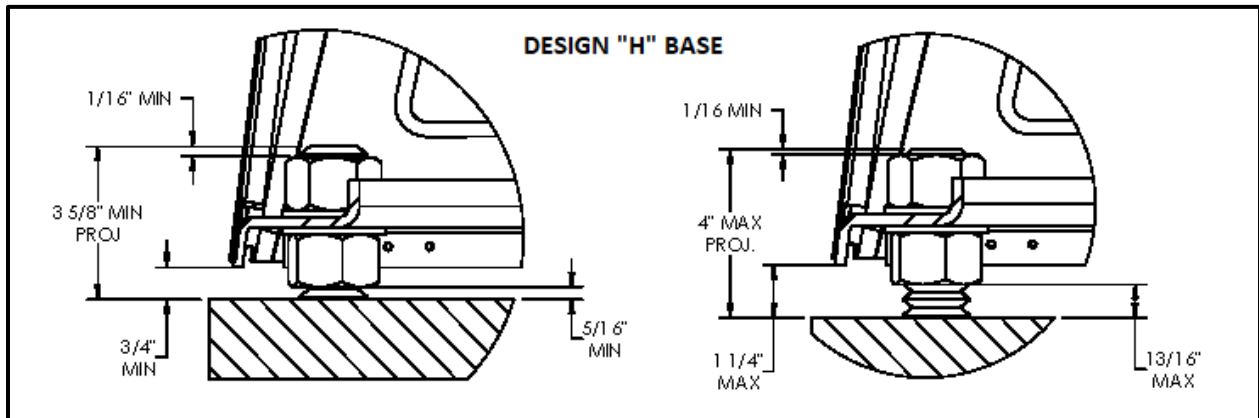


Figure 17-31: Design “H” Base 50 Foot Pole

Teflon or xylan coated F436 washers are required between the nuts and the base plate. Two washers per anchor rod. Install one washer between the leveling nut and bottom of the base plate and another washer between the top of the base plate and the top nut.

The stainless steel pole manufacturer will supply the Teflon or xylan coated F436 washers with the light poles. Do not install the coated washers on the anchors until it is time to install the pole on the foundation.

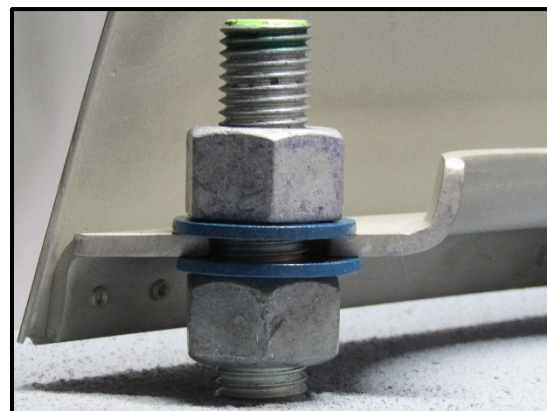


Figure 17-32: Teflon Coated Washers for Design “H” Base 50 Foot Pole

Design “E” 40 Foot Light Pole Installation

The 1 inch flange or lip around the base plate overhangs the lower portion of the anchor rod assemblies therefore covering the leveling nuts. This limits access to utilize a standard open-end wrench. Because of this overhang a Teflon or xylan coated 1/2 inch thick washer is required under the base plate of each anchor. The purpose of doing this is to lift the base plate and partially expose the leveling nut. This will in turn provide the access necessary to place a standard 1- 5/8 inch open end wrench head on the leveling nuts to turn.

Use the anchor rod assembly standoff distances specified in the manufacturer’s installation instructions sheet when installing the leveling nuts. Use the minimum standoff distance when possible. “Standoff” means the distance measured from the bottom of the leveling nut to the top of the foundation.

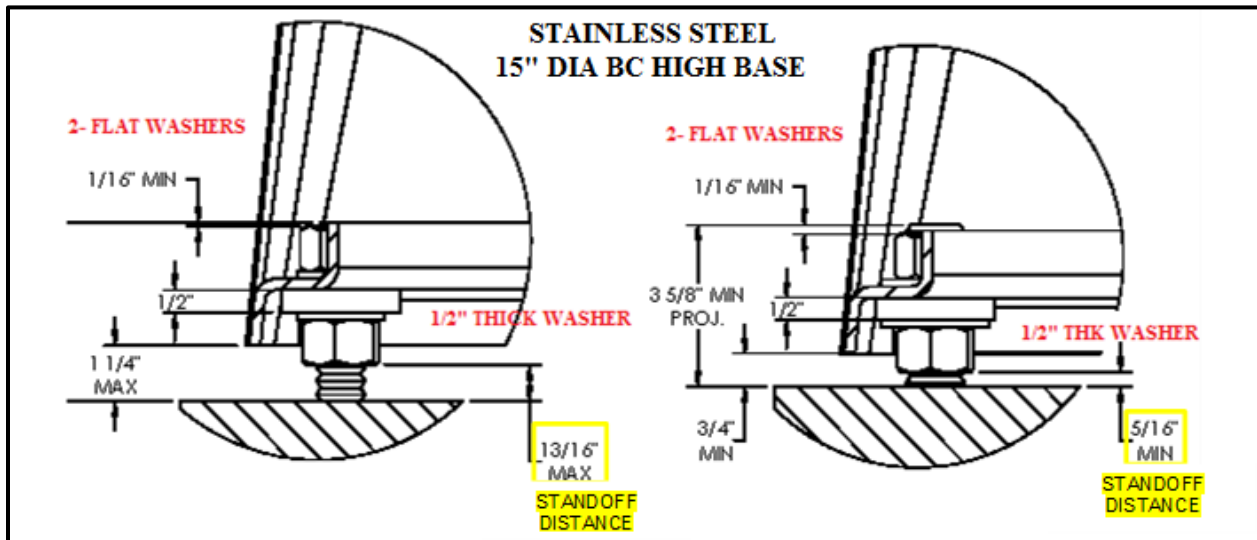


Figure 17-33: Design “E” Base 40 Foot Pole

Read carefully and strictly follow the instructions provided on the manufacturer’s installation instructions sheet to ensure correct placement and order of plies in the anchor rod connections. A “Stainless Steel Light Pole Design “E” Base Installation” sheet can be found in the Appendix that shows required distances and placement order of the plies in the anchor rod connections.

Install the Teflon or xylan coated F436 washers supplied by the pole manufacturer between the top nut and the baseplate. Do not install the coated washers and coated ½ thick washers/spacers on the anchors until it is time to install the pole on the foundation.

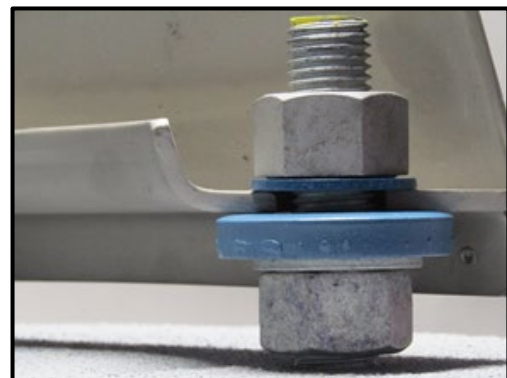


Figure 17-34: Teflon Coated Washer & ½" Thick Spacer for Design “E” Base For 40 Foot Pole

17.3.5 HIGH MAST LIGHT TOWER (HMLT) INSTALLATION

Install HMLTs (poles) on foundations in accordance with the manufacturer's pole erection drawings and installation instructions, 2545.3 "Pole Installation", High Mast Light Tower Special Provisions for the project, and the *MnDOT Anchor Rod Tightening Handbook*.

Before standing the HMLT on the foundation anchor rods provide the following:

- (1) Verify the position of the anchor rods matches the base plate holes
- (2) Verify the required 7 ½ inch anchor rod projection (measured from the top of anchor rod to the top of the foundation)
- (3) Verify that the leveling nuts turn onto the anchor rods well past the final elevation of the bottom of the leveling nut and backed off by one worker using an ordinary wrench without a cheater bar
- (4) Clean the anchor rods, nuts, and washers removing dirt, rust, burrs, loose scale, and other foreign material that would prevent solid seating of the connections

The required hydraulic torque wrench is the "Stealth Series" low clearance (profile) hydraulic tool with digital pendant to tighten the top nuts to the required torque values in accordance with contract documents.

The "Stealth Series" wrench can be purchased or leased from:

Hytorc MN- Sales & Rental Bolting Specialist
651-260-1508
glenn@hytorcnorth.com
420 Sycamore street west
Stillwater, MN 55082

Or use a low clearance (profile) hydraulic torque wrench with digital pendant and working digital torque read out in foot pounds to tighten the top nuts.



Figure 17-35: Required Hydraulic Torque Wrench

17.3.6 COMPLETE POLE INSTALLATION PROCESS

A complete pole installation process is defined in 2545.3H “Pole Installation” as from the time the pole is set on the foundation to the completion of the final tightening of anchor rod connections in accordance with the contract. Do not stop midway through the installation process. Do not stand poles on foundations without completion of final anchor rod connection tightening.

If there is concern about crane or equipment downtime, then plan accordingly to have two crews. Additional information has now been included in Special Provisions Lighting to “provide at least two crews; one crew to stand the pole and another crew to complete the required anchor rod tightening procedure in full on the same day of standing the pole.”



Figure 17-36: Setting a High Mast Light Tower with A Crane

17.3.7 LIGHT SYSTEM COMPONENT LABELING (2545.3)

The contractor must number the light poles or the luminaires when light poles are not required (underpass luminaires, tunnel luminaires, special luminaires, etc.) as specified in contract documents.

MnDOT approved labels are listed on MnDOT’s Approved/Qualified Products List (APL) for roadway lighting.



Figure 17-37: Lighting Pole Numbering

17.4 Rodent Intrusion Barrier for Traffic Control Signal and Light Poles

17.4.1 TRAFFIC SIGNAL POLES

The contactor must provide stainless steel woven wire cloth as specified in 2545.2 or an approved rodent intrusion barrier found on MnDOT's APL in traffic signal pole transformer bases MnDOT Standard Plate No. 8121. The stainless steel woven wire cloth is inserted and wound around the opening at the bottom of the pole transformer base in accordance with 2545.3 "Rodent Intrusion Barrier".



Figure 17-38: Stainless Steel Woven Wire Cloth

The rodent intrusion barrier found on MnDOT's APL should be installed according to the manufacturer's installation instructions. Use 100% silicone sealant to fill voids between the approved barrier and the base plate.



Figure 17-39: Approved Rodent Intrusion Barrier Found on MnDOT's APL

17.4.2 STEEL AND STAINLESS STEEL LIGHT POLES

The contractor must provide a stainless steel woven wire cloth as specified in 2545.2 or an approved rodent intrusion barrier found on MnDOT’s APL in steel and stainless-steel double-nut connection light pole bases with a 10 ¾ inch diameter base plate opening.

On light pole bases the woven wire cloth should be installed in accordance with 2545.3.



Figure 17-40: Woven Wire Cloth for Rodent Protection

The entire stainless steel woven wire cloth assembly must be grounded in accordance with the National Electrical Code (NEC).

The rodent intrusion barrier found on MnDOT’s APL should be installed according to the manufacturer’s installation instructions. Use 100% silicone sealant to fill voids between the approved barrier and the base plate.

A new rodent intrusion barrier was designed to fit the new design change of the stainless steel light pole base plate inverted lip.



Figure 17-41: Approved Rodent Intrusion Barrier Found on MnDOT’s APL New Design to Fit Base Plate Change

17.4.3 Aluminum Poles

For aluminum pole bases do not install stainless steel woven wire cloth. Instead, fill any gaps as a result of using leveling shims that exceed 1/8 in between the foundation and the aluminum pole base with 100% clear silicone sealant. Do not completely seal around the perimeter between the foundation and the aluminum pole base.

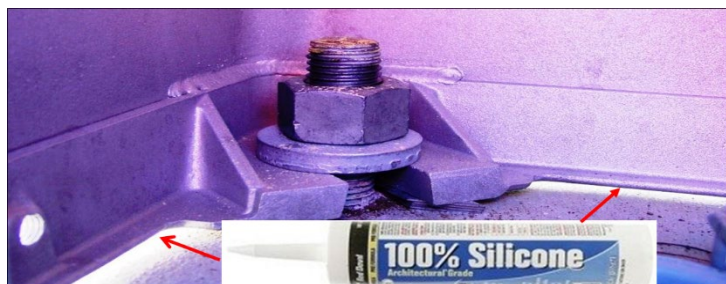


Figure 17-42: Aluminum Pole Rodent Intrusion

17.5 Chapter 17 Resources

- MnDOT Standard Specifications for Construction 3811, 2545.2, 2545.3,
- National Electrical Code (NEC).
- Standard Plate 8122, 8129
- AASHTO Standard Specifications of Structural Supports for Highway Signs, Luminaires, and Traffic Signals.