



*Florida Department of Transportation*

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GOVERNOR

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Tallahassee, FL 32399-0450

KEVIN J. THIBAUT, P.E.  
SECRETARY

June 29, 2021

Khoa Nguyen  
Director, Office of Technical Services  
Federal Highway Administration  
3500 Financial Plaza, Suite 400  
Tallahassee, Florida 32312

Re: State Specifications Office  
Section: **649**  
Proposed Specification: **6490500 Galvanized Steel Poles, Mast Arms, and Monotube Assemblies.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Jason Russell from the State Construction Office to update the articles for Remedial Work and Statewide Disputes Review Board. The following proposed changes are associated with changes to Section 646 and 715.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to [daniel.strickland@dot.state.fl.us](mailto:daniel.strickland@dot.state.fl.us).

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on File

Daniel Strickland, P.E.  
State Specifications Engineer

DS/ra

Attachment

cc: Florida Transportation Builders' Assoc.  
State Construction Engineer

**GALVANIZED STEEL POLES, MAST  
ARMS, AND MONOTUBE ASSEMBLIES  
(REV 5-25-21)**

SECTION 649 is expanded by the following new Articles:

**649-5 Remedial Work.**

During the painting warranty period, the responsible party shall perform all painting remedial work necessary to meet the requirements of this Specification at no cost to the Department. Such remedial work shall be performed within 180 days of notification of a failure by the Department or by the determination of the Statewide Disputes Review Board. Failure to perform such remedial work within the time frame specified will result in the work being performed by other forces at the responsible party's cost.

If the responsible party is the fabricator, the fabricator will be removed from the Prequalified Painted Galvanized Steel Poles and Aluminum Products Fabricators List for a minimum of six months or until payment in full for the correction of the deficiencies or defects has been made, whichever is longer.

If the responsible party is the Contractor, the Department will suspend, revoke, or deny the responsible party's certificate of qualification under the terms of Section 337.16(d)(2), Florida Statutes, for a minimum of six months or until payment in full for the correction of the deficiencies or defects has been made, whichever is longer.

**649-6 Statewide Disputes Review Board.**

The Statewide Disputes Review Board in effect for this Contract will resolve any and all disputes that may arise involving administration and enforcement of this Specification related to the painting remedial work performed during the warranty period. The Responsible Party and the Department acknowledge that use of the Statewide Disputes Review Board is required, and the determinations of the Statewide Disputes Review Board for disputes arising out of this Specification will be binding on both the Responsible Party and the Department, with no right of appeal by either party. Meet the requirements of 8-3.

ARTICLES 649-5 through 649-7 are deleted and the following substituted:

**649-5-7 Installation.**

Install foundations in accordance with Section 455. Do not install poles, mast arm poles, or monotubes until the foundation has achieved 70% of the specified 28-day concrete strength and verifying test results have been submitted to the Engineer. Determine concrete strength from tests on a minimum of two test cylinders prepared and tested in accordance with ASTM C31 and ASTM C39. Before erecting the pole, clean the top of the foundation of any laitance, oils, grease or any other deleterious materials. Erect strain poles in an orientation which considering the rake and the application, cable forces will produce a plumb pole. Erect monotubes plumb at the time of installation. Plumb the pole supporting mast arms after the mast arms, traffic signals or sign panels have been placed.

If the traffic signals and/or sign panels are not in place within two working days after the mast arm is erected, furnish and install a 3 foot x 2 foot blank sign panel on the bottom of each

mast arm within 6 feet of the mast arm tip and plumb the pole. Re-plumb the pole supporting mast arms after installation of traffic signals and sign panels.

Install ASTM F3125, Grade A325 bolt, nut and washer assemblies in accordance with the following. Use bolt, nut and washer assemblies that are free of rust and corrosion and are lubricated properly as demonstrated by being able to easily hand turn the nut on the bolt thread for its entire length. Tighten nuts to a snug-tight condition to bring the faying surfaces of the assembly into firm contact with plies solidly seated against each other, but not necessarily in continuous contact. Snug-tight is defined as the maximum nut rotation resulting from the full effort of a person using an ordinary spud wrench. Visually inspect the connection after snugging all bolts, ensuring firm contact has been achieved at a minimum between faying surfaces beneath bolts within one bolt diameter of bolt hole edges. Re-snug bolts in a connection where faying surfaces are not in firm contact. After bringing the faying surfaces to a snug-tight condition, tighten nuts in accordance with Table 460-7, Nut Rotation from the Snug-Tight Condition. Maintain as close to uniform contact pressure as possible on the faying surfaces during snugging and turn-of-nut process by utilizing suitable erection methods and a bolt tightening pattern that balances the clamping force of each bolt, as closely as possible, with the equal clamping force of a companion bolt.

Base plate installation steps are as follows:

1. Clean and lubricate the exposed threads of all anchor bolts. Clean and lubricate the threads and bearing surfaces of all leveling nuts. Re-lubricate the exposed threads of the anchor bolts and the threads of the leveling nuts if more than 24 hours has elapsed since earlier lubrication, or if the anchor bolts and leveling nuts have become wet since they were first lubricated.
2. Verify that the nuts can be turned onto the bolts past the elevation corresponding to the bottom of each in-place leveling nut and be backed off by the effort of a person using an ordinary spud wrench, without employing a pipe extension on the wrench handle.
3. Turn the leveling nuts onto the anchor bolts and align the nuts to the same elevation less than or equal to one bolt diameter from the top of the foundation.
4. Place structural plate washers on top of the leveling nuts; one washer corresponding to each anchor bolt.
5. Install the base plate onto the leveling nut washers, place structural plate washers on top of the base plate; one washer corresponding to each anchor bolt, and turn full or half-size anchor nuts onto the anchor bolts.
6. Tighten anchor nuts against the top of the base plate to a snug-tight condition in a star pattern. A star tightening pattern is one in which the nuts on opposite or near opposite sides of the bolt circle are successively tightened in a pattern resembling a star. For an 8 bolt circle with bolts sequentially numbered 1 to 8, tighten nuts in the following bolt order: (1, 5, 7, 3, 8, 4, 6, 2).
7. Tighten leveling nuts to a snug-tight condition in a star pattern. The distance from the bottom of the leveling nuts to the top of the concrete must not exceed one anchor bolt diameter after tightening.
8. Tighten each full-size retainer nut until it is in firm contact with the top surface of the anchor nut; then while preventing the anchor nut from rotating, tighten the retainer nut until it is snug tight using a star pattern. Before final tightening of the retainer nuts, mark the reference position of each snug-tight nut on one flat with a corresponding reference mark on the

anchor nut and base plate on each bolt. Then while preventing the anchor nut from rotating, incrementally turn the retainer nuts using a star pattern until achieving the required nut rotation specified in Table 649-1. Turn the nuts at least two full tightening cycles (passes). After tightening, verify the nut rotation. Do not exceed the Table 649-1 value by more than 20 degrees.

9. Install a screen over the gap between the base plate and foundation concrete in accordance with 649-6, or place a structural grout pad in accordance with 649-7.

Anchor Bolt Diameter (inches)	Nut Rotation from Snug-Tight Condition
$\leq 1-1/2$	1/3 turn
$> 1-1/2$	1/6 turn

**649-57.1 Camera Lowering Device Installation:** Meet the requirements of 641-4.4.

### **649-68 Screen Installation.**

On steel strain poles and steel monotube assemblies, install a screen that will prevent vermin and debris from entering the gap between the bottom of the base plate and the top of the concrete foundation. Cover the entire gap with a wire screen, the bottom horizontal wire of which shall be in full contact with the surface of the concrete foundation and the top horizontal wire of which shall not extend beyond the top surface of the base plate. For the screen, use standard grade plain weave galvanized steel wire cloth with 1/2 inch x 1/2 inch mesh and 0.063 inch diameter wires. Vertical screen wires shall not extend beyond the top and bottom horizontal wires of the screen. Use one continuous section of screen with only one overlapping splice where the ends come together and overlap the layers 3 inches minimum. Attach the screen to the vertical side of the base plate with self-tapping stainless steel screws (No. 8, 1/2 inch long) with stainless steel washers (1/4 inch inside diameter). Drill pilot holes into the base plate to facilitate screw installation. Install screws on 9 inch centers maximum and at least one screw shall be installed through the overlapping splice to clamp the layers together. Also clamp the overlapping splice layers together just above the concrete foundation with an all stainless steel fastener assembly consisting of a machine screw (No. 8, 5/8 inch long), nut and two flat washers (1/4 inch inside diameter) and lock washer. Tightly clamp the screen layers between the flat washers.

### **649-79 Structural Grout Pads.**

On mast arm support structures, install a structural grout pad in accordance with the Standard Plans and manufacturer's instructions. Prior to grout placement, flush the top of the foundation with water to remove any dirt and debris.

Mix grout to a fluid state in accordance with the manufacturer's recommendations. Test the grout fluidity using ASTM C939 Flow Cone Method. Discard any grout with an unacceptable efflux time.

Do not use mechanical means to push or vibrate the grout. Clean any excess grout from the base plate. Verify that water inside the pole will drain freely through the installed drain hole.

ARTICLE 649-8 is deleted:

**~~649-8 Remedial Work.~~**

~~During the warranty period, the responsible party shall perform all remedial work necessary to meet the requirements of this Specification at no cost to the Department. Such remedial work shall be performed within 180 days of notification of a failure by the Department. Failure to perform such remedial work within the time frame specified will result in the work being performed by other forces at the responsible party's cost.~~

~~If the responsible party is the fabricator, the fabricator will be removed from the list of Prequalified Fabricators of Painted Galvanized Steel Poles, Mast Arms and Monotube Assemblies for a minimum of six months or until payment in full for the correction of the deficiencies or defects has been made, whichever is longer.~~

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ARTICLE 649-9 is deleted:

**~~649-9 Statewide Disputes Review Board.~~**

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Table 649-1	
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