

6490000 GALVANIZED STEEL STRAIN POLES, MAST ARMS AND MONOTUBE
ASSEMBLIES
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Bruce Leach
407-908-3000
bruceleach@tcd-usa.com

Comment: (2-19-14, Internal)

I see a lot of problems with this new Spec.

1. Who would be responsible to do the Flow Cone Test ASTM C939? CEI or the Contractor?

Response: The Contractor.

2. Will we have to comply with Section 925?

Response: Yes, the spec states "Cure the grout in accordance with the manufacturer's instructions and Section 925."

3. Will this be part of our Q/C plan and have to be certified by an engineer?

Response: No.

4. Will the grout pad have a chamfer edge?

Response: No.

5. How do you propose to remove the backer rod?

Response: The backer rod has a slick outer surface that should be lubricated. We are open to any other methods that provide a working drain.

No change made.

Dan Hurtado
414-4155
dan.hurtado@dot.state.fl.us

Comment: (2-24-14, Internal)

The State Construction Office offers the following comments:

1. The language should be expanded to include cantilever monotube assemblies

Response: Section 649 was not written for monotube sign structures. The monotubes in 649 were in reference to our traffic signal monotube Design Standard. The standard was not used much and removed, but the specification still mentions monotubes in the event a custom designed traffic signal monotube is used.

No change made.

2. 649-2 already addresses the requirement to use QPL grouts meeting the requirements of Section 934. The requirement in 649-7 can be removed

Response: Agree. Change made.

3. SCO has received review comments from Industry (above and below - Leach and Shea comments) that appear legitimate and should be addressed

Response: Agree. Comments addressed in this document.

4. Although monotube assemblies do not have an associated Standard Design Index, it might be suitable to insert a detail into the mast-arm standard which depicts the installation. The detail could be referenced from within the Spec. A single drawing could eliminate a lot of the descriptive language and eliminate confusion in the field.

Response: The Design Standard Index for Mast Arms and Cantilever Sign Structures will be modified to show a grout pad.

5. Obtaining a manufacturer's representative is not necessary, and is a practice we are trying to depart from.

Response: Language has been removed.
Change made.

6. Section 649-5, 3rd paragraph. In the sentence beginning "After bringing the faying surfaces to a snug-tight condition..." the word "with" should not be struck-through.

Response: Agree. Change made.

Ed Shea
561-262-2449
eshea@thesignalgroup.com

Comment: (2-24-12, Internal)

1. Typically backer rod is something that is small in diameter in nature. Even if it could be removed, I suspect in time it will become clogged with debris preventing proper drainage.

Response: Maintenance has formed drain holes using backer rod. Other types of drain holes are not prohibited. We accept the reality that some drain holes may clog.
No change made.

2. From a practical point of view, is a Contractor going to be able to get a representative from the grout supplier on site to oversee the material is being installed properly. This may be OK on small one intersection projects, however what about projects that have many intersections where there will be several times this Rep. may need to show up. Is it possible to be pre-certified?

Response: Language has been removed.
Change made.

3. If the overall concern for re-introducing grout pads is due to anchor bolt nuts loosening from vibration or oscillation, maybe it should be considered to have “Jam” ½ nuts installed both below and on top of the base plated to secure the mainframe AB nuts from loosening instead of grout.

Response: Research has shown that an ungrouted anchor bolt group, with a one bolt diameter standoff distance, has half the capacity of an anchor bolt group with a properly grouted pad. Requiring a properly grouted pad on sign and signal support structures with significant torsion will reestablish the torsional safety factor for the anchor bolt group.
No change made.

Shailesh Patel
386-943-5347
shailesh.patel@dot.state.fl.us

Comment: (6-23-14) Suggested revisions are highlighted.

1. 649-2 Materials: (second paragraph)

→ Obtain strain poles, mast arm, and monotube assemblies from a fabrication facility that is listed on the Department's list of **Metal Producers with an Accepted Quality Control Program**, meeting the requirements of 105-3.¶

Response: This is the title of a Department document and capital letters are appropriate.
No change made.

2. 649-3 Fabrication: (third paragraph, first sentence)
Add a comma between “assemblies” and “including”.

Response: Thank you for your comment. No change made.

3. 649-4.1 Galvanizing:

→ **649-4.1 Galvanizing:** Galvanize all components in accordance with ASTM A123, except galvanize for all fastener assemblies, which shall be galvanized in accordance with ASTM A153. Use galvanizing methods which provide surfaces suitable for painting.¶

Response: Thank you for your comment. No change made.

4. 649-4.2 Surface Preparation:

→ **649-4.2 Surface Preparation:** Prepare all galvanized surfaces to be painted in accordance with ASTM D6386 and the **coating system manufacturer's of the coating system's** specifications. Provide a clean and suitable galvanized surface that maximizes coating system adhesion.¶

Response: Thank you for your comment. No change made.

5. 649-4.3.1 General: (7th and 8th sentences)

At the time of their delivery, the sample coupons described in this paragraph shall match the color of the strain poles, mast arms and monotube assemblies to within 1ΔE measured as specified in Section 975-4. If the delivered sample coupons exhibit a difference in color from the strain poles, mast arms and monotube assemblies greater than 1ΔE, ~~then~~ the sample coupons will be considered unacceptable and no payment shall be made for the materials which the sample coupons represent. Those materials shall not be accepted by the Department until acceptable

Response: The word “Section” is only used when referring to the entire section. No change made.

Second change will be made.

6. 649-4.3.2 Responsible Party Warranty:

Add the word “Section” before 975-4 and 5-11.

Response: The word “Section” is only used when referring to the entire section. No change made.

7. 649-5 Installation: (1st paragraph, 5th and 6th sentences)

deleterious materials. Erect strain poles in an orientation ~~which~~ where, considering the rake and the application, cable forces will produce a plumb pole. Erect monotubes plumb at the time of installation. Plumb ~~the pole's~~ supporting mast arms after the mast arms, traffic signals or sign panels have been placed.¶

Response: Thank you for your comment. No changes made.

8. 649-5 Installation: (3rd paragraph)

→ Install ASTM 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 ~~that~~ 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 full contact which is referred to as snug-tight. Snug-tight is defined as the maximum nut rotation resulting from the full effort of one person on using a 12 inch long wrench or equivalent. After bringing the faying surfaces to a snug-tight condition, tighten nuts in accordance with ~~the turn of nut method in 460-5, Table 460-7, Nut Rotation from the Snug-Tight Condition.~~ Maintain uniform contact pressure on the faying surfaces during snugging and turn-of-nut processes, by using 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.¶
Repeate Installation steps as follows:¶

Response: “That” has been deleted; “on” changed to “using”; hyphen will be added. No other changes made.

8. 649-5(5):

corresponding to each anchor bolt.¶

→ → 5) Install the base plate onto the leveling nut washers, **and** place structural plate washers on top of the base plate; one washer corresponding to each anchor bolt, and turn the top nuts onto the anchor bolts.¶

Response: Thank you for your comment. No changes made..

9. 649-5(8 & 10):

→ → 8) Before final tightening of the top nuts, mark the reference position of each **tip** nut in a snug-tight condition with a suitable marking on **one flat?** with a corresponding reference mark on the base plate at each bolt. Then incrementally turn the top nuts using a star pattern until achieving the required nut rotation specified in Table A. Turn the nuts **in** at least 2° full tightening cycles (passes). After tightening, verify the nut rotation. Do not exceed the Table A value by more than 20° degrees.¶

→ → 9) Tighten each retainer or jam nut until it is in firm contact with the top surface of the anchor bolt **nut, then Next,** while preventing the anchor bolt nut from rotating, tighten the jam nut until it is **snug-tight.**¶

→ → 10) *Install a screen over the gap between the base plate and foundation concrete in accordance with Section 649-6, or place a structural grout pad in accordance with Section 649-7.*¶

Response: Each side of a nut is known as a "flat", a hex nut has six of them.
"Tip" will be changed to "top"; "n" will be deleted
Hyphen will be added in "snug-tight".
Changes made.

10. 649-6:

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 **a minimum of 3 inches minimum.** Attach the screen to the vertical side of the base plate with self-tapping stainless steel screws (#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 at a maximum 9 inch on centers maximum spacing** 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

Response: Thank you for your comment. No changes made.

10. 649-8:

649-7.8 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 parties** 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 Strain Poles, Mast Arms and Monotube Assemblies for a minimum of six months or until payment **is received** 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 **is received** in full for the correction of the deficiencies or defects **has been made**, whichever is longer.¶

Response: Thank you for your comment. No changes made.

11. 649-10:

→ **649-910.2 Furnish and Install:** ~~The-Each~~ Contract unit price ~~each~~ for strain poles, mast arm and monotube assemblies, furnished and installed, will include all materials specified in the Contract Documents, including the foundation, cover plates, caps, clamps, blank sign panel, luminaire bracket, all labor, equipment, miscellaneous materials and hardware necessary for a complete and acceptable installation.¶

→ **649-910.3 Furnish:** ~~The-Each~~ Contract unit price ~~each~~ for strain poles, mast arm and monotube assemblies, furnished, will include all materials; ~~and~~ all shipping and handling costs involved in delivery as specified in the Contract Documents.¶

→ **649-910.4 Install:** ~~The-Each~~ Contract unit price ~~each~~ for strain poles, mast arm and monotube assemblies, installed, will include the foundation, blank sign panel, all labor, equipment, miscellaneous materials and hardware necessary for a complete and acceptable installation. The Engineer will supply materials as specified in the Contract Documents.¶

Response: Thank you for your comment. No changes made.
