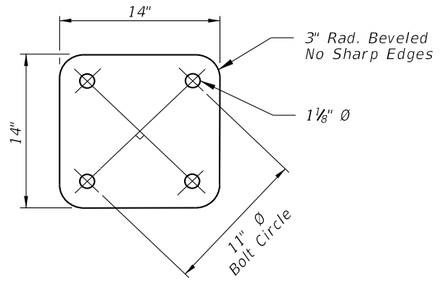
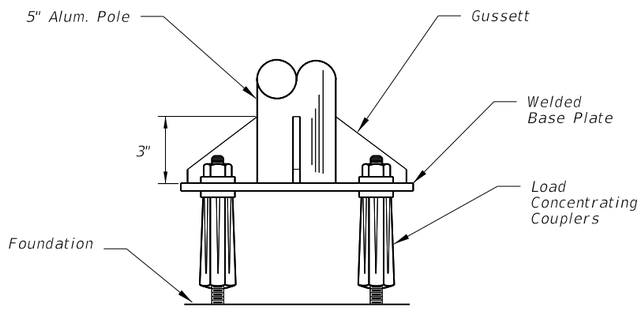
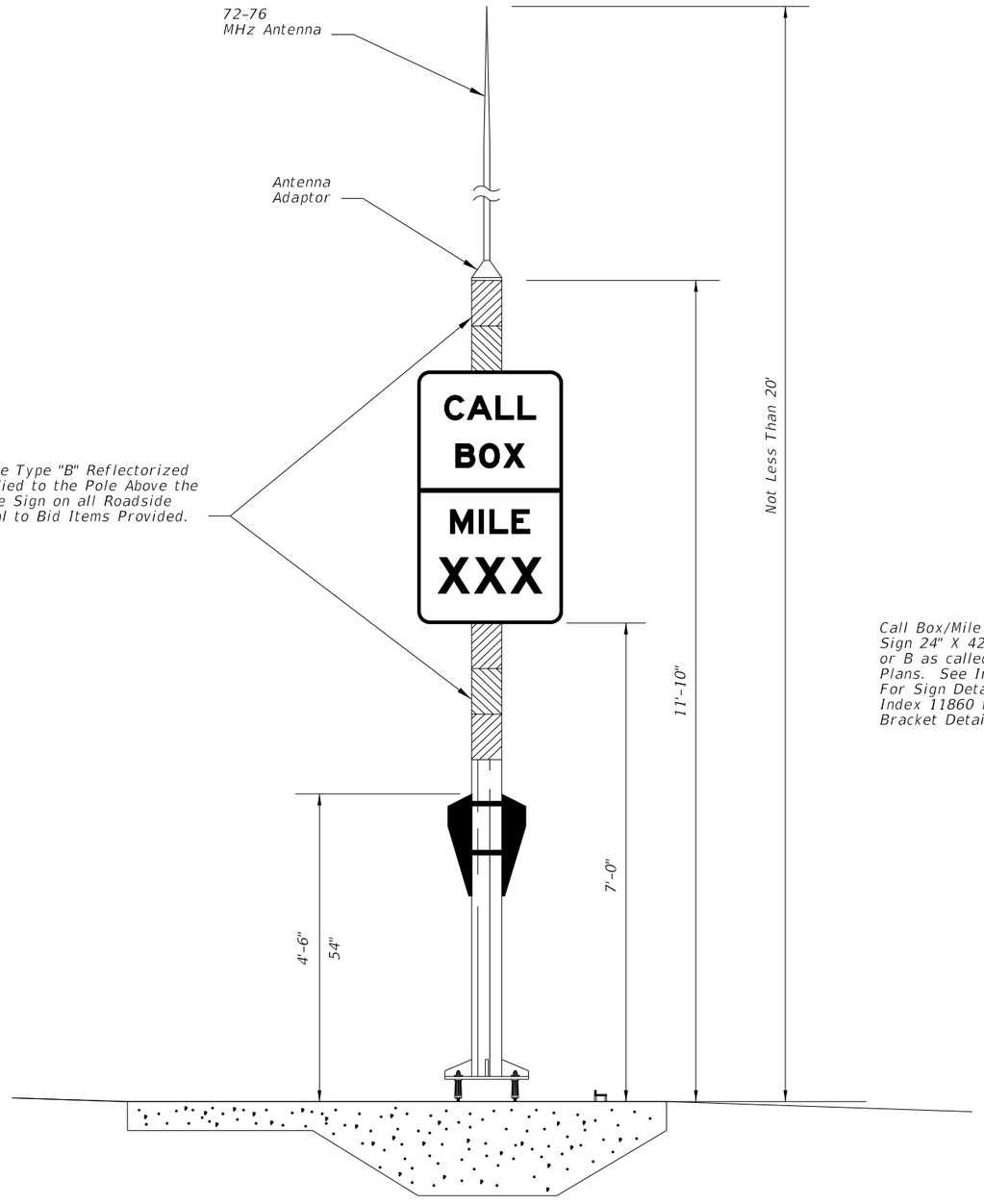


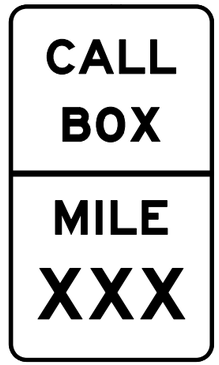




BASE PLATE & BOLT PATTERN



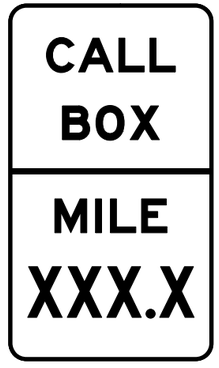

See Sheet 3 for Concrete Pad Details.

Call Box/Mile Marker Sign 24" X 42". Sign A or B as called for in Plans. See Index 17355 For Sign Details and Index 11860 for Sign Bracket Details.




FTP-63-06

SIGN A




FTP-64-06

SIGN B

TYPICAL MOTORIST AID CALL BOX TERMINAL

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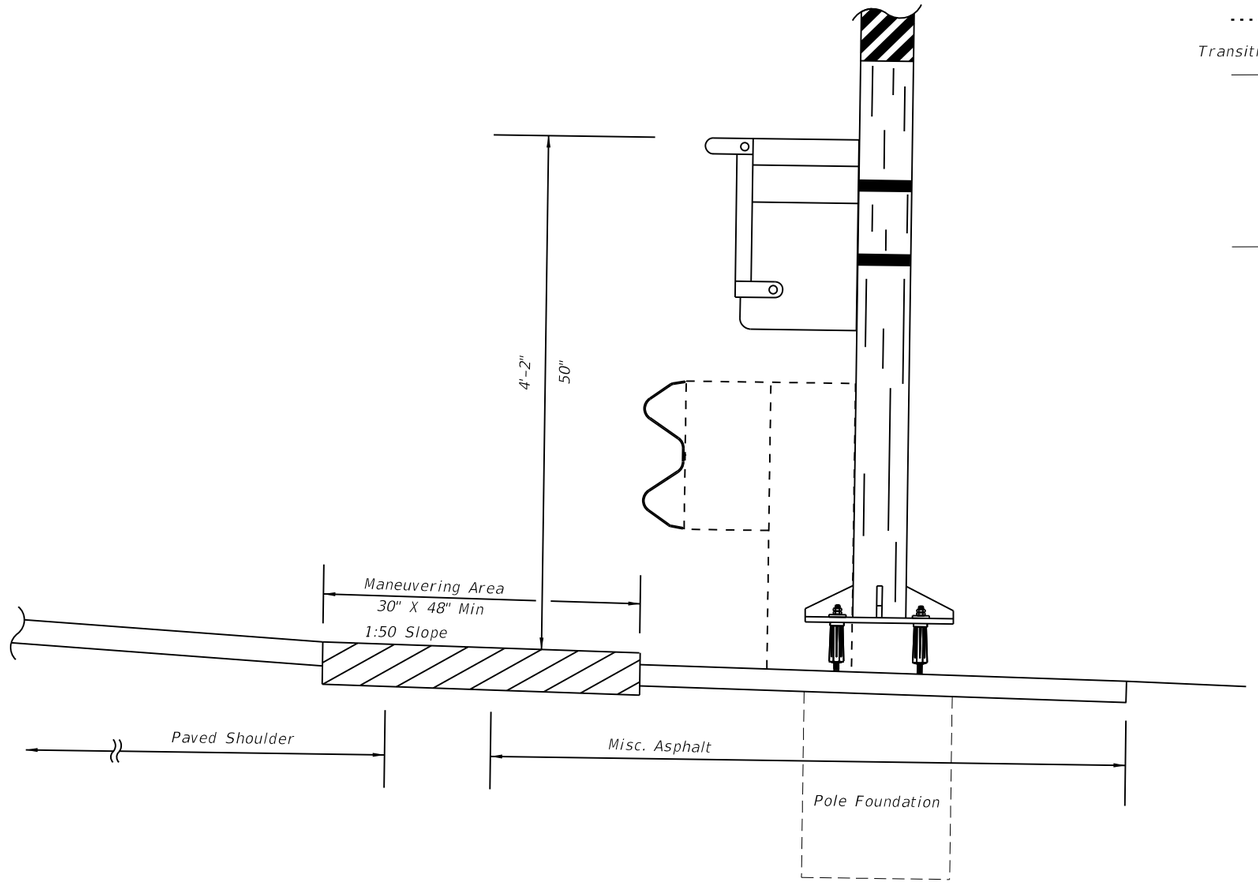
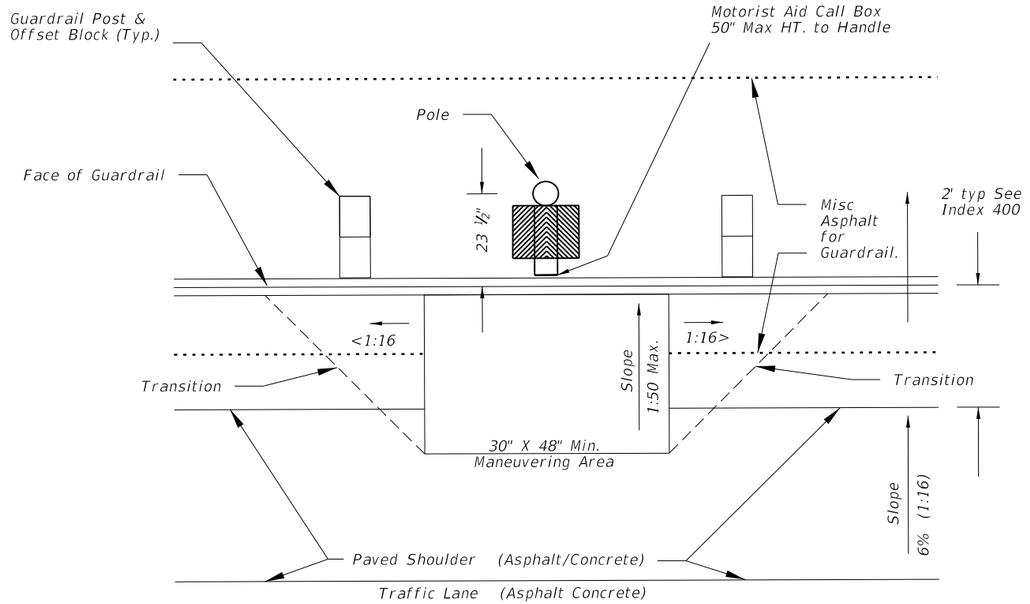
6/28/2012

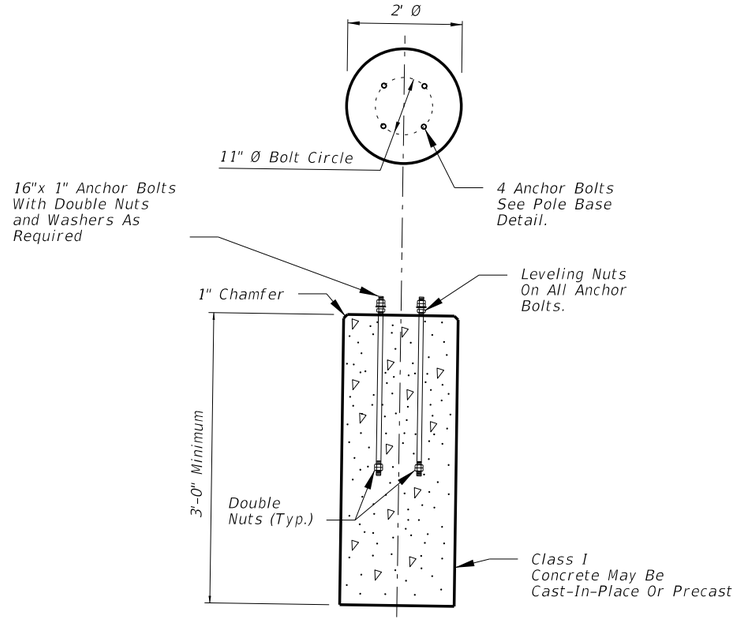
| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/10 | | | FDOT DESIGN STANDARDS 2013 | MOTORIST AID CALL BOX | INDEX NO. 17600 | SHEET NO. 1 |

EXISTING PAVEMENT INSTALLATION
Remove existing pavement minimum 1" depth throughout transition and maneuvering area, replace with misc asphalt.

NEW CONSTRUCTION
Hand work final shoulder pavement lift to plan dimensions.



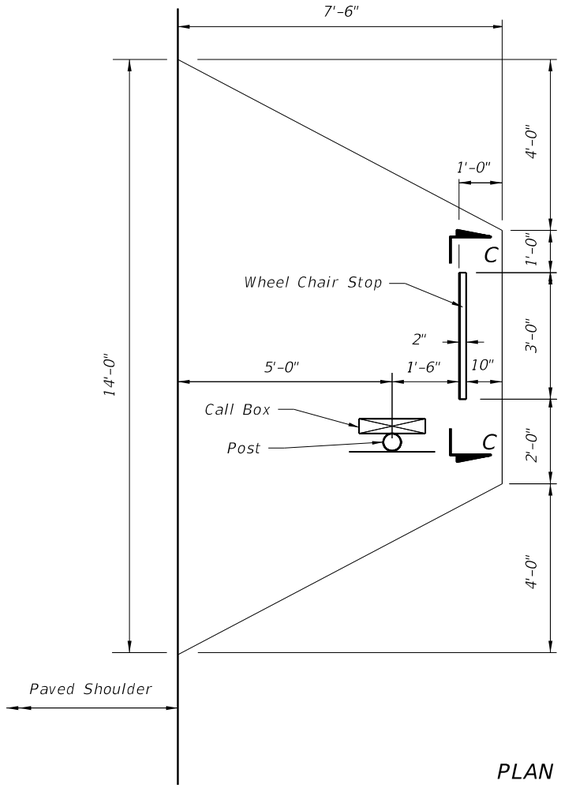




MOTORIST AID CALL BOX POLE FOUNDATION
TO BE USED ONLY BEHIND GUARDRAIL

CALL BOX BEHIND GUARDRAIL

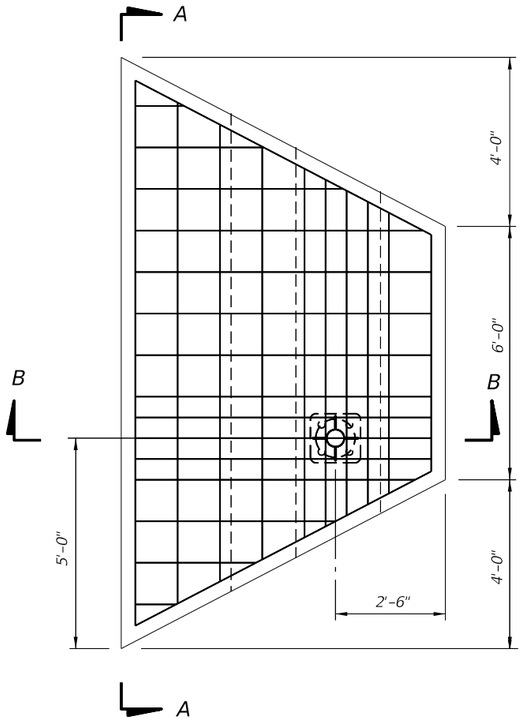


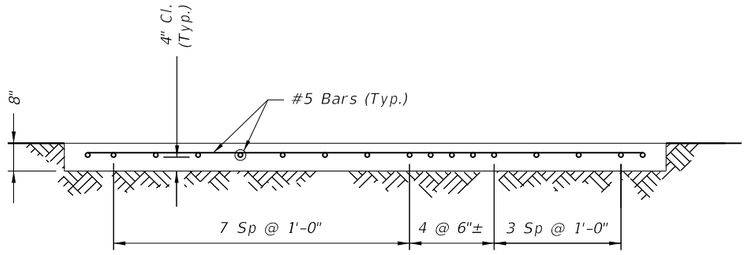
| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/09 | | | FDOT DESIGN STANDARDS 2013 | MOTORIST AID CALL BOX | INDEX NO. 17600 | SHEET NO. 2 |




PLAN

Call Box Attachment To Slab
As Per Manufacturer's Recommendation.

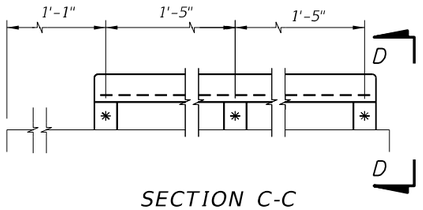


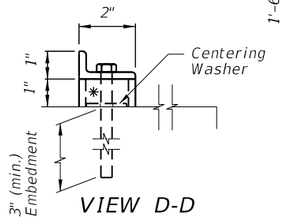

SECTION A-A

## MOTORIST AID CALL BOX CONCRETE PAD QUANTITIES

Concrete : 3.5 c.y. (each)
Reinforcing Steel : 243 lb (each)



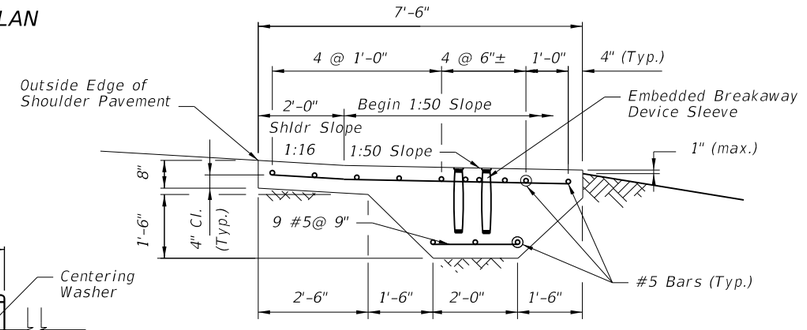

SECTION C-C




VIEW D-D

✱ 1 ½" ○ x 1" High
Galvanized Steel Pipe Spacer

2" x 1" x ¼" Galv. Angle And
3-⅜"○ x 5" Galvanized Steel Expansion
Anchor Bolt With 3" Min. Embedment



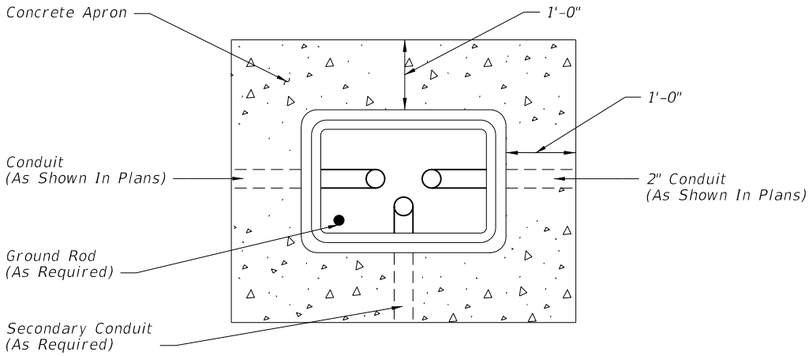

SECTION B-B

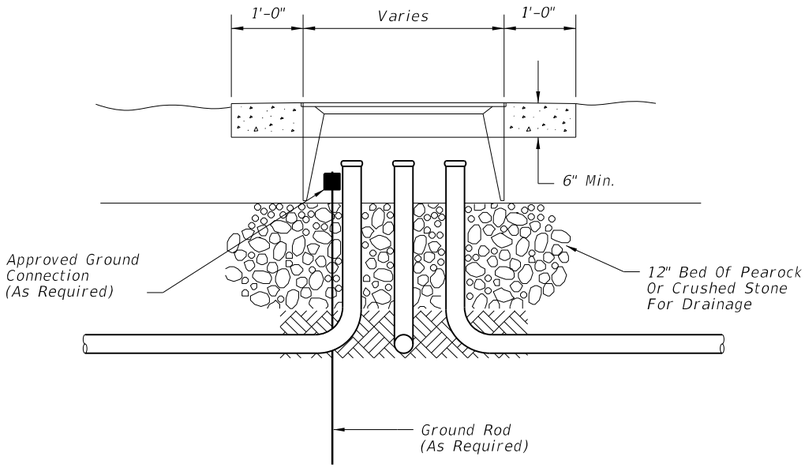
## GENERAL NOTES

1. Design Specifications: AASHTO Standard Specifications For Highway Bridges (Current Edition and approved revisons thereto).
2. Concrete: Concrete strength shall be Class I (f'c=3,000 psi).
3. Reinforcing Steel: Reinforcing Steel shall conform to ASTM A615, Grade 60.
4. Payment: Concrete Pad and Foundation shall be included in the contract unit price of call box assembly or terminal. It shall also include all labor, materials, and installation of embedded breakaway device sleeves, and miscellaneous galvanized steel for wheel chair stop and attachments.
5. Breakaway Device shall be paid for under Call Box Assembly.

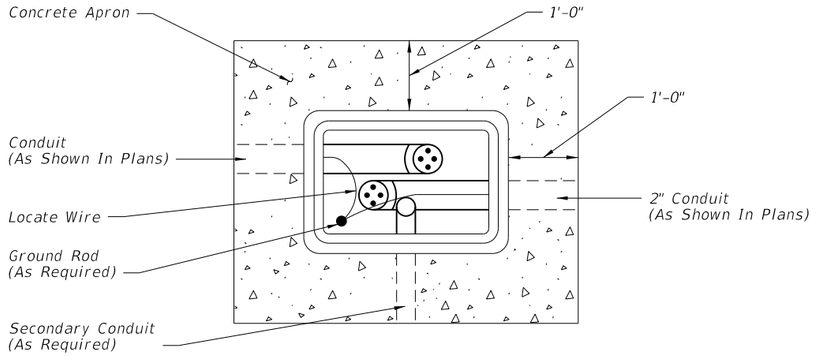
## WHEEL CHAIR STOP DETAIL

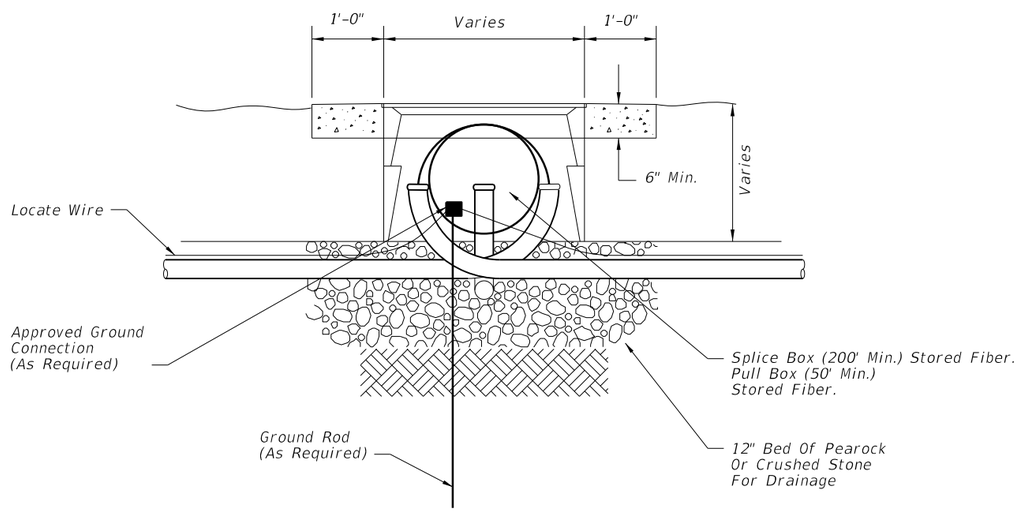
| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/09 | | | FDOT DESIGN STANDARDS 2013 | MOTORIST AID CALL BOX | INDEX NO. 17600 | SHEET NO. 3 |




PULL BOX



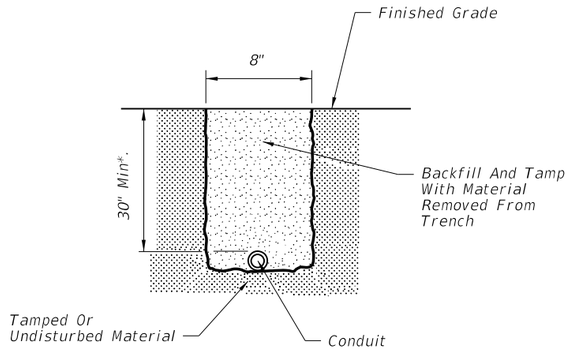




Rectangular boxes are depicted. Round fiber optic splice boxes and lids are allowed.

FIBER OPTIC BOX

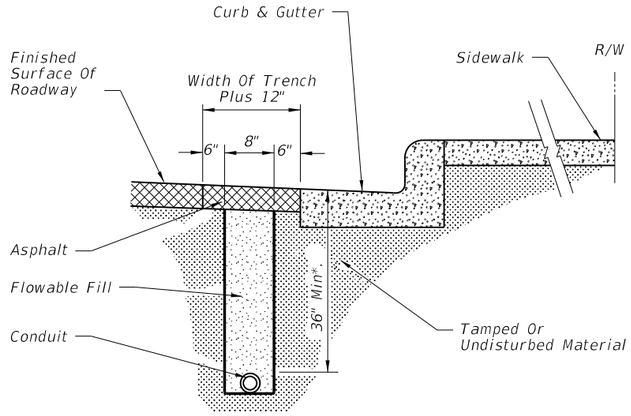
1. Boxes shall not be installed in roadways or driveways.
2. Boxes shall be on the Approved Product List (APL).
3. Boxes shall be installed flush with the finished grade surface.
4. Fiber Optic splice boxes shall be provided with cable hanger racks designed to support cables and splice enclosures. Cost of racks to be included in cost of splice box.
5. Fiber optic boxes shall contain only Fiber Optic Cable, Conduit, and Locate Wire.
6. Conduit center line shall be aligned to top edge of box to facilitate cable pulling.
7. All boxes shall have 1'-0" wide (min) concrete apron. Concrete for concrete aprons shall be Class NS with a minimum strength at 28 days of f'c=2.5 Ksi. Aprons shall be sloped away from box. Cost of apron to be included in the cost of each box.
8. Prevent the ingress of Water, Dirt, Sand, and other foreign materials into the conduit prior to, during and after construction using a foam-sealing material, rubber plug, or other device designed for this application and approved.

| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | PULL, SPLICE AND JUNCTION BOX | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 07/01/12 | | | | | | 17700 | 1 |




FOR USE IN AREAS NOT EXPOSED TO VEHICULAR TRAFFIC

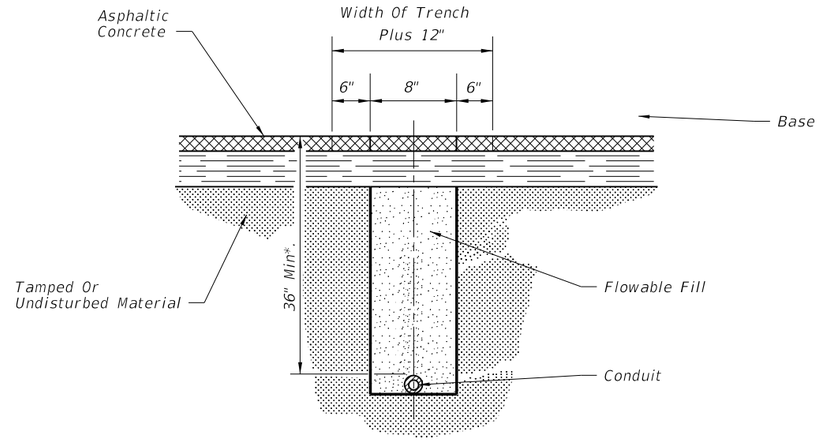
FIGURE A




FOR USE IN ASPHALT ROADWAY ADJACENT TO GUTTER WHEN PLACEMENT OUTSIDE OF THE PAVEMENT IS NOT FEASIBLE.

FIGURE B

Note:
1. Trench not to be open more than 250' at a time when construction area is subject to vehicular or pedestrian traffic.
2. Asphalt to be sawcut to leave neat lines at the pavement cut.
3. See note 3 Figure C.

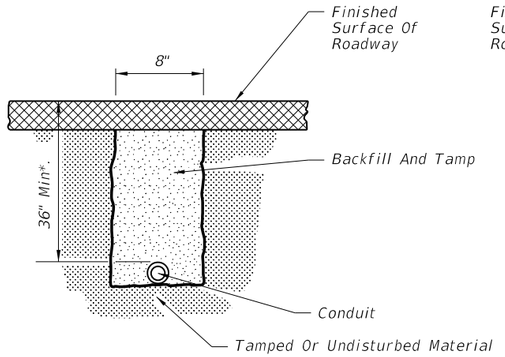



FOR USE IN INSTALLING CONDUIT UNDER EXISTING ASPHALT PAVEMENT NOT ADJACENT TO GUTTER WHEN JACKING OR DIRECT BORING IS NOT FEASIBLE.

FIGURE C

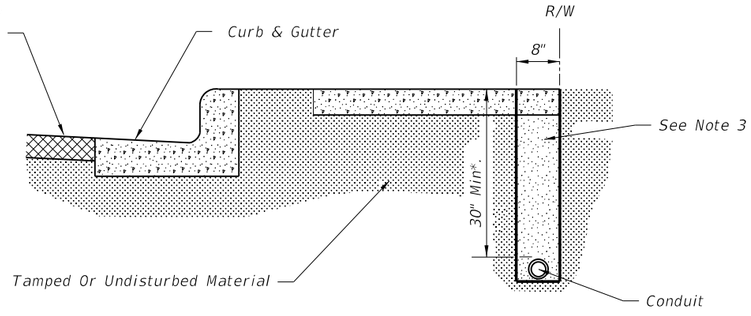
Note:
1. Rigid conduit must be used when jacking under existing pavement at 36" minimum depth.
2. Asphalt to be sawcut at the edges of the trench.
3. The removal and replacement of the additional pavement width (6") will not be required when the trench can be constructed without disturbing the asphalt surface on either side.

*May be adjusted due to field conditions upon approval of project engineer.




FOR USE INSTALLING CONDUIT UNDER A NEW ROADWAY PRIOR TO INSTALLATION OF BASE AND PAVEMENT

FIGURE D




FOR USE IN INSTALLING CONDUIT UNDER SIDEWALK

FIGURE E

Note:
1. Sidewalk patches to match existing joints.
2. Entire sidewalk slab must be replaced when specified in the plans.
3. Backfill and tamp with material from trench except at driveways. At driveways, backfill a length of trench within the driveway entirely with Flowable Fill.

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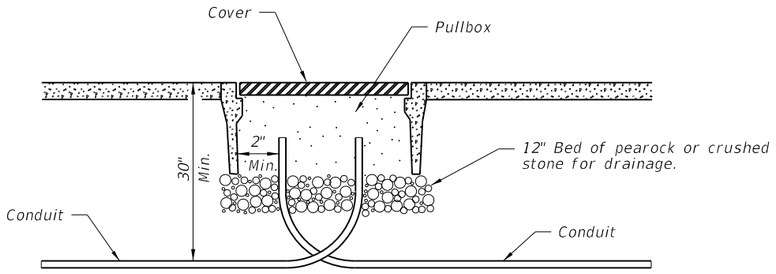
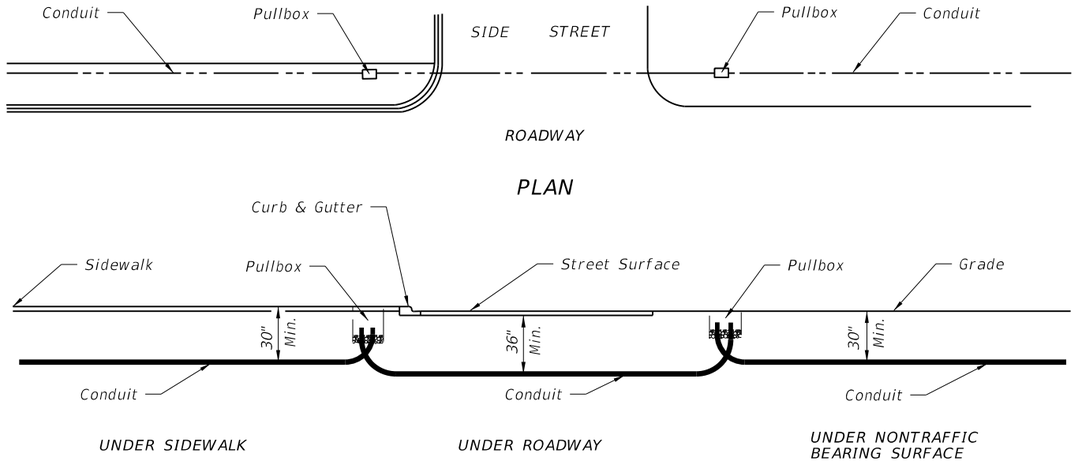
| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | CONDUIT INSTALLATION DETAILS | INDEX NO. 17721 | SHEET NO. 1 |




PULLBOX ENTRY OF CONDUIT UNDER SIDEWALKS

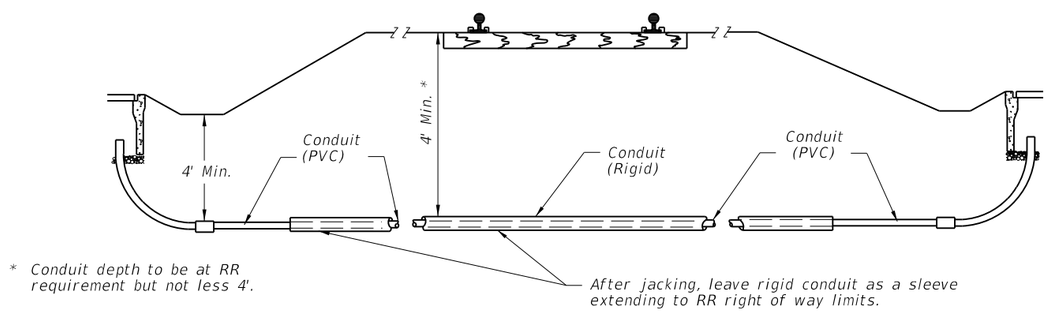
FIGURE A




Note:
Ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications for Road and Bridge Construction.

FIGURE B

Note:
One run of conduit (between pullboxes) shall not contain more than 360° of bend including pullbox bends.




FOR USE UNDER RAILROADS

FIGURE C



| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/00 | | | FDOT DESIGN STANDARDS 2013 | CONDUIT INSTALLATION DETAILS | INDEX NO. 17721 | SHEET NO. 2 |

## STEEL STRAIN POLE NOTES

1) Designed in accordance with FDOT Structures Manual.

2) Perform all welding in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). No Field welding is permitted on any part of the pole.

3) See Standard Index No. 17727 for grounding and span wire details.

4) Foundation Materials:
   a. Reinforcing Steel: ASTM A615 Grade 60.
   b. Concrete: Class IV, (Drilled Shaft) 4,000 psi (f'c) minimum Compressive Strength at 28-days for all environmental classifications.
   c. Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563 Grade A heavy-hex nuts and plate washers (all galvanized in accordance with ASTM F2329).

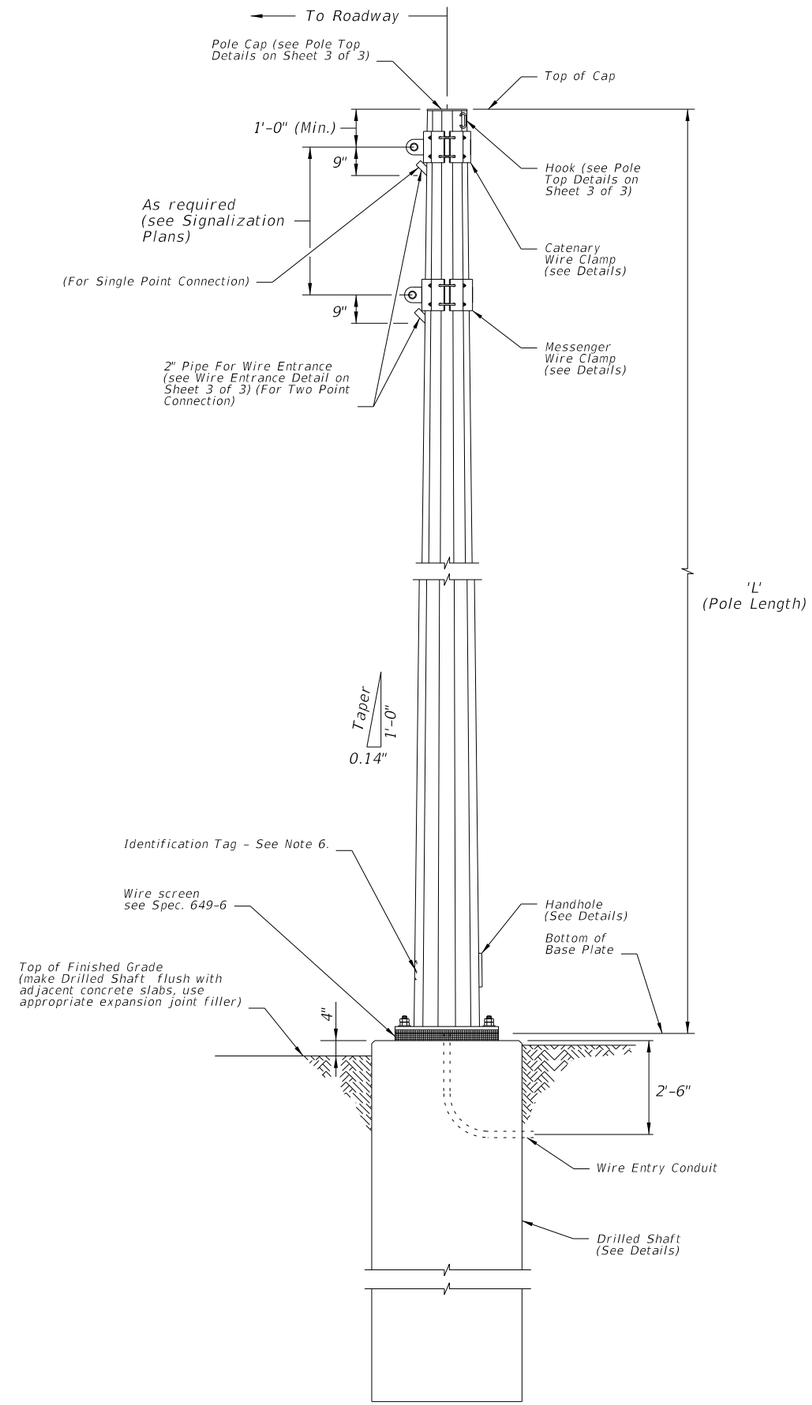
5) Strain Pole Specifications:
   a. Poles: ASTM A1011 Grade 50, 55, 60 or 65 (less than ¼") or ASTM A572 Grade 50, 55, 60, or 65 (1/4" and over) or ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield).
   b. Steel Plates: ASTM A36.
   c. Weld Metal: E70XX.
   d. Bolts: A325, Type 1. Hole Diameter: Bolt diameter plus 1/16".
   e. Base Plate: Hole Diameter; anchor bolt diameter plus ½".
   f. Handhole: Frame; ASTM A709 Grade 36 or ASTM A36, Cover; ASTM A1011 Grade 50, 55, 60 or 65.
   g. Aluminum Caps and Covers: ASTM B-26 (319-F).
   h. Stainless Steel Screws: AISI Type 316.
   i. Galvanization: All nuts, bolts and washers; ASTM F2329, All other steel; ASTM A123.

6) Pole Notes:
   a. See the Signalization Plans for clamp spacing, cable sizes and forces, signal and sign mounting locations and details.
   b. Tapered with the diameter changing at a rate of 0.14 inch per foot.
   c. Transverse welds are allowed only at the base.
   d. Poles constructed out of two or more sections with overlapping splices are not permitted.
   e. Locate the handhole 180 degrees from 2-inch wire entrance pipe.
   f. Furnish each pole with a 2"x4" (max) aluminum identification tag. Submit details for approval. Secure to pole with 0.125" stainless steel rivets or screws. Locate Identification Tag on the inside of pole and visible from handhole. Include the following information:
      Financial Project ID, Pole Type, Pole Height,
      Manufacturer's Name, F of Steel and Base Wall Thickness.

7) One hundred percent of full-penetration groove welds and a random 25 percent of partial penetration groove welds shall be inspected. Full-penetration groove weld inspection shall be performed by nondestructive methods of radiography or ultrasonics.

8) In accordance with specification 5-1.4.2, shop drawings are only required for additions, deletions, or modifications to this Design Standard.

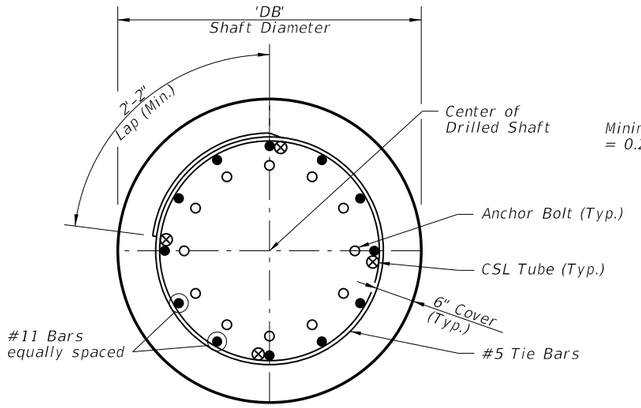
9) Verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube location ± two inches along the inner circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.




ELEVATION

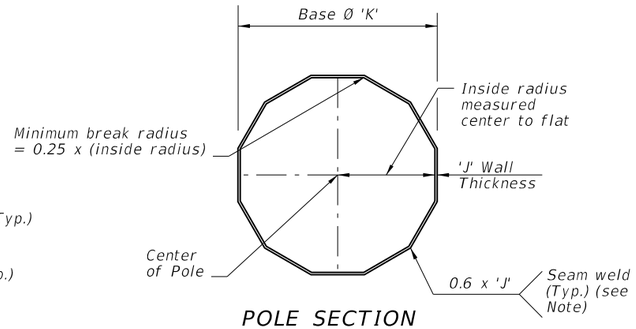
ELEVATION AND NOTES

| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | STEEL STRAIN POLE | INDEX NO. 17723 | SHEET NO. 1 |



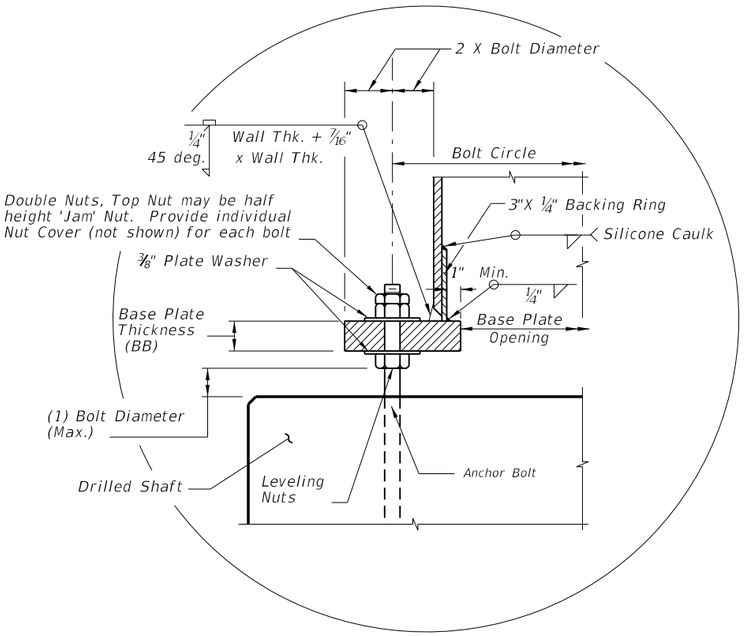

SECTION A-A

(Number of bars shown is for illustration purposes only)

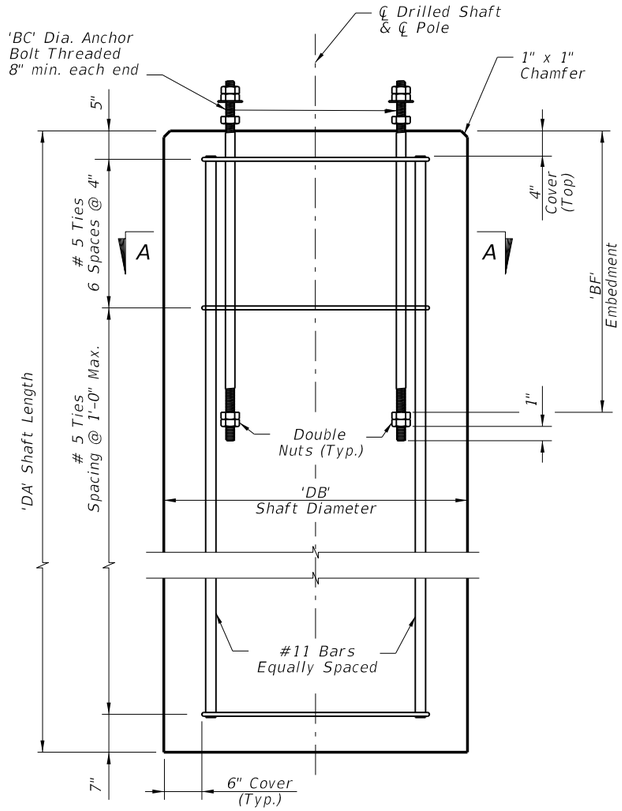



POLE SECTION

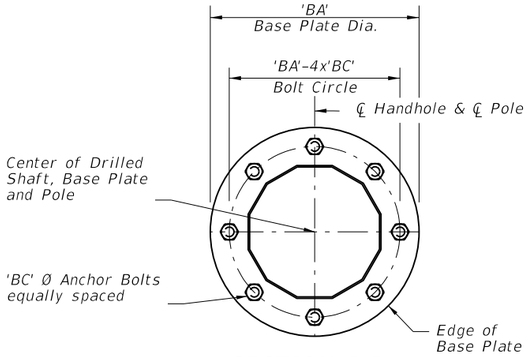
NOTE:
Longitudinal seam welds within 6" of circumferential welds shall be complete penetration welds.




DETAIL C

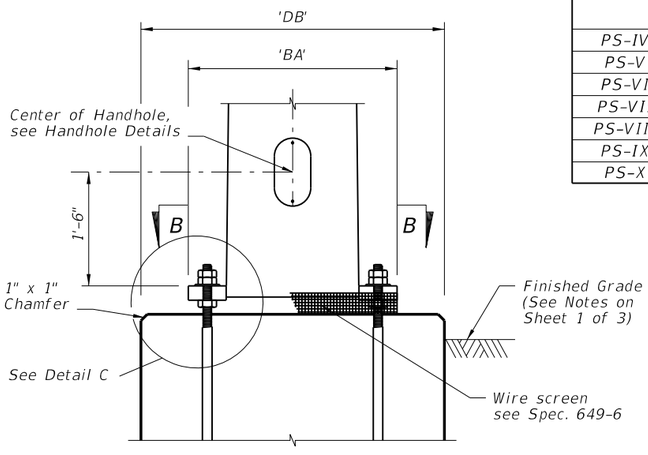



DRILLED SHAFT ELEVATION




SECTION B-B

NOTE:
Number of bolts shown for illustration purposes only.




PARTIAL ELEVATION

(Showing Base Plate, Anchor bolts and Handhole)

TABLE OF STRAIN POLE VARIABLES

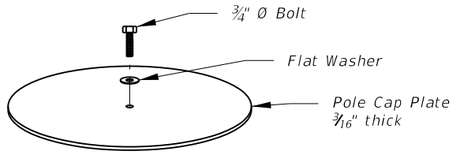
| POLE TYPE | MAXIMUM ALLOWABLE MOMENT (kip-ft) | POLE | | BASE CONNECTION | | | | | SHAFT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | J (in) | K (in) | No. of Bolts | BA (in) | BB (in) | BC (in) | BF (in) | DA (FT) | DB (FT) | No. of #11 bars |
| PS-IV | 95.4 | 0.250 | 14 | 8 | 25 | 2.50 | 1 3/8 | 60 | 14 | 4 | 14 |
| PS-V | 158.9 | 0.313 | 16 | 10 | 28 | 2.50 | 1 1/2 | 60 | 15 | 4 | 14 |
| PS-VI | 203.6 | 0.313 | 18 | 12 | 30 | 2.50 | 1 1/2 | 60 | 16 | 4 | 14 |
| PS-VII | 280.3 | 0.313 | 21 | 14 | 33 | 2.50 | 1 1/2 | 60 | 16 | 4.5 | 16 |
| PS-VIII | 338.0 | 0.313 | 23 | 16 | 35 | 2.50 | 1 1/2 | 60 | 17 | 4.5 | 16 |
| PS-IX | 400.9 | 0.313 | 25 | 12 | 39 | 3.00 | 1 3/4 | 60 | 17 | 5 | 18 |
| PS-X | 469.1 | 0.313 | 27 | 14 | 41 | 3.00 | 1 3/4 | 60 | 18 | 5 | 18 |

FOUNDATION NOTES:
The foundations for Steel Strain Poles are designed based upon the following conservative soil criteria which covers the great majority of soil types found in Florida:

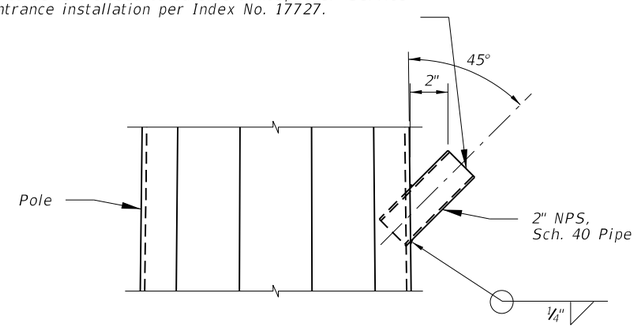
Classification = Cohesionless (Fine Sand)
Friction Angle = 30 Degrees (30°)
Unit Weight = 50 pcf (assumed saturated)

Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.

BASE AND FOUNDATION DETAILS AND TABLE OF VARIABLES

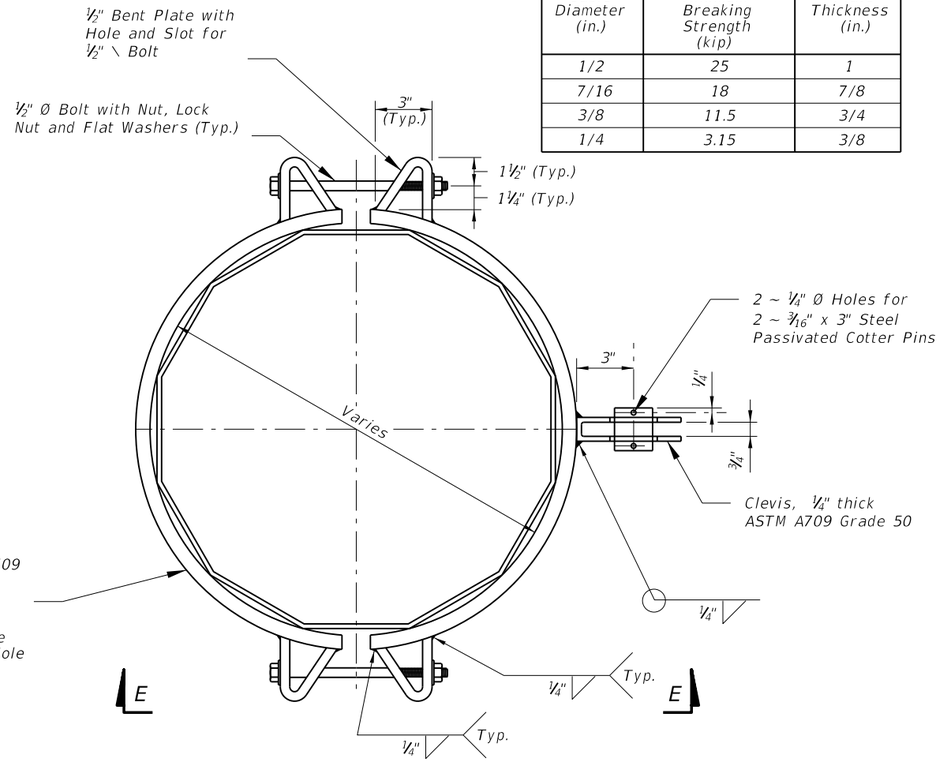



NOTE: A properly sized Service Head (Weather Head), shall be installed and fastened securely on to the standard pipe for each pole location. At locations other than service entrance, the service head face is to be left closed to outside atmosphere. Service entrance installation per Index No. 17727.



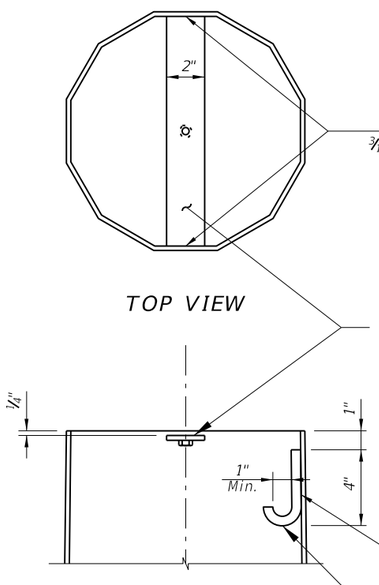

WIRE ENTRANCE DETAILS

| Cable Diameter (in.) | Minimum Breaking Strength (kip) | Plate Thickness (in.) |
|---|---|---|
| 1/2 | 25 | 1 |
| 7/16 | 18 | 7/8 |
| 3/8 | 11.5 | 3/4 |
| 1/4 | 3.15 | 3/8 |

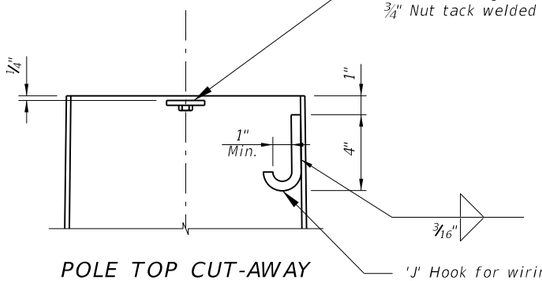



CATENARY AND MESSENGER WIRE CLAMPS

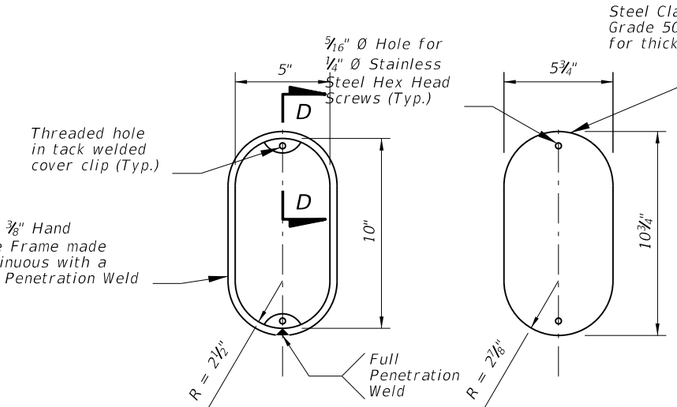
NOTE: Clamps have been sized for Design Cable Loads shown in the Table, and a Maximum Pole Diameter at the Clamp location of 2'-1".




TOP VIEW

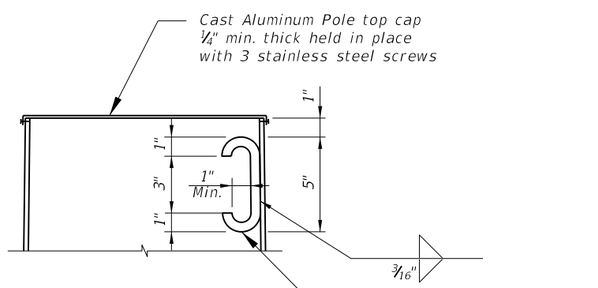



POLE TOP CUT-AWAY (Option 'a')



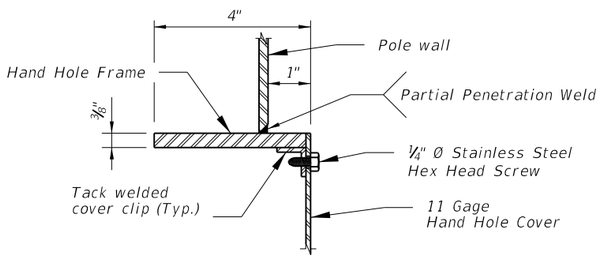

HAND HOLE FRAME

HAND HOLE COVER

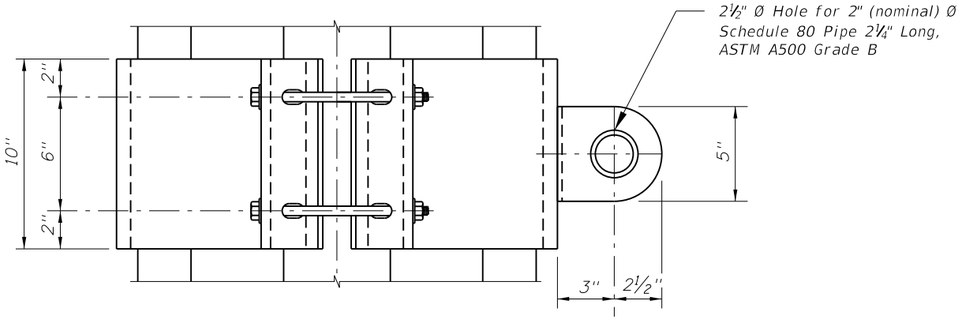



POLE TOP CUT-AWAY (Option 'b')

POLE TOP NOTE:
Any combination of the above two options may be used, provided both lifting and wiring is accommodated.




SECTION D-D (thru Hand Hole)




VIEW E-E

ATTACHMENT DETAILS

| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 01/01/09 | | | FDOT DESIGN STANDARDS 2013 | STEEL STRAIN POLE | INDEX NO. 17723 | SHEET NO. 3 |

## GENERAL NOTES:

Materials:

| | |
|---|---|
| Concrete: | Class V Special or Class VI<br>6 ksi minimum at 28 days<br>4 ksi minimum at transfer |
| Prestressed Strands: | ASTM A416 Grade 270<br>stress relieved or low relaxation |
| Spiral Reinforcing: | ASTM A82 cold-drawn steel wire |

Provide a minimum concrete cover of 1 inch.

For spiral reinforcing, one turn is required for splices and two turns are required at both the tip and butt ends of the pole.

The design Front Face and Back Face of poles may vary transversely from the section shown by ± ¼" to assist with removal from forms. Balance addition and subtraction of face widths to maintain section areas shown.

Provide hand hole and coupler cover plates made of non-corrosive materials. Attach cover plates to poles using lead anchors or threaded inserts embedded in the poles in conjunction with round headed chrome plated screws.

Tie ground wires to the interior of reinforcing steel as necessary to prevent displacement during concreting operations.

Provide Identification Markings on the poles where indicated on the following sheets. Include the following information using inset numerals with 1" height:

Financial Project ID
Pole Manufacturer
Standard Pole Type Number
Pole Length (L)

Provide a Class 3 Surface Finish as specified in Section 400-15.2.4 of the Standard Specifications.

Pick-up and support locations shown may vary with a tolerance of ± 3".

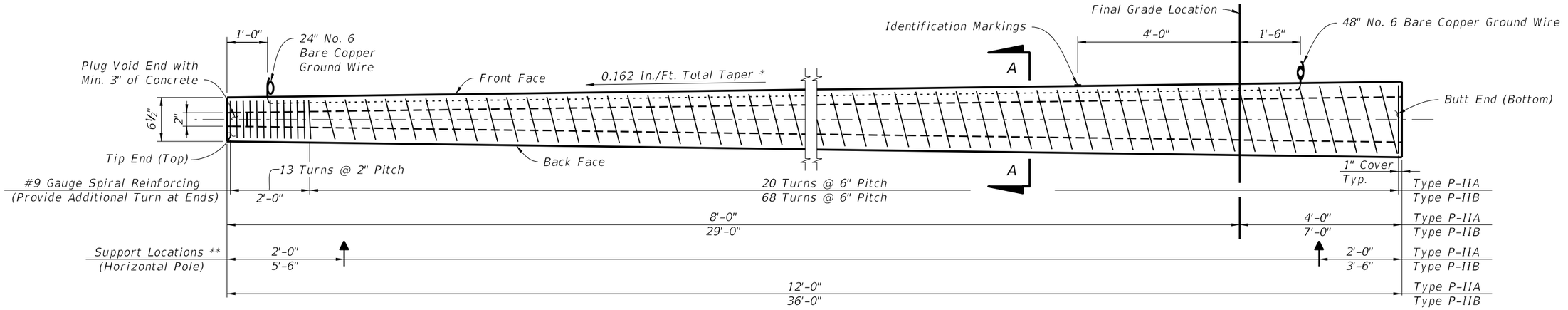
In accordance with Specification 5-1.4.2, shop drawings are only required for additions, deletions, or modifications to this Design Standard.

## INSTALLATION NOTES:

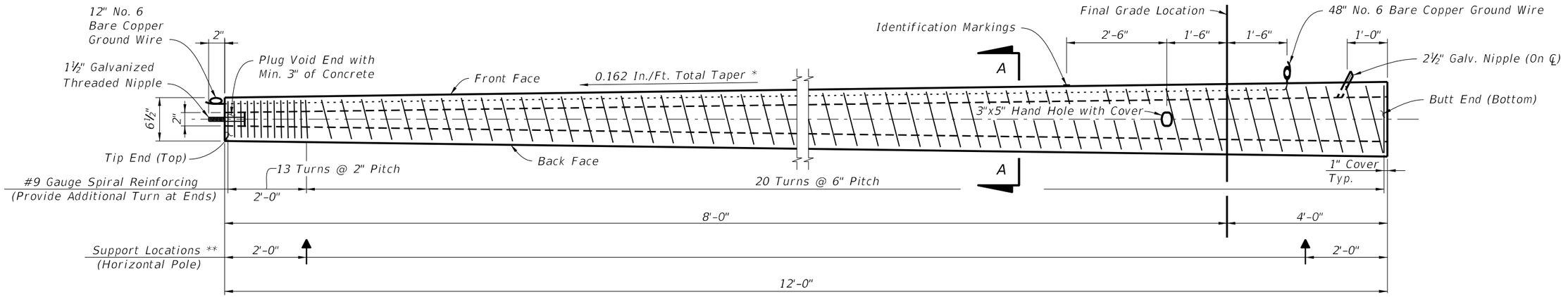
If a two point attachment is required by the plans, provide an eye bolt hole for the messenger wire or field-drill at the location indicated in the plans. When required, field-drill the eyebolt hole for the tether wire prior to installation.



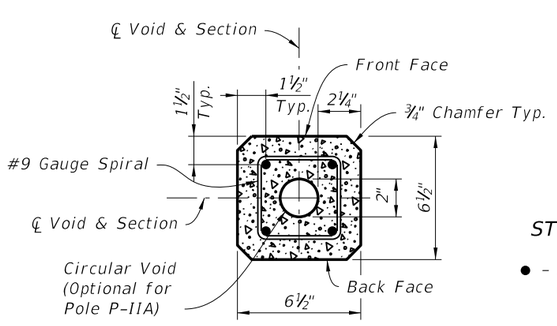
| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/12 | | | | | | 17725 | 1 |




*SERVICE POLE P-IIA (12 Ft.) & P-IIB (36 Ft.) ELEVATION*
*(Strands Not Shown)*



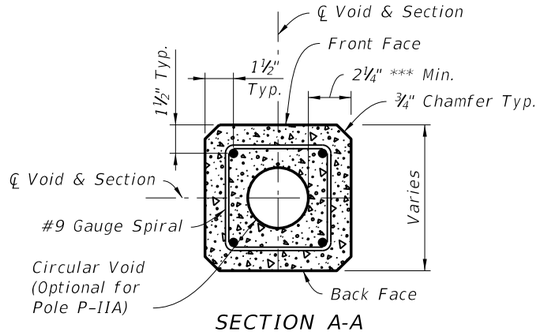

*PEDESTAL POLE P-IIC (12 Ft.) ELEVATION*
*(Strands Not Shown)*
*(For Installation, Refer to Standard Index 17504)*




*TIP END SECTION (TOP)*

*STRAND LEGEND*

- ● – *Prestressed Strand*
  *0.5 In. Grade 270, LRS*
  *24 Kips Before Transfer*
  *(4 strands total)*




*SECTION A-A*
*(Typical Square Section)*

*NOTES:*

*Work this Index with the Strain Pole Schedule in the plans.*

*Strands shown are continuous from Tip End to Butt End.*

*Elevation view scale is exaggerated vertically for clarity.*

*For final erection, tilt pole upright with single point attachment located a distance 4 Ft. (for P-IIA & P-IIC) or 10 Ft. (for P-IIB) from the Tip End face.*

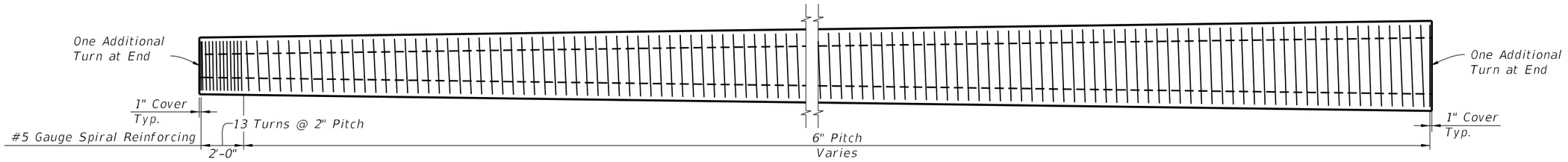
* *Taper includes pole width, strands, reinforcing and void. (0.081 In./Ft. per face)*

** *Support locations are for strand release, storage, lifting and transport. Keep Back Face oriented downward until final erection.*

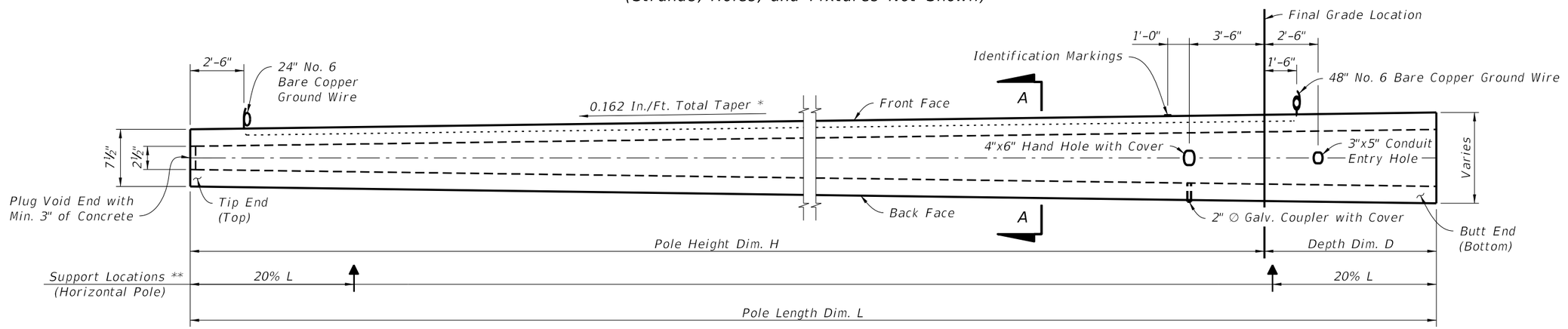
*** *Dimension may vary from 2¼" to 3½" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 2".*

# *SERVICE AND PEDESTAL POLE TYPE P-II*

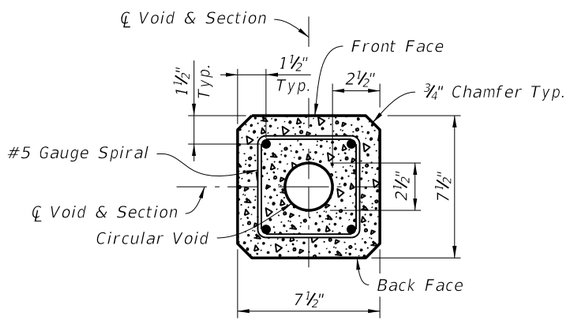
| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | 17725 | 2 |




SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)



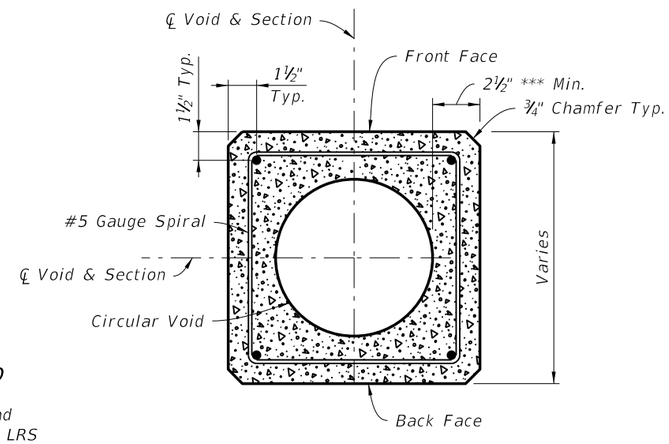

POLE ELEVATION
(Strands and Reinforcing Not Shown)
(See Design Standard Index 17900 and Specification 744 for
Modifications to Type P-III Poles Used at Traffic Monitoring Sites)




TIP END SECTION (TOP)

STRAND LEGEND

● – Prestressed Strand
0.5 In. Grade 270, LRS
31 Kips Before Transfer
(4 strands total)




SECTION A-A
(Typical Square Section)

NOTES:

Work this Index with the Strain Pole Schedule in the plans.

Strands shown are continuous from Tip End to Butt End.

Elevation view scale is exaggerated vertically for clarity.

For final erection, tilt pole upright with single point attachment located a distance 33.3% L from Tip End face.

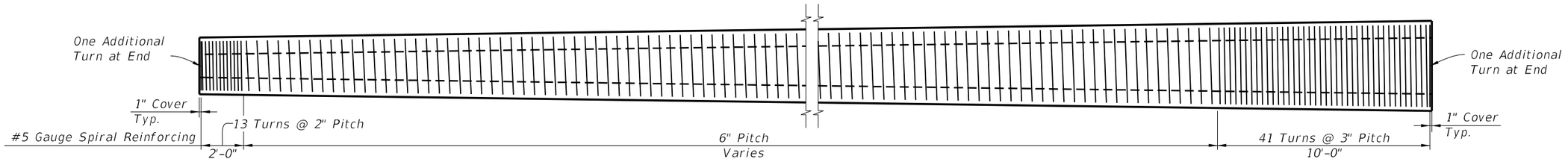
* Taper includes pole width, strands, reinforcing and void. (0.081 In./Ft. per face)

** Support locations are for strand release, storage, lifting and transport. Keep Back Face oriented downward until final erection.

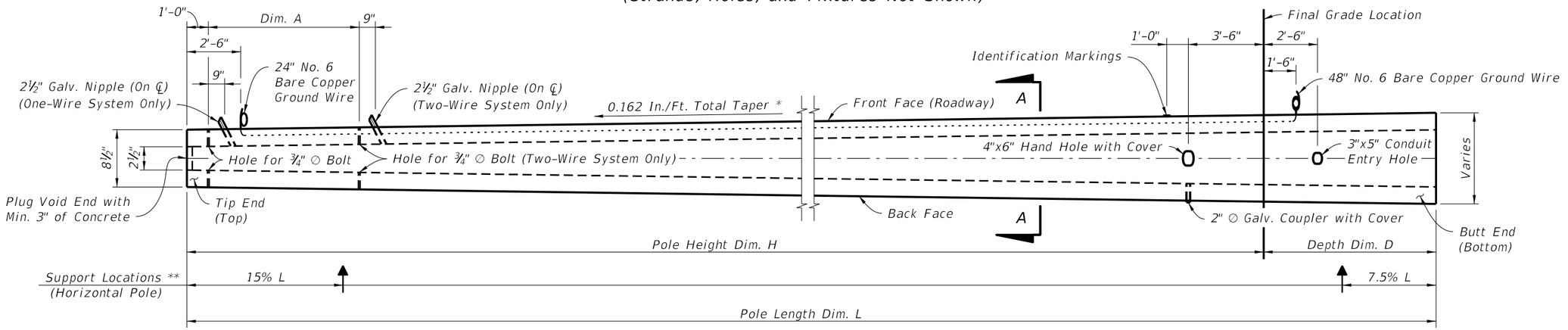
*** Dimension may vary from 2½" to 3¾" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 2½".

# LIGHTING AND TRAFFIC MONITORING POLES TYPE P-III

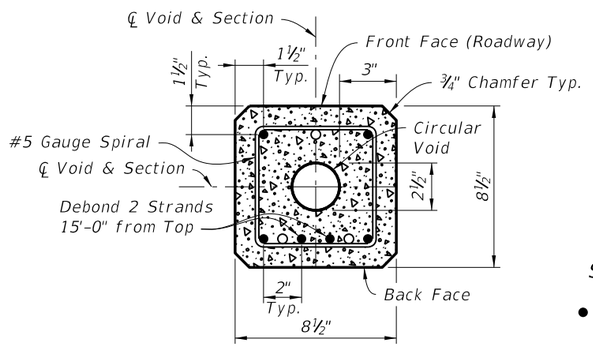
| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/12 | | | | | | 17725 | 3 |




SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)




POLE ELEVATION
(Strands and Reinforcing Not Shown)

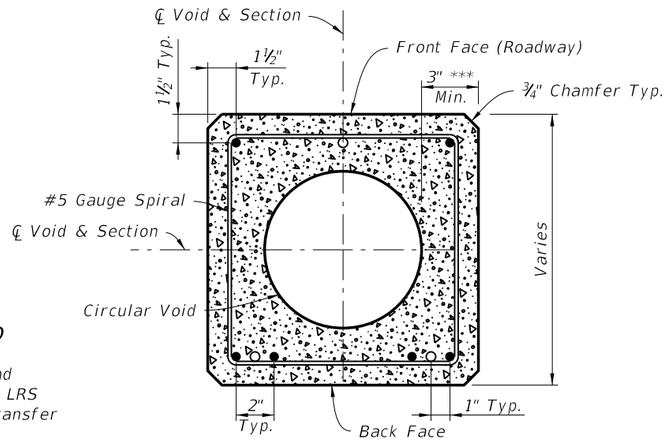



TIP END SECTION (TOP)
(For Dormant Strand Locations See Section A-A)

STRAND LEGEND

● – Prestressed Strand
0.5 In. Grade 270, LRS
31 Kips Before Transfer
(6 strands total)

○ – Dormant Strand
0.5 In. Grade 270, LRS
(3 strands total)




SECTION A-A
(Typical Square Section)

NOTES:

Work this Index with the Strain Pole Schedule in the plans.

Strands shown are continuous from Tip End to Butt End.

Elevation view scale is exaggerated vertically for clarity.

For final erection, tilt pole upright with single point attachment located a distance 20% L from the Tip End face.

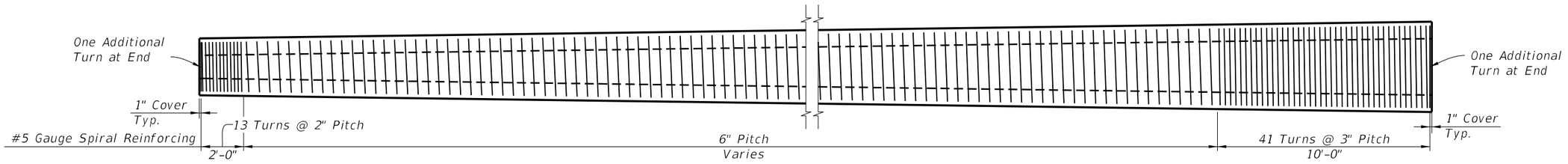
* Taper includes pole width, strands, reinforcing and void. (0.081 In./Ft. per face)

** Support locations are for strand release, storage, lifting and transport. Keep Back Face oriented downward until final erection.

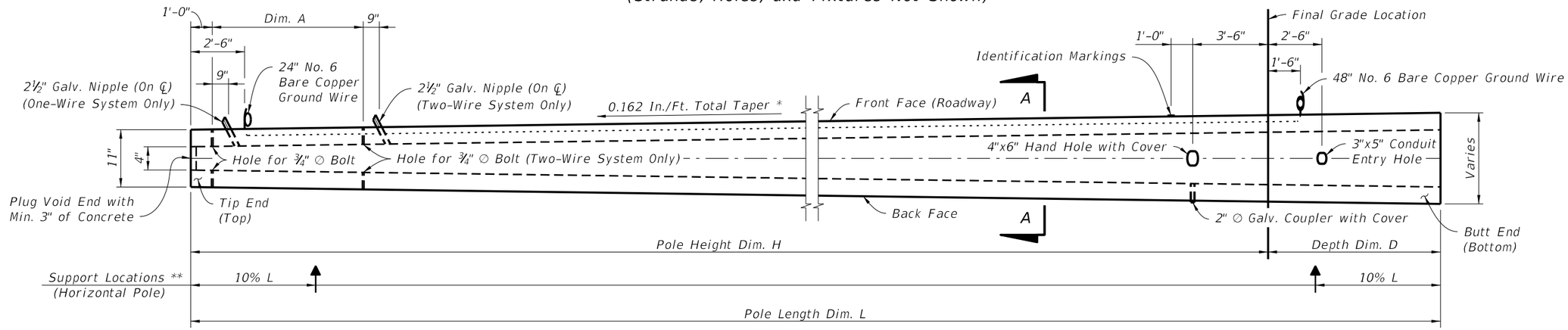
*** Dimension may vary from 3" to 4¼" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 2½".

# STRAIN POLE TYPE P-IV

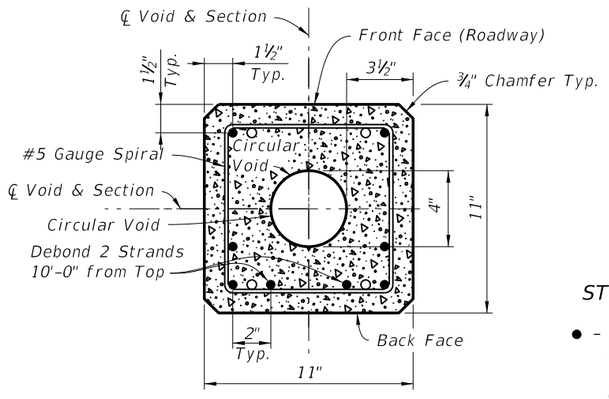
| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/12 | | | | | | 17725 | 4 |




SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)




POLE ELEVATION
(Strands and Reinforcing Not Shown)

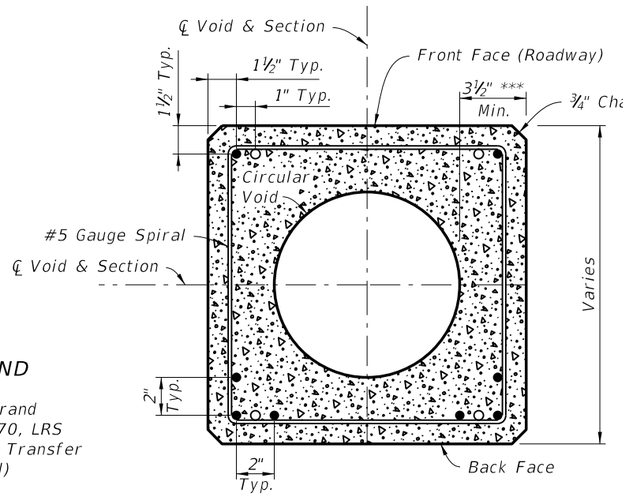



TIP END SECTION (TOP)
(For Dormant Strand Locations, See Section A-A)

STRAND LEGEND

● – Prestressed Strand
0.5 In. Grade 270, LRS
31 Kips Before Transfer
(8 strands total)

○ – Dormant Strand
0.5 In. Grade 270, LRS
(4 strands total)




SECTION A-A
(Typical Square Section)

NOTES:

Work this Index with the Strain Pole Schedule in the plans.

Strands shown are continuous from Tip End to Butt End.

Elevation view scale is exaggerated vertically for clarity.

For final erection, tilt pole upright with single point attachment located a distance 12.5% L from the Tip End face.

* Taper includes pole width, strands, reinforcing and void. (0.081 In./Ft. per face)

** Support locations are for strand release, storage, lifting and transport. Keep Back Face oriented downward until final erection.

*** Dimension may vary from 3½" to 4¾" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 4".

# STRAIN POLE TYPE P-V

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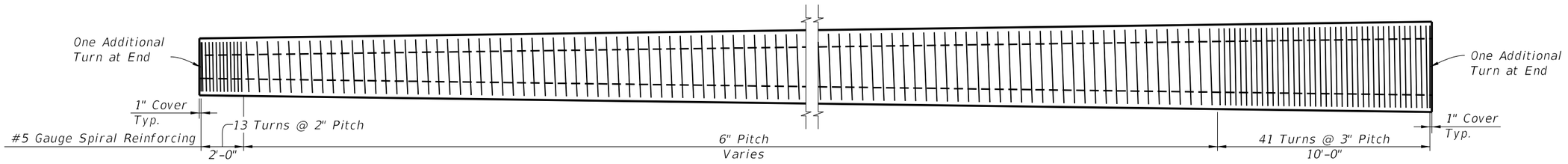
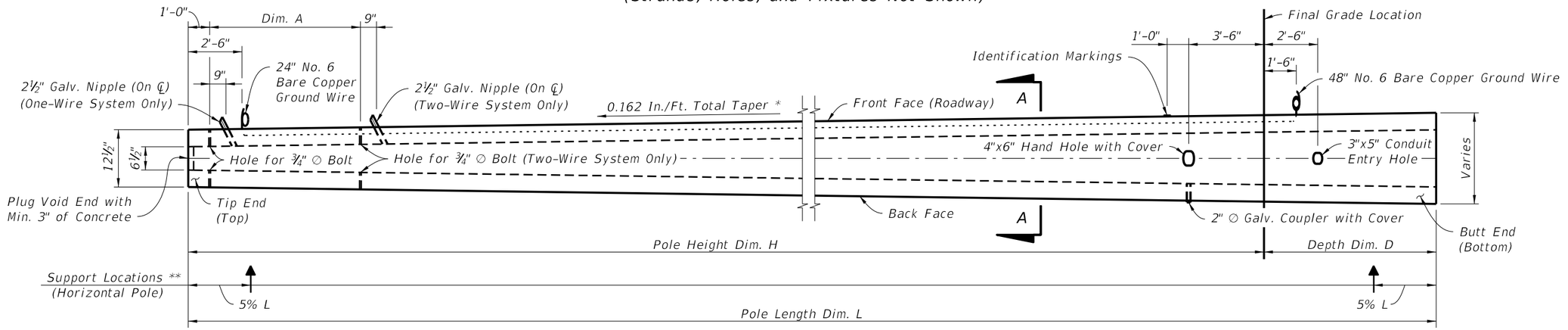
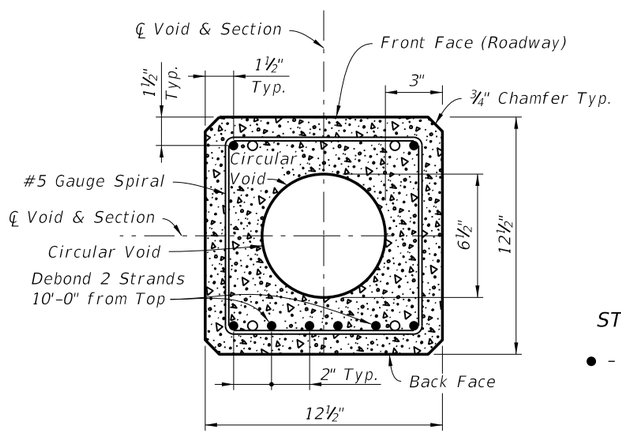
| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | 17725 | 5 |




SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)




POLE ELEVATION
(Strands and Reinforcing Not Shown)

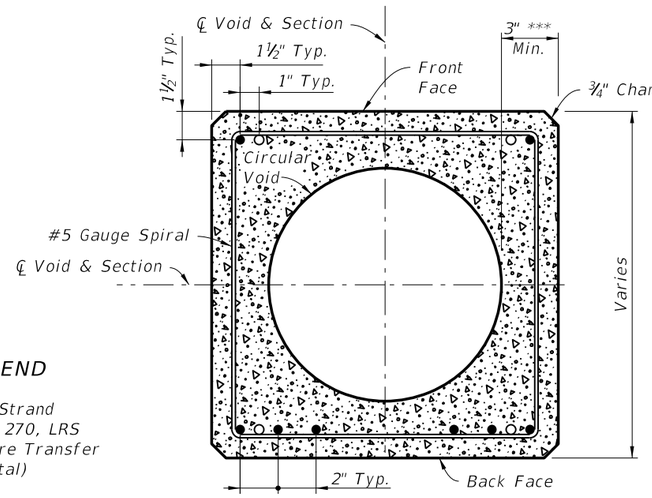



TIP END SECTION (TOP)
(For Dormant Strand Locations, See Section A-A)

STRAND LEGEND

● – Prestressed Strand
0.5 In. Grade 270, LRS
31 Kips Before Transfer
(8 strands total)

○ – Dormant Strand
0.5 In. Grade 270, LRS
(4 strands total)




SECTION A-A
(Typical Square Section)

NOTES:

Work this Index with the Strain Pole Schedule in the plans.

Strands shown are continuous from Tip End to Butt End.

Elevation view scale is exaggerated vertically for clarity.

For final erection, tilt pole upright with single point attachment located a distance 10% L from Tip End Face.

* Taper includes pole width, strands, reinforcing and void. (0.081 In./Ft. per face)

** Support locations are for strand release, storage, lifting and transport. Keep Back Face oriented downward until final erection.

*** Dimension may vary from 3" to 4¼" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 6½".

# STRAIN POLE TYPE P-VI

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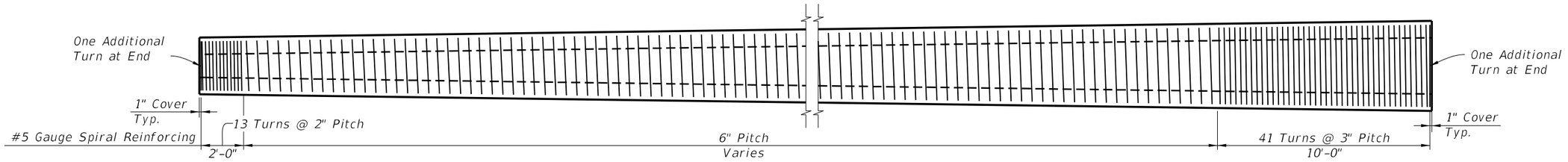
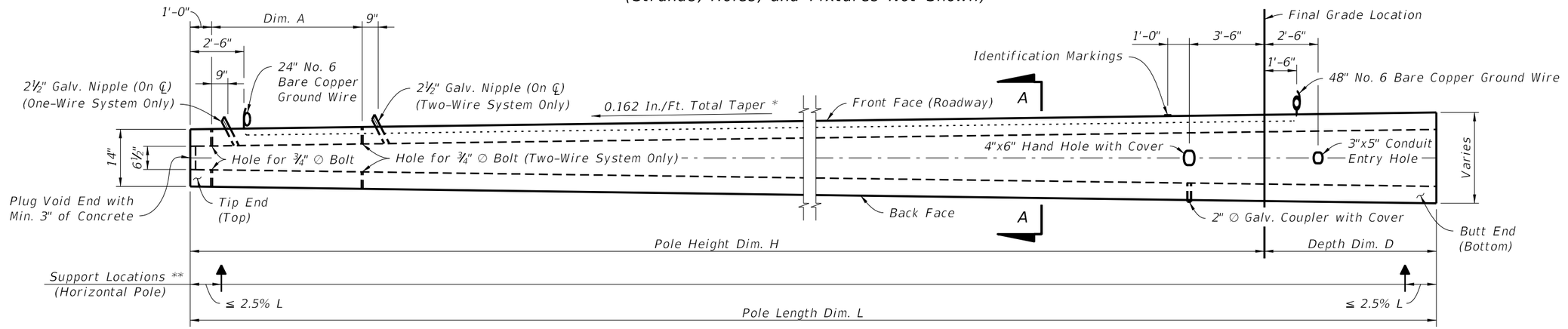
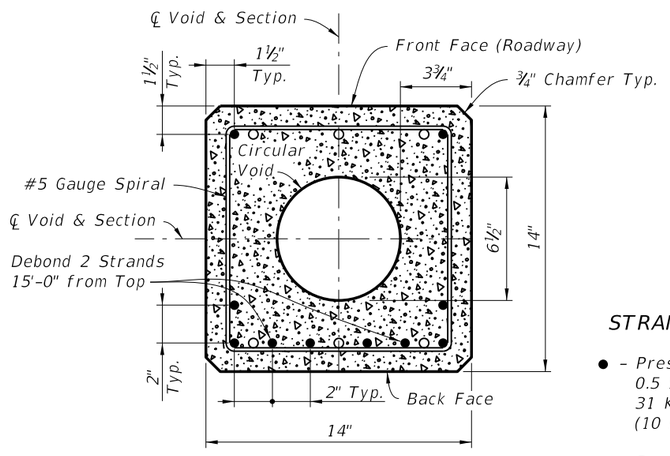
| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | 17725 | 6 |




SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)




POLE ELEVATION
(Strands and Reinforcing Not Shown)

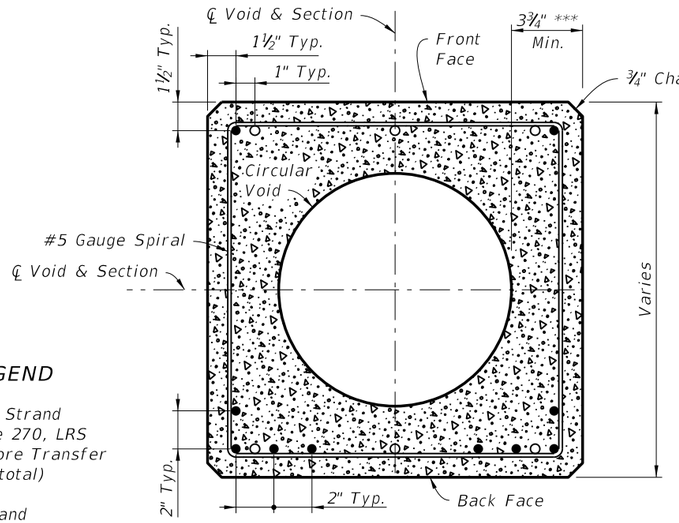



TIP END SECTION (TOP)
(For Dormant Strand Locations, See Section A-A)

STRAND LEGEND

● – Prestressed Strand
0.5 In. Grade 270, LRS
31 Kips Before Transfer
(10 strands total)

○ – Dormant Strand
0.5 In. Grade 270, LRS
(6 strands total)




SECTION A-A
(Typical Square Section)

NOTES:

Work this Index with the Strain Pole Schedule in the plans.

Strands shown are continuous from Tip End to Butt End.

Elevation view scale is exaggerated vertically for clarity.

For final erection, tilt pole upright with single point attachment located a distance 10% L from the Tip End face.

* Taper includes pole width, strands, reinforcing and void. (0.081 In./Ft. per face)

** Support locations are for strand release, storage, lifting and transport. Keep Back Face oriented downward until final erection.

*** Dimension may vary from 3¾" to 5" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 6½".

# STRAIN POLE TYPE P-VII

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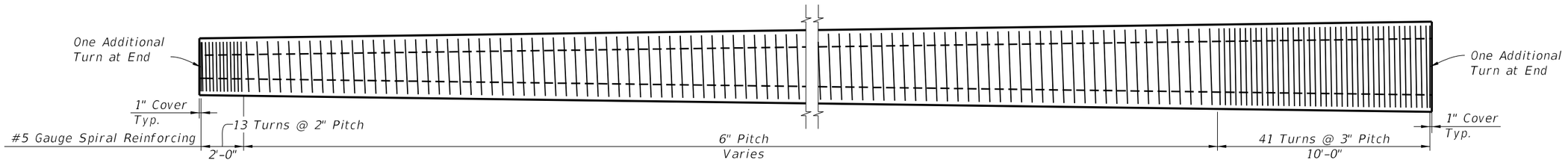
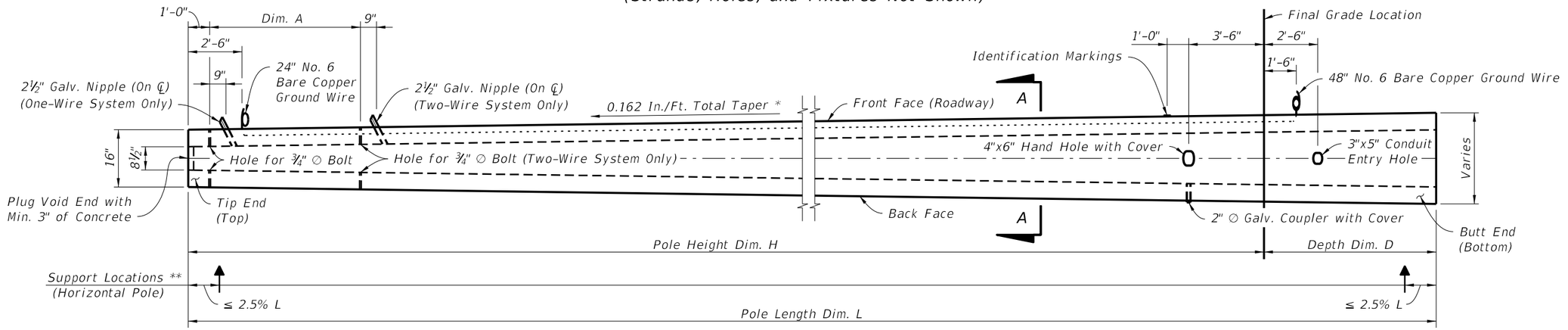
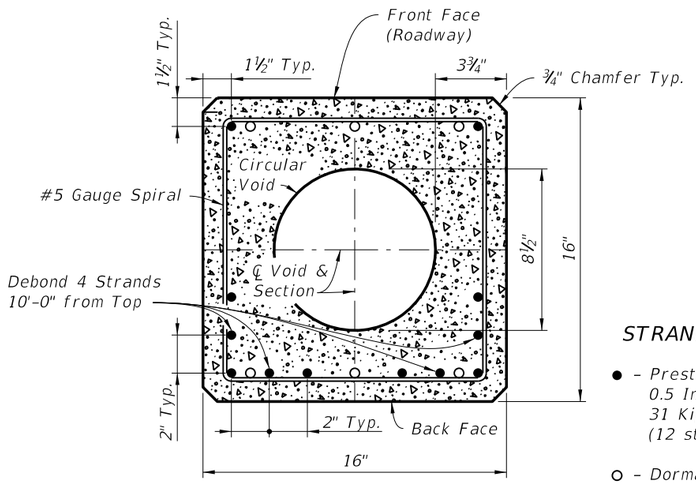
| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/12 | | | | | | 17725 | 7 |




SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)




POLE ELEVATION
(Strands and Reinforcing Not Shown)

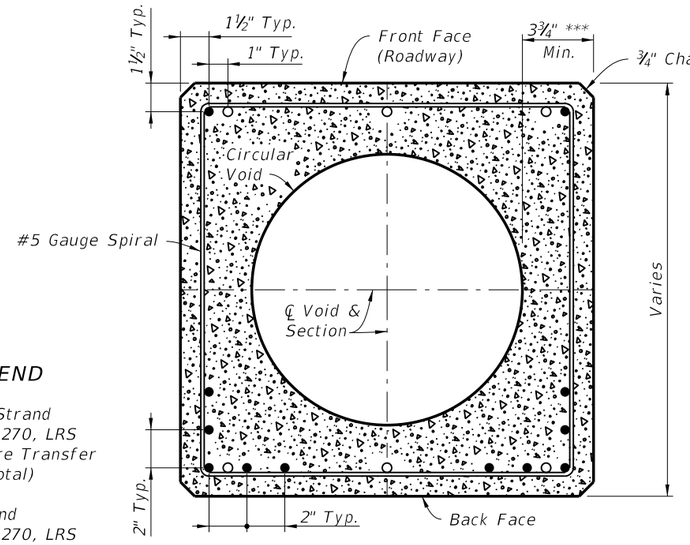



TIP END SECTION (TOP)
(For Dormant Strand Locations, See Section A-A)

STRAND LEGEND

● – Prestressed Strand
0.5 In. Grade 270, LRS
31 Kips Before Transfer
(12 strands total)

○ – Dormant Strand
0.5 In. Grade 270, LRS
(6 strands total)




SECTION A-A
(Typical Square Section)

NOTES:

Work this Index with the Strain Pole Schedule in the plans.

Strands shown are continuous from Tip End to Butt End.

Elevation view scale is exaggerated vertically for clarity.

For final erection, tilt pole upright with single point attachment located a distance 10% L from the Tip End face.

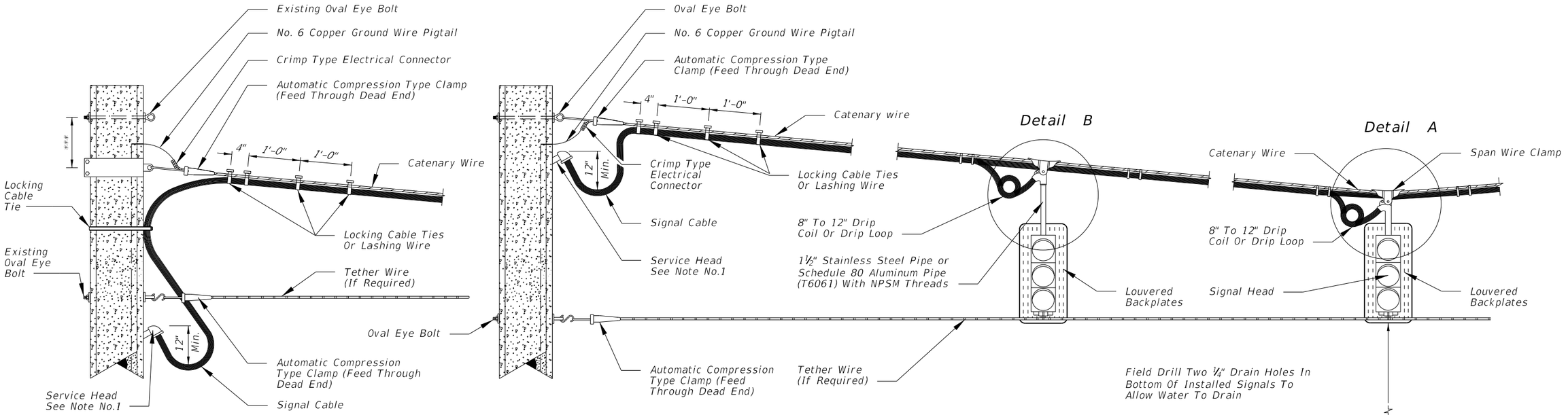
* Taper includes pole width, strands, reinforcing and void. (0.081 In./Ft. per face)

** Support locations are for strand release, storage, lifting and transport. Keep Back Face oriented downward until final erection.

*** Dimension may vary from 3¾" to 5" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 8½".

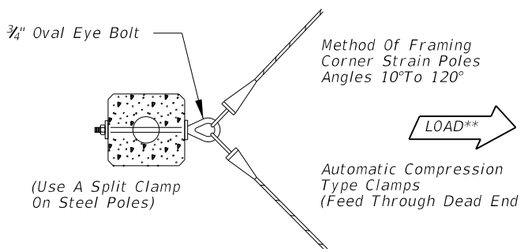
# STRAIN POLE TYPE P-VIII

| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | CONCRETE POLES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/12 | | | | | | 17725 | 8 |

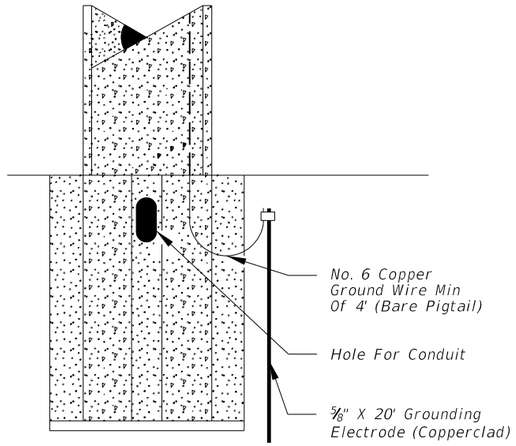



## RETROFIT INSTALLATION

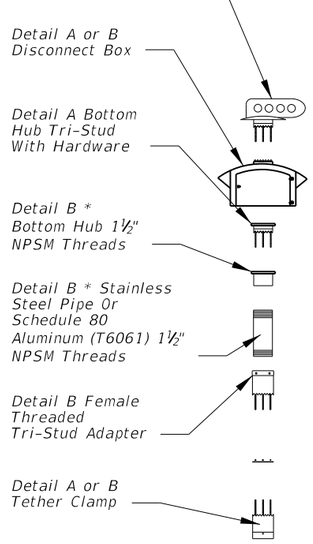
*** Clamp location shall be adjusted to compensate for reduced sag and vertical clearance to bottom of signal head.



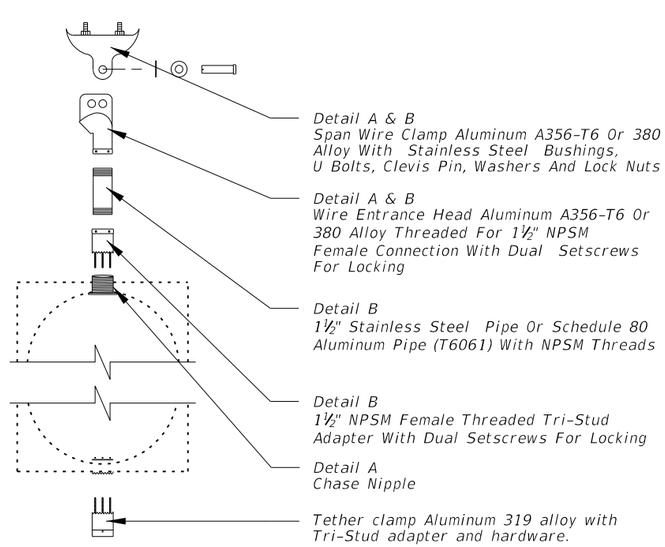

** The load face of pole shall be perpendicular to load.




## PRESTRESSED CONCRETE POLE NEW CONSTRUCTION




* For long pipe hangers a wire entrance head may be substituted for balancer and the drop pipe installed above the disconnect box.

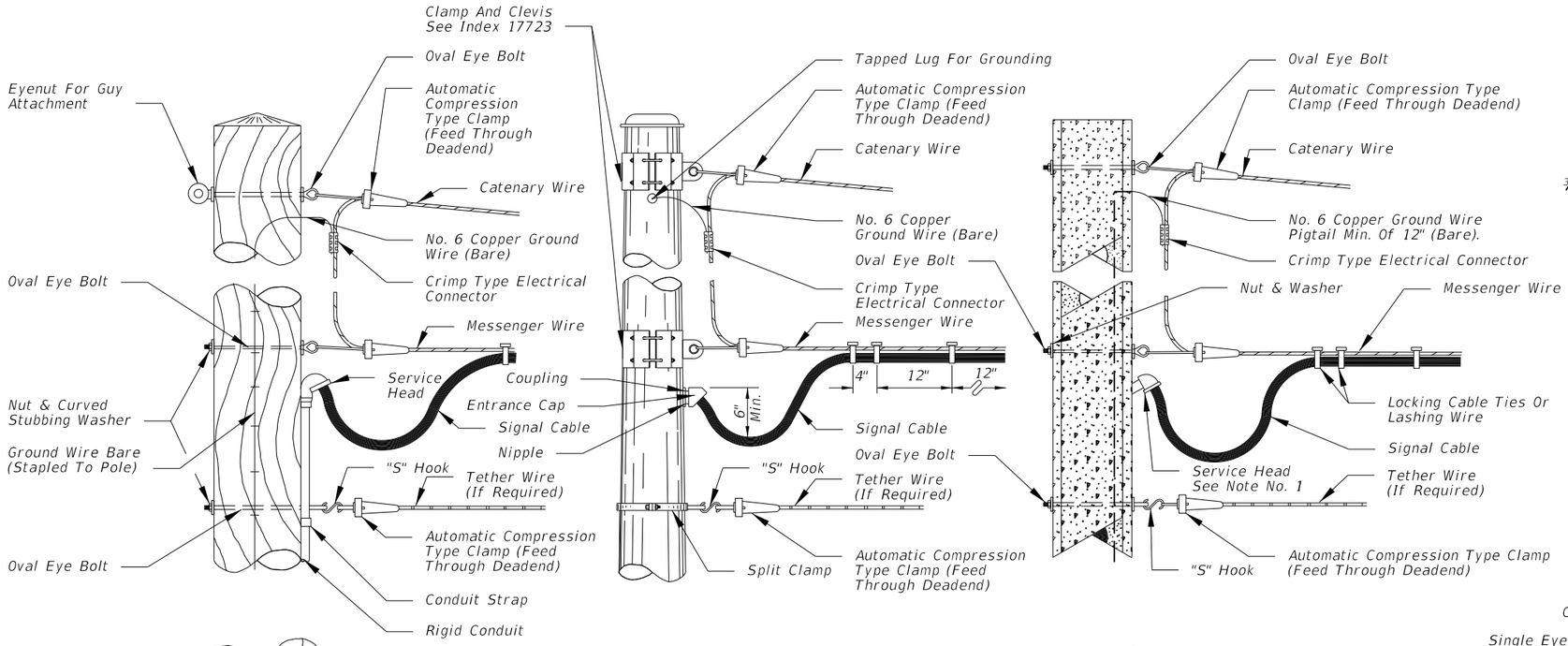


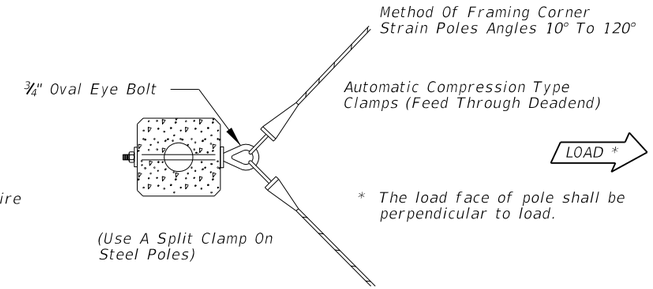

## SINGLE POINT ATTACHMENT

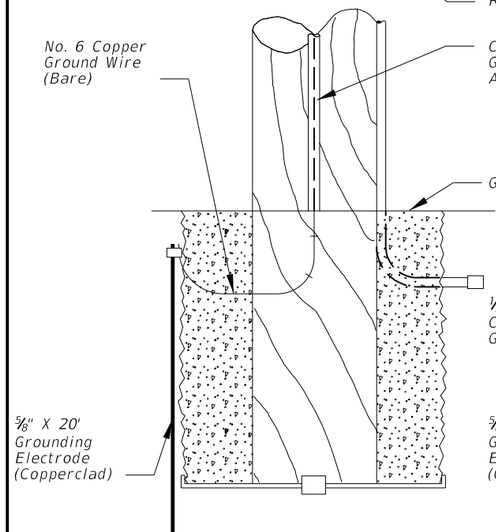
Notes:

1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. All hardware for signal attachment shall be stainless steel.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

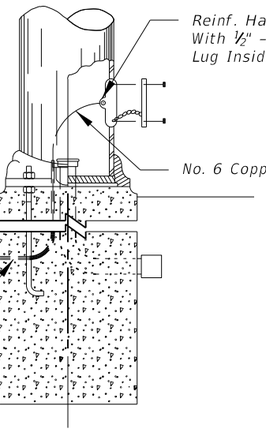
| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | SIGNAL CABLE & SPAN WIRE INSTALLATION DETAILS | INDEX NO. 17727 | SHEET NO. 1 |



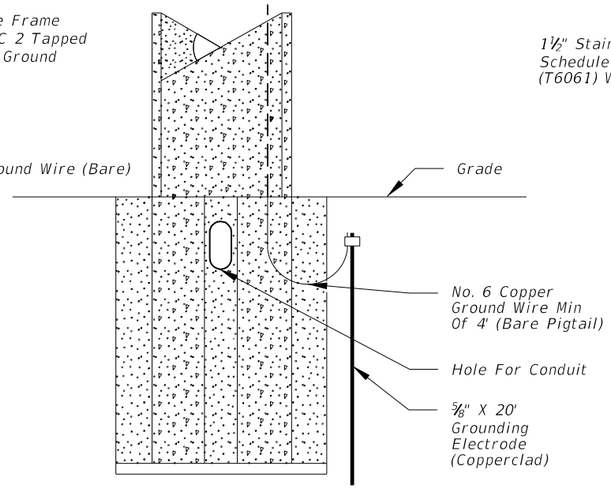



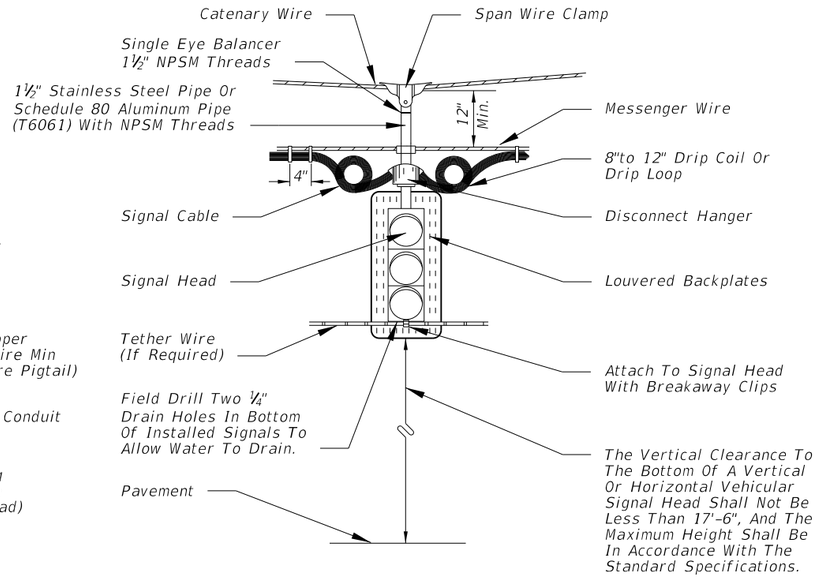

WOOD POLE




STEEL POLE




PRESTRESSED CONCRETE POLE




TWO POINT ATTACHMENT

Notes:

1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing of 2" between bolts.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

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6/28/2012

| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | SIGNAL CABLE & SPAN WIRE INSTALLATION DETAILS | INDEX NO. 17727 | SHEET NO. 2 |

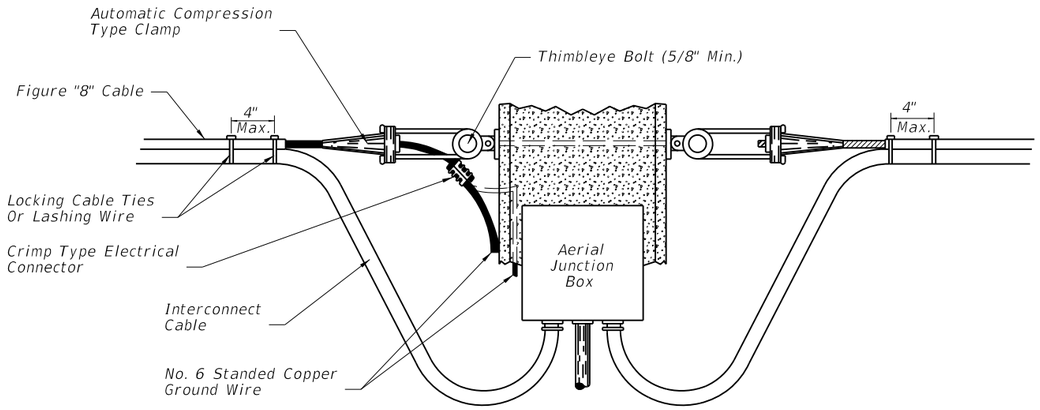



FIGURE A
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "8"

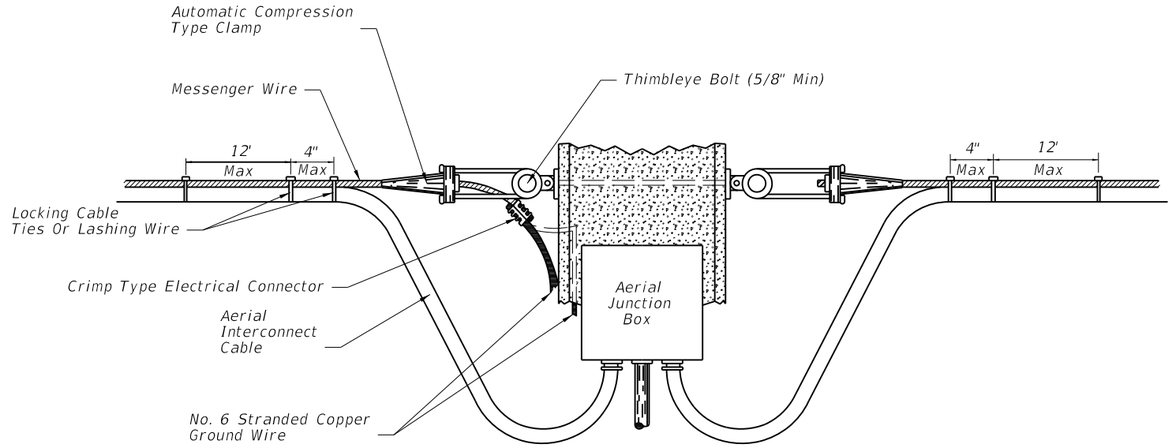



FIGURE B
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

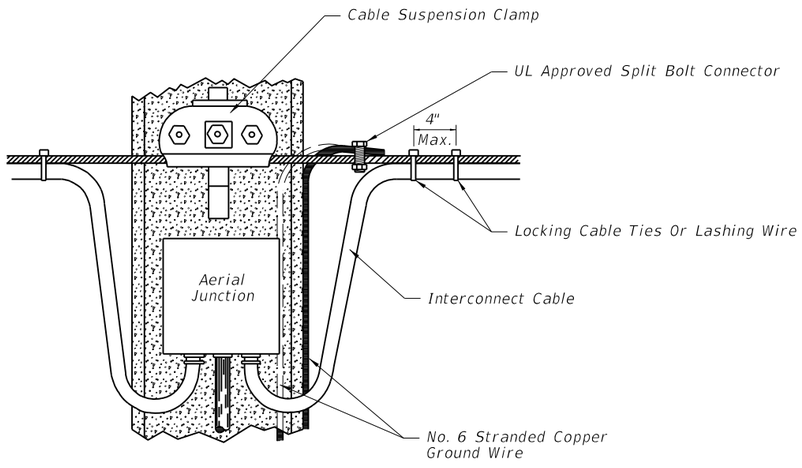


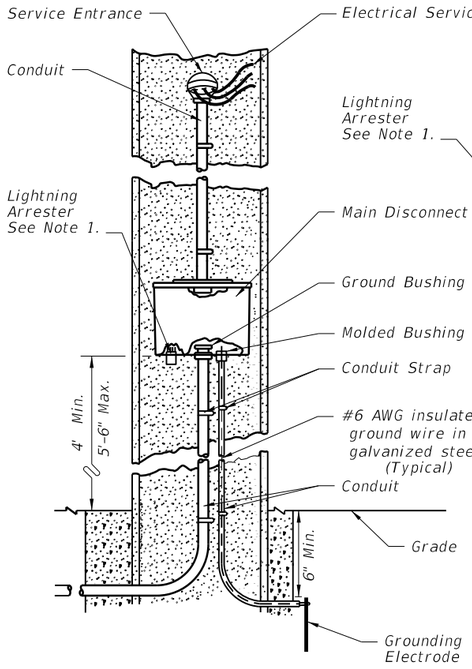

FIGURE C
CABLE DROP DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

Notes:

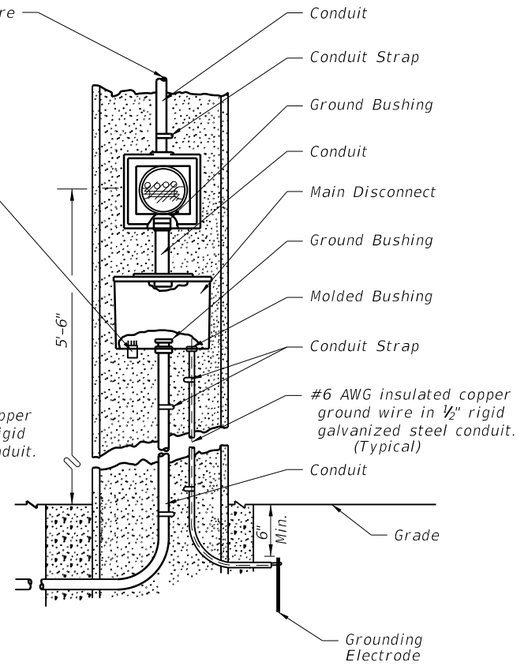
1. The messenger wire of the interconnect cables shall be grounded to the copper ground wire of the pole or to the external wire extending down the pole.
2. When utilizing the external ground wire to the pole, a piece of ½" conduit shall extend up the pole externally to a point 8' above finish grade to protect the ground wire connecting the messenger wire to the ground rod.
3. Locking cable ties or lashing wire when used shall be placed no further than 12" apart except at the point of cable drop or terminations where one (1) shall be placed at the point where the cables separate from the messenger wire and another placed 4" (max) from that tie. When using figure "8" interconnect cable only the locking cable ties shall be used.
4. If accessible the internal ground wire of the support pole may be used to ground the messenger wire.
5. Lashing wire should normally be used for distances of 12' or greater.
6. Meet all grounding requirements of Section 620 of the Standard Specifications.



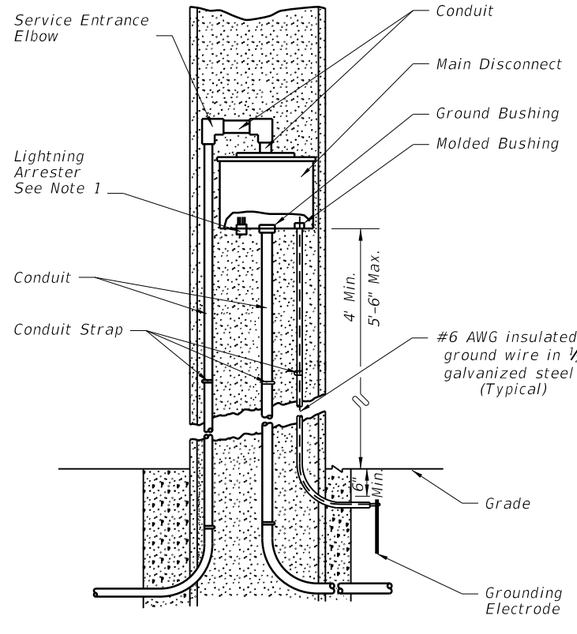
| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | AERIAL INTERCONNECT | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 07/01/00 | | | | | | 17733 | 1 |



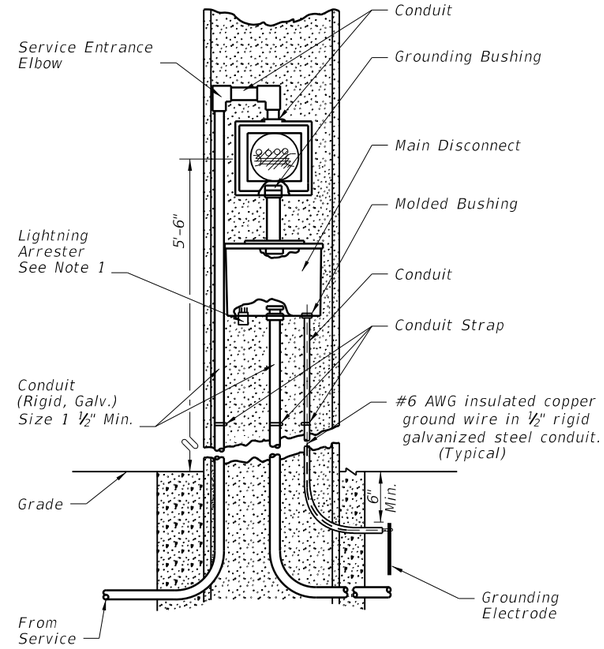

AERIAL FEED
(NO METER USED)
FIGURE A



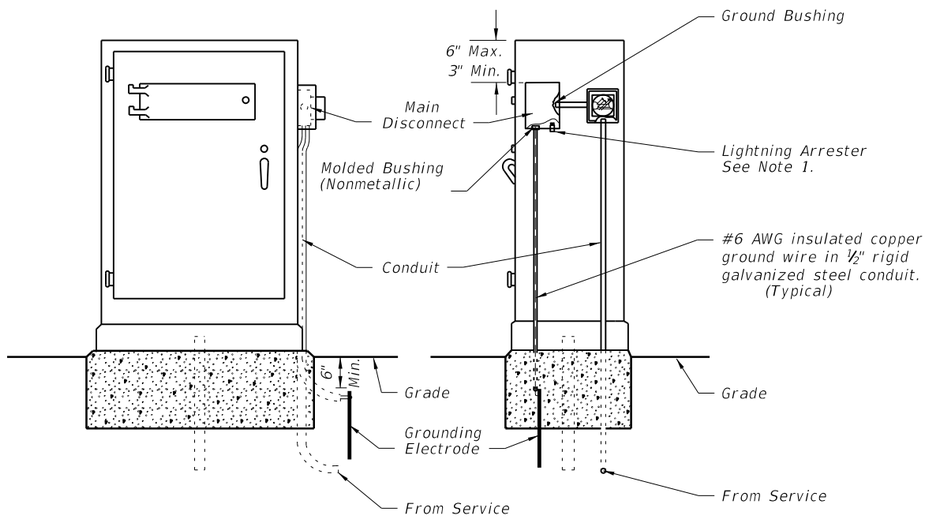

AERIAL FEED
(METER USED)
FIGURE B




UNDERGROUND FEED
(NO METER USED)
FIGURE C




TYPE "B" UNDERGROUND FEED
(METER USED)
FIGURE D




UNDERGROUND CABINET MOUNTED
(METER USED)
FIGURE E

NOTES:

1. The lightning arrester can be located on the side or bottom of the main disconnect enclosure at the Contractor's Option.
2. Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.
3. Bond all elements together to form an Intersection Grounding Network in accordance with Section 620 of the Department's current Standard Specifications for Road and Bridge Construction. The bond wire shall be run in conduit with the Electrical Service Wire or Signal Cable.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.
5. The Main Disconnect shall be lockable by padlock and four keys provided to the maintaining agency. The door shall have a minimum of three hinges and be lockable. No screws to be used to attach door.
6. The Main Disconnect shall be Nema 3R or better.



| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 07/01/09 | | | FDOT DESIGN STANDARDS 2013 | ELECTRIC POWER SERVICE | 17736 | 1 |

| POLE SELECTION TABLE – SINGLE ARM – WITH & WITHOUT LUMINAIRE | | | | | |
|---|---|---|---|---|---|
| ARM TYPE | D1 | D3 | D5 | D6 | D7 |
| POLE TYPE | S1 & S21 Lum | S2 & S22 Lum | S3 & S23 Lum | S4 & S24 Lum | S6 |

| POLE SELECTION TABLE – DOUBLE ARM – WITHOUT LUMINAIRE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ARM TYPE | D1 - D1 | D3 - D1 | D5 - D2 | D6 - D2 | D4 - D4 | D5 - D4 | D6 - D4 | D5 - D5 | D6 - D5 | D6 - D6 |
| POLE TYPE | S1 | S2 | S3 | S4 | S3 | S4 | S4 | S4 | S4 | S5 |

Arm 1 is listed first

| ARM DESIGN TABLE – ALL CASES | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARM TYPE | ARM LENGTH | MAST ARM | | | | ARM EXTENSION | | | | ARM CONNECTION & WELDS | | |
| | | FA/SA (ft) | FB/SB (in) | FC/SC (in) | FD/SD (in) | FE/SE (ft) | FF/SF (in) | FG/SG (in) | FH/SH (in) | HT (in) | FJ/SJ (in) | FK/SK (in) |
| D1 | 36'–0" | 36 | 8.96 | 14 | 0.1793 | | | | | 20 | 25 | 2.5 |
| D2 | 36'–0" | 36 | 8.96 | 14 | 0.1793 | | | | | 30 | 36 | 3 |
| D3 | 46'–0" | 36.3 | 8.92 | 14 | 0.1793 | 11.7 | 13.36 | 15 | 0.313 | 20 | 25 | 2.5 |
| D4 | 46'–0" | 36.3 | 8.92 | 14 | 0.1793 | 11.7 | 13.36 | 15 | 0.313 | 30 | 36 | 3 |
| D5 | 60'–0" | 36 | 7.96 | 13 | 0.1793 | 26 | 12.36 | 16 | 0.375 | 30 | 36 | 3 |
| D6 | 70'–6" | 39.4 | 9.49 | 15 | 0.1793 | 33.1 | 14.37 | 19 | 0.375 | 30 | 36 | 3 |
| D7 | 78'–0" | 40 | 8.44 | 14 | 0.1793 | 40 | 13.40 | 19 | 0.375 | 30 | 34 | 3 |

Arm Camber Angle = 2 degrees

| POLE, CONNECTION AND SHAFT DESIGN TABLE – SINGLE & DOUBLE ARM | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POLE TYPE | UA (ft) | UC (in) | UD (in) | UE (in) | UG (ft) | UPRIGHT BASE CONNECTION | | | | | CONNECTION PLATE DATA | | | | | | | | | DRILLED SHAFT DATA | | | | | |
| | | | | | | No. Bolts | BA (in) | BB (in) | BC (in) | BF (in) | HT (in) | FJ/SJ (in) | FL/SL (in) | FN/SN (in) | FO/SO (in) | FP/SP (in) | FR/SR (in) | FS/SS (in) | FT/ST (in) | DA (ft) | DB (ft) | RA | RB | RC | RD (in) |
| S1 | 24 | 12.64 | 16 | 0.375 | | 6 | 30 | 2.5 | 1.75 | 36 | 20 | 25 | 0.75 | 0.438 | 15.5 | 1 | 2 | 8 | 0.438 | 12 | 4 | 11 | 14 | 9 | 12 |
| S2 | 24 | 14.64 | 18 | 0.375 | | 6 | 32 | 2.5 | 1.75 | 36 | 20 | 25 | 0.75 | 0.438 | 15.5 | 1 | 2 | 8 | 0.438 | 12 | 4.5 | 11 | 16 | 9 | 12 |
| S3 | 24 | 17.64 | 21 | 0.375 | | 6 | 37 | 2.5 | 2 | 40 | 30 | 36 | 0.75 | 0.438 | 22 | 1.25 | 2.5 | 12.5 | 0.438 | 15 | 4.5 | 11 | 16 | 10 | 8 |
| S4 | 24 | 22.64 | 26 | 0.375 | | 6 | 42 | 2.5 | 2 | 40 | 30 | 36 | 0.75 | 0.438 | 22 | 1.25 | 2 | 12.5 | 0.438 | 17 | 5 | 11 | 18 | 10 | 8 |
| S5 | 24 | 23.64 | 27 | 0.375 | | 6 | 45 | 2.5 | 2.25 | 45 | 30 | 36 | 0.75 | 0.438 | 22 | 1.25 | 2 | 12.5 | 0.438 | 18 | 5 | 11 | 18 | 10 | 8 |
| S6 | 24 | 21.64 | 25 | 0.375 | | 6 | 41 | 2.5 | 2 | 40 | 30 | 34 | 0.75 | 0.5 | 16.5 | 1.25 | 2 | 12.5 | 0.5 | 15 | 5 | 11 | 18 | 10 | 8 |
| S21 Lum | 39 | 10.54 | 16 | 0.375 | 37.5 | 6 | 30 | 2.5 | 1.75 | 40 | 20 | 25 | 0.75 | 0.438 | 11.5 | 1 | 2 | 8 | 0.438 | 12 | 4 | 11 | 14 | 9 | 12 |
| S22 Lum | 39 | 12.54 | 18 | 0.375 | 37.5 | 6 | 32 | 2.5 | 1.75 | 40 | 20 | 25 | 0.75 | 0.438 | 12.5 | 1 | 2 | 8 | 0.438 | 12 | 4.5 | 11 | 16 | 9 | 12 |
| S23 Lum | 39 | 15.54 | 21 | 0.375 | 37.5 | 6 | 37 | 2.5 | 2 | 40 | 30 | 36 | 0.75 | 0.438 | 15 | 1.25 | 2.5 | 12.5 | 0.438 | 14 | 4.5 | 11 | 16 | 10 | 8 |
| S24 Lum | 39 | 20.54 | 26 | 0.375 | 37.5 | 6 | 42 | 2.5 | 2 | 40 | 30 | 36 | 0.75 | 0.438 | 17 | 1.25 | 2 | 12.5 | 0.438 | 15 | 5 | 11 | 18 | 10 | 8 |

| LUMINAIRE AND LUMINAIRE CONNECTION | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LA (ft) | LB (ft) | LC (in) | LD (in) | LE | LF (ft) | LG (in) | LH (in) | LJ (in) | LK (in) | LL (deg) | UG (ft) |
| 40 | 10 | 3 | 0.125 | 0.5 | 8 | 0.5 | 0.75 | 0.25 | 0.25 | 0 | 37.5 |

Notes:
1. Work this Index with Index No. 17745.
2. Design Wind Speed = 150 mph with Signal Backplates.

"D" MAST ARMS

| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | STANDARD MAST ARM ASSEMBLIES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/12 | | | | | | 17743 | 1 |

| POLE SELECTION TABLE – SINGLE ARM – WITH & WITHOUT LUMINAIRE | | | | | |
|---|---|---|---|---|---|
| ARM TYPE | E1 | E3 | E5 | E6 | E7 |
| POLE TYPE | T1 & T21 Lum | T2 & T22 Lum | T3 & T23 Lum | T4 & T24 Lum | T6 |

| POLE SELECTION TABLE – DOUBLE ARM – WITHOUT LUMINAIRE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ARM TYPE | E1 - E1 | E3 - E1 | E5 - E2 | E6 - E2 | E4 - E4 | E5 - E4 | E6 - E4 | E5 - E5 | E6 - E5 | E6 - E6 |
| POLE TYPE | T1 | T2 | T3 | T4 | T3 | T4 | T4 | T4 | T4 | T5 |

Arm 1 is listed first

| ARM DESIGN TABLE – ALL CASES | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARM TYPE | ARM LENGTH | MAST ARM | | | | ARM EXTENSION | | | | ARM CONNECTION & WELDS | | |
| | | FA/SA (ft) | FB/SB (in) | FC/SC (in) | FD/SD (in) | FE/SE (ft) | FF/SF (in) | FG/SG (in) | FH/SH (in) | HT (in) | FJ/SJ (in) | FK/SK (in) |
| E1 | 36'-0" | 36.0 | 5.96 | 11 | 0.25 | | | | | 22 | 23 | 2 |
| E2 | 36'-0" | 36.0 | 5.96 | 11 | 0.25 | | | | | 30 | 32 | 2.75 |
| E3 | 46'-0" | 36.3 | 7.06 | 12.14 | 0.25 | 11.7 | 11.36 | 13 | 0.313 | 22 | 23 | 2 |
| E4 | 46'-0" | 36.3 | 7.06 | 12.14 | 0.25 | 11.7 | 11.36 | 13 | 0.313 | 30 | 32 | 2.75 |
| E5 | 60'-0" | 36.0 | 6.10 | 11.14 | 0.25 | 26 | 10.36 | 14 | 0.375 | 30 | 32 | 2.75 |
| E6 | 70'-6" | 39.4 | 6.63 | 12.15 | 0.25 | 33.1 | 11.37 | 16 | 0.375 | 30 | 32 | 2.75 |
| E7 | 78'-0" | 40.0 | 7.50 | 13.10 | 0.1793 | 40 | 12.40 | 18 | 0.375 | 30 | 32 | 2.5 |

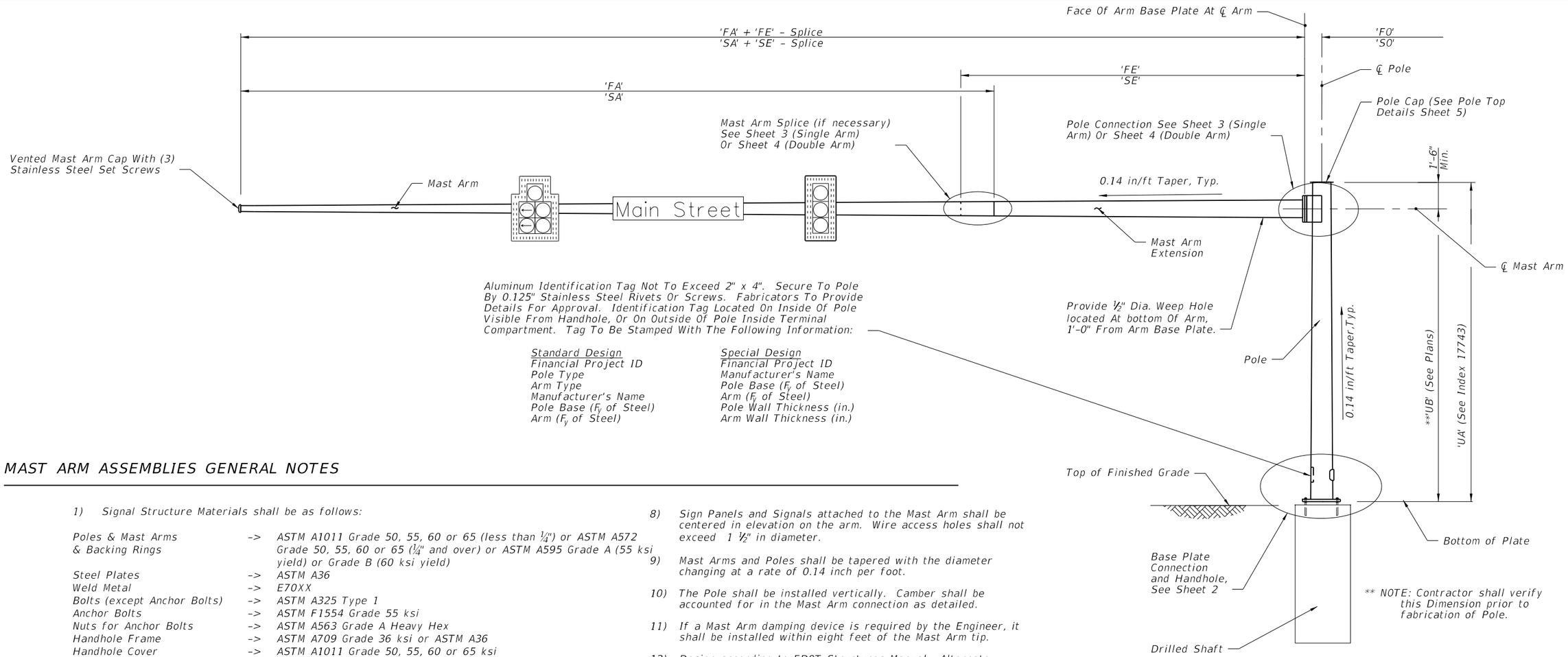
Arm Camber Angle = 2 degrees

| POLE, CONNECTION AND SHAFT DESIGN TABLE – SINGLE & DOUBLE ARM | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POLE TYPE | UA (ft) | UC (in) | UD (in) | UE (in) | UG (ft) | UPRIGHT BASE CONNECTION | | | | | CONNECTION PLATE DATA | | | | | | | | | DRILLED SHAFT DATA | | | | | |
| | | | | | | No. Bolts | BA (in) | BB (in) | BC (in) | BF (in) | HT (in) | FJ/SJ (in) | FL/SL (in) | FN/SN (in) | FO/SO (in) | FP/SP (in) | FR/SR (in) | FS/SS (in) | FT/ST (in) | DA (ft) | DB (ft) | RA | RB | RC | RD (in) |
| T1 | 24 | 10.64 | 14 | 0.375 | | 6 | 26 | 2.5 | 1.5 | 36 | 22 | 23 | 0.5 | 0.375 | 14 | 1 | 2.0 | 9 | 0.375 | 11 | 4 | 11 | 14 | 8 | 12 |
| T2 | 24 | 12.64 | 16 | 0.375 | | 6 | 28 | 2.5 | 1.5 | 36 | 22 | 23 | 0.5 | 0.375 | 14 | 1 | 2.0 | 9 | 0.375 | 12 | 4 | 11 | 14 | 9 | 12 |
| T3 | 24 | 15.64 | 19 | 0.375 | | 6 | 35 | 2.5 | 2 | 40 | 30 | 32 | 0.75 | 0.375 | 19.5 | 1.25 | 2.25 | 12.5 | 0.375 | 12 | 4.5 | 11 | 16 | 9 | 12 |
| T4 | 24 | 18.64 | 22 | 0.5 | | 6 | 38 | 2.5 | 2 | 40 | 30 | 32 | 0.75 | 0.375 | 19.5 | 1.25 | 2.0 | 12.5 | 0.375 | 15 | 4.5 | 11 | 16 | 10 | 8 |
| T5 | 24 | 18.64 | 22 | 0.5 | | 6 | 38 | 2.5 | 2 | 40 | 30 | 32 | 0.75 | 0.375 | 19.5 | 1.25 | 2.0 | 12.5 | 0.375 | 16 | 4.5 | 11 | 16 | 10 | 8 |
| T6 | 24 | 18.64 | 22 | 0.375 | | 6 | 38 | 2.5 | 2 | 40 | 30 | 32 | 0.75 | 0.438 | 15 | 1.25 | 2.0 | 12.5 | 0.438 | 14 | 4.5 | 11 | 16 | 10 | 8 |
| T21 Lum | 39 | 8.54 | 14 | 0.375 | 37.5 | 6 | 26 | 2.5 | 1.5 | 40 | 22 | 23 | 0.5 | 0.375 | 10 | 1 | 2.0 | 9 | 0.375 | 11 | 4 | 11 | 14 | 8 | 12 |
| T22 Lum | 39 | 10.54 | 16 | 0.375 | 37.5 | 6 | 30 | 2.5 | 1.75 | 40 | 22 | 23 | 0.5 | 0.375 | 11 | 1 | 2.0 | 9 | 0.375 | 12 | 4 | 11 | 14 | 9 | 12 |
| T23 Lum | 39 | 13.54 | 19 | 0.375 | 37.5 | 6 | 35 | 2.5 | 2 | 40 | 30 | 32 | 0.75 | 0.375 | 13 | 1.25 | 2.25 | 12.5 | 0.375 | 12 | 4.5 | 11 | 16 | 9 | 12 |
| T24 Lum | 39 | 16.54 | 22 | 0.375 | 37.5 | 6 | 38 | 2.5 | 2 | 40 | 30 | 32 | 0.75 | 0.375 | 15 | 1.25 | 2.0 | 12.5 | 0.375 | 14 | 4.5 | 11 | 16 | 10 | 12 |

| LUMINAIRE AND LUMINAIRE CONNECTION | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LA (ft) | LB (ft) | LC (in) | LD (in) | LE | LF (ft) | LG (in) | LH (in) | LJ (in) | LK (in) | LL (deg) | UG (ft) |
| 40 | 10 | 3 | 0.125 | 0.5 | 8 | 0.5 | 0.75 | 0.25 | 0.25 | 0 | 37.5 |

Notes:
1. Work this Index with Index No. 17745.
2. Design Wind Speed = 150 mph without Signal Backplates.
130 mph with or without Signal Backplates.
110 mph with or without Signal Backplates.

"E" MAST ARMS




Aluminum Identification Tag Not To Exceed 2" x 4". Secure To Pole By 0.125" Stainless Steel Rivets Or Screws. Fabricators To Provide Details For Approval. Identification Tag Located On Inside Of Pole Visible From Handhole, Or On Outside Of Pole Inside Terminal Compartment. Tag To Be Stamped With The Following Information:

| Standard Design | Special Design |
|---|---|
| Financial Project ID | Financial Project ID |
| Pole Type | Manufacturer's Name |
| Arm Type | Pole Base ($F_y$ of Steel) |
| Manufacturer's Name | Arm ($F_y$ of Steel) |
| Pole Base ($F_y$ of Steel) | Pole Wall Thickness (in.) |
| Arm ($F_y$ of Steel) | Arm Wall Thickness (in.) |

## MAST ARM ASSEMBLIES GENERAL NOTES

1) Signal Structure Materials shall be as follows:

| | | |
|---|---|---|
| Poles & Mast Arms & Backing Rings | –> | ASTM A1011 Grade 50, 55, 60 or 65 (less than ¼") or ASTM A572 Grade 50, 55, 60 or 65 (¼" and over) or ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield) |
| Steel Plates | –> | ASTM A36 |
| Weld Metal | –> | E70XX |
| Bolts (except Anchor Bolts) | –> | ASTM A325 Type 1 |
| Anchor Bolts | –> | ASTM F1554 Grade 55 ksi |
| Nuts for Anchor Bolts | –> | ASTM A563 Grade A Heavy Hex |
| Handhole Frame | –> | ASTM A709 Grade 36 ksi or ASTM A36 |
| Handhole Cover | –> | ASTM A1011 Grade 50, 55, 60 or 65 ksi |
| Caps | –> | ASTM A1011 Grade 50, 55, 60 or 65 ksi or ASTM B209 |
| Nut Covers | –> | ASTM B26 (319–F) |
| Stainless Steel Screws | –> | AISI Type 316 |
| Threaded Bars/Studs | –> | ASTM A36 or ASTM A307 |

2) Reinforcing Steel shall be ASTM A615 Grade 60 ksi.

3) Concrete shall be Class IV (Drilled Shaft) with a minimum 28–day compressive strength of 4,000 psi for all environmental classifications.

4) All welding shall conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).

5) All steel items shall be galvanized as follows:
All Nuts, Bolts, Washers and Threaded Bars/Studs –> F2329
All other steel items (including Pole & Mast Arm) –> ASTM A123

6) Locate handhole 180° from arm on single arm poles or 180° from first arm of double arm poles or see special instructions on Mast Arm Tabulation Sheet.

7) Except for Anchor Bolts, all bolt hole diameters shall be equal to the bolt diameter plus 1/16", prior to galvanizing. Hole diameters for Anchor Bolts shall not exceed the bolt diameter plus ½".

8) Sign Panels and Signals attached to the Mast Arm shall be centered in elevation on the arm. Wire access holes shall not exceed 1 ½" in diameter.

9) Mast Arms and Poles shall be tapered with the diameter changing at a rate of 0.14 inch per foot.

10) The Pole shall be installed vertically. Camber shall be accounted for in the Mast Arm connection as detailed.

11) If a Mast Arm damping device is required by the Engineer, it shall be installed within eight feet of the Mast Arm tip.

12) Design according to FDOT Structures Manual. Alternate Designs for Special Mast Arm Assemblies are not allowed.

13) Provide "J", or "C"–Hook at top of pole for signal cable support.

14) First and Second Arm Camber Angle = 2°.

15) Details for Signal and Sign Locations, Signal Head attachment, Sign Attachment, Pedestrian Head Attachment, and Foundation Conduit are not shown for clarity.

16) One hundred percent of full–penetration groove welds and a random 25 percent of partial penetration groove welds shall be inspected. Full–penetration groove weld inspection shall be performed by nondestructive methods of radiography or ultrasonics.

17) Use of split lock washer is not permitted.

18) In accordance with Specifications 5–1.4.2, Shop Drawings are only required for additions, deletions, or modifications to this Design Standard.

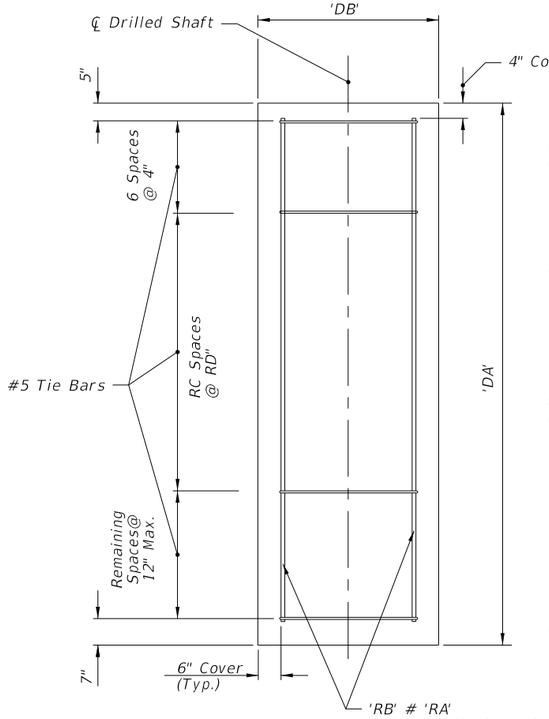
19) Verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube location +/– two inches along the inner circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.

ELEVATION VIEW

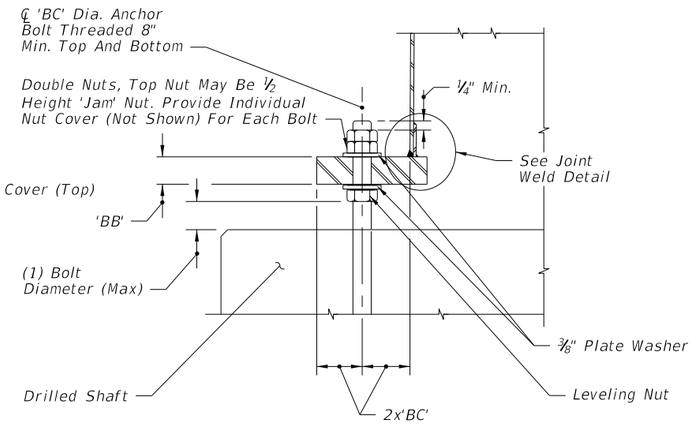
(Single Arm Shown, Double Arm Similar)
(Luminaire Arm Not Shown)

TYPICAL ELEVATION AND NOTES

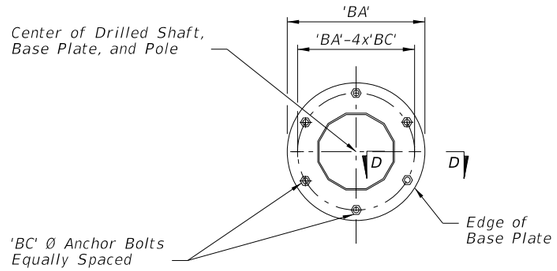
C:\d\projects\standards\roadway\17700-s\17745-01.dgn rd960rh 3:09:37 PM 6/28/2012



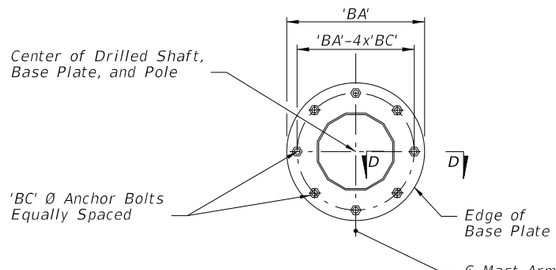

SECTION A-A




SECTION D-D

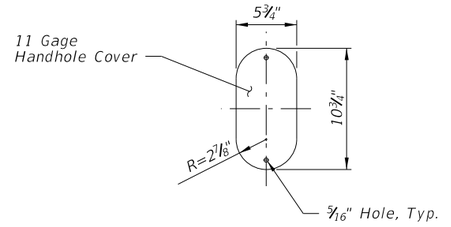



SECTION C-C
(6 Anchor Bolts)



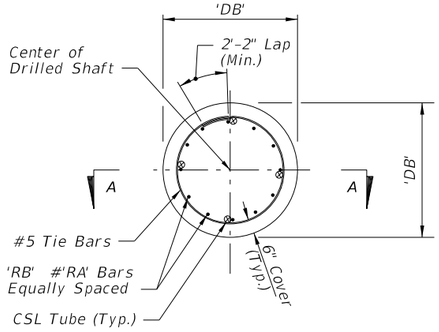

SECTION C-C
*Alternate Detail*
(8 Anchor Bolts)

NOTE:
See Index No. 17743 and the plans for actual quantity of bolts.

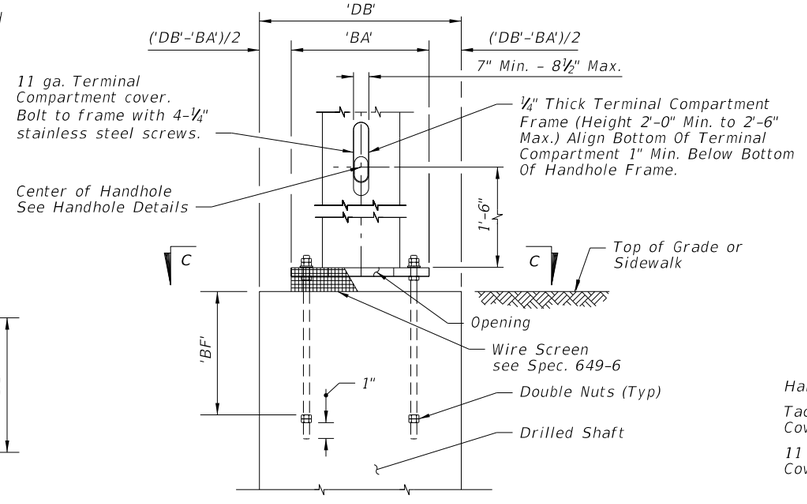



HANDHOLE COVER

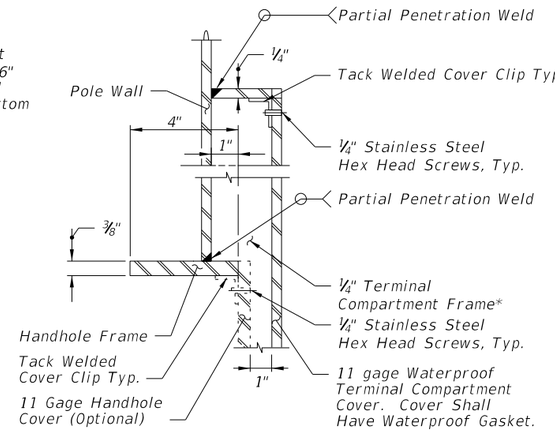
Note:
Handhole Cover may be omitted when Terminal Compartment is provided.




FOUNDATION PLAN

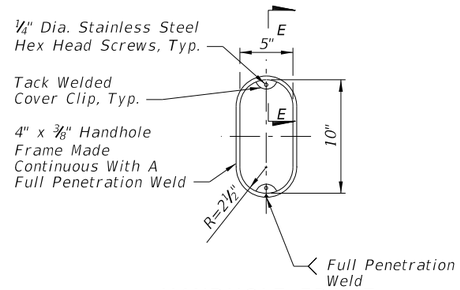



BASE PLATE AND ANCHORAGE ELEVATION
(Reinforcement Not Shown)




SECTION E-E
(Thru Handhole & Terminal Compartment)

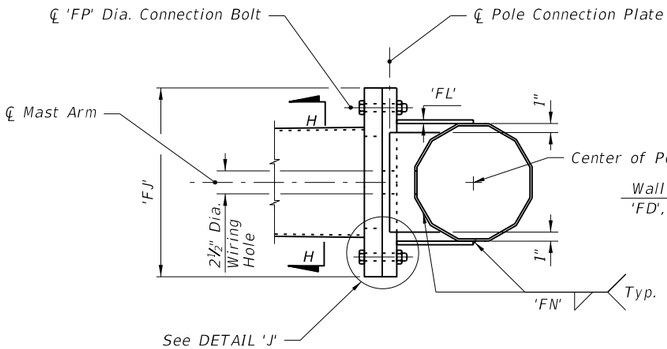
* Terminal Compartment is optional. See Mast Arm Tabulation to see if required and for locations.



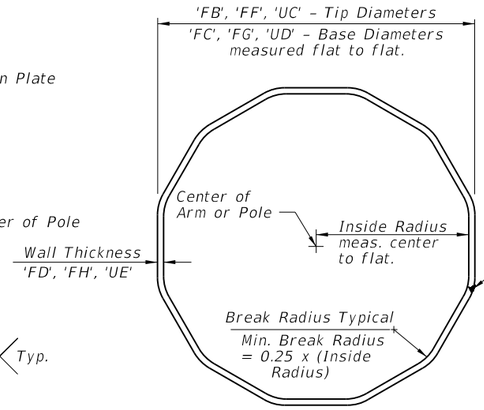

HANDHOLE FRAME
(w/Terminal Compartment Omitted)

# TYPICAL FOUNDATION AND BASE PLATE DETAILS

| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 07/01/12 | | | FDOT DESIGN STANDARDS 2013 | MAST ARM ASSEMBLIES | 17745 | 2 |

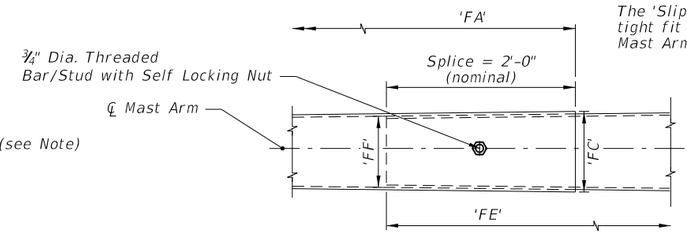



SECTION F-F



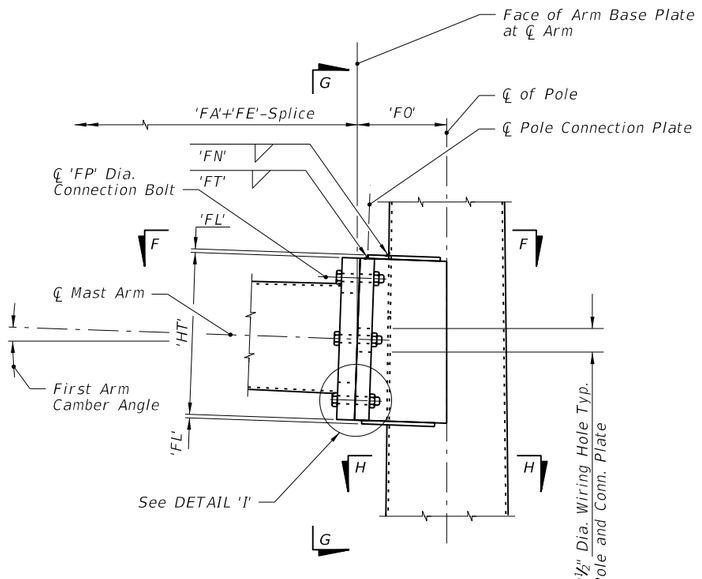

SECTION H-H

NOTE:
Longitudinal seam welds within six inches of circumferential welds shall be complete penetration welds. Longitudinal seam welds at telescopic field splices shall be complete penetration welds for the splice length plus six inches. Up to two longitudinal seam welds maximum permitted.

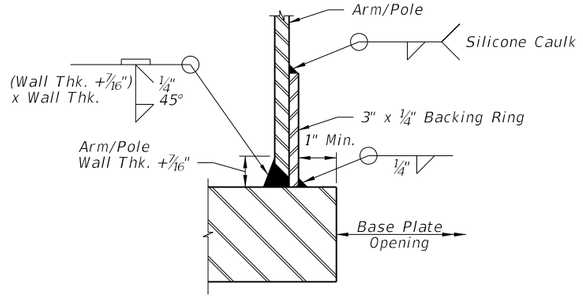



The 'Slip Joint' splice shall be a tight fit with no change in the Mast Arm slope due to the splice.

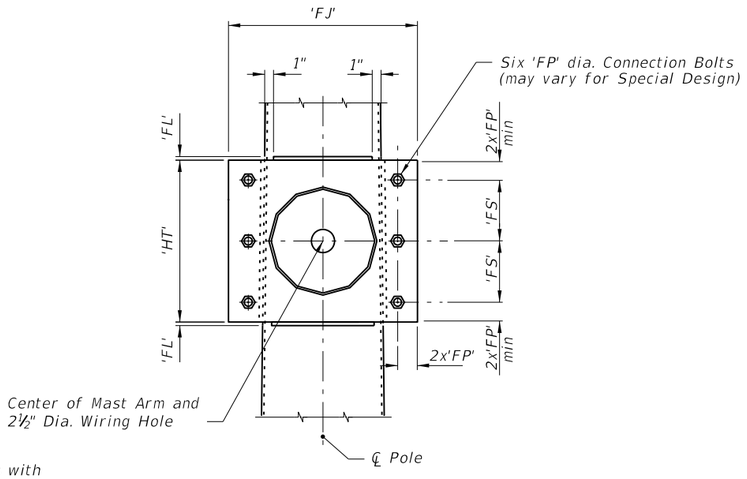
Arm Splice Detail



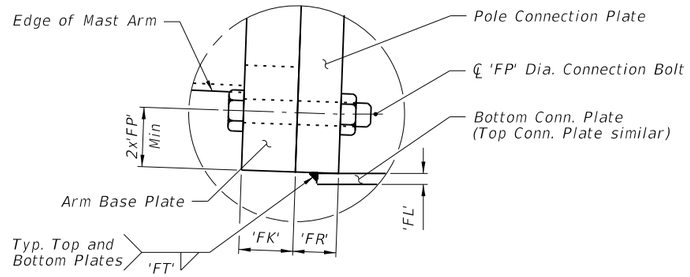

ELEVATION
(Single Arm Connection)



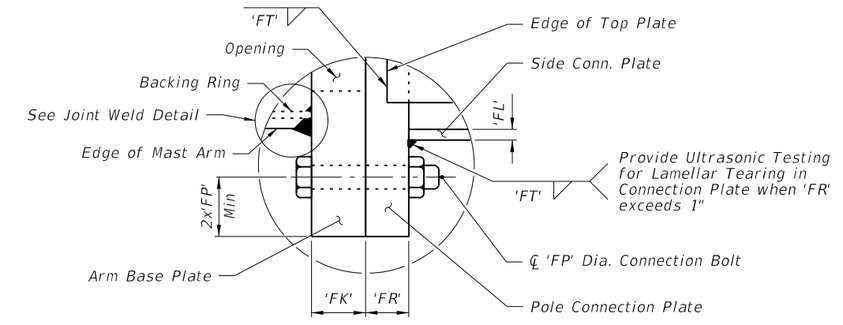

JOINT WELD DETAIL




SECTION G-G




DETAIL 'I'

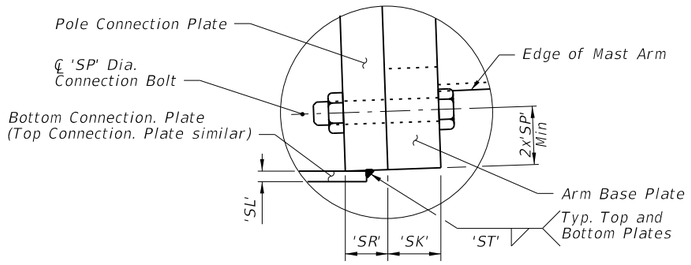



DETAIL 'J'

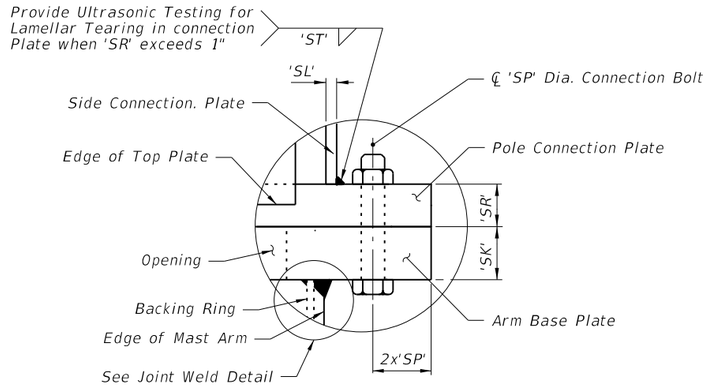
NOTE:

1. Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced.
2. Mast Arm and Connection Plates shall be match marked to ensure proper assembly.

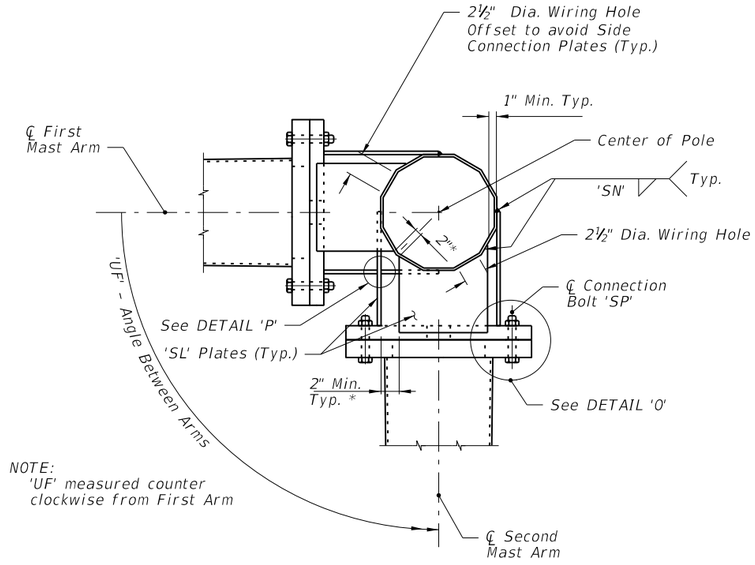
# TYPICAL SINGLE ARM CONNECTION DETAILS




DETAIL 'N'

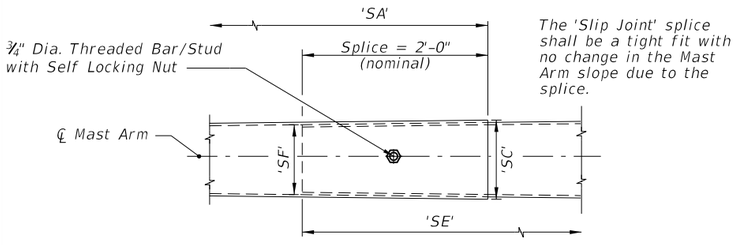



DETAIL 'O'

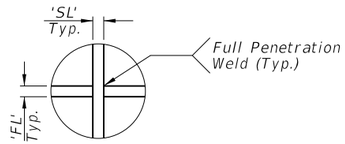



SECTION K-K

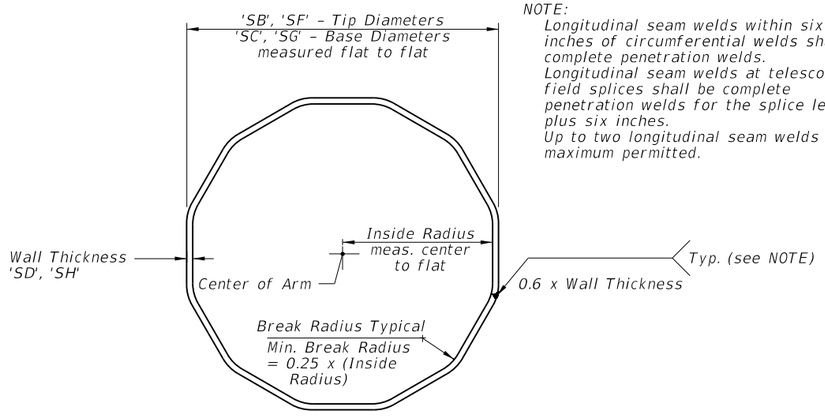
* Adjust width of top and bottom Connection Plates to maintain minimum clearance shown



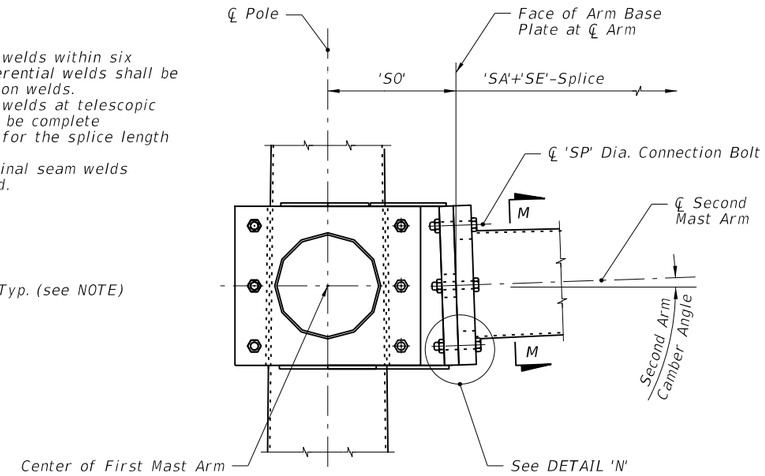

Arm Splice Detail



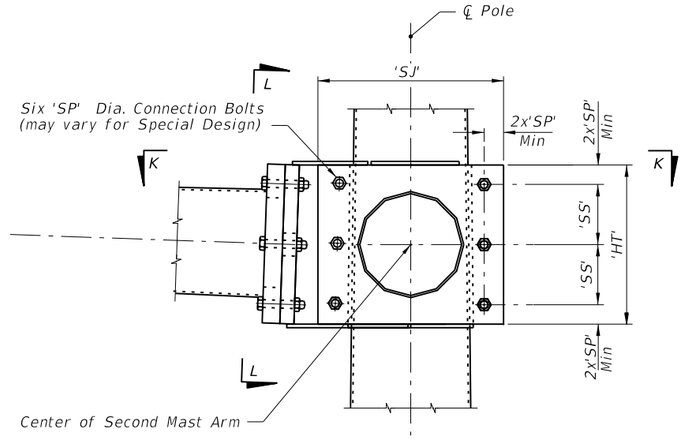

DETAIL 'P'




SECTION M-M




SECTION L-L



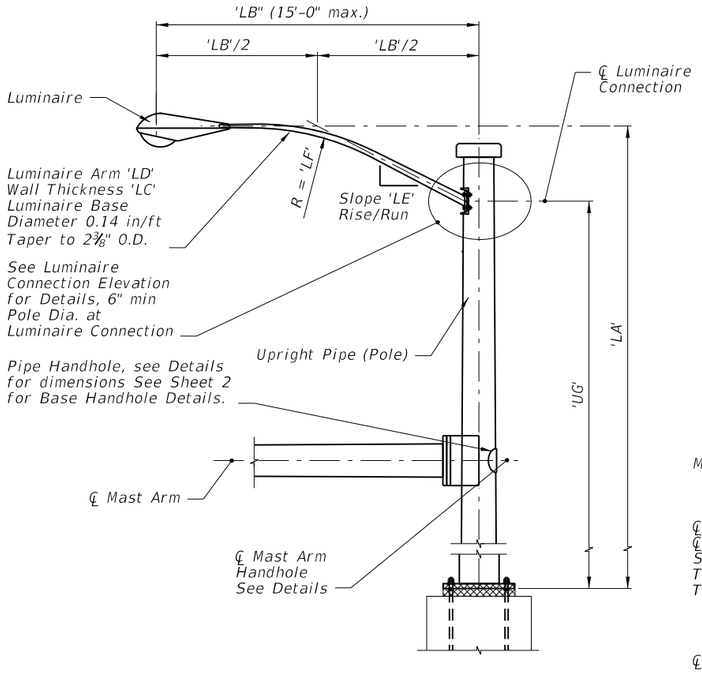

ELEVATION
(Double Arm Connection)

NOTE:
1. Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced.

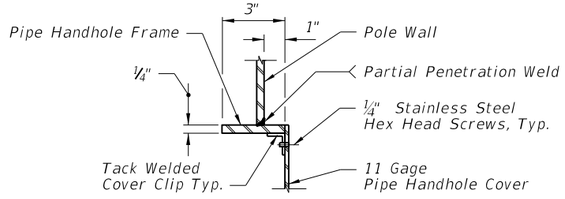
2. Mast Arm and Connection Plates shall be match marked to ensure proper assembly.

## TYPICAL DOUBLE ARM CONNECTION DETAILS

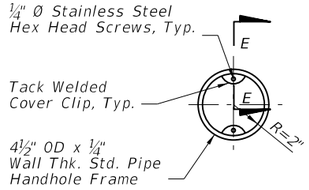
| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | MAST ARM ASSEMBLIES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/12 | | | | | | 17745 | 4 |



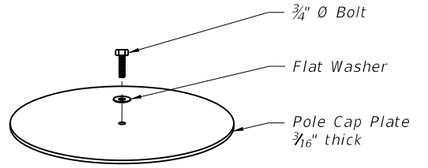

LUMINAIRE ELEVATION

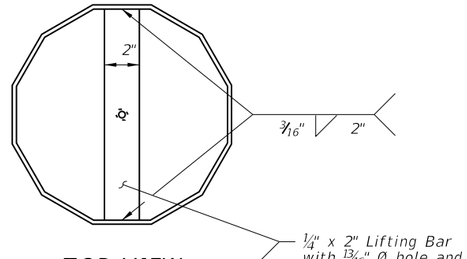



SECTION E-E
(thru Pipe Handhole)

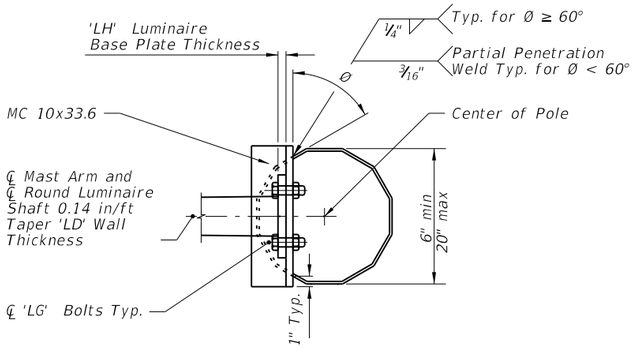



PIPE HANDHOLE FRAME

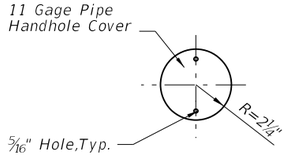


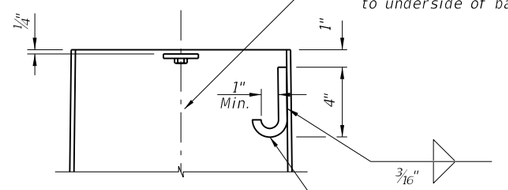

TOP VIEW



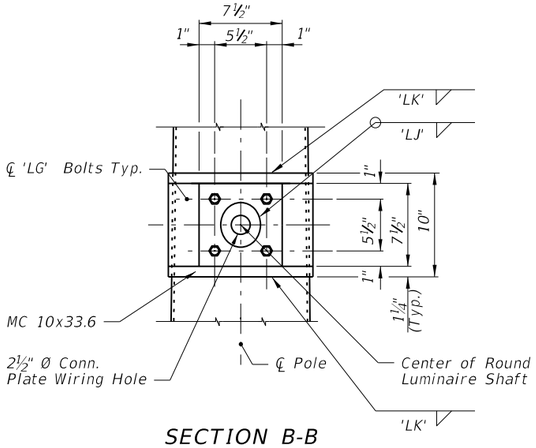

SECTION A-A




PIPE HANDHOLE COVER

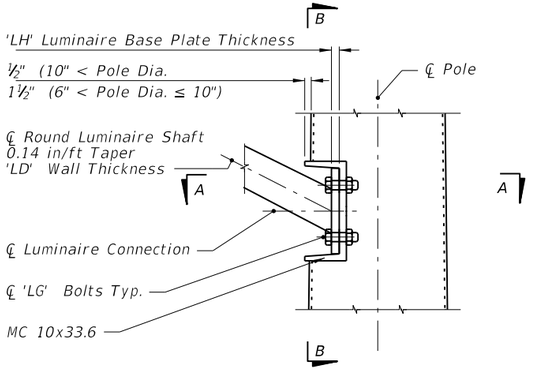



POLE TOP CUT-AWAY
(Option 'a')



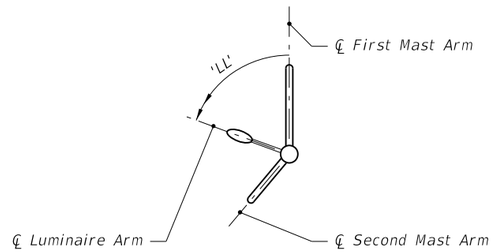

SECTION B-B

NOTE:
The Fabricator may substitute a 1/2" thick bent plate with the same flange width, height, and length as the MC 10x33.6 Channel section.



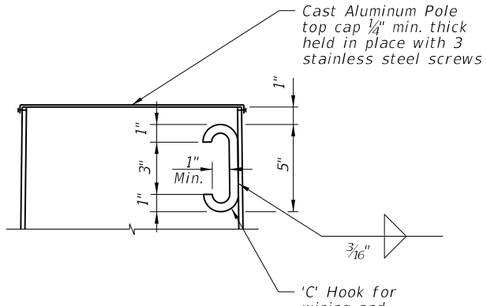

LUMINAIRE CONNECTION ELEVATION

NOTE:
The Pole shown on this sheet is a 12 sided section. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced




LUMINAIRE ORIENTATION

NOTE:
'LL' measured counter clockwise from First Arm.




POLE TOP CUT-AWAY
(Option 'b')

POLE TOP DETAILS

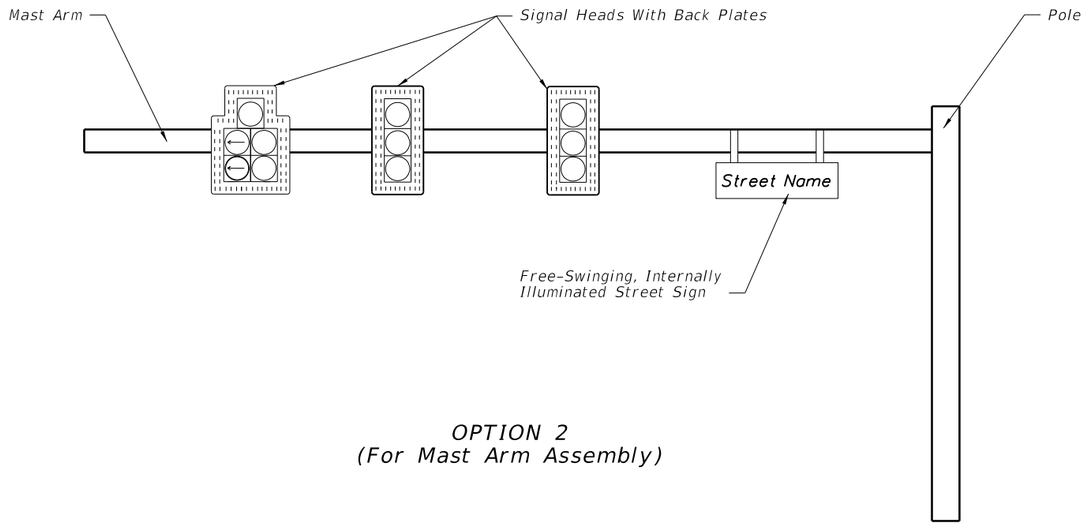
NOTE:
Any combination of the above two options may be used, provided both lifting and wiring is accommodated.

## NOTES:

1. Luminaire type and Luminaire to Arm Connection Details can be found elsewhere.
2. Align Luminaire Arm with single Mast Arm or first Arm of Double Mast Arm unless indicated otherwise in plans.

# TYPICAL LUMINAIRE ARM AND CONNECTION DETAILS

| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | MAST ARM ASSEMBLIES | 17745 | 5 |




OPTION 2
(For Mast Arm Assembly)

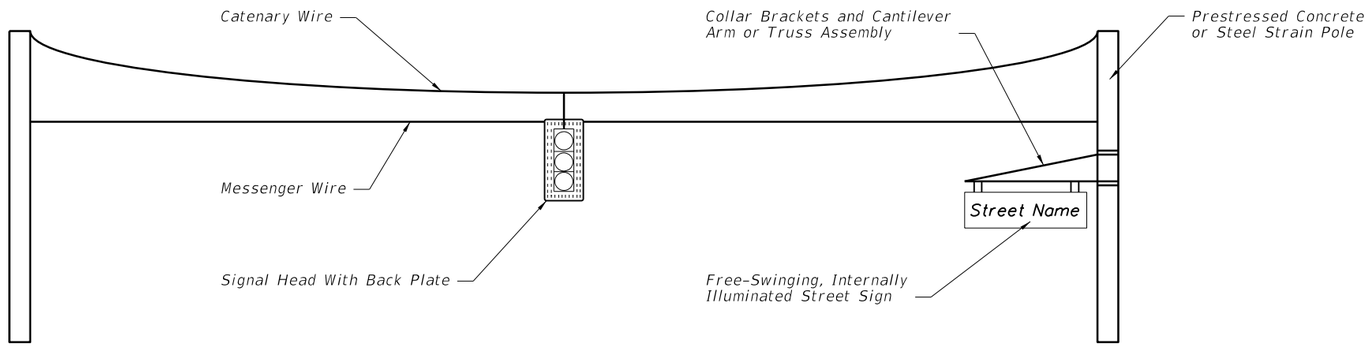
NOTES:

1. Free-swinging, internally-illuminated street signs shall only be installed on the signal pole for span wire assemblies. For mast arm assemblies the street sign may be installed on the arm or pole.

2. Free-swinging, internally-illuminated street signs shall meet the requirements of Section 699 of the Standard Specifications for Road and Bridge Construction.

3. Pole attachments and cantilever arm (or truss) assemblies may be accepted by Contractor certification provided the signs being supported meet the weight and area limitations included in Section 699 for "Acceptance by Certification".

4. Pole attachments and cantilever arm (or truss) assemblies supporting signs not meeting the weight or area limitations included in Section 699 for "Acceptance by Certification" require the submittal of structural calculations and Shop Drawings that have been prepared by and sealed by the Specialty Engineer.




OPTION 1
(For Span Wire Assembly)



| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/09 | | | FDOT DESIGN STANDARDS 2013 | FREE-SWINGING INTERNALLY-ILLUMINATED STREET SIGN ASSEMBLIES | INDEX NO. 17748 | SHEET NO. 1 |

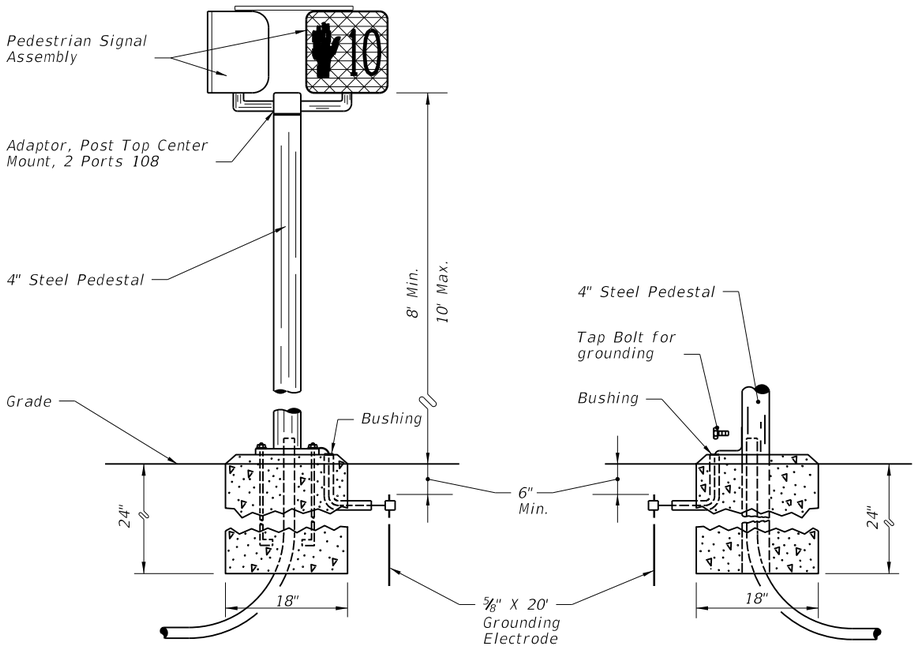
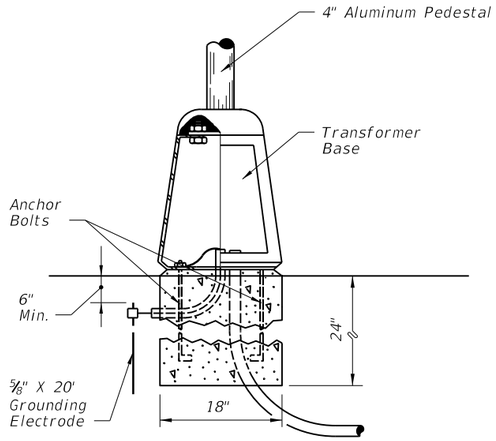



FIGURE A



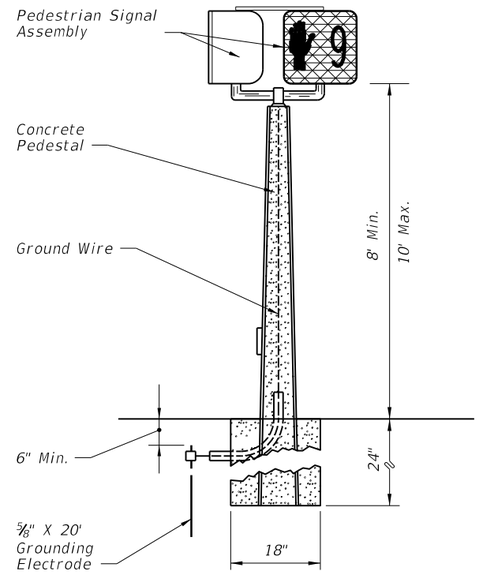




FIGURE B

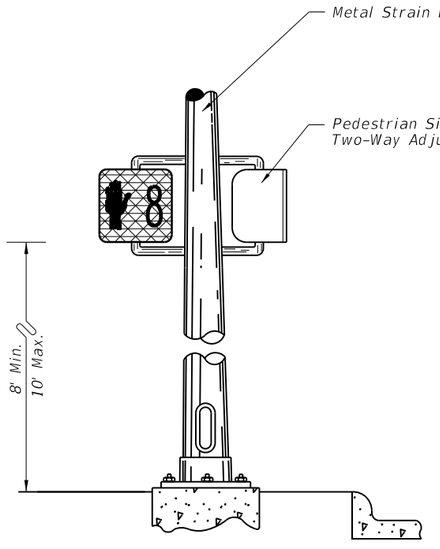



FIGURE C

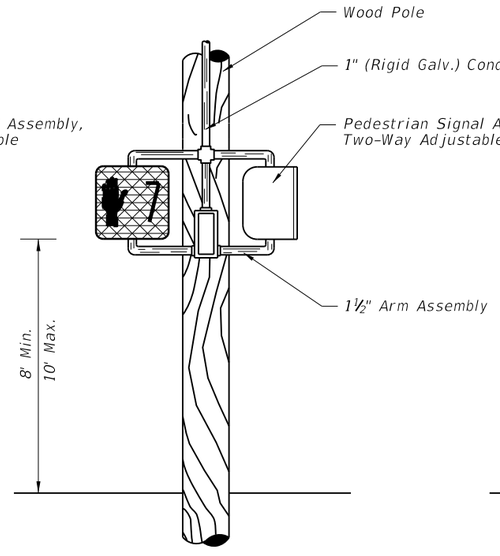



FIGURE D

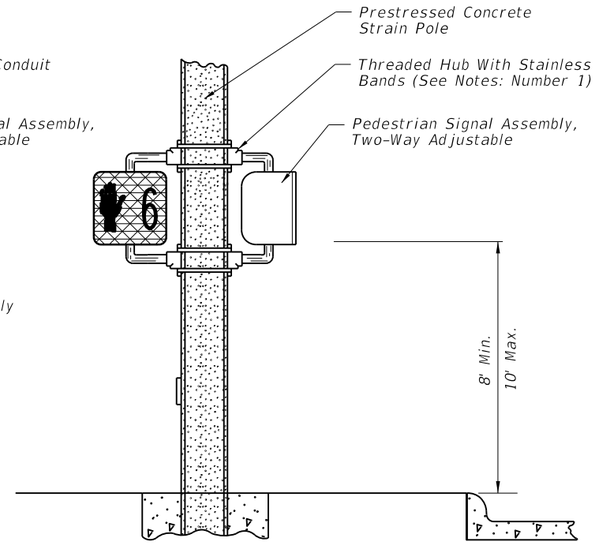



FIGURE E

## Notes:

1. As an option, the contractor will be allowed to install pedestrian signals on concrete poles and pedestals with the use of lead anchors (two bolts same size per hub) in lieu of the stranded steel bands.
2. Holes drilled or punched in metal poles or pedestals shall be thoroughly reamed, cleaned of all burrs and covered with two (2) coats of zinc rich paint as specified in the standard specifications for road and bridge, construction. Grommets or bushings shall be installed in holes.
3. Meet all grounding requirements of Section 620 of the Standard Specifications.



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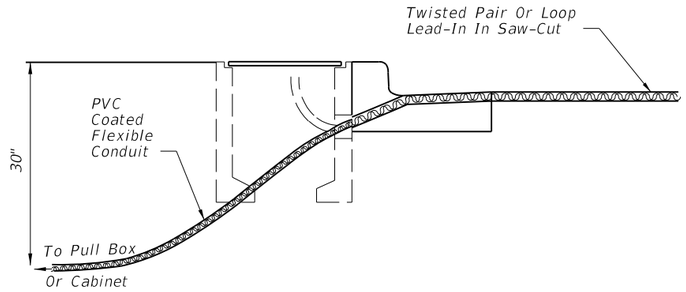
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | PEDESTRIAN CONTROL SIGNAL INSTALLATION DETAILS | 17764 | 1 |

## TWISTED PAIR AND LOOP LEAD-IN INSTALLATION WITH CURB & GUTTER

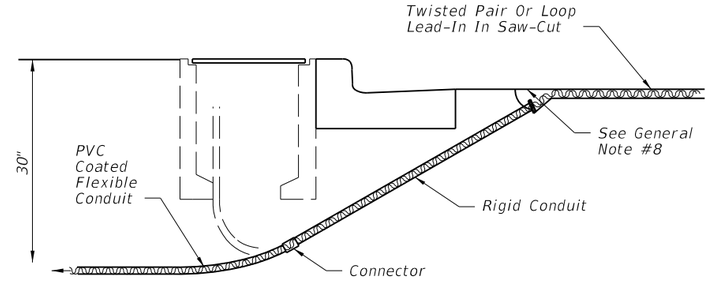
### ALTERNATIVE 1

Drill A Hole Through The Curb At The Point Which The Required Saw-Cut Depth Is Obtained Just Prior To Cutting The Top Inside Edge Of The Curb. Slide A Section Of Flexible Conduit At Least 6" Into The Hole From The Back Side Of The Curb But Not Within 2" Of The Top Of The Hole. The Conduit Shall Fit Snug Within The Drilled Hole. Fill The Top Of The Hole With Loop Sealant To The Level Of The Curb Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Flexible Conduit.




### ALTERNATIVE 2

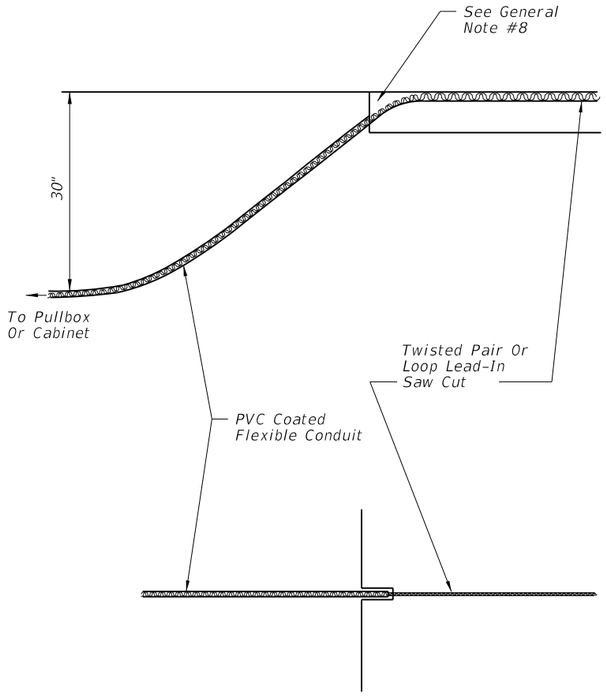
Drill A Hole ½" To 1" Larger In Diameter Than The Rigid Conduit To Be Used Through The Roadway Asphalt (Or Concrete) Surface And Base At An Appropriate Angle To Intercept The Trench Or Pull Box Hole. Place A Predetermined Length Of Rigid Conduit In The Hole And Drive The Conduit Into The Trench Or Hole. Install A Molded Bushing (Nonmetallic) On The Roadway End Of The Rigid, Conduit. The Top Of The Rigid Conduit Shall Be Approximately 2" Below The Roadway Surface. Fill The Hole With Loop Sealant To The Level Of The Roadway Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Rigid Conduit.




NOTE:
Other alternatives may be approved by the State Traffic Operations Engineer.

## TWISTED PAIR AND LOOP LEAD-IN INSTALLATION WITHOUT CURB & GUTTER

Cut A Slot In The Edge Of The Roadway Of Sufficient Size And Depth To Snugly Place The End Of The Flexible conduit. The End Of The Conduit Shall Be At Least 6" Into The Roadway And approximately 2" Below The Top Of The Roadway Surface. The Departure Angle Of The Conduit From The Roadway Shall Be 30° To 45°.



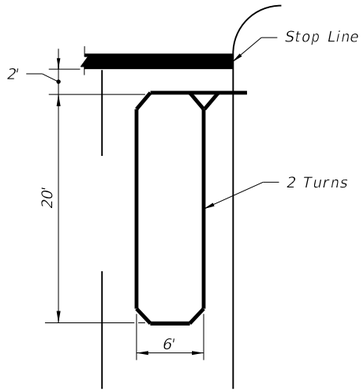

NOTE:
Other alternatives may be approved by the State Traffic Operations Engineer.

## GENERAL NOTES

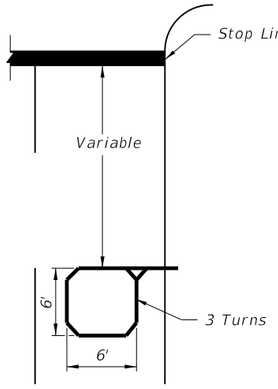
1. If the loop lead-in is 75' or less from the edge of the loop detector to controller cabinet, continue the twisted pair to the cabinet. If the loop lead-in is greater than 75' continue the twisted pair to the specified pullbox, splice to shielded lead-in wire and continue to the controller cabinet.
2. The width of all saw cuts shall be sufficient to allow unforced placement of loop wires or lead-in cables into the saw cut. The depth of all saw cuts, except across expansion joints, shall be 3" standard with a maximum of 4".
3. On resurfacing or new roadway construction projects, the loop wires and lead-in cables may be installed in the asphalt structural course prior to the placement of the final asphalt wearing course. The loop wires and lead-in cables shall be placed in a saw cut in the structural course. The depth of the cables below the top of the final surface shall comply with note 2.
4. A nonmetallic hold down material shall be used to secure loop wires and lead-ins to the bottom of saw-cuts. Hold down material shall be placed at approximately 12" intervals around loops and 24" intervals on lead-ins.
5. The minimum distance between the twisted pairs of loop lead-in wire is 6" from the loop to 12" from the pavement edge or curb.
6. Splice Connections in pull boxes with UL listed, watertight, insulated enclosures. Place one enclosure over the end of each conductor and place a third enclosure over the exposed end of the shielded cable.
7. As an alternate, a larger diameter enclosure that will accommodate both the splices of the conductors and the exposed end of the shielded cable may be used.
8. The maximum area of asphalt to be disturbed shall be 6"x 6". This area shall be restored as directed by the Engineer.



| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/02 | | | FDOT DESIGN STANDARDS 2013 | VEHICLE LOOP INSTALLATION DETAILS | INDEX NO. 17781 | SHEET NO. 1 |




TYPE A

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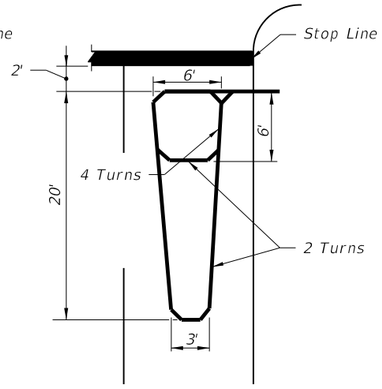
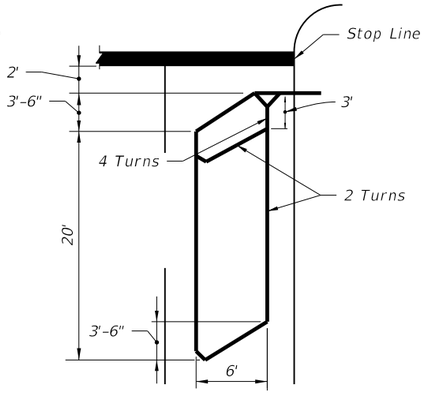
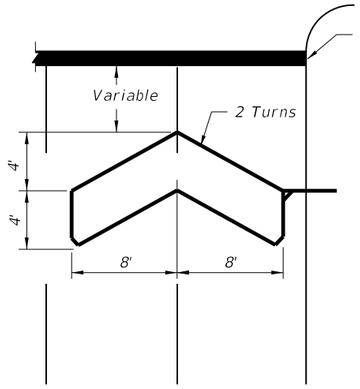


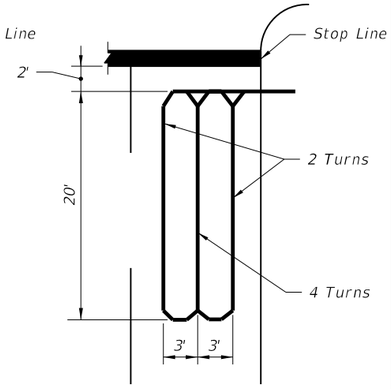

TYPE C




TYPE D

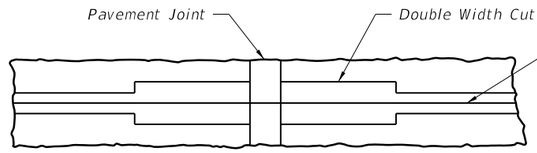



TYPE E

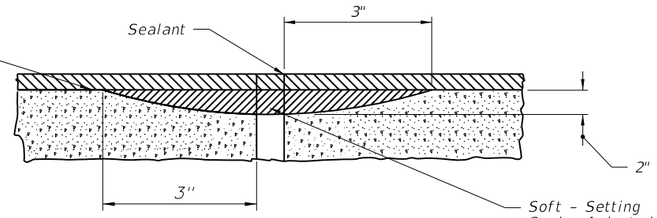



TYPE F

Note:
Loop conductors must follow saw-cut to bottom forming slack section at joint.

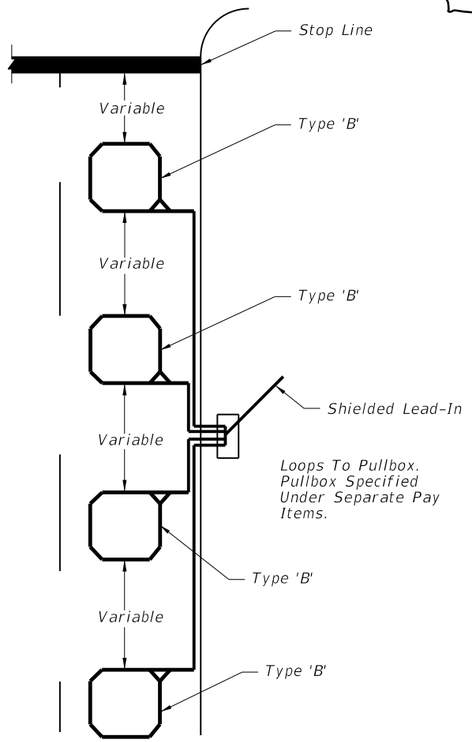



PLAN

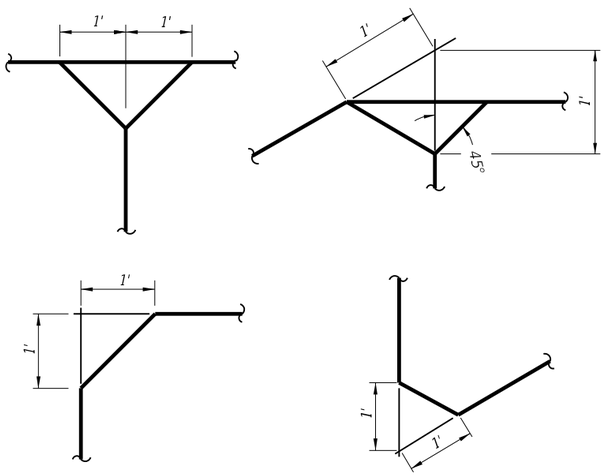



VERTICAL SECTION

CONCRETE PAVEMENT EXPANSION JOINTS




TYPE G




LOOP CORNER AND LEAD-IN DETAILS

Notes:

1. The "number of turns" indicated at the specified point on the loop refers to the number of passes of loop wires which are placed in the saw-cut forming the complete loop.
2. Loop types or details not drawn to scale.
3. Loop Types are centered in a single lane except Type E which is centered on two lanes.
4. The number of individual loops in the Type G loop may vary up to a maximum of four (4).
5. Lead-in may be connected to either end of loop.
6. The leading edge of loop Types A,C,D,& F may extend past the stop line a maximum of 10'. The length of these loops may be extended to a maximum of 60'. Each intersection should be individually designed and if the modifications noted above is required it must be noted or detailed in tne plans.
7. Loop lead-in wires should not be installed in the same pull box with signal power cable.



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|---|---|---|---|---|---|---|
| 07/01/00 | | | FDOT DESIGN STANDARDS 2013 | VEHICLE LOOP INSTALLATION DETAILS | 17781 | 2 |

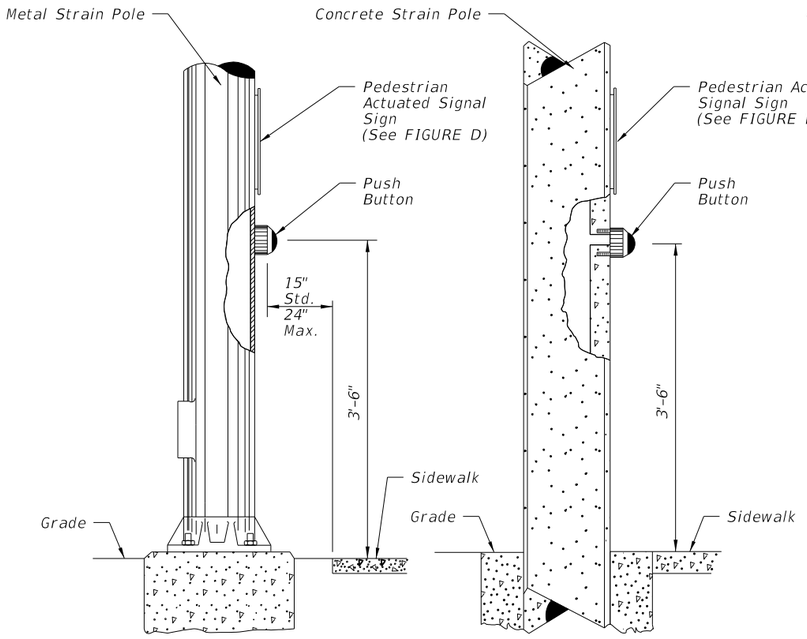
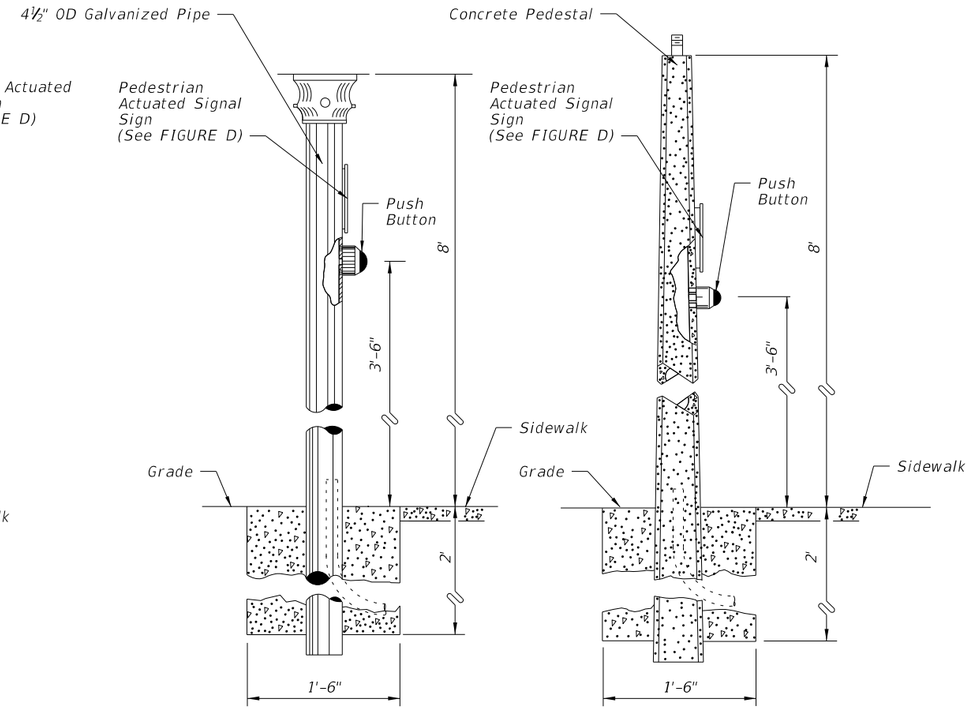



FIGURE A
POLE MOUNTED
DETECTOR STATION



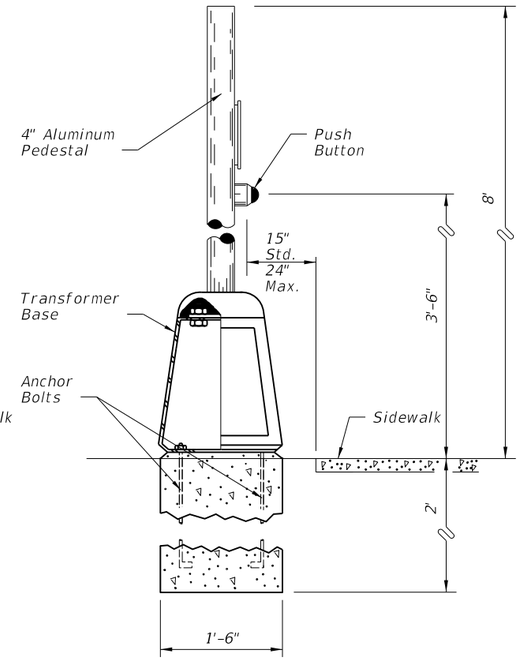




FIGURE B
PEDESTAL STATION
DETECTOR STATION

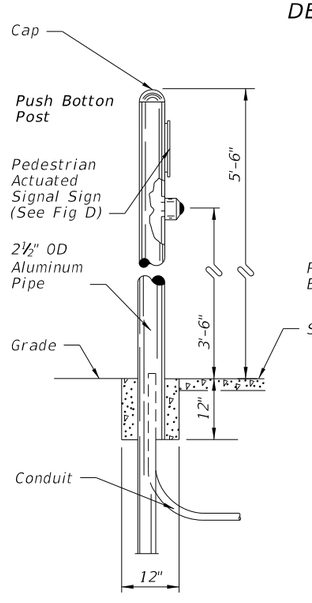



FIGURE C
POST DETECTOR STATION
DETECTOR STATION

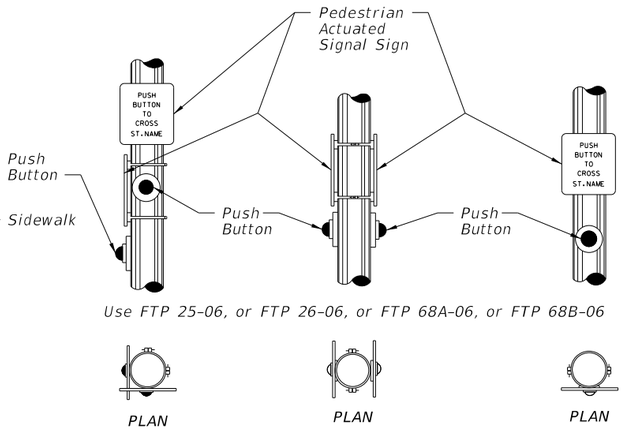



FIGURE D

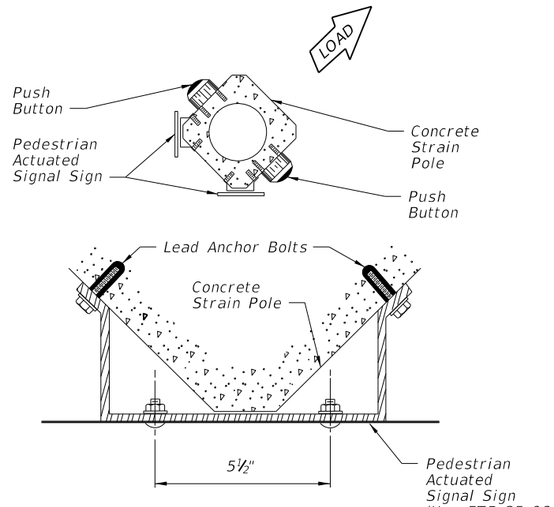



FIGURE E

*Notes:*

1. *Payment for sign is included in the price for the pedestrian detector.*
2. *Signs shall be mounted above detectors, explaining their purpose and use.*
3. *The positioning of pedestrian push button should clearly indicate which crosswalk signal is actuated by each push button.*
4. *Push buttons and signs are to be mounted in accordance with Standard Specifications, section 665.*
5. *Meet all grounding requirements of Section 620 of the Standard Specifications.*
6. *A 30"X48" landing is required centered on each push button.*

*Note To Designers:*

*The designer should ensure the distance to the Push Button in FIGURE A & B is maintained. This distance can vary depending on post or pedestal type or whether a frangible base is used and sidewalk configuration. This is specified to meet Americans with Disabilities Act.*

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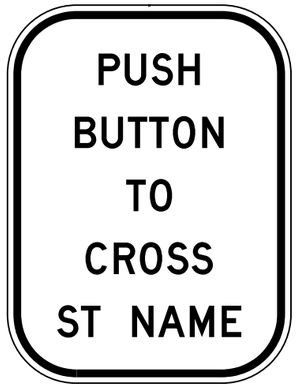
| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 01/01/12 | | | FDOT DESIGN STANDARDS 2013 | PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS | INDEX NO. 17784 | SHEET NO. 1 |

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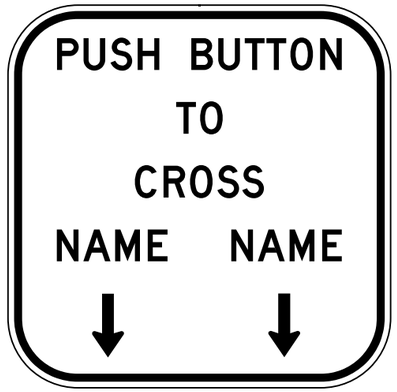


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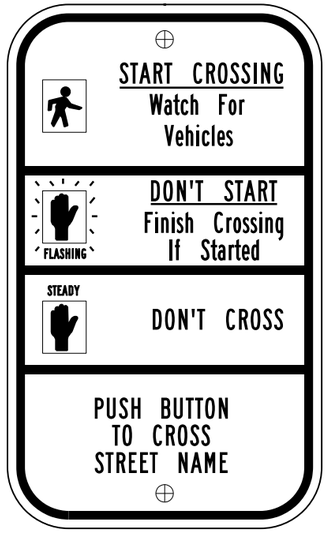


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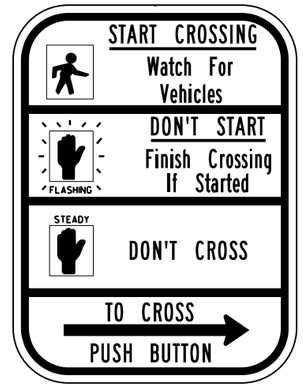
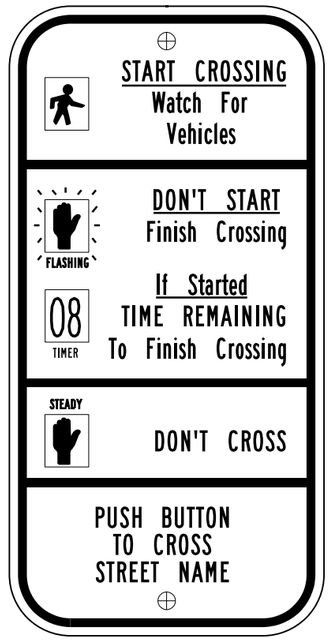



R10-3b
(Use Only for Case I)

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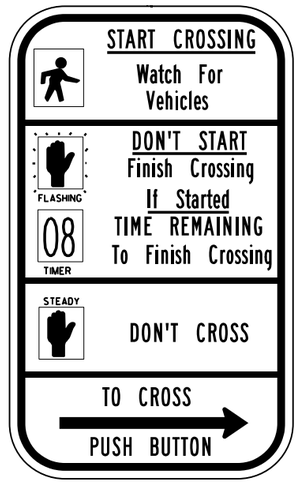


R10-3e
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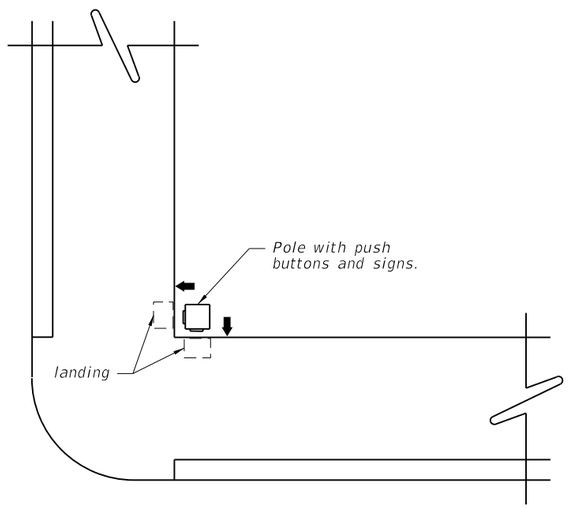
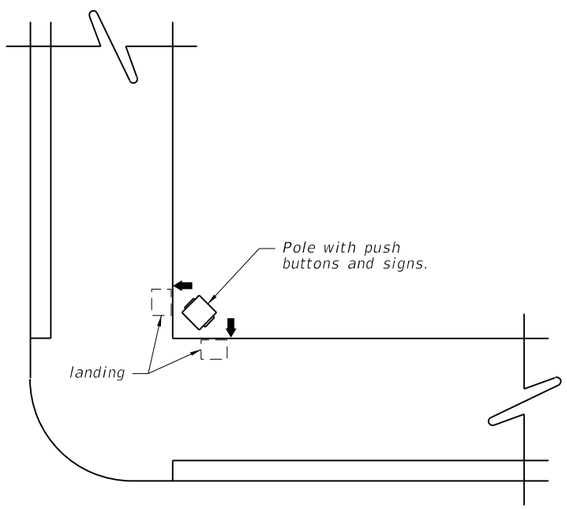



CASE I
POLE PARALLEL TO CURBLINE
ALTERNATE TO FIGURE E




CASE II
POLE DIAGONAL TO CURBLINE
ALTERNATE TO FIGURE E

NOTE:
1. Refer to the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES figure 2B-26 Pedestrian Signs, The STANDARD HIGHWAY SIGNS MANUAL (English) Sign R10-3b for Text Size, Spacing and Symbol size. Also see DESIGN STANDARDS Index 17355 for details of FTP signs.

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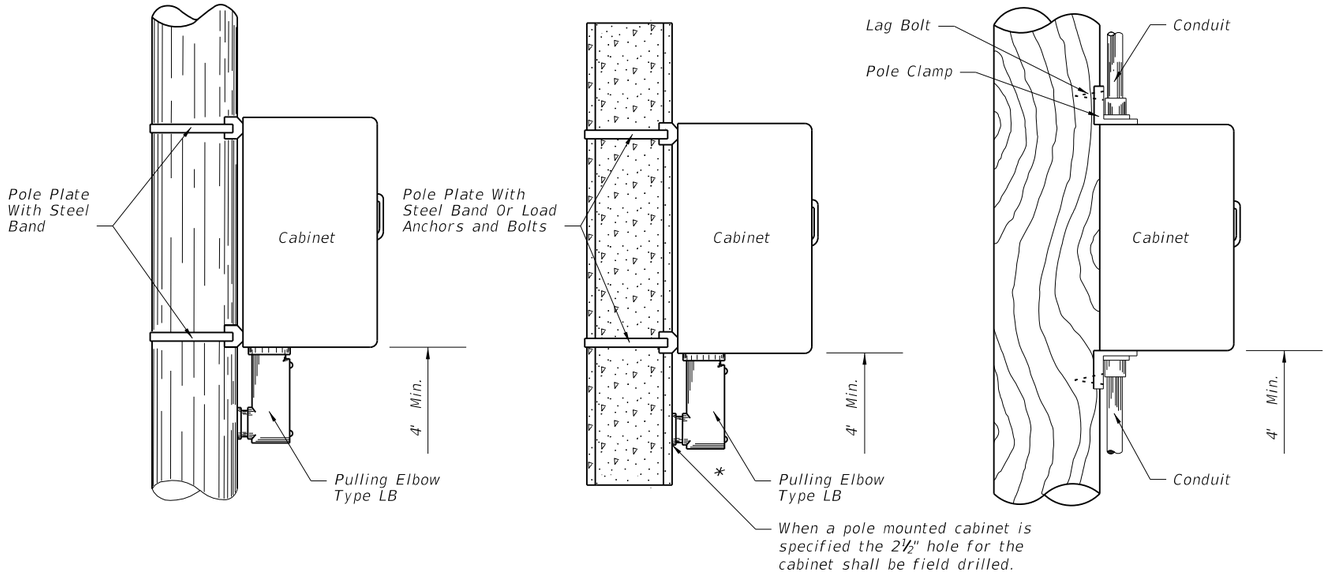
| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/12 | | | FDOT DESIGN STANDARDS 2013 | PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS | INDEX NO. 17784 | SHEET NO. 2 |

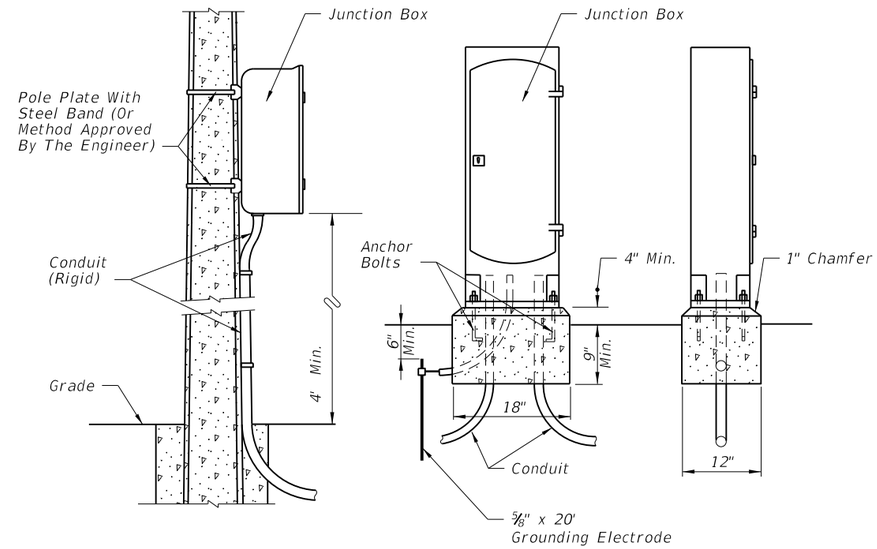



METAL POLE  CONCRETE POLE  WOOD POLE

## POLE MOUNTED CABINET

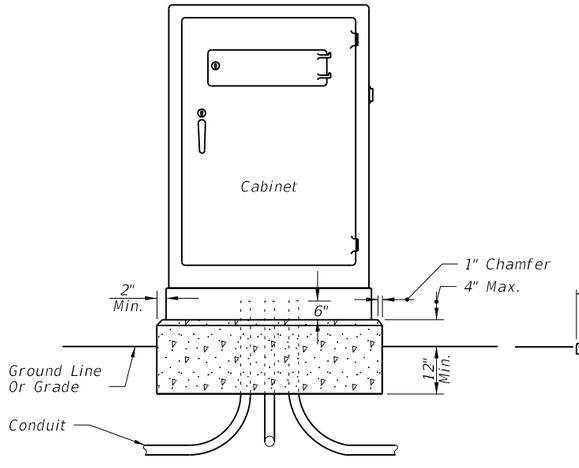
Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.

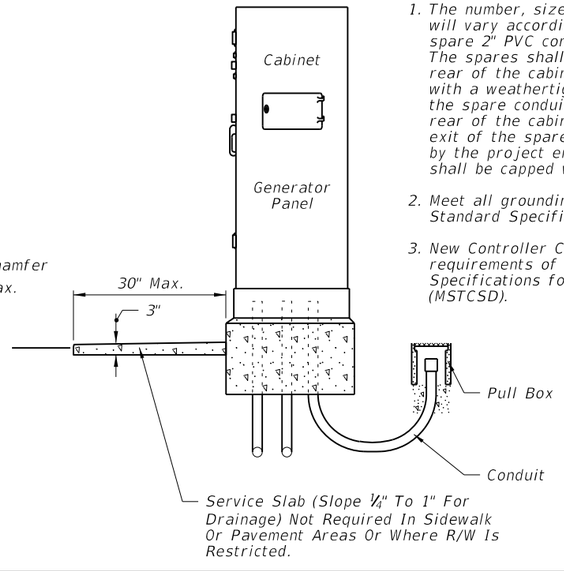
* If holes for cabinet mounting require relocation, original holes shall be filled in with concrete or covered with a noncorrosive cover plate.




POLE MOUNTED  BASE MOUNTED

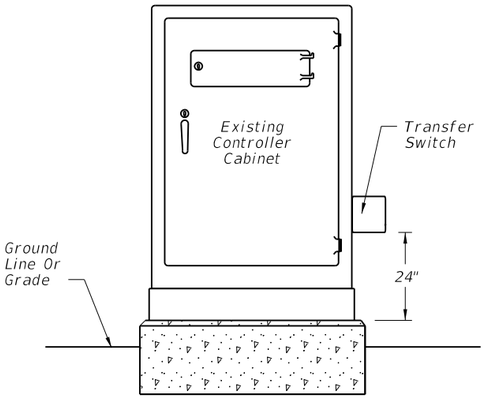
## INTERCONNECT JUNCTION BOX



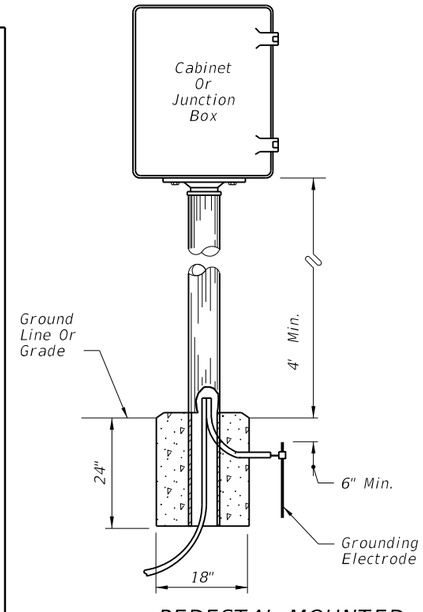

### Notes:

1. The number, size and orientation of conduit sweep will vary according to site condition or locations. Two spare 2" PVC conduits shall be provided in all bases. The spares shall exit in the direction of the center rear of the cabinet base, into a pullbox and capped with a weathertight fitting. If obstructions prevent the spare conduit from exiting to the rear, or the rear of the cabinet is located on the R/W line, a side exit of the spare conduits will have to be approved by the project engineer. All spare conduit sweeps shall be capped with a weatherproof fitting.
2. Meet all grounding rquirements of Section 620 of the Standard Specifications.
3. New Controller Cabinet installation shall meet the requirements of Section A676-1 of the Minimum Specifications for Traffic Control Signal Devices (MSTCSD).




Existing controller cabinets to be retrofitted shall meet the requirements of Section A678-16 of the Minimum Specifications for Traffic Control Signal Devices (MSTCSD).

The signalized intersection controller cabinet retrofit installation procedures are located at: http://www.dot.state.fl.us/TrafficOperations/Document Library Generator Power for Signalized Intersection




PEDESTAL MOUNTED

| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/07 | | | FDOT DESIGN STANDARDS 2013 | CABINET INSTALLATION DETAILS | INDEX NO. 17841 | SHEET NO. 1 |

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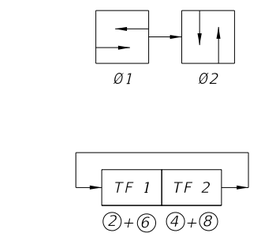
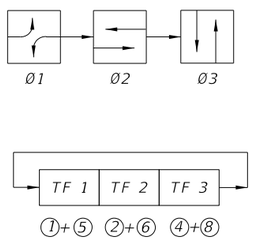
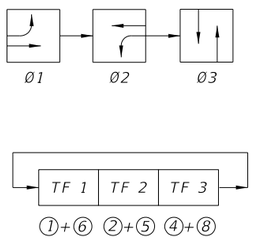



SOP 1




SOP 2

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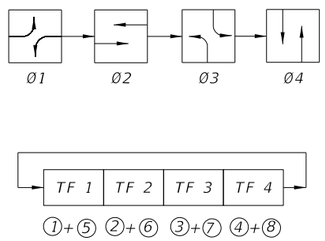


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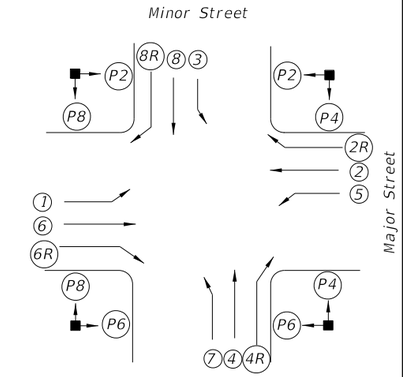
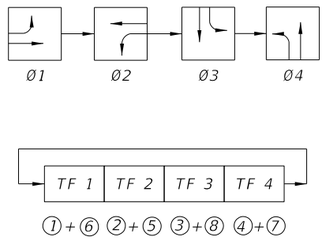
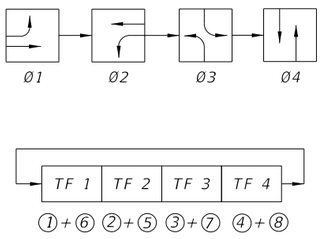



## SIGNALIZED INTERSECTION

*Vehicle movements & signal head number assignments are not directionally oriented but shall maintain their relative orientation about the intersection (I.E., movements 7 and 4 are always to the right of movements 1 and 6 etc.).*




SOP 5

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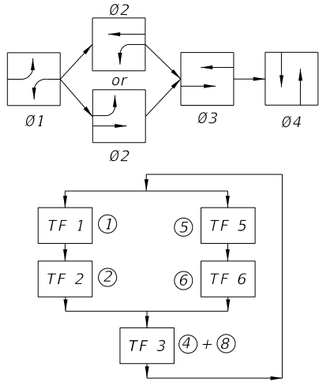
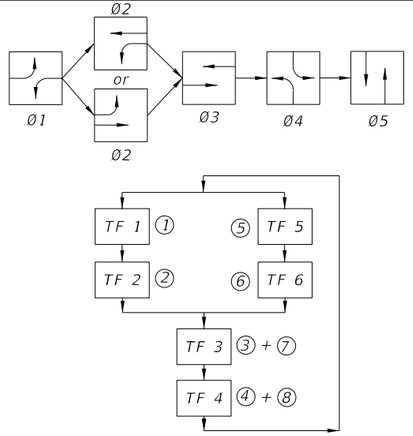
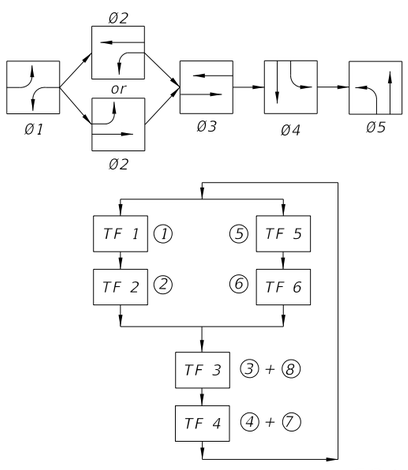


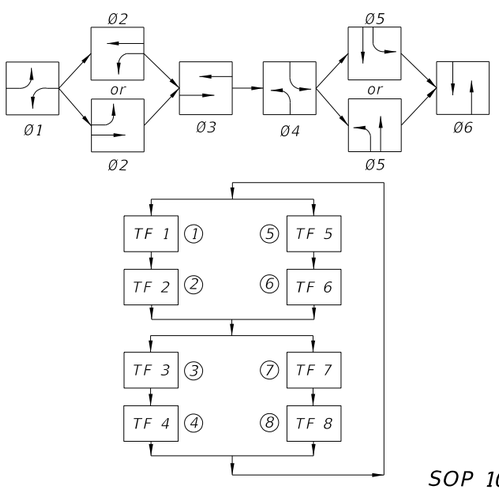

SOP 7




SOP 8




SOP 9




SOP 10

## LEGEND

- (X) Vehicle Movement Number
- (PX) Pedestrian Movement Number
- TF X Timing Function Number
- ØX Phase Number
- Green Arrow (Left or Right)
- Red Arrow
- Yellow Arrow

## SIGNAL CLEARANCE TABLE

(Blank Indicates No Clearance Required)

| SIGNAL INDICATIONS: From \ To | R | R | G | G | Y | WALK | DONT WALK |
|---|---|---|---|---|---|---|---|
| R | | | Y | | Y | | |
| R | | | Y | | Y | | |
| G | | | | | | | |
| G | | | | | | | |
| | | | | | | | |
| Y | | | | | | | |
| WALK | | | | | | | |
| DONT WALK | | | | | | Flash DONT WALK | |

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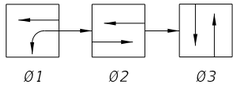
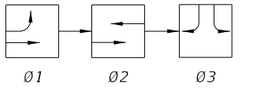
6/28/2012 3:10:09 PM rd960rh

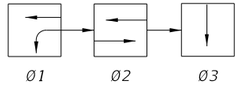
| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 07/01/05 | | | FDOT DESIGN STANDARDS 2013 | STANDARD SIGNAL OPERATING PLANS | 17870 | 1 |




SOP 11

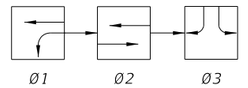



SOP 12



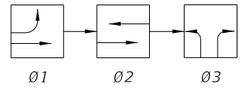

SOP 13

(ONE- WAY STREET INTERSECTION)



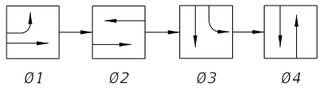

SOP 14

(DIAMOND INTERCHANGE OPERATION)

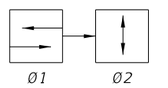



SOP 15

(DIAMOND INTERCHANGE OPERATION)

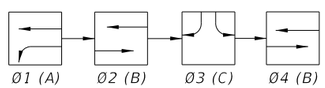



SOP 16




SOP 17

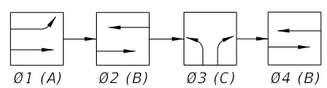
(MIDBLOCK)




NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain ABC, Or ACB Operation.

SOP 18

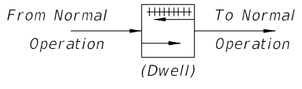
(DIAMOND INTERCHANGE OPERATIONS)



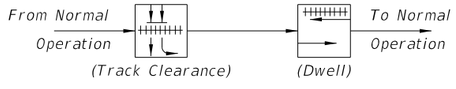

NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain ABC, Or ACB Operation.

SOP 19

(DIAMOND INTERCHANGE OPERATIONS)




POP 1

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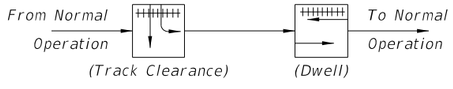
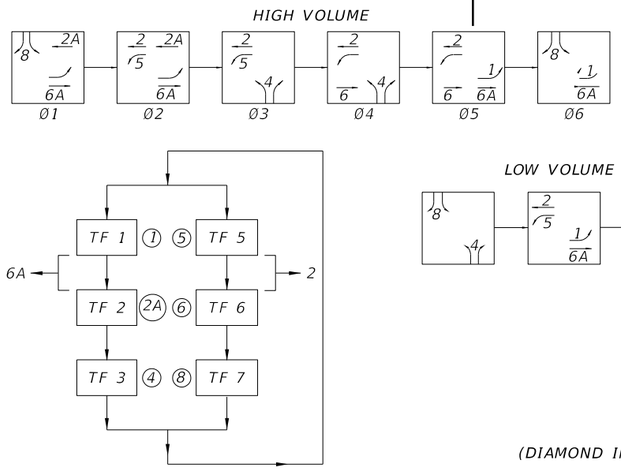


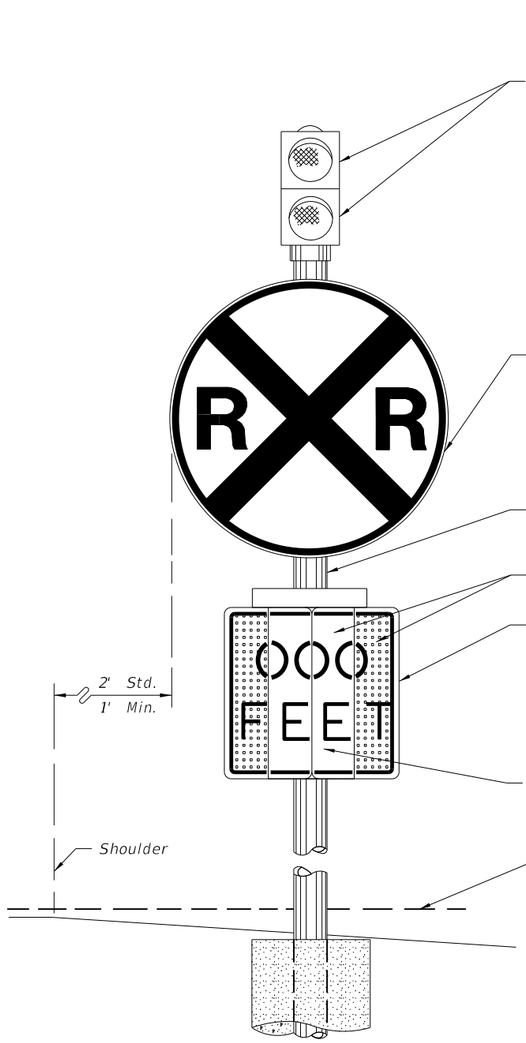

POP 3



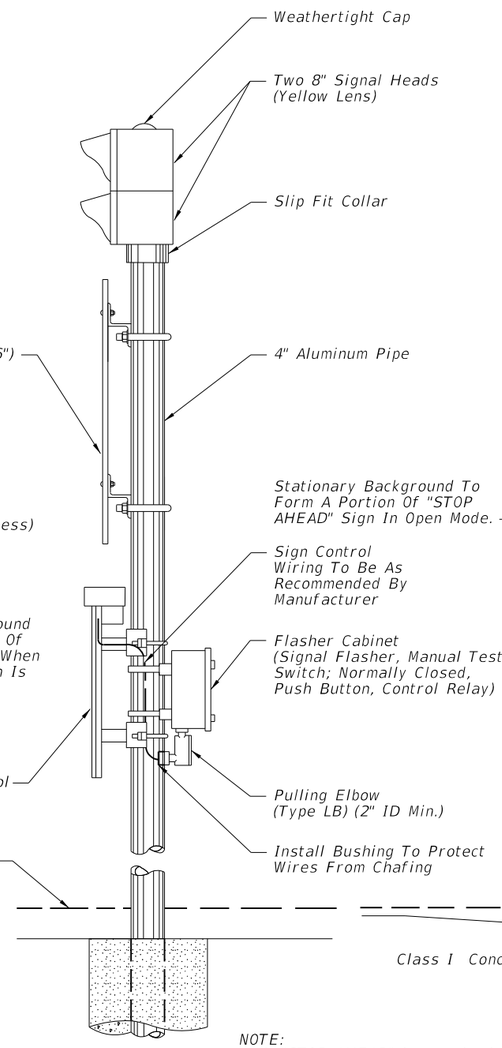

SOP 20

(DIAMOND INTERCHANGE OPERATIONS)

| LAST REVISION | REVISION | DESCRIPTION: | | | | |
|---|---|---|---|---|---|---|
| 07/01/00 | | | FDOT DESIGN STANDARDS 2013 | STANDARD SIGNAL OPERATING PLANS | INDEX NO. 17870 | SHEET NO. 2 |




FRONT VIEW

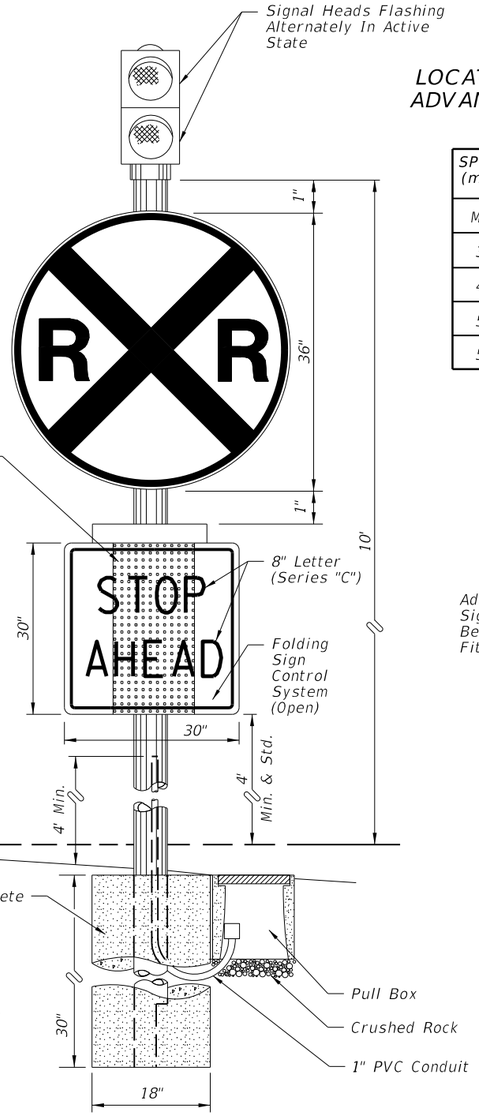



SIDE VIEW

NOTE:
1. "STOP AHEAD" is standard and preferred sign message.

Another message may be approved when appropriate for specific situations.

PASSIVE STATE
(TRAIN CIRCUIT NOT ACTUATED)



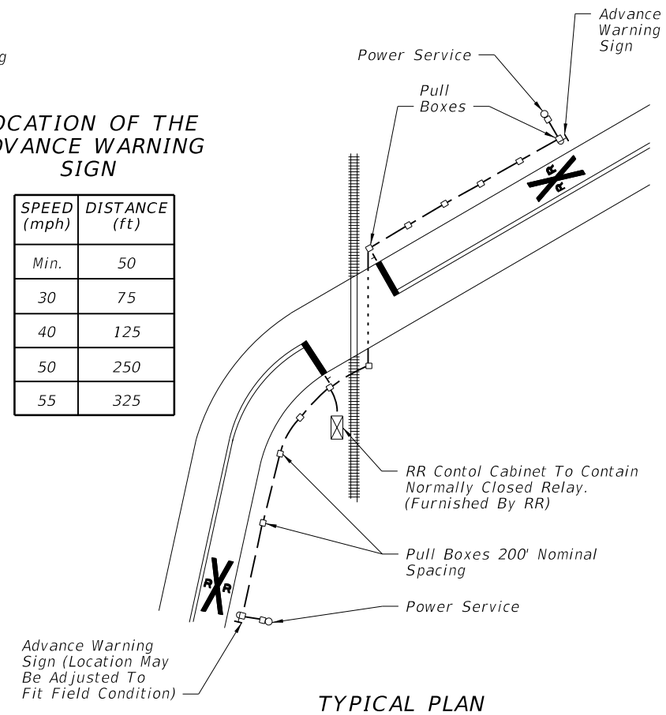

FRONT VIEW

ACTIVE STATE
(TRAIN CIRCUIT ACTUATED)

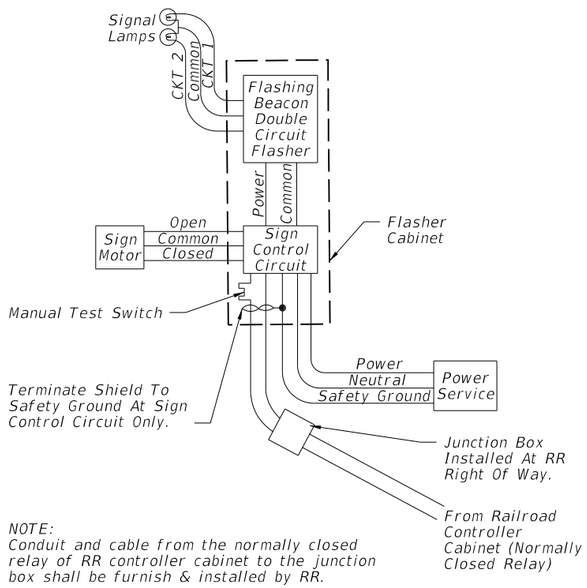
The Distance Is Measured Along Right Edge Of Pavement From RR Stop Bar To Sign Advance Warning Sign.

## LOCATION OF THE ADVANCE WARNING SIGN

| SPEED (mph) | DISTANCE (ft) |
|---|---|
| Min. | 50 |
| 30 | 75 |
| 40 | 125 |
| 50 | 250 |
| 55 | 325 |



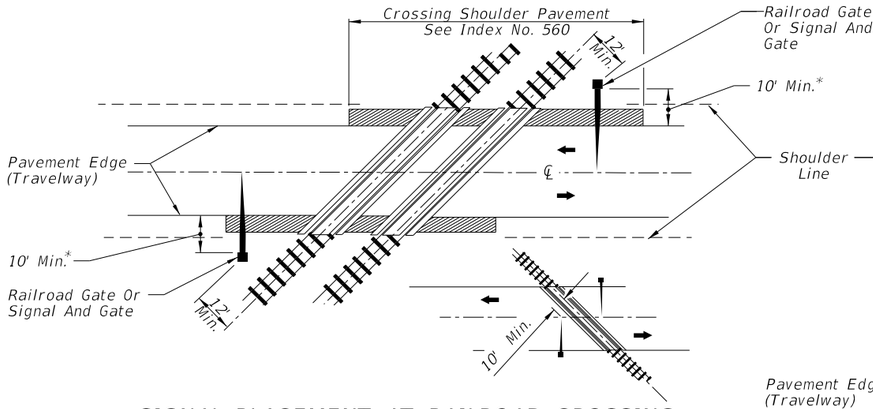

TYPICAL PLAN



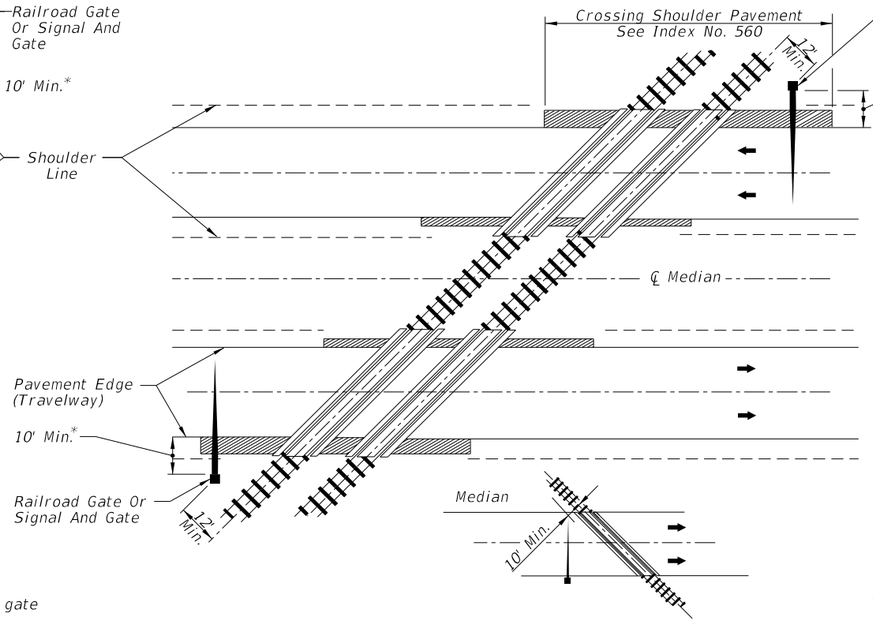

NOTE:
Conduit and cable from the normally closed relay of RR controller cabinet to the junction box shall be furnish & installed by RR.

FUNCTIONAL BLOCK DIAGRAM

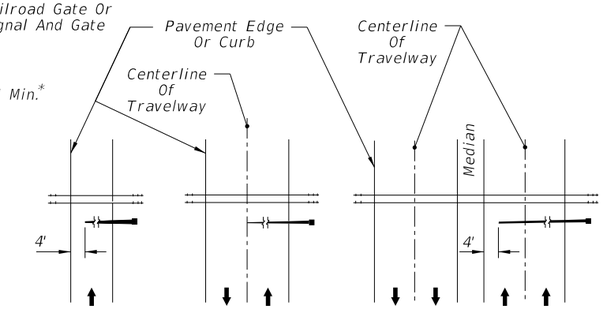
| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 07/01/05 | | | FDOT DESIGN STANDARDS 2013 | ADVANCE WARNING FOR R/R CROSSING | 17881 | 1 |




SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 - LANE DESIGN)




SIGNAL PLACEMENT AT RAILROAD CROSSING
(4 - LANE DESIGN)




Note:
Arrows denote direction of travel not pavement markings.

FIGURE 1

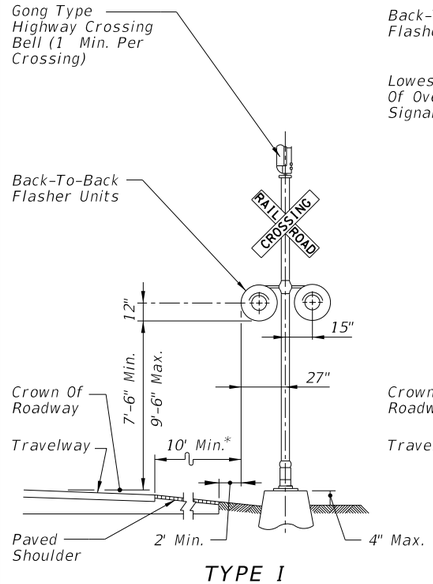
Gate Length Requirements
See Note 5 Sheet 3

## General Notes

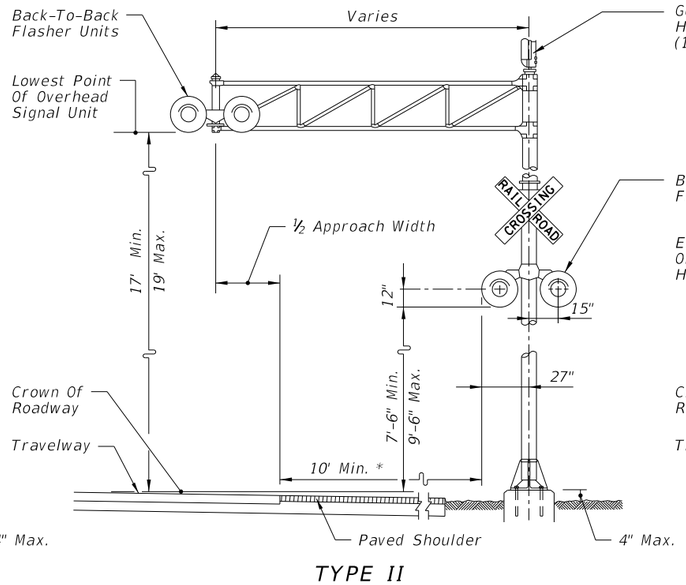
1. No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.
2. Advance flasher to be installed when and if called for in plans or specifications.
3. Top of foundation shall be no higher than 4" above finished shoulder grade.
4. Type of traffic control device
   I Flashing signals
   II Flashing signals with cantilever
   III Flashing signals with gate
   IV Flashing signals with cantilever and gate
   V Gate
5. Class of traffic control devices
   I Flashing signals–one track
   II Flashing signals–multiple tracks
   III Flashing signals and gates–one track
   IV Flashing signals and gates–multiple tracks

Note:
Two separate foundations may be required (one for signals, one for gate), depending on type of equipment used.

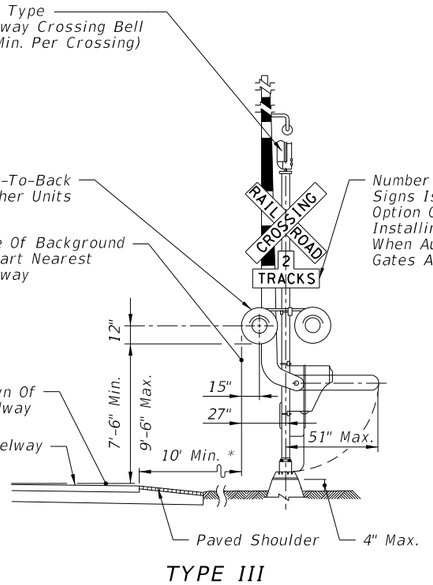
* When 10' is deemed impracticle the control device can be located as close as 2' from the edge of a paved shoulder but not less than 6' from the edge of the near traffic lane.



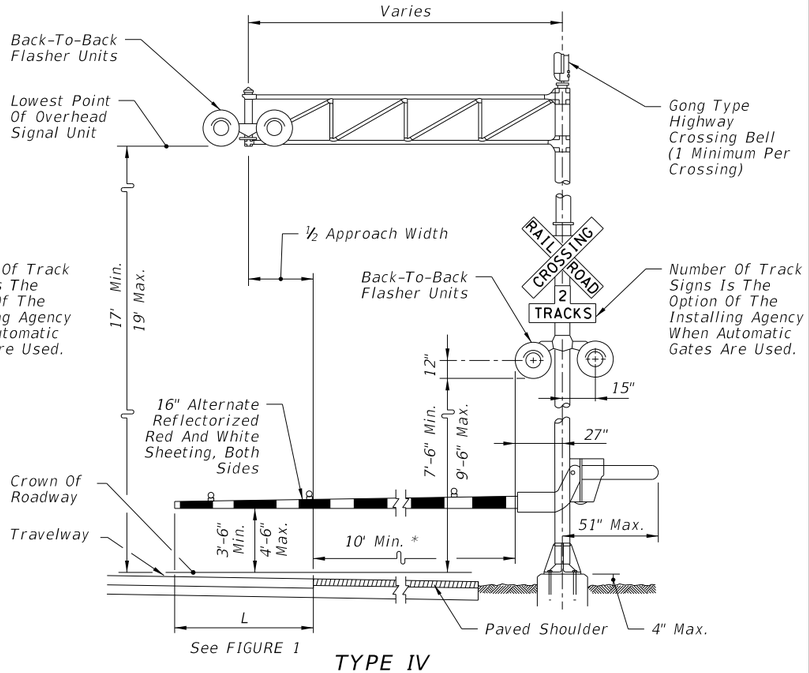

TYPE I




TYPE II

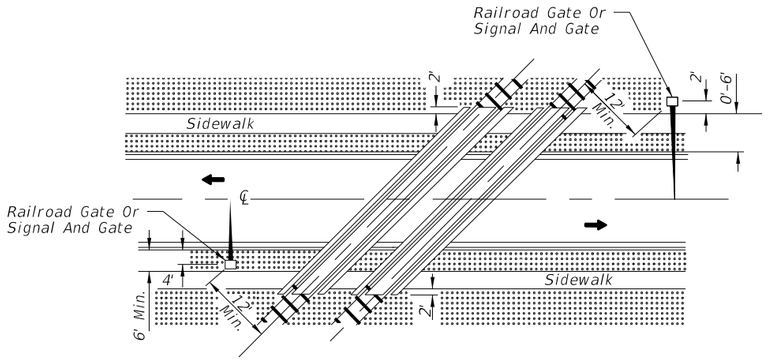



TYPE III




TYPE IV

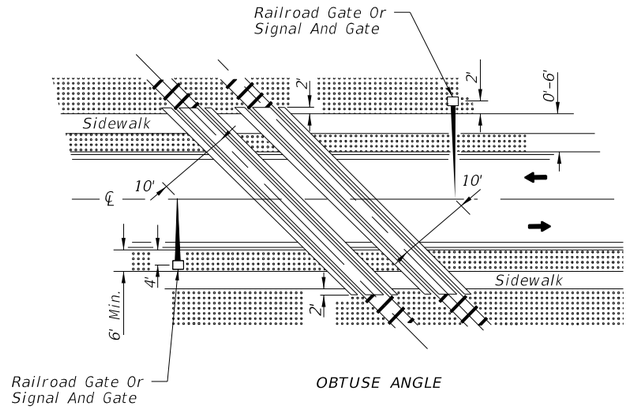
| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|---|
| 01/01/11 | | | | | | 17882 | 1 |




ACUTE ANGLE (AND RIGHT ANGLE)

SIGNAL PLACEMENT AT RAILROAD CROSSING

(2 LANES, CURB & GUTTER)



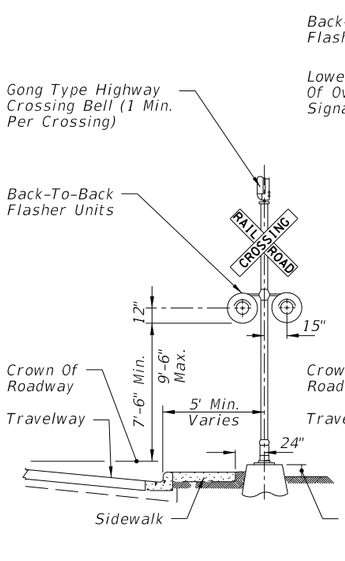

OBTUSE ANGLE

SIGNAL PLACEMENT AT RAILROAD CROSSING

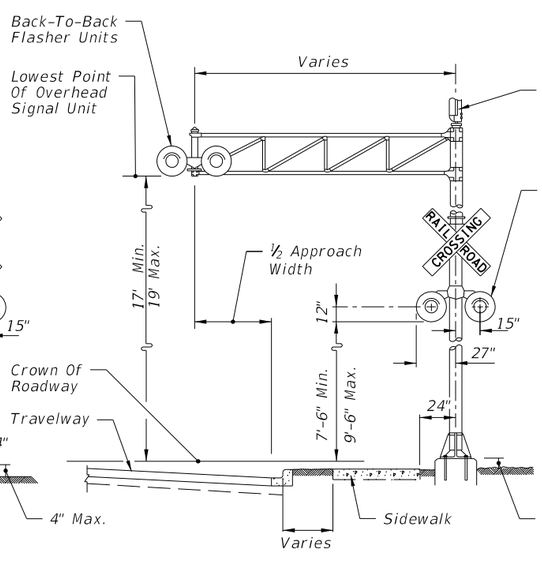
(2 LANES, CURB & GUTTER)

## GENERAL NOTES

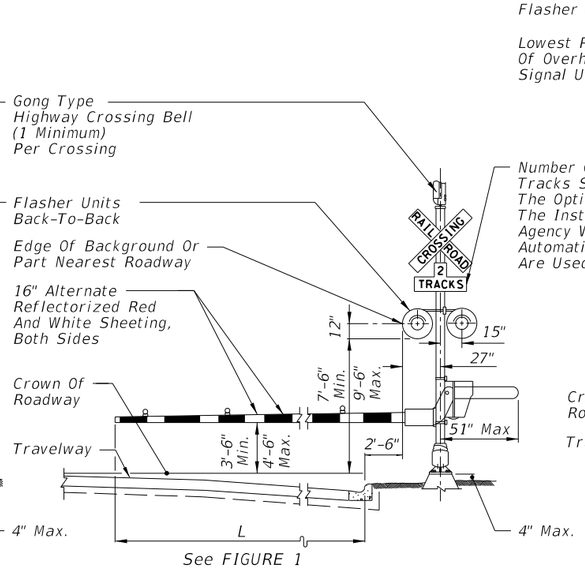
1. The location of flashing signals and stop lines shall be established based on future (or present) installation of gate with appropriate track clearances.
2. Where plans call for railroad traffic control devices to be installed in curbed medians, the minimum median width shall be 12'-6".
3. Location of railroad traffic control device is based on the distance available between face of curb & sidewalk. 0' to 6' – Locate device outside sidewalk. Over 6' – Locate device between face of curb and sidewalk.
4. Stop line to be perpendicular to edge of roadway, approx. 15' from nearest rail; or 8' from and parallel to gate when present.
5. When a cantilevered-arm flashing-light signal is used, the minimum vertical clearance shall be 17' from above the Crown of Roadway to the Lowest Point of the Overhead Signal Unit.




TYPE I

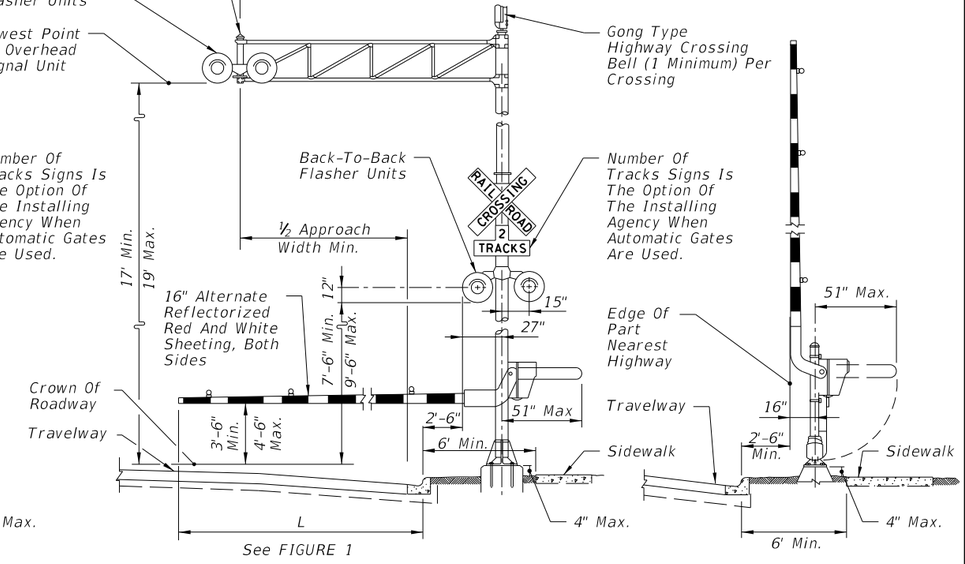



TYPE II




See FIGURE 1

TYPE III




See FIGURE 1

TYPE IV




TYPE V

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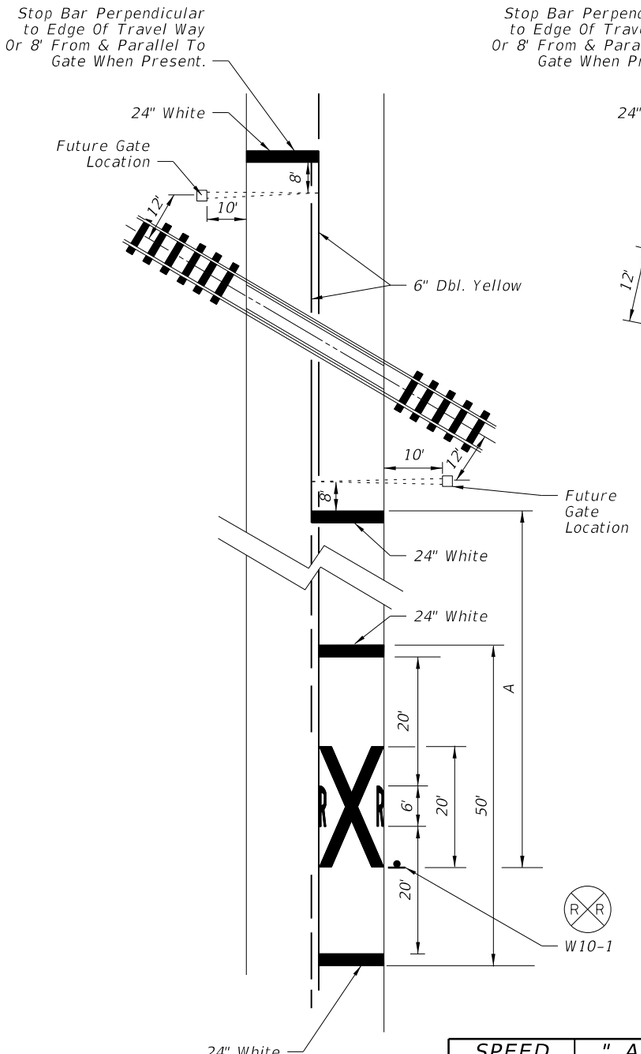
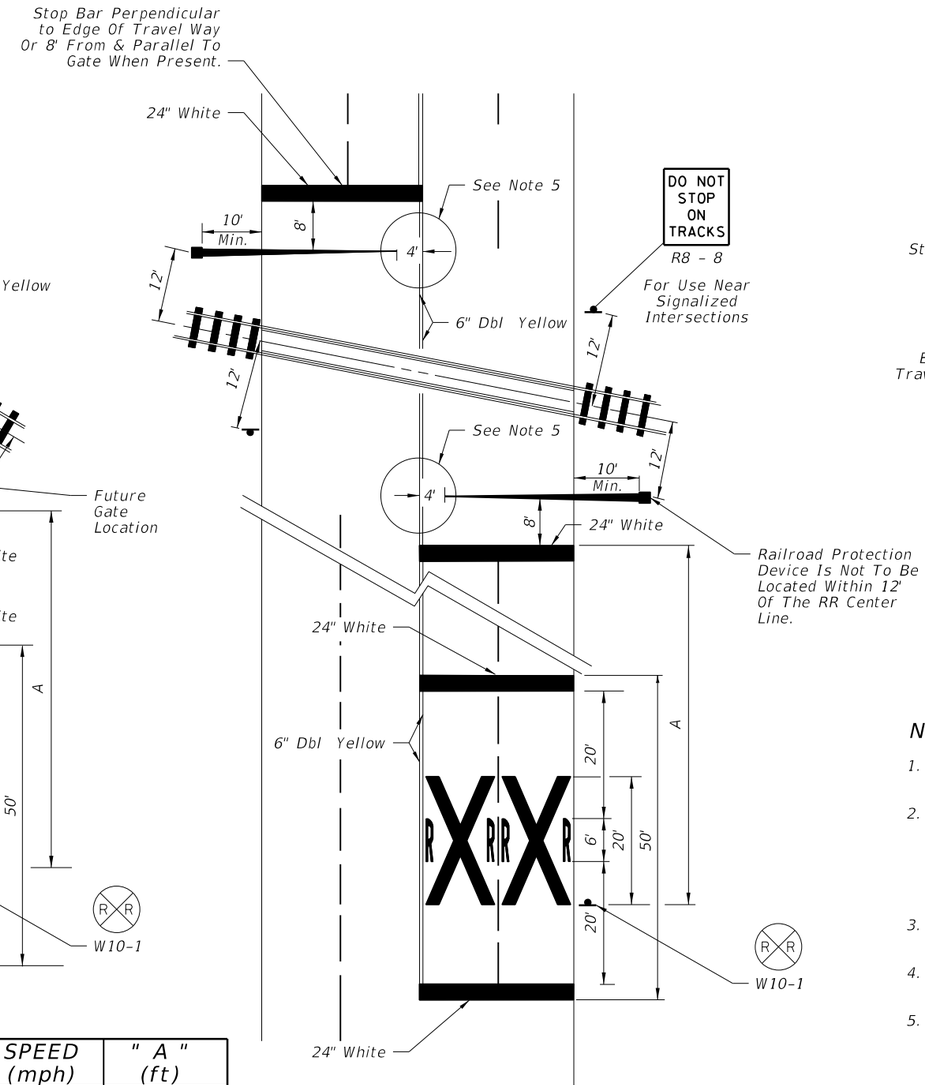
rd960rh
3:10:18 PM
6/28/2012

| LAST REVISION | REVISION | DESCRIPTION: | | | INDEX NO. | SHEET NO. |
|---|---|---|---|---|---|---|
| 01/01/11 | | | FDOT DESIGN STANDARDS 2013 | RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES | 17882 | 2 |

## RAILROAD CROSSING AT TWO (2)-LANE ROADWAY

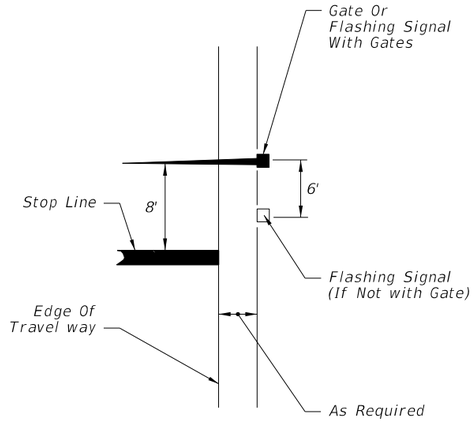


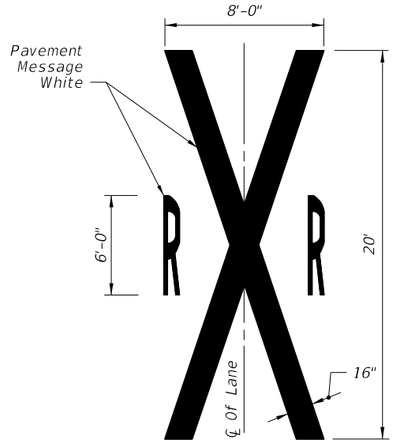

## RAILROAD CROSSING AT MULTILANE ROADWAY




| SPEED (mph) | " A " (ft) |
|---|---|
| 60 | 400 |
| 55 | 325 |
| 50 | 250 |
| 45 | 175 |
| 40 | 125 |
| 35 | 100 |
| URBAN | 85 MIN. |

## RELATIVE LOCATION OF CROSSING TRAFFIC CONTROL DEVICES

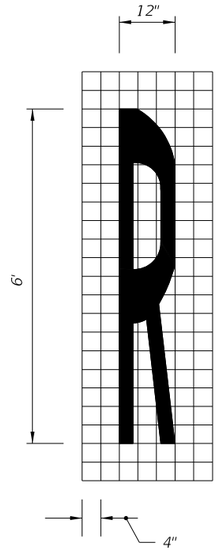



### NOTES:

1. When computing pavement message, quantities do not include traverse lines.
2. Placement of sign W10-1 in a residential or business district, where low speeds are prevalent, the W10-1 sign may be placed a minimum distance of 100' from the crossing. Where street intersections occur between the RR pavement message and the tracks an additional W10-1 sign and additional pavement message should be used.
3. A portion of the pavement markings symbol should be directly opposite the W10-1 sign.
4. Recommended location for FTP-61-06 or FTP-62-06 signs, 100' urban and 300' rural. See Index 17355 for sign details.
5. Gate Length Requirements:
   For Two-way undivided sections:
   The gate should extend to within 1' of the center line. On multiple approaches the maximum gate length may not reach to within 1' of the center line. For those cases, the distance from the gate to the center line shall be a maximum of 4'.

   For one-way or divided sections:
   The gate shall be of sufficient length such that the distance from the gate tip to the inside edge of pavement is a maximum of 4'.

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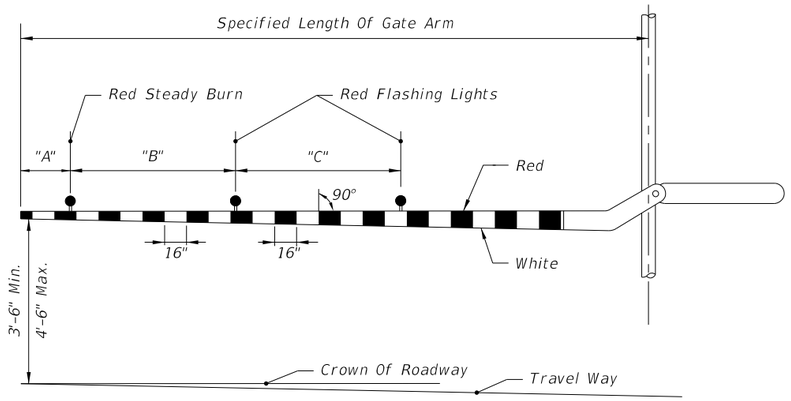
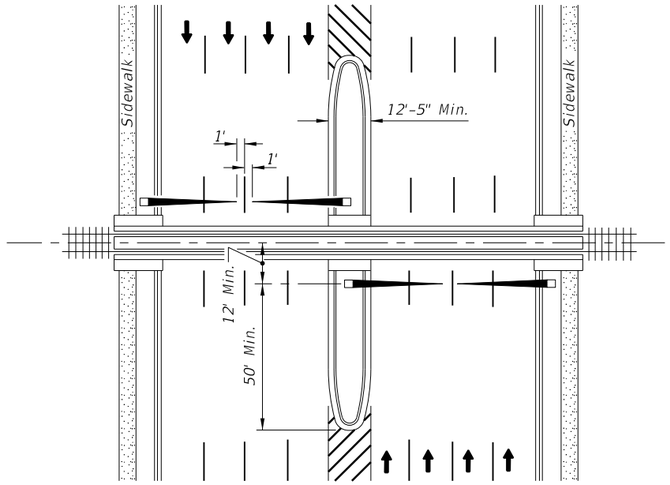
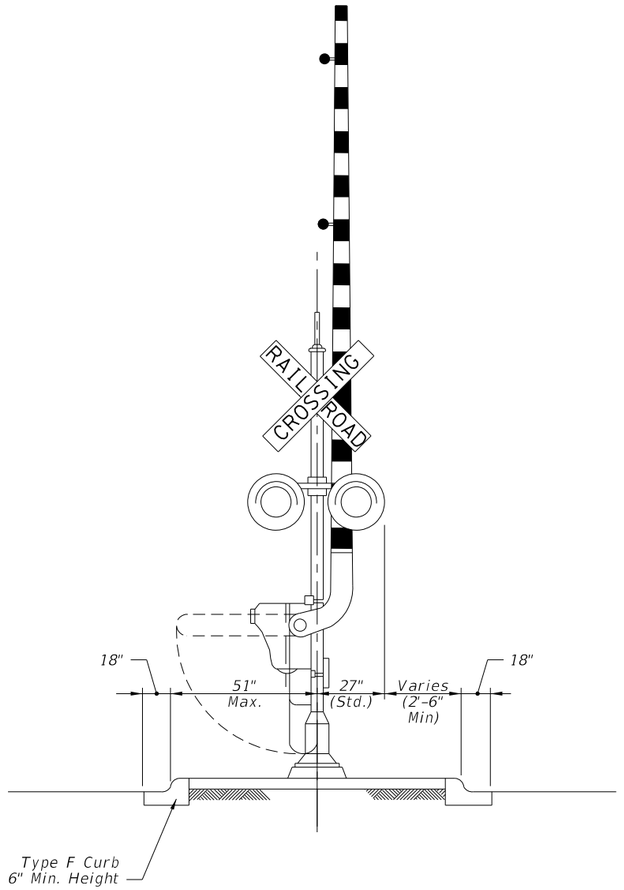
|---|---|---|---|---|---|---|
| 07/01/10 | | | FDOT DESIGN STANDARDS 2013 | RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES | 17882 | 3 |




PLAN




MEDIAN SECTION AT SIGNAL GATES

## RAILROAD GATE ARM LIGHT SPACING

| Specified Length Of Gate Arm | Dimension "A" | Dimension "B" | Dimension "C" |
|---|---|---|---|
| 14 Ft. | 6" | 36" | 5' |
| 15 Ft. | 18" | 36" | 5' |
| 16-17 Ft. | 24" | 36" | 5' |
| 18-19 Ft. | 28" | 41" | 5' |
| 20-23 Ft. | 28" | 4' | 5' |
| 24-28 Ft. | 28" | 5' | 5' |
| 29-31 Ft. | 36" | 6' | 6' |
| 32-34 Ft. | 36" | 7' | 7' |
| 35-37 Ft. | 36" | 9' | 9' |
| 38 And Over | 36" | 10' | 10' |

NOTE:
For additional information see the "Manual On Uniform Traffic Control Devices", Part 8; The "Traffic Control Handbook" , Part VIII; and AASHTO "A Policy On Geometric Design Of Streets And Highways".

## MEDIAN SIGNAL GATES FOR
## MULTILANE UNDIVIDED URBAN SECTIONS
## (THREE OR MORE DRIVING LANES IN ONE DIRECTION, 45 MPH OR LESS)

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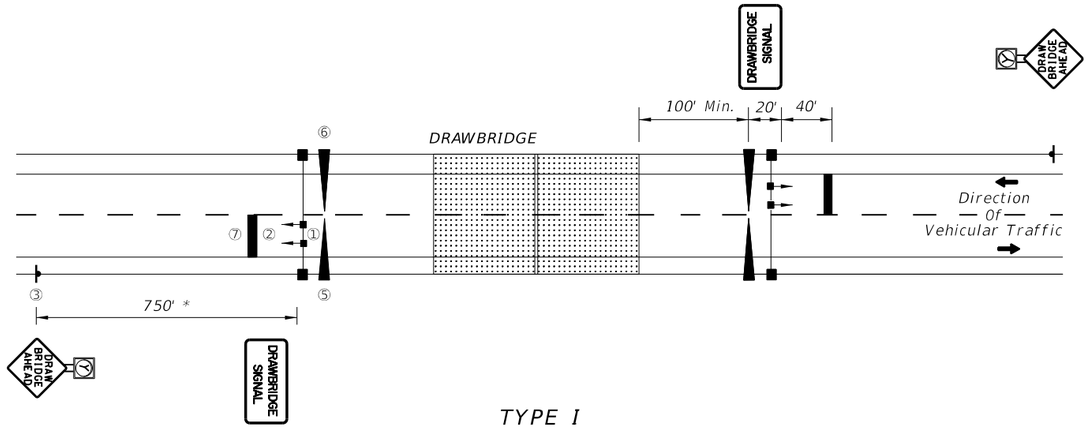
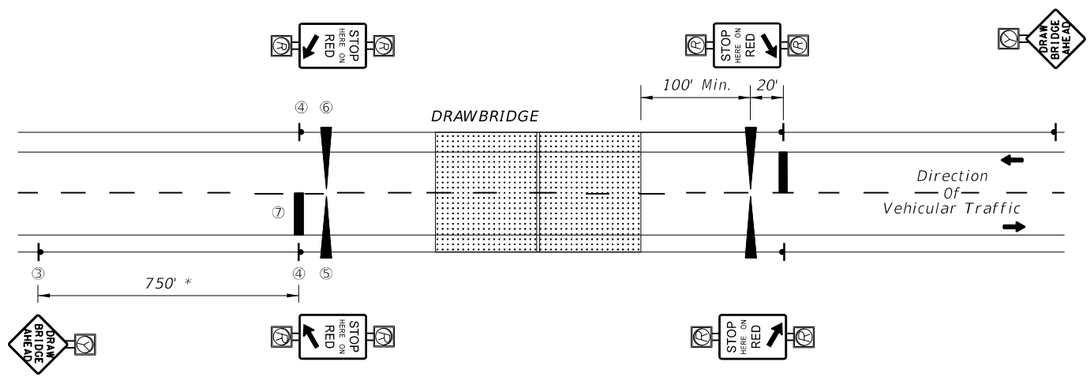
| 01/01/12 | | | | | | 17882 | 4 |

# TYPICAL BRIDGE MOUNTS




## TYPE I

TO BE USED WHERE BRIDGE OPERATORS ARE FULL TIME OR A DAILY BASIS.




## TYPE II

TO BE USED WHERE TYPE I IS NOT APPLICABLE (USUALLY WHEN THE BRIDGE OPERATOR IS "ON CALL").

LEGEND:

① TRAFFIC SIGNALS } Mast Arm Mounted (Off Bridge)
② DRAWBRIDGE SIGN } Monotube Support Mounted (On Bridge)
③ DRAWBRIDGE AHEAD SIGN WITH YELLOW FLASHING BEACON } Ground Mounted
④ STOP HERE ON RED SIGN WITH RED FLASHING BEACONS
⑤ ENTRANCE GATE
⑥ EXIT GATE
⑦ 24" THERMOPLASTIC STOP BAR

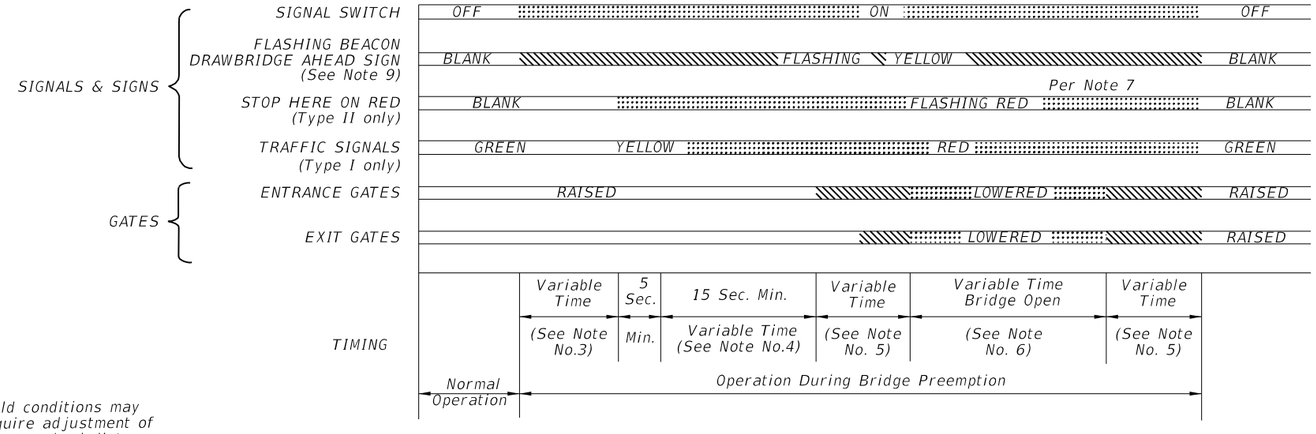
W8-5
SLIPPERY WHEN WET SIGN
See Note 11

## NOTES:

1. A bypass switch shall be installed to override each timing interval in case of a malfunction.
2. "STOP HERE ON RED" is omitted in Type I operation and "TRAFFIC SIGNALS" are omitted in Type II operation.
3. The time between beginning of flashing yellow on "Drawbridge Ahead" sign and the clearance of traffic signal to red, or beginning of flashing red should not be less than the travel time of a passenger car, from the sign location to the stop line, traveling at the 85 percentile approach speed.
4. Beginning of operation of drawbridge gates shall not be less than 15 seconds after steady red or 20 seconds after flashing red (Actual time may be determined by the bridge tender.)
5. Time of gate lowering and raising is dependent upon gate type.
6. Time of bridge opening is determined by the bridge tender.
7. Each gate shall be operated by a separate switch.
8. On each approach (Type II ), all four red signals shall be on the same two circuit flashers, with the two top signals on one circuit, and the two bottom signals on the alternately flashing circuit.
9. A Drawbridge Ahead sign is required for both types of signal operation, However a flashing beacon shall be added to the sign when physical conditions prevent a driver traveling at the 85% approach speed from having continuous view of at least one signal indication for approximately 10 seconds.
10. Requirements on gate installation are contained in Section 4I of the "Manual on Uniform Traffic Control Devices".
11. "In accordance with Traffic Engineering Manual (Topic Number 750-000-005) Section 2.1, SLIPPERY WHEN WET SIGNS shall be placed in advance of all MOVABLE and NONMOVABLE STEEL DECK BRIDGES."

* Field conditions may require adjustment of this standard distance.

## SEQUENCE CHART



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|---|---|---|---|---|---|---|
| 07/01/07 | | | FDOT DESIGN STANDARDS 2013 | TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS | 17890 | 1 |

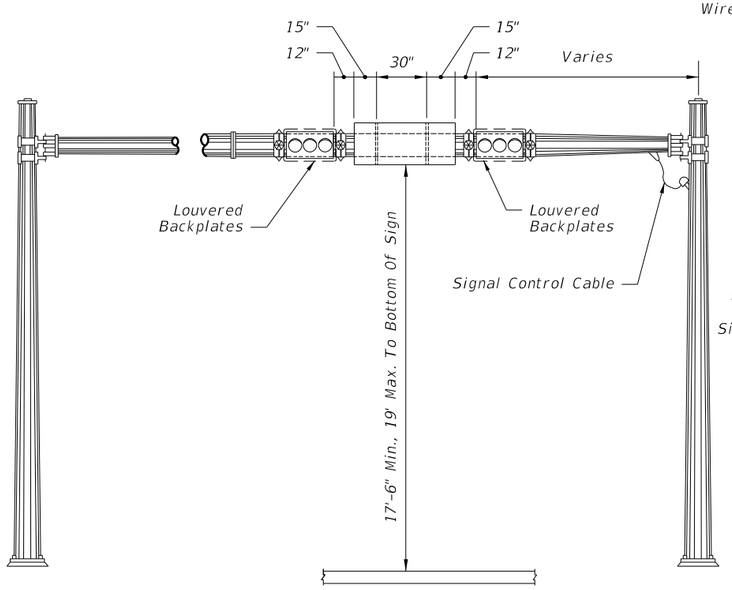


FIGURE - A

MONOTUBE SUPPORT MOUNTING

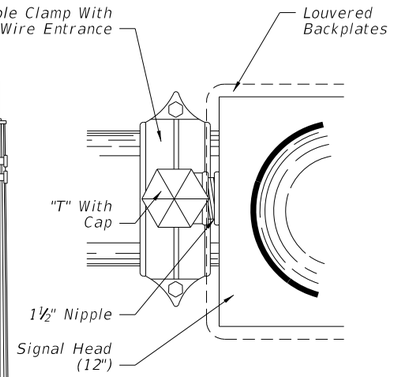


FIGURE - C

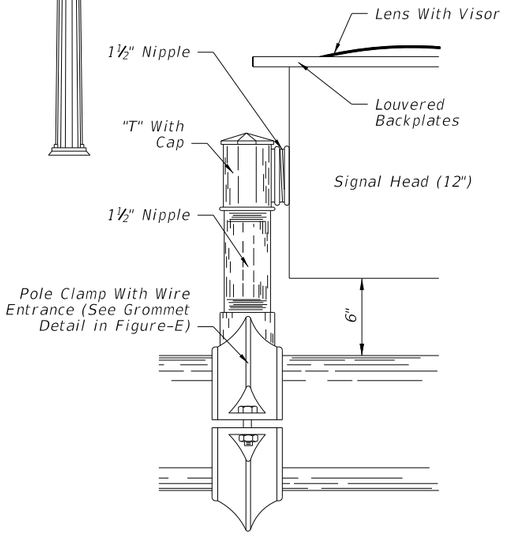


FIGURE - D

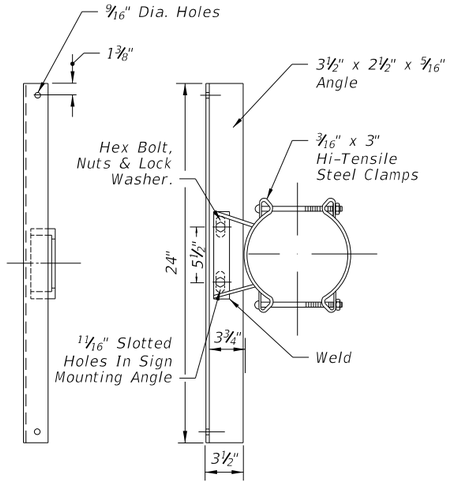


FIGURE - B

SIGN PANEL MOUNTING ASSEMBLY

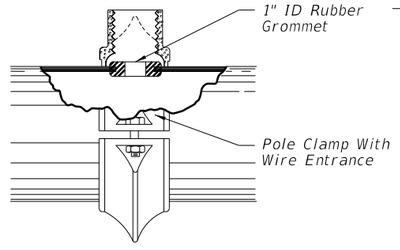


FIGURE - E

SIGNAL HEAD MOUNTING ASSEMBLY

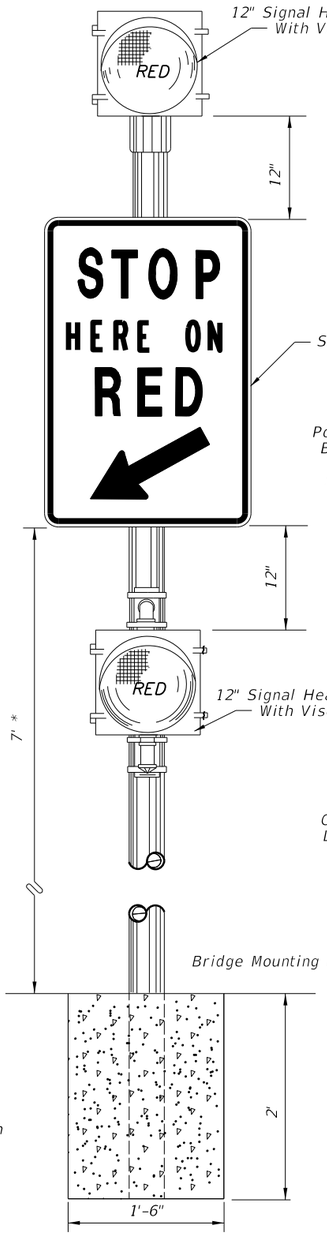


FIGURE - F

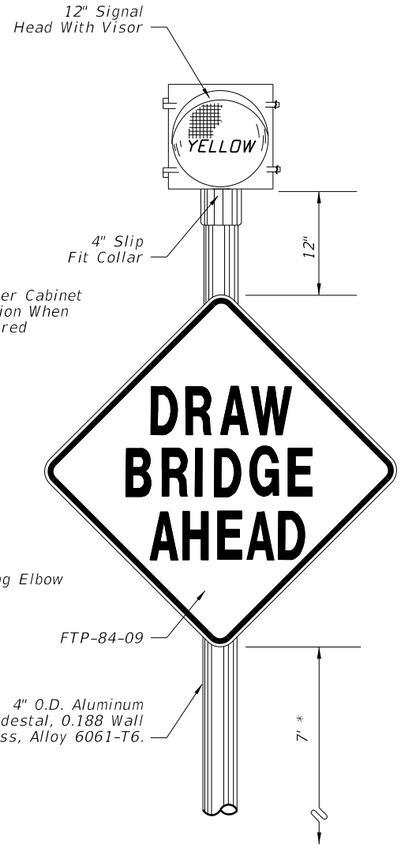


FIGURE - G

* Measured from the bottom of the sign to the near edge of the pavement. Horizontal distance between edge of the pavement and inside edge of sign will vary with condition at job site.

| LAST REVISION | REVISION | DESCRIPTION: | | | | |
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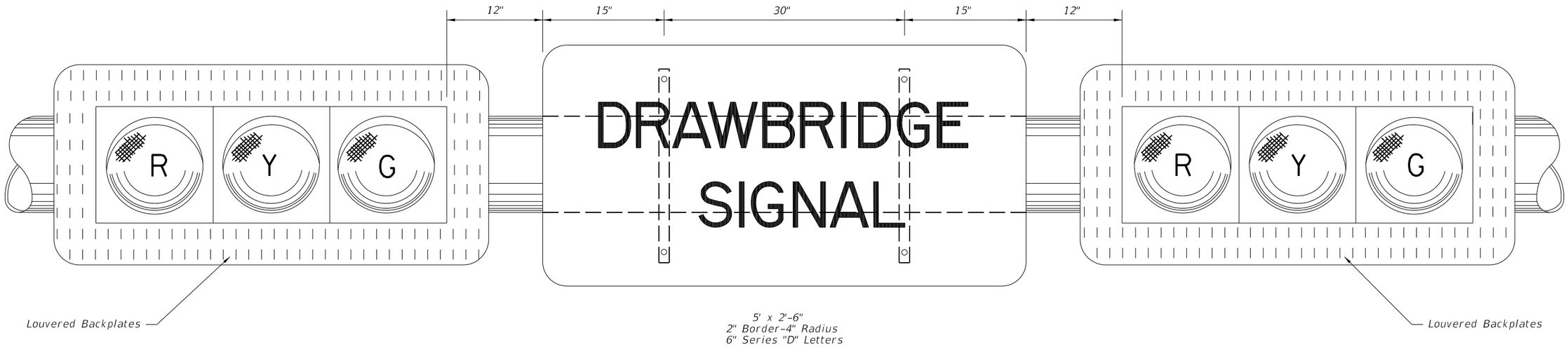
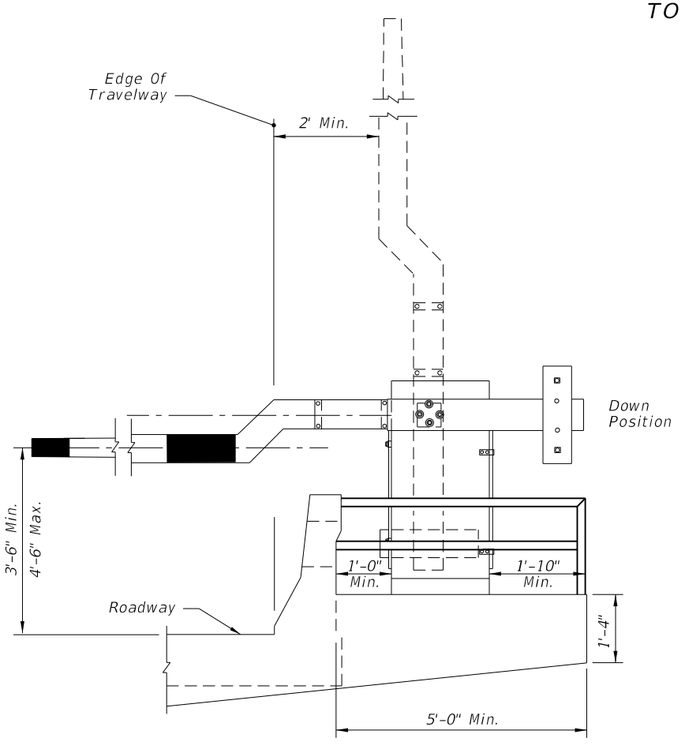
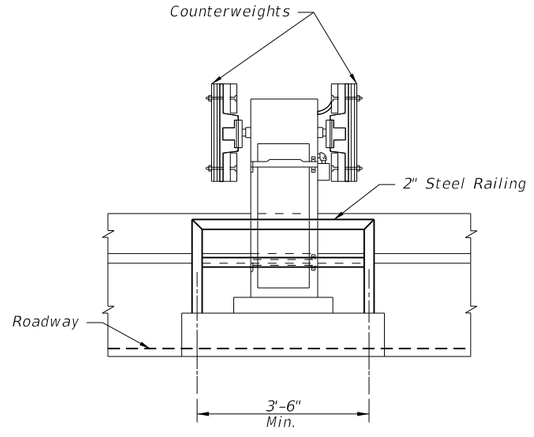
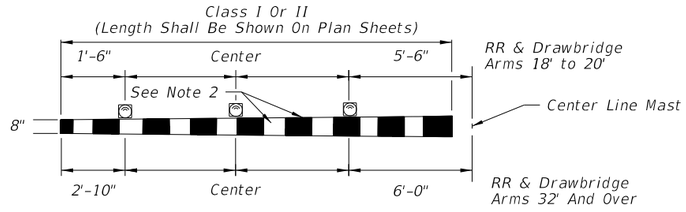



BLACK OPAQUE LEGEND AND BORDER ON REFLECTORIZED YELLOW BACKGROUND
TO BE USED WITH TYPE I OPERATION, AS SHOWN ON PREVIOUS SHEET
MONOTUBE SUPPORT MOUNTING




GATE & ARM DETAIL




TYPICAL LAMP PLACEMENT

NOTES:

1. 12 volt flashing red lights shall be mounted on gate arm and shall operate in the flashing mode only when gate arm is in the lower position or in the process of being lowered. The number of lights shall vary accordingly to length of the gate arm.
2. 16" alternate diagonal fully reflectorized red and white stripes.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| LAST REVISION | REVISION | DESCRIPTION: | | FDOT DESIGN STANDARDS 2013 | TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS | INDEX NO. | SHEET NO. |
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