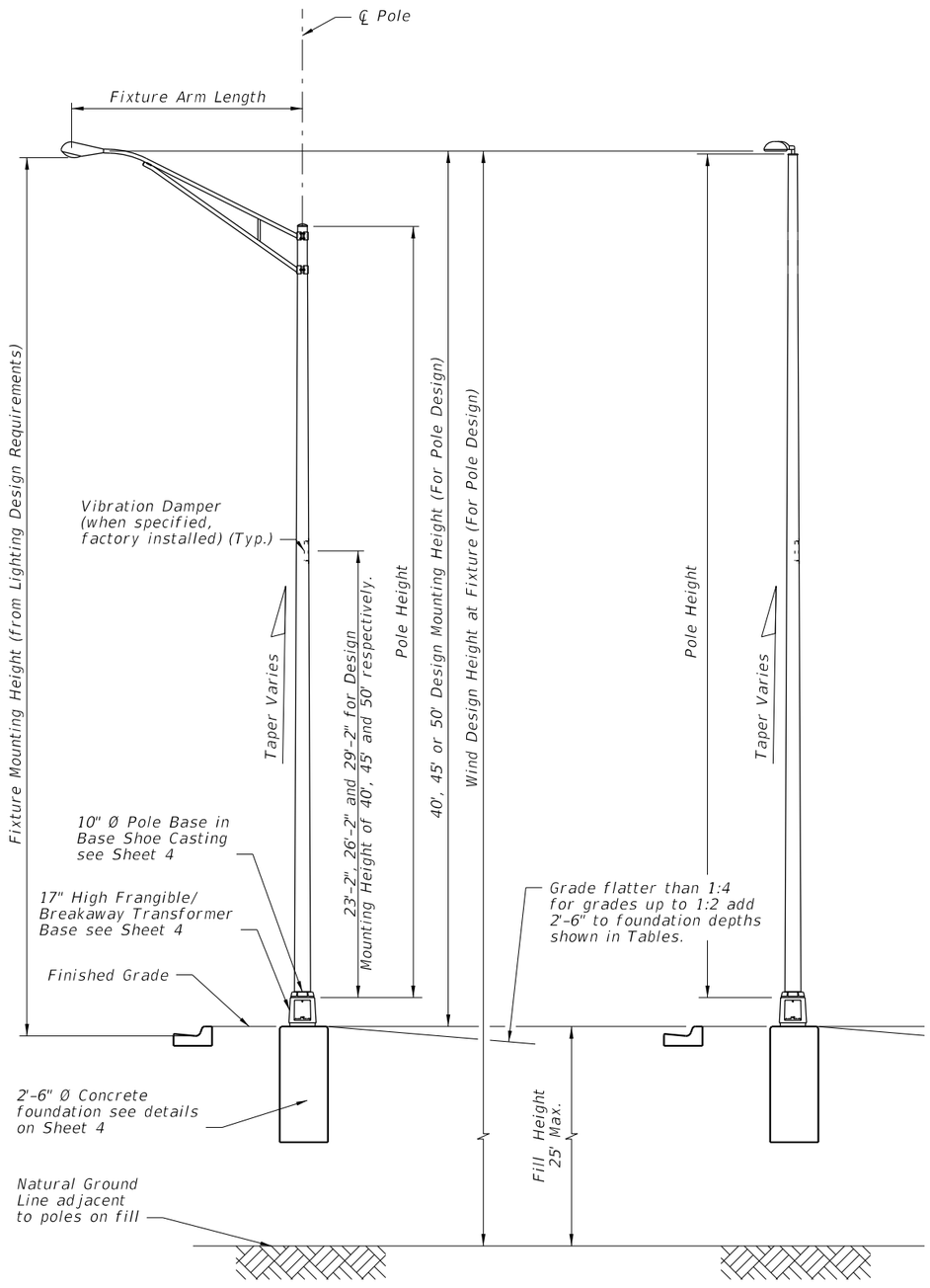
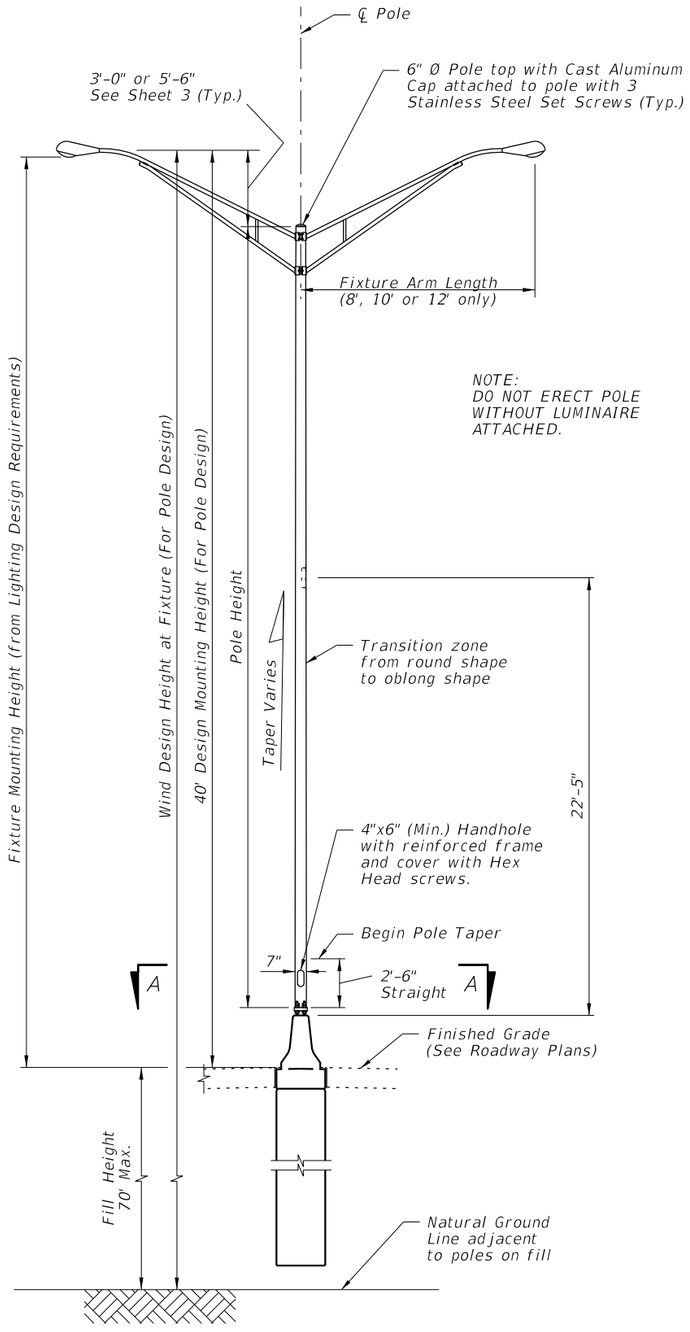
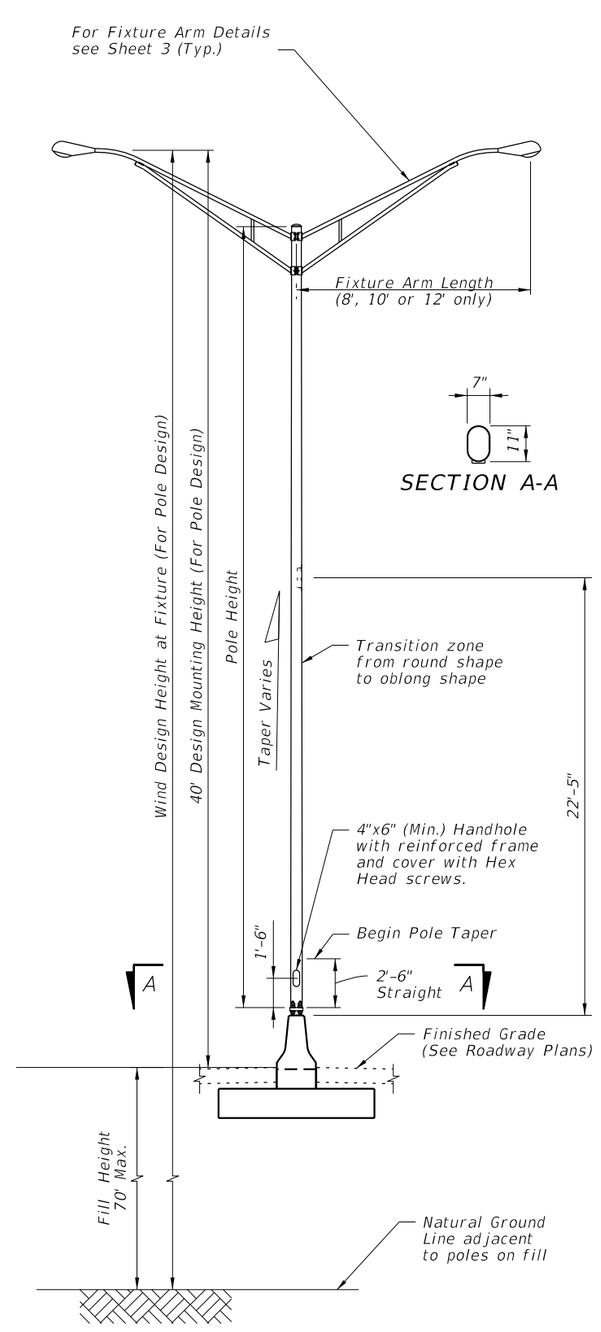


STANDARD ROADWAY ALUMINUM LIGHT POLE W/ARM

STANDARD ROADWAY ALUMINUM LIGHT POLE W/TOP MOUNT



MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE ON CYLINDRICAL FOUNDATION



MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE ON SPREAD FOOTING FOUNDATION

ELEVATIONS

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2016-17 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	INDEX NO.	SHEET NO.
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GENERAL NOTES

1. Poles are designed to support the following:
   A. Luminaire Effective Projected Area (EPA): 1.55 SF
   B. Weight: 75 lb.

2. Shop Drawings: This Index is considered fully detailed, only submit shop drawings for minor modifications not included in the Plans.

3. Materials:
   A. Pole and Arm Extrusions: ASTM B221, Alloy 6063–T6; Pole Connection Extrusions: ASTM B221, Alloy 6063–T6 or Alloy 6061–T6
   B. Bars, Plates, Stiffeners and Backer Ring: ASTM B221, Alloy 6063–T6
   C. Caps and Covers: ASTM B–26, Alloy 319–F
   D. Steel Bearing Plate: ASTM A709 or ASTM A36 Grade 36
   E. Aluminum Weld Material: ER 4043
   F. Transformer and Frangible Base Materials: ASTM B26 or ASTM B108, Alloy 356–T6
   G. Bolts, Nuts and Washers:
      a. Shoe Base Bolts: ASTM A325 Type 1
      b. Nuts: ASTM A563 Grade DH Heavy–Hex
      c. Washer: ASTM F436 Type 1
   H. Anchor Bolts, Nuts, and Washers:
      a. Anchor Bolts: ASTM F1554 Grade 55
      b. Nuts: ASTM A563 Grade A Heavy–Hex
      c. Plate Washer: ASTM A36
   I. Stainless Steel Fasteners: AISI 316
   J. Nut Covers: ASTM B26 (319–F)
   K. Concrete: Class 1
   L. Reinforcing Steel: Specification Section 415

4. Fabrication:
   A. Upright Splices: Not Allowed. Transverse welds are only allowed at the base.
   B. Roadway Light Pole Taper: Taper as required to provide a round top O.D. of 6" and a base O.D. of 10". Portions of the pole near the base shoe and at the arm connections may be held constant at 10" and 6" respectively to simplify fabrication.
   C. Median Barrier Mounted Light Pole Taper: Taper as required to provide a 6" O.D. round top with an 11" x 7" O.D. oblong base. Portions of the pole near the base and at the arm connections may be held constant at 11"x 7" oblong and 6" round respectively to simplify fabrication.
   D. Provide 'J', 'S' or 'C' hook at top of pole for electrical wires.
   E. Equip poles located on bridges, walls and concrete median barriers/Traffic Railings with a vibration damper.
   F. Perform all welding in accordance with Specification Secion 460–6.4.
   G. Embedded Junction Boxes (EJB):
      a. Weld all seams continuously and grind smooth.
      b. Hot Dip Galvanize after Fabrication.
      c. Provide a watertight cover with neoprene gasket and secure cover with galvanized screws.
   H. For Median Barrier Mounted Aluminum Light Poles, the fabricator must demonstrate the ability to produce a crack free pole. The fabricator's Department–approved QC Plan must contain the following information prior to fabrication:
      a. Tests demonstrating a pole with a 1#4" wall thickness achieves and ultimate moment capacity of 36 kip*ft in the strong axis and 30 kip*ft in the weak axis.
      b. Tests demonstrating a pole with a 5#16"wall thickness achieves an ultimate moment capacity of 44 kip*ft in the strong axis and 37 kip*ft in the weak axis.
      c. Test results showing the pole does not buckle at the shape transition area under the ultimate moment capacity loads.
      d. Complete details and calculations for the reinforced 4"x 6" (Min.) handhole located 1'–6" above the base plate.
   I. Identification Tag: (Submit details for approval.)
      a. 2" x 4" (Max.) aluminum identification tag.
      b. Locate on the inside of the transformer base and visible from the door opening.
      c. Secure to transformer base with 1#8" diameter stainless steel rivets or screws.
      d. Include the following information on the ID Tag:
         1. Financial Project ID
         2. Pole Height
         3. Manufacturer's Name

5. Coatings/Finish:
   A. Pole and Arm Finish: 50 grit satin rubbed.
   B. Galvanize Steel Bolts, Screws, Nuts and Washers: ASTM F2329
   C. Hot Dip Galvanize EJB and other steel items including poles: ASTM A123

6. Construction:
   A. Foundation: Specification Section 455, except payment for the foundation is included in the cost of the pole.
   B. Frangible Base and Clamp:
      a. Certify that the Clamp and Frangible Transformer Base Design are capable of providing the required capacity.
      b. Certify the Base conforms to the current FHWA required AASHTO Frangibility Requirements, tested under NCHRP Report 350 Guidelines (e.g. Akron Foundry TB1–17).
   C. Do not erect pole without Luminaire attached.

7. Payment Note: Include the cost of the EJB in the cost of the median barrier or Traffic Railing it is embedded in.

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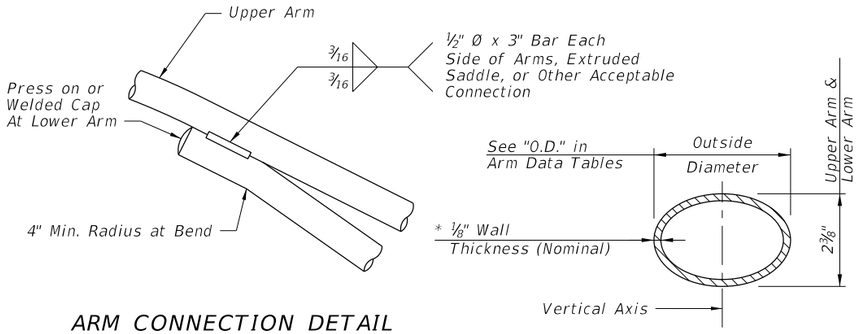
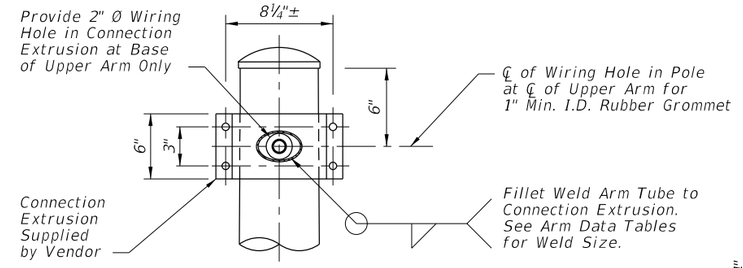
NOTES

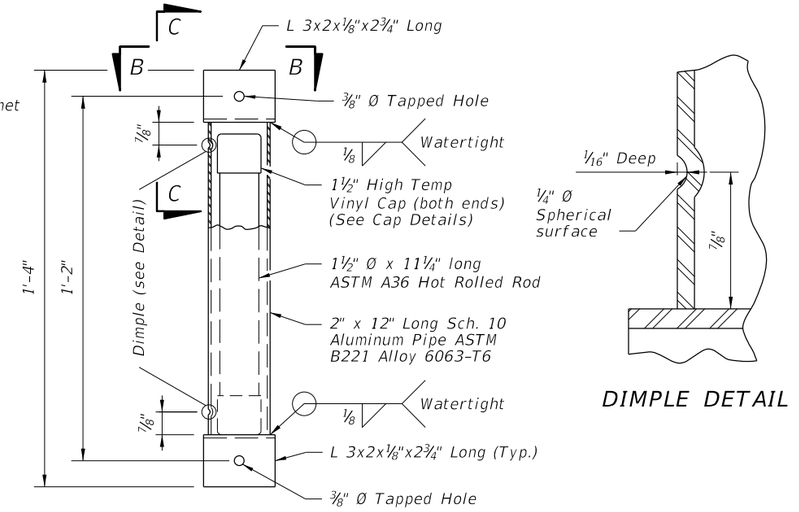


ARM CONNECTION DETAIL

ARM SECTION

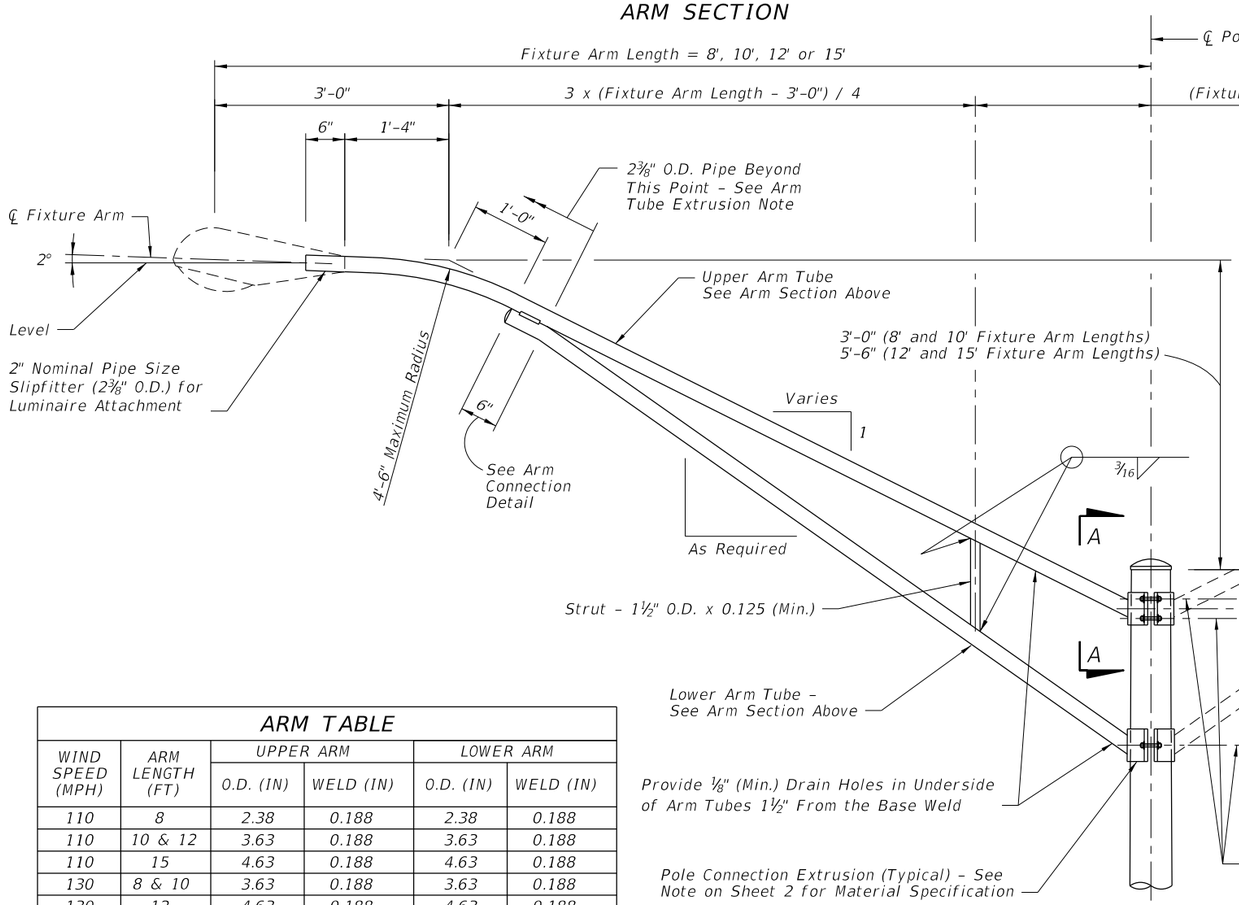


SECTION A-A
(Connection At Lower Arm Similar)



VIBRATION DAMPER ELEVATION

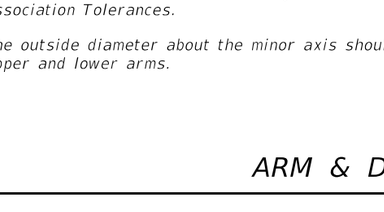
DIMPLE DETAIL



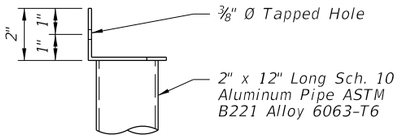
ARM ELEVATION

ARM TABLE					
WIND SPEED (MPH)	ARM LENGTH (FT)	UPPER ARM		LOWER ARM	
		O.D. (IN)	WELD (IN)	O.D. (IN)	WELD (IN)
110	8	2.38	0.188	2.38	0.188
110	10 & 12	3.63	0.188	3.63	0.188
110	15	4.63	0.188	4.63	0.188
130	8 & 10	3.63	0.188	3.63	0.188
130	12	4.63	0.188	4.63	0.188
130	15	4.63	0.25	4.63	0.25
150	8	3.63	0.188	3.63	0.188
150	10	3.63	0.250	3.63	0.250
150	12	4.63	0.250	4.63	0.250
150	15	4.63	0.313	4.63	0.313

* Increase Member Wall Thickness as Necessary to Meet Minimum Requirements of the Welding Code for the Connection Weld Sizes Shown in the Arm and Pole Tables.



VIEW B-B



VIEW C-C

HIGH TEMP VINYL CAP DETAIL

ARM TUBE EXTRUSIONS NOTES:

At the pole connections, provide arm tube extrusions with dimensions as shown in the ARM SECTION and as tabulated in the ARM DATA Tables. Uniformly transition elliptical section to a cylindrical section at the arm connection.

The fabricator may substitute elliptical cross sections other than those tabulated, provided the section properties about the vertical axis and the area of the section equal or exceed that of the required section, and provide minimum wall thickness of ⅛" nominal and within the Aluminum Association Tolerances.

The outside diameter about the minor axis should be held at 2⅜" at the upper and lower arms.

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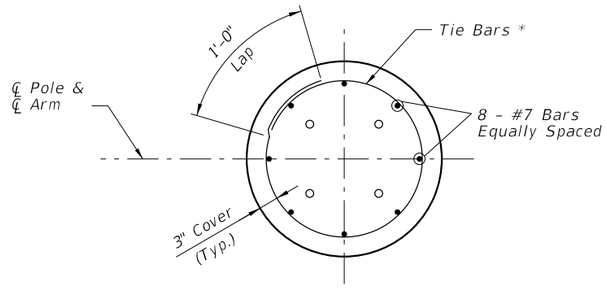
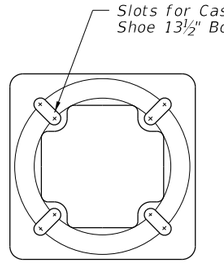
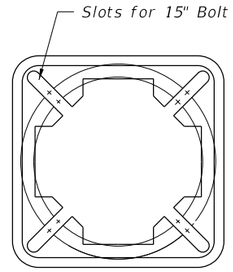
ARM & DAMPER DETAILS



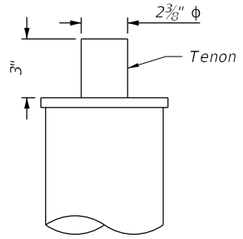
SECTION C-C



TOP VIEW TRANSFORMER BASE

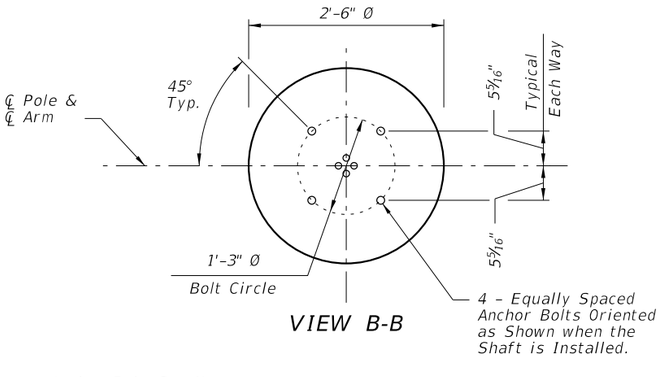


BOTTOM VIEW TRANSFORMER BASE



TOP MOUNT TENON

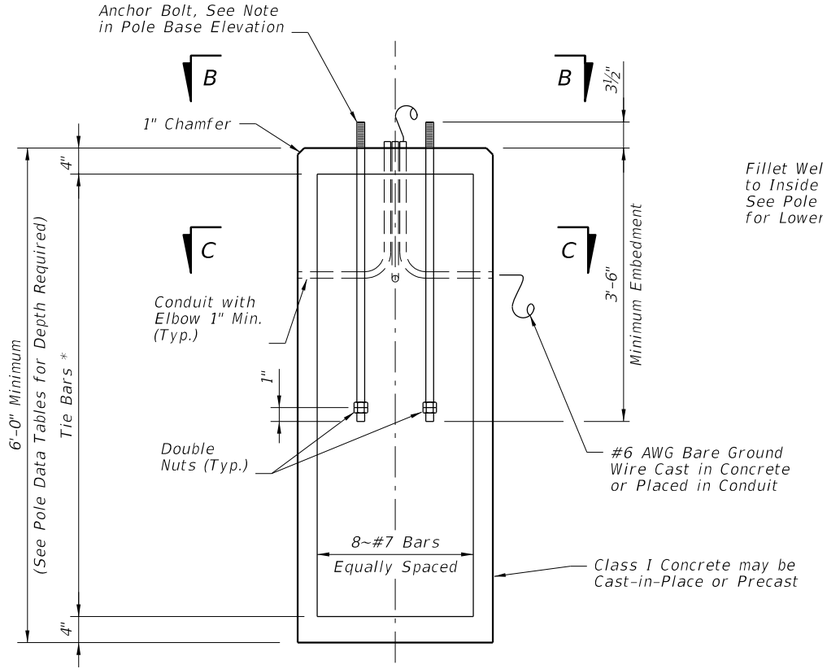
POLE TABLE W/ARM					
WIND SPEED (MPH)	ARM LENGTH (FT)	DESIGN MOUNTING HEIGHT (FT)	POLE WALL (IN)	UPPER WELD (IN)	LOWER WELD (IN)
110	8, 10, 12 & 15	40 & 45	0.156	0.156	0.156
110	8, 10, 12 & 15	50	0.188	0.188	0.188
130	8, 10 & 12	40	0.156	0.156	0.156
130	15	40	0.188	0.188	0.188
130	8, 10, & 12	45	0.188	0.188	0.188
130	15	45	0.250	0.250	0.250
130	8, 10, 12 & 15	50	0.250	0.250	0.250
150	8, 10, & 12	40	0.188	0.188	0.188
150	15	40	0.250	0.250	0.250
150	8, 10, 12 & 15	45	0.250	0.250	0.250
150	8, 10, 12 & 15	50	0.313	0.313	0.313



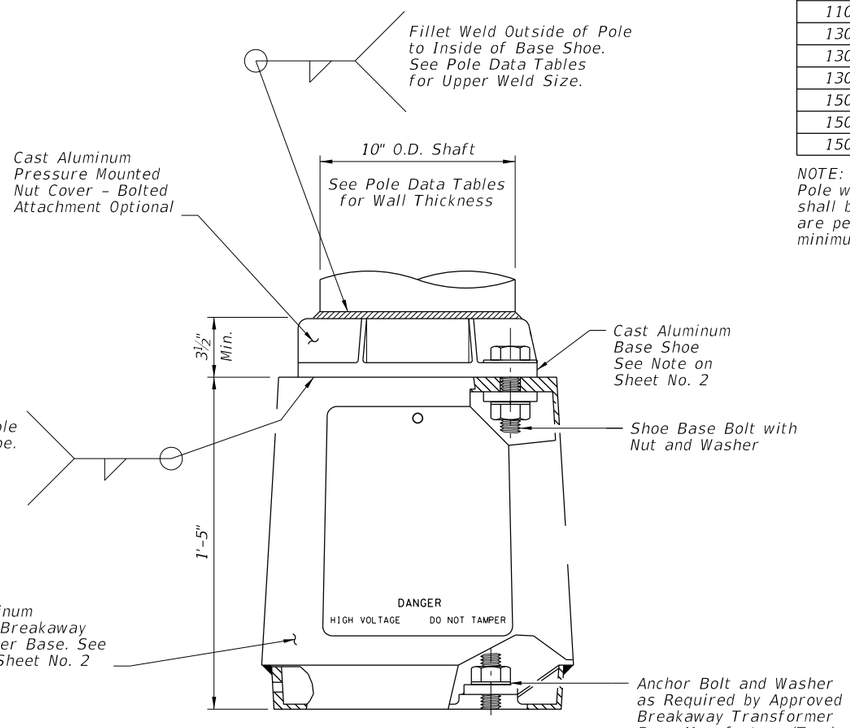
VIEW B-B

POLE TABLE W/TOP MOUNT				
WIND SPEED (MPH)	DESIGN MOUNTING HEIGHT (FT)	POLE WALL (IN)	UPPER WELD (IN)	LOWER WELD (IN)
110	40 & 45	0.125	0.125	0.125
110	50	0.156	0.156	0.156
130	40	0.125	0.125	0.125
130	45	0.156	0.156	0.156
130	50	0.188	0.188	0.188
150	40	0.156	0.156	0.156
150	45	0.188	0.188	0.188
150	50	0.250	0.250	0.250

NOTE:
Pole wall thicknesses shown in the POLE TABLE are nominals and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used provided the minimum Aluminum Association thicknesses are not violated.



FOUNDATION



POLE BASE ELEVATION

* #4 Tie Bars @ 12" centers (max.) or D10 (or W10) spiral @ 6" pitch, 3 flat turns top and 1 flat turn bottom.

FOUNDATION TABLE W/ARM		
WIND SPEED (MPH)	DESIGN MOUNTING HEIGHT (FT)	TOTAL DEPTH (FT) **
110	40	7
110	45 & 50	8
130	40 & 45	8
130	50	9
150	40 & 45	9
150	50	10

FOUNDATION TABLE W/TOP MOUNT		
WIND SPEED (MPH)	DESIGN MOUNTING HEIGHT (FT)	TOTAL DEPTH (FT) **
110	40	6
110	45 & 50	7
130	40	6
130	45 & 50	7
150	40 & 45	7
150	50	8

** Depths shown in table are for grades flatter than 1:4, for grades up to 1:2 add 2'-6" to foundation depths shown in table.

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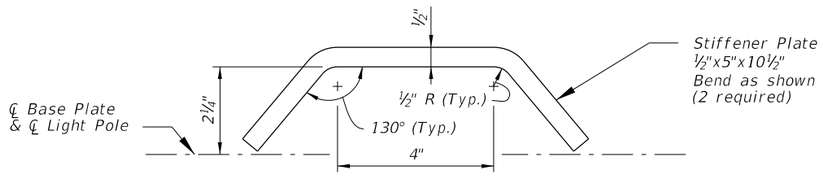
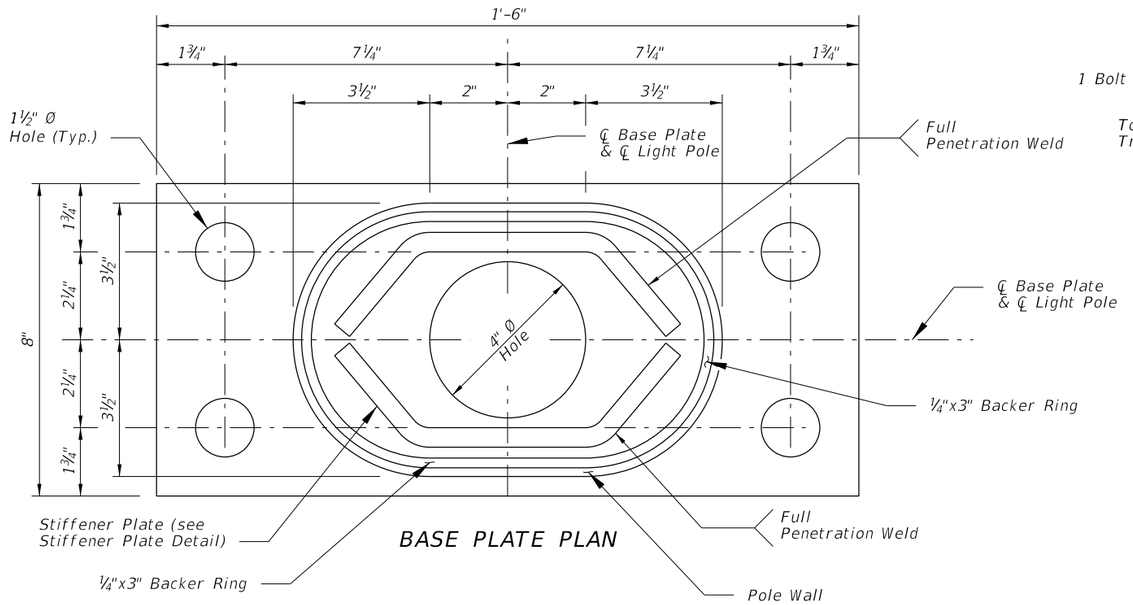
POLE AND BASE DETAILS FOR ROADWAY ALUMINUM LIGHT POLE

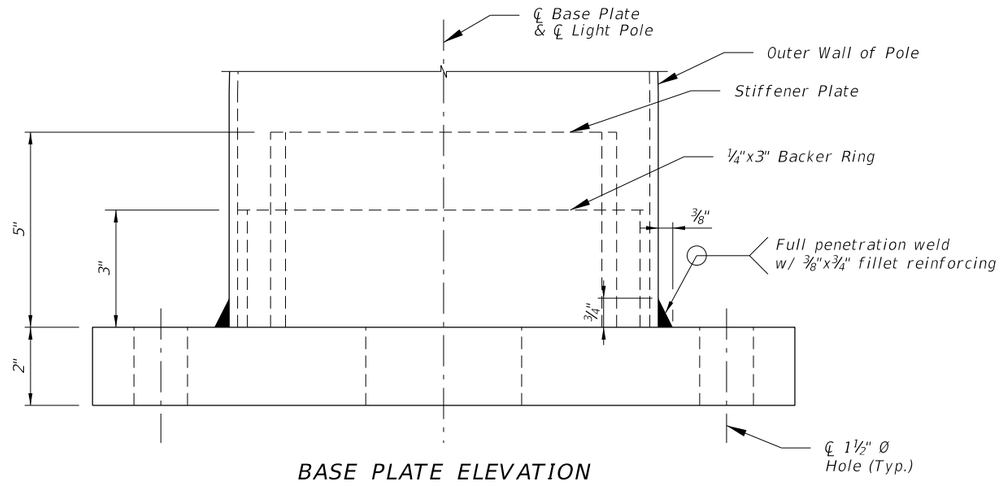
LAST REVISION	REVISION	DESCRIPTION:				
07/01/15			FDOT FY 2016-17 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	INDEX NO. 17515	SHEET NO. 4 of 8



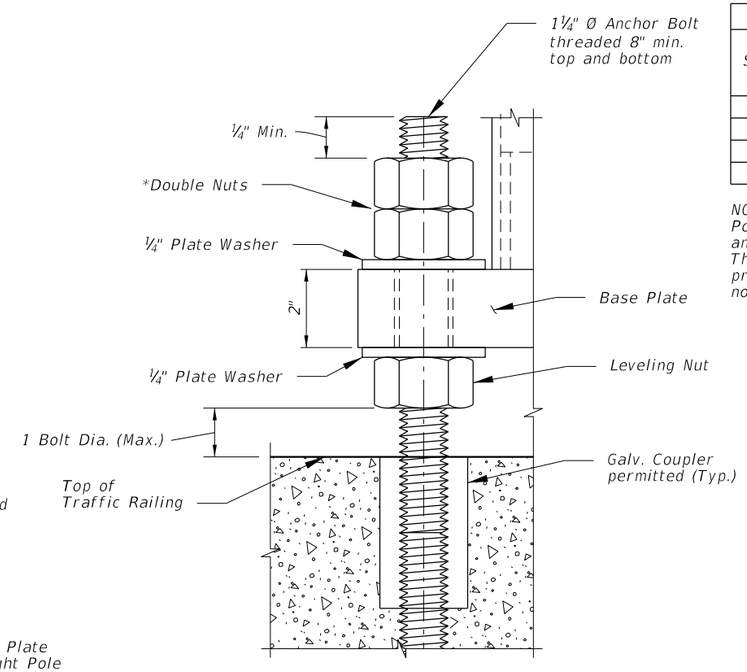
STIFFENER PLATE DETAIL



BASE PLATE PLAN



BASE PLATE ELEVATION



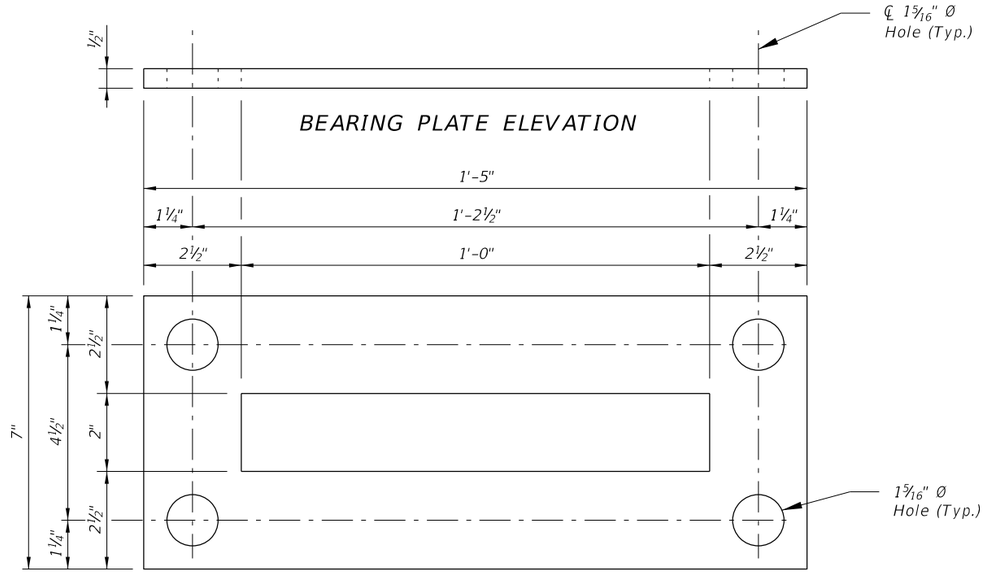
DETAIL 'A'

*Top nut may be ½ height
Jam Nut. Provide individual nut
cover (not shown) for each bolt.

POLE TABLE				
WIND SPEED (MPH)	ARM LENGTH (FT)	DESIGN MOUNTING HEIGHT (FT)	POLE WALL (IN)	FILL HEIGHT (FT)
110	8, 10, 12	40	0.25	Up to 70'
130	8, 10, 12	40	0.25	Up to 70'
150	8, 10, 12	40	0.25	Up to 20'
150	8, 10, 12	40	0.313	>20' to 70'

NOTE:
Pole wall thicknesses shown in the POLE TABLE are nominals and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used provided the minimum Aluminum Association thicknesses are not violated.

NOTE:
For locations of Bearing Plates, Base Plates and Detail 'A' see Sheets 6 & 7.



BEARING PLATE PLAN

BASE PLATE DETAILS FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/15			FDOT FY 2016-17 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	17515	5 of 8

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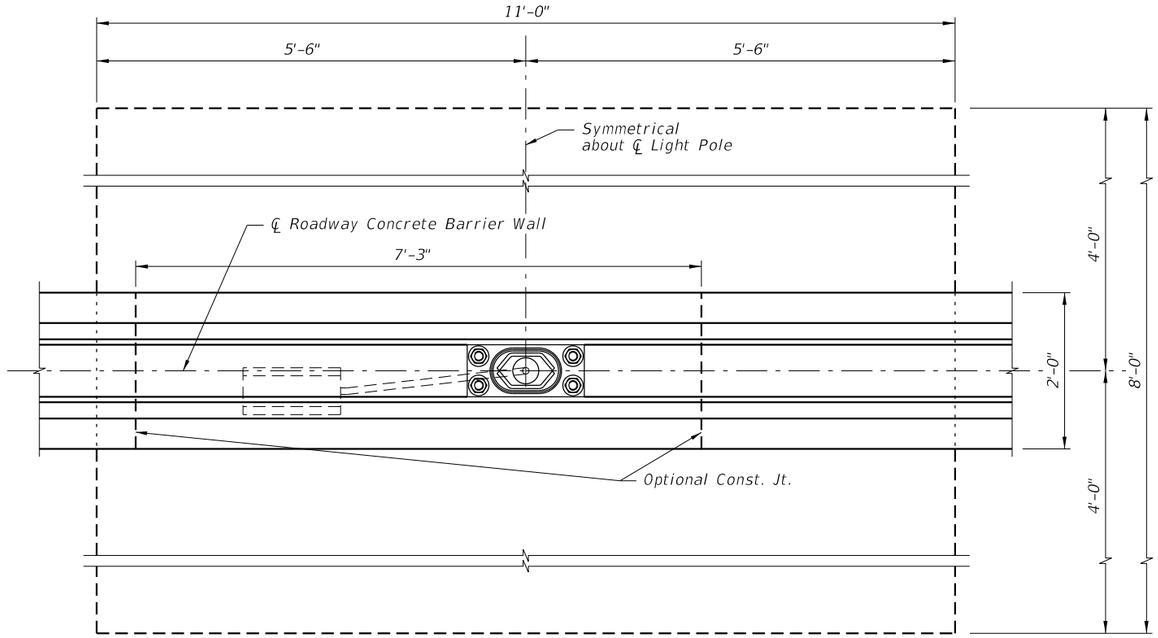
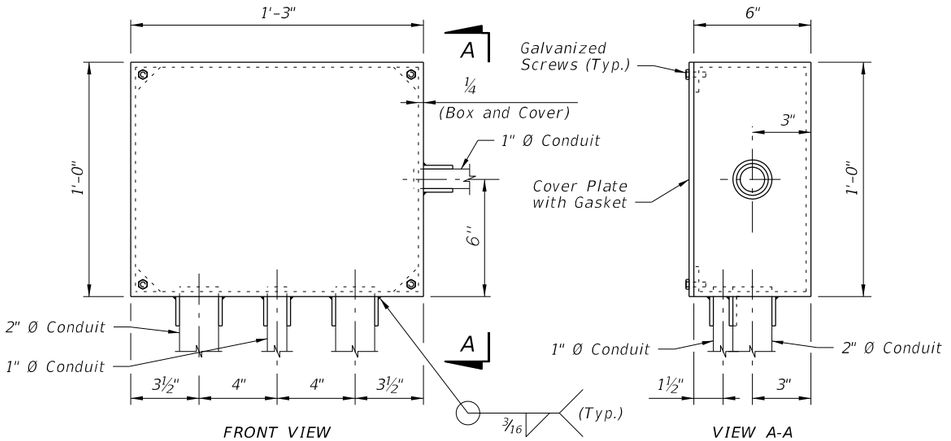


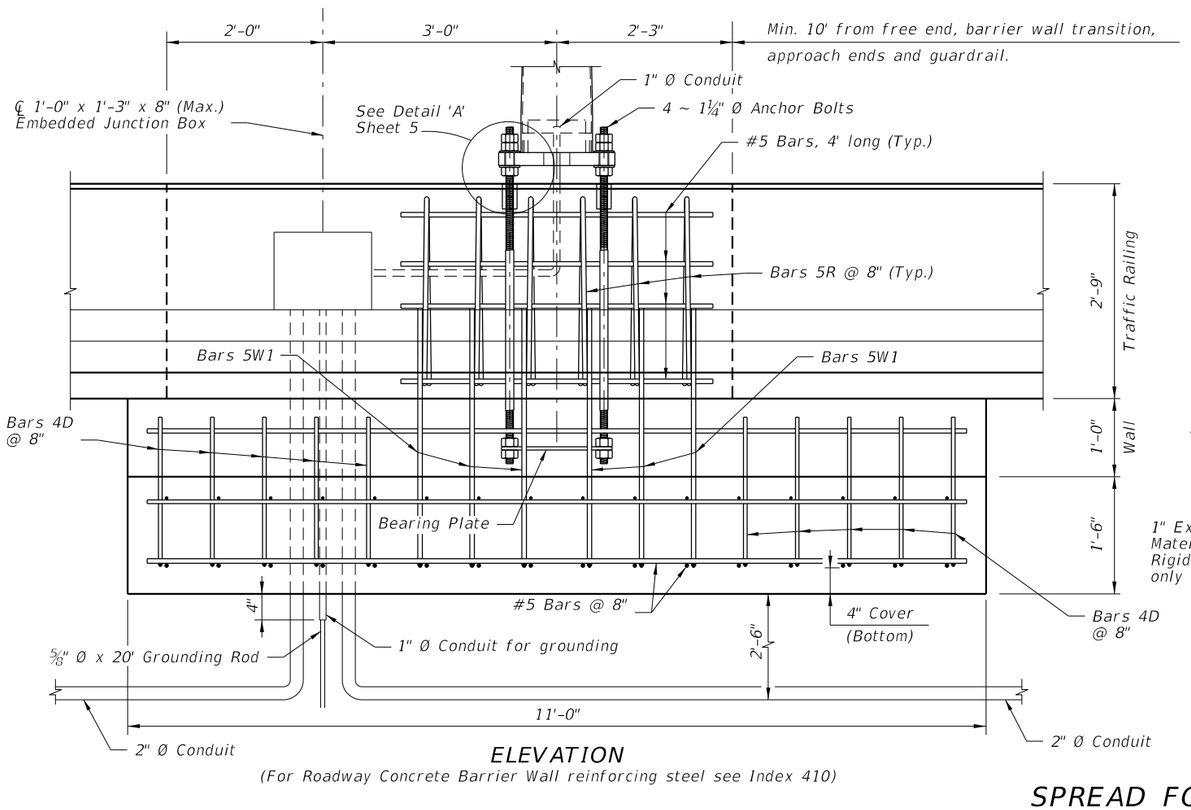
Provide dowel bars @ construction joint

PLAN

(Reinforcing steel not shown)

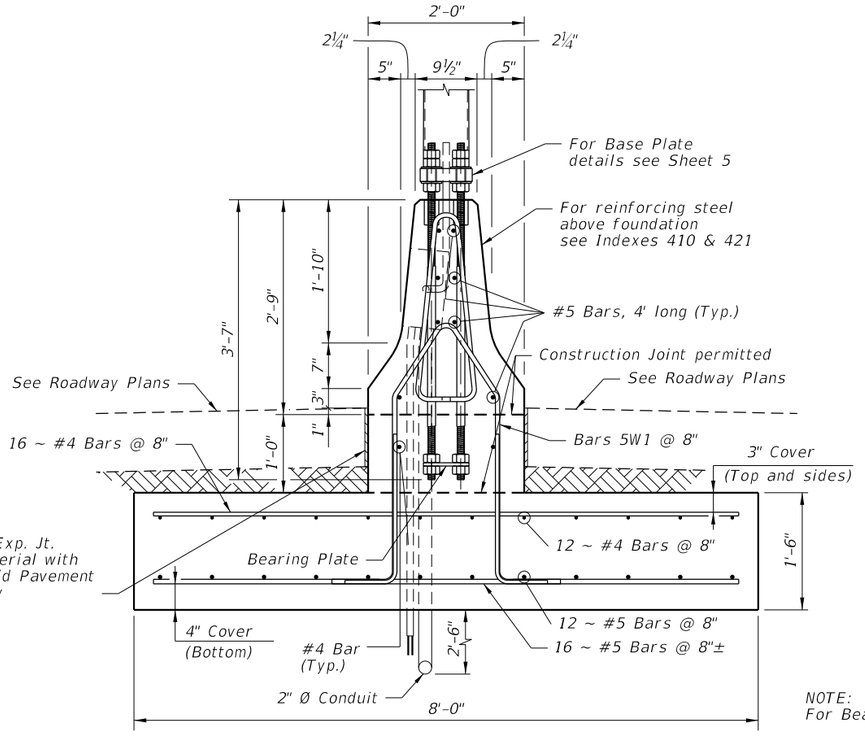


EMBEDDED JUNCTION BOX DETAILS

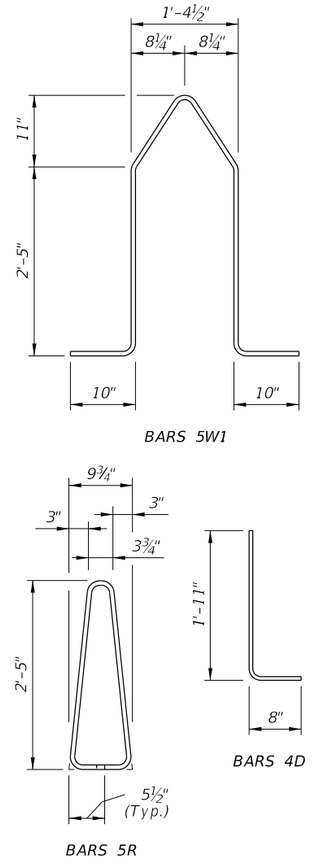


ELEVATION

(For Roadway Concrete Barrier Wall reinforcing steel see Index 410)



END VIEW



BAR BENDING DIAGRAMS

NOTE:
For Bearing Plate Details see Sheet 5.

SPREAD FOOTING DETAILS FOR MEDIAN BARRIER MOUNTED ALUMIMUM LIGHT POLE

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/15			FDOT	FY 2016-17 DESIGN STANDARDS	17515	6 of 8

STANDARD ALUMINUM LIGHTING

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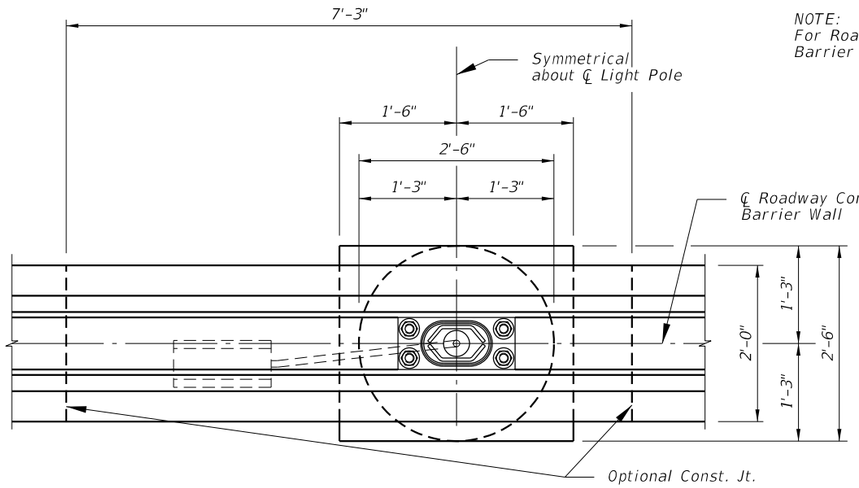
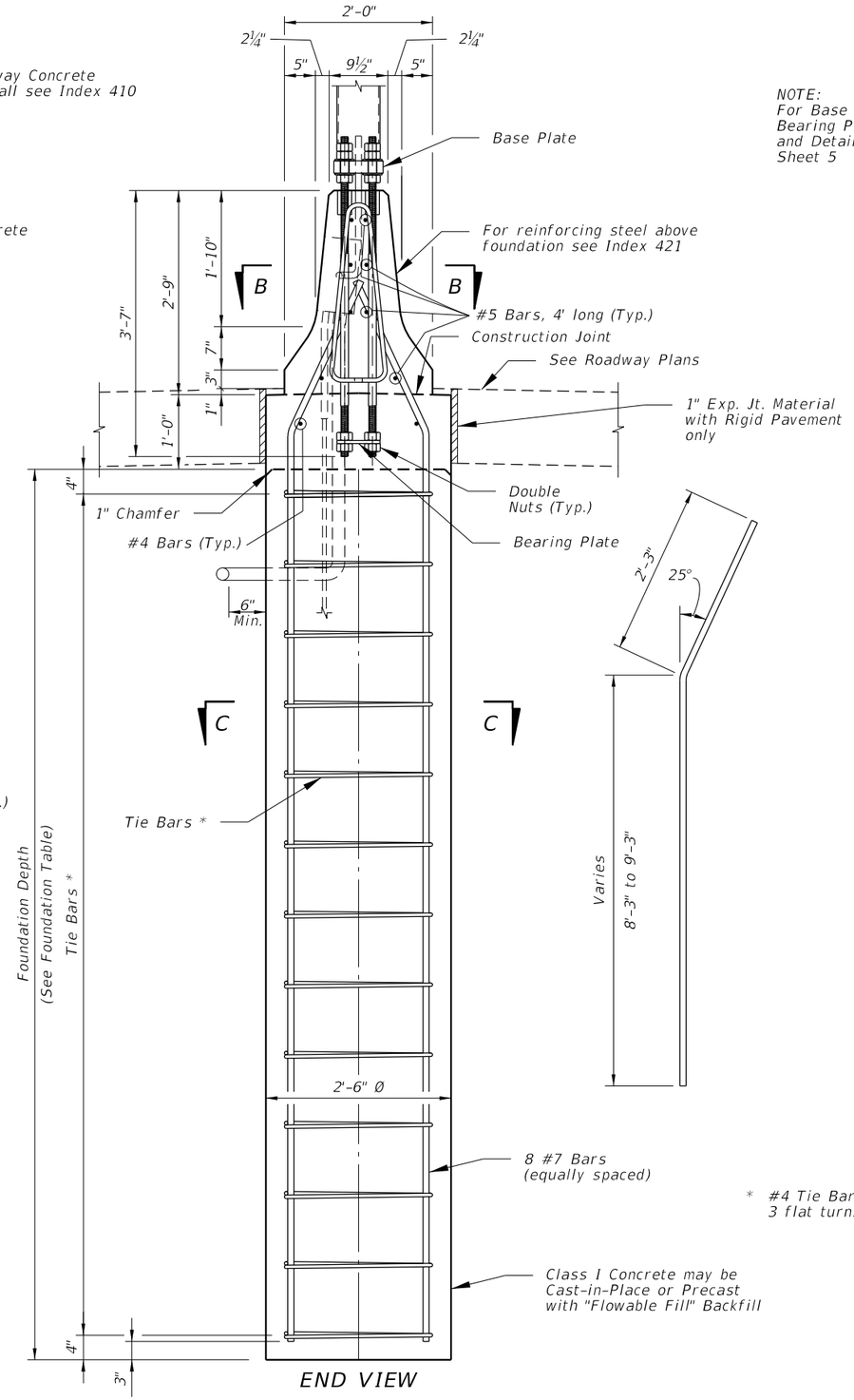
FOUNDATION TABLE		
WIND SPEED (MPH)	DESIGN MOUNTING HEIGHT (FT)	FOUNDATION DEPTH (FT)
110	40	8
130	40	9
150	40	9

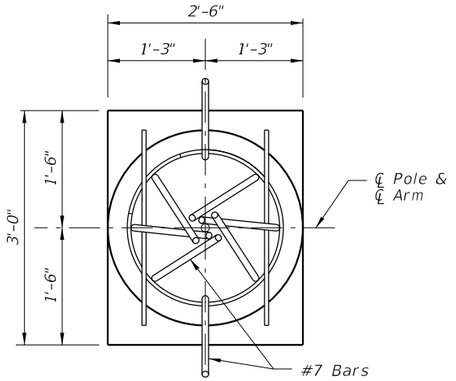
NOTE:
For Roadway Concrete Barrier Wall see Index 410

NOTE:
For Base Plate Details, Bearing Plate Detail and Detail 'A' see Sheet 5

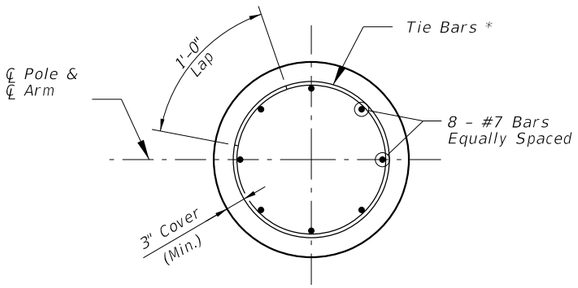


PLAN
(Reinforcing steel not shown)
Provide dowel bars @ construction joint



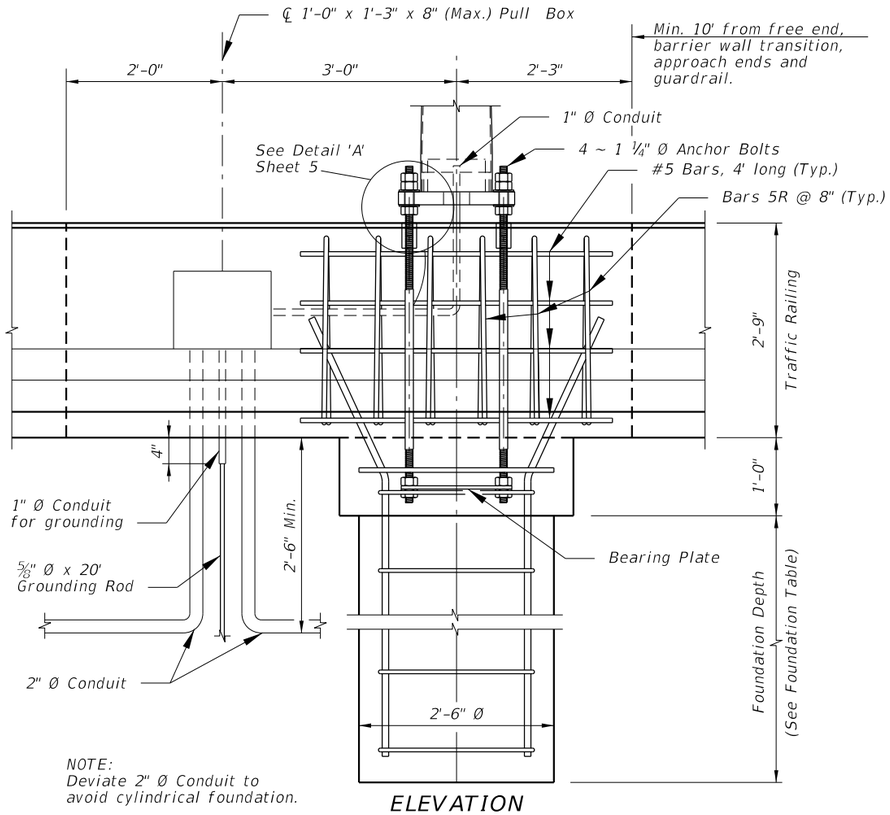


VIEW B-B



SECTION C-C

* #4 Tie Bars @ 12" centers (max.) or D10 (or W10) spiral @ 6" pitch, 3 flat turns top and 1 flat turn bottom.



NOTE:
Deviate 2" Ø Conduit to avoid cylindrical foundation.

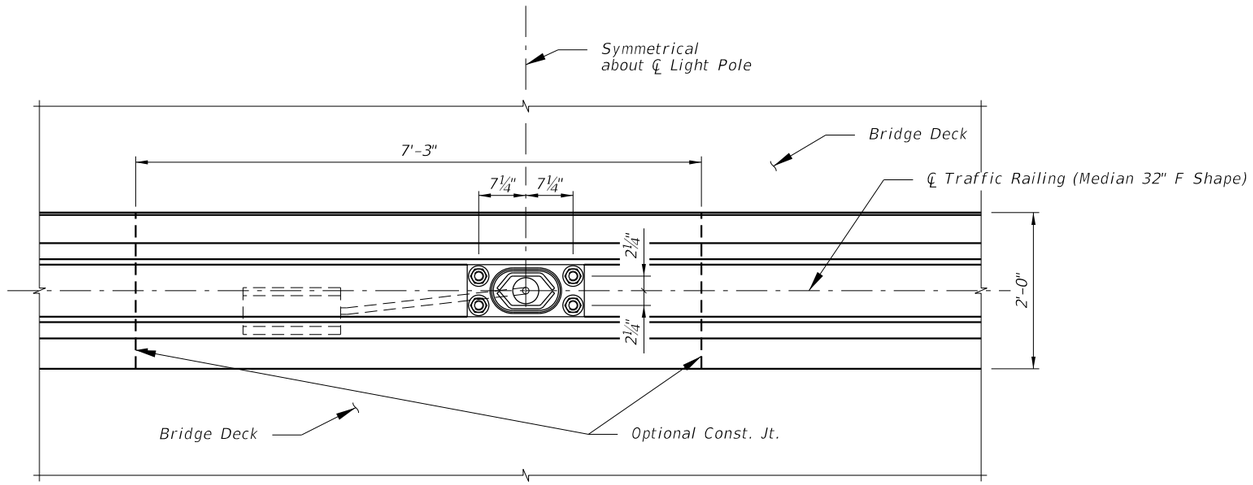
ELEVATION

(For Roadway Concrete Barrier Wall reinforcing steel see Index 410)

CYLINDRICAL FOUNDATION DETAILS FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

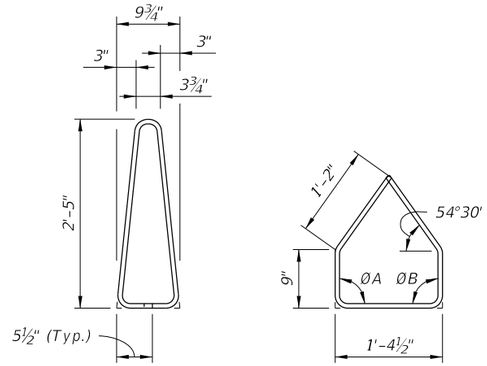
LAST REVISION	REVISION	DESCRIPTION:				
07/01/15			FDOT FY 2016-17 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	INDEX NO. 17515	SHEET NO. 7 of 8

11/30/2015 2:05:58 PM

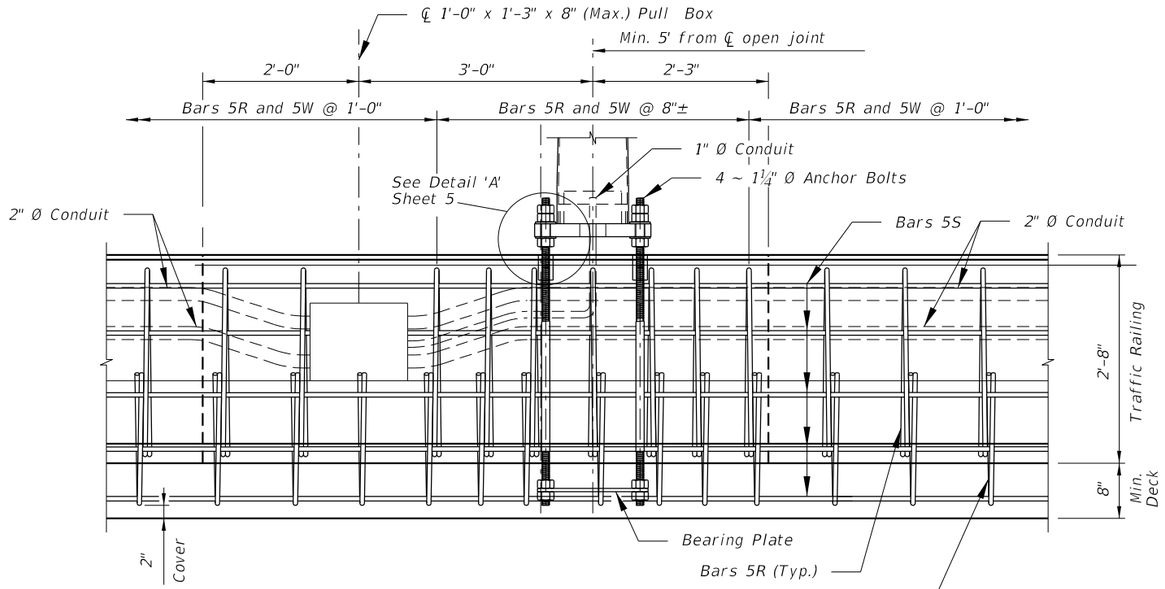


PLAN

(Reinforcing steel not shown)

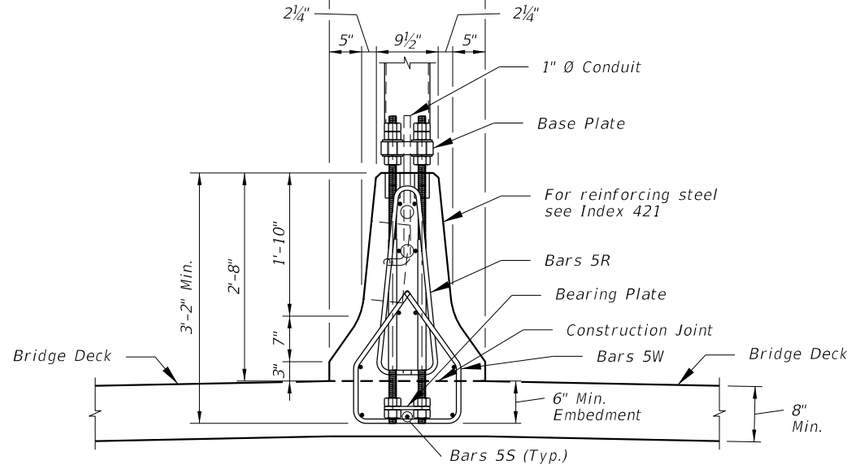


BAR BENDING DIAGRAMS



ELEVATION

(Longitudinal and transverse deck reinforcing steel not shown)



END VIEW

(Longitudinal and transverse deck reinforcing steel not shown)

NOTES:
1. For Base Plate Details, Bearing Plate Details and Detail 'A' see sheet 5.
2. See Index 421 for details of Traffic Railing (Median 32" F Shape) and angles ∠A and ∠B.

DETAILS FOR TRAFFIC RAILING (MEDIAN 32" F SHAPE) MOUNTED ALUMIMUM LIGHT POLE

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/15			FY 2016-17 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	17515	8 of 8

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