ORIGINATION FORM

Proposed Revisions to a Standard Plans Index

(Please provide all information – Incomplete forms will be returned)

Contact Information:

Date: September 5, 2017
Originator: **Richard Stepp**
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Email: richard.stepp@dot.state.fl.us

Standard Plans:

Index Number: **17515**
Sheet Number (s): 1, 2, 6, 7, 8
Index Title: Standard Aluminum Lighting

Summary of the changes:

1. Sheet 1: Update Note 7 for payment of Embedded Junction Box. Now references Spec 635.
2. Sheet 1: Add wind loads by county
3. Sheets 2, 6, 7, 8: Update all concrete sections and reinforcing steel designs for the new Single-Slope Concrete Barrier.

Commentary / Background:

Sheets 2 through 8 are part of the Index redevelopment project for Single-Slope Concrete Barrier and Traffic Railing.

Other Affected Offices / Documents: (Provide name of responsible personnel)

Yes	No		
☑	☐	Other Standard Plans –	Richard Stepp
☐	☑	FDOT Design Manual –	
☑	☐	Basis of Estimates Manual –	Ben Lewis, Melissa Hollis
☑	☐	Standard Specifications –	Ben Lewis, Rebecca Frimmel
☐	☑	Approved Product List –	
☐	☑	Construction –	
☐	☑	Maintenance –	

Origination Package Includes: (Email or hand deliver package to Derwood Sheppard)

Yes	N/A	
☑	☐	Redline Mark-ups
☐	☑	Proposed Standard Plan Instructions (SPI)
☐	☑	Revised SPI
☐	☑	Other Support Documents

Implementation:

☐ Design Bulletin (Interim) ☐ DCE Memo ☐ Program Mgmt. Bulletin ☑ FY-Standard Plans (Next Release)

Contact the Roadway Design Office for assistance in completing this form

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, Pole Connection Extrusions and Arm Extrusions: ASTM B221, Alloy 6063-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 F3125, Grade 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: ASTM F593 Alloy Group 2, Condition A, CW1 or SH1
   J. Nut Covers: ASTM B26 (319-F)
   K. Concrete: Class 1
   L. Reinforcing Steel: Specification Section 415

4. Fabrication:
   A. Weld Arm and Pole (Alloy 6063) in the T4 temper using 4043 filler. Age the Arm and Pole artificially to the T6 temper after welding.
   B. Upright Splices: Not Allowed. Transverse welds are only allowed at the base.
   C. 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.
   D. 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.
   E. Provide 'J', 'S' or 'C' hook at top of pole for electrical wires.
   F. Equip poles located on bridges, walls and concrete median barriers/Traffic Railings with a vibration damper.
   G. Perform all welding in accordance with AWS D1.2.
   H. 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.
   I. 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 ¼" 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.
   J. 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 ⅛" 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, Base Shoe, and Clamp:
      a. Certify that the Clamp, Frangible Transformer Base, and Base Shoe 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.~~ 7. Embedded Junction Boxes: Reference Spec 635

8. ← Added wind loads note

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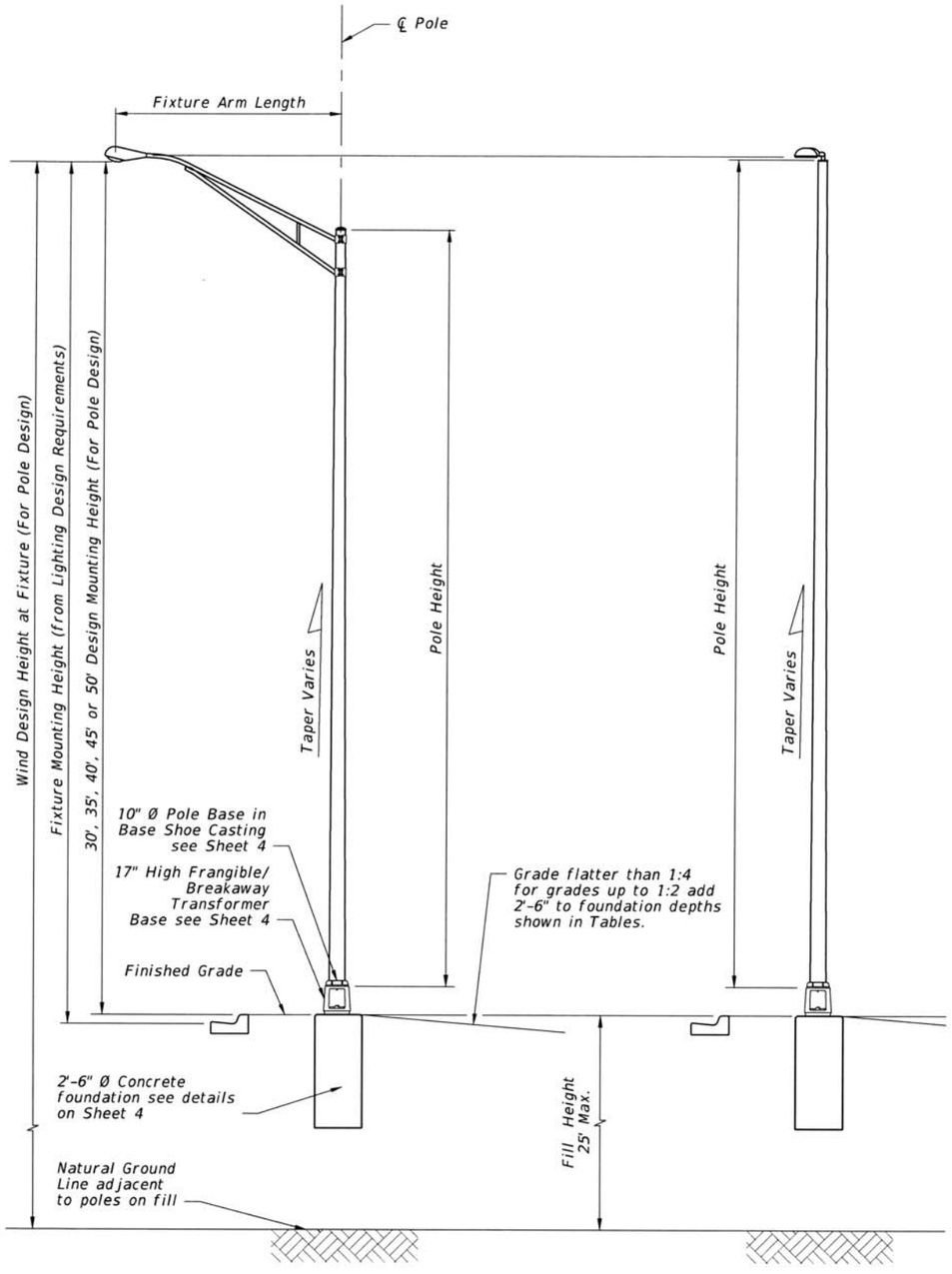
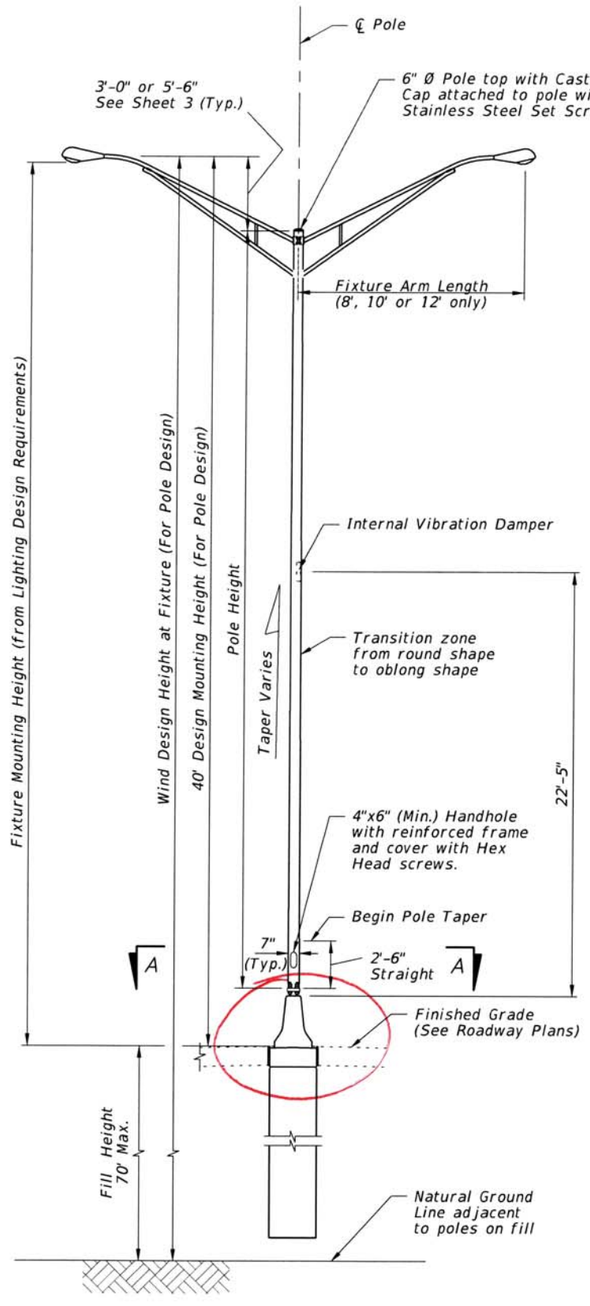
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2017-18 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	INDEX NO.	SHEET NO.
11/01/16					715-002 ~~17515~~		1 of 8

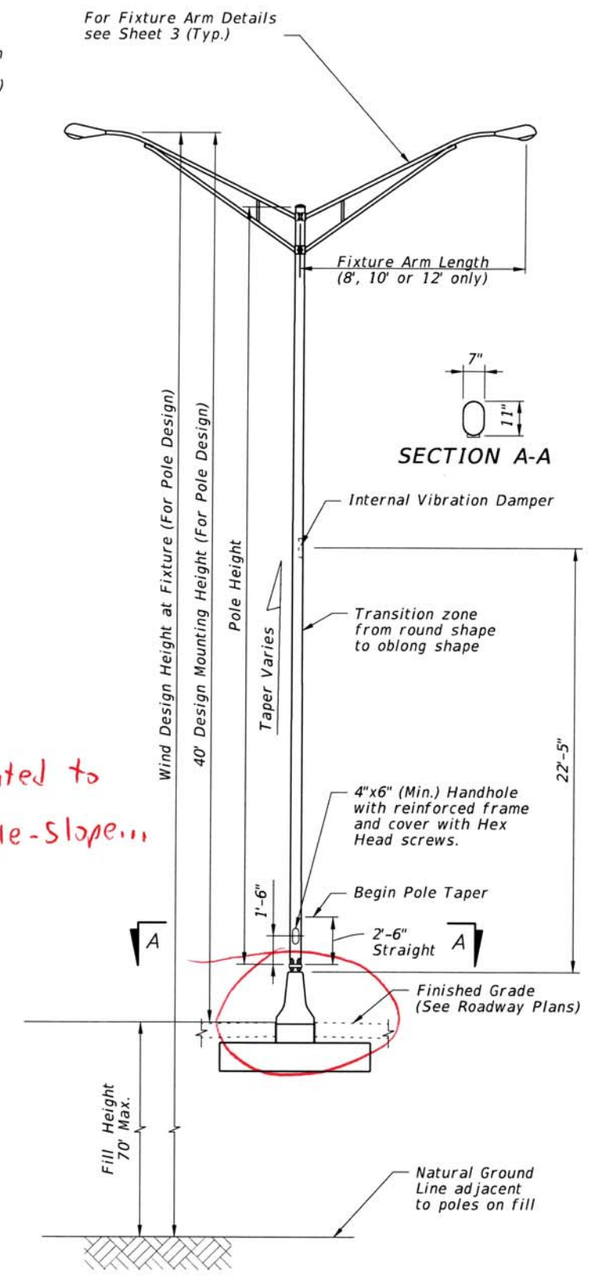


STANDARD ROADWAY ALUMINUM LIGHT POLE W/ARM

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

updated to Single-Slope...

ELEVATIONS

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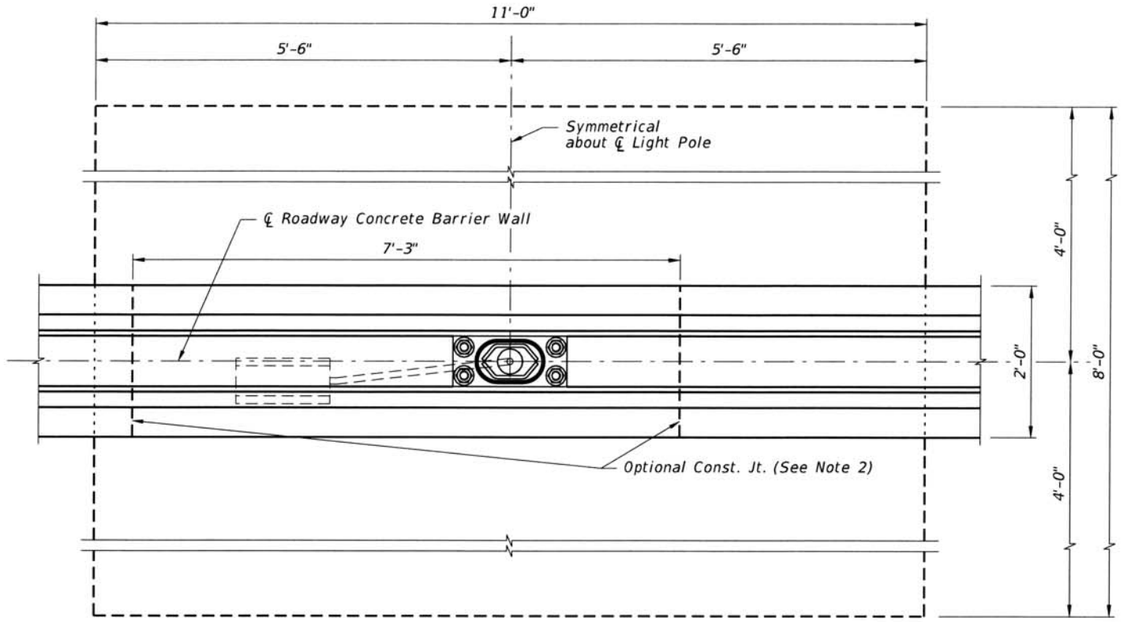
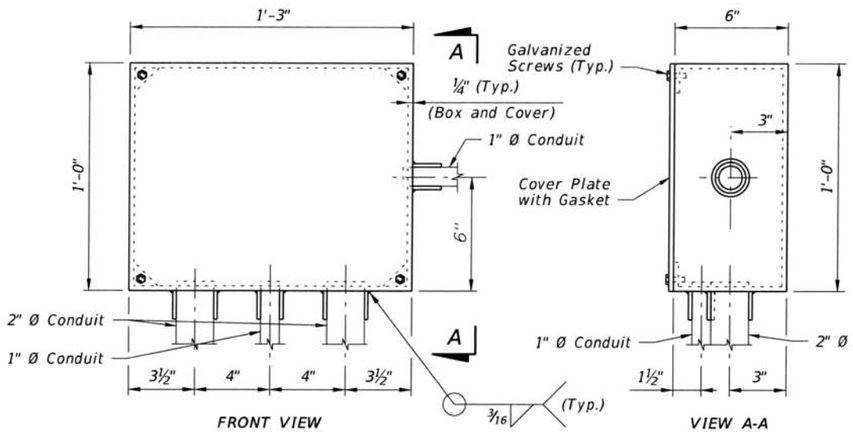
LAST REVISION	REVISION	DESCRIPTION:			
11/01/16			FDOT FY 2017-18 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING 715-002	INDEX NO. ~~17515~~	SHEET NO. 2 of 8



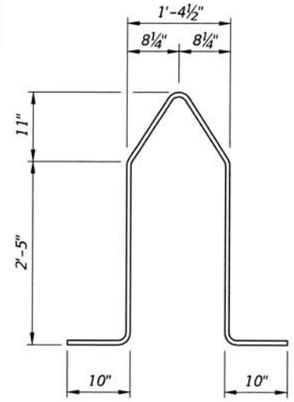
Provide dowel bars @ construction joint

PLAN
(Reinforcing steel not shown)

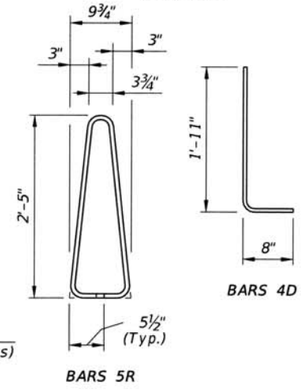


EMBEDDED JUNCTION BOX DETAILS

*Revised Plan, Elevation, End View, and Bar Bending Diagrams for Single-Slope Concrete Barriers...

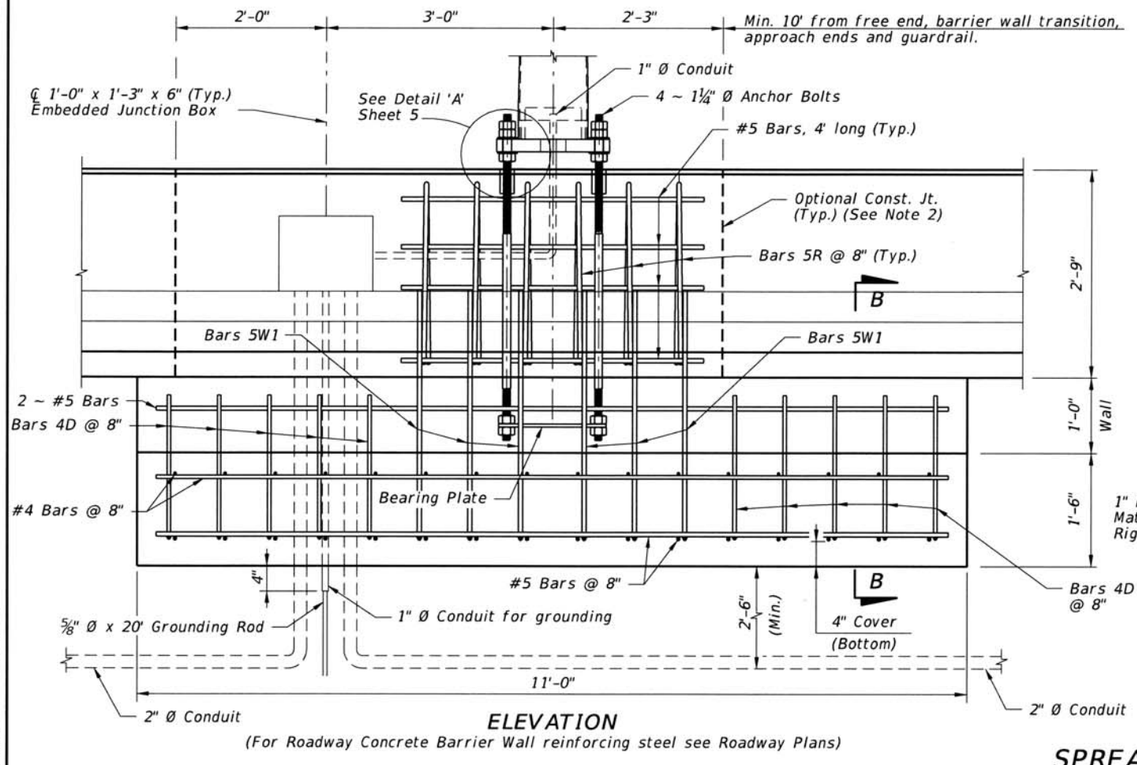


BARS 5W1

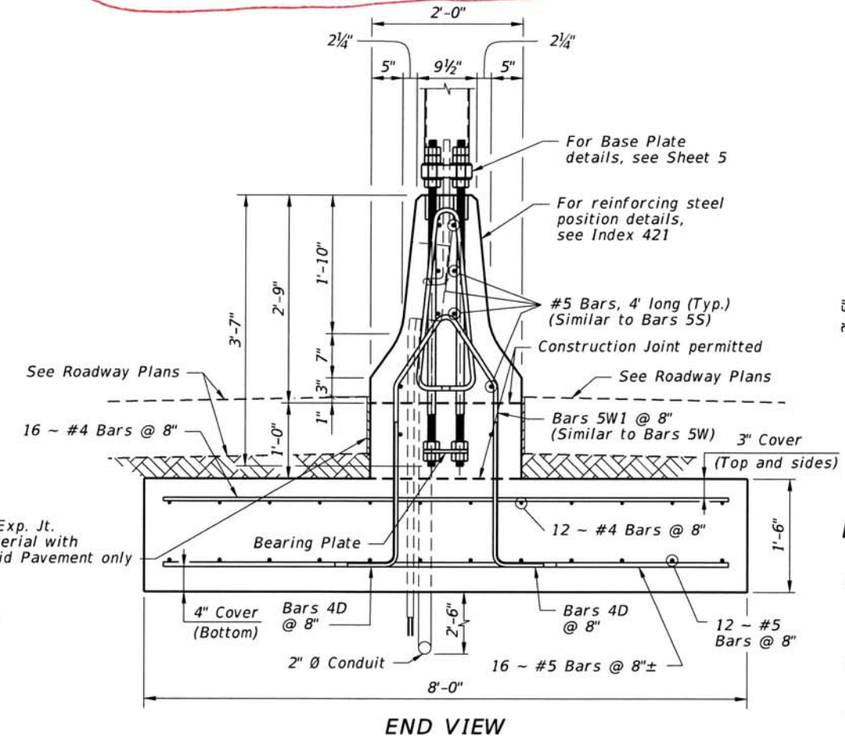


BARS 4D

BARS 5R



ELEVATION
(For Roadway Concrete Barrier Wall reinforcing steel see Roadway Plans)



END VIEW

BAR BENDING DIAGRAMS

NOTES:

1. For Bearing Plate Details, see Sheet 5.
2. Dowel Construction Joint per Index 410.
3. For adjacent Concrete Barrier Details, see Index 410

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SPREAD FOOTING DETAILS FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

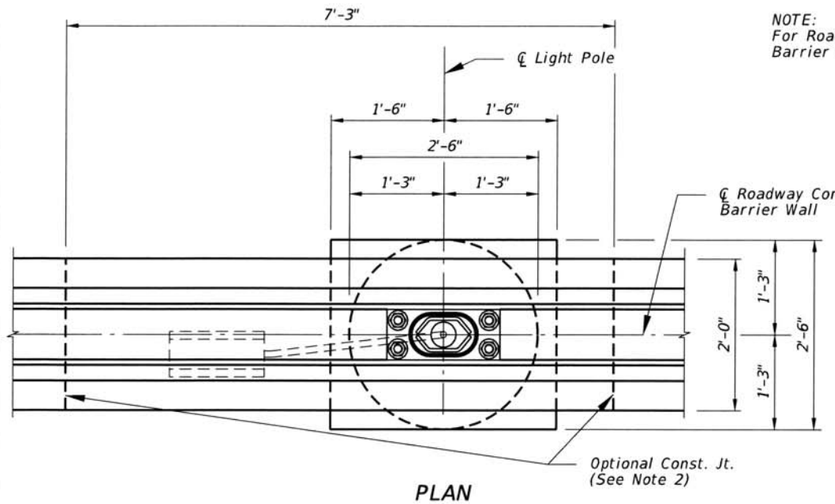
LAST REVISION 11/01/16	REVISION DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	INDEX NO. 715-002 ~~17515~~	SHEET NO. 6 of 8

NOTE:
For Roadway Concrete Barrier Wall see Index 410

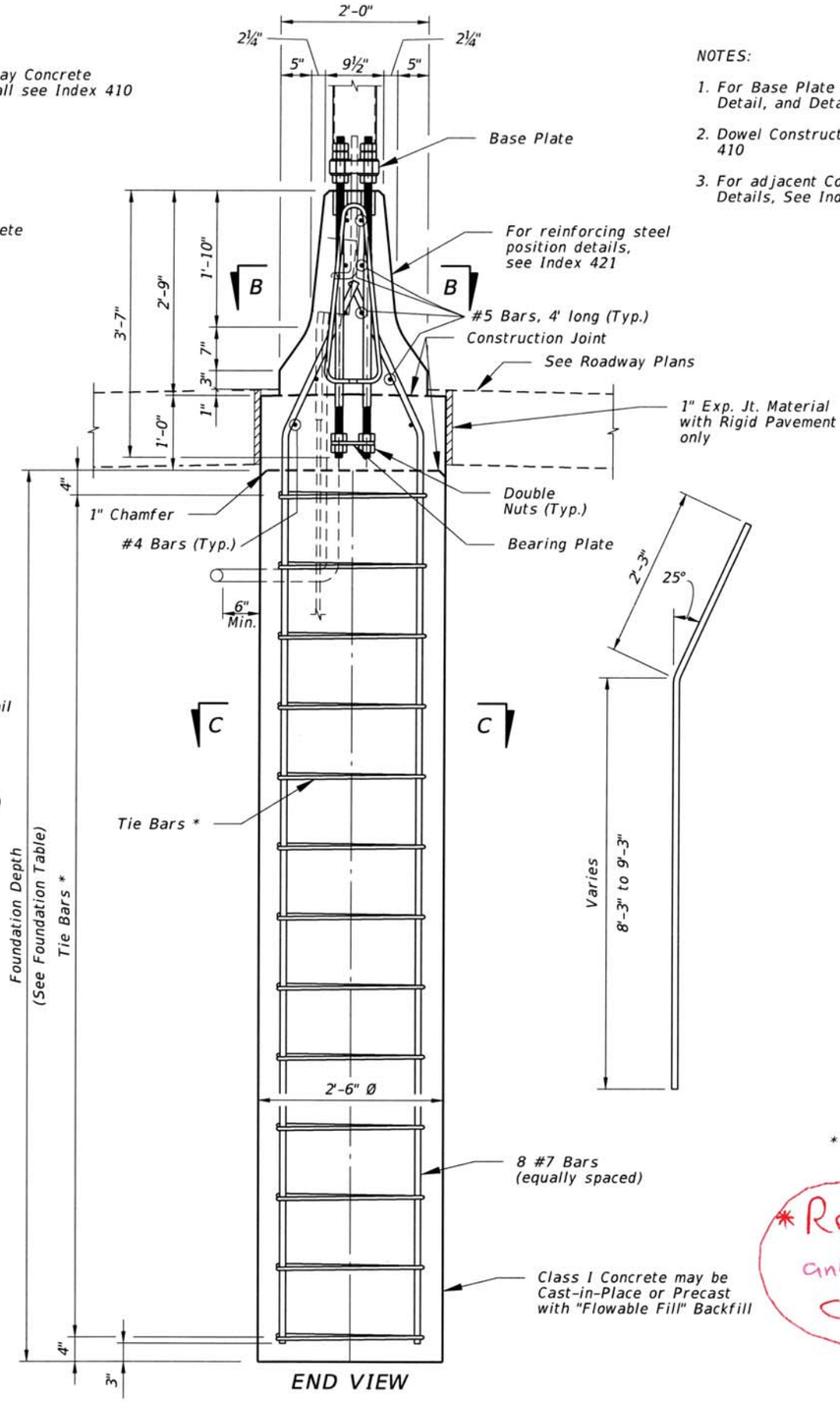
NOTES:

1. For Base Plate Details, Bearing Plate Detail, and Detail 'A', see Sheet 5.
2. Dowel Construction Joint per Index 410
3. For adjacent Concrete Barrier Details, See Index 410.

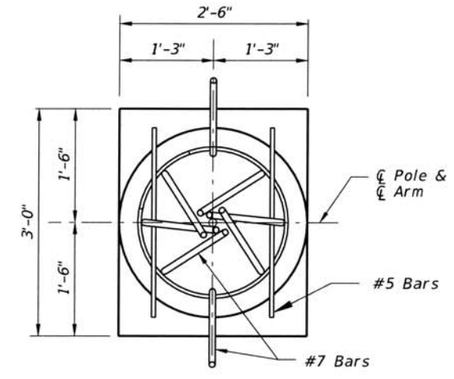
FOUNDATION TABLE		
WIND SPEED (MPH)	DESIGN MOUNTING HEIGHT (FT)	FOUNDATION DEPTH (FT)
120	40	8
140	40	9
160	40	9



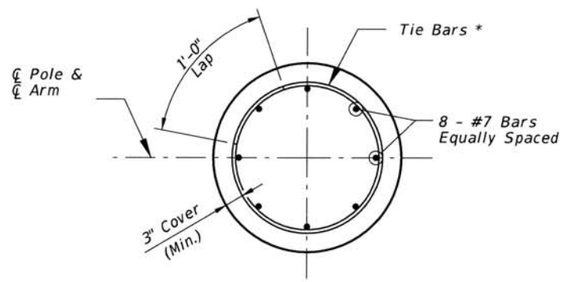
PLAN
(Reinforcing steel not shown)
Provide dowel bars @ construction joint



END VIEW

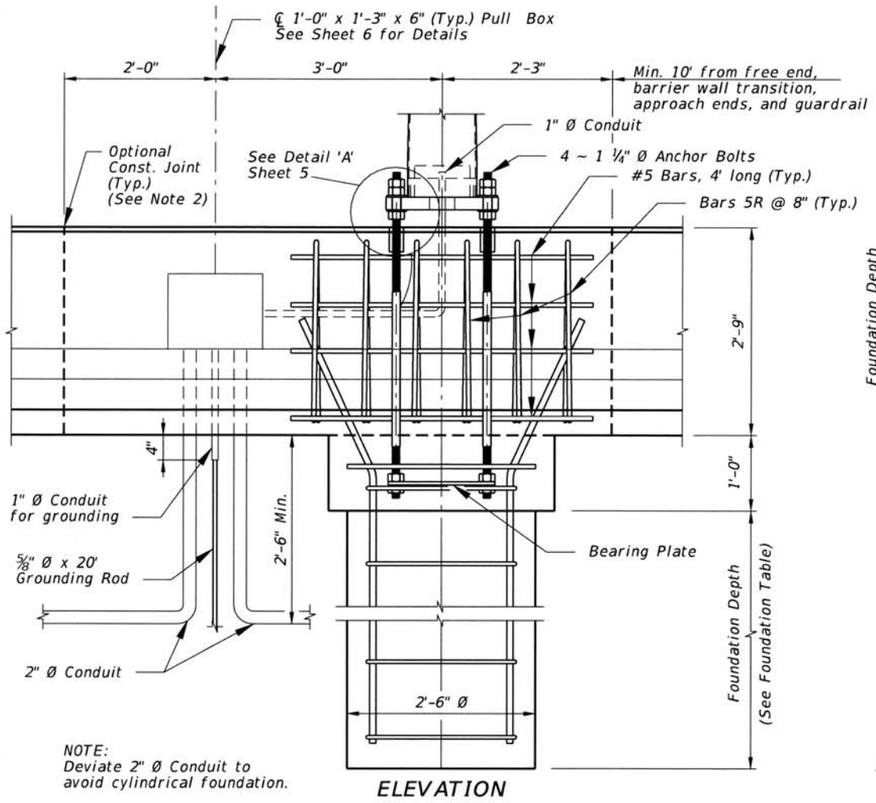


VIEW B-B



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

* Revised Plan, Elevation, End View, and Notes for Single-Slope Concrete Barriers...

CYLINDRICAL FOUNDATION DETAILS FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
11/01/16			FY 2017-18 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING	715-002 ~~17515~~	7 of 8

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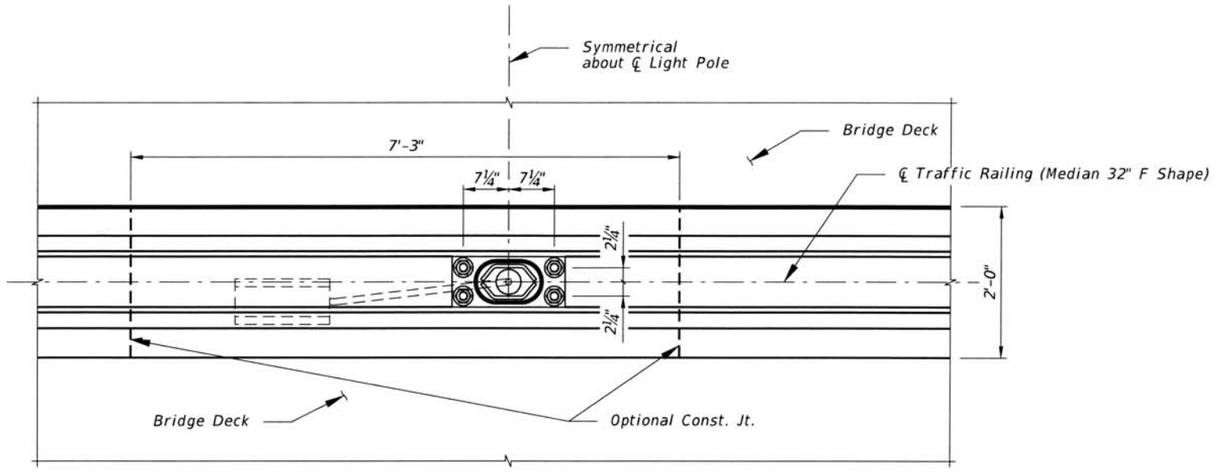
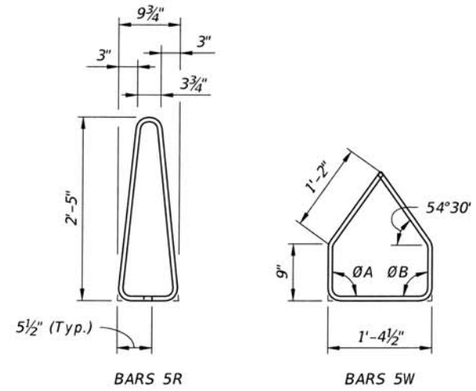
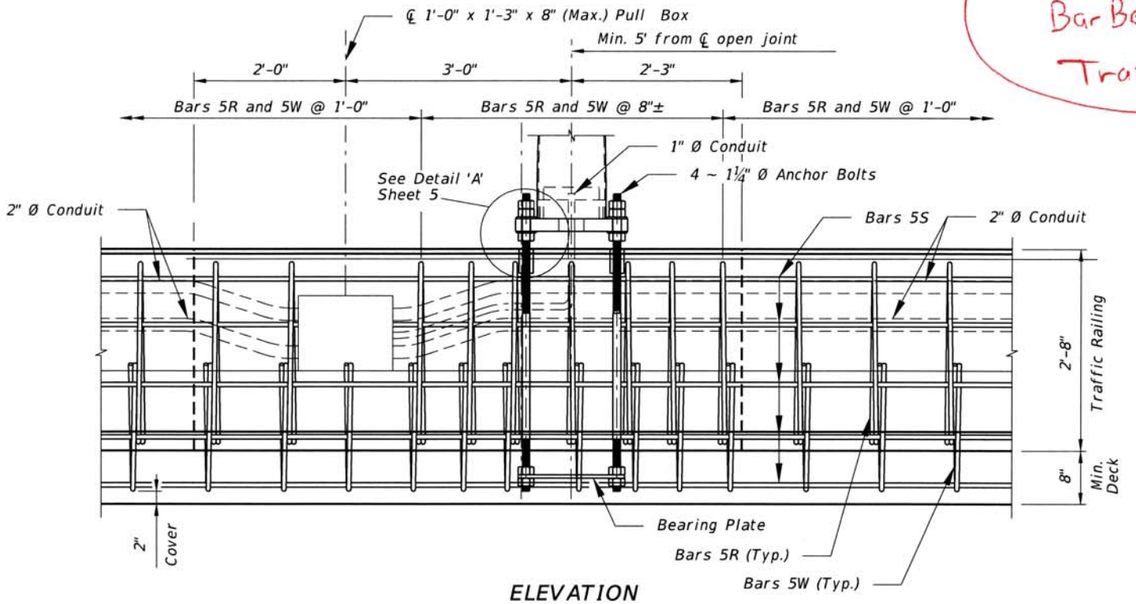


PLAN
(Reinforcing steel not shown)

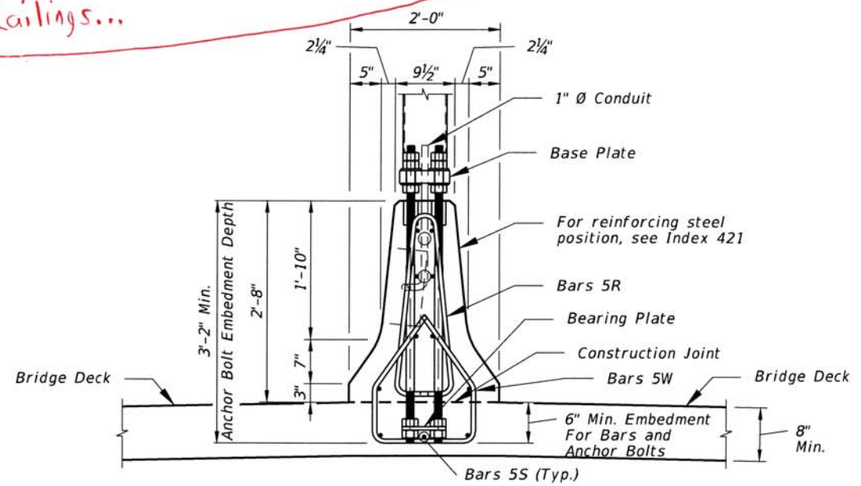


BAR BENDING DIAGRAMS
(See Note 2)

* Revised Plan, Elevation, End View, and Bar Bending Diagrams for Single-Slope Traffic Railings...



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 adjacent Traffic Railing (Median 32" F-Shape) and for angles ØA and ØB.

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

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
11/01/16			FDOT FY 2017-18 DESIGN STANDARDS	STANDARD ALUMINUM LIGHTING 715-002 ~~17515~~		8 of 8

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, Pole Connection Extrusions and Arm Extrusions: ASTM B221, Alloy 6063-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 F3125, Grade 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: ASTM F593 Alloy Group 2, Condition A, CW1 or SH1
   J. Nut Covers: ASTM B26 (319-F)
   K. Concrete: Class 1
   L. Reinforcing Steel: Specification Section 415

4. Fabrication:
   A. Weld Arm and Pole (Alloy 6063) in the T4 temper using 4043 filler. Age the Arm and Pole artificially to the T6 temper after welding.
   B. Upright Splices: Not Allowed. Transverse welds are only allowed at the base.
   C. 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.
   D. 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.
   E. Provide 'J', 'S' or 'C' hook at top of pole for electrical wires.
   F. Equip poles located on bridges, walls and concrete median barriers/Traffic Railings with a vibration damper.
   G. Perform all welding in accordance with AWS D1.2.
   H. Embedded Junction Box (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.
   I. 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 $\frac{1}{4}$" 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 $\frac{5}{16}$" 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.
   J. 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 $\frac{1}{8}$" 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, Base Shoe, and Clamp:
      a. Certify that the Clamp, Frangible Transformer Base, and Base Shoe 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. Embedded Junction Box (EJB): Install EJBs per Note 4 and in accordance with Specification Section 635, as shown on the following Sheets.

8. Wind Speed by County:

   120 MPH
   Alachua, Baker, Bradford, Calhoun, Clay, Columbia, Dixie, Duval, Gadsden, Gilchrist, Hamilton, Jackson, Jefferson, Lafayette, Leon, Liberty, Nassau, Madison, Putnam, Suwannee, Taylor, Union and Wakulla Counties.

   140 MPH
   Bay, Citrus, De Soto, Flagler, Franklin, Glades, Gulf, Hardee, Hendry, Hernando, Highlands, Hillsborough, Holmes, Lake, Levy, Manatee, Marion, Okaloosa, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Santa Rosa, Seminole, St. Johns, Sumter, Volusia, Walton and Washington Counties.

   160 MPH
   Brevard, Broward, Charlotte, Collier, Escambia, Indian River, Lee, Martin, Miami-Dade, Monroe, Palm Beach, Sarasota and St. Lucie Counties.

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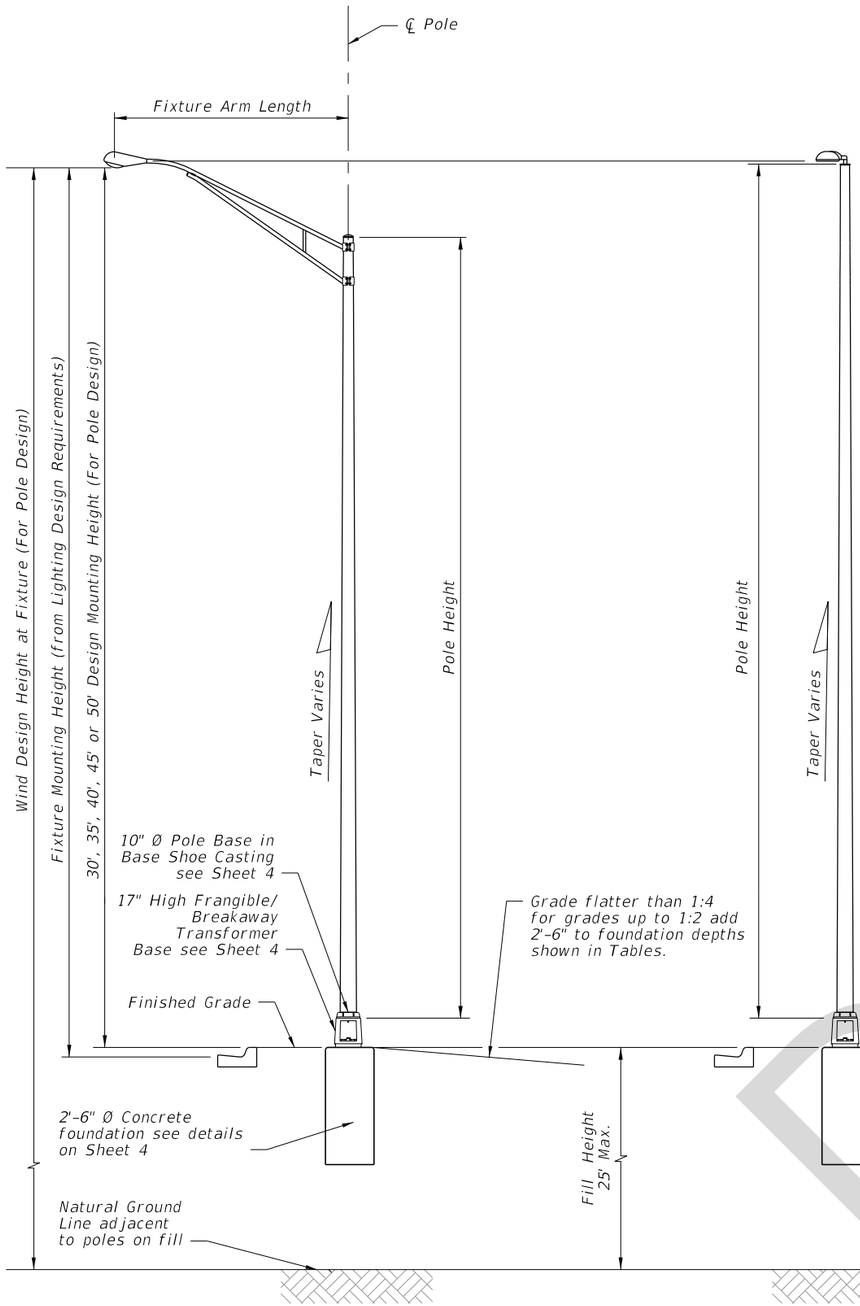
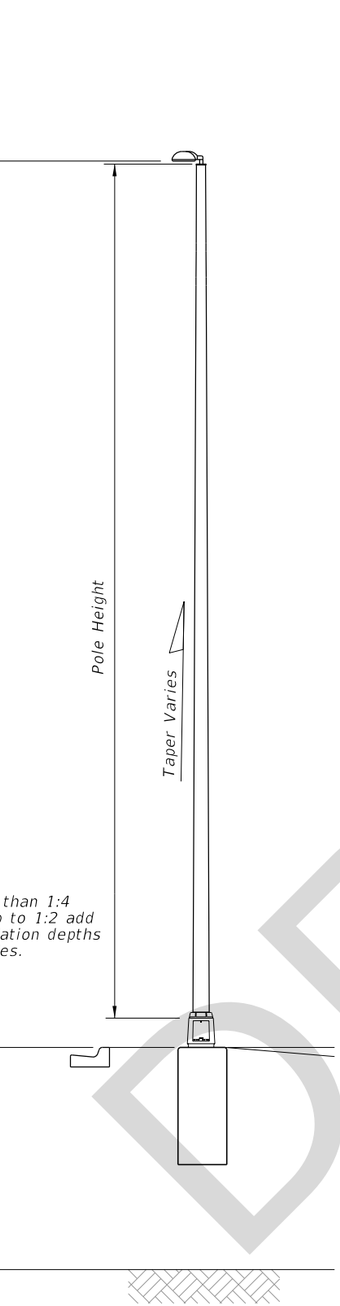
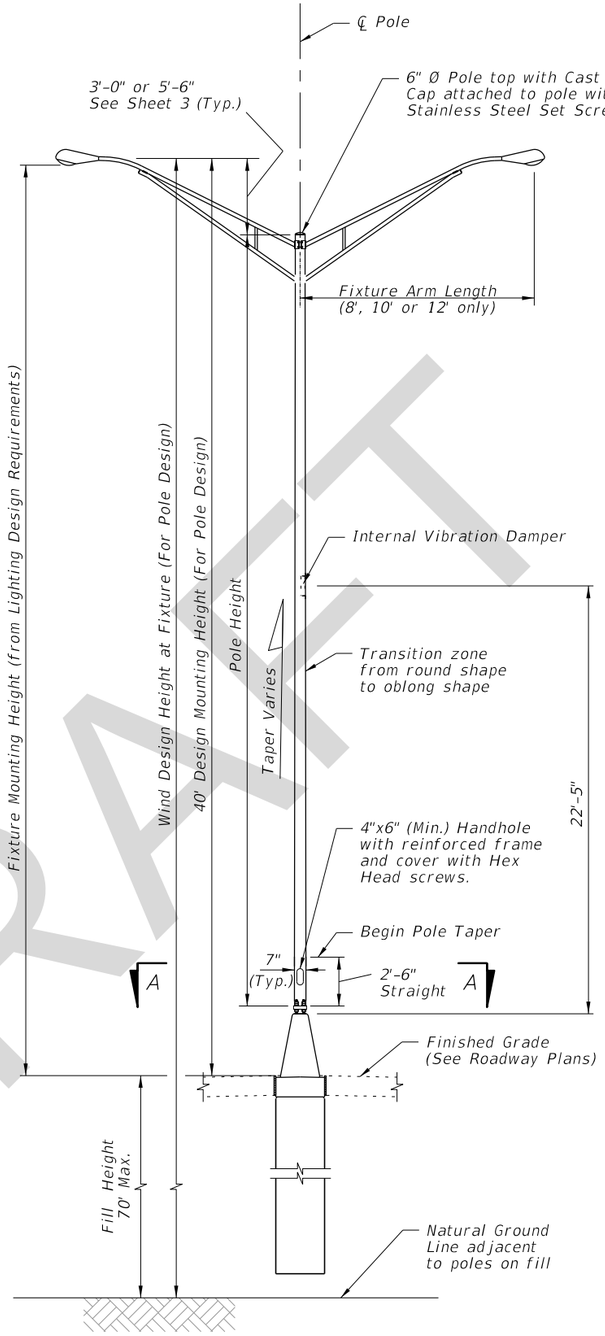


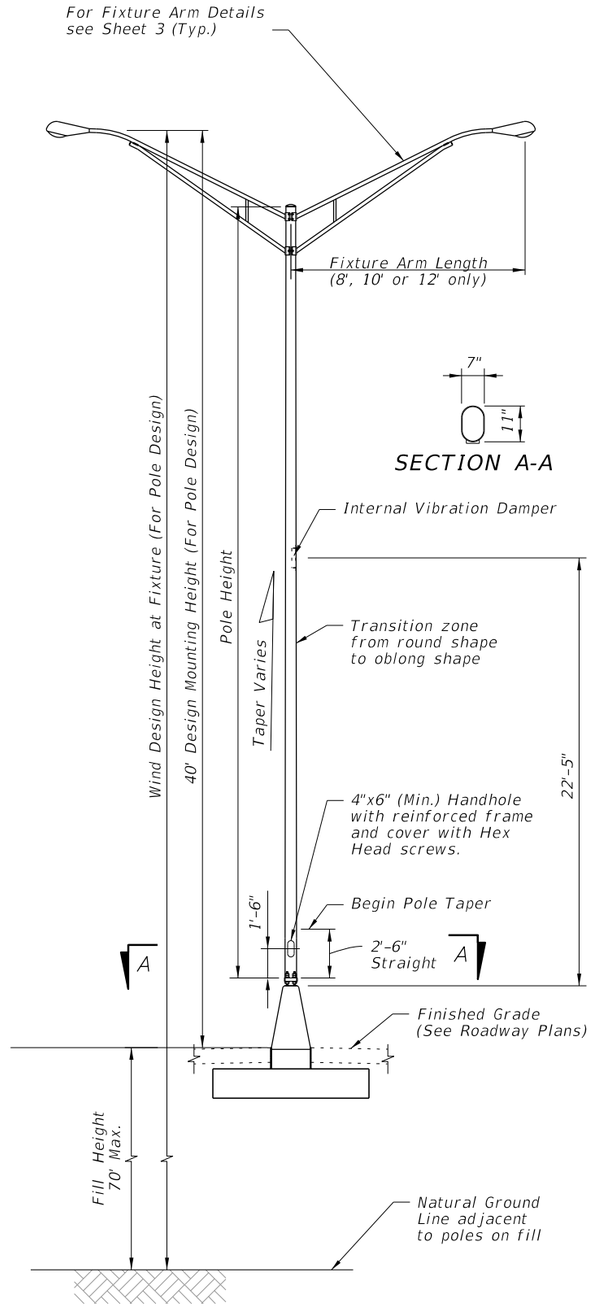
STANDARD ROADWAY ALUMINUM LIGHT POLE W/ARM



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

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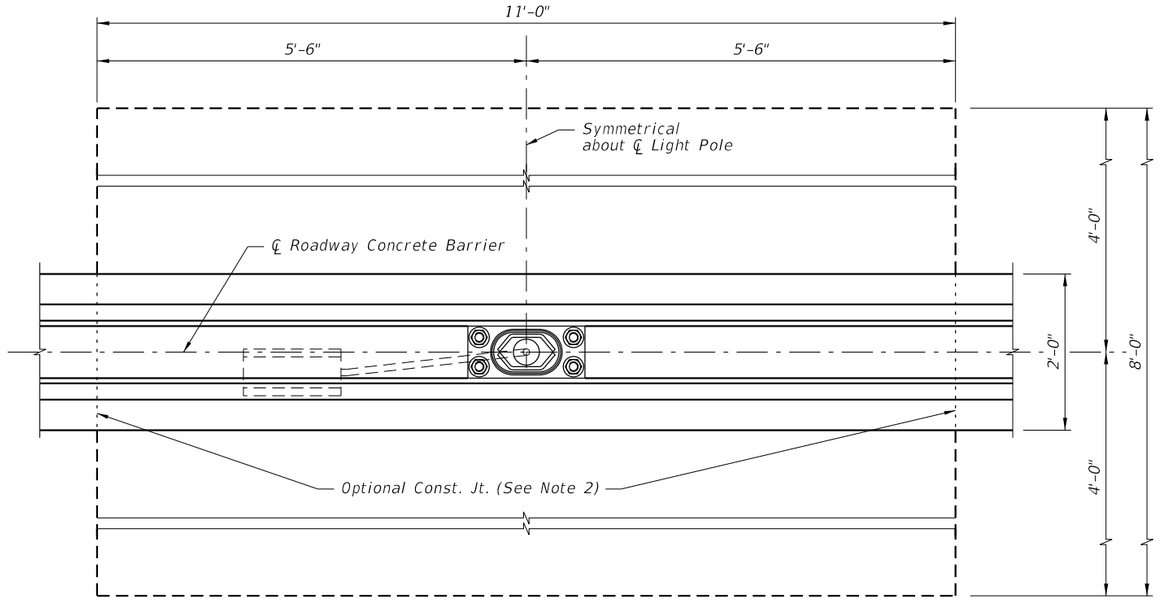
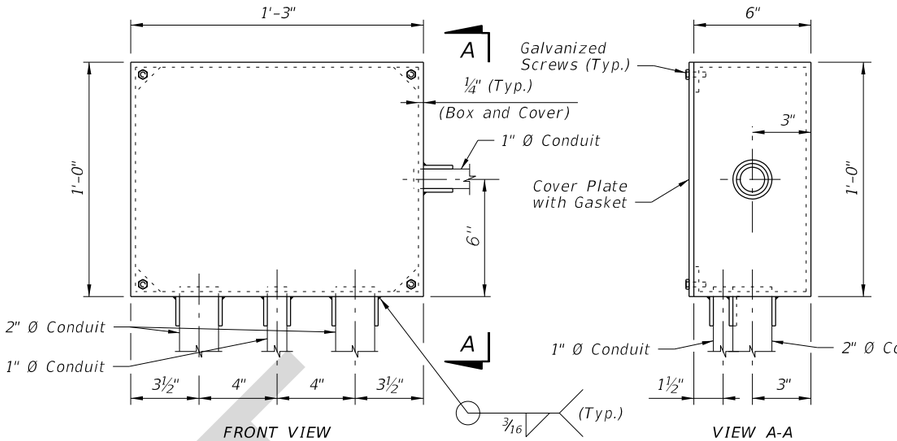
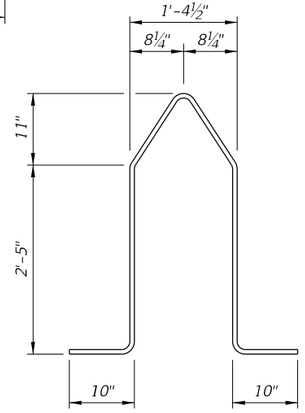
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2018-19 STANDARD PLANS	STANDARD ALUMINUM LIGHTING	INDEX	SHEET
11/01/17					715-002	2 of 8



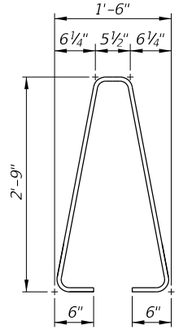
PLAN
(Reinforcing steel not shown)



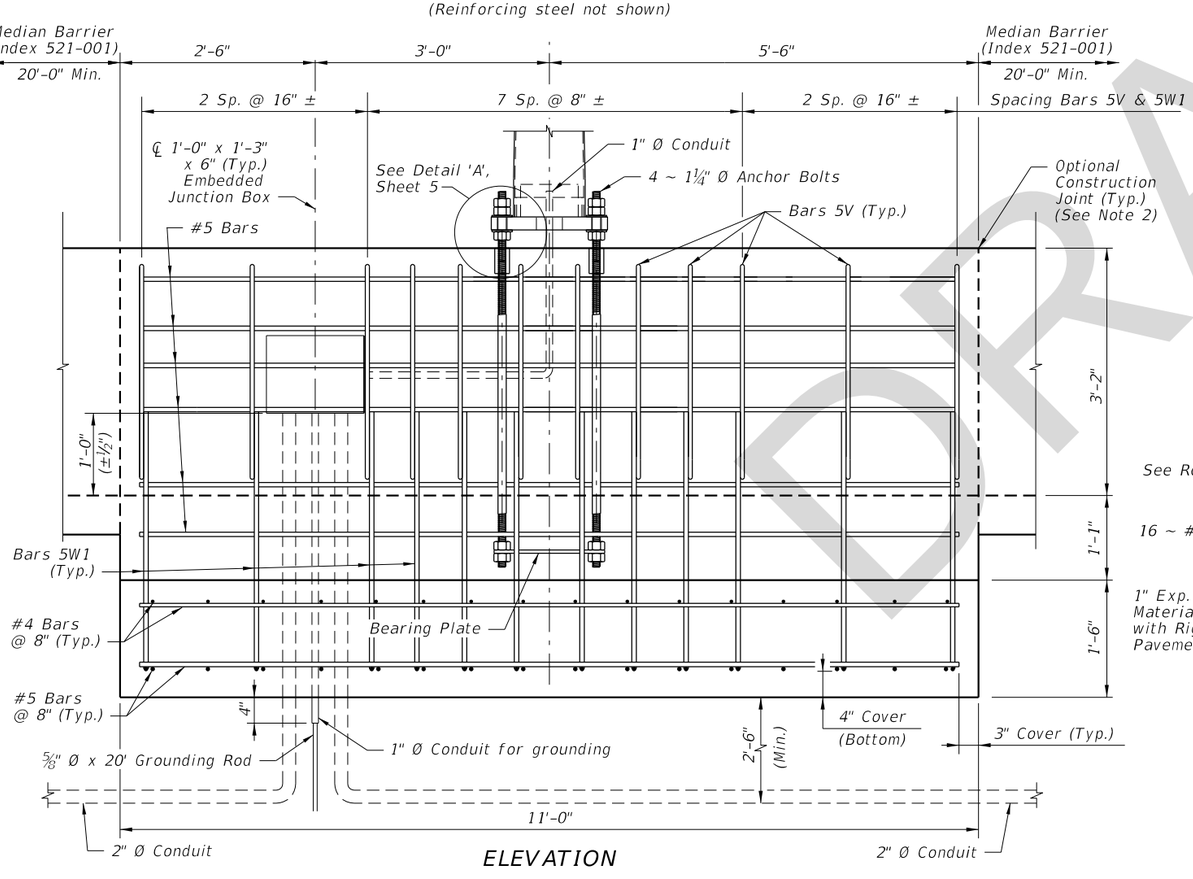
EMBEDDED JUNCTION BOX DETAILS



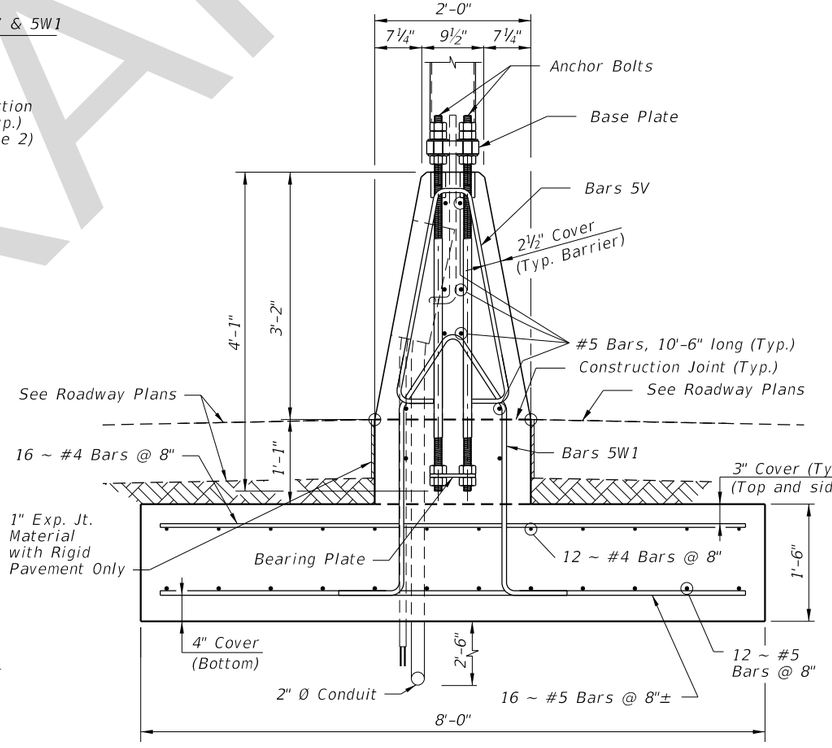
BAR 5W1



BAR 5V



ELEVATION

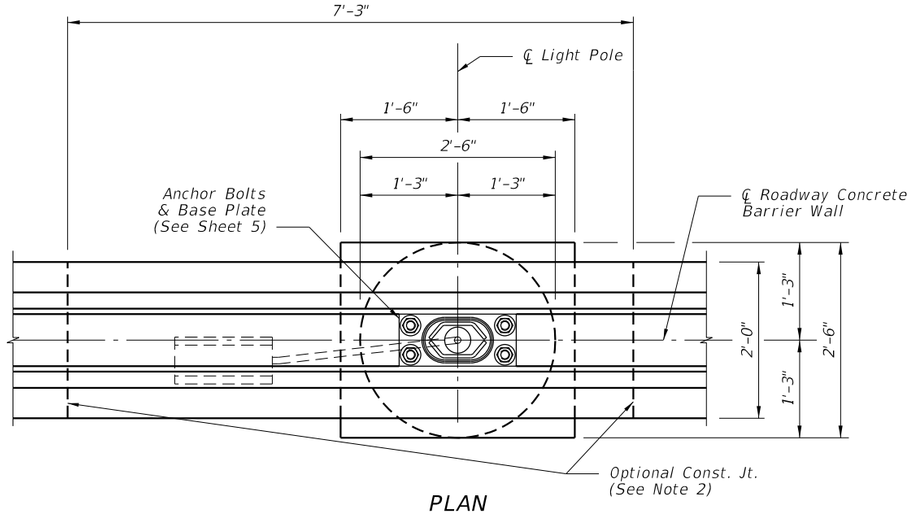


END VIEW

NOTES:

1. For Bearing Plate and Base Plate Details, see Sheet 5.
2. For connections to adjacent Median Barrier, use the Doweled Joint detail per Index 521-001. Alternatively, a continuos concrete pour or a construction joint may be substituted; these alternatives require the Median Barrier's longitudinal steel to lap a minimum of 2'-0" with the longitudinal steel shown herein.

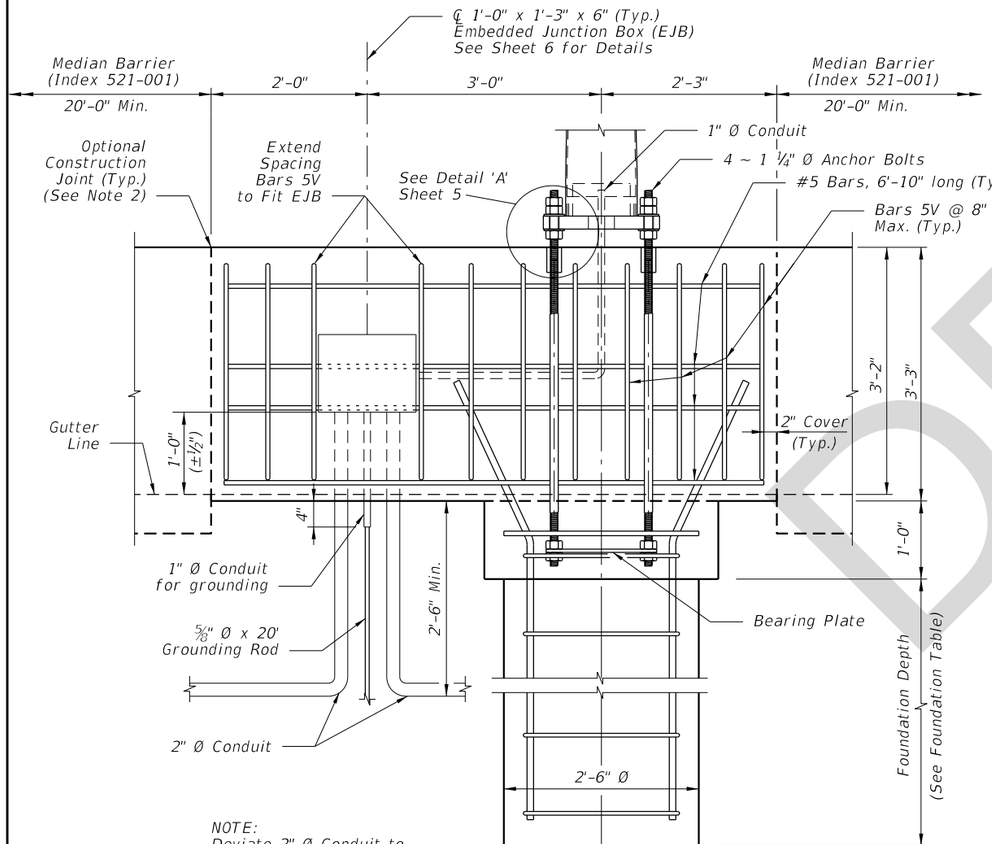
SPREAD FOOTING DETAILS FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE



PLAN

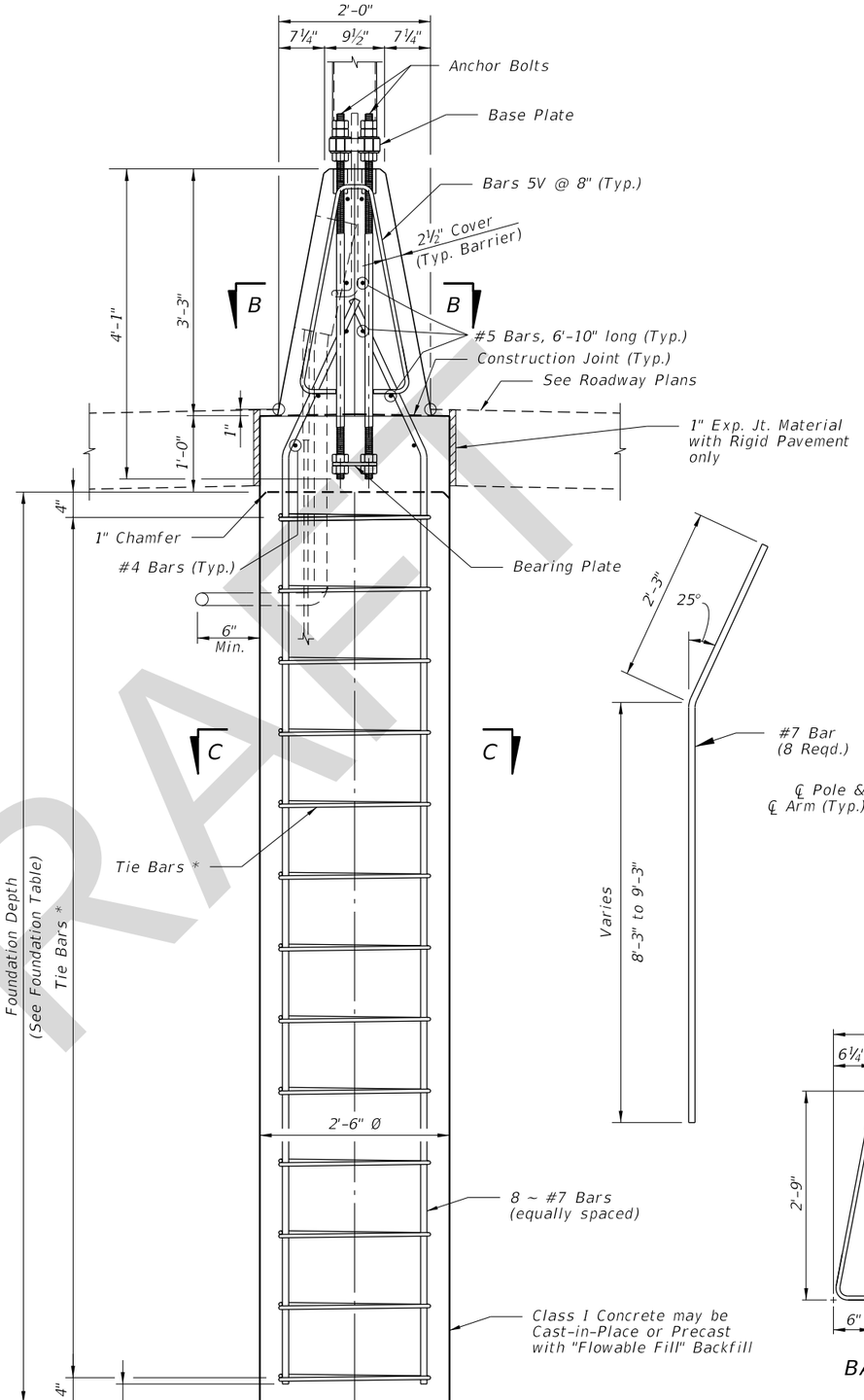
(Reinforcing steel not shown)

Provide dowel bars @ construction joint



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

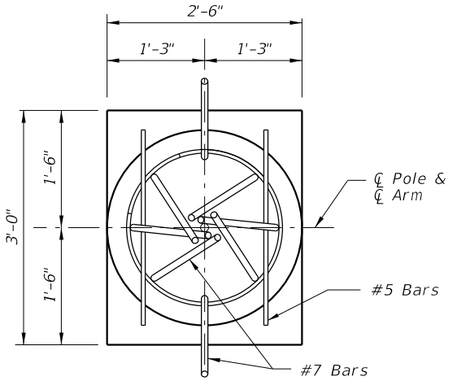
ELEVATION



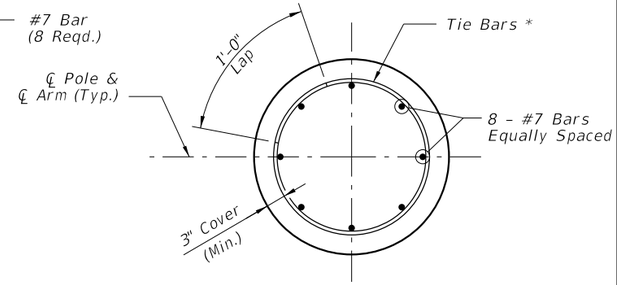
* #4 Tie Bars @ 12" centers (max.) or D10 (or W10) spiral @ 6" pitch, 3 flat turns top and 1 flat turn bottom.

END VIEW

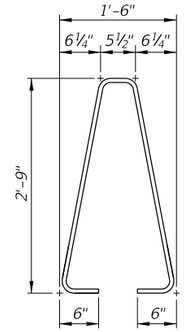
FOUNDATION TABLE		
WIND SPEED (MPH)	DESIGN MOUNTING HEIGHT (FT)	FOUNDATION DEPTH (FT)
120	40	8
140	40	9
160	40	9



VIEW B-B
(Anchor Bolts and Barrier Longitudinal Steel & Stirrups Not Shown)



SECTION C-C



BAR 5V

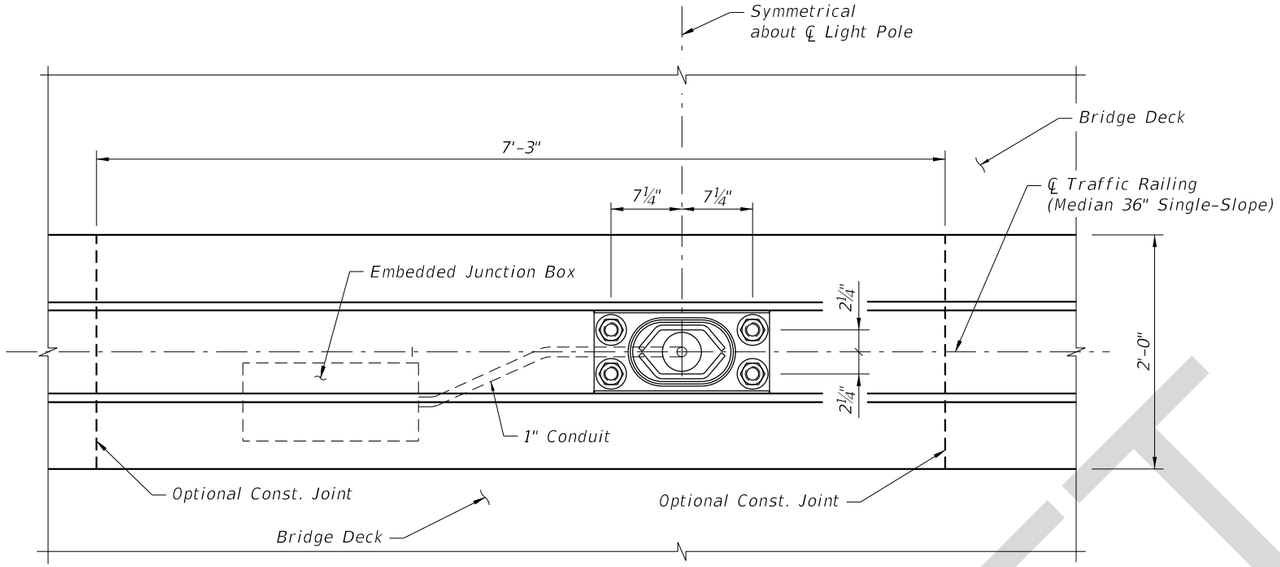
NOTES:

1. For Bearing Plate and Base Plate Details, see Sheet 5.
2. For connections to adjacent Median Barrier, use the Doweled Joint detail per Index 521-001. Alternatively, a continuos concrete pour or a construction joint may be substituted; these alternatives require the Median Barrier's longitudinal steel to lap a minimum of 2'-0" with the longitudinal steel shown herein.

CYLINDRICAL FOUNDATION DETAILS FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

9/6/2017 10:16:15 AM

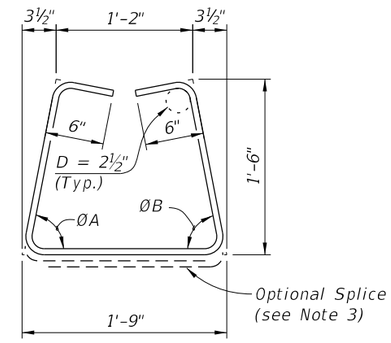
LAST REVISION	REVISION	DESCRIPTION:				
11/01/17			FDOT FY 2018-19 STANDARD PLANS	STANDARD ALUMINUM LIGHTING	INDEX 715-002	SHEET 7 of 8



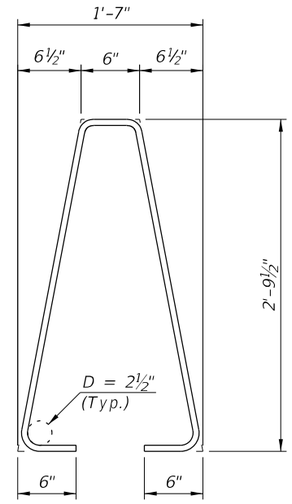
PLAN

(Reinforcing steel and 2" Ø Conduit not shown)

*At the Contractor's option, Bars 5W may be fabricated as a two piece bar with a 1'-2" lap splice at the bottom legs.

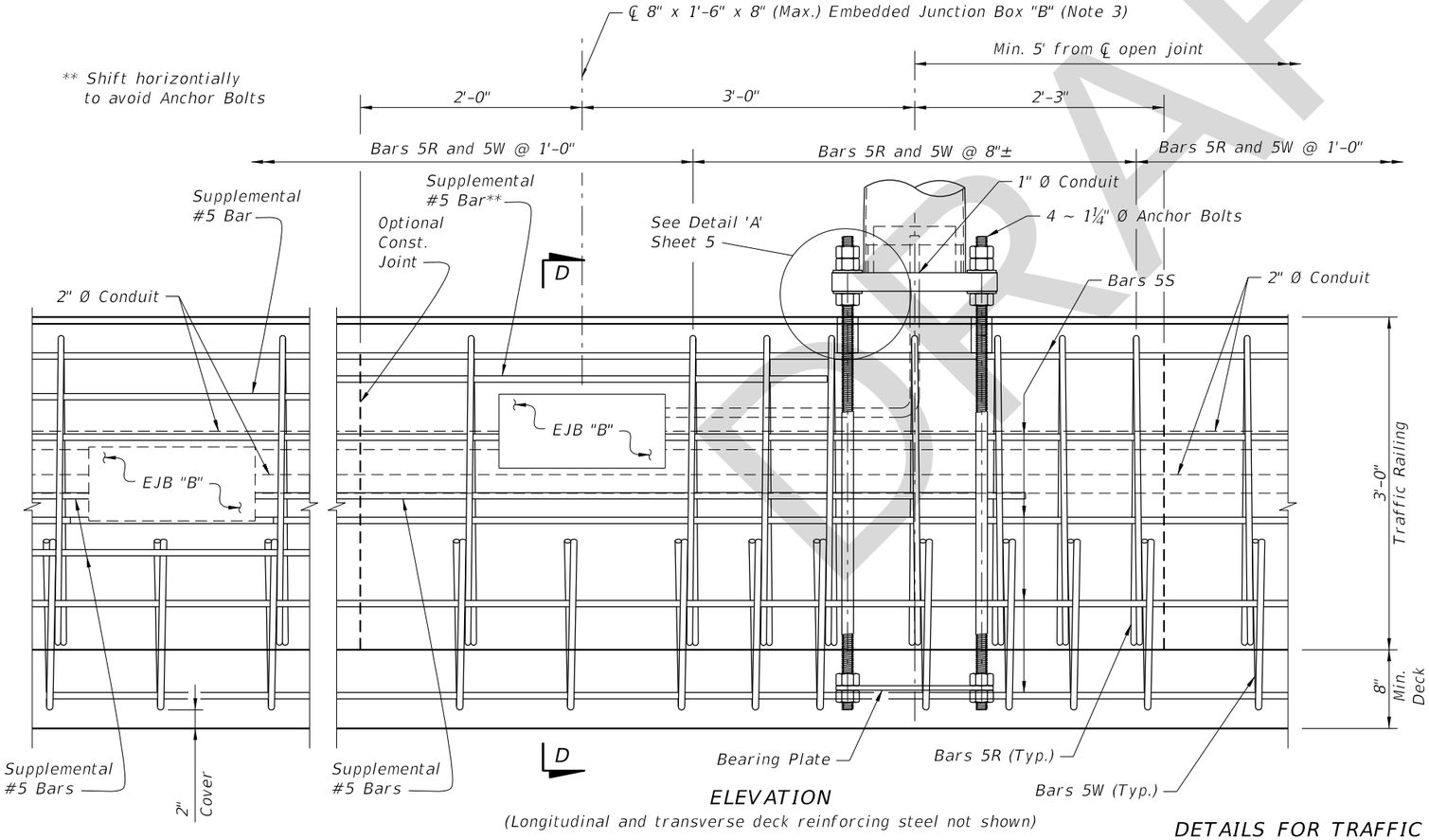


BAR 5W*



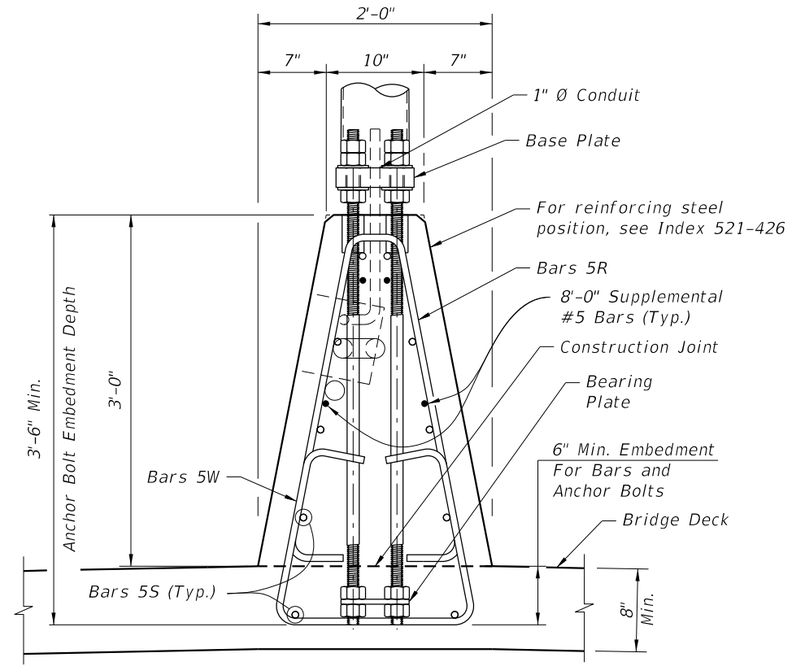
BAR 5R

** Shift horizontally to avoid Anchor Bolts



ELEVATION

(Longitudinal and transverse deck reinforcing steel not shown)



SECTION D-D

(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 521-426 for details of adjacent Traffic Railing (Median 36" Single-Slope) and for angles ∅A and ∅B.
3. See Index 630-010 for Conduit, EJB and supplemental reinforcing details.

DETAILS FOR TRAFFIC RAILING (MEDIAN 36" SINGLE-SLOPE) MOUNTED ALUMINUM LIGHT POLE

9/6/2017 10:16:16 AM

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2018-19 STANDARD PLANS	STANDARD ALUMINUM LIGHTING	INDEX	SHEET
11/01/17					715-002	8 of 8