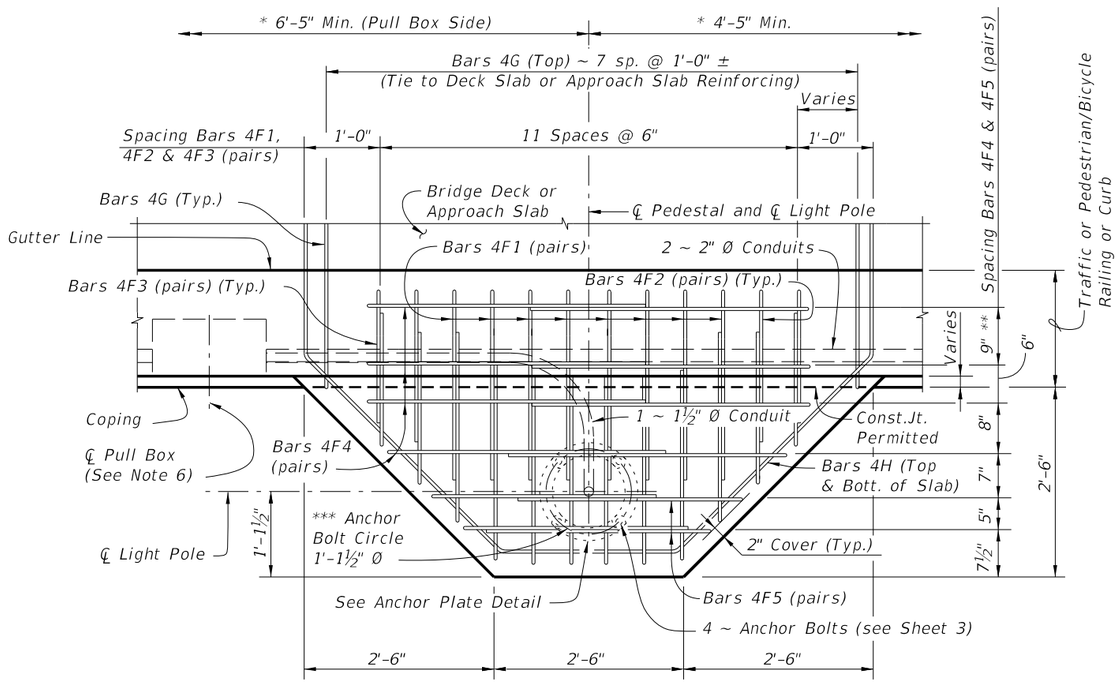
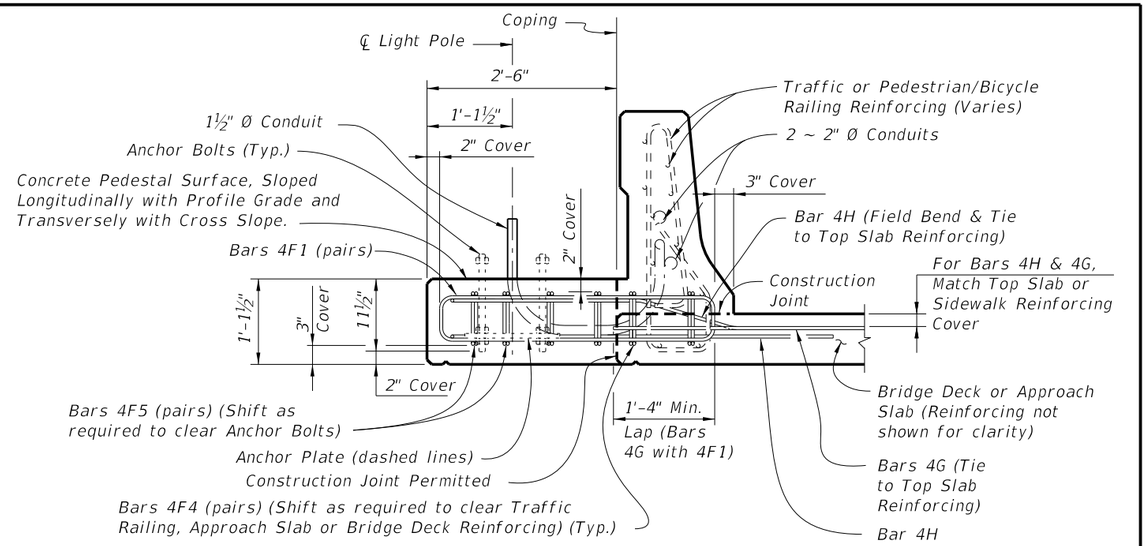
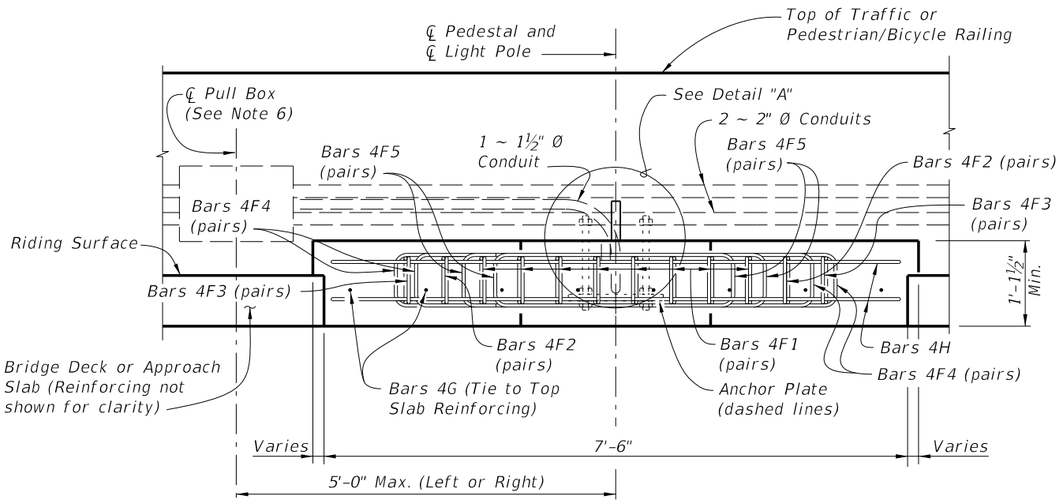


* Slip Forming Method of Construction requires the Engineer's approval within the limits shown.
** For Index No. 820 – Pedestrian/Bicycle Railing and concrete curb, this dimension is 3½". For raised sidewalks, this dimension is 1'-0" Max.
*** Anchor Bolt pattern orientation shall be as shown.

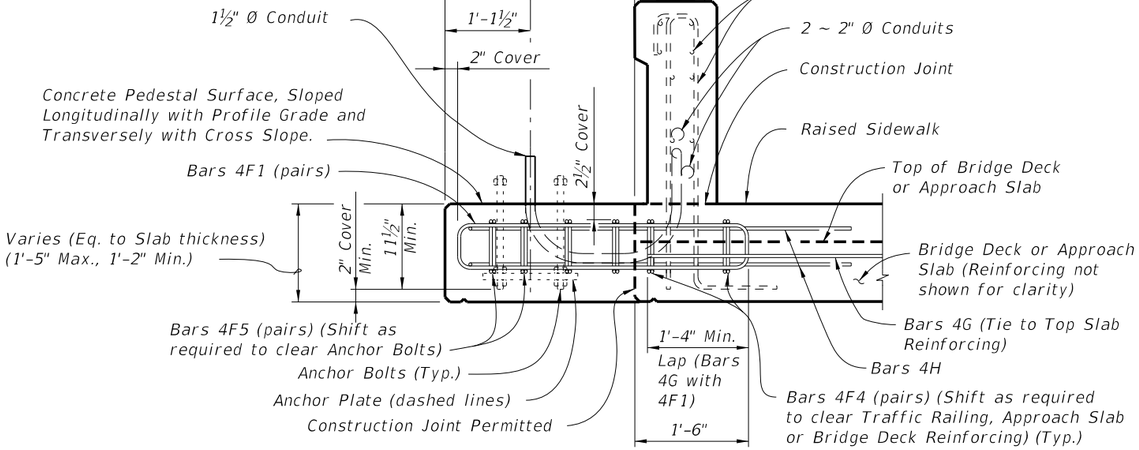


TYPICAL SECTION AT LIGHT POLE PEDESTAL FOR APPROACH SLAB OR BRIDGE DECK THICKNESS LESS THAN 1'-1½" AT COPING

PLAN VIEW



ELEVATION VIEW



TYPICAL SECTION AT LIGHT POLE PEDESTAL FOR APPROACH SLAB OR BRIDGE THICKNESS LESS THAN 1'-5½" AT COPING

CROSS REFERENCE:
For Detail "A", Anchor Plate Detail and Light Pole Pedestal Notes, see Sheet 3.

NOTE: Anchor Bolt, Nuts, Washers and Anchor Plate are dashed for clarity.

LIGHT POLE PEDESTAL FOR APPROACH SLAB OR BRIDGE DECK THICKNESS LESS THAN 1'-5½" AT COPING

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
01/01/12			FDOT DESIGN STANDARDS 2013	LIGHT POLE PEDESTAL	21200	1

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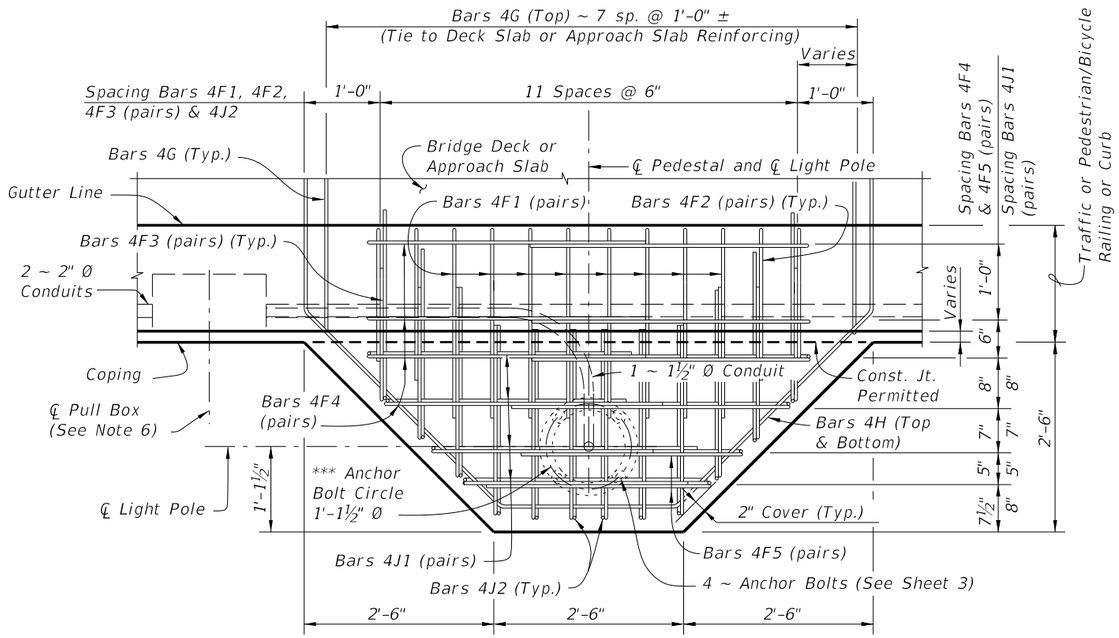
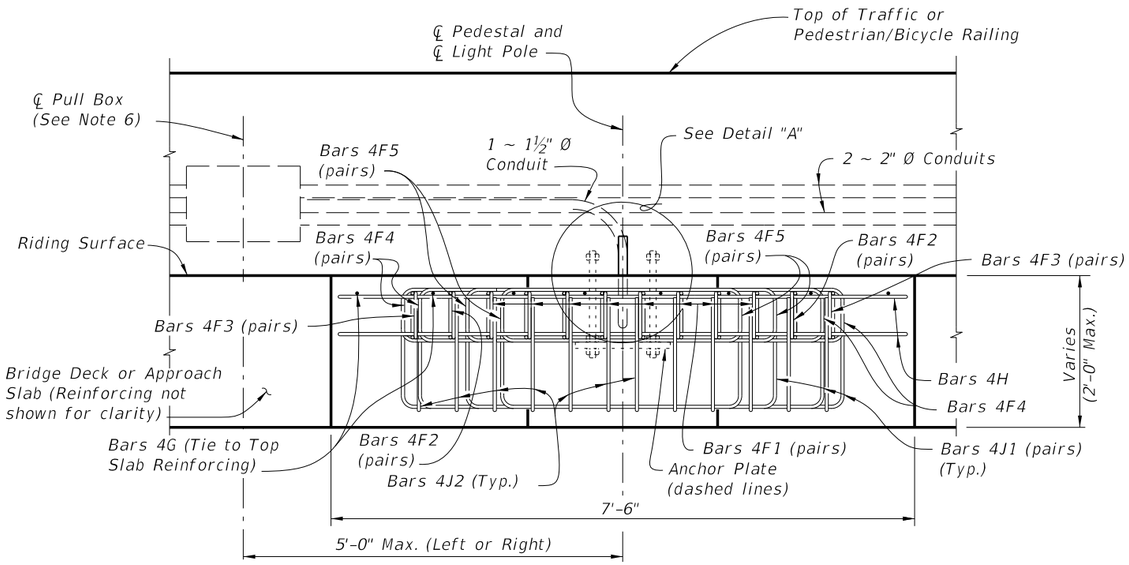
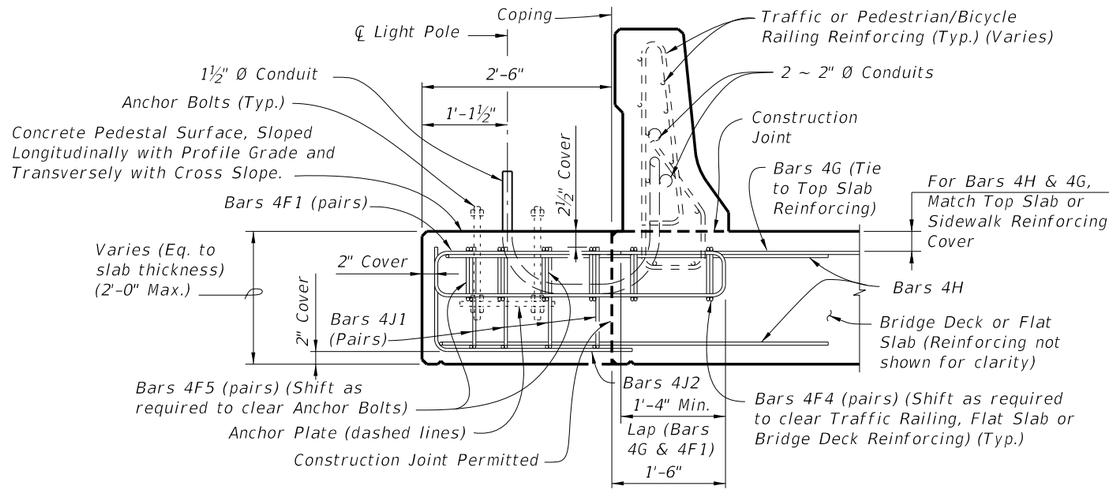


*** Anchor Bolt pattern orientation shall be as shown.

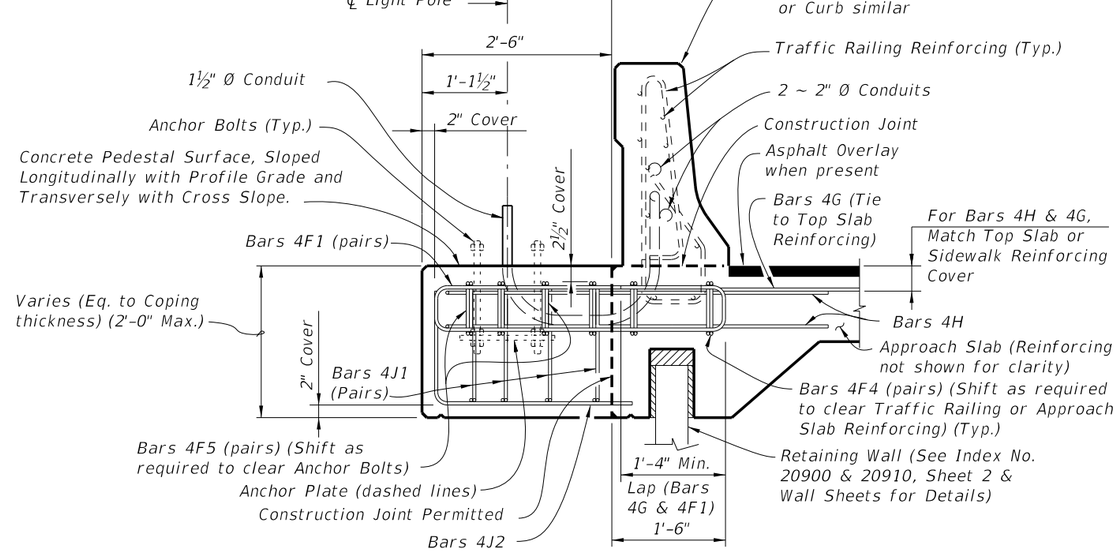
PLAN VIEW



ELEVATION VIEW



TYPICAL SECTION AT LIGHT POLE PEDESTAL FOR FLAT SLAB OR BRIDGE DECK THICKNESS AT COPING 1'-5½" OR GREATER



TYPICAL SECTION AT LIGHT POLE PEDESTAL FOR APPROACH SLAB ON RETAINING WALL

CROSS REFERENCE:
For Detail "A", Anchor Plate Detail and Light Pole Pedestal Notes, see Sheet 3.

NOTE: Anchor Bolt, Nuts, Washers and Anchor Plate are dashed for clarity.

LIGHT POLE PEDESTAL FOR APPROACH SLAB OR BRIDGE DECK THICKNESS AT COPING 1'-5½" OR GREATER

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LAST REVISION	REVISION	DESCRIPTION:		FDOT DESIGN STANDARDS 2013	LIGHT POLE PEDESTAL	INDEX NO.	SHEET NO.
01/01/12						21200	2

CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

REINFORCING STEEL NOTES:

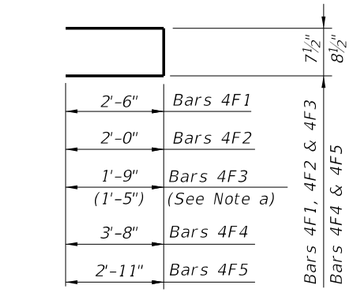
a. When Pedestal is attached to Pedestrian/Bicycle Railing – Index No. 820 or an 8" wide concrete curb and the Bridge Deck or Approach Slab thickness is less than 1'-1½", Bars 4F3 shall have leg length and bar length shown in parentheses.

b. The number of bars shown in parentheses is for Bars 4F4 when Pedestal is attached to Pedestrian/Bicycle Railing – Index No. 820 or an 8" wide concrete curb, and the Bridge Deck or Approach Slab thickness is less than 1'-1½".

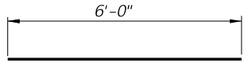
c. Lap Splices for Bars 4F1, 4F2 & 4F3 shall be a minimum of 1'-4". Lap Splices for Bars 4F4 & 4F5 shall be minimum of 1'-8".

d. Bars 4J1 and 4J2 are not required when Pedestal thickness is less than 1'-5½". Field trim height of bars to maintain cover when Pedestal thickness is less than 2'-0". Field trim length of Bars 4J2 on Retaining Wall Coping to maintain cover.

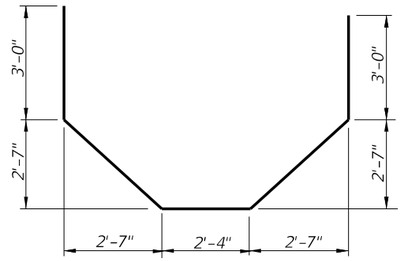
e. All bar dimensions in the bending diagrams are out to out.



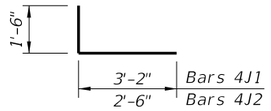
BARS 4F1, 4F2, 4F3, 4F4 & 4F5



BAR 4G



BAR 4H

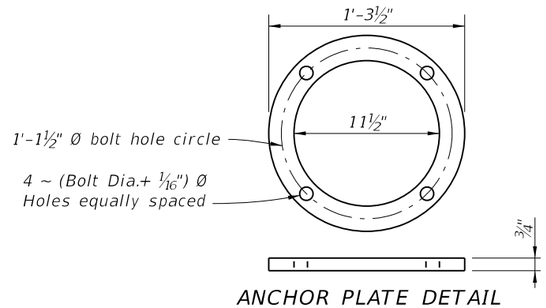


BARS 4J1 & 4J2

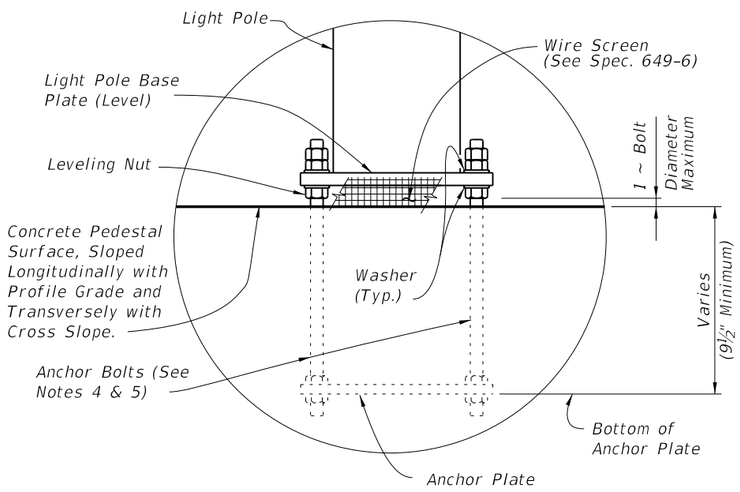
BILL OF REINFORCING STEEL

MARK	SIZE	NO. REQD.	LENGTH	NOTES
F1	4	16	5'-8"	c
F2	4	4	4'-8"	c
F3	4	4	4'-2" (3'-6")	a, c
F4	4	8 (6)	8'-3"	b, c
F5	4	4	6'-7"	c
G	4	8	6'-0"	–
H	4	2	15'-8"	–
J1	4	8	4'-8"	d
J2	4	12	4'-0"	d

( ) See Reinforcing Steel Note a & b.



ANCHOR PLATE DETAIL



DETAIL "A"

CROSS REFERENCE:
For location of Detail "A" see Sheets 1 and 2.

LIGHT POLE PEDESTAL NOTES

1. Concrete and Reinforcing Steel required for the construction of the Pedestal shall meet the same requirements as the Traffic Railing or Pedestrian/Bicycle Railing the Pedestal is attached to.

2. Light Pole Pedestal may be used with the following:
   Index No. 420 – Traffic Railing (32" F Shape),
   Index No. 422 – Traffic Railing (42" Vertical Shape),
   Index No. 423 – Traffic Railing (32" Vertical Shape),
   Index No. 424 – Traffic Railing (Corral Shape),
   Index No. 425 – Traffic Railing (42" F Shape),
   Index No. 820 – Pedestrian/Bicycle Railing,
   Index No. 821 – Aluminum Pedestrian/Bicycle Bullet Railing for Traffic Railing (32" F Shape), or
   Index No. 5210 – Traffic Railing /Sound Barrier (Bridge).
   Unless otherwise noted, Traffic Railing (32" F Shape) is shown in all Views and Sections. The Pedestal details for other Traffic Railings or Pedestrian/Bicycle Railing are similar.

3. The Pedestal and Deck are designed to resist the following Working Loads (Load Case 2) from the Light Pole applied at the top of the Pedestal:

Axial Dead Load	=	1.56 kip
Wind Load Moment about Transverse Axis	=	40.60 kip-Ft.
Wind Load Moment about Longitudinal Axis	=	28.30 kip-Ft.
Deadload Moment about Longitudinal Axis	=	1.69 kip-Ft.
Maximum Shear	=	1.38 kip
Torsion about Pole Axis	=	3.56 kip-Ft.

TABLE 1 - DESIGN LIMITATIONS FOR ANCHOR BOLTS (LOAD CASE 1)

WIND SPEED (MPH)	ARM LENGTH (Ft.)	BRIDGE DECK HEIGHT (Ft.)* DESIGN MOUNTING HEIGHT 40 Ft.	45 Ft.	50 Ft.
110	≤ 15	75	75	75
130	8 & 10	75	75	75
130	12	75	75	70
130	15	75	75	40
150	8	75	75	10
150	10	75	50	**
150	12	75	45	**
150	15	75	30	**

* Above natural ground or MLW. ** See Load Case 2.

4. ANCHOR BOLT DESIGN:
   Anchor Bolt design is based on the standard Roadway Aluminum Light Pole configurations shown on Index No. 17515 and the following design limitations:
   Load Case 1: See Table 1
   Load Case 2: 150 mph Design Wind Speed, 15' arm length, 50' Design Mounting Height with a 75' bridge deck height above natural ground, or MLW.

   Anchor Bolt Diameter: 1" Ø (Load Case 1), 1 ¼" Ø (Load Case 2).
   Anchor Bolts: ASTM F1554 Grade 55.
   Nuts: ASTM A563 Grade A, Heavy-Hex.
   Washers: ASTM F436 Type 1.
   Anchor Plate: ASTM A709 (Grade 36) or ASTM A36.
   All Nuts, Bolts and Washes shall be galvanized by ASTM F2329.

   The Contractor is responsible for ensuring the anchor bolt configuation is compatible with the light pole base plate. Submit modifications of the anchor bolt design to the Engineer for approval.

5. Anchor Bolts must be installed plumb.

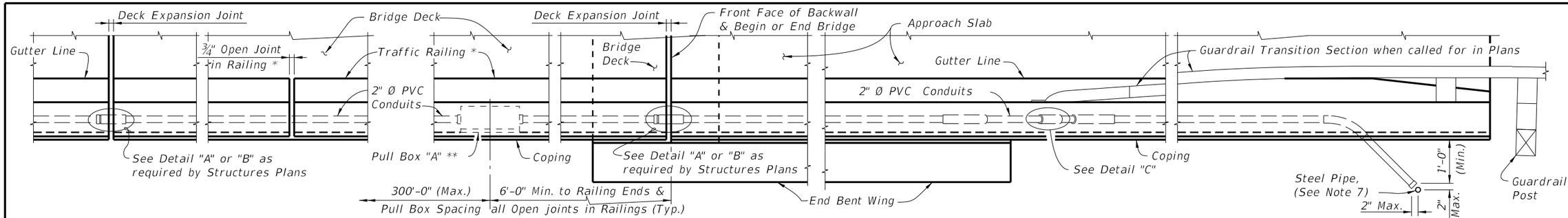
6. For Conduit, Pull Box, Expansion/Deflection Fitting and adjacent Reinforcing Steel Details, see Utility Conduit Detail Sheets.

7. PAYMENT: The cost of Wire Screen, Anchor Bolts, Nuts, Washers and Anchor Plates shall be included in the Bid Price for Light Poles. The cost of all Labor, Concrete and Reinforcing Steel required for the Construction of the Pedestals, Pull Boxes, and Miscellaneous Hardware required for the completion of the Electrical System, shall be included in the Bid Price for the Traffic Railing or Pedestrian/Bicycle Railing the Pedestal is attached to.

ESTIMATED LIGHT POLE PEDESTAL QUANTITIES PER LIGHT POLE PEDESTAL

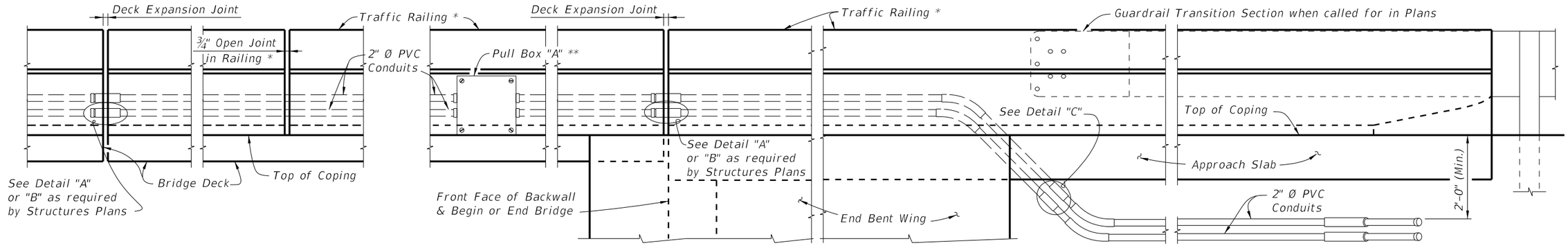
ITEM	UNIT	QUANTITY
Concrete Per Pedestal Thickness	CY/In.	0.040
Reinforcing Steel	LB	195 (182)

(The Reinforcing Steel quantity shown in parenthesis is for a Pedestal attached to Pedestrian/Bicycle Railing – Index No. 820 with Bridge Deck or Approach Slab thinner than 1'-1½". Add 59 Lbs. for Bars 4J1 & 4J2 when Pedestal Thickness is greater than 1'-5")



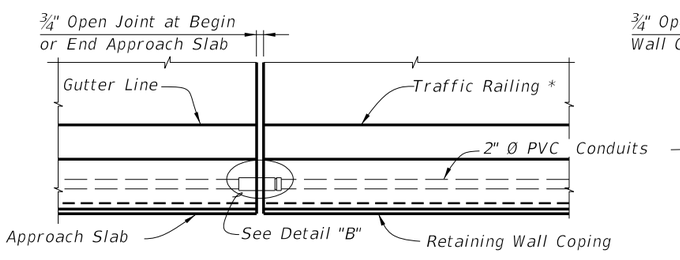
PARTIAL PLAN VIEW ALONG BRIDGE

PARTIAL PLAN VIEW ALONG APPROACH SLAB WITHOUT CONTINUING TRAFFIC RAILING

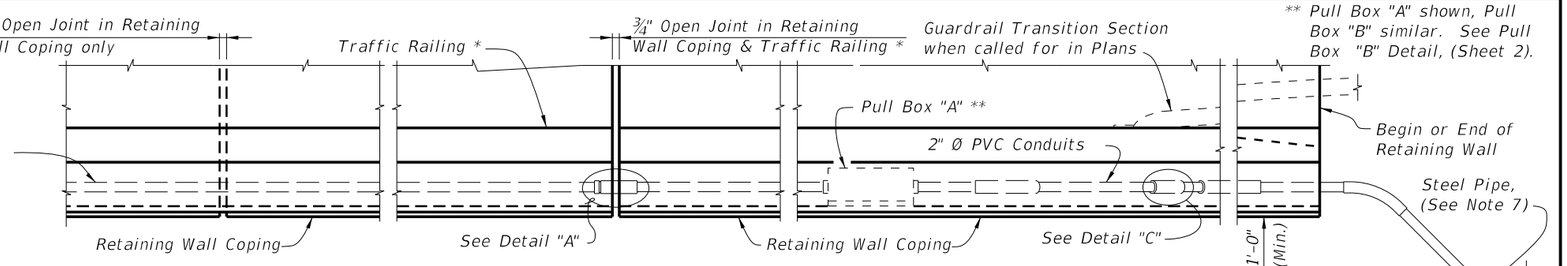


PARTIAL ELEVATION VIEW ALONG BRIDGE

PARTIAL ELEVATION VIEW ALONG APPROACH SLAB WITHOUT CONTINUING TRAFFIC RAILING

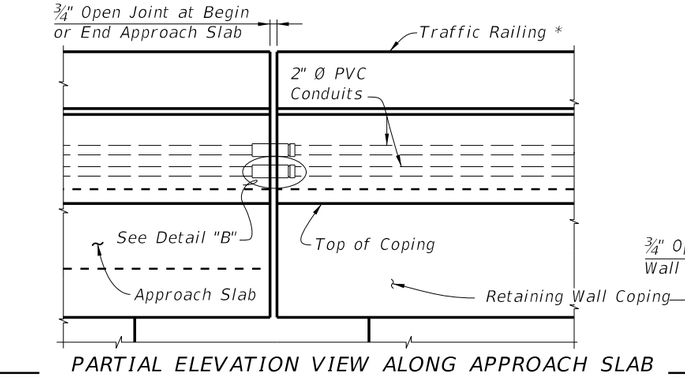


PARTIAL PLAN VIEW ALONG APPROACH SLAB WITH CONTINUING TRAFFIC RAILING



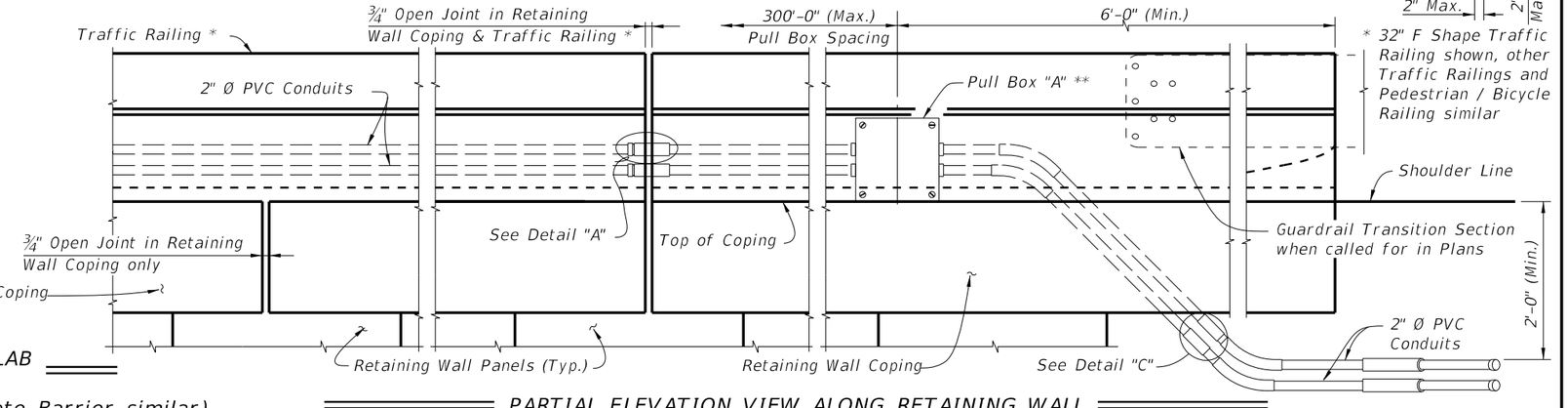
** Pull Box "A" shown, Pull Box "B" similar. See Pull Box "B" Detail, (Sheet 2).

PARTIAL PLAN VIEW ALONG RETAINING WALL



PARTIAL ELEVATION VIEW ALONG APPROACH SLAB WITH CONTINUING TRAFFIC RAILING

(Retaining Wall Mounted Traffic Railing shown, Roadway Concrete Barrier similar)



PARTIAL ELEVATION VIEW ALONG RETAINING WALL

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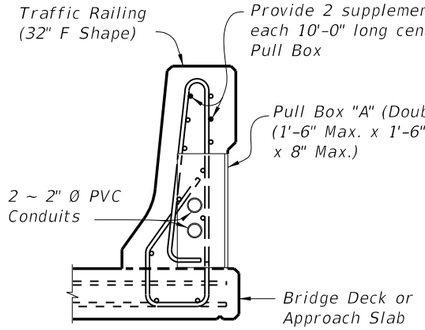
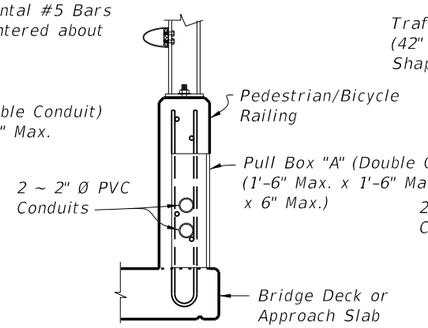
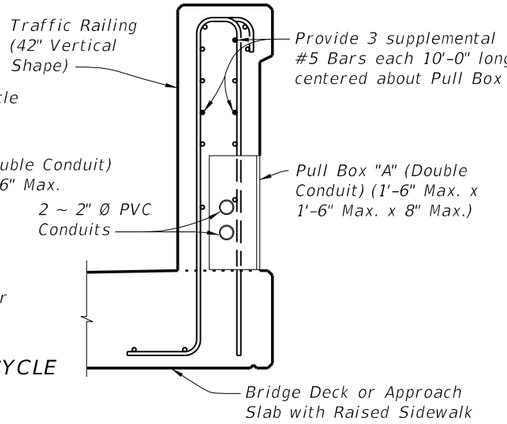
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
01/01/12			FDOT DESIGN STANDARDS 2013	CONDUIT DETAILS	21210	1



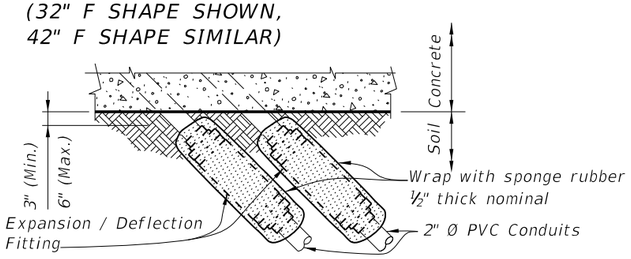
SECTION THRU TRAFFIC RAILING AT PULL BOX (32" F SHAPE SHOWN, 42" F SHAPE SIMILAR)



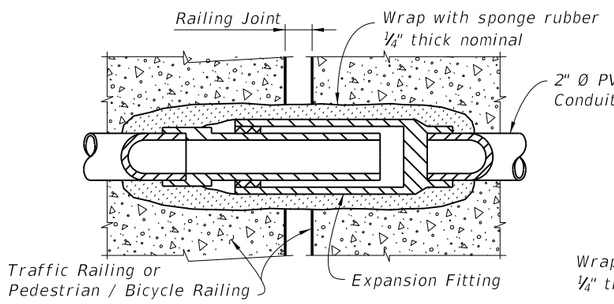
SECTION THRU PEDESTRIAN / BICYCLE RAILING AT PULL BOX



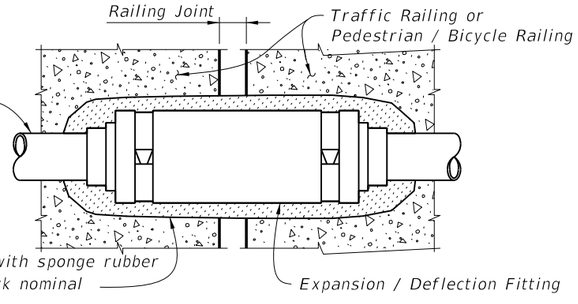
SECTION THRU TRAFFIC RAILING AT PULL BOX (42" VERTICAL SHAPE SHOWN, 32" VERTICAL SHAPE SIMILAR)



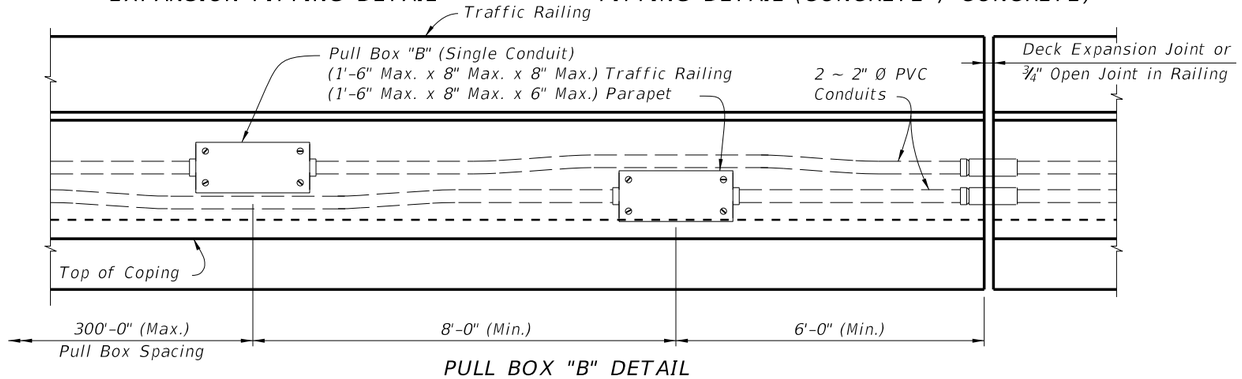
DETAIL "C" EXPANSION / DEFLECTION FITTING DETAIL (CONCRETE / SOIL)



DETAIL "A" EXPANSION FITTING DETAIL



DETAIL "B" EXPANSION / DEFLECTION FITTING DETAIL (CONCRETE / CONCRETE)



PULL BOX "B" DETAIL

CONDUIT GENERAL NOTES:

1. Furnish and install approved Conduits and Fittings in accordance with the Specifications, this Standard, and the National Electric Code (NEC) and as directed by the Engineer.

2. Furnish Schedule 80 PVC Rigid Nonmetallic Conduits in accordance with NEMA TC-2 and UL Standard 651. Furnish Fittings in accordance with NEMA TC-3 and UL Standard 514b. Conduit and Fittings must have UL labels: Conduit – on each 10-foot length; Fittings – stamped or molded on each Fitting. Connect Conduit and Fittings using solvent cement in accordance with the manufacturer's recommendations.

3. Furnish and install Pull Boxes sized in accordance with NEC requirements and the maximum size limits shown. For locations where the superstructure environment is classified as slightly or moderately aggressive, furnish Galvanized Steel or NEMA Type 4X Pull Boxes. Where the superstructure environment is classified as extremely aggressive, furnish NEMA Type 4X non-metallic Pull Boxes. All Pull Boxes shall include weatherproof covers with gaskets. Permanently indicate the utility within the Pull Box by stamping or molding the information using letters and symbols that are a minimum of ½" high. Install Pull Boxes adjacent to the Begin and End of Bridges, Begin and End of Retaining Walls, and at other required locations. Omit Pull Boxes at Begin or End of Retaining Walls adjacent to Bridges unless a precast Traffic Railing with junction slab is used. Position Pull Boxes as shown; do not place Pull Box openings on the traffic face of Traffic Railings.

4. Furnish and install Expansion Fittings at locations shown in the Plans. Certify that Expansion Fittings used at a given location are rated to accommodate the anticipated movement at that location: along Bridge decks – see Structures Plans, Expansion Joint Data Table; along Retaining Walls and other unspecified locations – 2" minimum.

5. Furnish and install Expansion/Deflection Fittings at locations shown in the Plans. Certify that Expansion/Deflection Fittings used at a given location are rated to accommodate a minimum rotation of 30 degrees and the anticipated movement at that location: along Bridge decks– see Structures Plans, Expansion Joint Data Table; along Retaining Walls and other unspecified locations – 0.7" minimum.

6. For all Conduit designated for future use, install, and leave in place, #12 AWG Pull Wire along the entire length of Conduit or #12 AWG Pull Wire on each End (from Traffic Railing Pull Box to in-ground Pull Box or capped End) of the Conduit with a polypropylene cord between Bridge Traffic Railing Pull Boxes in accordance with Section 630.

7. Stub out and cap the Conduit, and drive a steel pipe at the End of the Conduit as shown in this Standard. If required in the plans or by the Engineer, furnish and install in-ground Pull Boxes in accordance with Index 17700. Show location of stub out with Steel Pipe or in-ground Pull Box on As-Built plans.

8. Shift vertical Railing reinforcement symmetrically to provide 2" clearance to Pull Boxes. Space shifted vertical reinforcement at 3" centers minimum. Cut horizontal Railing reinforcement to provide 2" clearance to Pull Boxes and provide supplemental reinforcement as shown. Shift a maximum of 1" but do not cut Railing reinforcement to facilitate Conduit, Expansion Fitting and Expansion/Deflection Fitting placement. Do not bundle Conduits, or Conduits and horizontal reinforcement.

9. Unless otherwise shown in the plans, include the cost of furnishing and installing Conduit, Pull Cords and Wires, Pull Boxes, Expansion and Expansion/Deflection Fittings and all associated hardware required to complete the installation in the cost of the Traffic Railing or Pedestrian Railing (Parapet) that the Conduit is installed in.

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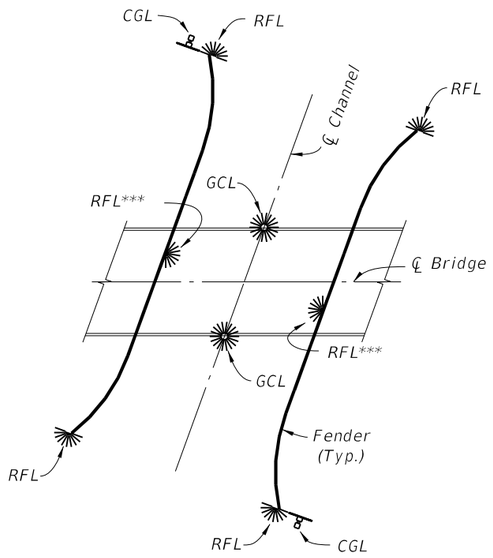
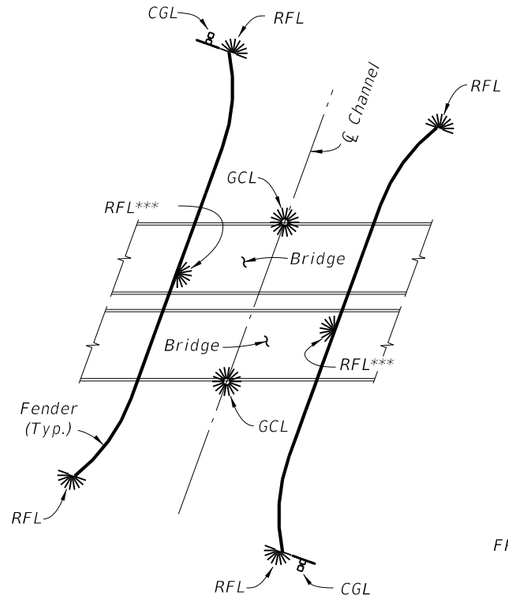
LAST REVISION	REVISION	DESCRIPTION:				
07/01/12			FDOT DESIGN STANDARDS 2013	CONDUIT DETAILS	INDEX NO. 21210	SHEET NO. 2



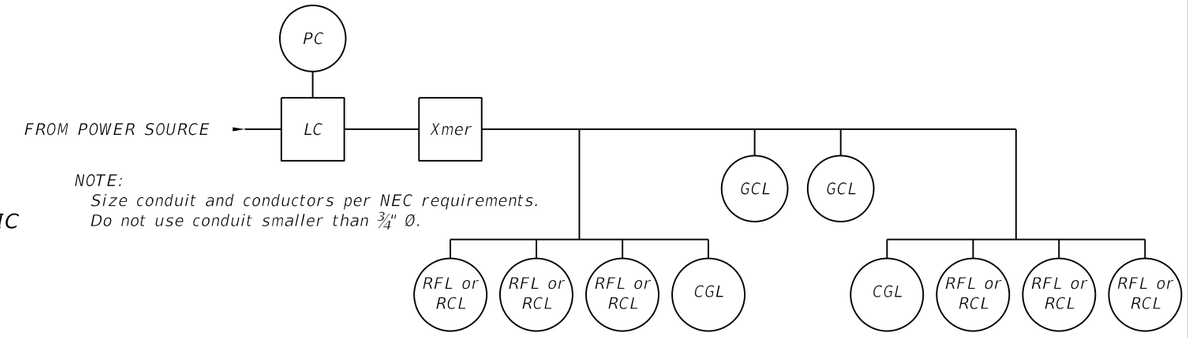
NAVIGATION LIGHT SYSTEM SCHEMATIC
FOR SINGLE BRIDGE WITH FENDERS



NAVIGATION LIGHT SYSTEM SCHEMATIC
FOR DUAL BRIDGES WITH FENDERS

NAVIGATION LIGHT NOTES:

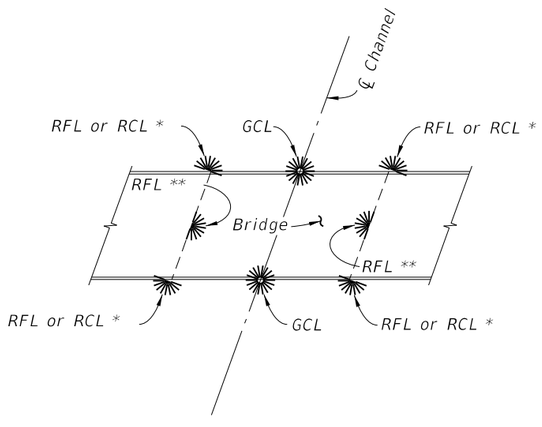
1. *Provide Navigation Light System in compliance with Specifications Section 510.*



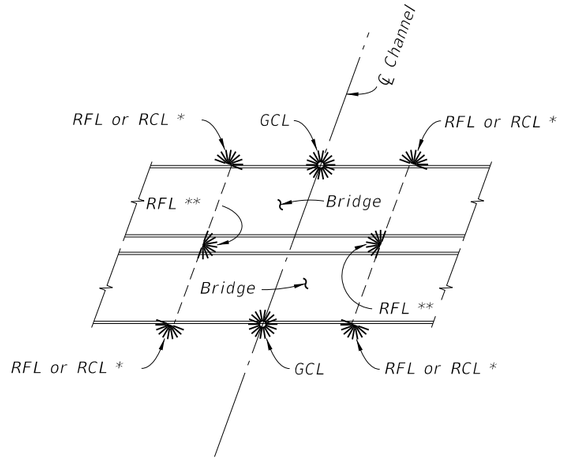
NOTE:
Size conduit and conductors per NEC requirements.
Do not use conduit smaller than ¾" Ø.

TYPICAL ELECTRICAL SCHEMATIC DIAGRAM

POWER CONDUCTORS			
DISTANCE (feet)	VOLTS	CONDUCTOR	TRANSFORMER
0 – 75	120	#12 AWG	N/A
75 – 500	120 or 240	#10 AWG	N/A
500–1000	240	#10 AWG	N/A
1000–2000	480	#10 AWG	2 KVA
2000–5000	480	#8 AWG	2 KVA
5000–10000	480	#6 AWG	2 KVA
over 10000	480	#4 AWG	2 KVA



NAVIGATION LIGHT SYSTEM SCHEMATIC
FOR SINGLE BRIDGE WITHOUT FENDERS



NAVIGATION LIGHT SYSTEM SCHEMATIC
FOR DUAL BRIDGES WITHOUT FENDERS

LEGEND

SYMBOL		DESCRIPTION
	LC	Lighting Contactor
	PC	Photocell Control
	Xmer	Transformer (If Required)
	RFL or RCL	Red Pier/Fender Light (180° visibility)
		Red Channel Margin Light (180° visibility)
	GCL	Green Center Channel Light (360° visibility)
	CGL	Clearance Gauge Light
	CM	Channel Margin or Pier inner surface whichever defines Channel Edge.

* Use RFL when Pier is at Channel Edge and see CFR, Title 33, part 118 for Mounting Height restrictions. Use RCL otherwise.
** Mounted only on the Pier that defines CM, otherwise does not apply.
*** RFL to be located at mid length of straight portion of fender.

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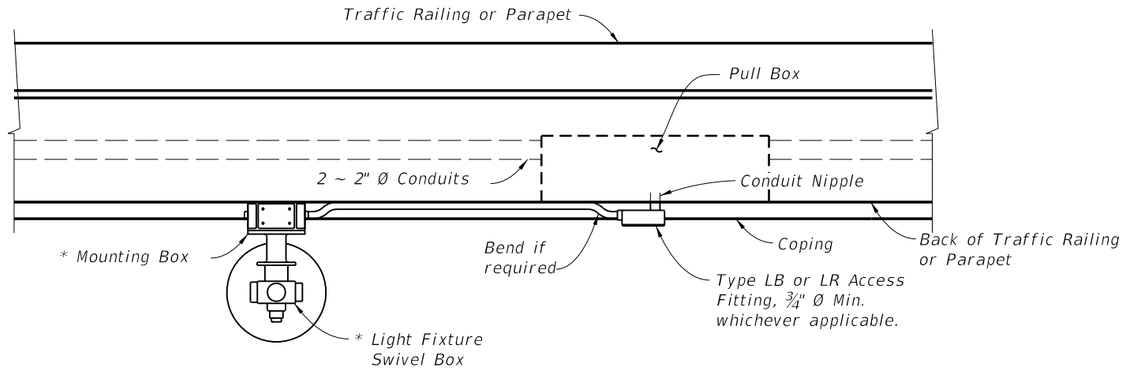
LAST REVISION	REVISION	DESCRIPTION:
01/01/12		

FDOT DESIGN STANDARDS
2013

NAVIGATION LIGHT SYSTEM DETAILS (FIXED BRIDGES)

INDEX NO. 21220

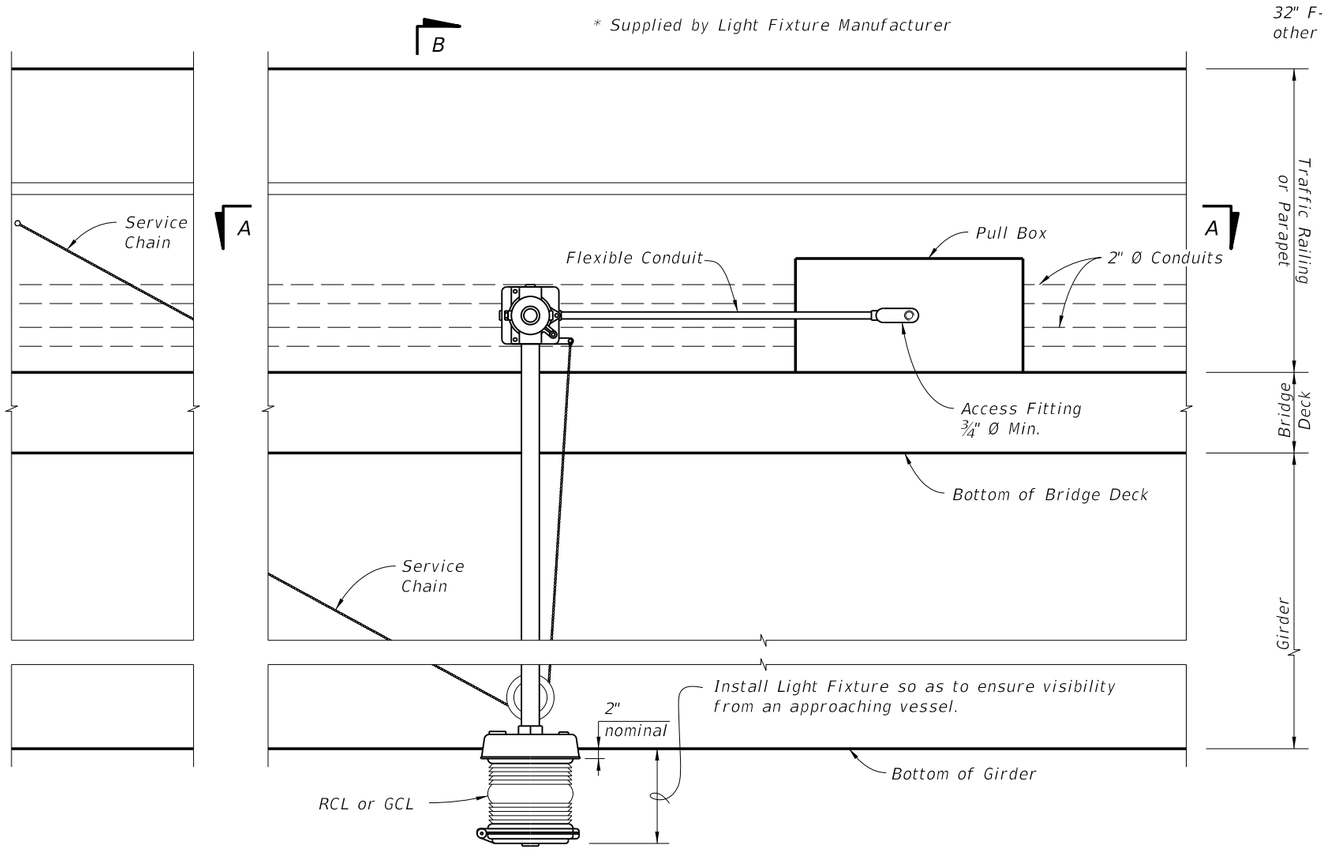
SHEET NO. 1



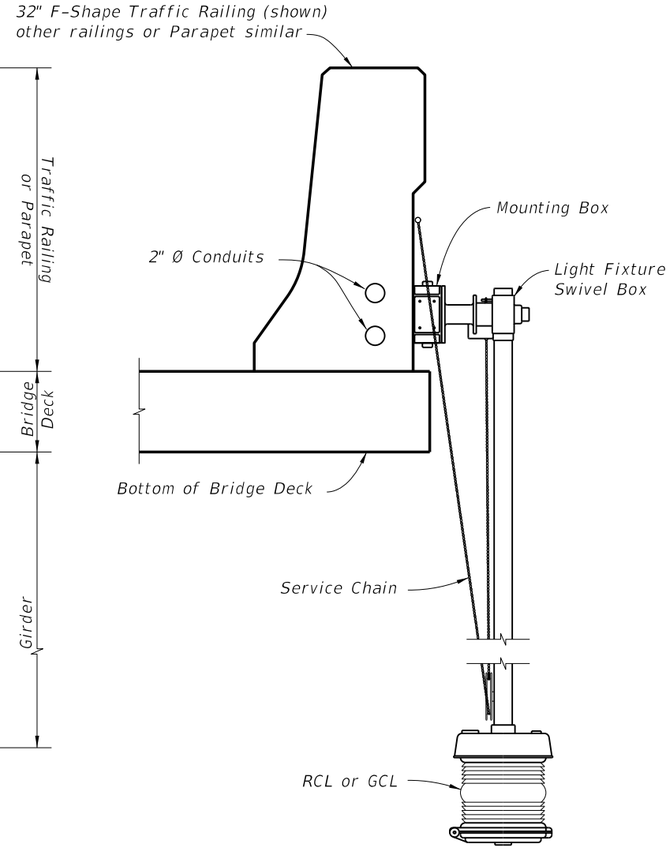
CROSS REFERENCES:
1. For Navigation Light System notes and legend, see Sheet 1.
2. See Utility Conduit Detail sheets for pull box dimensions & locations.

GCL OR RCL MOUNTING DETAILS (SCHEMATIC)
VIEW A-A
(Traffic Railing - 32" F Shape shown, other railings similar)

* Supplied by Light Fixture Manufacturer



GCL OR RCL MOUNTING DETAILS (SCHEMATIC)
ELEVATION VIEW
(Traffic Railing (32" F Shape) shown, other railings similar)



SECTION B-B
TYPICAL POSITION OF RCL OR GCL
RELATIVE TO SUPERSTRUCTURES

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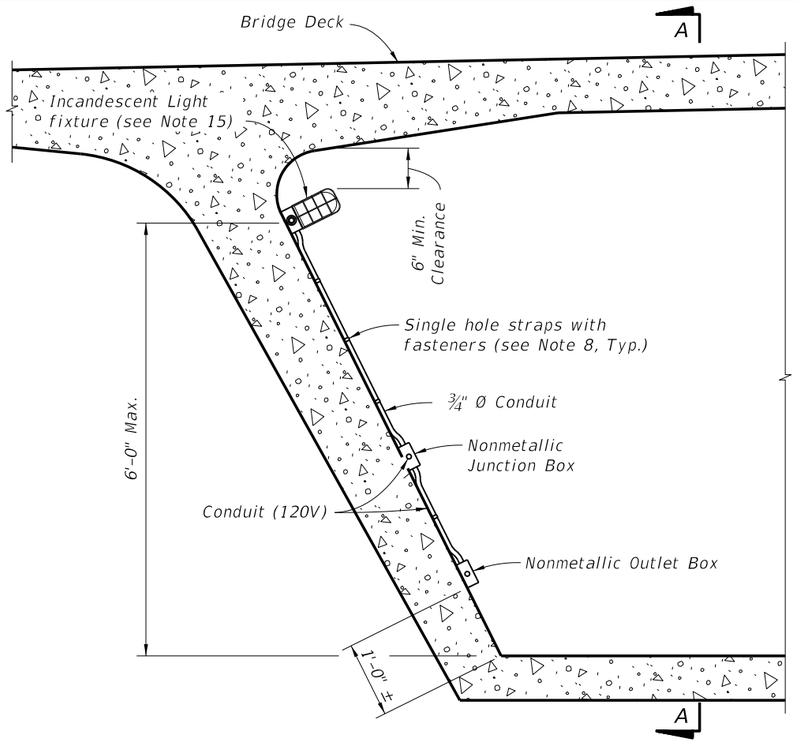
LAST REVISION	REVISION	DESCRIPTION:		FDOT DESIGN STANDARDS 2013	NAVIGATION LIGHT SYSTEM DETAILS (FIXED BRIDGES)	INDEX NO.	SHEET NO.
01/01/12						21220	2

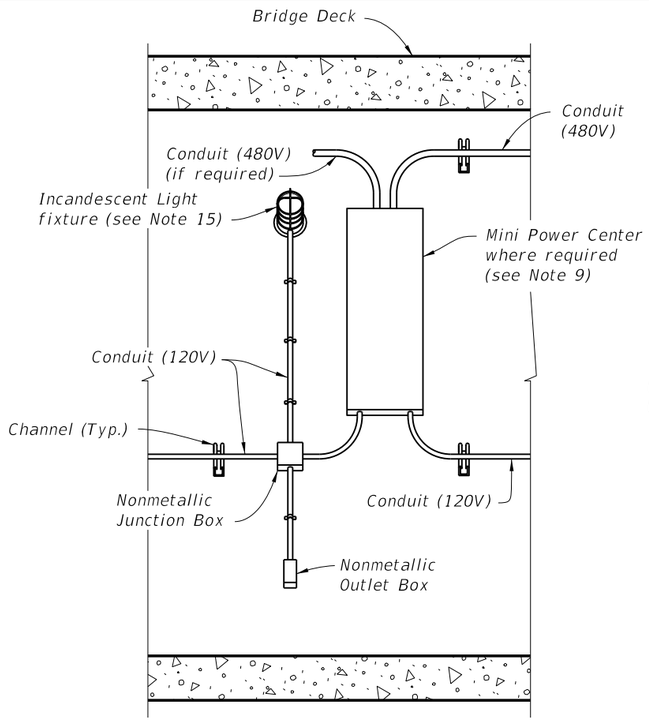
BOX GIRDER MAINTENANCE LIGHTING NOTES:

1. Submit shop drawings to the Engineer detailing the layout of the maintenance lighting system for the entire structure. The shop drawings must include, but not be limited to, the following items:
   a. Conduit layout and installation details through diaphragms, around post-tensioning (PT) ducts, lateral bracing and cross frames as necessary.
   b. Conduit access through box girder end diaphragms with minimum 1" clearance in all directions.
   c. Conduit expansion fitting details.
   d. Fastener details for the interior electrical system.
   e. Single line diagram showing mini power centers, switches, contactors, timers, etc.
   f. Mini power center details including circuit breaker details.
   g. Mini power center mounting details if required.
   h. Feeder schedule.
2. Ensure installation meets all requirements of the latest edition of the National Electrical Code (NEC) and local ordinances. Install grounding in accordance with NEC Article 250. Maintain separation between 480V and 120V Conductors / Conduits throughout.
3. Furnish all labor, equipment, materials, and incidentals required for a complete and functional installation.
4. Use only new, unused and Underwriters Laboratories (UL) listed equipment and materials for outdoor use.
5. Furnish and install polyvinyl chloride (PVC) conduit in conformance with UL Section 651, NEC Section 347 and NEMA TC-2, UV-resistant and schedule 80. Bend conduits as necessary to connect to loads.
6. Provide PVC sleeve 2" bigger in diameter than conduit to accommodate construction tolerance.
7. Install a UL labeled expansion fitting for specified PVC conduit at all structure expansion joints. Provide certification that the expansion fitting meets the following minimum requirements: Compatibility with the connected conduits, waterproof, UV protected and allows longitudinal movement equal to that of the Expansion Joint.
8. Use only Alloy 316 stainless steel supporting hardware. Provide minimum $\frac{3}{16}$" Ø fasteners. For concrete or SIP form mounting, provide anchor bolts (expansion, drop-in or adhesive) suitable for dynamic loading (due to vibration caused by traffic). Install fasteners to avoid conflicts with reinforcing steel and PT ducts. For structural steel mounting, do not attach fasteners to main members, i.e. webs and flanges.
9. Furnish power distribution at 480V AC, 1 phase, with step down transformers at regular intervals. Furnish 7.5 KVA mini power center with eight 20A breakers as the step down transformer, feeding a maximum of 20 lamps and 20 receptacles. Each mini power center will provide power to no more than 1000' of bridge, preferably 500' on each side of the mini power center. 480V top feed, 120V bottom feed to maintain separation.
10. Furnish and install lighting contactors to switch the 480V AC feeding the mini power centers.
11. Furnish and install copper conductors, Type XHHW. Do not use any conductor larger than #4 AWG.
12. Provide enough slack in all interior cable terminations to allow for minor shifting of the structure.
13. Furnish and install National Electric Manufacturers Association (NEMA) Type 4X (non-metallic) surface mounted boxes sized in conformance with the NEC.
14. Furnish and install 120V duplex receptacles (GFI, NEMA Type 5-20R), in non-metallic outlet boxes at 50' maximum on centers. Provide each receptacle with a gasketed weather-protective outdoor plate. Maximum wire size to connect to receptacles is #12 AWG.
15. Furnish and install surface mounted, fully enclosed, incandescent light fixtures with gasketed clear globes and wire guards at 50' maximum on centers. Provide 100 watt, 130 volt, vibration resistant and brass base incandescent lamps.
16. Locate switches at each end of each span and at every access door.
17. Provide six hour reset timers for each circuit to turn off the lighting system automatically.
18. Include the cost of the box maintenance lighting system in the pay item for Lighting - Inside Box Girder (LS).

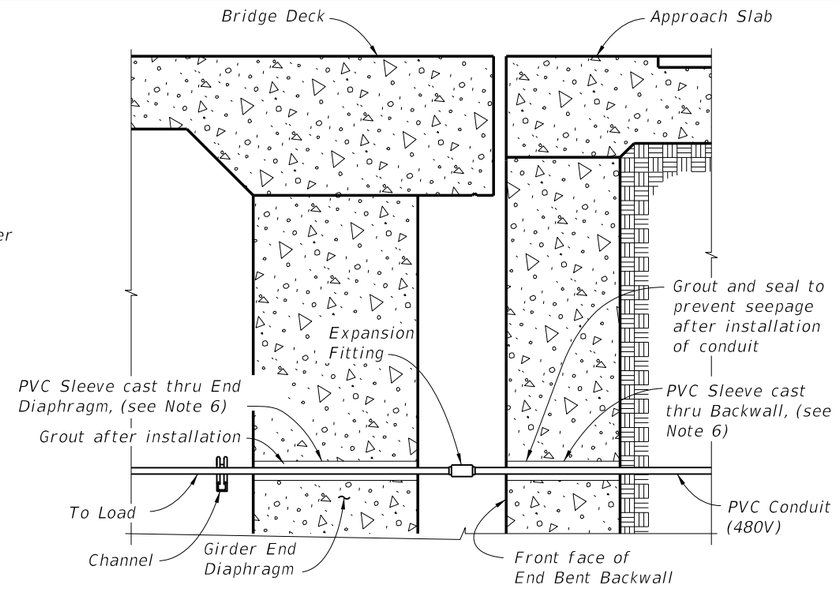
CROSS REFERENCES:
1. For Maintenance Light Details, see Sheet 2.
2. For actual bridge section, see Structures Plans.



LIGHTING DETAILS FOR CONCRETE BOX GIRDER BRIDGE

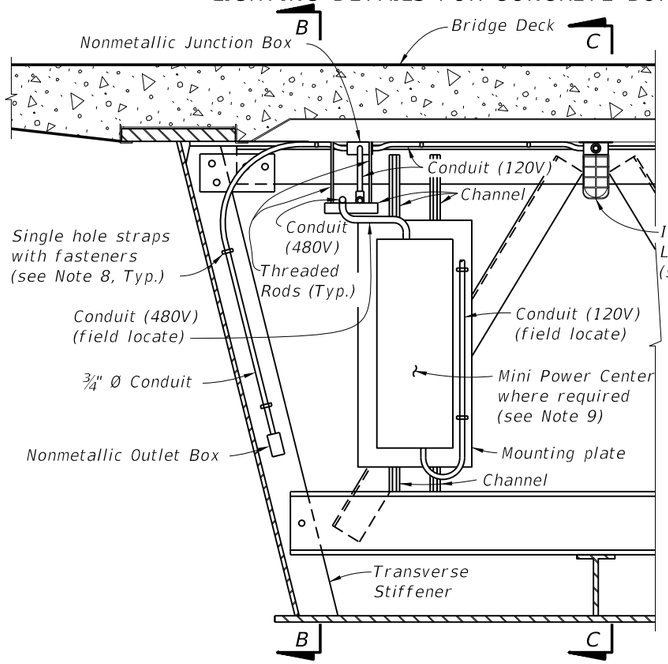


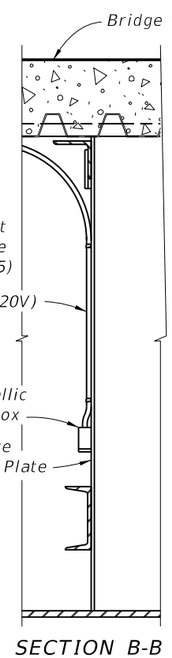
SECTION A-A



CONCRETE BOX GIRDER BRIDGE SECTION THRU END BENTS

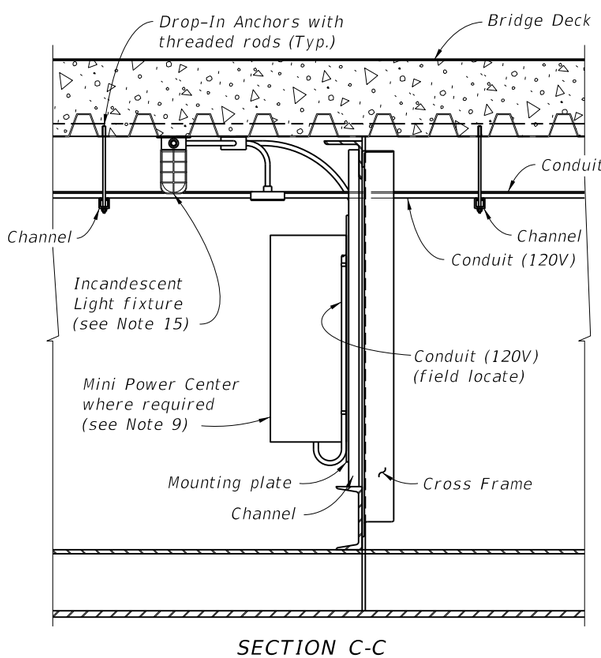
CROSS REFERENCE:
1. For Box Girder Maintenance Lighting Notes see Sheet 1.



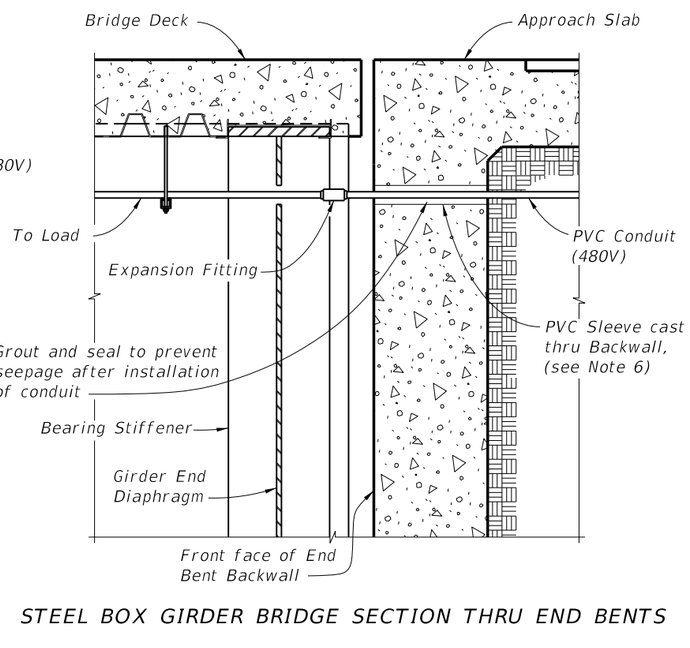


SECTION B-B

LIGHTING DETAILS FOR STEEL BOX GIRDER BRIDGE
(Cross Frame section shown, other Transverse Stiffener sections similar)



SECTION C-C



STEEL BOX GIRDER BRIDGE SECTION THRU END BENTS

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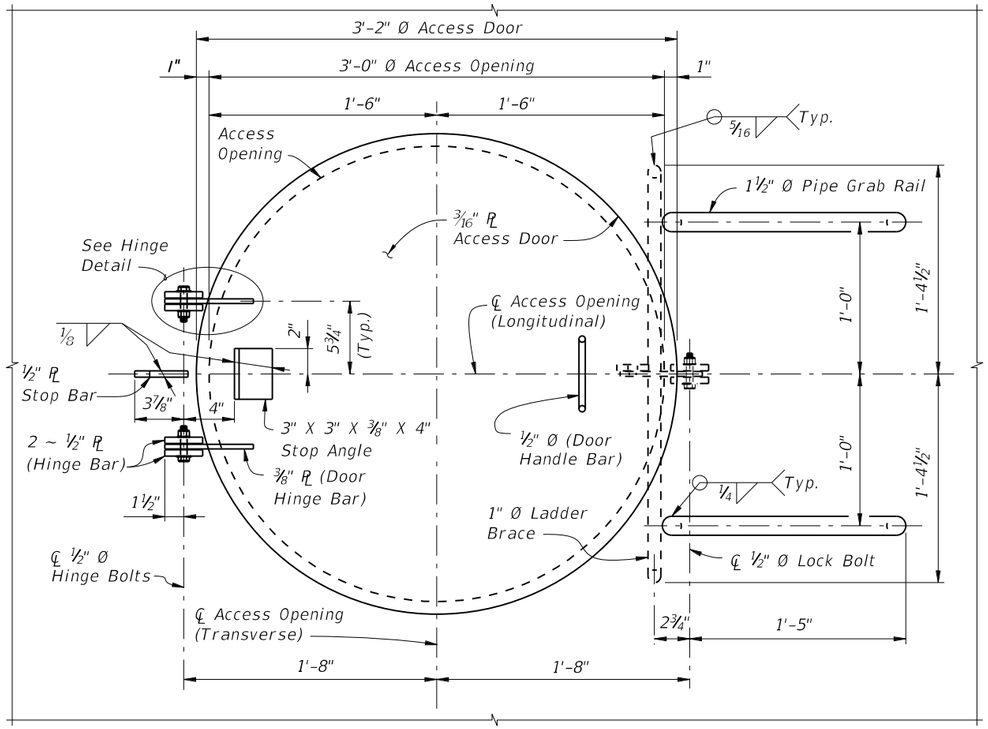
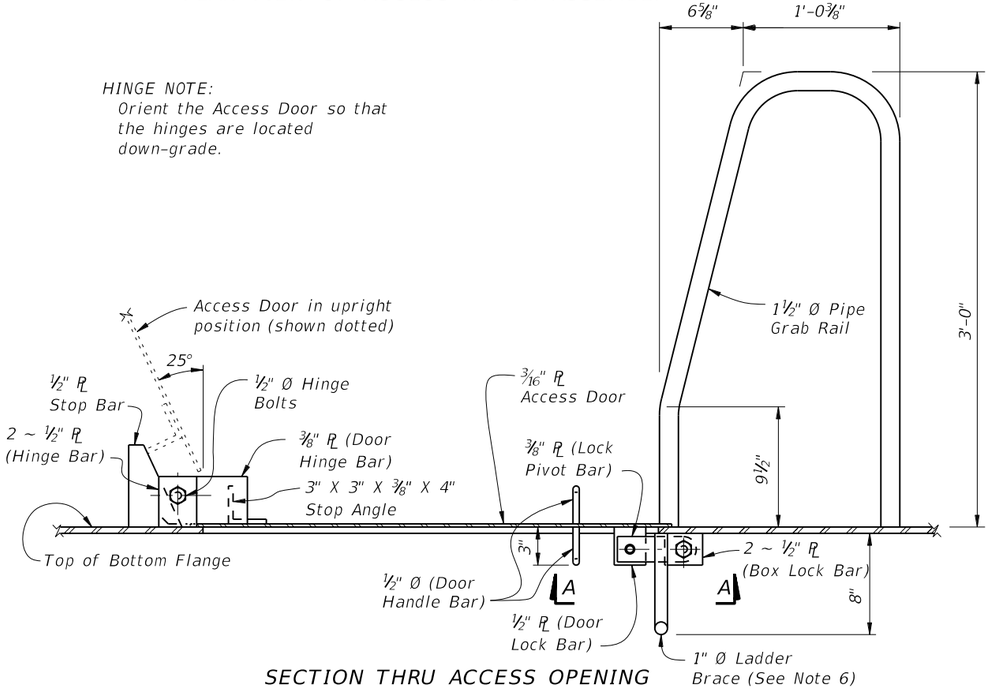
LAST REVISION	REVISION	DESCRIPTION:				
07/01/05			FDOT DESIGN STANDARDS 2013	MAINTENANCE LIGHTING FOR BOX GIRDERS	INDEX NO. 21240	SHEET NO. 2

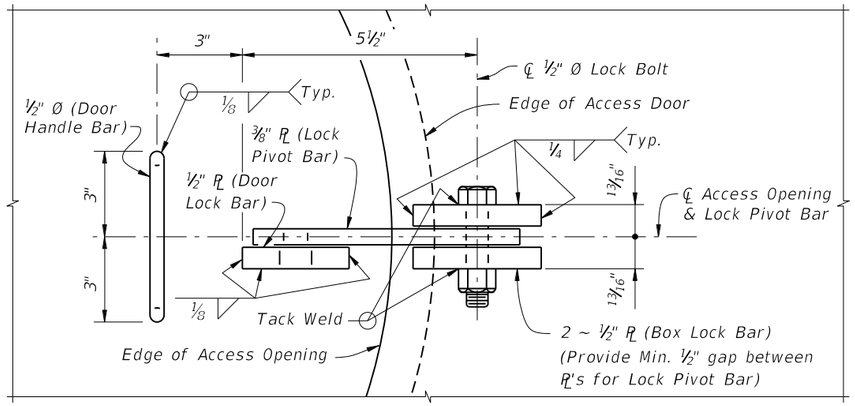


PLAN VIEW OF ACCESS HATCH ASSEMBLY

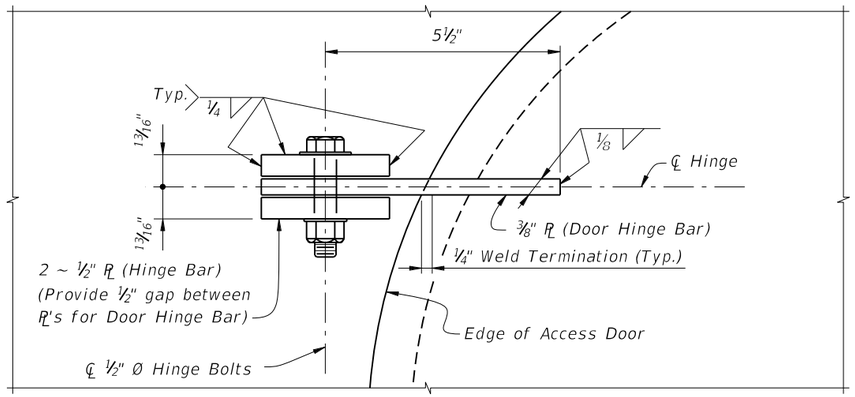
HINGE NOTE:
Orient the Access Door so that the hinges are located down-grade.



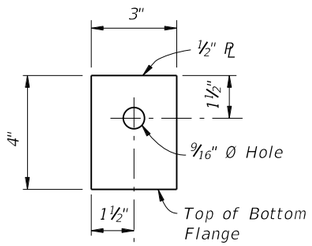
SECTION THRU ACCESS OPENING



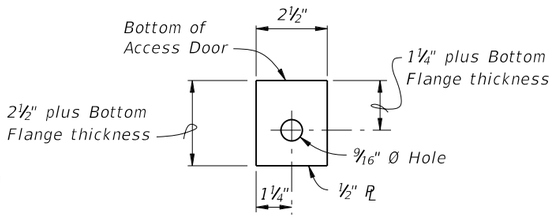
BOTTOM VIEW A-A



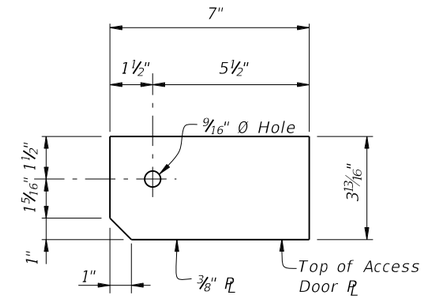
HINGE DETAIL



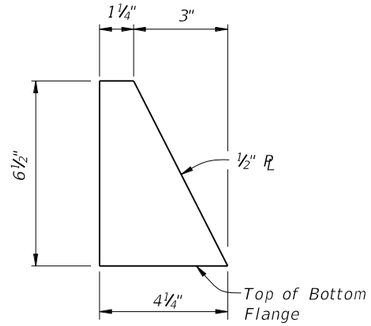
HINGE BAR DETAIL



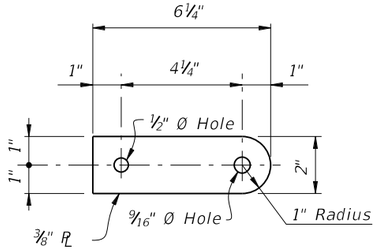
DOOR LOCK BAR DETAIL



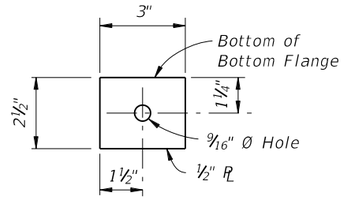
DOOR HINGE BAR DETAIL



STOP BAR DETAIL



LOCK PIVOT BAR DETAIL



BOX LOCK BAR DETAIL

NOTES:
1. All Structural Steel material in Access Door Assemblies shall conform to ASTM A709 Grade 36.
2. 1 1/2" Ø Pipe Grab Rail shall be in accordance with ASTM A53 Grade B for standard weight pipe (Schedule 40).
3. 1/2" Ø Door Handle Bar and 1" Ø Ladder Brace shall be in accordance with ASTM A36.
4. All bolts shall conform to ASTM A307 or A449. All nuts shall conform to ASTM A563 and all washers shall conform to ASTM F-436.
5. All exposed edges of plates and openings shall be ground smooth.
6. Place Ladder Brace near the End Bents exclusively and only when the height is reasonable for access by a Ladder.
7. See Framing Plan sheets for locations of Access Door Openings.
8. Coat structural steel in accordance with Specification Section 560.
9. All costs associated with Access Hatch Assembly and incidental items will be paid for under the Access Hatch Assembly pay item. No separate payment will be made for coating structural steel.

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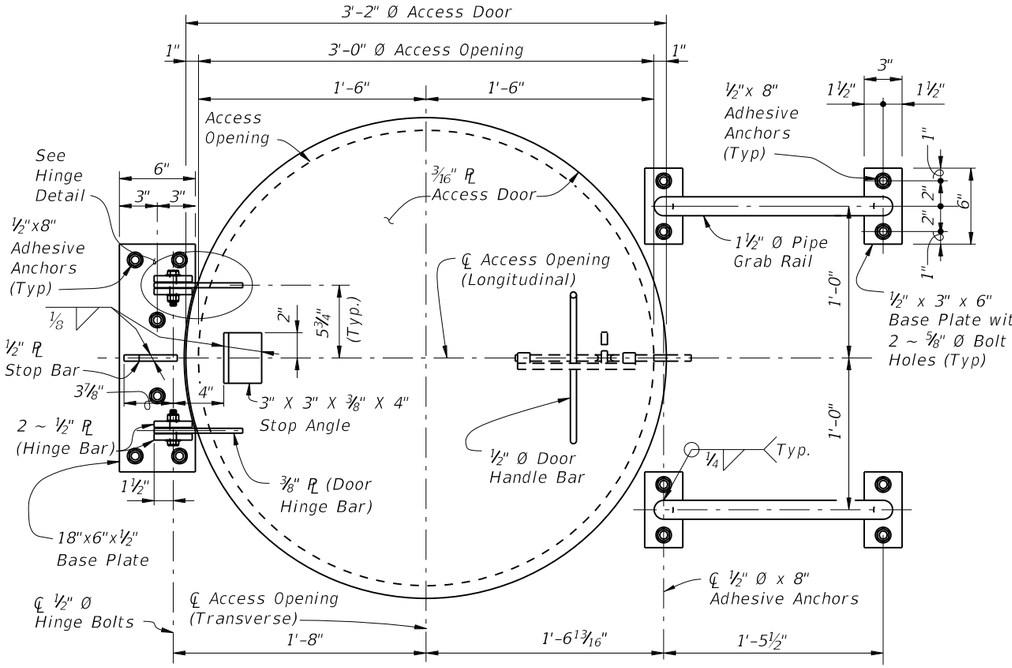
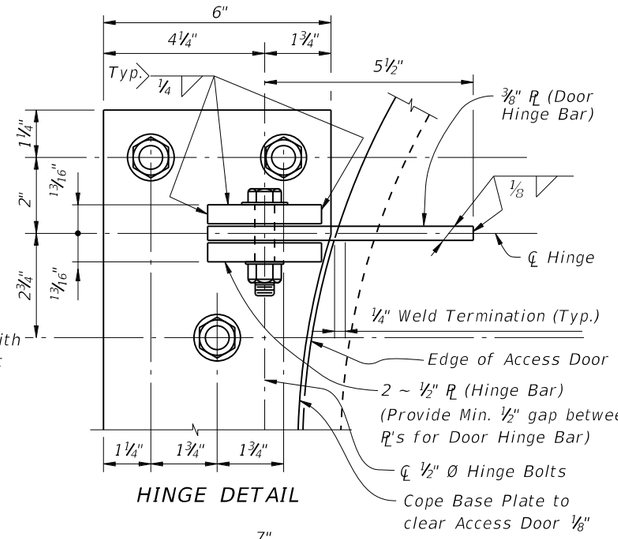
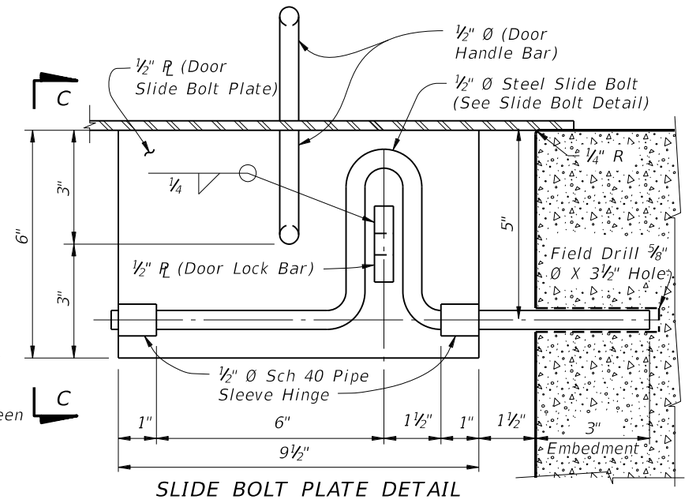
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
01/01/11			FDOT DESIGN STANDARDS 2013	ACCESS HATCH ASSEMBLY FOR STEEL BOX SECTIONS	21250	1



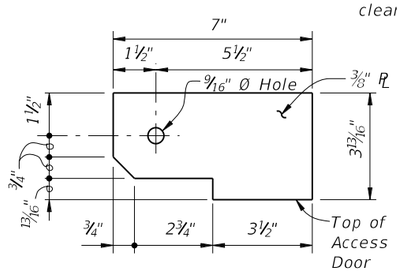
PLAN VIEW OF ACCESS HATCH ASSEMBLY



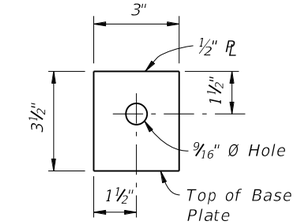
HINGE DETAIL



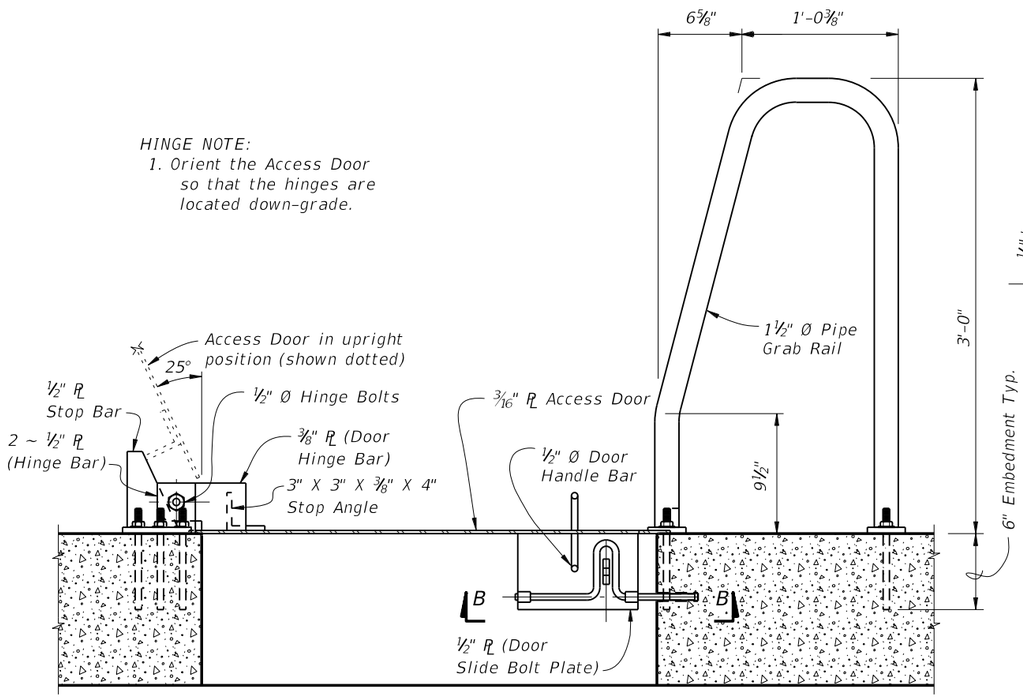
SLIDE BOLT PLATE DETAIL



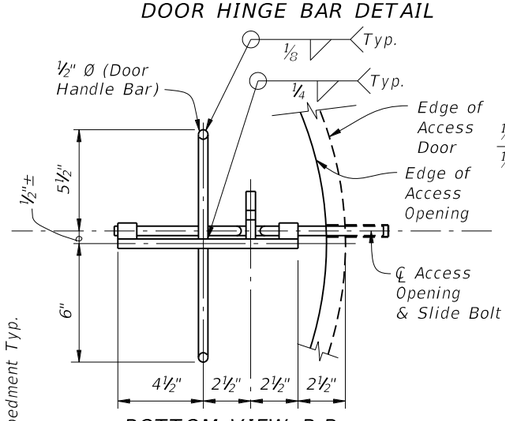
DOOR HINGE BAR DETAIL



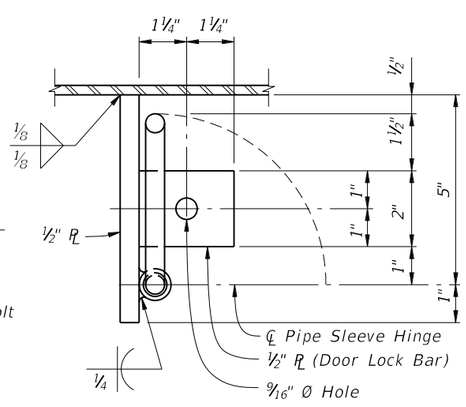
HINGE BAR DETAIL



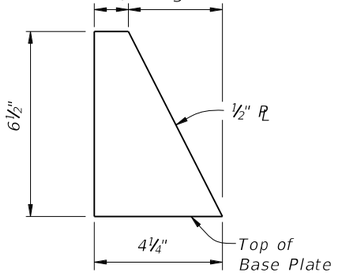
SECTION THRU ACCESS OPENING



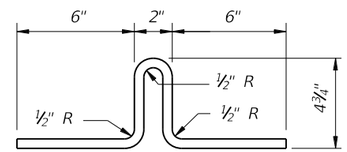
BOTTOM VIEW B-B



VIEW C-C



STOP BAR DETAIL



SLIDE BOLT DETAIL

NOTES:
1. All Structural Steel material in Access Door Assemblies shall conform to ASTM A709 Grade 36.
2. 1½" Ø Pipe Grab Rail shall be in accordance with ASTM A53 Grade B for standard weight pipe (Schedule 40).
3. ½" Ø Door Handle Bar shall be in accordance with ASTM A36.
4. All bolts shall conform to ASTM A307 or A449. All nuts shall conform to ASTM A563 and all washers shall conform to ASTM F-436.
5. All exposed edges of plates and openings shall be ground smooth.
6. See Framing Plan sheets for locations of Access Door Openings.
7. Coat structural steel in accordance with Specification Section 560.
8. All costs associated with Access Hatch Assembly and incidental items will be paid for under the Access Hatch Assembly pay item. No separate payment will be made for coating structural steel.

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LAST REVISION	REVISION	DESCRIPTION:				
01/01/11			FDOT DESIGN STANDARDS 2013	ACCESS HATCH ASSEMBLY FOR CONCRETE BOX SECTIONS	INDEX NO. 21251	SHEET NO. 1