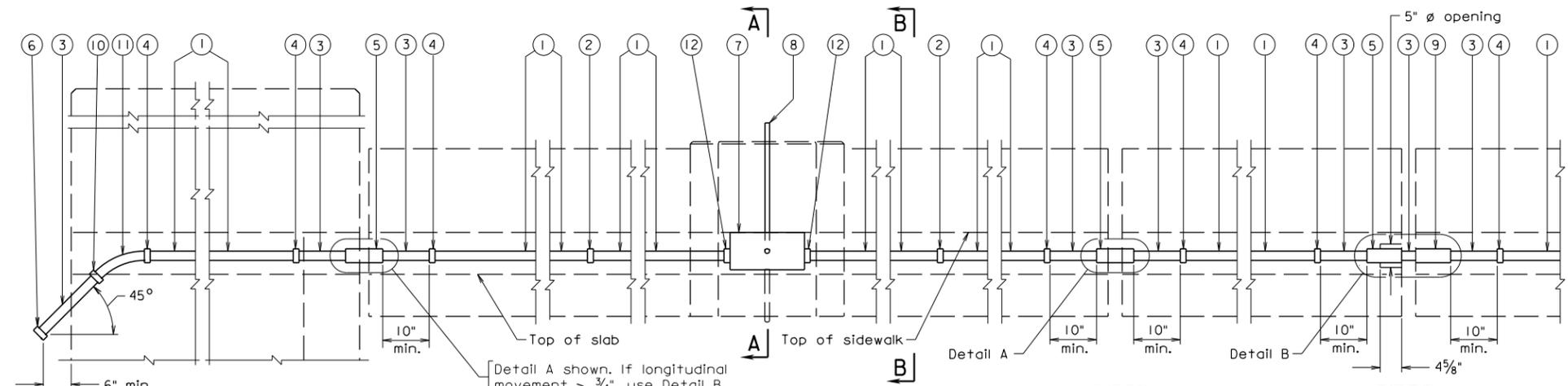
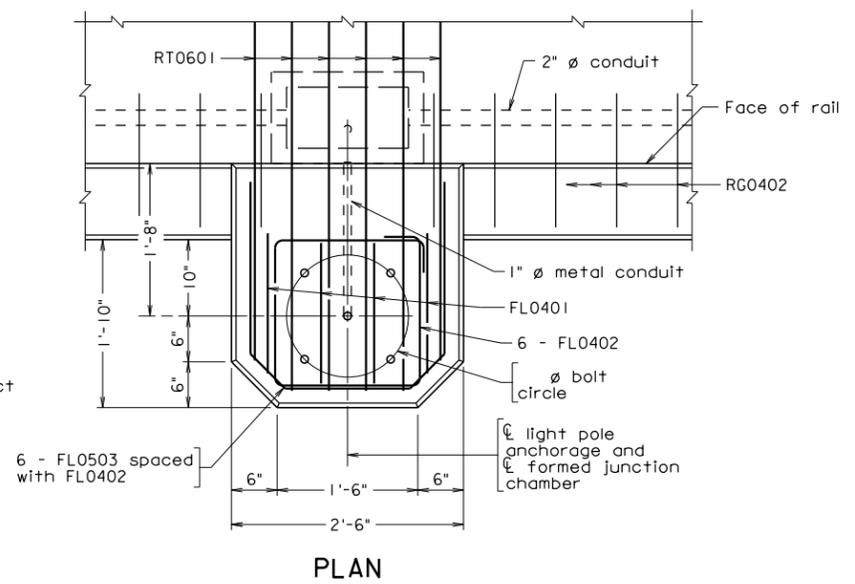


STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.			

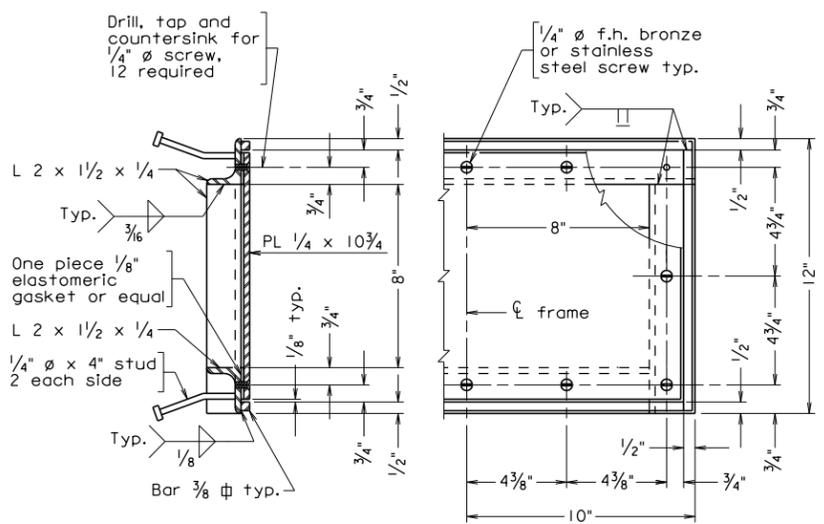


- ① 2" ϕ nonmetallic conduit
- ② Nonmetallic coupling
- ③ 2" ϕ metal conduit
- ④ Adapter to connect nonmetallic conduit to metal conduit
- ⑤ Metal expansion and deflection fitting
- ⑥ 2" ϕ pipe cap
- ⑦ 8" x 8" x 1'-4" junction box
- ⑧ 1" ϕ metal conduit. Furnish locknut and bushing to connect conduit to junction box.
- ⑨ Metal expansion fitting
- ⑩ Pipe coupling
- ⑪ 2" ϕ 45° 13" R steel elbow
- ⑫ Bell fitting or bushing to connect conduit to junction box

CONDUIT LAYOUT
Scale: $\frac{3}{4}" = 1'-0"$
(Railing not shown)



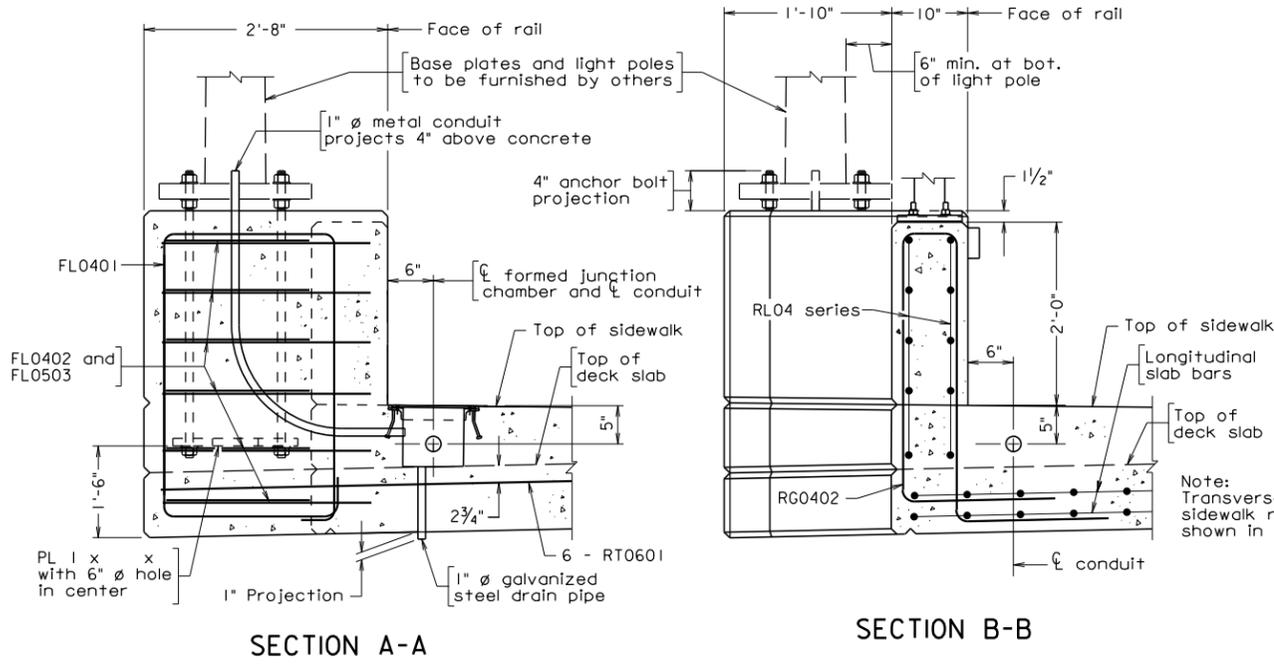
PLAN



JUNCTION CHAMBER FRAME
Scale: $3" = 1'-0"$

Abutment	Pier	Longitudinal Movement	t	Detail Type
.
.
.
.
.

When deck is continuous over pier, expansion and deflection fitting detail is not required.



SECTION A-A

SECTION B-B

Scale: $1" = 1'-0"$ unless otherwise shown.

Notes:

All reinforcing bars shall be Corrosion Resistant Reinforcing Steel, Class ...

Cut or bend bars to clear junction chamber.

Close adherence to the manufacturer's requirements in regard to clearances for the installation of deflection fittings shall be observed.

Junction chamber frame and cover to be galvanized, after fabrication, in accordance with ASTM A123.

Cost of Bridge Conduit System and anchorages shall be included in price bid for railing.

Anchor bolt specification:

- Nuts (Top): ASTM F467 Alloy 6262-T9 or 6061-T6, (Bottom): ASTM A563.
- Thread series for all nuts to be UNC-2B.
- Washers (Top): ASTM B209 Alloy Alclad 2024-T3 or T4, 2 1/4" ϕ x 0.165". (Bottom): ASTM F844.
- Rods: 1" diameter, ASTM A276, type 430 or 410 annealed, hot finished. Threads on rods may be rolled or cut. 3/2" at each end of rod shall be threaded. Each rod shall be supplied with 3 washers and 3 nuts.

In the designations noted above, top refers to hardware above the top of baseplate. Bottom refers to hardware below the baseplate including embedment in concrete.

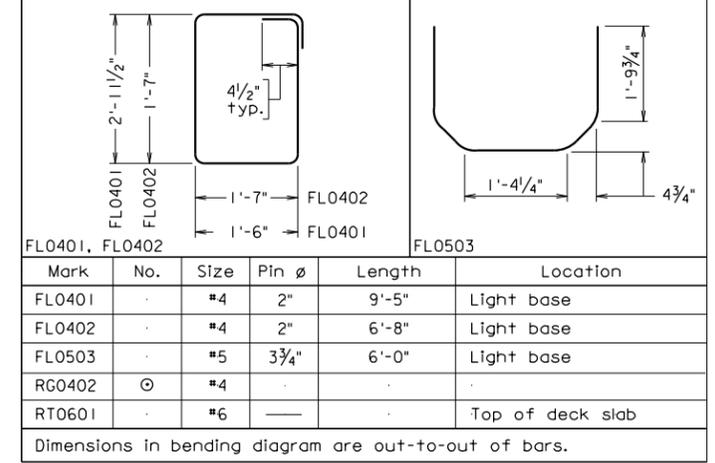
Longitudinal movement is the maximum amount of movement of the expansion and deflection fitting calculated for placement at 60° F and shall be adjusted in accordance with manufacturer's requirements. The amount of movement shall be increased or decreased for every 10° F temperature drop or rise respectively by t.

The Contractor shall determine all dimensions and details necessary for installation.

Conduit shall be grounded in conformance with Section 700 with grounding materials that conform to Section 238.

Location of light pole shall be adjusted such that rail post clears the light pole base area.

REINFORCING STEEL SCHEDULE



Mark	No.	Size	Pin ϕ	Length	Location
FL0401	.	#4	2"	9'-5"	Light base
FL0402	.	#4	2"	6'-8"	Light base
FL0503	.	#5	3 3/4"	6'-0"	Light base
RG0402	⊙	#4	.	.	.
RT0601	.	#6	—	.	Top of deck slab

Dimensions in bending diagram are out-to-out of bars.
⊙ Bars RG0402 are detailed and accounted for on the railing detail sheet (BR27C-series).

BCS-31A.dgn 08-07-2012

Sealed and Signed by:
Julius F.J. Volgyi Jr.
Lic. No. 010487
On the date of
Aug. 7, 2012

A copy of the original sealed and signed standard drawing is on file in the Central Office.

VDOT S&B DIVISION
RICHMOND, VA
STRUCTURAL ENGINEER

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
STRUCTURE AND BRIDGE DIVISION

BRIDGE CONDUIT SYSTEM

No.	Description	Date	Designed: S&B...DIV	Date	Plan No.	Sheet No.
			Drawn: ...S&B...DIV			
			Checked: S&B...DIV			

BCS-31A

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**BRIDGE CONDUIT SYSTEM
FOR LIGHTING WITH STEEL RAILING
BR27C-SERIES WITH SIDEWALK**

NOTES TO DESIGNER:

Standard is to be used only when lighting is installed as part of project and used with the Railing standard BR27C-series with sidewalk and when all railings are attached on the traffic side of the rail posts. Terminal wall for the steel railing is located on abutment or U-back wing.

Access to junction chamber is on the concrete sidewalk floor

Light pole anchorage is designed in accordance with AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, 4th Edition (2001), including Interim Specifications. Design requirements are as follows:

Pole mounting height: 40 feet
Pole size: avg. 6" O.D. (8" O.D. on base)
Bracket arm: length: 6'-0"; weight of truss: 15 lbs.

Size of luminaire: 3.2 sq. ft.
Weight of luminaire: 81 lbs.
Bolt circle for anchorage (base plate): 11" diameter thru 16" diameter

Light pole anchorage is to be located no closer than 4 feet to abutment (backwall) or parapet joint. Show location of centerline of light pole anchorage(s) on appropriate plan sheet, normally plan of deck slab. The standard provides for adequate pole clearance for placement of the rail on the front or back face of the post.

Size of junction chamber: 8" x 8" x 1'-4" if there is enough depth in the concrete sidewalk. Conduit size: 2" diameter. Show location and size of conduit(s) on transverse section sheet. Show location of junction chambers on appropriate plan sheet, normally plan of deck slab.

For larger conduits the bend radius in the conduit (steel elbow and nonmetallic elbow) and the run of the junction chamber need to be changed in the CONDUIT LAYOUT. The minimum run for the junction chamber is 8 x nominal diameter of conduit. For example, the minimum run for a 2" dia. conduit is 1'-4" (8 x 2" = 16" = 1'-4"). If larger conduit is used, JUNCTION CHAMBER FRAME needs to be adjusted, i.e., spacing of screws needs to be adjusted. Also, the size of the concrete blister needs to be adjusted to provide additional space between the junction chamber and the light anchorage.

Longitudinal movement (for filling table):

Coefficient of linear expansion of:

concrete: 0.000006 in./in./°F (AASHTO *Standard Specification for Highway Bridges*, 1996; 1997 and 1998 Interim Specifications; and VDOT modifications, Article 8.5.3)

steel: 0.0000065 in./in./°F (AASHTO *Standard Specification for Highway Bridges*, 1996; 1997 and 1998 Interim Specifications; and VDOT modifications, Article 10.2.2)

**BRIDGE CONDUIT SYSTEM
FOR LIGHTING WITH STEEL RAILING
BR27C-SERIES WITH SIDEWALK**

NOTES TO DESIGNER (cont'd):

Temperature ranges (AASHTO *Standard Specification for Highway Bridges*, 1996; 1997 and 1998 Interim Specifications; and VDOT modifications, Article 3.16):

concrete structures: 40°F

steel structures: 60°F

Example: Steel structure, 250 feet of expansion

Longitudinal movement = $250 \times 0.0000065 \times 60 = 0.0975 \text{ ft} = 1 \frac{1}{8} \text{ in.}$
 $t \text{ (movement/10°F)} = 250 \times 0.0000065 \times 10 = 0.01625 \text{ ft} = \frac{3}{16} \text{ in.}$

ADD THE FOLLOWING NOTES, DIMENSIONS, DETAILS, ETC. TO STANDARD:

PLAN:

Add diameter of bolt circle.

SECTION A-A:

Add size of plate.

TABLE:

Complete table. Use $\frac{1}{8}$ " multiples for longitudinal movement. Use $\frac{1}{16}$ " multiples for t (movement/10°F).

For reinforcing steel schedule, complete the No. (number of bars) column.
For RT0601, input the length of bar.

NOTES:

Complete first note by adding the Class I, II or III of corrosion resistant reinforcing steel required.
For additional information on corrosion resistant reinforcing steel (CRR), see Structure and Bridge Division Memorandum (current IIM-S&B-81).