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

Notes:

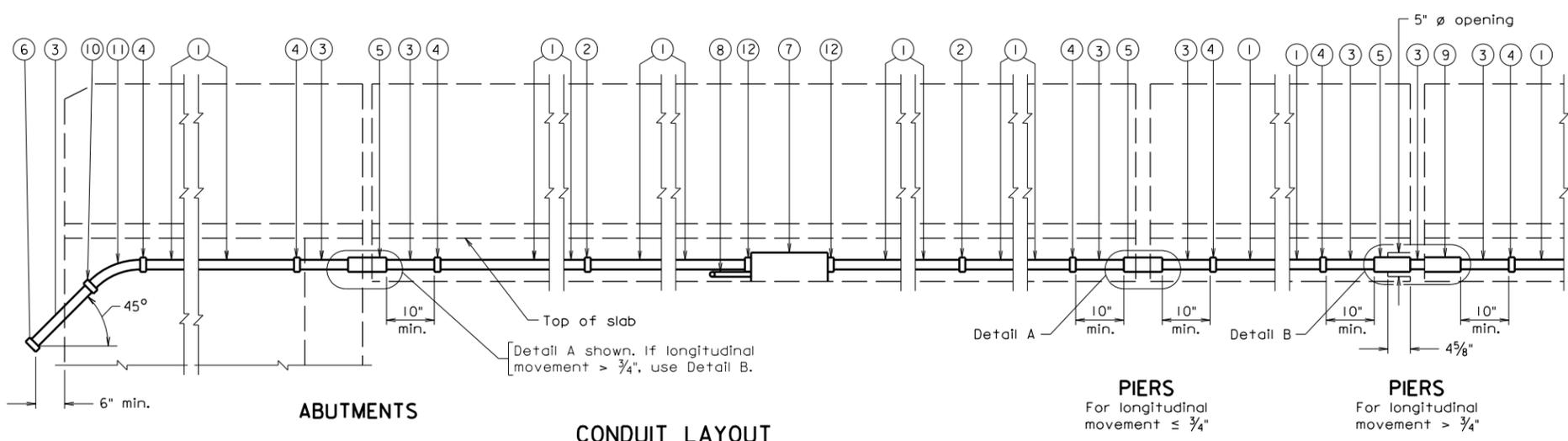
Close adherence to the manufacturer's requirements in regard to clearances for the installation of deflection fittings shall be observed.

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

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.

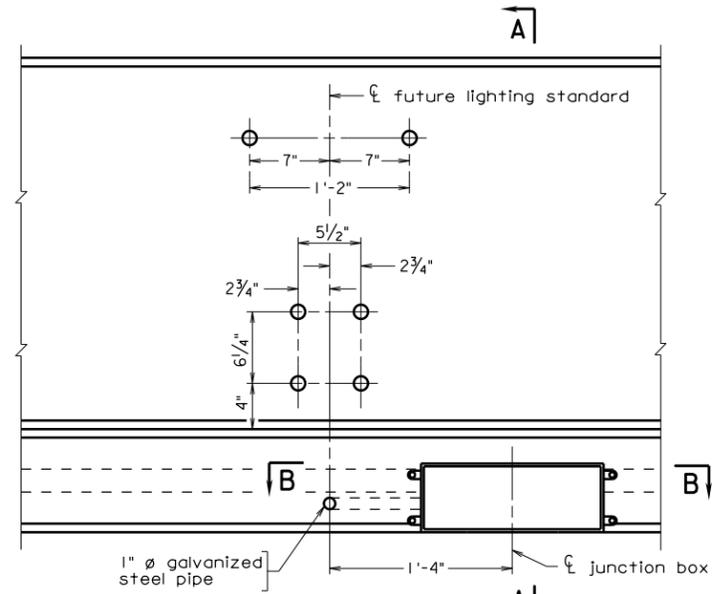
The Contractor shall determine all dimensions and details necessary for installation.

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

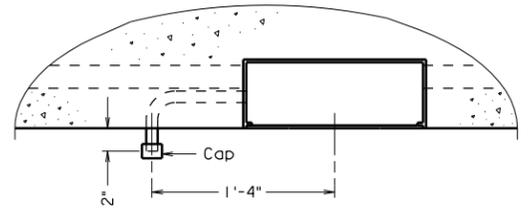


- ① 2" ϕ nonmetallic conduit
- ② Nonmetallic coupling
- ③ 2" ϕ metal conduit
- ④ Adapter to connect nonmetallic conduit to metal conduit
- ⑤ Metal expansion and deflection fitting
- ⑥ 2" ϕ pipe cap
- ⑦ 8" x 6" x 1'-4" junction box
- ⑧ 1" ϕ galvanized steel pipe. Furnish locknut and bushing to connect 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

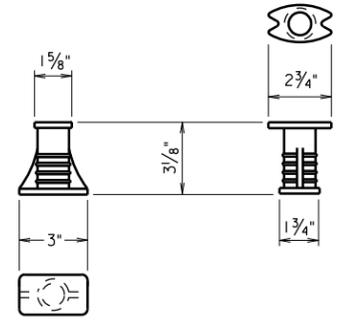
CONDUIT LAYOUT
Scale: 3/4" = 1'-0"



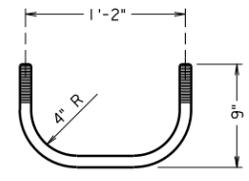
ELEVATION



SECTION B-B



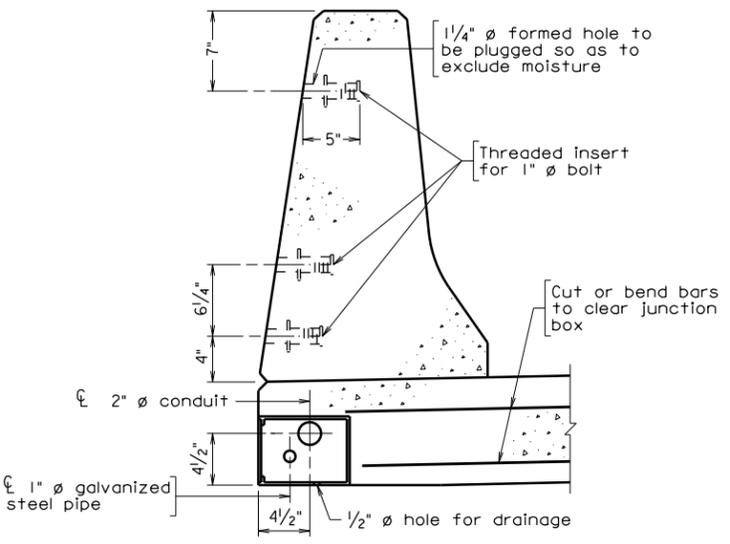
THREADED INSERT FOR 1" ϕ BOLT
Scale: 3" = 1'-0"



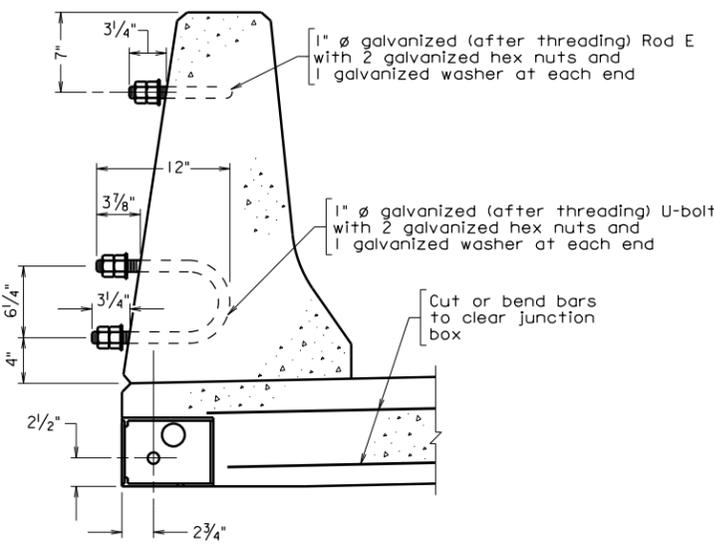
1" ϕ GALVANIZED ROD E

| Abutment | Pier | Longitudinal Movement | + | Detail Type |
|----------|------|-----------------------|---|-------------|
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When deck is continuous over pier, expansion and deflection fitting detail is not required.



SECTION A-A



ALTERNATE SECTION A-A

Scale: 1/2" = 1'-0" unless otherwise shown. ©2010, Commonwealth of Virginia

bcs21a.dgn

06-14-2010

BCS-21A

Sealed and Signed by:
Julius F.J. Volgyi Jr.,
Lic. No. 010487
On the date of
June 14, 2010

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 |
| | | | Drawn: S&B DIV | Plan No. |
| | | | Checked: S&B DIV | Sheet No. |
| Revisions | | | BCS-21A | |

**BRIDGE CONDUIT SYSTEM
FOR FUTURE LIGHTING
WITH F-SHAPE PARAPET**

NOTES TO DESIGNER:

Standard is to be used only when lighting is not installed as part of project but at some future date and only the conduit and anchorage system is required. Details are for use with F-shape parapet. Terminal wall for parapet is located on abutment or U-back wing.

Access to junction box is from the outside of the parapet, not from the traffic side.

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.

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.

Size of junction chamber: 8" x 6" x 6". Show location of junction box(es) on appropriate plan sheet, normally plan of deck slab. Conduit size: 2" diameter. Show location and size of conduit(s) on transverse section sheet. For larger conduits the bend radius in the conduit (steel elbow) in the CONDUIT LAYOUT needs to be changed.

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)

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

**BRIDGE CONDUIT SYSTEM
FOR FUTURE LIGHTING
WITH F-SHAPE PARAPET**

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

TABLE:

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