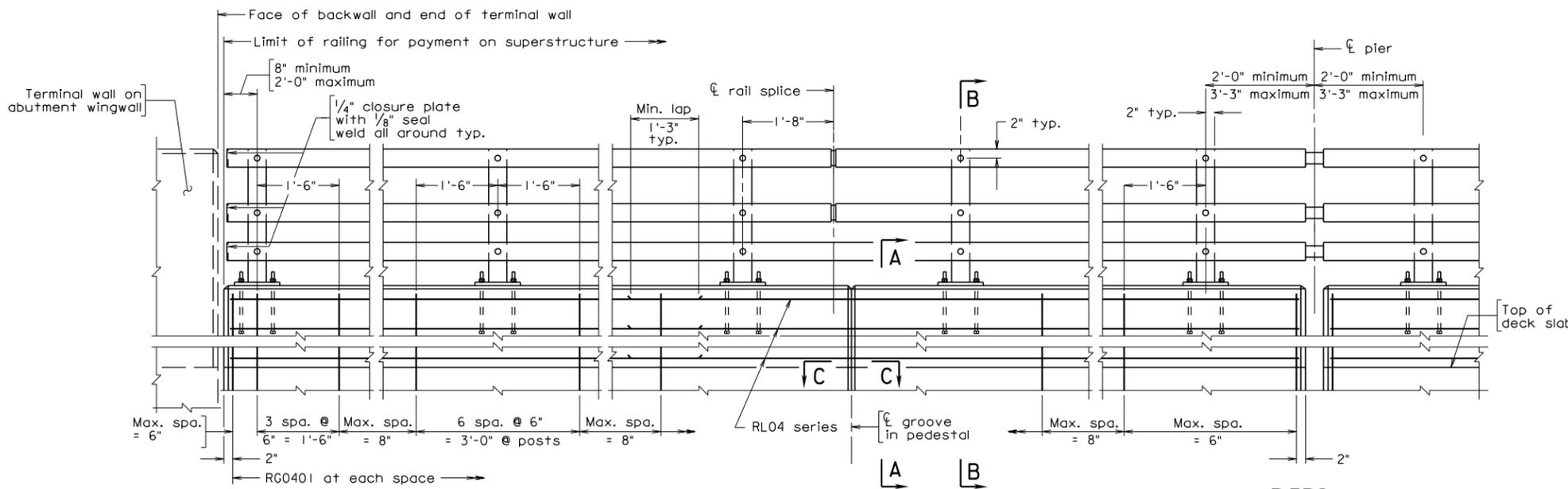


STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	NO.
VA.			



ABUTMENTS

PIERS with joint in slab

ELEVATION

Notes:

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

All concrete shall be Class A4.

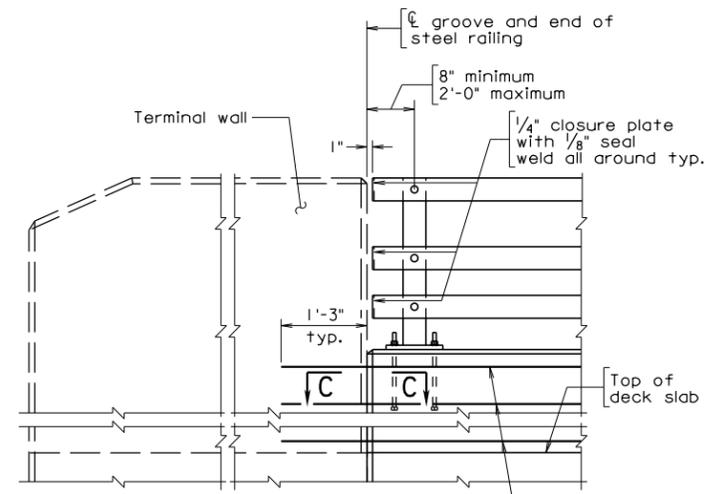
All bevels for concrete on this sheet shall be 3/4". Rounded edges with 1" radius may be used in lieu of bevels along top or railing.

Plates shall be ASTM A36 steel.

Posts and rail members shall be ASTM A500 Grade B steel. Steel pipe sleeves shall be ASTM A53. Round head bolts shall be ASTM449. All other bolts shall be ASTM A 325. Nuts shall be ASTM A563, Grade DH or ASTM A194, Grade 2H and washers shall be ASTM F436. All steel shall be hot dip galvanized.

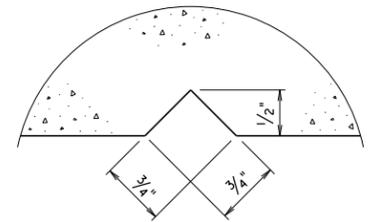
Posts shall be seated on neoprene pads 1/8" minimum thickness, having a nominal durometer hardness of 60. Pads shall conform to post base dimensions.

Bolts for attaching rails to posts are 3/4" diameter round head (with slot in head) with hex nut and washer. Holes in post and railing tubing shall be 7/8" diameter. Bolt extensions beyond the nut shall be limited to the smaller of one and a half finishing turns or 1/4 inch. If the extension is longer, the excess will be cut off, the edges of the bolt end ground so that no sharp edges remain and cold galvanizing applied to damaged galvanized areas.

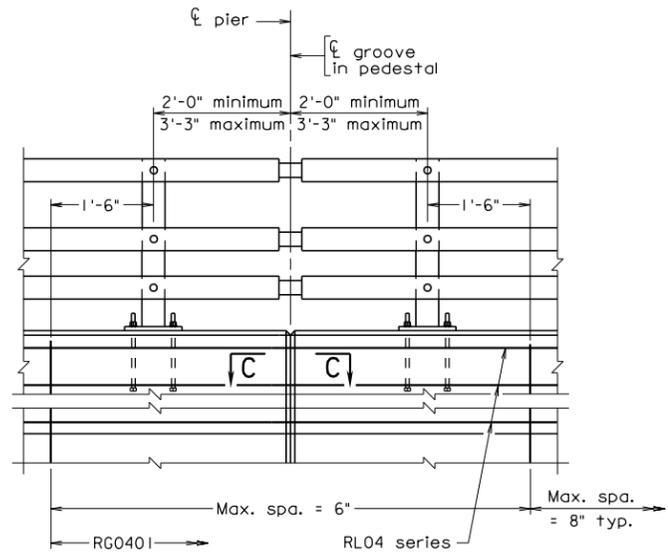


ABUTMENT

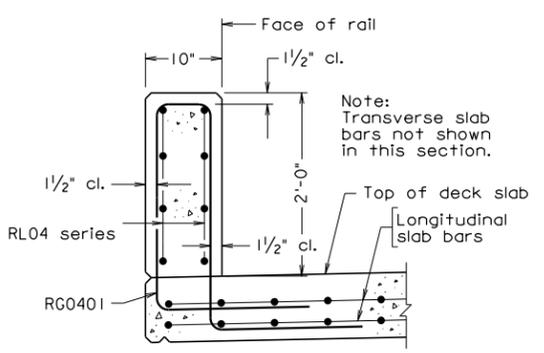
PART ELEVATION Terminal Wall on Superstructure



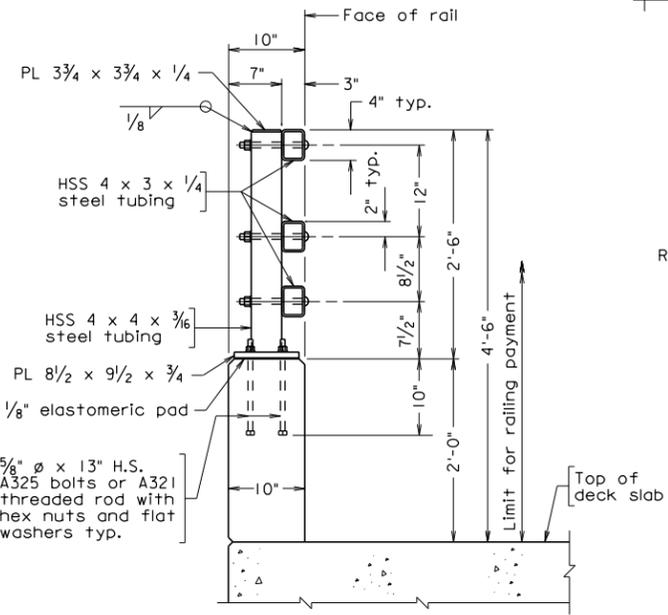
SECTION C-C Full scale Groove detail for both sides of rail



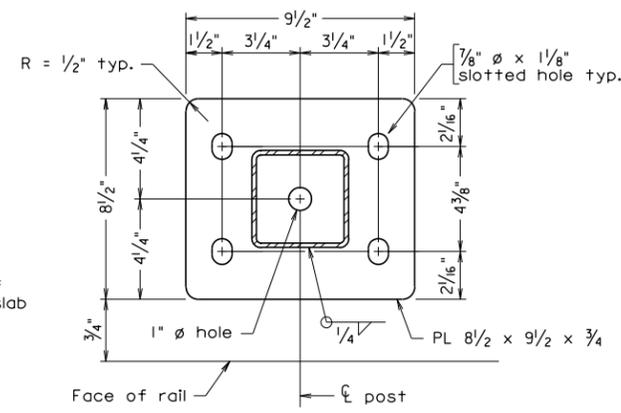
PIERS Continuous - without joint in slab



SECTION A-A Scale: 1" = 1'-0"



SECTION B-B Scale: 1" = 1'-0"



BASE PLATE DETAIL Scale: 1" = 1'-0"

Cut bottom of posts to match cross slope before welding so that posts will be vertical. Steel shims may be used for adjusting post alignment, maximum thickness of shim build-up not to exceed 1/8". Where more tilting of the post is required, the concrete shall be ground down.

Anchor bolts may be set normal to profile grade.

Barrier delineator size, color, and spacing to be in accordance with the Specifications. Cost of delineator to be included in the price bid for railing. Reflective surface of barrier delineator, in all instances, to be facing oncoming traffic.

1/2" diameter drain holes shall be provided in both top and bottom rails approximately half-way between posts except at open joints near piers. Drain holes shall be provided at each low end of rail.

Spacing of grooves for U-back wings to be approximately 8'-0". Maximum spacing of grooves in pedestal shall be limited to 3 x post spacing, shall be centered between posts and shall be no closer than 10'-0" to joints.

Plan dimensions shown are measured in the respective horizontal and vertical planes. The reinforcing steel shown has been detailed based on a standard 1/4" per foot cross slope. The Contractor shall adjust the reinforcing steel as required for other cross slopes.

For details and reinforcing steel schedule of terminal wall, see sheet ...

For details of rail connections and additional notes, see sheet...

REINFORCING STEEL SCHEDULE					
Mark	Size	No.	Length	Pin $\phi$	Location
RG0401	#4			3"	Parapet
RL04	#4				Parapet

Dimensions in bending diagram are out-to-out of bars.

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION					
STRUCTURE AND BRIDGE DIVISION					
54"-BR27C STEEL RAILING					
No.	Description	Date	Designed: S&B...DIV	Date	Plan No.
			Drawn: ...S&B...DIV		Sheet No.
Revisions			Checked: S&B...DIV	BR27C-14	

BR27C-14 12-14-2012 br27c14.dgn

Sealed and Signed by:  
Julius F.J. Volgyi Jr.  
Lic. No. 010487  
On the date of  
December 14, 2012

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

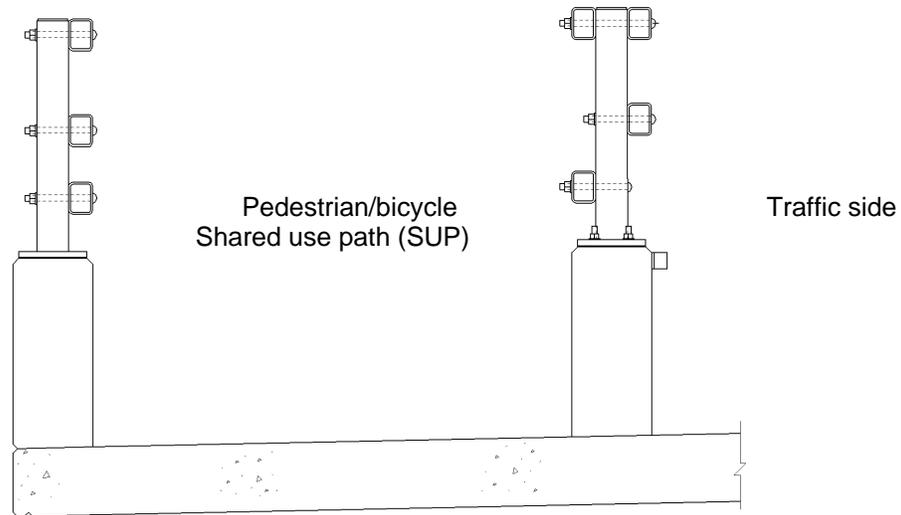
VDOT S&B DIVISION  
RICHMOND, VA  
STRUCTURAL ENGINEER

## 54"-BR27\_ STEEL RAILING

### BR27C-SERIES

#### NOTES TO DESIGNER:

This railing is detailed for pedestrian/bicycle shared use path (SUP) and used on the outside of a structure provided that there is a traffic barrier separating the pedestrian/bicycle access from traffic (ie., standard BR27C-13). For railing mounted on a sidewalk utilizing pedestrian/bicycle access without a traffic barrier, see Standard BR27C-15. The steel railing has a height of 4'-6" and has been crash tested for TL-4 (TL = test level). The crash tested rail has been modified to meet the rail opening requirements of the AASHTO *Standard Specifications for Highway Bridges* as well as the AASHTO *LRFD Bridge Design Specifications*. A design exception has been approved by the FHWA. The standard may be used when an open railing is required.



**On Outside of Structure**

**On Inside of Structure  
(Standard BR27C-13)**

#### **BR27C-14 STEEL RAILING**

SUP: For geometrics of shared used path, see Office Practice, Vol V – Part 2, Chapter 6, sheets 4-10 to 4-16.

Bid Item: Do not use the non-standard bid item for this rail. The bid item for this rail shall be RAILING BR27C 3 RAILS. See Office Practice, Vol. V – Part 2, Chapter 3.

The rail connections and fabricator's notes (BR27C-16) is to be included in the plans when using this standard. The appropriate terminal wall standard (BR27T-5 to BR27T-8) is added if the terminal wall is to be on the superstructure. The guard rail transitioning from the roadway will not be attached to the terminal wall on the outside of structure, but on the inside of structure. Therefore, the terminal wall standard selected would have to be modified by removing details and notes that pertain to guard rail attachment.

## **STANDARD BR27C-14: NOTES TO DESIGNER**

VOL. V - PART 3  
DATE: 14Dec2012  
SHEET 2 of 3  
FILE NO. BR27C-14-2

## 54"-BR27\_ STEEL RAILING

### BR27C-SERIES

#### NOTES TO DESIGNER: (cont'd)

If an initial bituminous overlay is used on the bridge at the time of construction, vertical dimensions and dimensions for reinforcing steel need to be adjusted. The dimensions shown are established from the top of the roadway surface. Therefore, for example if 1" overlay at the roadway surface is set, the 2'-0" dimension and overall 4'-6" height of the rail would need to be adjusted to 2'-1" and 4'-7" respectively (Section B-B) and the 2'-0" dimension in Section A-A would have to be adjusted to 2'-1".

It is the Contractor's responsibility to determine the number of reinforcing bars required as well as any details or dimensions. Therefore, these items are to be left blank in the Reinforcing Steel Schedule.

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

##### SECTION A-A:

Modify vertical dimension (2'-0") as noted above if an initial overlay is used on bridge.

##### SECTION B-B:

Modify vertical dimensions (2'-0" and 4'-6" railing height) as noted above if an initial overlay is used on bridge.

##### 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).

Complete sheet no. for terminal wall if added in the plans.

Complete sheet no. for rail connections and fabricator's notes.

##### REINFORCING STEEL SCHEDULE:

Add dimensions and length for rebar RG0401.

##### TITLE BLOCK:

Replace standard designation with Plan No.