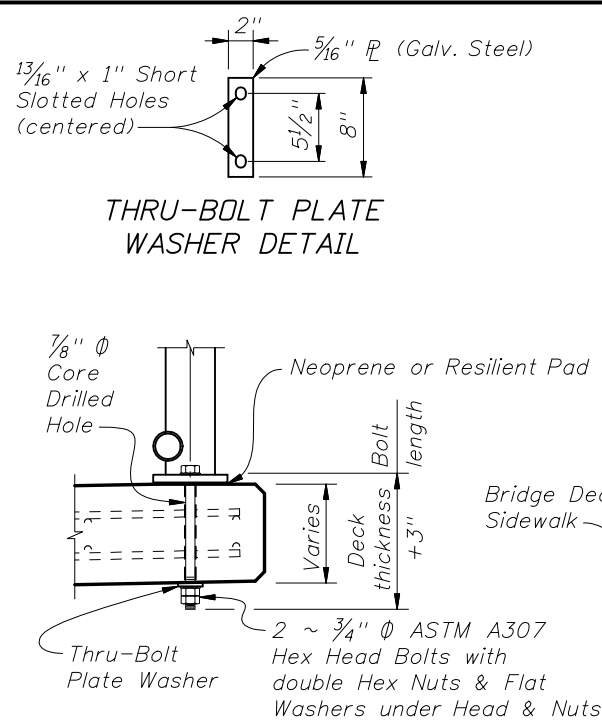
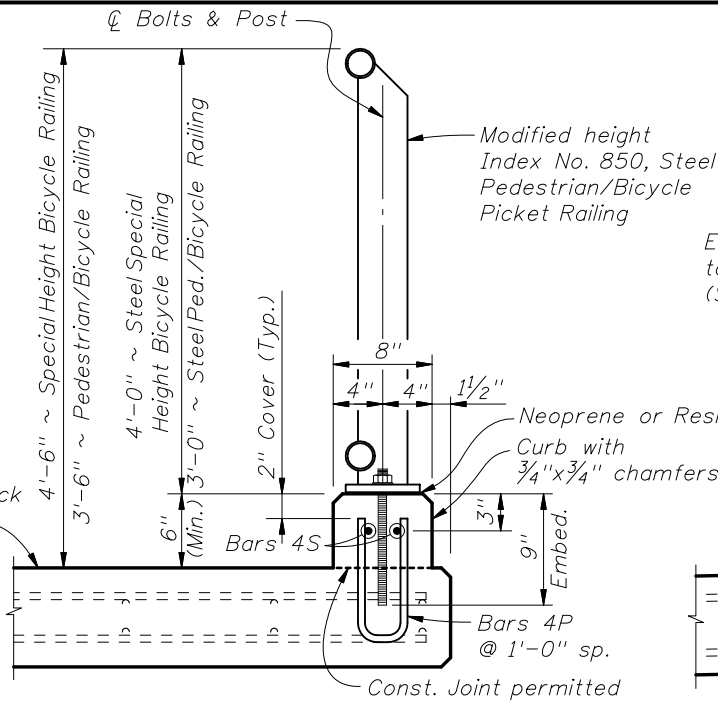


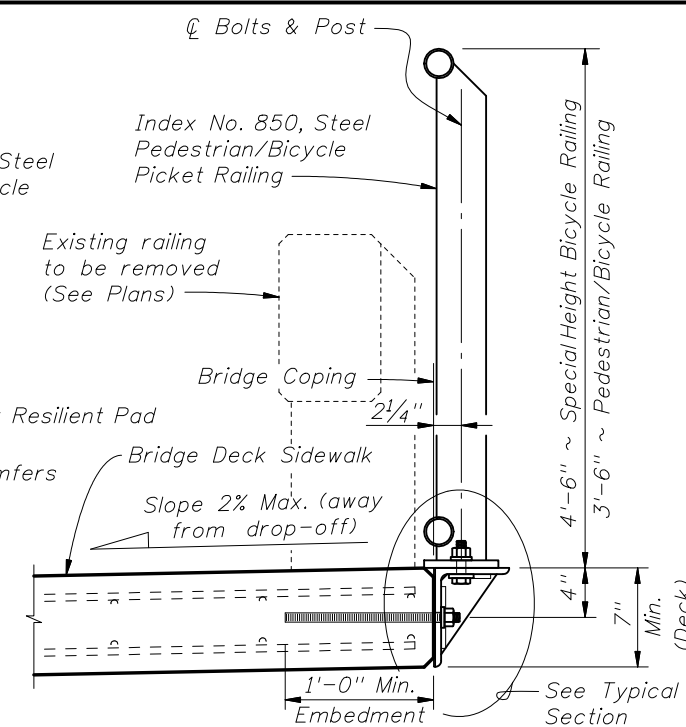
SCHEME 1 -
TYPICAL SECTION THROUGH DECK MOUNTED RAILING
(Adhesive Anchor Option shown - SCHEME 1A)



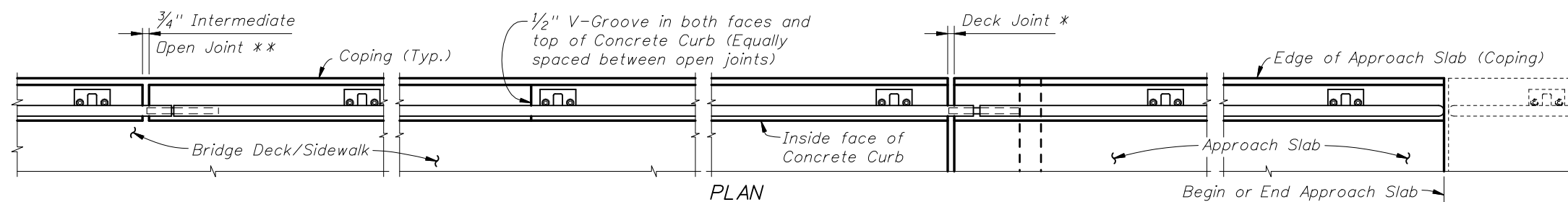
SCHEME 1B - DETAILS
(Thru-Bolt Option)



SCHEME 2 -
TYPICAL SECTION THROUGH CURB MOUNTED RAILING



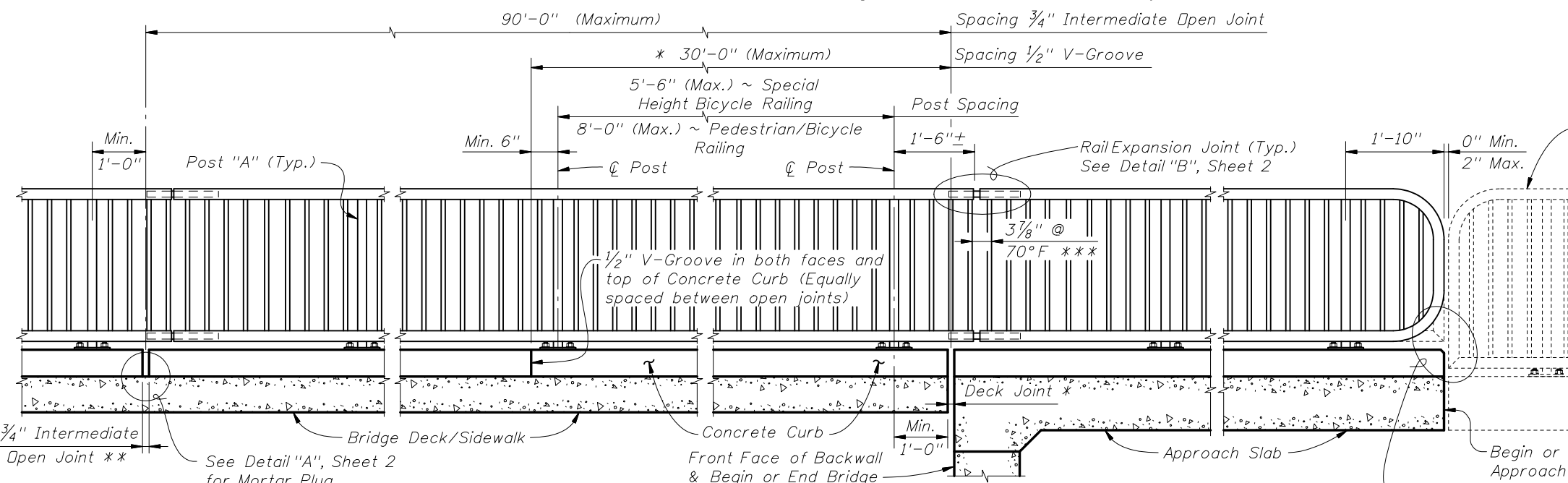
SCHEME 3 -
TYPICAL SECTION THROUGH SIDE MOUNTED RAILING (RETROFIT)



PLAN
(Scheme 2 shown, other Schemes similar, Reinforcing Steel not shown for clarity)

INSTRUCTIONS TO DESIGNER:

1. Provide railing layout ControlDrawings in the Plans to show post spacing, curb joint, V-groove, deck joint, expansion joint locations and Scheme number.
2. For existing bridge retrofits special end treatment details may be required for perpendicular or flared wingwalls at Begin and End Bridge. Provide existing railing removal details when required.



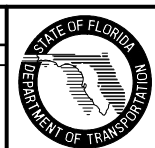
ELEVATION OF INSIDE FACE OF RAILING
(Scheme 2 shown, other Schemes similar, Reinforcing Steel not shown for clarity)

* See Structures Plans, Superstructure Sheets for actual dimensions and joint orientation. Open Curb Joints at Deck Expansion Joint locations shall match the dimension of the Deck Joint. For treatment of Railings on skewed bridges see Index No. 490. Deck Joint at Begin Bridge or End Bridge shown. Deck Joint at ϕ Pier or Intermediate Bent similar.

** $3/4$ " Intermediate Open Joints shall be provided at locations coinciding with $3/4$ " Joints for the Traffic Railing.

*** Clear opening between adjacent pickets at Rail Expansion Joints, above Deck Expansion Joints with a total thermal movement greater than 4", must be reduced to $3/2$ ".

REVISIONS			
DATE	BY	DESCRIPTION	
01/01/08	SJN	Changed Pedestrian and Bicycle Railing designations	



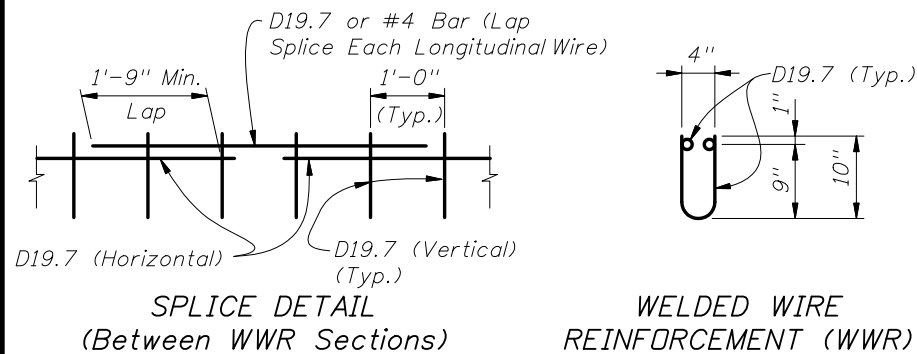
2008 Interim Design Standard

BRIDGE PEDESTRIAN/BICYCLE PICKET RAILING (STEEL)

Interim Date: 01/01/08
Sheet No.: 1 of 2
Index No.: 851

ALTERNATE REINFORCING (WELDED WIRE REINF.) DETAILS

NOTE: Place wire panels to minimize the end overhang. End Overhangs greater than 4 3/4" are not permitted.



CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

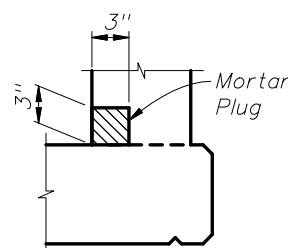
BILL OF REINFORCING STEEL

MARK	SIZE	LENGTH
P	4	2'-0"
S	4	As Reqd.

	As Reqd.
	As Reqd.

CURB REINFORCING STEEL NOTES:

- All bar dimensions in the bending diagrams are out to out.
- The reinforcement for the curb on a retaining wall shall be the same as detailed for an 8" deck.
- All reinforcing steel at the open joints shall have a 2" minimum cover.
- Bars 4S may be continuous or spliced at the construction joints. Bar splices for Bars 4S shall be a minimum of 1'-9".
- At the option of the Contractor Welded Wire Reinforcement (WWR) may be used in lieu of all Bars 4P and 4S. Welded Wire Reinforcement shall conform to ASTM A497.



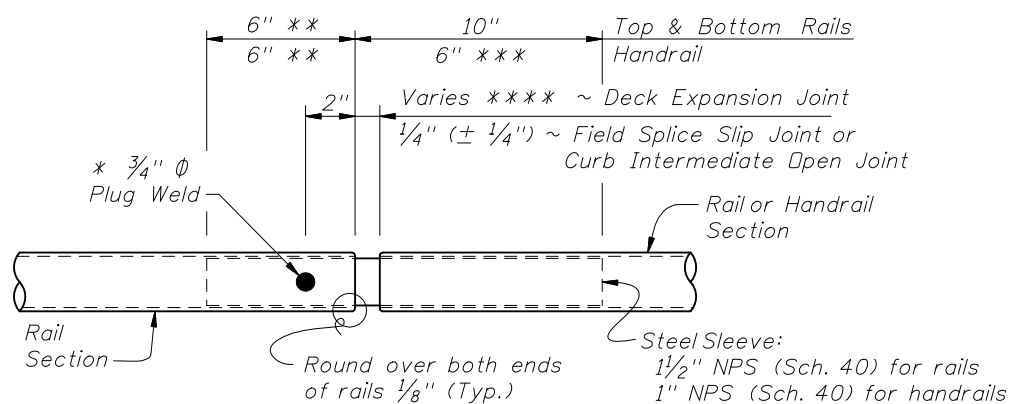
DETAIL "A" - SECTION AT INTERMEDIATE OPEN JOINT

NOTE: At Intermediate Open Joints, the lower 3" portion of the open joint shall be plugged by filling it with mortar in accordance with Section 400 of the Specifications.

ESTIMATED CONCRETE CURB QUANTITIES (SCHEME 2)

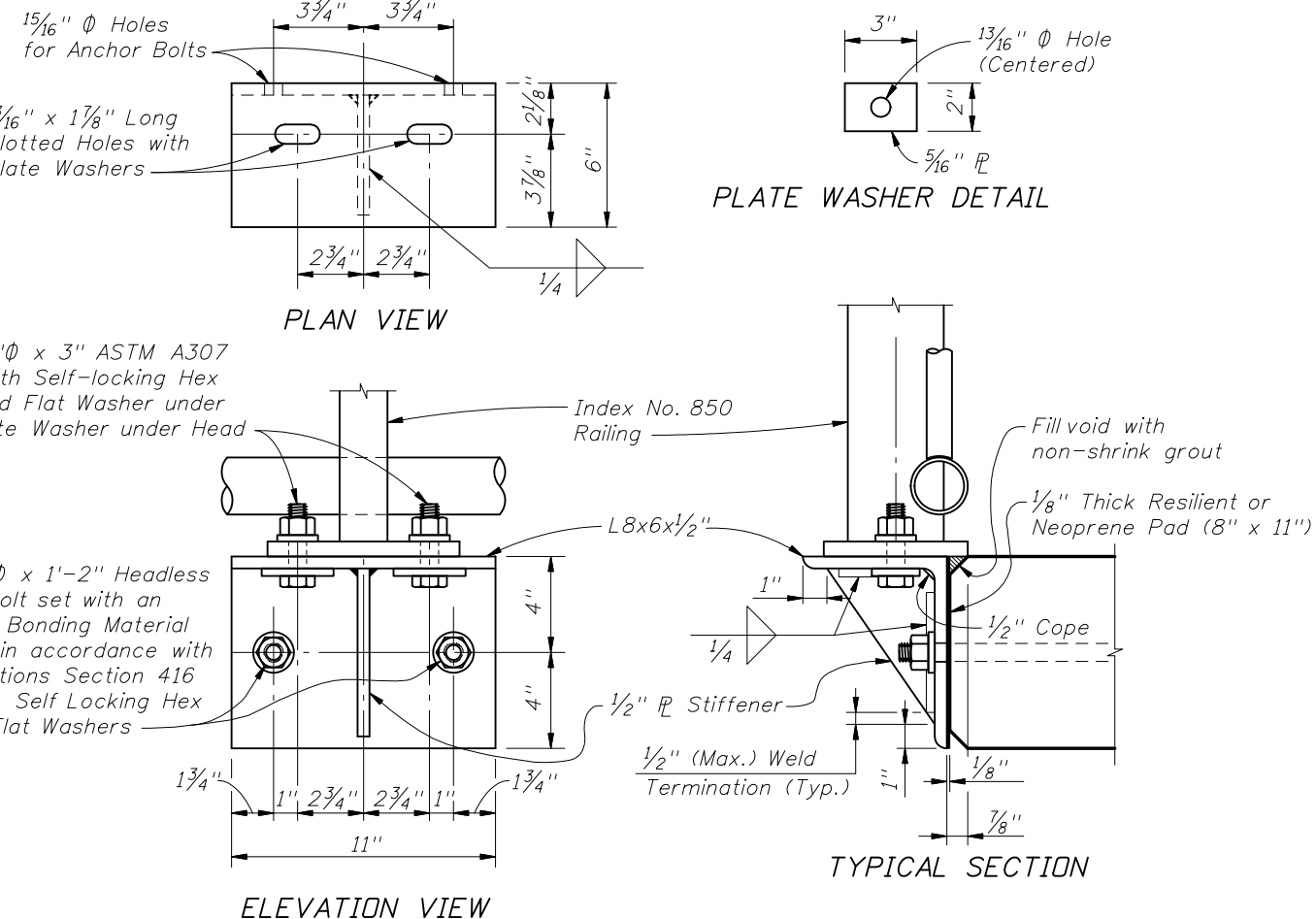
ITEM	UNIT	QUANTITY
Concrete	CY/LF	0.0124
Reinforcing Steel	LB/LF	4.01

SCHEME 2 - CONCRETE CURB DETAILS



DETAIL "B" - EXPANSION JOINT (FIELD SPLICE SLIP JOINT SIMILAR)

- * At the Contractor's option 2 ~ 1/4" Ø x 3/4" Pan Head Stainless Steel (Type 316 or 18-8 Alloy) Set Screws at 2" spacing along outside face of railing may be substituted for the 3/4" Ø plug weld. Set screws must be set flush against the outside face of rail.
- ** Embedded length may be 4" for plug welded connection. Maintain venting of ends of pickets during galvanizing.
- *** Increase handrail sleeve embedment to 8" for Expansion Joint openings greater than 2".
- **** Expansion Joint opening shall match the clear opening in the deck joint but not greater than 3".



SCHEME 3 - SIDE MOUNTED SUPPORT BRACKET DETAILS

BRIDGE PICKET RAILING NOTES:

APPLICABILITY NOTE: Bridge Picket Railing is limited to use on bridges with an expansion joint thermal movements not exceeding 5". Scheme 3 is limited to bridge retrofit applications where additional sidewalk width is required.

RAILING DETAILS: For Railing fabrication and installation details and notes see Index No. 850, except that railing shall be fabricated and installed normal to the Profile Grade longitudinally and vertical transversely.

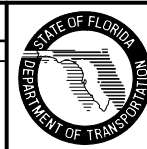
CONCRETE CURB (Scheme 2): Construct concrete curb vertical with the top surface finished level transversely. Concrete class shall be the same as the bridge deck.

SIDE MOUNTED SUPPORT BRACKET (Scheme 3): L-Shape and Stiffener Plate shall be in accordance with ASTM A36. Welding shall be in accordance with the American Society of Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). Weld metal shall be E60XX or E70XX. Nondestructive testing of welds is not required. The bracket shall be hot-dip galvanized after fabrication in accordance with Section 962 of the Specifications.

PAYMENT: Railing shall be paid per linear foot (Item No. 515-2-abb) for the steel railing and include the cost of support brackets (Scheme 3). Concrete and reinforcing steel quantities for the concrete curb (Scheme 2), will be included in the bridge deck plan quantity pay items. Payment will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, pickets, rail splice assembly, base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the railing.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	SJN	Added requirement for set screw to be set flush against outside face of rail and 18-8 Alloy option, in DETAILS "B". Changed field splice joint tolerance to ± 1/4" in Detail "B".			



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Interim Date 01/01/08	Sheet No. 2 of 2
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