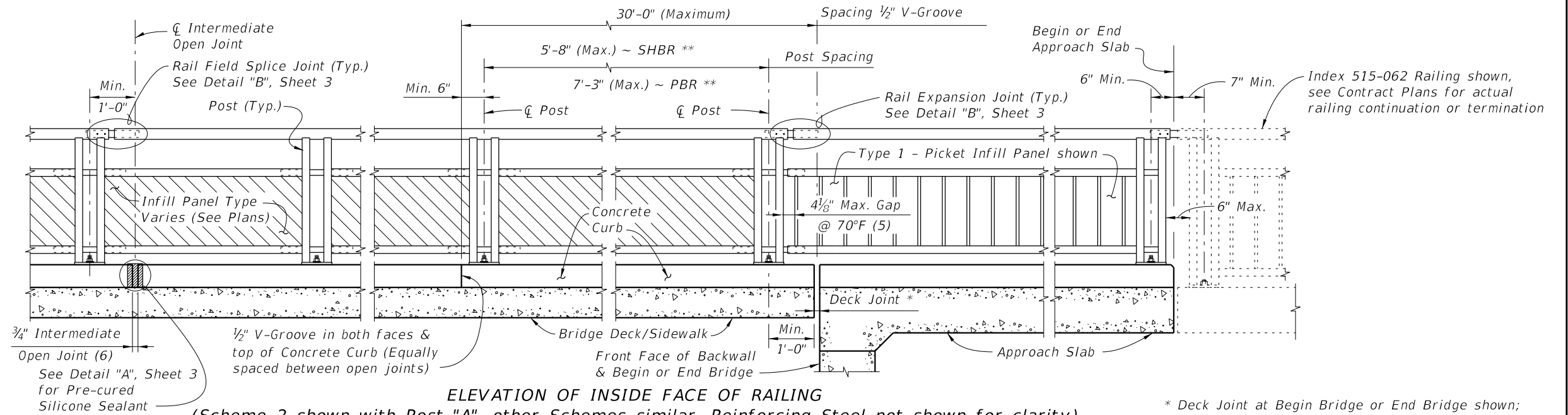


PLAN
(Scheme 2 shown, other Schemes similar, Reinforcing Steel not shown for clarity)



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


* Deck Joint at Begin Bridge or End Bridge shown; Deck Joint at ϕ Pier or Intermediate Bent similar.

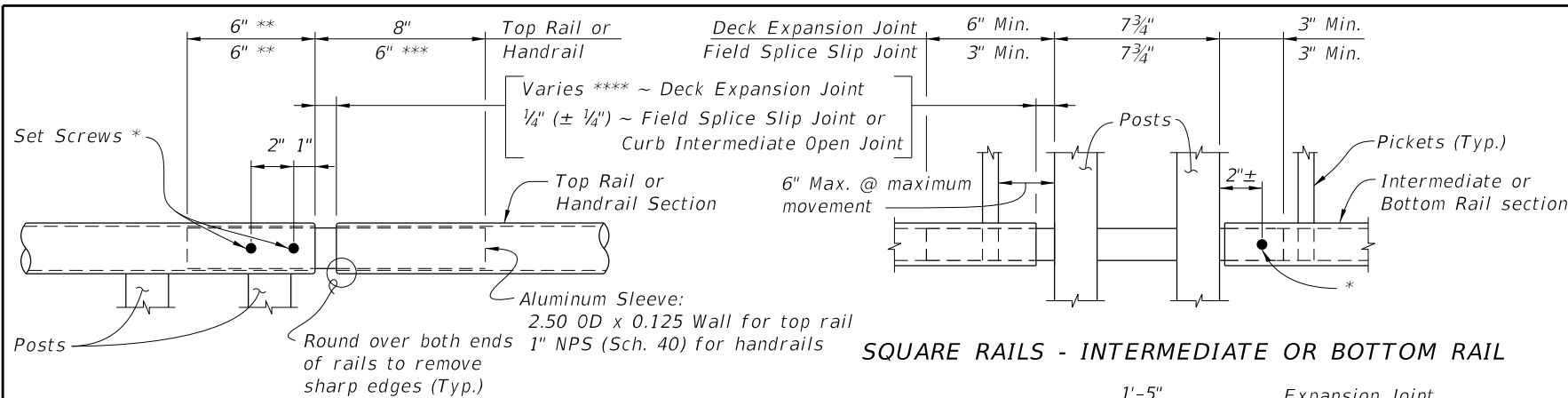
** SHBR ~ Special Height Bicycle Railing
PBR ~ Pedestrian/Bicycle Railing

NOTES:

- Shop Drawings are required.
- Work this Index with Index 515-062 Aluminum Bicycle/Pedestrian Railing Details and Specification Section 515. Refer to the IDS for Design Criteria and Limits of Use.
- Materials:
 - Galvanized Steel Fasteners: Hex Head Bolt ASTM A307, Hex Nuts ASTM A563, Washers ASTM F436
 - Aluminum:
 - Support Bracket (Scheme 3) L-shape and Stiffener Plate: ASTM B209, Alloy 6061-T6
 - Bottle-guard (Schemes 1 & 3) L-shape: ASTM B209, Alloy 6061-T6 or 6063-T5
 - Concrete: Same as bridge deck
 - Pre-cured Silicone Sealant: Specification Section 932
 - Bearing Pads: Provide 1/8" thick Plain, Fabric Reinforced or Fabric Laminated pads meeting the requirements of Specification Section 932 for Ancillary Structures.
- See Structures Plans, Superstructure Sheets for bridge information including concrete type, deck expansion joint locations and orientations, and thermal movement.
- Railings:
 - For thermal movement greater than 4" (up to a maximum of 5"), clear opening between adjacent pickets, or panels at Rail Expansion Joints above Deck Joints must be reduced to 3 1/2".
 - For treatment of railings on skewed bridges see Index 521-427.
- Curbs:
 - Match open curb joints at Deck Expansion Joint locations to the deck joint dimension.
 - Construct Concrete Curb (Scheme 2) vertical with the top surface finished level transversely. See Concrete Curb Details Sheet 3.
 - Provide 3/4" Intermediate open joints in curbs coinciding with the 3/4" joints in the traffic railing.
- Payment: Support bracket (Scheme 3) is incidental to the cost of railing. Curb concrete and reinforcing steel (Scheme 2) are included in the bridge deck quantities.

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2020-21 STANDARD PLANS	BRIDGE PEDESTRIAN/BICYCLE RAILING (ALUMINUM)	INDEX 515-061	SHEET 1 of 3
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ROUND RAILS - TOP RAIL OR HANDRAIL

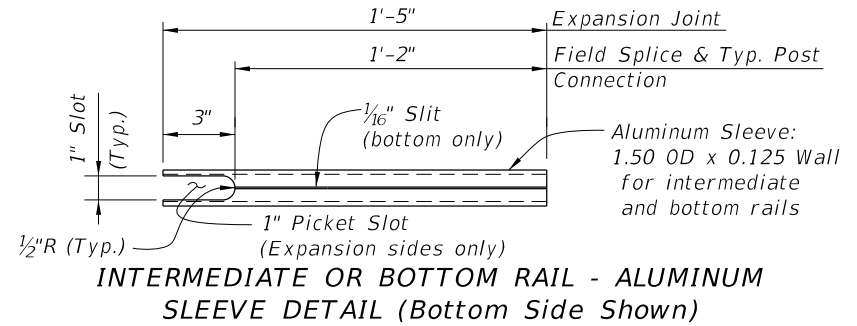
* $\frac{1}{4}$ " \varnothing x $\frac{3}{4}$ " Pan Head Aluminum (Alloy 7075-T73) or Stainless Steel (Type 316 or 18-8 Alloy) Set Screws along outside face of railing. Set screws must be set flush against the rail surface. A $\frac{3}{4}$ " \varnothing plug weld may be substituted for the two set screws at expansion joints.

** Embedded length may be 4" for plug welded connection.

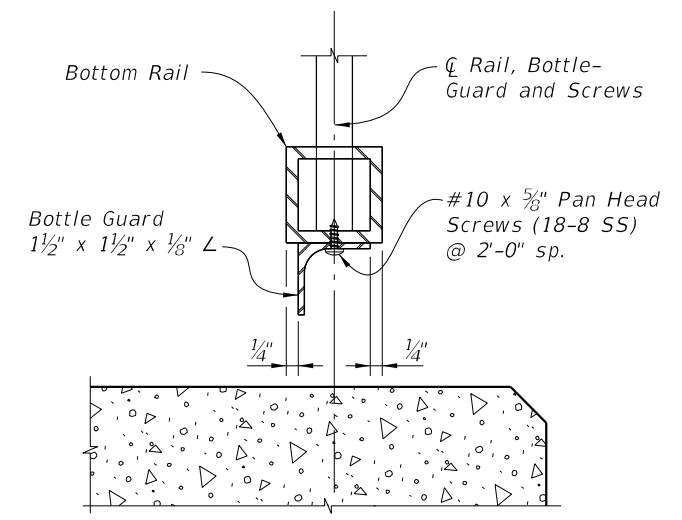
*** Increase handrail sleeve embedment to 8" for Expansion Joint openings greater than 2".

**** Expansion Joint opening shall match the clear opening in the deck joint but not greater than 3".

SQUARE RAILS - INTERMEDIATE OR BOTTOM RAIL



INTERMEDIATE OR BOTTOM RAIL - ALUMINUM SLEEVE DETAIL (Bottom Side Shown)



TYPICAL SECTION THROUGH BOTTOM RAIL (Post Not Shown for Clarity)

SCHEME 1 - BOTTLE GUARD DETAIL

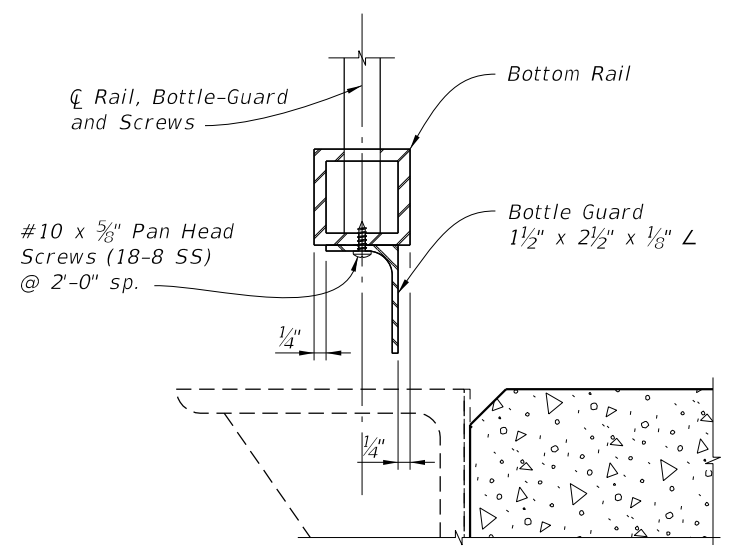
DETAIL "B" EXPANSION JOINT (FIELD SPLICE SIMILAR)

ALTERNATE REINFORCING (WWR) DETAILS		CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS										
NOTE: Place wire panels to minimize the end overhang. End Overhangs greater than 4 3/4" are not permitted.		BILL OF REINFORCING STEEL										
<p>SPLICE DETAIL (Between WWR Sections)</p>		<table border="1"> <thead> <tr> <th>MARK</th> <th>SIZE</th> <th>LENGTH</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>4</td> <td>2'-0"</td> </tr> <tr> <td>S</td> <td>4</td> <td>As Req'd.</td> </tr> </tbody> </table>	MARK	SIZE	LENGTH	P	4	2'-0"	S	4	As Req'd.	<p>WWR SECTION DETAIL</p>
MARK	SIZE	LENGTH										
P	4	2'-0"										
S	4	As Req'd.										
<p>CURB REINFORCING STEEL NOTES:</p> <ol style="list-style-type: none"> 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'-8". Deformed WWR meeting the requirements of Specifications Section 931 may be used in lieu of all Bars 4P and 4S. 		<p>DETAIL "A" - SECTION AT INTERMEDIATE OPEN JOINT</p>										

ESTIMATED CONCRETE CURB QUANTITIES (SCHEME 2)		
ITEM	UNIT	QUANTITY
Concrete	CY/LF	0.0124
Reinforcing Steel	LB/LF	4.01

INTERMEDIATE JOINT SEAL NOTE:
At Intermediate Open Joints, seal the lower 6" portion of the open joint with Pre-cured Silicone Sealant. Apply sealant prior to any Class V finish coating and remove all curing compound and loose material from the surface prior to application of bonding agent.

SCHEME 2 - CONCRETE CURB DETAILS



TYPICAL SECTION THROUGH BOTTOM RAIL (Post Not Shown for Clarity)

SCHEME 3 - BOTTLE GUARD DETAIL

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