3D VIEW OF RAILING WITH TYPE 1 - PICKET INFILL PANEL
(42" Height shown, 48" Height Similar)

TABLE 1 - RAILING MEMBERS			
MEMBER	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
Post "A"	HSS 2½ x 1½ x⅛	2.50" x 1.50"	0.125"
Post "B"	HSS 2½ x 1½ x 3/16	2.50" x 1.50"	0.188"
Top Rail	2½" NPS (Sch. 10)	2.875"	0.120"
	HSS 3.000 x 0.120	3.000"	0.120"
End Hoops	2½" NPS (Sch. 10)	2.875"	0.120"
	HSS 3.000 x 0.120	3.000"	0.120"
Top Rail Joint/Splice Sleeves	HSS 2.500 x 0.125	2.500"	0.125"
Intermediate & Bottom Rail	HSS 2 x 2 x 3/16	2.00" x 2.00"	0.188" (1)
Int. & Bottom Rail Post Connection Sleeve	HSS 1.500 x 0.125	1.500"	0.125" (1)
Handrail Joint/Splice Sleeves	1" NPS (Sch. 40)	1.315"	0.133"
	HSS 1.500 x 0.125	1.500"	0.125"
Handrails	1½" NPS (Sch. 40)	1.900"	0.145"
Handrail Support Bar	¾" Ø Round Bar	0.750"	N/A
Pickets (Type 1 Infill Panel)	¾" Ø Round Bar	0.750"	N/A
Infill Panel Members (Types 2 – 5)	Varies (See Details)	Varies	Varies

TABLE 1 NOTES:

(1) 0.125" wall thickness permitted for rails with post spacings less than 5'–8", except that Post Connection Sleeve must be 1¼" NPS (Sch. 40).

NOTES

Notes:

1. *Shop Drawings are required; see Specification Section 515*
2. *For bridge mounted railings work this Index with Index 515-051 Bridge Bicycle/Pedestrian Railing*
3. *Materials:*
   - *A. Pipe Rails and Pickets: ASTM A500 Grade B, C or D, or ASTM A53 Grade B for standard weight pipe (Schedule 40) and ASTM A36 for bars.*
   - *B. Structural Tube: ASTM A500 Grade A, B, C, or D or ASTM A501*
   - *C. Steel Plate: ASTM A36 or ASTM A709 Grade 36*
   - *D. U-Channels and filler plates: ASTM A36 or ASTM A1011 (Grade 36).*
   - *E. Stainless steel (SS) screws: Type 316 or 18-8 Alloy*
   - *F. Galvanized Steel Fasteners: coated in accordance with Specification Section 962.*
     - *a. Hex Head Bolts: ASTM A 307*
       - *1. ⅞" diameter single bolt option, Grade 36*
       - *2. 7/16" four bolt option, Grade 55*
     - *b. Adhesive Anchors: ASTM F1554 fully threaded rods, Grade 55*
     - *c. Hex Nuts: ASTM A563*
     - *d. Flat Washers: ASTM F436*
     - *e. Plate Washers: ASTM A36 or ASTM A706 Grade 36.*
   - *G. Shims: ASTM B209 Alloy 6061*
   - *H. Bearing Pads: ⅛" Plain, Fabric Reinforced or Fabric Laminated pads that meet the requirements of Specification Section 932 for Ancillary Structures.*
4. *Fabricate pickets and vertical panel elements parallel to the posts; except Type 2, 3 and 5 panel infills may be fabricated parallel to the longitudinal grade. Maintain a maximum clear opening of 5⅞" for standard installations and 3⅞" when a 4" sphere requirement is indicated in the Data Tables.*
5. *Maximum spacing between expansion joints is 40'-0". Locate an Expansion Joint between the posts on either side of the Deck Expansion Joint.*
6. *Field splices are similar to the Expansion Joint Detail and may be approved by the Engineer to facilitate handling; but the top rail must be continuous across a minimum of two posts.*
7. *For intermediate and bottom horizontal rails, the screwed joints shown may be substituted with alternate joints shown in detail "K".*
8. *Make corners and changes in tangential longitudinal alignment with a 9" bend radius or terminate adjoining sections with mitered end sections when handrails are not required.*
9. *For changes in tangential longitudinal alignment greater than 45', position posts a maximum of 2'-0" each side of the corner but not at the corner apex.*
10. *For curved longitudinal alignments, shop bend the top and bottom rails and handrails to match the alignment radius.*
11. *Handrails are required and must be continuous at landings for:*
    - *A. Grades Steeper than 5%,*
    - *B. Three or more steps*
12. *Installation: Cutting of reinforcing steel is permitted for post installed anchors.*

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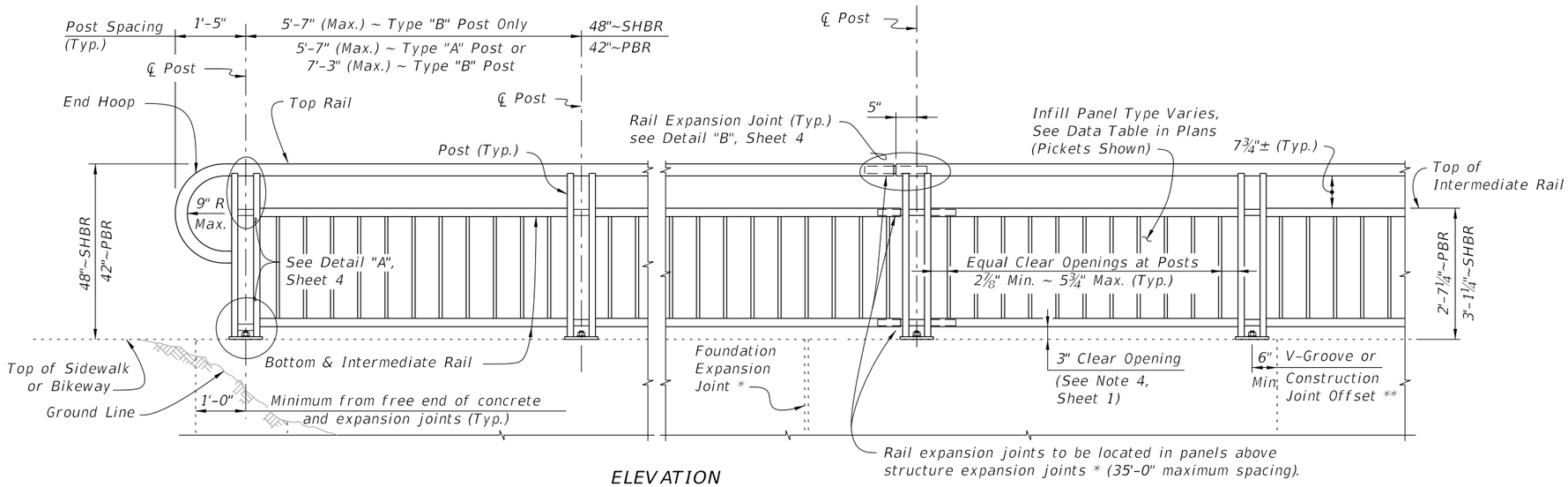
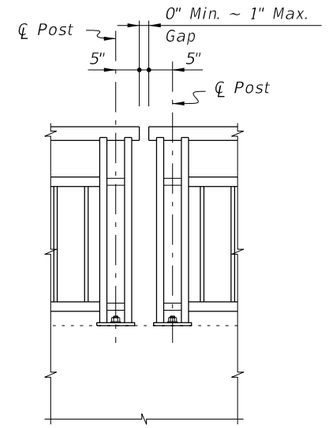


ELEVATION
(Showing Outside Face of Railing with Type "A" Posts)

TYPICAL RAILING DETAILS & RAILINGS ON GRADES 0% TO 5%

(Type 1 - Picket Railing Shown, Other Types Similar)

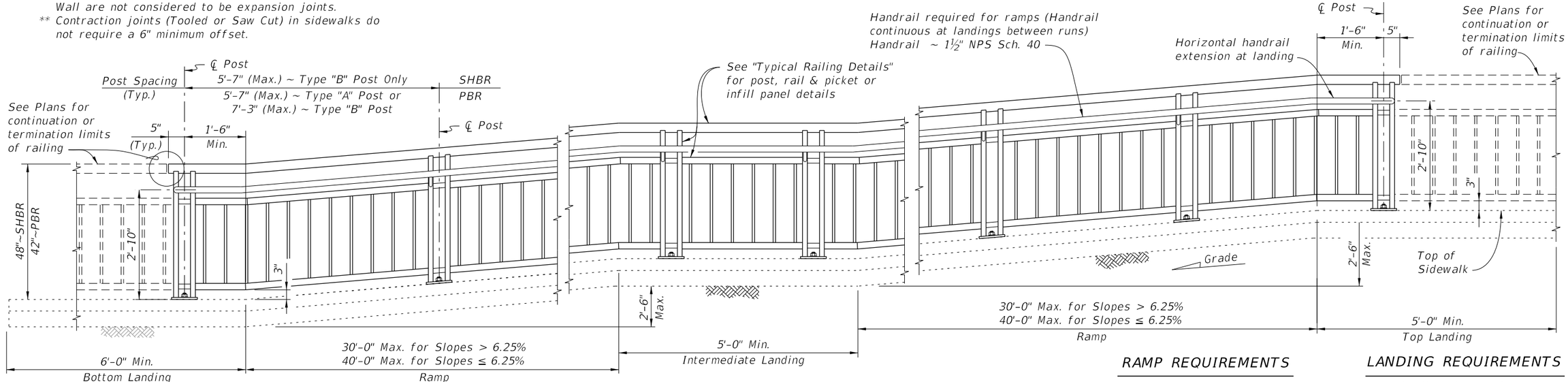


Note: Non-continuous corners are permitted when handrails are not required.

EXPANDED ELEVATION AT CORNERS

DETAIL FOR NON-CONTINUOUS RAILING AT CORNERS

NOTES:
* Keyed construction joints in Index 400-011 Gravity Wall are not considered to be expansion joints.
** Contraction joints (Tooled or Saw Cut) in sidewalks do not require a 6" minimum offset.



ELEVATION
(Showing Inside Face of Railing with Type "A" Posts)

RAMP REQUIREMENTS

For slopes greater than 5%:
Max. ramp slope = 8.33%
Max. ramp cross-slope = 2.0%

LANDING REQUIREMENTS

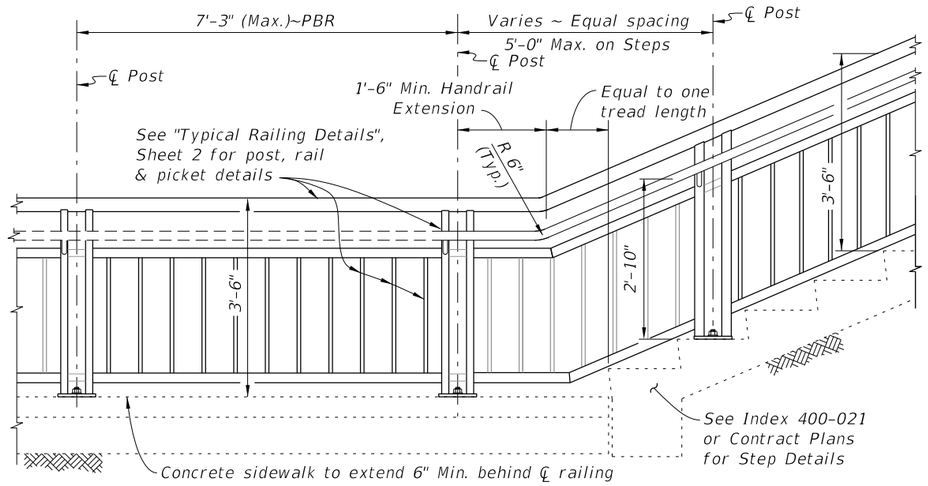
Max. landing slope = 2%
Max. landing cross-slope = 2%

RAILINGS ON GRADES STEEPER THAN 5%

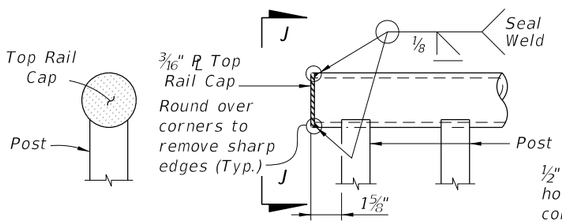
(Type 1 - Picket Railing Shown, Other Types Similar)

9/28/2026 11:56:02 AM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2027-28 STANDARD PLANS	PEDESTRIAN/BICYCLE RAILING (STEEL)	515-052	2 of 8

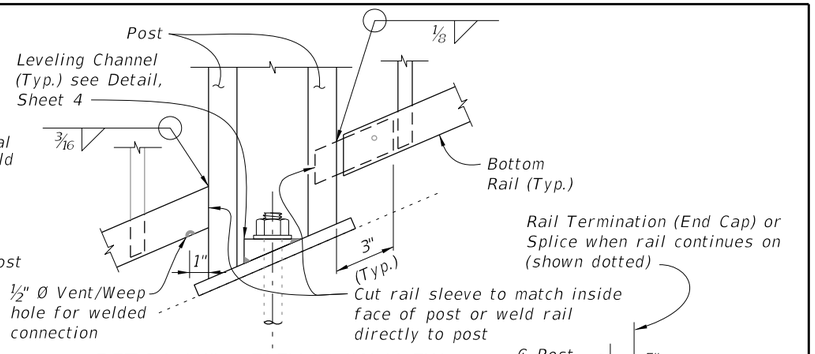


RAILING CONTINUATION BEYOND STEPS OR STAIRS
(Bottom shown, Top similar)



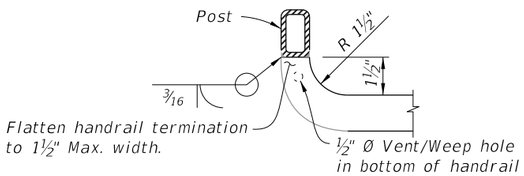
VIEW J-J

DETAIL "J" - ELEVATION VIEW
TOP RAIL TERMINATION



DETAIL "K" - ELEVATION VIEW
BOTTOM RAIL CONNECTION
(Intermediate Rail Similar)

RAIL TERMINATION DETAILS



DETAIL "L" - PLAN VIEW
HANDRAIL TERMINATION

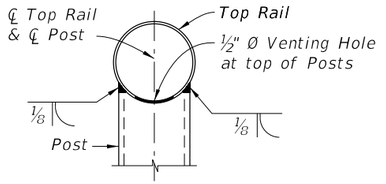
ELEVATION
(At-Grade Steps shown,
Elevated Stairs similar)

ALTERNATE HANDRAIL END TREATMENT OR
MOUNTING LOCATION FOR SLOPED WALLS

RAILINGS ON STEPS & STAIRS

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2027-28 STANDARD PLANS	PEDESTRIAN/BICYCLE RAILING (STEEL)	INDEX	SHEET
11/01/16					515-052	3 of 8

9/28/2026 11:56:05 AM



SECTION A-A
(Top Rail Connection)

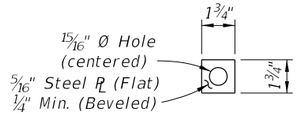
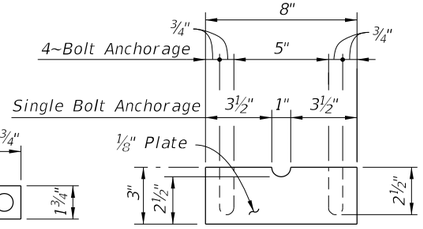
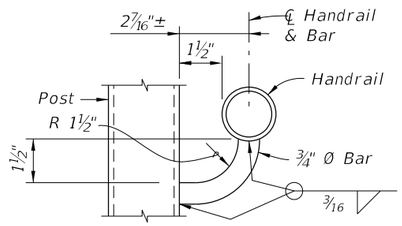


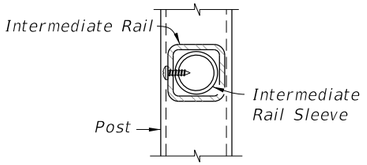
PLATE WASHER DETAIL



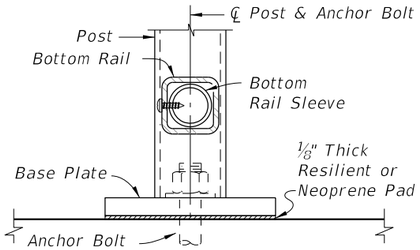
SHIM PLATE DETAIL



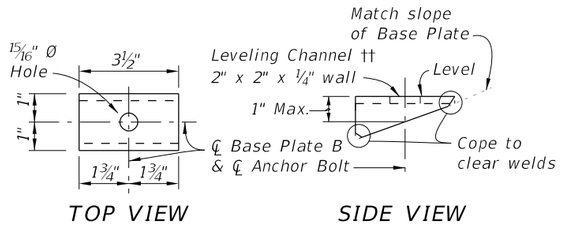
SECTION B-B
(Handrail Connection)



SECTION C-C
(Intermediate Rail Connection)

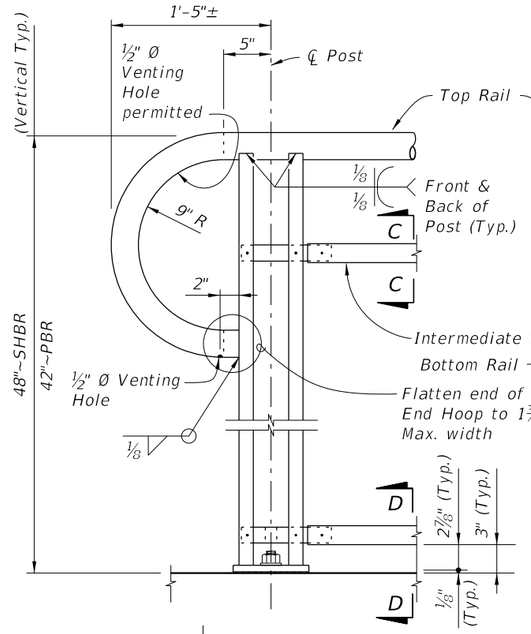


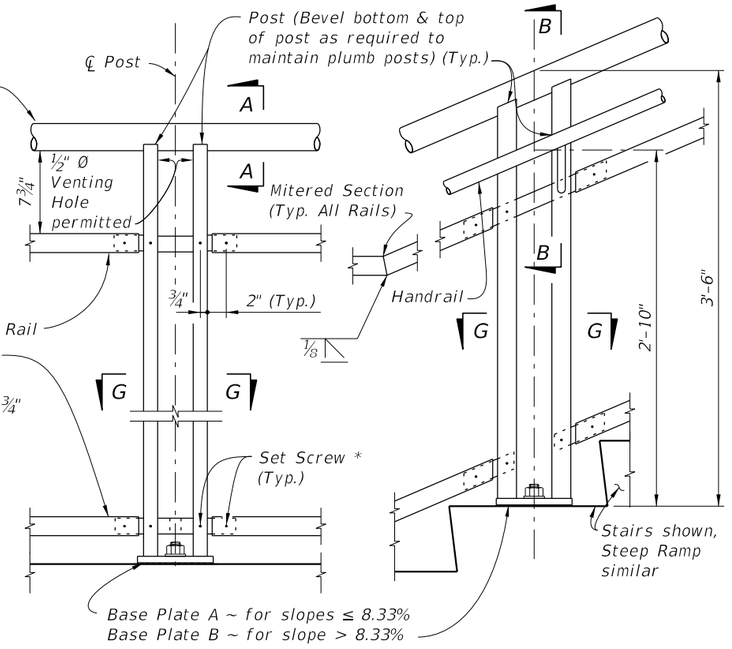
SECTION D-D
(Bottom Rail Connection -
Single Anchor Bolt Shown)



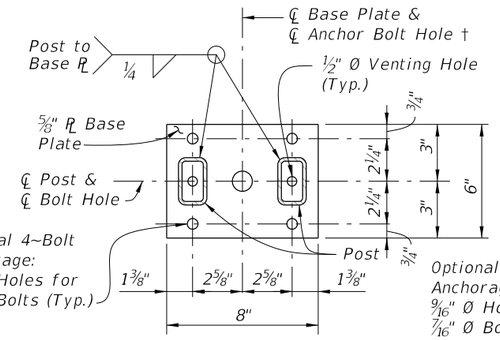
TOP VIEW SIDE VIEW

LEVELING CHANNEL DETAIL

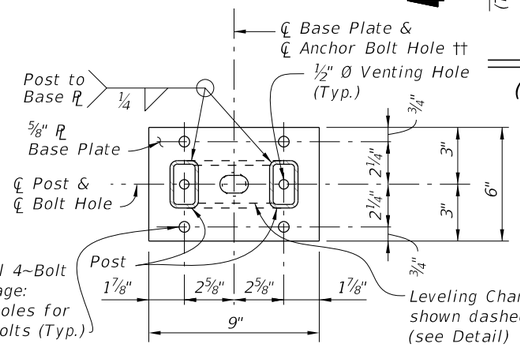




DETAIL "A" - RAIL CONNECTIONS
(Pickets/Panels and 4~Bolt Anchorage Not Shown for Clarity)



BASE PLATE A



BASE PLATE B

SECTION G-G - BASE PLATE DETAILS

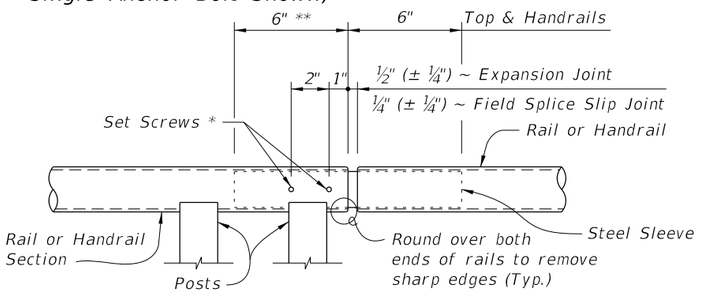
NOTES:

† Base Plate A (Ramps – Bolts normal) use 1⅛" Ø Holes for Single Anchor Bolts with Flat Washers for slopes ≤ 8.33%.

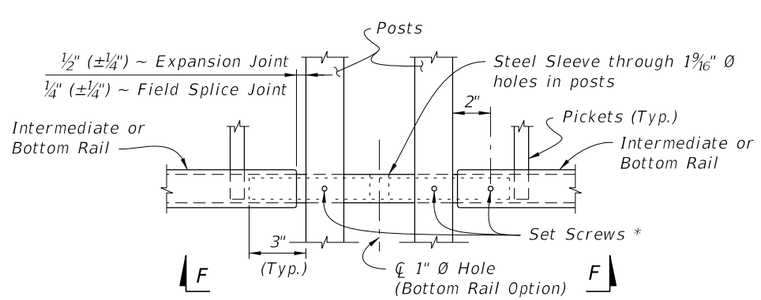
†† Base Plate B (Stairs – Bolts plumb) use 1¼" Ø Holes for Single Anchor Bolts with Beveled Plate and Washers for slopes > 8.33% to ≤ 15%; use 15⁄16" x 1½" Slotted Holes with Leveling Channel for slopes > 15%.

* ¼" Ø x ¾" Pan Head Stainless Steel (Type 316 or 18-8 Alloy) Set Screws. Screws must be set flush against the outside face of rails & posts and underside of handrails. ½" Ø plug welds may be substituted for the Set Screws. Do not provide Set Screws for Rails at free end of Expansion Joints.

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

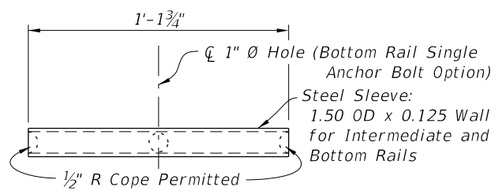


ROUND RAILS - TOP RAIL OR HANDRAIL
(Top Rail at Expansion Joint Shown)



SQUARE RAILS - INTERMEDIATE OR BOTTOM RAIL
(Bottom Rail at Expansion Joint Shown)

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



VIEW F-F
INTERMEDIATE OR BOTTOM RAIL -
STEEL SLEEVE DETAIL (Bottom Side Shown)

CROSS REFERENCE:

For location of Details "B", See Sheet 2.

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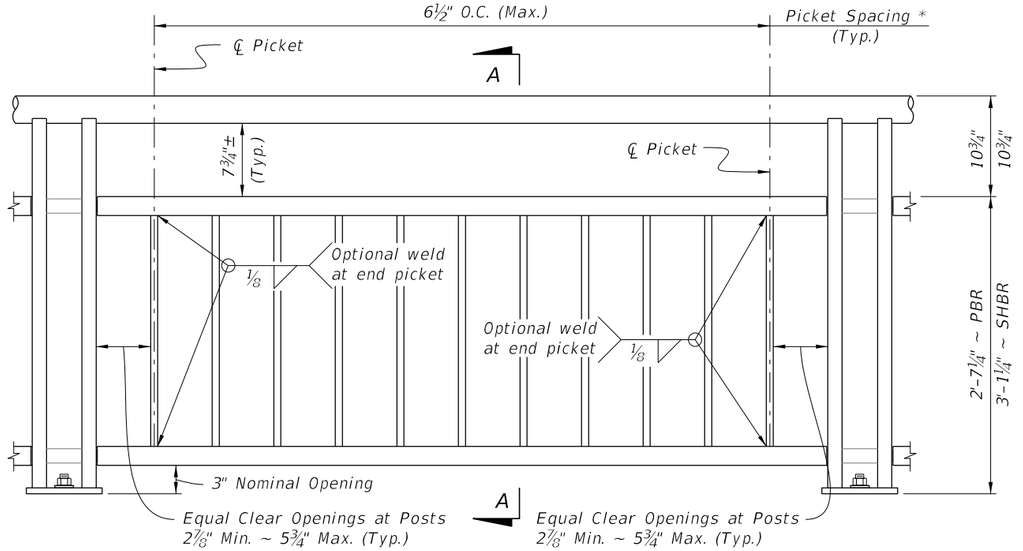
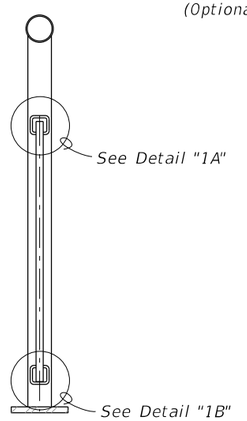
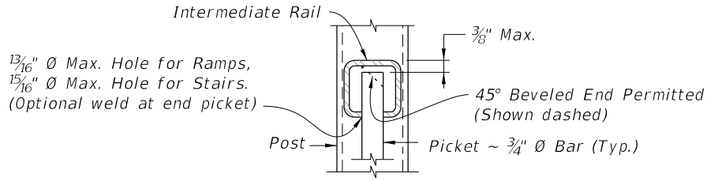
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2027-28 STANDARD PLANS	PEDESTRIAN/BICYCLE RAILING (STEEL)	INDEX 515-052	SHEET 4 of 8



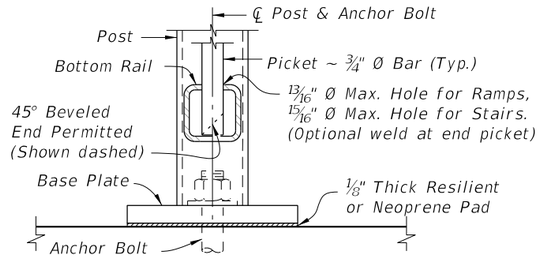
TYPE 1 - PICKET INFILL PANEL



SECTION A-A

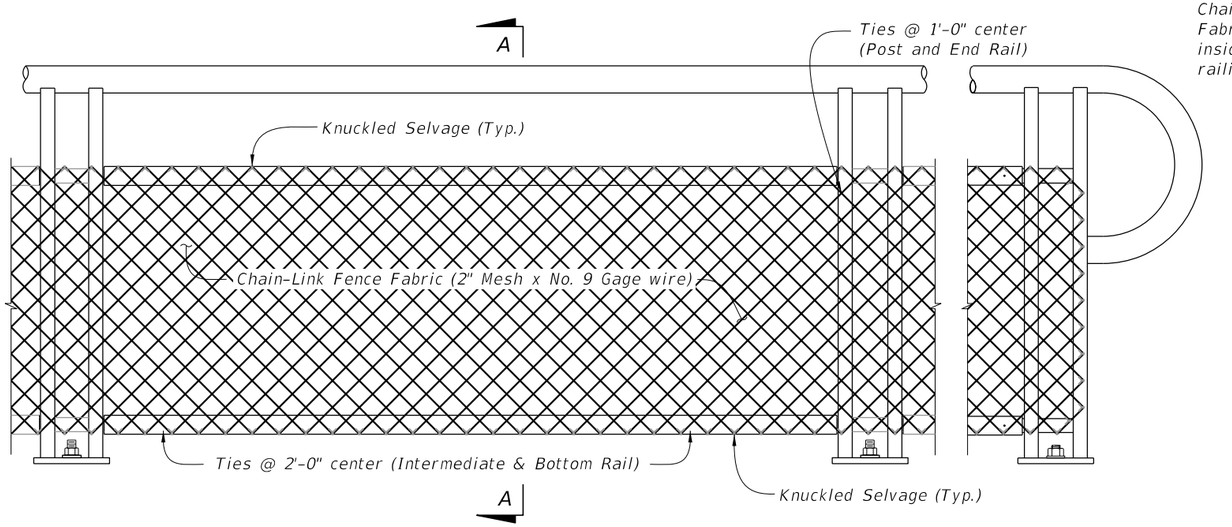


DETAIL "1A"
(Top of Picket Connection)

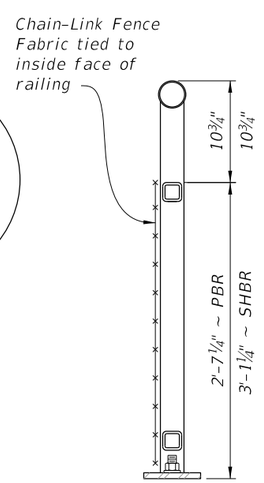


DETAIL "1B"
(Bottom of Picket Connection)

PICKET NOTES:
* Picket Spacing of 6½" centers is based on a ¾" Ø Bar for standard applications.
When shown in the Contract Plans a 4½" picket spacing may be required. See Note 4 (Sheet 1).



TYPE 2 - CHAIN-LINK (Continuous Infill Panel)



SECTION A-A

TABLE 2 - CHAIN-LINK PANEL COMPONENT MATERIALS		
COMPONENT	ASTM	COMPONENT INFORMATION
Chain-Link Fence Fabric (2" mesh with knuckled top and bottom selvage)	A 392	Zinc-Coated Steel – No. 9 gage (coated wire diameter), Class 2 Coating
	A 491	Aluminum-Coated Steel – No. 9 gage (coated wire diameter)
	F 668	Polyvinyl Chloride (PVC) Coated Steel – No. 9 gage Zinc-Coated Wire (metallic-coated core wire diameter) ~ See Plans for specified color of PVC.
Tie Wires	F 626	Zinc-Coated Steel Wire – No. 9 gage with coating to match Chain-Link Fence Fabric.
Tension Bars	F 626	3⁄16" (Min. thickness) x ¾" (Min. width) x 2'-3" (Min. height) Steel Bars
Miscellaneous Fence Components	F 626	Zinc-Coated Steel

CHAIN-LINK PANEL NOTE:
Chain-Link Fence Fabric shall be continuous along limits of railing. Splicing of Chain-Link panels using Tension Bars at 20'-0" minimum increments is permitted.

NOTES:
1. See Plans for Infill Panel option required.

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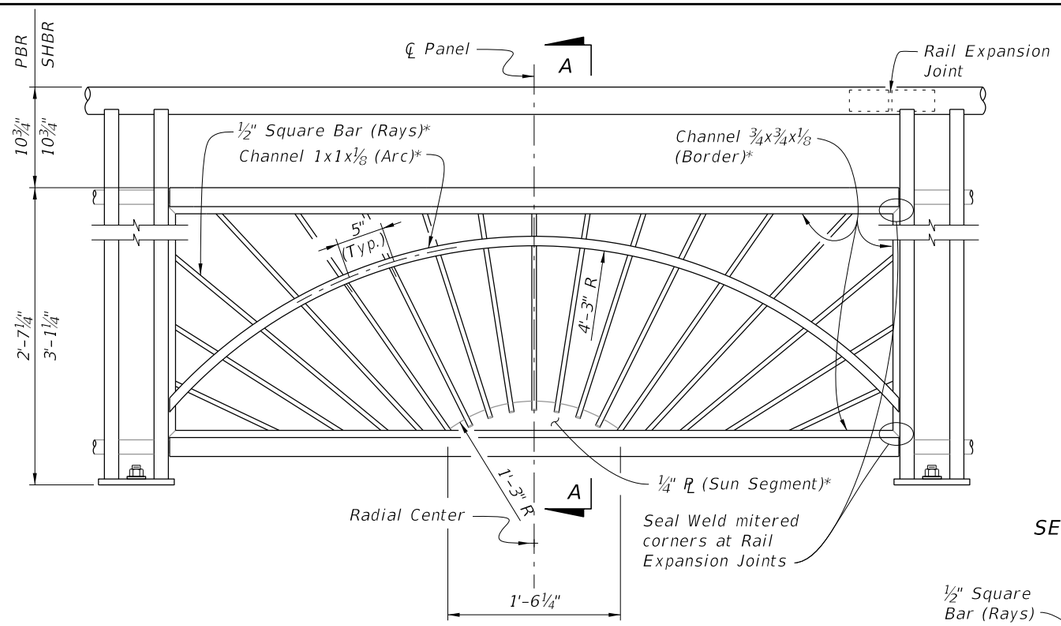
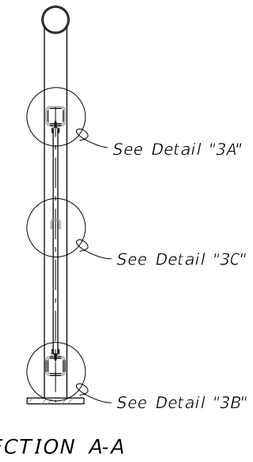
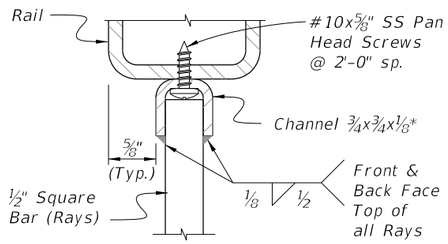


TYPE 3 - SUNSHINE INFILL PANEL

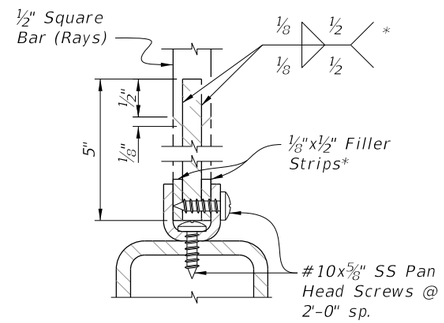
* Arc, Rays and Sun Segment may be formed in a single panel from ½" steel plate pattern cut with laser or plasma CNC, welded to a 1x1x⅛ Angle Border or the ¾x¾x⅛ Channel Border shown.



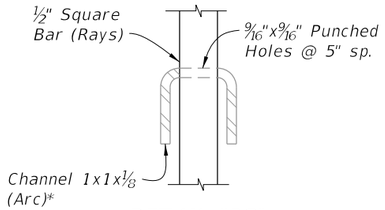
SECTION A-A



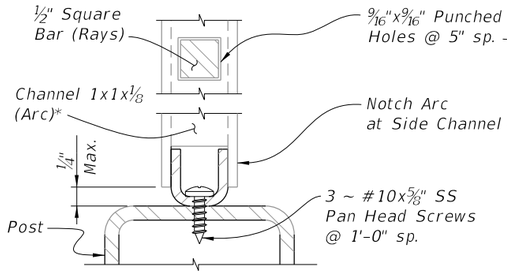
DETAIL "3A"
INTERMEDIATE RAIL/RAY CONNECTION



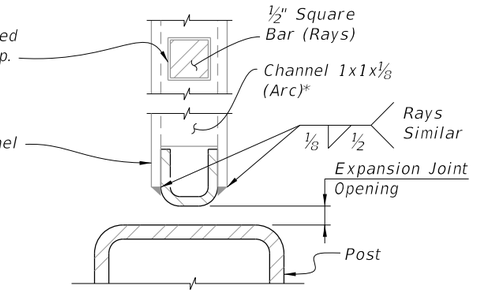
DETAIL "3B"
BOTTOM RAIL/RAY CONNECTION



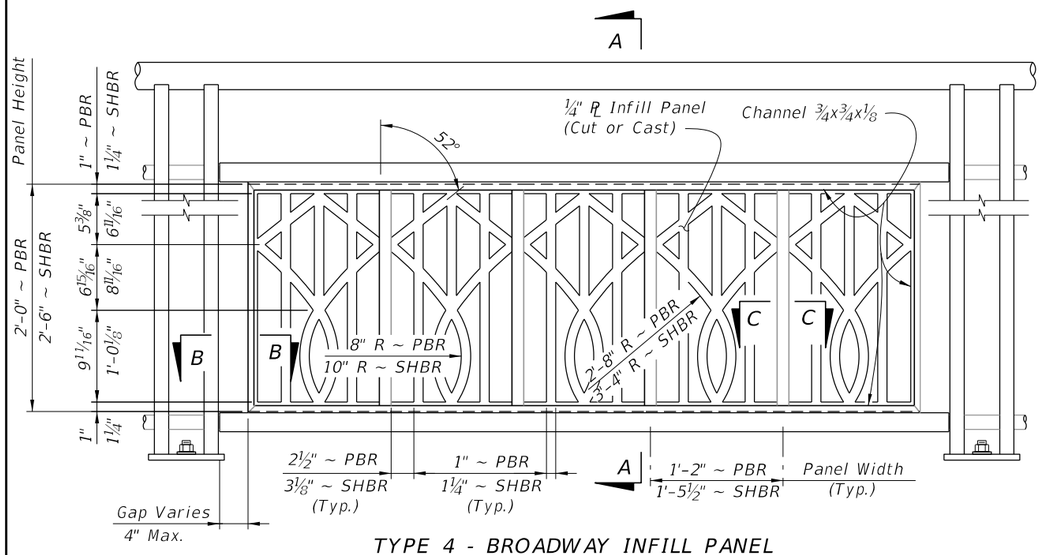
DETAIL "3C"
RAY/ARC CONNECTION



DETAIL "3D"
ARC/POST CONNECTION
(Continuous Top Rail)

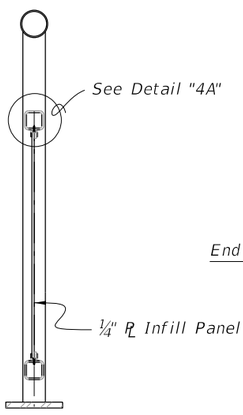


DETAIL "3E"
PANEL END CONNECTION
AT POST WITH EXPANSION JOINT

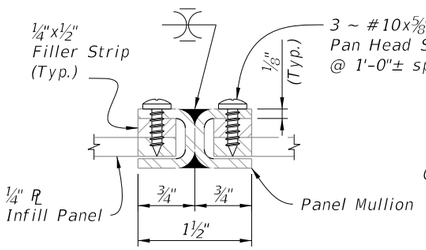


TYPE 4 - BROADWAY INFILL PANEL

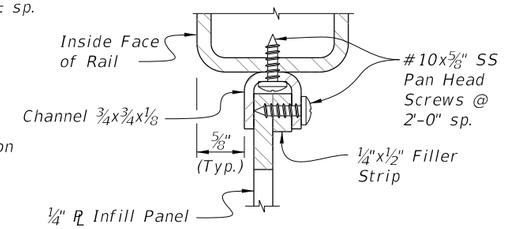
NOTE:
See Plans for Infill Panel Option required.



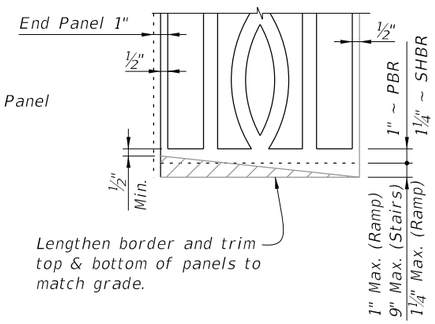
SECTION A-A



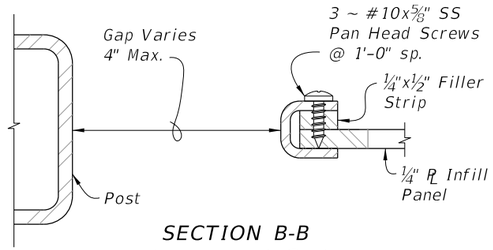
SECTION C-C
PANEL/SPLICE CONNECTION



DETAIL "4A"
PANEL/RAIL CONNECTION
(Top Shown, Bottom Similar)



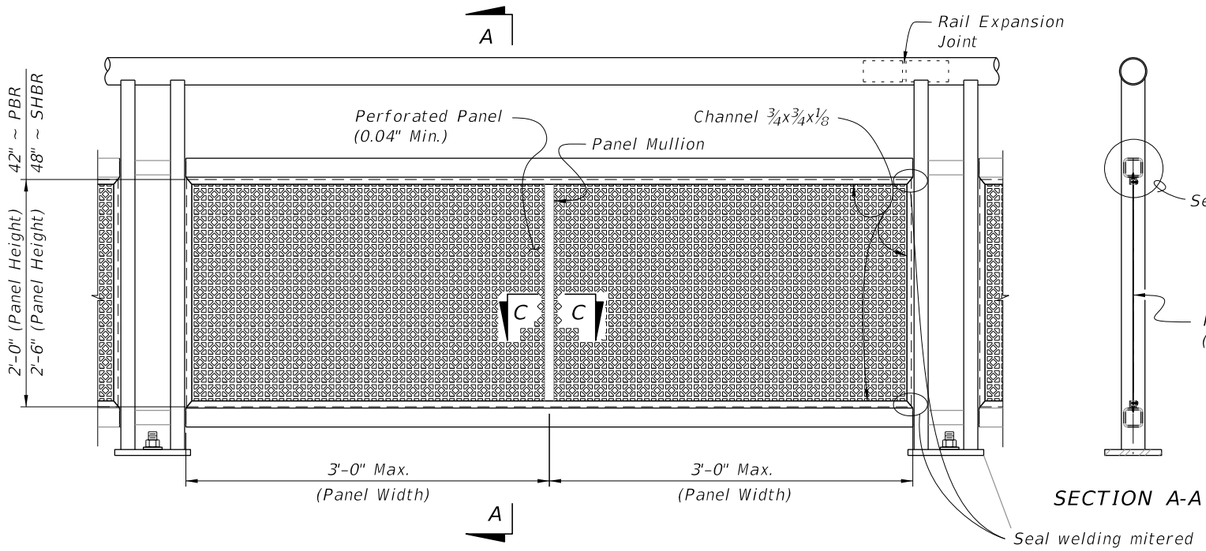
PANEL ADJUSTMENT FOR RAILINGS
ON GRADES



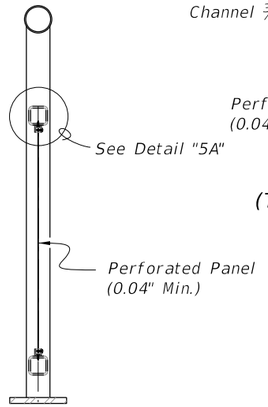
SECTION B-B
PANEL END CAP

9/28/2026 11:56:13 AM

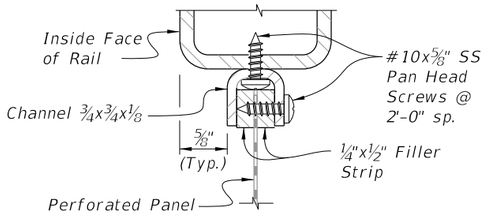
LAST REVISION	REVISION	DESCRIPTION:	FY 2027-28 STANDARD PLANS	PEDESTRIAN/BICYCLE RAILING (STEEL)	INDEX	SHEET
11/01/16					515-052	6 of 8



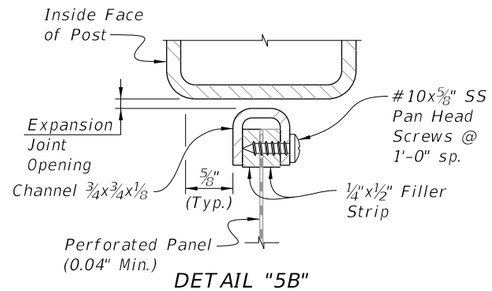
TYPE 5 - PERFORATED INFILL PANEL



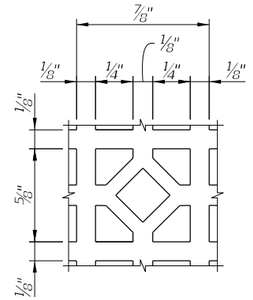
SECTION A-A



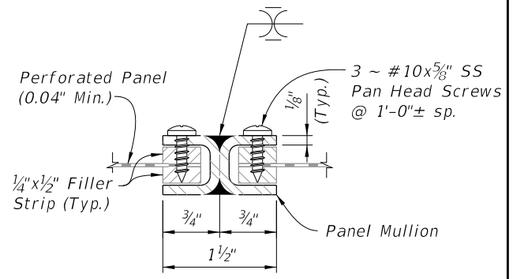
DETAIL "5A"
PANEL/RAIL CONNECTION
(Top Shown, Bottom Similar)



DETAIL "5B"
PANEL END CONNECTION
(Expansion Joint Shown, Sides Similar)



REPEATING PATTERN DETAIL
FOR PERFORATED PANEL



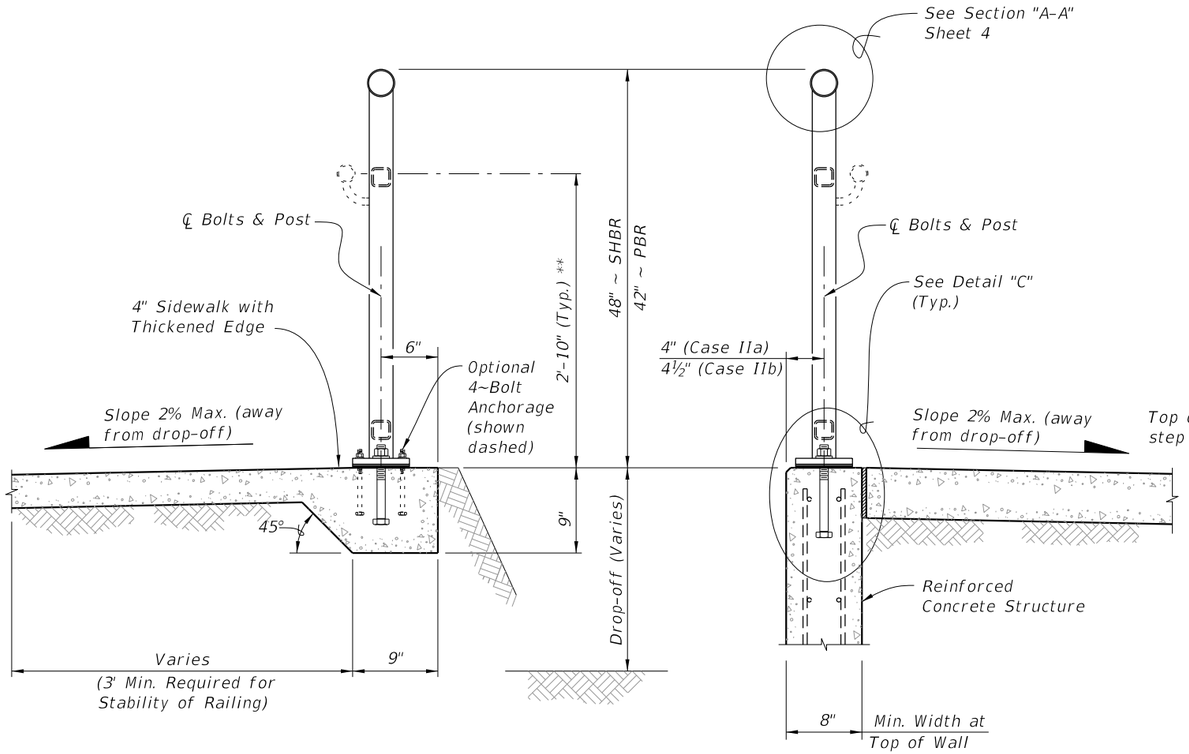
SECTION C-C
PANEL/SPLICE CONNECTION

NOTES:

1. See Plans for Infill Panel Type required.

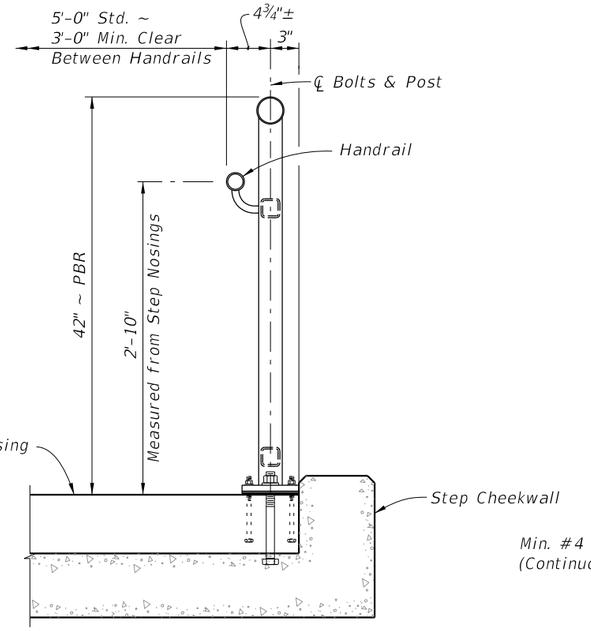
9/28/2026 11:56:15 AM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2027-28 STANDARD PLANS	PEDESTRIAN/BICYCLE RAILING (STEEL)	515-052	7 of 8

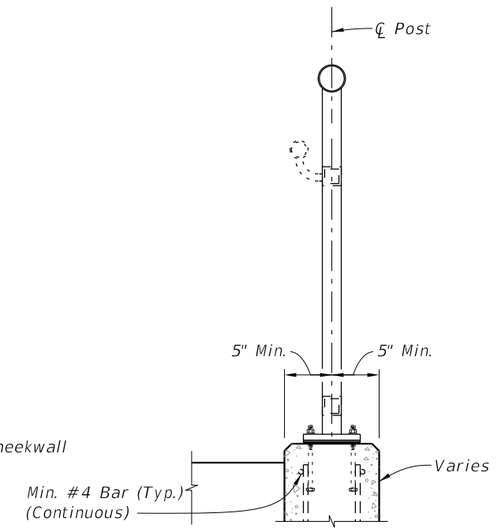


TYPICAL SECTION ON CONCRETE SIDEWALK
(Case I)

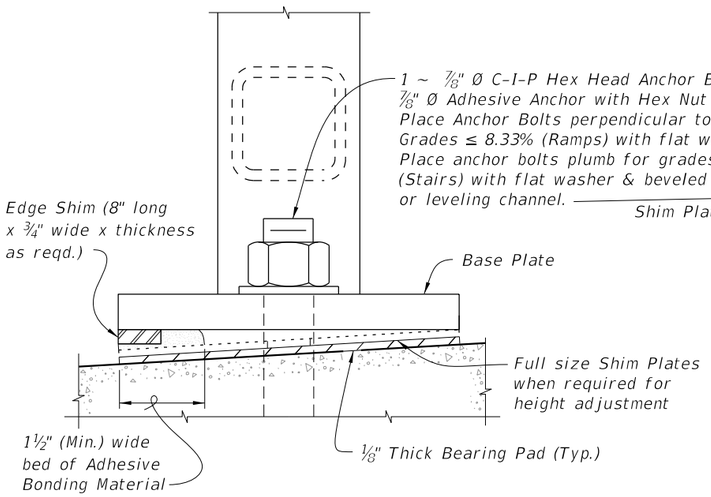
TYPICAL SECTION ON RETAINING WALL
(Case II)



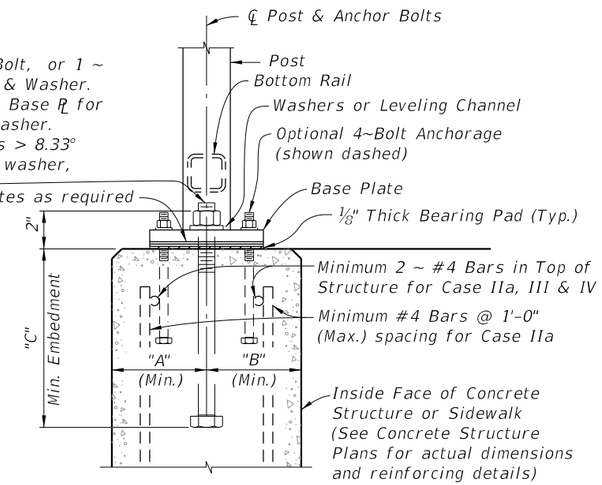
TYPICAL SECTION ON STEPS & STAIRS
(Case III)



TYPICAL SECTION FOR 4~BOLT ANCHORAGE
(Case IV)



DETAIL "D" (OPTIONAL SHIMMING DETAIL
FOR CROSS SLOPE CORRECTION)
(Used in lieu of Beveled Shim Plates)



DETAIL "C"
(Cast-In-Place Anchor Bolts shown,
Adhesive Anchors similar)

ANCHOR BOLT TABLE							
CASE	STRUCTURE TYPE	DIMENSIONS			ANCHOR LENGTH		ANCHOR SIZE
		A Edge Dist.	B Edge Dist.	C Embedment	C-I-P Hex Head Bolt	Adhesive Anchor	
I	Unreinforced Concrete	6"	1'-2"	6"	7½"	8"	⅞" Ø
IIa	Reinforced Concrete	4"	4"	9"	10½"	11"	⅞" Ø
IIb	Gravity Wall Index 400-011	4½"	3½" @ top	9"	10½"	11"	⅞" Ø
III	Step Cheekwall	4½"	4½"	9"	10½"	11"	⅞" Ø
IV	Varies	5"	5"	5"	6½"	7"	7/16" Ø

** When required; measured from top of sidewalk.

9/28/2026 11:56:18 AM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/20			FY 2027-28 STANDARD PLANS	PEDESTRIAN/BICYCLE RAILING (STEEL)	515-052	8 of 8