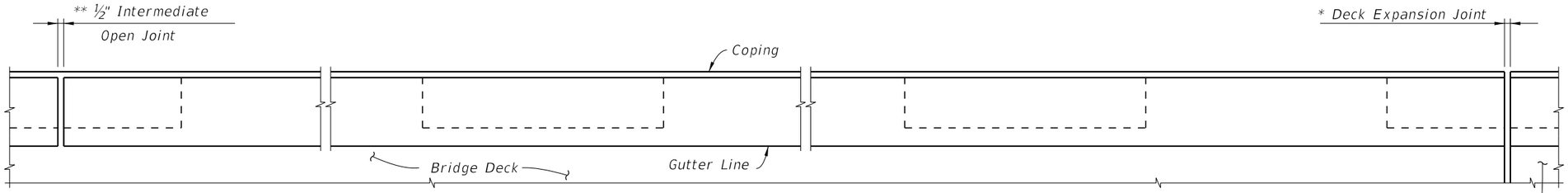
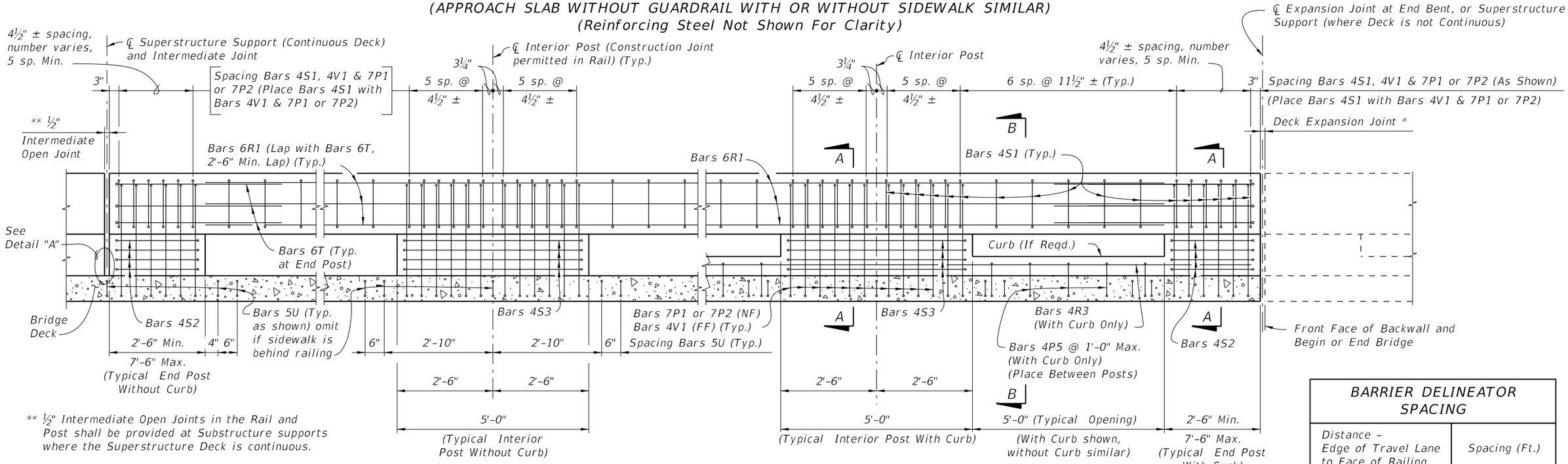


* See Structures Plans Superstructure and Approach Slab Sheets for actual dimensions and joint orientation. Provide open Railing Joints at Deck Expansion Joint locations matching the dimension of the Deck Joint. See Sheets 6 and 7 for details at Skewed Deck Joints.

PLAN OF RAILING ON BRIDGE DECK (WITHOUT SIDEWALK SHOWN, WITH SIDEWALK SIMILAR)
(APPROACH SLAB WITHOUT GUARDRAIL WITH OR WITHOUT SIDEWALK SIMILAR)
(Reinforcing Steel Not Shown For Clarity)



** ½" Intermediate Open Joints in the Rail and Post shall be provided at Substructure supports where the Superstructure Deck is continuous.

NOTE:
End Post dimensions for a given span shall match.

ELEVATION OF INSIDE FACE OF RAILING
(BRIDGE DECK SHOWN,
APPROACH SLAB WITHOUT GUARDRAIL OR ADJACENT TO ROADWAY BARRIER SIMILAR)

BARRIER DELINEATOR SPACING	
Distance – Edge of Travel Lane to Face of Railing	Spacing (Ft.)
< 4'	40'
4' to 8'	80'
> than 8'	None Required

TRAFFIC RAILING NOTES

This railing has been structurally evaluated to be equivalent or greater in strength to other railings which have been crash tested to NCHRP Report 350 TL-4 Criteria.

CONCRETE AND REINFORCING STEEL : See Structures Plans General Notes.
AGGREGATE LIMITATION: The aggregate used in the concrete mix shall be a #67 aggregate.
GUARDRAIL : For Guardrail connection details see Index No. 400.
SUPERELEVATED BRIDGES : At the option of the Contractor the Traffic Railing on superelevated bridges may be constructed perpendicular to the roadway surface. The cost of all modifications will be at the Contractor's expense.

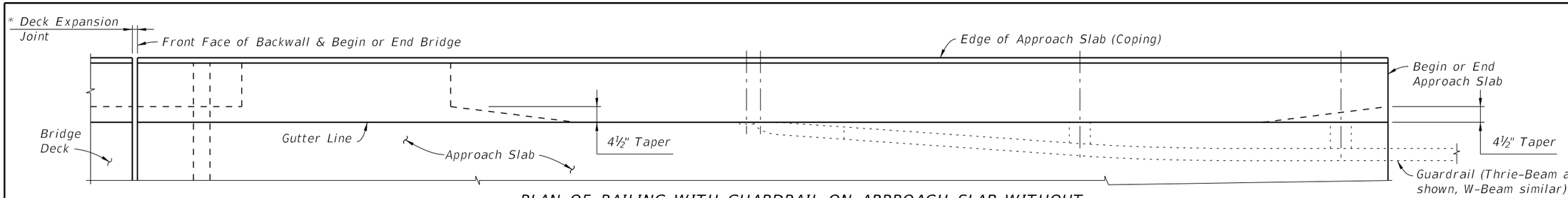
RETAINING WALL : If the Traffic Railing Barrier is to be provided on a retaining wall, the railing sections will be the same as on Sheets 3 and 4. See Retaining Wall Plans for payment.
NAME, DATE AND BRIDGE NUMBER : The Name and Bridge Number shall be placed on the Traffic Railing so as to be seen on the driver's right side when approaching the bridge. The Name shall be as shown in the General Notes in the Structures Plans. The Date shall be placed on the driver's left side when approaching the bridge. The Date shall be the year the bridge is completed. For a widening when the existing railing is removed, use both the existing date and the year of the widening. Black plastic letters and figures 3" in height may be used, as approved by the Engineer, in lieu of the letters and figures formed by ⅜" V-Grooves. V-Grooves shall be formed by preformed letters and figures.
BARRIER DELINEATORS: Barrier Delineators shall meet Specification Section 993. Install Barrier Delineators on top of the Traffic Railing 2" from the face on the traffic side at the spacing shown in the table above. Barrier Delineator color (white or yellow) shall match the color of the near edgeline. The cost of the Barrier Delineators shall be included in the Contract Unit Price for the Traffic Railing.

NOTES:
(NF) means Near Face, (FF) means Far Face.

CROSS REFERENCES:
For Sections see Sheets 3 and 4.
For Detail "A" see Sheet 3.
For Quantities and Quantity Breakdown see Sheet 5.

6/23/2015 4:32:37 PM

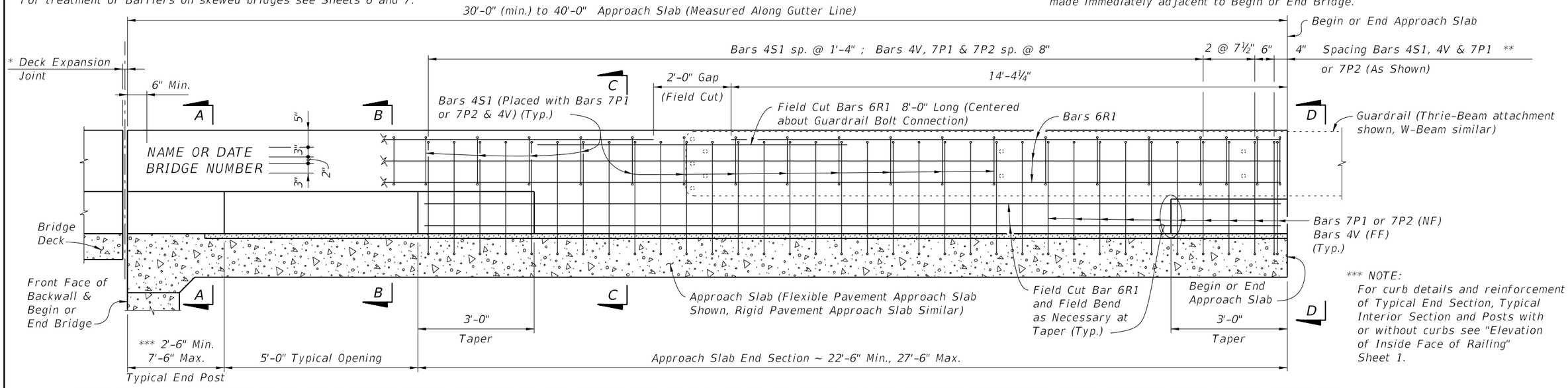
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/13			FDOT 2016 DESIGN STANDARDS	TRAFFIC RAILING - (CORRAL SHAPE)	424	1 of 7



* See Structures Plans, Superstructure and Approach Slab Sheets for actual dimensions and joint orientation. Open railing Joints at Deck Expansion Joint locations shall match the dimension of the Deck Joint. For treatment of Barriers on skewed bridges see Sheets 6 and 7.

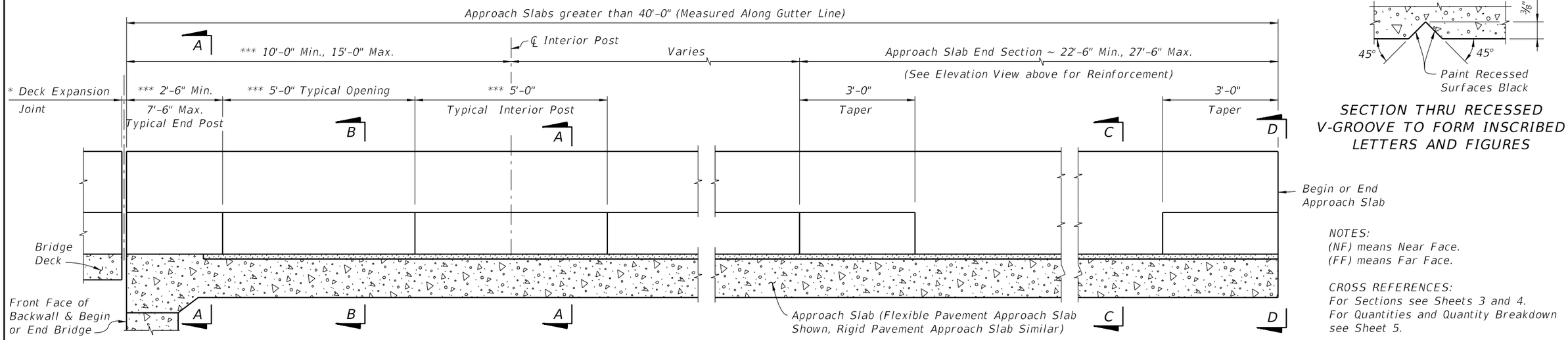
PLAN OF RAILING WITH GUARDRAIL ON APPROACH SLAB WITHOUT SIDEWALK (APPROACH SLAB WITH ADJACENT SIDEWALK SIMILAR) (Reinforcing Steel Not Shown For Clarity)

** Begin placing Railing Bars 7P1 or 7P2 and 4V on Approach Slab at the barrier end and proceed toward Begin or End Bridge to ensure placement of guardrail bolt holes If required, adjustments to the bar spacing for Bars 7P1 or 7P2 and 4V shall be made immediately adjacent to Begin or End Bridge.



*** NOTE:
For curb details and reinforcement of Typical End Section, Typical Interior Section and Posts with or without curbs see "Elevation of Inside Face of Railing" Sheet 1.

ELEVATION OF INSIDE FACE OF RAILING WITH GUARDRAIL ON APPROACH SLABS 40'-0" OR LESS ALONG GUTTER (WITHOUT CURB SHOWN, WITH CURB SIMILAR)



SECTION THRU RECESSED V-GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

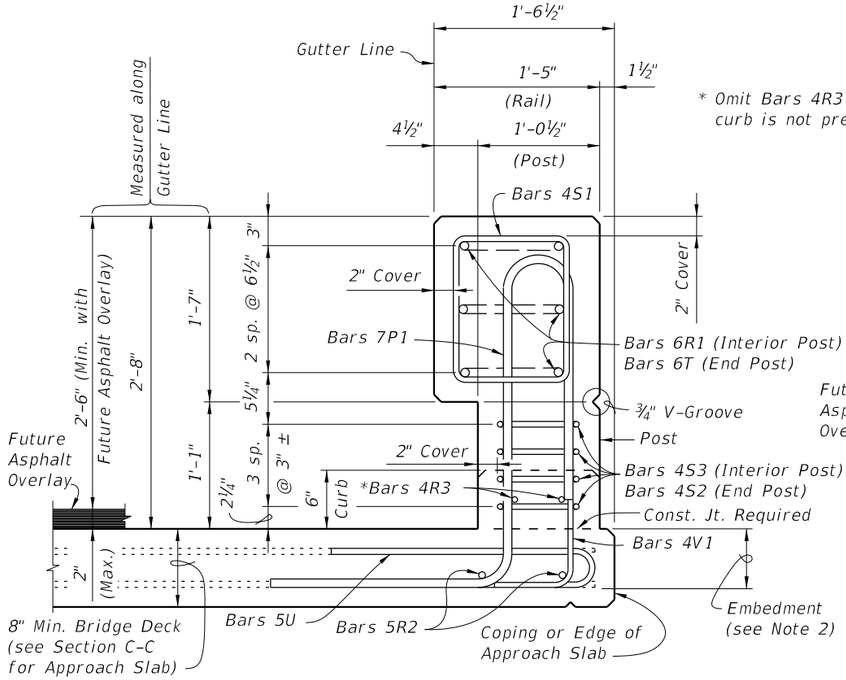
NOTES:
(NF) means Near Face.
(FF) means Far Face.

CROSS REFERENCES:
For Sections see Sheets 3 and 4.
For Quantities and Quantity Breakdown see Sheet 5.

ELEVATION OF INSIDE FACE OF RAILING WITH GUARDRAIL ON APPROACH SLABS GREATER THAN 40'-0" ALONG GUTTER (WITHOUT CURB SHOWN, WITH CURB SIMILAR)

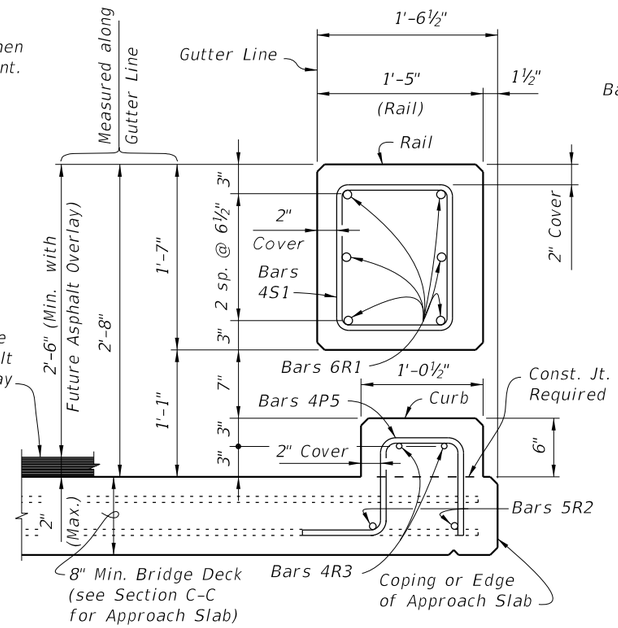
4:32:38 PM
6/23/2015

LAST REVISION	REVISION	DESCRIPTION:	2016 DESIGN STANDARDS	TRAFFIC RAILING - (CORRAL SHAPE)	INDEX NO.	SHEET NO.
01/01/11			FDOT		424	2 of 7

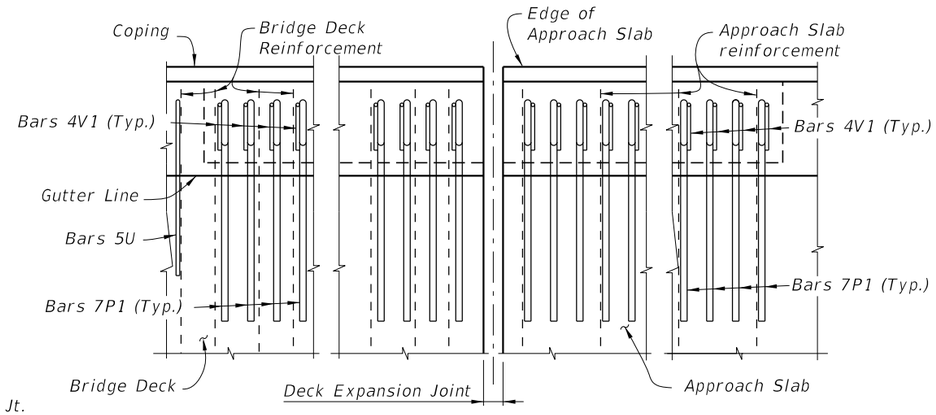


* Omit Bars 4R3 when curb is not present.

SECTION A-A (WITH CURB SHOWN, WITHOUT CURB SIMILAR)



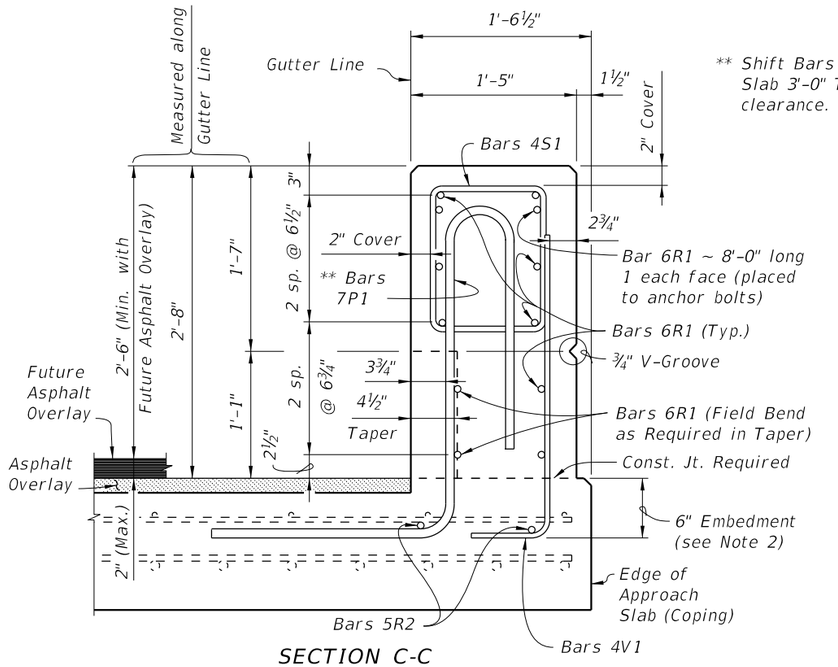
SECTION B-B (WITH CURB SHOWN, WITHOUT CURB SIMILAR)



PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB
(END POST SHOWN, INTERIOR POST SIMILAR)
(Bars R, S and T not shown for clarity)

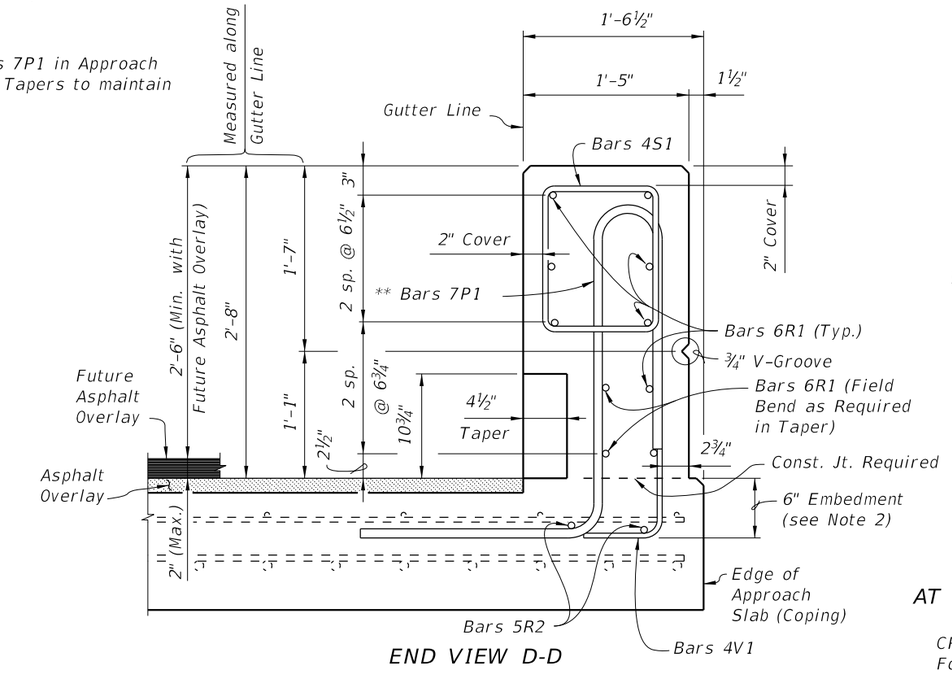
NOTES:
1) Shift deck and approach slab transverse reinforcement minimally to allow placement of Bars 7P & 4V.
2) For decks to 8½" place Bars 7P1 & 4V with the bottom mat of reinforcement as shown in Section A-A. For decks and slabs thicker than 8½" place Bars 7P1 and 4V with 6" embedment. At skewed joints, place Bars 7P3 and 4V with 5" embedment.

TYPICAL SECTIONS THRU RAILING (BRIDGE DECK SHOWN, APPROACH SLAB SIMILAR)

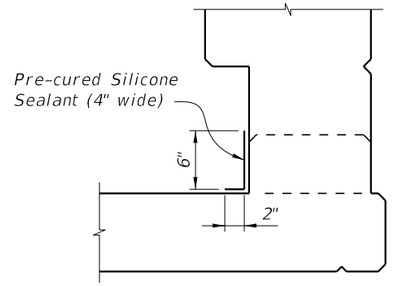


** Shift Bars 7P1 in Approach Slab 3'-0" Tapers to maintain clearance.

SECTION C-C



END VIEW D-D



INTERMEDIATE JOINT SEAL NOTES:
1. At Intermediate Open Joints in Curb Sections, seal the lower 6" portion of the open joint with Pre-cured Silicone Sealant in accordance with Specification Section 932.
2. 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.
3. The cost of the Pre-cured Silicone Sealant shall be included in the Contract Unit Price for the Traffic Railing.

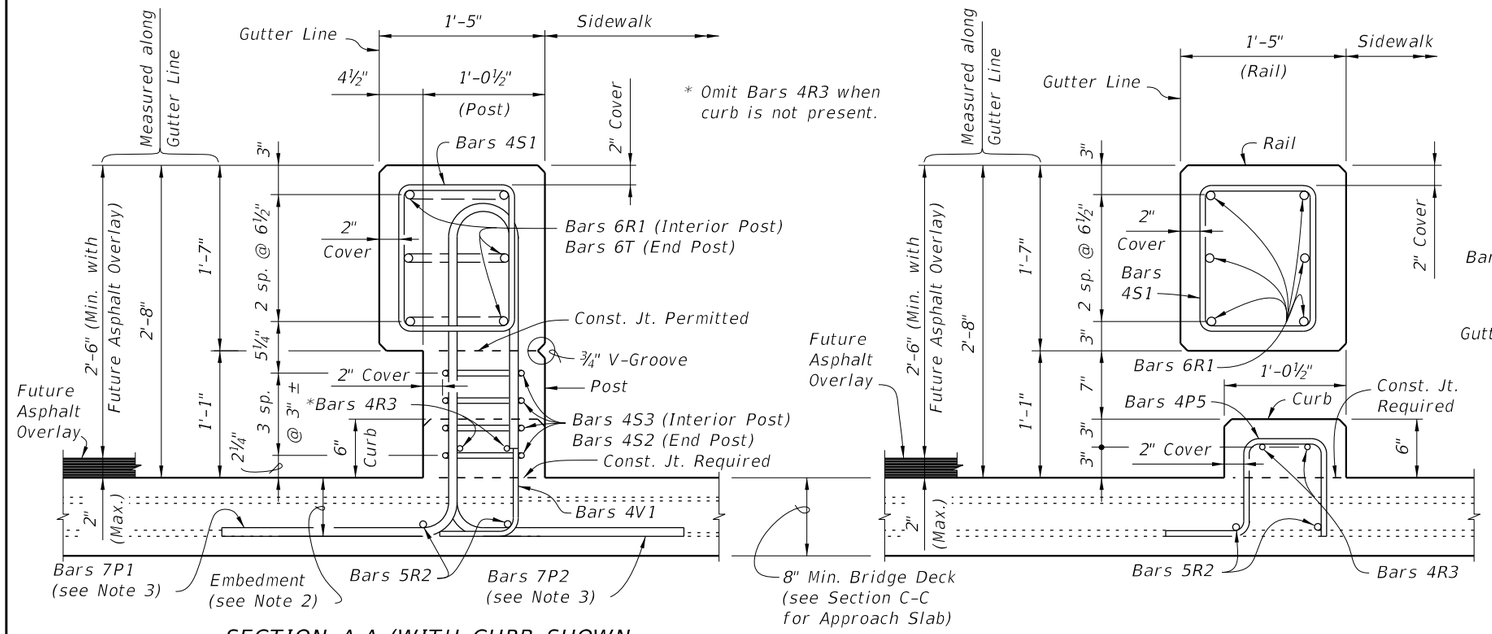
DETAIL "A" - SECTION
AT INTERMEDIATE OPEN JOINT WITH CURB

TYPICAL SECTIONS THRU RAILING END SECTIONS ON APPROACH SLAB WITH GUARDRAIL
(APPROACH SLAB (FLEXIBLE PAVEMENT APPROACHES) SHOWN, APPROACH SLAB (RIGID PAVEMENT APPROACHES) SIMILAR)

CROSS REFERENCES:
For Locations of Sections and Detail "A", see Sheets 1 and 2.
For Quantities and Rebar Details see Sheet 5.

6/23/2015 4:32:39 PM

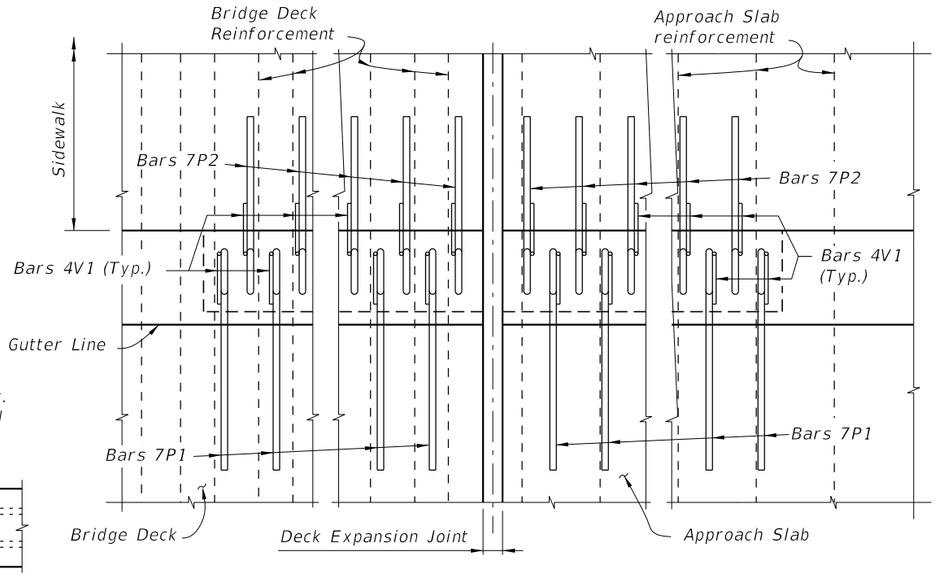
LAST REVISION	REVISION	DESCRIPTION:			
01/01/11			FDOT 2016 DESIGN STANDARDS	TRAFFIC RAILING - (CORRAL SHAPE)	INDEX NO. 424 / SHEET NO. 3 of 7



SECTION A-A (WITH CURB SHOWN, WITHOUT CURB SIMILAR)

SECTION B-B

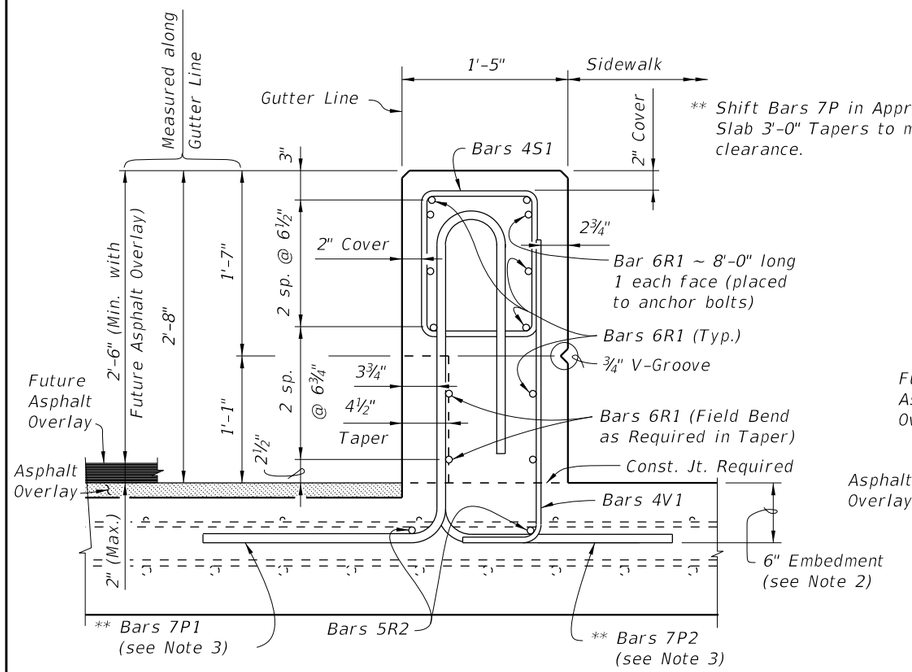
TYPICAL SECTIONS THRU RAILING ON BRIDGE DECK WITH SIDEWALK (SHOWN)
(RAILING ON APPROACH SLAB SIMILAR)



PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB WITH SIDEWALK
(Bars R, S and T not shown for clarity)

RAILING ADJACENT TO SIDEWALK NOTES:

1) *End Post detailed above, Interior Post and Approach Slab End Section similar.*
2) *For decks to 8½" place Bars 7P1 and 7P2 and 4V with the bottom mat of reinforcement as shown in Section A-A. For decks and slabs thicker than 8½" place Bars 7P1 and 7P2 and 4V with 6" embedment.*
3) *Alternate Bars 7P1 and 7P2 at each post. At End Posts 3 each (Min.) required, at Intermediate Post 6 each required.*
4) *Reverse direction of every other Bar 4V1 to match direction of Bars 7P1 or 7P2.*
5) *Shift deck and approach slab transverse reinforcement minimally to allow placement of Bars 7P & 4V.*



SECTION C-C

END VIEW D-D

TYPICAL SECTIONS THRU RAILING END SECTION ON APPROACH SLAB WITH SIDEWALK AND GUARDRAIL
(APPROACH SLAB (FLEXIBLE PAVEMENT APPROACHES) SHOWN, APPROACH SLAB (RIGID PAVEMENT APPROACHES) SIMILAR)

CROSS REFERENCES:
For Locations of Sections see Sheets 1 and 2.
For Quantities and Rebar Details see Sheet 5.

6/23/2015 4:32:39 PM

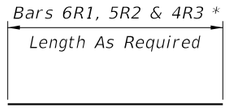
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/05			FDOT 2016 DESIGN STANDARDS	TRAFFIC RAILING - (CORRAL SHAPE)	424	4 of 7

CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

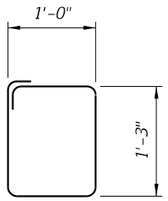
BILL OF REINFORCING STEEL

MARK	SIZE	LENGTH	LB/BAR
P1	7	7'-4"	15.00
P2	7	7'-3"	14.82
P3	7	7'-2"	14.65
*** P4	7	7'-3"	14.82
* P5	4	2'-11"	1.94
R1	6	As Reqd.	1.5 (LB/LF)
R2	5	As Reqd.	1.04 (LB/LF)
* R3	4	As Reqd.	0.67 (LB/LF)
** S1	4	5'-0"	3.34
** S2	4	Varies 6'-3" Min. 16'-3" Max.	Varies 4.18 Min. 10.86 Max.
** S3	4	11'-3"	7.52
T	6	11'-4"	17.02
U	5	4'-8"	4.87
V1	4	3'-2"	2.12
*** V2	4	3'-6"	2.34

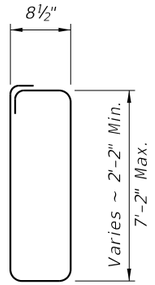
* Bars 4P5 and 4R3 are to be used with a curb only.
** Bend Bars 4S1, 4S2 & 4S3 around a #3 Stirrup Pin.
*** Bars 7P4 & 4V2 are to be used on C-I-P Concrete Retaining Walls.



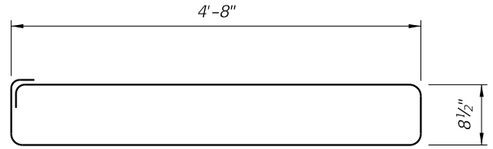
Bars 6R1, 5R2 & 4R3



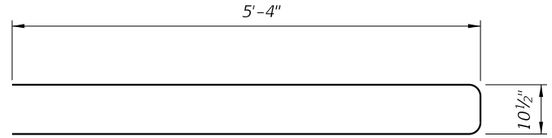
Stirrup Bar 4S1



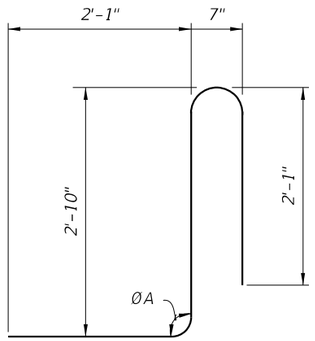
Stirrup Bar 4S2



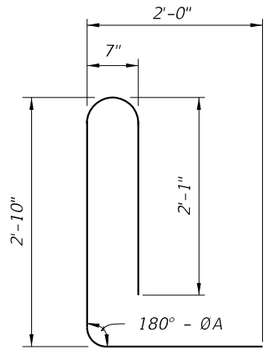
Stirrup Bar 4S3



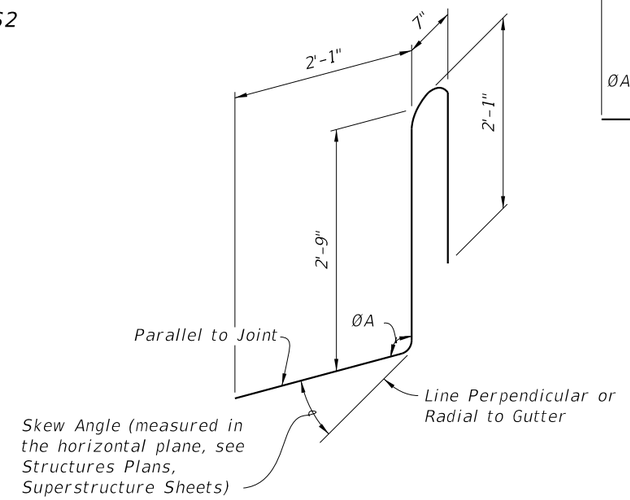
Stirrup Bar 6T



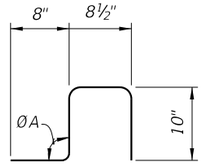
Bar 7P1



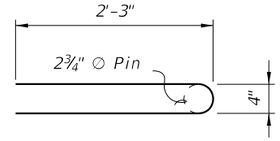
Bar 7P2



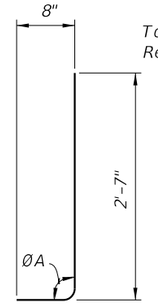
Bar 7P3 (Requires 3 Dimensional Bend)



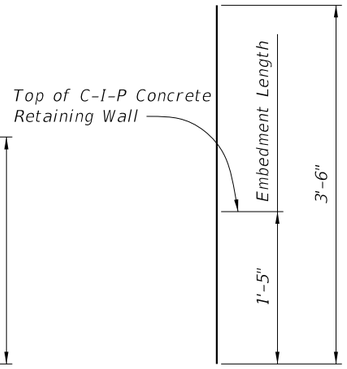
Bar 4P5 *



Stirrup Bar 5U



Bar 4V1



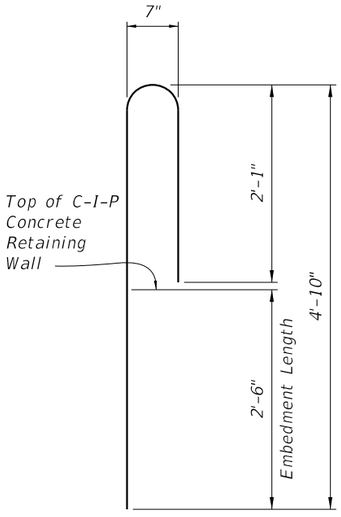
Bar 4V2 ***

REINFORCING STEEL NOTES:

1. All bar dimensions in the bending diagrams are out to out.
2. The reinforcement for the railing on a C-I-P Concrete Retaining Wall shall be the same as detailed above for a 8" deck with ØA = 90°, where applicable. If bottom horizontal legs of Bars 7P1, 7P3 and 4V1 prohibit placement, Bars 7P4 and 4V2 may be substituted for Bars 7P1, 7P3 and 4V1 as shown.
3. All reinforcing steel at the open joints shall have a 2" minimum cover unless otherwise noted.
4. At Construction Joints Bars 6R1, 5R2 and 4R3 may be continuous or spliced. Where bars are spliced provide a 2'-6" Min. lap length for Bar 6R1, a 2'-0" Min. lap length for Bars 5R2 and a 1'-3" Min. lap length for Bars 4R3.
5. The skew angle for Bars 7P3 may vary from joint to joint and side to side, see Structures Plans, Superstructure Sheets for details.

ROADWAY OR SIDEWALK CROSS-SLOPE	HIGH SIDE ØA	LOW SIDE ØA
0% to 2%	90°	90°
2% to 6%	93°	87°
6% to 10%	96°	84°

ØA shall be 90° if Contractor elects to place Railing Perpendicular to the Deck.

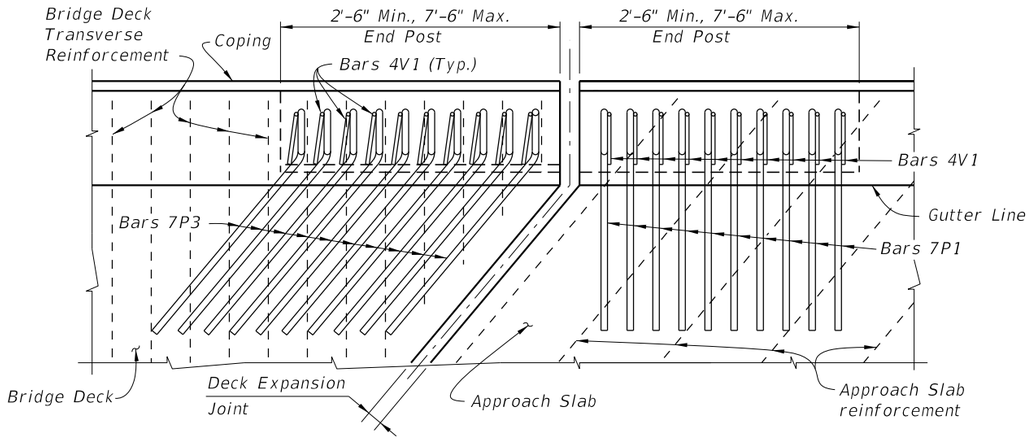


Bar 7P4 ***

ESTIMATED TRAFFIC RAILING QUANTITIES		
ITEM	CONCRETE QUANTITY (CY)	REBAR QUANTITY (LB)
Typical 10'-0" Section w/Curb	1.13	451
Typical 10'-0" Section w/o Curb	1.03	428
Approach Slab with Guardrail End Section	0.14 (per LF)	44 (per LF)

6/23/2015 4:32:40 PM

LAST REVISION	REVISION	DESCRIPTION:			
07/01/05			FDOT 2016 DESIGN STANDARDS	TRAFFIC RAILING - (CORRAL SHAPE)	INDEX NO. 424 / SHEET NO. 5 of 7

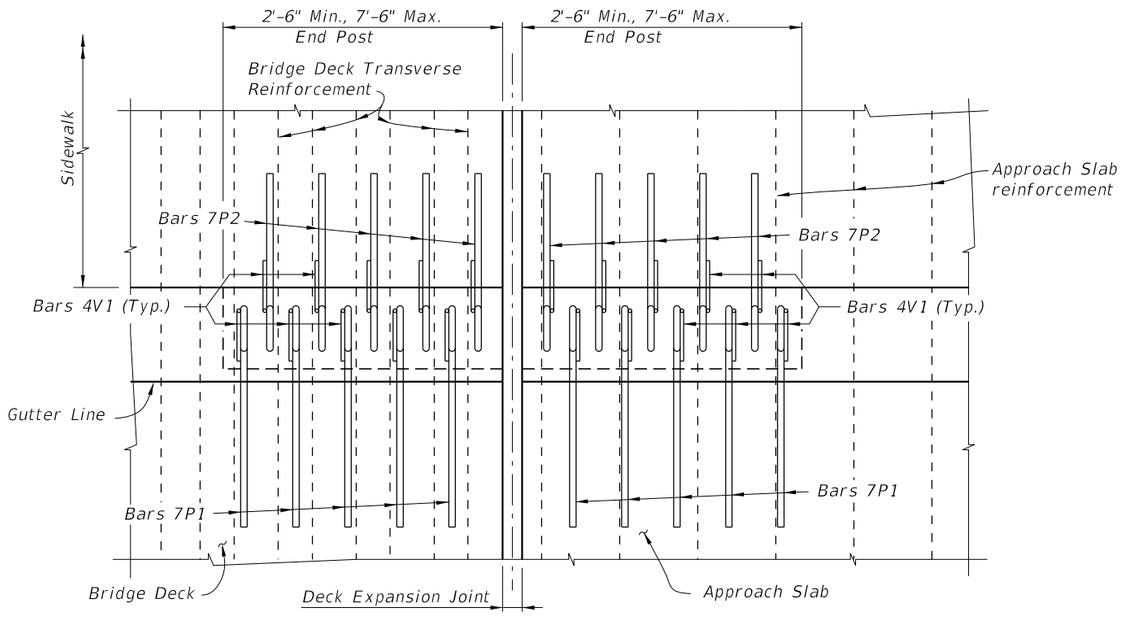


PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB - SKEW ANGLE GREATER THAN 15 DEGREES

NOTES:
1) Railing expansion joint shall match the deck expansion joint which shall be turned perpendicular or radial to the gutter line. See Structures Plans, Superstructure and Approach Slab Sheets for details.
2) Bars 4S1 (not shown) shall be placed perpendicular or radial to the gutter.

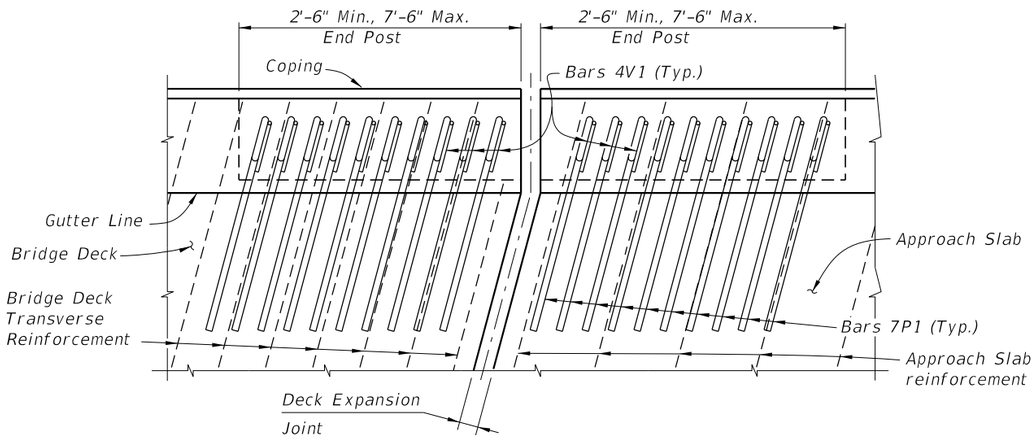
BRIDGE DECK AND APPROACH SLAB WITHOUT GUARDRAIL ATTACHED (SHOWN):
3) End Post & Approach Slab End Section – Place Bars 7P1 & 4V1 in obtuse corners of intersection of deck joint and gutter line. Place Bars 7P3 & 4V1 in acute corners of intersection of deck joint and gutter line as required. Interior Post – use Bars 7P1 and 4V1 placed with bottom mat of reinforcement. Shift deck or slab reinforcement minimally to allow proper placement of Bars 7P and 4V and to facilitate placement of concrete.

APPROACH SLAB WITH GUARDRAIL ATTACHED (NOT SHOWN):
4) Place Bars 7P1 & 4V1 in obtuse corners of intersection of deck joint and gutter line and Bars 7P3 & 4V1 in acute corners of intersection of deck joint and gutter line as required. Shift deck or slab reinforcement minimally to allow proper placement of Bars 7P & 4V and to facilitate placement of concrete.
5) Begin placing Railing Bars 7P & 4V on Approach Slab at the railing end and proceed toward Begin or End Bridge to ensure placement of guardrail bolt holes. If required, adjustments to the bar spacing for Bars 7P & 4V shall be made immediately adjacent to Begin or End Bridge.



PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB WITH SIDEWALK - 0 DEGREE SKEW ANGLE

NOTES:
1) Alternate Bars 7P1 with Bars 7P2 and reverse direction of every other Bar 4V1 as detailed above to facilitate placement of concrete.
2) Shift deck transverse reinforcement minimally to allow placement of Bars 7P & 4V.



PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB - SKEW ANGLE 15 DEGREES OR LESS

NOTES:
1) Railing expansion joint shall match the deck expansion joint which shall be turned perpendicular or radial to the gutter line. See Structures Plans, Superstructure and Approach Slab Sheets for details.
2) Bars 4S1 (not shown) shall be placed perpendicular or radial to the gutter.
3) Bars 7P & 4V in the Approach Slab may be rotated to match Approach Slab reinforcement or placed perpendicular or radial to the gutter line.

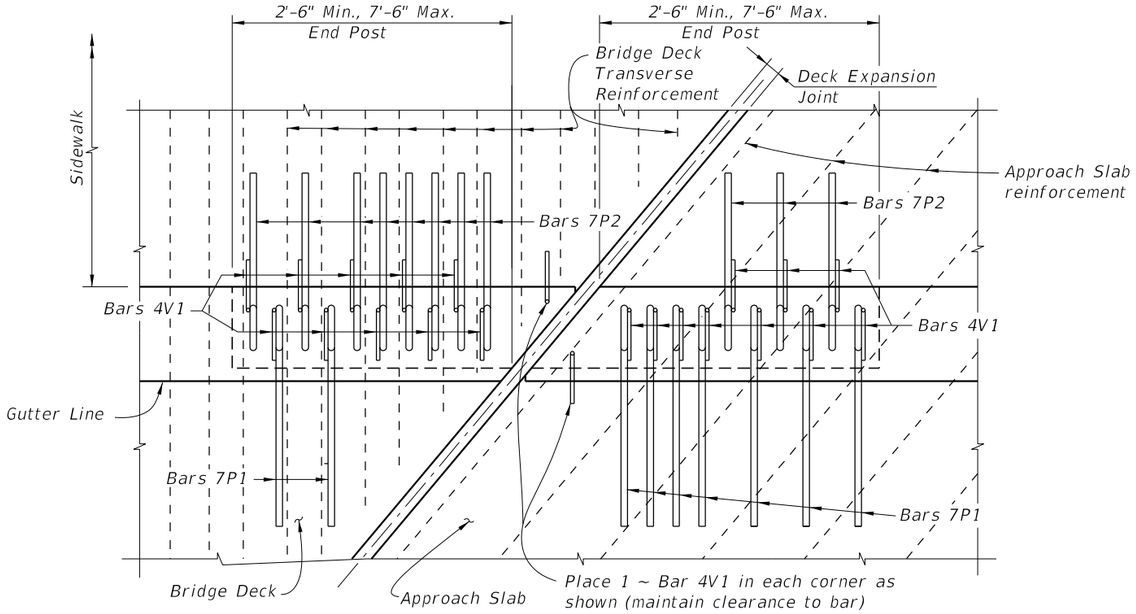
BRIDGE DECK AND APPROACH SLAB WITHOUT GUARDRAIL ATTACHED (SHOWN):
4) Rotate vertical Bars 7P & 4V to match bridge deck reinforcement. Shift deck & slab transverse reinforcement to allow proper placement of Bars 7P & 4V and to facilitate placement of concrete.

APPROACH SLAB WITH GUARDRAIL ATTACHED (NOT SHOWN):
5) Begin placing Railing Bars 7P & 4V on Approach Slab at the railing end and proceed toward Begin or End Bridge to ensure placement of guardrail bolt holes. If required, adjustments to the bar spacing for Bars 7P & 4V shall be made immediately adjacent to Begin or End Bridge.
6) Bars 7P at end of the railing shall be field cut and shifted to maintain clearance, see Railing End Taper Detail Sheet 2 for similar details.

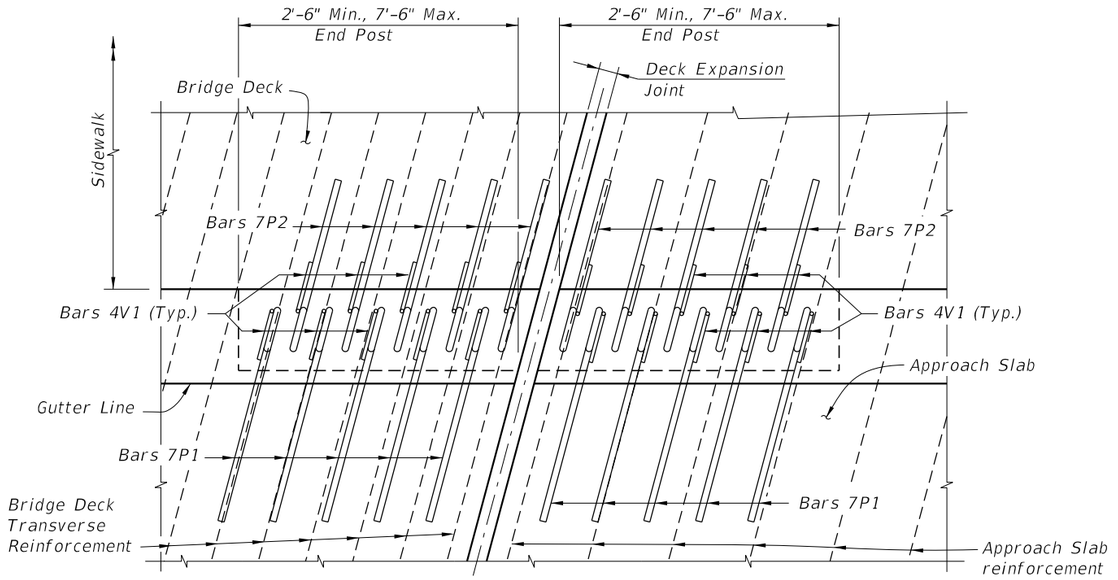
GENERAL NOTES:
1) Deck Expansion Joint at begin or end bridge shown. Deck Expansion Joints at ℄ Pier or Intermediate Bents are similar.
2) Partial Plan Views shown are intended as guides only. See Structures Plans, Superstructure and Approach Slab Sheets for skew angles, joint orientation, dimensions and details.

6/23/2015 4:32:41 PM

LAST REVISION	REVISION	DESCRIPTION:			
07/01/05			2016 DESIGN STANDARDS	TRAFFIC RAILING - (CORRAL SHAPE)	INDEX NO. 424 / SHEET NO. 6 of 7

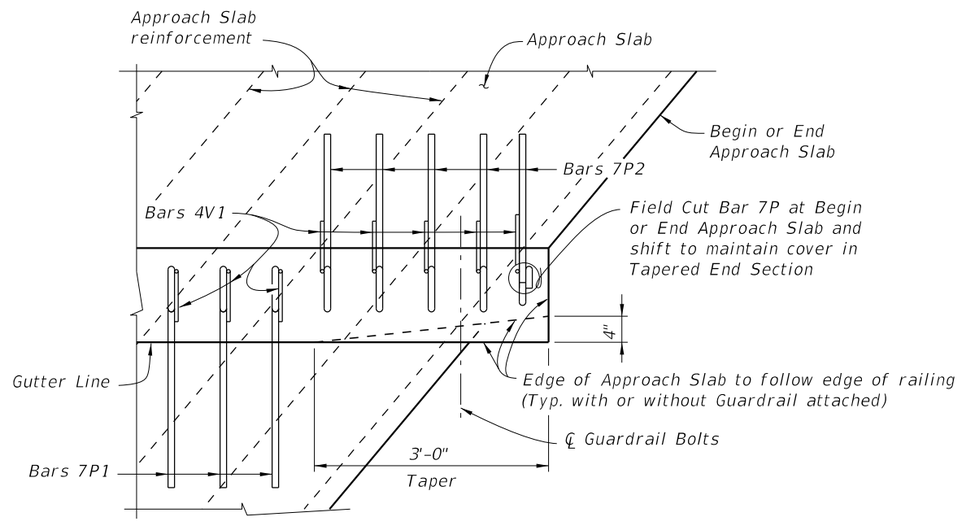


PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB WITH SIDEWALK
- SKEW ANGLE GREATER THAN 15 DEGREES



PARTIAL PLAN VIEW OF BRIDGE DECK AND APPROACH SLAB WITH SIDEWALK
- SKEW ANGLE 15 DEGREES OR LESS

NOTES:
1) Railing ends at deck expansion joints shall follow the deck joint with allowance for joint movement. Expansion joint at the inside face of parapet shall be turned perpendicular or radial to this line. See Structures Plans, Superstructure and Approach Slab Sheets for details.
2) Bars 4S1 (not shown) shall be placed perpendicular or radial to the gutter.
3) Edge of Approach Slab adjacent to the roadway shall follow end of railing, Bars 7P at end of the railing shall be field cut and shifted to maintain clearance, see detail bottom left this sheet for similar details.
BRIDGE DECK AND APPROACH SLAB WITHOUT GUARDRAIL ATTACHED (SHOWN):
4) Alternate Bars 7P1 with Bars 7P2 and reverse direction of every other Bar 4V1 to facilitate placement of concrete.
5) Bars 7P & 4V shall be rotated to match bridge deck reinforcement. Shift deck transverse reinforcement minimally to allow placement of Bars 7P & 4V.
6) Railing End Post and reinforcement detailed above. Railing Interior Post reinforcement similar.
APPROACH SLAB WITH GUARDRAIL ATTACHED (NOT SHOWN):
7) Begin placing Railing Bars 7P & 4V on Approach Slab at the railing end and proceed toward Begin or End Bridge to ensure placement of guardrail bolt holes. If required, adjustments to the bar spacing for Bars 7P & 4V shall be made immediately adjacent to Begin or End Bridge.



PARTIAL PLAN VIEW AT BEGIN OR END APPROACH SLAB WITH
SIDEWALK AND RAILING WITH GUARDRAIL ATTACHED
- SKEW ANGLE GREATER THAN 15 DEGREES SHOWN, 15 DEGREES OR LESS SIMILAR

NOTES:
1) Railing ends at deck expansion joints shall follow the deck joint with allowance for joint movement. Expansion joint at the inside face of parapet shall be turned perpendicular or radial to this line. See Structures Plans, Superstructure and Approach Slab Sheets for details.
2) Bars 4S1 (not shown) shall be placed perpendicular or radial to the gutter.
BRIDGE DECK AND APPROACH SLAB WITHOUT GUARDRAIL ATTACHED (NOT SHOWN):
3) Deck transverse reinforcement may be shifted minimally as required to allow proper placement of Bars 7P & 4V and to facilitate placement of concrete. Bars 7P1 & 4V1 or 7P2 & 4V1 shall be used on opposing sides of the joint depending on the direction of the skew, see Detail above. Approach Slab reinforcement may be shifted if conflicts occur.
4) Interior Post – alternate Bars 7P1 with Bars 7P2 and reverse direction of every other Bar 4V1 to facilitate placement of concrete.
5) End Post – alternate Bars 7P1 with Bars 7P2 and reverse direction of Bars 4V1 (as detailed) where possible.
APPROACH SLAB WITH GUARDRAIL ATTACHED (SHOWN):
6) Use Bars 7P2 and reverse direction of Bars 4V1 where skew restricts use of Bars 7P1 & 4P1.
7) Begin placing Railing Bars 7P & 4V on Approach Slab at the railing end and proceed toward Begin or End Bridge to ensure placement of guardrail bolt holes. If required, adjustments to the bar spacing for Bars 7P & 4V shall be made immediately adjacent to Begin or End Bridge.

6/23/2015 4:32:41 PM

LAST REVISION	REVISION	DESCRIPTION:				
07/01/05			FDOT 2016 DESIGN STANDARDS	TRAFFIC RAILING - (CORRAL SHAPE)	INDEX NO. 424	SHEET NO. 7 of 7