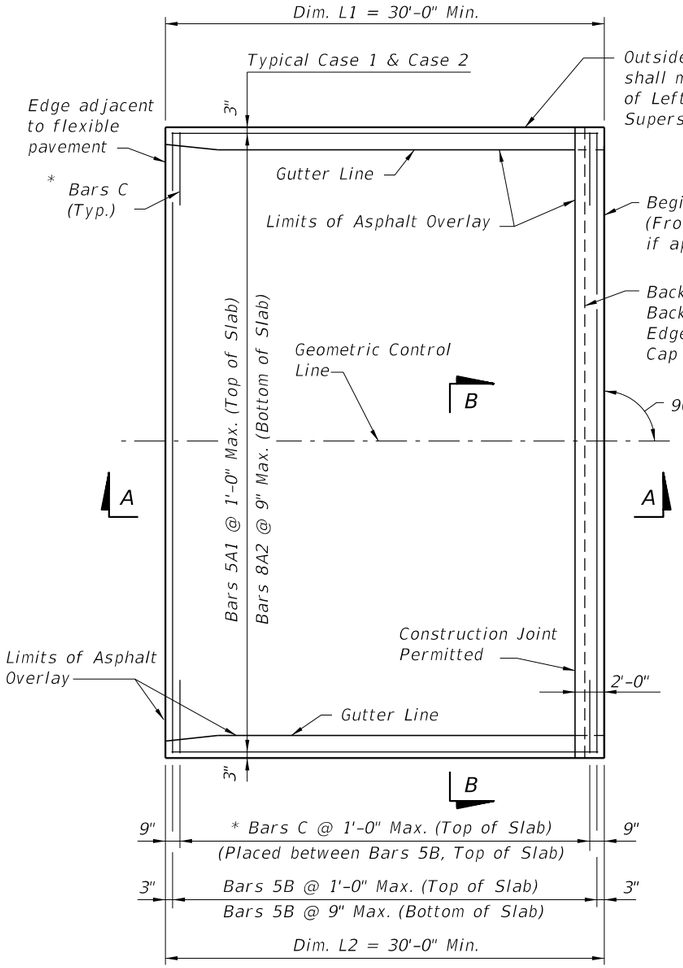
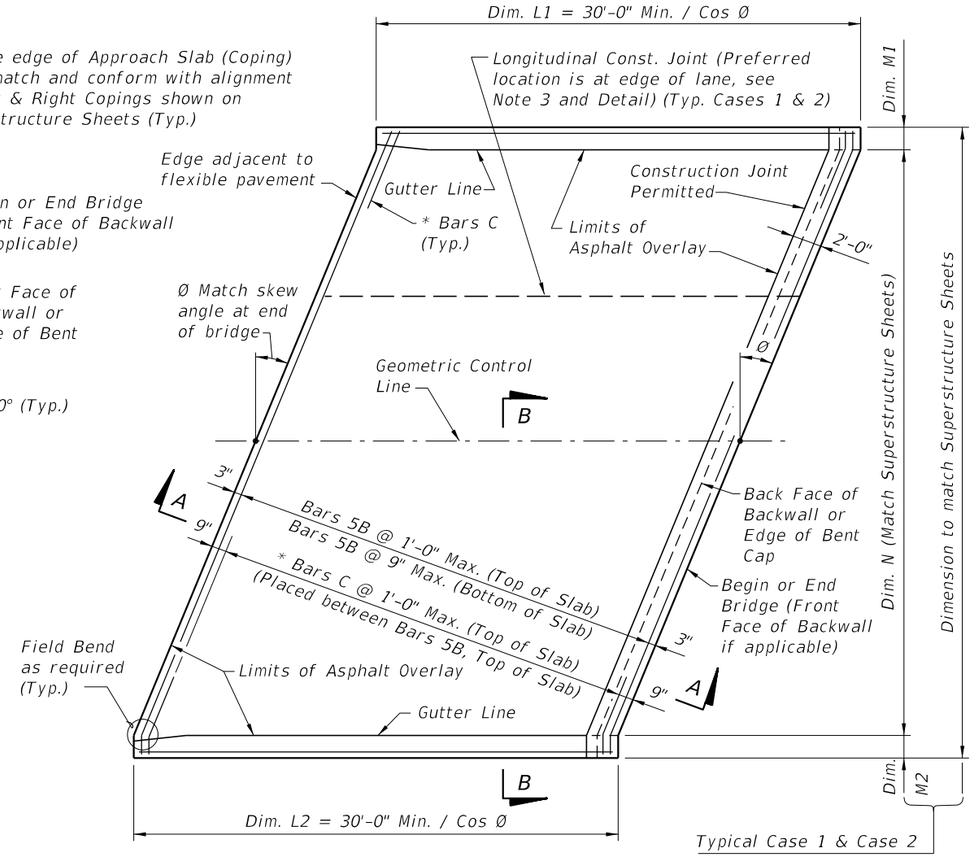
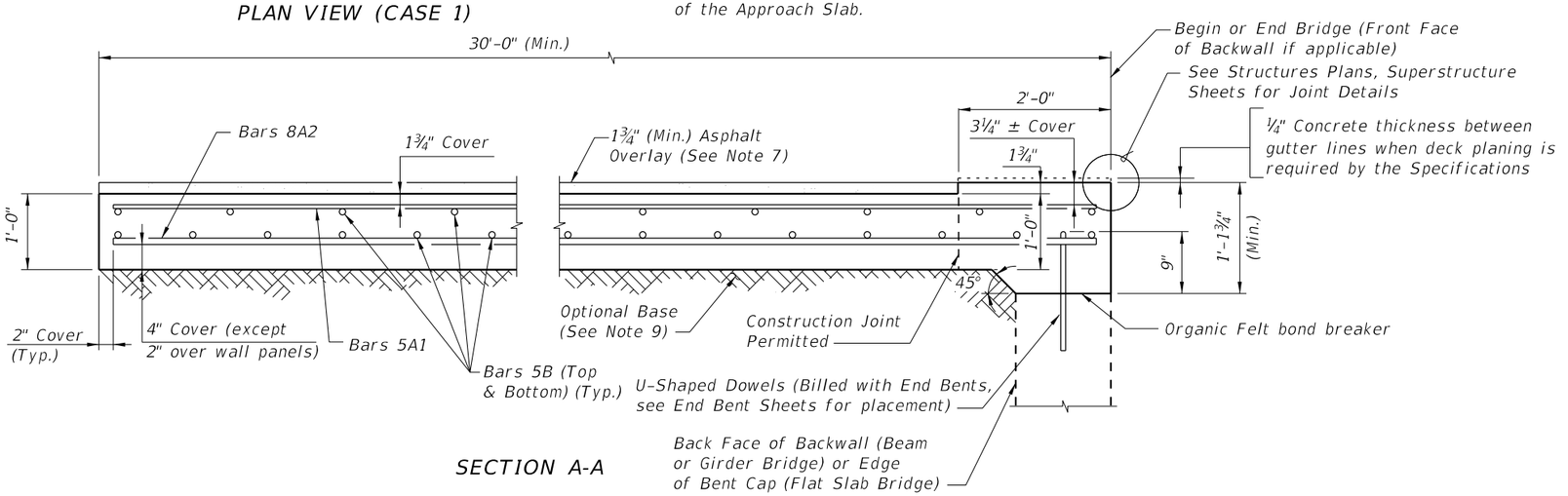


PLAN VIEW (CASE 1)



PLAN VIEW (CASE 2)

* NOTE: Bars C are required as shown when the 36" or 42" Single-Slope Traffic Railings, or the Traffic Railing/Noise Wall, are used at the edge of the Approach Slab.



SECTION A-A

GENERAL NOTES

1. SURFACE TREATMENT: As an option to Class 4 Floor Finish (Bridge Floor Grooving) per Section 400 a hand tined or heavy broomed finish may be permitted on the concrete portion of the riding surface. Sidewalk areas shall receive a broomed finish. The top surface of the concrete beneath the asphalt overlay shall be raked.
2. CONDUIT: If required, see Structures Plans for Conduit Details.
3. When a longitudinal construction joint is necessary or allowed by the Engineer, the transverse steel shall be extended as shown in the Longitudinal Construction Joint Detail.
4. The plan view for CASE 1 applies when the skew angle (Ø) = 0°. Relevant details also apply to CASE 2.
5. The plan view for CASE 2 applies where the skew angle (Ø) is > 0°. The slab shown represents a skew to the right for an approach slab at begin bridge; approach slab at the end of bridge or a left skew shall be treated similarly.
6. Deformed WWR must meet the requirements of Specification Section 931.
7. Continue the asphalt pavement over the approach slab and match the friction course type used on the roadway.
8. Approach slabs shown in Plan View Cases 1 and 2 represent a typical approach slab with edge barriers and no sidewalks. Provide railings, parapets and raised sidewalks as detailed in the Contract Plans.
9. PAYMENT: Deformed WWR for the edge of Approach Slabs on retaining walls is not included in the estimated quantity for reinforcing steel and is considered incidental to the work. See Roadway Plans for Asphalt Overlay and Optional Base details and quantities.

CROSS REFERENCES:

For Section B-B, Longitudinal Construction Joint Detail and Approach Slab Details see Sheet 2.

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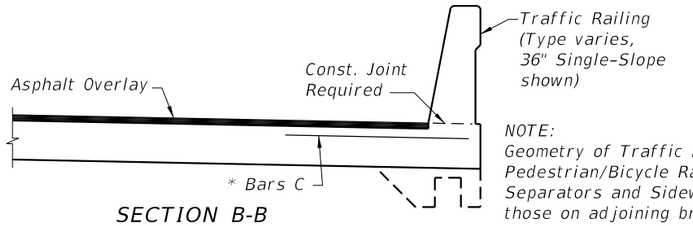
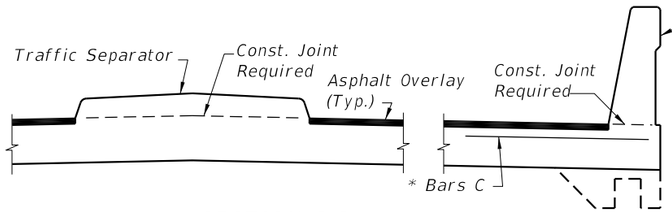
LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	APPROACH SLABS (30 FT.) (FLEXIBLE PAVEMENT APPROACHES)	INDEX	SHEET
11/01/17					400-090	1 of 2



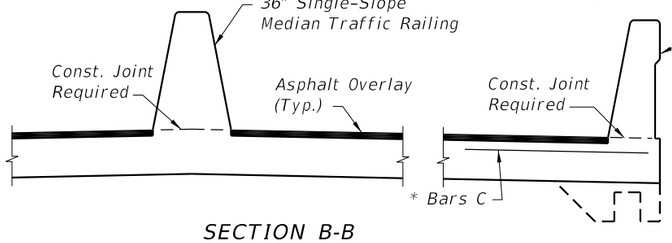
NOTE:
Geometry of Traffic Railings, Pedestrian/Bicycle Railings, Traffic Separators and Sidewalks to match those on adjoining bridge.

SECTION B-B
STANDARD APPROACH SLAB

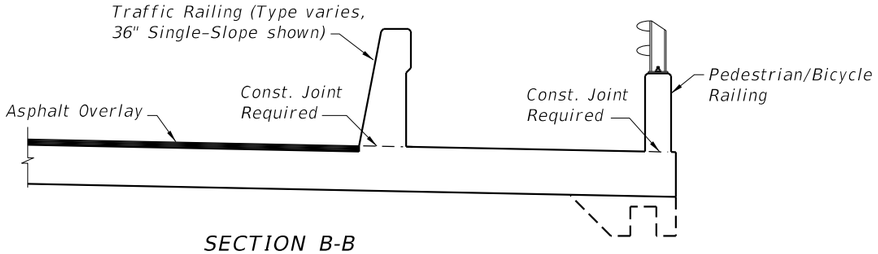


SECTION B-B
APPROACH SLAB WITH TRAFFIC SEPARATOR

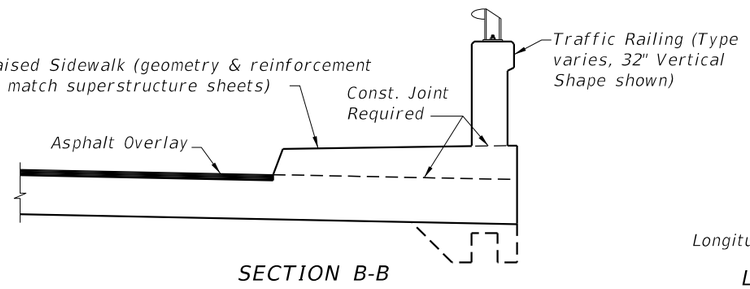
*NOTE: Bars C are required as shown when the 36" or 42" Single-Slope Traffic Railing, or the Traffic Railing/Noise Wall, are used at the edge of the Approach Slab.



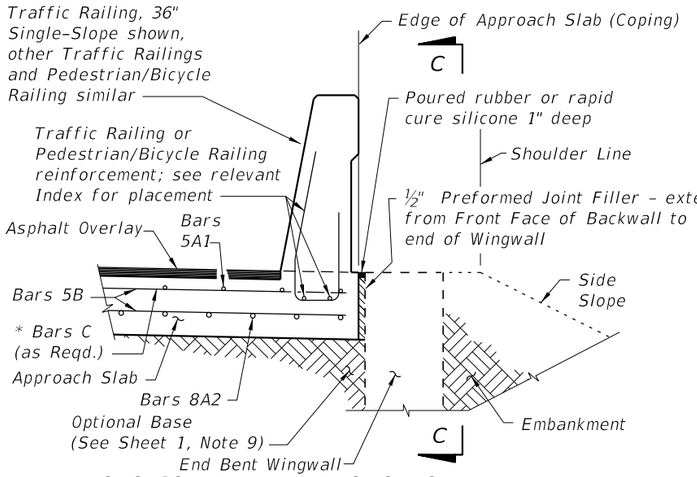
SECTION B-B
APPROACH SLAB WITH MEDIAN TRAFFIC RAILING



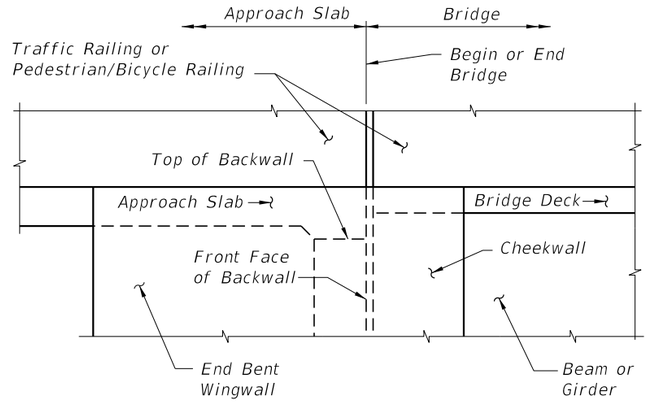
SECTION B-B
APPROACH SLAB WITH SIDEWALK



SECTION B-B
APPROACH SLAB WITH RAISED SIDEWALK

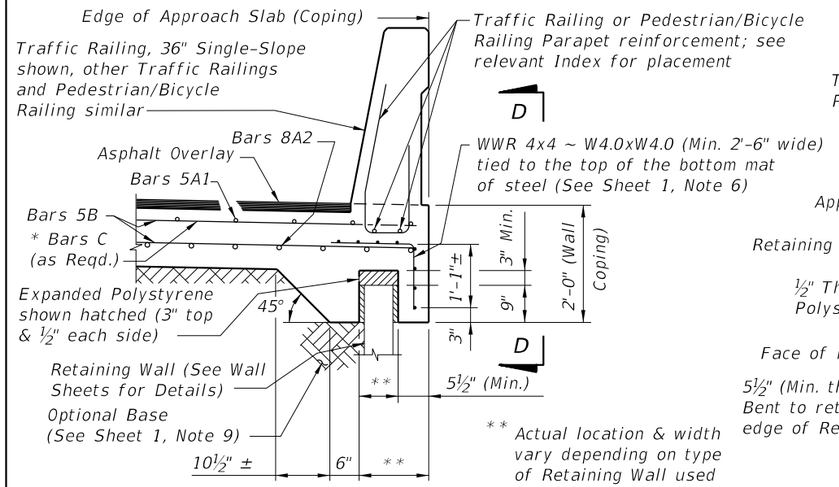


SECTION THRU APPROACH SLAB
AND END BENT WINGWALL

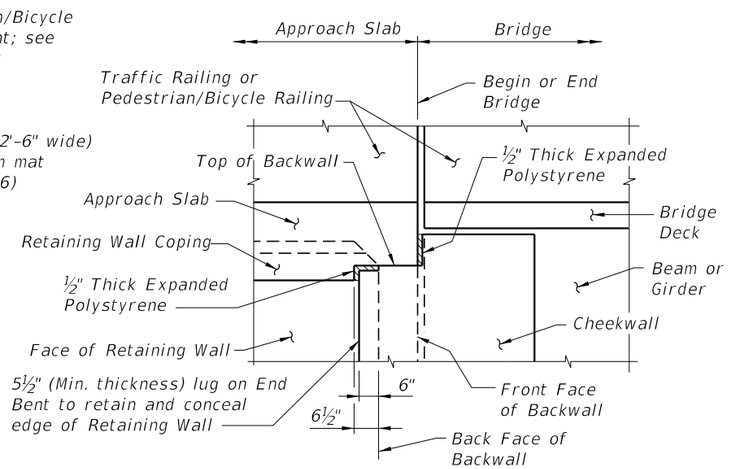


VIEW C-C AT BEGIN OR END BRIDGE (BEAM
BRIDGE SHOWN, FLAT SLAB BRIDGE SIMILAR)

APPROACH SLAB WITH WINGWALL DETAILS

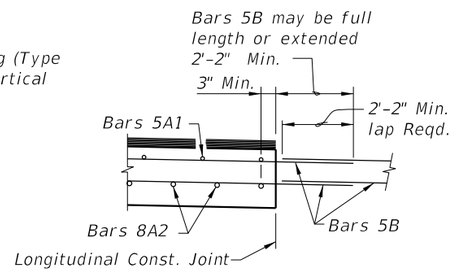


SECTION THRU APPROACH SLAB
AND RETAINING WALL

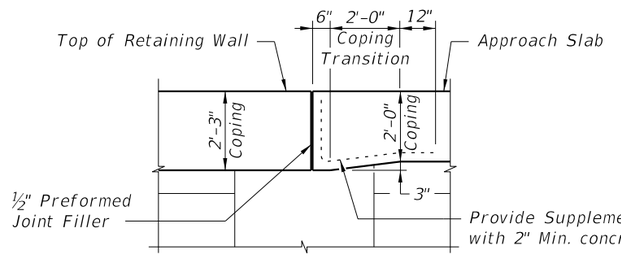


VIEW D-D AT BEGIN OR END BRIDGE (BEAM
BRIDGE SHOWN, FLAT SLAB BRIDGE SIMILAR)

APPROACH SLAB WITH RETAINING WALL DETAILS



LONGITUDINAL CONSTRUCTION
JOINT DETAIL



COPING TRANSITION DETAIL FOR
RETAINING WALLS WITH 2'-3" COPING HEIGHT
(Railing Not Shown For Clarity)

CROSS REFERENCES:

For location of Section B-B and Longitudinal Construction Joint see Sheet 1.

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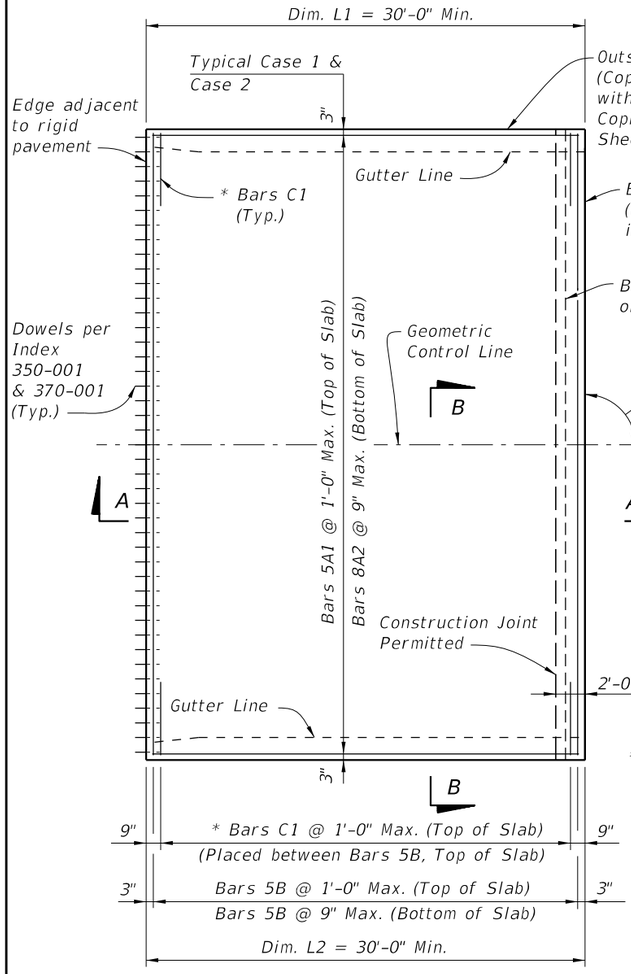
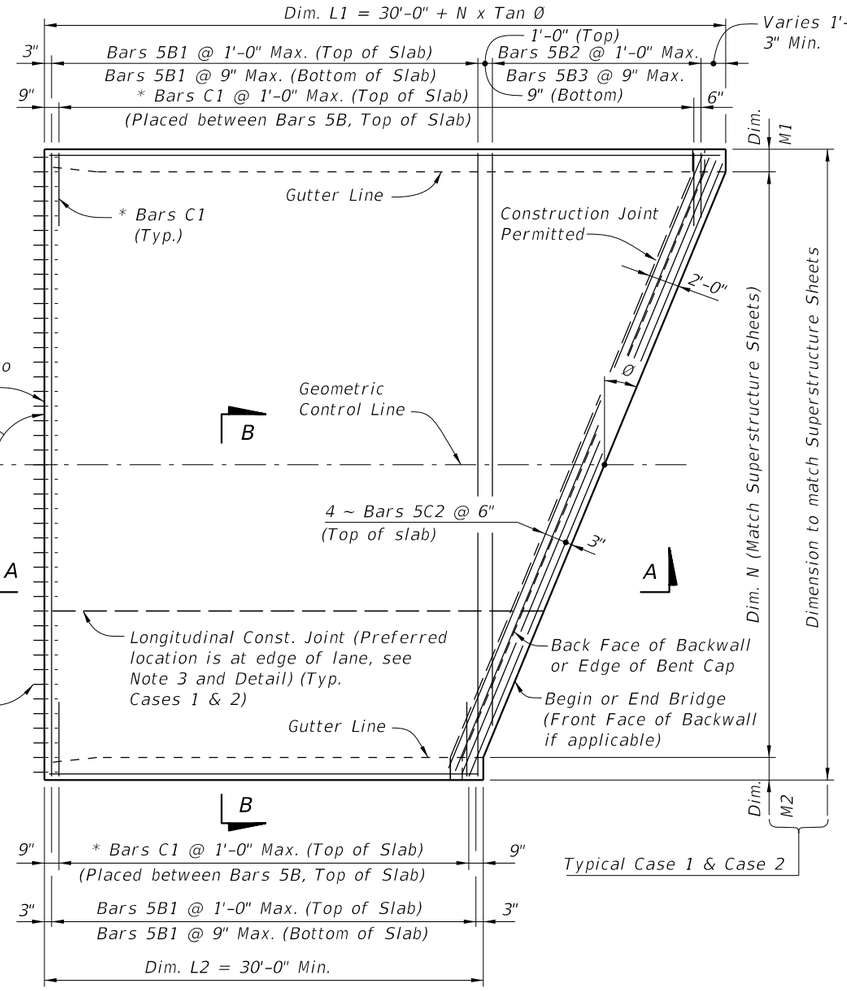
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	APPROACH SLABS (30 FT.) (FLEXIBLE PAVEMENT APPROACHES)	INDEX	SHEET
11/01/17						400-090	2 of 2

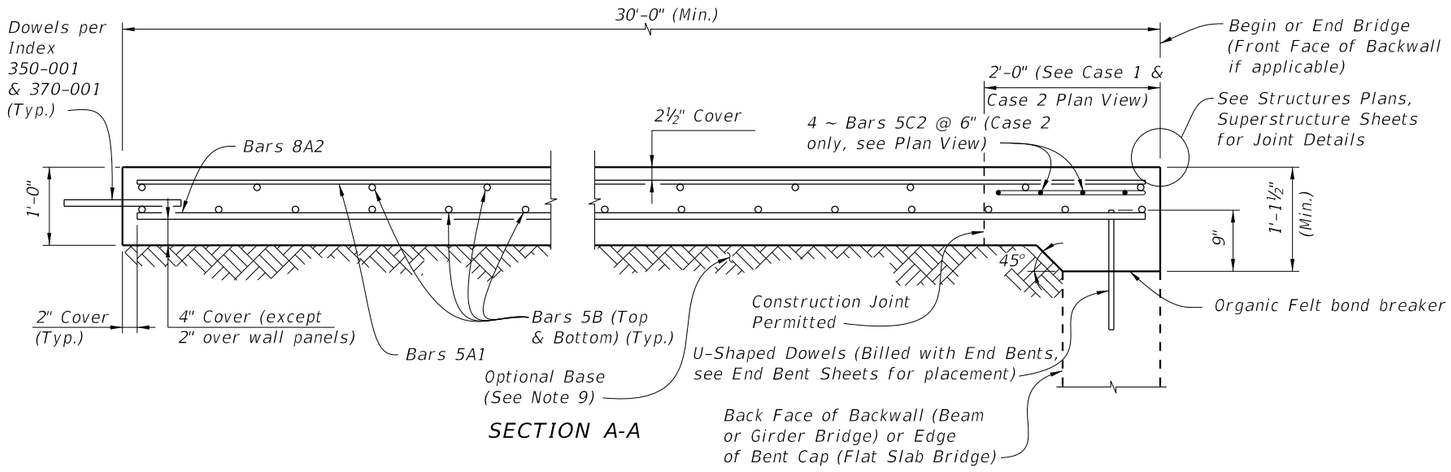


* NOTE: Bars C1 are required as shown when the 36" or 42" Single-Slope Traffic Railings, or the Traffic Railing/Noise Wall, are used at the edge of the Approach Slab.

PLAN VIEW (CASE 1)



PLAN VIEW (CASE 2)



SECTION A-A

GENERAL NOTES

1. SURFACE TREATMENT: Apply a Class 4 Floor Finish (Grooved) to the riding surface from begin or end approach slab joint to begin or end bridge. See Bid Item Notes. Apply a broomed finish to sidewalk areas.
2. CONDUIT: If required, see Structures Plans for Conduit details.
3. When a longitudinal construction joint is necessary or allowed by the Engineer, the transverse steel shall be extended as shown in the Longitudinal Construction Joint Detail.
4. The plan view for CASE 1 applies when the skew angle (Ø) = 0°. Relevant details also apply to CASE 2.
5. The plan view for CASE 2 applies where the skew angle (Ø) is > 0°. The slab shown represents a skew to the right for an approach slab at begin bridge; approach slab at the end of bridge or a left skew shall be treated similarly. The shown reinforcement shall be utilized, and Dowels provided in accordance with Index 350-001 and 370-001.
6. Deformed WWR must meet the requirements of Specification Section 931.
7. PROFILOGRAPH: If profilograph requirements apply, planing may be required. The permitted construction joint shown in Section A-A will facilitate the placement of the expansion joint.
8. Approach slabs shown in Plan View Cases 1 and 2 represent a typical approach slab with edge barriers and no sidewalks. Provide railings, parapets, traffic separators and sidewalks as detailed on the additional approach slab sheets.
9. PAYMENT: Deformed WWR for the edge of Approach Slabs on retaining walls is not included in the estimated quantity for reinforcing steel and is considered incidental to the work. See Roadway Plans for Optional Base details and quantities.

CROSS REFERENCES:

For Section B-B, Longitudinal Construction Joint Detail and Approach Slab Details see Sheet 2.

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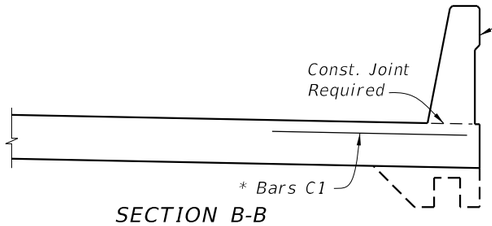
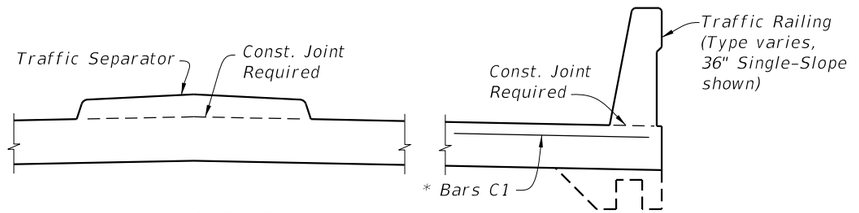
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/17			FY 2019-20 STANDARD PLANS	APPROACH SLABS (30 FT.) (RIGID PAVEMENT APPROACHES)	400-091	1 of 2



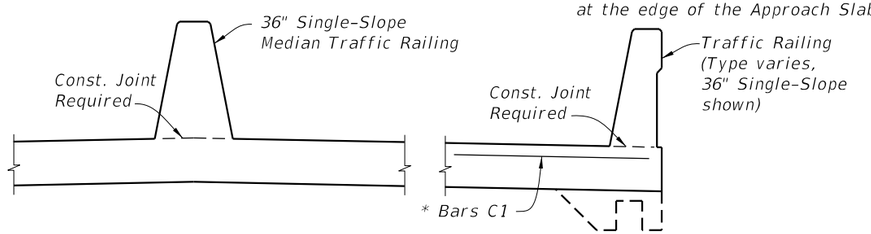
NOTE:
Geometry of Traffic Railings, Pedestrian/Bicycle Railings, Traffic Separators and Sidewalks to match those on adjoining bridge.

SECTION B-B
STANDARD APPROACH SLAB

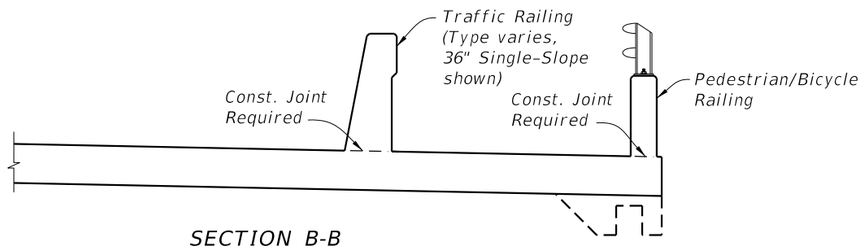


SECTION B-B
APPROACH SLAB WITH TRAFFIC SEPARATOR

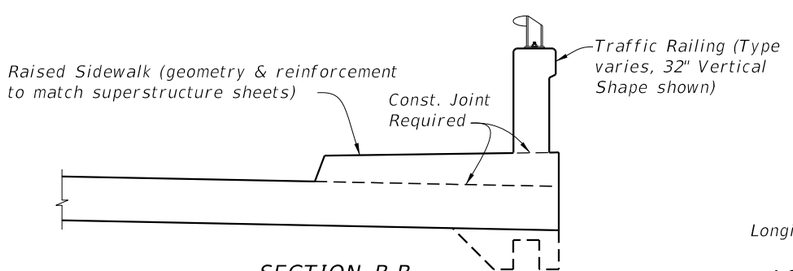
*NOTE: Bars C1 are required as shown when the 36" or 42" Single-Slope Traffic Railing, or the Traffic Railing/Noise Wall, are used at the edge of the Approach Slab.



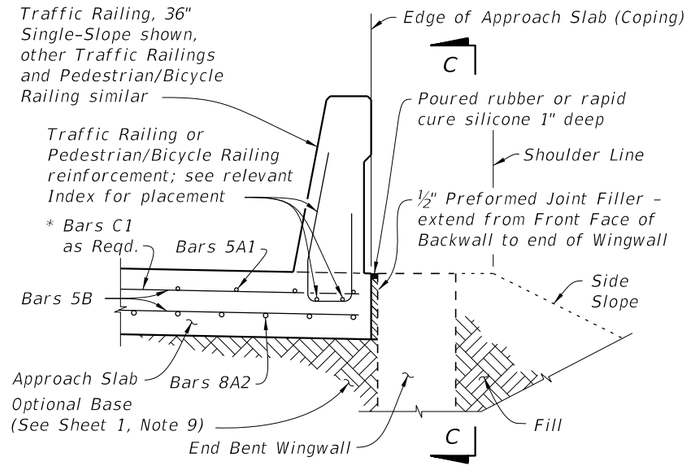
SECTION B-B
APPROACH SLAB WITH MEDIAN TRAFFIC RAILING



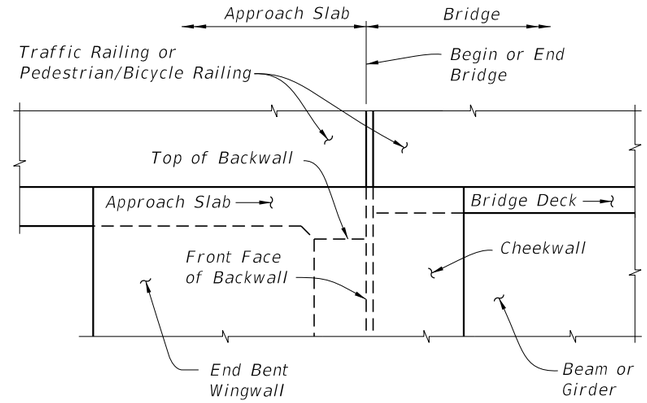
SECTION B-B
APPROACH SLAB WITH SIDEWALK



SECTION B-B
APPROACH SLAB WITH RAISED SIDEWALK

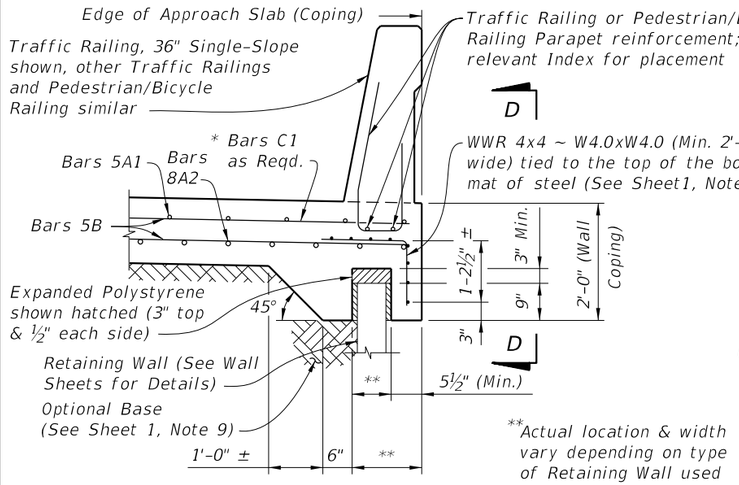


SECTION THRU APPROACH SLAB
AND END BENT WINGWALL



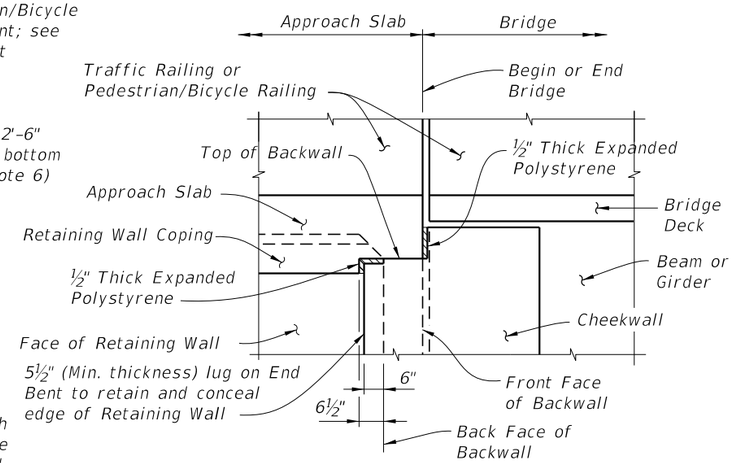
VIEW C-C AT BEGIN OR END BRIDGE (BEAM
BRIDGE SHOWN, FLAT SLAB BRIDGE SIMILAR)

APPROACH SLAB WITH WINGWALL DETAILS



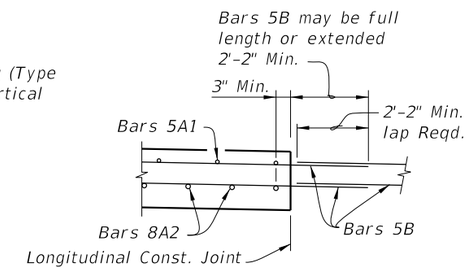
**Actual location & width vary depending on type of Retaining Wall used

SECTION THRU APPROACH SLAB
AND RETAINING WALL

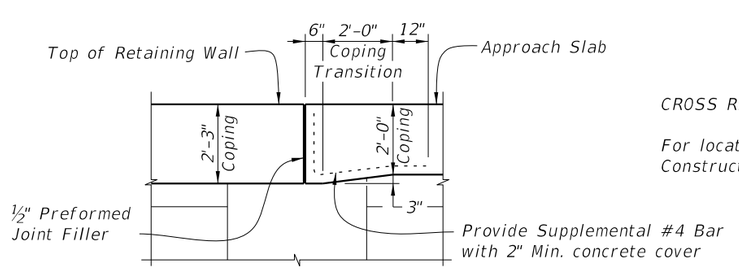


VIEW D-D AT BEGIN OR END BRIDGE (BEAM
BRIDGE SHOWN, FLAT SLAB BRIDGE SIMILAR)

APPROACH SLAB WITH RETAINING WALL DETAILS



LONGITUDINAL CONSTRUCTION
JOINT DETAIL



COPING TRANSITION DETAIL FOR
RETAINING WALLS WITH 2'-3" COPING HEIGHT
(Railing Not Shown For Clarity)

CROSS REFERENCES:

For location of Section B-B and Longitudinal Construction Joint see Sheet 1.

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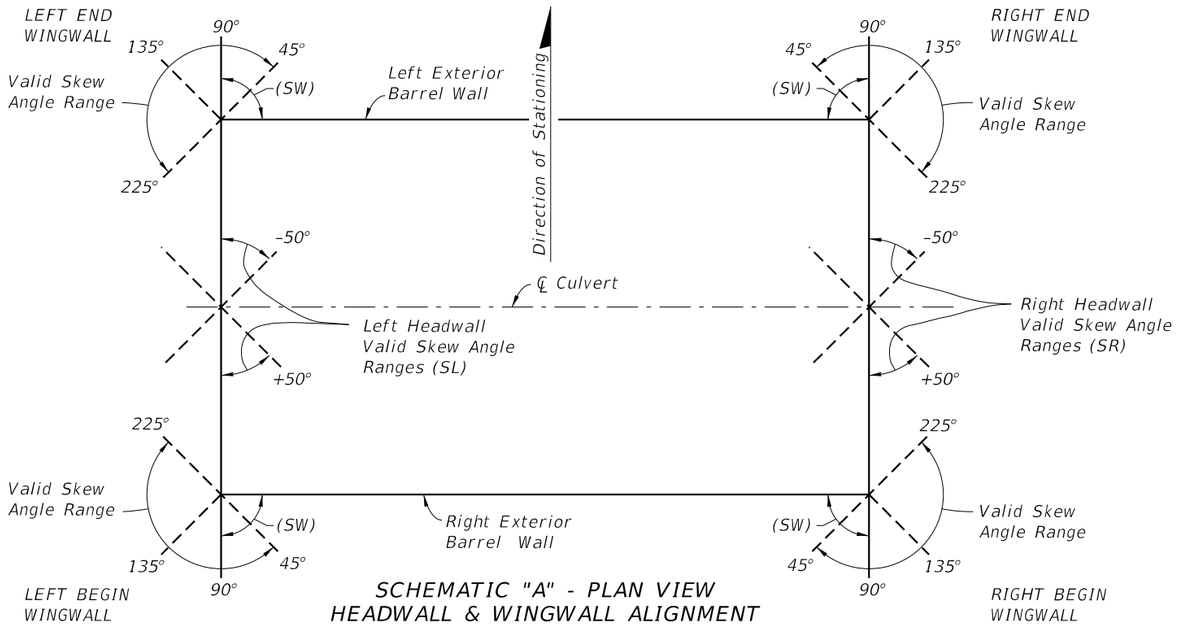
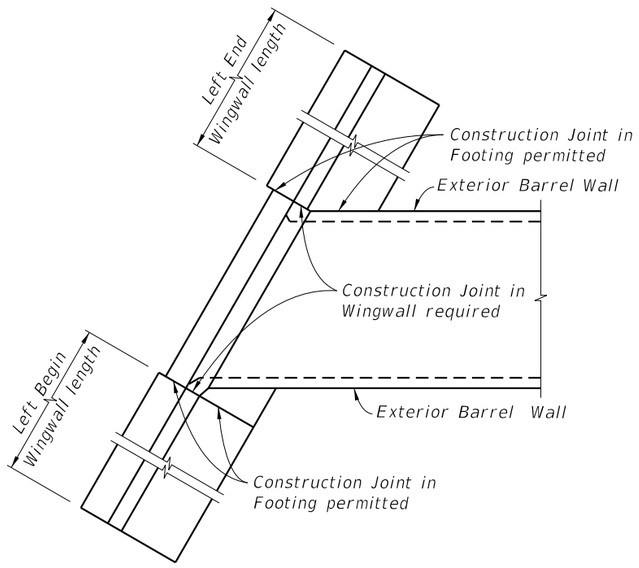
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	APPROACH SLABS (30 FT.) (RIGID PAVEMENT APPROACHES)	INDEX	SHEET
11/01/17						400-091	2 of 2



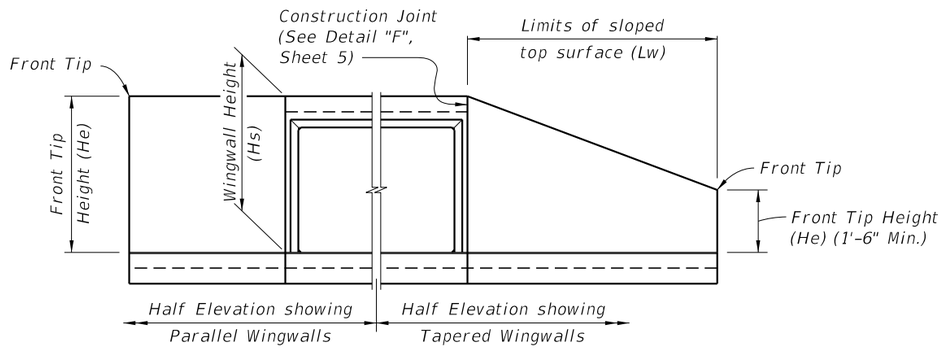
SCHEMATIC "A" - PLAN VIEW
HEADWALL & WINGWALL ALIGNMENT

NOTE: All headwall and culvert skew angles are measured in degrees from a line perpendicular to the centerline of culvert (counter-clockwise positive), see Schematic "B".



PART PLAN SHOWING PARALLEL WINGWALLS
AND LOCATION OF CONSTRUCTION JOINTS

NOTE:
Construction Joints in wingwalls and footings are located as follows: For non-skewed wingwalls they are located adjacent to the exterior face of the exterior barrel wall; when the ℄ of wingwall and ℄ of exterior barrel wall results in an acute angle see Left End Wingwall above, and when the angle is obtuse see Left Begin Wingwall above and Detail C (Sheet 5).



END ELEVATION
OF CULVERT

GENERAL NOTES:

LIVE LOAD: HL-93.

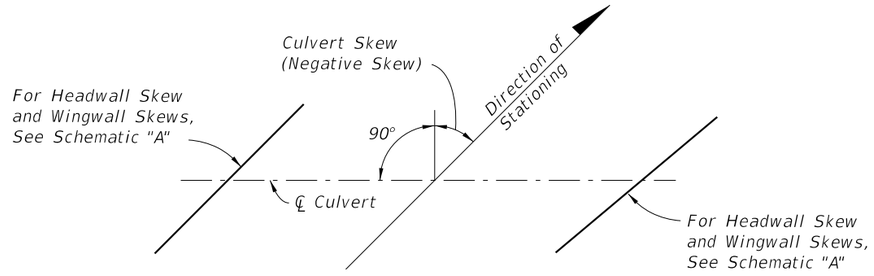
CONSTRUCTION LOADING: It is the construction Contractor's responsibility to provide for supporting construction loads that exceed AASHTO HL-93, and any construction load applied prior to 2 feet of compacted fill placed above the top slab.

SURFACE FINISH: All concrete surfaces shall receive a general surface finish.

SKEWED CONSTRUCTION JOINTS: Construction joints in barrels of culverts with skewed wingwalls may be placed parallel to the headwalls and the reinforcing steel, and the slabs may be cut provided that the cut reinforcing steel extends beyond the construction joint enough for splices to be made in accordance with Table 1 on this sheet. The cost of construction joints and additional reinforcing shall be at the expense of the Contractor.

CULVERT EXTENSIONS: For cut backs and ties into existing concrete box culverts see Sheet 6 of 8.

REINFORCING STEEL: See the "Box Culvert Data Tables" in the Contract Plans for grade and bar spacing. See the Reinforcing Bar List in the Contract Plans for bar sizes and bar bending details.



SCHEMATIC "B" - PLAN VIEW
CULVERT ALIGNMENT

NOTE: For Culvert Skew see Contract Plans.

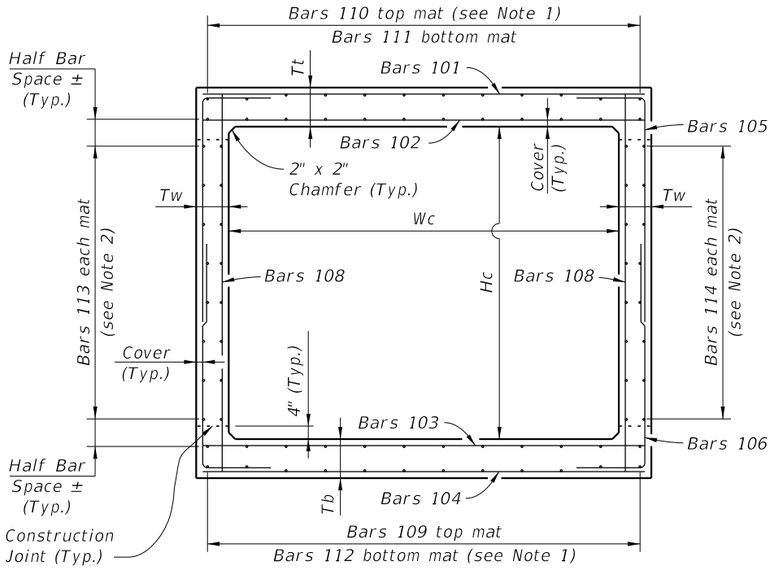
TABLE 1 - MINIMUM BAR SPLICE LENGTHS FOR LONGITUDINAL REINFORCING

BAR SIZE	SPLICE (CLASS B) CLASS II (3400 psi)	SPLICE (CLASS B) CLASS IV (5500 psi)	BAR SIZE	SPLICE (CLASS B) CLASS II (3400 psi)	SPLICE (CLASS B) CLASS IV (5500 psi)
#3	1'-4"	1'-0"	#8	3'-5"	2'-8"
#4	1'-9"	1'-4"	#9	4'-3"	3'-4"
#5	2'-2"	1'-8"			
#6	2'-7"	2'-0"			
#7	3'-0"	2'-4"			

TABLE 1 NOTE: Splice lengths are based on an AASHTO Class B tension lap splice for the Specification Section 346 concrete class shown.

4/22/2019 9:28:25 AM

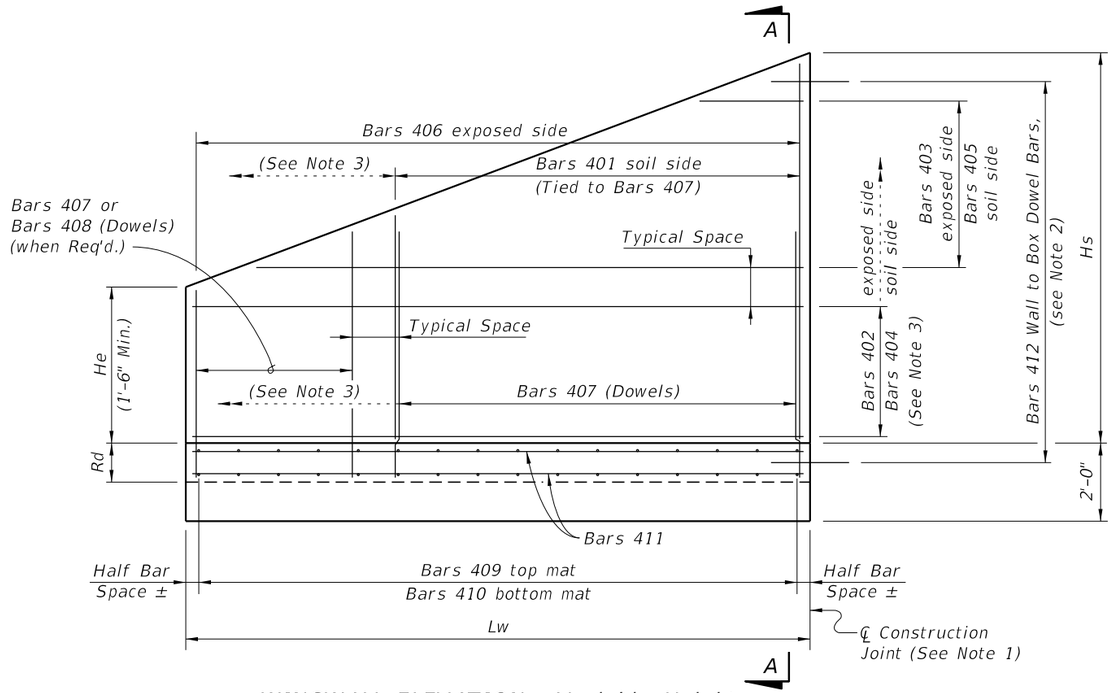
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	1 of 8



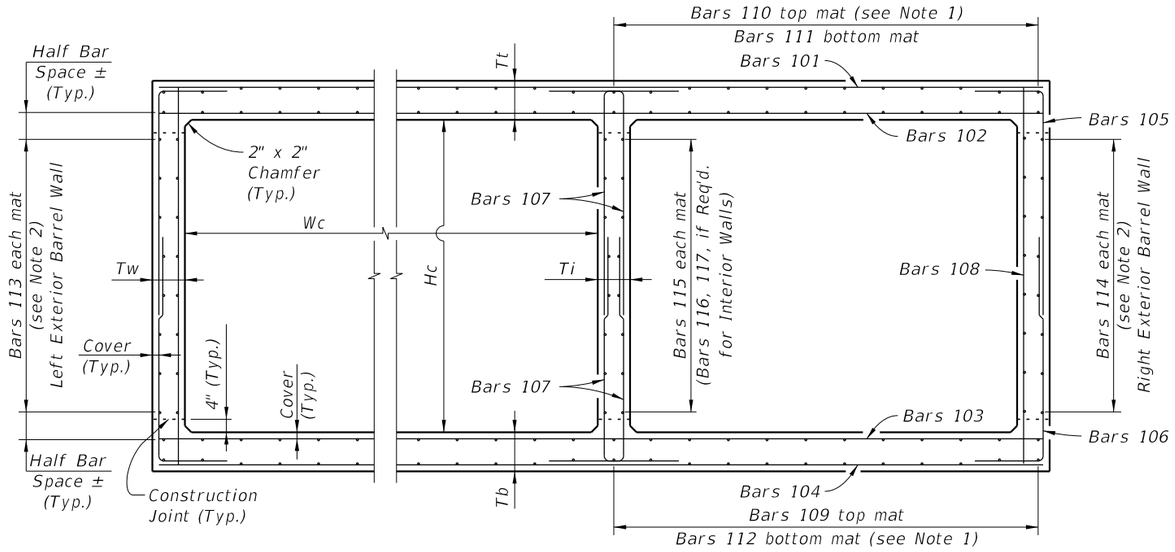
TYPICAL SECTION THRU SINGLE BARREL CULVERT

CULVERT BARREL NOTES:

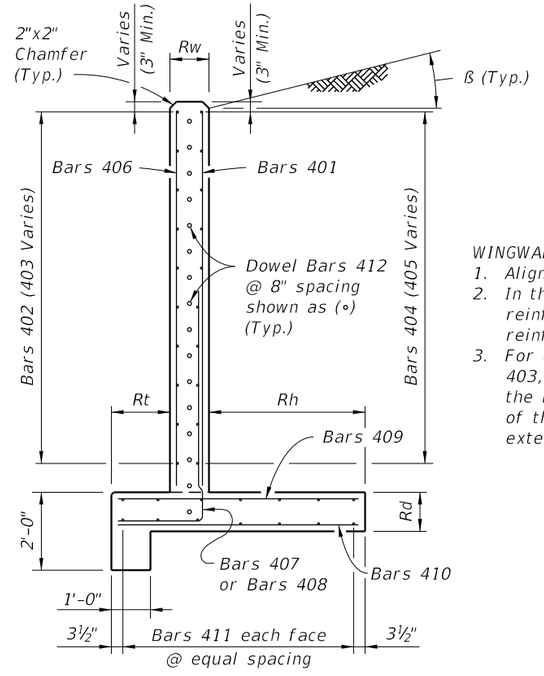
1. Space Bars 110 and 112 with a bar in each corner, and at the ℄ of interior walls (for multiple barrel culverts only), and the remaining bars placed at equal spacing shown in the Contract Plans. Adjust last bar spacing when required.
2. Place Bars 113 and 114 at spacing shown in the Contract Plans evenly between Bars 109 and 111.
3. Locate the first transverse bar from the ends of the culvert at one half the bar spacing, but provide the minimum reinforcement cover and not greater than 4" clear.



WINGWALL ELEVATION - Variable Height
(Left End shown - other corners similar)



TYPICAL SECTION THRU MULTIPLE BARREL CULVERT



WINGWALL SECTION A-A

WINGWALL NOTES:

1. Align construction joint perpendicular to wingwall.
2. In the vicinity of the construction joint, field bend reinforcement as necessary to maintain minimum reinforcement cover.
3. For constant height wingwalls, variable length Bars 403, 405 & 408 are not required, and as such the limits of Bars 401 & 407 extend the full length of the wingwall, and the limits of Bars 402 & 404 extend to the full height of the wingwall.

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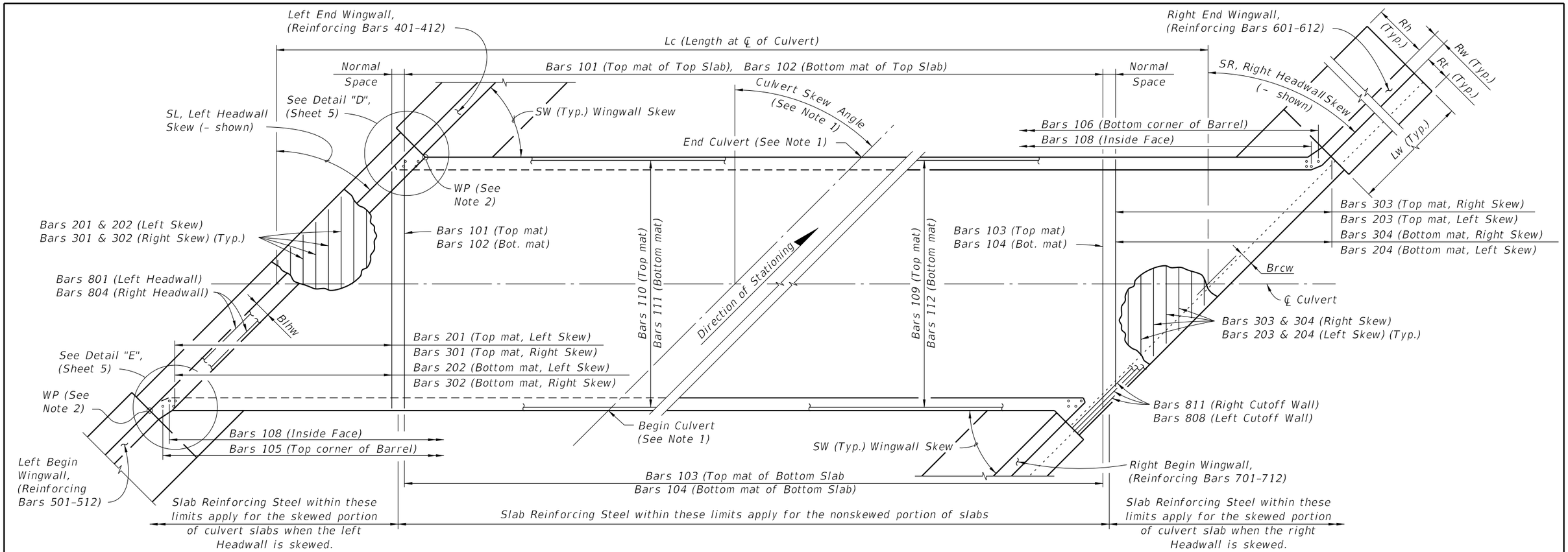
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/13			FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	2 of 8

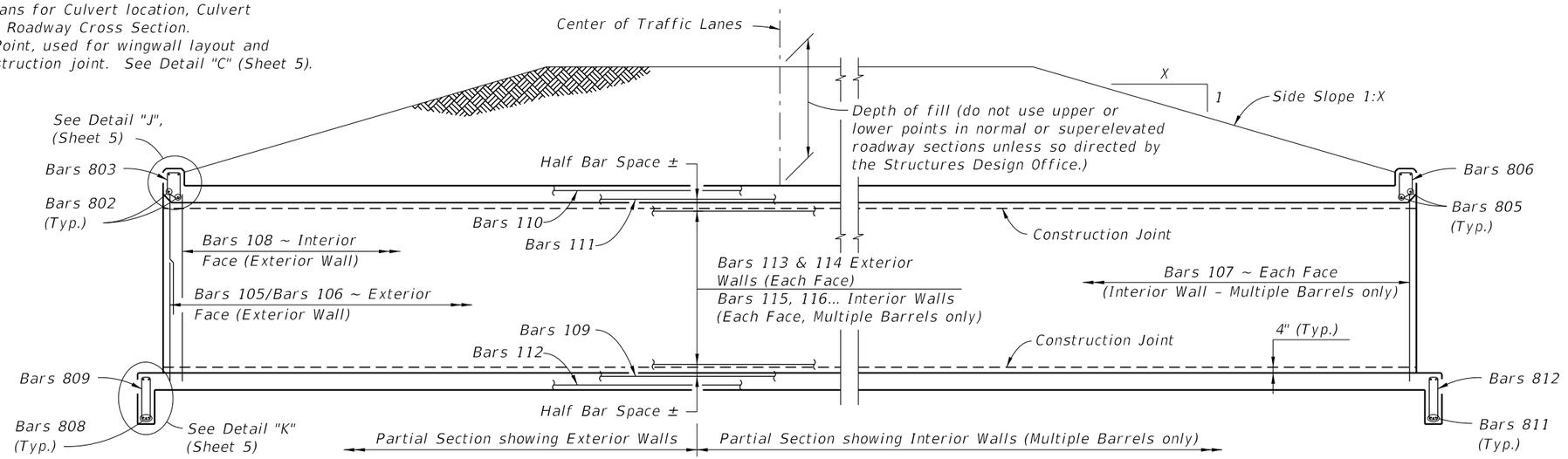


PARTIAL PLAN TOP SLAB
(Left Side, Left Skew)

PARTIAL PLAN BOTTOM SLAB
(Right Side, Right Skew)

NOTES:
1. See Contract Plans for Culvert location, Culvert Skew Angle and Roadway Cross Section.
2. WP = Working Point, used for wingwall layout and location of construction joint. See Detail "C" (Sheet 5).

SINGLE BARREL BOX CULVERT
(Skewed Culvert With Parallel Wingwalls Shown)



LONGITUDINAL SECTION THRU CULVERT
(Transverse Top & Bottom Slab Reinforcing Not Shown For Clarity)

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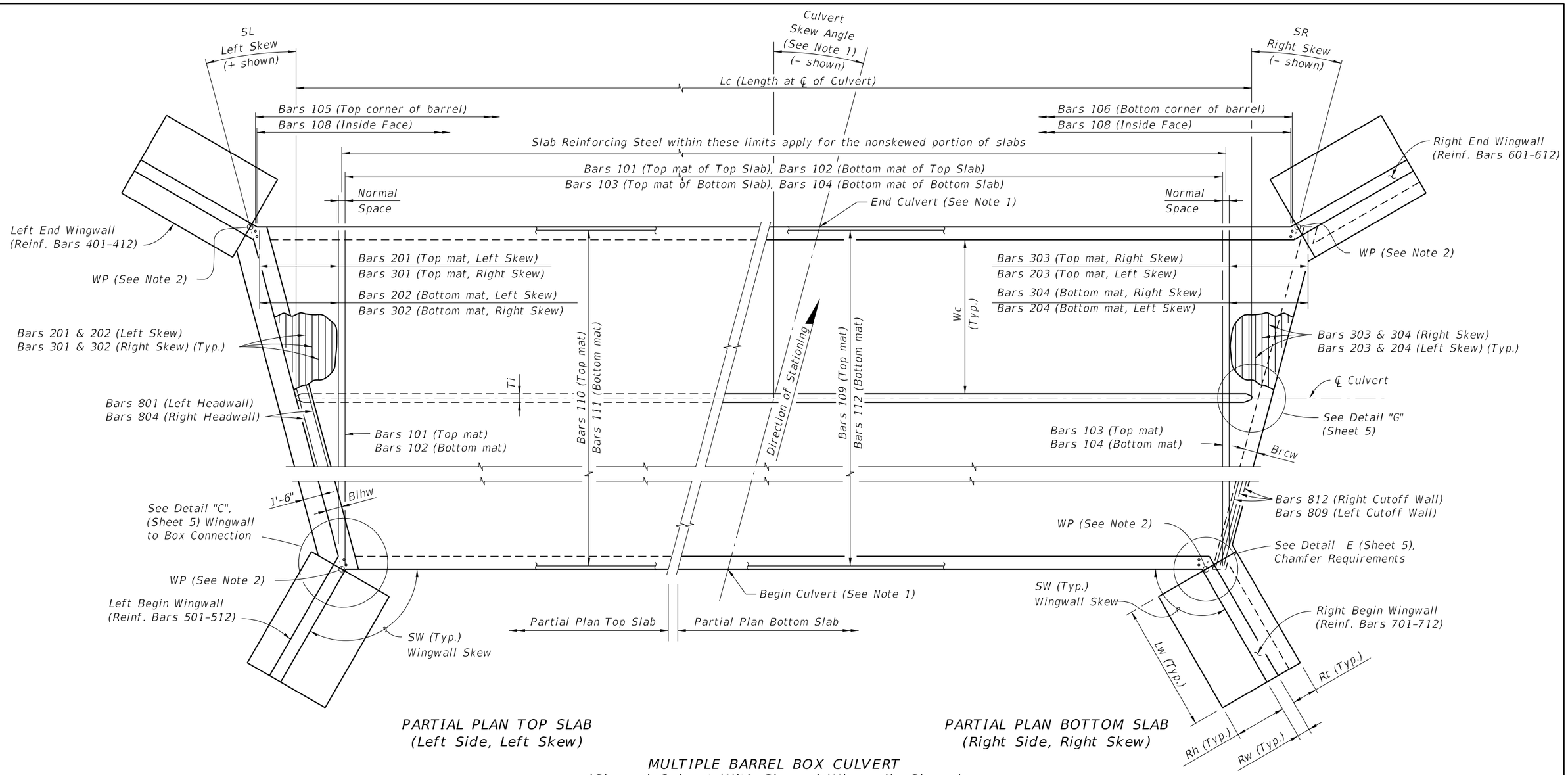
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/07			FDOT FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	3 of 8



PARTIAL PLAN TOP SLAB
(Left Side, Left Skew)

PARTIAL PLAN BOTTOM SLAB
(Right Side, Right Skew)

MULTIPLE BARREL BOX CULVERT
(Skewed Culvert With Skewed Wingwalls Shown)

NOTES:
1. See Contract Plans for Culvert Location, Culvert Skew Angle and Roadway Cross Section.
2. WP = Working Point, used for wingwall layout and location of construction joint. See Detail C (Sheet 5).

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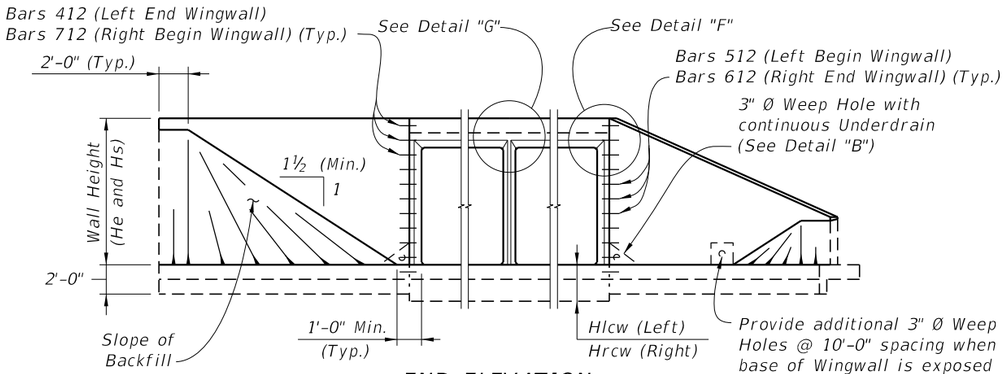
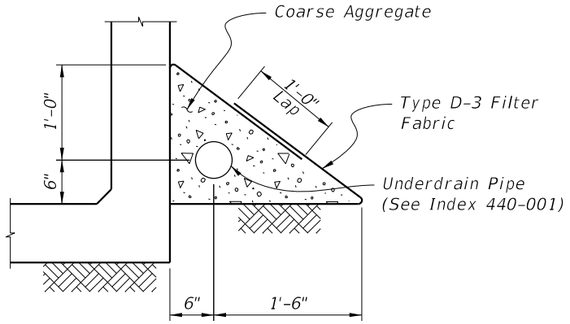


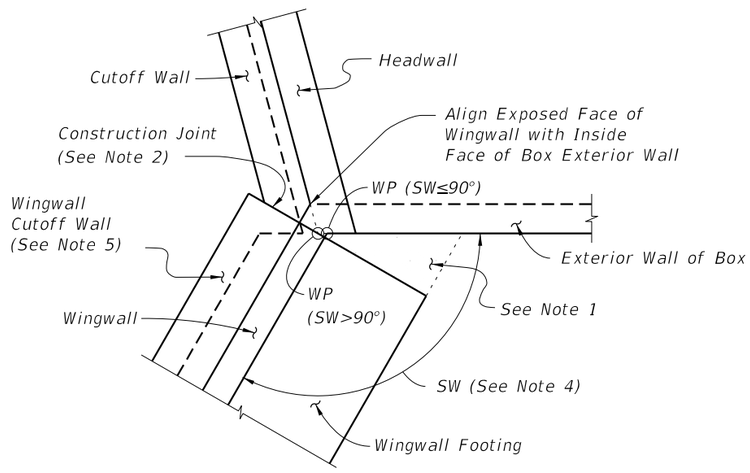
END ELEVATION
(Showing Constant Height And Variable Height Wingwalls)



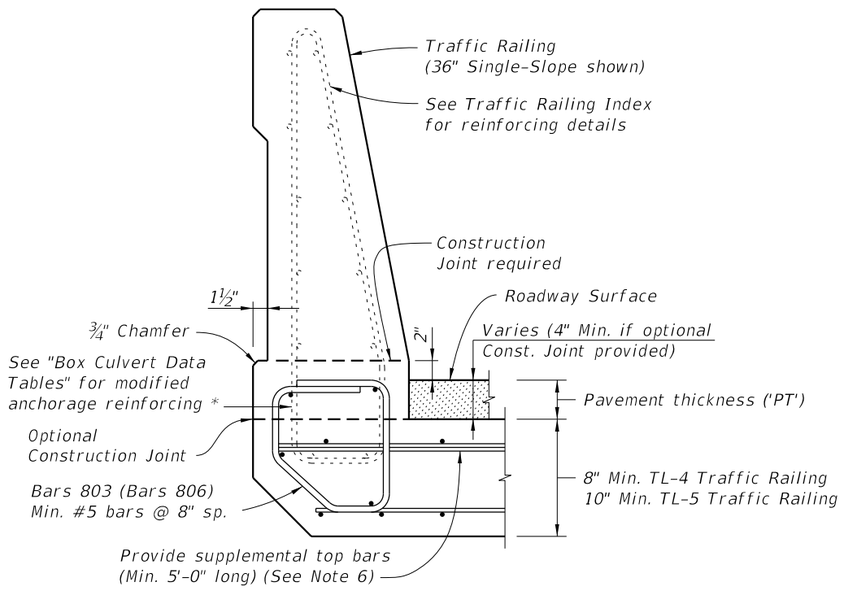
DETAIL "B"
UNDERDRAIN DETAIL
(Similar to Type II ~ Index 440-001)

NOTES:
1. For small angles, the Contractor may elect to fill the area between the box and the wingwall footing with unreinforced concrete. For wingwall skew angles less then 90 degrees, field bend wingwall reinforcement as necessary while maintaining cover. No additional payment will be made for this work.
2. Location of Construction Joint determined by WP at theoretical intersection of:
   – Soil side face of Headwall and outside face of Box Exterior Wall, for SW≤90°;
   – Outside face of Wingwall and outside face of Box Exterior Wall, for SW>90°.
3. Provide 6" chamfer when angle 'A' is greater than 45°. Maintain minimum wall thickness. Field adjust reinforcing to maintain cover.
4. Wingwall Skew Angles (SW) are measured from the adjacent box exterior wall to the wingwall.
5. Turn or extend Wingwall Cutoff Wall as necessary to meet Box Cutoff Wall.
6. Provide additional reinforcement in the top of the top slab below traffic railings to ensure a minimum area of 0.80 sq. in./ft. transverse reinforcing.

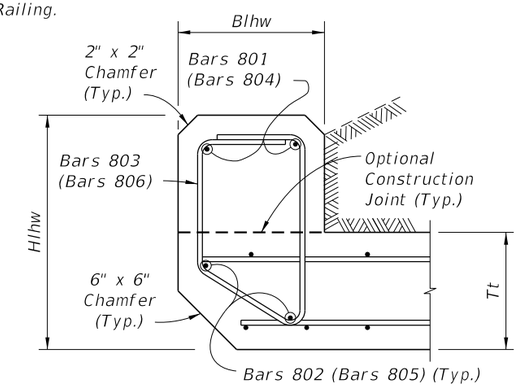
* Included in the cost of the Traffic Railing.



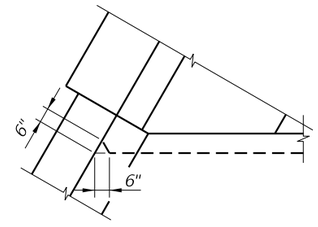
DETAIL "C" - PLAN VIEW
WINGWALL TO BOX CONNECTION
(Left Begin Corner Shown, Other Corners Similar)



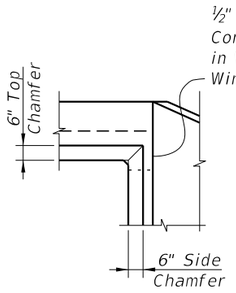
DETAIL "I"
TRAFFIC RAILING ATTACHMENT TO HEADWALL



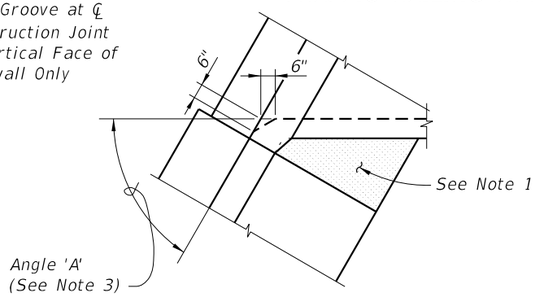
DETAIL "J"
LEFT HEADWALL SECTION
(Right Headwall similar)



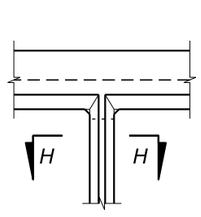
DETAIL "D"



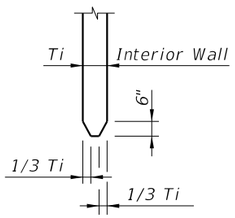
DETAIL "F"



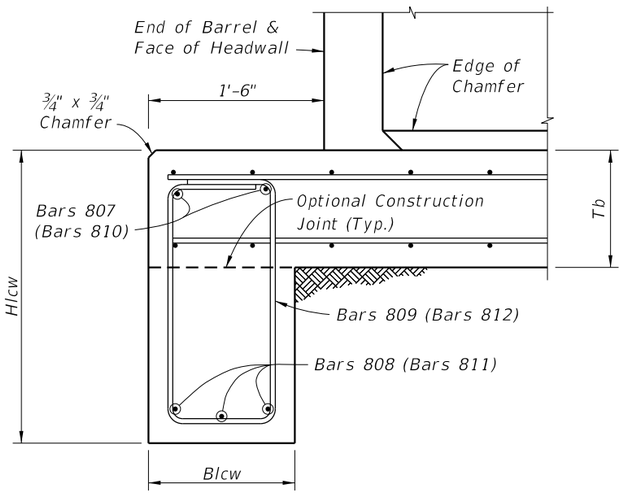
DETAIL "E"



DETAIL "G"



SECTION H-H



DETAIL "K"
LEFT CUTOFF WALL SECTION
(Right Cutoff Wall similar)

CROSS REFERENCE:
See Sheet 3 for locations of Details "D", "E", "J" & "K".
See Sheet 4 for locations of Detail "C".

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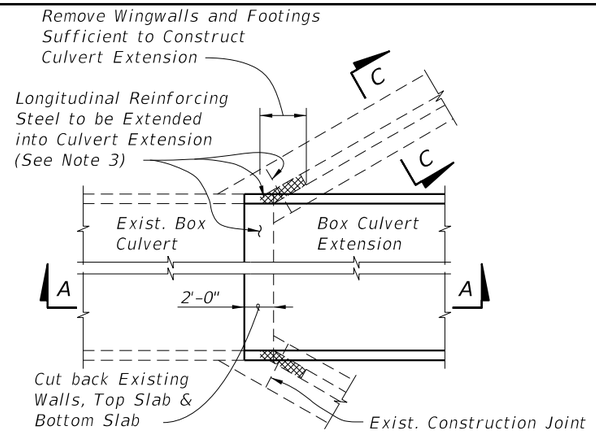
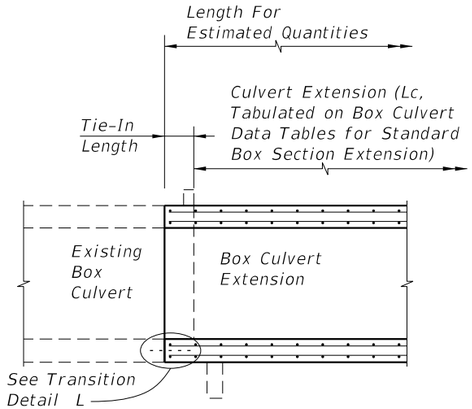
11/01/17			FDOT FY 2019-20 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX 400-289	SHEET 5 of 8

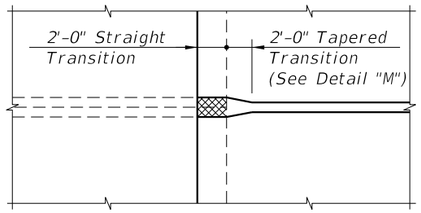


OUTSIDE WALLS OF BOXES

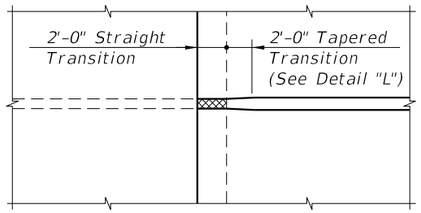


SECTION A-A

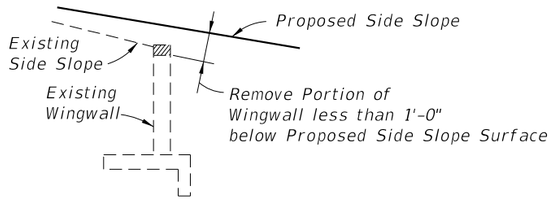
FLARED WINGWALL



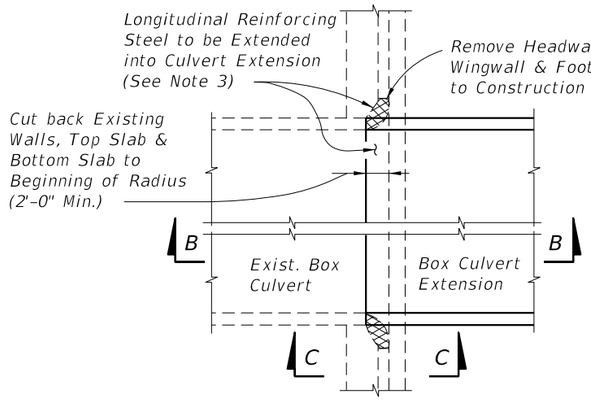
INTERIOR DOUBLE WALLS OF BOXES



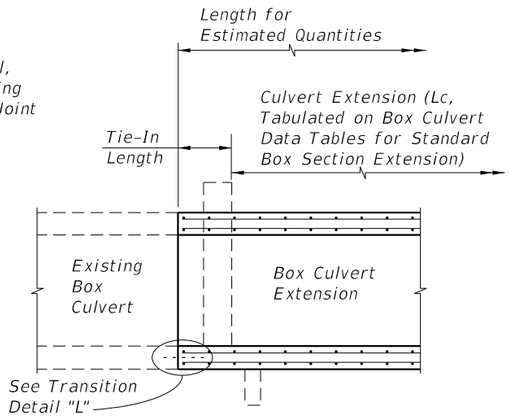
INTERIOR SINGLE WALLS OF BOXES



SECTION C-C



OUTSIDE WALLS OF BOXES



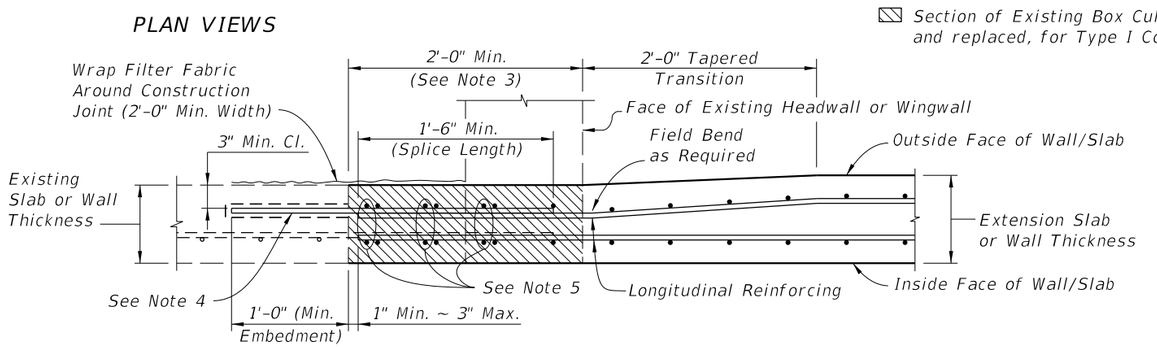
SECTION B-B

STRAIGHT WINGWALL

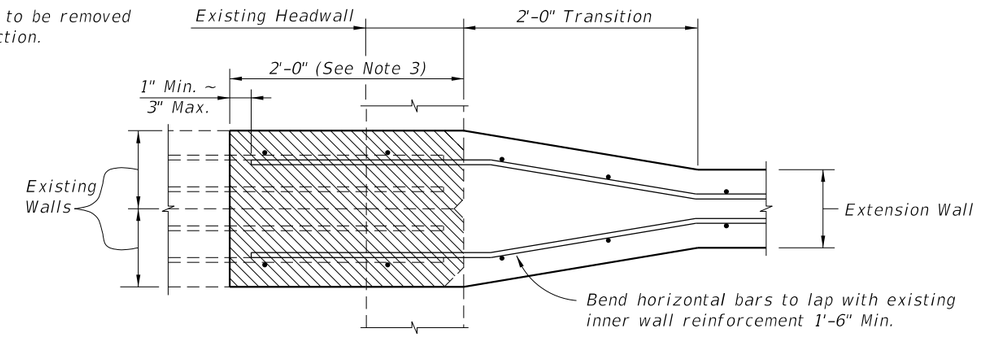
NOTES:

1. The Box Culvert Data Tables and Reinforcing Bar List do not include the additional quantities needed for dowel connections or transitions from double walls of existing concrete box culverts; the cost for additional reinforcement and the thickened concrete wall in the transitional area shall be included in the costs for concrete and steel in the culvert extension.
2. Cost for removal and disposal of material from existing headwalls, wingwalls and box, and cost of cleaning, straightening and extending or doweling longitudinal reinforcing steel shall be included in the cost for concrete and steel of the culvert extension.
3. Remove existing concrete while avoiding damage to existing reinforcement. Clean and straighten existing reinforcement, lap and tie onto extension reinforcement.
4. Dowel in #4 Bars @ 1'-0" max. spacing into wall/slab when there is a single mat of existing reinforcing steel, otherwise splice 1'-6" as shown for inside reinforcement. Use an Adhesive Bonding Material System in accordance with Specifications Section 416 & 937.
5. Provide additional transverse bars for top and bottom slab, parallel and full width of any skewed joint connection when shown in the Plans.
6. See Box Culvert Data Table notes in Plans for Connection Types allowed.

PLAN VIEWS

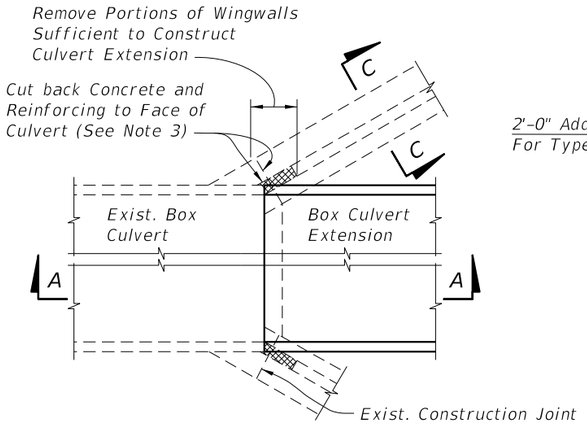


DETAIL "L" - TRANSITION FOR EXTERIOR WALL/SLAB EXTENSION
(Interior Single Walls Similar)

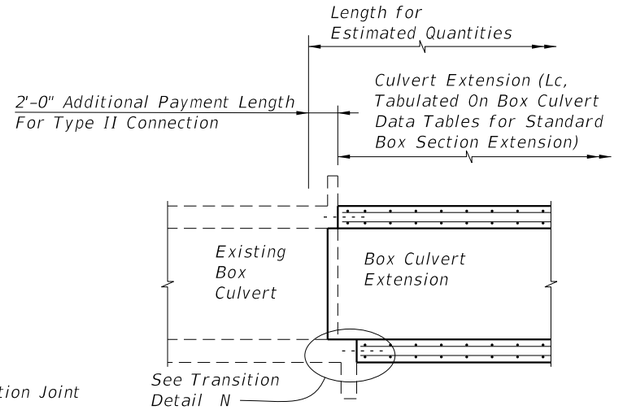


DETAIL "M" - TRANSITION FOR INTERIOR DOUBLE WALLS OF BOX CULVERTS

TYPE I CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS (CUT BACK EXISTING CONCRETE)

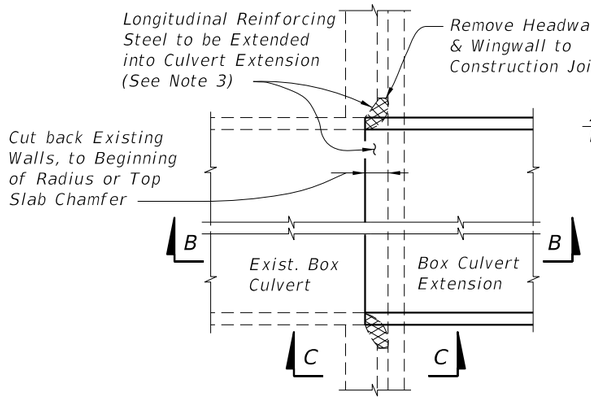


OUTSIDE WALLS OF BOXES

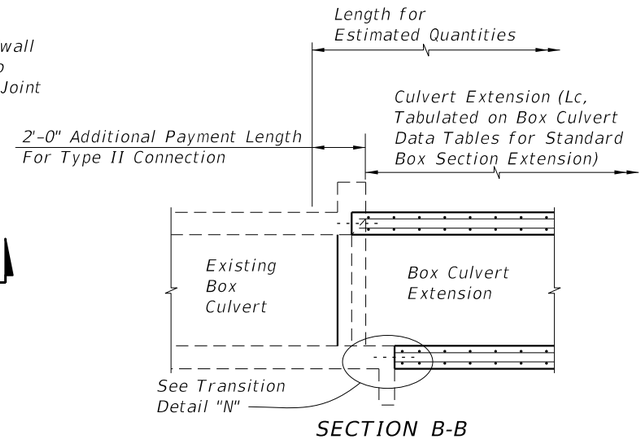


SECTION A-A

FLARED WINGWALL

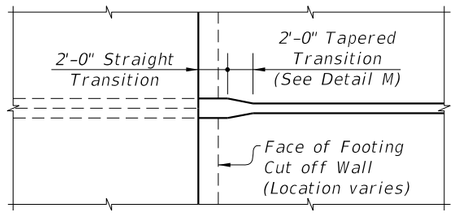


OUTSIDE WALLS OF BOXES

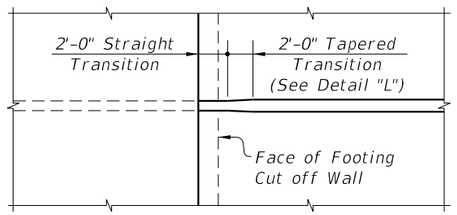


SECTION B-B

STRAIGHT WINGWALL

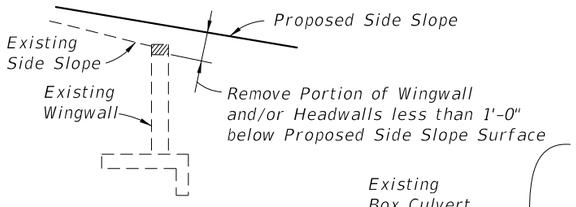


INTERIOR DOUBLE WALLS OF BOXES

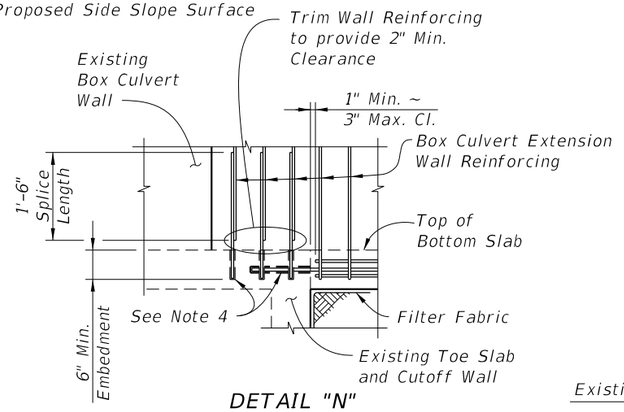


INTERIOR SINGLE WALLS OF BOXES

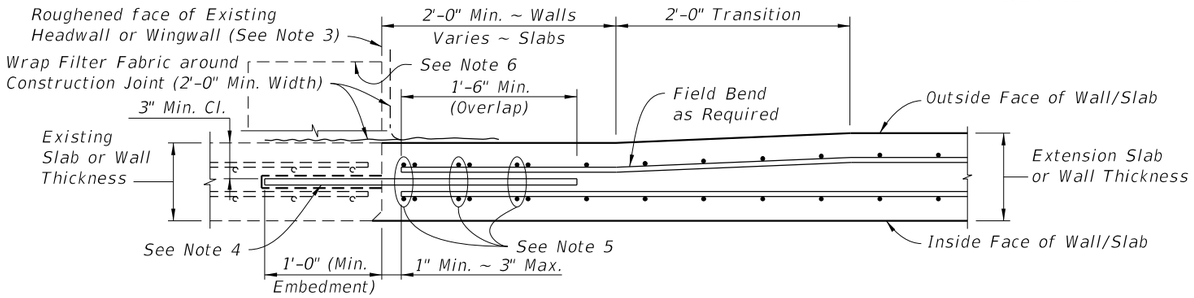
PLAN VIEWS



SECTION C-C



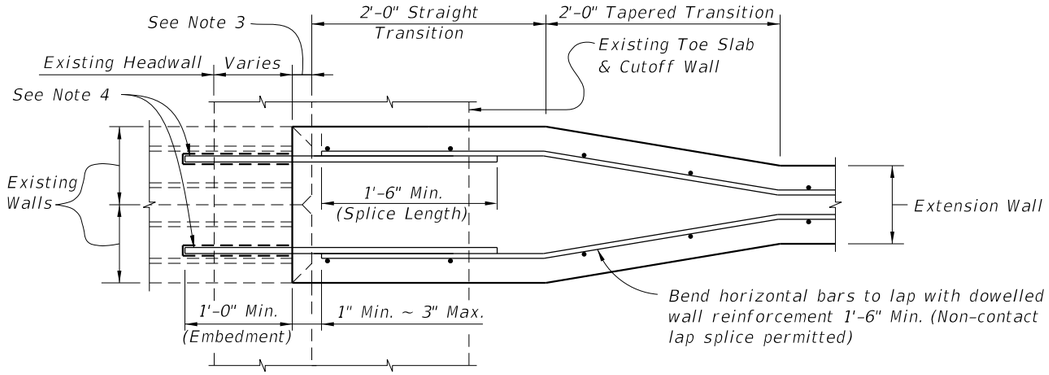
DETAIL "N"



DETAIL "L" - TRANSITION FOR EXTERIOR WALL/SLAB EXTENSION
(Interior Single Walls Similar)

NOTES:

1. The Box Culvert Data Tables and Reinforcing Bar List do not include the additional quantities needed for dowel connections or transitions from double walls of existing concrete box culverts; the cost for additional reinforcement and the thickened concrete wall in the transitional area shall be included in the costs for concrete and steel in the culvert extension.
2. Cost for roughening and cleaning existing headwalls, wingwalls and box, and cost of doweling longitudinal reinforcing steel shall be included in the cost for concrete and steel of the culvert extension.
3. Remove existing concrete and reinforcing back to edge of any chamfers exceeding 1". Roughen and clean existing or exposed surface and coat with a Type A epoxy bonding compound in accordance with the manufacturer's recommendations.
4. Dowel in #5 Bars @ 1'-0" max. spacing horizontally into center of wall/slab. Provide vertical dowels in footing to match size, alignment and spacing of outside vertical wall reinforcing. Use an Adhesive Bonding Material System in accordance with Specifications Section 416 & 937.
5. Provide additional transverse bars for top and bottom slab, parallel and full width of any skewed joint connection when shown in the Plans.
6. Remove top of existing headwall when necessary to provide 1'-0" clearance below finished grade. Saw cut full width and seal with Type F-2 epoxy compound to protect exposed reinforcing.
7. See Box Culvert Data Table notes in Plans for Connection Types allowed.



DETAIL "M" - TRANSITION FOR INTERIOR DOUBLE WALLS OF BOX CULVERTS

TYPE II CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS
(ADHESIVE DOWEL TO EXISTING CONCRETE)

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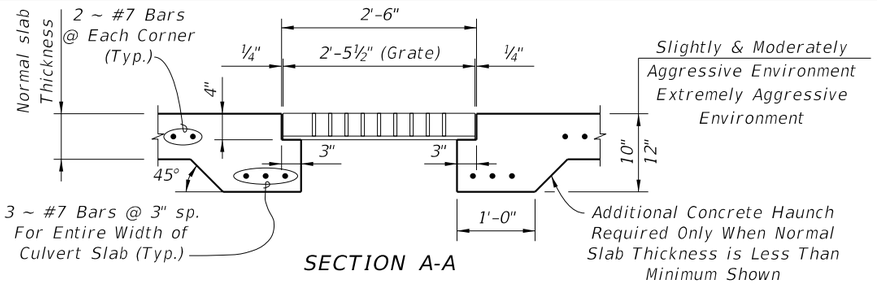
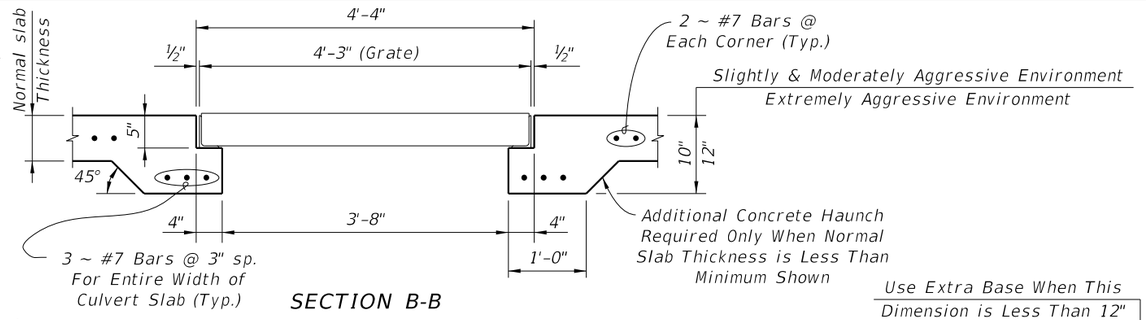
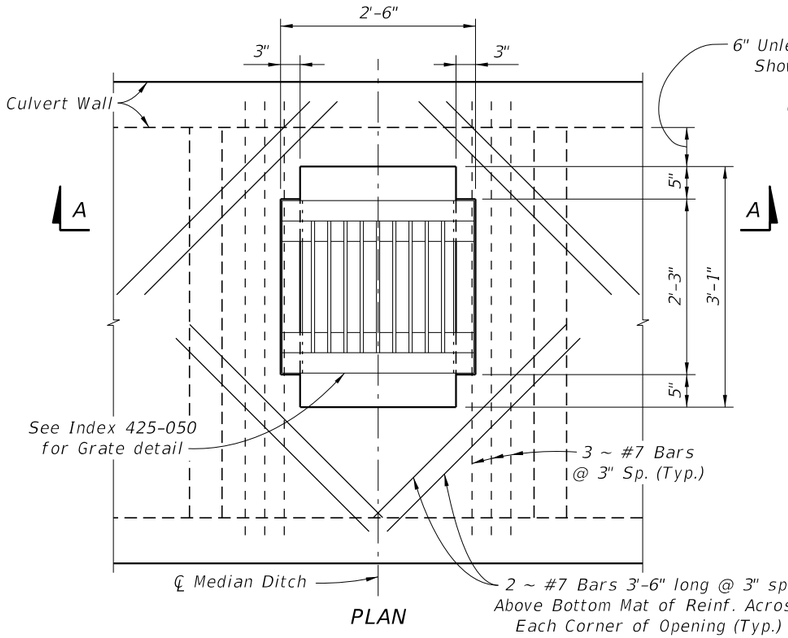


SECTION A-A

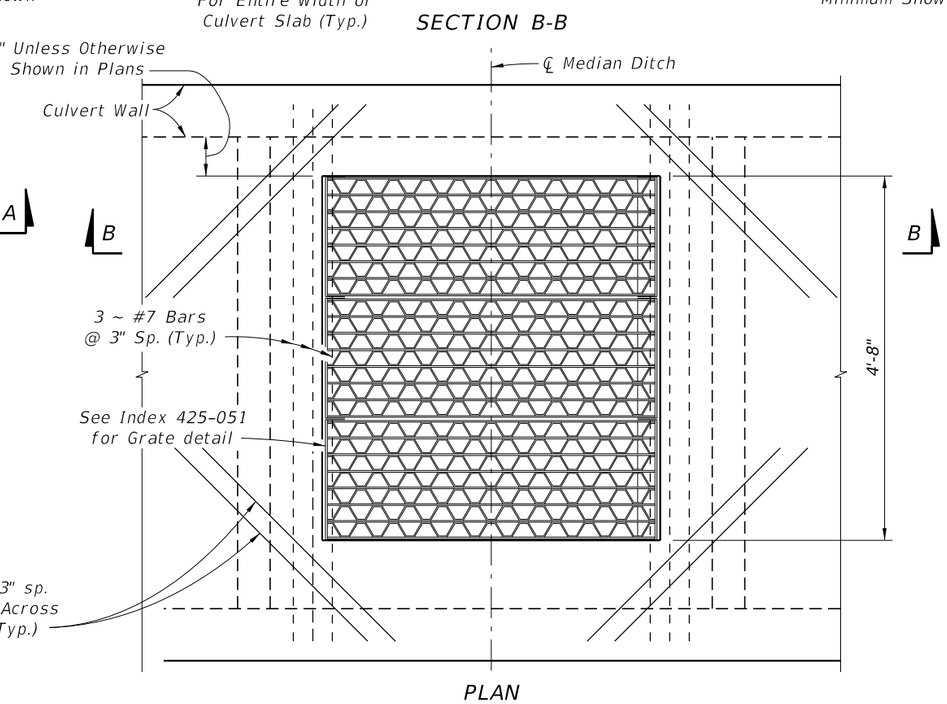


SECTION B-B



PLAN

INLET TYPE A GRATE



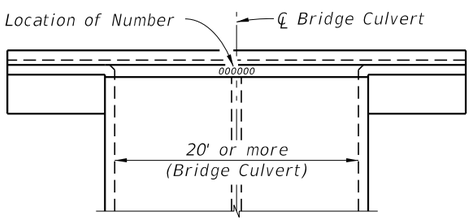
PLAN

INLET TYPE B GRATE

NOTES:

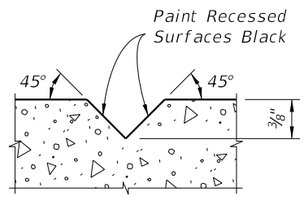
1. Cost of Steel Grating to be included in cost of Box Culvert.
2. All reinforcing shall be 2" clear for Slightly and Moderately Aggressive Environments, and 3" clear for Extremely Aggressive Environments.

INLET IN TOP OF BOX CULVERT



The number is to be placed in the center of the top surface of all bridge culvert headwalls. For Bridge Number see Plan-Profile sheet(s).

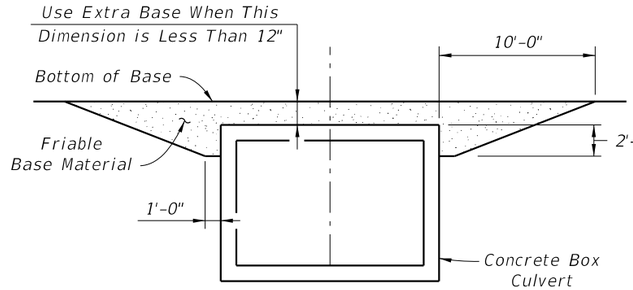
TOP VIEW OF HEADWALL



SECTION THRU RECESSED V-GROOVE TO FORM INSCRIBED FIGURES

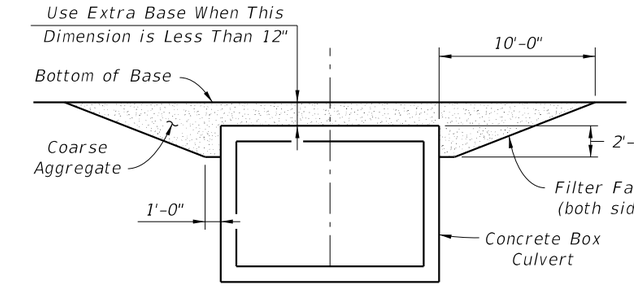
Black Plastic Figures 3" in height as approved by the Engineer may be used in lieu of numbers formed by ⅜" V-Grooves. V-Grooves shall be formed by preformed figures.

BRIDGE CULVERT NUMBER LOCATION



The cost of furnishing and installing extra friable base material shall be included in the cost of the Box Culvert.

FRIABLE BASE



Place coarse aggregate in 6 inch lifts and compact sufficiently as to be firm and unyielding. Provide coarse aggregate gravel or stone meeting the requirements of Specification Section 901-2 or 901-3 respectively. Meet the gradation requirements of Specification Section 901-6, Grades 4, 467, 5, 56 or 57 unless restricted in the plans. Provide Type D-3 filter fabric (see Specification Section 985). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the Box Culvert.

ASPHALTIC CONCRETE BASE

NOTE: Extra base is required when cross box culverts are located on facilities subject to high speed traffic (>45 mph) or high traffic volumes (>1600 ADT) and the cover is within the range specified in the notation above.

EXTRA BASE FOR BOX CULVERTS CROSSING UNDER FLEXIBLE PAVEMENT

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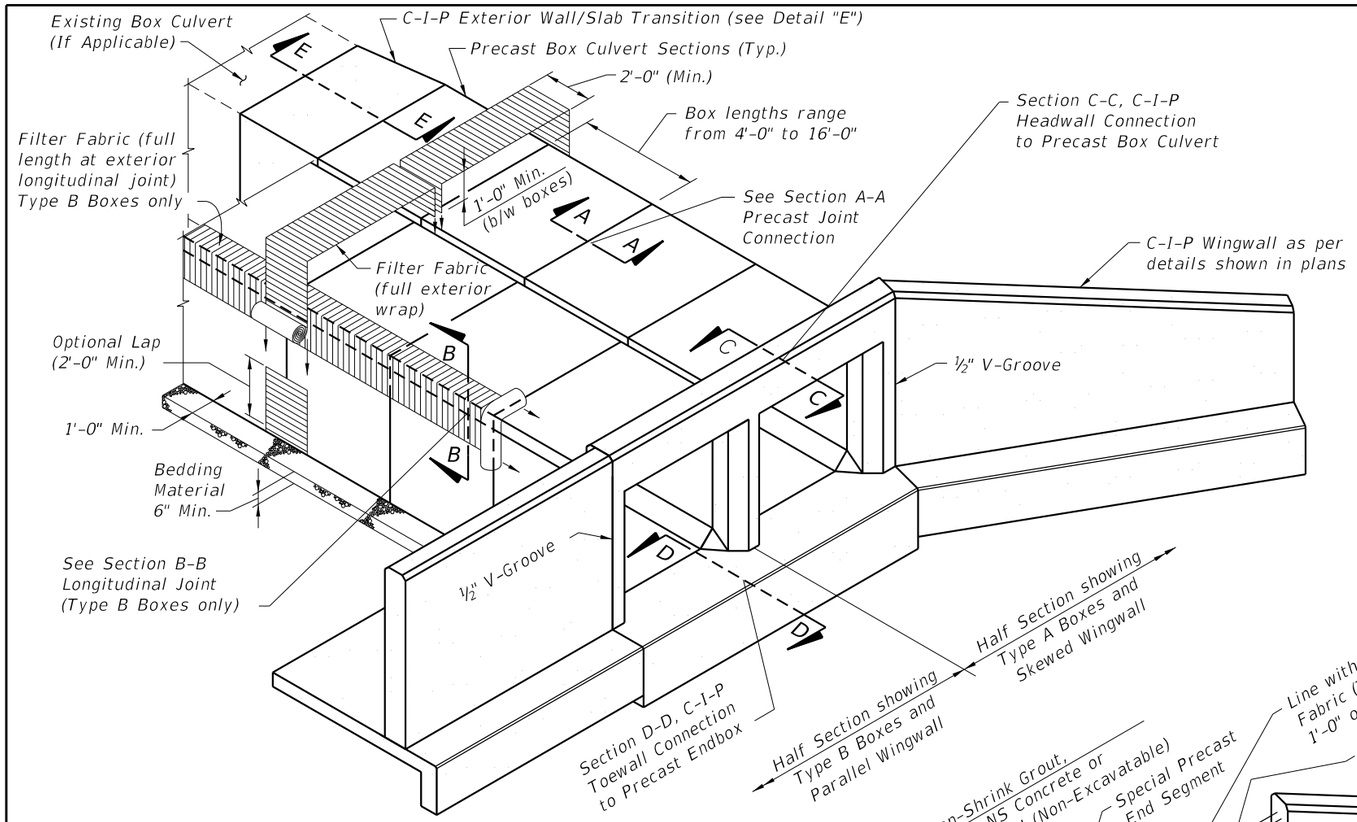
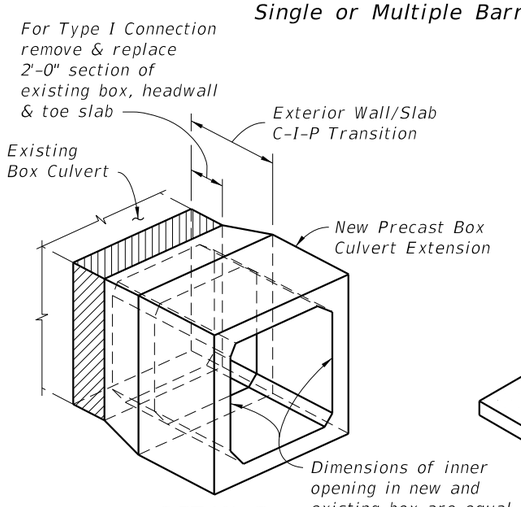
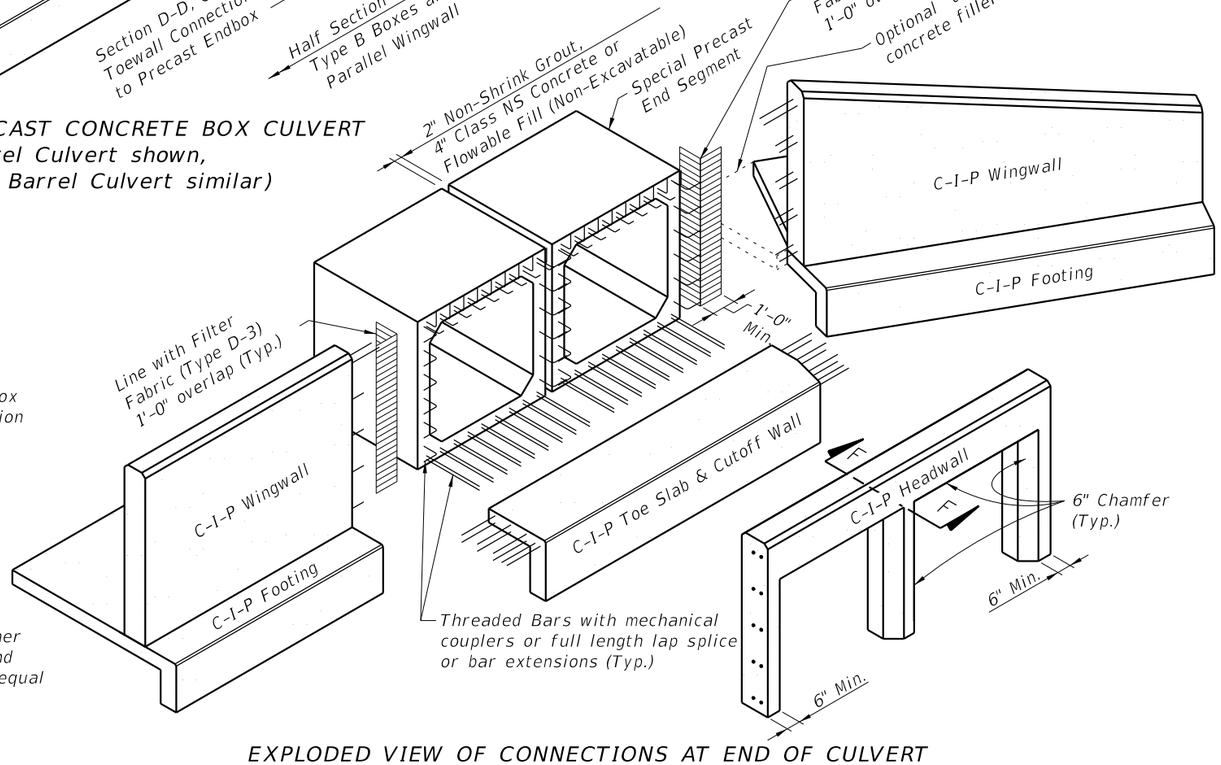


ISOMETRIC VIEW OF PRECAST CONCRETE BOX CULVERT
(Double Barrel Culvert shown, Single or Multiple Barrel Culvert similar)

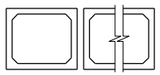
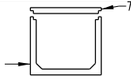
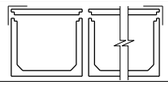
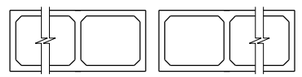


DETAIL E
PICTORIAL VIEW OF EXTERIOR WALL/SLAB TRANSITION



EXPLODED VIEW OF CONNECTIONS AT END OF CULVERT
(Double Barrel Culvert shown, Single or Multiple Barrel Culvert similar)

PERMITTED PRECAST ALTERNATE BOX SECTIONS

TYPE	DESCRIPTION	SINGLE BARREL	MULTIPLE BARRELS	DESIGN NOTES
A	Single Cell Monolithic (Four Sided)			Index 400–292 or Contractor Design
B	Single Cell Two–Piece (Four Sided)			Contractor Design
C	Multicell Monolithic	Not Applicable		Contractor Design

GENERAL NOTES:

1. Specifications:
   - General:
     - FDOT Standard Specifications for Road and Bridge Construction, Section 410 (current edition, and supplements thereto).
   - Concrete (Precast):
     - Class III or Class II Modified (5,000 psi) for slightly aggressive environments.
     - Class IV (5,500 psi) for moderately to extremely aggressive environments.
   - Concrete (Cast–In–Place):
     - Class II (3,400 psi) for slightly aggressive environments.
     - Class IV (5,500 psi) for moderately to extremely aggressive environments.
   - Reinforcing Steel:
     - Maintain minimum clearance of 2" for slightly and moderately aggressive environments or 3" for extremely aggressive environments, unless otherwise shown. Equal area substitution of welded wire (WWR) reinforcement is permitted.
2. Work this Index with the Cast–In–Place Concrete Box Culvert Details and Data Tables shown in the plans, Index 400–289 and the Precast Concrete Box Culverts shown in the shop drawings.
3. All joints between precast sections must be tongue & groove with joint sealant. Joints between cast–in–place & precast sections shall have longitudinal reinforcing extending from top, bottom & both side slabs of the precast box tied to the cast–in–place reinforcement. Single barrel culverts may have precast headwalls cast integrally with the end segment when approved by the Engineer.
4. Extension of existing multiple barrel box culverts with multiple single cell precast box culverts is not permitted unless approved by the District Structures Engineer. Full transition details must be shown in the shop drawings when approved.
5. Culverts larger than the specified size may be substituted with no additional payment to the Contractor. Substitution must be approved by the Engineer, minimum earth cover and invert elevations shown in the Contract Documents must be maintained.

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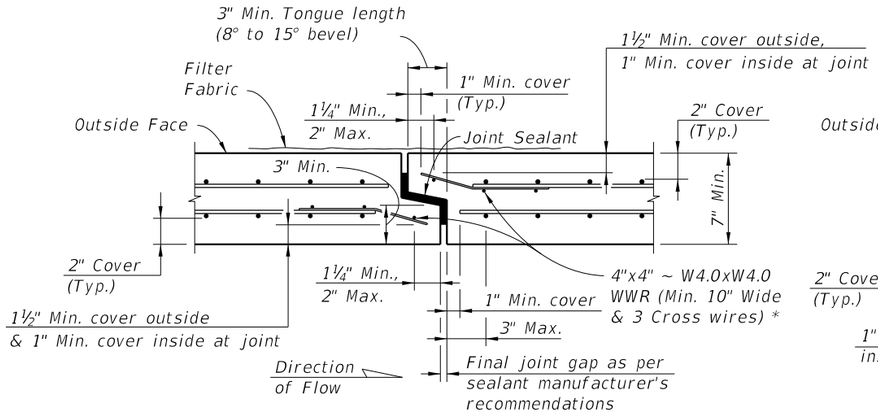
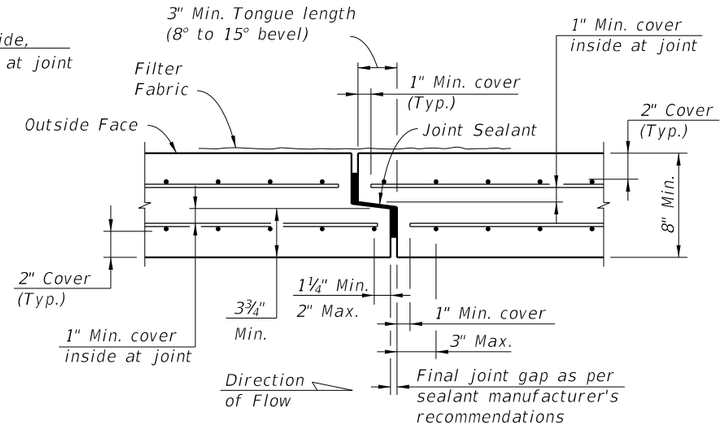
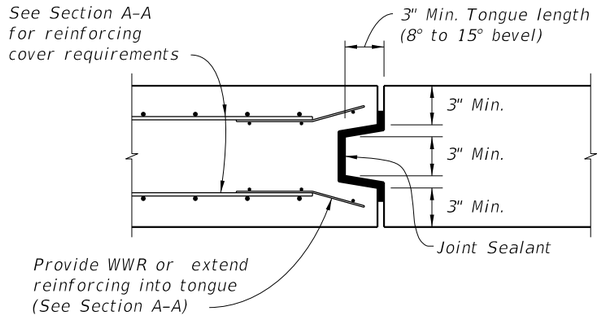


SECTION A-A
(2" Cover - Thin Wall Detail)

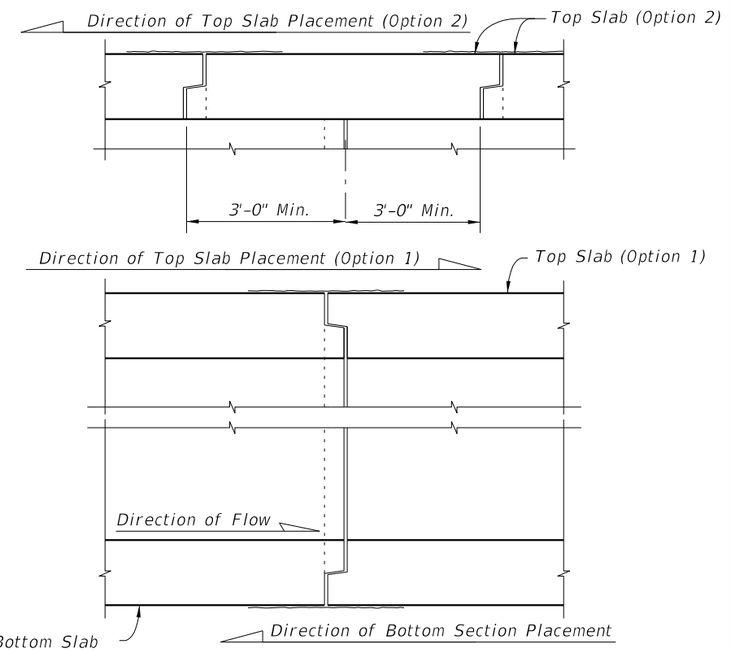


SECTION A-A
(2" Cover - Thick Wall Detail)

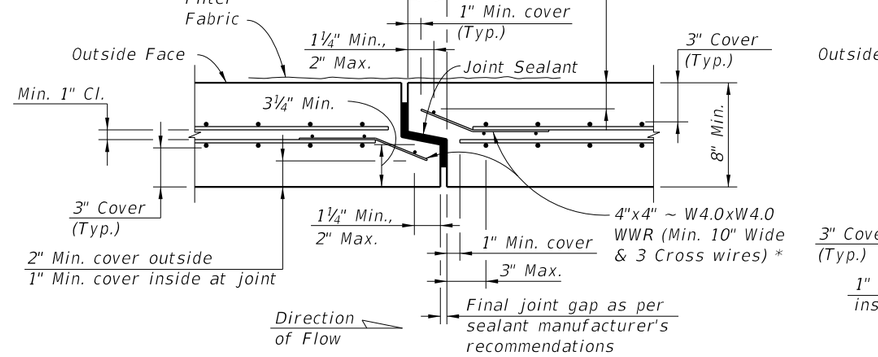


ALTERNATE BOTTOM SLAB TRANSVERSE JOINT
TYPICAL SECTION
(DOUBLE-SIDED TONGUE & GROOVE JOINT)
(All reinforcing not shown for clarity)

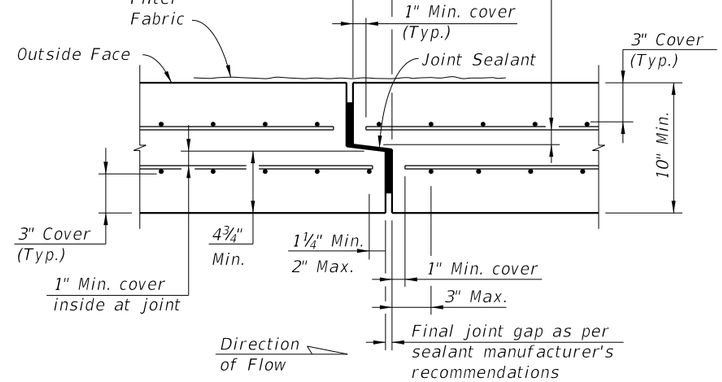
NOTE:
Bottom Slab Joints in Type B Boxes may be single tongue & groove joints as shown in Section A-A when the Top Slab Joints are oriented as shown in Schematic "A".



SCHEMATIC "A"
TYPE B BOX SECTION PLACEMENT
FOR SINGLE TONGUE & GROOVE JOINTS



SECTION A-A
(3" Cover - Thin Wall Detail)



SECTION A-A
(3" Cover - Thick Wall Detail)

* *At the Contractor's option when the box culvert reinforcing utilizes WWR, extend wall and slab reinforcing into the joint and bend to maintain cover in lieu of 4"x4" ~ W4.0xW4.0 WWR at joint. Transverse wire in tongue may be cut at corners of box to allow bending of the WWR.*

PRECAST SEGMENT TO SEGMENT TONGUE & GROOVE TRANSVERSE JOINTS

TWO-PIECE PRECAST SEGMENT
ADDITIONAL JOINT DETAILS
(TYPE B BOX)

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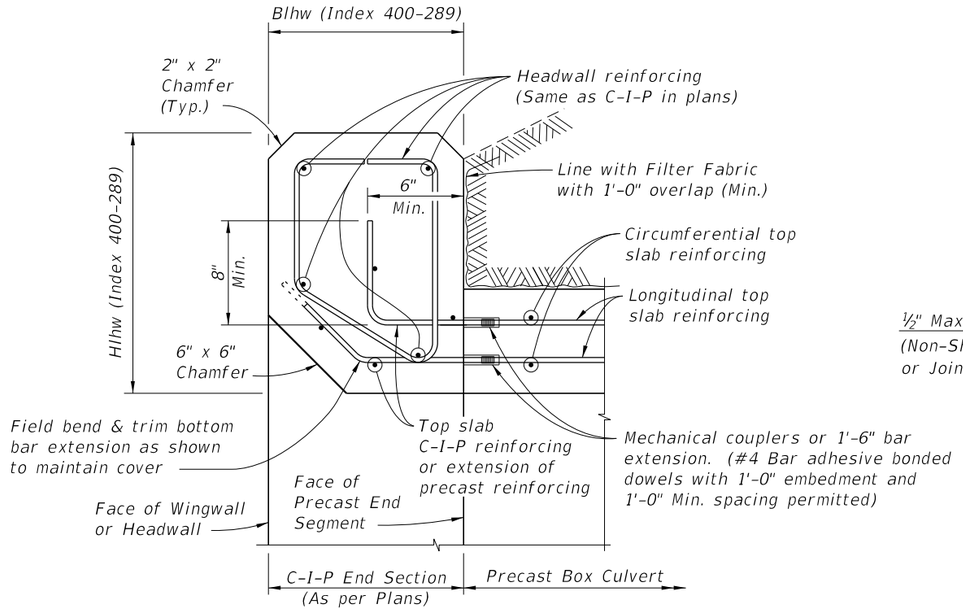
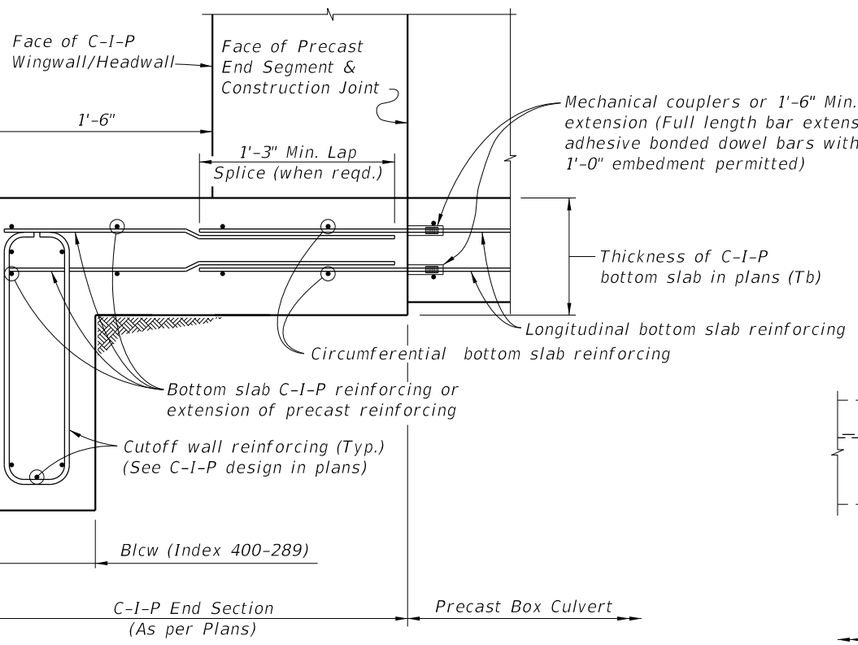
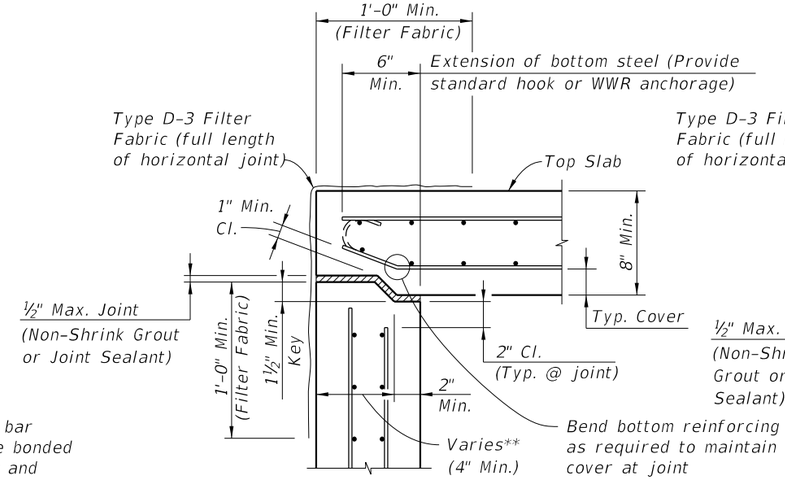


SECTION C-C
C-I-P HEADWALL DETAILS AND CONNECTION TO PRECAST BOX

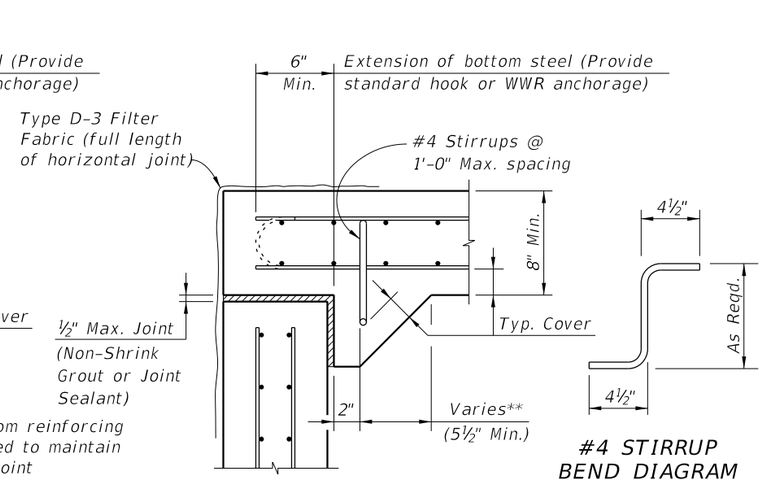


SECTION D-D
C-I-P TOE SLAB & CUTOFF WALL DETAILS
AND CONNECTION TO PRECAST BOX

* Provide additional 6" depth of cutoff wall at no additional cost.



SECTION B-B
TOP SLAB TO WALL JOINT
(KEYED JOINT)

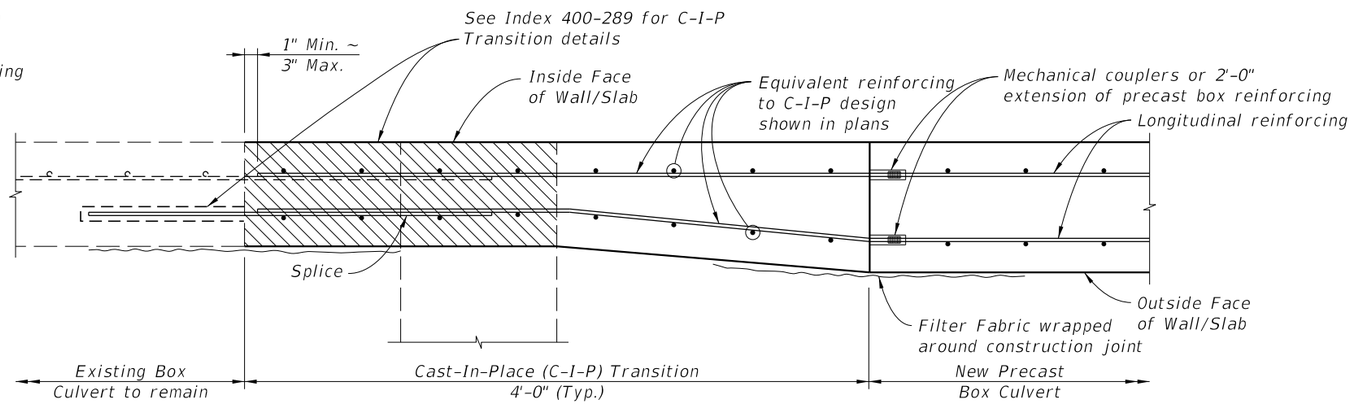


SECTION B-B
TOP SLAB TO WALL JOINT
(HAUNCHED JOINT)

#4 STIRRUP
BEND DIAGRAM

** Provide adequate width to satisfy shear strength requirements at joint

TYPE B BOX LONGITUDINAL JOINTS



Section of Existing Box Culvert to be removed and replaced, for Type I Connection.

SECTION E-E
EXTERIOR WALL/SLAB TRANSITION DETAIL FOR PRECAST EXTENSION
(Type I Connection shown, Type II Connection similar)

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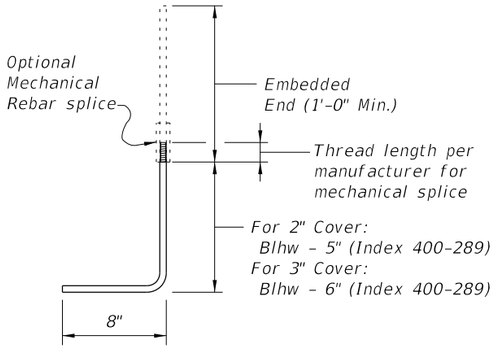
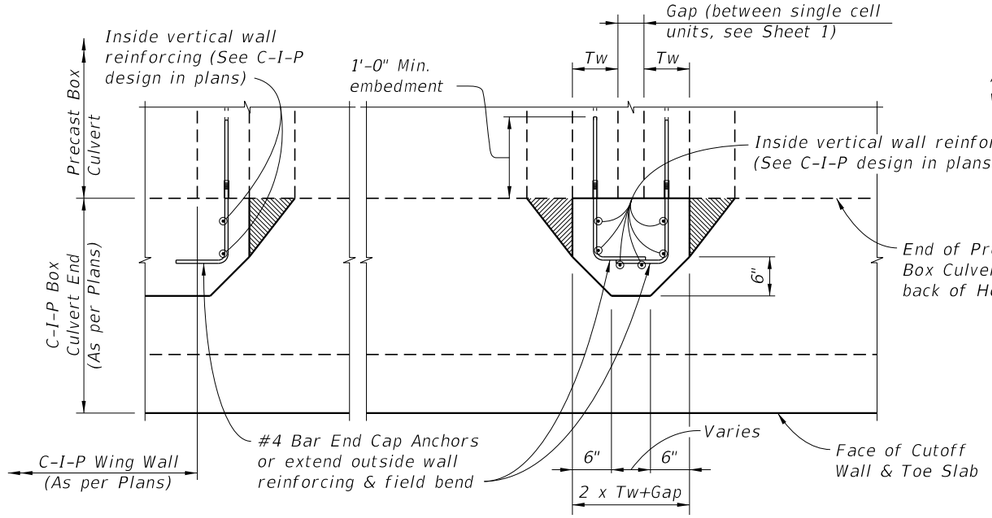
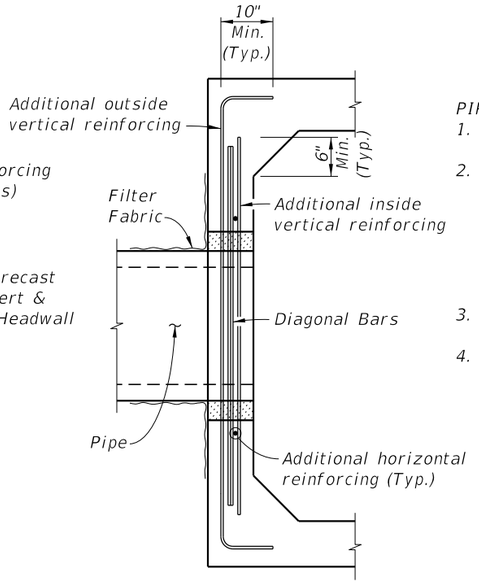


#4 BAR END CAP ANCHOR
BAR BEND DIAGRAM



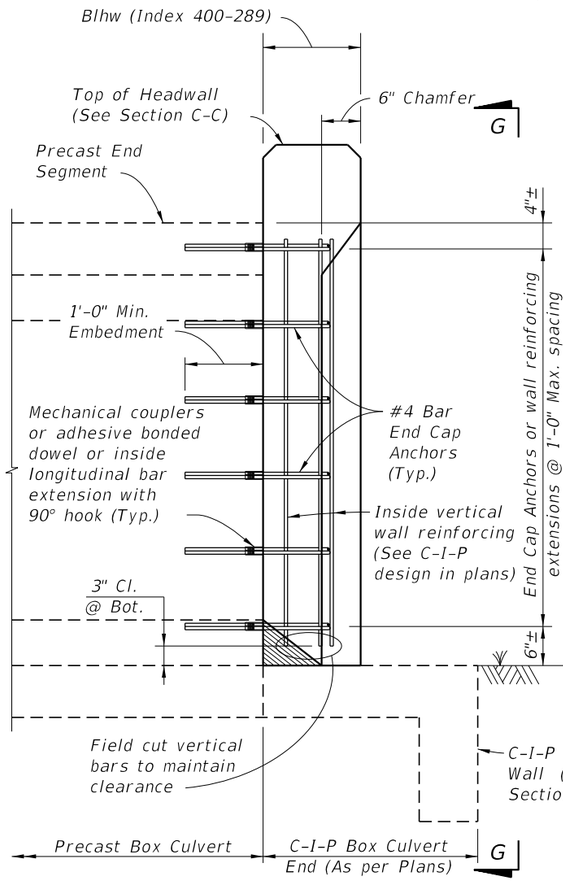
SECTION H-H



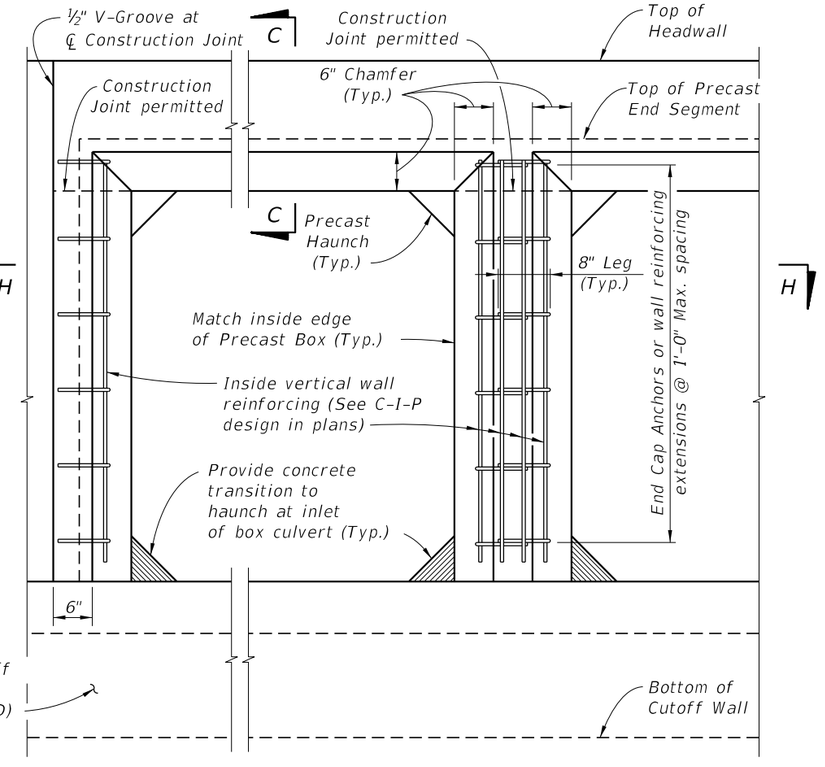
SECTION I-I
(Showing additional blockout reinforcing only)

PIPE BLOCKOUT NOTES:

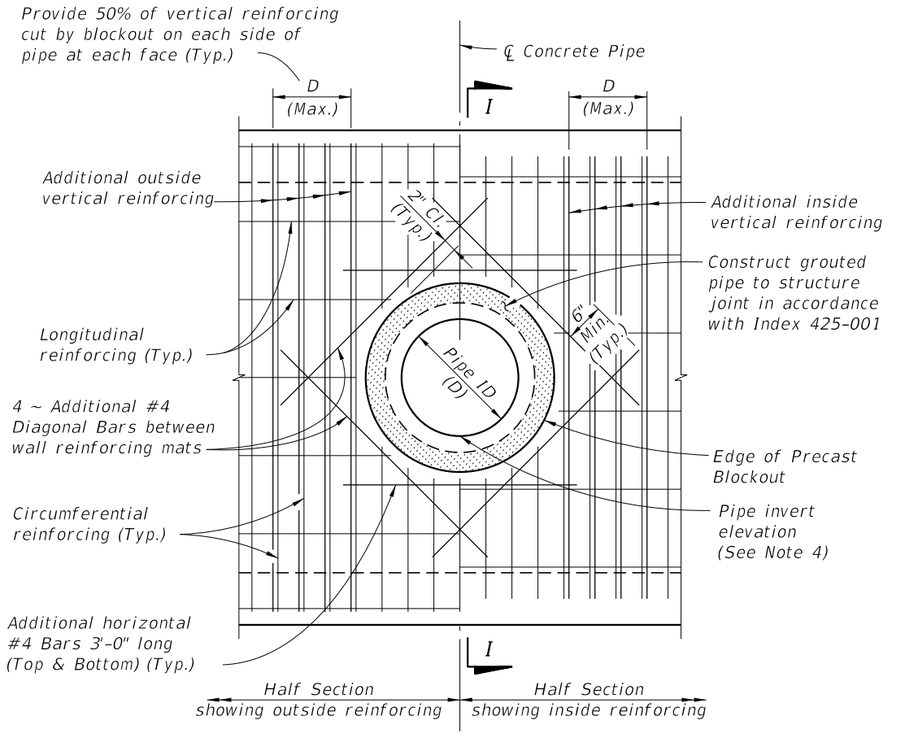
1. Cut box culvert reinforcement as required to maintain 2" cover.
2. For Precast Sections construct opening a minimum of 1'-6" away from any box to box joint, except opening may be a minimum of 1'-0" away from joint when at least 2'-0" of clearance to the box to box joint is provided on the opposite side of the pipe opening.
3. Pipe blockout diameter to be 6" greater than pipe outside diameter.
4. See Drainage Plans for size, placement, and invert elevation.



SECTION F-F



VIEW G-G
(Headwall, Toe Slab and Cutoff Wall Reinforcing not shown for clarity)



ELEVATION VIEW

PIPE BLOCKOUT DETAILS

C-I-P END CAP DETAILS AND CONNECTION TO PRECAST BOX

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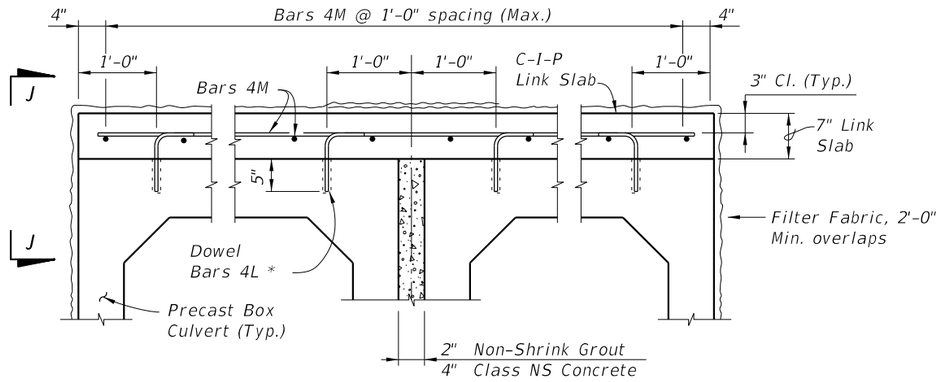


LINK SLAB TYPICAL SECTION
(Multiple Barrel Culvert shown, Single Barrel Culvert similar)

* Install dowels with an Adhesive Bonding Material System in accordance with Specification Section 416. The Contractor may substitute mechanical couplers in lieu of adhesive bonded dowels. Shift dowels to clear box culvert reinforcing.

LINK SLAB NOTES:

1. Provide a Cast-In-Place Link Slab to ensure uniform joint opening of precast box culverts when the differential settlement shown in the plans exceeds the following limits, except that a Link Slab is not required for differential settlements less than ½".

$$\Delta Y \leq \frac{(L)^2}{760 \times R \times W}$$

Where:
ΔY = Maximum Long-Term Differential Settlement (ft.)
R = Exterior height of Box Culvert (ft.)
W = Length of Box Culvert Segments (ft.)
L = Effective length for single curvature deflection (ft.)

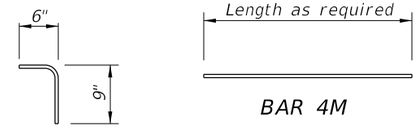
2. Extend Link Slab to back face of headwalls and to limits of existing box culverts for extensions.

ESTIMATED LINK SLAB QUANTITIES		
ITEM	UNIT	QUANTITY
Class II or IV Concrete (Culvert)	CY/SF	0.0216
Reinforcing Steel (Roadway)	Lb./SF	1.52

NOTE: Estimated quantities are based the plan area of precast box slabs, and are provided for information only. No additional payment will be made for Link Slabs where these are required for the precast box culverts.

BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
L	4	2 per Barrel/Ft.	1'-3"
M	4	As Reqd.	As Reqd.

REINFORCING STEEL BENDING DIAGRAMS



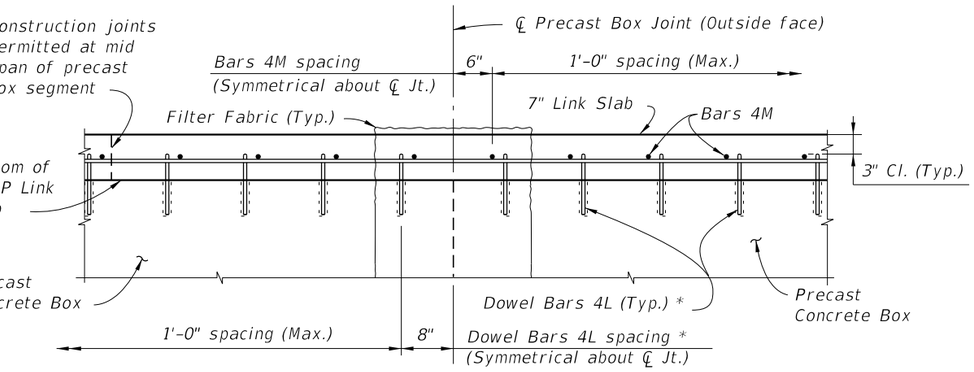
DOWEL BARS 4L

BAR 4M

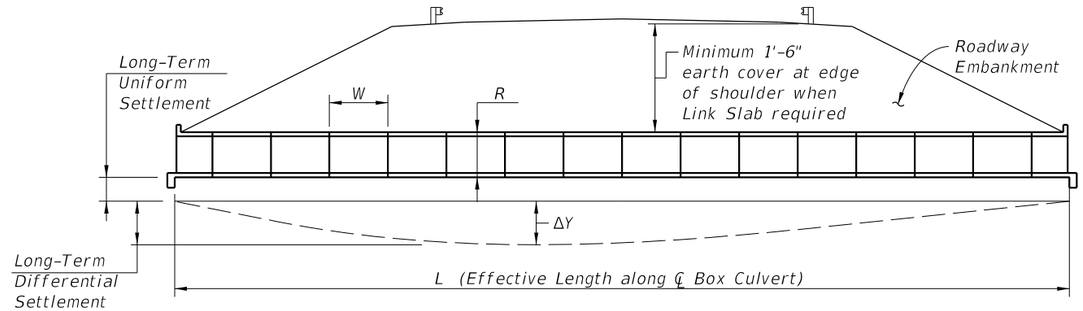
NOTES:
1. All bar dimensions are out to out.
2. Lap splice length for Bars 4M is 1'-4" minimum.

DESIGN NOTE:

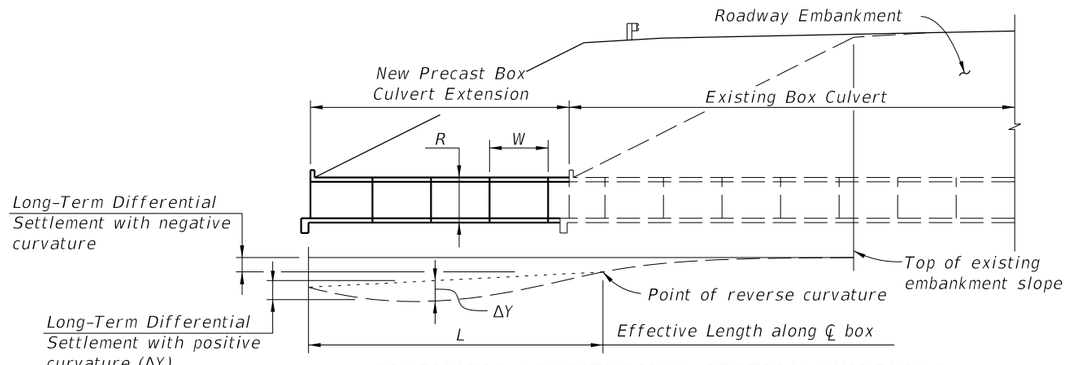
1. Link Slab required when joint openings from differential settlement exceed ⅛" as determined in Link Slab Note 1.



VIEW J-J



SCHEMATIC LONGITUDINAL SECTION (NEW CONSTRUCTION)



SCHEMATIC LONGITUDINAL SECTION (WIDENING)

DIFFERENTIAL SETTLEMENT COUNTERMEASURES FOR PRECAST BOX CULVERTS

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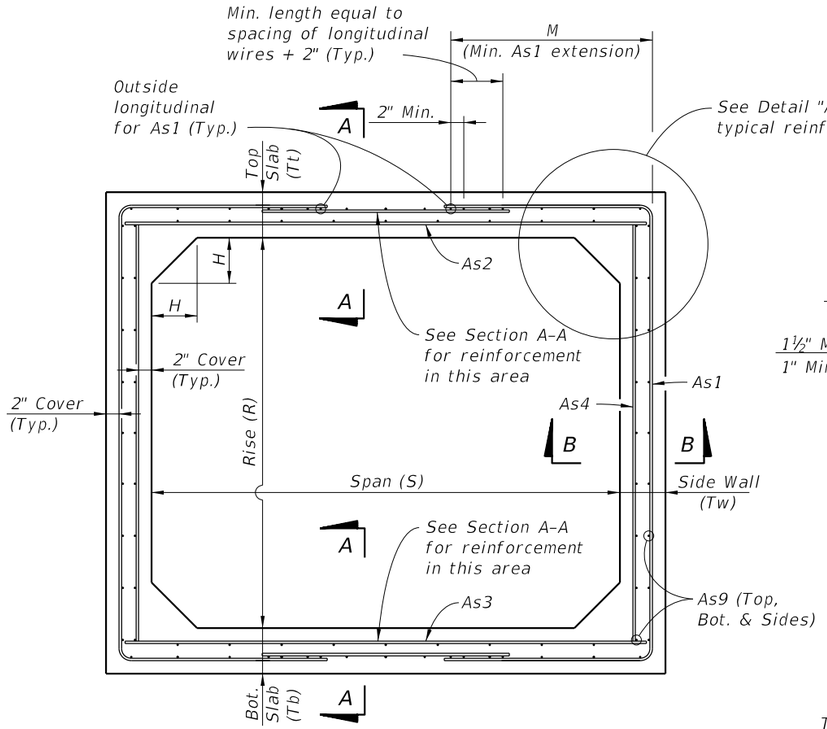
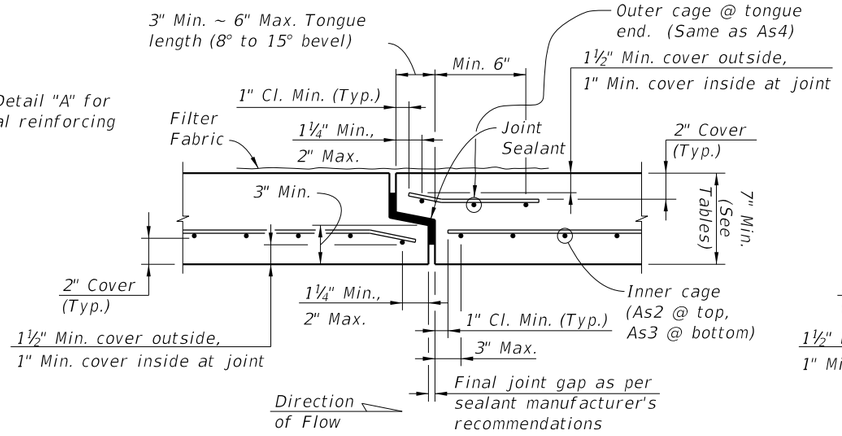
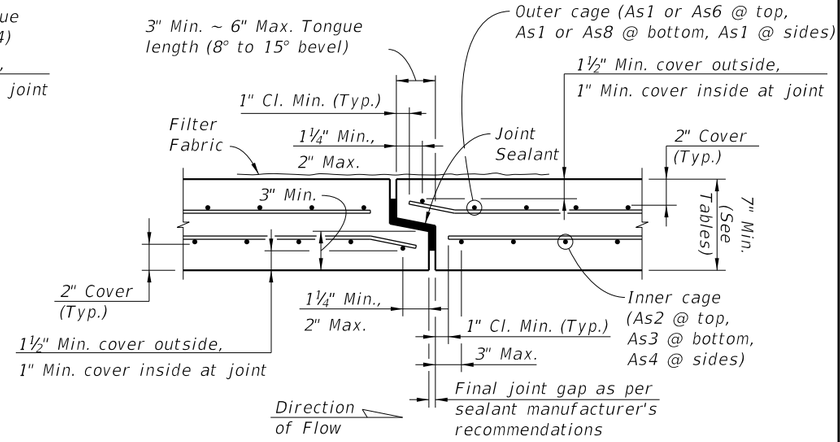


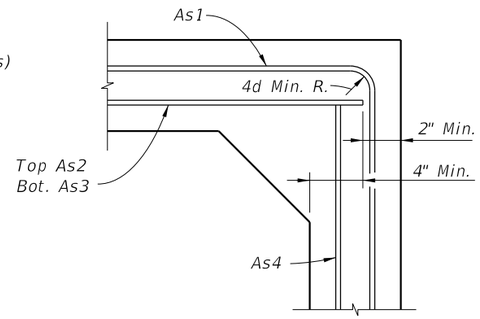
TYPICAL BOX SECTION (TYPE 2)
DESIGN EARTH COVER 2' OR GREATER
(Option 1 Reinforcing Configuration Shown)



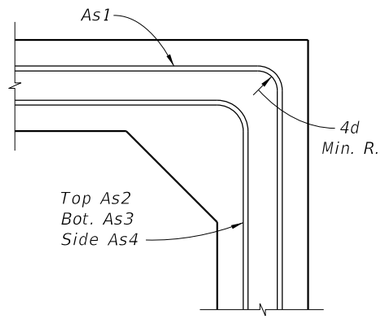
SECTION A-A



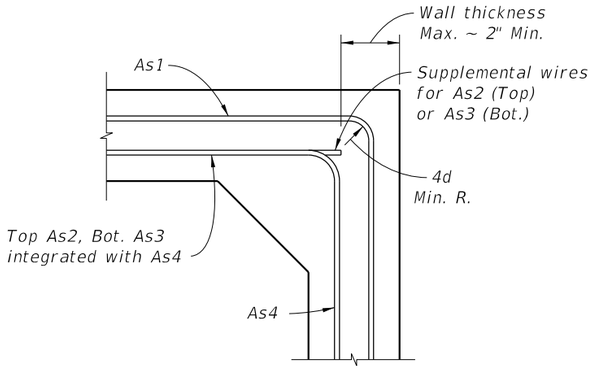
SECTION B-B
TYPICAL SECTION THRU JOINT



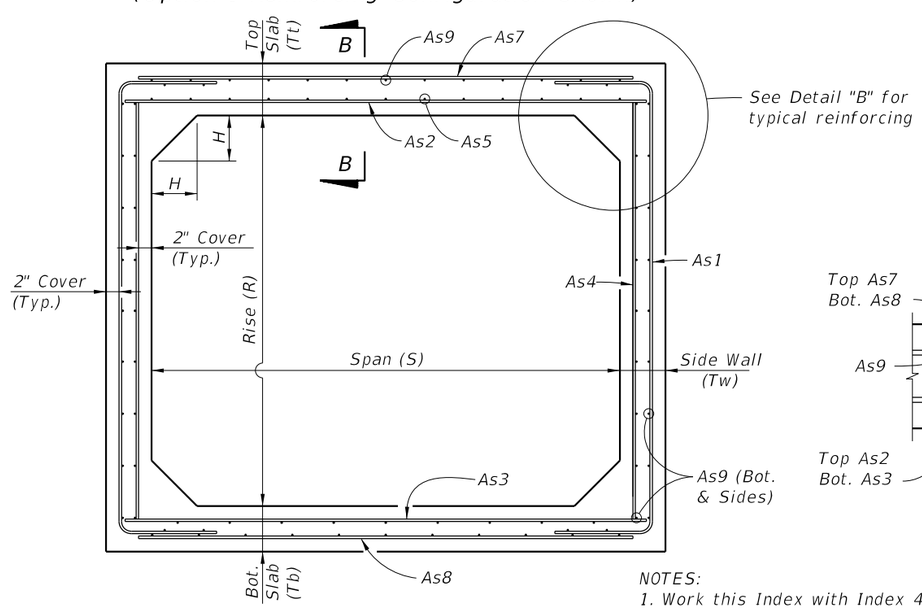
DETAIL "A"
(OPTION 1)



DETAIL "A"
(OPTION 2)

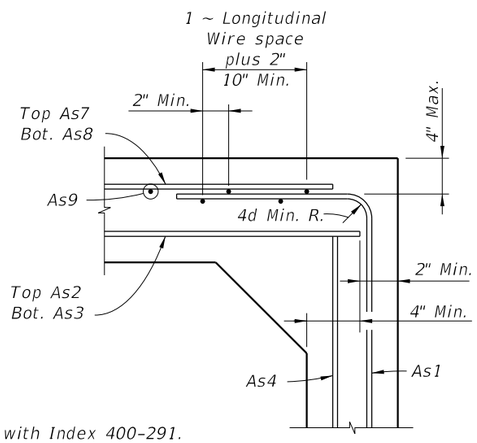


DETAIL "A"
(OPTION 3)

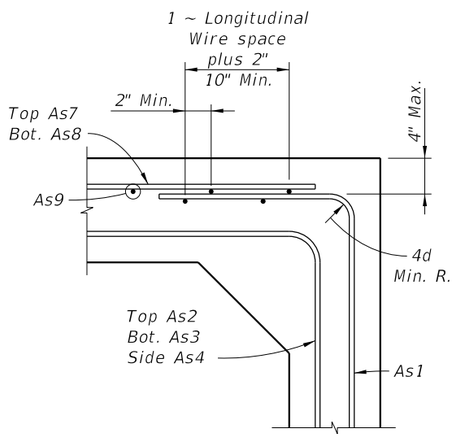


TYPICAL BOX SECTION (TYPE 1)
DESIGN EARTH COVER LESS THAN 2'
(Option 1 Reinforcing Configuration Shown)

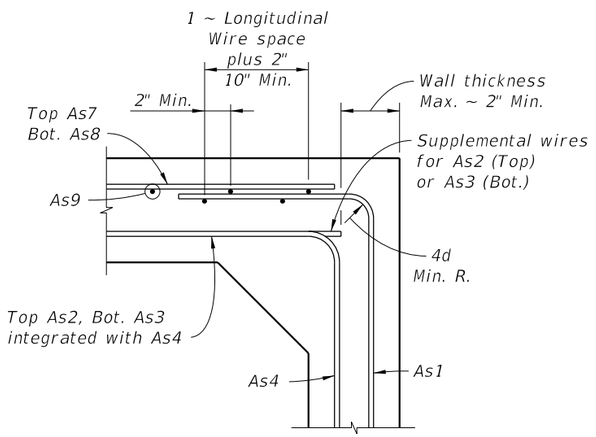
NOTES:
1. Work this Index with Index 400-291.
2. See sheets 2 thru 5 for dimensions and areas of reinforcement.



DETAIL "B"
(OPTION 1)



DETAIL "B"
(OPTION 2)



DETAIL "B"
(OPTION 3)

STANDARD PRECAST BOX CULVERT WITH 2" CONCRETE COVER

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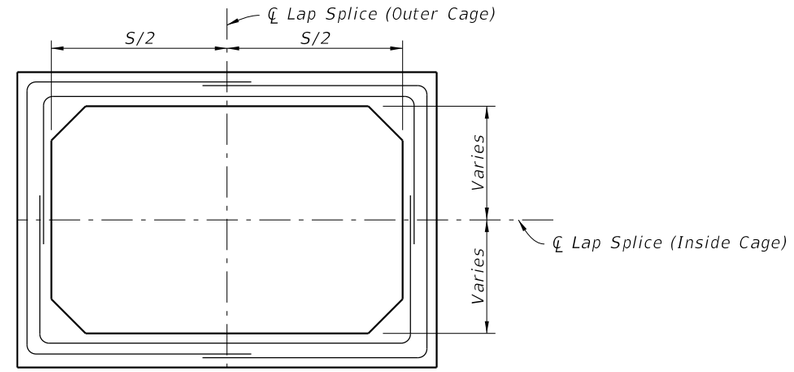
GENERAL NOTES:

1. These precast designs may be substituted for cast-in-place box culverts designed to AASHTO LRFD Bridge Design Specifications, 4th Edition. Designs are based on the design criteria shown in FDOT Structures Design Guidelines.
2. Loading: HL-93 & any fill heights between the minimum & maximum shown.
3. Only one design of precast box culvert is to be used for any installation.
4. Reinforcing steel must consist of smooth or deformed welded wire reinforcement (WWR) meeting the requirements of Specification Section 931. Longitudinal reinforcement may consist of reinforcing bars meeting the requirements of Specification Section 931. Minimum cover must be 2" for slightly or moderately aggressive environments or 3" for extremely aggressive environments, unless otherwise shown. The spacing of circumferential wires must not be less than 2" nor more than 4". The spacing of longitudinal wires or bars must not be more than 8".
5. As9 longitudinal wires must have a minimum cross-sectional area of 40% of the circumferential wires, but not less than a W2.5 or D4.0 for WWR, or #3 bars for deformed bars.
6. Welding of reinforcement must be limited to the locations shown in ASTM C1577 and in accordance with ANSI/AWS D1.4 "Structural Welding Code – Reinforcing Steel".
7. For alternate reinforcing configuration Options 2 and 3 shown in Detail "A" and "B" (Sheet 1), As1 may be extended to the middle of either slab and lap spliced with As7 and As8. As4 may be lap spliced at any location or connected to As2 or As3 at corners by welding.
8. Haunch dimensions may vary between the minimum and maximum dimensions shown in the Design Tables but only one haunch dimension must be used within the full length of the box culvert installation.
9. Submittal of redesign calculations are not required for any increase to the slab and/or wall thickness when the minimum reinforcement areas shown in the Design Tables are provided.
10. For Design Earth Cover greater than 10 feet, the Contractor may interpolate the required areas of reinforcement and slab or wall thickness. Interpolated areas of reinforcement, slab or wall thickness must be approved by the Engineer.
11. Minimum length of precast box segments is 4 feet and maximum length is 16 feet.
12. See Index 400-291 for connections to wingwalls, headwalls and other general details.



SCHEMATIC OF LAP SPLICE LOCATIONS
FOR OPTION 2 & 3 REINFORCING CONFIGURATIONS

TABLE 1A - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 3' & 4' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
3' x 3'	7	7	7	4 to 8	0.33' - <2'	0.17	0.29	0.21	0.17	0.17	0.17	0.17	See General Note 5	–
					2' - <3'	0.13	0.28	0.21	0.09	–	–	–		31
					3' - <5'	0.09	0.17	0.17	0.09	–	–	–		31
					5' - 10'	0.09	0.17	0.17	0.09	–	–	–		31
					15'	0.09	0.17	0.17	0.09	–	–	–		31
					20'	0.12	0.17	0.17	0.09	–	–	–		31
					25'	0.14	0.18	0.18	0.09	–	–	–		31
					30'	0.17	0.21	0.22	0.09	–	–	–		31
					35'	0.19	0.25	0.25	0.09	–	–	–		31
4' x 3'	7	7	7	4 to 8	0.33' - <2'	0.19	0.38	0.26	0.17	0.19	0.17	0.19		–
					2' - <3'	0.19	0.38	0.26	0.09	–	–	–		38
					3' - <5'	0.14	0.20	0.22	0.09	–	–	–		38
					5' - 10'	0.11	0.17	0.17	0.09	–	–	–		38
					15'	0.15	0.17	0.18	0.09	–	–	–		38
					20'	0.20	0.23	0.23	0.09	–	–	–		38
					25'	0.24	0.28	0.29	0.09	–	–	–		38
					30'	0.29	0.34	0.35	0.09	–	–	–		38
4' x 4'	7	7	7	4 to 8	0.33' - <2'	0.19	0.41	0.28	0.17	0.21	0.17	0.19		–
					2' - <3'	0.19	0.41	0.28	0.09	–	–	–		38
					3' - <5'	0.14	0.21	0.24	0.09	–	–	–		38
					5' - 10'	0.12	0.17	0.17	0.09	–	–	–		38
					15'	0.16	0.19	0.20	0.09	–	–	–		38
					20'	0.21	0.25	0.25	0.09	–	–	–		38
					25'	0.26	0.31	0.32	0.09	–	–	–		38
					30'	0.31	0.37	0.38	0.09	–	–	–		38

TABLE 1B - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 3' & 4' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
3' x 3'	8	8	8	4 to 8	0.33' - <2'	0.20	0.26	0.32	0.20	0.20	0.20	0.20	See General Note 5	–
					2' - <3'	0.16	0.25	0.31	0.10	–	–	–		31
					3' - <5'	0.10	0.20	0.20	0.10	–	–	–		31
					5' - 10'	0.10	0.20	0.20	0.10	–	–	–		31
					15'	0.10	0.20	0.20	0.10	–	–	–		31
					20'	0.10	0.20	0.20	0.10	–	–	–		31
					25'	0.11	0.20	0.20	0.10	–	–	–		31
					30'	0.13	0.20	0.20	0.10	–	–	–		31
					35'	0.15	0.21	0.21	0.10	–	–	–		31
4' x 3'	8	8	8	4 to 8	0.33' - <2'	0.20	0.31	0.22	0.20	0.20	0.20	0.20		–
					2' - <3'	0.12	0.31	0.22	0.10	–	–	–		38
					3' - <5'	0.12	0.20	0.20	0.10	–	–	–		38
					5' - 10'	0.10	0.20	0.20	0.10	–	–	–		38
					15'	0.12	0.20	0.20	0.10	–	–	–		38
					20'	0.16	0.20	0.20	0.10	–	–	–		38
					25'	0.19	0.24	0.24	0.10	–	–	–		38
					30'	0.22	0.28	0.29	0.10	–	–	–		38
4' x 4'	8	8	8	4 to 8	0.33' - <2'	0.20	0.33	0.24	0.20	0.20	0.20	0.20		–
					2' - <3'	0.17	0.33	0.24	0.10	–	–	–		38
					3' - <5'	0.12	0.20	0.20	0.10	–	–	–		38
					5' - 10'	0.10	0.20	0.20	0.10	–	–	–		38
					15'	0.13	0.20	0.20	0.10	–	–	–		38
					20'	0.16	0.21	0.22	0.10	–	–	–		38
					25'	0.20	0.26	0.27	0.10	–	–	–		38
					30'	0.23	0.31	0.32	0.10	–	–	–		38

NOTES: 1. See Sheet 1 for Reinforcing Details and dimension locations.
2. See Sheet 14 for WWR Bending Diagram.

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TABLE 2A - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 5' & 6' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
5' x 3'	7	7	7	4 to 8	0.33' - <2'	0.31	0.48	0.42	0.17	0.21	0.23	0.31	See General Note 5	-
					2' - <3'	0.31	0.48	0.42	0.09	-	-	-		45
					3' - <5'	0.20	0.27	0.27	0.09	-	-	-		36
					5' - 10'	0.17	0.19	0.21	0.09	-	-	-		36
					15'	0.24	0.25	0.25	0.09	-	-	-		35
					20'	0.32	0.33	0.33	0.09	-	-	-		35
					25'	0.39	0.41	0.42	0.09	-	-	-		35
					30'	0.47	0.50	0.50	0.09	-	-	-		35
5' x 4'	7	7	7	4 to 8	0.33' - <2'	0.30	0.51	0.45	0.17	0.23	0.21	0.30		-
					2' - <3'	0.30	0.51	0.45	0.09	-	-	-		45
					3' - <5'	0.18	0.30	0.29	0.09	-	-	-		45
					5' - 10'	0.17	0.21	0.23	0.09	-	-	-		36
					15'	0.24	0.27	0.28	0.09	-	-	-		35
					20'	0.31	0.36	0.37	0.09	-	-	-		35
					25'	0.39	0.45	0.46	0.09	-	-	-		35
					30'	0.46	0.55	0.56	0.09	-	-	-		35
5' x 5'	7	7	7	4 to 8	0.33' - <2'	0.30	0.53	0.48	0.17	0.24	0.21	0.30		-
					2' - <3'	0.29	0.53	0.48	0.09	-	-	-		45
					3' - <5'	0.19	0.31	0.31	0.09	-	-	-		45
					5' - 10'	0.19	0.22	0.25	0.09	-	-	-		45
					15'	0.26	0.29	0.31	0.09	-	-	-		36
					20'	0.34	0.39	0.40	0.09	-	-	-		35
					25'	0.41	0.49	0.50	0.09	-	-	-		35
					30'	0.49	0.59	0.61	0.09	-	-	-		35
6' x 3'	7.5	7	7	4 to 12	0.33' - <2'	0.39	0.54	0.48	0.17	0.22	0.25	0.39		-
	7	7	7		2' - <3'	0.39	0.58	0.49	0.09	-	-	-		43
					3' - <5'	0.28	0.36	0.36	0.09	-	-	-		39
					5' - 10'	0.25	0.26	0.28	0.09	-	-	-		39
					15'	0.36	0.34	0.34	0.09	-	-	-		38
					20'	0.47	0.46	0.46	0.09	-	-	-		38
	7	7.5	7		25'	0.59	0.57	0.55	0.09	-	-	-		38
	8	8	7		30'	0.60	0.64	0.64	0.09	-	-	-		38
6' x 4'	7.5	7	7	4 to 12	0.33' - <2'	0.37	0.58	0.52	0.17	0.24	0.23	0.37		-
	7	7	7		2' - <3'	0.37	0.61	0.53	0.09	-	-	-		43
					3' - <5'	0.26	0.39	0.39	0.09	-	-	-		39
					5' - 10'	0.24	0.28	0.31	0.09	-	-	-		39
					15'	0.35	0.37	0.38	0.09	-	-	-		38
					20'	0.46	0.50	0.50	0.09	-	-	-		38
	7	7.5	7		25'	0.56	0.63	0.60	0.09	-	-	-		38
	8	8	7		30'	0.58	0.69	0.69	0.09	-	-	-		38
6' x 5'	7.5	7	7	4 to 12	0.33' - <2'	0.36	0.60	0.56	0.17	0.25	0.22	0.36		-
	7	7	7		2' - <3'	0.36	0.64	0.56	0.09	-	-	-		43
					3' - <5'	0.26	0.410	0.42	0.09	-	-	-		43
					5' - 10'	0.25	0.30	0.33	0.09	-	-	-		39
					15'	0.34	0.40	0.41	0.09	-	-	-		38
					20'	0.46	0.54	0.54	0.09	-	-	-		38
	7	7.5	7		25'	0.56	0.67	0.65	0.09	-	-	-		38
	8	8	8		30'	0.60	0.74	0.74	0.09	-	-	-		38
6' x 6'	7.5	7	7	4 to 12	0.33' - <2'	0.36	0.63	0.59	0.17	0.26	0.22	.036		-
	7	7	7		2' - <3'	0.35	0.67	0.59	0.09	-	-	-		52
					3' - <5'	0.27	0.43	0.44	0.09	-	-	-		52
					5' - 10'	0.27	0.32	0.35	0.09	-	-	-		43
					15'	0.38	0.43	0.44	0.09	-	-	-		39
					20'	0.50	0.57	0.59	0.09	-	-	-		39
	7	7.5	7		25'	0.60	0.72	0.70	0.09	-	-	-		38
	8	8	7		30'	0.67	0.78	0.79	0.09	-	-	-		38

TABLE 2B - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 5' & 6' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
5' x 3'	8	8	8	4 to 8	0.33' - <2'	0.26	0.39	0.36	0.20	0.20	0.20	0.26	See General Note 5	-
					2' - <3'	0.26	0.39	0.36	0.10	-	-	-		45
					3' - <5'	0.16	0.23	0.24	0.10	-	-	-		36
					5' - 10'	0.13	0.20	0.20	0.10	-	-	-		36
					15'	0.19	0.21	0.22	0.10	-	-	-		35
					20'	0.24	0.28	0.28	0.10	-	-	-		35
					25'	0.30	0.34	0.35	0.10	-	-	-		35
					30'	0.36	0.41	0.41	0.10	-	-	-		35
5' x 4'	8	8	8	4 to 8	0.33' - <2'	0.25	0.42	0.38	0.20	0.20	0.20	0.25		-
					2' - <3'	0.25	0.42	0.38	0.10	-	-	-		45
					3' - <5'	0.16	0.25	0.25	0.10	-	-	-		45
					5' - 10'	0.13	0.20	0.20	0.10	-	-	-		36
					15'	0.19	0.23	0.24	0.10	-	-	-		35
					20'	0.24	0.30	0.31	0.10	-	-	-		35
					25'	0.30	0.37	0.38	0.10	-	-	-		35
					30'	0.35	0.45	0.46	0.10	-	-	-		35
5' x 5'	8	8	8	4 to 8	0.33' - <2'	0.25	0.44	0.41	0.20	0.20	0.20	0.25		-
					2' - <3'	0.25	0.44	0.41	0.10	-	-	-		45
					3' - <5'	0.16	0.26	0.27	0.10	-	-	-		45
					5' - 10'	0.15	0.20	0.22	0.10	-	-	-		45
					15'	0.20	0.25	0.26	0.10	-	-	-		36
					20'	0.26	0.32	0.33	0.10	-	-	-		35
					25'	0.32	0.40	0.41	0.10	-	-	-		35
					30'	0.37	0.48	0.49	0.10	-	-	-		35
6' x 3'	8	8	8	4 to 12	0.33' - <2'	0.32	0.47	0.41	0.20	0.20	0.25	0.32		-
					2' - <3'	0.32	0.47	0.41	0.10	-	-	-		43
					3' - <5'	0.23	0.30	0.31	0.10	-	-	-		39
					5' - 10'	0.19	0.22	0.24	0.10	-	-	-		39
					15'	0.28	0.29	0.29	0.10	-	-	-		38
					20'	0.36	0.38	0.38	0.10	-	-	-		38
					25'	0.45	0.47	0.47	0.10	-	-	-		38
					30'	0.54	0.57	0.57	0.10	-	-	-		38
6' x 4'	8	8	8	4 to 12	0.33' - <2'	0.31	0.50	0.44	0.20	0.21	0.23	0.31		-
					2' - <3'	0.31	0.50	0.44	0.10	-	-	-		43
					3' - <5'	0.23	0.32	0.34	0.10	-	-	-		39
					5' - 10'	0.19	0.24	0.26	0.10	-	-	-		39
					15'	0.27	0.31	0.32	0.10	-	-	-		38
					20'	0.35	0.41	0.41	0.10	-	-	-		38
					25'	0.43	0.51	0.51	0.10	-	-	-		38
					30'	0.52	0.62	0.62	0.10	-	-	-		38
6' x 5'	8	8	8	4 to 12	0.33' - <2'	0.30	0.52	0.47	0.20	0.22	0.22	0.30		-
					2' - <3'	0.30	0.52	0.47	0.10	-	-	-		43
					3' - <5'	0.22	0.34	0.36	0.10	-	-	-		43
					5' - 10'	0.20	0.26	0.28	0.10	-	-	-		39
					15'	0.27	0.33	0.34	0.10	-	-	-		38
					20'	0.36	0.44	0.45	0.10	-	-	-		38
					25'	0.44	0.55	0.55	0.10	-	-	-		38
					30'	0.52	0.66	0.67	0.10	-	-	-		38
6' x 6'	8	8	8	4 to 12	0.33' - <2'	0.30	0.54	0.50	0.20	0.22	0.22	0.30		-
					2' - <3'	0.30	0.54	0.50	0.10	-	-	-		52
					3' - <5'	0.23	0.36	0.38	0.10	-	-	-		52
					5' - 10'	0.21	0.27	0.30	0.10	-	-	-		43
					15'	0.29	0.35	0.37	0.10	-	-	-		39
					20'	0.38	0.47	0.48	0.10	-	-	-		39
					25'	0.47	0.59	0.60	0.10	-	-	-		38
					30'	0.55	0.70	0.71	0.10	-	-	-		38

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TABLE 3 - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 7' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
7' x 4'	8	8	8	4 to 12	0.33' – <2'	0.37	0.58	0.49	0.20	0.22	0.29	0.37	See General Note 5	–
					2' – <3'	0.37	0.58	0.49	0.10	–	–	–		43
					3' – <5'	0.30	0.40	0.42	0.10	–	–	–		43
					5' – 10'	0.26	0.30	0.33	0.10	–	–	–		43
					15'	0.37	0.40	0.40	0.10	–	–	–		41
					20'	0.49	0.53	0.53	0.10	–	–	–		41
	8	8	8	7 to 12	25'	0.60	0.67	0.66	0.10	–	–	–		41
	8.5	8.5	8		30'	0.68	0.79	0.78	0.10	–	–	–		41
7' x 5'	8	8	8	4 to 12	0.33' – <2'	0.36	0.60	0.53	0.20	0.23	0.28	0.36		–
					2' – <3'	0.36	0.60	0.53	0.10	–	–	–		47
					3' – <5'	0.30	0.42	0.45	0.10	–	–	–		43
					5' – 10'	0.26	0.32	0.35	0.10	–	–	–		43
					15'	0.37	0.43	0.44	0.10	–	–	–		41
					20'	0.48	0.57	0.57	0.10	–	–	–		41
	8	8	8	7 to 12	25'	0.60	0.72	0.72	0.10	–	–	–		41
	8.5	8.5	8		30'	0.67	0.84	0.84	0.10	–	–	–		41
7' x 6'	8	8	8	4 to 12	0.33' – <2'	0.36	0.63	0.56	0.20	0.24	0.27	0.36		–
					2' – <3'	0.36	0.63	0.56	0.10	–	–	–		59
					3' – <5'	0.29	0.44	0.47	0.10	–	–	–		47
					5' – 10'	0.27	0.34	0.37	0.10	–	–	–		43
					15'	0.38	0.46	0.46	0.10	–	–	–		41
					20'	0.49	0.60	0.61	0.10	–	–	–		41
	8	8	8	7 to 12	25'	0.61	0.76	0.76	0.10	–	–	–		41
	8.5	8.5	8		30'	0.69	0.89	0.89	0.10	–	–	–		41
7' x 7'	8	8	8	4 to 12	0.33' – <2'	0.36	0.65	0.58	0.20	0.25	0.27	0.36		–
					2' – <3'	0.36	0.65	0.58	0.10	–	–	–		59
					3' – <5'	0.30	0.46	0.50	0.10	–	–	–		59
					5' – 10'	0.30	0.35	0.50	0.10	–	–	–		47
					15'	0.41	0.48	0.50	0.10	–	–	–		43
					20'	0.53	0.64	0.65	0.10	–	–	–		43
	8	8	8	7 to 12	25'	0.65	0.80	0.81	0.10	–	–	–		43
	8.5	9	8		30'	0.72	0.92	0.91	0.10	–	–	–		41

TABLE 4 - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 8' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
8' x 4'	9	8.5	8	4 to 12	0.33' – <2'	0.40	0.60	0.52	0.20	0.22	0.28	0.39	See General Note 5	–
	8	8	8		2' – <3'	0.45	0.66	0.54	0.10	–	–	–		50
					3' – <5'	0.39	0.48	0.50	0.10	–	–	–		50
					5' – 10'	0.34	0.38	0.40	0.10	–	–	–		45
					15'	0.49	0.51	0.50	0.10	–	–	–		41
					20'	0.65	0.68	0.66	0.10	–	–	–		41
	8.5	8.5	8	8 to 12	25'	0.76	0.83	0.80	0.10	–	–	–		41
	9.5	9.5	8		30'	0.79	0.94	0.92	0.10	–	–	–		41
8' x 5'	9	8.5	8	4 to 12	0.33' – <2'	0.38	0.65	0.59	0.20	0.22	0.30	0.37		–
	8	8	8		2' – <3'	0.43	0.69	0.58	0.10	–	–	–		50
					3' – <5'	0.37	0.51	0.53	0.10	–	–	–		45
					5' – 10'	0.33	0.41	0.42	0.10	–	–	–		45
					15'	0.48	0.54	0.53	0.10	–	–	–		41
					20'	0.63	0.73	0.70	0.10	–	–	–		41
	8.5	8.5	8	8 to 12	25'	0.74	0.88	0.86	0.10	–	–	–		41
	9.5	9.5	8		30'	0.77	1.00	0.98	0.10	–	–	–		41
8' x 6'	9	9	8	4 to 12	0.33' – <2'	0.32	0.65	0.58	0.20	0.23	0.25	0.31		–
	8	8	8		2' – <3'	0.42	0.71	0.61	0.10	–	–	–		50
					3' – <5'	0.37	0.54	0.56	0.10	–	–	–		50
					5' – 10'	0.34	0.43	0.45	0.10	–	–	–		45
					15'	0.49	0.57	0.57	0.10	–	–	–		41
					20'	0.64	0.77	0.76	0.10	–	–	–		41
	8.5	8.5	8	8 to 12	25'	0.74	0.94	0.92	0.10	–	–	–		41
	9.5	9.5	8		30'	0.78	1.05	1.04	0.10	–	–	–		41
8' x 7'	9	9	8	4 to 12	0.33' – <2'	0.31	0.67	0.60	0.20	0.24	0.24	0.31		–
	8	8	8		2' – <3'	0.42	0.74	0.64	0.10	–	–	–		55
					3' – <5'	0.37	0.56	0.59	0.10	–	–	–		55
					5' – 10'	0.36	0.45	0.47	0.10	–	–	–		50
					15'	0.51	0.61	0.61	0.10	–	–	–		45
					20'	0.66	0.81	0.80	0.10	–	–	–		41
	8.5	8.5	8	8 to 12	25'	0.78	0.98	0.97	0.10	–	–	–		41
	9.5	9.5	8		30'	0.84	1.10	1.09	0.10	–	–	–		41
8' x 8'	9	9	8	4 to 12	0.33' – <2'	0.32	0.68	0.62	0.20	0.24	0.25	0.32		–
	8	8	8		2' – <3'	0.43	0.76	0.67	0.14	–	–	–		65
					3' – <5'	0.38	0.58	0.61	0.14	–	–	–		65
					5' – 10'	0.39	0.46	0.50	0.13	–	–	–		55
					15'	0.55	0.64	0.65	0.10	–	–	–		45
					20'	0.71	0.86	0.85	0.10	–	–	–		45
	8.5	8.5	8	8 to 12	25'	0.84	1.03	1.02	0.10	–	–	–		41
	9.5	9.5	8		30'	0.93	1.15	1.15	0.10	–	–	–		41

NOTES:
1. See Sheet 1 for Reinforcing Details and dimension locations.
2. See Sheet 2 for General Notes.
3. See Sheet 14 for Welded Wire Reinforcement Bending Diagram.

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TABLE 5 - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 9' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
9' x 5'	9.5	9.5	9	4	0.33' - <2'	0.41	0.62	0.53	0.22	0.23	0.34	0.38	See General Note 5	-
	9	9	9	to 12	2' - <3'	0.44	0.65	0.54	0.11	-	-	-		54
					3' - <5'	0.39	0.53	0.51	0.11	-	-	-		49
					5' - 10'	0.35	0.42	0.44	0.11	-	-	-		49
					15'	0.50	0.56	0.55	0.11	-	-	-		44
					20'	0.65	0.75	0.73	0.11	-	-	-		44
	9.5	9.5	9	8 to 12	25'	0.77	0.92	0.90	0.11	-	-	-		44
	10.5	11	9		30'	0.81	1.05	1.02	0.11	-	-	-		44
9' x 6'	9.5	9.5	9	4	0.33' - <2'	0.38	0.64	0.56	0.23	0.23	0.33	0.37		-
	9	9	9	to 12	2' - <3'	0.43	0.67	0.57	0.11	-	-	-		54
					3' - <5'	0.37	0.55	0.54	0.11	-	-	-		49
					5' - 10'	0.35	0.45	0.47	0.11	-	-	-		49
					15'	0.49	0.60	0.59	0.11	-	-	-		44
					20'	0.65	0.80	0.78	0.11	-	-	-		44
	9.5	9.5	9	8 to 12	25'	0.76	0.98	0.95	0.11	-	-	-		44
	10.5	11	9		30'	0.80	1.10	1.08	0.11	-	-	-		44
9' x 7'	9.5	9.5	9	4	0.33' - <2'	0.37	0.67	0.59	0.22	0.23	0.32	0.37		-
	9	9	9	to 12	2' - <3'	0.42	0.69	0.60	0.11	-	-	-		59
					3' - <5'	0.37	0.58	0.56	0.11	-	-	-		54
					5' - 10'	0.36	0.47	0.49	0.11	-	-	-		49
					15'	0.50	0.63	0.63	0.11	-	-	-		44
					20'	0.66	0.84	0.80	0.11	-	-	-		44
	9.5	9.5	9	8 to 12	25'	0.77	1.02	1.00	0.11	-	-	-		44
	10.5	11	9		30'	0.81	1.15	1.13	0.11	-	-	-		44
9' x 8'	9.5	9.5	9	4	0.33' - <2'	0.37	0.68	0.61	0.22	0.23	0.31	0.37		-
	9	9	9	to 12	2' - <3'	0.42	0.71	0.62	0.11	-	-	-		59
					3' - <5'	0.37	0.60	0.59	0.11	-	-	-		59
					5' - 10'	0.38	0.49	0.51	0.11	-	-	-		54
					15'	0.53	0.66	0.66	0.11	-	-	-		44
					20'	0.68	0.88	0.87	0.11	-	-	-		44
	9.5	9.5	9	8 to 12	25'	0.81	1.07	1.05	0.11	-	-	-		44
	10.5	11	9		30'	0.86	1.20	1.18	0.11	-	-	-		44
9' x 9'	9.5	9.5	9	4	0.33' - <2'	0.38	0.70	0.63	0.22	0.23	0.32	0.38		-
	9	9	9	to 12	2' - <3'	0.43	0.73	0.65	0.15	-	-	-		72
					3' - <5'	0.38	0.62	0.61	0.15	-	-	-		72
					5' - 10'	0.41	0.50	0.53	0.14	-	-	-		59
					15'	0.57	0.69	0.70	0.12	-	-	-		49
					20'	0.73	0.92	0.91	0.11	-	-	-		49
	9.5	10	9	8 to 12	25'	0.83	1.11	1.09	0.11	-	-	-		44
	10.5	11	9		30'	0.93	1.25	1.23	0.11	-	-	-		44

TABLE 6 - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 10' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
10' x 5'	10	10	10	4	0.33' - <2'	0.46	0.62	0.52	0.24	0.24	0.41	0.45	See General Note 5	-
				to 12	2' - <3'	0.46	0.62	0.52	0.12	-	-	-		58
					3' - <5'	0.42	0.54	0.50	0.12	-	-	-		53
					5' - 10'	0.38	0.46	0.49	0.12	-	-	-		52
					15'	0.52	0.59	0.58	0.12	-	-	-		47
					20'	0.69	0.78	0.76	0.12	-	-	-		47
	10.5	10.5	10	8 to 12	25'	0.81	0.97	0.93	0.12	-	-	-		47
	11.5	12	10		30'	0.87	1.11	1.11	0.12	-	-	-		47
10' x 6'	10	10	10	4	0.33' - <2'	0.44	0.64	0.54	0.24	0.24	0.39	0.44		-
				to 12	2' - <3'	0.44	0.64	0.54	0.12	-	-	-		58
					3' - <5'	0.39	0.57	0.52	0.12	-	-	-		52
					5' - 10'	0.37	0.48	0.52	0.12	-	-	-		52
					15'	0.51	0.62	0.61	0.12	-	-	-		47
					20'	0.67	0.83	0.80	0.12	-	-	-		47
	10.5	10.5	10	8 to 12	25'	0.79	1.02	0.99	0.12	-	-	-		47
	11.5	12	10		30'	0.85	1.17	1.14	0.12	-	-	-		47
10' x 7'	10	10	10	4	0.33' - <2'	0.43	0.66	0.57	0.24	0.24	0.38	0.43		-
				to 12	2' - <3'	0.43	0.66	0.57	0.12	-	-	-		58
					3' - <5'	0.38	0.59	0.55	0.12	-	-	-		58
					5' - 10'	0.37	0.50	0.54	0.12	-	-	-		52
					15'	0.52	0.66	0.65	0.12	-	-	-		47
					20'	0.67	0.87	0.85	0.12	-	-	-		47
	10.5	10.5	10	8 to 12	25'	0.79	1.07	1.04	0.12	-	-	-		47
	11.5	12	10		30'	0.84	1.22	1.19	0.12	-	-	-		47
10' x 8'	10	10	10	4	0.33' - <2'	0.43	0.68	0.60	0.24	0.24	0.38	0.43		-
				to 12	2' - <3'	0.43	0.68	0.60	0.12	-	-	-		64
					3' - <5'	0.38	0.62	0.57	0.12	-	-	-		58
					5' - 10'	0.38	0.52	0.57	0.12	-	-	-		52
					15'	0.53	0.69	0.68	0.12	-	-	-		47
					20'	0.68	0.91	0.89	0.12	-	-	-		47
	10.5	10.5	10	8 to 12	25'	0.81	1.12	1.09	0.12	-	-	-		47
	11.5	12	10		30'	0.86	1.27	1.25	0.12	-	-	-		47
10' x 9'	10	10	10	4	0.33' - <2'	0.43	0.70	0.62	0.24	0.24	0.38	0.43		-
				to 12	2' - <3'	0.43	0.70	0.62	0.12	-	-	-		70
					3' - <5'	0.39	0.64	0.60	0.12	-	-	-		64
					5' - 10'	0.40	0.54	0.59	0.12	-	-	-		58
					15'	0.56	0.72	0.72	0.12	-	-	-		52
					20'	0.71	0.95	0.94	0.12	-	-	-		47
	10.5	11	10	8 to 12	25'	0.82	1.15	1.13	0.12	-	-	-		47
	11.5	12	10		30'	0.90	1.32	1.30	0.12	-	-	-		47
10' x 10'	10	10	10	4	0.33' - <2'	0.44	0.71	0.64	0.24	0.24	0.38	0.44		-
				to 12	2' - <3'	0.44	0.71	0.64	0.17	-	-	-		79
					3' - <5'	0.40	0.65	0.62	0.16	-	-	-		70
					5' - 10'	0.44	0.56	0.61	0.15	-	-	-		64
					15'	0.60	0.75	0.76	0.12	-	-	-		52
					20'	0.76	0.99	0.99	0.12	-	-	-		52
	10.5	11	10	8 to 12	25'	0.86	1.20	1.18	0.12	-	-	-		47
	11.5	12	10		30'	0.97	1.36	1.35	0.13	-	-	-		47

NOTES:
1. See Sheet 1 for Reinforcing Details and dimension locations.
2. See Sheet 2 for General Notes.
3. See Sheet 14 for WWR Bending Diagram.

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TABLE 7 - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 11' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
11' x 4'	11	11	11	4	0.33' - <2'	0.51	0.57	0.47	0.27	0.27	0.45	0.48	See General Note 5	-
				to	2' - <3'	0.51	0.57	0.47	0.14	-	-	-		62
					3' - <5'	0.48	0.57	0.46	0.14	-	-	-		62
					5' - 10'	0.47	0.50	0.50	0.14	-	-	-		55
				12	15'	0.59	0.58	0.56	0.14	-	-	-		55
					20'	0.77	0.77	0.74	0.14	-	-	-		55
	11.5	11.5	11	8 to	25'	0.92	0.95	0.91	0.14	-	-	-		55
	13	13	11	12	30'	0.94	1.09	1.06	0.14	-	-	-		55
11' x 6'	11	11	11	4	0.33' - <2'	0.45	0.62	0.52	0.27	0.27	0.41	0.45		-
				to	2' - <3'	0.45	0.62	0.52	0.14	-	-	-		62
					3' - <5'	0.42	0.58	0.51	0.14	-	-	-		55
					5' - 10'	0.43	0.56	0.56	0.14	-	-	-		55
				12	15'	0.54	0.65	0.64	0.14	-	-	-		50
					20'	0.70	0.86	0.83	0.14	-	-	-		50
	11.5	11.5	11	8 to	25'	0.83	1.07	1.03	0.14	-	-	-		50
	13	13	11	12	30'	0.85	1.22	1.19	0.14	-	-	-		50
11' x 8'	11	11	11	4	0.33' - <2'	0.42	0.67	0.57	0.27	0.27	0.39	0.43		-
				to	2' - <3'	0.43	0.67	0.57	0.14	-	-	-		62
					3' - <5'	0.39	0.63	0.56	0.14	-	-	-		62
					5' - 10'	0.43	0.60	0.61	0.14	-	-	-		55
				12	15'	0.54	0.72	0.71	0.14	-	-	-		50
					20'	0.70	0.94	0.92	0.14	-	-	-		50
	11.5	11.5	11	8 to	25'	0.82	1.16	1.13	0.14	-	-	-		50
	13	13	11	12	30'	0.86	1.32	1.30	0.14	-	-	-		50
11' x 10'	11	11	11	4	0.33' - <2'	0.44	0.71	0.62	0.27	0.27	0.38	0.44		-
				to	2' - <3'	0.44	0.71	0.62	0.14	-	-	-		75
					3' - <5'	0.41	0.67	0.61	0.14	-	-	-		69
					5' - 10'	0.47	0.64	0.66	0.14	-	-	-		62
				12	15'	0.59	0.78	0.78	0.14	-	-	-		55
					20'	0.75	1.03	1.01	0.14	-	-	-		50
	11.5	12	11	8 to	25'	0.85	1.24	1.22	0.14	-	-	-		50
	13	13.5	11	12	30'	0.91	1.40	1.39	0.14	-	-	-		50
11' x 11'	11	11	11	4	0.33' - <2'	0.45	0.72	0.64	0.27	0.27	0.39	0.45		-
				to	2' - <3'	0.45	0.72	0.64	0.18	-	-	-		86
					3' - <5'	0.42	0.69	0.63	0.18	-	-	-		75
					5' - 10'	0.51	0.66	0.69	0.16	-	-	-		69
				12	15'	0.63	0.81	0.82	0.14	-	-	-		55
					20'	0.80	1.07	1.06	0.14	-	-	-		55
	11.5	12	11	8 to	25'	0.91	1.29	1.27	0.14	-	-	-		50
	13	13.5	11	12	30'	0.99	1.44	1.44	0.14	-	-	-		50

TABLE 8 - STANDARD PRECAST BOX CULVERT DESIGNS (2" COVER) - 12' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
12' x 4'	12	12	12	4	0.33' - <2'	0.52	0.57	0.45	0.29	0.29	0.47	0.49	See General Note 5	-
				to	2' - <3'	0.52	0.57	0.45	0.15	-	-	-		73
					3' - <5'	0.50	0.54	0.45	0.15	-	-	-		66
					5' - 10'	0.50	0.52	0.52	0.15	-	-	-		66
				12	15'	0.63	0.61	0.59	0.15	-	-	-		59
					20'	0.82	0.81	0.77	0.15	-	-	-		59
	12.5	12.5	12	8 to	25'	0.99	0.99	0.95	0.15	-	-	-		59
	14	14	12	12	30'	1.03	1.15	1.11	0.15	-	-	-		59
12' x 6'	12	12	12	4	0.33' - <2'	0.47	0.62	0.51	0.29	0.29	0.42	0.46		-
				to	2' - <3'	0.47	0.62	0.51	0.15	-	-	-		66
					3' - <5'	0.45	0.60	0.51	0.15	-	-	-		59
					5' - 10'	0.47	0.59	0.59	0.15	-	-	-		59
				12	15'	0.57	0.68	0.66	0.15	-	-	-		53
					20'	0.74	0.90	0.86	0.15	-	-	-		53
	12.5	12.5	12	8 to	25'	0.88	1.11	1.06	0.15	-	-	-		53
	14	14.5	12	12	30'	0.92	1.27	1.24	0.15	-	-	-		53
12' x 8'	12	12	12	4	0.33' - <2'	0.44	0.67	0.56	0.29	0.29	0.40	0.44		-
				to	2' - <3'	0.44	0.67	0.56	0.15	-	-	-		66
					3' - <5'	0.41	0.64	0.56	0.15	-	-	-		59
					5' - 10'	0.45	0.63	0.64	0.15	-	-	-		59
				12	15'	0.56	0.75	0.73	0.15	-	-	-		53
					20'	0.72	0.98	0.95	0.15	-	-	-		53
	12.5	13	12	8 to	25'	0.85	1.20	1.16	0.15	-	-	-		53
	14	14.5	12	12	30'	0.89	1.38	1.35	0.15	-	-	-		53
12' x 10'	12	12	12	4	0.33' - <2'	0.44	0.71	0.60	0.29	0.29	0.39	0.44		-
				to	2' - <3'	0.44	0.71	0.60	0.15	-	-	-		73
					3' - <5'	0.42	0.68	0.60	0.15	-	-	-		66
					5' - 10'	0.47	0.67	0.69	0.15	-	-	-		59
				12	15'	0.59	0.81	0.81	0.15	-	-	-		53
					20'	0.75	1.06	1.04	0.15	-	-	-		53
	12.5	13	12	8 to	25'	0.87	1.30	1.26	0.15	-	-	-		53
	14	14.5	12	12	30'	0.92	1.47	1.45	0.15	-	-	-		53
12' x 12'	12	12	12	4	0.33' - <2'	0.46	0.74	0.64	0.29	0.29	0.40	0.46		-
				to	2' - <3'	0.46	0.74	0.64	0.20	-	-	-		93
					3' - <5'	0.42	0.72	0.64	0.20	-	-	-		80
					5' - 10'	0.54	0.71	0.74	0.18	-	-	-		73
				12	15'	0.66	0.87	0.89	0.15	-	-	-		59
					20'	0.83	1.14	1.13	0.15	-	-	-		59
	12.5	13	12	8 to	25'	0.96	1.39	1.37	0.15	-	-	-		53
	14	14.5	12.5	12	30'	1.05	1.56	1.56	0.15	-	-	-		53

NOTES:

1. See Sheet 1 for Reinforcing Details and dimension locations.
2. See Sheet 2 for General Notes.
3. See Sheet 14 for Welded Wire Reinforcement Bending Diagram.

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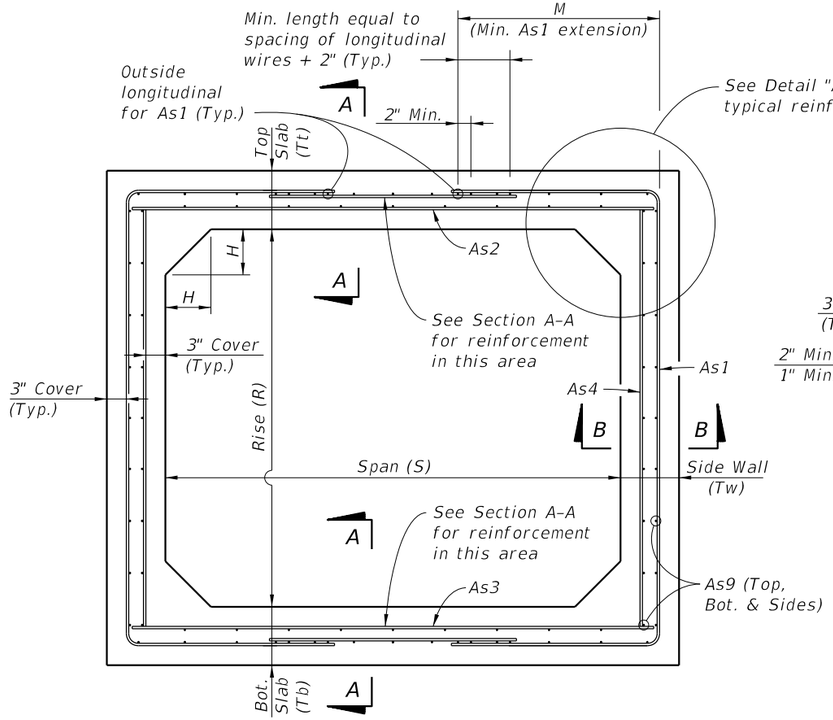
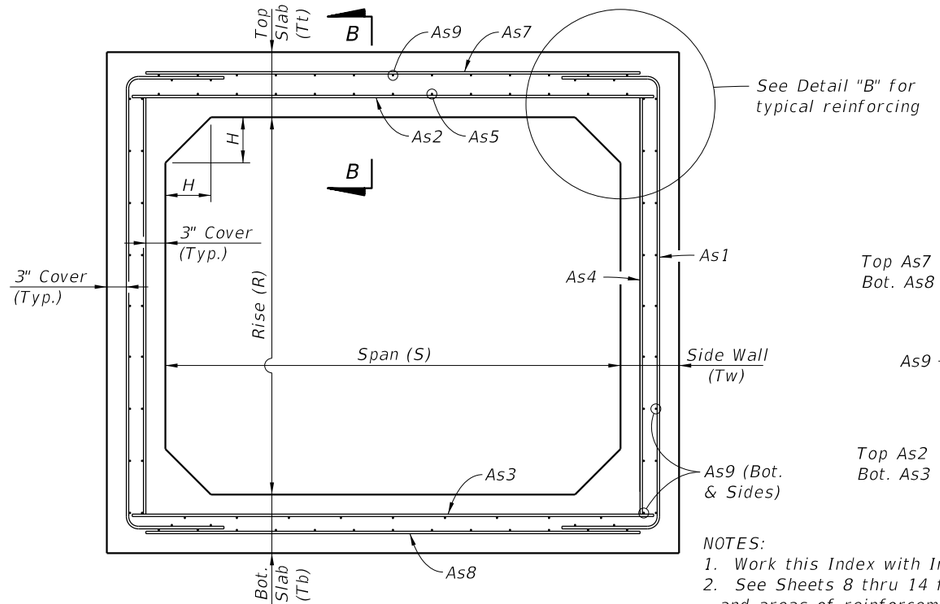
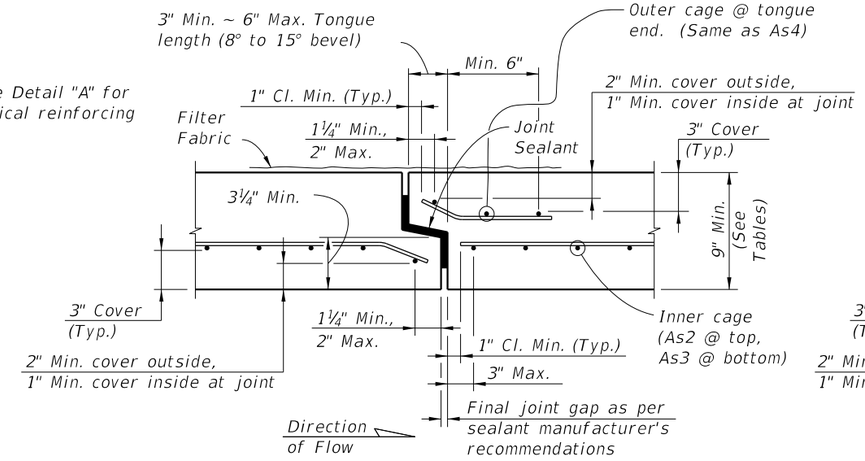


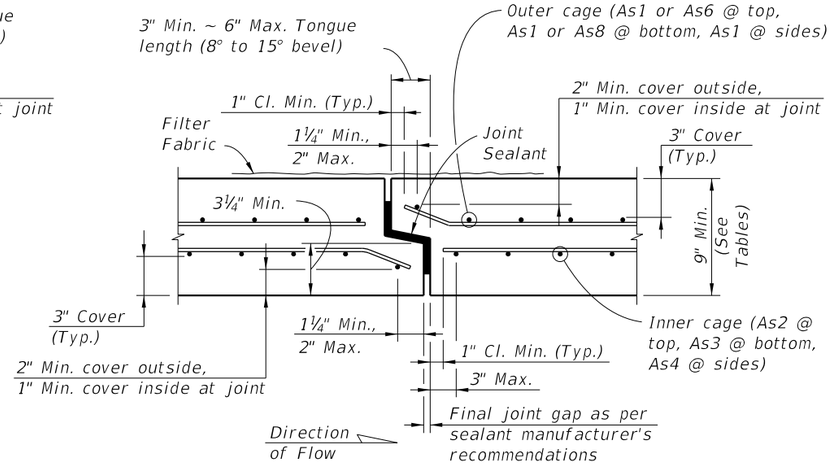
TYPICAL BOX SECTION (TYPE 2)
DESIGN EARTH COVER 2' OR GREATER
(Option 1 Reinforcing Configuration Shown)



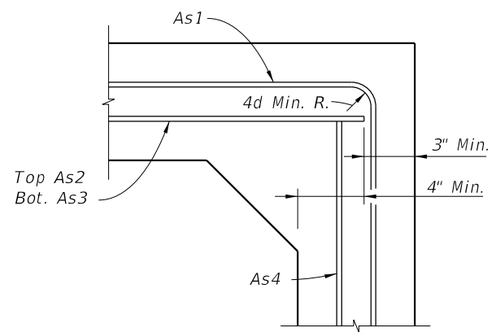
TYPICAL BOX SECTION (TYPE 1)
DESIGN EARTH COVER LESS THAN 2'
(Option 1 Reinforcing Configuration Shown)



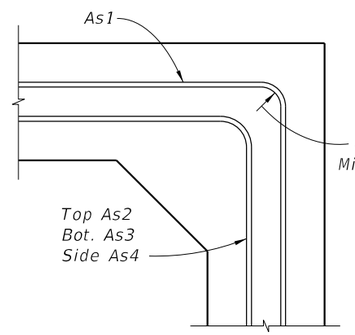
SECTION A-A



SECTION B-B
TYPICAL SECTION THRU JOINT



DETAIL "A"
(OPTION 1)



DETAIL "A"
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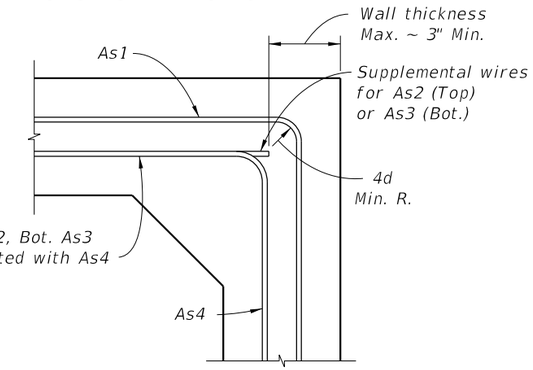

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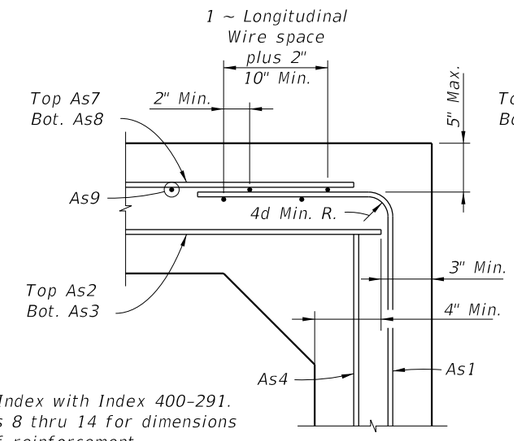
(OPTION 3)



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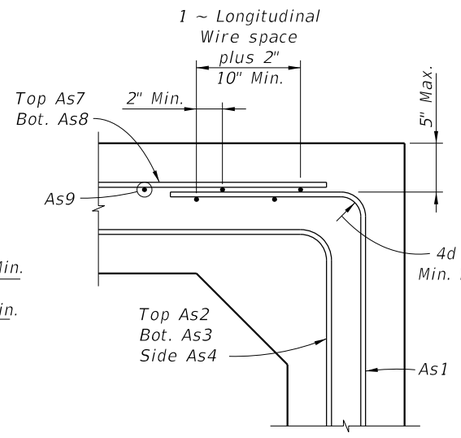

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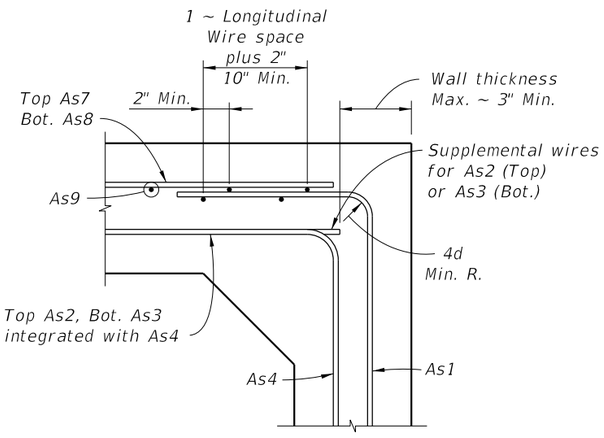

DETAIL "B"
(OPTION 3)

NOTES:
1. Work this Index with Index 400-291.
2. See Sheets 8 thru 14 for dimensions and areas of reinforcement.

STANDARD PRECAST BOX CULVERT WITH 3" CONCRETE COVER

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LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	STANDARD PRECAST CONCRETE BOX CULVERTS	INDEX	SHEET
07/01/13						400-292	7 of 14

TABLE 9A - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 3' & 4' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
3' x 3'	9	9	9	4 to 8	0.33' - <2'	0.22	0.24	0.22	0.22	0.22	0.22	0.22	See General Note 5	-
					2' - <3'	0.11	0.23	0.22	0.11	-	-	-		31
					3' - <5'	0.11	0.22	0.22	0.11	-	-	-		31
					5' - 10'	0.11	0.22	0.22	0.11	-	-	-		31
					15'	0.11	0.22	0.22	0.11	-	-	-		31
					20'	0.13	0.22	0.22	0.11	-	-	-		31
					25'	0.16	0.22	0.22	0.11	-	-	-		31
					30'	0.19	0.24	0.25	0.11	-	-	-		31
					35'	0.22	0.28	0.29	0.11	-	-	-		31
4' x 3'	9	9	9	4 to 8	0.33' - <2'	0.22	0.32	0.24	0.22	0.22	0.22	0.22		-
					2' - <3'	0.17	0.31	0.24	0.11	-	-	-		38
					3' - <5'	0.13	0.22	0.22	0.11	-	-	-		38
					5' - 10'	0.13	0.22	0.22	0.11	-	-	-		38
					15'	0.17	0.22	0.22	0.11	-	-	-		38
					20'	0.23	0.26	0.27	0.11	-	-	-		38
					25'	0.28	0.32	0.34	0.11	-	-	-		38
					30'	0.33	0.39	0.40	0.11	-	-	-		38
4' x 4'	9	9	9	4 to 8	0.33' - <2'	0.22	0.34	0.26	022	0.22	0.22	0.22		-
					2' - <3'	0.17	0.33	0.26	0.11	-	-	-		38
					3' - <5'	0.13	0.22	0.22	0.11	-	-	-		38
					5' - 10'	0.14	0.22	0.22	0.11	-	-	-		38
					15'	0.19	0.22	0.23	0.11	-	-	-		38
					20'	0.24	0.28	0.30	0.11	-	-	-		38
					25'	0.29	0.36	0.37	0.11	-	-	-		38
					30'	0.34	0.43	0.45	0.11	-	-	-		38

TABLE 9B - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 3' & 4' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
3' x 3'	10	10	10	4 to 8	0.33' - <2'	0.24	0.24	0.24	0.24	0.24	0.24	0.24	See General Note 5	-
					2' - <3'	0.12	0.24	0.24	0.24	-	-	-		31
					3' - <5'	0.12	0.24	0.24	0.24	-	-	-		31
					5' - 10'	0.12	0.24	0.24	0.24	-	-	-		31
					15'	0.12	0.24	0.24	0.24	-	-	-		31
					20'	0.12	0.24	0.24	0.24	-	-	-		31
					25'	0.13	0.24	0.24	0.24	-	-	-		31
					30'	0.15	0.24	0.24	0.12	-	-	-		31
					35'	0.18	0.24	0.24	0.12	-	-	-		31
4' x 3'	10	10	10	4 to 8	0.33' - <2'	0.24	0.26	0.24	0.24	0.24	0.24	0.24		-
					2' - <3'	0.14	0.26	0.24	0.12	-	-	-		38
					3' - <5'	0.12	0.24	0.24	0.12	-	-	-		38
					5' - 10'	0.12	0.24	0.24	0.12	-	-	-		38
					15'	0.14	0.24	0.24	0.12	-	-	-		38
					20'	0.18	0.24	0.24	0.12	-	-	-		38
					25'	0.22	0.26	0.27	0.12	-	-	-		38
					30'	0.26	0.31	0.32	0.12	-	-	-		38
4' x 4'	10	10	10	4 to 8	0.33' - <2'	0.24	0.28	0.24	0.24	0.24	0.24	0.24		-
					2' - <3'	0.14	0.28	0.24	0.12	-	-	-		38
					3' - <5'	0.12	0.24	0.24	0.12	-	-	-		38
					5' - 10'	0.12	0.24	0.24	0.12	-	-	-		38
					15'	0.15	0.24	0.24	0.12	-	-	-		38
					20'	0.19	0.24	0.24	0.12	-	-	-		38
					25'	0.23	0.28	0.30	0.12	-	-	-		38
					30'	0.27	0.34	0.35	0.12	-	-	-		38

NOTES:
1. See Sheet 2 for General Notes.
2. See Sheet 7 for Reinforcing Details and dimension locations.
3. See Sheet 14 for WWR Bending Diagrams.

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TABLE 10A - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 5' & 6' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
5' x 3'	9	9	9	4 to 8	0.33' - <2'	0.27	0.39	0.37	0.22	0.22	0.22	0.27	See General Note 5	–
					2' - <3'	0.26	0.39	0.37	0.11	–	–	–		45
					3' - <5'	0.19	0.24	0.25	0.11	–	–	–		36
					5' - 10'	0.20	0.22	0.22	0.11	–	–	–		36
					15'	0.28	0.28	0.30	0.11	–	–	–		35
					20'	0.37	0.38	0.39	0.11	–	–	–		35
					25'	0.45	0.48	0.49	0.11	–	–	–		35
					30'	0.54	0.58	0.59	0.11	–	–	–		35
5' x 4'	9	9	9	4 to 8	0.33' - <2'	0.26	0.42	0.39	0.22	0.22	0.22	0.26		–
					2' - <3'	0.26	0.42	0.39	0.11	–	–	–		45
					3' - <5'	0.19	0.26	0.27	0.11	–	–	–		45
					5' - 10'	0.20	0.22	0.23	0.11	–	–	–		36
					15'	0.27	0.31	0.33	0.11	–	–	–		35
					20'	0.36	0.42	0.43	0.11	–	–	–		35
					25'	0.44	0.52	0.54	0.11	–	–	–		35
					30'	0.53	0.63	0.65	0.11	–	–	–		35
5' x 5'	9	9	9	4 to 8	0.33' - <2'	0.27	0.44	0.42	0.22	0.22	0.22	0.27		–
					2' - <3'	0.27	0.44	0.42	0.11	–	–	–		45
					3' - <5'	0.20	0.27	0.28	0.11	–	–	–		45
					5' - 10'	0.22	0.23	0.26	0.11	–	–	–		45
					15'	0.30	0.34	0.36	0.11	–	–	–		36
					20'	0.38	0.45	0.47	0.11	–	–	–		35
					25'	0.47	0.56	0.59	0.11	–	–	–		35
					30'	0.55	0.68	0.71	0.11	–	–	–		35
6' x 3'	9	9	9	4 to 12	0.33' - <2'	0.34	0.47	0.42	0.22	0.22	0.25	0.34		–
					2' - <3'	0.34	0.47	0.42	0.11	–	–	–		43
					3' - <5'	0.27	0.31	0.32	0.11	–	–	–		39
					5' - 10'	0.29	0.26	0.28	0.11	–	–	–		39
					15'	0.42	0.39	0.40	0.11	–	–	–		38
					20'	0.55	0.52	0.53	0.11	–	–	–		38
					25'	0.68	0.66	0.67	0.11	–	–	–		38
					30'	0.82	0.81	0.82	0.11	–	–	–		38
6' x 4'	9	9	9	4 to 12	0.33' - <2'	0.33	0.50	0.46	0.22	0.22	0.23	0.33		–
					2' - <3'	0.33	0.50	0.46	0.11	–	–	–		43
					3' - <5'	0.27	0.33	0.35	0.11	–	–	–		39
					5' - 10'	0.28	0.29	0.31	0.11	–	–	–		39
					15'	0.40	0.43	0.45	0.11	–	–	–		38
					20'	0.52	0.57	0.59	0.11	–	–	–		38
					25'	0.65	0.73	0.74	0.11	–	–	–		38
					30'	0.78	0.88	0.90	0.11	–	–	–		38
6' x 5'	9	9	9	4 to 12	0.33' - <2'	0.33	0.52	0.49	0.22	0.22	0.23	0.33		–
					2' - <3'	0.33	0.52	0.49	0.11	–	–	–		43
					3' - <5'	0.27	0.35	0.37	0.11	–	–	–		43
					5' - 10'	0.29	0.31	0.34	0.11	–	–	–		39
					15'	0.41	0.46	0.49	0.11	–	–	–		38
					20'	0.53	0.62	0.64	0.11	–	–	–		38
					25'	0.66	0.78	0.80	0.11	–	–	–		38
					30'	0.78	0.95	0.97	0.11	–	–	–		38
6' x 6'	9	9	9	4 to 12	0.33' - <2'	0.34	0.55	0.51	0.22	0.22	0.24	0.34		–
					2' - <3'	0.34	0.54	0.51	0.11	–	–	–		52
					3' - <5'	0.29	0.37	0.39	0.11	–	–	–		52
					5' - 10'	0.32	0.34	0.37	0.11	–	–	–		43
					15'	0.44	0.50	0.53	0.11	–	–	–		39
					20'	0.57	0.66	0.70	0.11	–	–	–		39
					25'	0.70	0.84	0.87	0.11	–	–	–		38
					30'	0.83	1.02	1.05	0.11	–	–	–		38

TABLE 10B - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 5' & 6' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
5' x 3'	10	10	10	4 to 12	0.33' - <2'	0.24	0.33	0.32	0.24	0.24	0.24	0.24	See General Note 5	–
					2' - <3'	0.22	0.33	0.32	0.12	–	–	–		45
					3' - <5'	0.16	0.24	0.24	0.12	–	–	–		36
					5' - 10'	0.16	0.24	0.24	0.12	–	–	–		36
					15'	0.23	0.24	0.24	0.12	–	–	–		35
					20'	0.29	0.30	0.31	0.12	–	–	–		35
					25'	0.36	0.38	0.39	0.12	–	–	–		35
					30'	0.43	0.46	0.47	0.12	–	–	–		35
5' x 4'	10	10	10	4 to 12	0.33' - <2'	0.24	0.35	0.34	0.24	0.24	0.24	0.24		–
					2' - <3'	0.22	0.35	0.34	0.12	–	–	–		45
					3' - <5'	0.15	0.24	0.24	0.12	–	–	–		45
					5' - 10'	0.16	0.24	0.24	0.12	–	–	–		36
					15'	0.22	0.25	0.27	0.12	–	–	–		35
					20'	0.29	0.33	0.34	0.12	–	–	–		35
					25'	0.36	0.41	0.43	0.12	–	–	–		35
					30'	0.42	0.50	0.51	0.12	–	–	–		35
5' x 5'	10	10	10	4 to 12	0.33' - <2'	0.24	0.37	0.36	0.24	0.24	0.24	0.24		–
					2' - <3'	0.21	0.37	0.36	0.12	–	–	–		45
					3' - <5'	0.16	0.24	0.25	0.12	–	–	–		45
					5' - 10'	0.17	0.24	0.24	0.12	–	–	–		45
					15'	0.24	0.27	0.29	0.12	–	–	–		36
					20'	0.30	0.36	0.38	0.12	–	–	–		35
					25'	0.37	0.44	0.47	0.12	–	–	–		35
					30'	0.44	0.53	0.56	0.12	–	–	–		35
6' x 3'	10	10	10	4 to 12	0.33' - <2'	0.28	0.40	0.36	0.24	0.24	0.24	0.28		–
					2' - <3'	0.28	0.40	0.36	0.12	–	–	–		43
					3' - <5'	0.22	0.26	0.28	0.12	–	–	–		39
					5' - 10'	0.24	0.24	0.24	0.12	–	–	–		39
					15'	0.34	0.31	0.32	0.12	–	–	–		38
					20'	0.44	0.41	0.42	0.12	–	–	–		38
					25'	0.54	0.52	0.53	0.12	–	–	–		38
					30'	0.64	0.63	0.64	0.12	–	–	–		38
6' x 4'	10	10	10	4 to 12	0.33' - <2'	0.27	0.42	0.39	0.24	0.24	0.24	0.27		–
					2' - <3'	0.27	0.42	0.39	0.12	–	–	–		43
					3' - <5'	0.21	0.28	0.30	0.12	–	–	–		39
					5' - 10'	0.23	0.24	0.25	0.12	–	–	–		39
					15'	0.32	0.34	0.35	0.12	–	–	–		38
					20'	0.42	0.45	0.47	0.12	–	–	–		38
					25'	0.51	0.56	0.58	0.12	–	–	–		38
					30'	0.61	0.68	0.70	0.12	–	–	–		38
6' x 5'	10	10	10	4 to 12	0.33' - <2'	0.26	0.44	0.42	0.24	0.24	0.24	0.26		–
					2' - <3'	0.26	0.44	0.42	0.12	–	–	–		43
					3' - <5'	0.22	0.30	0.33	0.12	–	–	–		43
					5' - 10'	0.24	0.25	0.27	0.12	–	–	–		39
					15'	0.33	0.36	0.39	0.12	–	–	–		38
					20'	0.42	0.48	0.51	0.12	–	–	–		38
					25'	0.52	0.61	0.63	0.12	–	–	–		38
					30'	0.61	0.74	0.76	0.12	–	–	–		38
6' x 6'	10	10	10	4 to 12	0.33' - <2'	0.27	0.46	0.44	0.24	0.24	0.24	0.27		–
					2' - <3'	0.27	0.46	0.44	0.12	–	–	–		52
					3' - <5'	0.23	0.31	0.34	0.12	–	–	–		52
					5' - 10'	0.25	0.27	0.30	0.12	–	–	–		43
					15'	0.35	0.39	0.42	0.12	–	–	–		39
					20'	0.45	0.52	0.55	0.12	–	–	–		39
					25'	0.54	0.65	0.68	0.12	–	–	–		38
					30'	0.64	0.78	0.81	0.12	–	–	–		38

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LAST REVISION	REVISION	DESCRIPTION:				
07/01/13			FDOT FY 2019-20 STANDARD PLANS	STANDARD PRECAST CONCRETE BOX CULVERTS	INDEX 400-292	SHEET 9 of 14

TABLE 11A - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 7' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
7' x 4'	9	9	9	4 to 12	0.33' - <2'	0.42	0.58	0.52	0.22	0.22	0.31	0.42	See General Note 5	-
					2' - <3'	0.42	0.58	0.51	0.11	-	-	-		43
					3' - <5'	0.36	0.41	0.44	0.11	-	-	-		43
					5' - 10'	0.39	0.40	0.39	0.11	-	-	-		43
					15'	0.56	0.56	0.58	0.11	-	-	-		41
					20'	0.74	0.76	0.77	0.11	-	-	-		41
					25'	0.92	0.97	0.97	0.11	-	-	-		41
	9	9.5	9	7 to 12	30'	1.09	1.18	1.10	0.11	-	-	-		41
7' x 5'	9	9	9	4 to 12	0.33' - <2'	0.41	0.61	0.55	0.22	0.23	0.30	0.41		-
					2' - <3'	0.41	0.61	0.55	0.11	-	-	-		47
					3' - <5'	0.37	0.43	0.47	0.11	-	-	-		43
					5' - 10'	0.39	0.41	0.43	0.11	-	-	-		43
					15'	0.56	0.61	0.63	0.11	-	-	-		41
					20'	0.73	0.82	0.83	0.11	-	-	-		41
					25'	0.90	1.04	1.06	0.11	-	-	-		41
	9	9.5	9	7 to 12	30'	1.06	1.26	1.19	0.11	-	-	-		41
7' x 6'	9	9	9	4 to 12	0.33' - <2'	0.42	0.63	0.58	0.22	0.24	0.30	0.42		-
					2' - <3'	0.42	0.63	0.58	0.11	-	-	-		59
					3' - <5'	0.38	0.45	0.50	0.11	-	-	-		47
					5' - 10'	0.41	0.44	0.47	0.11	-	-	-		43
					15'	0.57	0.65	0.68	0.11	-	-	-		41
					20'	0.75	0.87	0.90	0.11	-	-	-		41
					25'	0.93	1.11	1.13	0.11	-	-	-		41
	9	9.5	9	7 to 12	30'	1.07	1.35	1.27	0.11	-	-	-		41
7' x 7'	9	9	9	4 to 12	0.33' - <2'	0.44	0.66	0.61	0.22	0.25	0.31	0.44		-
					2' - <3'	0.44	0.65	0.61	0.11	-	-	-		59
					3' - <5'	0.41	0.47	0.52	0.11	-	-	-		59
					5' - 10'	0.44	0.47	0.52	0.11	-	-	-		47
					15'	0.62	0.69	0.74	0.11	-	-	-		43
					20'	0.80	0.93	0.97	0.11	-	-	-		43
					25'	0.99	1.18	1.22	0.11	-	-	-		43
	9	9.5	9	7 to 12	30'	1.12	1.43	1.36	0.11	-	-	-		41

TABLE 11B - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 7' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
7' x 4'	10	10	10	4 to 12	0.33' - <2'	0.33	0.49	0.44	0.24	0.24	0.24	0.33	See General Note 5	-
					2' - <3'	0.33	0.49	0.44	0.12	-	-	-		43
					3' - <5'	0.29	0.35	0.38	0.12	-	-	-		43
					5' - 10'	0.31	0.30	0.31	0.12	-	-	-		43
					15'	0.44	0.44	0.45	0.12	-	-	-		41
					20'	0.58	0.59	0.60	0.12	-	-	-		41
					25'	0.71	0.74	0.75	0.12	-	-	-		41
					30'	0.85	0.91	0.91	0.12	-	-	-		41
7' x 5'	10	10	10	4 to 12	0.33' - <2'	0.32	0.51	0.47	0.24	0.24	0.24	0.32		-
					2' - <3'	0.32	0.51	0.47	0.12	-	-	-		47
					3' - <5'	0.29	0.37	0.41	0.12	-	-	-		43
					5' - 10'	0.31	0.32	0.35	0.12	-	-	-		43
					15'	0.44	0.47	0.50	0.12	-	-	-		41
					20'	0.57	0.63	0.65	0.12	-	-	-		41
					25'	0.70	0.80	0.82	0.12	-	-	-		41
					30'	0.84	0.97	0.99	0.12	-	-	-		41
7' x 6'	10	10	10	4 to 12	0.33' - <2'	0.33	0.53	0.50	0.24	0.24	0.24	0.33		-
					2' - <3'	0.33	0.53	0.50	0.12	-	-	-		59
					3' - <5'	0.30	0.38	0.43	0.12	-	-	-		47
					5' - 10'	0.33	0.35	0.38	0.12	-	-	-		43
					15'	0.45	0.51	0.54	0.12	-	-	-		41
					20'	0.58	0.68	0.70	0.12	-	-	-		41
					25'	0.72	0.85	0.88	0.12	-	-	-		41
					30'	0.85	1.04	1.06	0.12	-	-	-		41
7' x 7'	10	10	10	4 to 12	0.33' - <2'	0.35	0.55	0.52	0.24	0.24	0.24	0.35		-
					2' - <3'	0.35	0.55	0.52	0.12	-	-	-		59
					3' - <5'	0.32	0.40	0.46	0.12	-	-	-		59
					5' - 10'	0.35	0.37	0.41	0.12	-	-	-		47
					15'	0.48	0.54	0.58	0.12	-	-	-		43
					20'	0.62	0.72	0.76	0.12	-	-	-		43
					25'	0.76	0.90	0.94	0.12	-	-	-		43
					30'	0.90	1.10	1.13	0.12	-	-	-		41

NOTES:
1. See Sheet 2 for General Notes.
2. See Sheet 7 for Reinforcing Details and dimension locations.
3. See Sheet 14 for WWR Bending Diagrams.

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TABLE 12A - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 8' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
8' x 4'	9	9	9	4 to 12	0.33' - <2'	0.52	0.66	0.57	0.22	0.24	0.42	0.52	See General Note 5	-
					2' - <3'	0.52	0.66	0.57	0.11	-	-	-		50
					3' - <5'	0.48	0.49	0.52	0.11	-	-	-		50
					5' - 10'	0.52	0.48	0.49	0.11	-	-	-		45
					15'	0.75	0.72	0.72	0.11	-	-	-		41
					20'	1.00	0.98	0.97	0.11	-	-	-		41
	9	9.5	9	8 to 12	25'	1.25	1.24	1.14	0.11	-	-	-		41
	10	10.5	9		30'	1.31	1.29	1.21	0.11	-	-	-		41
8' x 5'	9	9	9	4 to 12	0.33' - <2'	0.51	0.69	0.60	0.22	0.25	0.40	0.51		-
					2' - <3'	0.51	0.69	0.60	0.11	-	-	-		50
					3' - <5'	0.46	0.52	0.56	0.11	-	-	-		45
					5' - 10'	0.51	0.51	0.53	0.11	-	-	-		45
					15'	0.74	0.77	0.78	0.11	-	-	-		41
					20'	0.97	1.05	1.05	0.11	-	-	-		41
	9	9.5	9	8 to 12	25'	1.20	1.33	1.23	0.11	-	-	-		41
	10	10.5	9		30'	1.26	1.38	1.30	0.11	-	-	-		41
8' x 6'	9	9	9	4 to 12	0.33' - <2'	0.51	0.72	0.64	0.22	0.26	0.39	0.51		-
					2' - <3'	0.51	0.72	0.64	0.11	-	-	-		50
					3' - <5'	0.47	0.55	0.59	0.11	-	-	-		50
					5' - 10'	0.52	0.55	0.58	0.11	-	-	-		45
					15'	0.74	0.83	0.85	0.11	-	-	-		41
					20'	0.97	1.12	1.13	0.11	-	-	-		41
	9	9.5	9	8 to 12	25'	1.18	1.42	1.32	0.11	-	-	-		41
	10	10.5	9		30'	1.26	1.46	1.39	0.11	-	-	-		41
8' x 7'	9	9	9	4 to 12	0.33' - <2'	0.52	0.74	0.67	0.22	0.26	0.40	0.52		-
					2' - <3'	0.52	0.74	0.67	0.11	-	-	-		55
					3' - <5'	0.49	0.57	0.62	0.11	-	-	-		55
					5' - 10'	0.55	0.59	0.63	0.11	-	-	-		50
					15'	0.77	0.88	0.91	0.11	-	-	-		41
					20'	1.01	1.19	1.21	0.11	-	-	-		41
	9	9.5	9	8 to 12	25'	1.21	1.51	1.41	0.11	-	-	-		41
	10	10.5	9		30'	1.31	1.53	1.47	0.11	-	-	-		41
8' x 8'	9	9	9	4 to 12	0.33' - <2'	0.55	0.77	0.70	0.22	0.27	0.41	0.55		-
					2' - <3'	0.55	0.77	0.70	0.13	-	-	-		65
					3' - <5'	0.53	0.59	0.64	0.12	-	-	-		65
					5' - 10'	0.60	0.63	0.68	0.11	-	-	-		55
					15'	0.83	0.93	0.98	0.11	-	-	-		45
					20'	1.08	1.26	1.29	0.11	-	-	-		45
	9	9.5	9	8 to 12	25'	1.28	1.59	1.50	0.11	-	-	-		41
	10	10.5	9		30'	1.41	1.61	1.55	0.11	-	-	-		41

TABLE 12B - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 8' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
8' x 4'	10	10	10	4 to 12	0.33' - <2'	0.42	0.56	0.49	0.24	0.24	0.32	0.41	See General Note 5	-
					2' - <3'	0.42	0.56	0.49	0.12	-	-	-		50
					3' - <5'	0.38	0.42	0.46	0.12	-	-	-		50
					5' - 10'	0.41	0.38	0.39	0.12	-	-	-		45
					15'	0.59	0.56	0.57	0.12	-	-	-		41
					20'	0.78	0.75	0.76	0.12	-	-	-		41
					25'	0.97	0.96	0.96	0.12	-	-	-		41
	10	10.5	10	8 to 12	30'	1.15	1.16	1.10	0.12	-	-	-		41
8' x 5'	10	10	10	4 to 12	0.33' - <2'	0.40	0.58	0.52	0.24	.034	0.31	0.40		-
					2' - <3'	0.40	0.58	0.52	0.12	-	-	-		50
					3' - <5'	0.37	0.45	0.48	0.12	-	-	-		45
					5' - 10'	0.41	0.41	0.43	0.12	-	-	-		45
					15'	0.58	0.60	0.62	0.12	-	-	-		41
					20'	0.76	0.81	0.81	0.12	-	-	-		41
					25'	0.94	1.03	1.03	0.12	-	-	-		41
	10	10.5	10	8 to 12	30'	1.10	1.24	1.24	0.12	-	-	-		41
8' x 6'	10	10	10	4 to 12	0.33' - <2'	0.40	0.60	0.55	0.24	0.24	0.30	0.40		-
					2' - <3'	0.40	0.60	0.55	0.12	-	-	-		50
					3' - <5'	0.37	0.47	0.51	0.12	-	-	-		50
					5' - 10'	0.42	0.43	0.46	0.12	-	-	-		45
					15'	0.58	0.64	0.67	0.12	-	-	-		41
					20'	0.76	0.86	0.88	0.12	-	-	-		41
					25'	0.94	1.09	1.11	0.12	-	-	-		41
	10	10.5	10	8 to 12	30'	1.09	1.32	1.26	0.12	-	-	-		41
8' x 7'	10	10	10	4 to 12	0.33' - <2'	0.41	0.63	0.58	0.24	0.24	0.30	0.41		-
					2' - <3'	0.41	0.63	0.58	0.12	-	-	-		55
					3' - <5'	0.39	0.49	0.53	0.12	-	-	-		55
					5' - 10'	0.44	0.46	0.50	0.12	-	-	-		50
					15'	0.61	0.68	0.72	0.12	-	-	-		45
					20'	0.78	0.91	0.94	0.12	-	-	-		41
					25'	0.97	1.16	1.18	0.12	-	-	-		41
	10	10.5	10	8 to 12	30'	1.11	1.40	1.34	0.12	-	-	-		41
8' x 8'	10	10	10	4 to 12	0.33' - <2'	0.44	0.64	0.60	0.24	0.24	0.31	0.44		-
					2' - <3'	0.44	0.64	0.60	0.12	-	-	-		65
					3' - <5'	0.42	0.51	0.56	0.12	-	-	-		65
					5' - 10'	0.47	0.50	0.55	0.12	-	-	-		55
					15'	0.65	0.72	0.77	0.12	-	-	-		45
					20'	0.84	0.96	1.01	0.12	-	-	-		45
					25'	1.03	1.22	1.26	0.12	-	-	-		41
	10	10.5	10	8 to 12	30'	1.16	1.47	1.42	0.12	-	-	-		41

NOTES:
1. See Sheet 2 for General Notes.
2. See Sheet 7 for Reinforcing Details and dimension locations.
3. See Sheet 14 for WWR Bending Diagrams.

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TABLE 13A - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 9' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
9' x 5'	9	9	9	4 to 12	0.33' - <2'	0.62	0.78	0.65	0.22	0.26	0.52	0.61	See General Note 5	–
					2' - <3'	0.62	0.78	0.65	0.11	–	–	–		54
					3' - <5'	0.58	0.63	0.61	0.11	–	–	–		49
					5' - 10'	0.65	0.63	0.64	0.11	–	–	–		49
					15'	0.95	0.96	0.95	0.11	–	–	–		44
	9	9	9	8	20'	1.26	1.32	1.28	0.11	–	–	–		44
	10	10.5	9	to	25'	1.39	1.41	1.32	0.11	–	–	–		44
	11	11.5	9	12	30'	1.46	1.50	1.42	0.11	–	–	–		44
9' x 6'	9	9	9	4 to 12	0.33' - <2'	0.60	0.81	0.69	0.22	0.27	0.51	0.60		–
					2' - <3'	0.60	0.81	0.69	0.11	–	–	–		54
					3' - <5'	0.56	0.66	0.65	0.11	–	–	–		49
					5' - 10'	0.65	0.68	0.69	0.11	–	–	–		49
					15'	0.94	1.03	1.02	0.11	–	–	–		44
	9	9	9	8	20'	1.25	1.40	1.38	0.11	–	–	–		44
	10	10.5	9	to	25'	1.37	1.49	1.40	0.11	–	–	–		44
	11	11.5	9	12	30'	1.44	1.58	1.50	0.11	–	–	–		44
9' x 7'	9	9	9	4 to 12	0.33' - <2'	0.61	0.84	0.72	0.22	0.28	0.51	0.61		–
					2' - <3'	0.61	0.83	0.72	0.11	–	–	–		59
					3' - <5'	0.58	0.69	0.68	0.11	–	–	–		54
					5' - 10'	0.67	0.73	0.75	0.11	–	–	–		49
					15'	0.96	1.09	1.10	0.11	–	–	–		44
	9	9	9	8	20'	1.27	1.49	1.47	0.11	–	–	–		44
	10	10.5	9	to	25'	1.38	1.57	1.48	0.11	–	–	–		44
	11	11.5	9	12	30'	1.49	1.70	1.58	0.11	–	–	–		44
9' x 8'	9	9.5	9	4 to 12	0.33' - <2'	0.60	0.85	0.73	0.22	0.29	0.52	0.53		–
					2' - <3'	0.64	0.86	0.76	0.12	–	–	–		59
					3' - <5'	0.62	0.72	0.72	0.11	–	–	–		59
					5' - 10'	0.71	0.77	0.81	0.11	–	–	–		54
					15'	1.01	1.16	1.17	0.11	–	–	–		44
	9	9.5	9	8	20'	1.27	1.56	1.45	0.11	–	–	–		44
	10	10.5	9	to	25'	1.45	1.65	1.57	0.11	–	–	–		44
	11	11.5	9	12	30'	1.59	1.72	1.66	0.11	–	–	–		44
9' x 9'	9	9.5	9	4 to 12	0.33' - <2'	0.68	0.88	0.76	0.22	0.29	0.55	0.57		–
					2' - <3'	0.68	0.88	0.78	0.18	–	–	–		72
					3' - <5'	0.68	0.75	0.78	0.18	–	–	–		72
					5' - 10'	0.79	0.82	0.88	0.17	–	–	–		59
					15'	1.11	1.22	1.26	0.13	–	–	–		49
	9	9.5	9	8	20'	1.37	1.64	1.54	0.13	–	–	–		49
	10	10.5	9	to	25'	1.56	1.73	1.65	0.13	–	–	–		44
	11	11.5	9.5	12	30'	1.56	1.73	1.68	0.12	–	–	–		44

TABLE 13B - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 9' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
9' x 5'	10	10	10	4 to 12	0.33' - <2'	0.49	0.65	0.57	0.24	0.24	0.40	0.48	See General Note 5	–
					2' - <3'	0.49	0.65	0.57	0.12	–	–	–		54
					3' - <5'	0.46	0.54	0.53	0.12	–	–	–		49
					5' - 10'	0.52	0.50	0.51	0.12	–	–	–		49
					15'	0.75	0.74	0.75	0.12	–	–	–		44
					20'	0.98	1.01	1.00	0.12	–	–	–		44
	10	10.5	10	8 to	25'	1.21	1.27	1.19	0.12	–	–	–		44
	11	11.5	10	12	30'	1.30	1.36	1.30	0.12	–	–	–		44
9' x 6'	10	10	10	4 to 12	0.33' - <2'	0.48	0.68	0.60	0.24	0.24	0.39	0.48		–
					2' - <3'	0.48	0.68	0.60	0.12	–	–	–		54
					3' - <5'	0.45	0.57	0.56	0.12	–	–	–		49
					5' - 10'	0.52	0.53	0.56	0.12	–	–	–		49
					15'	0.74	0.79	0.81	0.12	–	–	–		44
					20'	0.97	1.07	1.07	0.12	–	–	–		44
	10	10.5	10	8 to	25'	1.18	1.35	1.28	0.12	–	–	–		44
	11	11.5	10	12	30'	1.27	1.44	1.38	0.12	–	–	–		44
9' x 7'	10	10	10	4 to 12	0.33' - <2'	0.49	0.70	0.63	0.24	0.24	0.39	0.49		–
					2' - <3'	0.49	0.70	0.63	0.12	–	–	–		59
					3' - <5'	0.46	0.59	0.59	0.12	–	–	–		54
					5' - 10'	0.54	0.57	0.60	0.12	–	–	–		49
					15'	0.75	0.84	0.86	0.12	–	–	–		44
					20'	0.98	1.13	1.14	0.12	–	–	–		44
	10	10.5	10	8 to	25'	1.18	1.43	1.36	0.12	–	–	–		44
	11	11.5	10	12	30'	1.28	1.52	1.46	0.12	–	–	–		44
9' x 8'	10	10	10	4 to 12	0.33' - <2'	0.51	0.72	0.65	0.24	0.24	0.39	0.51		–
					2' - <3'	0.51	0.72	0.65	0.12	–	–	–		59
					3' - <5'	0.49	0.61	0.62	0.12	–	–	–		59
					5' - 10'	0.57	0.60	0.65	0.12	–	–	–		54
					15'	0.79	0.89	0.92	0.12	–	–	–		44
					20'	1.02	1.20	1.22	0.12	–	–	–		44
	10	10.5	10	8 to	25'	1.21	1.50	1.44	0.12	–	–	–		44
	11	11.5	10	12	30'	1.33	1.59	1.54	0.12	–	–	–		44
9' x 9'	10	10	10	4 to 12	0.33' - <2'	0.54	0.74	0.68	0.24	0.24	0.41	0.54		–
					2' - <3'	0.54	0.74	0.68	0.15	–	–	–		72
					3' - <5'	0.53	0.63	0.64	0.13	–	–	–		72
					5' - 10'	0.62	0.64	0.70	0.12	–	–	–		59
					15'	0.85	0.94	0.99	0.12	–	–	–		49
					20'	1.09	1.26	1.29	0.12	–	–	–		49
	10	10.5	10	8 to	25'	1.28	1.56	1.52	0.12	–	–	–		44
	11	11.5	10	12	30'	1.42	1.66	1.66	0.12	–	–	–		44

NOTES:
1. See Sheet 2 for General Notes.
2. See Sheet 7 for Reinforcing Details and dimension locations.
3. See Sheet 14 for WWR Bending Diagrams.

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TABLE 14 - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 10' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
10' x 5'	10	10	10	4 to 12	0.33' - <2'	0.60	0.73	0.61	0.24	0.24	0.50	0.57	See General Note 5	–
					2' - <3'	0.60	0.73	0.61	0.12	–	–	–		58
					3' - <5'	0.57	0.64	0.58	0.12	–	–	–		53
					5' - 10'	0.65	0.60	0.60	0.12	–	–	–		52
					15'	0.94	0.90	0.89	0.12	–	–	–		47
	10	10	10	8 to 12	20'	1.24	1.23	1.19	0.12	–	–	–		47
	11	11.5	10		25'	1.39	1.37	1.28	0.12	–	–	–		47
	12.5	12.5	10		30'	1.38	1.43	1.41	0.12	–	–	–		47
10' x 6'	10	10	10	4 to 12	0.33' - <2'	0.58	0.75	0.64	0.24	0.24	0.48	0.56		–
					2' - <3'	0.58	0.75	0.64	0.12	–	–	–		58
					3' - <5'	0.56	0.67	0.62	0.12	–	–	–		52
					5' - 10'	0.64	0.64	0.65	0.12	–	–	–		52
					15'	0.92	0.96	0.95	0.12	–	–	–		47
	10	10	10	8 to 12	20'	1.21	1.31	1.27	0.12	–	–	–		47
	11	11.5	10		25'	1.35	1.44	1.36	0.12	–	–	–		47
	12.5	12.5	10		30'	1.35	1.51	1.49	0.12	–	–	–		47
10' x 7'	10	10	10	4 to 12	0.33' - <2'	0.57	0.78	0.67	0.24	0.24	0.48	0.57		–
					2' - <3'	0.57	0.78	0.67	0.12	–	–	–		58
					3' - <5'	0.58	0.70	0.65	0.12	–	–	–		58
					5' - 10'	0.65	0.68	0.70	0.12	–	–	–		52
					15'	0.92	1.02	1.02	0.12	–	–	–		47
	10	10	10	8 to 12	20'	1.21	1.38	1.35	0.12	–	–	–		47
	11	11.5	10		25'	1.33	1.52	1.44	0.12	–	–	–		47
	12.5	12.5	10		30'	1.38	1.58	1.57	0.12	–	–	–		47
10' x 8'	10	10	10	4 to 12	0.33' - <2'	0.58	0.80	0.70	0.24	0.26	0.48	0.58		–
					2' - <3'	0.58	0.80	0.70	0.12	–	–	–		64
					3' - <5'	0.60	0.72	0.68	0.12	–	–	–		58
					5' - 10'	0.67	0.72	0.75	0.12	–	–	–		52
					15'	0.95	1.08	1.08	0.12	–	–	–		47
	10	10	10	8 to 12	20'	1.24	1.45	1.44	0.12	–	–	–		47
	11	11.5	10		25'	1.36	1.59	1.52	0.12	–	–	–		47
	12.5	12.5	10		30'	1.45	1.64	1.64	0.12	–	–	–		47
10' x 9'	10	10	10	4 to 12	0.33' - <2'	0.61	0.82	0.73	0.24	0.26	0.50	0.61		–
					2' - <3'	0.61	0.82	0.73	0.14	–	–	–		70
					3' - <5'	0.64	0.75	0.73	0.13	–	–	–		64
					5' - 10'	0.72	0.77	0.80	0.12	–	–	–		58
					15'	1.00	1.13	1.15	0.12	–	–	–		52
	10	10	10	8 to 12	20'	1.30	1.53	1.52	0.12	–	–	–		47
	11	11.5	10		25'	1.42	1.66	1.60	0.12	–	–	–		47
	12.5	12.5	10		30'	1.57	1.70	1.72	0.12	–	–	–		47
10' x 10'	10	10	10	4 to 12	0.33' - <2'	0.66	0.84	0.75	0.24	0.27	0.52	0.65		–
					2' - <3'	0.66	0.84	0.75	0.20	–	–	–		79
					3' - <5'	0.70	0.77	0.79	0.19	–	–	–		70
					5' - 10'	0.79	0.81	0.87	0.18	–	–	–		64
					15'	1.09	1.19	1.23	0.15	–	–	–		52
	10	10	10	8 to 12	20'	1.40	1.61	1.61	0.14	–	–	–		52
	11	11.5	10		25'	1.53	1.74	1.68	0.14	–	–	–		47
	12.5	12.5	10.5		30'	1.60	1.71	1.74	0.14	–	–	–		47

TABLE 15 - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 11' SPANS

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
11' x 4'	11	11	11	4 to 12	0.33' - <2'	0.60	0.66	0.54	0.27	0.27	0.52	0.56	See General Note 5	–
					2' - <3'	0.60	0.66	0.54	0.14	–	–	–		62
					3' - <5'	0.60	0.61	0.53	0.14	–	–	–		62
					5' - 10'	0.79	0.63	0.62	0.14	–	–	–		55
					15'	1.01	0.82	0.79	0.14	–	–	–		55
	12	12	11	8 to 12	20'	1.34	1.11	1.06	0.14	–	–	–		55
	13.5	13.5	11		25'	1.52	1.27	1.23	0.14	–	–	–		55
					30'	1.54	1.37	1.34	0.14	–	–	–		50
11' x 6'	11	11	11	4 to 12	0.33' - <2'	0.57	0.71	0.60	0.27	0.27	0.47	0.53		–
					2' - <3'	0.56	0.71	0.60	0.14	–	–	–		62
					3' - <5'	0.56	0.67	0.59	0.14	–	–	–		55
					5' - 10'	0.73	0.71	0.72	0.14	–	–	–		55
					15'	0.92	0.92	0.91	0.14	–	–	–		50
	11	11	11	8 to 12	20'	1.21	1.25	1.21	0.14	–	–	–		50
	12	12	11		25'	1.37	1.43	1.39	0.14	–	–	–		50
	13.5	13.5	11		30'	1.39	1.53	1.50	0.14	–	–	–		50
11' x 8'	11	11	11	4 to 12	0.33' - <2'	0.55	0.76	0.66	0.27	0.27	0.46	0.55		–
					2' - <3'	0.55	0.76	0.66	0.14	–	–	–		62
					3' - <5'	0.54	0.72	0.65	0.14	–	–	–		62
					5' - 10'	0.73	0.79	0.82	0.14	–	–	–		55
					15'	0.93	1.03	1.03	0.14	–	–	–		50
	11	11	11	8 to 12	20'	1.21	1.39	1.36	0.14	–	–	–		50
	12	12.5	11		25'	1.34	1.56	1.50	0.14	–	–	–		50
	13.5	13.5	11		30'	1.41	1.66	1.65	0.14	–	–	–		50
11' x 10'	11	11	11	4 to 12	0.33' - <2'	0.60	0.81	0.71	0.27	0.27	0.48	0.60		–
					2' - <3'	0.60	0.81	0.71	0.15	–	–	–		75
					3' - <5'	0.61	0.77	0.70	0.14	–	–	–		69
					5' - 10'	0.80	0.88	0.93	0.14	–	–	–		62
					15'	1.01	1.13	1.15	0.14	–	–	–		55
	11	11	11	8 to 12	20'	1.30	1.52	1.52	0.14	–	–	–		50
	12	12.5	11		25'	1.42	1.70	1.65	0.14	–	–	–		50
	13.5	14	11		30'	1.53	1.77	1.74	0.14	–	–	–		50
11' x 11'	11	11	11	4 to 12	0.33' - <2'	0.64	0.83	0.74	0.27	0.27	0.51	0.64		–
					2' - <3'	0.64	0.83	0.74	0.21	–	–	–		86
					3' - <5'	0.67	0.79	0.75	0.21	–	–	–		75
					5' - 10'	0.88	0.93	0.99	0.19	–	–	–		69
					15'	1.09	1.19	1.23	0.16	–	–	–		55
	11	11	11	8 to 12	20'	1.40	1.59	1.60	0.15	–	–	–		55
	12	12.5	11		25'	1.54	1.77	1.73	0.15	–	–	–		50
	13.5	14	11.5		30'	1.57	1.77	1.76	0.14	–	–	–		50

NOTES:
1. See Sheet 2 for General Notes.
2. See Sheet 7 for Reinforcing Details and dimension locations.
3. See Sheet 14 for WWR Bending Diagrams.

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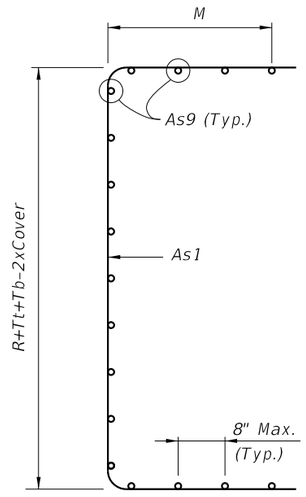
TABLE 16 - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 12' SPANS

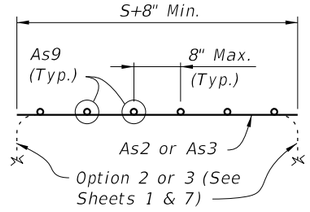
SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
12' x 4'	12	12	12	4 to 12	0.33' - <2'	0.59	0.64	0.51	0.29	0.29	0.52	0.55	See General Note 5	–
					2' - <3'	0.60	0.64	0.51	0.15	–	–	–		73
					3' - <5'	0.60	0.61	0.51	0.15	–	–	–		66
					5' - 10'	0.81	0.61	0.61	0.15	–	–	–		66
					15'	1.04	0.80	0.77	0.15	–	–	–		59
					20'	1.37	1.08	1.03	0.15	–	–	–		59
	13	13	12	8 to 12	25'	1.58	1.26	1.21	0.15	–	–	–		59
	14.5	14.5	12		30'	1.63	1.38	1.34	0.15	–	–	–		53
12' x 6'	12	12	12	4 to 12	0.33' - <2'	0.56	0.70	0.57	0..29	0.29	0.47	0.52		–
					2' - <3'	0.56	0.70	0.57	0.15	–	–	–		66
					3' - <5'	0.56	0.67	0.57	0.15	–	–	–		59
					5' - 10'	0.74	0.69	0.70	0.15	–	–	–		59
					15'	0.94	0.90	0.88	0.15	–	–	–		53
					20'	1.23	1.22	1.17	0.15	–	–	–		53
	13	13	12	8 to 12	25'	1.40	1.42	1.37	0.15	–	–	–		53
	14.5	15	12		30'	1.44	1.54	1.48	0.15	–	–	–		53
12' x 8'	12	12	12	4 to 12	0.33' - <2'	0.55	0.75	0.63	0.29	0.29	0.45	0.53		–
					2' - <3'	0.55	0.75	0.63	0.15	–	–	–		66
					3' - <5'	0.55	0.73	0.63	0.15	–	–	–		59
					5' - 10'	0.73	0.77	0.79	0.15	–	–	–		59
					15'	0.93	1.00	0.99	0.15	–	–	–		53
	12	12	12	8 to 12	20'	1.21	1.35	1.31	0.15	–	–	–		53
	13	13.5	12		25'	1.35	1.55	1.48	0.15	–	–	–		53
	14.5	15	12		30'	1.40	1.67	1.62	0.15	–	–	–		53
12' x 10'	12	12	12	4 to 12	0.33' - <2'	0.57	0.80	0.68	0.29	0.29	0.46	0.57		–
					2' - <3'	0.57	0.80	0.68	0.15	–	–	–		73
					3' - <5'	0.59	0.77	0.68	0.15	–	–	–		66
					5' - 10'	0.78	0.85	0.89	0.15	–	–	–		59
					15'	0.98	1.10	1.11	0.15	–	–	–		53
	12	12	12	8 to 12	20'	1.26	1.47	1.45	0.15	–	–	–		53
	13	13.5	12		25'	1.39	1.68	1.63	0.15	–	–	–		53
	14.5	15	12		30'	1.48	1.79	1.76	0.15	–	–	–		53
12' x 12'	12	12	12	4 to 12	0.33' - <2'	0.65	0.84	0.73	0.29	0.29	0.50	0.65		–
					2' - <3'	0.65	0.84	0.73	0.23	–	–	–		93
					3' - <5'	0.68	0.81	0.75	0.22	–	–	–		80
					5' - 10'	0.90	0.94	1.01	0.21	–	–	–		73
					15'	1.12	1.20	1.24	0.18	–	–	–		59
	12	12	12	8 to 12	20'	1.42	1.60	1.61	0.16	–	–	–		59
	13	13.5	12		25'	1.57	1.81	1.78	0.16	–	–	–		53
	14.5	15	12.5		30'	1.63	1.86	1.85	0.15	–	–	–		53

NOTES:
1. See Sheet 2 of 14 for General Notes.
2. See Sheet 7 of 14 for Reinforcing Details and dimension locations.

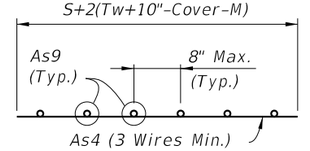
WELDED WIRE REINFORCEMENT BENDING DIAGRAM



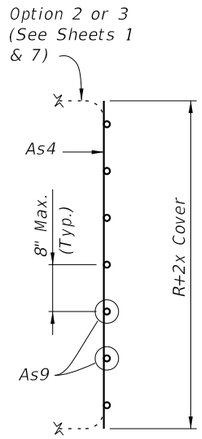
WWR PIECE NO. 1
(2 Reqd. per segment)



WWR PIECE NO. 2
(2 Reqd. per segment)

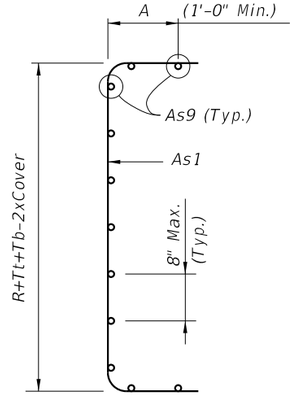


WWR PIECE NO. 4
(Tongue Reinforcement)
(4 Reqd. per segment)

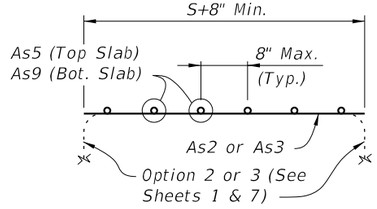


WWR PIECE NO. 3
(2 Reqd. per segment)

TYPE 2 BOX SECTION (DESIGN EARTH COVER 2' OR GREATER)



WWR PIECE NO. 1
(2 Reqd. per segment)



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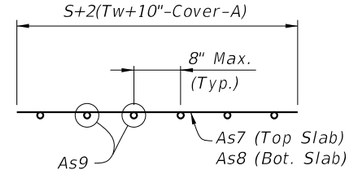
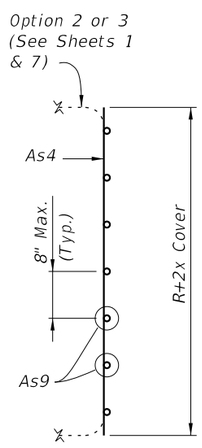
(2 Reqd. per segment)



WWR PIECE NO. 4
(2 Reqd. per segment)



WWR PIECE NO. 3
(2 Reqd. per segment)

TYPE 1 BOX SECTION (DESIGN EARTH COVER LESS THAN 2')

REINFORCEMENT NOTES:
1. Reinforcement bending dimensions are out-to-out.
2. See General Notes 4, 5 and 6 on Sheet 2.
3. See Tables 1 thru 16 for dimensions M, R, S, Tb, Tt and Tw.
4. Dimension "A" is determined by the Manufacturer in accordance with the requirements of Detail "B" on Sheets 1 and 7.

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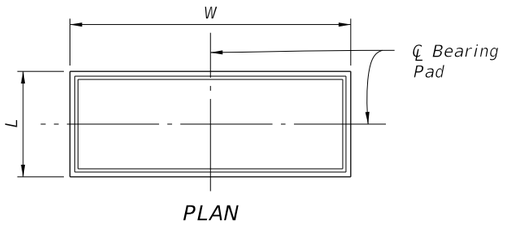
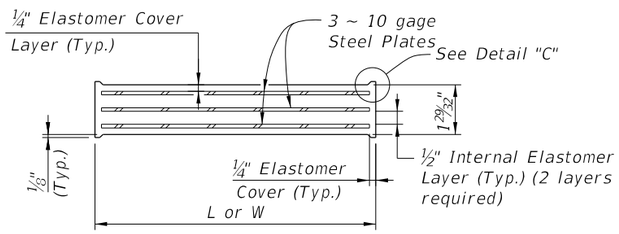
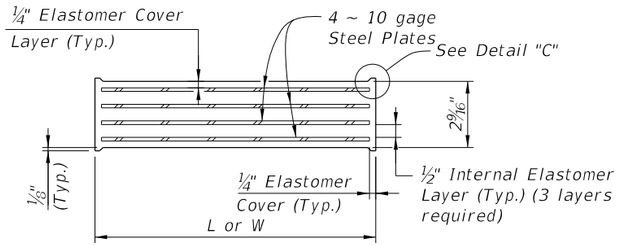


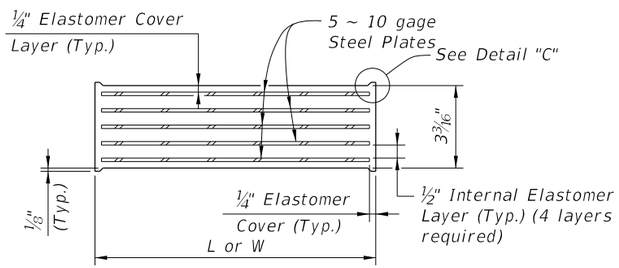
PLAN



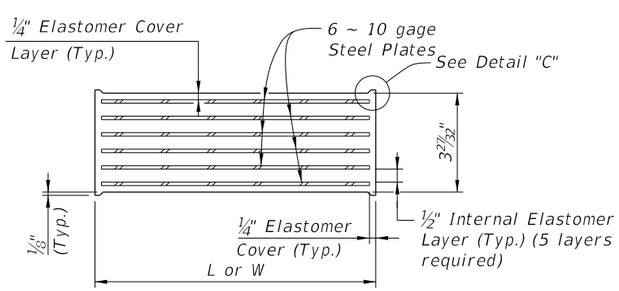
TYPICAL SECTION TYPE D, E & AA PAD



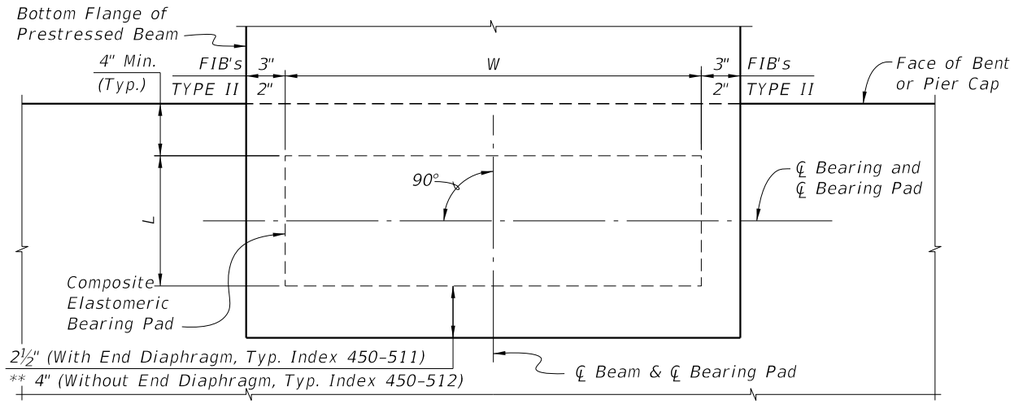
TYPICAL SECTION TYPE F, G & AB PAD



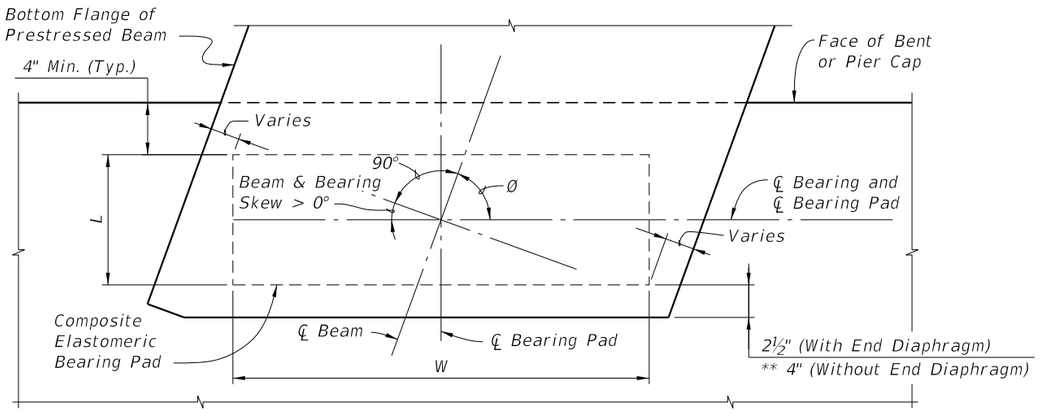
TYPICAL SECTION TYPE H PAD



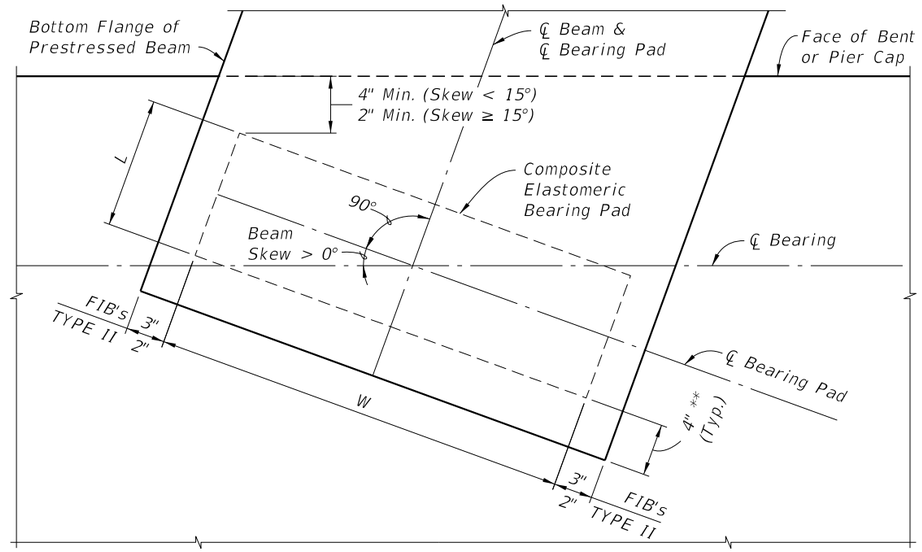
TYPICAL SECTION TYPE J & K PAD



PARTIAL PLAN (Beam & Bearing Skew = 0°)



PARTIAL PLAN (Beam & Bearing Skew > 0°) (Use Index 450-511)

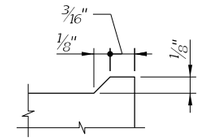


PARTIAL PLAN WITH SQUARED END BEAM (Use Index 450-512)
(Beam Skew > 0°; Bearing Skew = 0°)

	BEAM TYPE	BEARING PAD DIMENSIONS		*BEVELED BEARING PLATE DIMENSIONS	
PAD TYPE (See Note 1)		L	W	C	D
D (G=110psi)	FLORIDA I-BEAM	8"	2'-8"	1'-0"	3'-0"
E (G=110psi)		10"	2'-8"	1'-0"	3'-0"
F (G=110psi)		10"	2'-8"	1'-0"	3'-0"
G (G=150psi)		10"	2'-8"	1'-0"	3'-0"
H (G=150psi)		10"	2'-8"	1'-0"	3'-0"
J (G=150psi)		10"	2'-8"	1'-0"	3'-0"
K (G=150psi)		1'-0"	2'-8"	1'-1½"	3'-0"
AA (G=110psi)	AASHTO TYPE II	10"	1'-2"	1'-0"	1'-4"
AB (G=150psi)		10"	1'-2"	1'-0"	1'-4"

* Work this sheet with the appropriate type Bearing Plate Detail (See Bearing Plate Data Table) and BEARING PAD DATA TABLE in the Structures Plans. See TABLE OF BEAM VARIABLES and BEARING PLATE DATA TABLE in the Structures Plans for locations where beveled bearing plates are required.

** Offset to End of Beam is reduced to 2" for Type K Pad.



DETAIL "C"

BEARING PAD NOTES:

1. Neoprene in Type D, E, F & AA bearing pads shall have a shear modulus (G) of 110 psi. Neoprene in Type G, H, J, K & AB bearing pads shall have a shear modulus (G) of 150 psi.
2. Steel Plates in bearing pads shall conform to ASTM A1011 Grade 36, Type 1.
3. See Bearing Pad Data Table in Structures Plans for quantities of Type D, E, F, G, H, J, K, AA and/or AB Bearing Pads.

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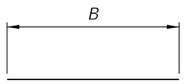
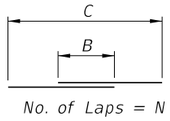
LAST REVISION	REVISION	DESCRIPTION:				
07/01/15			FDOT	FY 2019-20 STANDARD PLANS	COMPOSITE ELASTOMERIC BEARING PADS - PRESTRESSED FLORIDA-I & AASHTO TYPE II BEAM	INDEX 400-510 / SHEET 1 of 1



TYPE 1



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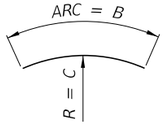
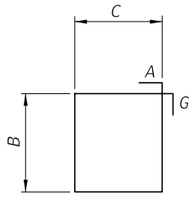
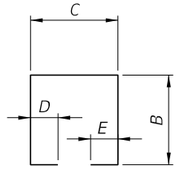


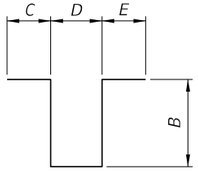
TYPE 3



TYPE 4



TYPE 5



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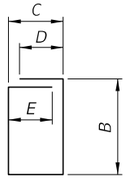

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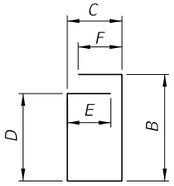

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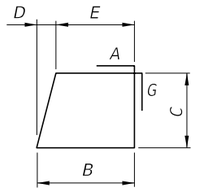
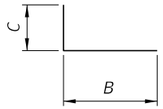
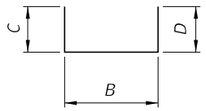


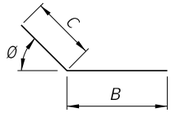
TYPE 9



TYPE 10



TYPE 1 1



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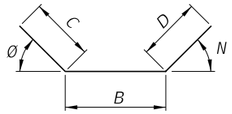
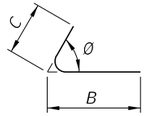
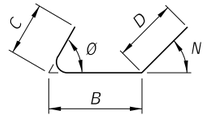


TYPE 13



TYPE 14



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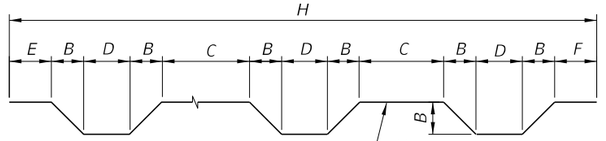
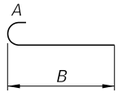
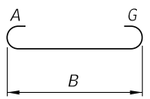


TYPE 16

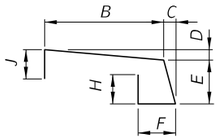
Number of Beams or Walls = N
Number of D's = N–1
Number of B's = 2N–2
Number of C's = N–2
45° Typical



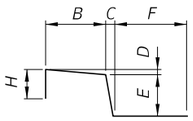
TYPE 17



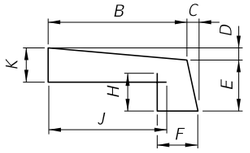
TYPE 18



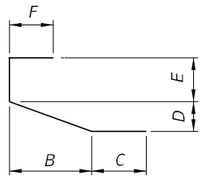
TYPE 19



TYPE 20



TYPE 21



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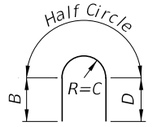

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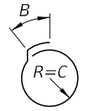

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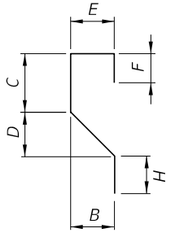

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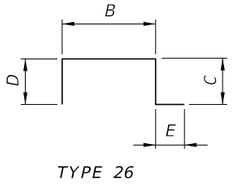
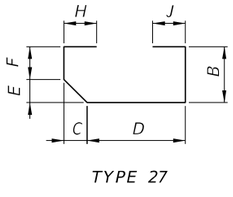
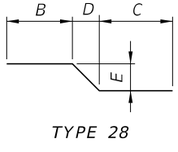


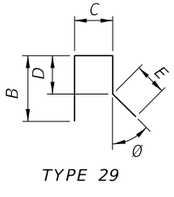
TYPE 26



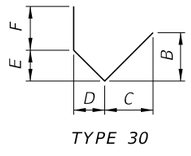
TYPE 27



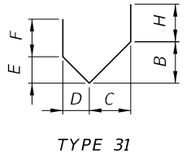
TYPE 28



TYPE 29



TYPE 30



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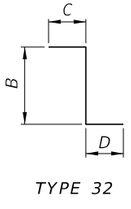
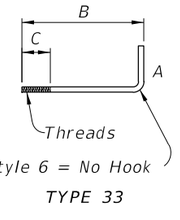
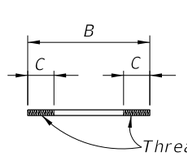


TYPE 32



Style 6 = No Hook

TYPE 33



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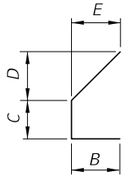

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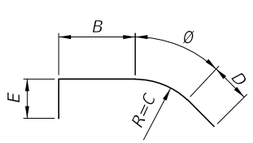
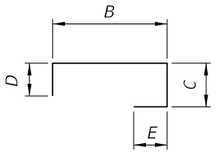
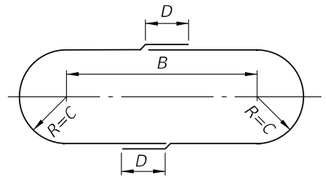


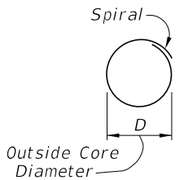
TYPE 36



TYPE 37

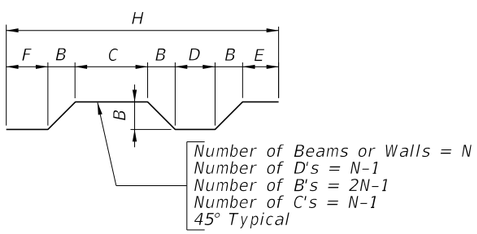


TYPE 38



TYPE 39

C = Pitch
B = Overall Height
Ø = Spirals shall be ASTM A615 Grade 60 plain or deformed bars or ASTM A1064 plain or deformed steel wire.
N = Total number of closed turns at Top and Bottom of columns
Splices may be accomplished by lapping 1.5 turns. Cost of Channel Spacers and Splices shall be included in the Contract Unit Price for Reinf. Steel (Substructure)



Number of Beams or Walls = N
Number of D's = N–1
Number of B's = 2N–1
Number of C's = N–1
45° Typical

TYPE 40

TYPE 41

TYPE 42

TYPE 43

HOOK DETAILS

180° 90°

BAR SIZE	D	180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2¼"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3¾"	7"	5"	10"
#6	4½"	8"	6"	1'–0"
#7	5¼"	10"	7"	1'–2"
#8	6"	11"	8"	1'–4"
#9	9½"	1'–3"	11¾"	1'–7"
#10	10¾"	1'–5"	1'–1¼"	1'–10"
#11	12"	1'–7"	1'–2¾"	2'–0"
#14	18¼"	2'–3"	1'–9¾"	2'–7"
#18	24"	3'–0"	2'–4½"	3'–5"
STYLE		1		3

90° 135°

STIRRUPS (TIES SIMILAR)

STIRRUP & TIE HOOK DIMENSIONS

BAR SIZE	D	90° HOOKS	135° HOOKS	
		A or G	A or G	H *
#3	1½"	4"	4"	2½"
#4	2"	4½"	4½"	3"
#5	2½"	6"	5½"	3¾"
#6	4½"	1'–0"	8"	4½"
#7	5¼"	1'–2"	9"	5¼"
#8	6"	1'–4"	10½"	6"
STYLE		4	5	

STYLE 6 = NO HOOK

* Dimension is approximate.

Hook Styles Detailed on this sheet are for Illustration Only.

Actual Hook Style for any particular bar will be shown under A or G Heading on REINFORCING BAR LIST sheet(s) in Structures Plans.

All Dimensions are out-to-out.

NOTE: For Bar Dimensions See REINFORCING BAR LIST Sheet(s) in Structures Plans.

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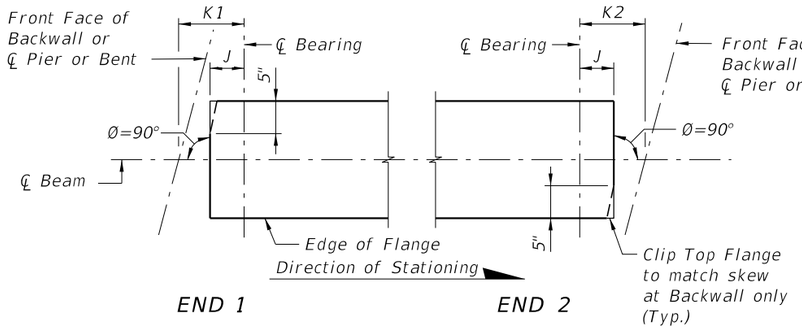
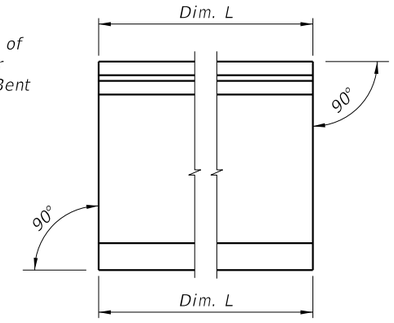
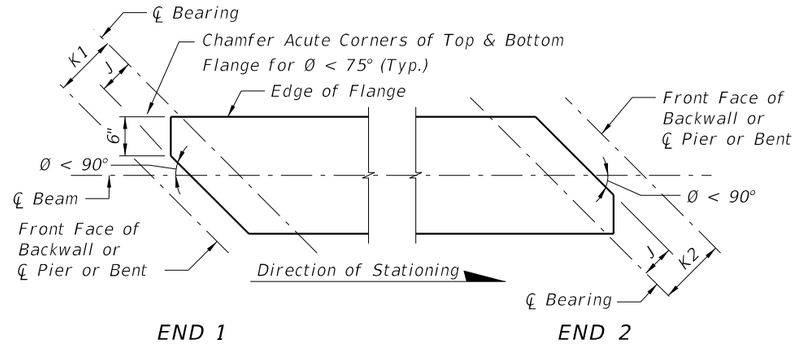
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FDOT FY 2019-20 STANDARD PLANS	BAR BENDING DETAILS (STEEL)	415-001	1 of 1



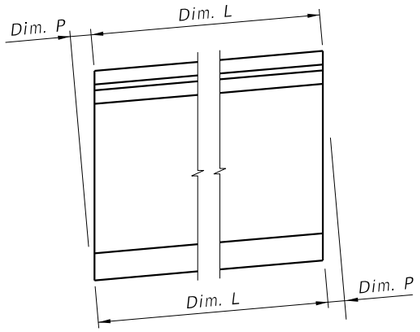
CASE 1
(Standard Orientation for New Construction)



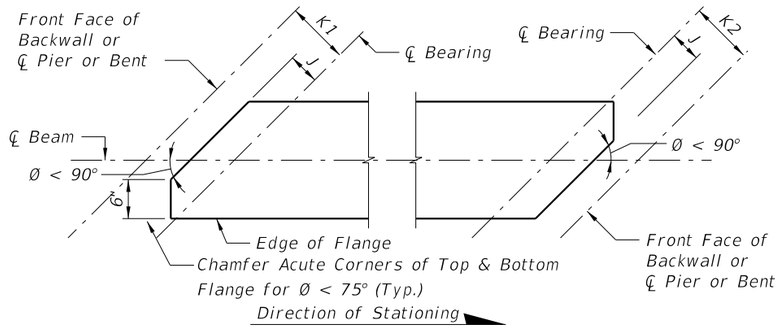
CONDITION 1
(Dim P = 0.0)



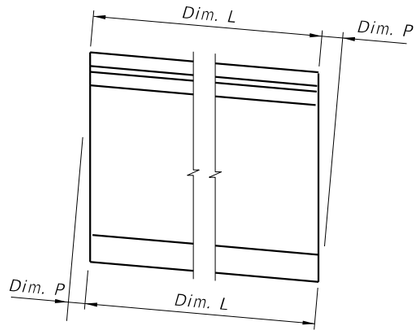
CASE 2
(Special Orientation for Widenings)



CONDITION 2



CASE 3
(Special Orientation for Widenings)



CONDITION 3

SCHEMATIC PLAN VIEWS AT BEAM ENDS

SCHEMATIC END ELEVATIONS OF BEAMS
(Showing Vertical Bevel of Beam End)

BEAM NOTES

1. Work this Index with the Florida-I Beam Standard Details (Index 450-036 thru 450-096) and the Table of Beam Variables in Structures Plans.
2. All bar bend dimensions are out-to-out.
3. Concrete cover: 2 inches minimum.
4. Strands N: ⅜" Ø minimum, stressed to 10,000 lbs. each.
5. Place one (1) Bar 5K or 5Z at each location. Alternate the direction of the ends for each bar (see "ELEVATION AT END OF BEAM" in Standard Details.
6. Tie Bars 5K and 5Z to the fully bonded strands in the bottom or center row (see "STRAND PATTERN" on the Table of Beam Variables sheet in Structures Plans).
   A. At the Contractor's option, the length of the bottom legs of Bars 5K and 5Z may be extended to facilitate tying to the exterior strands.
   B. For deformed WWR, supplemental transverse #4 bars are permitted to support Pieces K & S under the cross wires on the bottom row of strands.
7. Place Bars 3C1, 3D1 and 4M1 in beam END 1, and Bars 3C2, 3D2 and 4M2 in beam END 2. END 1 and END 2 are shown on the Standard Details "ELEVATION".
8. For Beams with vertically beveled end conditions: Place first row of Bars 3C1, 3C2, 3D1, 3D2, 5K, 5Y and 5Z parallel to the end of the beam. Progressively rotate remaining bars within the limits of Bars 5Z until vertical by adjusting the spacing at the top of beam up to a maximum of 1". For deformed WWR, cut top cross wire and rotate bars as required or reduce end cover at top of the beam to 1" minimum.
9. For beams with skewed end conditions:
   A. Place end reinforcement parallel to the skewed end of the beam. End reinforcement is defined as Bars 3C1, 3C2, 3D1, 3D2, 5K, 4M1, 4M2, 5Y and 5Z placed within the limits of the spacing for Bars 3C in "ELEVATION AT END OF BEAM".
   B. Beyond the limits of the spacing for Bars 3C, place Bars 3D3, 5K and 4M3 perpendicular to the longitudinal axis of the beam. Fan Bars as needed to avoid overlapping bars at the transition to Bars 3D3 and 4M3, and field cut to maintain minimum cover. Provide additional Bars 4M1, 4M2, 3D1 and 3D2 as required; additional bars are not included in the "BILL OF REINFORCING STEEL". For placement locations see Skewed Beam End Details for Widening Existing Bridges.
   C. Adjust the dimensions of Bars 3C1, 3C2, 3D1, 3D2, 4M1 and 4M2 as shown on the Bending Diagram.
   D. WWR is not permitted for end reinforcement Bars 3D1, 3D2, 4M1 and 4M2; use bar reinforcement.
10. Contractor Options:
   A. Deformed WWR may be used in lieu of Bars 3D, 5K, 4M, and 5Z as shown on the Standard Details; except at skewed ends (see Note 9).
   B. Bars 3D1, 3D2 and 3D3 may be fabricated as a single bar with a 1'-0" minimum lap splice of the top legs, or the length of the bottom legs may be extended to facilitate tying to the exterior strands.
11. Embedment of Safety Line Anchorage Devices are permitted in the top flange to accommodate fall protection systems. See shop drawings for details and spacing of any required anchorage devices.
12. For beams with ends that will not be permanently encased in concrete diaphragms, cut wedges and recess Prestressing strands at the end of the beam without damaging the surrounding concrete. See "STRAND CUTTING AND PROTECTING DETAIL" on Sheet 2. Protect end of wedged recessed strands in accordance with Specification Section 450.
13. Holes in the beam web for temporary bracing or shipping devices must be formed prior to casting. Fill holes not meeting all the following criteria in accordance with Specification Section 450.
   A. The superstructure environmental classification is slightly or moderately aggressive
   B. Clear cover to adjacent steel reinforcing is 1"or greater
   C. Hole inside diameter is 2" maximum
   D. Non-metallic, non-water absorbing forming materials such as PVC, may be left in place permanently.

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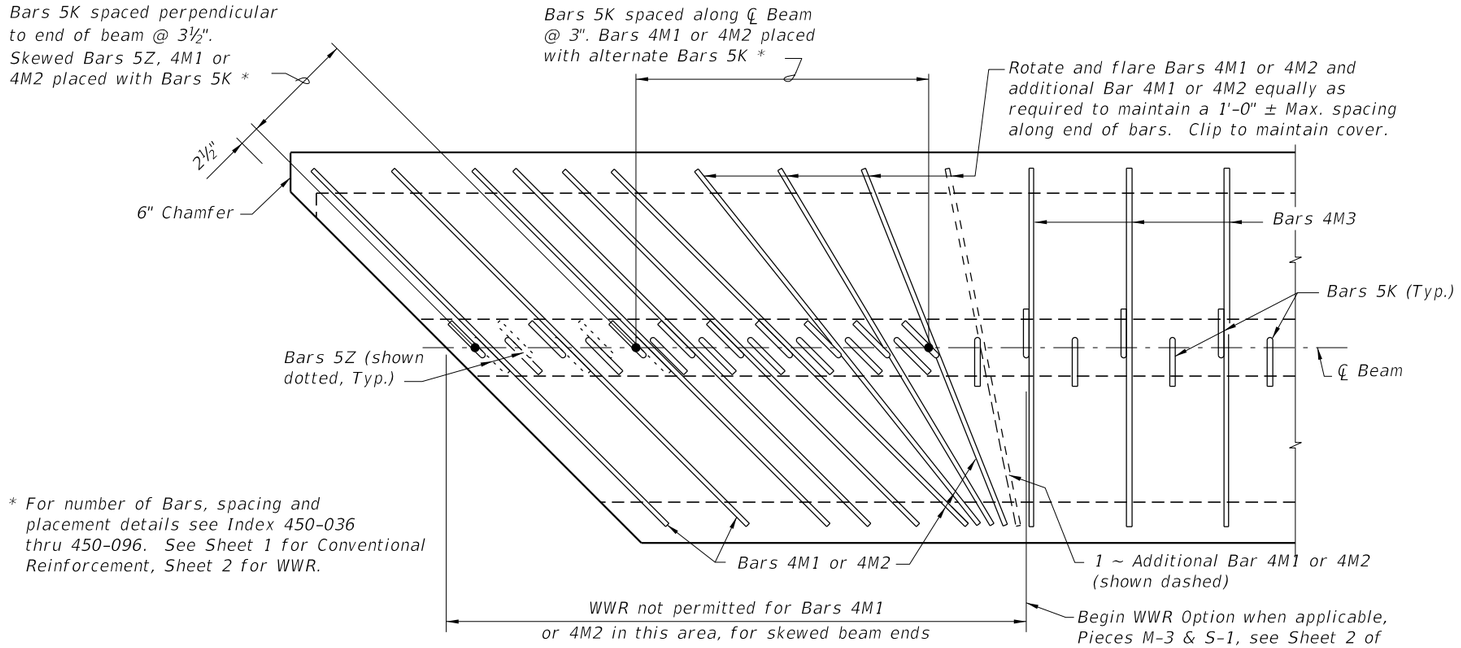
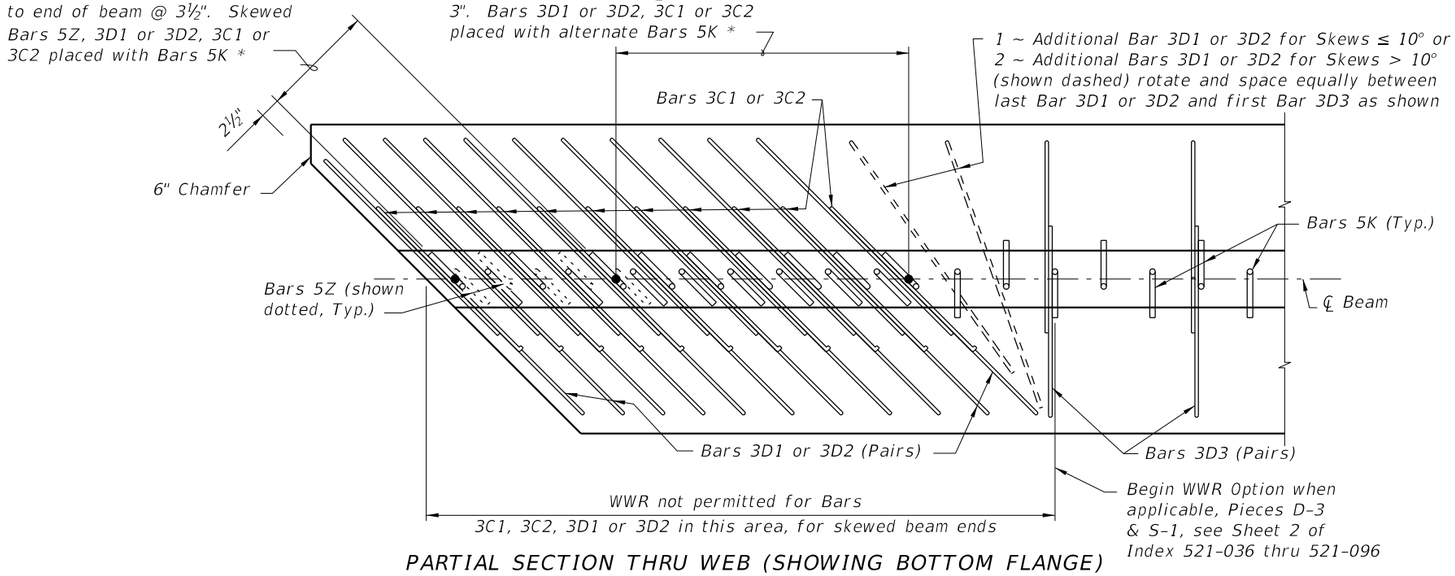
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	FLORIDA-I BEAM - TYPICAL DETAILS & NOTES	INDEX	SHEET
11/01/19						450-010	1 of 2

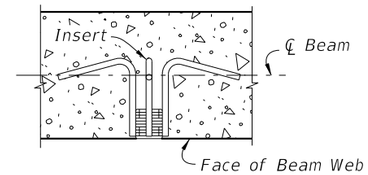


PARTIAL PLAN VIEW (SHOWING TOP FLANGE)
(End 1 Shown, End 2 Similar)
(Bars 5A, 5Y & Strands N not shown for clarity)



PARTIAL SECTION THRU WEB (SHOWING BOTTOM FLANGE)
(END 1 Shown, END 2 Similar)
(Bars 5Y, Strands, and Embedded Bearing Plate "A" not shown for clarity)

SKEWED BEAM END DETAILS FOR WIDENING EXISTING BRIDGES
(Florida-I 36 Beam shown, others similar)

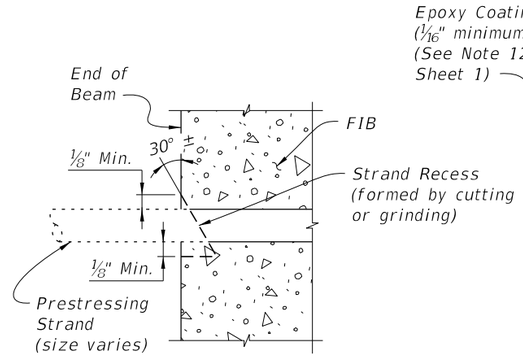


PLAN SECTION THRU BEAM WEB AT INSERT FOR DIAPHRAGM REINFORCING
(When Intermediate Diaphragms are Required by Design)

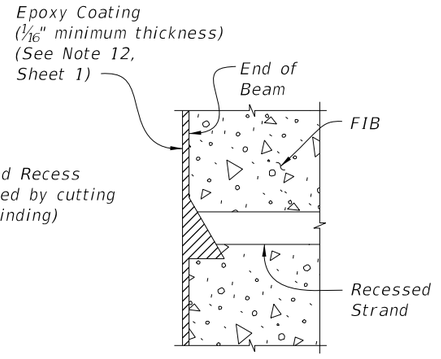
INSERT NOTES

1. Provide 1" Ø, zinc-electroplated, ferrule wing nut or coil inserts, UNC threads, 1/0 minimum gage wire, not more than 4" in depth with a minimum ultimate tensile strength of 11,400 lbs. in 4,000 psi concrete.
2. If inserts are needed on both sides (faces) of beam webs, an assembly as long as the thickness of the beam web, consisting of two (2) ferrule or coil inserts attached by two (2) or more struts may be utilized. The connecting struts shall have a minimum ultimate tensile strength of 11,400 lbs.
3. Inserts for diaphragm reinforcing are required at each end of each intermediate diaphragm shown on the Beam Framing Plan and may be required at the end of the beams when end diaphragms are shown. See Superstructure and Beam Framing Plans for longitudinal location of inserts for each face of beam.

INSERT DETAIL



TYPICAL SECTION SHOWING CUT STRAND RECESS LIMITS



TYPICAL SECTION AFTER PROTECTING

STRAND CUTTING AND PROTECTING DETAIL

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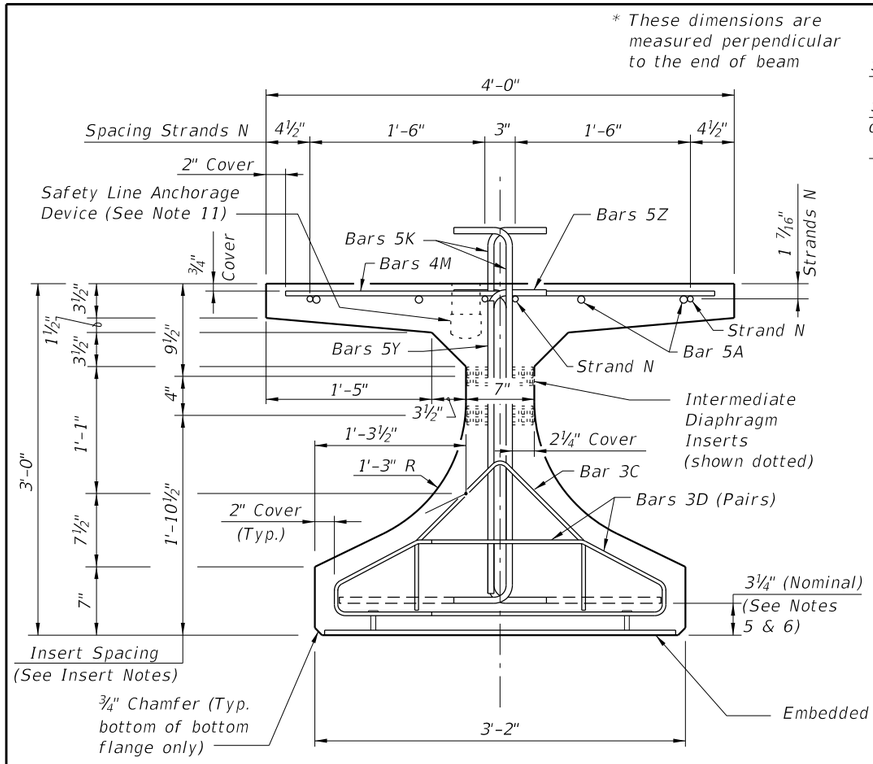
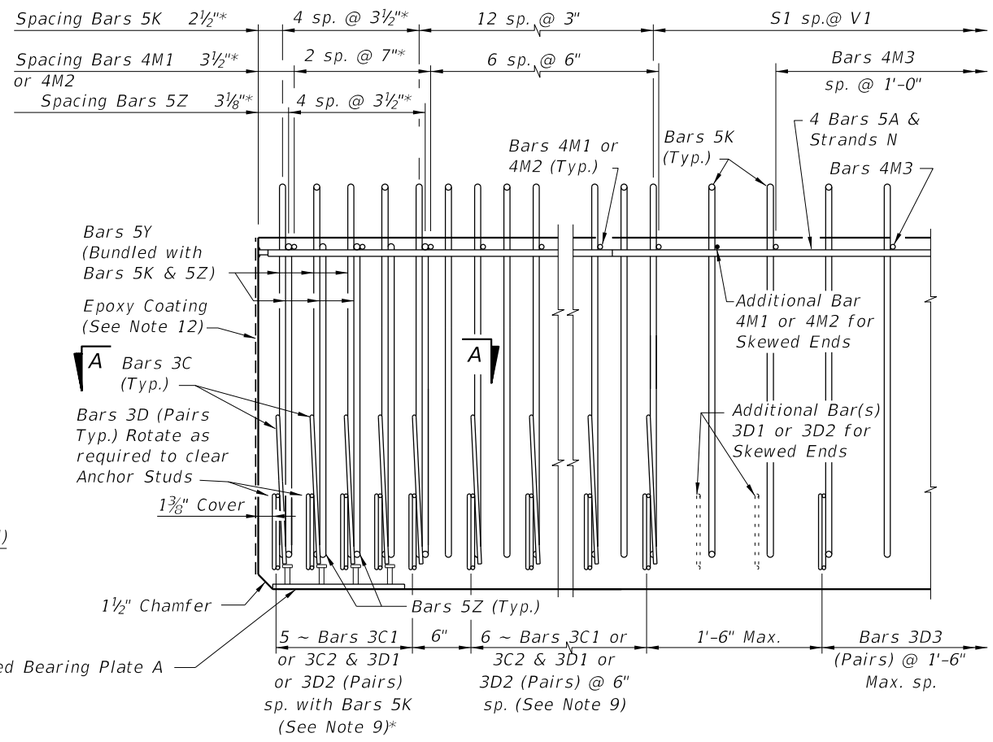
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	FLORIDA-I BEAM - TYPICAL DETAILS & NOTES	INDEX	SHEET
11/01/16						450-010	2 of 2



END VIEW



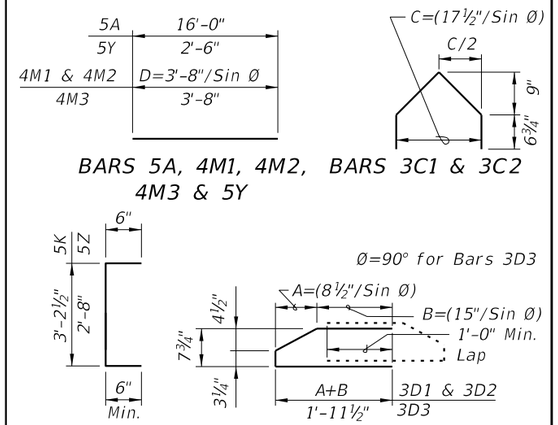
ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)

CONVENTIONAL REINFORCING BAR BENDING DETAILS

BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	5	8	16'-0"
C1	7, 8 & 9	3	11 (End 1)	Varies
C2	7, 8 & 9	3	11 (End 2)	Varies
D1	7, 8, 9 & 10	3	22 (End 1)	Varies
D2	7, 8, 9 & 10	3	22 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	4'-2"
M1	7 & 9	4	9 (End 1)	Varies
M2	7 & 9	4	9 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	⅜" Ø Strand	4	Dim. L
Y	8 & 9	5	12	2'-6"
Z	5, 6, 8, 9 & 10	5	10	3'-8"

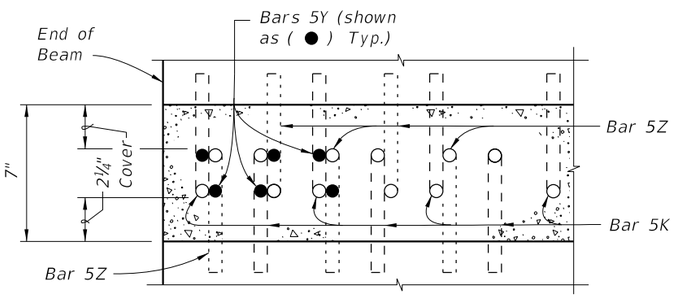
BENDING DIAGRAMS (See Note 2)



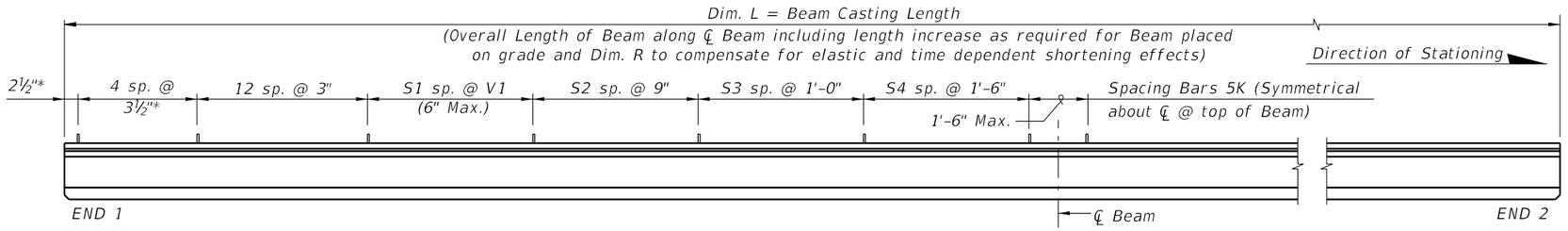
BARS 5A, 4M1, 4M2, 4M3 & 5Y BARS 3C1 & 3C2

BARS 5K & 5Z BARS 3D1, 3D2 & 3D3

NOTES:
A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.
B. For referenced notes, see Index 450-010.
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)



ELEVATION

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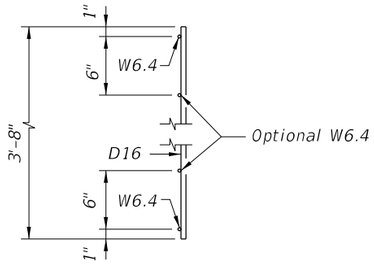
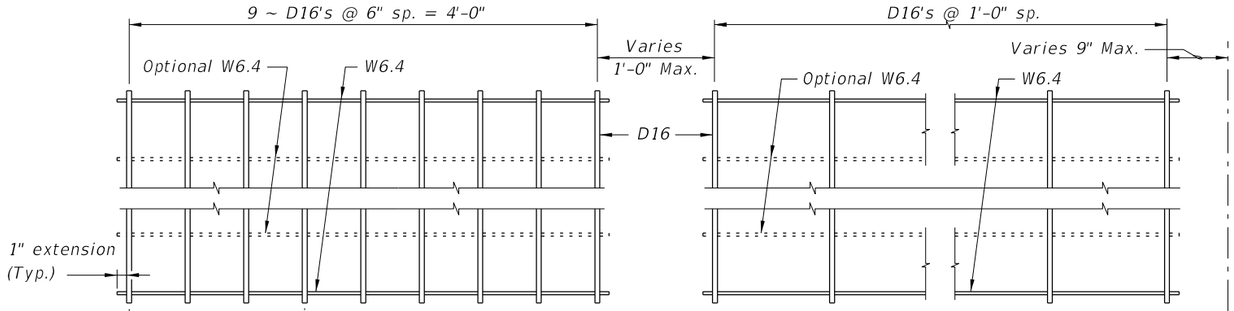
LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 36 BEAM - STANDARD DETAILS	INDEX 450-036	SHEET 1 of 2

ALTERNATE REINFORCING STEEL (WWR) DETAILS

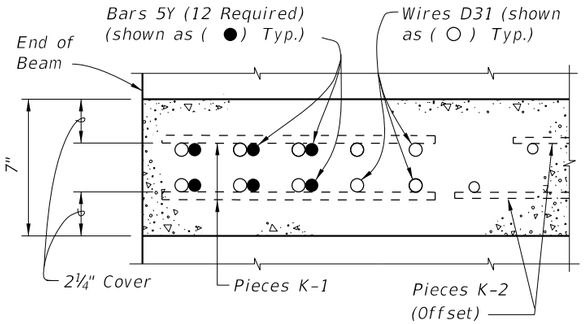


PIECES M
END VIEW

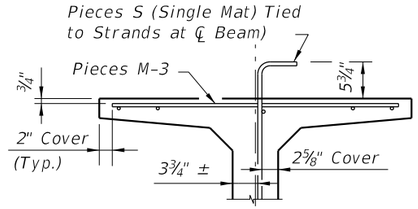


PLAN VIEW
PIECE M-1
(2 Required)

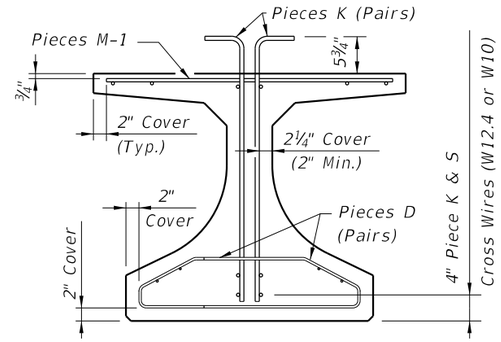
PLAN VIEW
PIECE M-3
(2 Required)



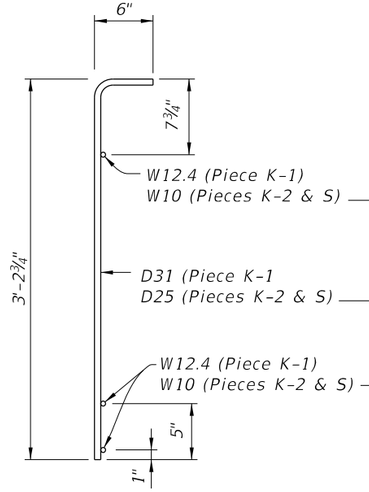
SECTION A-A
FOR WELDED WIRE REINFORCEMENT



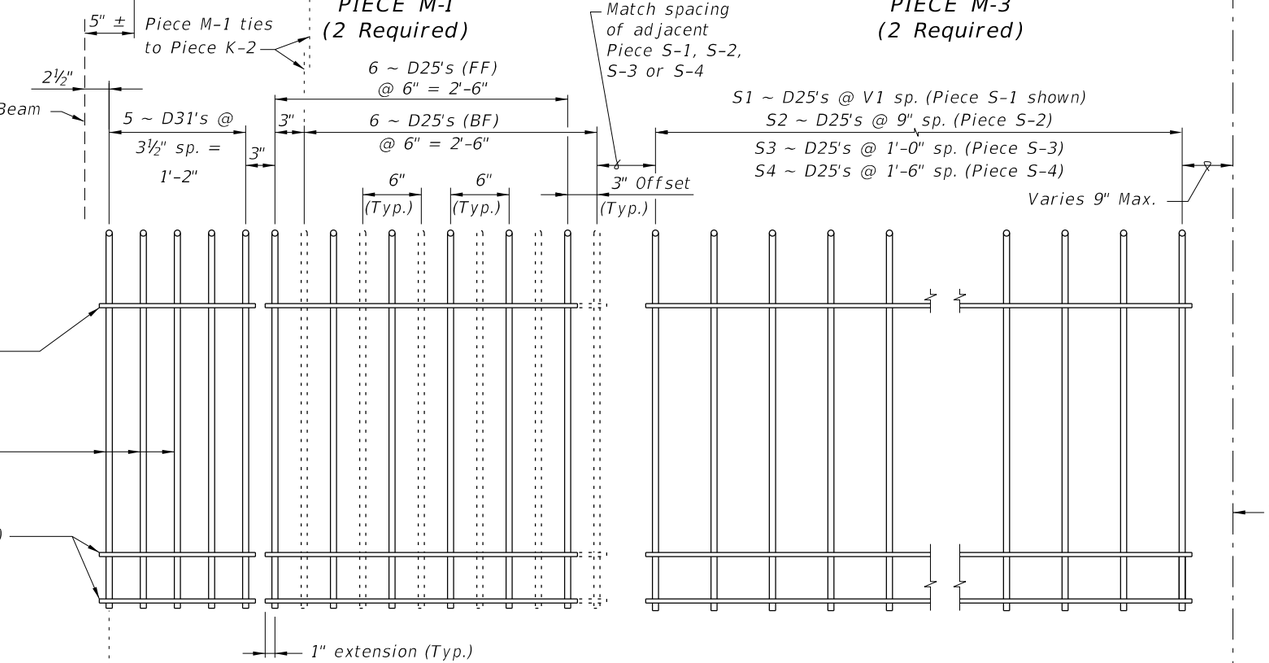
PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands not Shown for Clarity)



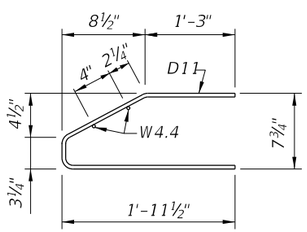
PIECES K & S
END VIEW



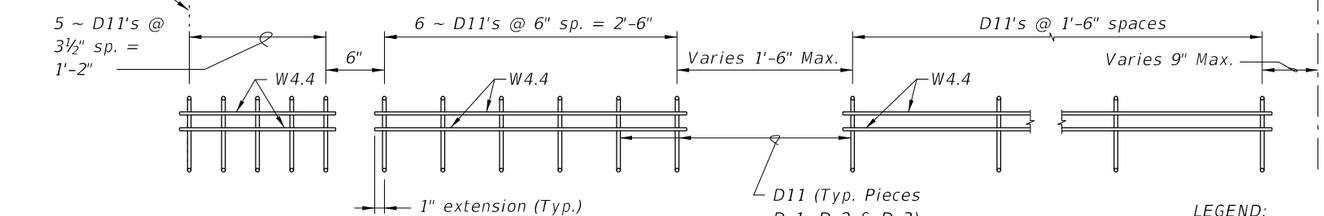
PIECE K-1
(Aligned EF)
(4 Required ~
2 Pairs)

PIECE K-2
(FF Shown Solid,
BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required Each Piece)



PIECES D
END VIEW



PIECE D-1
(4 Required ~ 2 Pairs)

PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 5A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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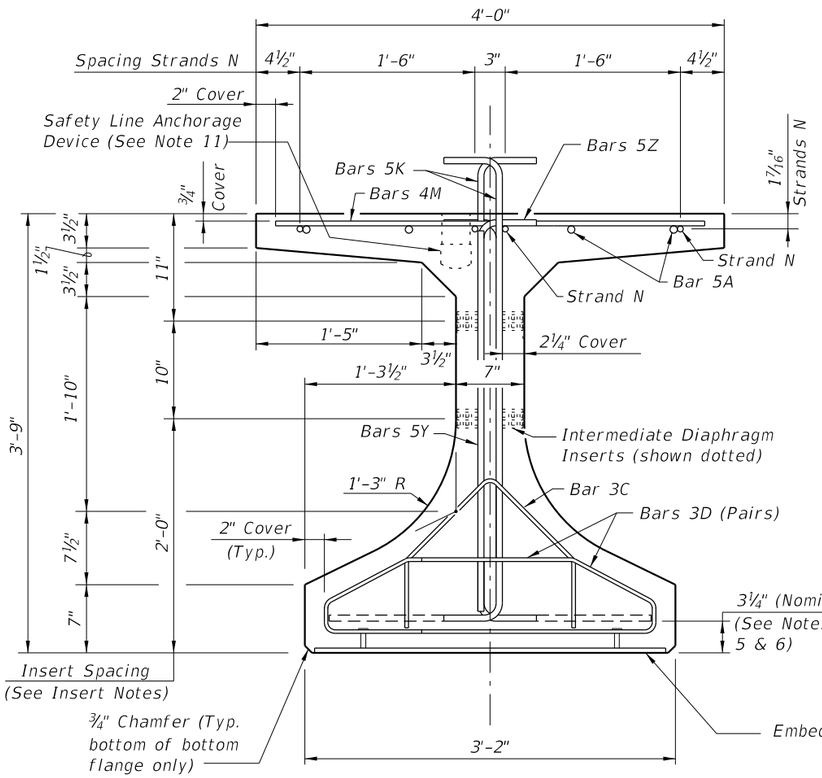
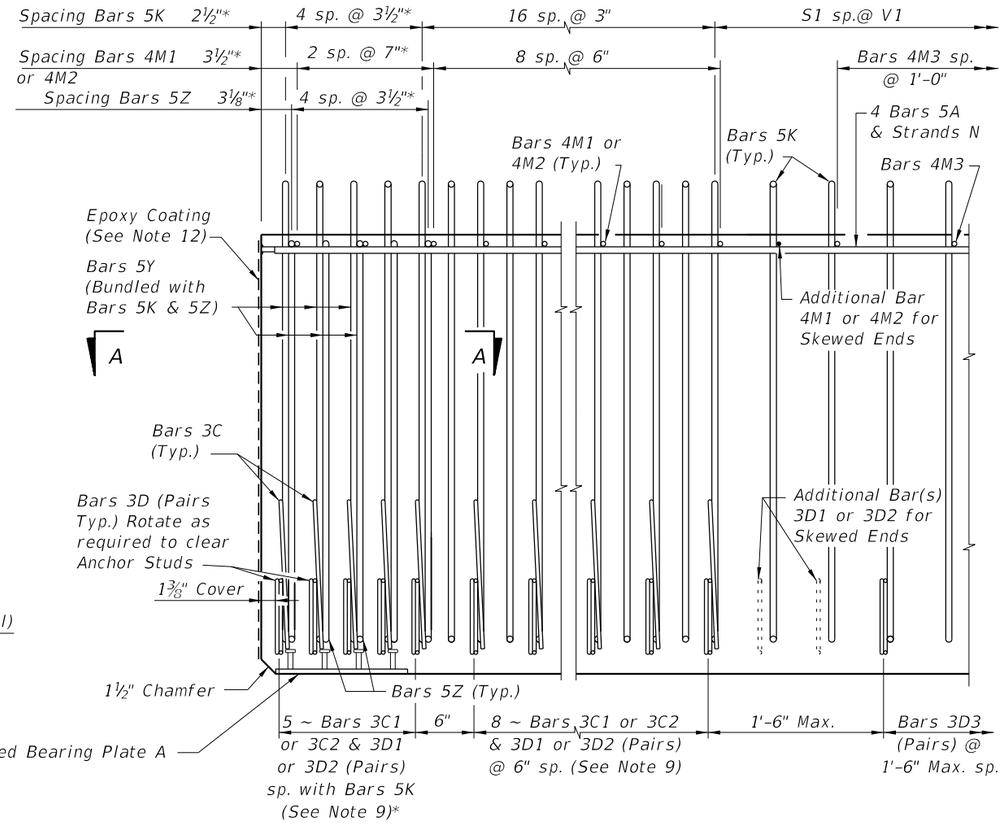
LAST REVISION	REVISION	DESCRIPTION:			
11/01/16			FY 2019-20 STANDARD PLANS	FLORIDA-I 36 BEAM - STANDARD DETAILS	INDEX 450-036 / SHEET 2 of 2



END VIEW



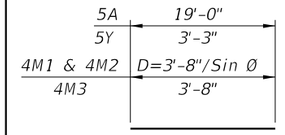
ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)

CONVENTIONAL REINFORCING BAR BENDING DETAILS

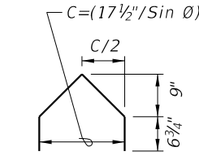
BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	5	8	19'-0"
C1	7, 8 & 9	3	13 (End 1)	Varies
C2	7, 8 & 9	3	13 (End 2)	Varies
D1	7, 8, 9 &10	3	26 (End 1)	Varies
D2	7, 8, 9 &10	3	26 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	4'-11"
M1	7 & 9	4	11 (End 1)	Varies
M2	7 & 9	4	11 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	⅜" Ø Strand	4	Dim. L
Y	8 & 9	5	12	3'-3"
Z	5, 6, 8, 9 & 10	5	10	4'-5"

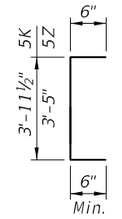
BENDING DIAGRAMS (See Note 2)



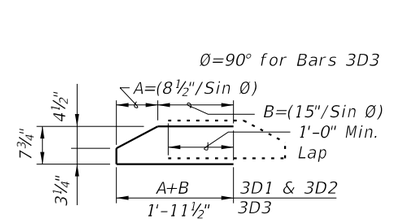
BARS 5A, 4M1, 4M2, 4M3 & 5Y



BARS 3C1 & 3C2

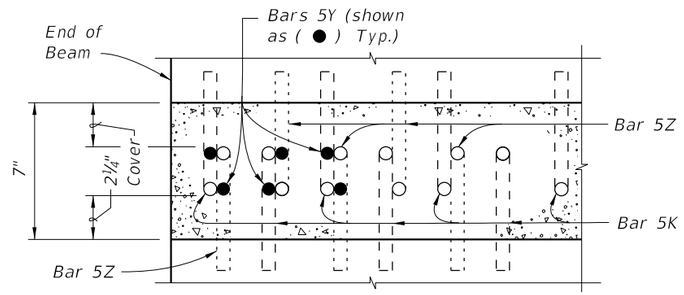


BARS 5K & 5Z

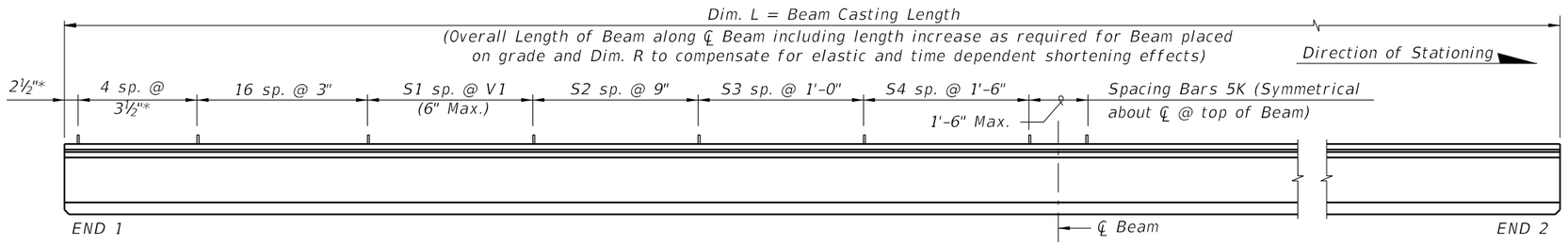


BARS 3D1, 3D2 & 3D3

NOTES:
A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.
B. For referenced notes, see Index 450-010.
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)



ELEVATION

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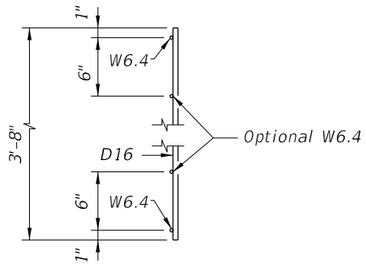
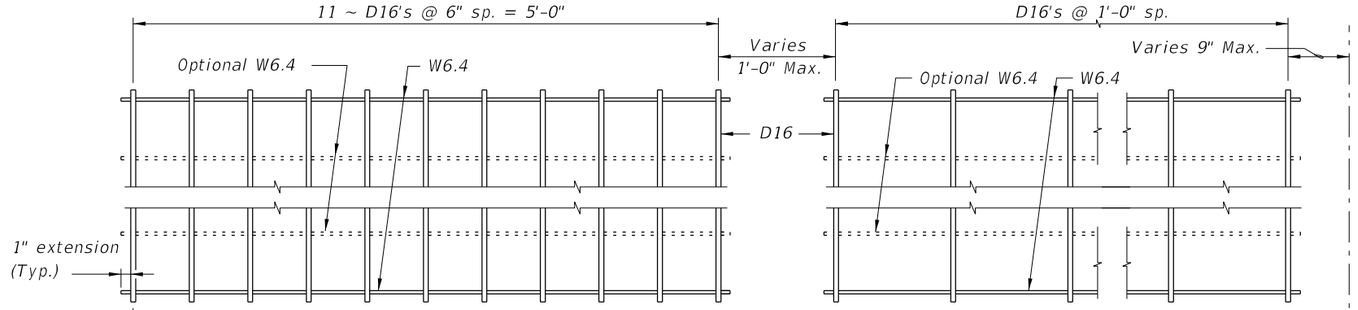
LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 45 BEAM - STANDARD DETAILS	INDEX 450-045	SHEET 1 of 2

ALTERNATE REINFORCING STEEL (WWR) DETAILS

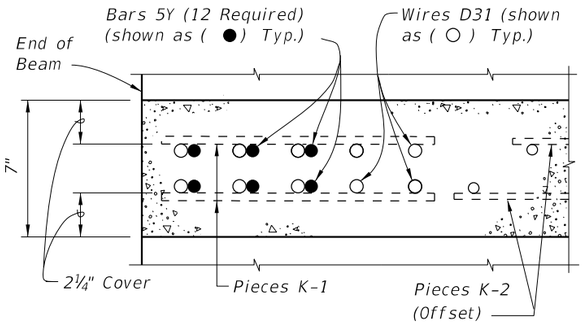


PIECES M
END VIEW

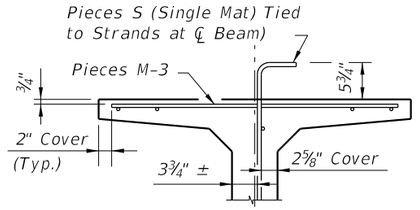


PLAN VIEW
PIECE M-1
(2 Required)

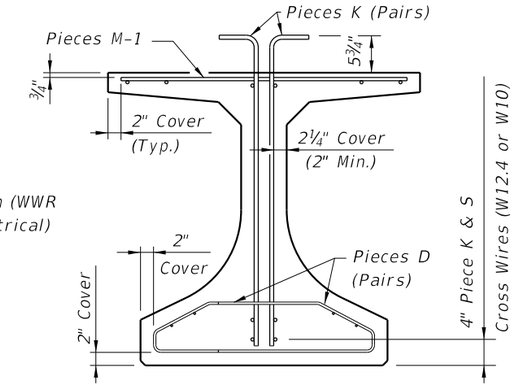
PLAN VIEW
PIECE M-3
(2 Required)



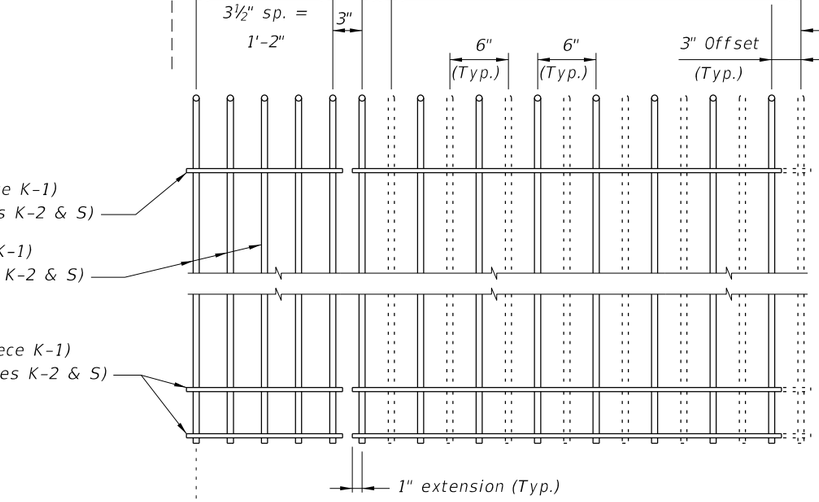
SECTION A-A
FOR WELDED WIRE REINFORCEMENT



PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands not Shown for Clarity)

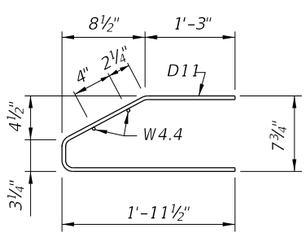


PIECES K & S
END VIEW

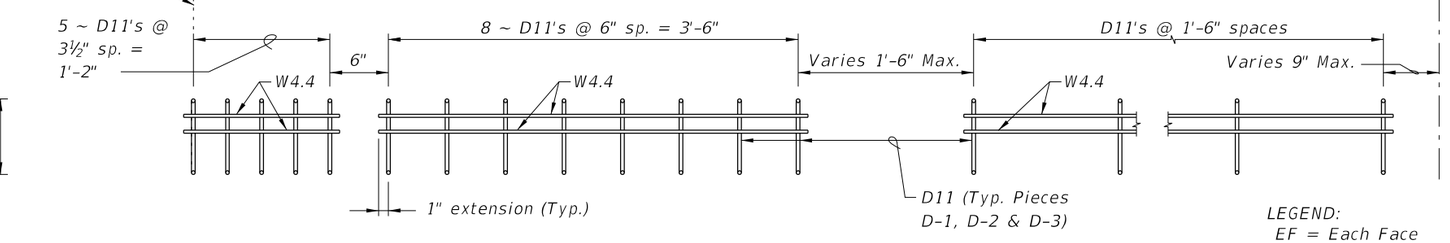
PIECE K-1
(Aligned EF)
(4 Required
~ 2 Pairs)

PIECE K-2
(FF Shown Solid, BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required Each Piece)



PIECES D
END VIEW



PIECE D-1
(4 Required ~ 2 Pairs)

PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 5A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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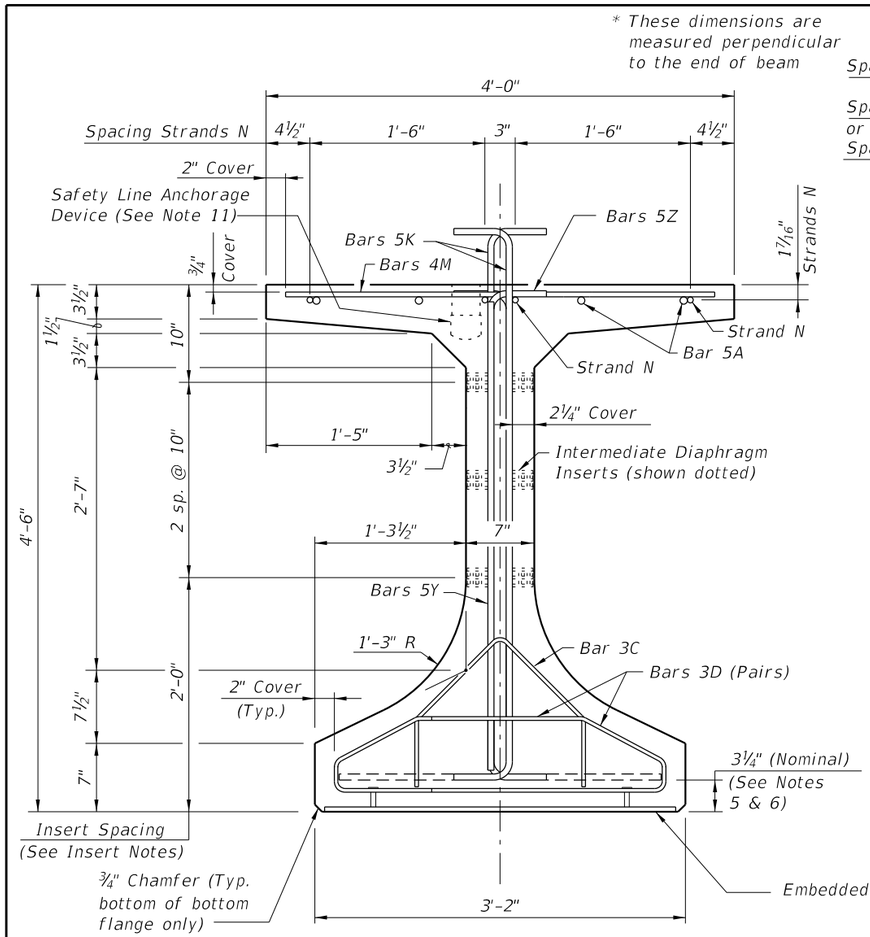
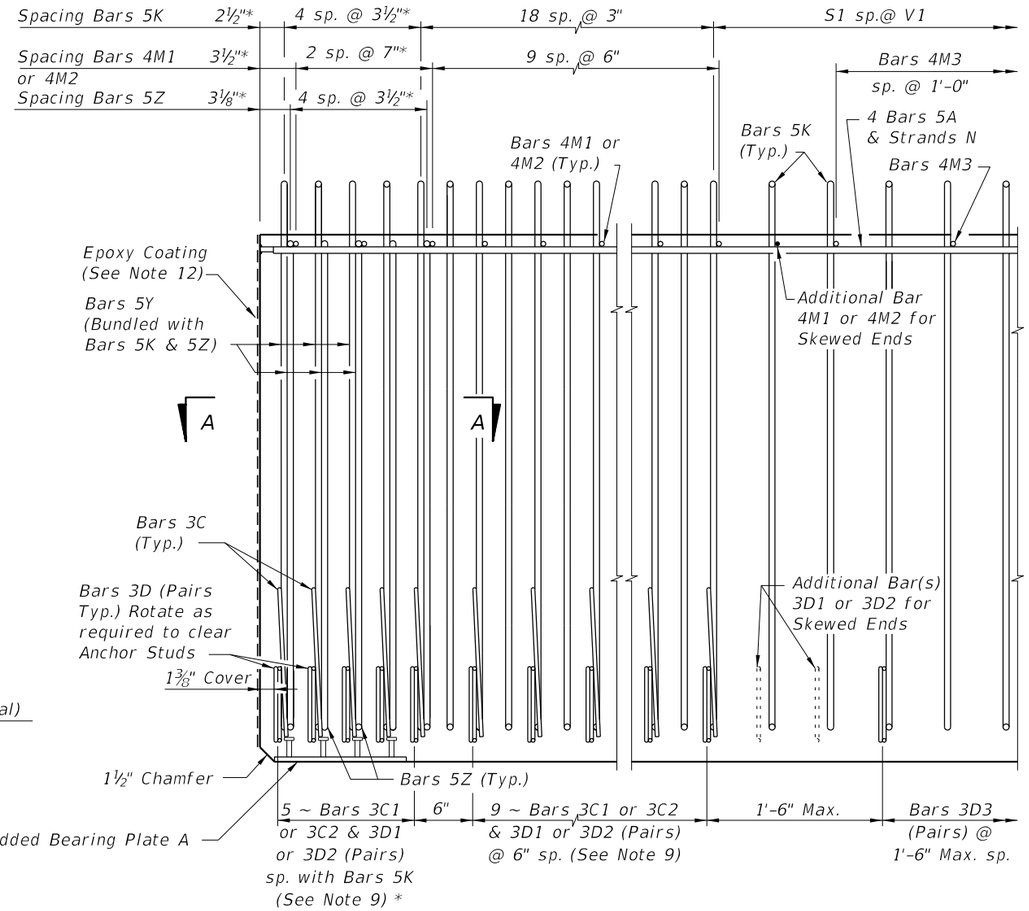
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 45 BEAM - STANDARD DETAILS	INDEX 450-045	SHEET 2 of 2



END VIEW



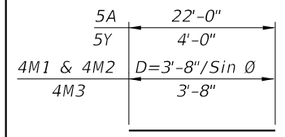
ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)

CONVENTIONAL REINFORCING BAR BENDING DETAILS

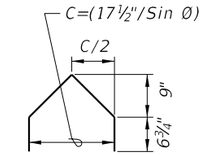
BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	5	8	22'-0"
C1	7, 8 & 9	3	14 (End 1)	Varies
C2	7, 8 & 9	3	14 (End 2)	Varies
D1	7, 8, 9 & 10	3	28 (End 1)	Varies
D2	7, 8, 9 & 10	3	28 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	5'-8"
M1	7 & 9	4	12 (End 1)	Varies
M2	7 & 9	4	12 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	⅜" Ø Strand	4	Dim. L
Y	8 & 9	5	12	4'-0"
Z	5, 6, 8, 9 & 10	5	10	5'-2"

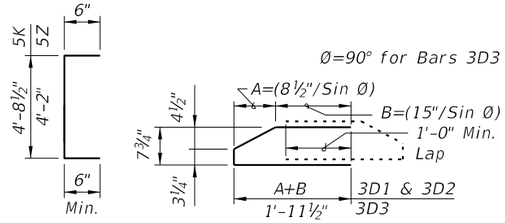
BENDING DIAGRAMS (See Note 2)



BARS 5A, 4M1, 4M2, 4M3 & 5Y

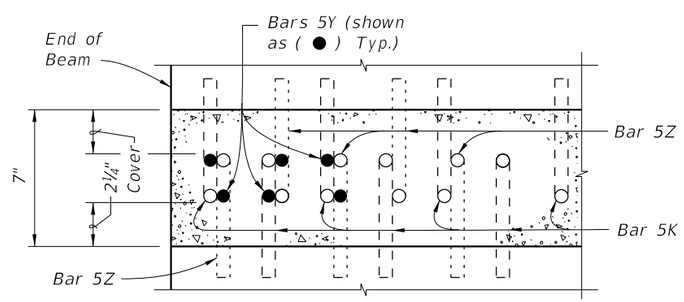


BARS 3C1 & 3C2

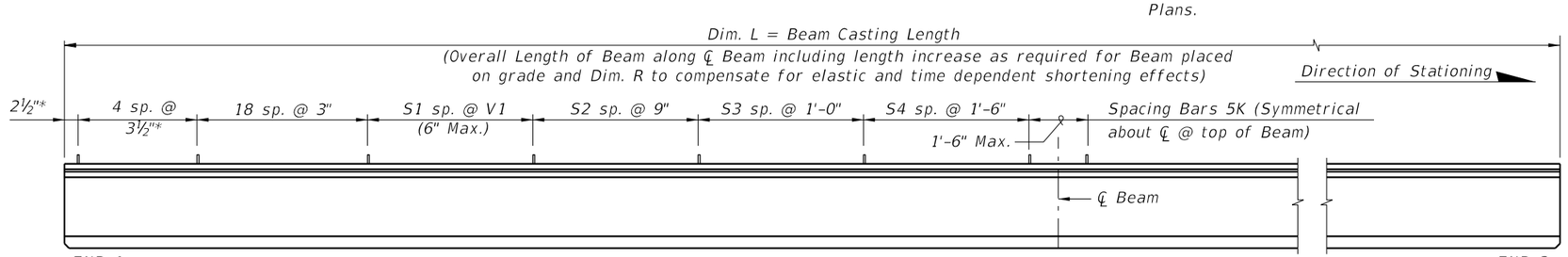


BARS 5K & 5Z BARS 3D1, 3D2 & 3D3

NOTES:
A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.
B. For referenced notes, see Index 450-010.
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)



ELEVATION

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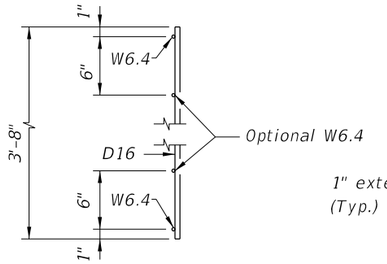
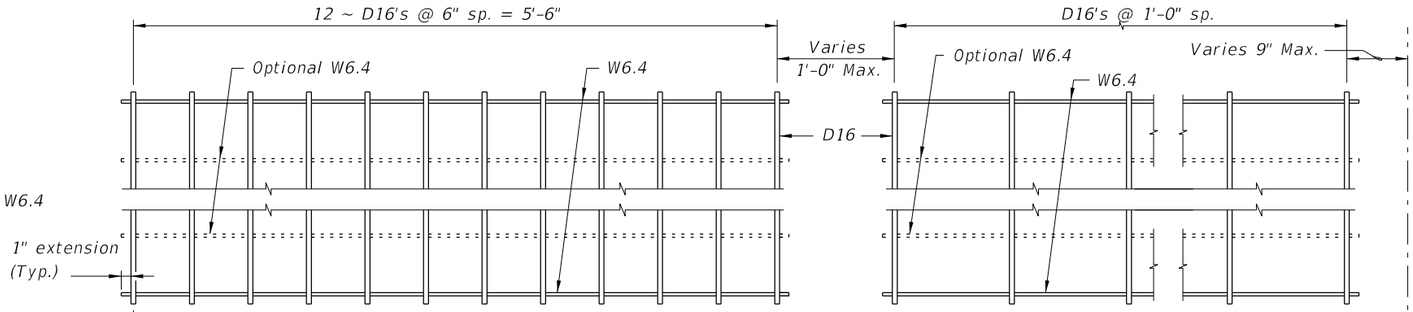
LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 54 BEAM - STANDARD DETAILS	INDEX 450-054	SHEET 1 of 2

ALTERNATE REINFORCING STEEL (WWR) DETAILS

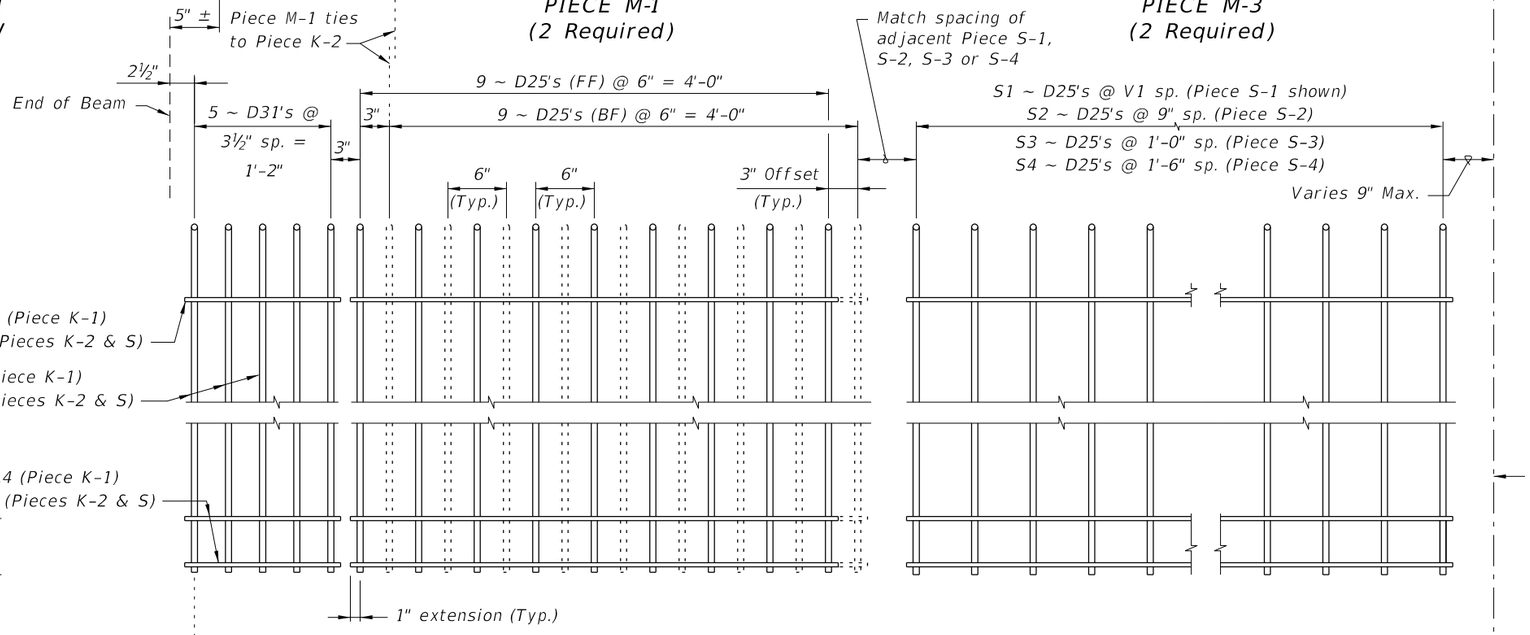


PIECES M
END VIEW



PLAN VIEW
PIECE M-1
(2 Required)

PLAN VIEW
PIECE M-3
(2 Required)

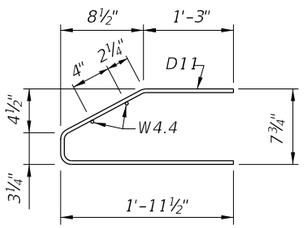


PIECES K & S
END VIEW

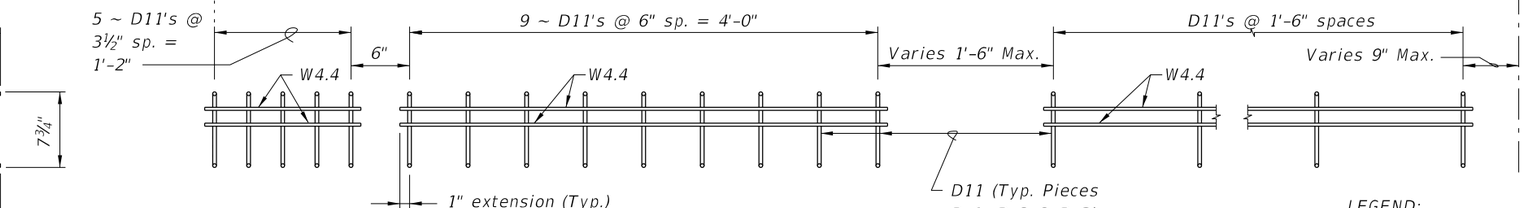
PIECE K-1
(Aligned EF)
(4 Required
~ 2 Pairs)

PIECE K-2
(FF Shown Solid, BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required Each Piece)



PIECES D
END VIEW

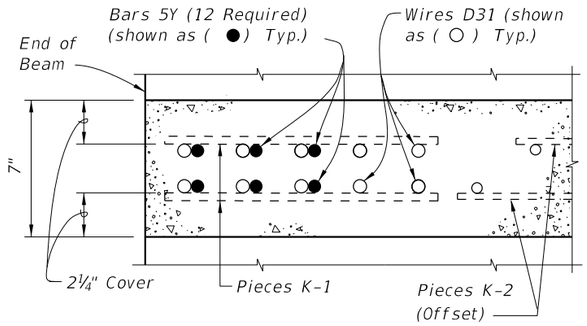


PIECE D-1
(4 Required ~ 2 Pairs)

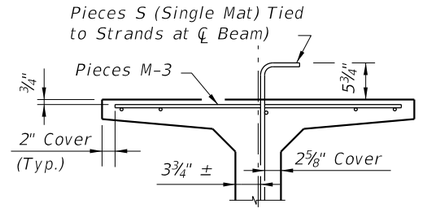
PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

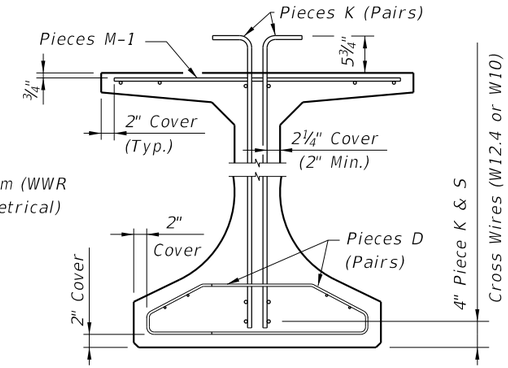
LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face



SECTION A-A
FOR WELDED WIRE REINFORCEMENT



PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands not Shown for Clarity)

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 5A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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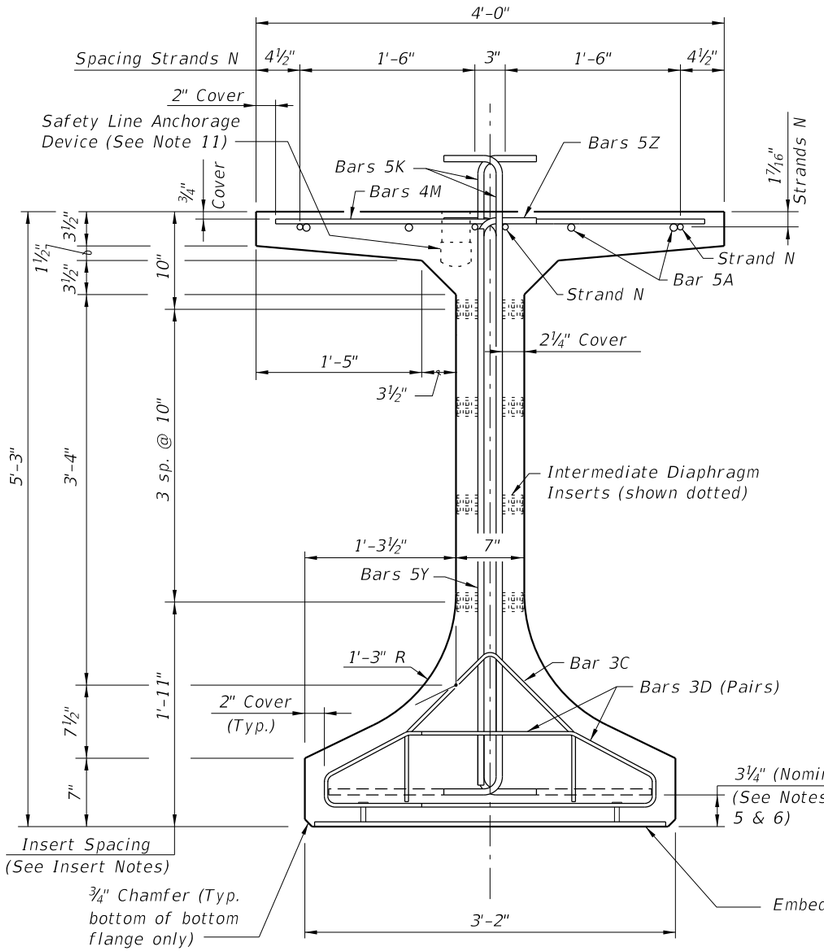
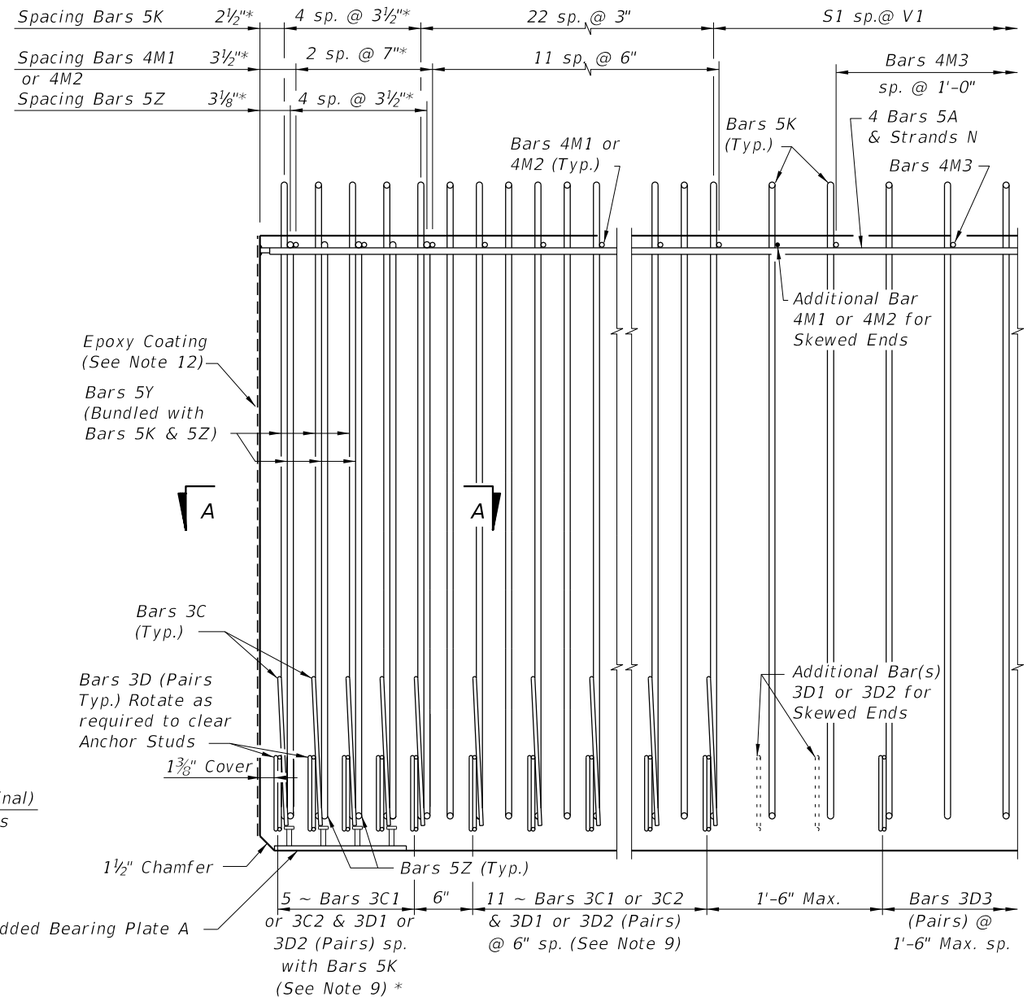
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 54 BEAM - STANDARD DETAILS	INDEX 450-054	SHEET 2 of 2

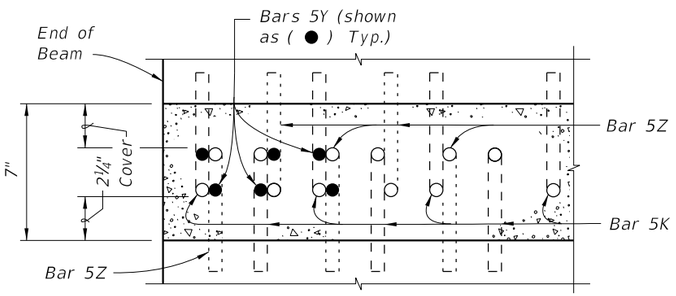
* These dimensions are measured perpendicular to the end of beam



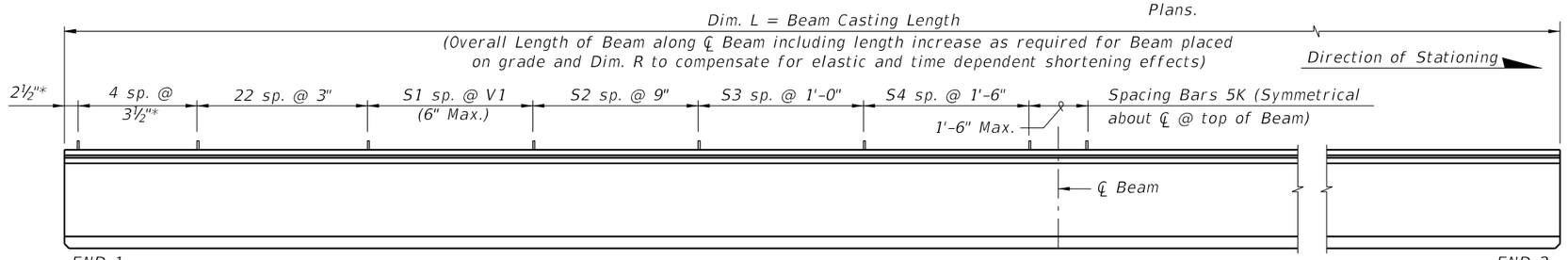
END VIEW



ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)



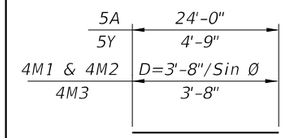
ELEVATION

CONVENTIONAL REINFORCING BAR BENDING DETAILS

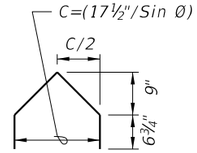
BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	5	8	24'-0"
C1	7, 8 & 9	3	16 (End 1)	Varies
C2	7, 8 & 9	3	16 (End 2)	Varies
D1	7, 8, 9 & 10	3	32 (End 1)	Varies
D2	7, 8, 9 & 10	3	32 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	6'-5"
M1	7 & 9	4	14 (End 1)	Varies
M2	7 & 9	4	14 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	⅜" Ø Strand	4	Dim. L
Y	8 & 9	5	12	4'-9"
Z	5, 6, 8, 9 & 10	5	10	5'-11"

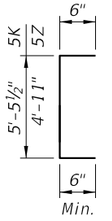
BENDING DIAGRAMS (See Note 2)



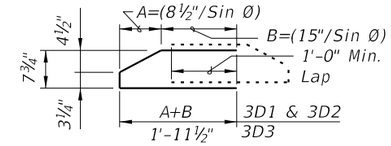
BARS 5A, 4M1, 4M2, 4M3 & 5Y



BARS 3C1 & 3C2



BARS 5K & 5Z



BARS 3D1, 3D2 & 3D3

NOTES:
A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.
B. For referenced notes, see Index 450-010.
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.

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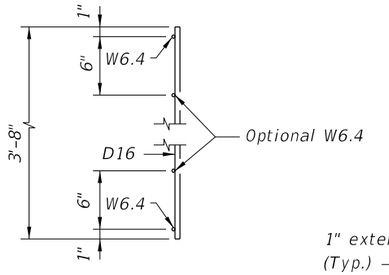
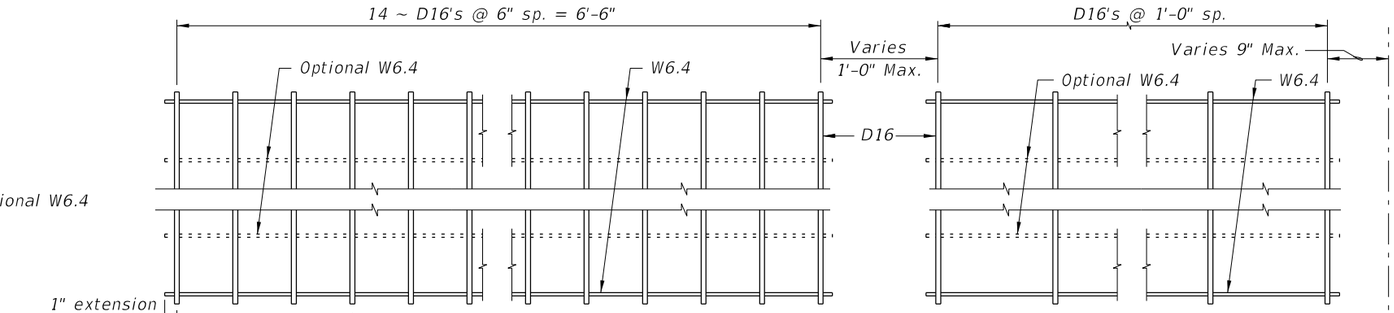
LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 63 BEAM - STANDARD DETAILS	INDEX 450-063	SHEET 1 of 2

ALTERNATE REINFORCING STEEL (WWR) DETAILS

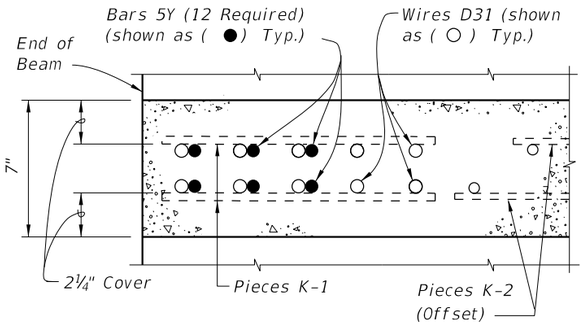


PIECES M
END VIEW

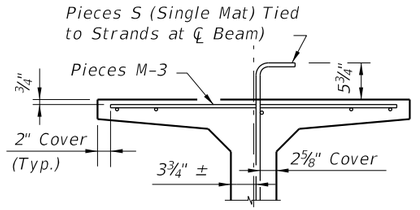


PLAN VIEW
PIECE M-1
(2 Required)

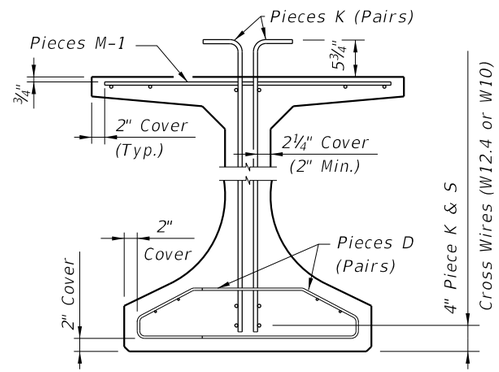
PLAN VIEW
PIECE M-3
(2 Required)



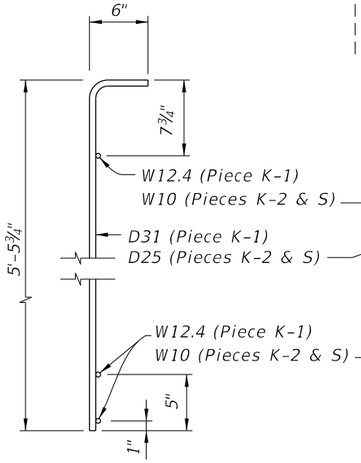
SECTION A-A
FOR WELDED WIRE REINFORCEMENT



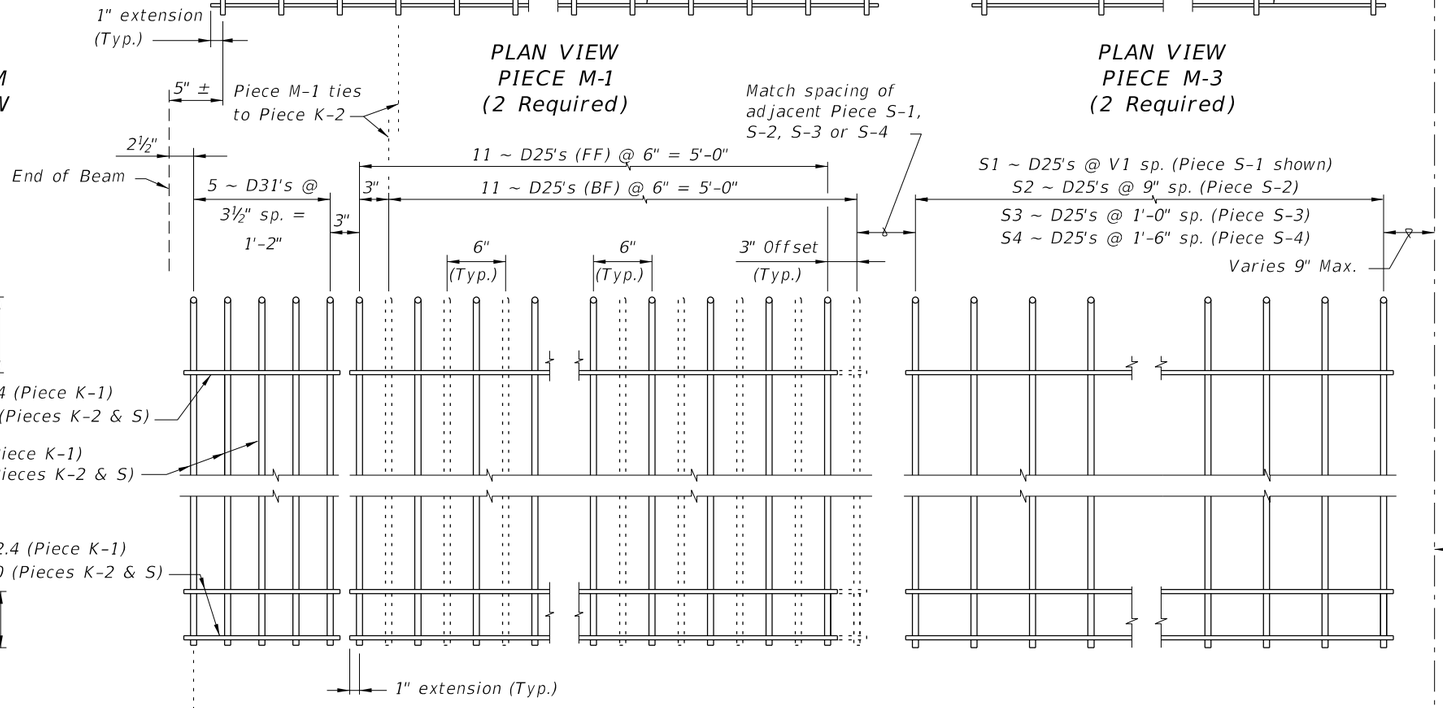
PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands not Shown for Clarity)



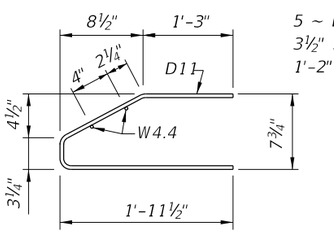
PIECES K & S
END VIEW



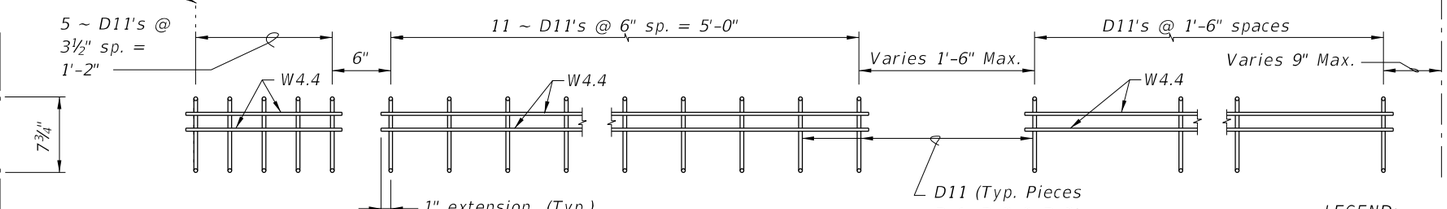
PIECE K-1
(Aligned EF)
(4 Required
~ 2 Pairs)

PIECE K-2
(FF Shown Solid, BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required Each Piece)



PIECES D
END VIEW



PIECE D-1
(4 Required ~ 2 Pairs)

PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 5A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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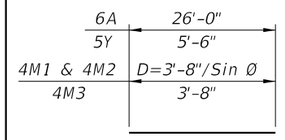
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 63 BEAM - STANDARD DETAILS	INDEX 450-063	SHEET 2 of 2

CONVENTIONAL REINFORCING BAR BENDING DETAILS

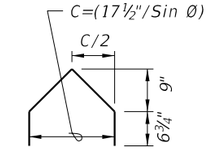
BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	6	8	26'-0"
C1	7, 8 & 9	3	19 (End 1)	Varies
C2	7, 8 & 9	3	19 (End 2)	Varies
D1	7, 8, 9 & 10	3	38 (End 1)	Varies
D2	7, 8, 9 & 10	3	38 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	7'-2"
M1	7 & 9	4	17 (End 1)	Varies
M2	7 & 9	4	17 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	3/8" Ø Strand	4	Dim. L
Y	8 & 9	5	16	5'-6"
Z	5, 6, 8, 9 & 10	5	12	6'-8"

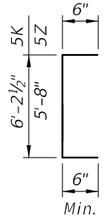
BENDING DIAGRAMS (See Note 2)



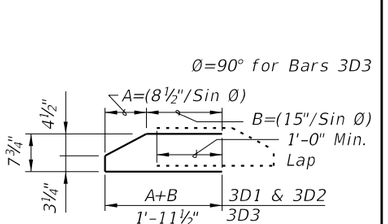
BARS 6A, 4M1, 4M2, 4M3 & 5Y



BARS 3C1 & 3C2



BARS 5K & 5Z



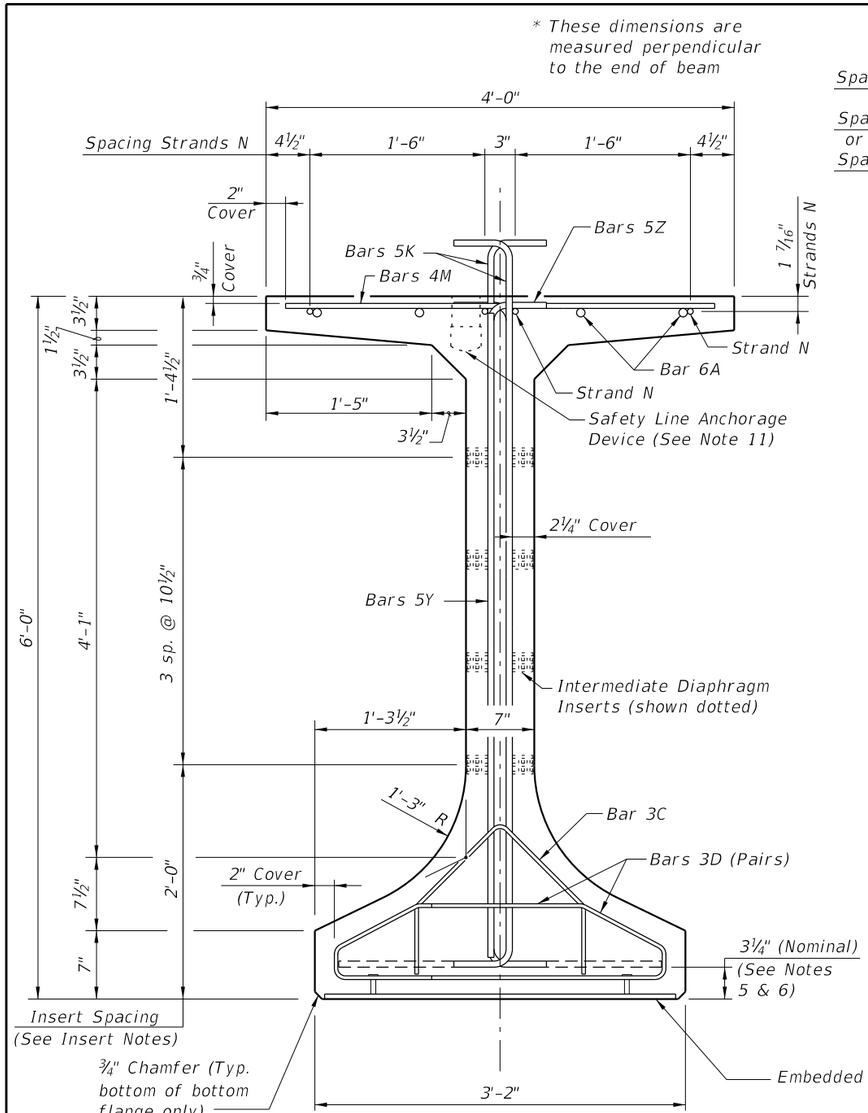
BARS 3D1, 3D2 & 3D3

NOTES:

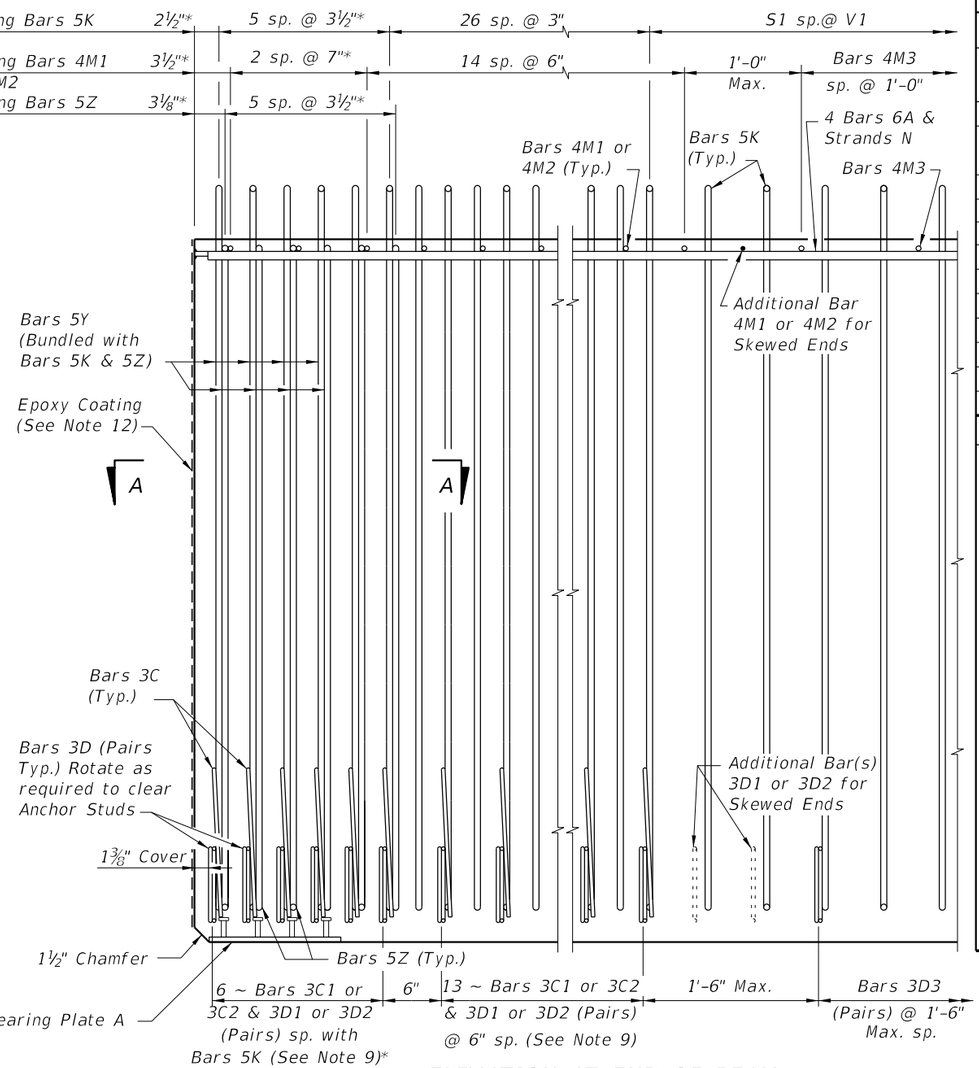
A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.

B. For referenced notes, see Index 450-010.

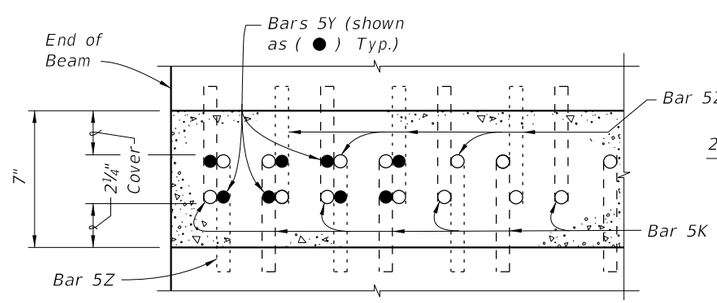
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.



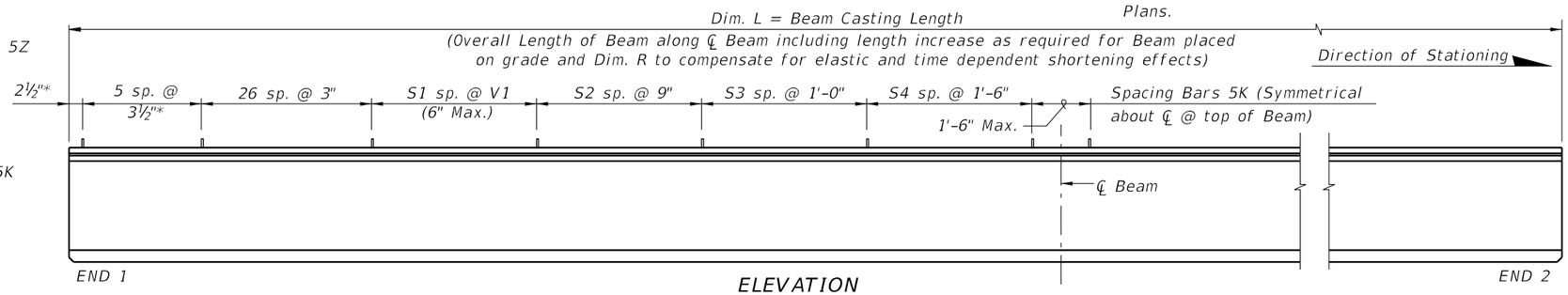
END VIEW



ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)

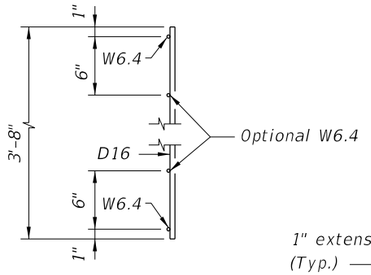


ELEVATION

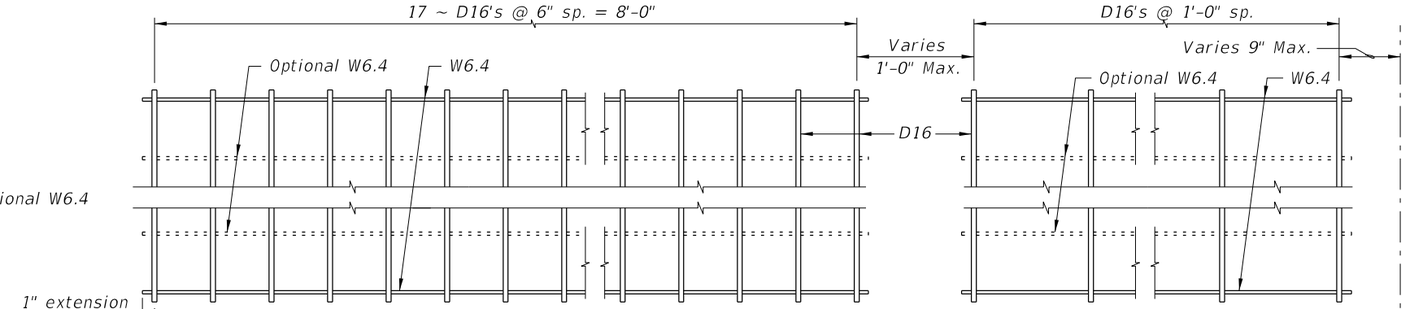
10/24/2018 2:52:39 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	FLORIDA-I 72 BEAM - STANDARD DETAILS	INDEX	SHEET
11/01/18						450-072	1 of 2

ALTERNATE REINFORCING STEEL (WWR) DETAILS

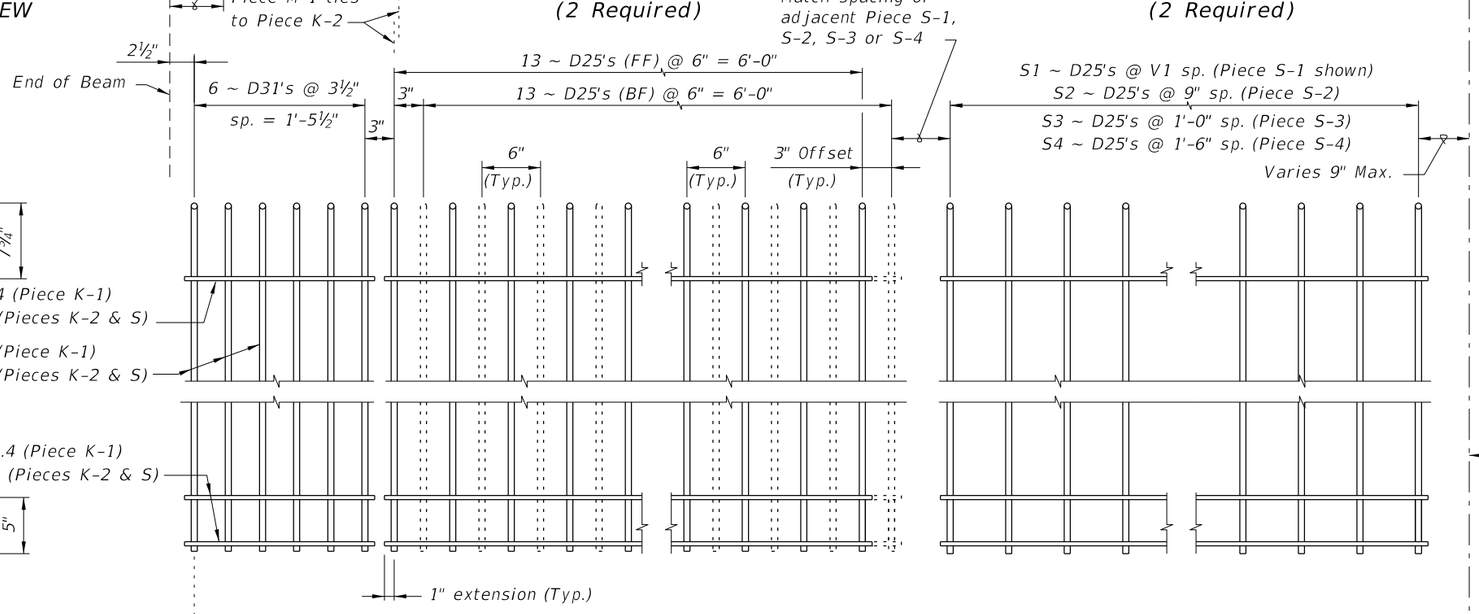


PIECES M
END VIEW



PLAN VIEW
PIECE M-1
(2 Required)

PLAN VIEW
PIECE M-3
(2 Required)

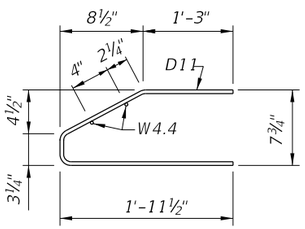


PIECES K & S
END VIEW

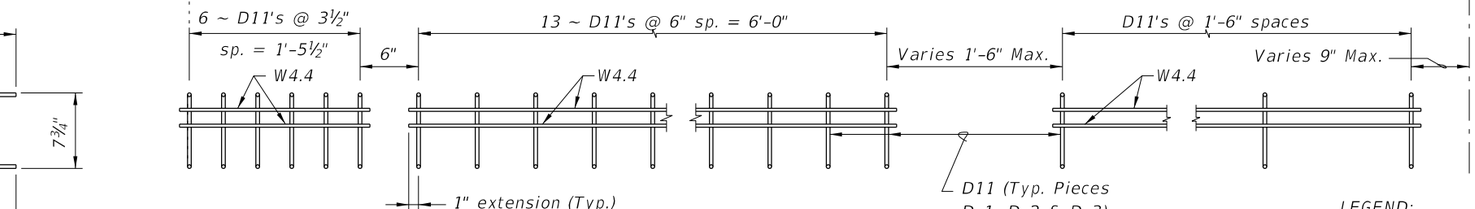
PIECE K-1
(Aligned EF)
(4 Required
~ 2 Pairs)

PIECE K-2
(FF Shown Solid, BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required ~ Each Piece)



PIECES D
END VIEW

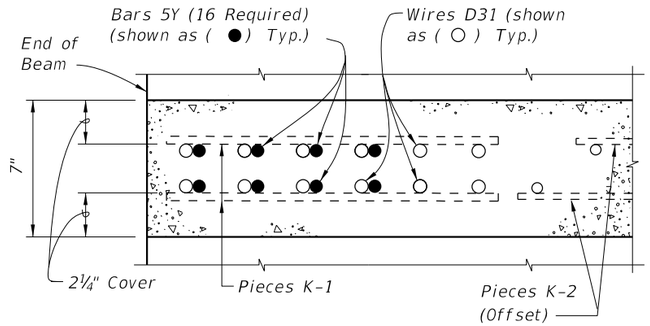


PIECE D-1
(4 Required ~ 2 Pairs)

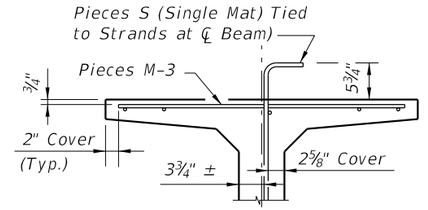
PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

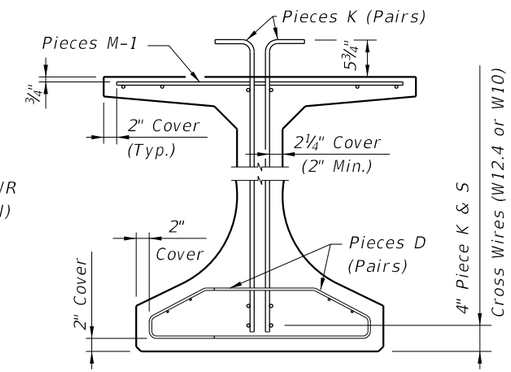
LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face



SECTION A-A
FOR WELDED WIRE REINFORCEMENT



PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands not Shown for Clarity)

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 6A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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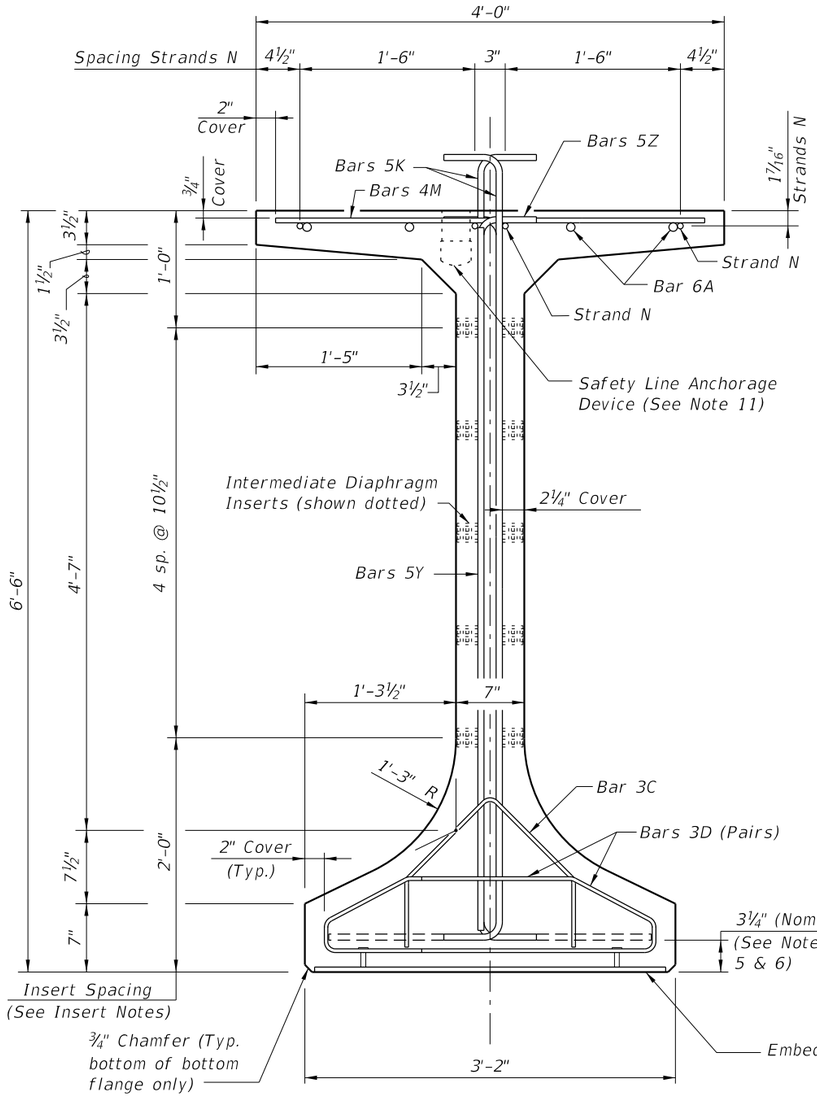
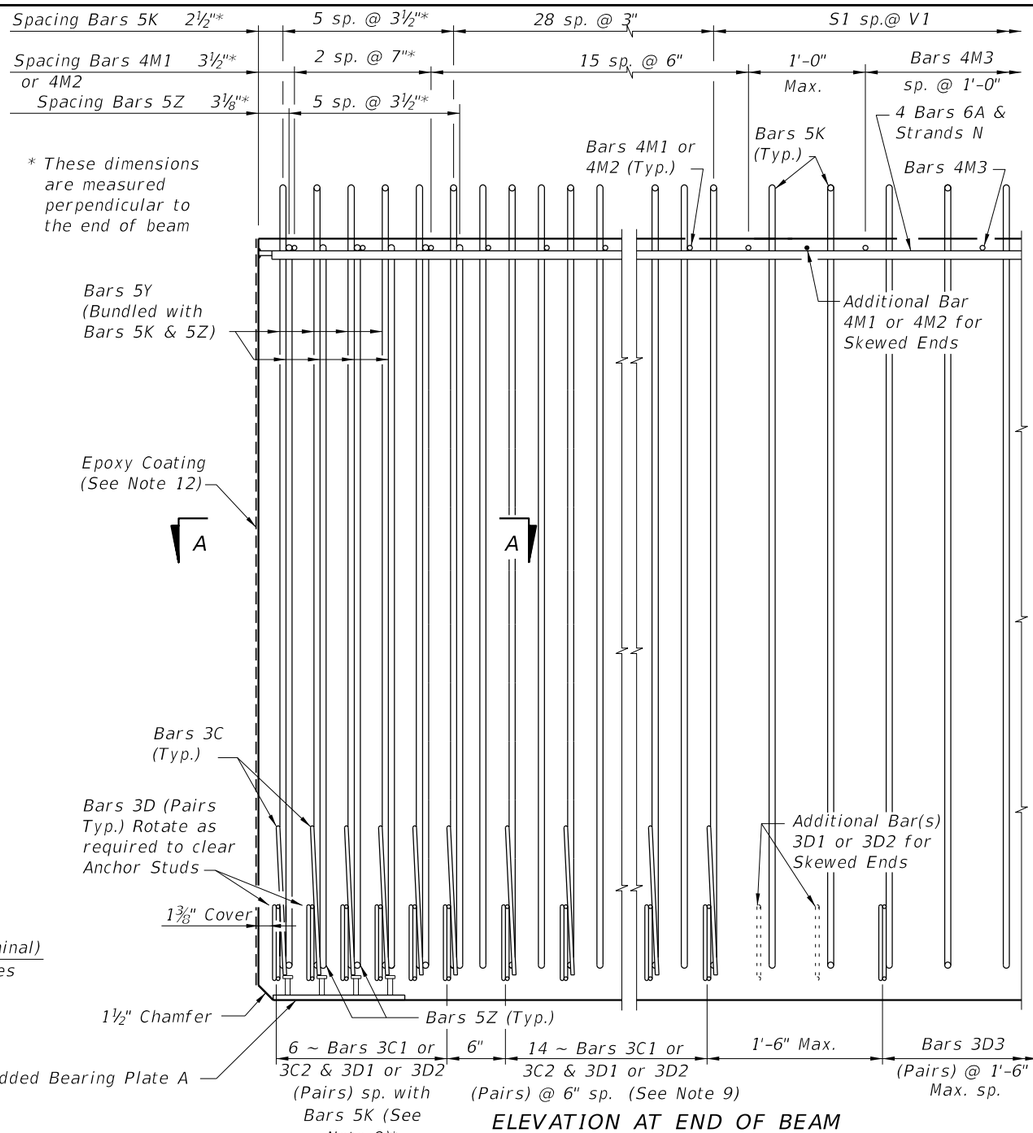
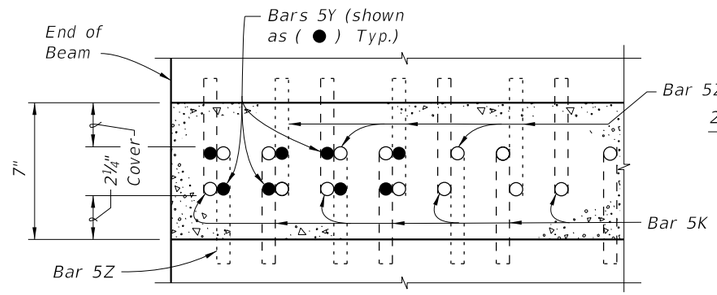
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 72 BEAM - STANDARD DETAILS	INDEX 450-072	SHEET 2 of 2



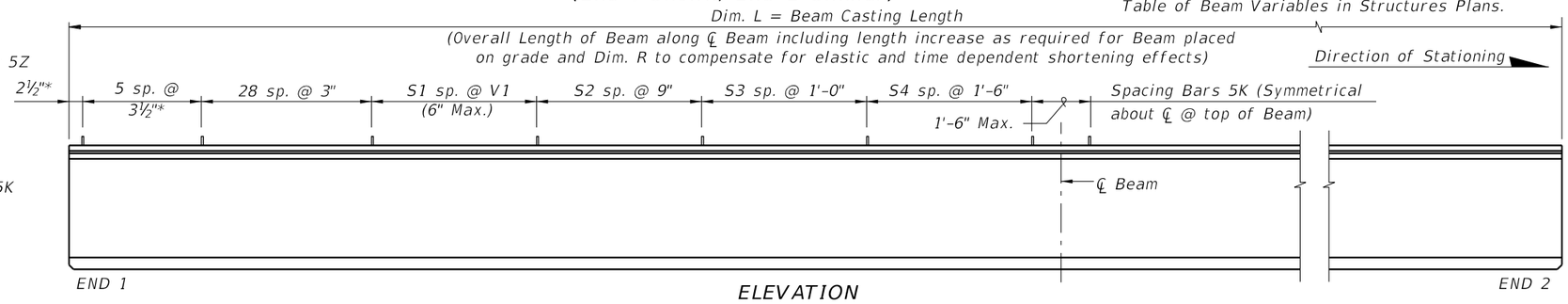
END VIEW



ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)



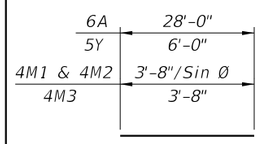
ELEVATION

CONVENTIONAL REINFORCING BAR BENDING DETAILS

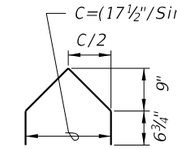
BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	6	8	28'-0"
C1	7, 8 & 9	3	20 (End 1)	Varies
C2	7, 8 & 9	3	20 (End 2)	Varies
D1	7, 8, 9 & 10	3	40 (End 1)	Varies
D2	7, 8, 9 & 10	3	40 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	7'-8"
M1	7 & 9	4	18 (End 1)	Varies
M2	7 & 9	4	18 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	⅜" Ø Strand	4	Dim. L
Y	8 & 9	5	16	6'-0"
Z	5, 6, 8, 9 & 10	5	12	7'-2"

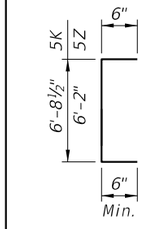
BENDING DIAGRAMS (See Note 2)



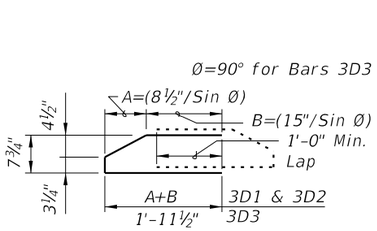
BARS 6A, 4M1, 4M2, 4M3 & 5Y



BARS 3C1 & 3C2



BARS 5K & 5Z



BARS 3D1, 3D2 & 3D3

NOTES:
A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.
B. For referenced notes, see Index 450-010.
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.

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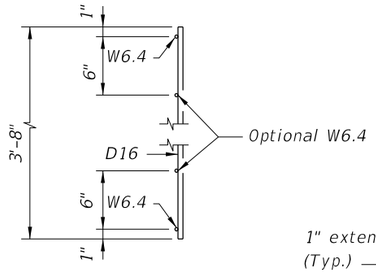
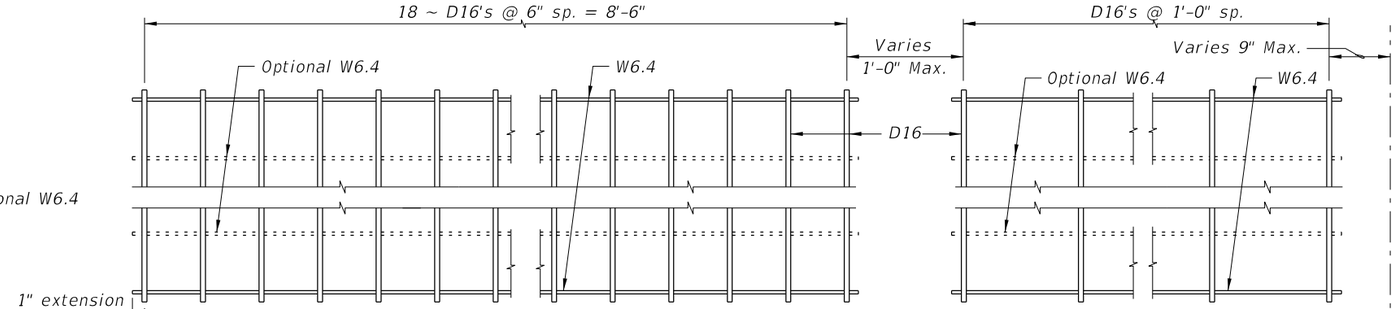
LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 78 BEAM - STANDARD DETAILS	INDEX 450-078	SHEET 1 of 2

ALTERNATE REINFORCING STEEL (WWR) DETAILS

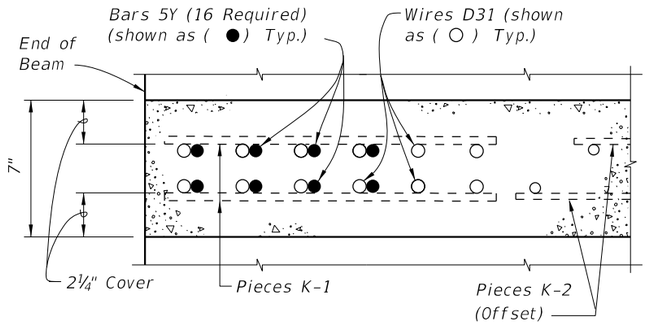


PIECES M
END VIEW

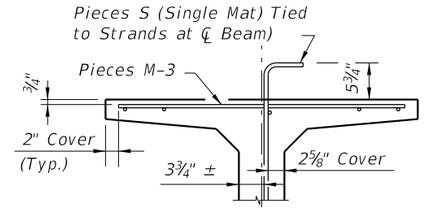


PLAN VIEW
PIECE M-1
(2 Required)

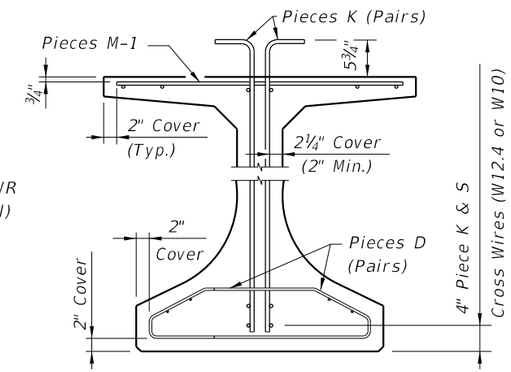
PLAN VIEW
PIECE M-3
(2 Required)



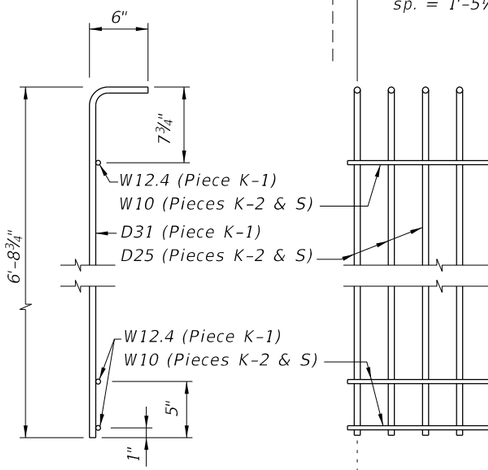
SECTION A-A
FOR WELDED WIRE REINFORCEMENT



PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands N not Shown for Clarity)

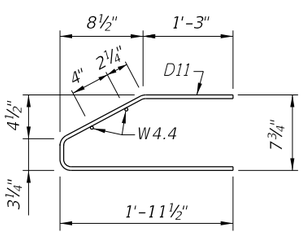


PIECES K & S
END VIEW

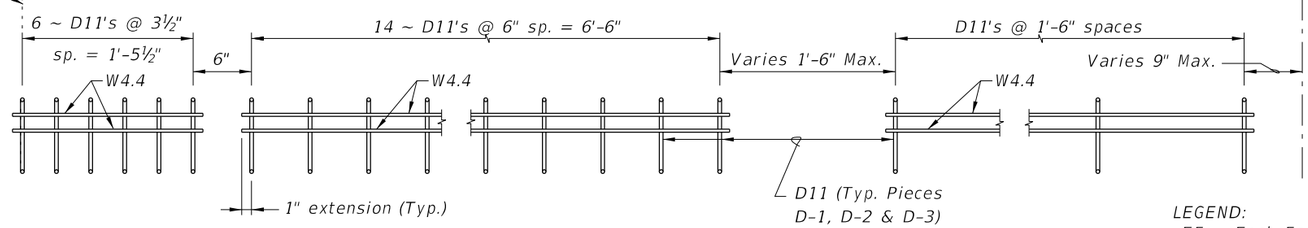
PIECE K-1
(Aligned EF)
(4 Required
~ 2 Pairs)

PIECE K-2
(FF Shown Solid, BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required ~ Each Piece)



PIECES D
END VIEW



PIECE D-1
(4 Required ~ 2 Pairs)

PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 6A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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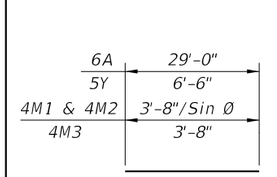
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	FLORIDA-I 78 BEAM - STANDARD DETAILS	INDEX	SHEET
11/01/16						450-078	2 of 2

CONVENTIONAL REINFORCING BAR BENDING DETAILS

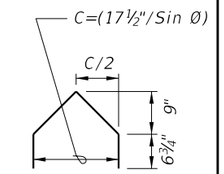
BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	6	8	29'-0"
C1	7, 8 & 9	3	21 (End 1)	Varies
C2	7, 8 & 9	3	21 (End 2)	Varies
D1	7, 8, 9 & 10	3	42 (End 1)	Varies
D2	7, 8, 9 & 10	3	42 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	8'-2"
M1	7 & 9	4	19 (End 1)	Varies
M2	7 & 9	4	19 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	½" Ø Strand	4	Dim. L
Y	8 & 9	5	16	6'-6"
Z	5, 6, 8, 9 & 10	5	12	7'-8"

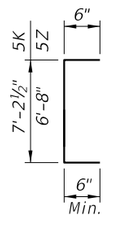
BENDING DIAGRAMS (See Note 2)



BARS 6A, 4M1, 4M2, 4M3 & 5Y

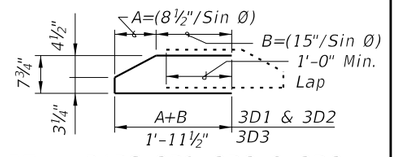


BARS 3C1 & 3C2

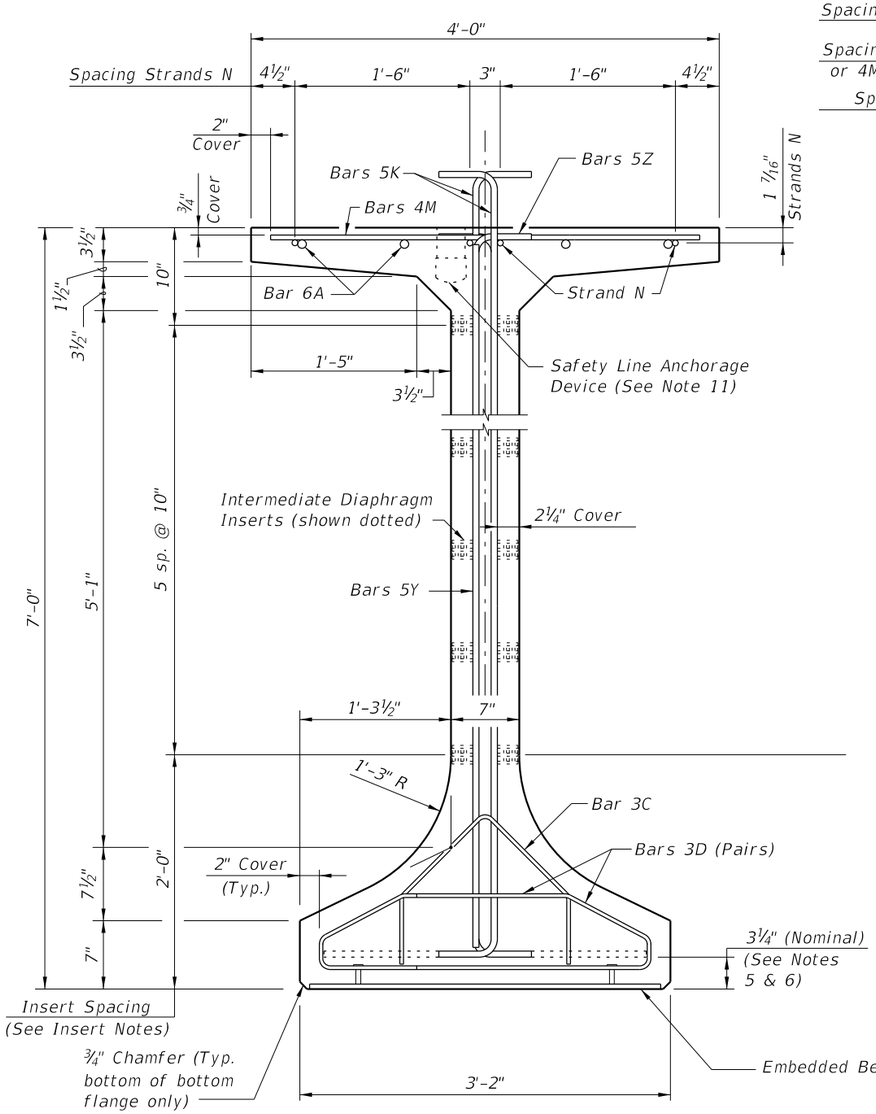


BARS 5K & 5Z

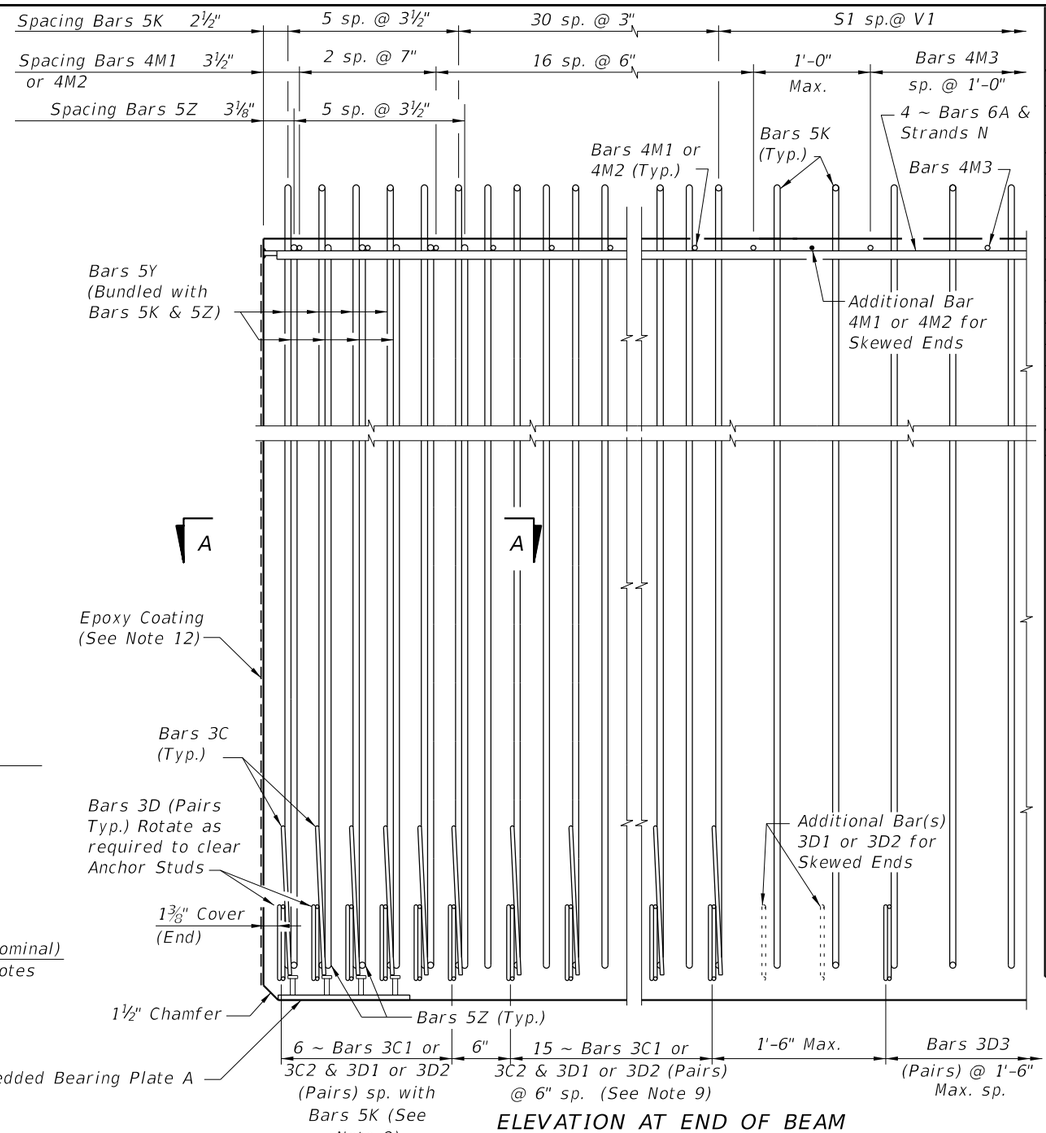
Ø=90° for Bars 3D3



BARS 3D1, 3D2 & 3D3



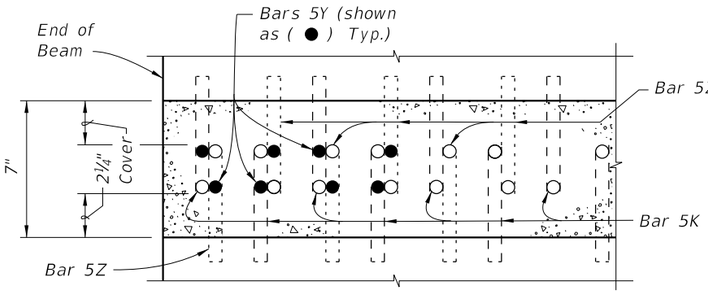
END VIEW



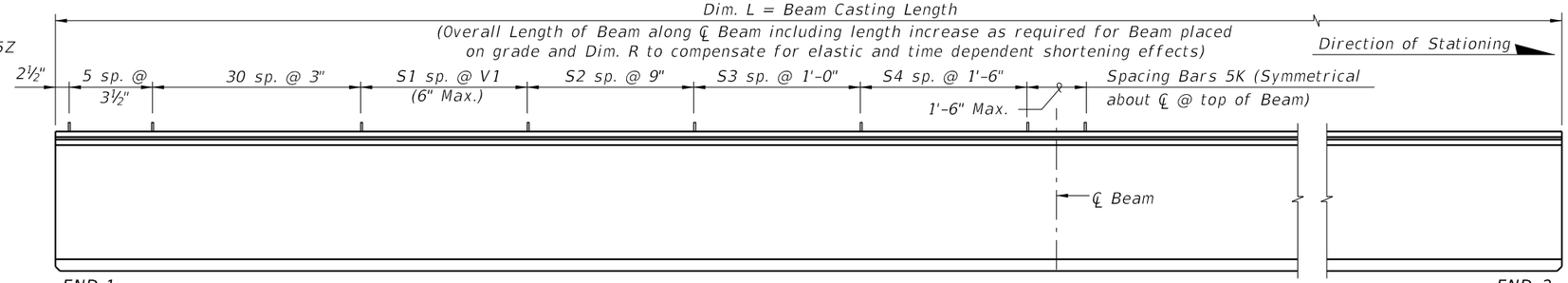
ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)

NOTES:

A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.
B. For referenced notes, see Index 450-010.
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)



ELEVATION

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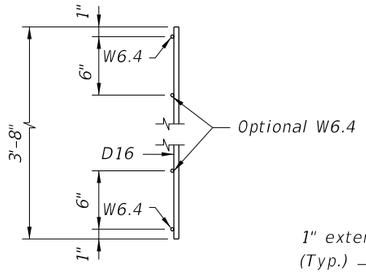
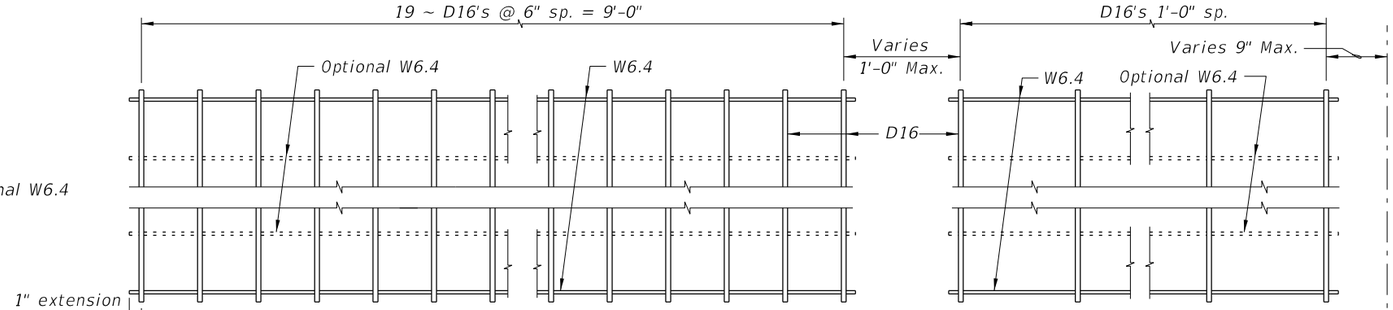
LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 84 BEAM - STANDARD DETAILS	INDEX 450-084	SHEET 1 of 2

ALTERNATE REINFORCING STEEL (WWR) DETAILS

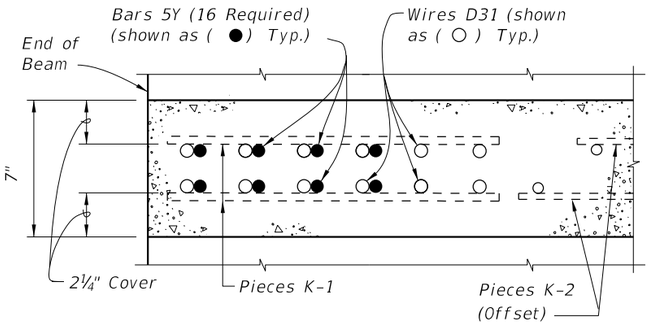


PIECES M
END VIEW

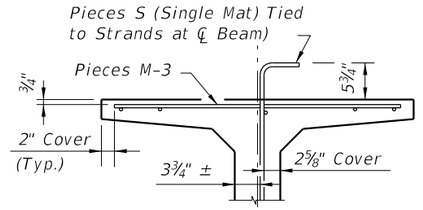


PLAN VIEW
PIECE M-1
(2 Required)

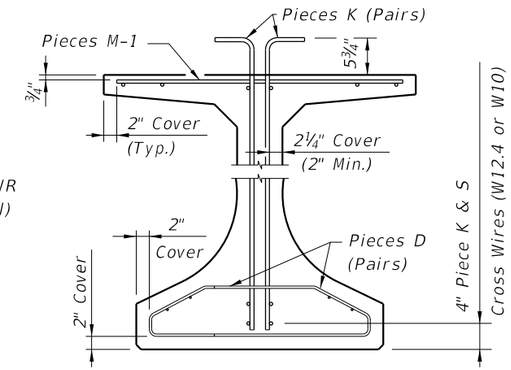
PLAN VIEW
PIECE M-3
(2 Required)



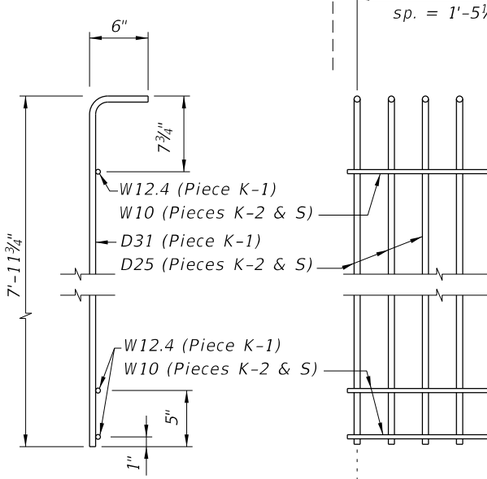
SECTION A-A
FOR WELDED WIRE REINFORCEMENT



PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands N not Shown for Clarity)

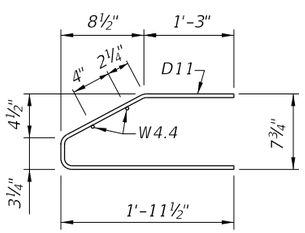


PIECES K & S
END VIEW

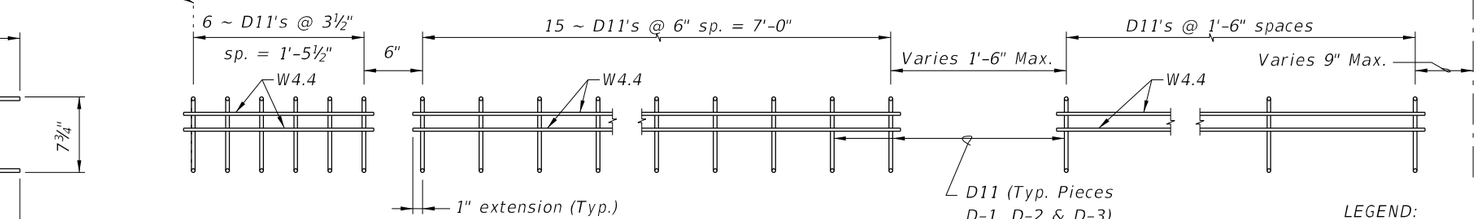
PIECE K-1
(Aligned EF)
(4 Required ~
2 Pairs)

PIECE K-2
(FF Shown Solid, BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required ~ Each Piece)



PIECES D
END VIEW



PIECE D-1
(4 Required ~ 2 Pairs)

PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 6A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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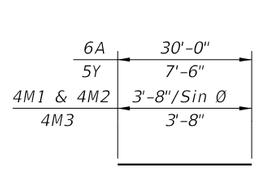
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 84 BEAM - STANDARD DETAILS	INDEX 450-084	SHEET 2 of 2

CONVENTIONAL REINFORCING BAR BENDING DETAILS

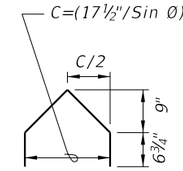
BILL OF REINFORCING STEEL

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 2)
A	—	6	8	30'-0"
C1	7, 8 & 9	3	23 (End 1)	Varies
C2	7, 8 & 9	3	23 (End 2)	Varies
D1	7, 8, 9 & 10	3	46 (End 1)	Varies
D2	7, 8, 9 & 10	3	46 (End 2)	Varies
D3	9 & 10	3	See Table	4'-3"
K	5, 6, 8, 9 & 10	5	See Table	9'-2"
M1	7 & 9	4	21 (End 1)	Varies
M2	7 & 9	4	21 (End 2)	Varies
M3	9	4	See Table	3'-8"
N	4 & 12	½" Ø Strand	4	Dim. L
Y	8 & 9	5	16	7'-6"
Z	5, 6, 8, 9 & 10	5	12	8'-8"

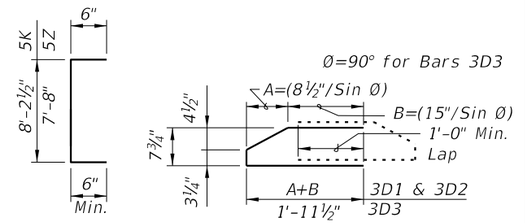
BENDING DIAGRAMS (See Note 2)



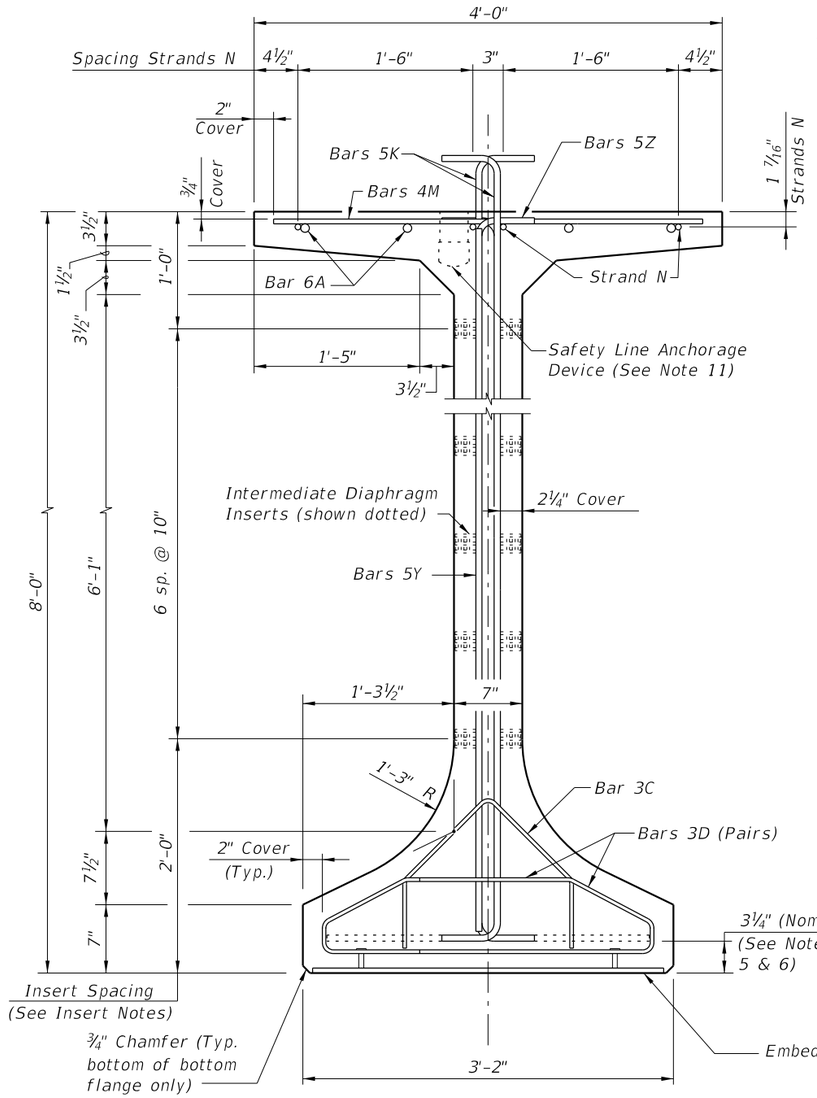
BARS 6A, 4M1, 4M2, 4M3 & 5Y



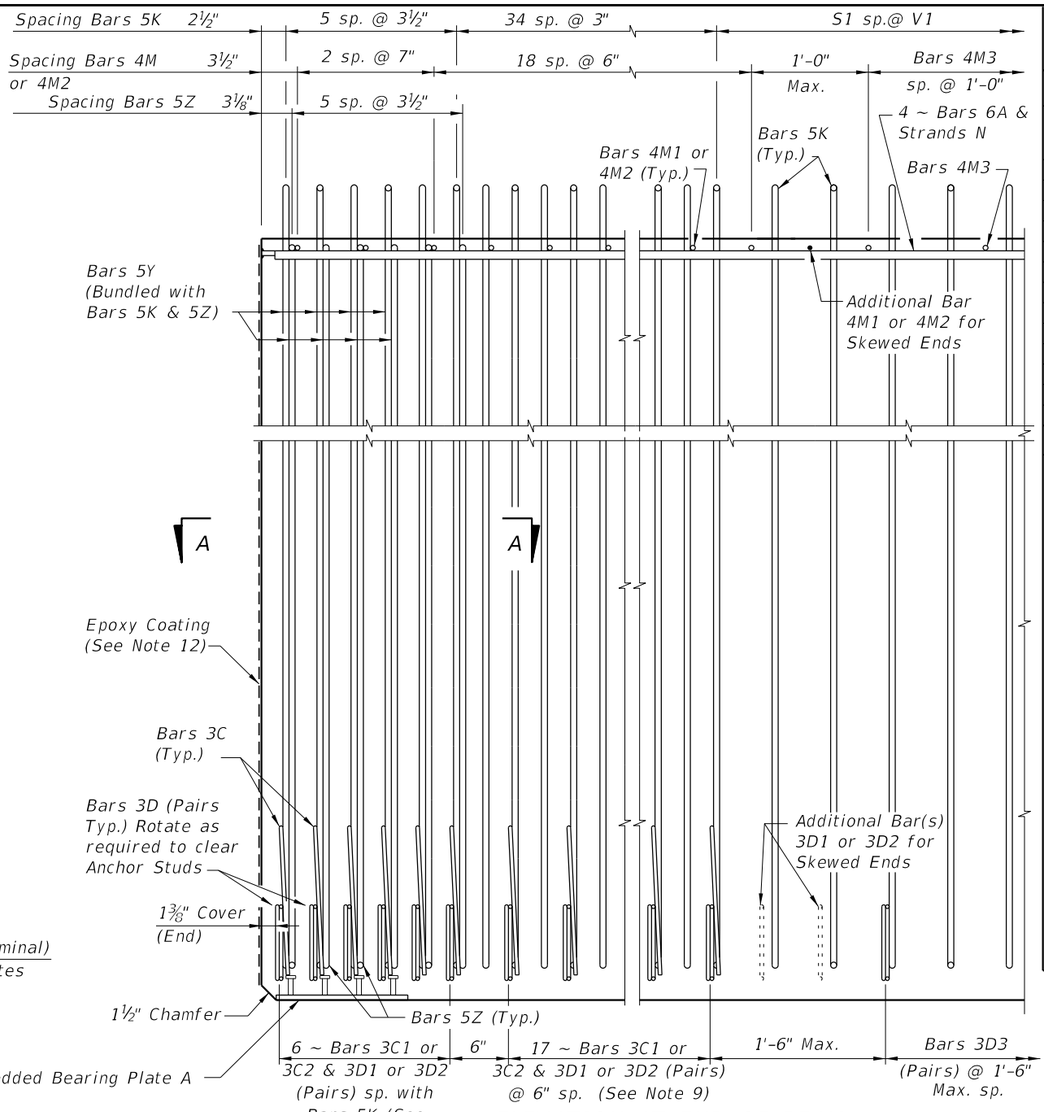
BARS 3C1 & 3C2



BARS 5K & 5Z BARS 3D1, 3D2 & 3D3



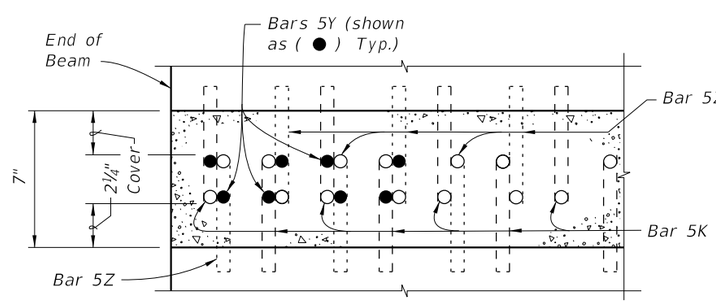
END VIEW



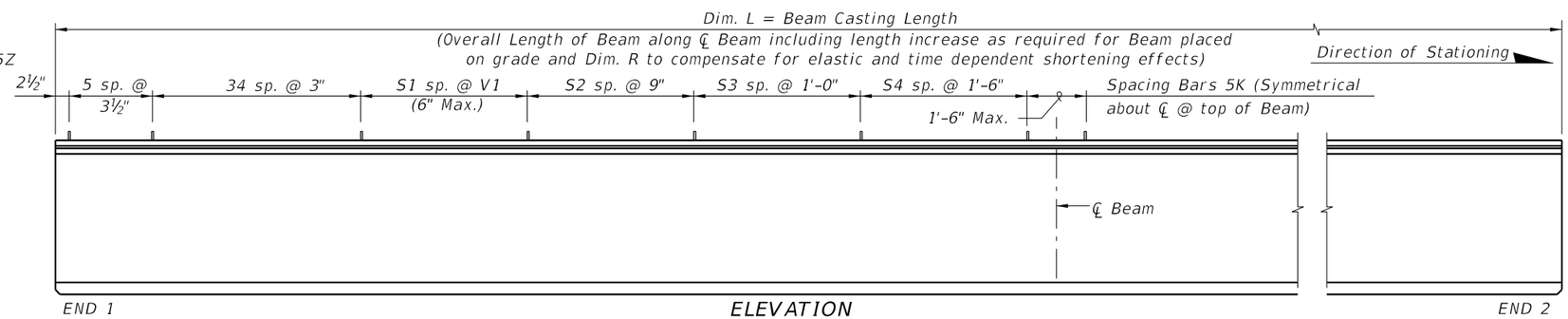
ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)
(End 1 Shown, End 2 Similar)

NOTES:

A. Work this Index with Index 450-010 – Typical Florida-I Beam Details and Notes and the Florida-I Beam – Table of Beam Variables in Structures Plans.
B. For referenced notes, see Index 450-010.
C. For Dimensions A, B, C, D, L, R & V1 and number of spaces S1 thru S4, see Florida-I Beam – Table of Beam Variables in Structures Plans.



SECTION A-A FOR CONVENTIONAL REINFORCING
(Showing Bars 5K, 5Y & 5Z Only)



ELEVATION

LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FY 2019-20 STANDARD PLANS	FLORIDA-I 96 BEAM - STANDARD DETAILS	INDEX 450-096	SHEET 1 of 2

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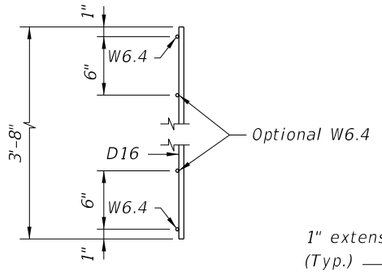
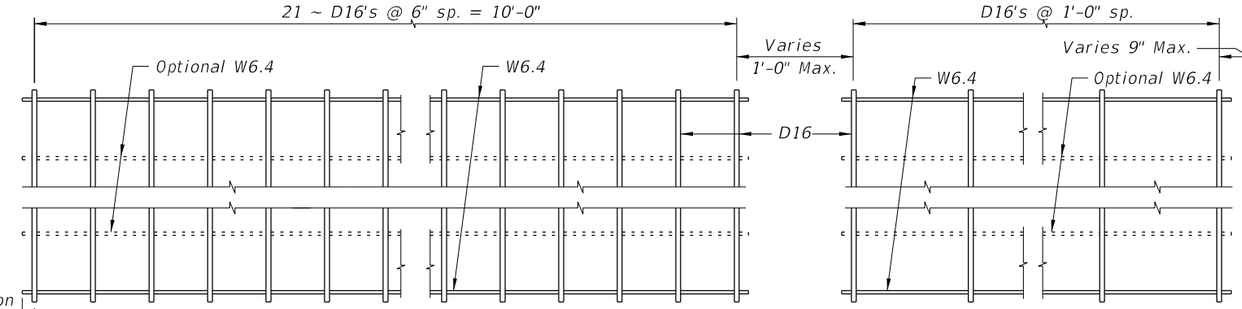
ALTERNATE REINFORCING STEEL (WWR) DETAILS

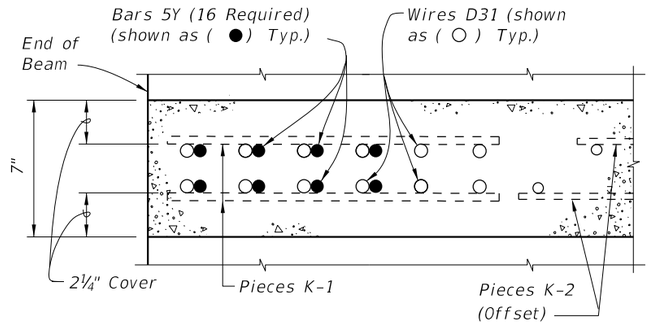


PIECES M
END VIEW

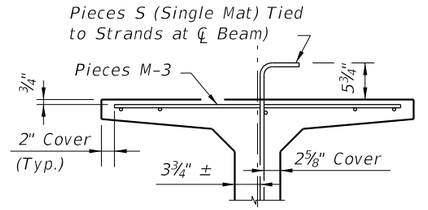


PLAN VIEW
PIECE M-1
(2 Required)

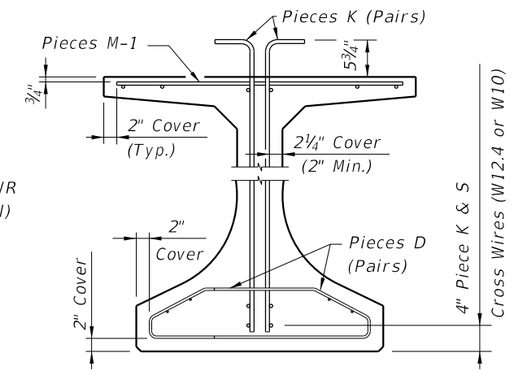
PLAN VIEW
PIECE M-3
(2 Required)



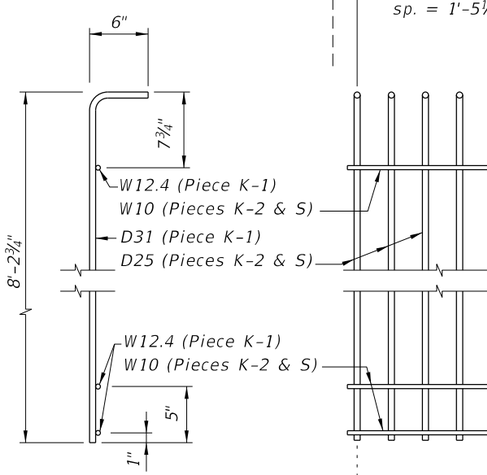
SECTION A-A
FOR WELDED WIRE REINFORCEMENT



PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, C, Y
and Strands N not Shown for Clarity)

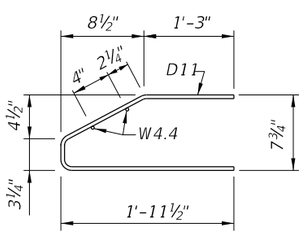


PIECES K & S
END VIEW

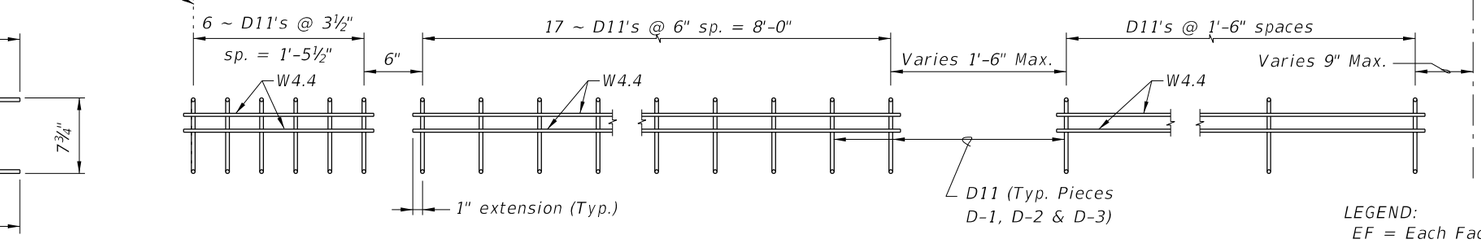
PIECE K-1
(Aligned EF)
(4 Required ~
2 Pairs)

PIECE K-2
(FF Shown Solid, BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required ~ Each Piece)



PIECES D
END VIEW



PIECE D-1
(4 Required ~ 2 Pairs)

PIECE D-2
(4 Required ~ 2 Pairs)

PIECE D-3
(4 Required ~ 2 Pairs)

LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face

NOTES:

a. See Sheet 1 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 6A & 3C as shown on Sheet 1. Place additional Bars 5Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1, D-2 & M-1 shall not be used; Conventional Reinforcement Bars D1, D2, C1, C2, M1 & M2 shall be used. See Index 450-010 Skewed Beam End Details and Note 9 for placement details. Shift Pieces K & Bars 5Y to accommodate skewed end conditions and align with Bars C and D.

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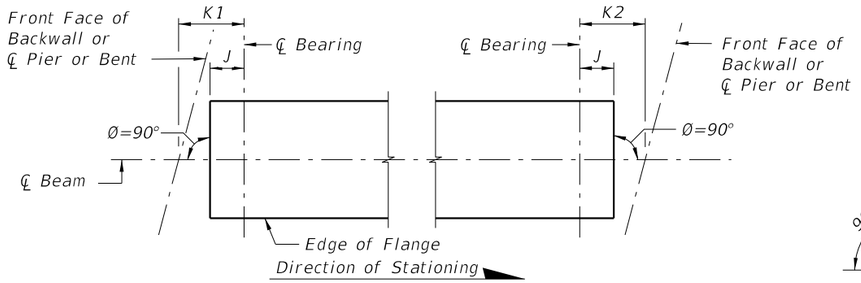
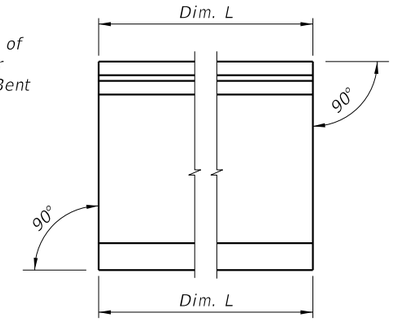
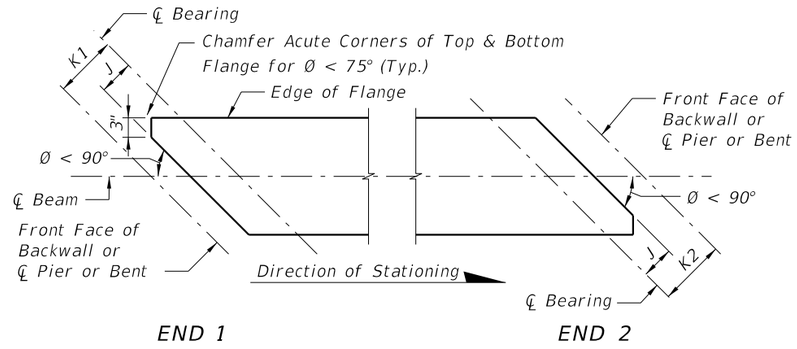
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	FLORIDA-I 96 BEAM - STANDARD DETAILS	INDEX	SHEET
11/01/16					450-096	2 of 2



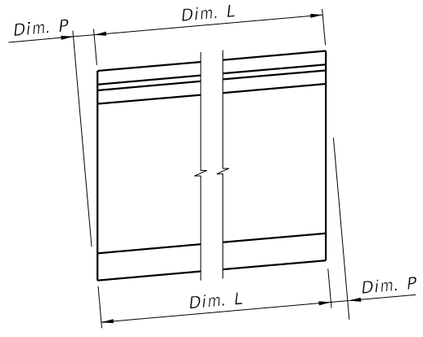
CASE 1
(Standard Orientation for New Construction)



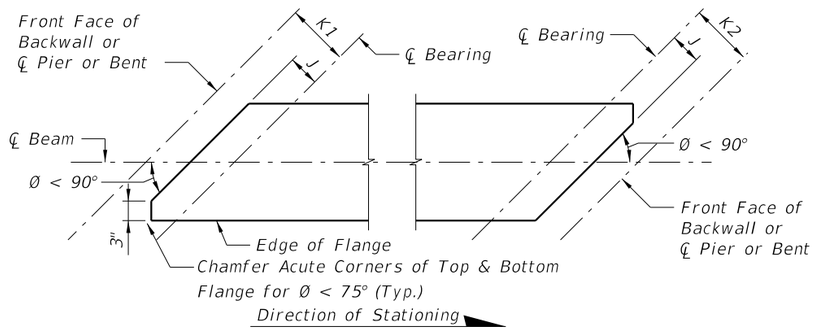
CONDITION 1
(Dim P = 0.0)



CASE 2
(Special Orientation for Widenings)

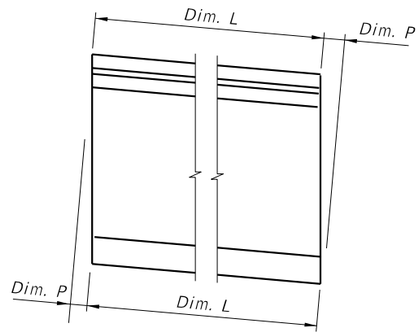


CONDITION 2



CASE 3
(Special Orientation for Widenings)

SCHEMATIC PLAN VIEWS AT BEAM ENDS



CONDITION 3

SCHEMATIC END ELEVATIONS OF BEAMS
(Showing Vertical Bevel of Beam End)

BEAM NOTES

1. Work this Index with the Table of Beam Variables in Structures Plans.
2. All bar bend dimensions are out to out.
3. Concrete cover: 2 inches minimum.
4. Strands N: 3/8" Ø minimum, stressed to 10,000 lbs. each.
5. Place one (1) Bar 4K or 5Z at each location. Alternate the direction of the ends for each bar.
6. Tie Bars 4K and 5Z to the fully bonded strands in the bottom or center row (see "STRAND PATTERN" on the Table of Beam Variables sheet in Structures Plans).
7. Place Bars 3D1 in beam END 1, and Bars 3D2 in beam END 2.
8. For Beams with vertically beveled end conditions:
   - A. Place first row of Bars 3D1, 3D2, 4K, 4Y and 5Z parallel to the end of the beam. Progressively rotate remaining bars within the limits of Bars 5Z until vertical by adjusting the spacing at the top of beam up to a maximum of 1".
   - B. For deformed WWR, cut top cross wire and rotate bars as required or reduce end cover at top of the beam to minimum 1".
9. For beams with skewed end conditions:
   - A. WWR is not permitted for end reinforcement Bars 3D1, and 3D2 on skewed ends; use bar reinforcement.
   - B. Place end reinforcement parallel to the skewed end of the beam. End reinforcement is defined as Bars 3D1, 3D2, 4K, 4Y and 5Z placed within the limits of the spacing for Bars 3D in "ELEVATION AT END OF BEAM".
   - C. Beyond the limits of the spacing for Bars 3D, place Bars 4K perpendicular to the longitudinal axis of the beam. For placement see "SKEWED BEAM END DETAILS FOR WIDENING EXISTING BRIDGES" (Sheet 2).
10. Contractor Options:
    - A. Deformed WWR may be used in lieu of Bars 3D, 4K, and 5Z as shown on Sheet 4; except at skewed ends (See Note 9).
    - B. Bars 3D1 and 3D2 may be fabricated as a two-piece bar with a 1'-0" minimum lap splice of the bottom legs.
    - C. For deformed WWR, supplemental transverse #4 bars are permitted to support Pieces K & S under the cross wires on the bottom row of strands or above Strands N.
11. Embedment of Safety Line Anchorage Devices are permitted in the top flange to accommodate fall protection systems. See shop drawings for details and spacing of required anchorage devices.
12. For beams with ends that will not to be encased in concrete diaphragms, cut wedges and recess Prestressing Strands at the end of the beam without damaging the surrounding concrete. See "STRAND CUTTING AND PROTECTING DETAIL" on Sheet 2.
13. Holes in the beam web for temporary bracing or shipping devices must be formed prior to casting. Fill holes not meeting all the following criteria in accordance with Specification Section 450.
    - A. The superstructure environmental classification is slightly or moderately aggressive
    - B. Clear cover to adjacent steel reinforcing is 1"or greater
    - C. Hole inside diameter is 2" maximum
    - D. Non-metallic, non-water absorbing forming materials such as PVC, may be left in place permanently.

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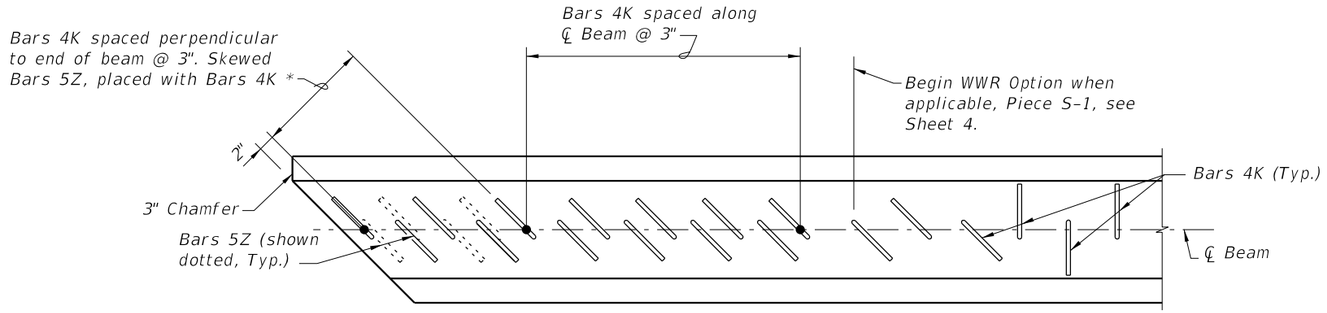
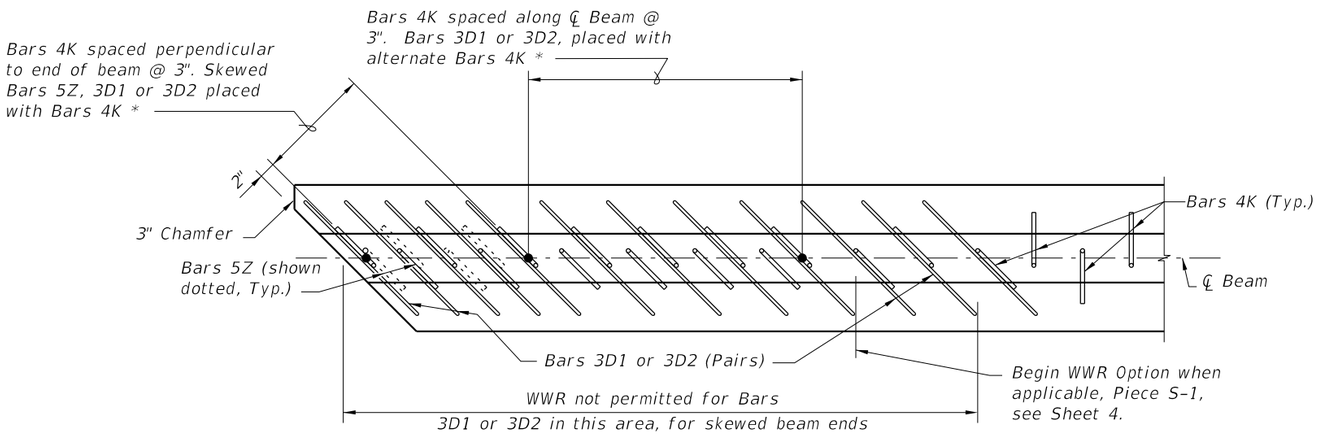
DETAILS AND NOTES

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	AASHTO TYPE II BEAM	INDEX	SHEET
11/01/18					450-120	1 of 4



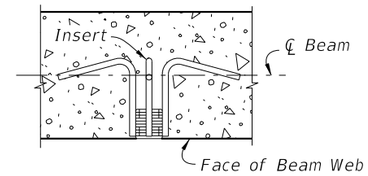
PARTIAL PLAN VIEW (SHOWING TOP FLANGE)
(End 1 Shown, End 2 Similar)
(Bars 5A, 4Y & Strands N not shown for clarity)

* For number of Bars, spacing and placement details see Sheet 3. See Sheet 3 for Conventional Reinforcement, Sheet 4 for WWR.



PARTIAL SECTION THRU WEB (SHOWING BOTTOM FLANGE)
(End 1 Shown, End 2 Similar)
(Bars 4Y & Strands not shown for clarity)

SKEWED BEAM END DETAILS FOR WIDENING EXISTING BRIDGES

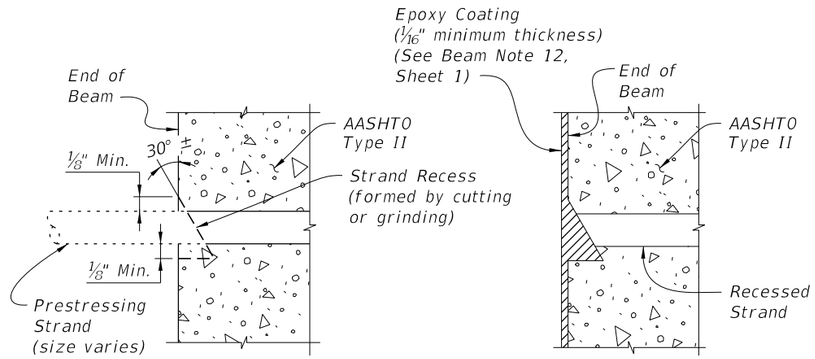


PLAN SECTION THRU BEAM WEB AT INSERT FOR DIAPHRAGM REINFORCING
(When Intermediate Diaphragms are Required by Design)

INSERT NOTES

1. Provide 1" Ø, zinc-electroplated, ferrule wing nut or coil inserts, UNC threads, 1/0 minimum gage wire, not more than 4" in depth with a minimum ultimate tensile strength of 11,400 lbs. in 4,000 psi concrete.
2. If inserts are needed on both sides (faces) of beam webs, an assembly as long as the thickness of the beam web, consisting of two (2) ferrule or coil inserts attached by two (2) or more struts may be utilized. The connecting struts shall have a minimum ultimate tensile strength of 11,400 lbs.
3. Inserts for diaphragm reinforcing are required at each end of each intermediate diaphragm shown on the Beam Framing Plan and may be required at the end of the beams when end diaphragms are shown. See Superstructure and Beam Framing Plans for longitudinal location of inserts for each face of beam.

INSERT DETAIL

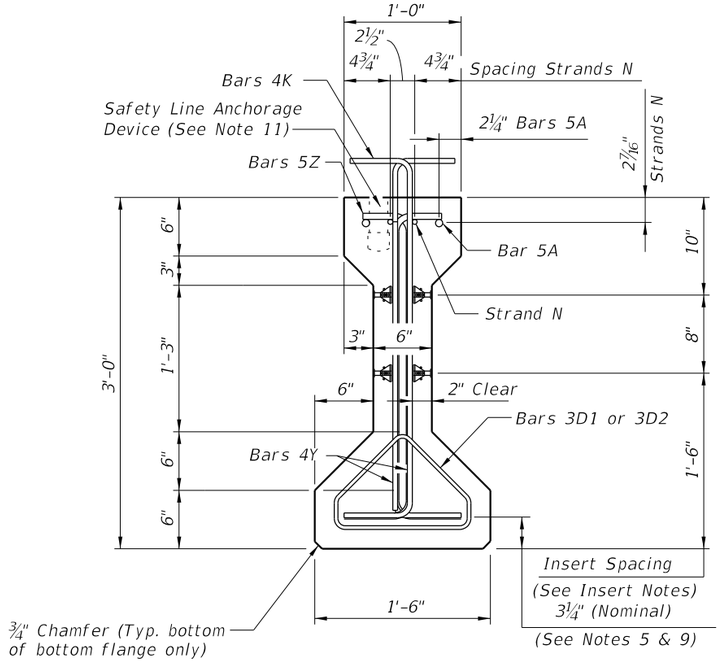


TYPICAL SECTION SHOWING CUT STRAND RECESS LIMITS

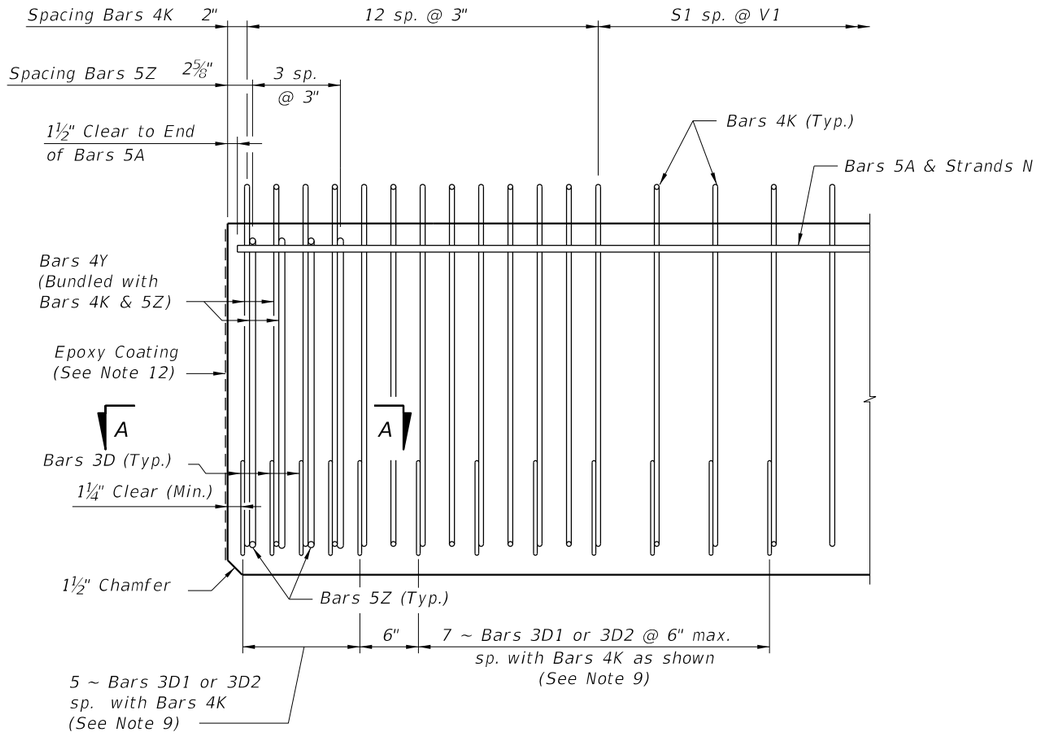
TYPICAL SECTION AFTER PROTECTING

STRAND CUTTING AND PROTECTING DETAIL

DETAILS AND NOTES



END VIEW

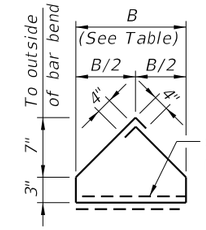


ELEVATION AT END OF BEAM
(Flanges Not Shown For Clarity)

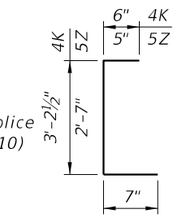
BILL OF REINFORCING STEEL FOR ONE BEAM ONLY

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 1)
A	—	5	4	12'-0"
D1	8, 9 & 10	3	12	See Table
D2	8, 9 & 10	3	12	See Table
K	5, 6, 8, 9 & 10	4	See Table	4'-4"
N	4 & 12	⅜" Ø Strand	2	DIM L+5"
Y	8 & 9	4	8	2'-6"
Z	5, 6, 8, 9 & 10	5	8	3'-7"

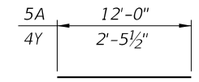
BENDING DIAGRAMS (See Note 1)



BARS 3D1 & 3D2



BARS 4K & 5Z



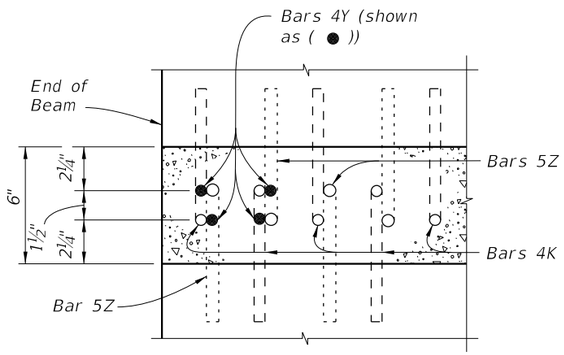
BARS 5A & 4Y

NOTES:

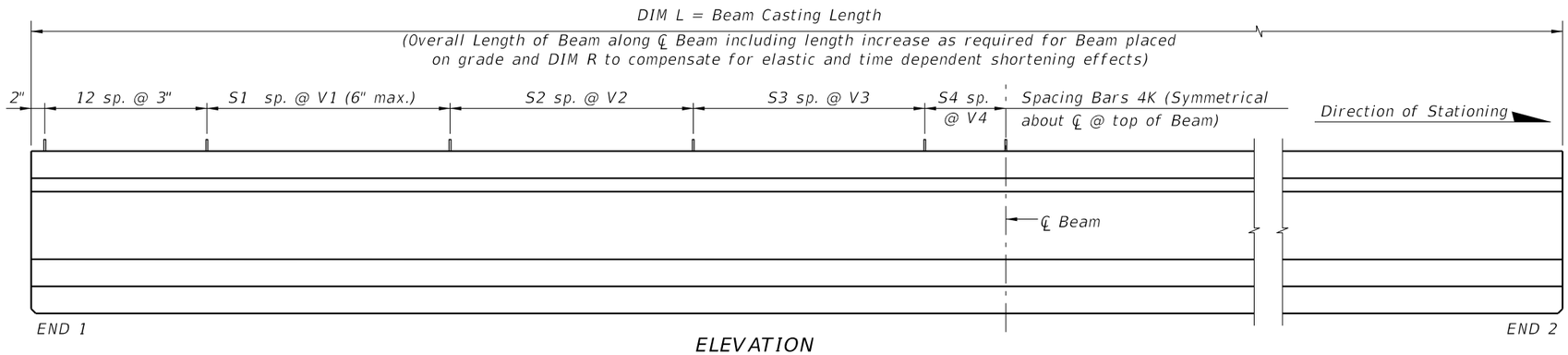
Work this Index with the AASHTO Type II Beam – Table of Beam Variables in Structures Plans.

For referenced notes, see Sheet 1.

For Dimensions L, R, V1 thru V4 and number of spaces S1 thru S4, see AASHTO Type II Beam – Table of Beam Variables.



SECTION A-A
(Showing Bars 4K, 4Y & 5Z Only)



ELEVATION

STANDARD DETAILS

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2019-20 STANDARD PLANS	AASHTO TYPE II BEAM	450-120	3 of 4

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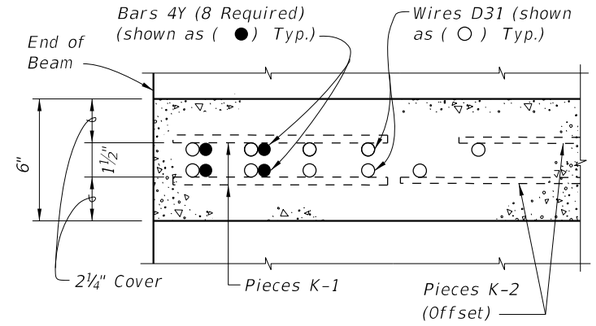
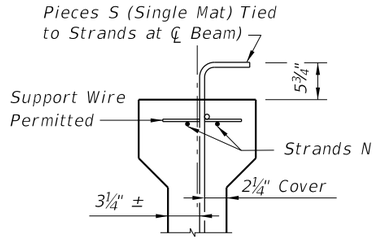
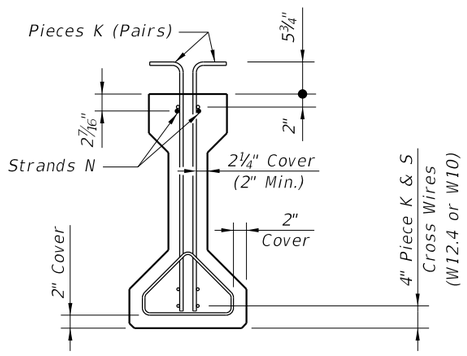


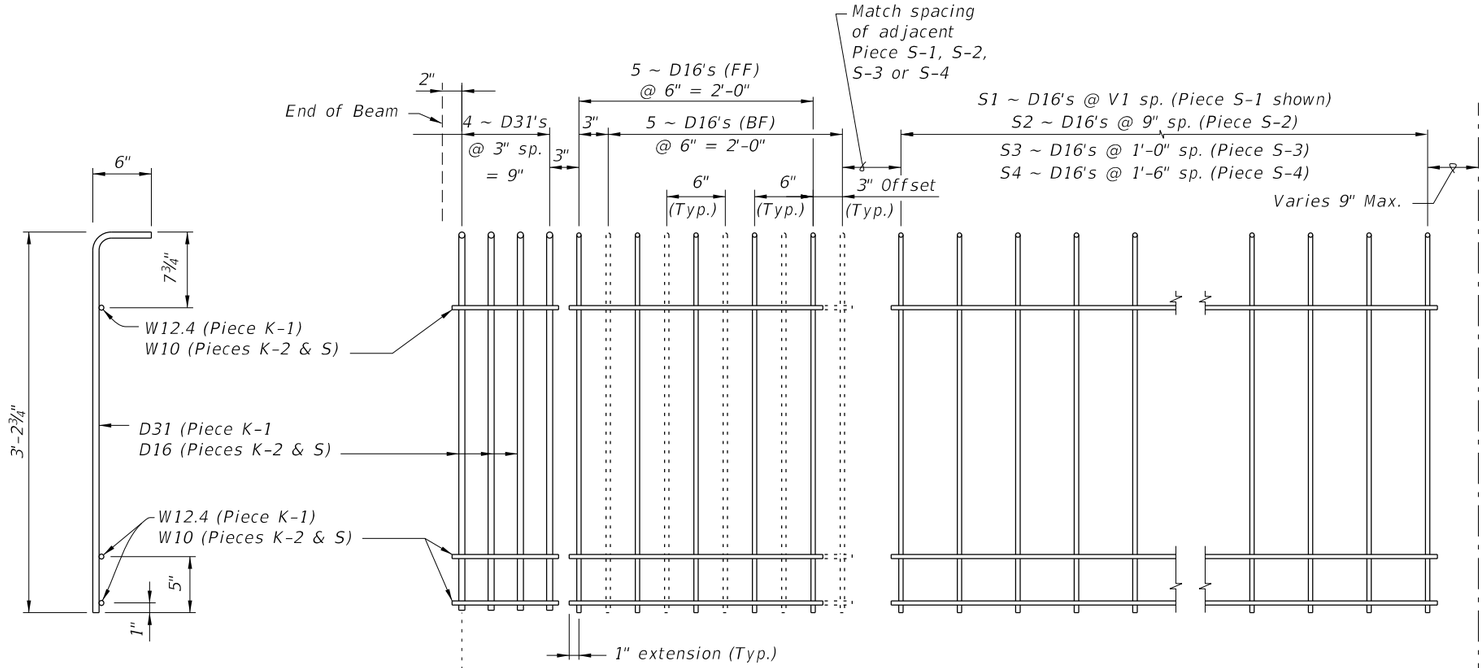
SECTION A-A
FOR WELDED WIRE REINFORCEMENT



PARTIAL SECTION AT CENTER BEAM



PARTIAL BEAM END VIEW
(Conventional Reinforcing Bars A, Y and
Bottom Strands not Shown for Clarity)

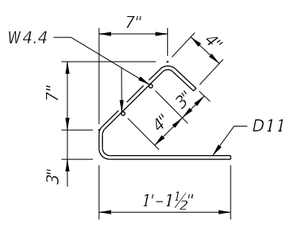


PIECES K & S
END VIEW

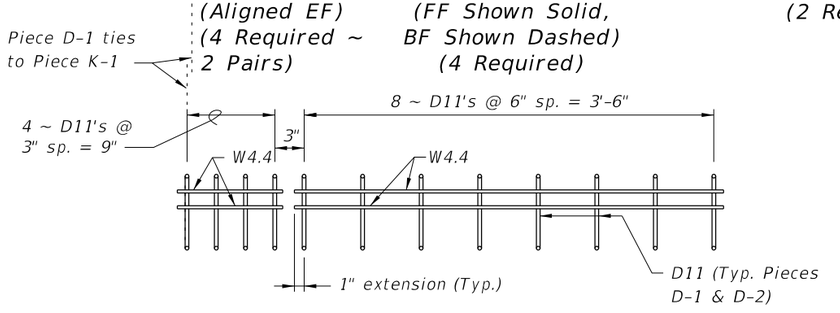
PIECE K-1
(Aligned EF)
(4 Required ~
2 Pairs)

PIECE K-2
(FF Shown Solid,
BF Shown Dashed)
(4 Required)

PIECE S-1, S-2, S-3 or S-4
(2 Required Each Piece)



PIECES D
END VIEW



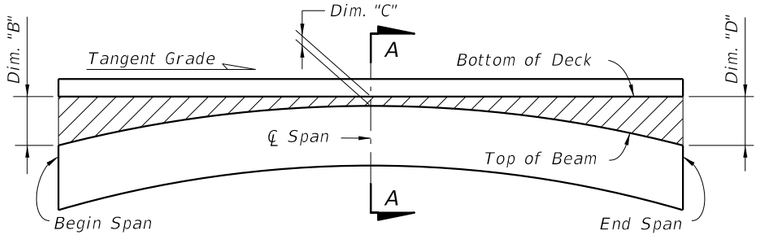
PIECE D-1
(4 Required ~ 2 Pairs)

PIECE D-2
(4 Required ~ 2 Pairs)

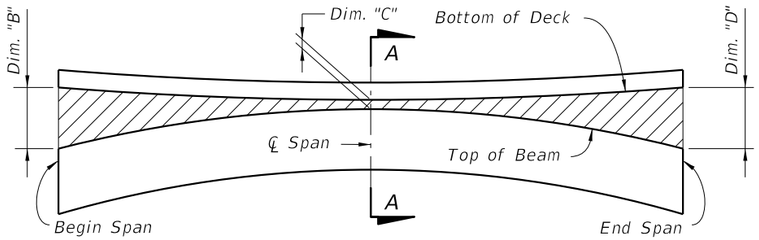
LEGEND:
EF = Each Face
FF = Front Face
BF = Back Face

NOTES:
a. See Sheet 3 for placement details & Table of Beam Variables in Structures Plans for variables S1, S2, S3, S4 & V1.
b. Place Conventional Reinforcement Bars 5A as shown on Sheet 3. Place additional Bars 4Y as shown in Section A-A for WWR. Bars 5Z will not be used with the WWR Option.
c. Pieces may be fabricated in multiple length sections.
d. For beams with skewed end conditions, Pieces D-1 & D-2 shall not be used; Conventional Reinforcement Bars D1 & D2 shall be used. See Sheet 2 Skew Details and Sheet 1 Note 9 for placement details. Shift Pieces K & Bars 4Y to accommodate skewed end conditions and align with Bars D.

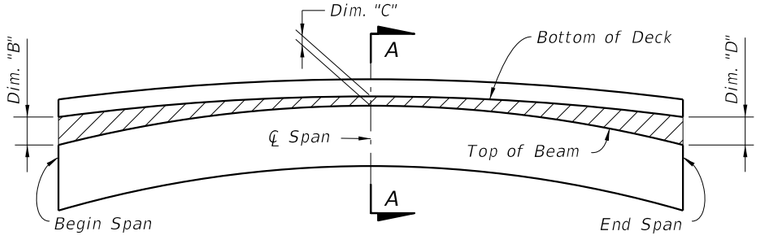
STANDARD DETAILS



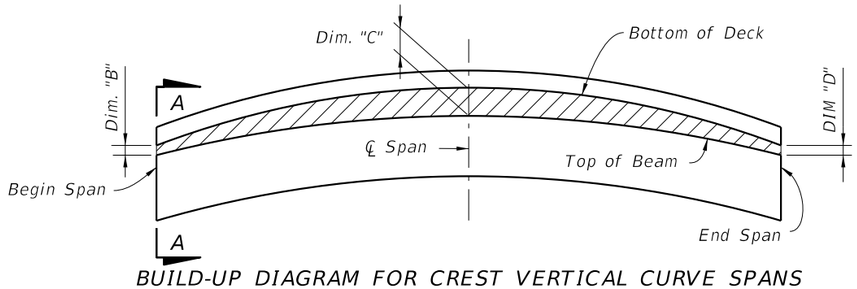
BUILD-UP DIAGRAM FOR TANGENT SPANS
(ALONG ℄ BEAM) (CASE 1)



BUILD-UP DIAGRAM FOR SAG VERTICAL CURVE & HORIZONTAL CURVE SPANS
(ALONG ℄ BEAM) (CASE 2)



BUILD-UP DIAGRAM FOR CREST VERTICAL CURVE SPANS
- CONTROL AT ℄ SPAN
(ALONG ℄ BEAM) (CASE 3)

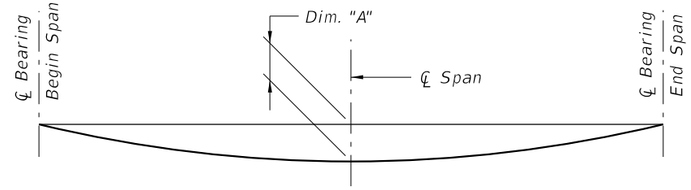


BUILD-UP DIAGRAM FOR CREST VERTICAL CURVE SPANS
- CONTROL AT BEGIN OR END SPAN
(ALONG ℄ BEAM) (CASE 4)

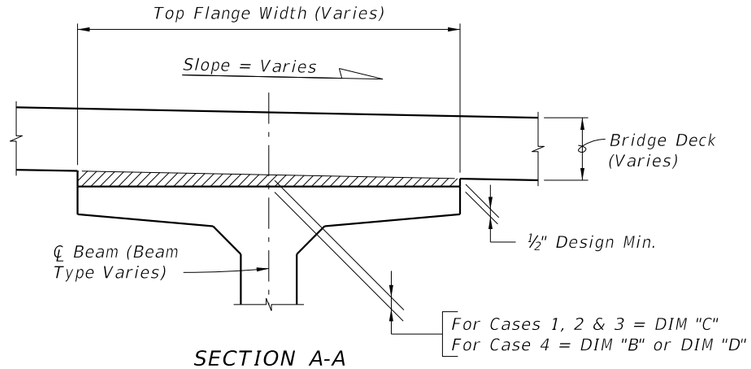
BEAM CAMBER AND BUILD-UP NOTES:

The build-up values given in the Data Table* are based on theoretical beam cambers. The Contractor shall monitor beam cambers for the purpose of predicting camber values at the time of the deck pour. If the predicted cambers based on field measurements differ more than +/- ½" from the theoretical "Net Beam Camber @ 120 Days" shown in the Data Table*, obtain approval from the Engineer to modify the build-up dimensions as required. When the measured beam cambers create a conflict with the bottom mat of deck steel, notify the Engineer a minimum of 21 days prior to casting.

Dim. "A" includes the weight of the Stay-In-Place Formwork.



DEAD LOAD DEFLECTION DIAGRAM



SECTION A-A
BUILD-UP OVER BEAMS
(Florida-I Beam Shown
AASHTO Type II Similar)

* NOTE:
Work this Index with the Build-up and Deflection Data Table for Florida-I and AASHTO Type II Beams in Structures Plans.

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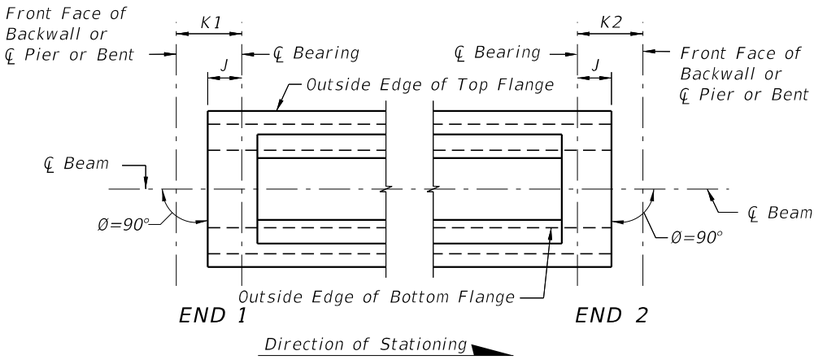
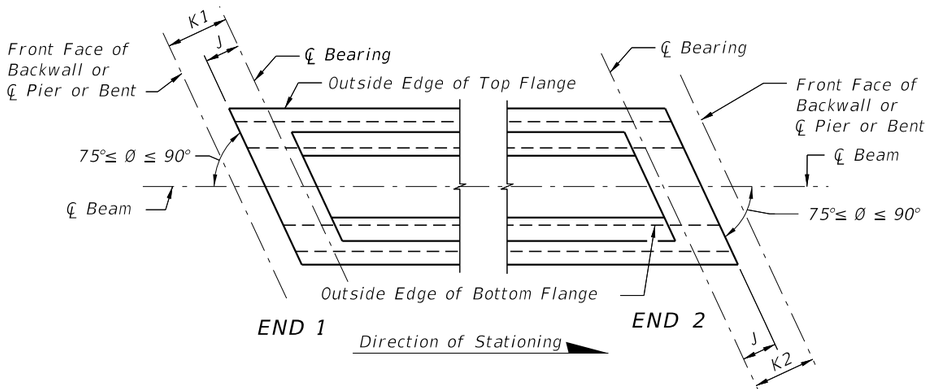
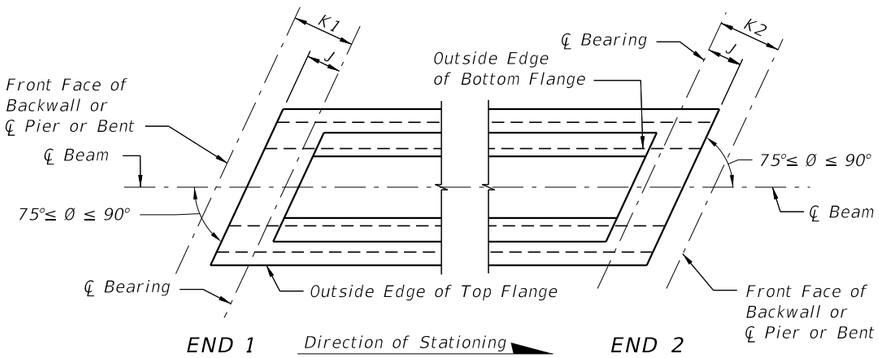
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	PRESTRESSED I-BEAMS BUILD-UP & DEFLECTION DATA	INDEX	SHEET
07/01/15						450-199	1 of 1



CASE 1



CASE 2



CASE 3

SCHEMATIC PLAN VIEWS AT BEAM ENDS

BEAM NOTES

1. Work this Index with the Florida-U Beam Standard Details (Index 450-248, 450-254, 450-263 and 450-272) and the Table of Beam Variables in Structures Plans.
2. All bar bend dimensions are out-to-out.
3. Concrete cover: 2 inches minimum. Maximum aggregate size is a No. 67.
4. Concrete face may be sloped with a maximum 1:24 draft to facilitate formwork removal.
5. Strands N: $\frac{3}{8}$" Ø minimum, stressed to 10,000 lbs. each.
6. Tie Bars 5K to the fully bonded strands in the bottom row (see "STRAND PATTERN" on the Table of Beam Variables sheet in Structures Plans).
7. For beams without skewed ends or vertically beveled end conditions (see Note 8) the Engineer may approve the use of deformed WWR in lieu of Bars 6A1, 4A2, 5B, 4C, 3D, 5E, 4F, 4G, 4H, 5K, 5L and 4M. The spacing and sizes of deformed WWR must match the reinforcing sizes shown on the Florida-U Beam Standard Details sheets.
8. For Beams with vertically beveled end conditions, where "Dim. P" exceeds 1", place Bars 5E, and the first Bars 4F and 5K parallel to the end of the beam. Fan the remaining Bars 4F and 5K within the limits of "Dim. B" (End Diaphragm) at equal spaces until vertical.
9. Embedment of Safety Line Anchorage Devices are permitted in the top flange to accommodate fall protection systems. See shop drawings for details and spacing of any anchorage devices or other required embedded hardware.
10. Intermediate diaphragms must be cast and concrete release strength obtained prior to removing the beam from casting bed.
11. Place drains pipes adjacent to each web at each beam end (four drains per beam).
    - A. Drain Pipe: 2" NPS Schedule 80 PVC.
    - B. Cover, wrap and secure wire screen around the end of the pipe prior to casting. Extend screen a minimum of 1" down the pipe sides.
    - C. Provide removable pipe plugs during casting. Remove plugs from the inside of pipes after casting.
12. Protection of Strands:
    - A. Provide a 2" deep recess around all strands (including dormant) or strand groups. Extend the recessed blockout to the web face and bottom of the flange for the bottom row of strands.
    - B. After detensioning, cut strands $\frac{1}{2}$" from recessed surface and fill the blockout to protect strands with Type F-2 or Q Epoxy Compound in accordance with Specification Section 926.
13. Use Stay-In-Place metal deck forms inside the beams.
14. Prior to deck placement, provide temporary blocking under each web at both ends of every beam. Ensure the temporary blocking is adequate to resist movements and rotations during deck placement. Leave temporary blocking and bracing in place for a minimum of four days after the deck is placed.
15. Based on the deck forming system and deck placement sequence, evaluate and provide any required temporary bracing between the U Beams.

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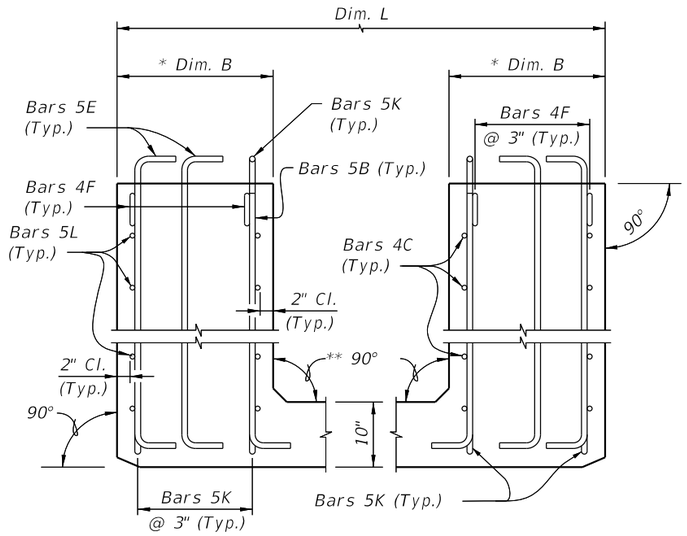
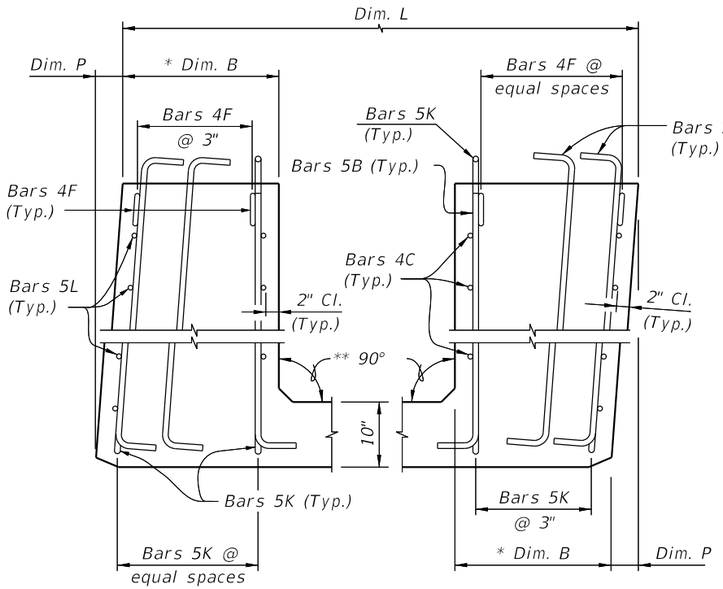
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-U BEAM - TYPICAL DETAILS & NOTES	INDEX 450-210	SHEET 1 of 2



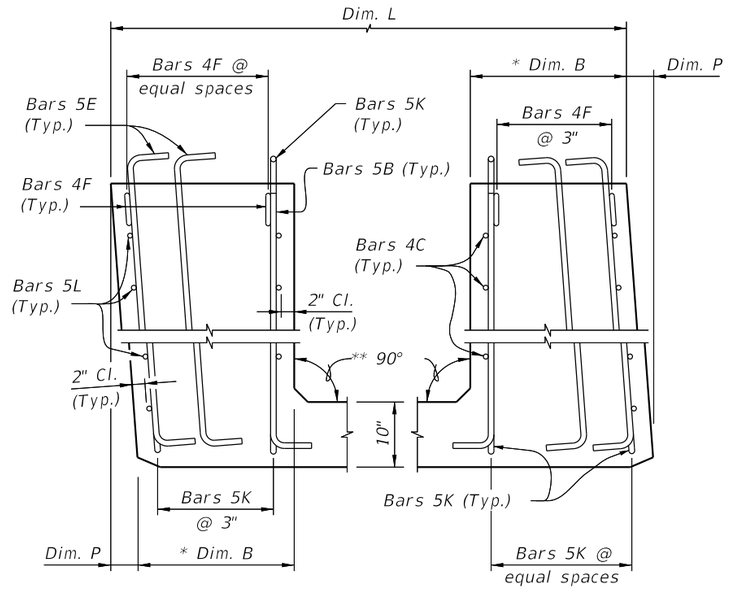
* Dim. B is 1'-6" for Florida-U 48 and 54 Beams and 2'-0" for Florida-U 63 and 72 Beams.

** Note 4, Sheet 1.

CONDITION 1
(P = 0.0)



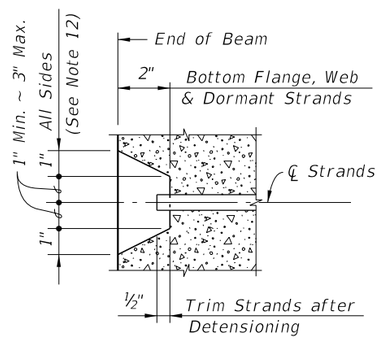
CONDITION 2



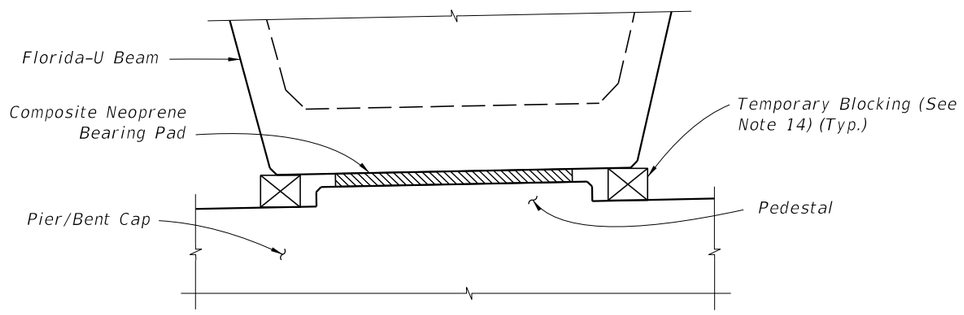
CONDITION 3

SCHEMATIC END ELEVATIONS OF BEAMS

(Showing Vertical Bevel of Beam End)



TYPICAL STRAND BLOCKOUT DETAIL



TEMPORARY BLOCKING OF BEAM ENDS

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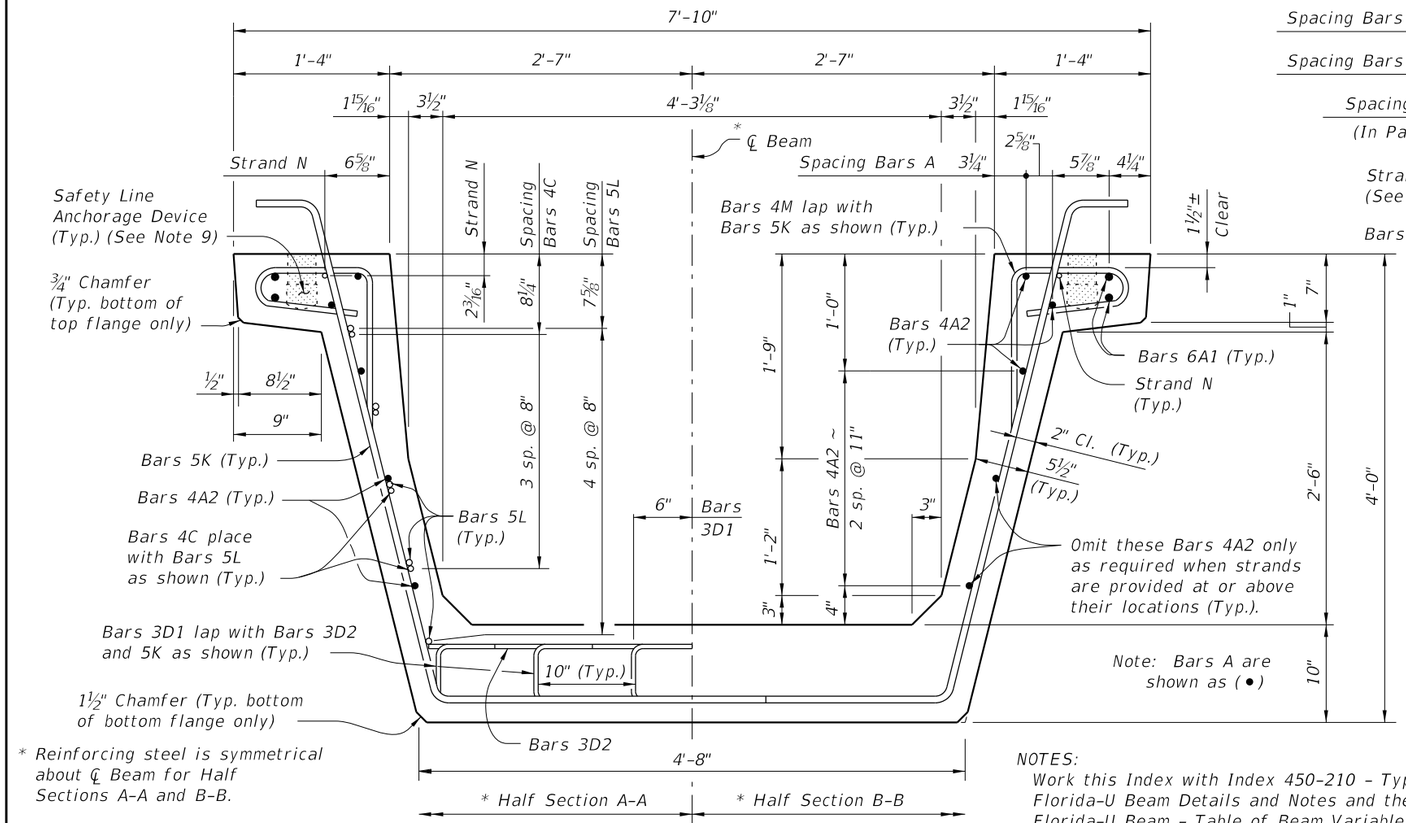
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2019-20 STANDARD PLANS	FLORIDA-U BEAM - TYPICAL DETAILS & NOTES	450-210	2 of 2



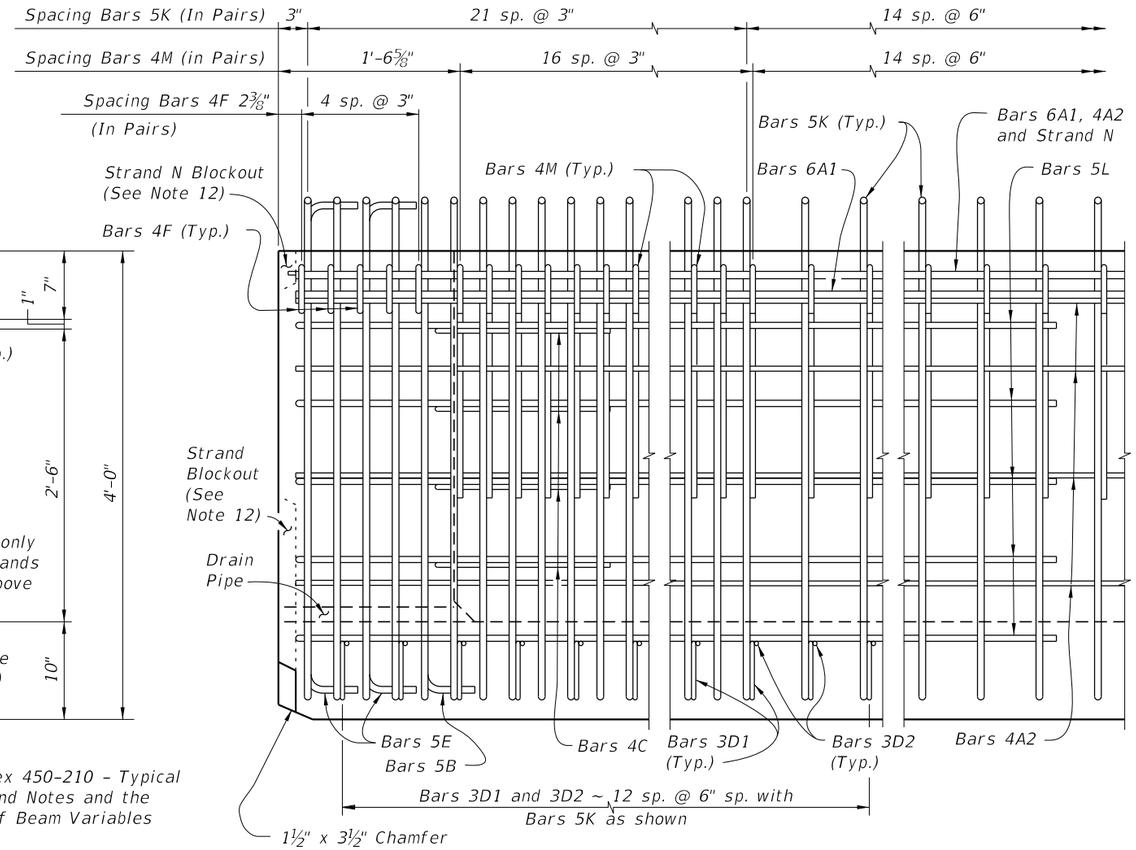
* Reinforcing steel is symmetrical about ℄ Beam for Half Sections A-A and B-B.

** Intermediate Diaphragms shall be provided:
(1) - At midspan.
(2) - At 20'-0" Max. from midspan when beam length (L) exceeds 60 Ft.

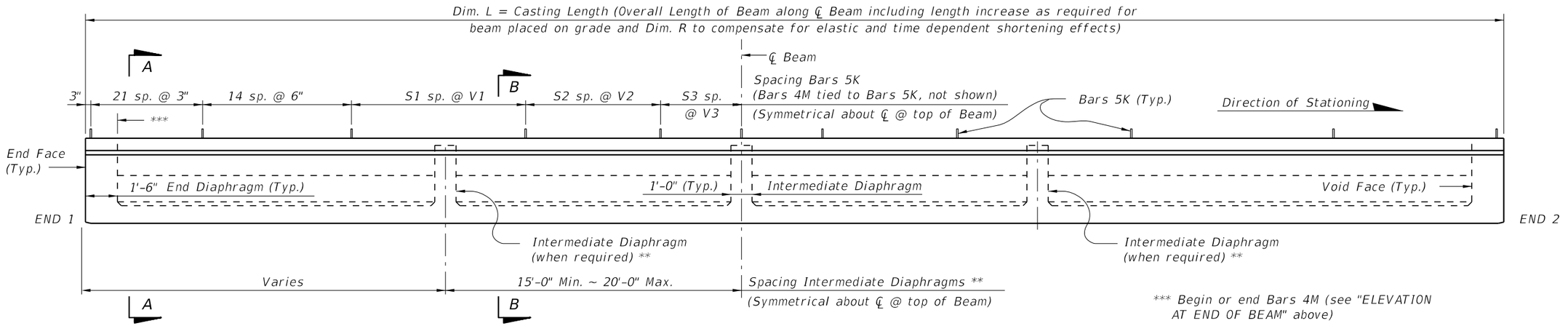
TYPICAL SECTION

NOTES:
Work this Index with Index 450-210 - Typical Florida-U Beam Details and Notes and the Florida-U Beam - Table of Beam Variables in Structures Plans.

For referenced notes see Index 450-210.



ELEVATION AT END OF BEAM



ELEVATION

*** Begin or end Bars 4M (see "ELEVATION AT END OF BEAM" above)

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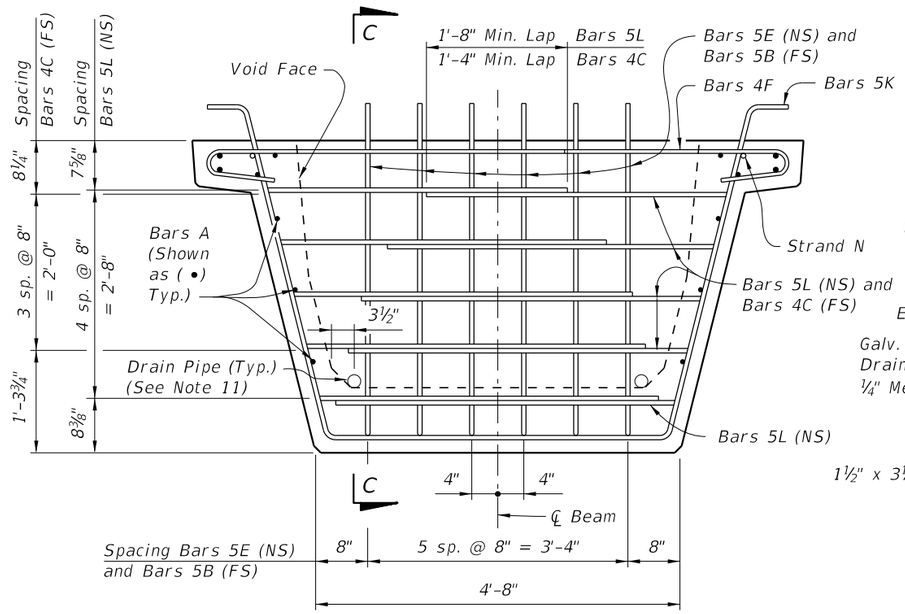
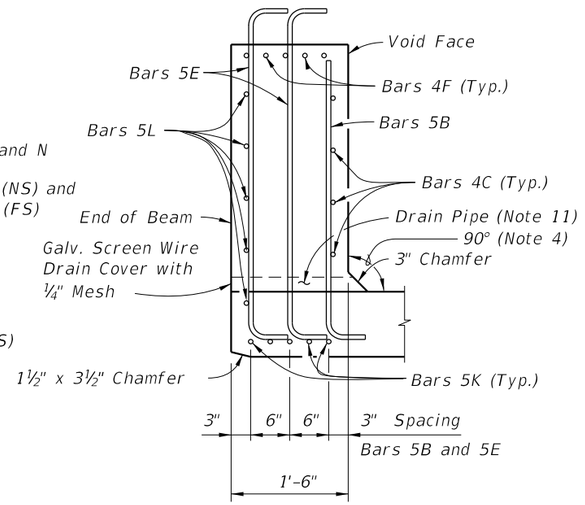
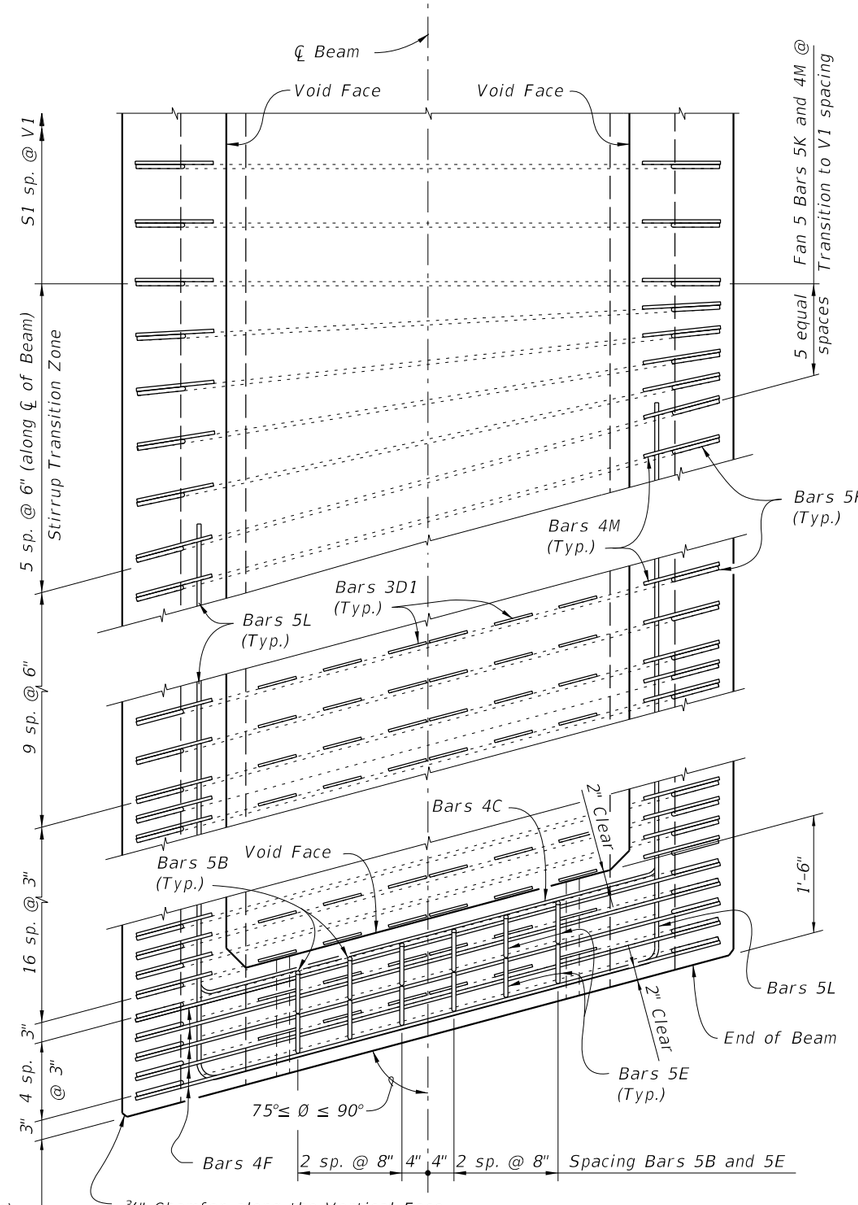
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-U 48 BEAM - STANDARD DETAILS	INDEX 450-248	SHEET 1 of 3



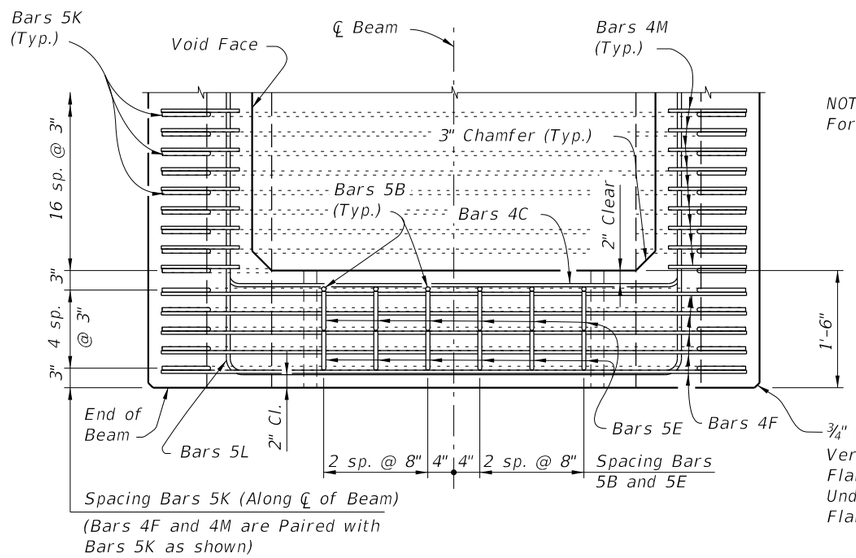
END VIEW AT END DIAPHRAGM



SECTION C-C



TOP VIEW OF SKEWED END DIAPHRAGM
AND STIRRUP TRANSITION ZONE
(Bars 3D2 Not Shown For Clarity)



NOTES:
For referenced notes see Index 450-210.

TOP VIEW OF END DIAPHRAGM
(Bars 3D1 And 3D2 Not Shown For Clarity)

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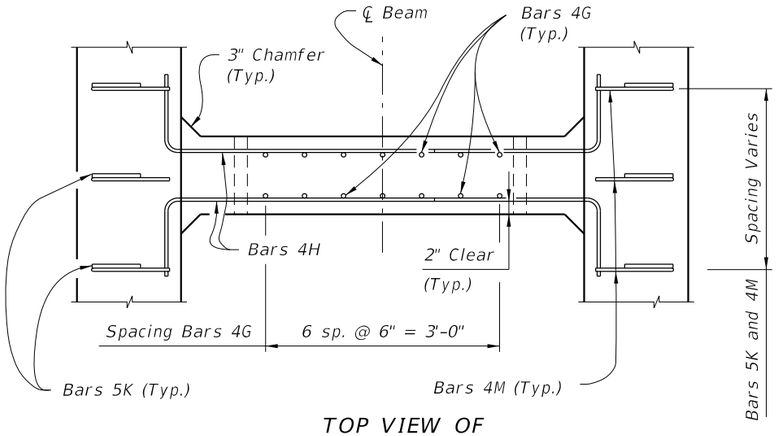
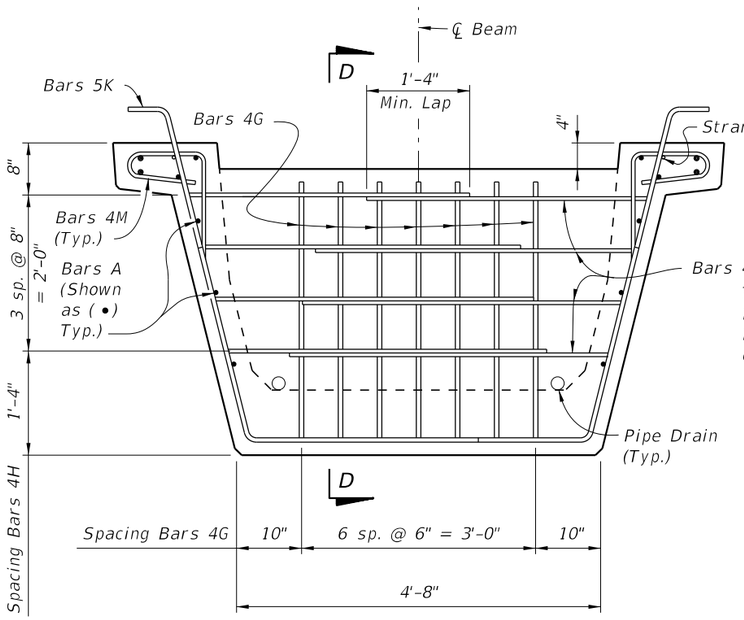
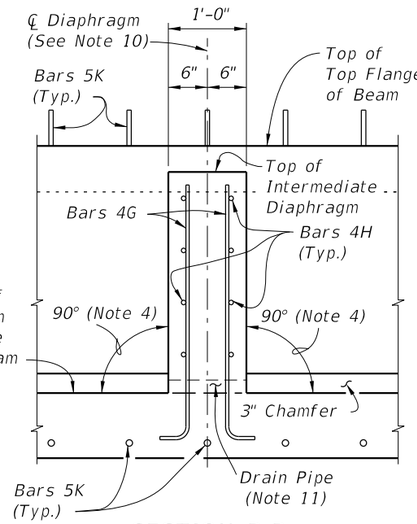
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2019-20 STANDARD PLANS	FLORIDA-U 48 BEAM - STANDARD DETAILS	450-248	2 of 3



TOP VIEW OF INTERMEDIATE DIAPHRAGM



SECTION AT INTERMEDIATE DIAPHRAGM



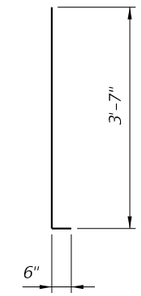
SECTION D-D

NOTES:
For referenced notes see Index 450-210.

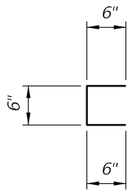
CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL
FOR ONE BEAM ONLY

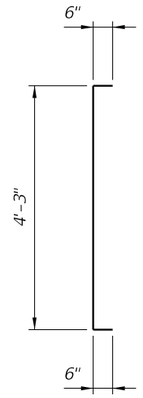
MARK	SIZE	NO. REQD.	LENGTH
A1	6	4	Dim. L - 4"
A2	4	10	Dim. L - 4"
B	5	12	4'-1"
C	4	16	5'-1"
D1	3	156	1'-6"
D2	3	26	4'-6"
E	5	24	5'-3"
F	4	20	6'-2"
G	4	See Table	4'-0"
H	4	See Table	4'-7"
K	5	See Table	8'-0"
L	5	20	14'-0"
M	4	See Table	3'-11"
N	3/8" Ø Strand	2	Dim. L - 3"



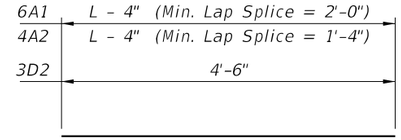
Bars 5B



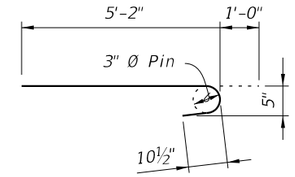
Bars 3D1



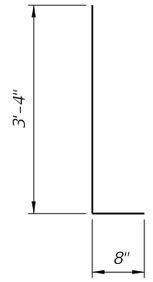
Bars 5E



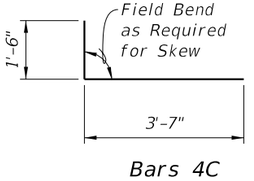
Bars 6A1, 4A2 and 3D2



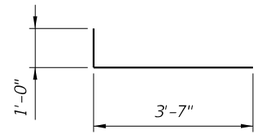
Bars 4F



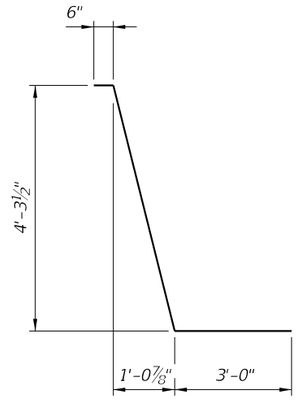
Bars 4G



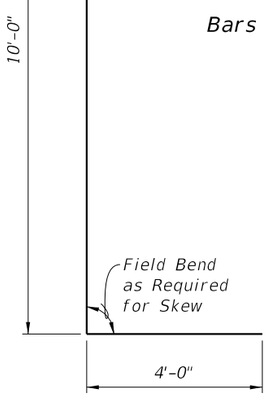
Bars 4C



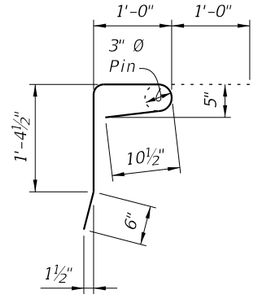
Bars 4H



Bars 5K



Bars 5L

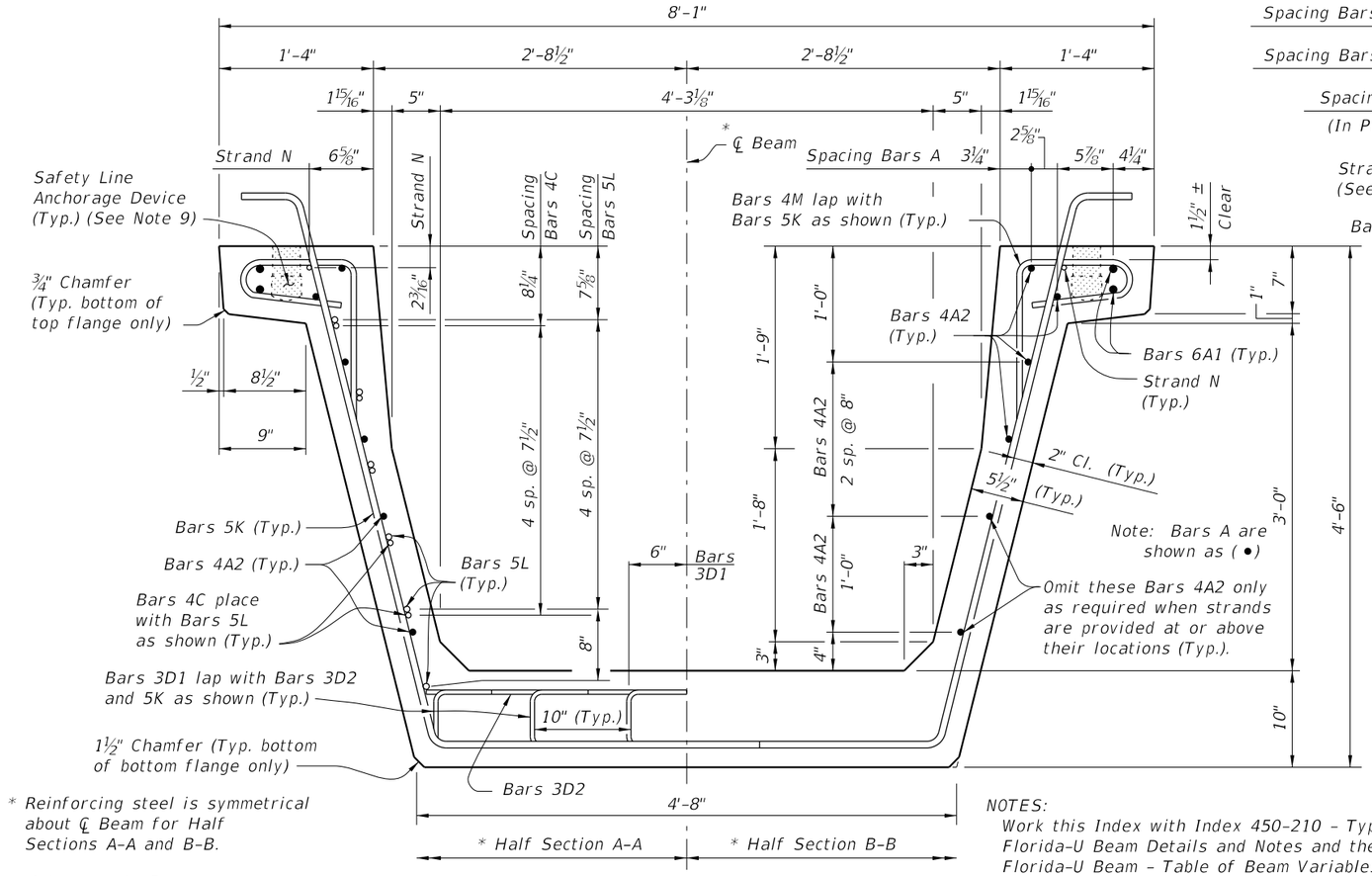


Bars 4M

10/24/2018 2:53:07 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FDOT	FY 2019-20 STANDARD PLANS	450-248	3 of 3

FLORIDA-U 48 BEAM - STANDARD DETAILS



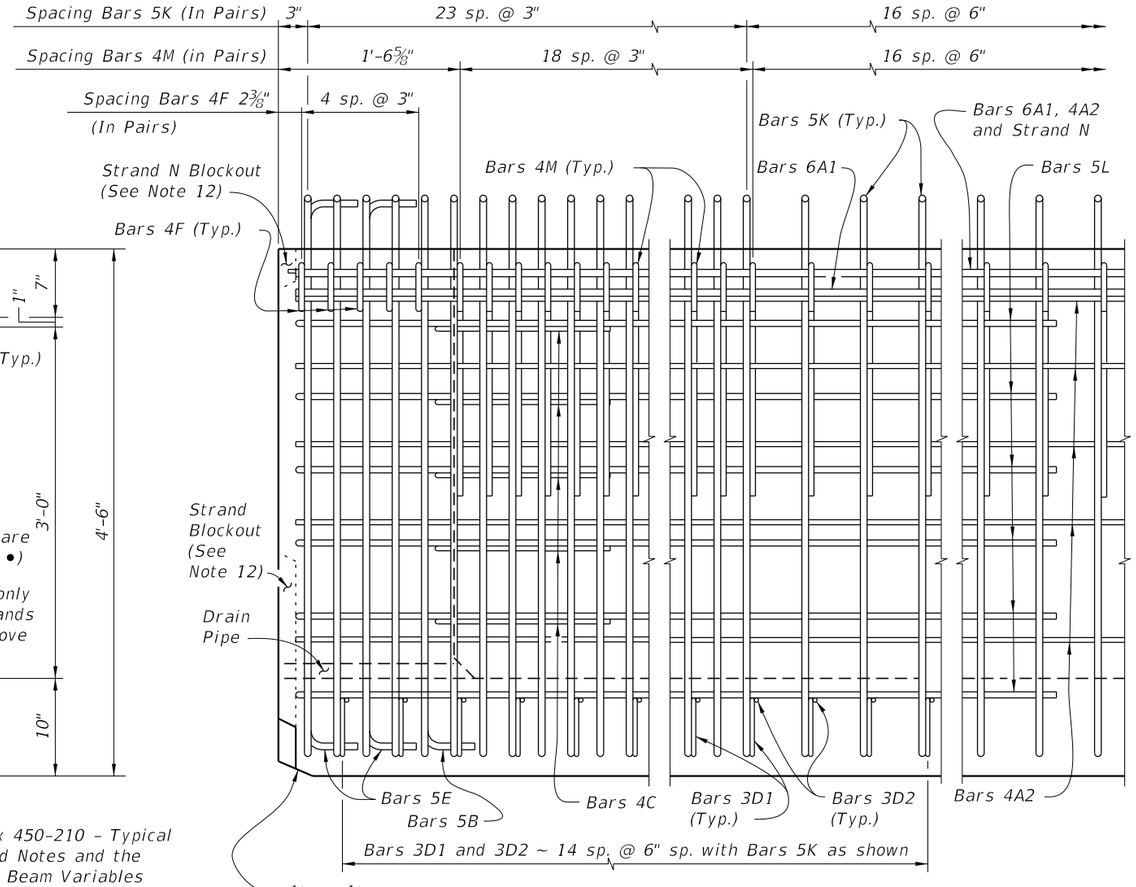
* Reinforcing steel is symmetrical about ℄ Beam for Half Sections A-A and B-B.

** Intermediate Diaphragms shall be provided:
(1) - At midspan.
(2) - At 20'-0" Max. from midspan when beam length (L) exceeds 60 Ft.

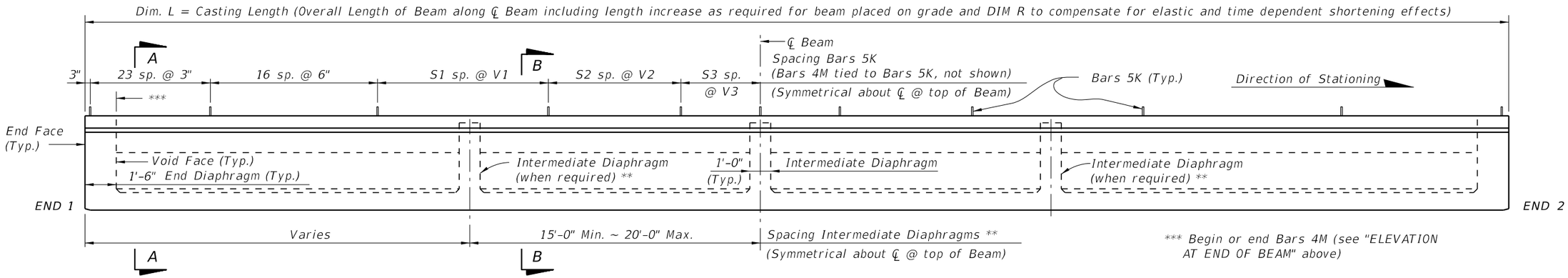
TYPICAL SECTION

NOTES:
Work this Index with Index 450-210 - Typical Florida-U Beam Details and Notes and the Florida-U Beam - Table of Beam Variables in Structures Plans.

For referenced notes see Index 450-210.



ELEVATION AT END OF BEAM

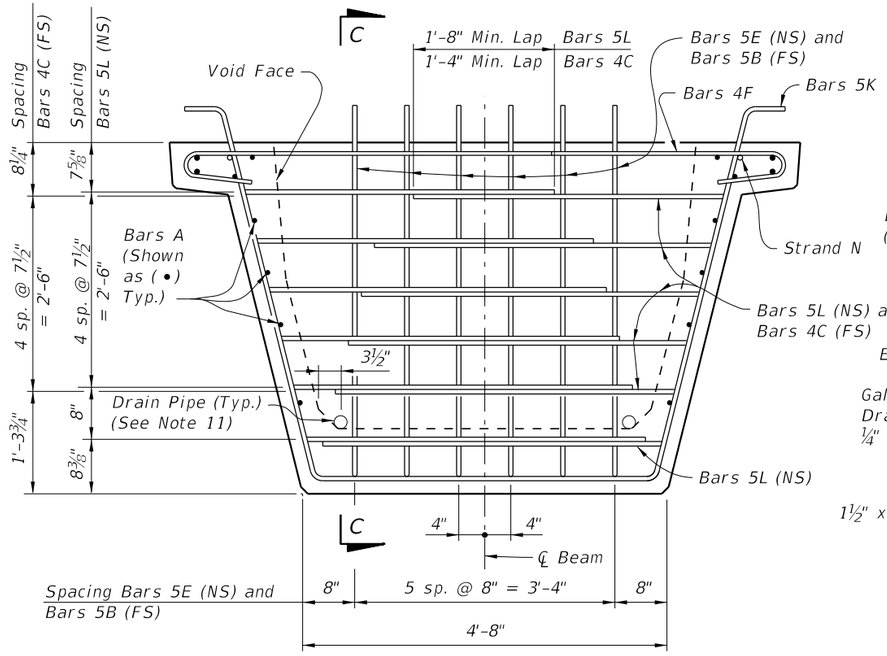


ELEVATION

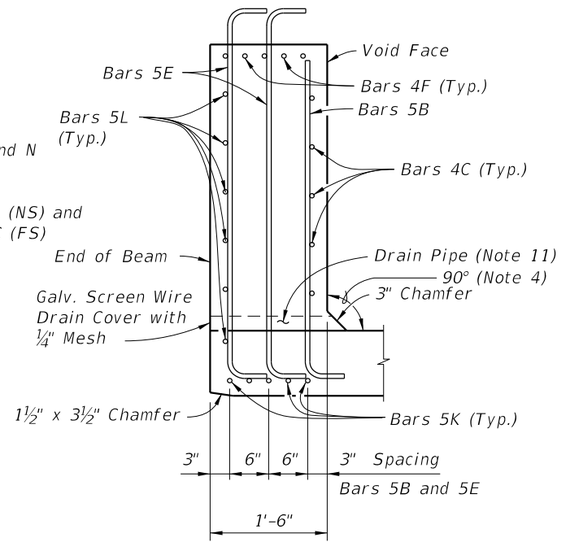
*** Begin or end Bars 4M (see "ELEVATION AT END OF BEAM" above)

10/24/2018 2:53:08 PM

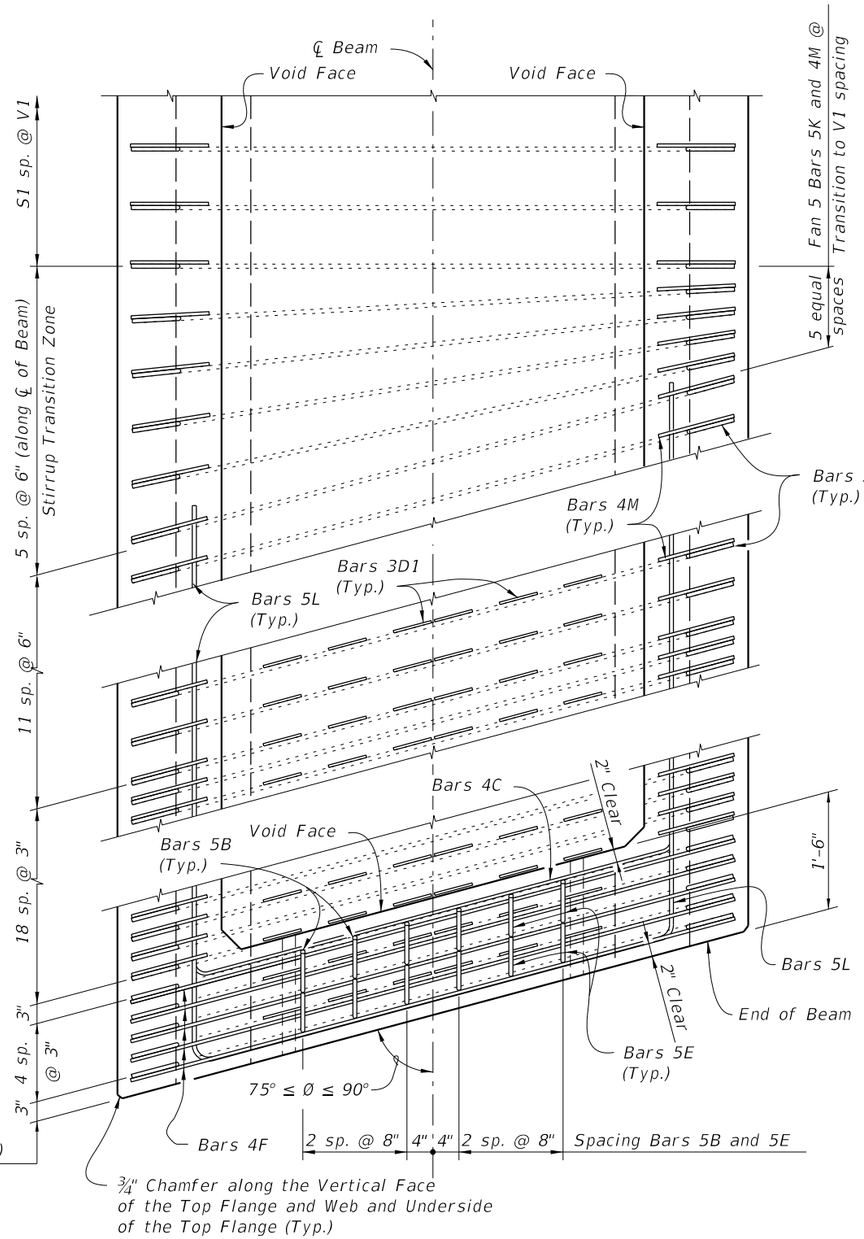
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-U 54 BEAM - STANDARD DETAILS	INDEX 450-254	SHEET 1 of 3



END VIEW AT END DIAPHRAGM

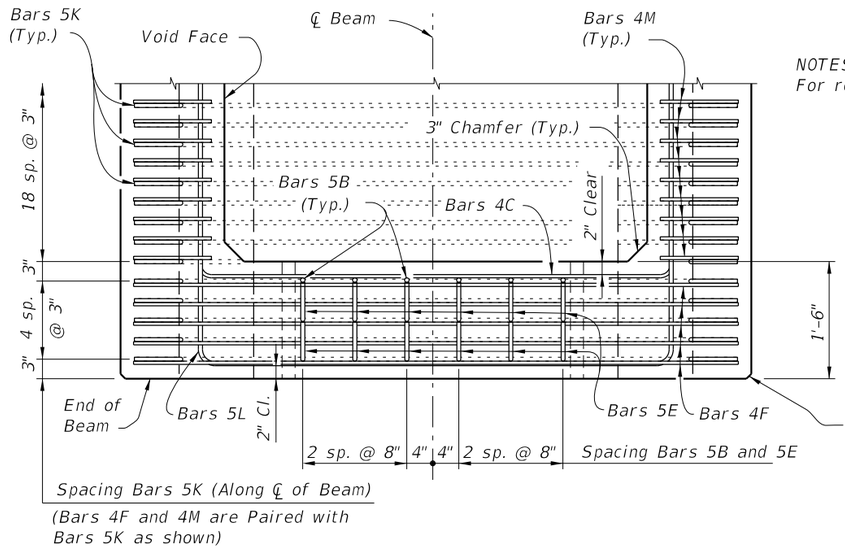


SECTION C-C



Spacing Bars 5K (Along ℄ of Beam)
(Bars 4F and 4M are Paired with Bars 5K as shown)

TOP VIEW OF SKEWED END DIAPHRAGM AND STIRRUP TRANSITION ZONE
(Bars 3D2 Not Shown For Clarity)



TOP VIEW OF END DIAPHRAGM
(Bars 3D1 And 3D2 Not Shown For Clarity)

NOTES:
For referenced notes see Index 450-210.

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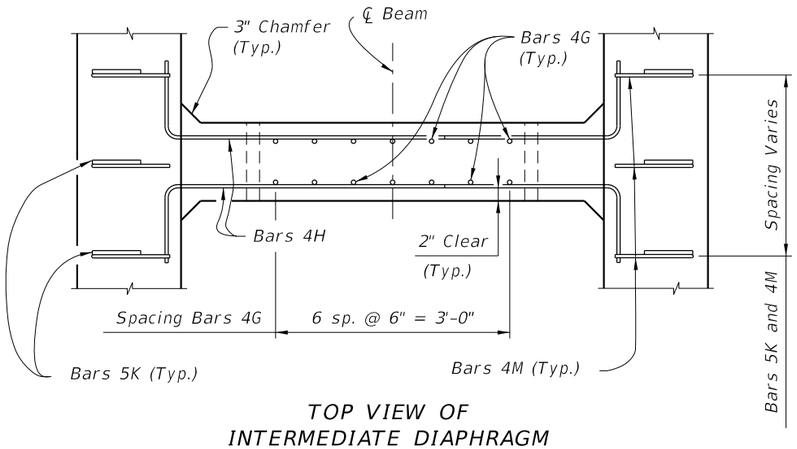
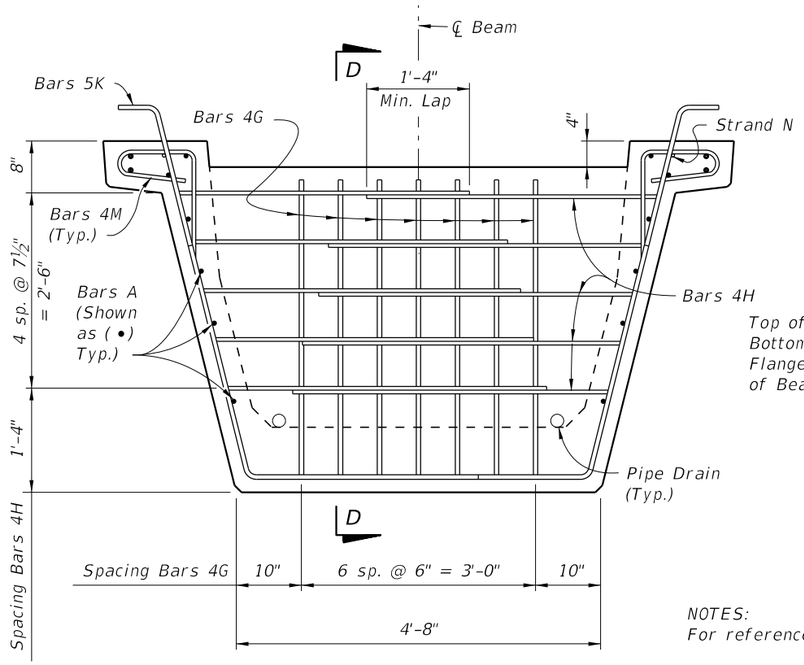
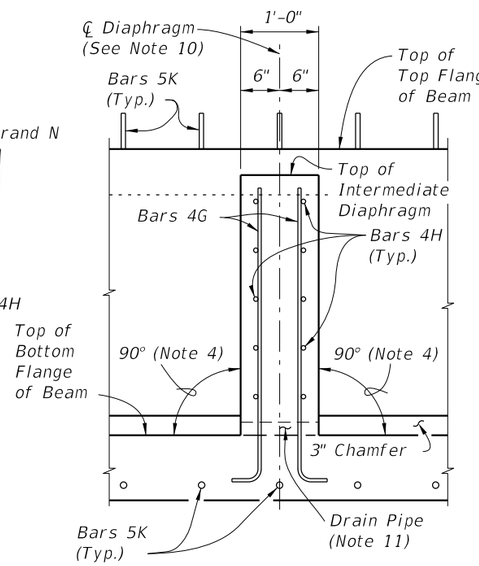
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-U 54 BEAM - STANDARD DETAILS	INDEX 450-254	SHEET 2 of 3



TOP VIEW OF INTERMEDIATE DIAPHRAGM



SECTION AT INTERMEDIATE DIAPHRAGM



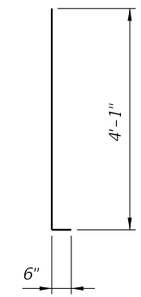
SECTION D-D

NOTES:
For referenced note see Index 450-210.

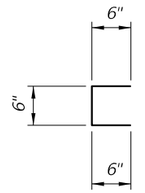
CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL FOR ONE BEAM ONLY

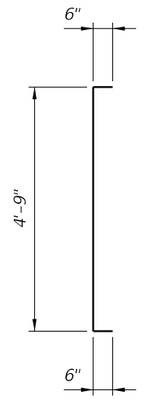
MARK	SIZE	NO. REQD.	LENGTH
A1	6	4	Dim. L – 4"
A2	4	12	Dim. L – 4"
B	5	12	4'-7"
C	4	20	5'-3"
D1	3	180	1'-6"
D2	3	30	4'-6"
E	5	24	5'-9"
F	4	20	6'-4"
G	4	See Table	4'-6"
H	4	See Table	4'-9"
K	5	See Table	8'-6"
L	5	24	16'-2"
M	4	See Table	3'-11"
N	⅜" Ø Strand	2	Dim. L – 3"



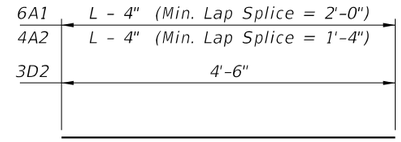
Bars 5B



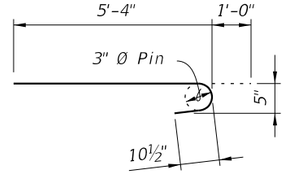
Bars 3D1



Bars 5E

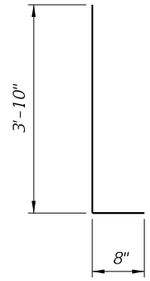


Bars 6A1, 4A2 and 3D2

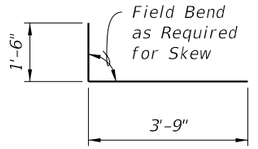


Bars 4F

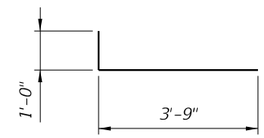
Bars 5L



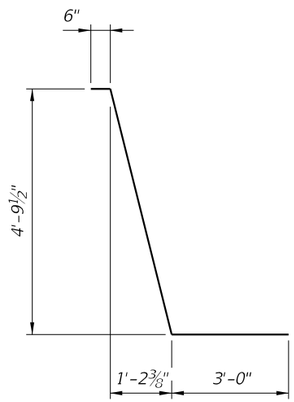
Bars 4G



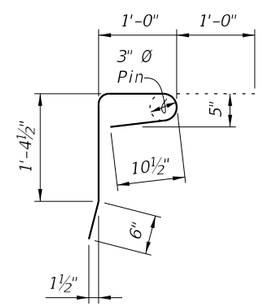
Bars 4C



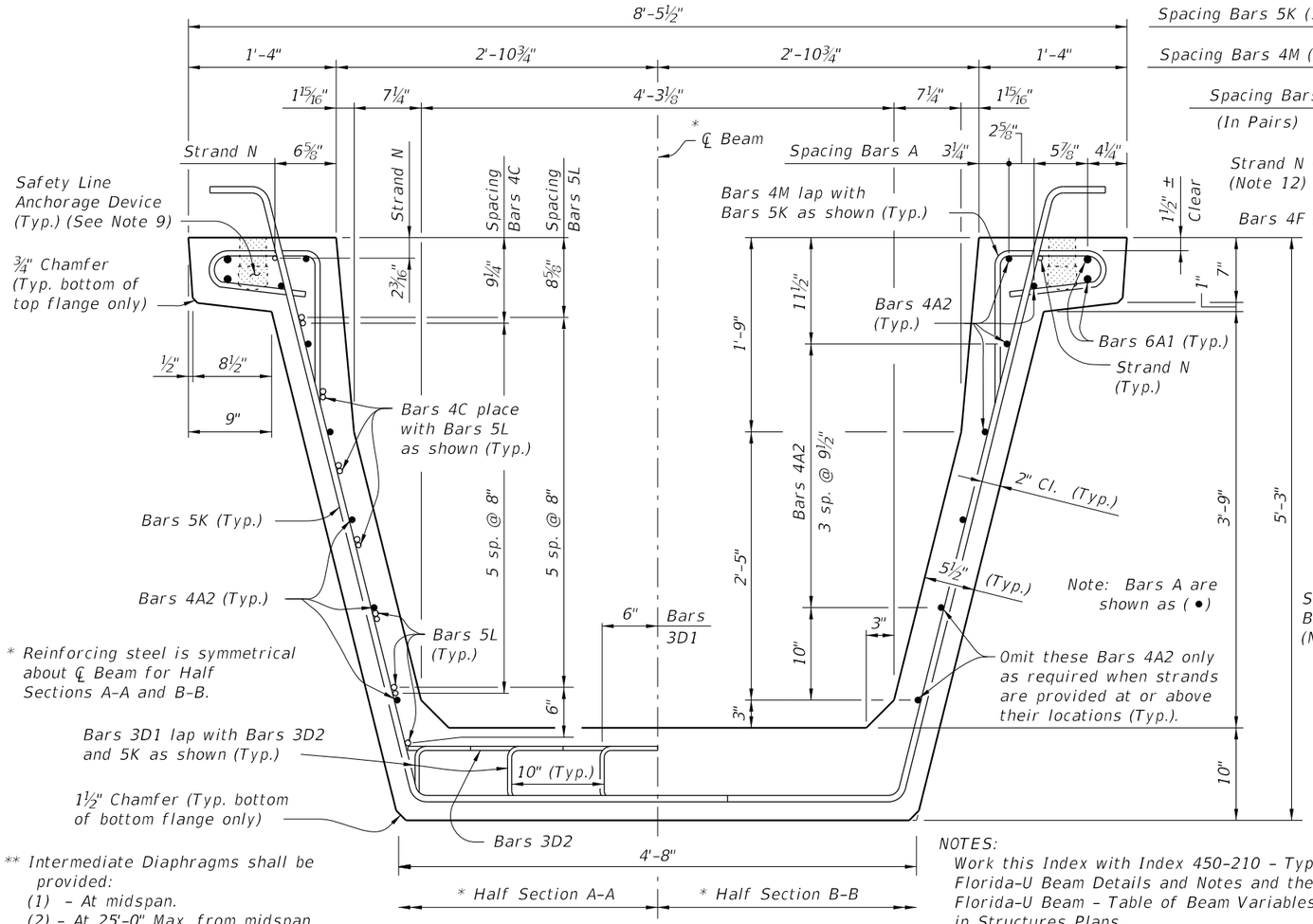
Bars 4H



Bars 5K



Bars 4M



* Reinforcing steel is symmetrical about ℄ Beam for Half Sections A-A and B-B.

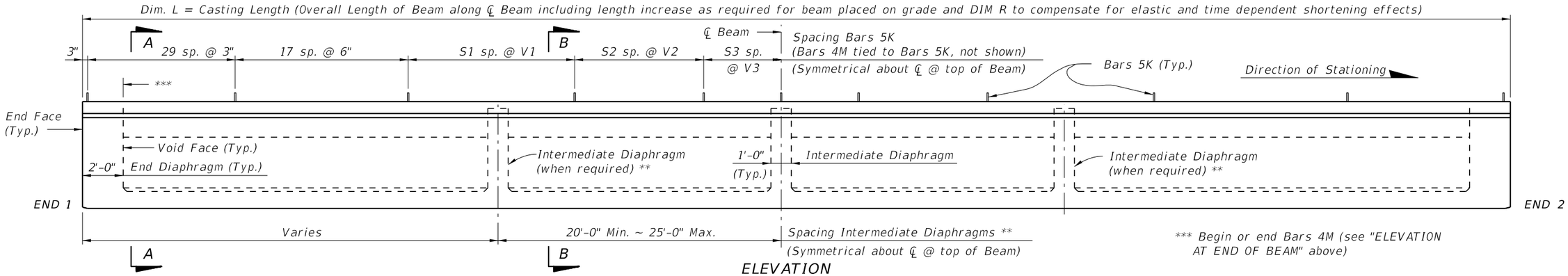
** Intermediate Diaphragms shall be provided:
(1) - At midspan.
(2) - At 25'-0" Max. from midspan when beam length (L) exceeds 70 Ft.

TYPICAL SECTION

NOTES:
Work this Index with Index 450-210 - Typical Florida-U Beam Details and Notes and the Florida-U Beam - Table of Beam Variables in Structures Plans.

For referenced notes see Index 450-210.

ELEVATION AT END OF BEAM

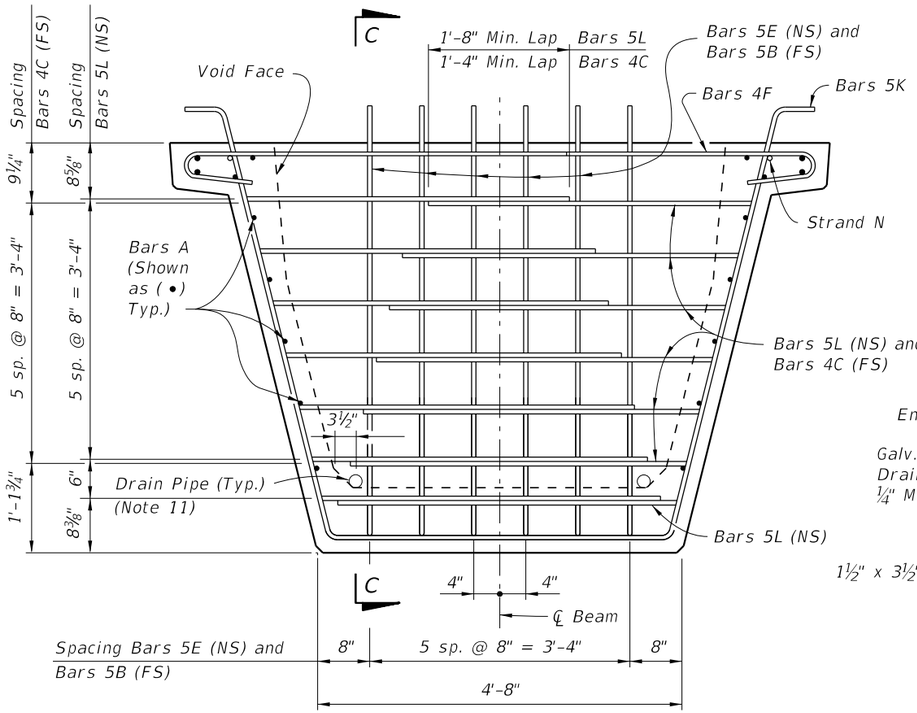


ELEVATION

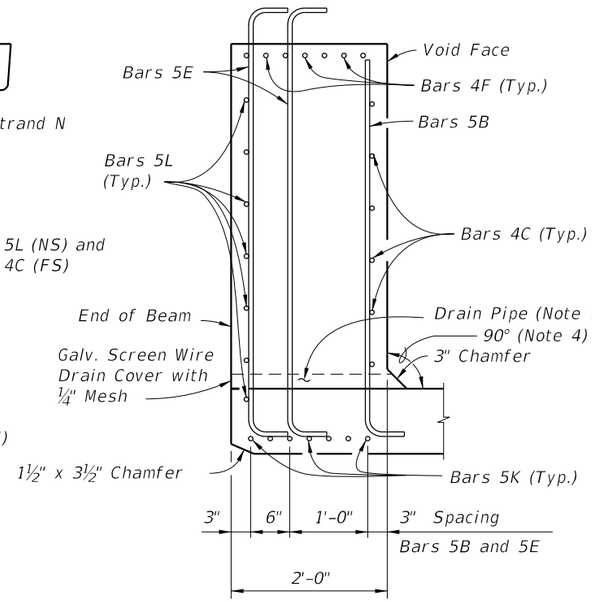
*** Begin or end Bars 4M (see "ELEVATION AT END OF BEAM" above)

10/24/2018 2:53:10 PM

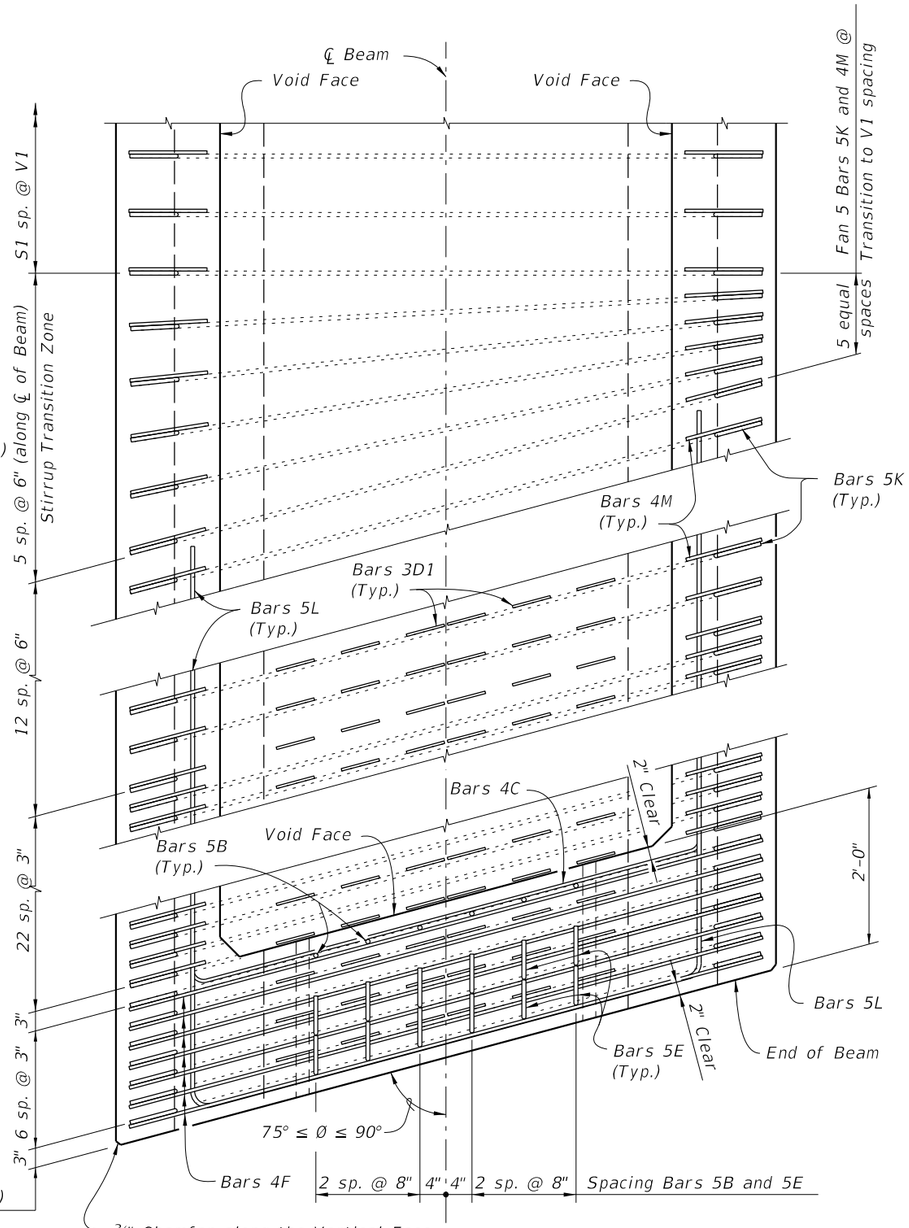
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-U 63 BEAM - STANDARD DETAILS	INDEX 450-263	SHEET 1 of 3



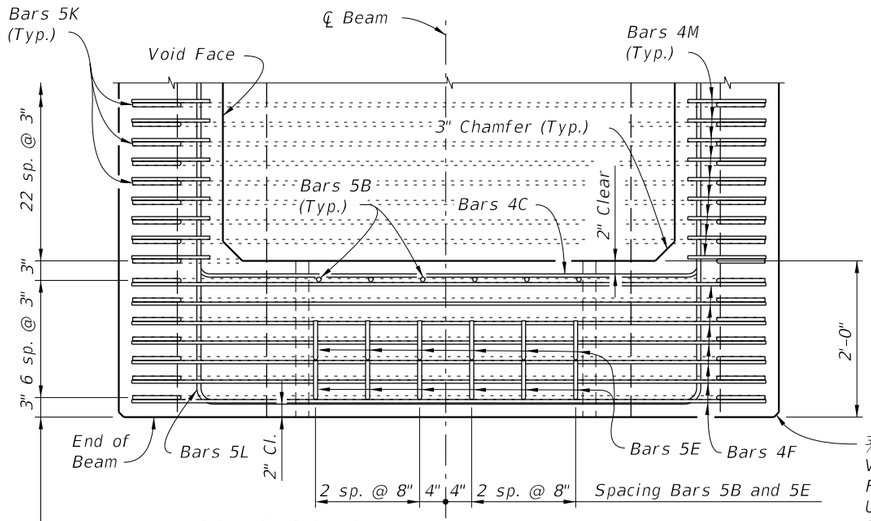
END VIEW AT END DIAPHRAGM



SECTION C-C



TOP VIEW OF SKEWED END DIAPHRAGM
AND STIRRUP TRANSITION ZONE
(Bars 3D2 Not Shown For Clarity)

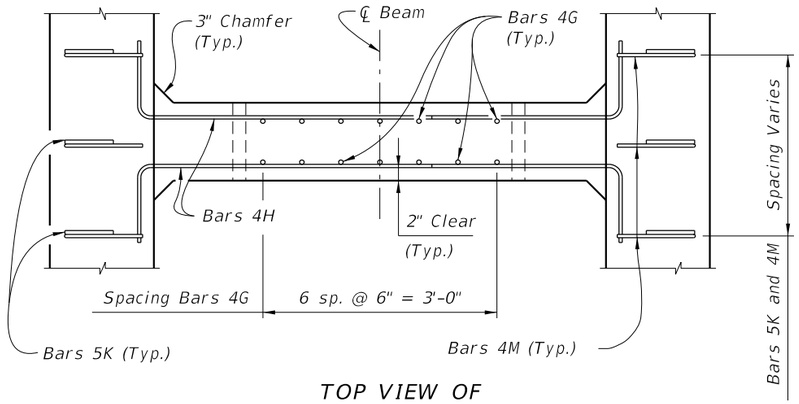


TOP VIEW OF END DIAPHRAGM
(Bars 3D1 And 3D2 Not Shown For Clarity)

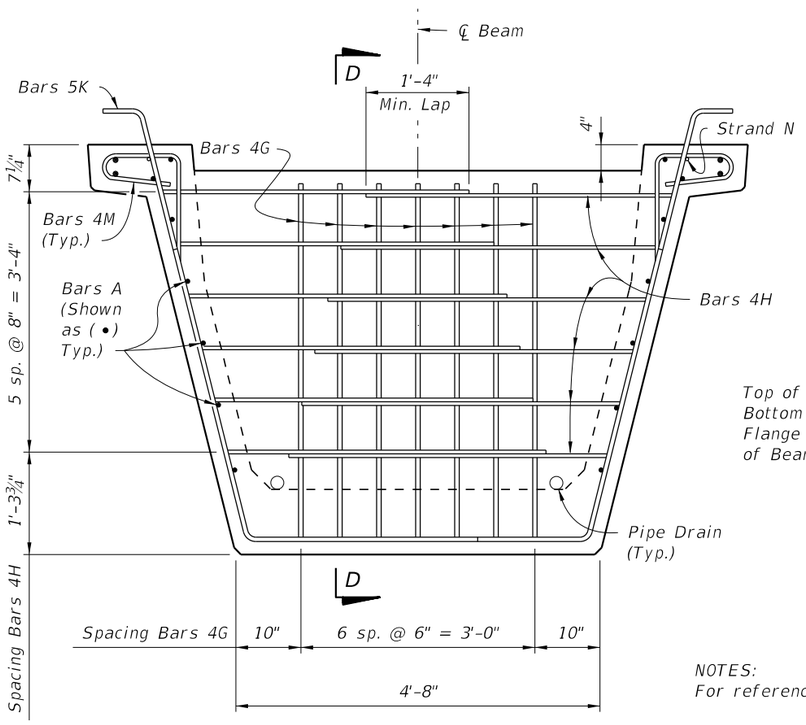
NOTES:
For referenced note see Index 450-210.

10/24/2018 2:53:12 PM

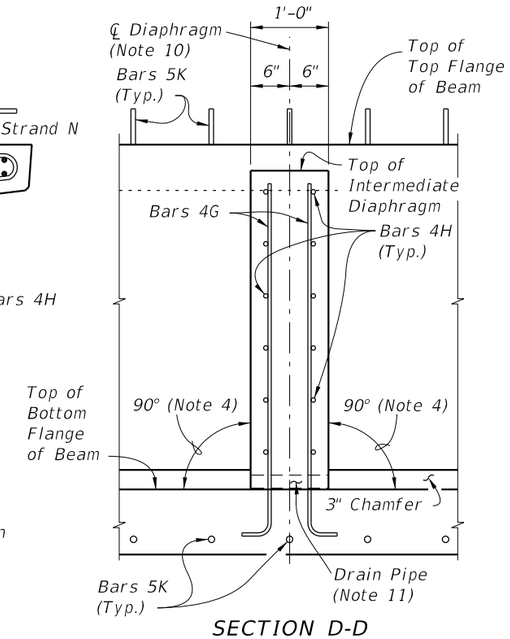
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FY 2019-20 STANDARD PLANS	FLORIDA-U 63 BEAM - STANDARD DETAILS	450-263	2 of 3



TOP VIEW OF INTERMEDIATE DIAPHRAGM



SECTION AT INTERMEDIATE DIAPHRAGM



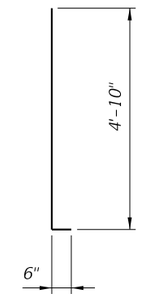
SECTION D-D

NOTES:
For referenced notes see Index 450-210.

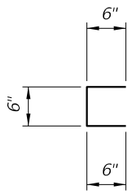
CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL FOR ONE BEAM ONLY

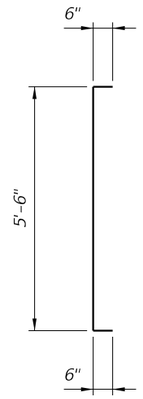
MARK	SIZE	NO. REQD.	LENGTH
A1	6	4	Dim. L – 4"
A2	4	12	Dim. L – 4"
B	5	12	5'-4"
C	4	24	5'-5"
D1	3	204	1'-6"
D2	3	34	4'-6"
E	5	24	6'-6"
F	4	28	6'-6"
G	4	See Table	5'-3"
H	4	See Table	4'-11"
K	5	See Table	9'-2½"
L	5	28	17'-8"
M	4	See Table	3'-11"
N	⅜" Ø Strand	2	Dim. L – 3"



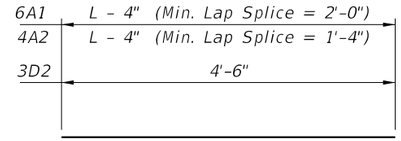
Bars 5B



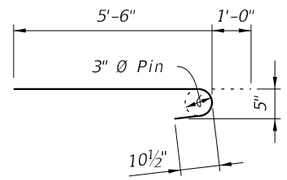
Bars 3D1



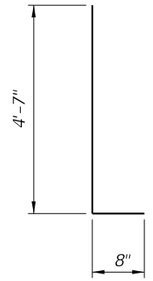
Bars 5E



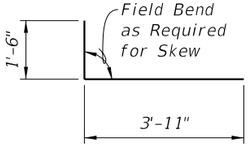
Bars 6A1, 4A2 and 3D2



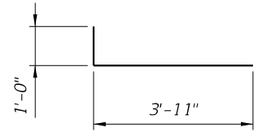
Bars 4F



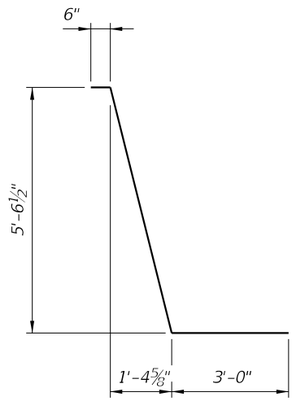
Bars 4G



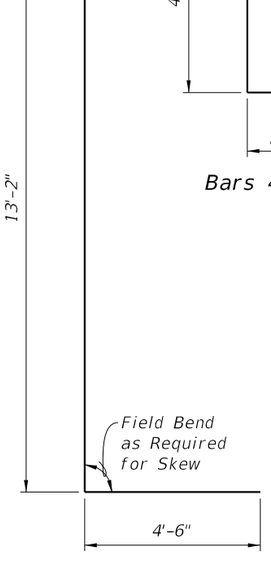
Bars 4C



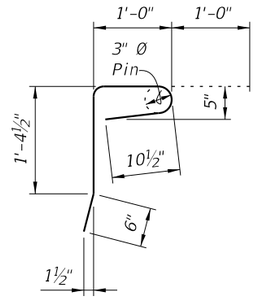
Bars 4H



Bars 5K



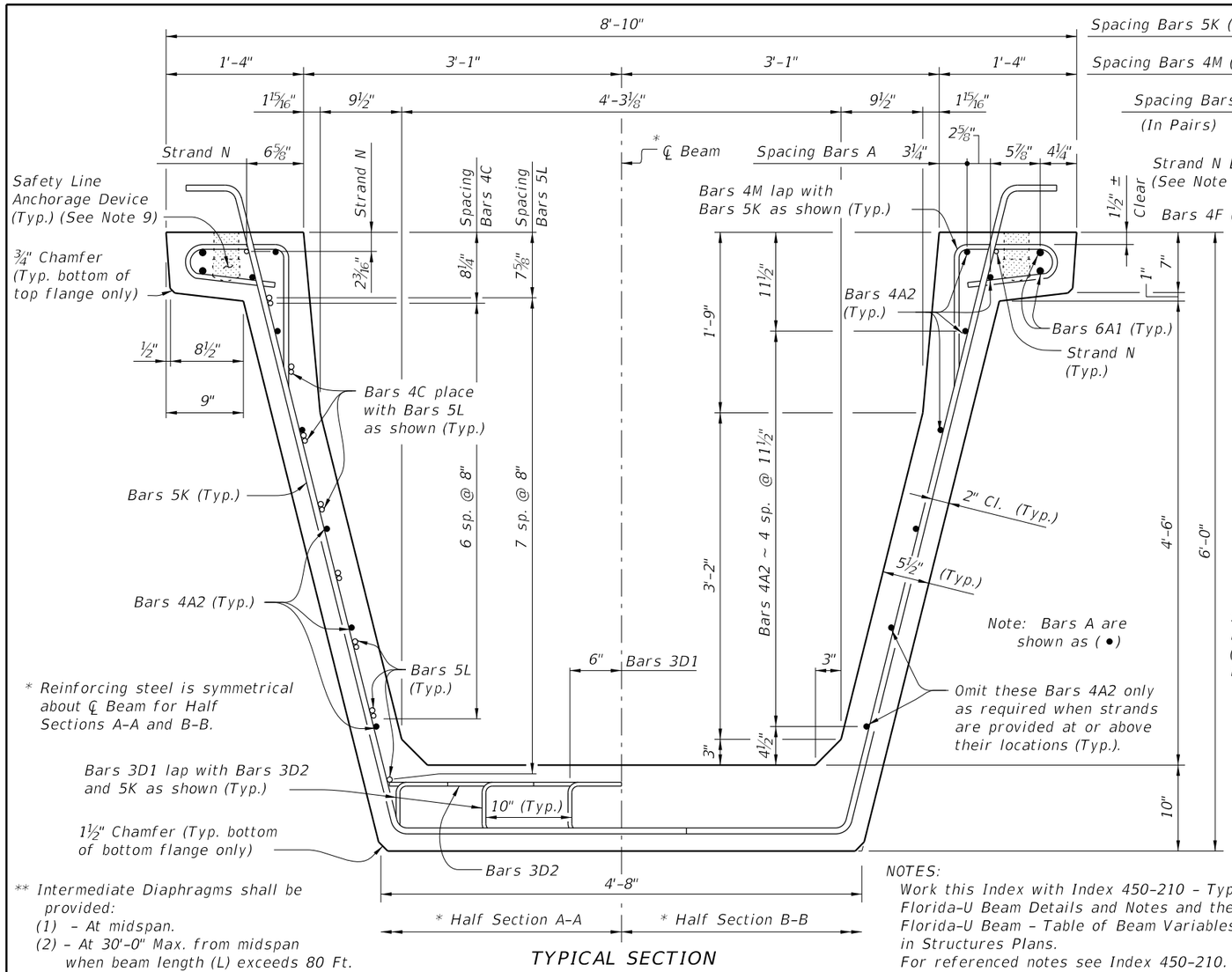
Bars 5L



Bars 4M

10/24/2018 2:53:12 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-U 63 BEAM - STANDARD DETAILS	450-263	3 of 3

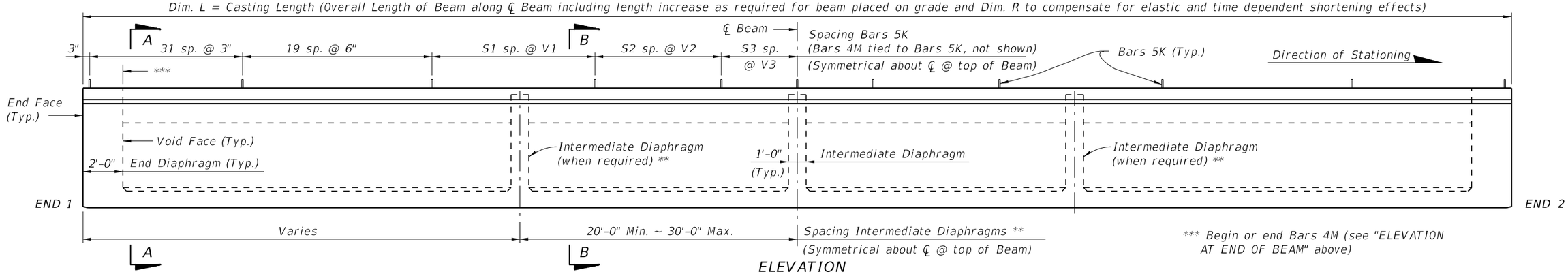


NOTES:
Work this Index with Index 450-210 - Typical Florida-U Beam Details and Notes and the Florida-U Beam - Table of Beam Variables in Structures Plans.
For referenced notes see Index 450-210.

TYPICAL SECTION

ELEVATION AT END OF BEAM

Dim. L = Casting Length (Overall Length of Beam along ℄ Beam including length increase as required for beam placed on grade and Dim. R to compensate for elastic and time dependent shortening effects)



ELEVATION

*** Begin or end Bars 4M (see "ELEVATION AT END OF BEAM" above)

LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	FLORIDA-U 72 BEAM - STANDARD DETAILS	INDEX 450-272	SHEET 1 of 3

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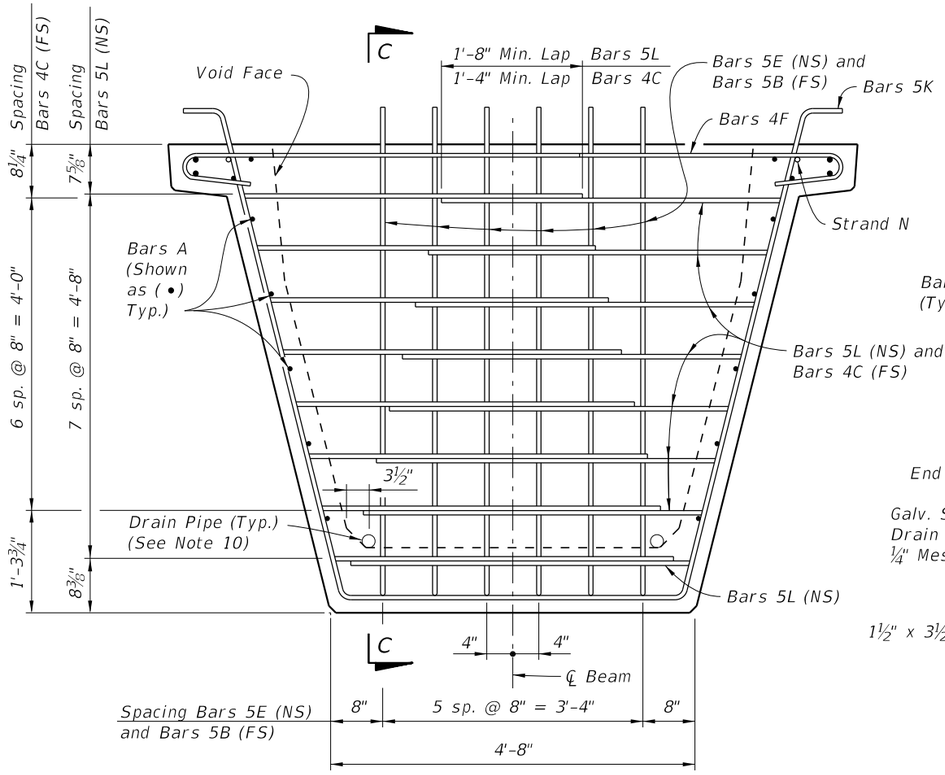
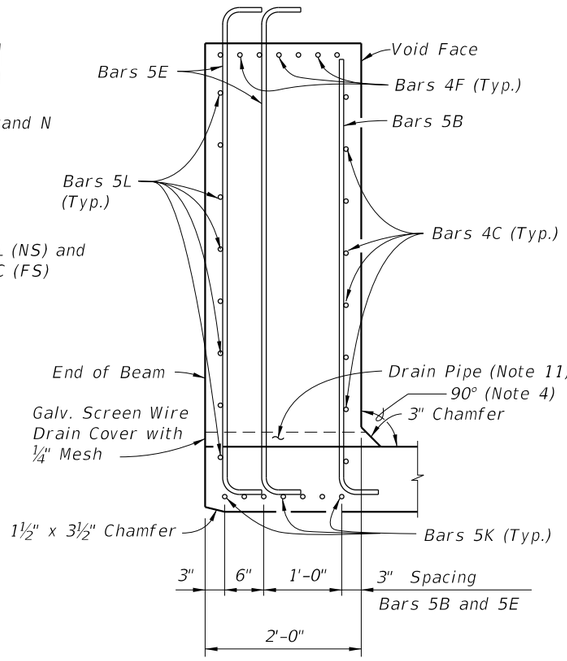
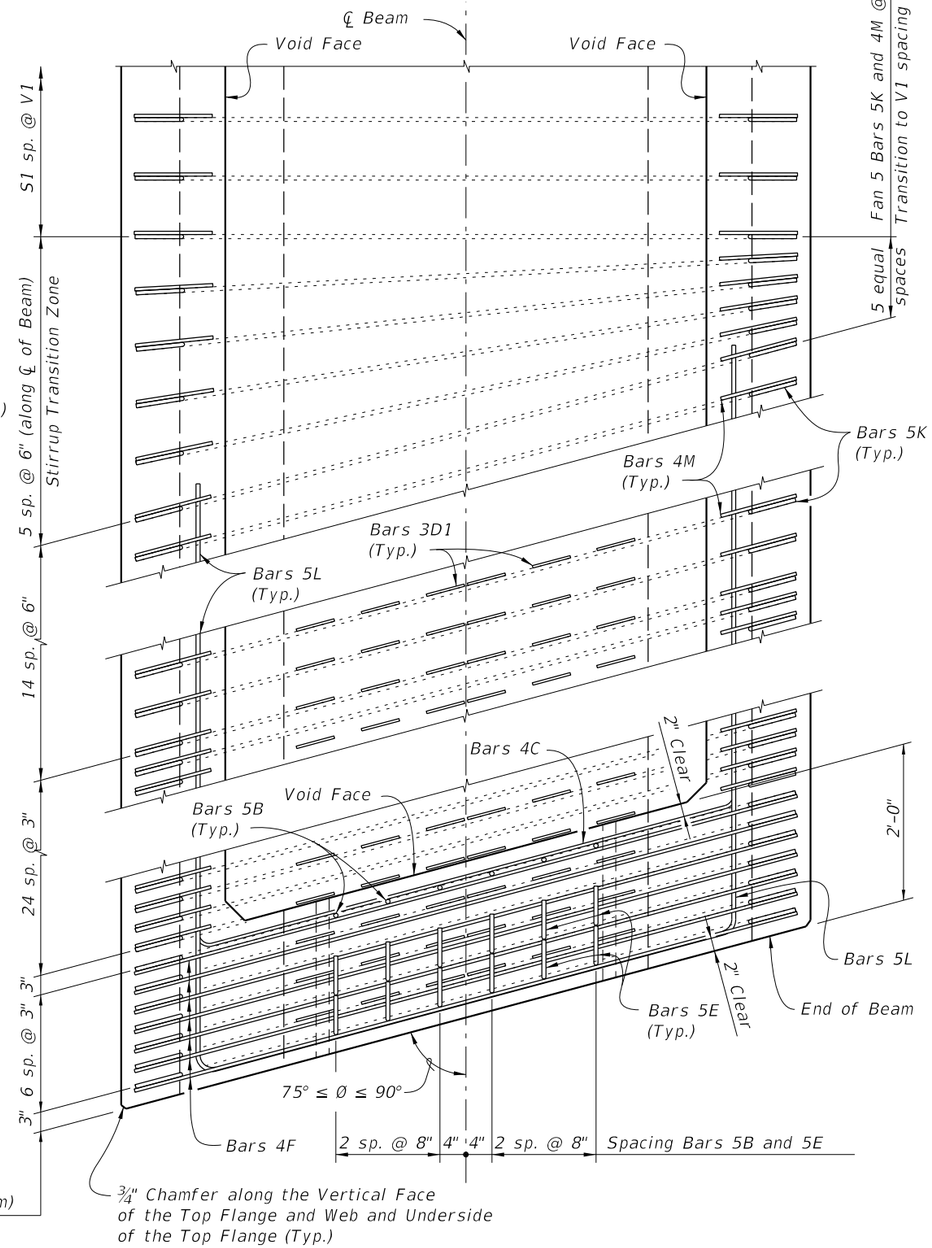


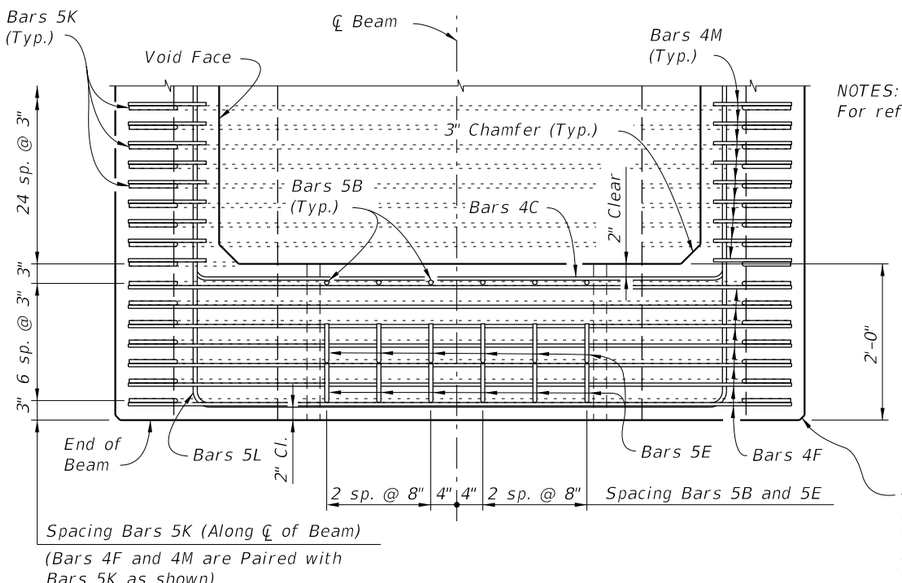
END VIEW AT END DIAPHRAGM



SECTION C-C

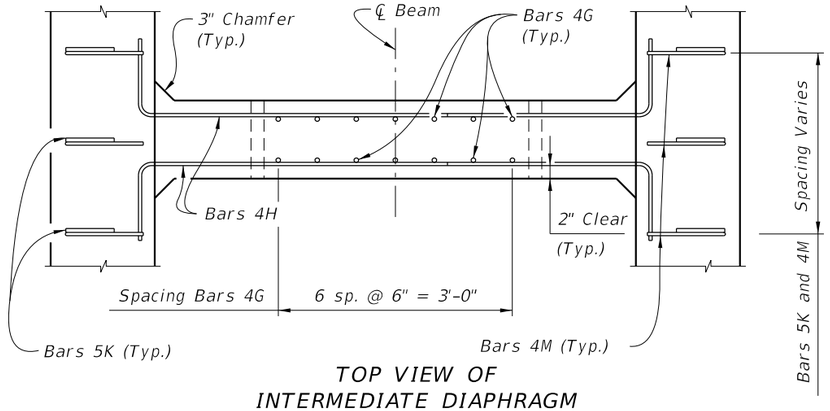


TOP VIEW OF SKEWED END DIAPHRAGM
AND STIRRUP TRANSITION ZONE
(Bars 3D2 Not Shown For Clarity)

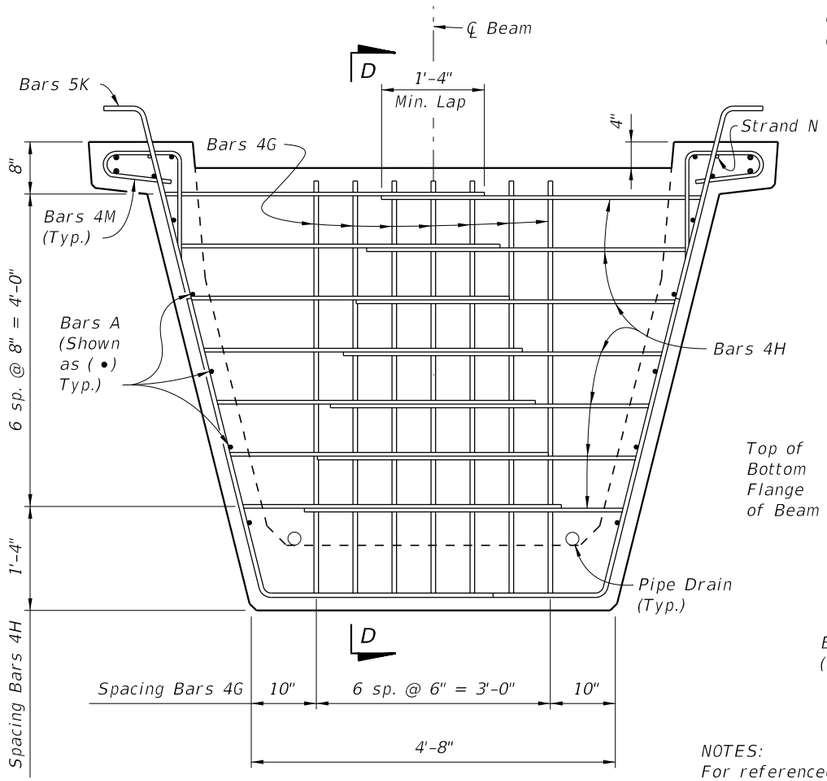


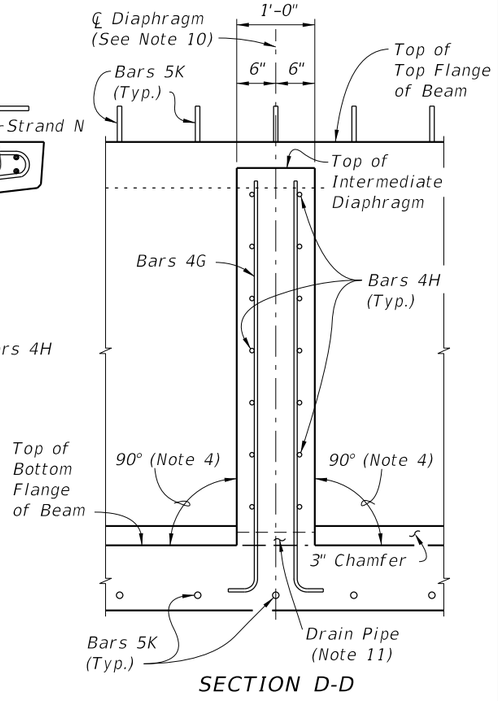
NOTES:
For referenced notes see Index 450-210.

TOP VIEW OF END DIAPHRAGM
(Bars 3D1 And 3D2 Not Shown For Clarity)



TOP VIEW OF INTERMEDIATE DIAPHRAGM





SECTION D-D

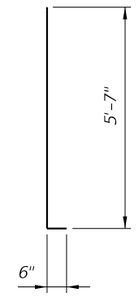
SECTION AT INTERMEDIATE DIAPHRAGM

NOTES:
For referenced notes see Index 450-210.

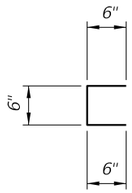
CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL FOR ONE BEAM ONLY

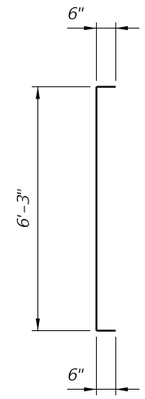
MARK	SIZE	NO. REQD.	LENGTH
A1	6	4	Dim. L - 4"
A2	4	14	Dim. L - 4"
B	5	12	6'-1"
C	4	28	5'-7"
D1	3	228	1'-6"
D2	3	38	4'-6"
E	5	24	7'-3"
F	4	28	6'-9"
G	4	See Table	6'-0"
H	4	See Table	5'-1"
K	5	See Table	10'-0"
L	5	32	19'-6"
M	4	See Table	3'-11"
N	3/8" Ø Strand	2	Dim. L - 3"



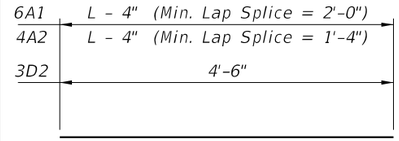
Bars 5B



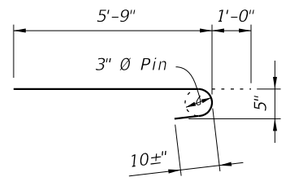
Bars 3D1



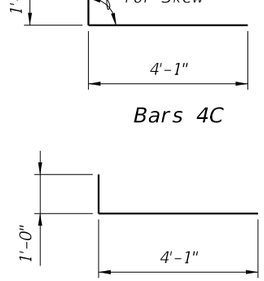
Bars 5E



Bars 6A1, 4A2 and 3D2



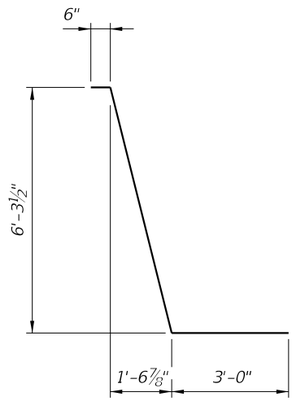
Bars 4F



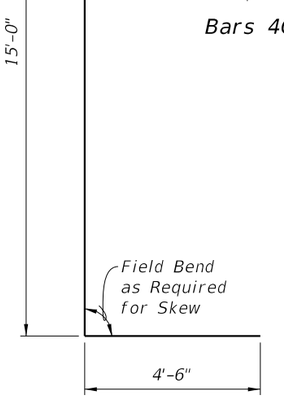
Bars 4G

Bars 4C

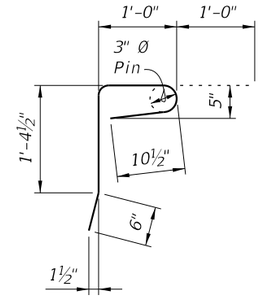
Bars 4H



Bars 5K



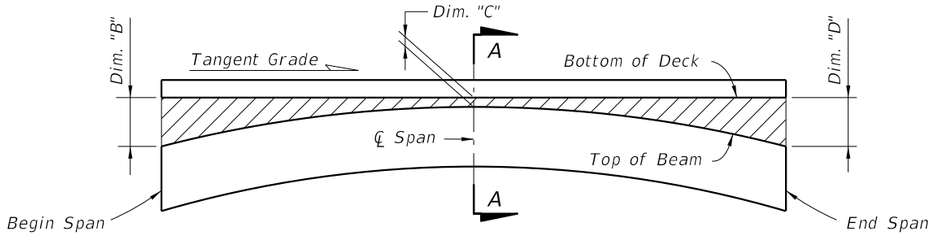
Bars 5L



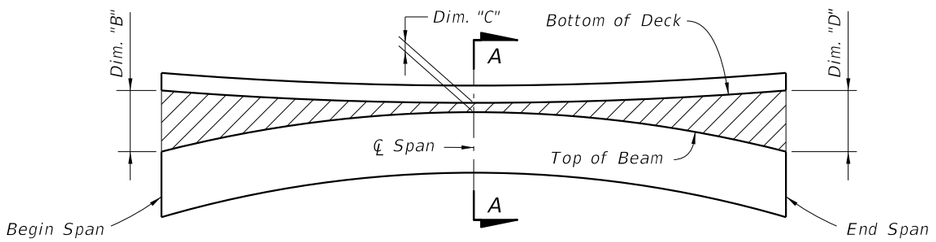
Bars 4M

10/24/2018 2:53:14 PM

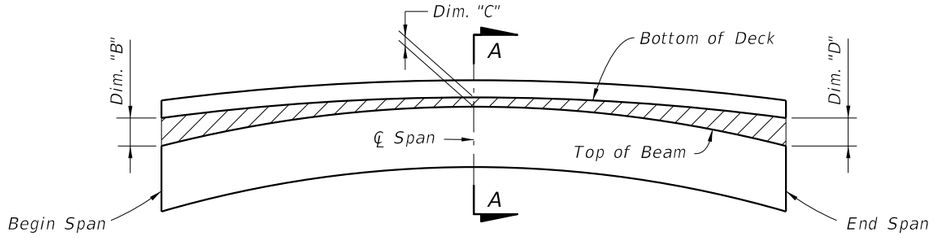
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT	FY 2019-20 STANDARD PLANS	FLORIDA-U 72 BEAM - STANDARD DETAILS	INDEX 450-272 / SHEET 3 of 3



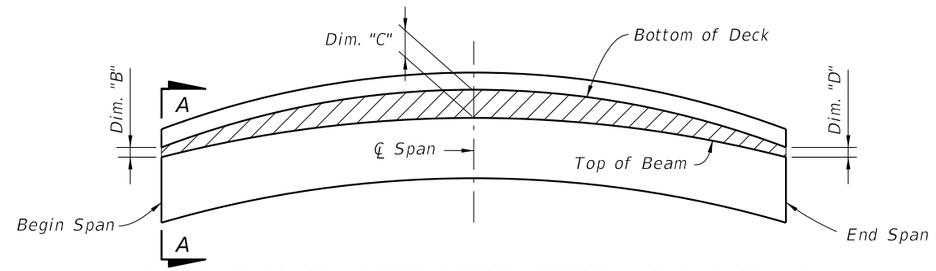
BUILD-UP DIAGRAM FOR TANGENT SPANS
(ALONG ℄ FLANGE) (CASE 1)



BUILD-UP DIAGRAM FOR SAG VERTICAL CURVE & HORIZONTAL CURVE SPANS
(ALONG ℄ FLANGE) (CASE 2)



BUILD-UP DIAGRAM FOR CREST VERTICAL CURVE SPANS
- CONTROL AT ℄ SPAN
(ALONG ℄ FLANGE) (CASE 3)

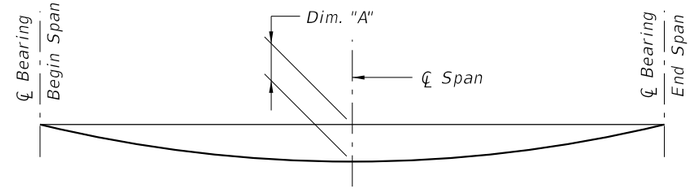


BUILD-UP DIAGRAM FOR CREST VERTICAL CURVE SPANS
- CONTROL AT BEGIN OR END SPAN
(ALONG ℄ FLANGE) (CASE 4)

BEAM CAMBER AND BUILD-UP NOTES:

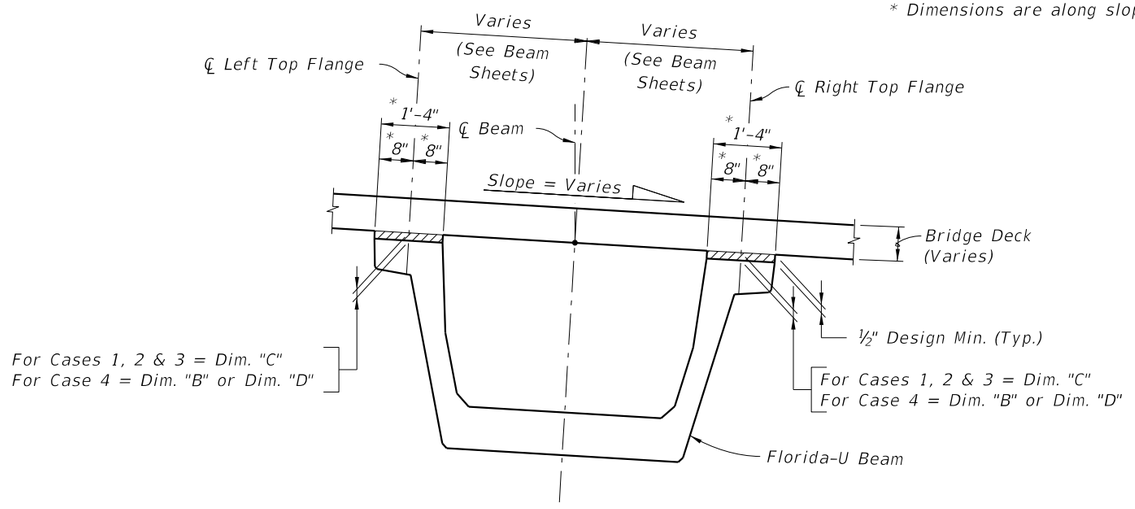
The build-up values given in the Data Table* are based on theoretical beam cambers. The Contractor shall monitor beam cambers for the purpose of predicting camber values at the time of the deck pour. If the predicted cambers based on field measurements differ more than +/- ½" from the theoretical "Net Beam Camber @ 120 Days" shown in the Data Table*, obtain approval from the Engineer to modify the build-up dimensions as required. When the measured beam cambers create a conflict with the bottom mat of deck steel, notify the Engineer a minimum of 21 days prior to casting.

Dim. "A" includes the weight of the Stay-In-Place Formwork.



DEAD LOAD DEFLECTION DIAGRAM
(ALONG ℄ BEAM)

* Dimensions are along slope.

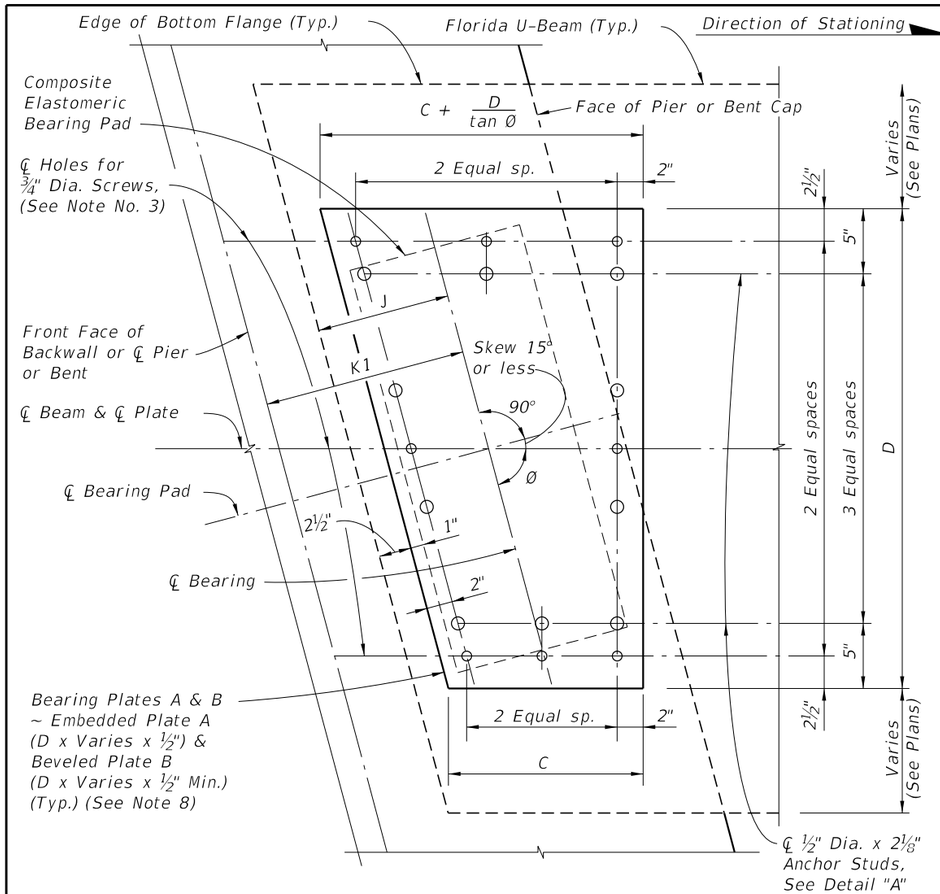


SECTION A-A
BUILD-UP OVER BEAMS
(LOOKING AHEAD STATION)

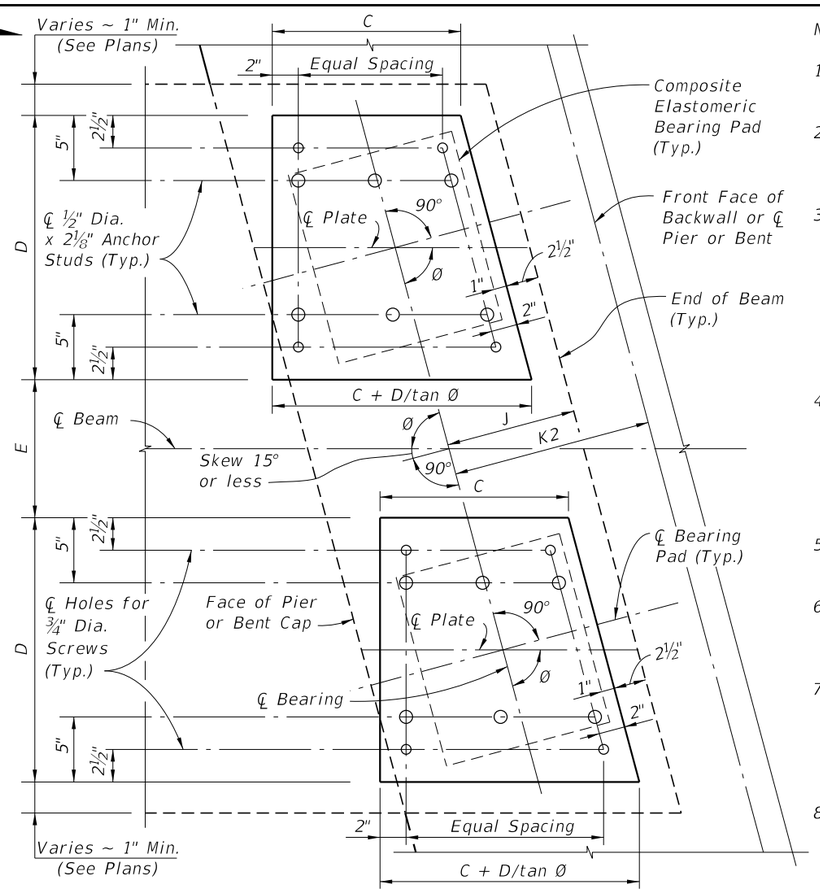
* NOTE:
Work this Index with the Build-up and Deflection Data Table for Florida-U Beams in Structures Plans.

10/24/2018 2:53:15 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	FLORIDA-U BEAMS - BUILD-UP & DEFLECTION DATA	INDEX	SHEET
07/01/15						450-299	1 of 1



PLAN VIEW OF TYPICAL SINGLE BEARING

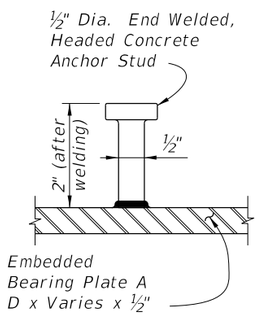


PLAN VIEW OF TYPICAL DOUBLE BEARING

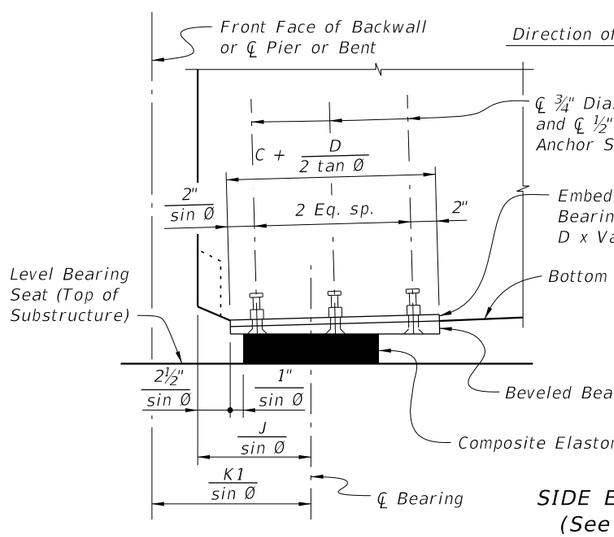
NOTES:

1. Work this sheet with the 'BEVELED BEARING PLATE DATA TABLE' in the plans.
2. Beveled Bearing Plates B with Embedded Bearing Plates A are required for beams only as scheduled in the 'TABLE OF BEAM VARIABLES' on Beam Sheets.
3. Bearing plate material shall conform to ASTM A36 or ASTM A709 (Grade 36 or 50). Headed Concrete Anchor Studs shall conform to Specification Section 502. Hot-dip galvanized Bearing Plates A & B after fabrication except Galvanized Caps may be welded in place after hot-dip galvanizing. Drill Bearing Plates A and B as an assembled unit, thread Bearing Plate A only. Drill and thread holes perpendicular to bottom of Plate B and prior to plates being galvanized (ASTM A 123).
4. Provide Electroplated, Flat Countersunk Head Cap Screws in accordance with ASTM F 835. Electroplating shall be ASTM B 633, SC 2, Type 1. Provide screws long enough to maintain a ¾" minimum embedment into Embedded Bearing Plate A and Galvanized Cap. Provide steel Galvanized Caps with ½" Min. to 1½" Max. height and nominal 1" inside diameter.
5. Include the cost of Beveled Bearing Plates in the pay item for Prestressed Beams (Florida U-Beams).
6. For Dimensions C and D, see 'BEVELED BEARING PLATE DATA TABLE' in the Structures Plans. For Dimensions J, K1 and K2, see 'TABLE OF BEAM VARIABLES' on Beam Sheets.
7. All details and dimensions shown are along ℄ Beam for single bearings or ℄ Plate parallel to ℄ Beam for double bearings, except for dimensions to ¾" Dia. Screws and ½" Dia. x 2⅛" Anchor Studs, which are along ℄ Screws or ℄ Anchor Studs. Positive Slope shown, Negative Slope similar.
8. When Skew = 0°, dimensions for Embedded Bearing Plate A are D x C x ½" and for Beveled Plate B are D x C x ½" Min.

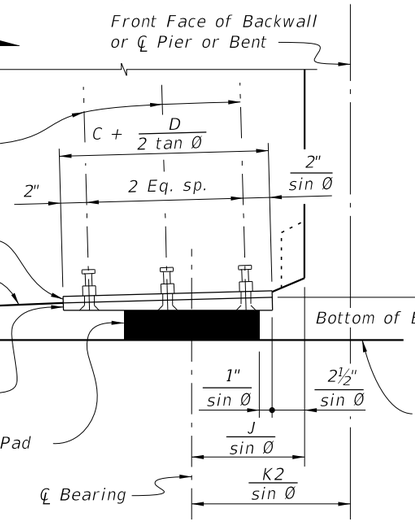
PLAN
(0° < Skew ≤ 15° shown, Skew = 0° Similar)

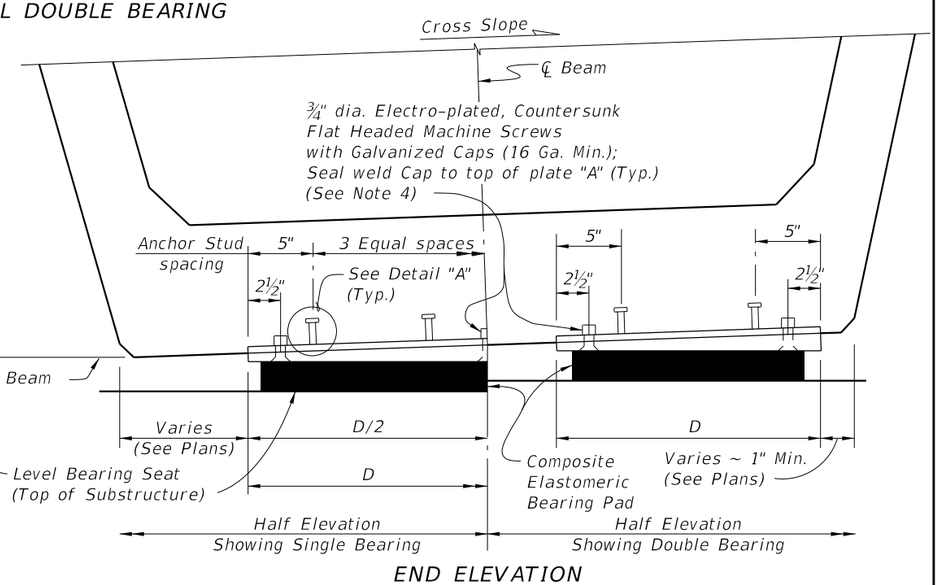


DETAIL "A"



SIDE ELEVATION
(See Note 7)

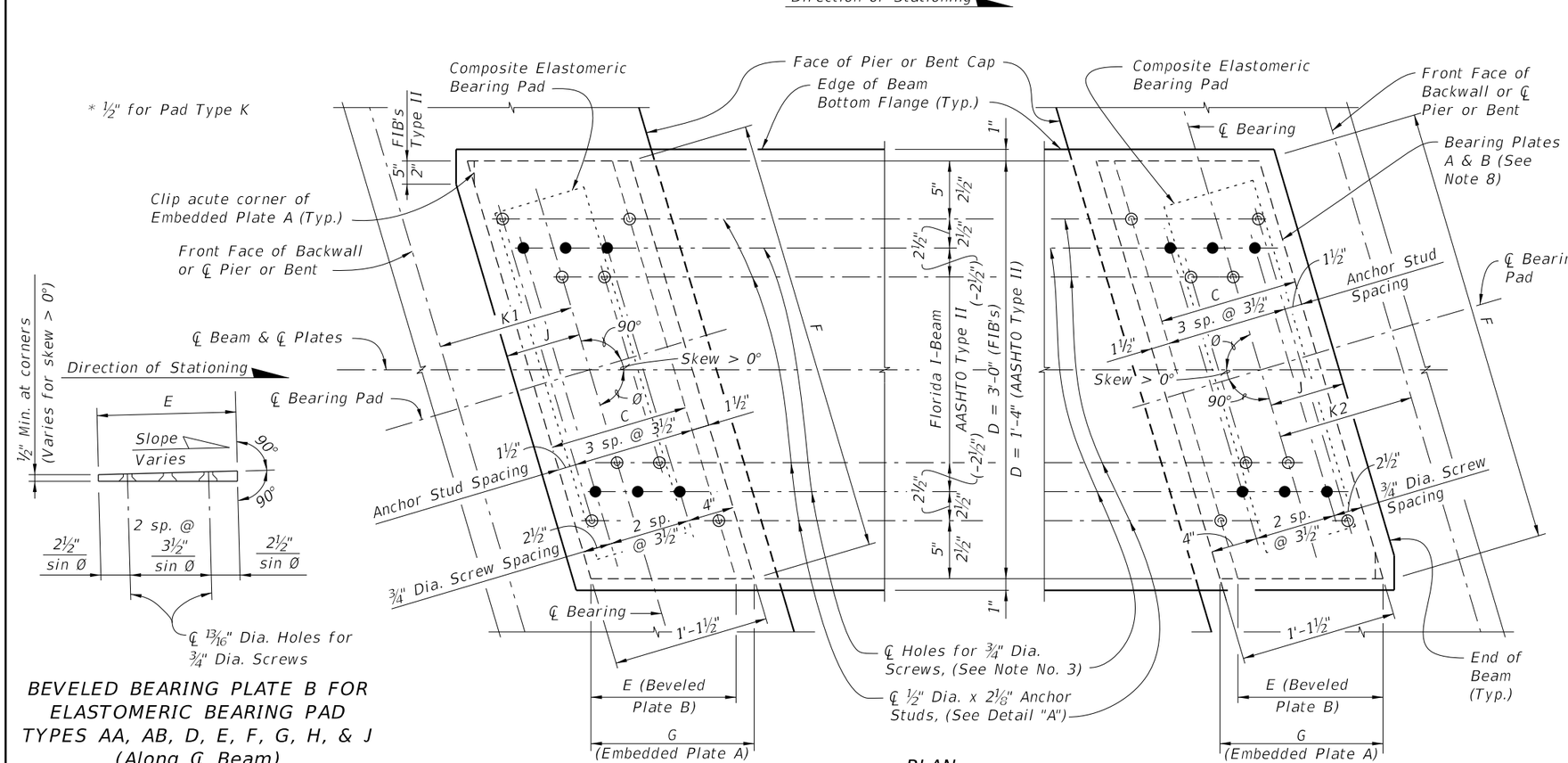




END ELEVATION
(Positive Cross Slope shown, Negative Cross Slope similar)

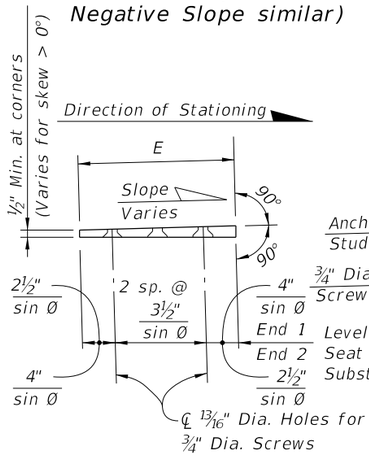
10/24/2018 2:53:16 PM

LAST REVISION	REVISION	DESCRIPTION:				
01/01/10			FDOT FY 2019-20 STANDARD PLANS	BEVELED BEARING PLATE DETAILS - PRESTRESSED FLORIDA-U BEAMS	INDEX 450-502	SHEET 1 of 1

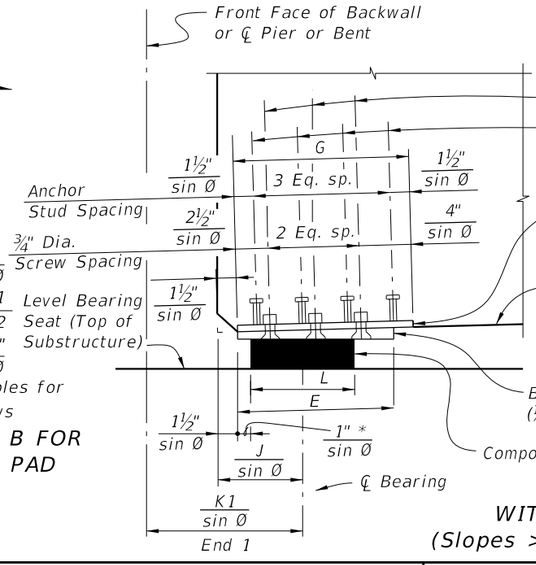


PLAN

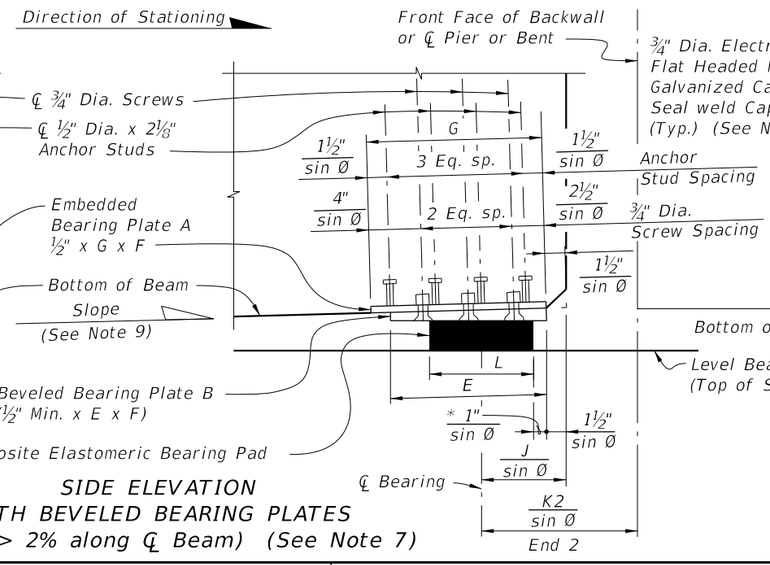
(0° < Skew ≤ 45° FIB Shown, Skew = 0° and AASHTO Type II Similar)



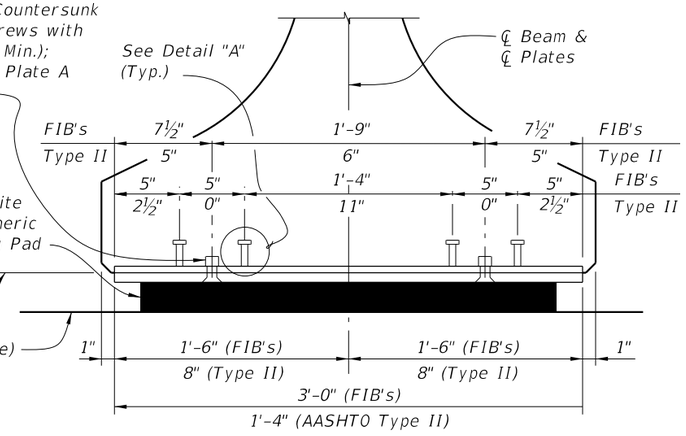
BEVELED BEARING PLATE B FOR ELASTOMERIC BEARING PAD TYPES AA, AB, D, E, F, G, H, & J (Along ℄ Beam) (Positive Slope shown; Negative Slope similar)



BEVELED BEARING PLATE B FOR ELASTOMERIC BEARING PAD TYPE K (Along ℄ Beam)



SIDE ELEVATION WITH BEVELED BEARING PLATES (Slopes > 2% along ℄ Beam) (See Note 7)



END ELEVATION WITH BEVELED BEARING PLATE

NOTES:

1. Work this sheet with Index 400-510 – Composite Elastomeric Bearing Pads, and the 'BEARING PLATE DATA TABLE' in the Structures Plans.
2. Embedded Bearing Plates A are required for all Florida-I beams. Beveled Bearing Plates B with Embedded Bearing Plates A are required for beams as scheduled in the 'BEARING PLATE DATA TABLE' in the Structures Plans.
3. Bearing plate material shall conform to ASTM A36 or ASTM A709 (Grade 36 or 50). Headed Concrete Anchor Studs shall conform to Specification Section 502. Hot-dip galvanize Bearing Plates A & B after fabrication except that Galvanized Caps may be welded in place after hot-dip galvanizing. Drill Bearing Plates A and B as an assembled unit, thread Bearing Plate A only. Holes are not required in Plate A when Plate B is not required. Drill and thread holes perpendicular to Embedded Plate A and prior to plates being galvanized (ASTM A 123).
4. Provide Electroplated, Flat Head Cap Screws in accordance with ASTM F 835. Electroplating shall be ASTM B633, SC 2, Type 1. Provide screws long enough to maintain a ¾" minimum embedment into Embedded Bearing Plate A and Galvanized Cap. Provide steel Galvanized Caps with ½" Min. to 1½" Max. height and nominal 1" inside diameter.
5. Include the cost of Bearing Plates in the pay item for Prestressed Beams.
6. For Pad Type and Dimensions C, D, E, F and G, see the 'BEARING PLATE DATA TABLE' in the Structures Plans. For Dimensions J, K1 and K2, see 'TABLE OF BEAM VARIABLES' in the Structures Plans.
7. All details and dimensions shown are along ℄ Beam, except for dimensions to ¾" Dia. Screws and ½" Dia. x 2⅛" Anchor Studs, which are along ℄ Screws or ℄ Anchor Studs. Positive Slope shown, Negative Slope similar.
8. When Skew = 0°, F = D = 3'-0" (Florida-I Beams) or 1'-4" (AASHTO Type II Beams) E = C, and G = 1'-1½".
9. Slope is determined along ℄ Beam at ℄ Bearing. See 'BEARING PLATE DATA TABLE' in the Structures Plans for Slope and Angle Ø.

CROSS REFERENCE:
See Sheet 2 for Detail "A".

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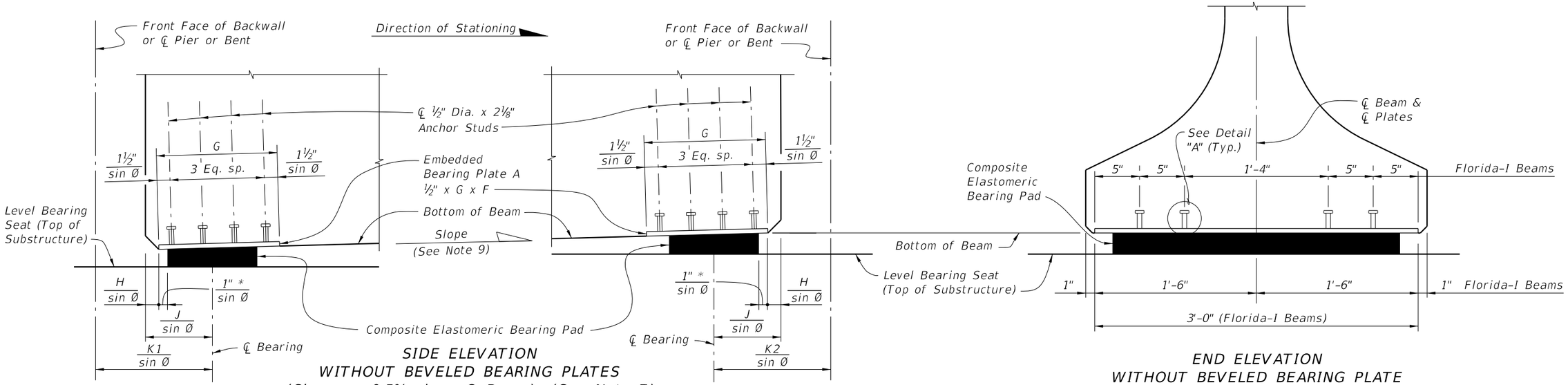
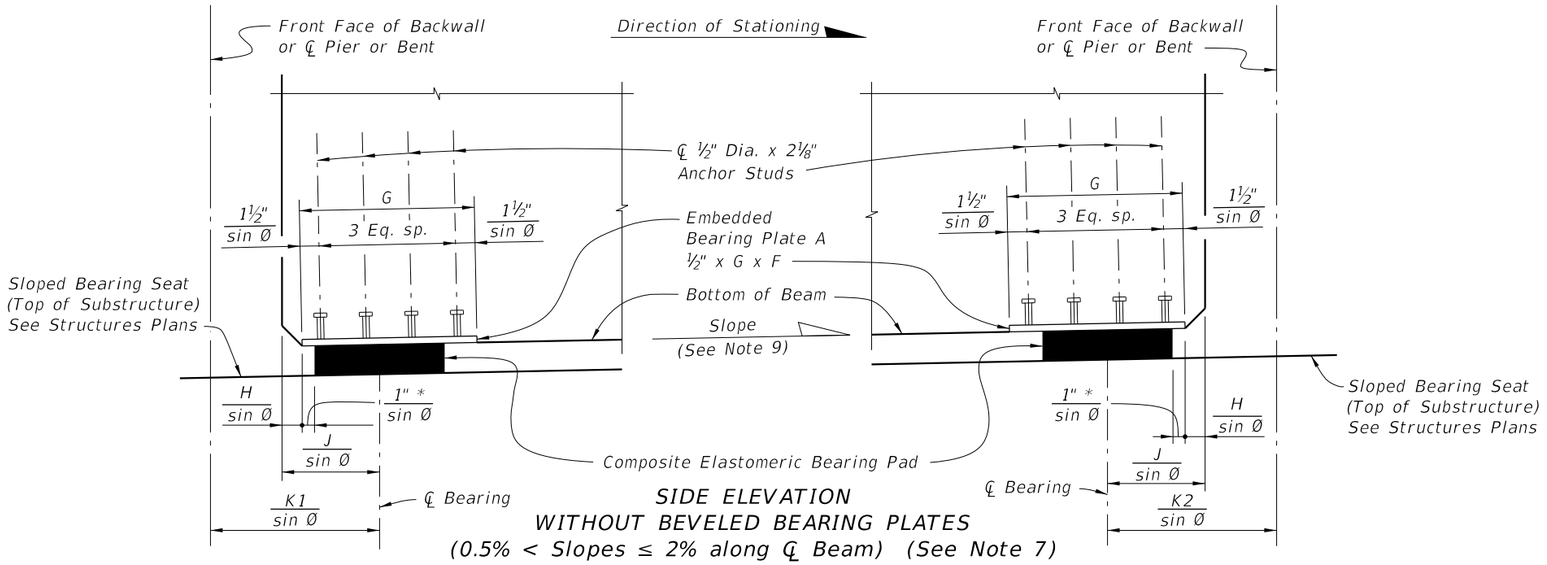
LAST REVISION	REVISION	DESCRIPTION:			
07/01/14			FY 2019-20 STANDARD PLANS	BEARING PLATES (TYPE 1) - PRESTRESSED FLORIDA-I AND AASHTO TYPE II BEAMS	INDEX 450-511 / SHEET 1 of 2



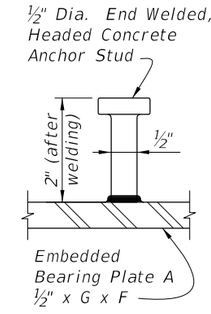
SIDE ELEVATION
WITHOUT BEVELED BEARING PLATES
(Slopes ≤ 0.5% along ℄ Beam) (See Note 7)

END ELEVATION
WITHOUT BEVELED BEARING PLATE

* ½" Pad Type K



SIDE ELEVATION
WITHOUT BEVELED BEARING PLATES
(0.5% < Slopes ≤ 2% along ℄ Beam) (See Note 7)



DETAIL "A"

CROSS REFERENCE:
See Sheet 1 for dimension H and Notes.

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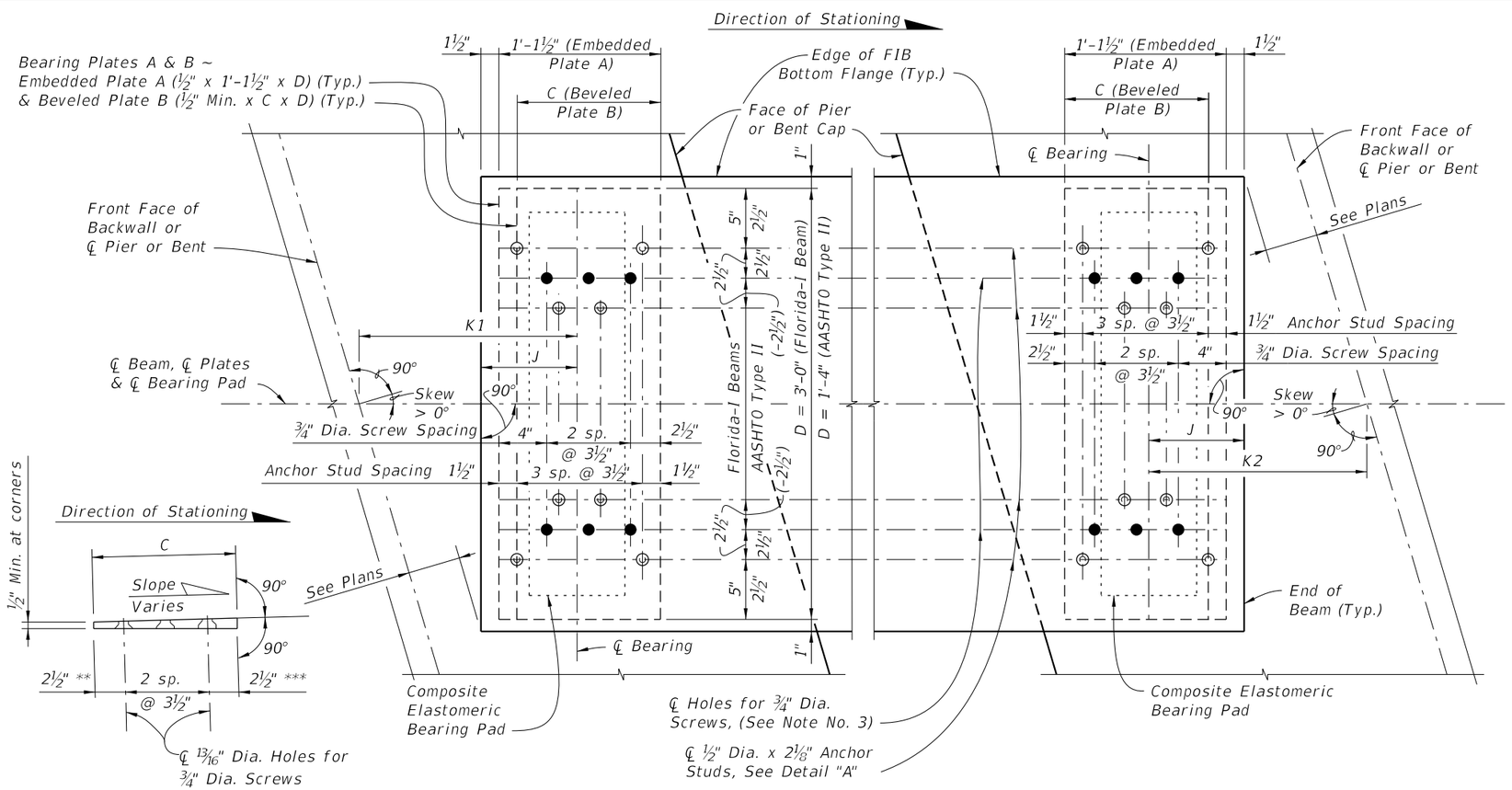
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	BEARING PLATES (TYPE 1) - PRESTRESSED FLORIDA-I AND AASHTO TYPE II BEAMS	INDEX	SHEET
07/01/14						450-511	2 of 2



BEVELED BEARING PLATE B
(Along ℄ Beam)
(Positive Slope shown; Negative Slope similar)

PLAN
(FIB Skewed Alignment Shown, Skew = 0° and AASHTO Type II Similar)

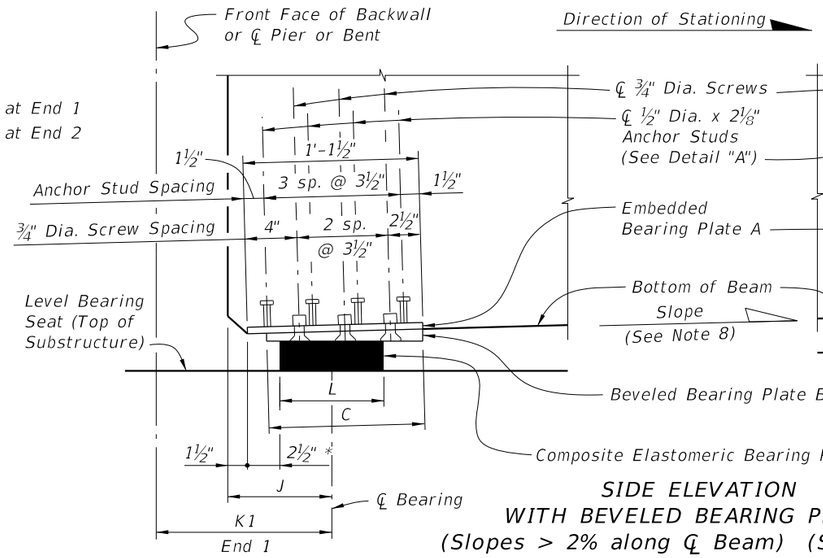
NOTES:

1. *Work this sheet with Index 400-510 – Composite Elastomeric Bearing Pads, and 'BEARING PLATE DATA TABLE' in the Structures Plans.*
2. *Embedded Bearing Plates A are required for all Florida-I beams. Beveled Bearing Plates B with Embedded Bearing Plates A are required for beams as scheduled in the 'BEARING PLATE DATA TABLE' in the Structures Plans.*
3. *Bearing plate material shall conform to ASTM A36 or ASTM A709 (Grade 36 or 50). Headed Concrete Anchor Studs shall conform to Specification Section 502. Hot-dip galvanize Bearing Plates A & B after fabrication except that Galvanized Caps may be welded in place after hot-dip galvanizing. Drill Bearing Plates A and B as an assembled unit, thread Bearing Plate A only. Holes are not required in Plate A when Plate B is not required. Drill and thread holes perpendicular to Embedded Plate A and prior to plates being galvanized (ASTM A 123).*
4. *Provide Electroplated, Flat Head Cap Screws in accordance with ASTM F 835. Electroplating shall be ASTM B633, SC 2, Type 1. Provide screws long enough to maintain a ¾" minimum embedment into Embedded Bearing Plate A and Galvanized Cap. Provide steel Galvanized Caps with ½" Min. to 1½" Max. height and nominal 1" inside diameter.*
5. *Include the cost of Bearing Plates in the pay item for Prestressed Beams.*
6. *For Pad Type and Dimension C, see the 'BEARING PLATE DATA TABLE' in the Structures Plans. For Dimensions J, K1 and K2, see 'TABLE OF BEAM VARIABLES' in the Structures Plans.*
7. *All details and dimensions shown are along ℄ Beam. Positive Slope shown, Negative Slope similar.*
8. *Slope is determined along ℄ Beam at ℄ Bearing. See 'BEARING PLATE DATA TABLE' in the Structures Plans for Slope.*

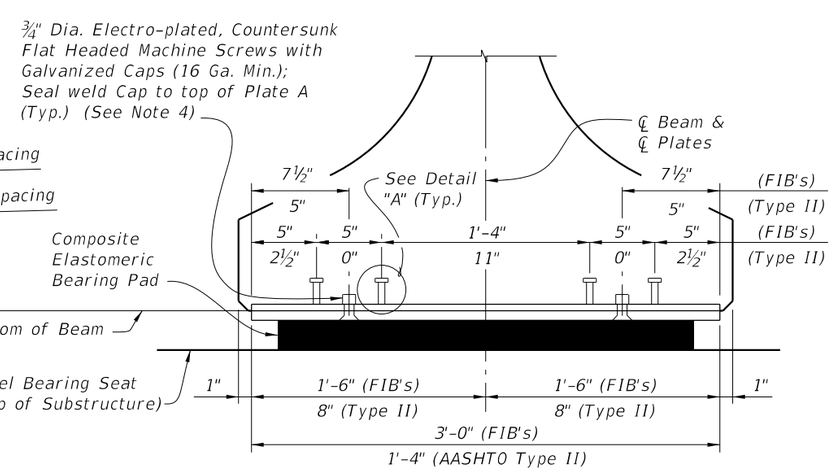
CROSS REFERENCE:
See Sheet 2 for Detail "A"

LEGEND:

* ½" for Pad Type K
** 4" for Pad Type K at End 1
*** 4" for Pad Type K at End 2



SIDE ELEVATION
WITH BEVELED BEARING PLATES
(Slopes > 2% along ℄ Beam) (See Note 7)



END ELEVATION
WITH BEVELED BEARING PLATE

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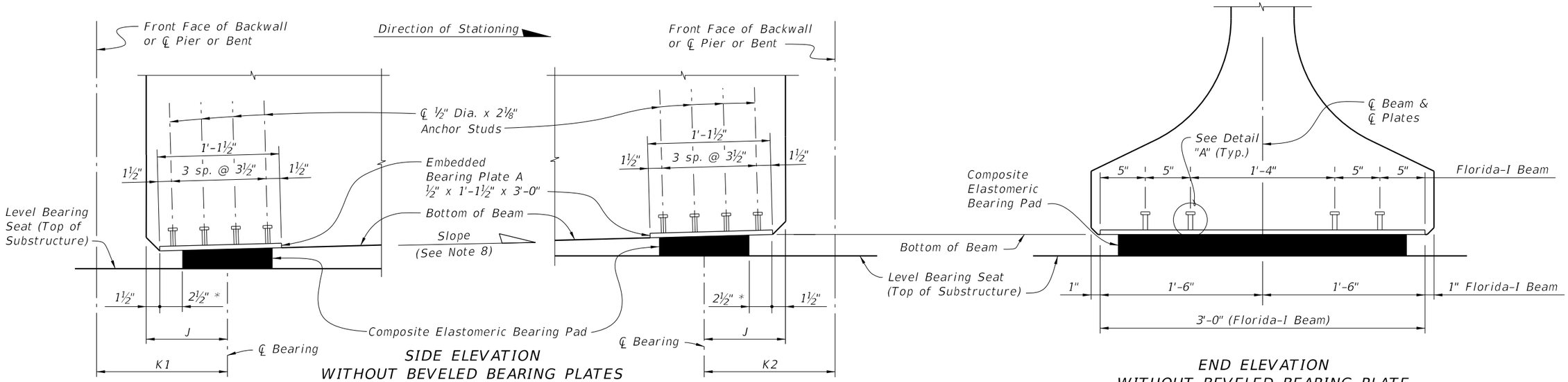
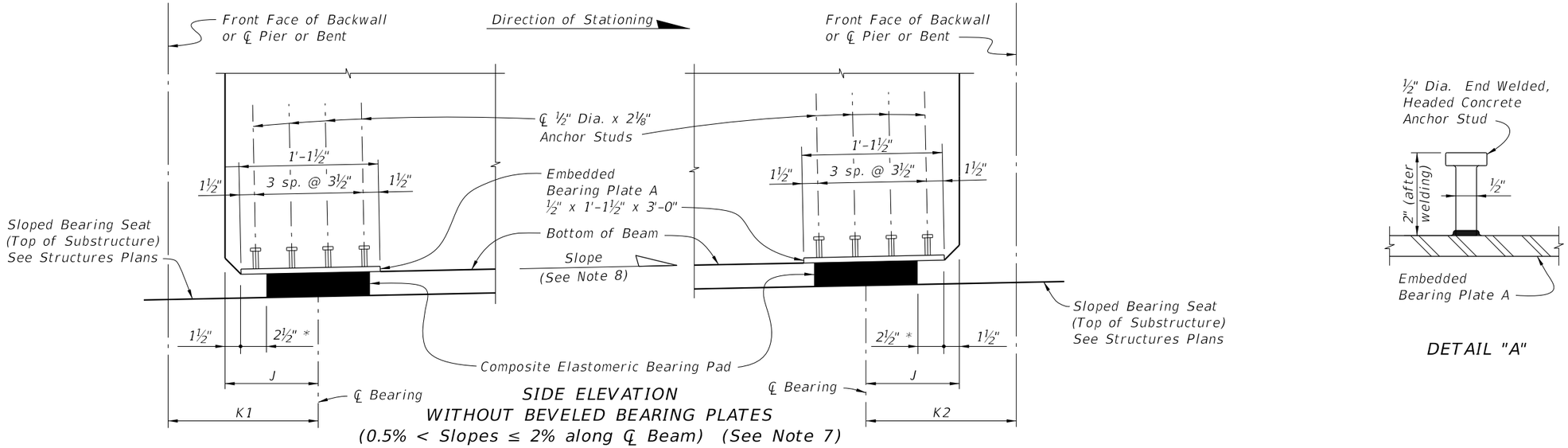
LAST REVISION	REVISION	DESCRIPTION:				
07/01/14			FDOT FY 2019-20 STANDARD PLANS	BEARING PLATES (TYPE 2) - PRESTRESSED FLORIDA-I AND AASHTO TYPE II BEAMS	INDEX 450-512	SHEET 1 of 2



SIDE ELEVATION
WITHOUT BEVELED BEARING PLATES
(Slopes ≤ 0.5% along ℄ Beam) (See Note 7)

END ELEVATION
WITHOUT BEVELED BEARING PLATE

* ½" for Pad Type K



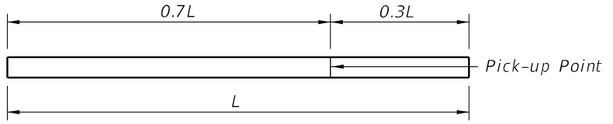
SIDE ELEVATION
WITHOUT BEVELED BEARING PLATES
(0.5% < Slopes ≤ 2% along ℄ Beam) (See Note 7)

DETAIL "A"

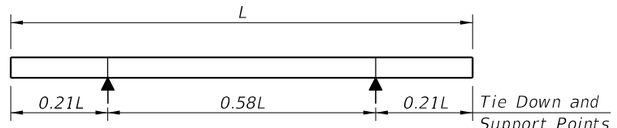
CROSS REFERENCE:
See Sheet 1 for Notes.

10/24/2018 2:53:19 PM

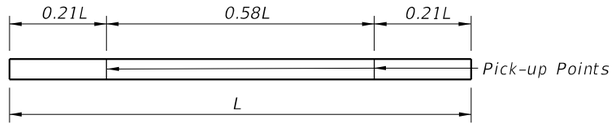
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/14			FDOT FY 2019-20 STANDARD PLANS	BEARING PLATES (TYPE 2) - PRESTRESSED FLORIDA-I AND AASHTO TYPE II BEAMS	450-512	2 of 2



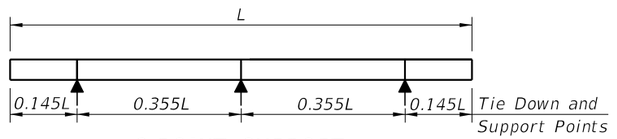
1-POINT PICK-UP



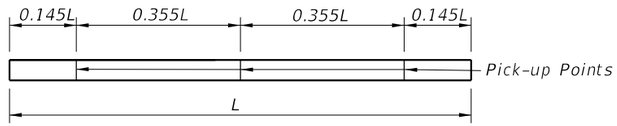
2-POINT SUPPORT



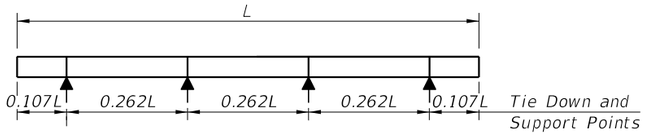
2-POINT PICK-UP



3-POINT SUPPORT



3-POINT PICK-UP



4-POINT SUPPORT

PILE PICK-UP DETAILS

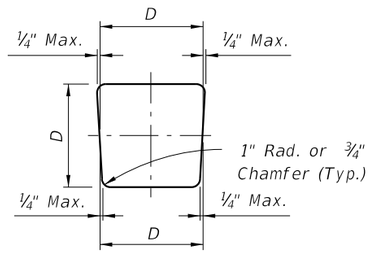
STORAGE AND TRANSPORTATION SUPPORT DETAILS

PRESTRESSED CONCRETE PILE NOTES:

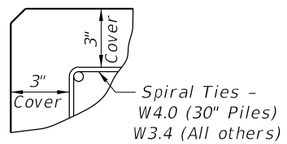
1. Work this Index with the Square Prestressed Concrete Pile Splices (Index 455-002), the Prestressed Concrete Pile Standards (Index 455-012 thru 455-030), the High Moment Capacity Square Prestressed Concrete Pile (Index 455-031) and the Pile Data Table in the Structures Plans.
2. Concrete:
   - A. Piles: Class V (Special), except use Class VI for High Moment Capacity Pile (Index 455-031).
   - B. High Capacity Splice Collar: Class V (Special).
   - C. Silica Fume: See "GENERAL NOTES" in the Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required.
3. Concrete strength at time of prestress transfer:
   - A. Piles: 4,000 psi minimum.
   - B. High Moment Capacity Piles: 6,500 psi minimum.
4. Carbon-Steel Reinforcing:
   - A. Bars: Meet the requirements of Specification Section 415.
   - B. Prestressing Strands: Meet the requirements of Specification Section 933.
   - C. Protect all strands permanently exposed to the environment and not embedded under final conditions in accordance with Specification Section 450.
5. Spiral Ties:
   - A. Tie each wrap of the spiral strand to a minimum of two corner strands.
   - B. One full turn required for spiral splices.
6. Pile Splices: Fill dowel holes and form the joint between pile sections with a Type AB Epoxy Compound in accordance with Specification Section 962. Use an Epoxy Bonding Compound or an Epoxy Mortar as recommended by the Manufacturer.

TABLE OF MAXIMUM PILE PICK-UP AND SUPPORT LENGTHS

	D = Square Pile Size (inches)						Required Storage and Transportation Detail	Pick-Up Detail
	12	14	18	20	24	30		
Maximum Pile Length (Feet)	48	52	59	62	68	87	2, 3, or 4 point	1 Point
	69	75	85	89	98	124	2, 3, or 4 point	2 Point
	99	107	121	128	140	178	3 or 4 point	3 Point



TYPICAL PILE SHAPE FOR MOLD FORMS



DETAIL SHOWING TYPICAL COVER

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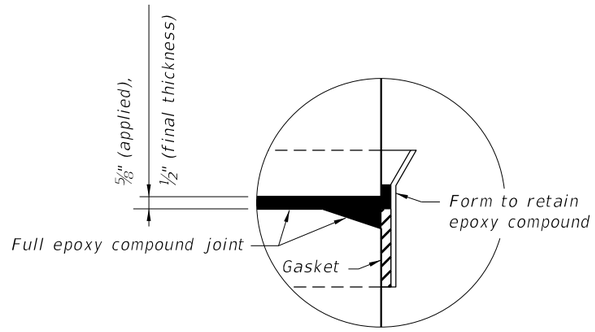
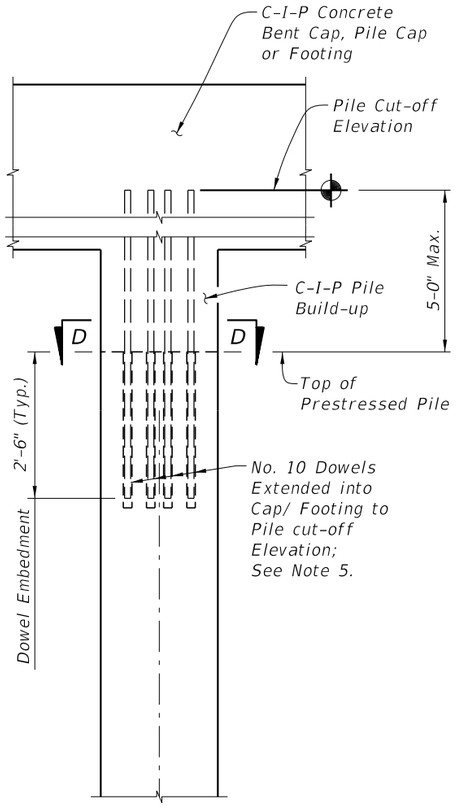
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT	FY 2019-20 STANDARD PLANS	SQUARE PRESTRESSED CONCRETE PILES - TYPICAL DETAILS & NOTES	INDEX 455-001	SHEET 1 of 1

NOTES:

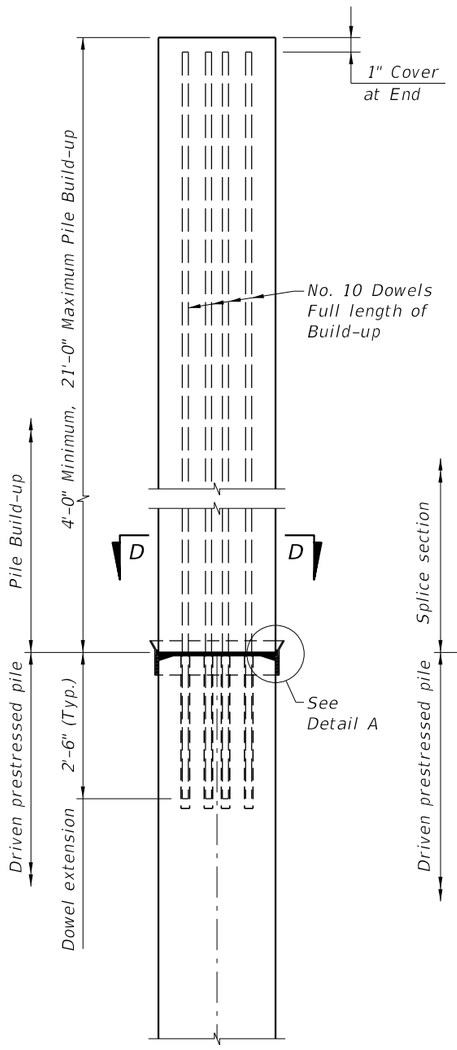
1. For Sections D-D, E-E, & F-F see Index 455-012 thru 455-030 for applicable concrete pile size and Pile Splice Reinforcement Details.
2. Prestressing strands, spiral ties and/or reinforcement are not shown for clarity.
3. In cases where pile splices are desired due to length limitations in shipping and/or handling, the "Drivable Preplanned Prestressed Precast Splice Detail" shall be used. Mechanical Pile Splices contained on the Approved Products List (APL) may also be used.
4. When preformed dowel holes are utilized, the 1" spiral tie pitch shall be continued to 4'-0" below the head of the pile, See Index 455-018, 455-020 & 455-024. Preformed holes shall utilize either removable preforming material or stay-in-place corrugated galvanized steel ducts. Stay-in-place ducts shall be fabricated from galvanized sheet steel meeting the requirements of ASTM A653, Coating Designation G90, 26 gauge. Ducts shall be 2" diameter with a minimum corrugation (rib) height of 0.12 in. Ducts shall be fabricated with either welded or interlocked seams. Galvanizing of welded seams will not be required.
5. For tension piles where top of Prestressed Pile is less than 3 feet below Pile Cut-off Elevation, extend No. 10 Dowels into cap beyond Pile Cut-off Elevation to achieve development as approved by the Engineer.



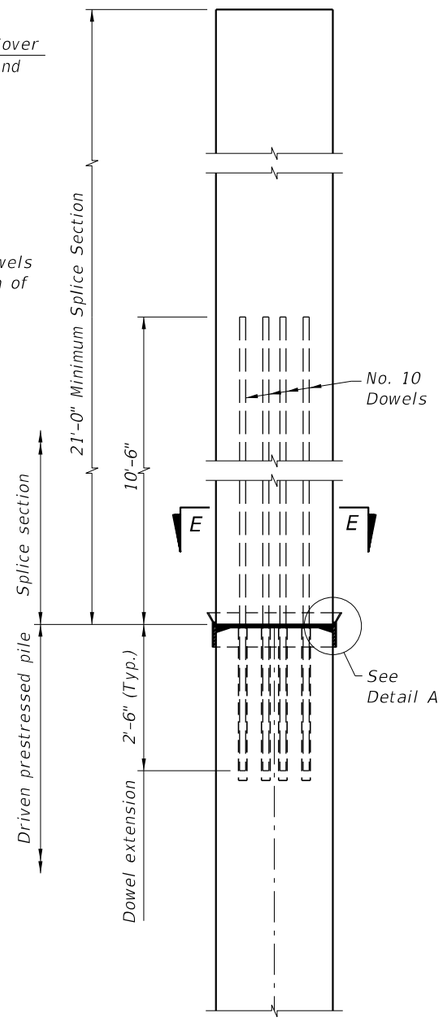
DETAIL A



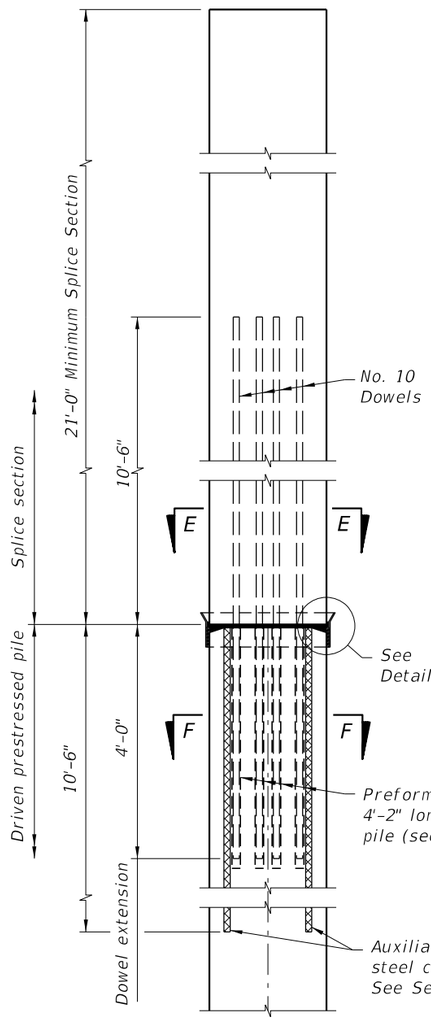
UNFORESEEN
REINFORCED C-I-P
PILE BUILD-UP DETAIL



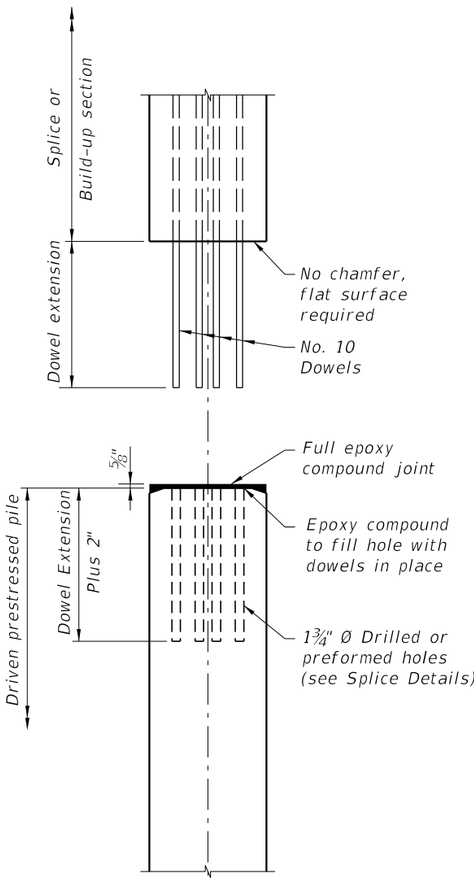
NON-DRIVABLE UNFORESEEN
REINFORCED PRECAST
PILE BUILD-UP DETAIL



DRIVABLE UNFORESEEN
PRESTRESSED PRECAST
PILE SPLICE DETAIL



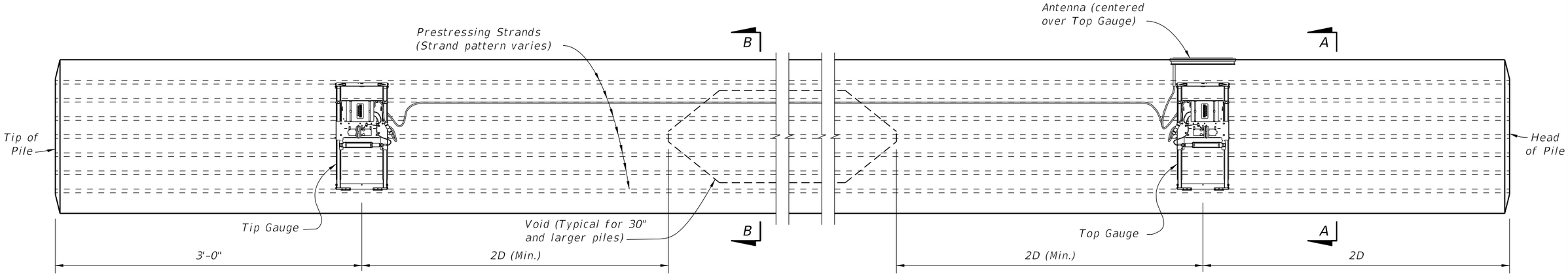
DRIVABLE PREPLANNED
PRESTRESSED PRECAST
PILE SPLICE DETAIL



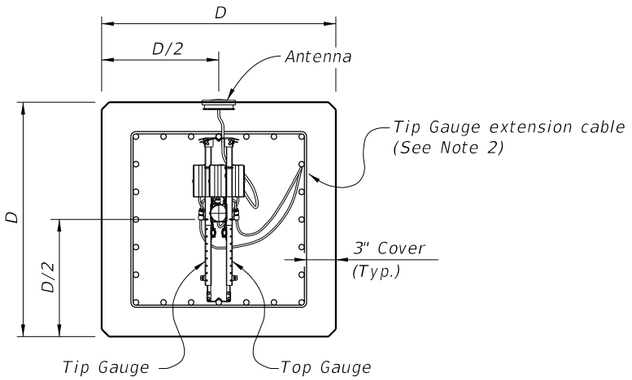
TYPICAL SPLICE
BEFORE BONDING

10/24/2018 2:53:21 PM

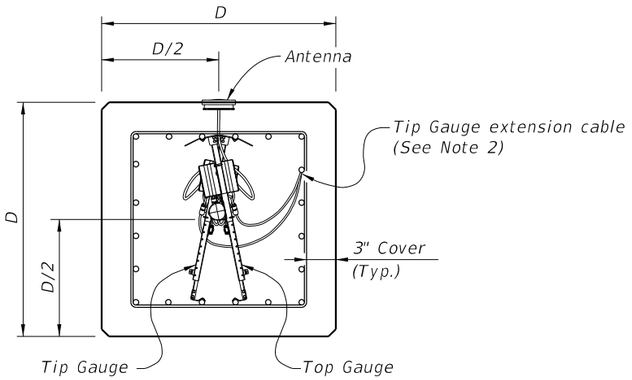
LAST REVISION	REVISION	DESCRIPTION:				
07/01/14			FDOT FY 2019-20 STANDARD PLANS	SQUARE PRESTRESSED CONCRETE PILE SPLICES	INDEX 455-002	SHEET 1 of 1



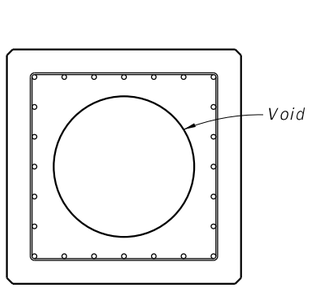
ELEVATION



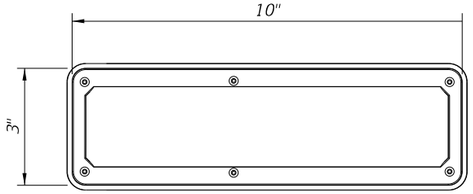
SECTION A-A
(Strand Pattern with odd number of strands per face)



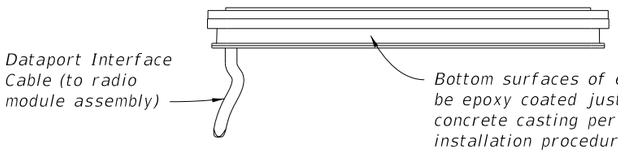
SECTION A-A
(Strand Pattern with even number of strands per face)



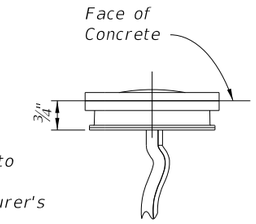
SECTION B-B
(Showing Voided Pile,
Solid Pile Similar)



ANTENNA TOP VIEW



ANTENNA SIDE VIEW



ANTENNA END VIEW

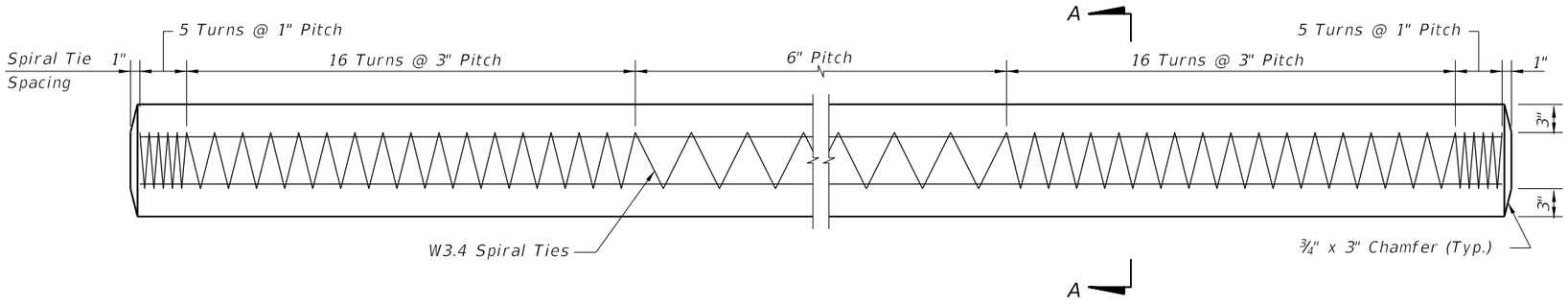
NOTES:

1. For piles 18" and larger installed for bridge foundations, provide EDC Instrumentation in accordance with Specification Section 455.

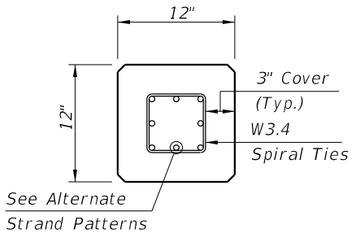
2. Attach Tip Gauge extension cable to the underside of the strand shown in Section A-A. Secure cable to strand with nylon wire ties spaced a maximum of 6ft. along cable.

10/24/2018 2:53:21 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	SQUARE PRESTRESSED CONCRETE PILES - EDC INSTRUMENTATION	INDEX	SHEET
07/01/15						455-003	1 of 1



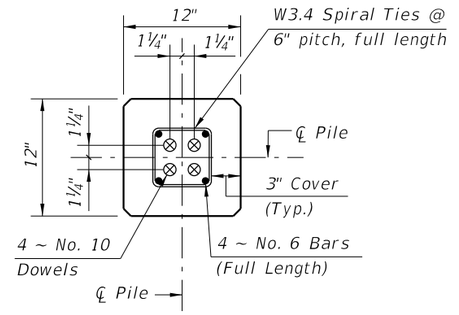
ELEVATION



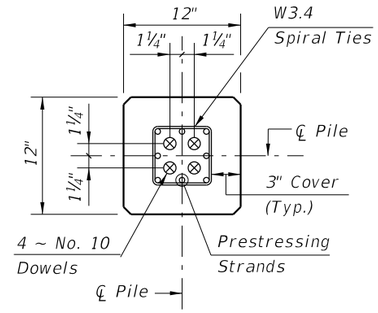
SECTION A-A

ALTERNATE STRAND PATTERNS

4 ~ 0.6" Ø, Grade 270 LRS, at 44 kips
8 ~ ½" Ø (Special), Grade 270 LRS, at 25 kips
8 ~ ½" Ø, Grade 270 LRS, at 24 kips
8 ~ 7/16" Ø, Grade 270 LRS, at 23 kips
12 ~ ⅜" Ø, Grade 270 LRS, at 16 kips



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Splice Detail)



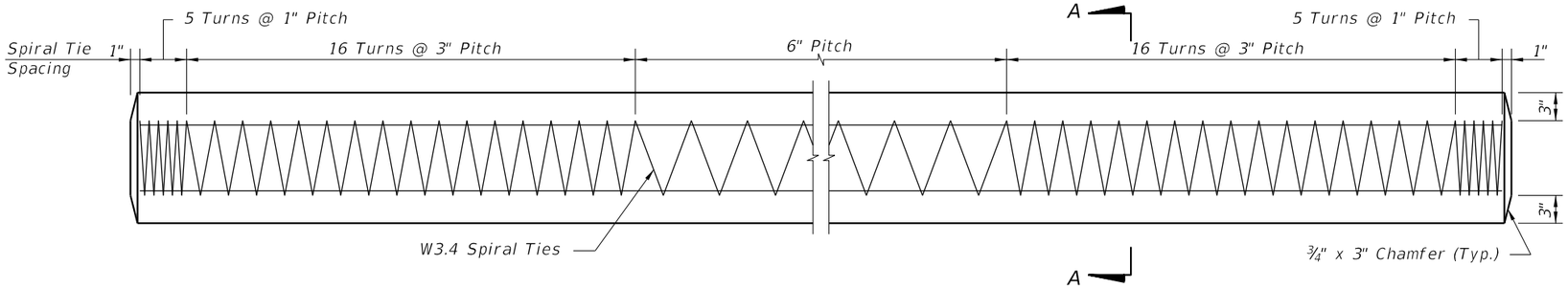
SECTION E-E
(See Drivable Unforeseen Prestressed Precast Pile Splice Detail)

PILE SPLICE REINFORCEMENT DETAILS

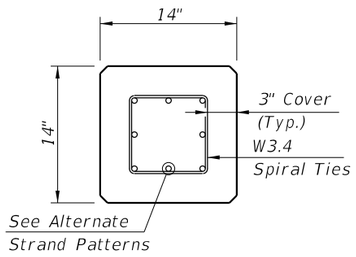
NOTES:
1. Work this Index with Index 450-001 – Typical Details and Notes for Square Prestressed Concrete Piles and Index 455-002 – Square Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.

10/24/2018 2:53:22 PM

LAST REVISION	REVISION	DESCRIPTION:				
01/01/12			FDOT FY 2019-20 STANDARD PLANS	12" SQUARE PRESTRESSED CONCRETE PILE	INDEX 455-012	SHEET 1 of 1



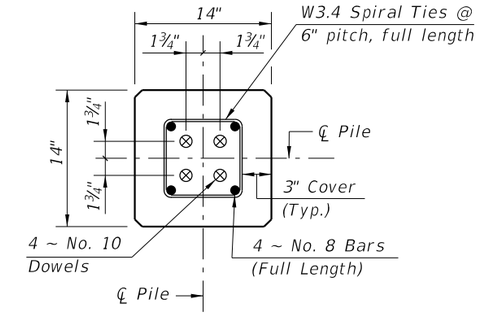
ELEVATION



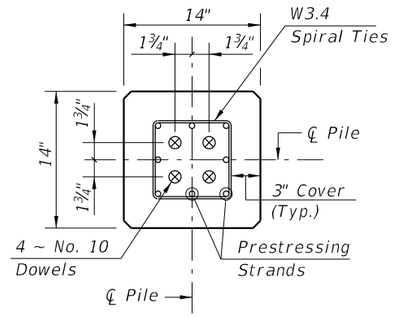
SECTION A-A

ALTERNATE STRAND PATTERNS

8 ~ 0.6" Ø, Grade 270 LRS, at 33 kips
8 ~ ½" Ø (Special), Grade 270 LRS, at 31 kips
8 ~ ½" Ø, Grade 270 LRS, at 31 kips
12 ~ 7/16" Ø, Grade 270 LRS, at 21 kips
16 ~ ⅜" Ø, Grade 270 LRS, at 16 kips



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Splice Detail)



SECTION E-E
(See Drivable Unforeseen Prestressed Precast Splice Detail)

PILE SPLICE REINFORCEMENT DETAILS

NOTES:
1. Work this Index with Index 455-001 – Typical Details and Notes for Square Prestressed Concrete Piles and Index 455-002 – Square Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized.
   The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.

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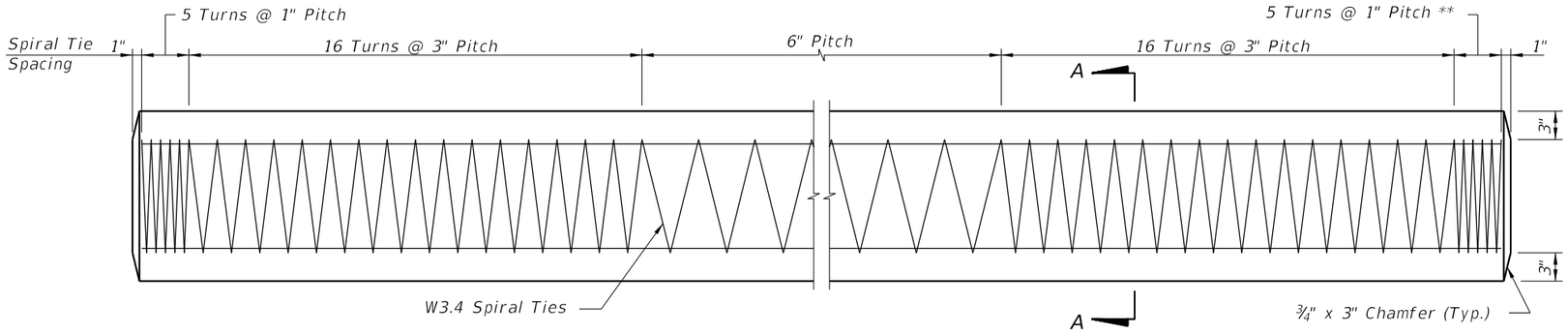
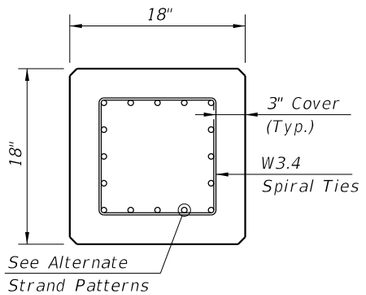
LAST REVISION	REVISION	DESCRIPTION:				
01/01/12			FDOT FY 2019-20 STANDARD PLANS	14" SQUARE PRESTRESSED CONCRETE PILE	INDEX 455-014	SHEET 1 of 1



ELEVATION

*** See Note 4 on Index 455-002*

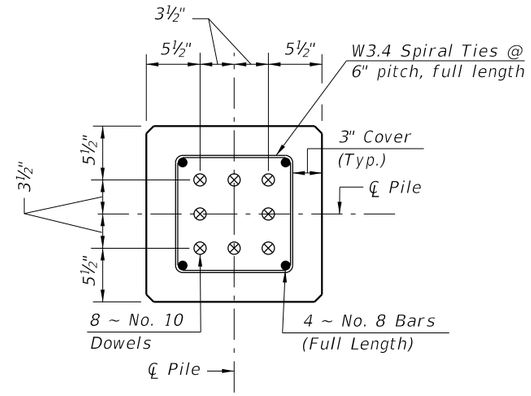


SECTION A-A

ALTERNATE STRAND PATTERNS

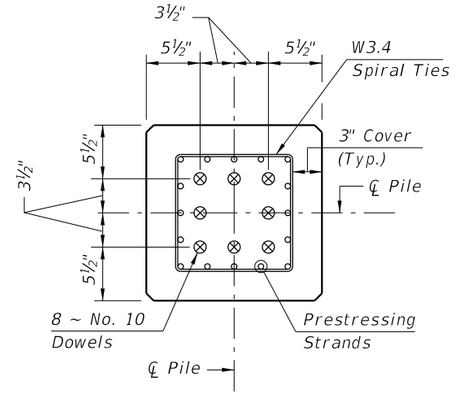
12 ~ 0.6" Ø, Grade 270 LRS, at 35 kips
12 ~ ½" Ø (Special), Grade 270 LRS, at 34 kips
16 ~ ½" Ø, Grade 270 LRS, at 26 kips
20 ~ 7/16" Ø, Grade 270 LRS, at 21 kips
24 ~ ⅜" Ø, Grade 270 LRS, at 17 kips

NOTES:
1. *Work this Index with Index 455-001 – Typical Details and Notes for Square Prestressed Concrete Piles and Index 455-002 – Square Prestressed Concrete Pile Splices.*
2. *Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:*
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.



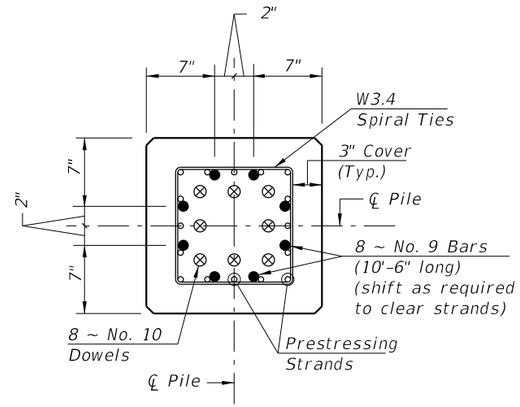
SECTION D-D

(See Non-Drivable Unforeseen Reinforced Precast Splice Detail)



SECTION E-E

(See Drivable Prestressed Precast Splice Detail)



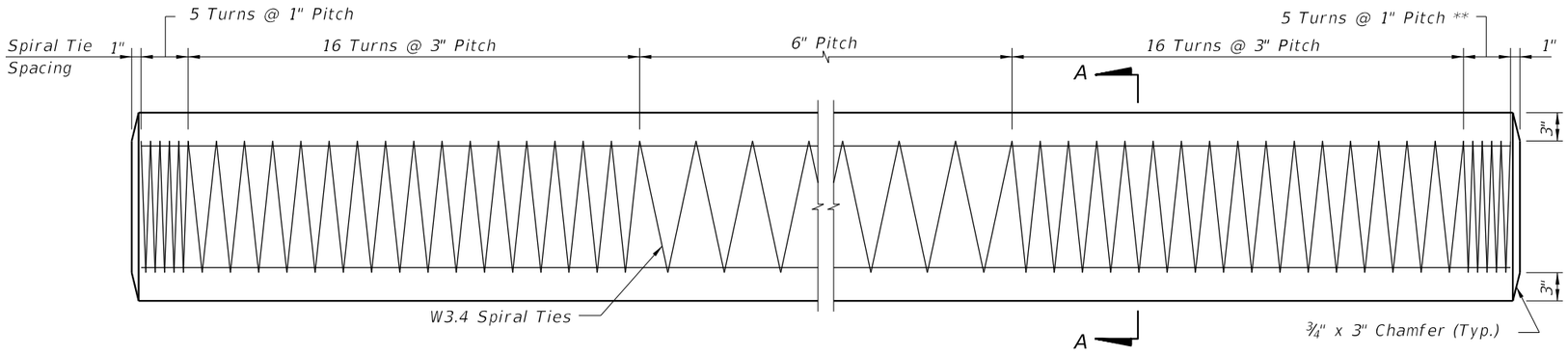
SECTION F-F

(See Drivable Preplanned Splice Detail)

PILE SPLICE REINFORCEMENT DETAILS

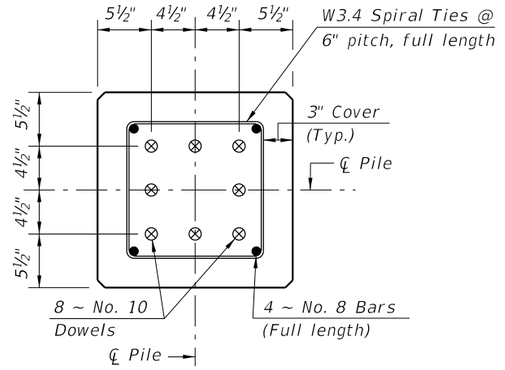
10/24/2018 2:53:23 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	18" SQUARE PRESTRESSED CONCRETE PILE	INDEX	SHEET
01/01/12						455-018	1 of 1



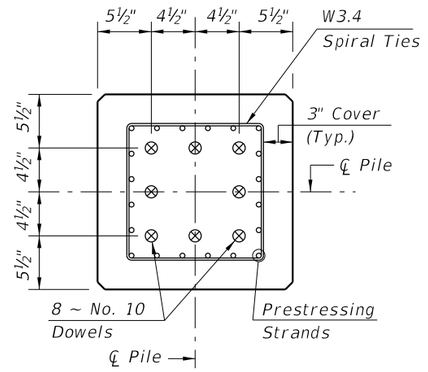
ELEVATION

** See Note 4 on Index 455-002



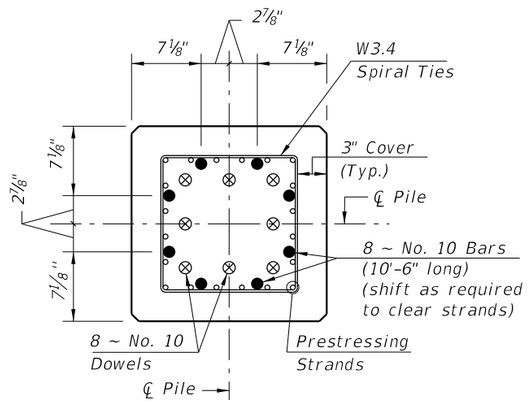
SECTION D-D

(See Non-Drivable Unforeseen Reinforced Precast Pile Splice Detail)



SECTION E-E

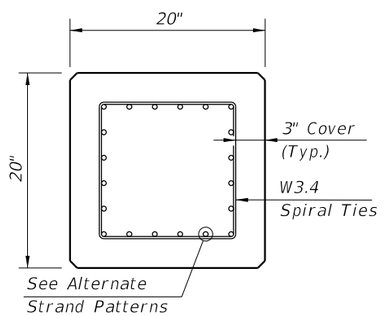
(See Drivable Prestressed Precast Pile Splice Detail)



SECTION F-F

(See Drivable Preplanned Pile Splice Detail)

PILE SPLICE REINFORCEMENT DETAILS



SECTION A-A

ALTERNATE STRAND PATTERNS

12 ~ 0.6" Ø, Grade 270 LRS, at 42 kips
16 ~ ½" Ø (Special), Grade 270 LRS, at 31 kips
16 ~ ½" Ø, Grade 270 LRS, at 31 kips
24 ~ 7/16" Ø, Grade 270 LRS, at 21 kips

NOTES:

1. *Work this Index with Index 455-001 – Typical Details and Notes for Square Prestressed Concrete Piles and Index 455-002 – Square Prestressed Concrete Pile Splices.*
2. *Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:*
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.

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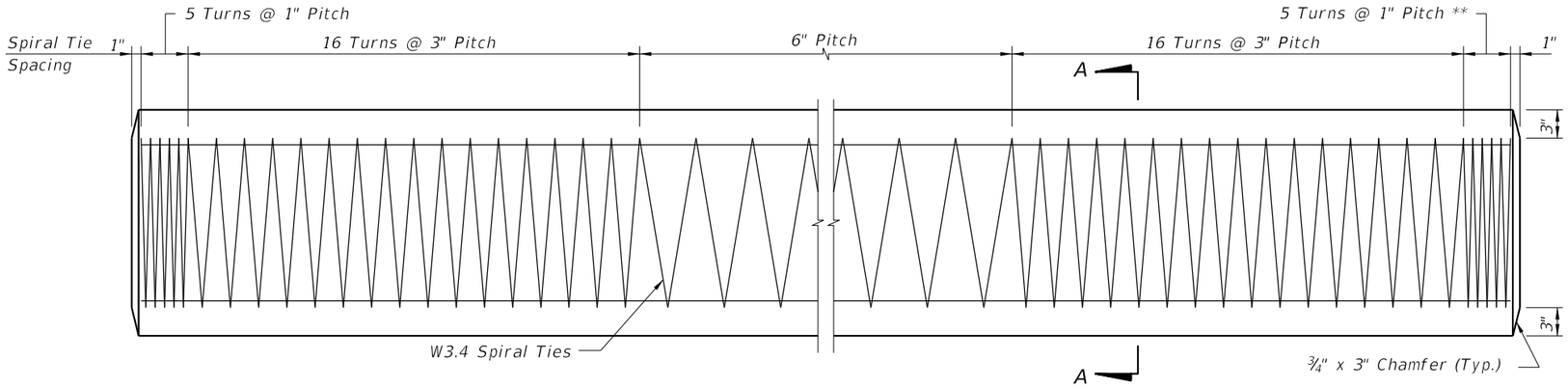
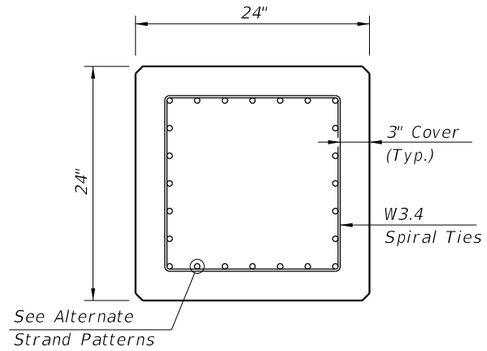
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	20" SQUARE PRESTRESSED CONCRETE PILE	INDEX	SHEET
01/01/12						455-020	1 of 1



ELEVATION

** See Note 4 on Index 455-002

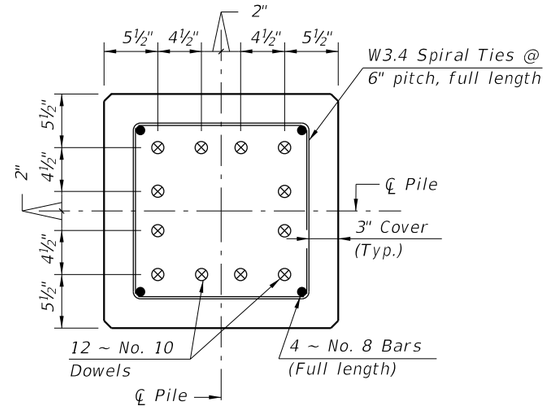


SECTION A-A

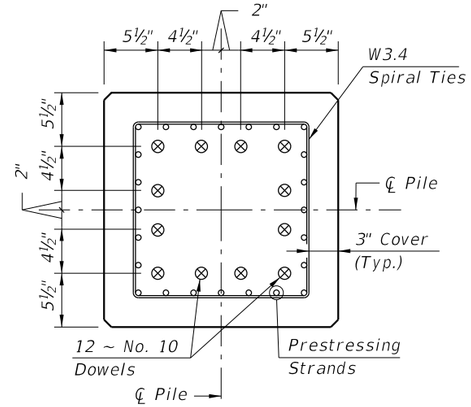
ALTERNATE STRAND PATTERNS

16 ~ 0.6" Ø, Grade 270 LRS, at 44 kips
20 ~ ½" Ø (Special), Grade 270 LRS, at 34 kips
24 ~ ½" Ø, Grade 270 LRS, at 31 kips

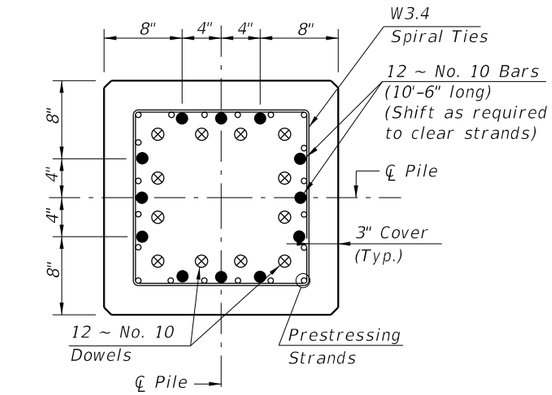
NOTES:
1. Work this Index with Index 455-001 – Typical Details and Notes for Square Prestressed Concrete Piles and Index 455-002 – Square Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Splice Detail)



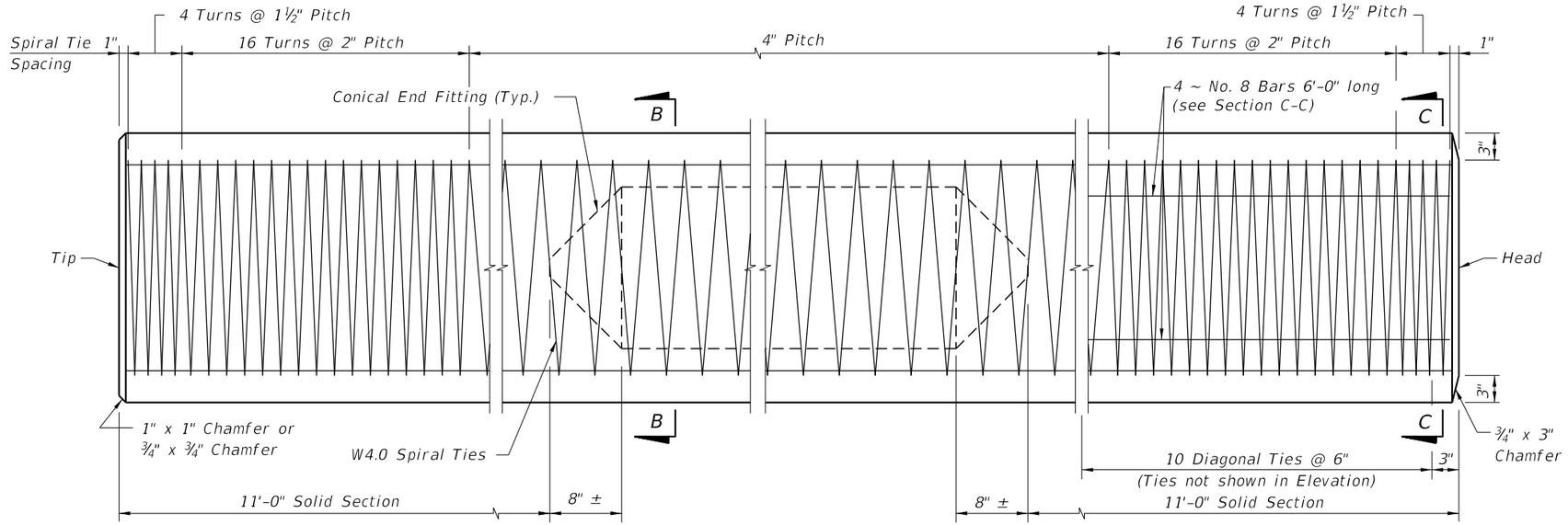
SECTION E-E
(See Drivable Prestressed Precast Pile Splice Detail)



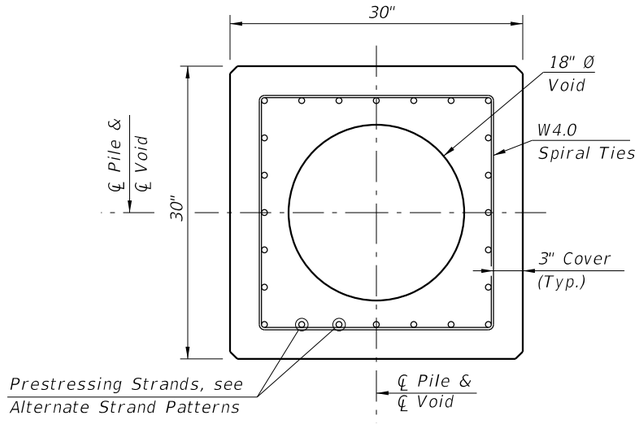
SECTION F-F
(See Drivable Preplanned Pile Splice Detail)

10/24/2018 2:53:25 PM

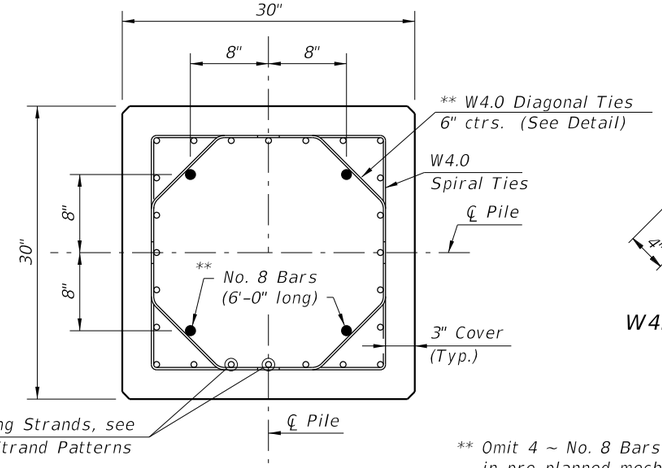
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/12			FDOT FY 2019-20 STANDARD PLANS	24" SQUARE PRESTRESSED CONCRETE PILE	455-024	1 of 1



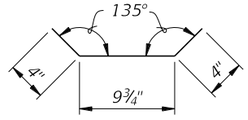
ELEVATION



SECTION B-B
(See Pile Splice Reinforcement Details)



SECTION C-C
(See Pile Splice Reinforcement Details)



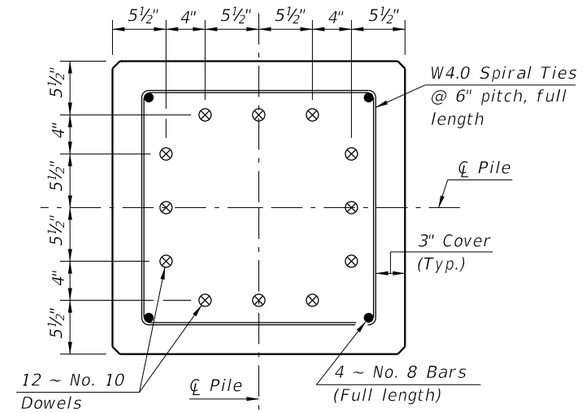
W4.0 DIAGONAL TIE DETAIL

** Omit 4 ~ No. 8 Bars and Diagonal Ties in pre-planned mechanical splice.

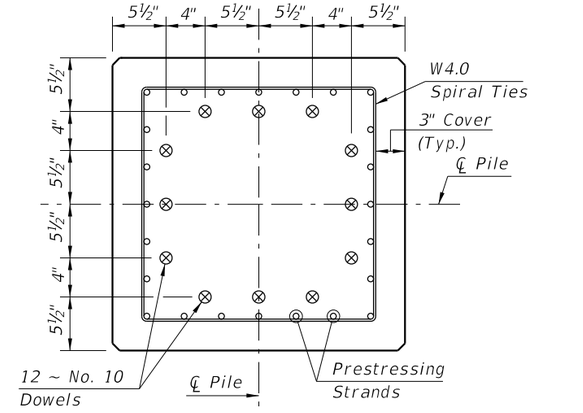
ALTERNATE STRAND PATTERNS

20 ~ 0.6" Ø, Grade 270 LRS, at 41 kips
24 ~ ½" Ø (Special), Grade 270 LRS, at 34 kips
28 ~ ½" Ø, Grade 270 LRS, at 29 kips

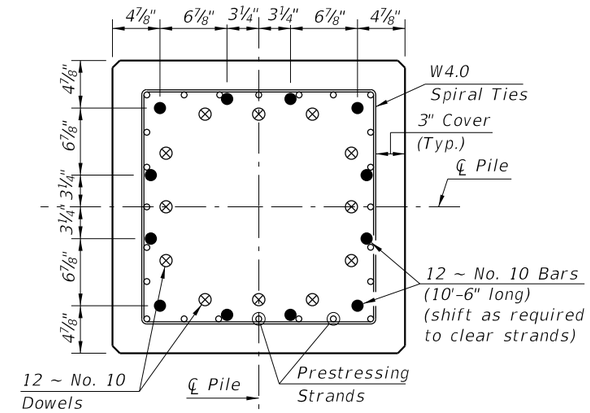
NOTES:
1. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows: Place one strand at each corner and place the remaining strands equally spaced between the corner strands. The total strand pattern shall be concentric with the nominal concrete section of the pile.
2. CONTRACTOR OPTION: The 30" pile may be cast SOLID by omitting the 18" Ø void. In this event, the Contractor shall submit calculations for approval and a proposed strand configuration that provide net prestressing after losses equal to 1000 psi. Alternate configurations for the Diagonal Ties, to maintain the position of the 4 ~ #8 Bars, may be approved by the Engineer.
3. Work this Index with Index 455-001 – Typical Details and Notes for Square Prestressed Concrete Piles and Index 455-002 – Square Prestressed Concrete Pile Splices.



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Splice Detail)



SECTION E-E
(See Drivable Prestressed Precast Pile Splice Detail)

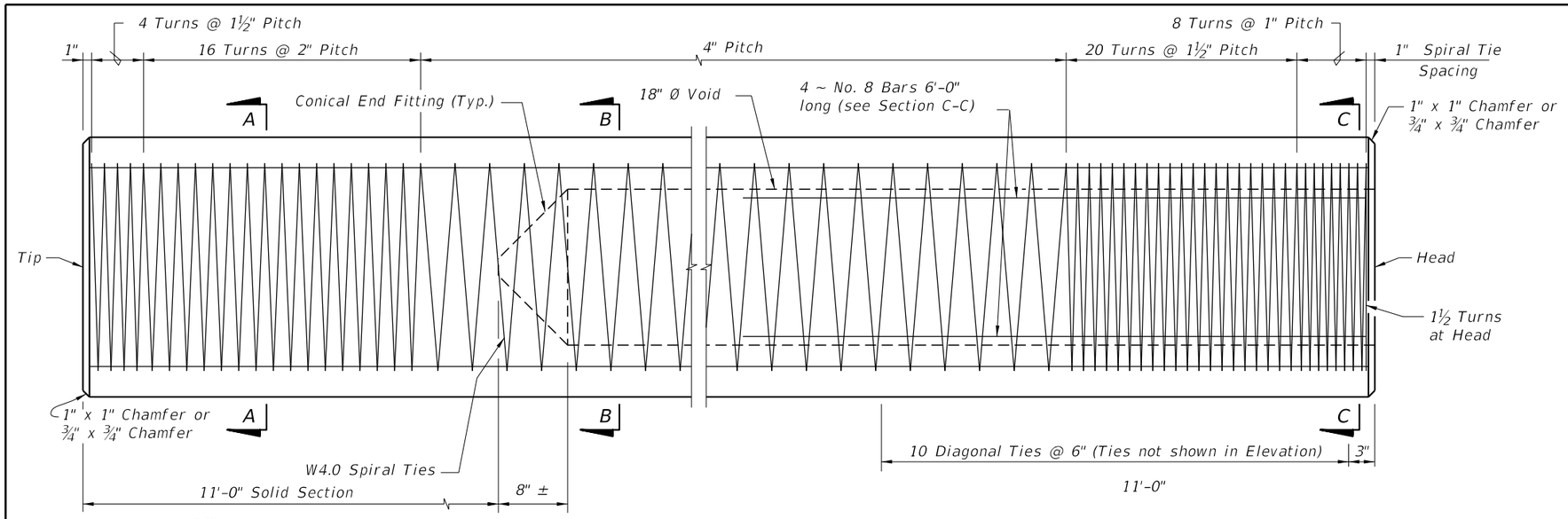


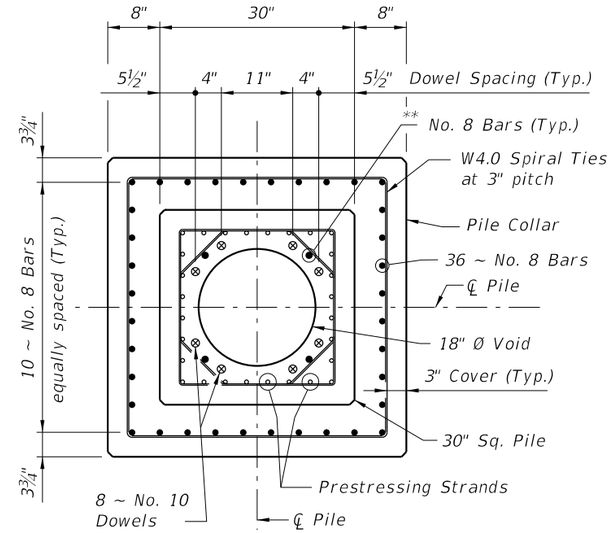
SECTION F-F
(See Drivable Preplanned Pile Splice Detail)

PILE SPLICE DETAILS

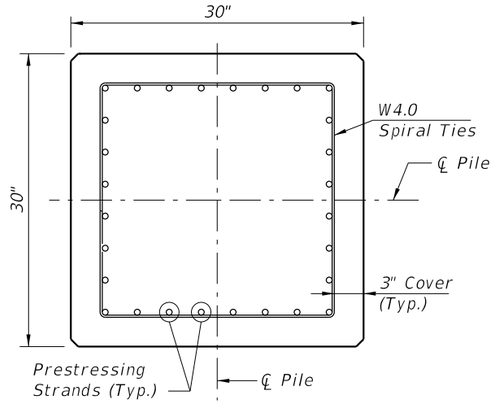
10/24/2018 2:53:25 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/15			FY 2019-20 STANDARD PLANS	30" SQUARE PRESTRESSED CONCRETE PILE	455-030	1 of 1



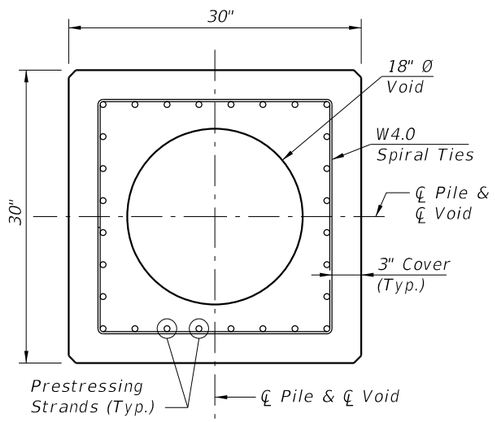


SECTION D-D
SECTION THRU PILE COLLAR

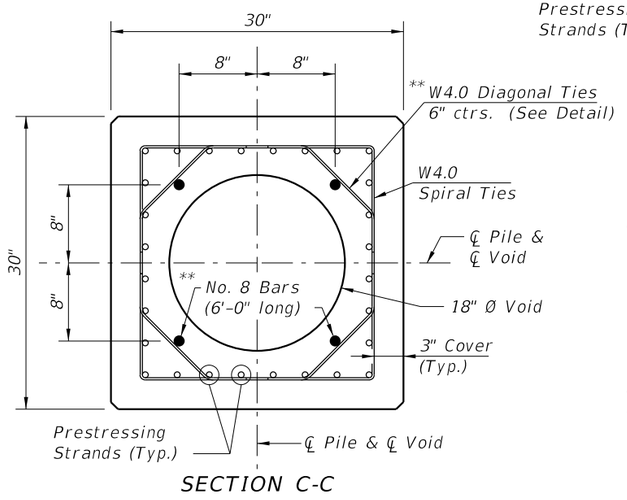


SECTION A-A

ELEVATION



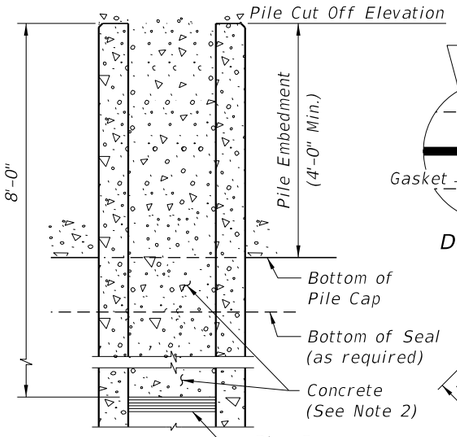
SECTION B-B



SECTION C-C

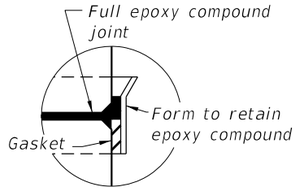
STRAND PATTERN

28 ~ 0.6" Ø, Grade 270 LRS, at 29.5 kips

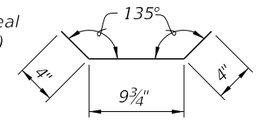


SECTION THROUGH PILE AT PILE CAP

** Omit 4 ~ No. 8 Bars and Diagonal Ties in pre-planned mechanical splice.

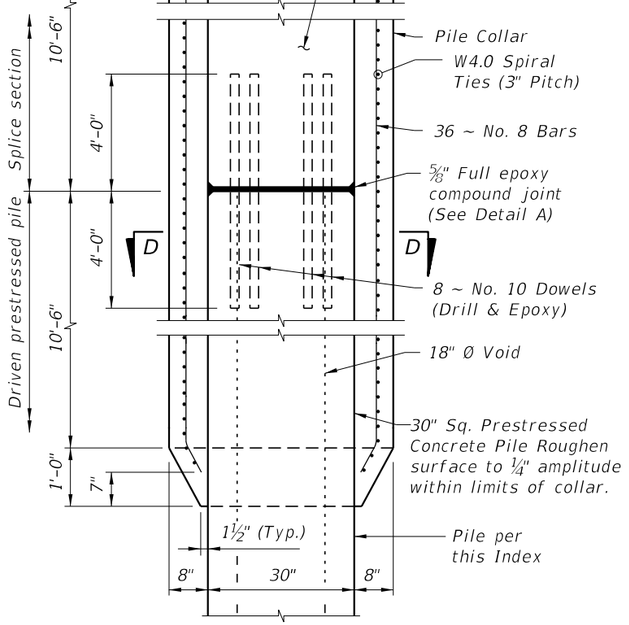


DETAIL A



W4.0 DIAGONAL TIE DETAIL

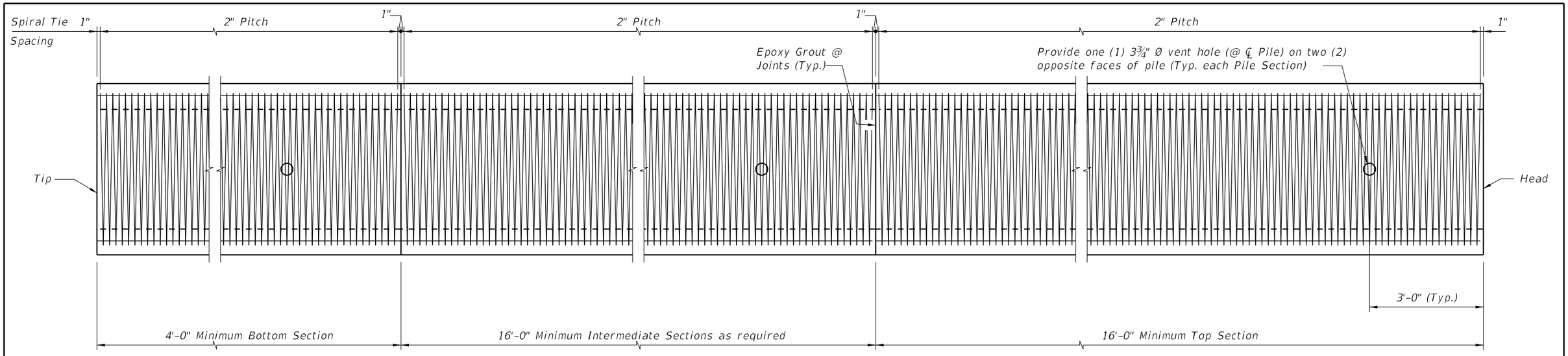
NOTES:
1. After the pile is driven and cut to grade, the top 8'-0" of the 18" Ø Void shall be filled with concrete. Prior to filling the top 8'-0" of the 18" Ø Void with concrete, strip the cardboard form material from the void and sand/water blast all interface surfaces. Seal void and fill with potable water for 4-5 hours. Remove water to a surface-saturated-dry condition prior to making the concrete pour. In lieu of the cardboard form material and the surface preparation requirements described above, a stay-in-place corrugated thin wall galvanized pipe may be used. The concrete fill material shall be of the same type and strength as called for in the pile cap and paid for as substructure concrete.
2. Collar concrete shall reach a strength of 6,000 psi before pile driving is resumed.
3. Work this Index with Index 455-001 – Typical Details and Notes for Square Prestressed Concrete Piles.



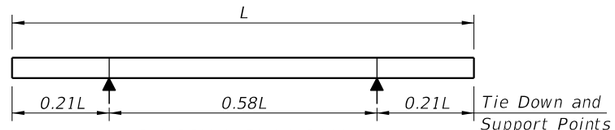
DETAIL OF PILE COLLAR FOR HIGH MOMENT CAPACITY 30" SQUARE PRESTRESSED PILE
-PILE SPLICE DETAIL-

10/24/2018 2:53:26 PM

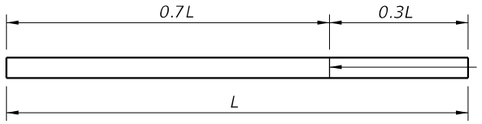
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	30" SQUARE PRESTRESSED CONCRETE PILE - HIGH MOMENT CAPACITY	INDEX	SHEET
07/01/15						455-031	1 of 1



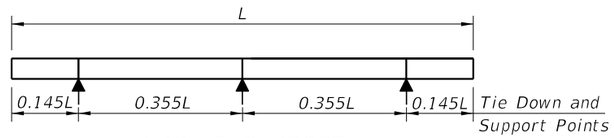
ELEVATION



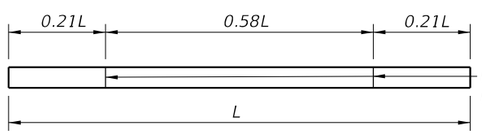
2-POINT SUPPORT



1-POINT PICK-UP

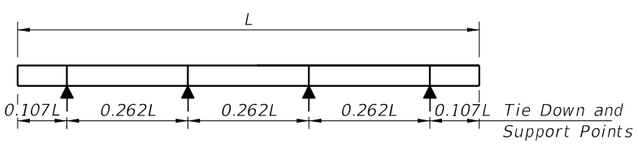


3-POINT SUPPORT



2-POINT PICK-UP

PILE PICK-UP DETAILS



4-POINT SUPPORT

STORAGE AND TRANSPORTATION SUPPORT DETAILS

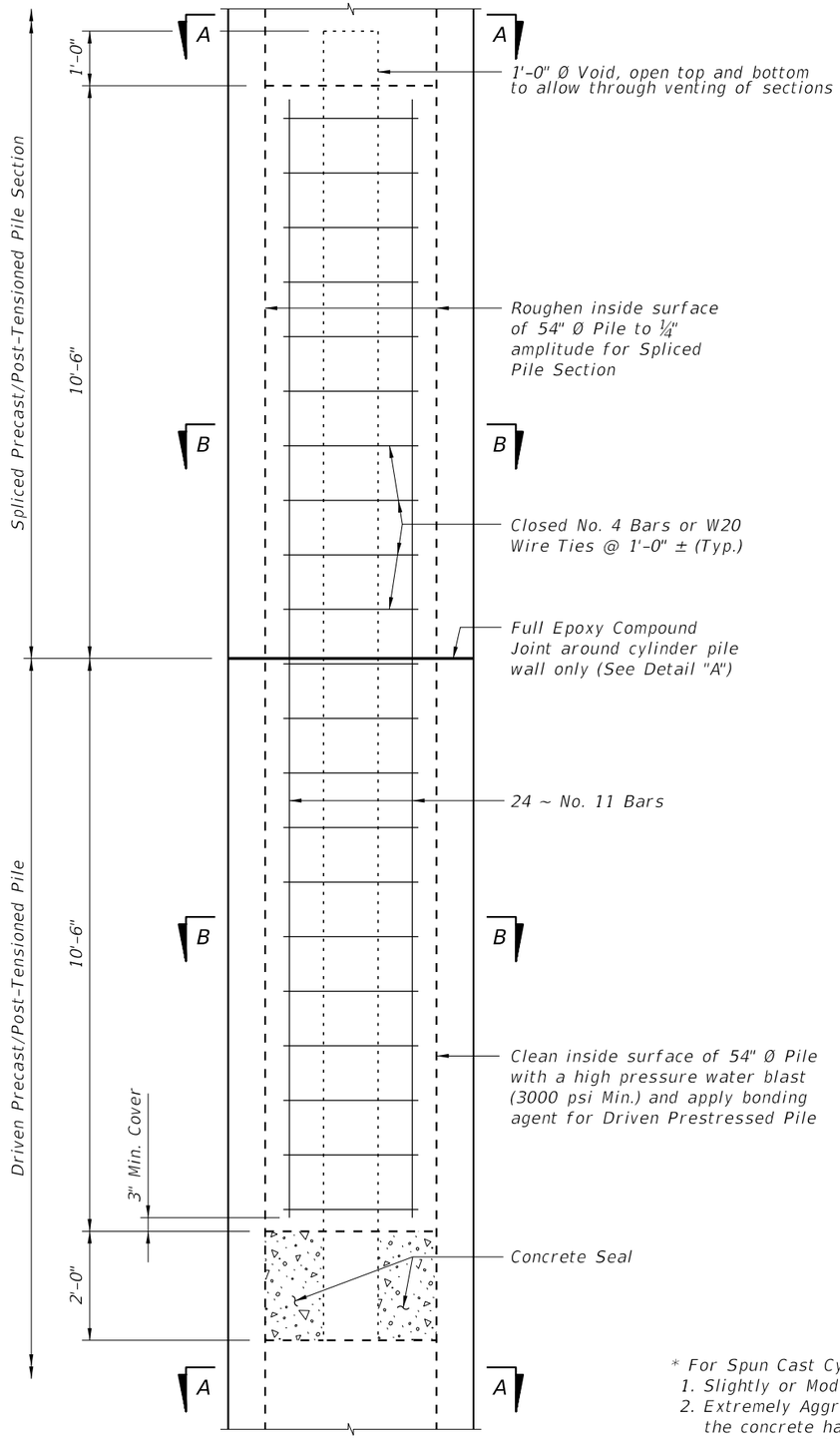
TABLE OF MAXIMUM PILE PICK-UP AND SUPPORT LENGTHS		
Maximum Pile Length (Feet)	Required Storage and Transportation Detail	Pick-Up Detail
119	2, 3, or 4 point	1 Point
170	2, 3, or 4 point	2 Point

NOTES

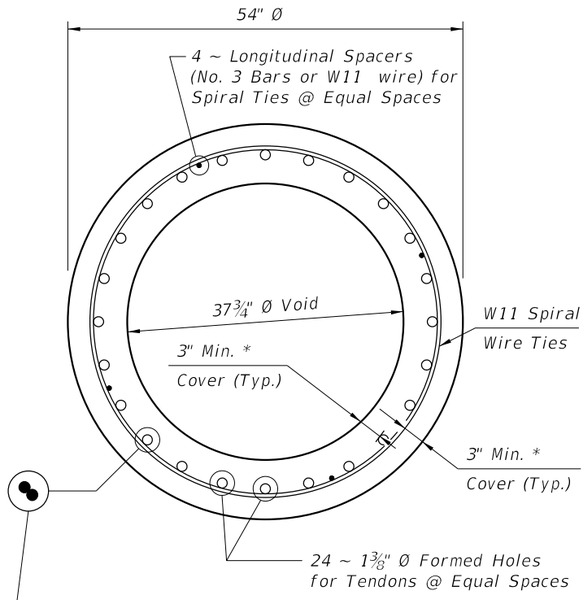
1. Work this Index with the Pile Data Table in the Structures Plans.
2. Concrete:
   - A. Piles: Class V (Special).
   - B. Splice: Class IV.
   - C. Silica Fume: See "GENERAL NOTES" in Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required.
3. Concrete Strength at time of prestress transfer:
   - A. Piles: 6,000 psi minimum.
4. Carbon-Steel Reinforcing:
   - A. Bars: Meet the requirements of Specification Section 415.
   - B. Prestressing Strands: Meet the requirements of Specification Section 933.
   - C. Tendons: Two seven-wire ½" dia. (Special) Grade 270, low-relaxation strands tensioned to 33.8 kips.
   - D. Protect all carbon-steel strands permanently exposed to the environment and not embedded under final conditions in accordance with Specification Section 450.
   - E. Spiral Ties:
     - a. One half turn is required for carbon-steel spiral splice.
     - b. One full turn is required at the pile head and tip.
5. Pile Splices:
   - A. Epoxy: Type AB Epoxy Compound or Mortar must meet the requirements of Specification Section 926.
     - a. Use a Type AB Epoxy Bonding Compound or Epoxy Mortar, as recommended by the Manufacturer, to form the joint between pile sections
     - b. Use a Type AB Epoxy Bonding Compound as a bonding agent on internal pile surfaces.
   - B. Driving: Resume pile driving after splice concrete reaches a minimum strength of 5,500 psi.
6. Mark piles at the pick-up points to indicate the proper points for attaching handling lines.

10/24/2018 2:53:27 PM

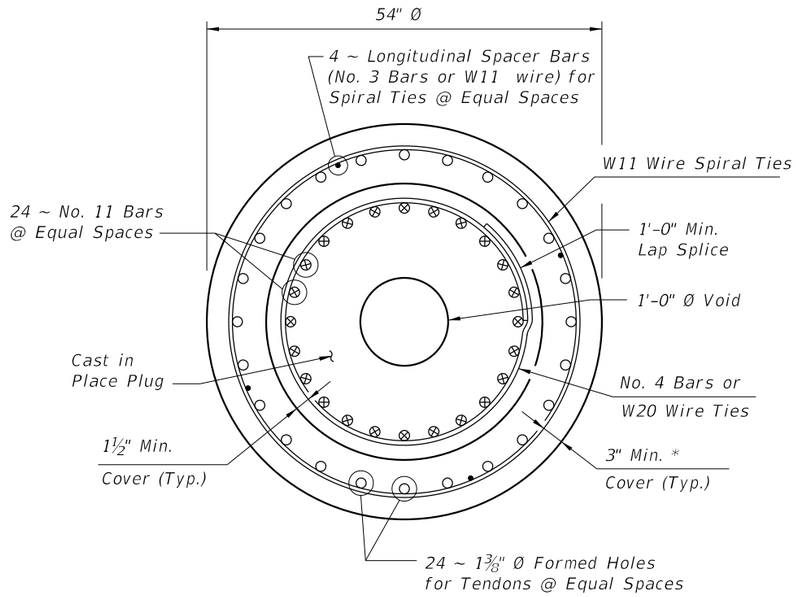
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT	FY 2019-20 STANDARD PLANS	54" PRECAST/POST-TENSIONED CONCRETE CYLINDER PILE	INDEX 455-054 / SHEET 1 of 2



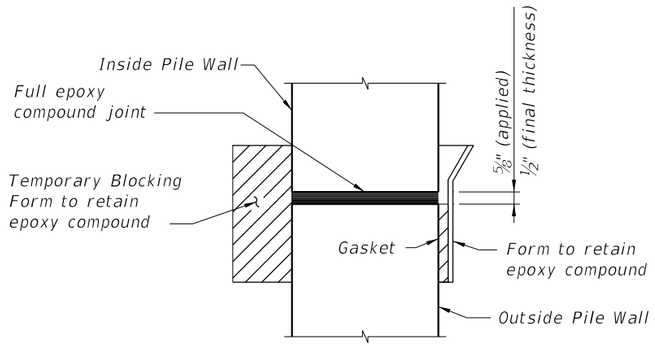
DRIVABLE UNFORESEEN FIELD SPLICE DETAIL
(Cast-In-Place Plug)



SECTION A-A



SECTION B-B



DETAIL "A"

* For Spun Cast Cylinder Piles, the following requirements for concrete cover apply:
1. Slightly or Moderately Aggressive Environments: The concrete cover may be reduced to 2 inches.
2. Extremely Aggressive Environments: The concrete cover may be reduced to 2 inches as long as the concrete has a documented chloride ion penetration apparent diffusion coefficient with a mean value of 0.005 in² per year or less; otherwise, a 3-inch concrete cover is required.

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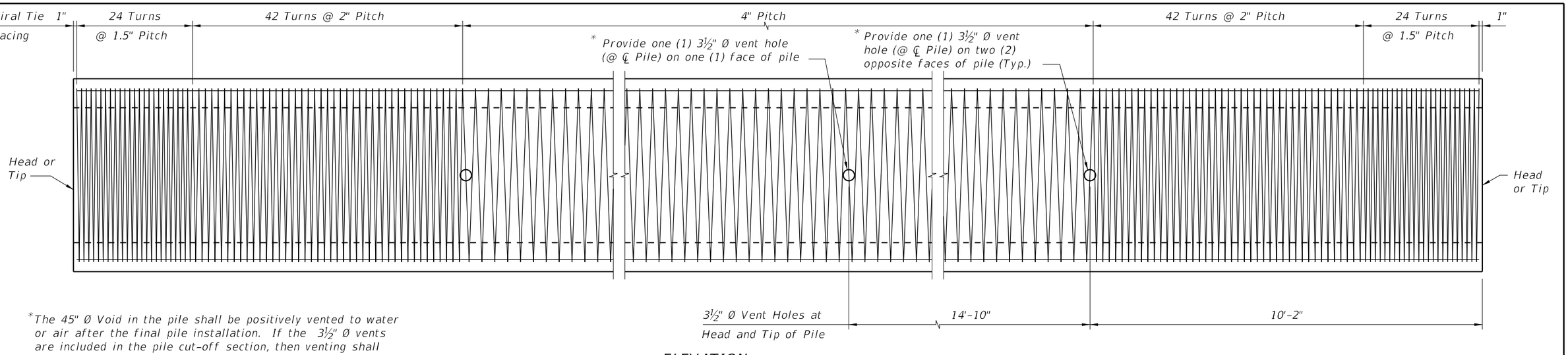
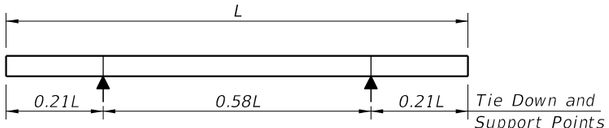
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/13			FDOT FY 2019-20 STANDARD PLANS	54" PRECAST/POST-TENSIONED CONCRETE CYLINDER PILE	455-054	2 of 2

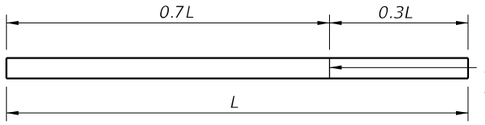


*The 45" Ø Void in the pile shall be positively vented to water or air after the final pile installation. If the 3½" Ø vents are included in the pile cut-off section, then venting shall be provided by the use of a 1" Ø PVC conduit through the substructure cap or column.

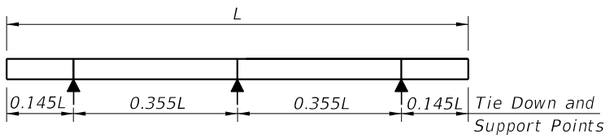
ELEVATION



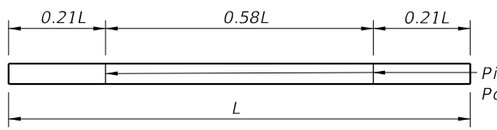
2-POINT SUPPORT



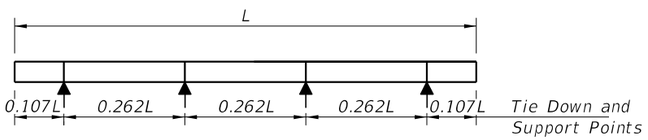
1-POINT PICK-UP



3-POINT SUPPORT



2-POINT PICK-UP



4-POINT SUPPORT

PILE PICK-UP DETAILS

STORAGE AND TRANSPORTATION SUPPORT DETAILS

TABLE OF MAXIMUM PILE PICK-UP AND SUPPORT LENGTHS		
Maximum Pile Length (Feet)	Required Storage and Transportation Detail	Pick-Up Detail
122	2, 3, or 4 point	1 Point
174	2, 3, or 4 point	2 Point

NOTES

1. Work this Index with the Pile Data Table in the Structures Plans.
2. Concrete:
   - A. Piles: Class V (Special)
   - B. Splice Collar: Class IV
   - C. Silica Fume: See "GENERAL NOTES" in the Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required.
3. Concrete Strength at time of prestress transfer:
   - A. Piles: 4,000 psi minimum.
4. Carbon-Steel Reinforcing:
   - A. Bars: Meet the requirements of Specification Section 415
   - B. Prestressing Strands: Use 0.6 dia. carbon-steel, Grade 270, low-relaxation strand stressed to 44.0 kips that meets the requirements of Specification Section 933.
   - C. Protect all carbon-steel strands permanently exposed to the environment and not embedded under final conditions in accordance with Specification Section 450.
5. Spiral Ties:
   - A. One half turn is required for carbon-steel spiral splices
   - B. One full turn is required at the head and tip of each pile
6. Pile Splices:
   - A. Epoxy: Type AB Epoxy Compound or Epoxy Mortar must meet the requirements of Specification Section 926.
     - a. Use a Type AB Epoxy Bonding Compound or Epoxy Mortar, as recommended by the Manufacturer, to form the joint between pile sections.
     - b. Use a Type AB Epoxy Bonding Compound as a bonding agent on internal pile surfaces.
   - B. Splices: Resume pile driving after the splice concrete reaches a minimum strength of 5,500 psi.
7. Mark piles at the pick-up points to indicate the proper points for attaching handling lines.

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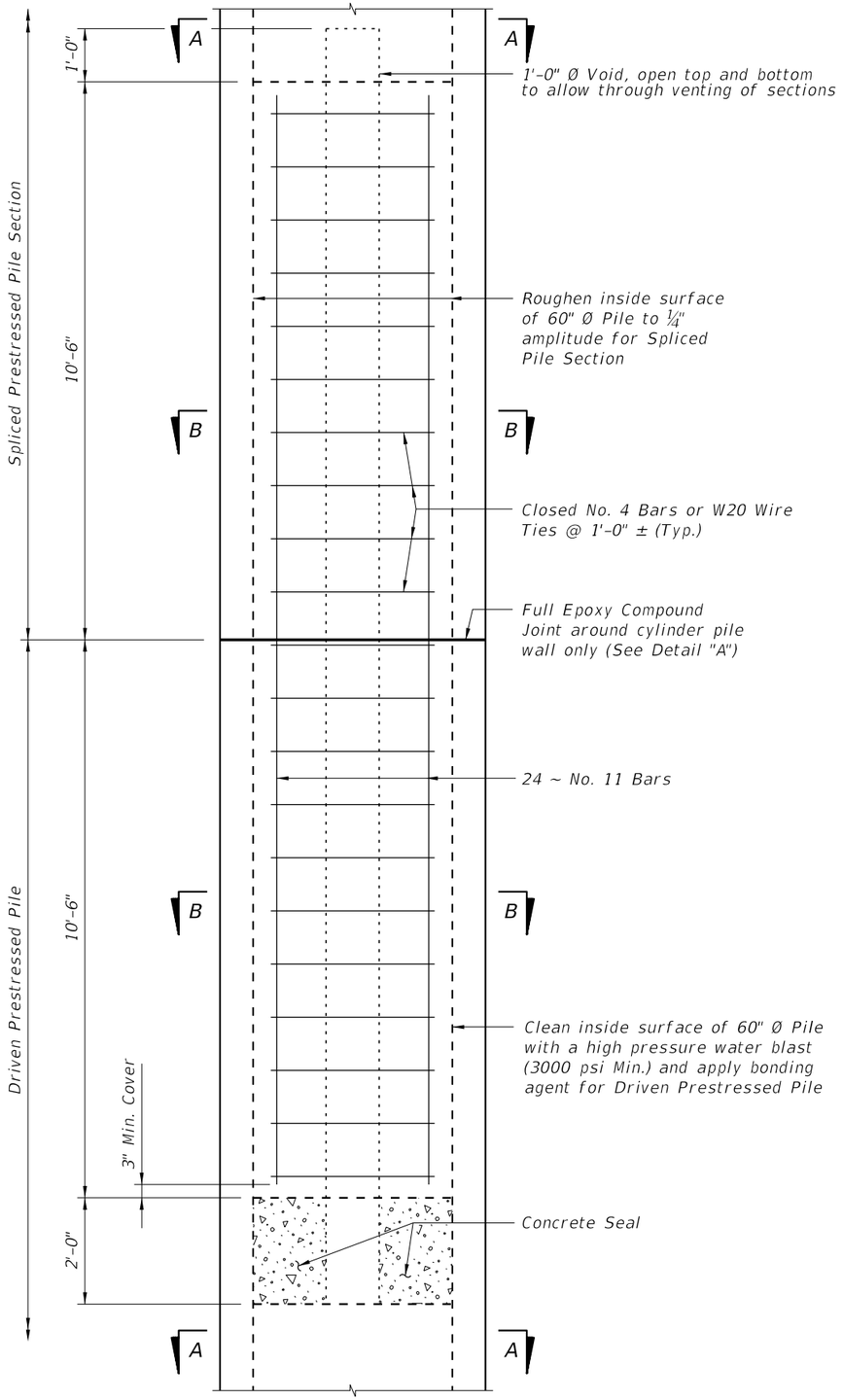
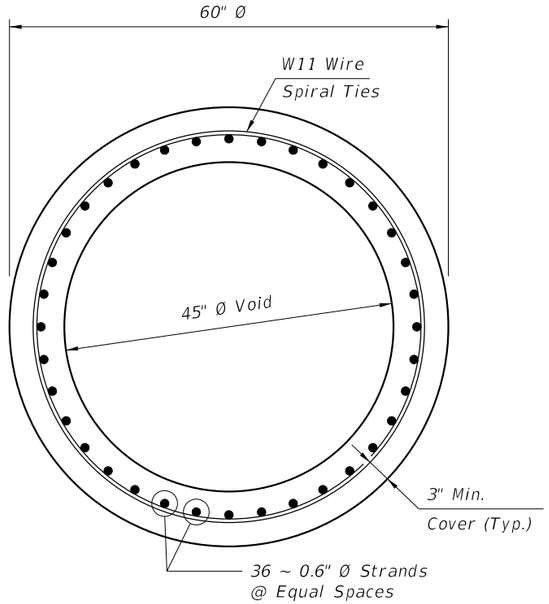
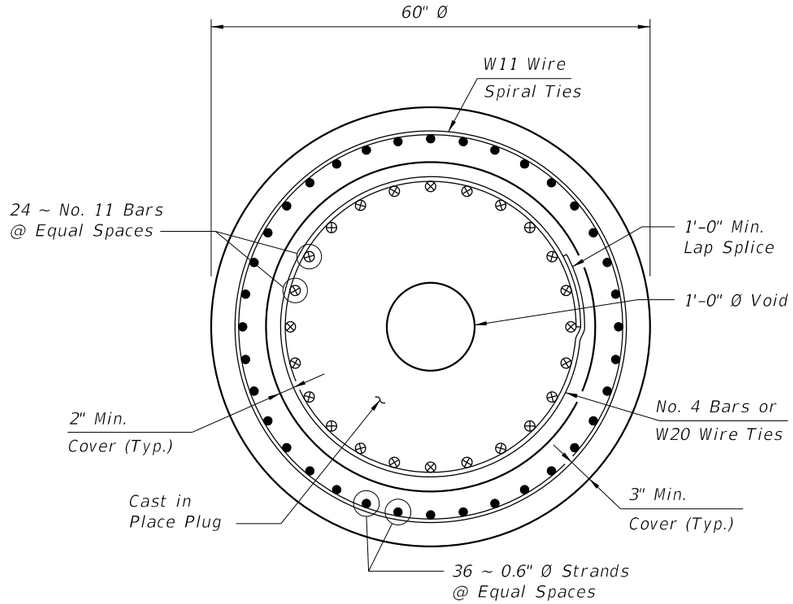
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	60" PRESTRESSED CONCRETE CYLINDER PILE	INDEX	SHEET
11/01/16						455-060	1 of 2



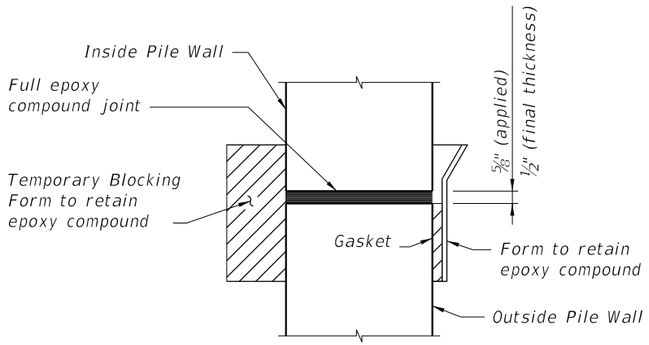
DRIVABLE UNFORESEEN FIELD SPLICE DETAIL
(Cast in Place Plug)



SECTION A-A



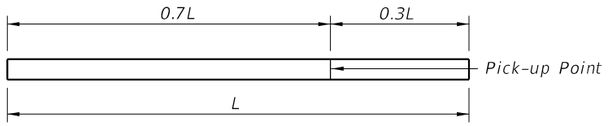
SECTION B-B



DETAIL "A"

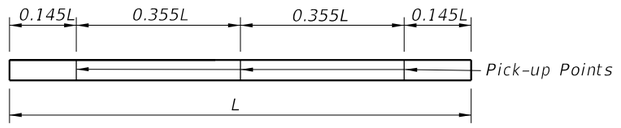
10/24/2018 2:53:29 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	60" PRESTRESSED CONCRETE CYLINDER PILE	INDEX	SHEET
01/01/12						455-060	2 of 2



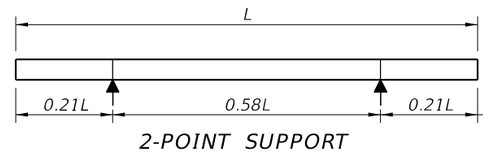
1-POINT PICK-UP

2-POINT PICK-UP

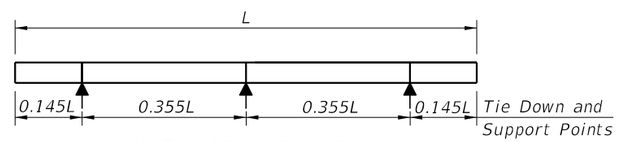


3-POINT PICK-UP

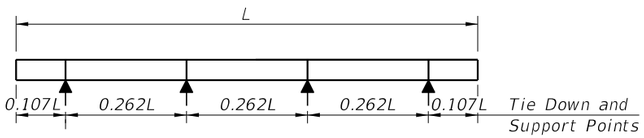
PILE PICK-UP DETAILS



2-POINT SUPPORT



3-POINT SUPPORT



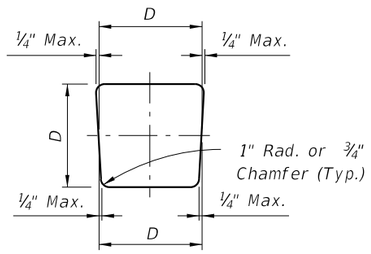
4-POINT SUPPORT

STORAGE AND TRANSPORTATION SUPPORT DETAILS

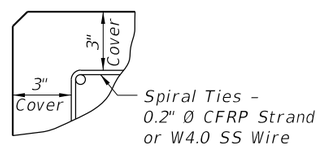
PRESTRESSED CONCRETE PILE NOTES:

1. Work this Index with the Square Prestressed Concrete Pile Splices (Index 455-102), the Prestressed Concrete Pile Standards (Index 455-112, 455-114, 455-118, 455-124, 455-130, and the Pile Data Table in the Structures Plans.
2. Concrete:
   - A. Piles: Class V (Special)
   - B. Silica Fume: See "GENERAL NOTES" in the Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required for options using stainless steel strand and reinforcing.
3. Concrete strength at time of prestress transfer:
   - A. Piles: 4,000 psi minimum.
4. Reinforcing:
   - A. Bars:
     - a. Stainless Steel: Meet the requirements of Specification Section 931 for Type 304, Grade 75.
     - b. Carbon FRP: Meet the requirements of Specification Section 932.
   - B. Prestressing Strands:
     - a. Stainless Steel: Seven-wire HSSS, UNS S32205 (Type 2205) or UNS S31803 strand, meeting the requirements of Specification Section 933.
     - b. Carbon FRP: Meet the requirements of Specification Section 933.
5. Spiral Ties:
   - A. Tie each wrap of the spiral strand to a minimum of two corner strands.
   - B. One full turn required for spiral splices.
6. Pile Splices: Fill dowel holes and form the joint between pile sections with a Type AB Epoxy Compound in accordance with Specification Section 926. Use an Epoxy Bonding Compound or an Epoxy Mortar as recommended by the Manufacturer.

TABLE OF MAXIMUM PILE PICK-UP AND SUPPORT LENGTHS							
	D = Square Pile Size (inches)					Required Storage and Transportation Detail	Pick-Up Detail
	12	14	18	24	30		
Maximum Pile Length (Feet)	48	52	59	68	87	2, 3, or 4 point	1 Point
	69	75	85	98	124	2, 3, or 4 point	2 Point
	99	107	121	140	178	3 or 4 point	3 Point



TYPICAL PILE SHAPE FOR MOLD FORMS



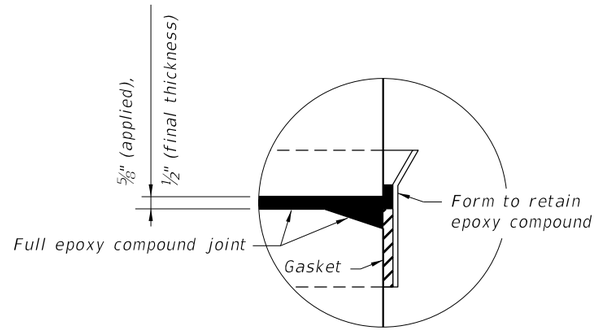
DETAIL SHOWING TYPICAL COVER

10/24/2018 2:53:30 PM

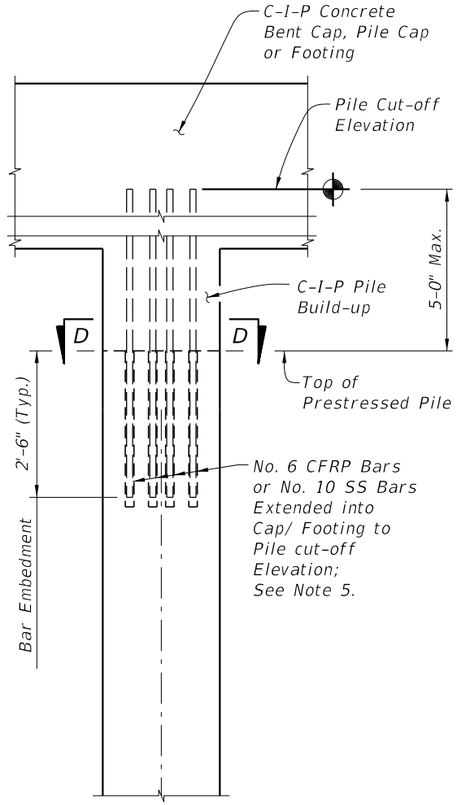
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	SQUARE CFRP & SS PRESTRESSED CONCRETE PILES - TYPICAL DETAILS & NOTES	INDEX	SHEET
11/01/16						455-101	1 of 1

NOTES:

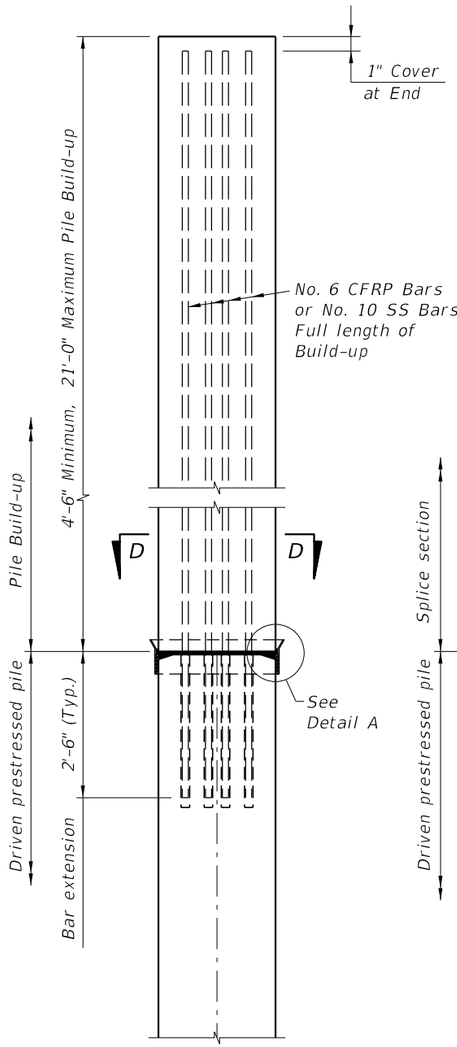
1. For Sections D-D, & E-E, see Index 455-112, 455-114, 455-118, 455-124 or 455-130 for applicable concrete pile size and Pile Splice Reinforcement Details.
2. Prestressing strands, spiral ties and/or reinforcement are not shown for clarity.
3. In cases where pile splices are desired due to length limitations in shipping and/or handling, the "Drivable Preplanned Prestressed Precast Splice Detail" shall be used.
4. When preformed dowel holes are utilized, the 1" spiral tie pitch shall be continued to 4'-0" below the head of the pile, See Index 455-118, 455-124. Preformed holes shall utilize either removable preforming material or stay-in-place corrugated galvanized steel ducts. Stay-in-place ducts shall be fabricated from galvanized sheet steel meeting the requirements of ASTM A653, Coating Designation G90, 26 gauge. Ducts shall be 1½" diameter for CFRP Bars, and 2" diameter for SS Bars with a minimum corrugation (rib) height of 0.12 in. Ducts shall be fabricated with either welded or interlocked seams. Galvanizing of welded seams will not be required.
5. For tension piles where top of Prestressed Pile is less than 3 feet below Pile Cut-off Elevation, extend No. 6 CFRP Bars or No. 10 SS into cap beyond Pile Cut-off Elevation to achieve development as approved by the Engineer.



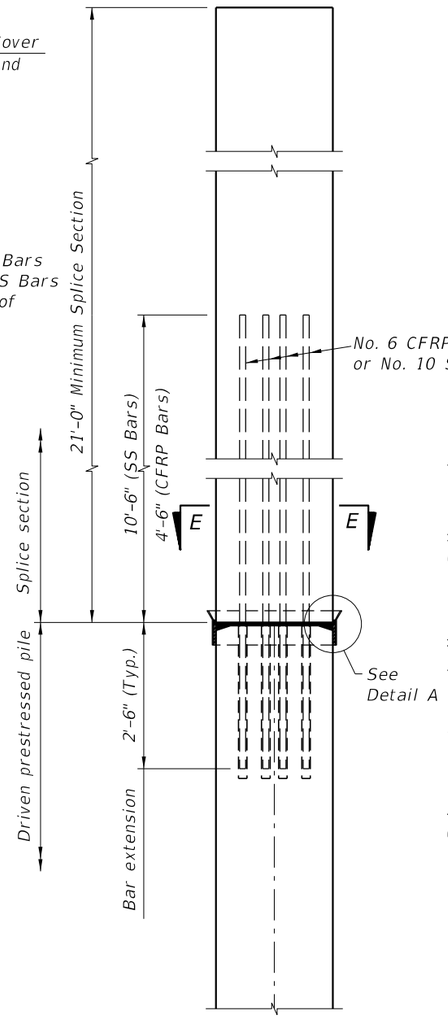
DETAIL A



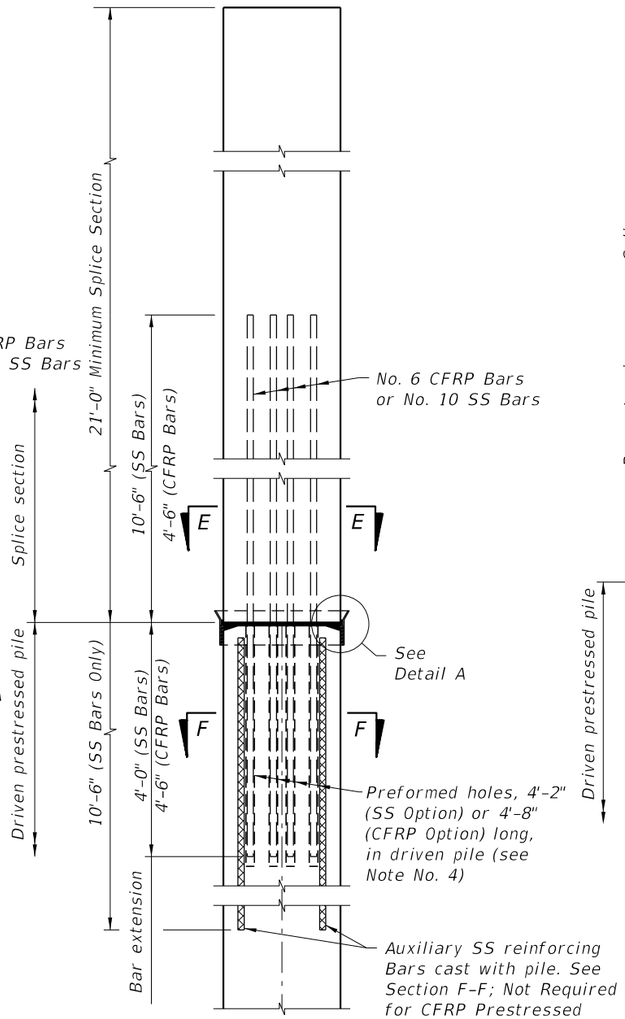
UNFORESEEN
REINFORCED C-I-P
PILE BUILD-UP DETAIL



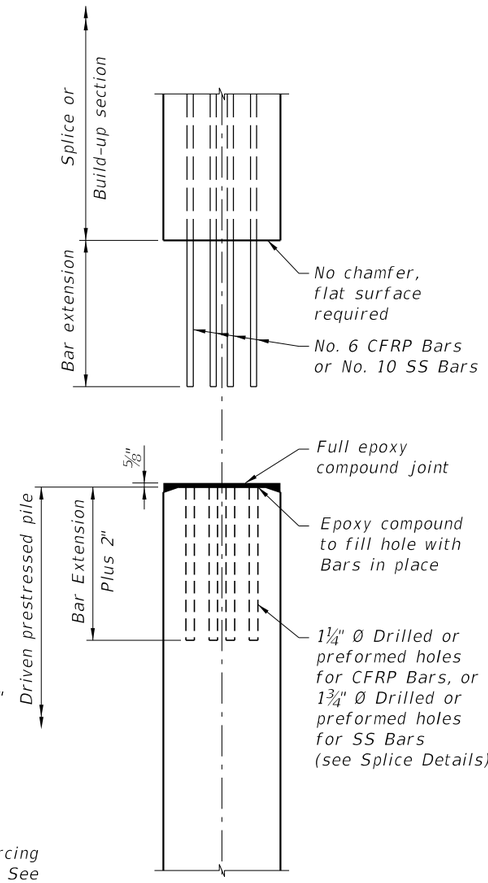
NONDRIVABLE UNFORESEEN
REINFORCED PRECAST
PILE BUILD-UP DETAIL



DRIVABLE UNFORESEEN
PRESTRESSED PRECAST
PILE SPLICE DETAIL



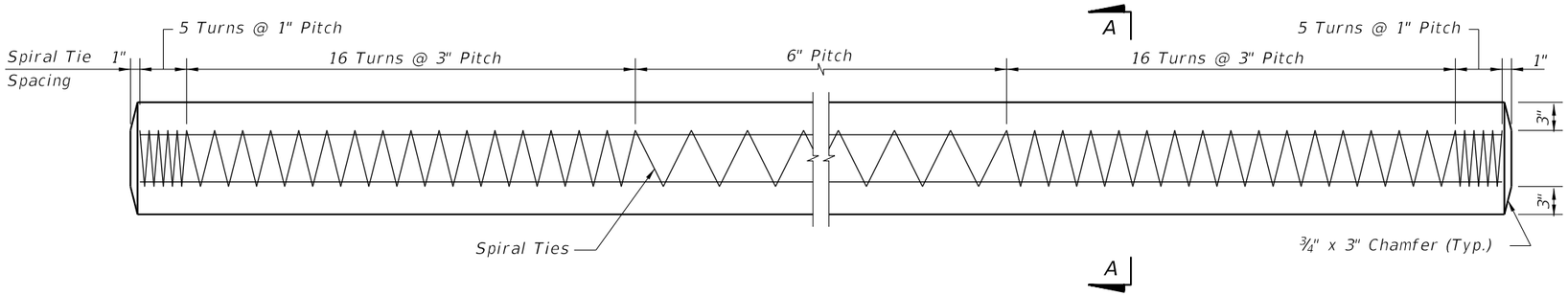
DRIVABLE PREPLANNED
PRESTRESSED PRECAST
PILE SPLICE DETAIL



TYPICAL SPLICE
BEFORE BONDING

10/24/2018 2:53:31 PM

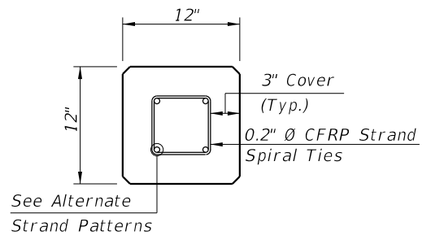
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/16			FDOT FY 2019-20 STANDARD PLANS	SQUARE CFRP & SS PRESTRESSED CONCRETE PILE SPLICES	455-102	1 of 1



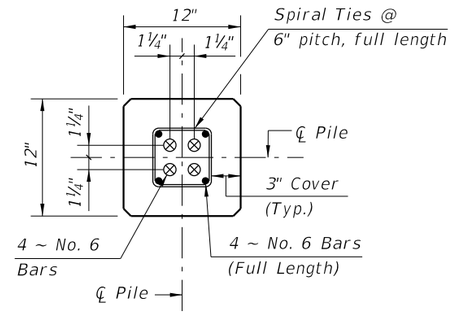
ELEVATION

ALTERNATE STRAND PATTERNS

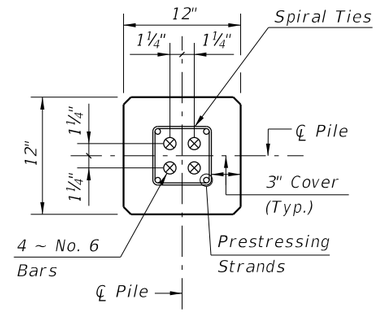
4 ~ 0.6" Ø, CFRP 7-Strand, at 42 kips
4 ~ ½" Ø, CFRP Single-Strand, at 41 kips



SECTION A-A



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E
(See Drivable Unforeseen Prestressed Precast Pile Splice Detail)

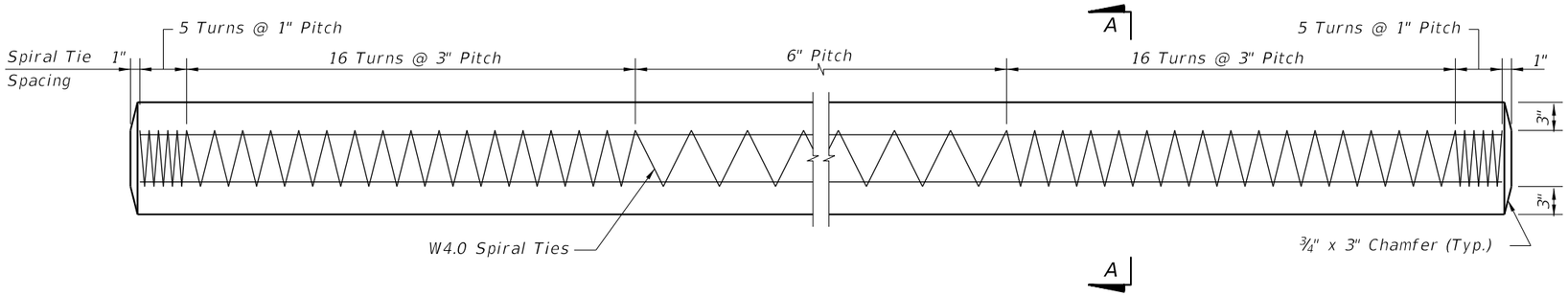
CFRP PILE SPLICE REINFORCEMENT DETAILS

NOTES:
1. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized.

CFRP PRESTRESSED PILE DETAILS

10/24/2018 2:53:31 PM

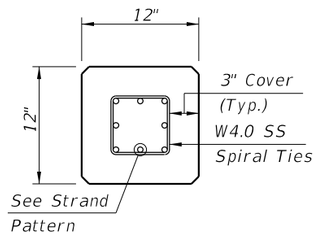
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	12" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX	SHEET
11/01/16						455-112	1 of 2



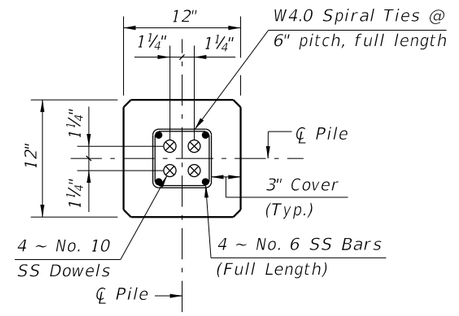
ELEVATION

STRAND PATTERN

8 ~ ½" Ø, HSSS at 24 kips

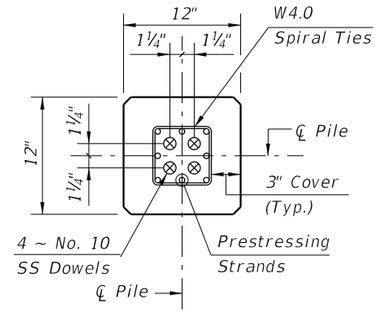


SECTION A-A



SECTION D-D

(See Nondrivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E

(See Drivable Unforeseen Prestressed Precast Pile Splice Detail)

SS PILE SPLICE REINFORCEMENT DETAILS

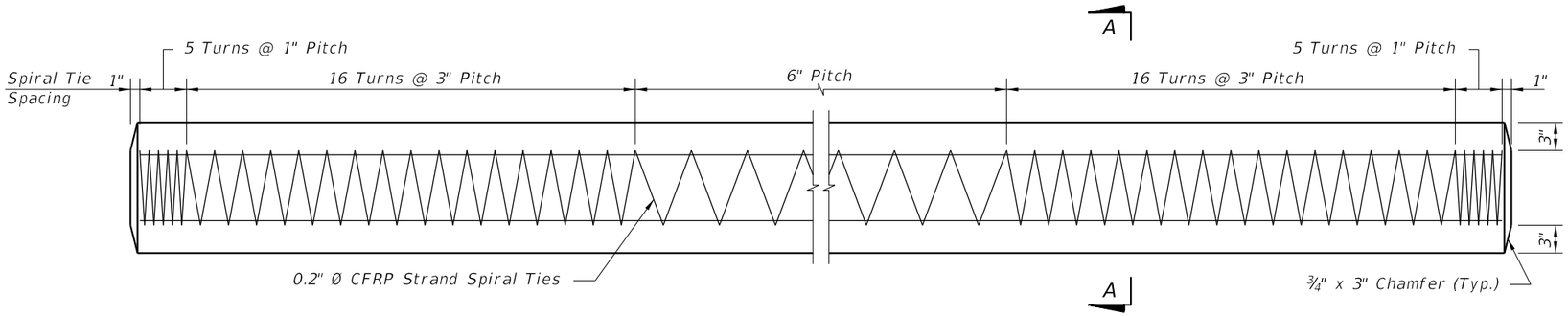
NOTES:

1. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Strand Patterns may be utilized.
   The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.

SS PRESTRESSED PILE DETAILS

10/24/2018 2:53:32 PM

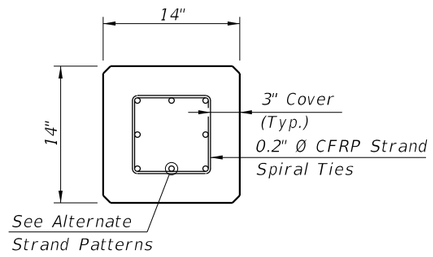
LAST REVISION	REVISION	DESCRIPTION:				
01/01/16			FDOT FY 2019-20 STANDARD PLANS	12" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX 455-112	SHEET 2 of 2



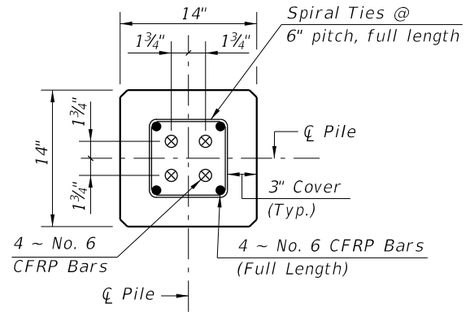
ELEVATION

ALTERNATE STRAND PATTERNS

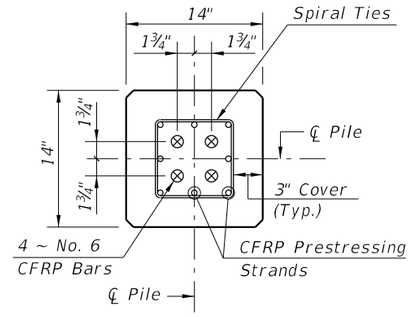
8 ~ 0.6" Ø, CFRP 7-Strand, at 31.5 kips
8 ~ ½" Ø, CFRP Single-Strand, at 30.5 kips



SECTION A-A



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E
(See Drivable Unforeseen Prestressed Precast Pile Splice Detail)

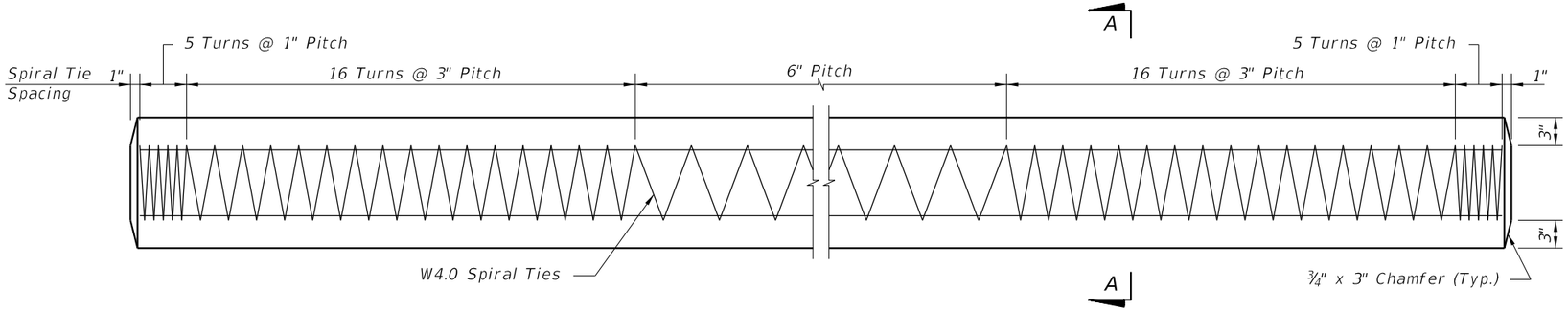
CFRP PILE SPLICE REINFORCEMENT DETAILS

NOTES:
1. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized.
   The strands shall be located as follows:
   Place one strand at each corner and equally space the remaining strands between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.

CFRP PRESTRESSED PILE DETAILS

10/24/2018 2:53:33 PM

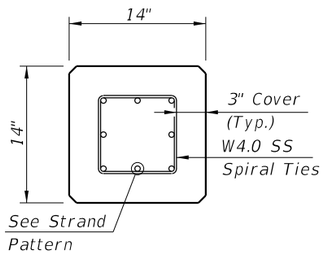
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	14" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX	SHEET
11/01/16						455-114	1 of 2



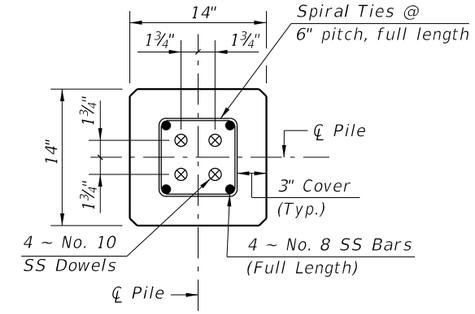
ELEVATION

STRAND PATTERN

12 ~ ½" Ø, HSSS at 23 kips

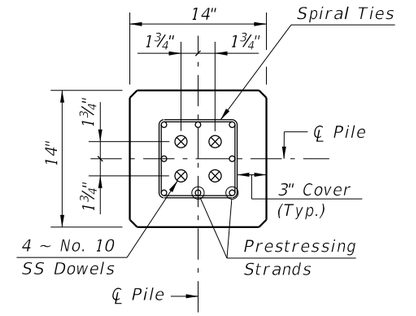


SECTION A-A



SECTION D-D

(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E

(See Drivable Unforeseen Prestressed Precast Splice Detail)

SS PILE SPLICE REINFORCEMENT DETAILS

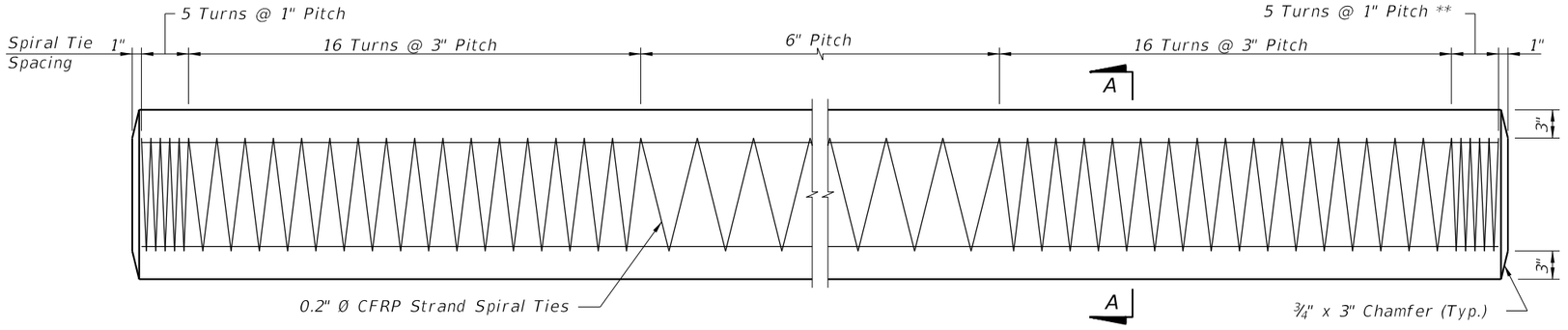
NOTES:

1. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.

SS PRESTRESSED PILE DETAILS

10/24/2018 2:53:33 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	14" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX	SHEET
01/01/16						455-114	2 of 2

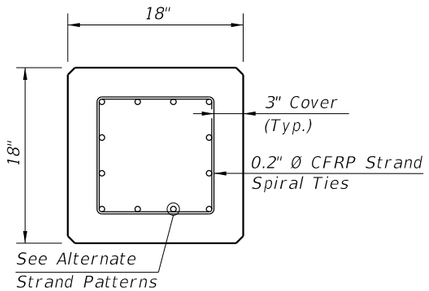


ELEVATION

** See Note 4 on Index 455-102

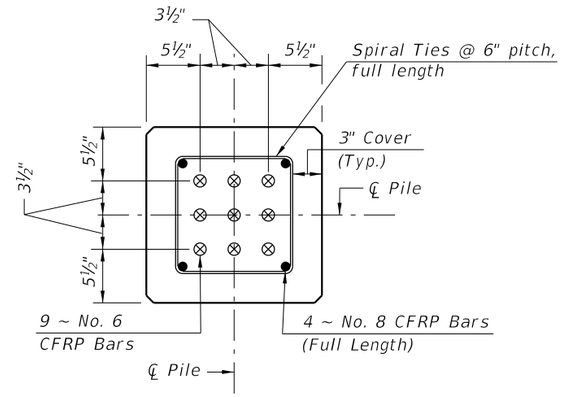
ALTERNATE STRAND PATTERNS

12 ~ 0.6" Ø, CFRP 7-Strand, at 34 kips
12 ~ ½" Ø, CFRP Single-Strand, at 33 kips

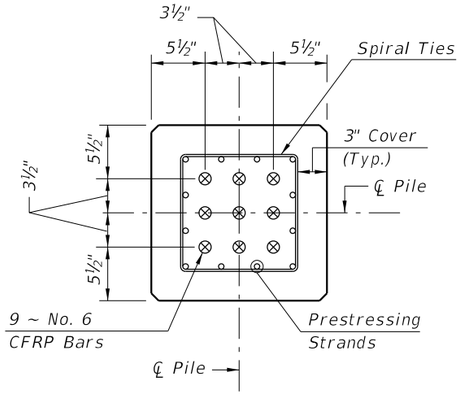


SECTION A-A

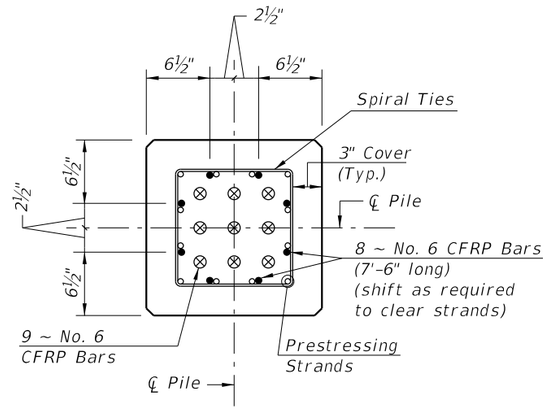
NOTES:
1. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Strand Patterns may be utilized.
   The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E
(See Drivable Prestressed Precast Splice Detail)



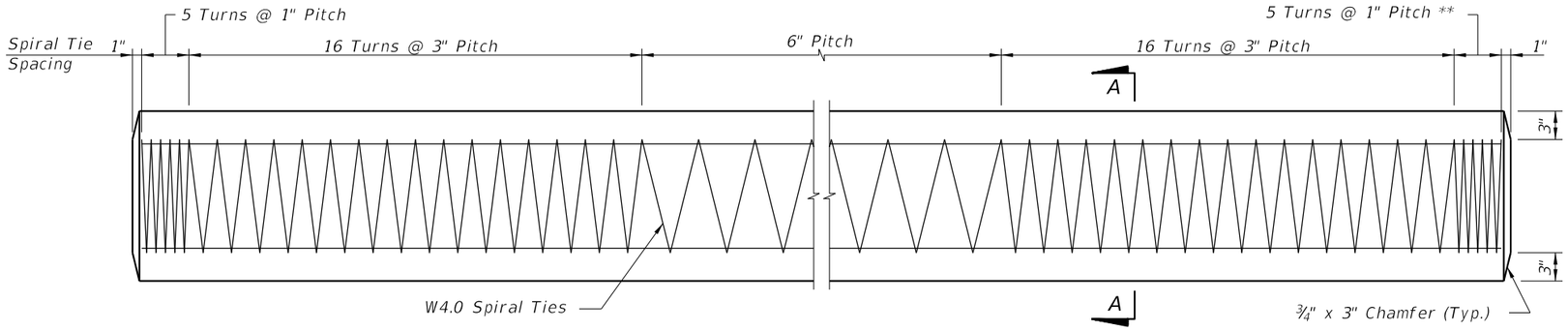
SECTION F-F
(See Drivable Preplanned Prestressed Precast Splice Detail)

CFRP PILE SPLICE REINFORCEMENT DETAILS

CFRP PRESTRESSED PILE DETAILS

10/24/2018 2:53:34 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	18" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX	SHEET
11/01/16						455-118	1 of 2

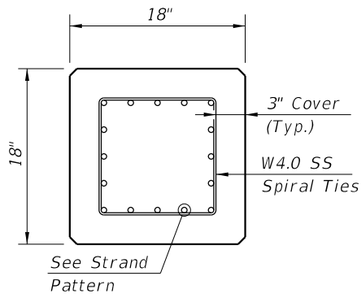


ELEVATION

** See Note 4 on Index 455-102

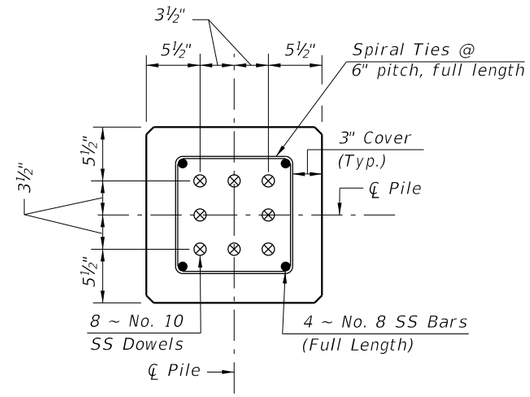
STRAND PATTERN

16 ~ ½" Ø, HSSS, at 26 kips



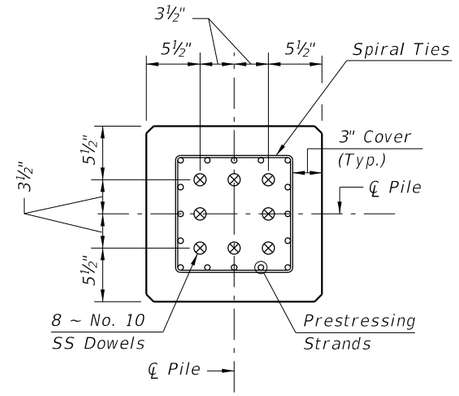
SECTION A-A

NOTES:
1. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Strand Patterns may be utilized. The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.



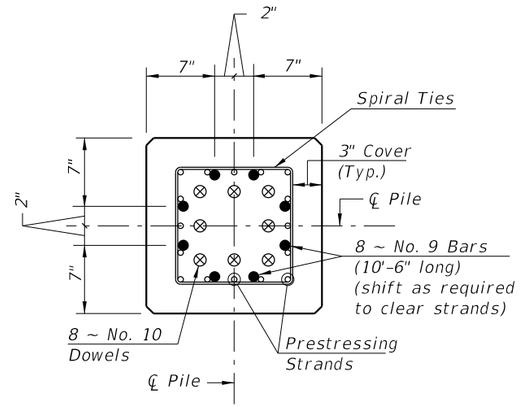
SECTION D-D

(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E

(See Drivable Prestressed Precast Splice Detail)



SECTION F-F

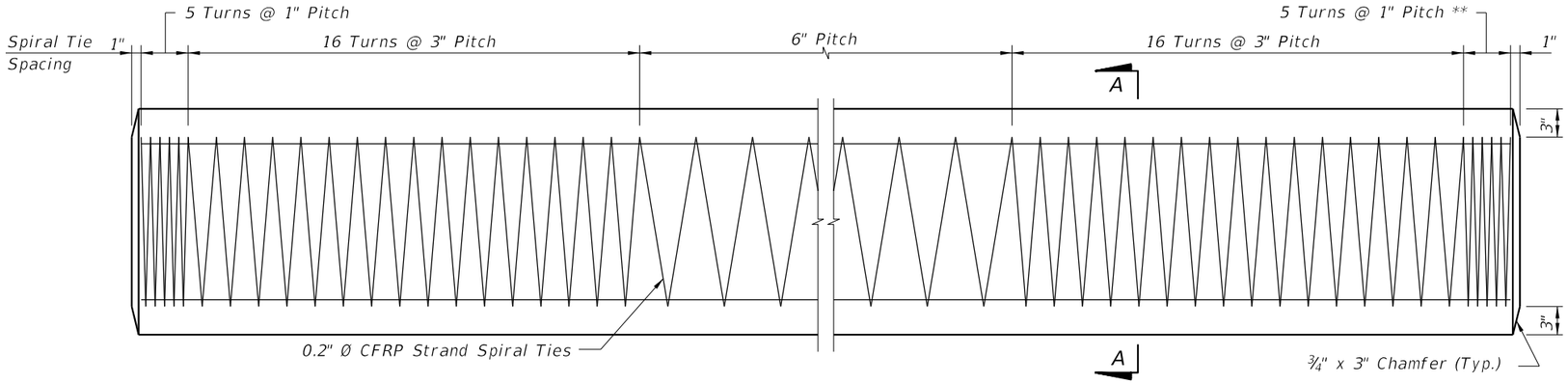
(See Drivable Preplanned Predtresses Precast Splice Detail)

SS PILE SPLICE REINFORCEMENT DETAILS

SS PRESTRESSED PILE DETAILS

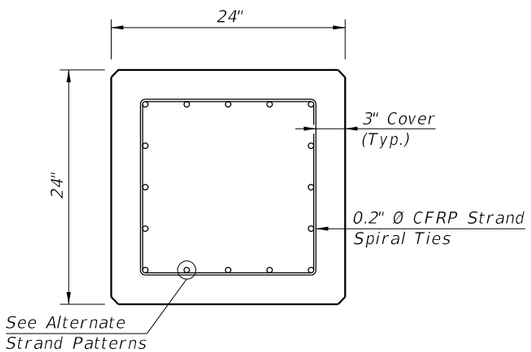
10/24/2018 2:53:37 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/16			FY 2019-20 STANDARD PLANS	18" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	455-118	2 of 2



SPIRAL TIE ELEVATION

** See Note 4 on Index 455-102

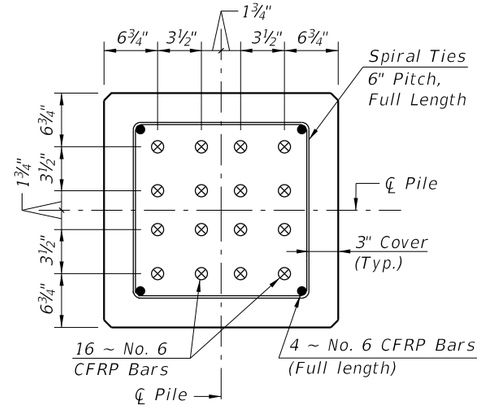


SECTION A-A

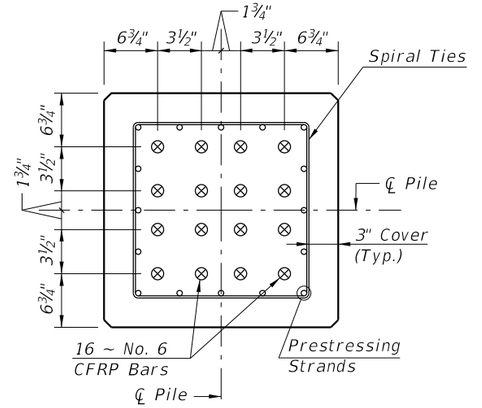
ALTERNATE STRAND PATTERNS

16 ~ 0.6" Ø, CFRP 7-Strand, at 42 kips
16 ~ ½" Ø, CFRP Single-Strand, at 41 kips

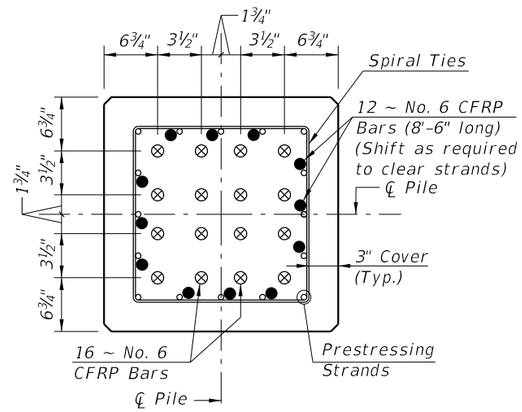
NOTES:
1. Work this Index with Index 455-101 - Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 - Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Strand Patterns may be utilized.
   The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E
(See Drivable Prestressed Precast Pile Splice Detail)



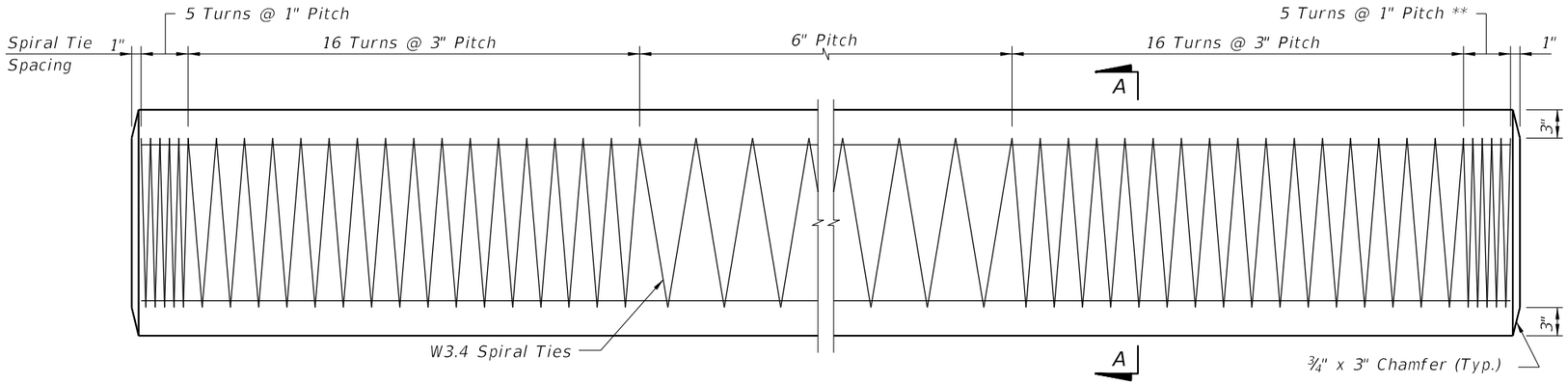
SECTION F-F
(See Drivable Preplanned Prestressed Precast Pile Splice Detail)

CFRP PILE SPLICE REINFORCEMENT DETAILS

10/24/2018 2:53:37 PM

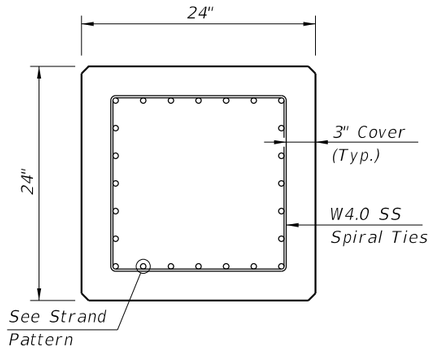
CFRP PRESTRESSED PILE DETAILS

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	24" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX	SHEET
11/01/16						455-124	1 of 2



ELEVATION

** See Note 4 on Index 455-102



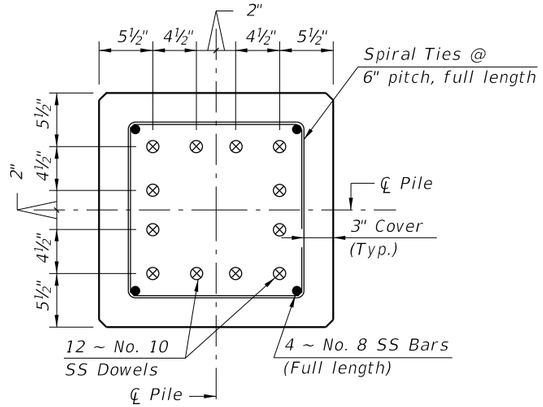
SECTION A-A

STRAND PATTERN

28 ~ ½" Ø, HSSS at 26 kips

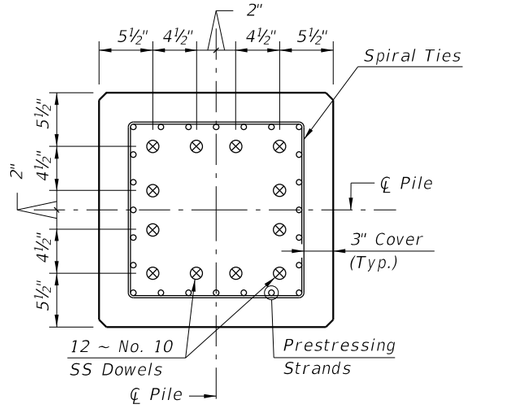
NOTES:

1. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.
2. Any of the given Strand Patterns may be utilized.
   The strands shall be located as follows:
   Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   The total strand pattern shall be concentric with the nominal concrete section of the pile.



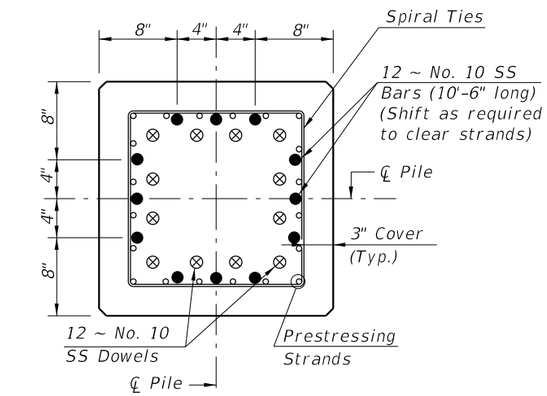
SECTION D-D

(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E

(See Drivable Prestressed Precast Pile Splice Detail)



SECTION F-F

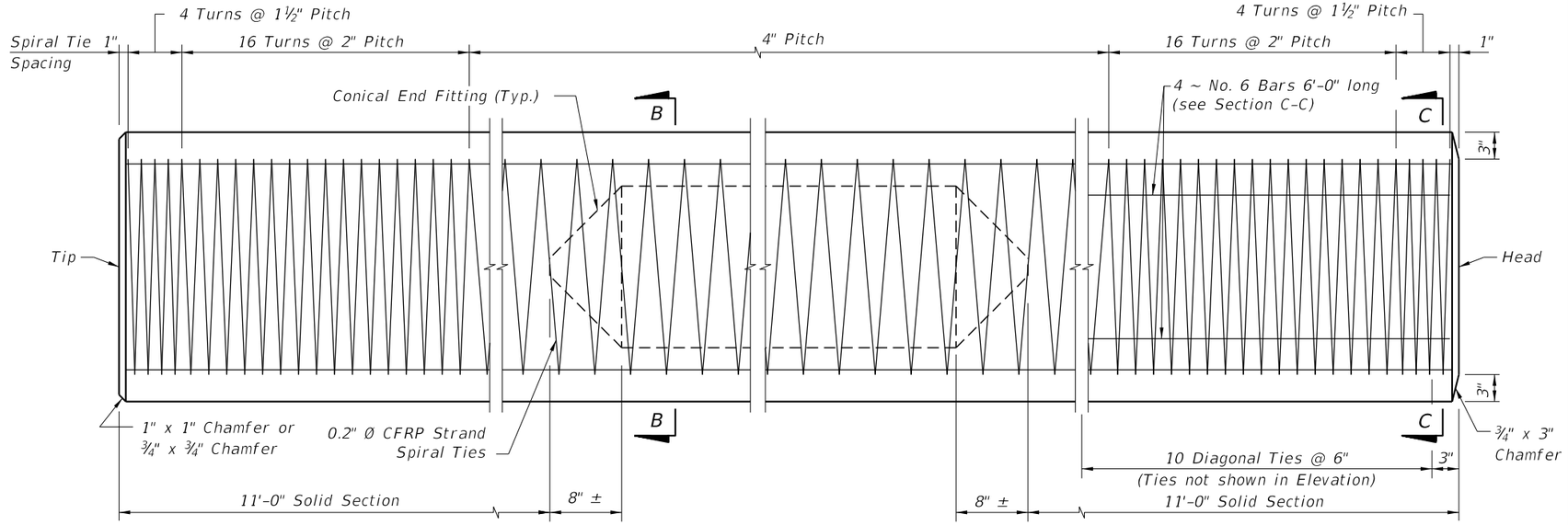
(See Drivable Preplanned Pile Splice Detail)

SS PILE SPLICE REINFORCEMENT DETAILS

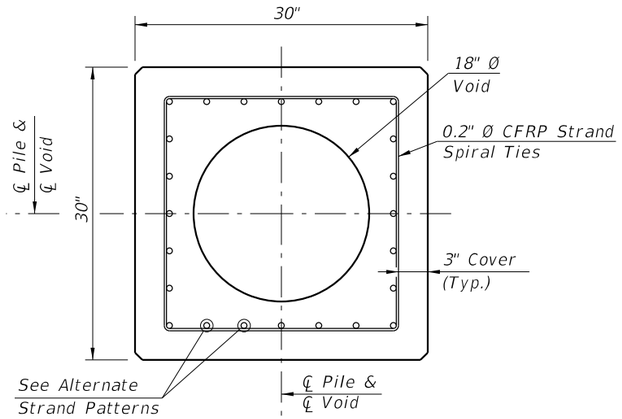
SS PRESTRESSED PILE DETAILS

10/24/2018 2:53:38 PM

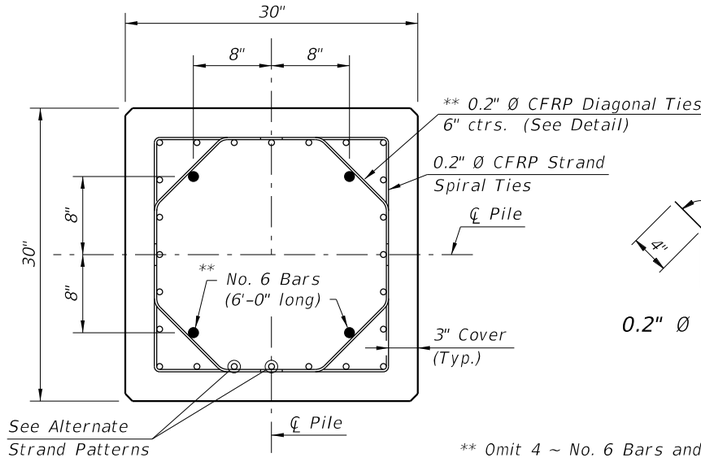
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	24" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX	SHEET
01/01/16						455-124	2 of 2



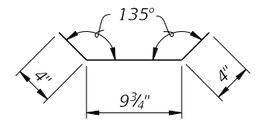
ELEVATION



SECTION B-B
(See Pile Splice Reinforcement Details)



SECTION C-C
(See Pile Splice Reinforcement Details)



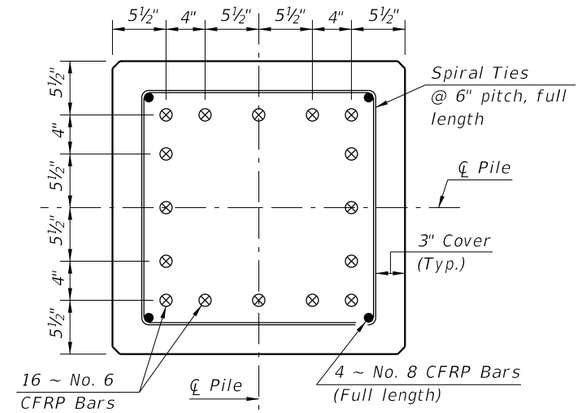
0.2" Ø DIAGONAL TIE DETAIL

** Omit 4 ~ No. 6 Bars and Diagonal Ties in pre-planned mechanical splice.

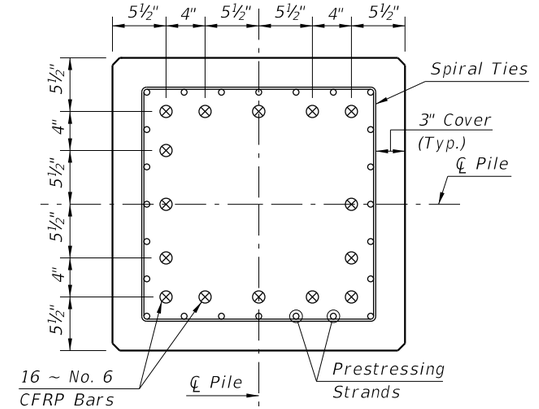
ALTERNATE STRAND PATTERNS

20 ~ 0.6" Ø, CFRP 7-Strand at 38 kips
20 ~ ½" Ø, CFRP Single-Strand at 37 kips

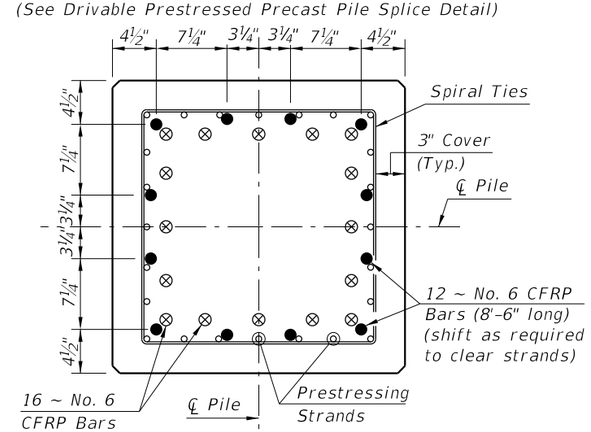
NOTES:
1. Any of the given Strand Patterns may be utilized. The strands shall be located as follows: Place one strand at each corner and place the remaining strands equally spaced between the corner strands. The total strand pattern shall be concentric with the nominal concrete section of the pile.
2. CONTRACTOR OPTION: The 30" pile may be cast SOLID by omitting the 18" Ø void. In this event, the Contractor shall submit calculations for approval and a proposed strand configuration that provide net prestressing after losses equal to 1000 psi. Alternate configurations for the Diagonal Ties, to maintain the position of the 4 ~ #6 Bars, may be approved by the Engineer.
3. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E
(See Drivable Prestressed Precast Pile Splice Detail)



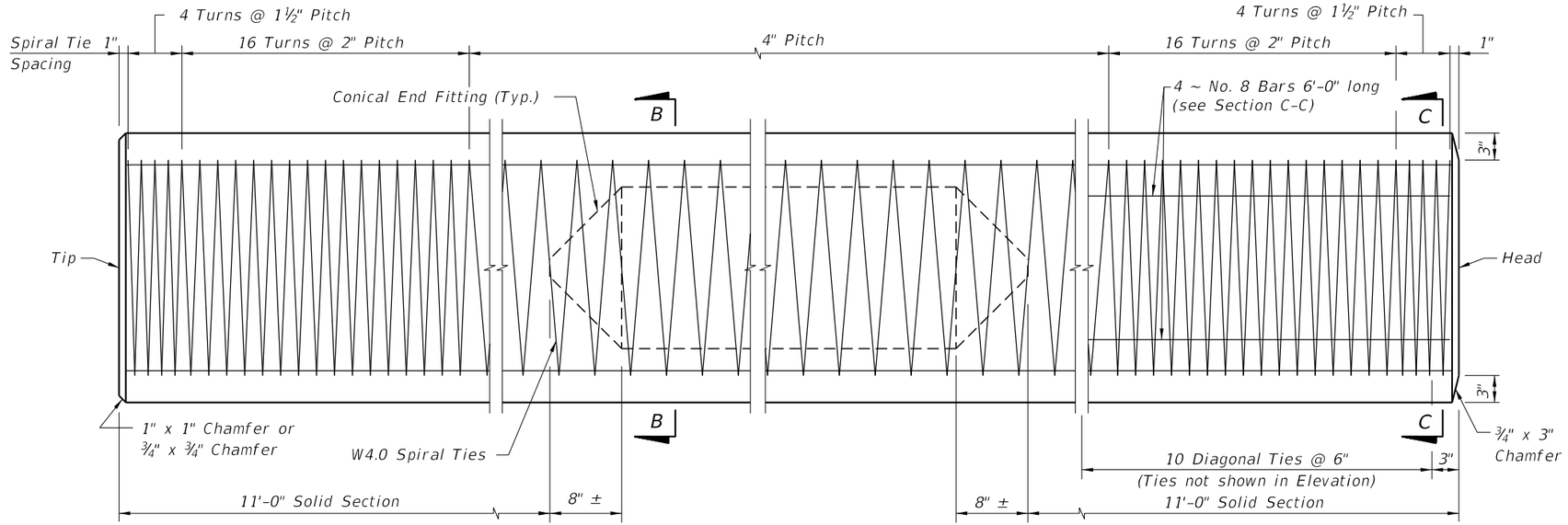
SECTION F-F
(See Drivable Preplanned Prestressed Precast Pile Splice Detail)

CFRP PILE SPLICE DETAILS

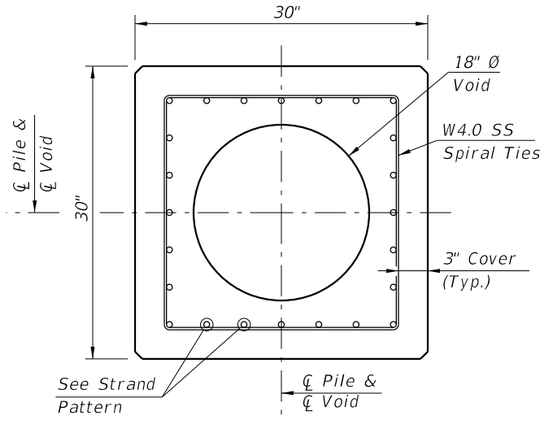
CFRP PRESTRESSED PILE DETAILS

10/24/2018 2:53:39 PM

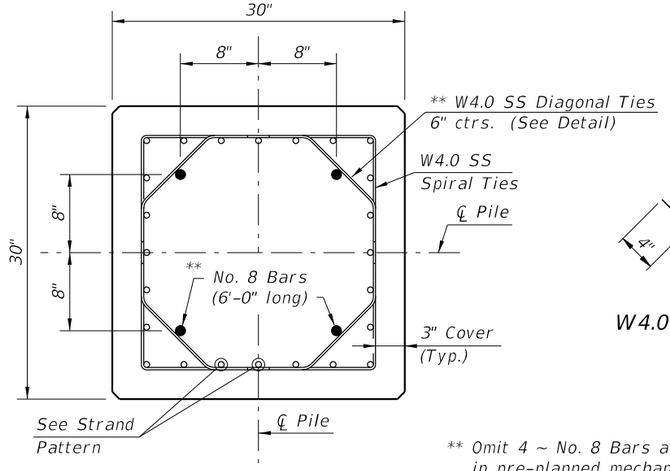
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	30" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX 455-130	SHEET 1 of 2



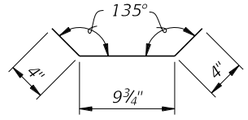
ELEVATION



SECTION B-B
(See Pile Splice Reinforcement Details)



SECTION C-C
(See Pile Splice Reinforcement Details)



W4.0 DIAGONAL TIE DETAIL

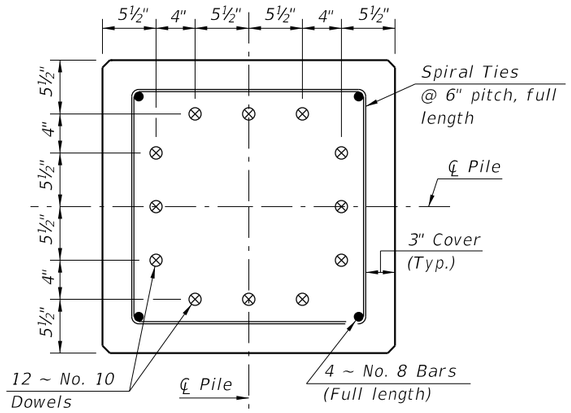
** Omit 4 ~ No. 8 Bars and Diagonal Ties in pre-planned mechanical splice.

STRAND PATTERN

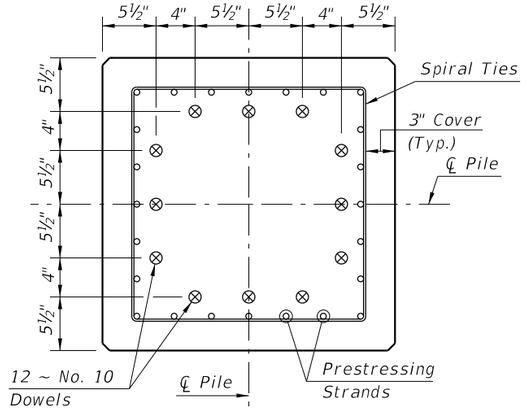
32 ~ ½" Ø, HSSS at 26 kips

NOTES:

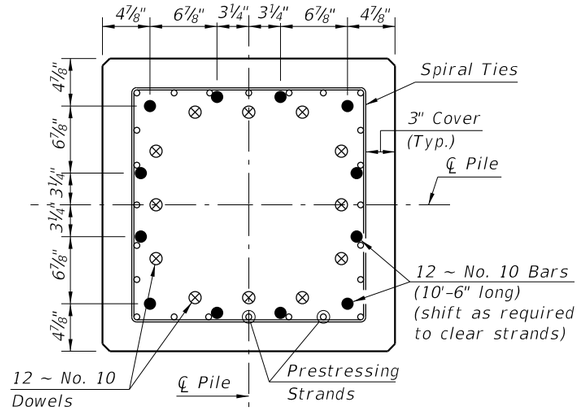
1. Any of the given Strand Patterns may be utilized. The strands shall be located as follows: Place one strand at each corner and place the remaining strands equally spaced between the corner strands. The total strand pattern shall be concentric with the nominal concrete section of the pile.
2. CONTRACTOR OPTION: The 30" pile may be cast SOLID by omitting the 18" Ø void. In this event, the Contractor shall submit calculations for approval and a proposed strand configuration that provide net prestressing after losses equal to 1000 psi. Alternate configurations for the Diagonal Ties, to maintain the position of the 4 ~ #8 Bars, may be approved by the Engineer.
3. Work this Index with Index 455-101 – Typical Details and Notes for Square CFRP & SS Prestressed Concrete Piles and Index 455-102 – Square CFRP & SS Prestressed Concrete Pile Splices.



SECTION D-D
(See Non-Drivable Unforeseen Reinforced Precast Pile Build-Up Detail)



SECTION E-E
(See Drivable Prestressed Precast Pile Splice Detail)



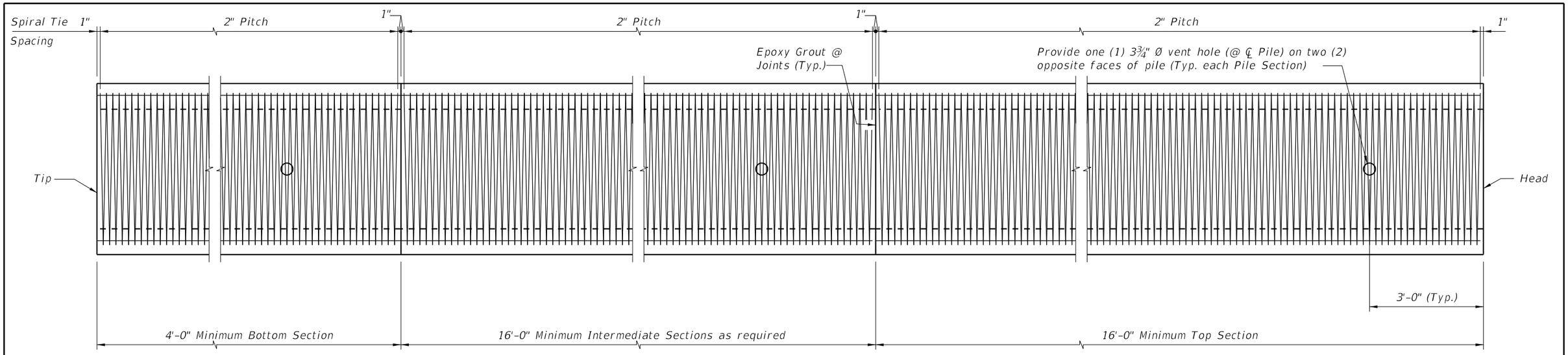
SECTION F-F
(See Drivable Preplanned Prestressed Precast Pile Splice Detail)

SS PILE SPLICE DETAILS

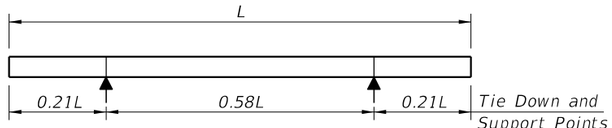
SS PRESTRESSED PILE DETAILS

10/24/2018 2:53:39 PM

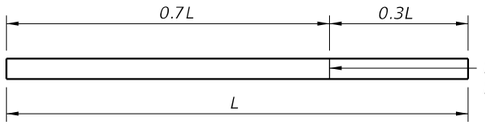
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	30" SQUARE CFRP & SS PRESTRESSED CONCRETE PILE	INDEX	SHEET
01/01/16					455-130	2 of 2



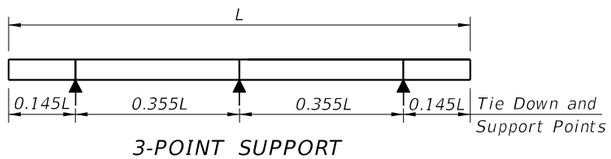
ELEVATION



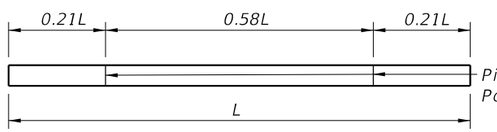
2-POINT SUPPORT



1-POINT PICK-UP

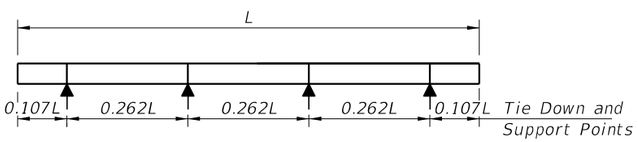


3-POINT SUPPORT



2-POINT PICK-UP

PILE PICK-UP DETAILS



4-POINT SUPPORT

STORAGE AND TRANSPORTATION SUPPORT DETAILS

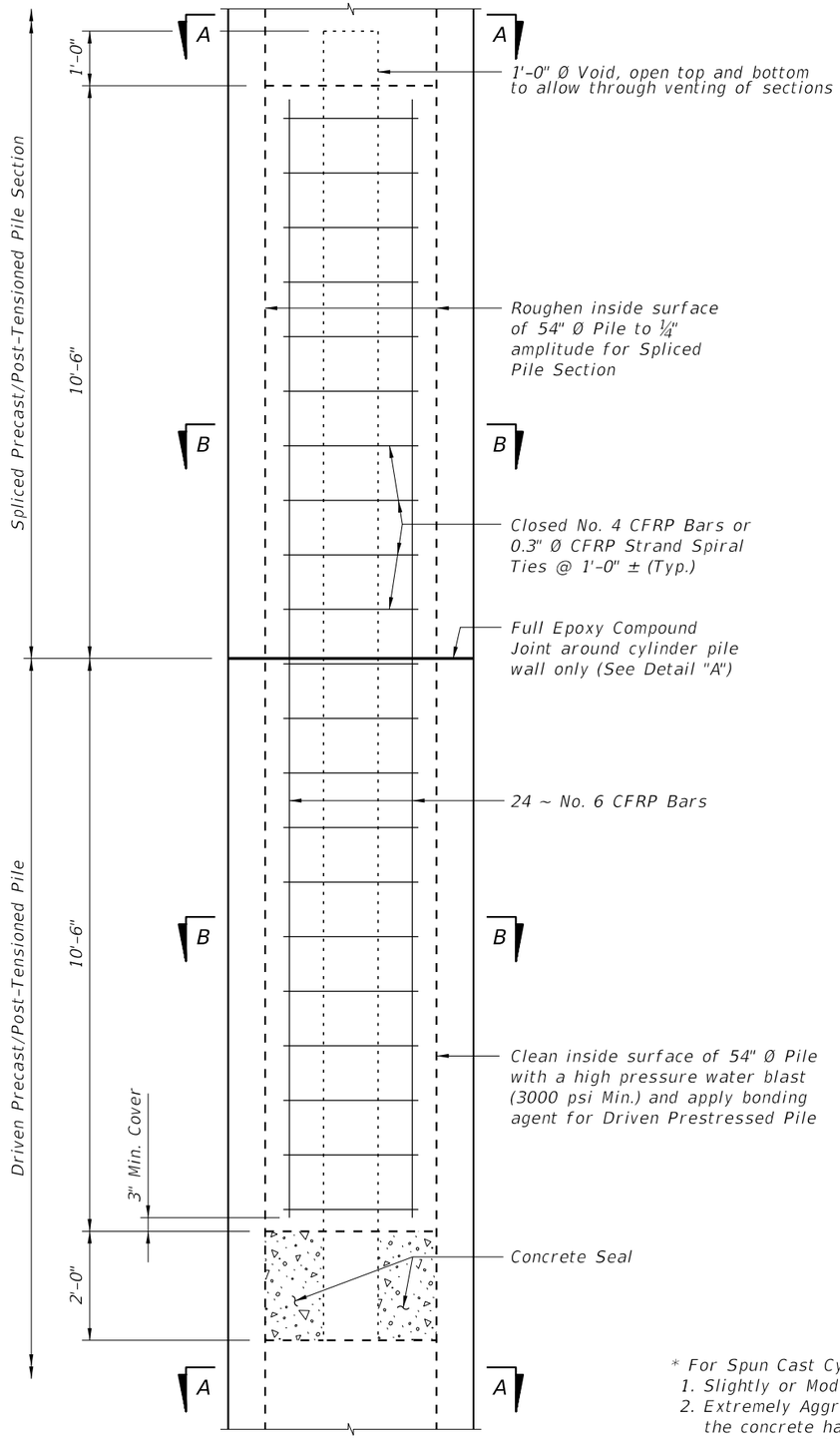
TABLE OF MAXIMUM PILE PICK-UP AND SUPPORT LENGTHS		
Maximum Pile Length (Feet)	Required Storage and Transportation Detail	Pick-Up Detail
119	2, 3, or 4 point	1 Point
170	2, 3, or 4 point	2 Point

NOTES

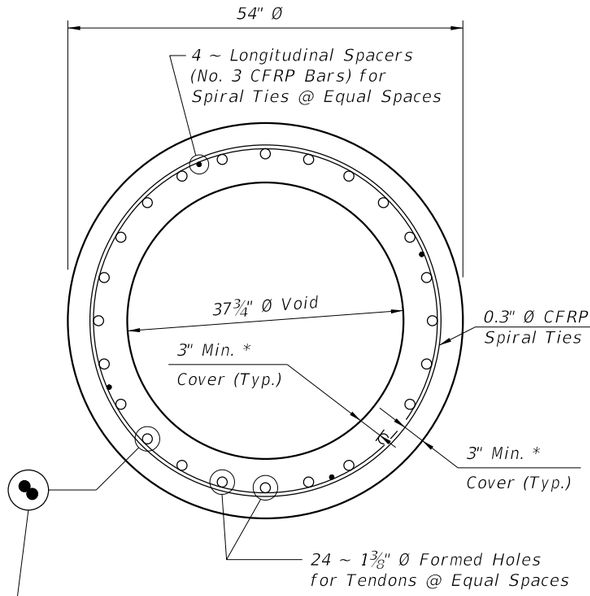
1. Work this Index with the Pile Data Table in the Structures Plans.
2. Concrete:
   - A. Piles: Class V (Special)
   - B. Splice: Class IV
   - C. Silica Fume: See "GENERAL NOTES" in Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required for options using stainless steel strand and reinforcing.
3. Concrete Strength at time of prestress transfer:
   - A. Piles: 6,000 psi minimum.
4. Reinforcing:
   - A. Bars:
     - a. Stainless Steel: Meet the requirements of Specification Section 931 for Type 304, Grade 75.
     - b. Carbon FRP: Meet the requirements of Specification Section 932.
   - B. Prestressing Strands:
     - a. Stainless Steel: Seven-wire HSSS, UNS S32205 (Type 2205) or UNS S31803 strand, meeting the requirements of Specification Section 933.
     - b. Carbon FRP: Meet the requirements of Specification Section 933.
   - C. Spiral Ties:
     - a. One half turn is required for carbon steel spiral splice.
     - b. One full turn is required at the pile head and tip.
5. Pile Splices:
   - A. Epoxy: Type AB Epoxy Compound or Mortar must meet the requirements of Specification Section 926.
     - a. Use a Type AB Epoxy Bonding Compound or Epoxy Mortar, as recommended by the Manufacturer, to form the joint between pile sections.
     - b. Use a Type AB Epoxy Bonding Compound as a bonding agent on internal pile surfaces.
   - B. Driving: Resume pile driving after splice concrete reaches a minimum strength of 5,500 psi.
6. Mark piles at the pick-up points to indicate the proper points for attaching handling lines.

10/24/2018 2:53:41 PM

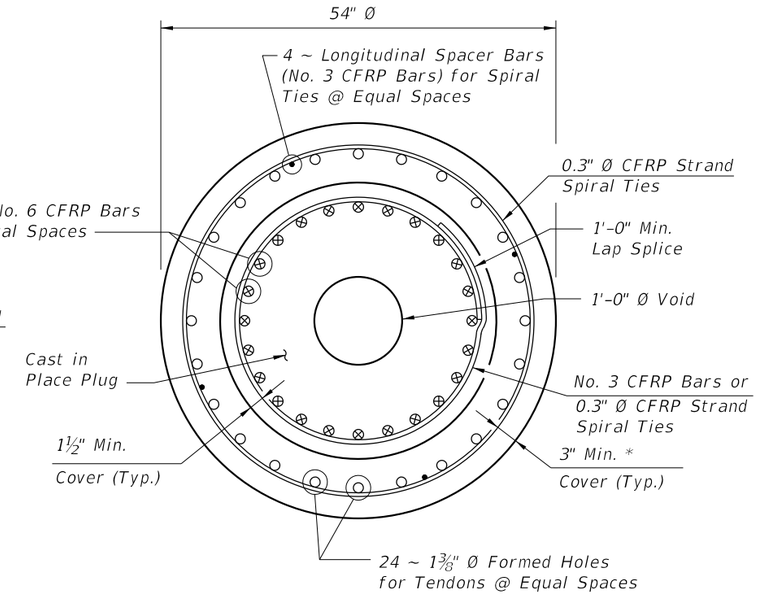
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	54" PRECAST/POST-TENSIONED CFRP & SS CONCRETE CYLINDER PILE	INDEX	SHEET
11/01/16						455-154	1 of 3



DRIVABLE UNFORESEEN FIELD SPLICE DETAIL
(Cast-In-Place Plug)



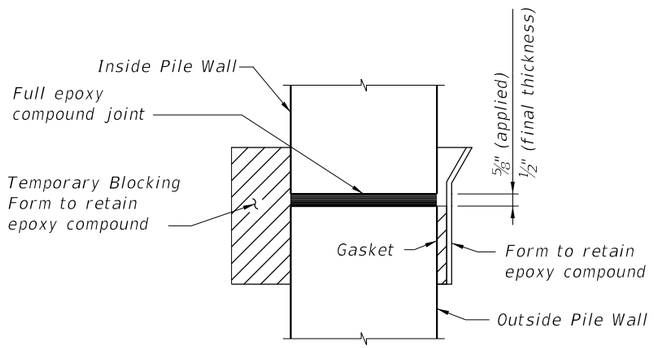
SECTION A-A



SECTION B-B

ALTERNATE STRAND PATTERNS

48 ~ 0.5" Ø, Single-Strand, at 28 kips
48 ~ 0.6" Ø, 7-Strand, at 29 kips



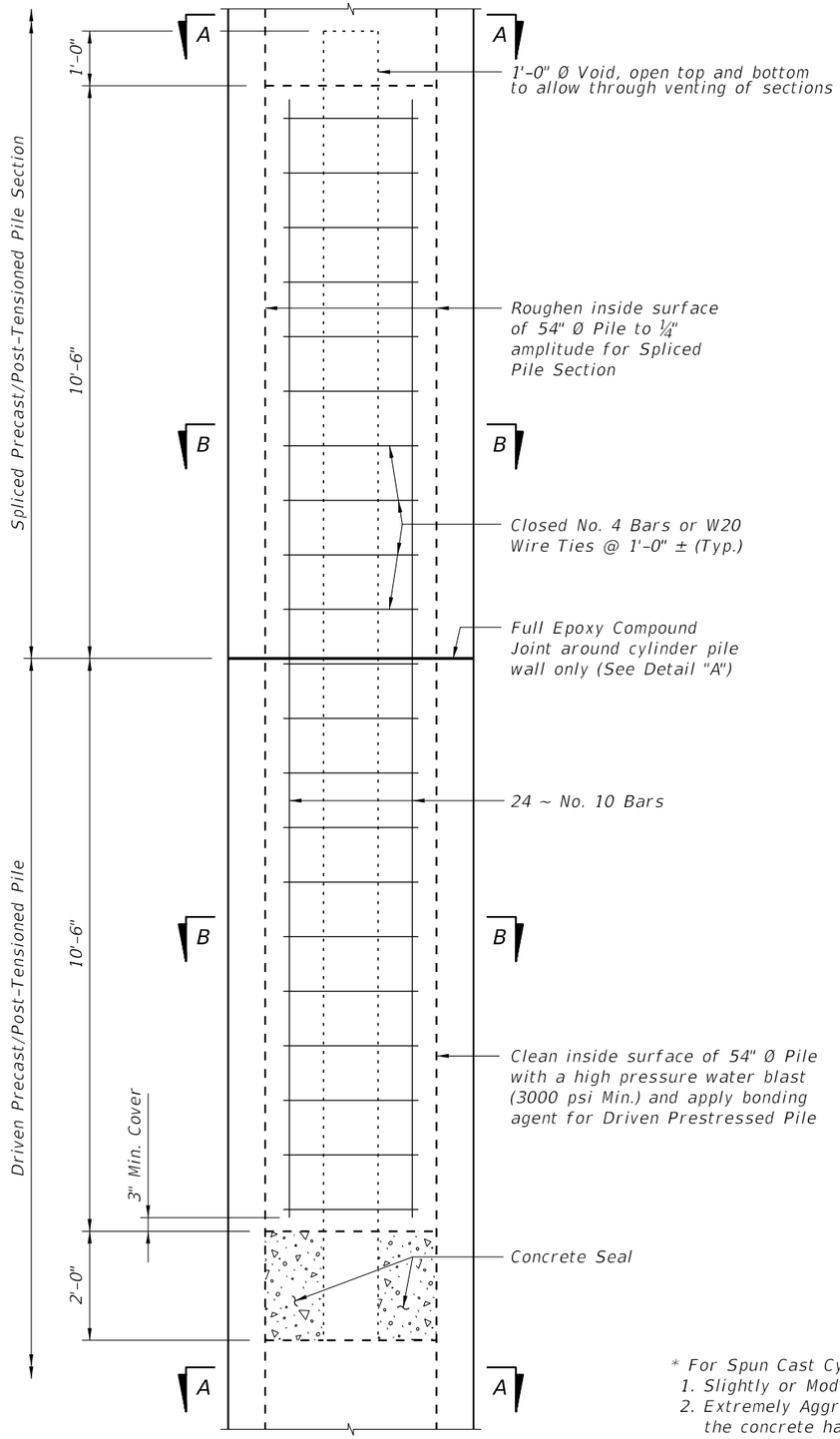
DETAIL "A"

* For Spun Cast Cylinder Piles, the following requirements for concrete cover apply:
1. Slightly or Moderately Aggressive Environments: The concrete cover may be reduced to 2 inches.
2. Extremely Aggressive Environments: The concrete cover may be reduced to 2 inches as long as the concrete has a documented chloride ion penetration apparent diffusion coefficient with a mean value of 0.005 in² per year or less; otherwise, a 3-inch concrete cover is required.

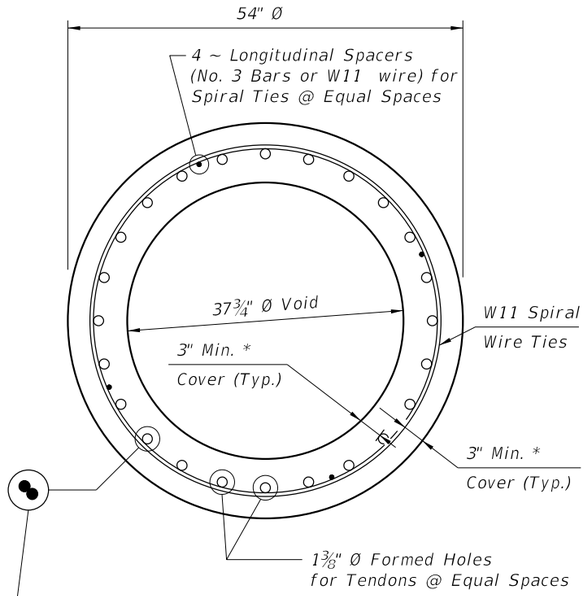
CFRP POST-TENSIONED PILE DETAILS

LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	54" PRECAST/POST-TENSIONED CFRP & SS CONCRETE CYLINDER PILE	INDEX	SHEET
01/01/16					455-154	2 of 3

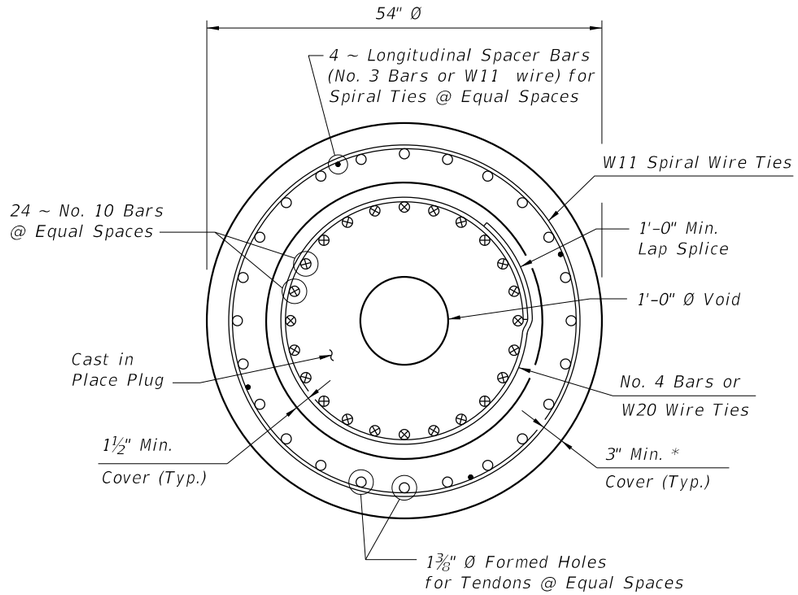
10/24/2018 2:53:41 PM



DRIVABLE UNFORESEEN FIELD SPLICE DETAIL
(Cast-In-Place Plug)



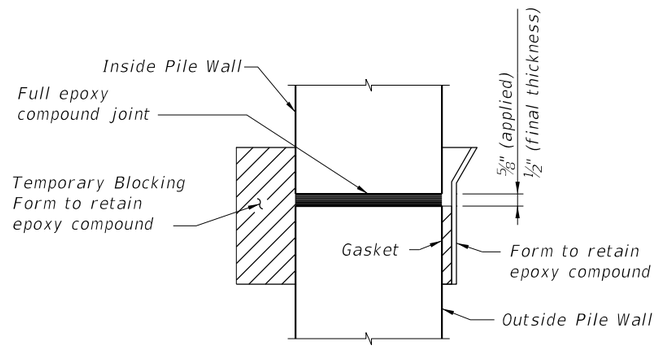
SECTION A-A



SECTION B-B

ALTERNATE STRAND PATTERNS

72 ~ ½" Ø, HSSS Strands, at 21 kips (24~3 strand tendons)
58 ~ ½" Ø, HSSS Strands, at 24 kips (29~2 strand tendons)
48 ~ 0.6" Ø, HSSS Strands, at 32 kips (24~2 strand tendons)



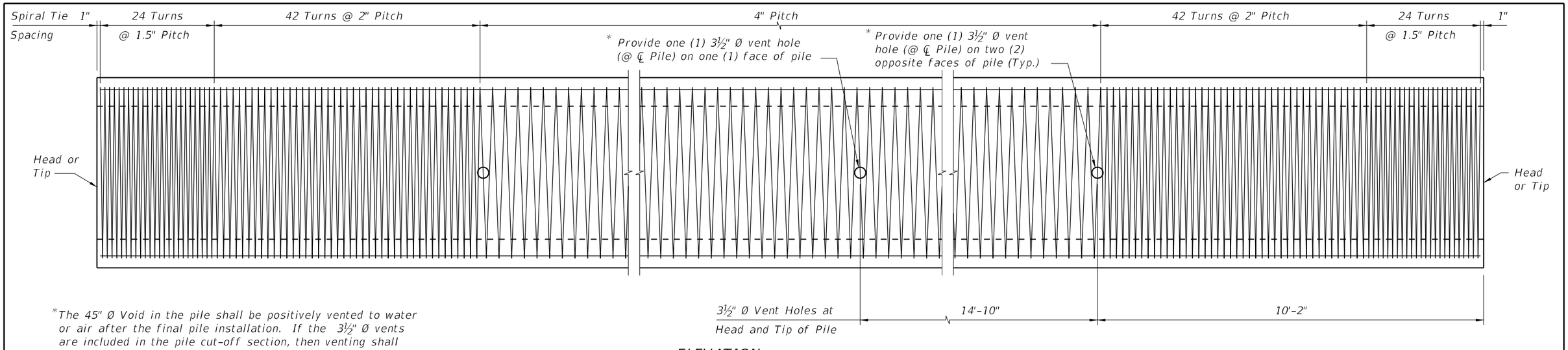
DETAIL "A"

* For Spun Cast Cylinder Piles, the following requirements for concrete cover apply:
1. Slightly or Moderately Aggressive Environments: The concrete cover may be reduced to 2 inches.
2. Extremely Aggressive Environments: The concrete cover may be reduced to 2 inches as long as the concrete has a documented chloride ion penetration apparent diffusion coefficient with a mean value of 0.005 in² per year or less; otherwise, a 3-inch concrete cover is required.

SS POST-TENSIONED PILE DETAILS

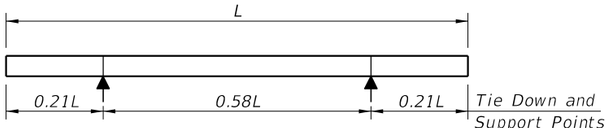
10/24/2018 2:53:42 PM

LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	54" PRECAST/POST-TENSIONED CFRP & SS CONCRETE CYLINDER PILE	INDEX	SHEET
01/01/16					455-154	3 of 3

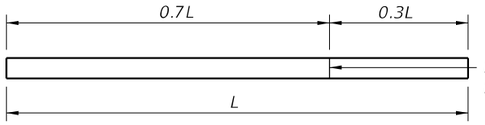


*The 45" Ø Void in the pile shall be positively vented to water or air after the final pile installation. If the 3½" Ø vents are included in the pile cut-off section, then venting shall be provided by the use of a 1" Ø PVC conduit through the substructure cap or column.

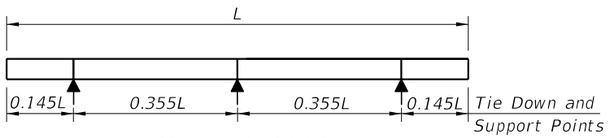
ELEVATION



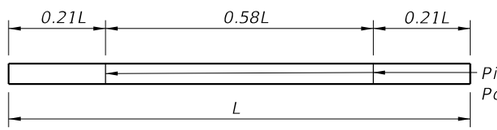
2-POINT SUPPORT



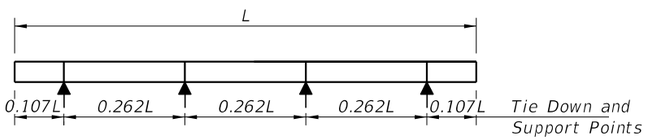
1-POINT PICK-UP



3-POINT SUPPORT



2-POINT PICK-UP



4-POINT SUPPORT

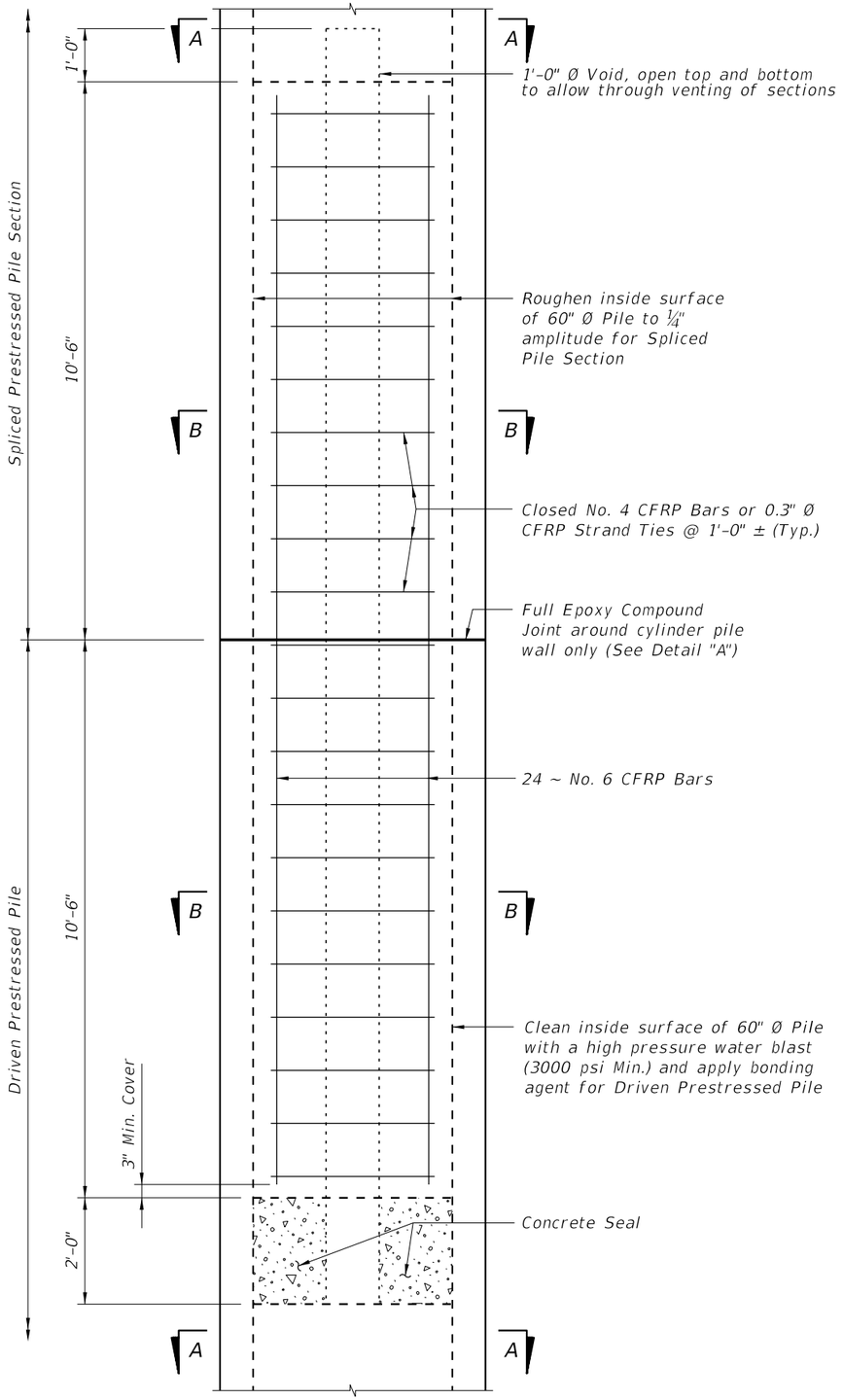
PILE PICK-UP DETAILS

STORAGE AND TRANSPORTATION SUPPORT DETAILS

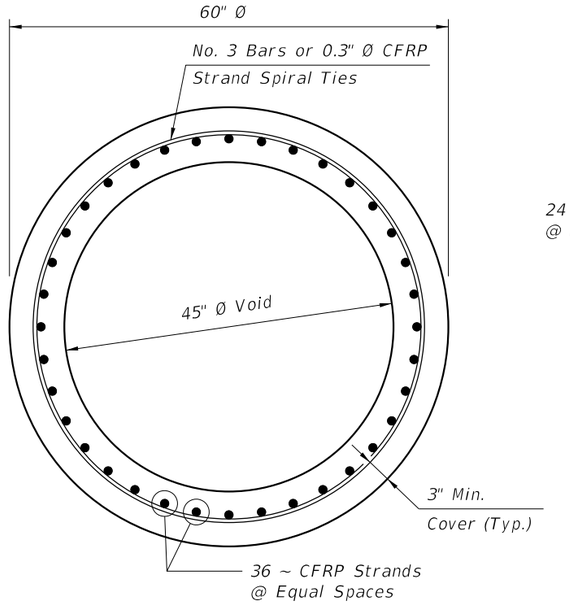
TABLE OF MAXIMUM PILE PICK-UP AND SUPPORT LENGTHS		
Maximum Pile Length (Feet)	Required Storage and Transportation Detail	Pick-Up Detail
122	2, 3, or 4 point	1 Point
174	2, 3, or 4 point	2 Point

NOTES

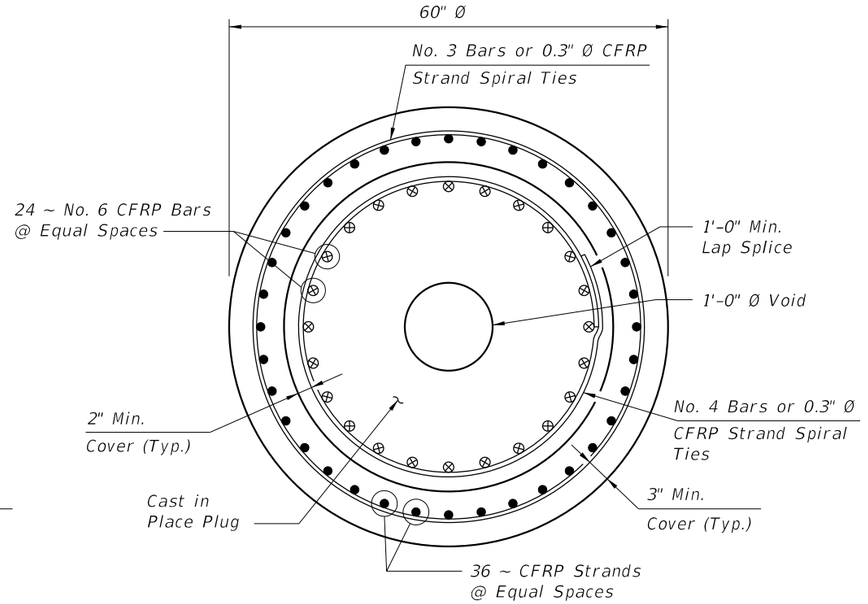
1. Work this Index with the Pile Data Table in the Structures Plans.
2. Concrete:
   - A. Piles: Class V (Special)
   - B. Splice Collar: Class IV
   - C. Silica Fume: See "GENERAL NOTES" in the Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required.
3. Concrete Strength at time of prestress transfer:
   - A. Piles: 4,000 psi minimum.
4. Reinforcing:
   - A. Bars:
     - a. Stainless Steel: Meet the requirements of Specification Section 931 for Type 304, Grade 75.
     - b. Carbon FRP: Meet the requirements of Specification Section 932.
   - B. Prestressing Strands:
     - a. Stainless Steel: Seven-wire HSSS, UNS S32205 (Type 2205) or UNS S31803 strand, meeting the requirements of Specification Section 933.
     - b. Carbon FRP: Meet the requirements of Specification Section 933.
   - C. Spiral Ties:
     - a. One half turn is required for carbon steel spiral splice.
     - b. One full turn is required at the pile head and tip.
5. Pile Splices:
   - A. Epoxy: Type AB Epoxy Compound or Epoxy Mortar must meet the requirements of Specification Section 926.
     - a. Use a Type AB Epoxy Bonding Compound or Epoxy Mortar, as recommended by the Manufacturer, to form the joint between pile sections
     - b. Use a Type AB Epoxy Bonding Compound as a bonding agent on internal pile surfaces.
   - B. Splices: Resume pile driving after the splice concrete reaches a minimum strength of 5,500 psi.
6. Mark piles at the pick-up points to indicate the proper points for attaching handling lines.



DRIVABLE UNFORESEEN FIELD SPLICE DETAIL
(Cast in Place Plug)



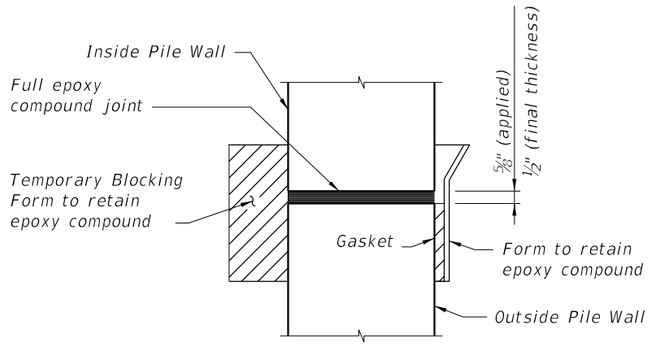
SECTION A-A



SECTION B-B

ALTERNATE STRAND PATTERNS

0.5" Ø, CFRP Single-Strand, at 39 kips
0.6" Ø, CFRP 7-Strand, at 40 kips

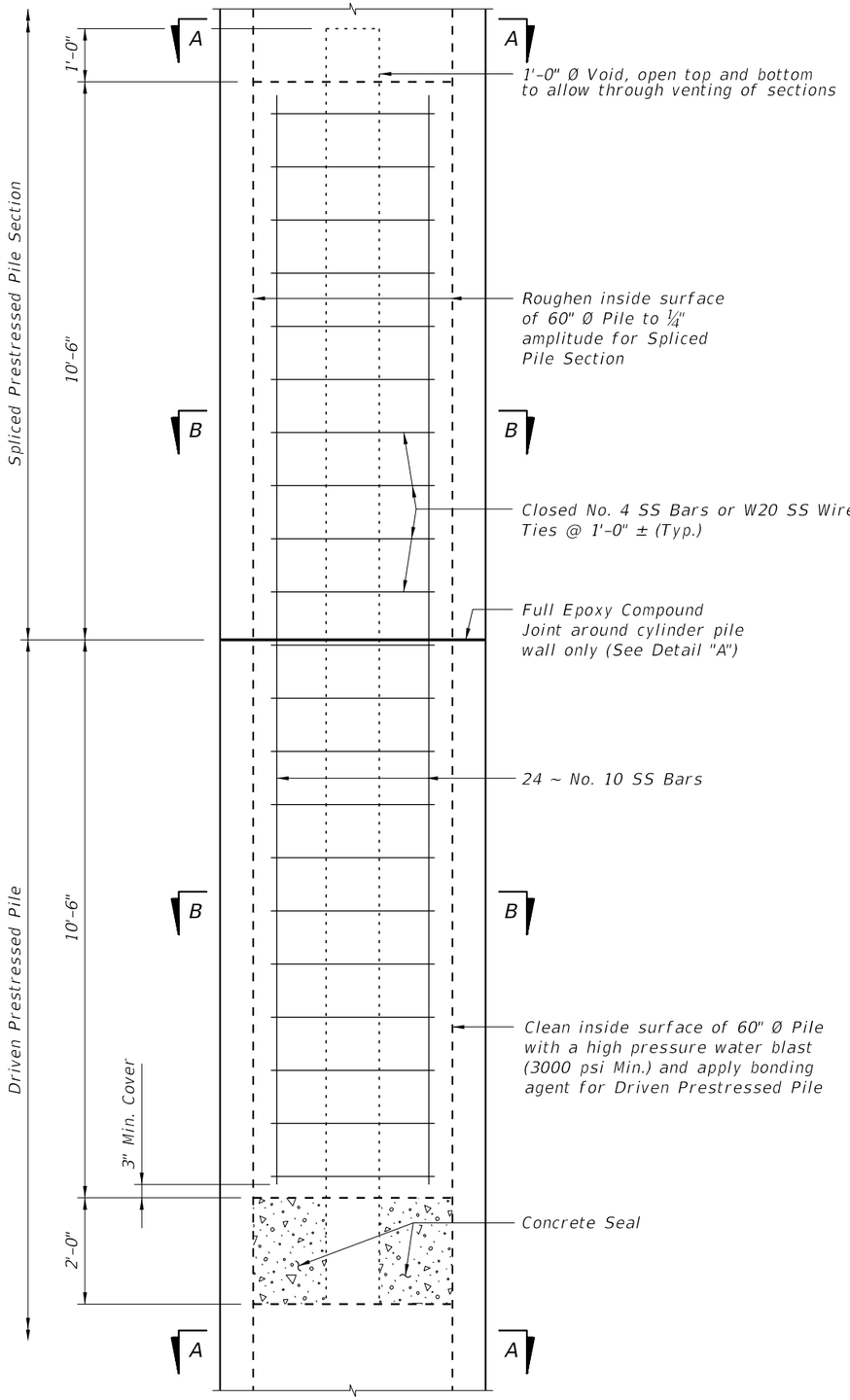


DETAIL "A"

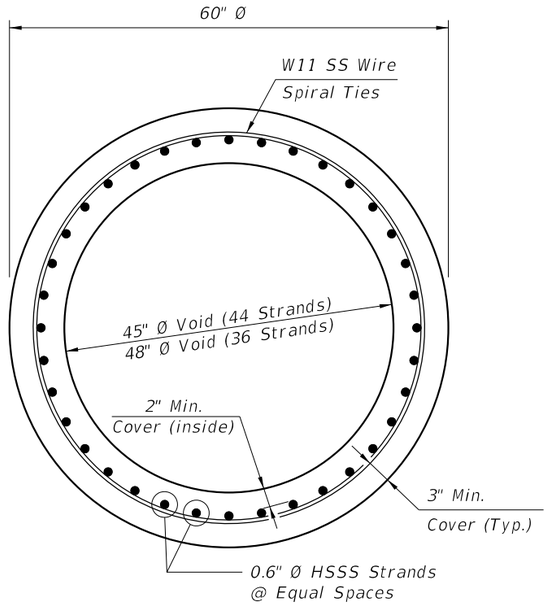
CFRP POST-TENSIONED PILE DETAILS

LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	60" PRESTRESSED CFRP & SS CONCRETE CYLINDER PILE	INDEX	SHEET
01/01/16					455-160	2 of 3

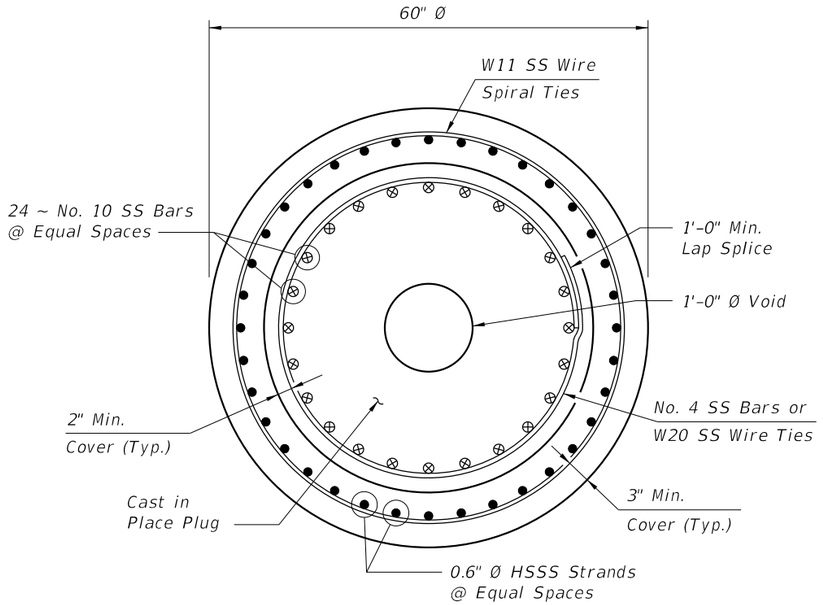
12/3/2018 9:58:24 AM



DRIVABLE UNFORESEEN FIELD SPLICE DETAIL
(Cast in Place Plug)



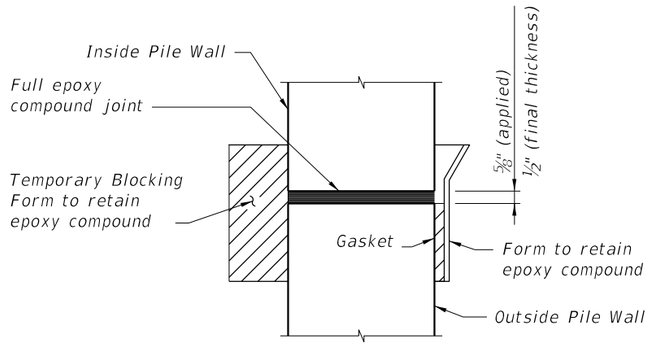
SECTION A-A



SECTION B-B

ALTERNATE STRAND PATTERNS

44 ~ 0.6" Ø, HSSS Strand, at 36 kips
36 ~ 0.6" Ø, HSSS Strand, at 36 kips

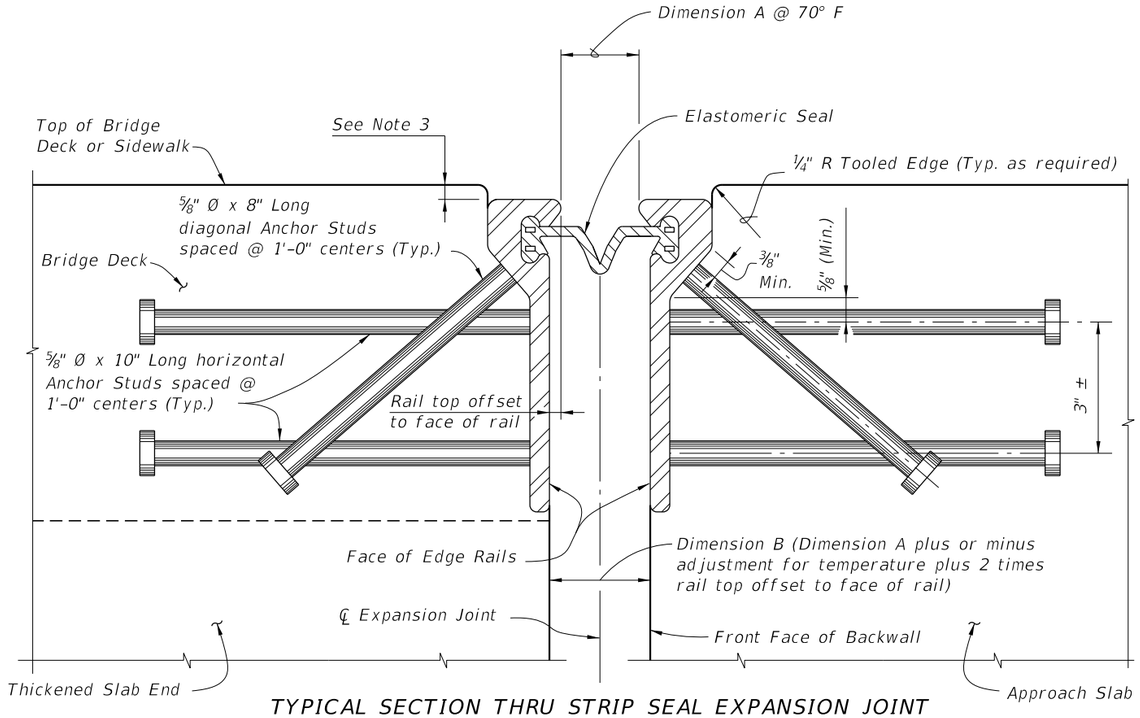


DETAIL "A"

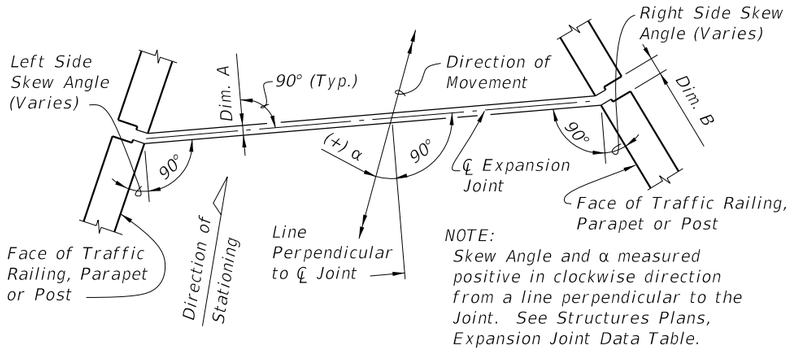
SS POST-TENSIONED PILE DETAILS

12/3/2018 9:58:35 AM

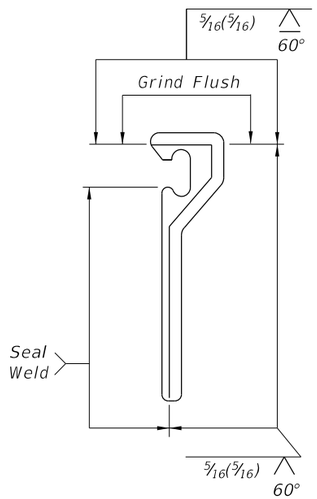
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	60" PRESTRESSED CFRP & SS CONCRETE CYLINDER PILE	INDEX	SHEET
01/01/16						455-160	3 of 3



TYPICAL SECTION THRU STRIP SEAL EXPANSION JOINT
(Begin or End Concrete Girder Bridge shown,
Intermediate Supports and Steel Girder Bridge similar.
Reinforcing Steel and Girder details not shown for clarity.)



MOVEMENT SCHEMATIC



SHOP SPLICE DETAIL

GENERAL NOTES:

1. *Furnish Strip Seal Expansion Joint Systems in accordance with Specification Section 458.*
2. *Shape of Edge Rail shown is representative, minor variations depending on manufacturer are permitted.*
3. *Recess the Edge Rail below the concrete surface in accordance with Specification Section 458.*
4. *Refer to the Expansion Joint Data Table in the Structures Plans for joint movement and Dimension A.*
5. *Refer to Specification Section 458 for installation and fabrication requirements.*

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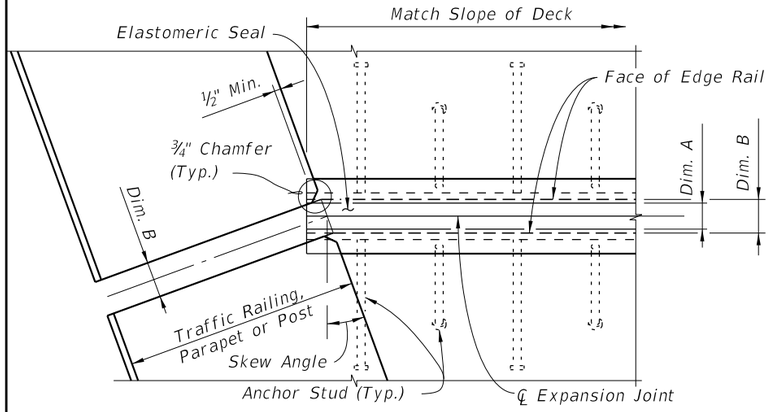
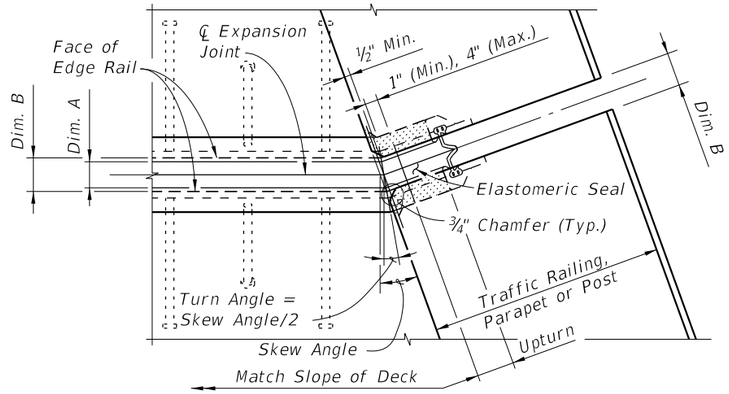
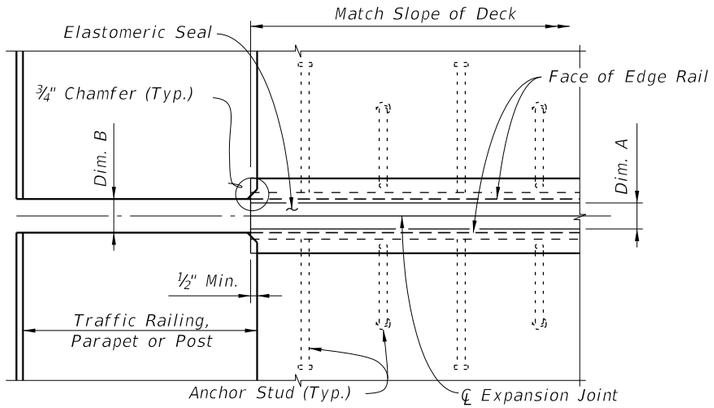
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	EXPANSION JOINT SYSTEM - STRIP SEAL	INDEX	SHEET
07/01/13						458-100	1 of 3



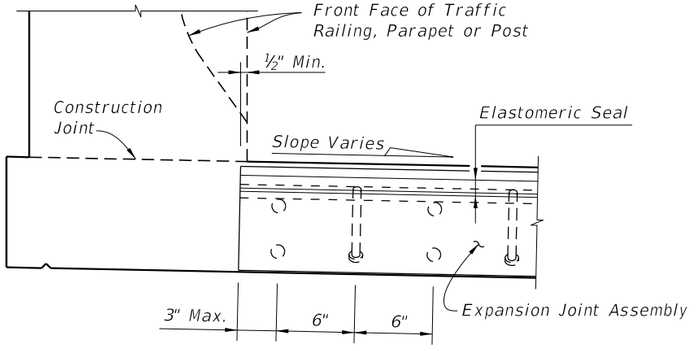
PARTIAL PLAN VIEW OF SKEWED JOINTS



PARTIAL PLAN VIEW OF JOINTS SKEWED GREATER THAN 6°



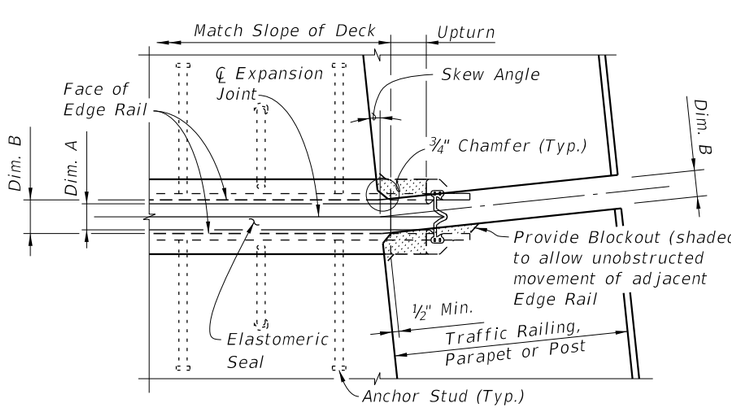
PARTIAL PLAN VIEW OF NONSKEWED JOINTS



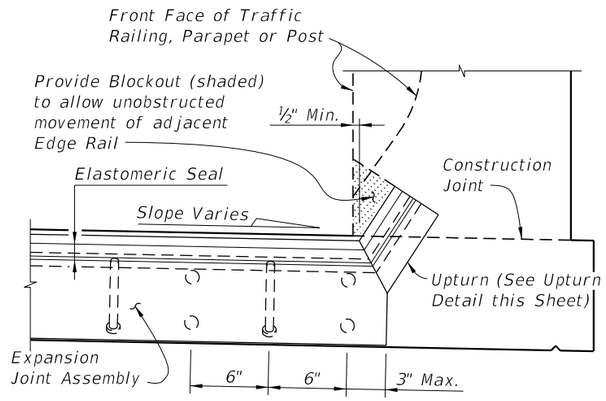
PARTIAL SECTION ALONG ℄ JOINT

JOINT TREATMENT AT HIGH SIDE OF DECK WITH SLOPE ≥ 1%

(Sidewalk Cover Plate where applicable not shown for clarity)



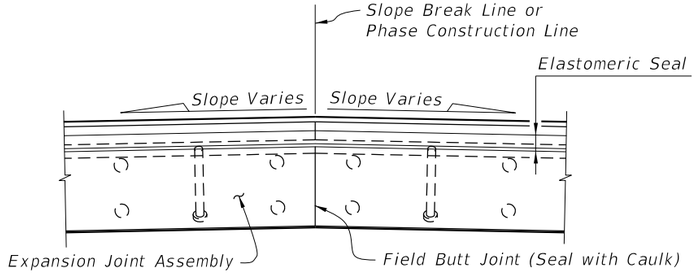
PARTIAL PLAN VIEW OF NONSKEWED JOINTS & JOINTS SKEWED 6° OR LESS



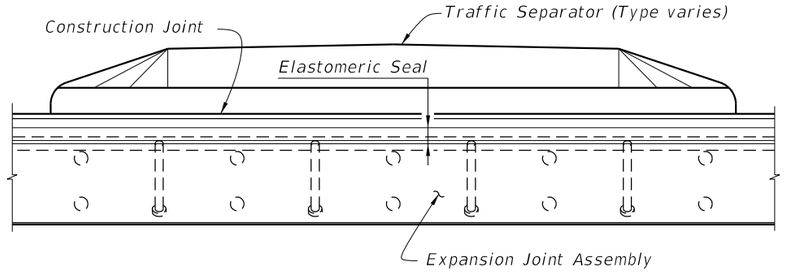
PARTIAL SECTION ALONG ℄ JOINT

JOINT TREATMENT AT LOW SIDE OF DECK & HIGH SIDE OF DECK WITH SLOPE < 1%

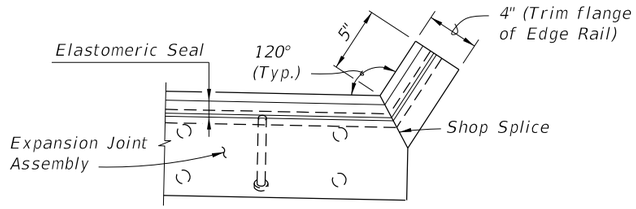
(Sidewalk Cover Plate where applicable not shown for clarity)



PARTIAL SECTION ALONG ℄ JOINT AT FIELD BUTT JOINT LOCATION (CROWNED DECK OR SLAB SHOWN)



PARTIAL SECTION ALONG ℄ JOINT THRU TRAFFIC SEPARATOR

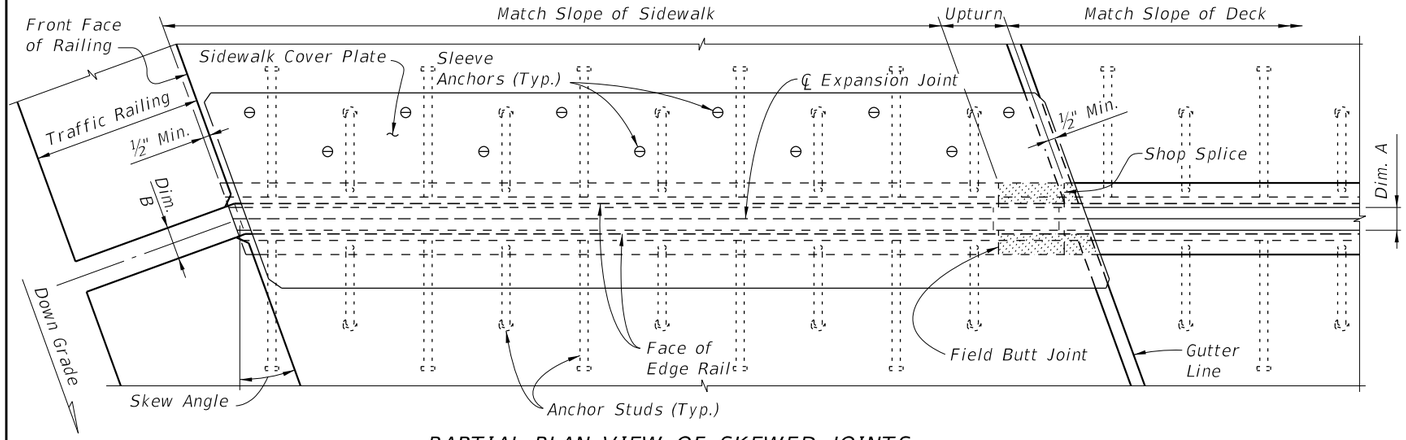


UPTURN DETAIL

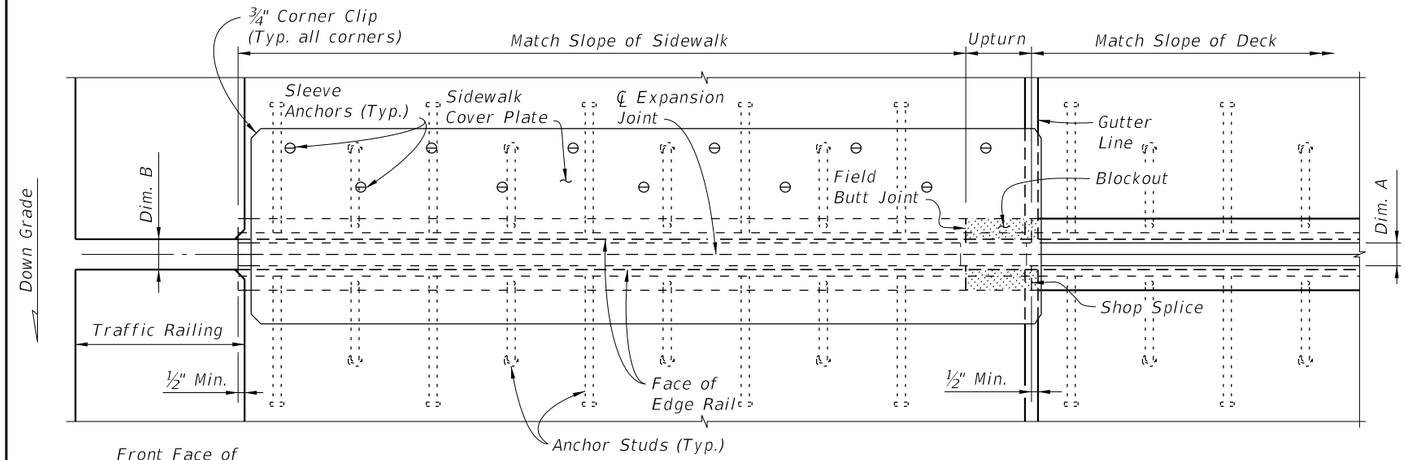
(TYPICAL AT TRAFFIC BARRIERS AND PARAPETS)

10/24/2018 2:53:46 PM

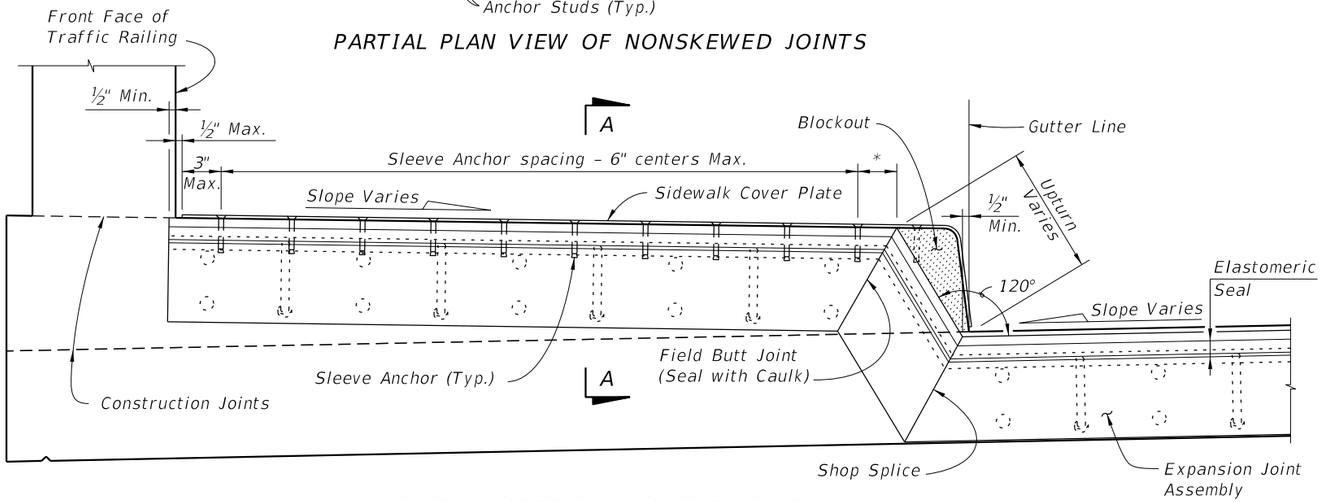
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/14			FY 2019-20 STANDARD PLANS	EXPANSION JOINT SYSTEM - STRIP SEAL	458-100	2 of 3



PARTIAL PLAN VIEW OF SKEWED JOINTS



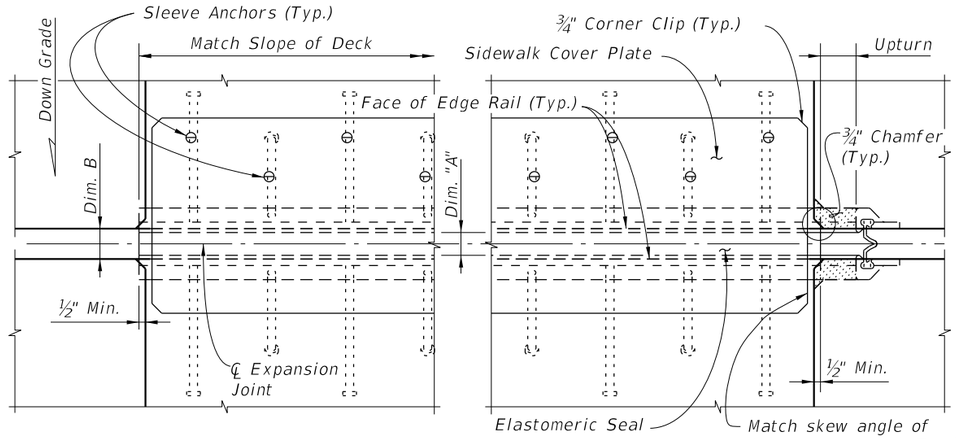
PARTIAL PLAN VIEW OF NONSKEWED JOINTS



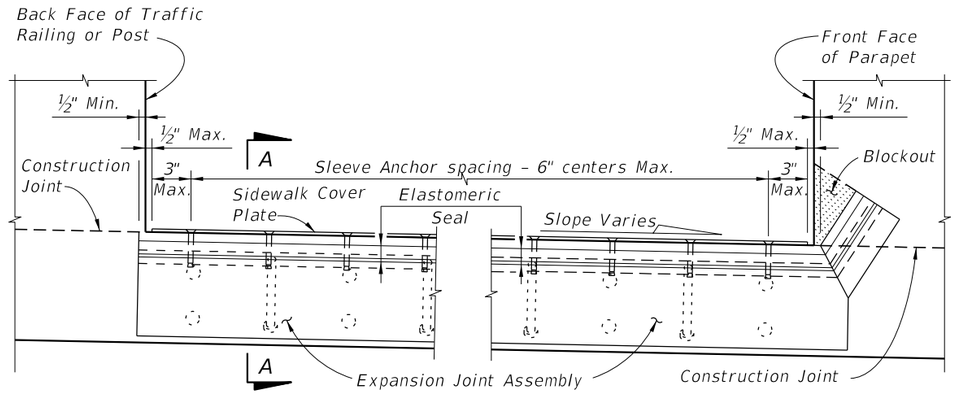
PARTIAL SECTION ALONG ℄ JOINT

RAISED SIDEWALK DETAIL

* Distance from ℄ Sleeve Anchor to edge of concrete is 2 inches minimum, 3 inches maximum.

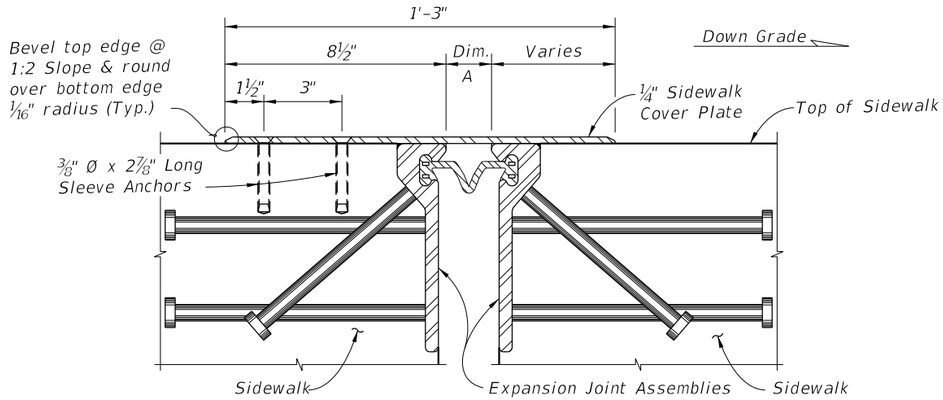


PARTIAL PLAN VIEW



PARTIAL SECTION ALONG ℄ JOINT

FLUSH SIDEWALK DETAIL



SECTION A-A

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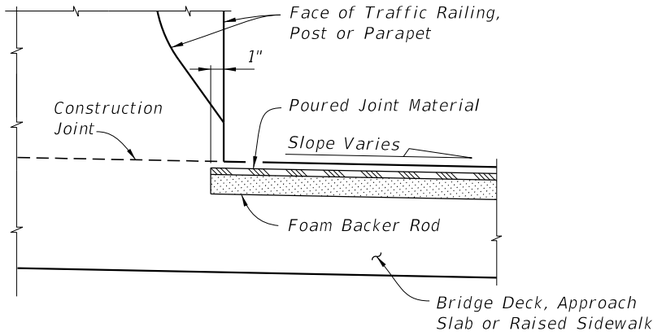
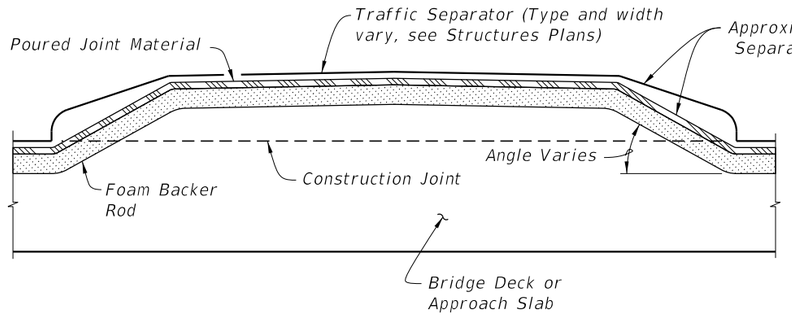
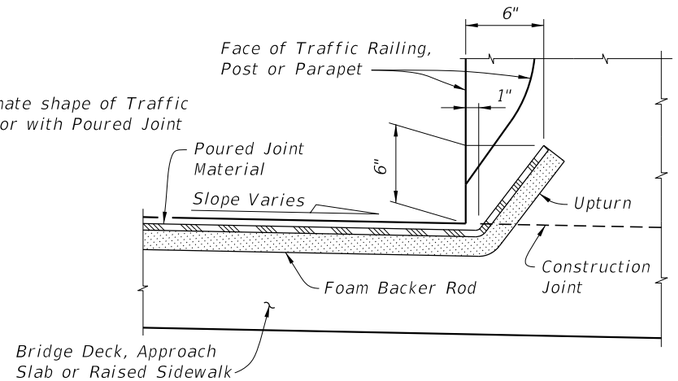
LAST REVISION	REVISION	DESCRIPTION:				
07/01/13			FDOT FY 2019-20 STANDARD PLANS	EXPANSION JOINT SYSTEM - STRIP SEAL	INDEX 458-100	SHEET 3 of 3



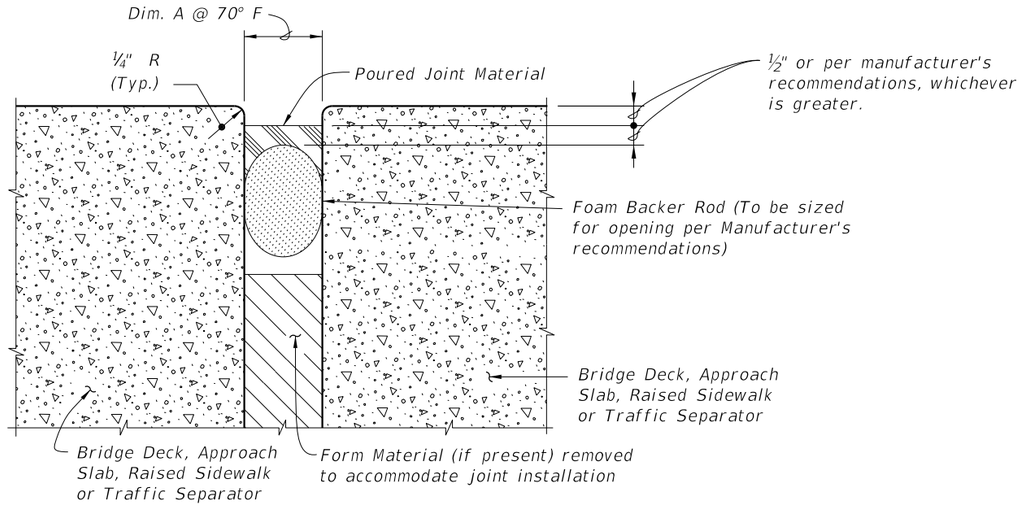
PARTIAL SECTION ALONG ℄ JOINT
JOINT TREATMENT AT HIGH SIDE OF
DECK WITH SLOPES 1% OR GREATER



PARTIAL SECTION ALONG ℄ JOINT,
JOINT TREATMENT AT TRAFFIC SEPARATOR



PARTIAL SECTION ALONG ℄ JOINT
JOINT TREATMENT AT LOW SIDE OF DECK OR
HIGH SIDE OF DECK WITH SLOPES < 1%



TYPICAL SECTION THRU JOINT

GENERAL NOTES:

1. Furnish and install Poured Joint With Backer Rod Expansion Joint Systems in accordance with Specification Sections 458 and 932 using Type D silicone sealant material.
2. Refer to the Structures Plans, Poured Expansion Joint Data Table for Dim. A @ 70° F.

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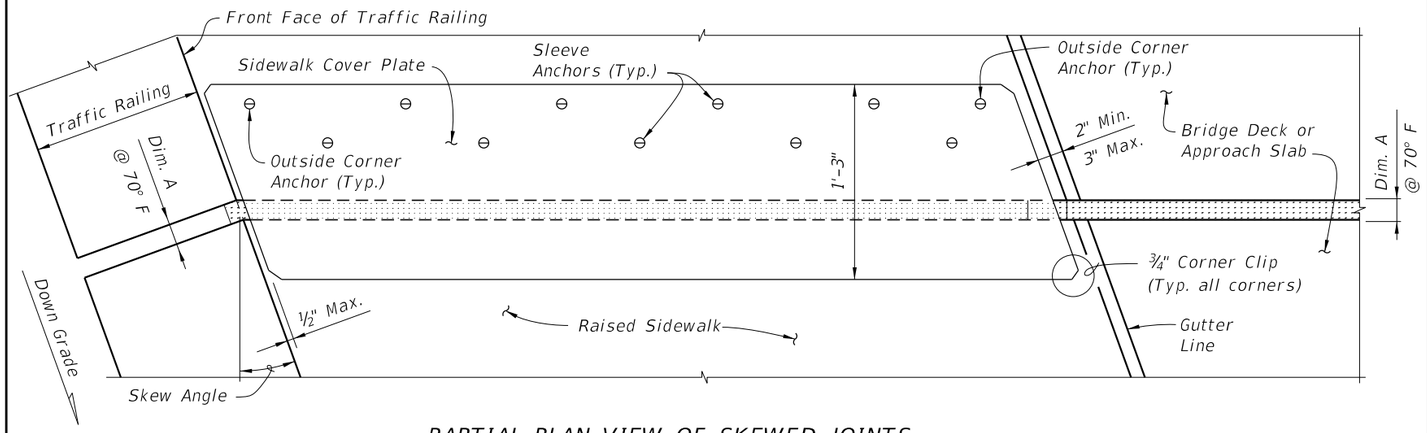
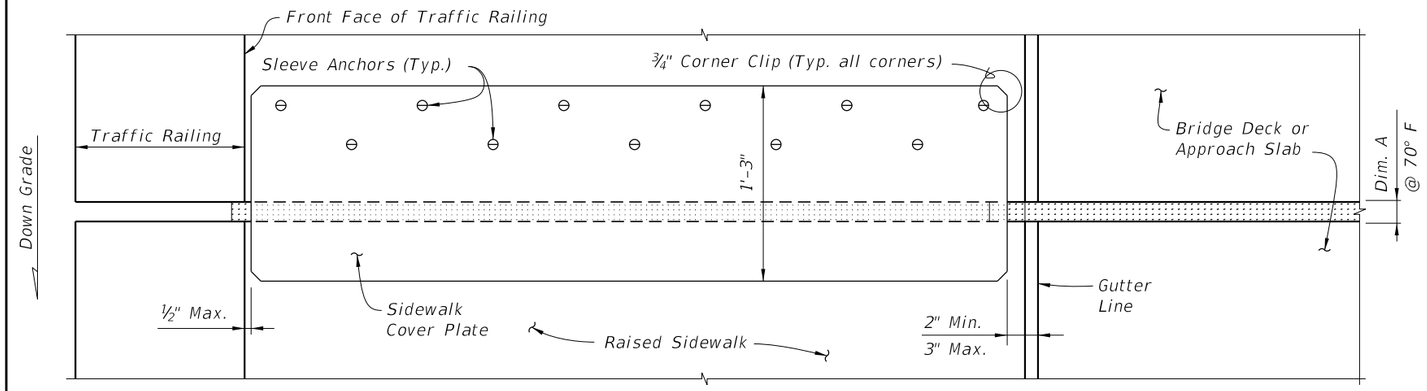
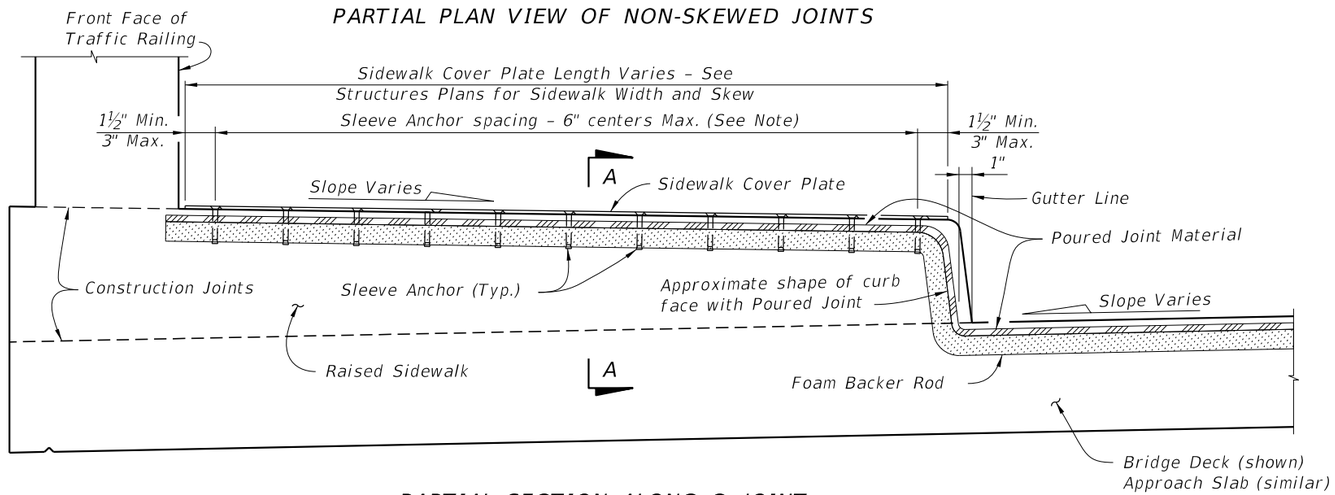
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	EXPANSION JOINT SYSTEM - POURED JOINT WITH BACKER ROD	INDEX	SHEET
07/01/14					458-110	1 of 2



PARTIAL PLAN VIEW OF SKEWED JOINTS

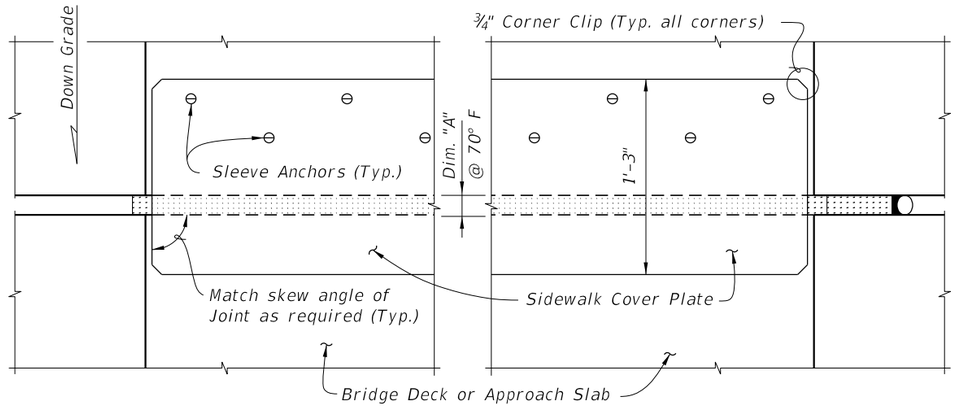


PARTIAL PLAN VIEW OF NON-SKEWED JOINTS

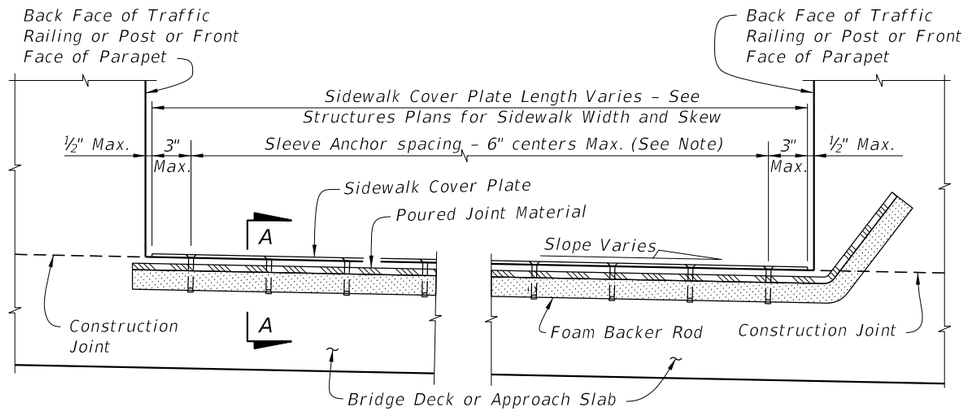


PARTIAL SECTION ALONG ℄ JOINT

RAISED SIDEWALK DETAIL

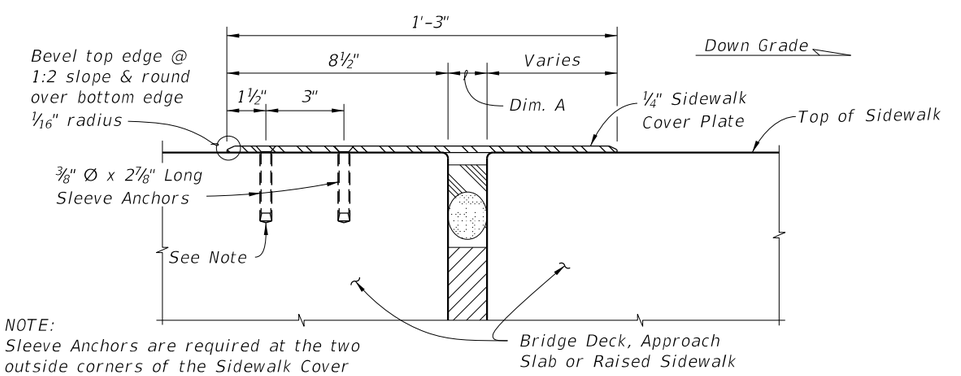


PARTIAL PLAN VIEW



PARTIAL SECTION ALONG ℄ JOINT

FLUSH SIDEWALK DETAIL



NOTE:
Sleeve Anchors are required at the two outside corners of the Sidewalk Cover Plate. Space Sleeve Anchors uniformly between the corner anchors.

SECTION A-A

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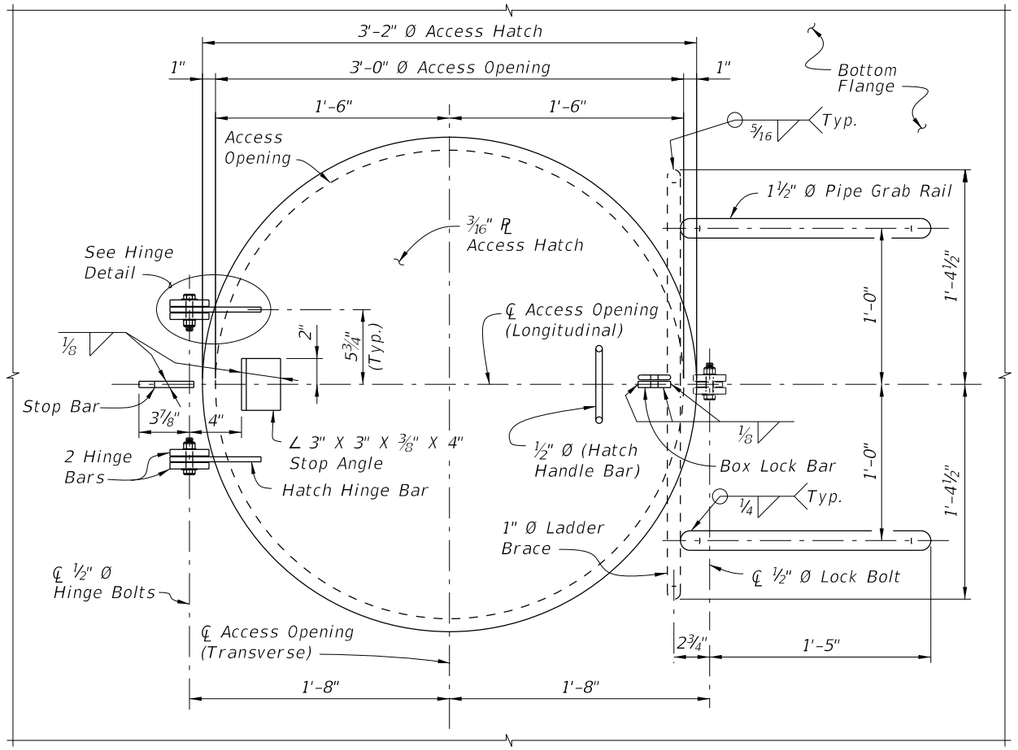
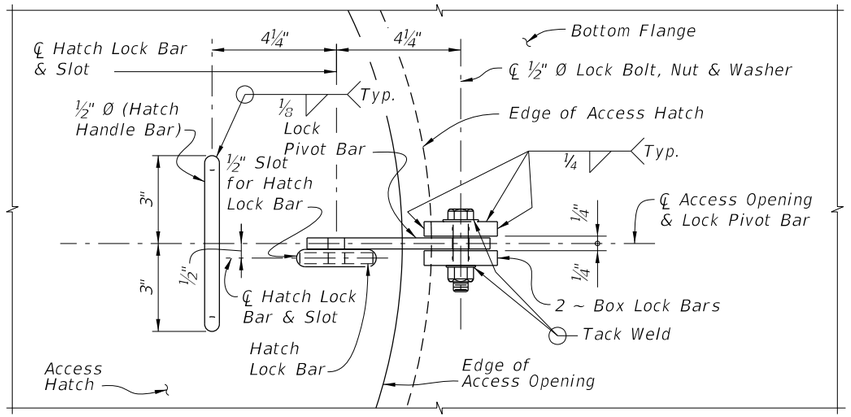
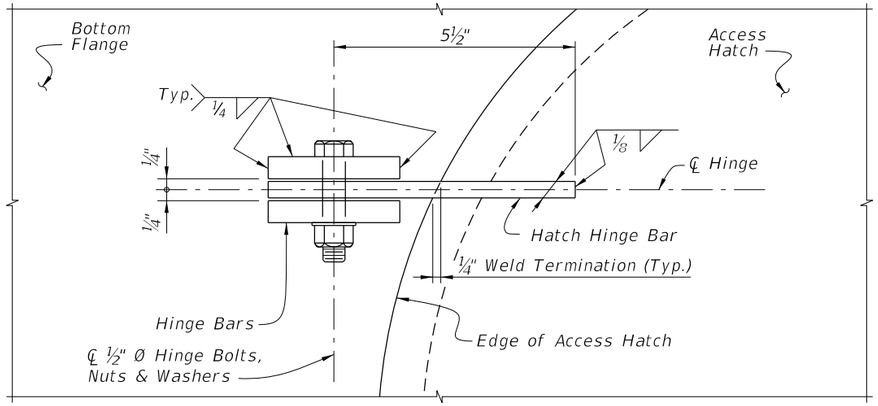
LAST REVISION	REVISION	DESCRIPTION:				
07/01/13			FDOT FY 2019-20 STANDARD PLANS	EXPANSION JOINT SYSTEM - POURED JOINT WITH BACKER ROD	INDEX 458-110	SHEET 2 of 2



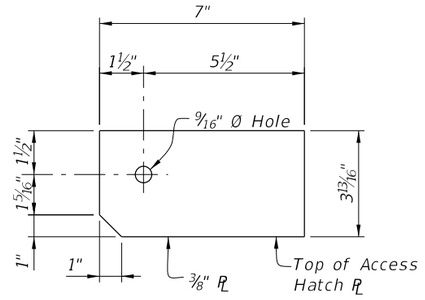
PLAN VIEW OF ACCESS HATCH ASSEMBLY



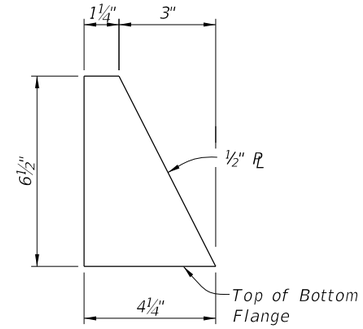
VIEW A-A



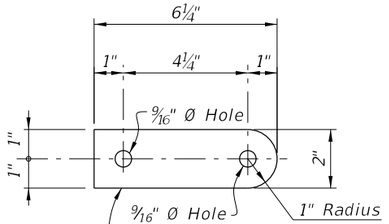
HINGE DETAIL



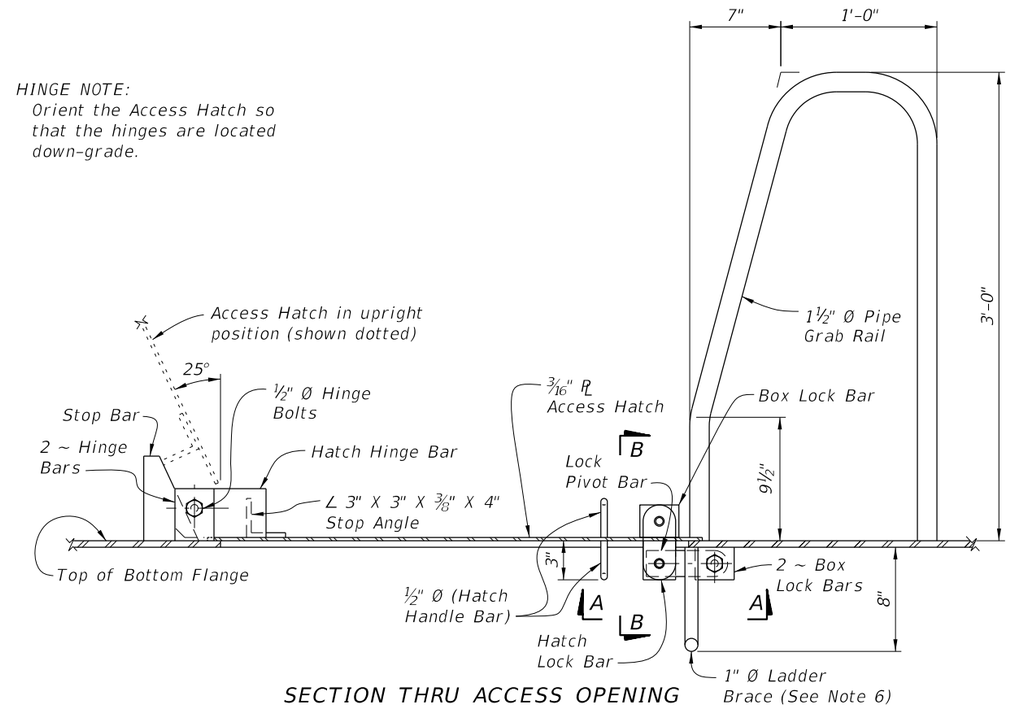
HATCH HINGE BAR DETAIL



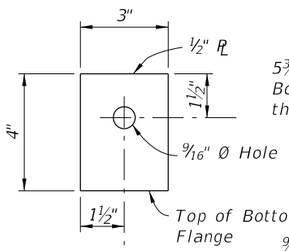
STOP BAR DETAIL



LOCK PIVOT BAR DETAIL



SECTION THRU ACCESS OPENING



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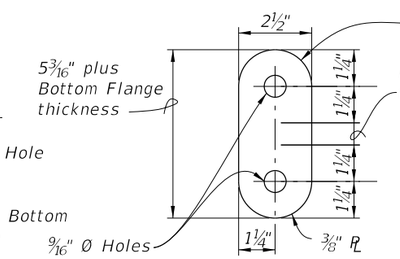
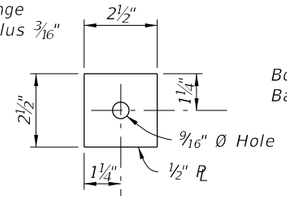
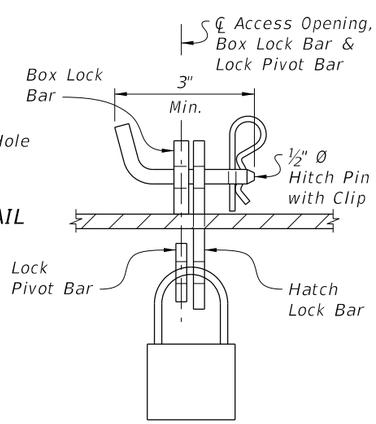


HATCH LOCK BAR DETAIL



BOX LOCK BAR DETAIL



VIEW B-B
HATCH LOCK ASSEMBLY DETAIL

NOTES:

1. All Structural Steel material in Access Hatch Assemblies shall conform to ASTM A709 Grade 36.
2. 1½" Ø Pipe Grab Rail shall be in accordance with ASTM A53 Grade B for standard weight pipe (Schedule 40).
3. ½" Ø Hatch Handle Bar, Hitch Pin and 1" Ø Ladder Brace shall be in accordance with ASTM A36.
4. All bolts shall conform to ASTM A307 or A449. All nuts shall conform to ASTM A563 and all washers shall conform to ASTM F-436.
5. All exposed edges of plates and openings shall be ground smooth.
6. Place Ladder Brace near the End Bents exclusively and only when the height is reasonable for access by a Ladder.
7. See Framing Plan sheets for locations of Access Hatch Openings.
8. Coat structural steel in accordance with Specification Section 560.
9. Include the cost of the Access Hatch Assembly and incidental items in the cost of the Steel Box Girders. No separate payment will be made for coating structural steel.

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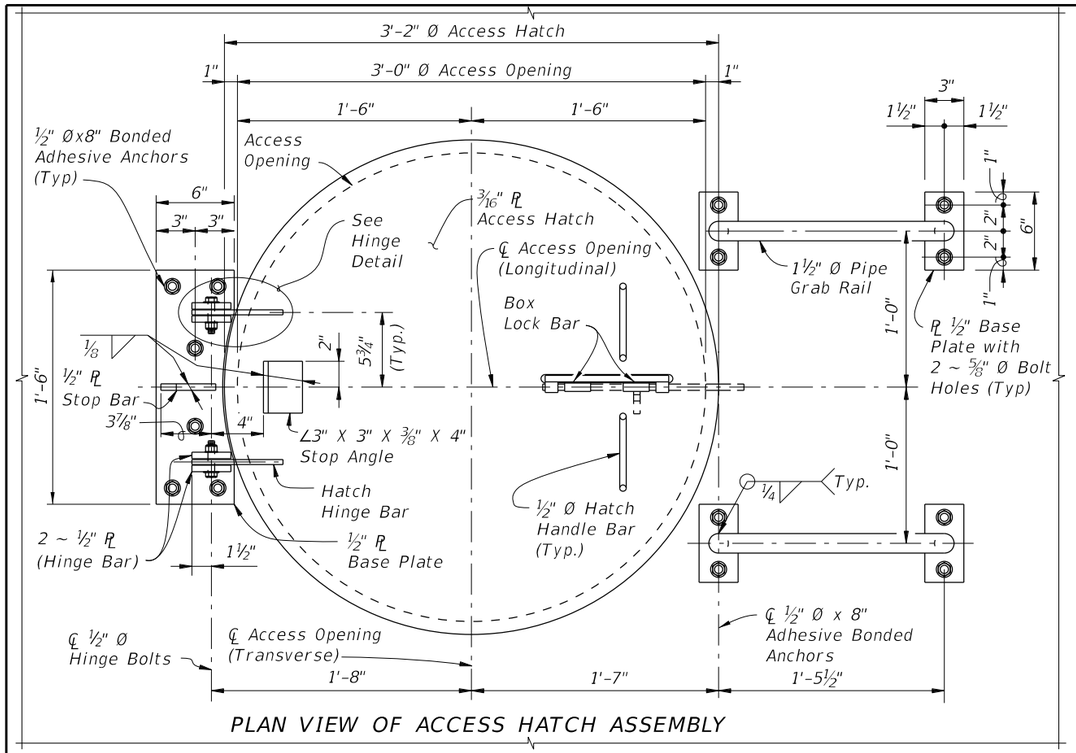
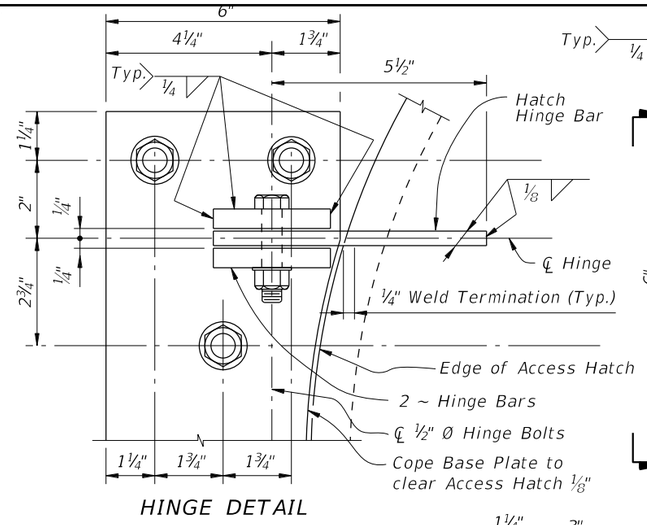
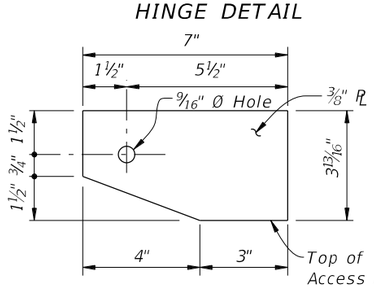
LAST REVISION	REVISION	DESCRIPTION:				
07/01/15			FDOT	FY 2019-20 STANDARD PLANS	ACCESS HATCH ASSEMBLY FOR STEEL BOX SECTIONS	INDEX 460-250 / SHEET 1 of 1



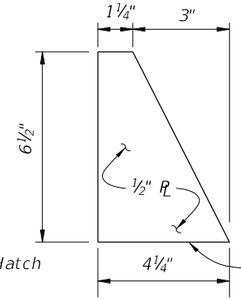
PLAN VIEW OF ACCESS HATCH ASSEMBLY



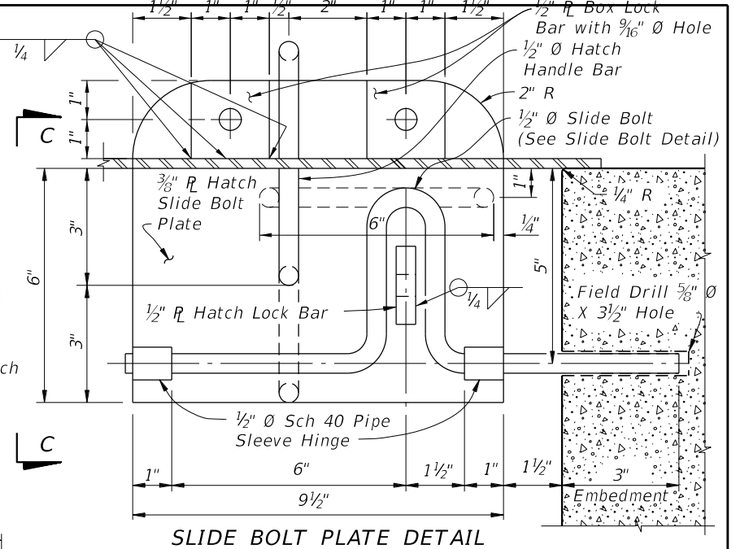
HINGE DETAIL



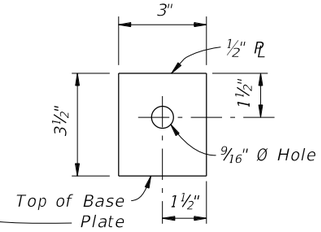
HATCH HINGE BAR DETAIL



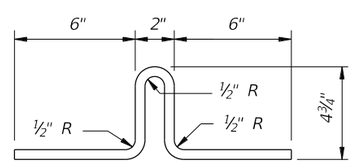
STOP BAR DETAIL



SLIDE BOLT PLATE DETAIL

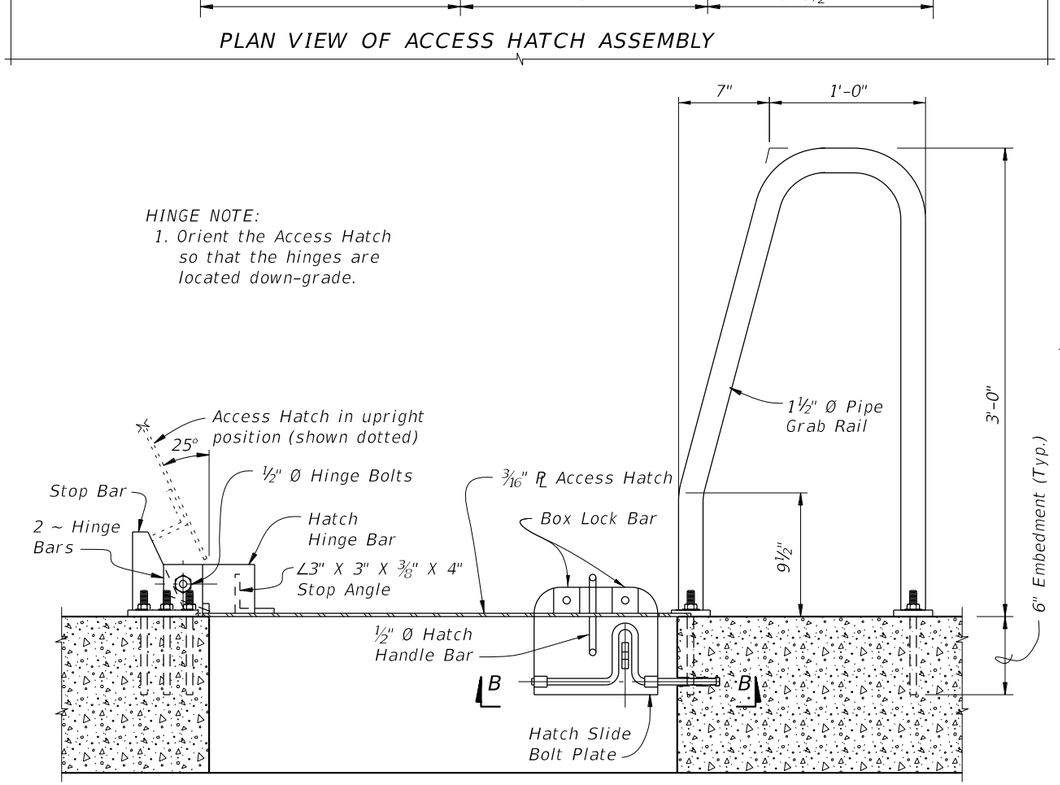


HINGE BAR DETAIL

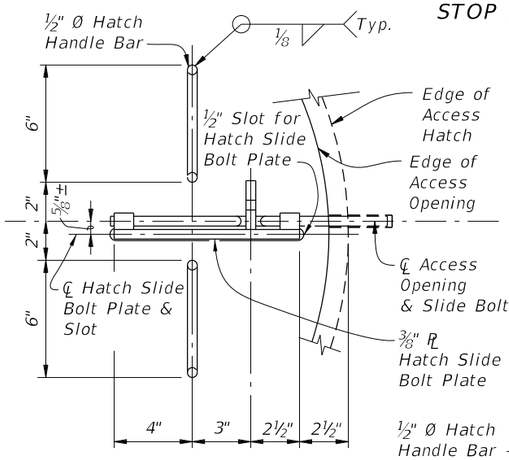


SLIDE BOLT DETAIL

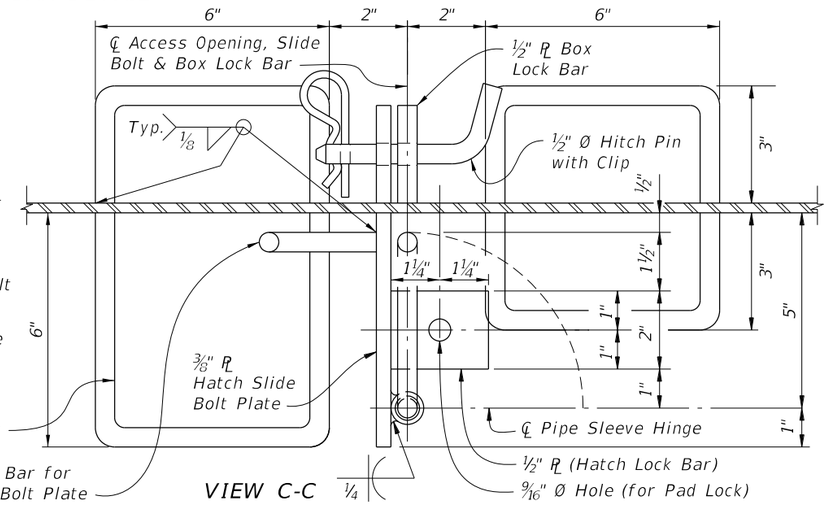
HINGE NOTE:
1. Orient the Access Hatch so that the hinges are located down-grade.



SECTION THRU ACCESS OPENING



VIEW B-B



VIEW C-C

NOTES:
1. All Structural Steel material in Access Hatch Assemblies shall conform to ASTM A709 Grade 36.
2. 1½" Ø Pipe Grab Rail shall be in accordance with ASTM A53 Grade B for standard weight pipe (Schedule 40).
3. ½" Ø Hatch Handle Bar and Hitch Pin shall be in accordance with ASTM A36.
4. All bolts shall conform to ASTM A307 or A449. All nuts shall conform to ASTM A563 and all washers shall conform to ASTM F-436.
5. All exposed edges of plates and openings shall be ground smooth.
6. See Framing Plan sheets for locations of Access Hatch Openings.
7. Coat structural steel in accordance with Specification Section 560.
8. Include the cost of the Access Hatch Assembly and incidental items in the cost of the Concrete Box Section. No separate payment will be made for coating structural steel.

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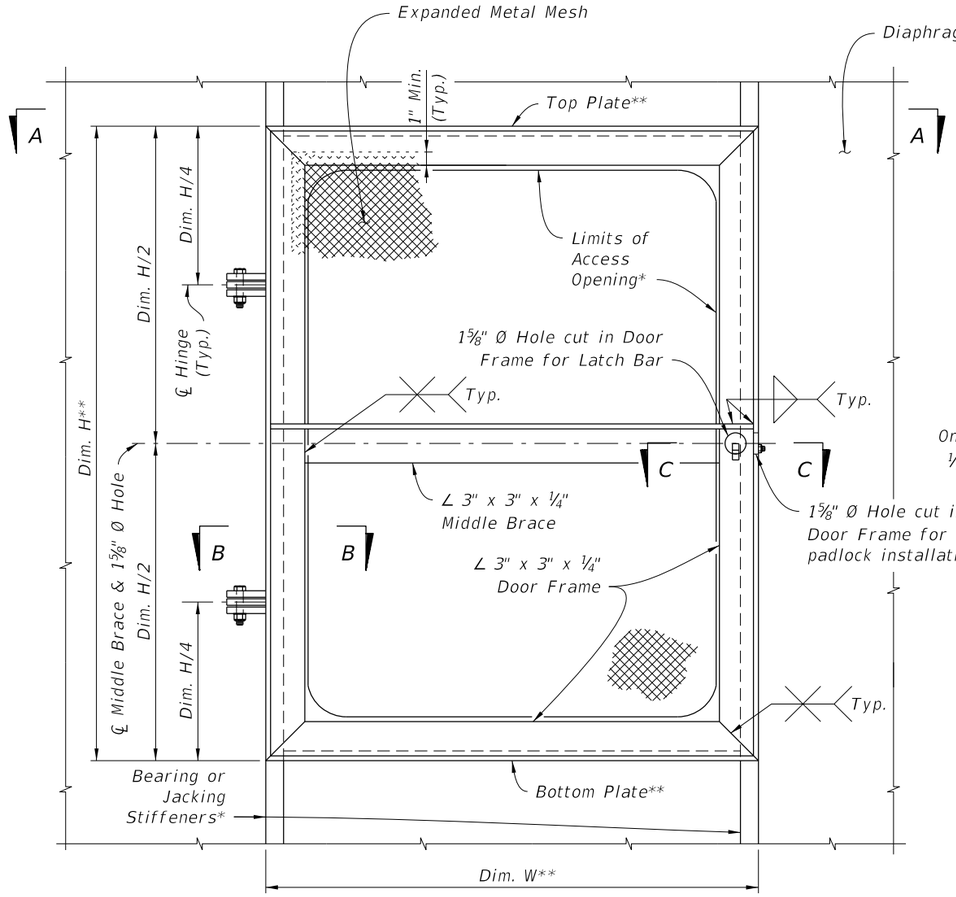
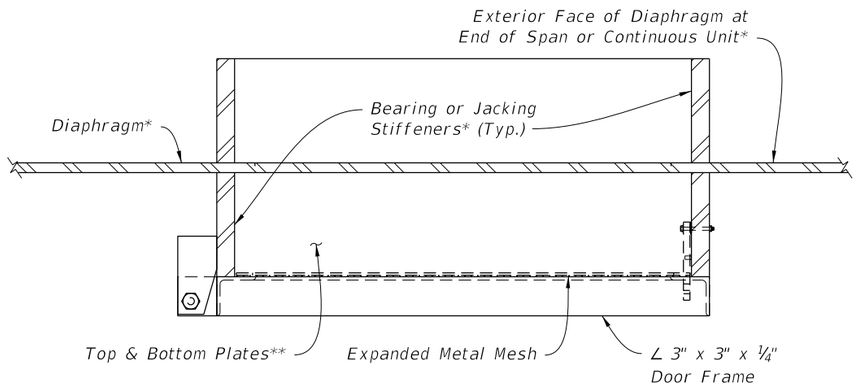
LAST REVISION	REVISION	DESCRIPTION:			
07/01/15			FY 2019-20 STANDARD PLANS	ACCESS HATCH ASSEMBLY FOR CONCRETE BOX SECTIONS	INDEX 460-251 / SHEET 1 of 1

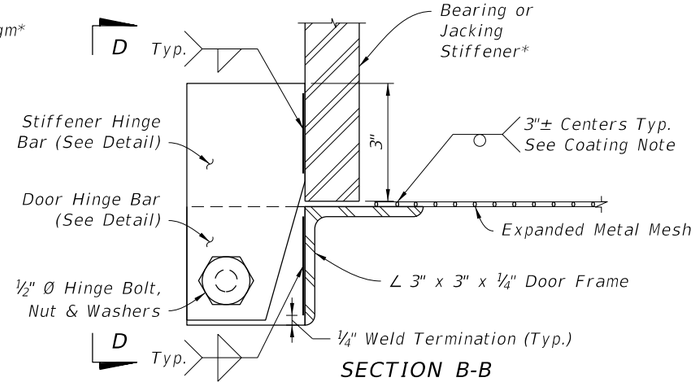


ELEVATION VIEW OF ACCESS DOOR ASSEMBLY

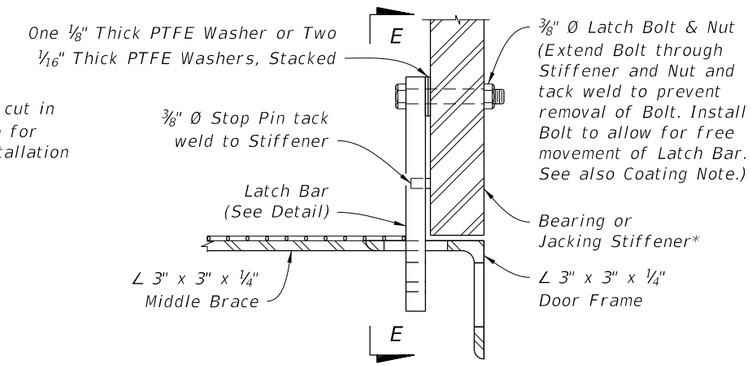
(At Access Opening in End Internal Diaphragm as seen from inside the Box Girder. Right Hand Door shown; Left Hand Door opposite hand)



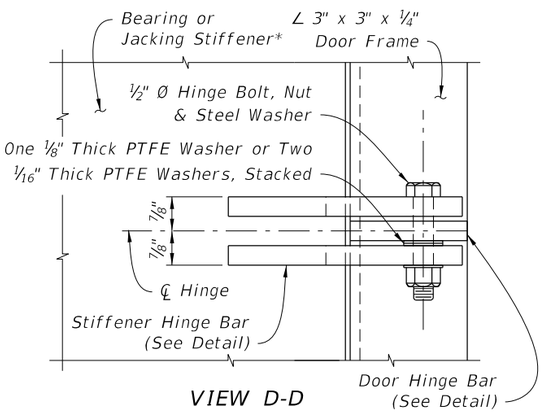
SECTION A-A



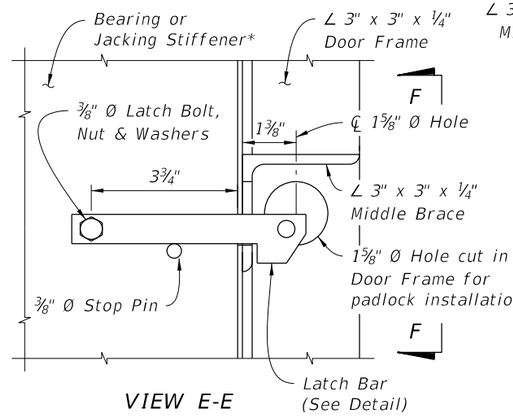
SECTION B-B



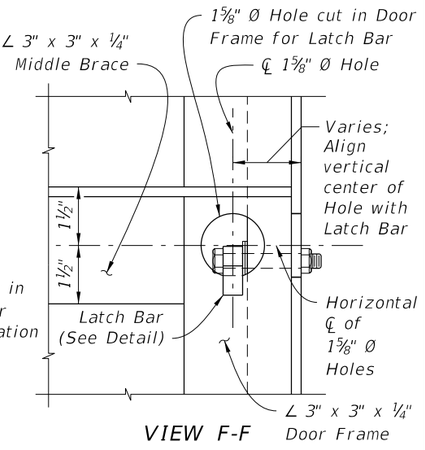
SECTION C-C



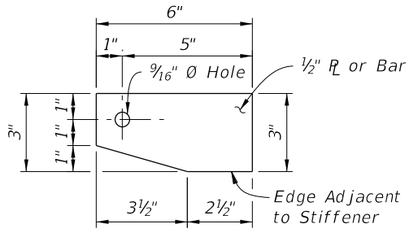
VIEW D-D



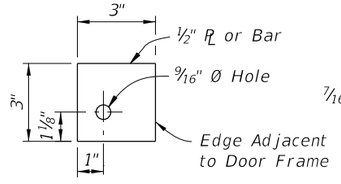
VIEW E-E



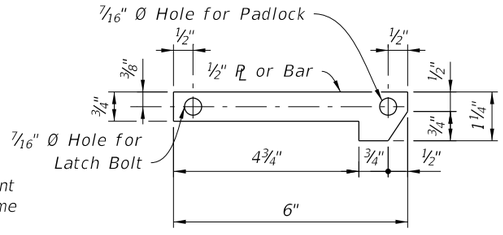
VIEW F-F



STIFFENER HINGE BAR DETAIL



DOOR HINGE BAR DETAIL



LATCH BAR DETAIL

* See Plans for dimensions and details.

** See Access Door Assembly for Steel Box Girders Data Table in the Plans for Dim. H & Dim. W.

ACCESS DOOR NOTES:

STRUCTURAL STEEL:

Fabricate Door Assemblies using structural steel in accordance with Specification 962, any grade. Grind all exposed edges and burs smooth. Non-destructive testing of welds is not required. See Plans for details of Diaphragm, Stiffeners and Top and Bottom Plates.

EXPANDED METAL MESH:

Expanded metal mesh shall be ½" No. 16 expanded carbon steel metal mesh in accordance with ASTM F1267, Type I or II, Class 2, Grade A.

BOLTS, NUTS AND STEEL WASHERS:

Bolts shall be stainless steel hex head bolts meeting the requirements of ASTM F593, Type 316. Nuts shall be ASTM F594, Type 316. Steel washers shall be stainless steel compatible with the bolts and nuts.

PTFE WASHERS:

PTFE washers shall be ¾" or 1" O.D. (nominal), 1/16" or 1/8" thick, sized for use with ⅜" or ½" diameter bolts as shown.

COATING:

Coat Access Door Assemblies after complete fabrication, including the expanded metal mesh, using an Interior Box Girder Coating System in accordance with Specification 975. Weld expanded metal mesh to the door frame after the door frame has been abrasive blast cleaned and prior to coating. Install Bolts and PTFE Washers after coating. Touch-up tack weld on Latch Bolt after welding.

DOOR HINGE LOCATION:

Place door hinges on the transverse downward side of the access opening.

PADLOCKS:

Provide a suitable keyed commercial grade, weather resistant padlock with a 2" shackle for each Access Door Assembly located at Bridge Abutments. Key all padlocks for Access Door Assemblies and Access Hatches (if present) on an individual bridge alike.

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LAST REVISION	REVISION	DESCRIPTION:	FDOT			INDEX	SHEET
07/01/15			FY 2019-20 STANDARD PLANS	ACCESS DOOR ASSEMBLY FOR STEEL BOX SECTIONS		460-252	1 of 1

TRAFFIC RAILING NOTES

This Traffic Railing Retrofit has been structurally evaluated to be equivalent or greater in strength to a design which has been successfully crash tested in accordance with NCHRP Report 350 TL-4 criteria.

CONCRETE: Concrete for Transition Blocks and Curbs shall be Class II (Bridge Deck).

REINFORCING STEEL: Reinforcing steel shall be ASTM A615, Grade 60.

THRIE-BEAM GUARDRAIL: Steel Thrie-Beam Elements shall meet the requirements for Class B (10 Gauge) Guardrail of AASHTO M 180, Type II (Zinc coated). The minimum panel length for Thrie-Beam Elements shall be 12'-6". Field drilled holes for Post connections shall be ¾" by 2½" slotted holes.

GUARDRAIL BOLTS: Guardrail bolts, nuts and washers shall be in accordance with AASHTO M180.

GUARDRAIL POSTS AND BASE PLATES: Posts and Base Plates shall be in accordance with ASTM A36 or ASTM A709 Grade 36.

ANCHOR BOLTS, NUTS AND WASHERS: Adhesive-Bonded Anchors and Anchor Bolts shall be fully threaded rods in accordance with ASTM F1554 Grade 105 or ASTM A193 Grade B7. At the Contractor's option, Anchor Bolts for through bolting may be in accordance with ASTM A449. All Nuts shall be single self-locking hex nuts and in accordance with ASTM A563 or ASTM A194. Flat Washers shall be in accordance with ASTM F436 and Plate Washers (for long slotted holes only) shall be in accordance with ASTM A36 or ASTM A709 Grade 36. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and the exposed trimmed ends of anchors shall be coated with a galvanizing compound in accordance with the Specifications.

COATINGS: All Nuts, Bolts, Anchors, Washers, Guardrail Posts, Anchor Plates and Base Plates shall be hot-dip galvanized in accordance with the Specifications. Guardrail Post Assemblies shall be hot-dip galvanized after fabrication.

ADHESIVE-BONDED ANCHORS AND DOWELS: Adhesive Bonding Material Systems for Anchors and Dowels shall comply with Specification Section 937 and be installed in accordance with Specification Section 416. The field testing proof loads required by Specification Section 416 shall be 15,000 lbs. for ⅞" Ø anchor bolts; 55,000 lbs. for the 1¼" anchor bolts with 13" embedment; and 30,500 lbs. for the 1¼" Ø anchor bolts with 5" embedment.

BRIDGES ON CURVED ALIGNMENTS: The details presented in these Indexes are shown for bridges on tangent alignments. Details for bridges on horizontally curved alignments are similar.

POST SPACING: Posts shall be located along the length of the bridge at typical 6'-3" or 3'-1½" spaces. Utilize the Modified Post Spacing at Intermediate Deck Joints Details as required to clear deck joints. Establish post spacing along the bridge and Roadway Guardrail Transition beginning with the Key Post. The variable post spacings located near begin and end bridge may be utilized to optimize the typical post spacing. Variable lengths of guardrail overlap are also permitted to optimize the typical post spacing. Symmetry of post spacing is not necessary.

THRIE-BEAM EXPANSION SECTION: Thrie-Beam Expansion Sections shall be installed at locations shown in the Plans. Install nuts for splice bolts finger-tight at 2½" slots in thrie beam expansion sections. Nuts shall fully engage bolts with a minimum of one bolt thread extending beyond the nuts. Distort the first thread on the outside of the nut to prevent loosening. Tighten guardrail bolts in 3¾" slots at guardrail post(s) that lie between the slotted expansion splice and bridge deck joint so that the bolt heads are in full contact with thrie-beam elements, but not so tight as to impede movement due to expansion.

BEARING PADS: Provide plain Neoprene pads with a durometer hardness of 60 or 70 and meeting the requirements of Specification Section 932, for ancillary structures.

ELEVATION MARKERS: Elevation Markers need not be replaced when portions of the existing traffic railing carrying existing elevation markers are removed.

BARRIER DELINEATORS: Install Barrier Delineators at the top of the guardrail offset blocks in accordance with Specification Section 705.

PEDESTRIAN SAFETY TREATMENTS: Pedestrian Safety Treatment is required when called for in the Plans. See Index 536-001 for details.

BRIDGE NAME PLATE: If a portion of the existing Traffic Railing is to be removed that carries the bridge name, number and or date, or if the installation of the Traffic Railing (Thrie Beam Retrofit) will obscure the bridge name, number and or date, then replace the information that has been removed or obscured, with 3" tall black lettering on white nonreflective sheeting applied to the top of the adjacent guardrail. The information must be clearly visible from the right side of the approaching travel lane. The sheeting and adhesive backing shall comply with Specification Section 994 and may comprise of individual decals of letters and numbers.

PAYMENT: Payment will be made under Metal Traffic Railing (Thrie-Beam Retrofit) which shall include all materials and labor required to fabricate and install the barrier and lapped guardrail where necessary to maintain post spacing. Transition Blocks and Curbs, Bridge Name Plate and Barrier Delineators and installation of Elevation Markers, where required, will not be paid for directly but shall be considered as incidental work.

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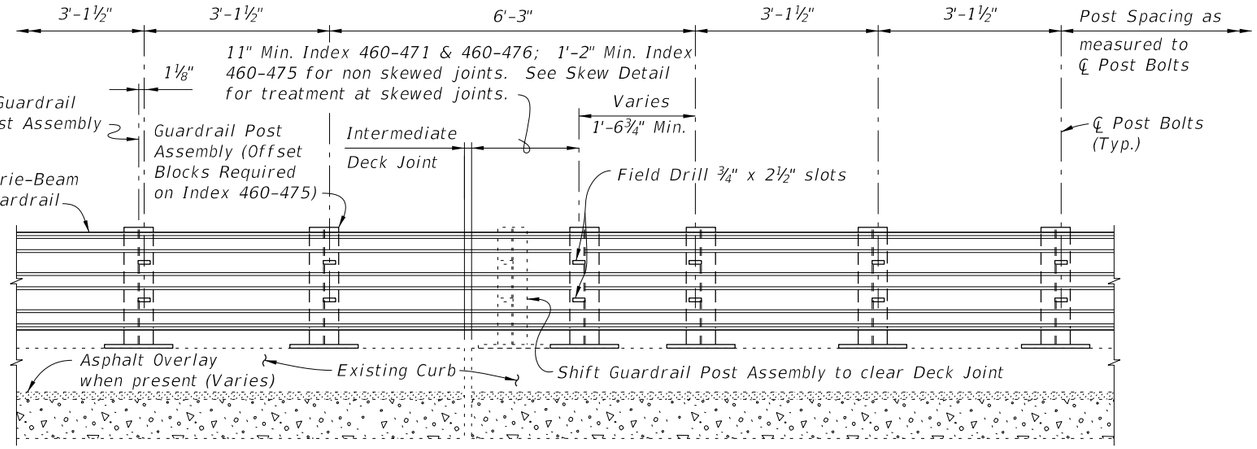
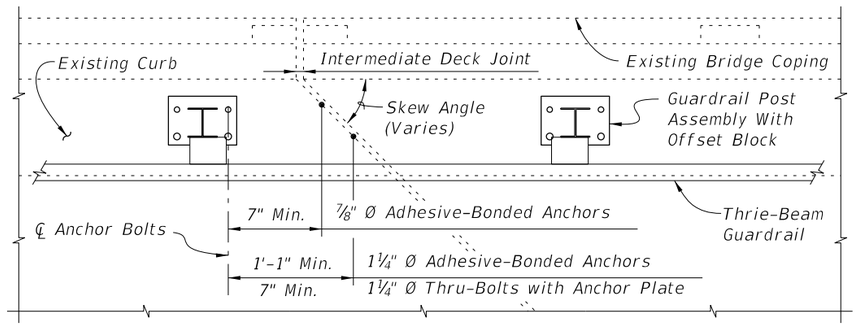
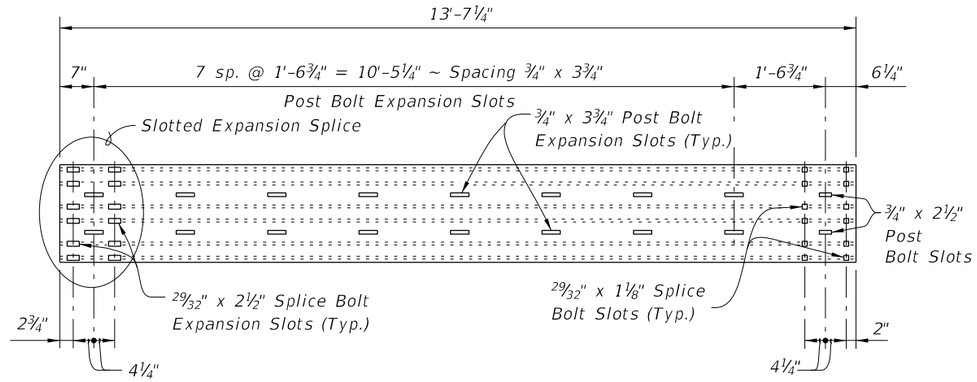
11/01/17			FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) TYPICAL DETAILS & NOTES	INDEX 460-470	SHEET 1 of 3



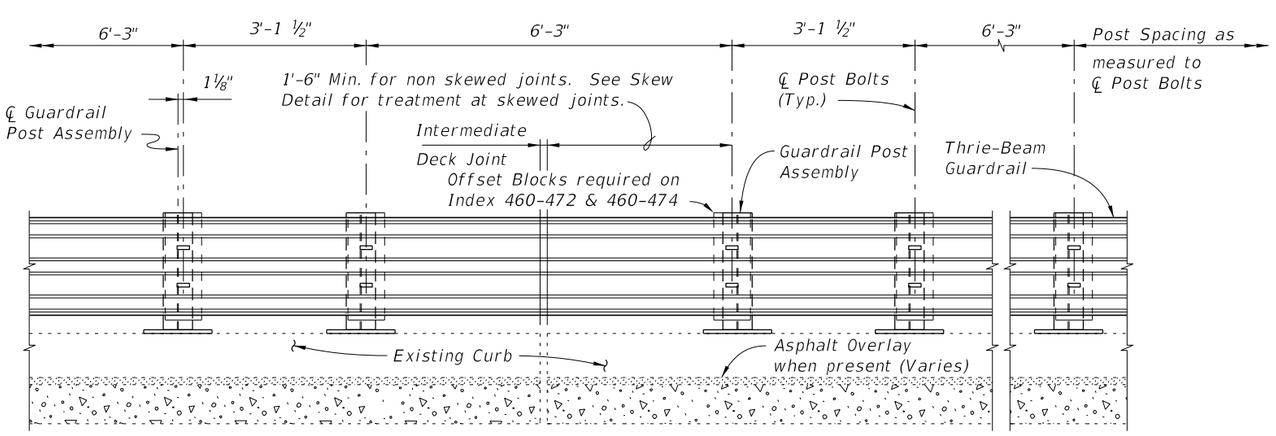
PARTIAL ELEVATION OF INSIDE FACE OF RAILING
MODIFIED POST SPACING AT INTERMEDIATE DECK JOINTS DETAIL
FOR INDEX 460-471, 460-475 & 460-476



PARTIAL PLAN
INTERMEDIATE JOINT SKEW DETAIL



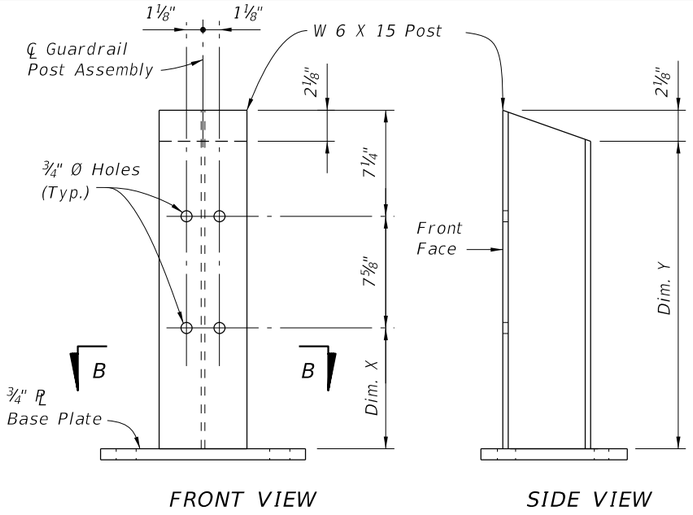
THRIE-BEAM EXPANSION SECTION



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
MODIFIED POST SPACING AT INTERMEDIATE DECK JOINTS DETAIL
FOR INDEX 460-472, 460-473 & 460-474

10/24/2018 2:53:53 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) TYPICAL DETAILS & NOTES	INDEX	SHEET
01/01/08						460-470	2 of 3

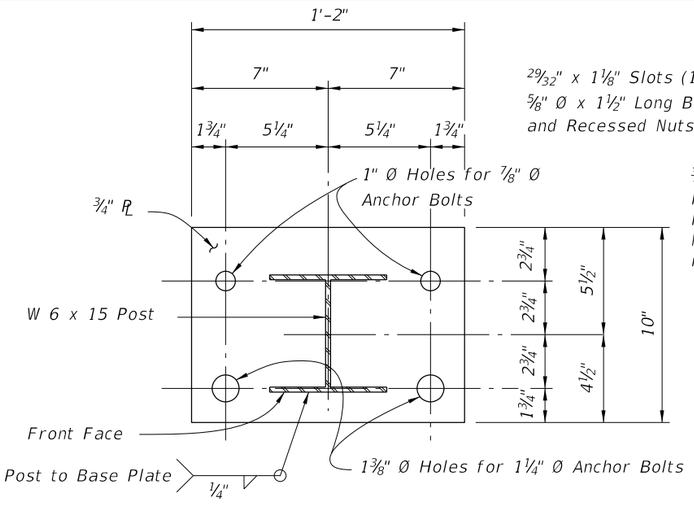


FRONT VIEW SIDE VIEW

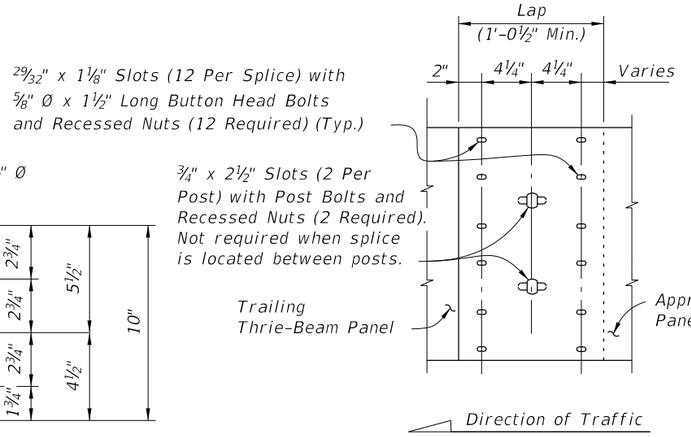
POST DIMENSION TABLE			
POST	CURB HEIGHT (DIM. A)	DIM. X	DIM. Y
Post "A"	5" to 7"	11¼"	2'-0"
Post "B"	> 7" to 10"	9¼"	1'-10"
Post "C"	> 10" to 1'-0"	7¼"	1'-8"

Note: Dim. A is equal to the exposed curb height. For location of Dim. A see Index 460-471 thru 460-476, Sheet 1.

GUARDRAIL POST ASSEMBLY DETAIL

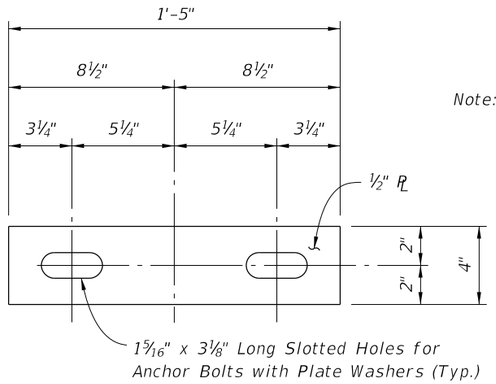


SECTION B-B



THRIE-BEAM GUARDRAIL SPLICE

Note: All Thrie Beam Panels shall be lapped in the direction of adjacent traffic. At the Contractor's option, laps may be extended. Field drill holes in Trailing Thrie Beam Guardrail Panel as required.



ANCHOR PLATE DETAIL

Note: The Anchor Plate and Plate Washer are applicable only to 1¼" Ø Anchor Bolts that are to be thru-bolted for Index 460-471 & 460-476.

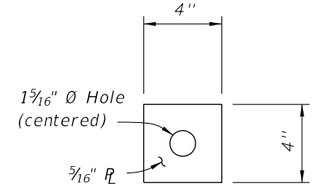
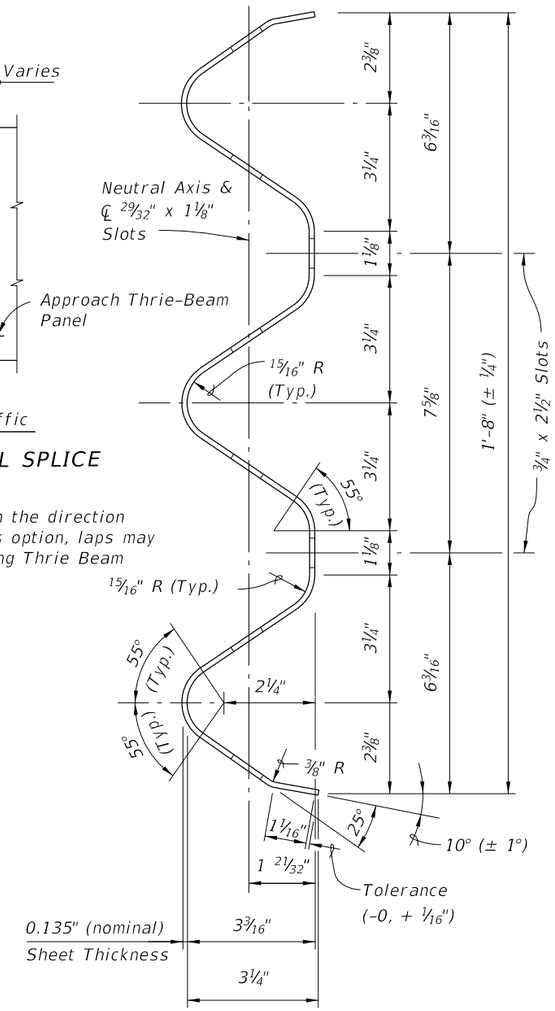
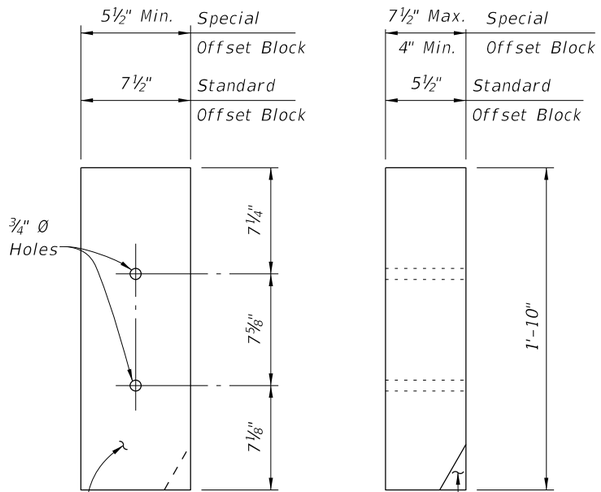


PLATE WASHER DETAIL



TYPICAL SECTION THRU THRIE-BEAM GUARDRAIL (EXPANSION SECTION SIMILAR)

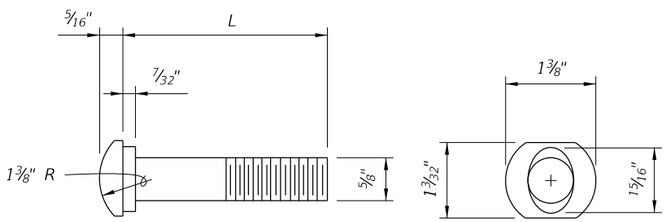


FRONT VIEW SIDE VIEW

OFFSET BLOCK DETAIL

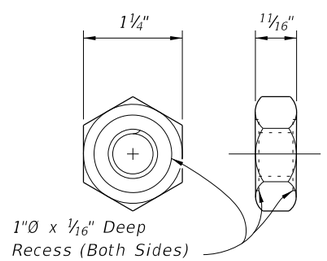
OFFSET BLOCK NOTES:

1. Offset blocks shall be timber or Approved Alternate. Uniformity of block size and alignment of guardrail shall be maintained along length of retrofit.
2. Post bolt holes in offset blocks to be centered (± ¼").
3. Timber offset blocks shall be dressed on all four sides (S4S).
4. Block assemblies for Special Offset Blocks can be made up of 2 or 3 Special or Standard Offset Blocks, field dressed as required.



⅝" OVAL SHOULDER BUTTON HEAD BOLT

L	THREAD LENGTH	APPLICATION
1½"	Full Length	Rail Splice Bolt, Post Bolt for Index 460-471, 460-473 & 460-476
Varies (8" Min.)	4" Min.	Post Bolt for Index 460-472, 460-473, 460-474, 460-475 & 460-476



⅝" MODIFIED HEAVY HEX NUT (RECESSED NUT)

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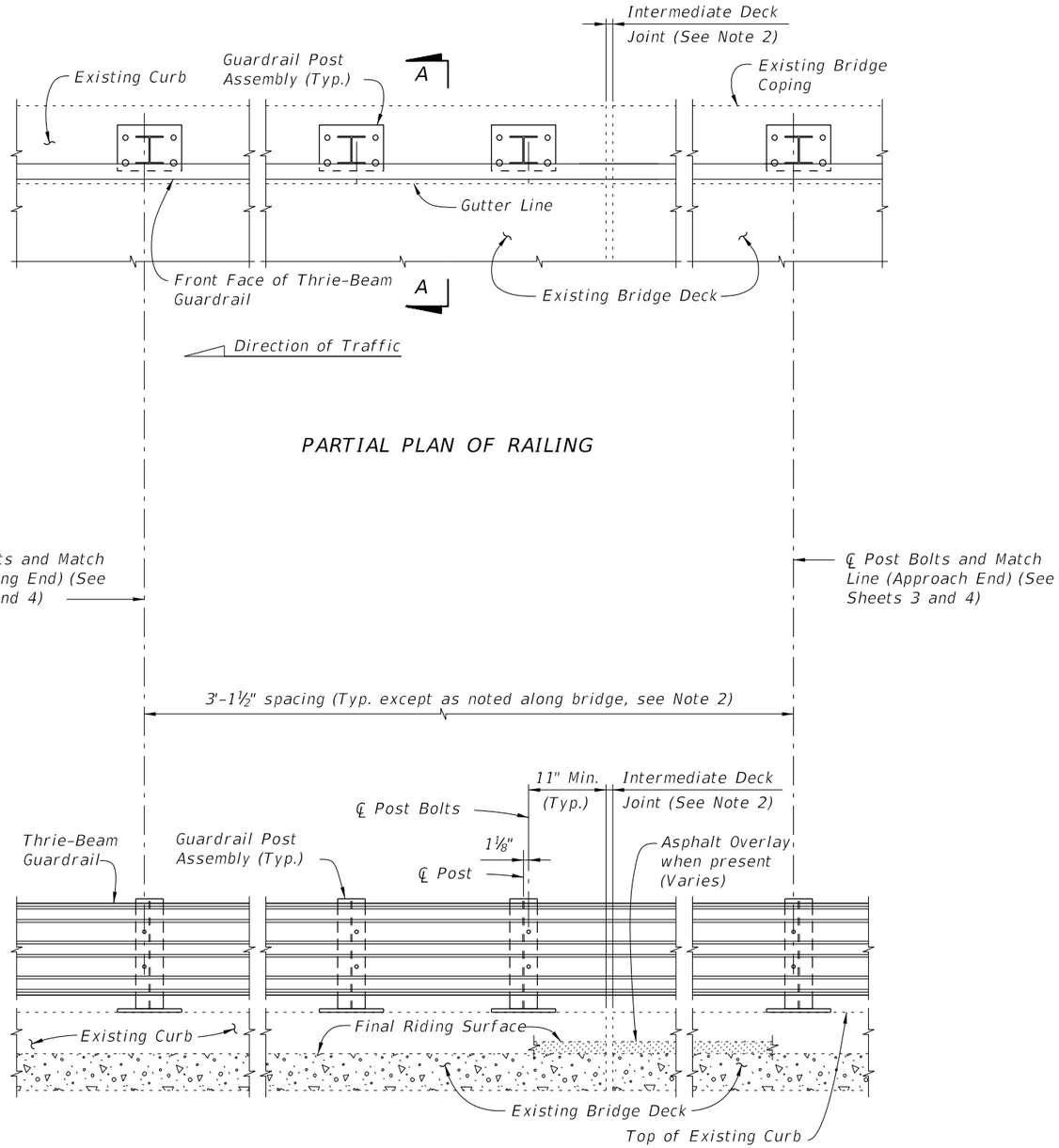
01/01/08			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) TYPICAL DETAILS & NOTES	INDEX 460-470	SHEET 3 of 3



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING

TYPICAL TREATMENT OF RAILING ALONG BRIDGE

NOTES:

1. On approach end provide Index 536-002 (as shown) or other site specific treatment, see Roadway Plans. For treatment of trailing end see Roadway Plans.
2. Actual joint dimension and orientation vary. For Intermediate Deck Joints use the Modified Post Spacing at Intermediate Deck Joints Detail, Index 460-470, Sheet 2, as required.
3. Areas where existing structure has been removed shall match adjoining areas and shall be finished flat by grouting or grinding as required. Exposed existing reinforcing steel shall be burned off 1" below existing concrete and grouted over.

CROSS REFERENCES:
For Section A-A see Sheet 2.
For Traffic Railing Notes and Details see Index 460-470.

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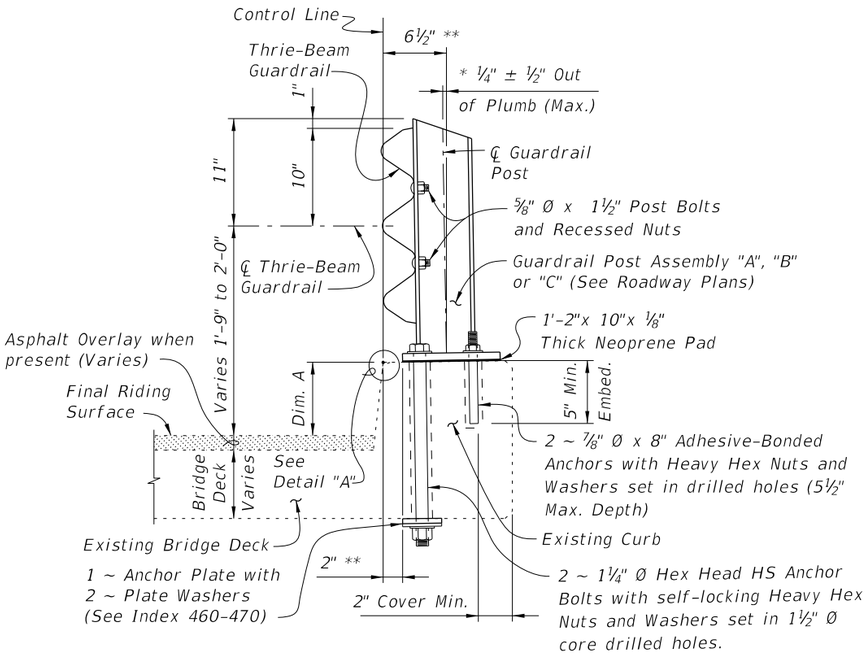
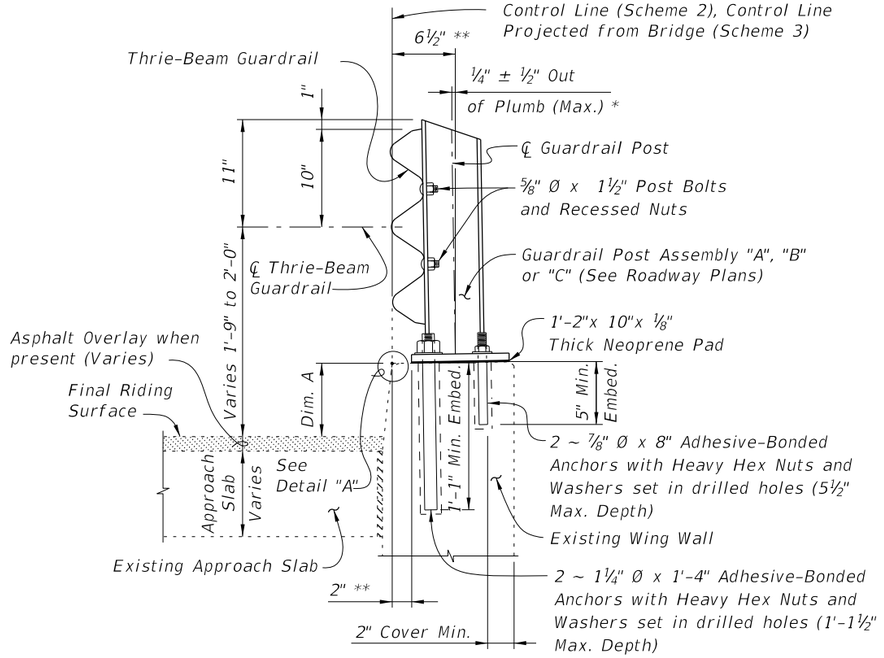
01/01/08						460-471	1 of 4

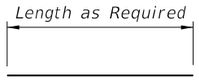


SECTION A-A
TYPICAL SECTION THRU RAILING ON BRIDGE DECK

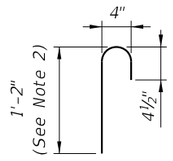


SECTION B-B
TYPICAL SECTION THRU RAILING ALONG APPROACH SLAB
(SCHEME 2 SHOWN, SCHEME 3 SIMILAR)

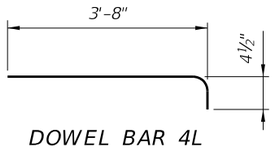
BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
A	4	AS REQUIRED
D	4	1'-11"
L	4	4'-1"



BAR 4A



Dowel Bar 4D
(Standard 180° Hook)



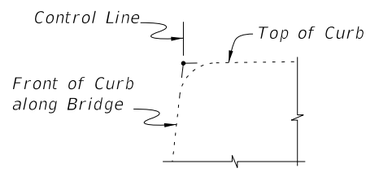
DOWEL BAR 4L

BAR BENDING DIAGRAMS

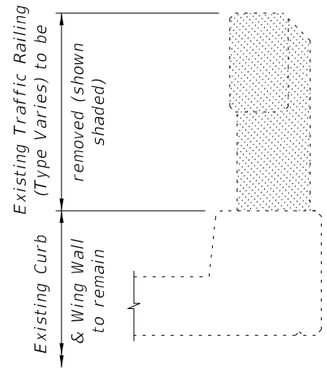
NOTES:
1. All bar dimensions are out to out.
2. The 1'-2" vertical dimension shown for Bar 4D is based on a curb height of 9". If curb height is less or more than 9", decrease or increase this dimension by an amount equal to the difference in curb height.

* Shim with washers around Anchors as required to maintain tolerance.

** Offset may vary ± 1" for Adhesive-Bonded Anchors to clear existing curb reinforcing and provide minimum edge clearance. Offset shall be consistent along length of bridge.



DETAIL "A"



TYPICAL SECTION THRU EXISTING TRAFFIC RAILING SHOWING LIMITS OF REMOVAL
(BRIDGE DECK SHOWN, WING WALL SIMILAR)

CROSS REFERENCES:
For location of Section A-A see Sheets 1, 3 & 4.
For location of Section B-B see Sheets 3 & 4.
For application of Dim. A see Post Dimension Table on Index 460-470, Sheet 3.

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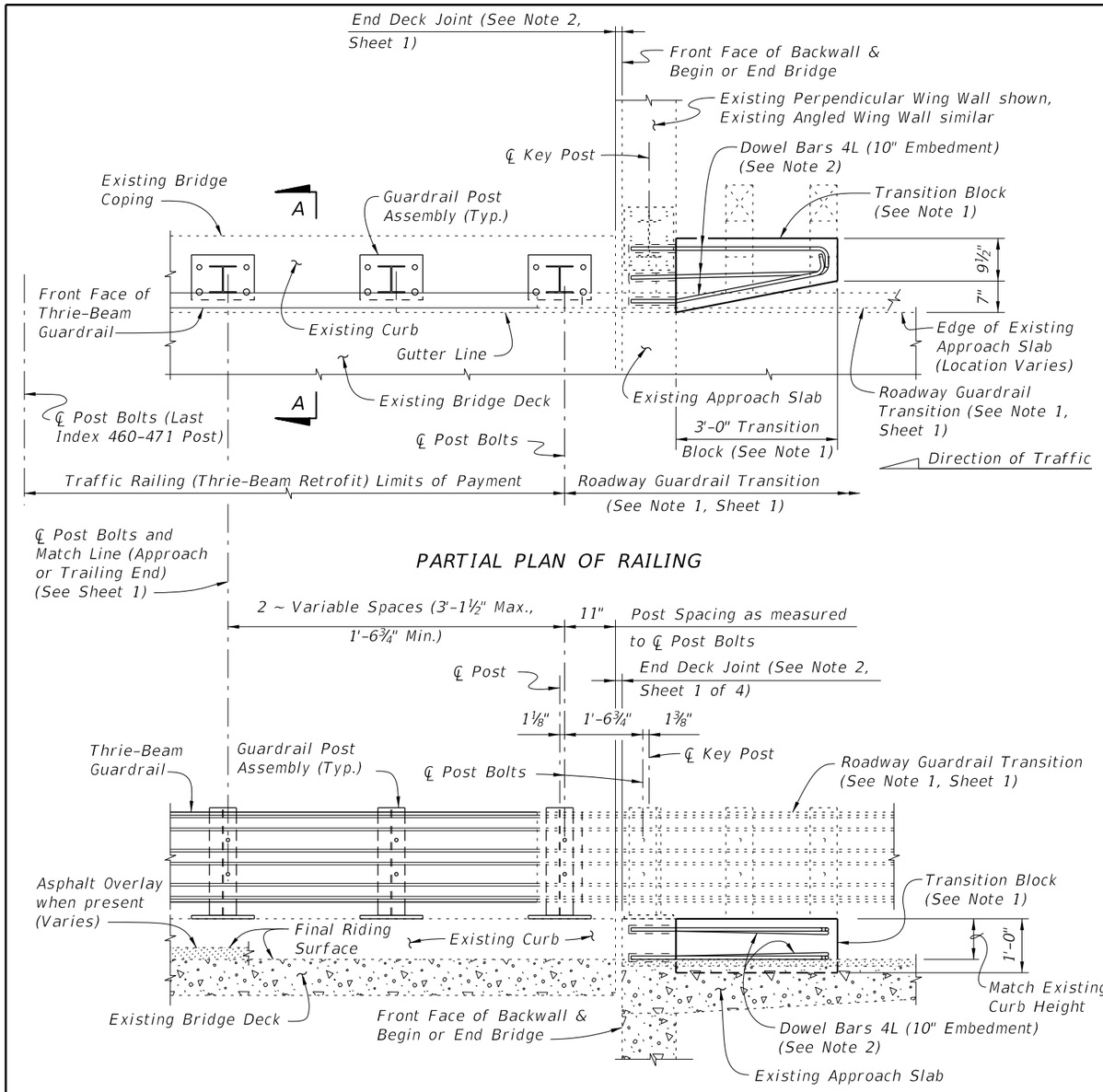
01/01/08						460-471	2 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING

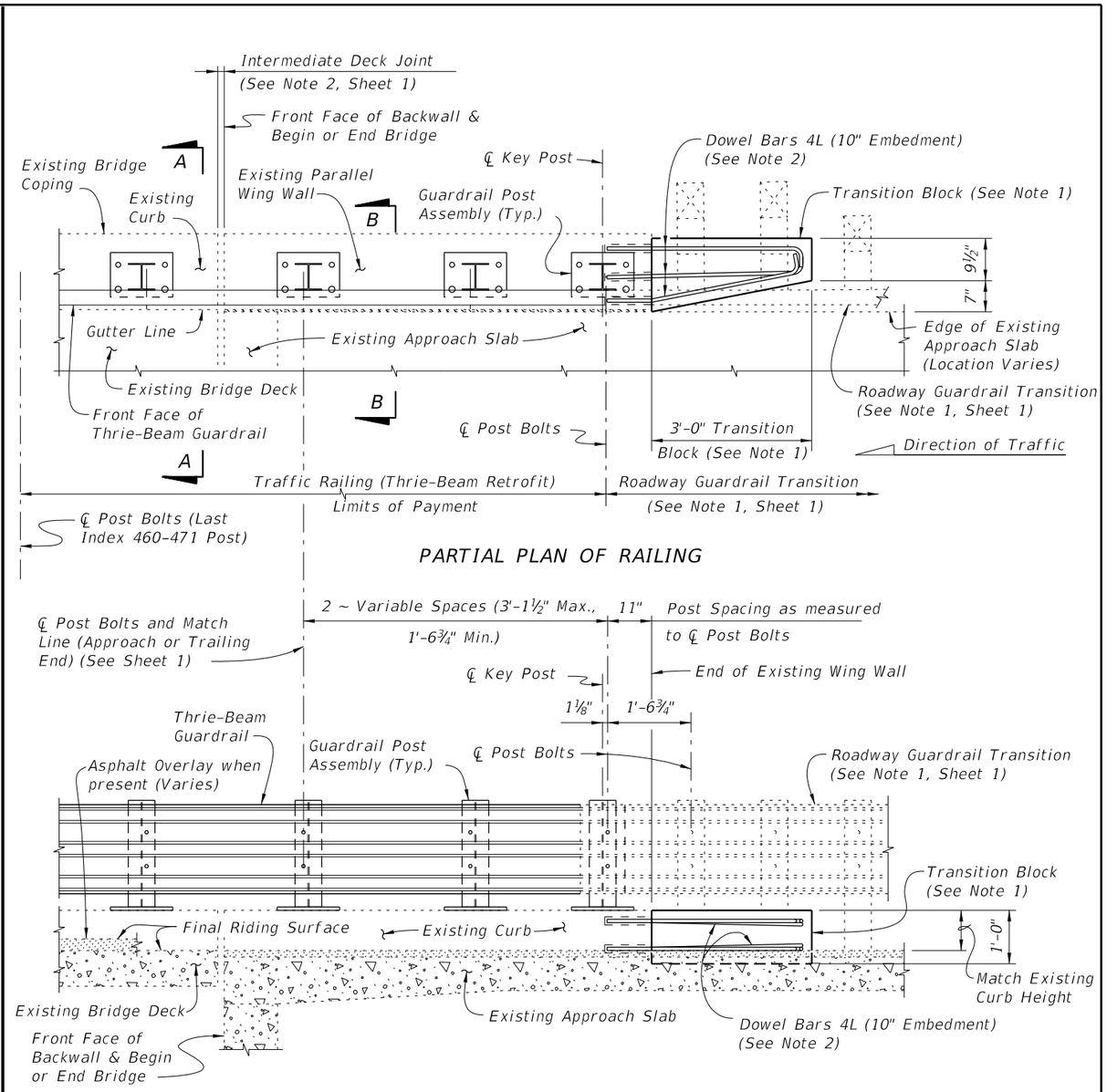
SCHEME 1

RAILING END TREATMENT FOR PERPENDICULAR OR ANGLED WING WALLS

SCHEME 1 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab does not have a curb, see Roadway Plans. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING

SCHEME 2

RAILING END TREATMENT FOR PARALLEL WING WALLS

SCHEME 2 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab does not have a curb, see Roadway Plans. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

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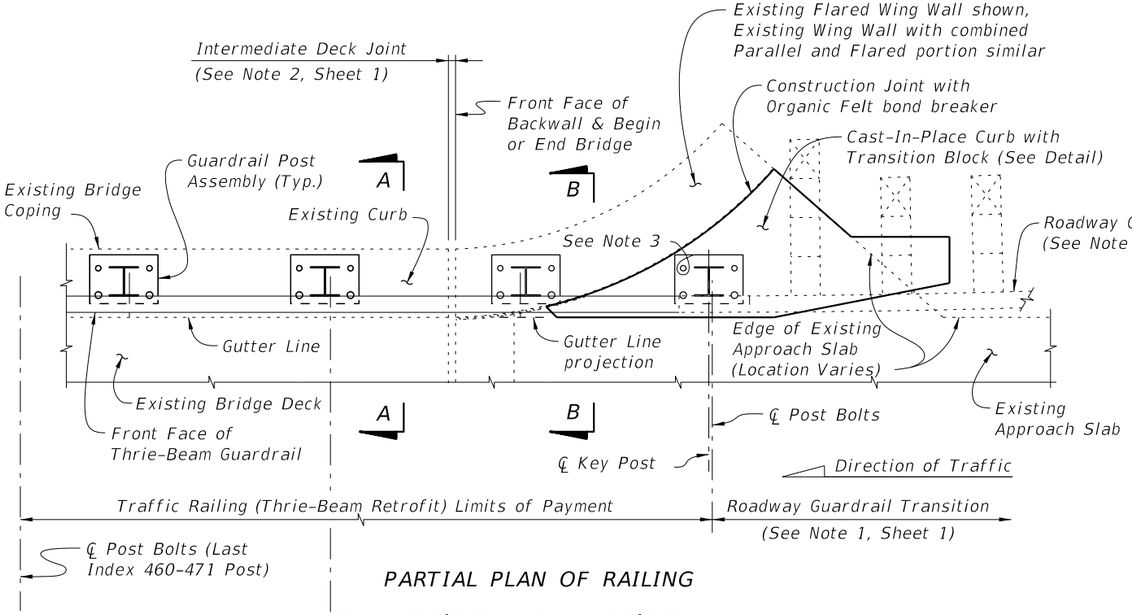
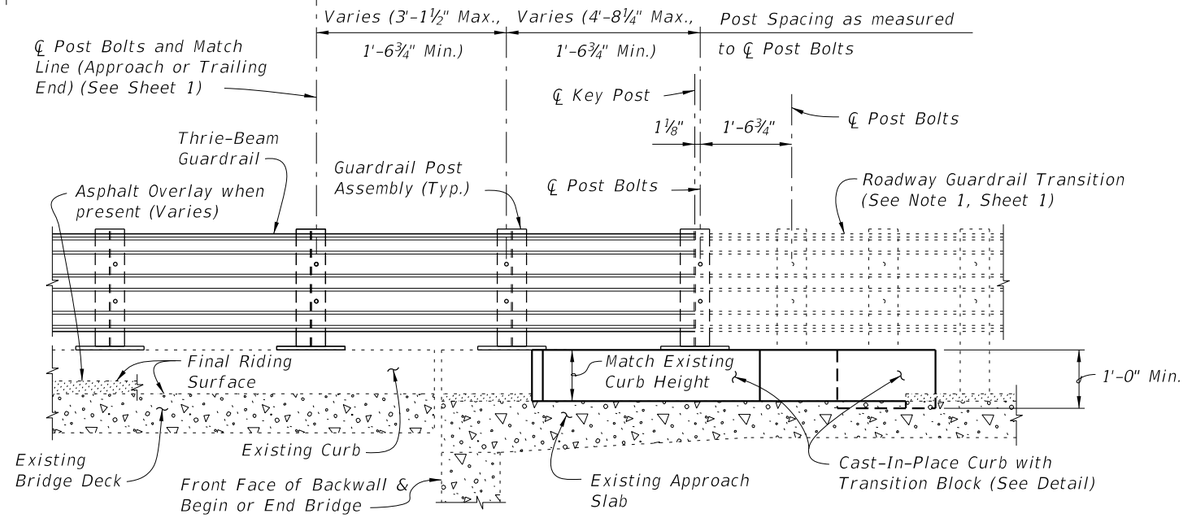
01/01/08			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) NARROW CURB	INDEX 460-471	SHEET 3 of 4



PARTIAL PLAN OF RAILING



PARTIAL ELEVATION OF INSIDE FACE OF RAILING

SCHEME 3

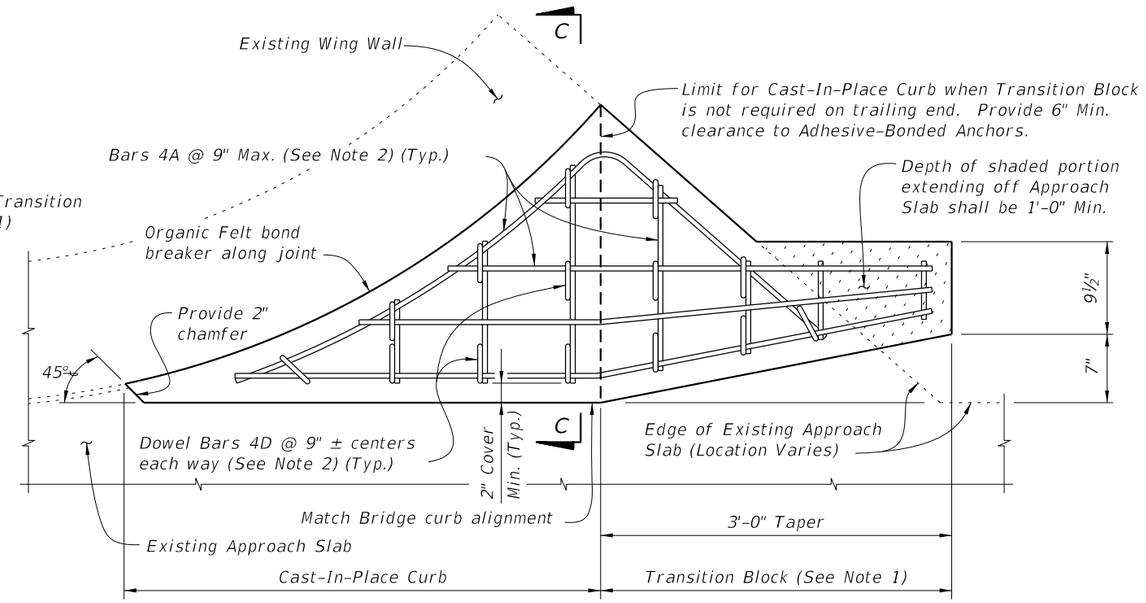
RAILING END TREATMENT FOR FLARED WING WALLS

SCHEME 3 NOTES:

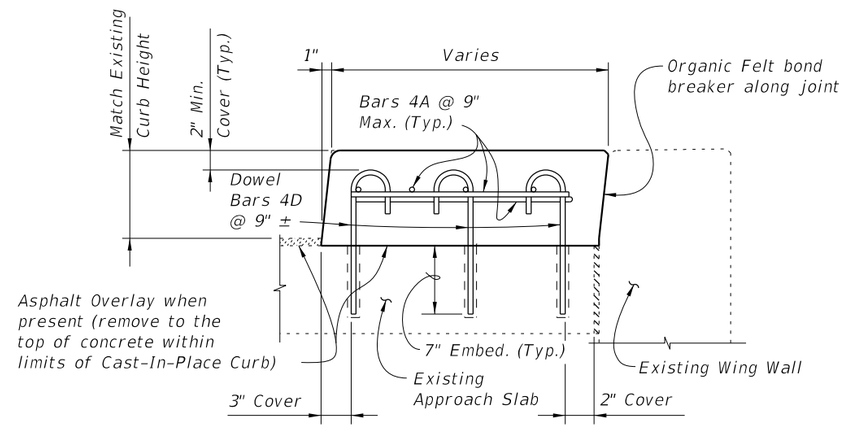
1. Provide Cast-In-Place Curb as shown. Shape and height of Transition Block and Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field cut and bend Bars 4A and rotate Dowel Bars 4B within Curb and Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

3. A single ⅞" Ø x 8" Adhesive-Bonded Anchor may be omitted as shown when 2" clear cover cannot be provided.



PLAN OF CAST-IN-PLACE CURB & TRANSITION BLOCK DETAIL
(Approach End with Transition Block Shown, Trailing End without Transition Block Similar)



SECTION C-C

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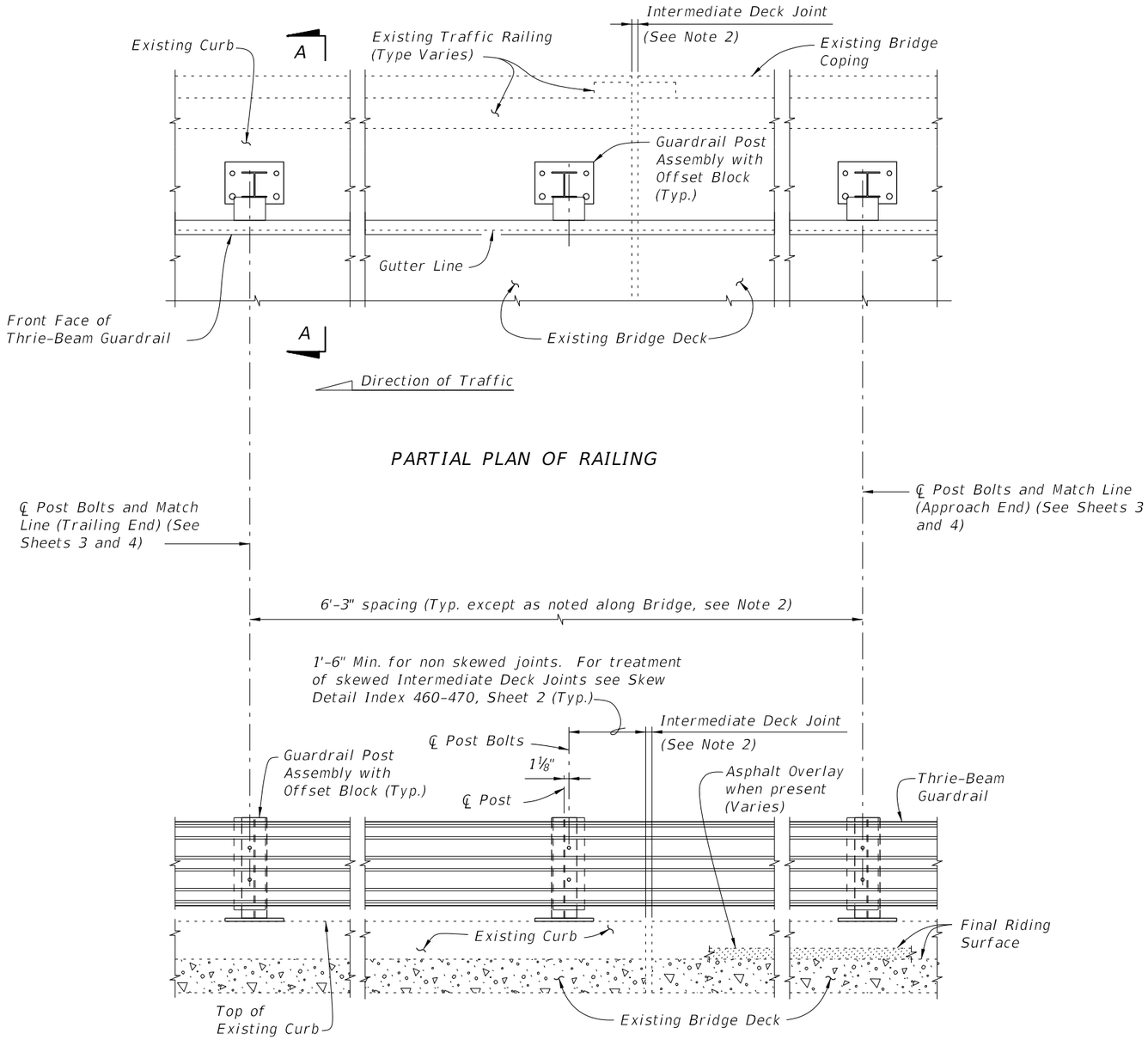
LAST REVISION 11/01/16	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) NARROW CURB	INDEX 460-471	SHEET 4 of 4



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Traffic Railing not shown for clarity)

TYPICAL TREATMENT OF RAILING ALONG BRIDGE

NOTES:

1. On approach end provide Index 536-002 (as shown) or other site specific treatment, see Roadway Plans. For treatment of trailing end see Roadway Plans.
2. Actual joint dimension and orientation vary. For Intermediate Deck Joints use the Modified Post Spacing at Intermediate Deck Joints Detail, Index 460-470, Sheet 2, as required.
3. Areas where existing structure has been removed shall match adjoining areas and shall be finished flat by grouting or grinding as required. Exposed existing reinforcing steel shall be burned off 1" below existing concrete and grouted over.

CROSS REFERENCES:
For Section A-A see Sheet 2.
For Traffic Railing Notes and Details
see Index 460-470.

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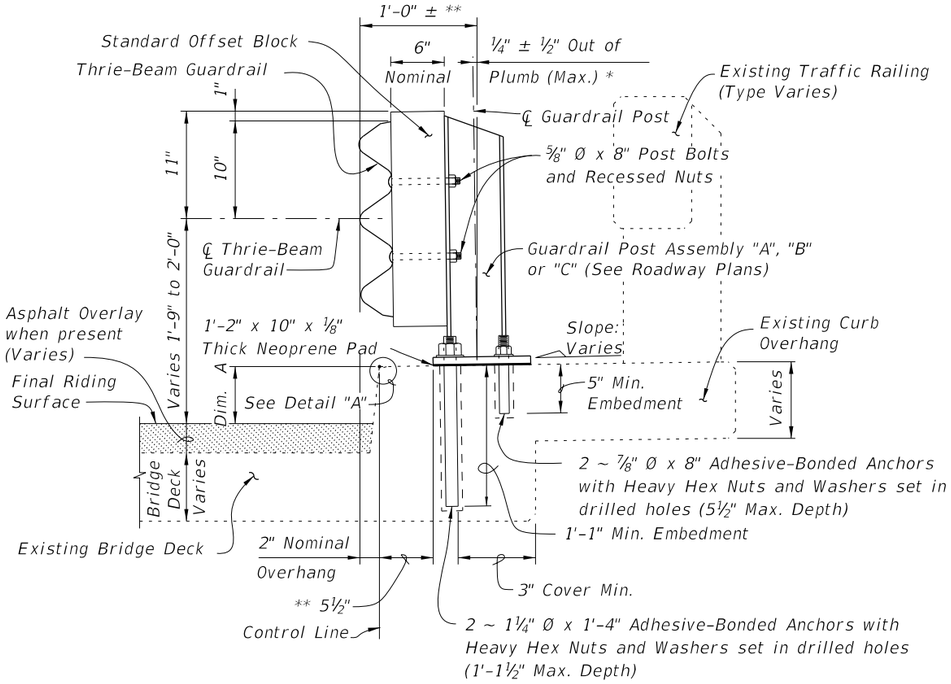
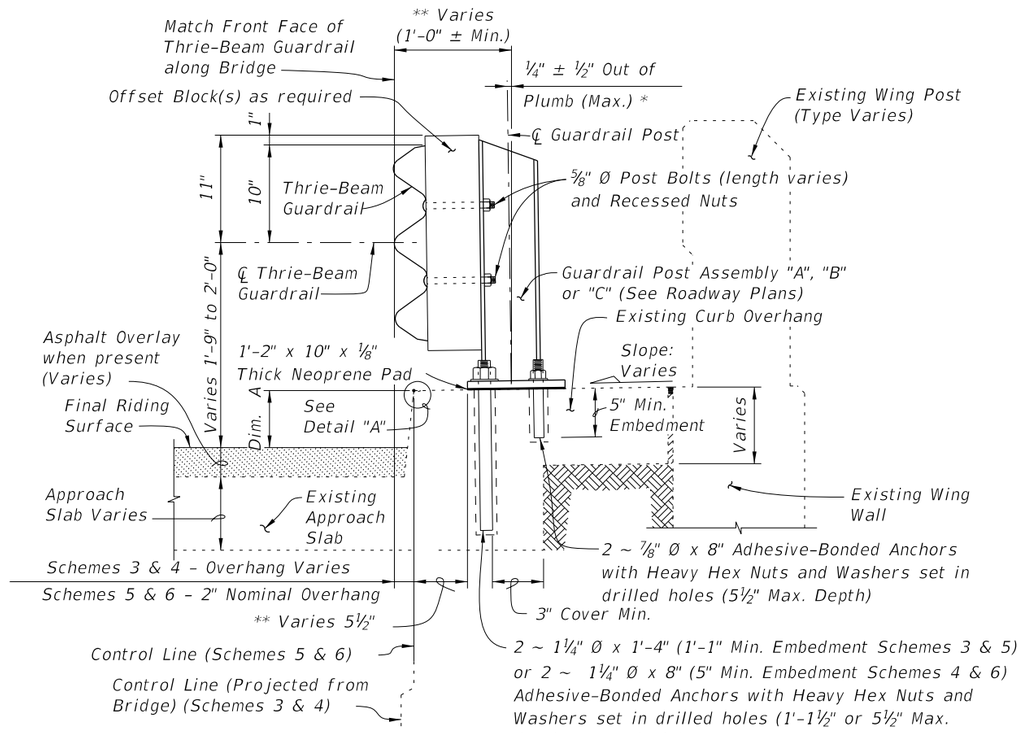
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 1	INDEX	SHEET
01/01/08						460-472	1 of 4



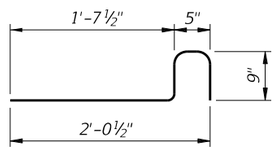
SECTION A-A
TYPICAL SECTION THRU RAILING ON BRIDGE DECK



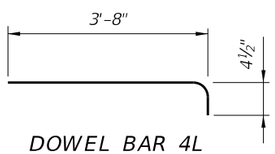
SECTION B-B
TYPICAL SECTION THRU RAILING ALONG APPROACH SLAB
(SCHEMES 5 AND 6 SHOWN, SCHEMES 3 AND 4 SIMILAR)

BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
D	4	3'-7"
L	4	4'-1"
M	4	2'-8"

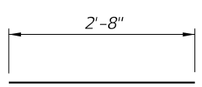
BAR BENDING DIAGRAMS



DOWEL BAR 4D



DOWEL BAR 4L

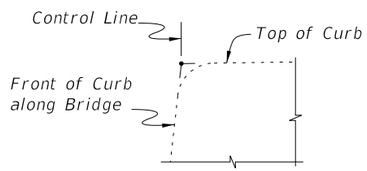


BAR 4M

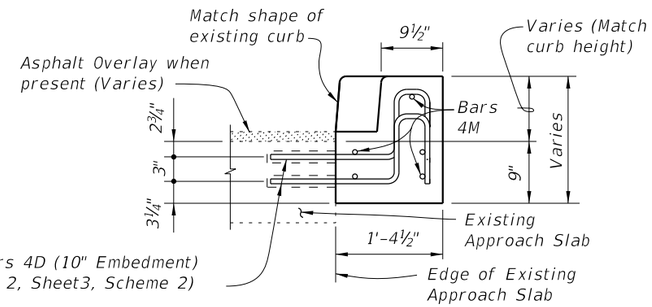
NOTE: All bar dimensions are out to out.

* Shim with washers around Anchors as required to maintain tolerance.

** Offset may vary ± 1" for Adhesive-Bonded Anchors to clear existing curb reinforcing and provide minimum edge clearance. Offset shall be consistent along length of bridge.



DETAIL "A"

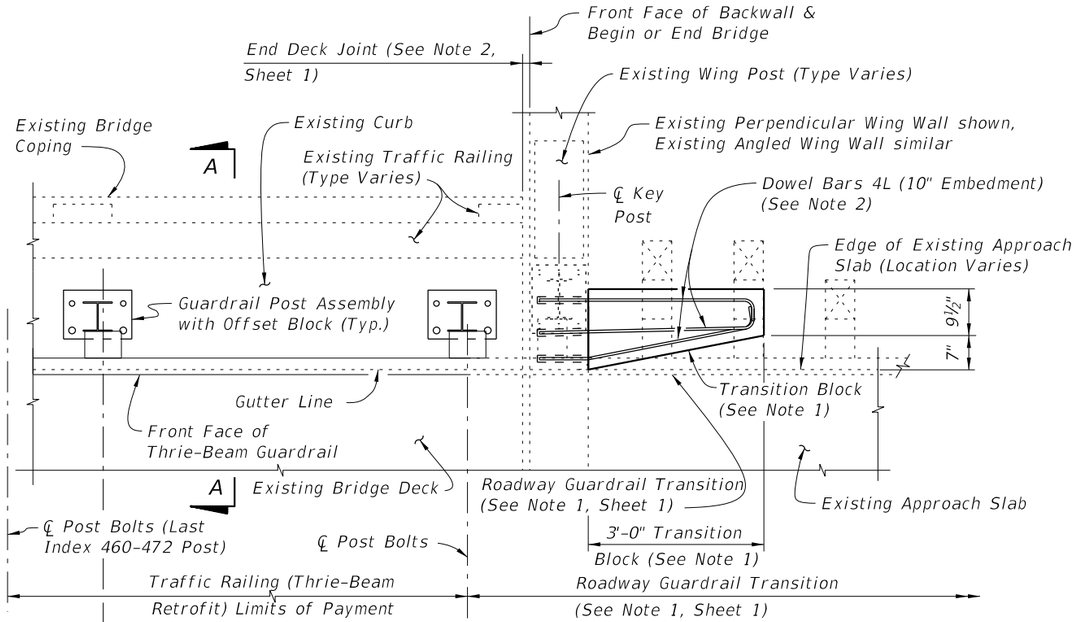


VIEW C-C

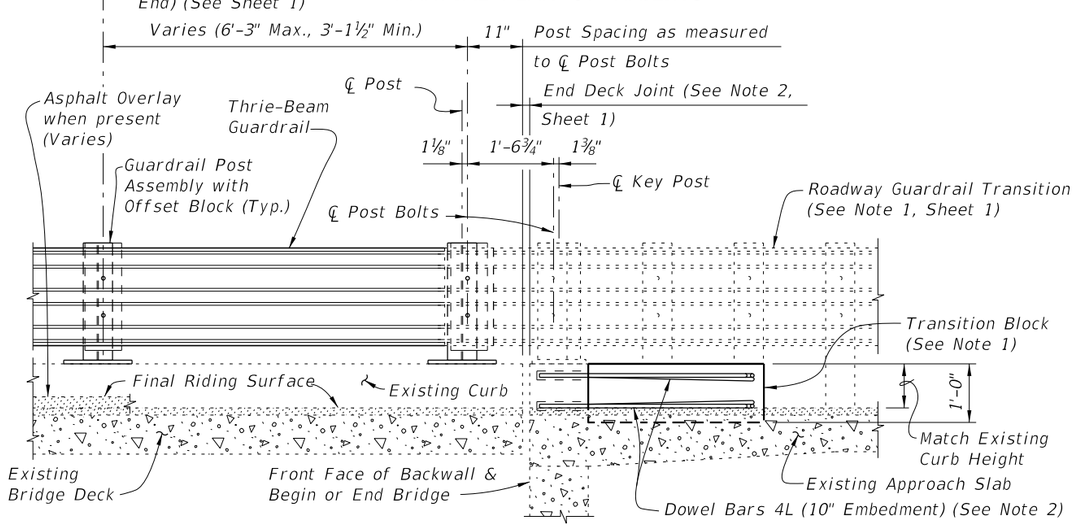
CROSS REFERENCES:
For location of Section A-A see Sheets 1, 3 & 4.
For location of Section B-B see Sheet 4.
For location of View C-C see Sheet 3.
For application of Dim. A see Post Dimension Table on Index 460-470, Sheet 3.

10/24/2018 2:53:59 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 1	INDEX	SHEET
07/01/08						460-472	2 of 4



PARTIAL PLAN OF RAILING



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

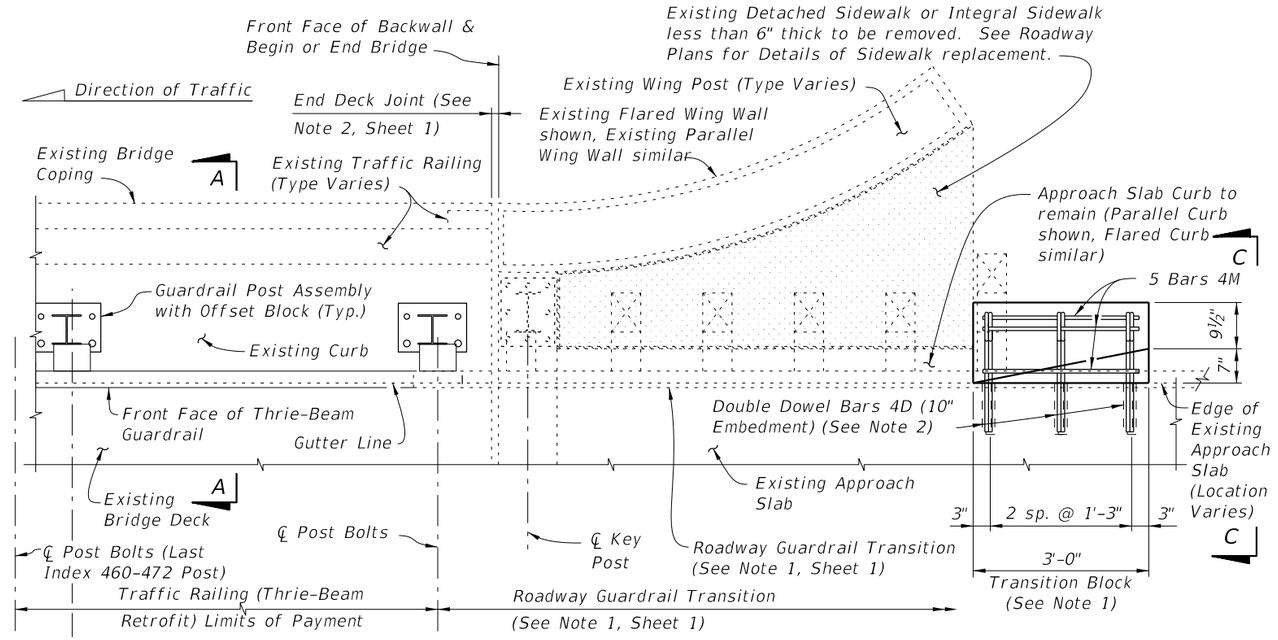
SCHEME 1

RAILING END TREATMENT FOR PERPENDICULAR OR ANGLED WING WALLS

SCHEME 1 NOTES:

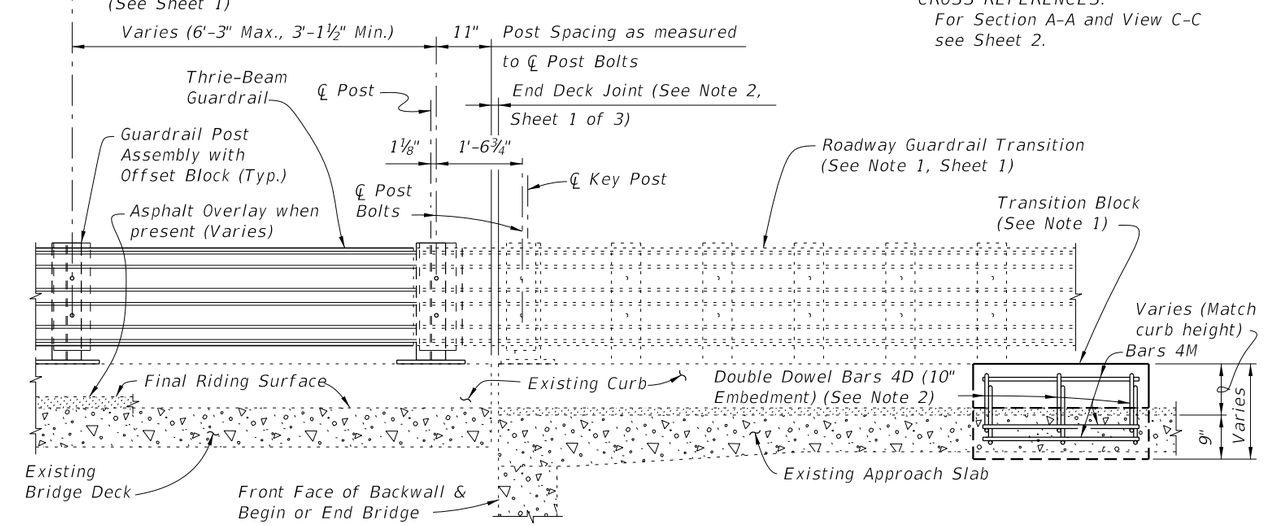
1. Provide Transition Block (as shown) or Curb if existing Approach Slab does not have a curb, see Roadway Plans. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.



PARTIAL PLAN OF RAILING

CROSS REFERENCES:
For Section A-A and View C-C see Sheet 2.



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEME 2

RAILING END TREATMENT FOR PARALLEL OR FLARED CURBS WITH DETACHED SIDEWALKS OR INTEGRAL SIDEWALKS LESS THAN 6" THICK

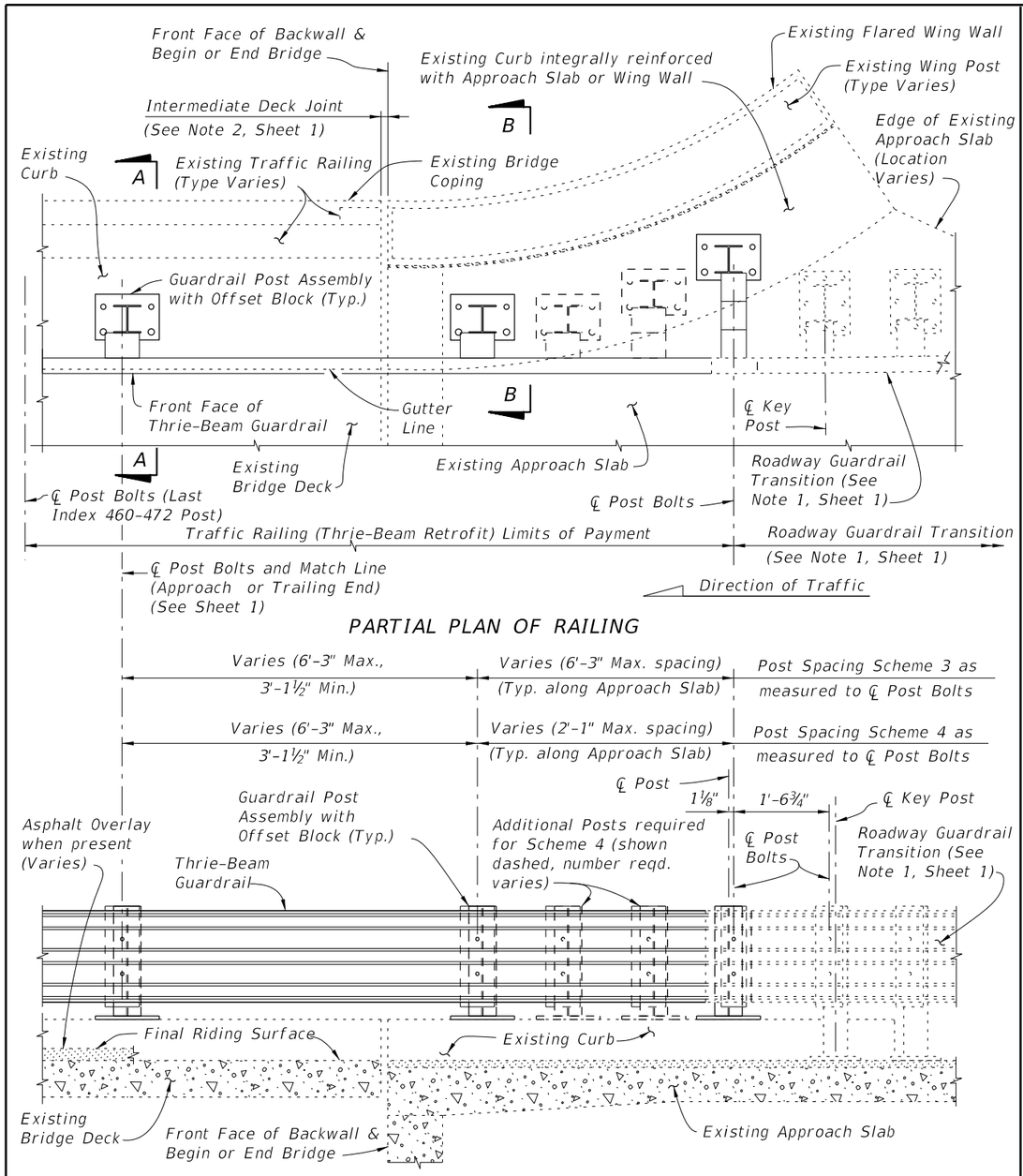
SCHEME 2 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic and on bridges with flared Approach Slab Curbs.

2. Field bend or tilt Dowel Bars 4D and Bars 4M within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

10/24/2018 2:54:00 PM

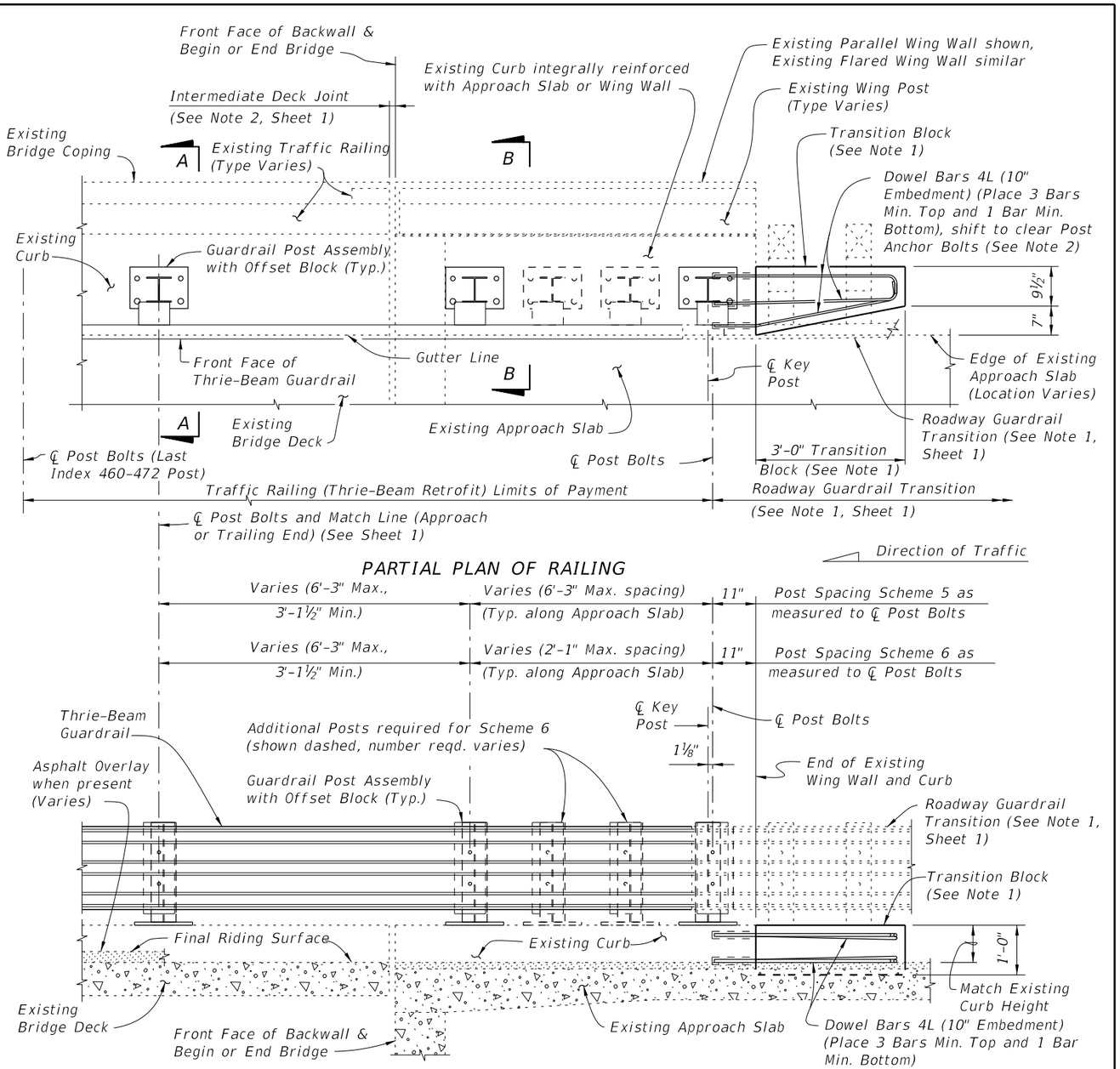
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 1	INDEX	SHEET
01/01/08						460-472	3 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 3 AND 4
RAILING END TREATMENT FOR FLARED INTEGRAL CURBS



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 5 AND 6
RAILING END TREATMENT FOR PARALLEL INTEGRAL CURBS

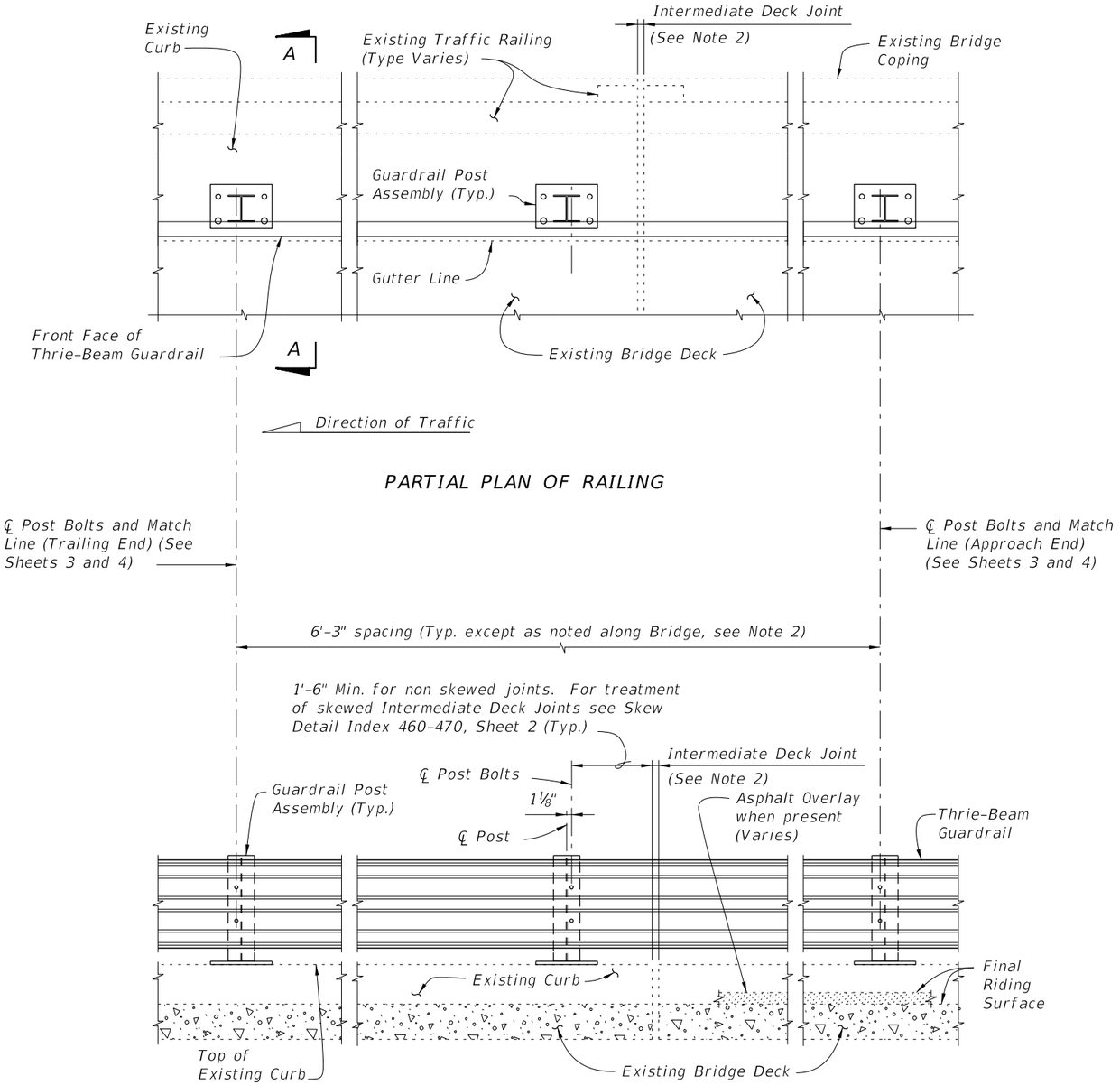
SCHEMES 5 AND 6 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

10/24/2018 2:54:01 PM

LAST REVISION	REVISION	DESCRIPTION:				
01/01/08			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 1	INDEX 460-472	SHEET 4 of 4



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Traffic Railing not shown for clarity)

TYPICAL TREATMENT OF RAILING ALONG BRIDGE

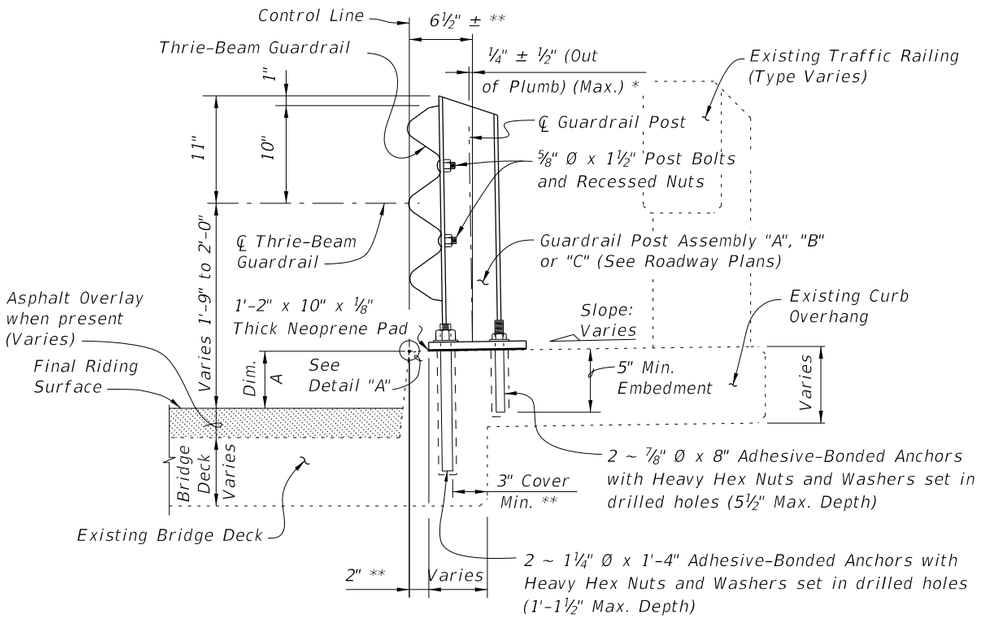
NOTES:

1. On approach end provide Index 536-002 (as shown) or other site specific treatment, see Roadway Plans. For treatment of trailing end see Roadway Plans.
2. Actual joint dimension and orientation vary. For Intermediate Deck Joints use the Modified Post Spacing at Intermediate Deck Joints Detail, Index 460-470, Sheet 2, as required.
3. Areas where existing structure has been removed shall match adjoining areas and shall be finished flat by grouting or grinding as required. Exposed existing reinforcing steel shall be burned off 1" below existing concrete and grouted over.

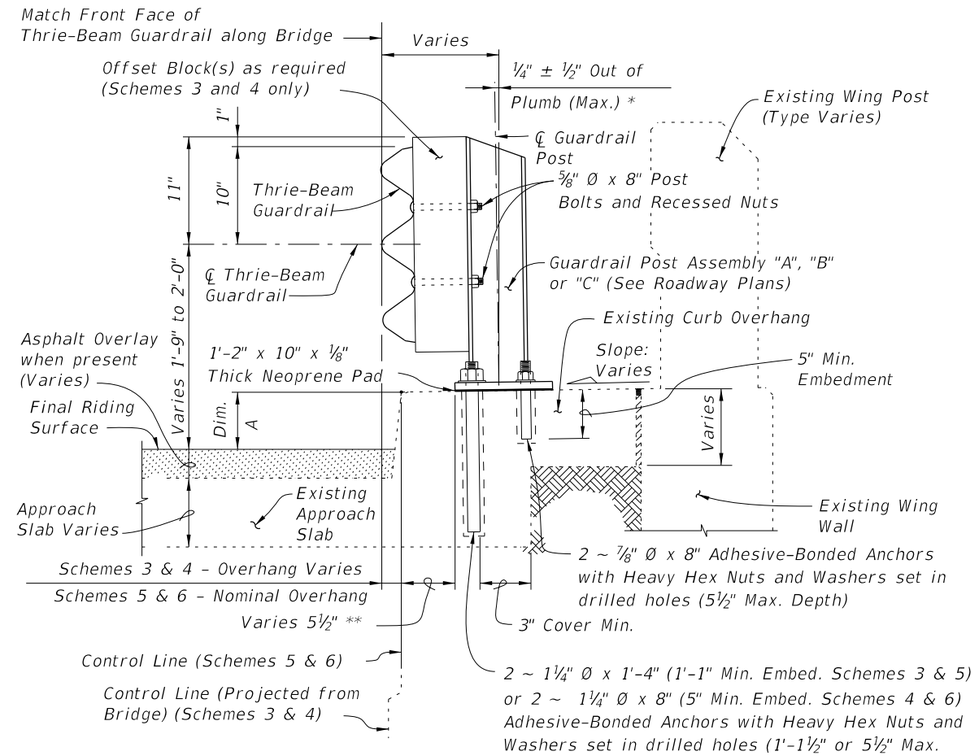
CROSS REFERENCES:
For Section A-A see Sheet 2.
For Traffic Railing Notes and Details see Index 460-470.

10/24/2018 2:54:02 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 2	INDEX	SHEET
01/01/08						460-473	1 of 4



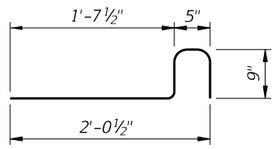
SECTION A-A
TYPICAL SECTION THRU RAILING ON BRIDGE DECK



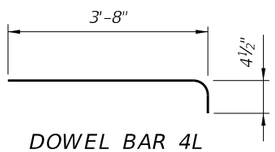
SECTION B-B
TYPICAL SECTION THRU RAILING ALONG APPROACH SLAB
(SCHEMES 5 AND 6 SHOWN, SCHEMES 3 AND 4 SIMILAR)

BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
D	4	3'-7"
L	4	4'-1"
M	4	2'-8"

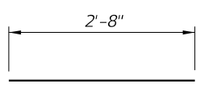
BAR BENDING DIAGRAMS



DOWEL BAR 4D



DOWEL BAR 4L

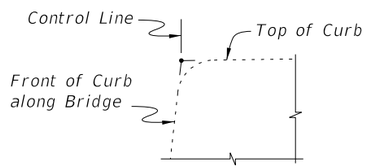


BAR 4M

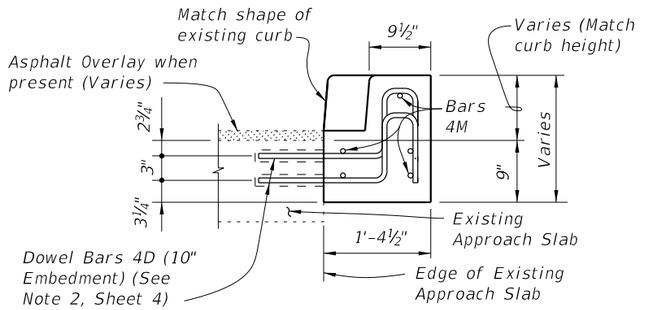
NOTE: All bar dimensions are out to out.

* Shim with washers around Anchor Bolts and Anchors as required to maintain tolerance.

** Offset may vary ± 1" for Adhesive-Bonded Anchors and Anchor Bolts to clear existing curb reinforcing and provide minimum edge clearance. Offset shall be consistent along length of bridge.



DETAIL "A"

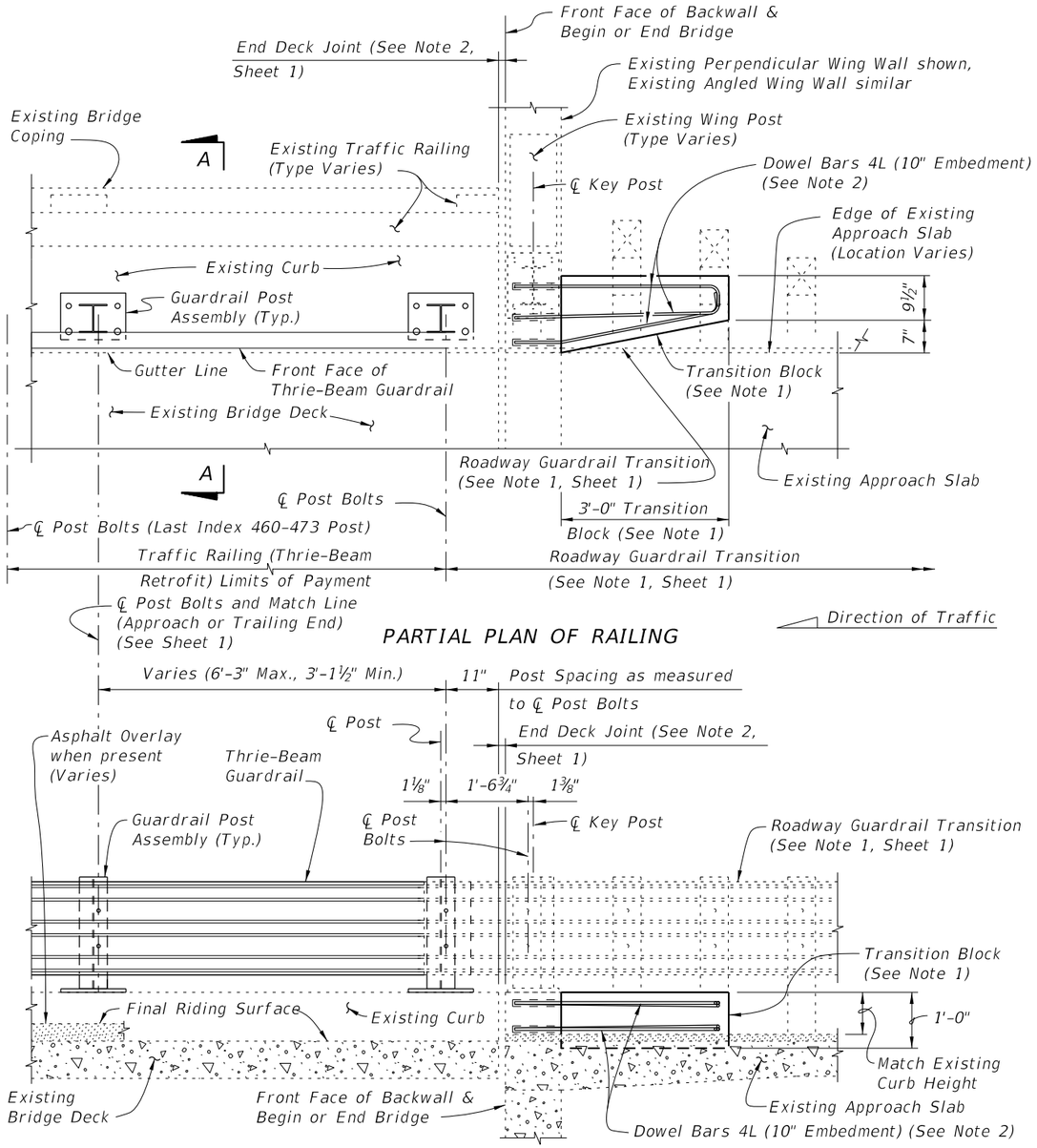


VIEW C-C

CROSS REFERENCES:
For location of Section A-A see Sheet 1, 3 and 4.
For location of Section B-B see Sheet 4.
For location of View C-C see Sheet 3.
For Traffic Railing Notes and Details see Index 460-470.
For application of Dim. A see Post Dimension Table on Index 460-470, Sheet 3.

10/24/2018 2:54:03 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 2	INDEX	SHEET
07/01/08						460-473	2 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

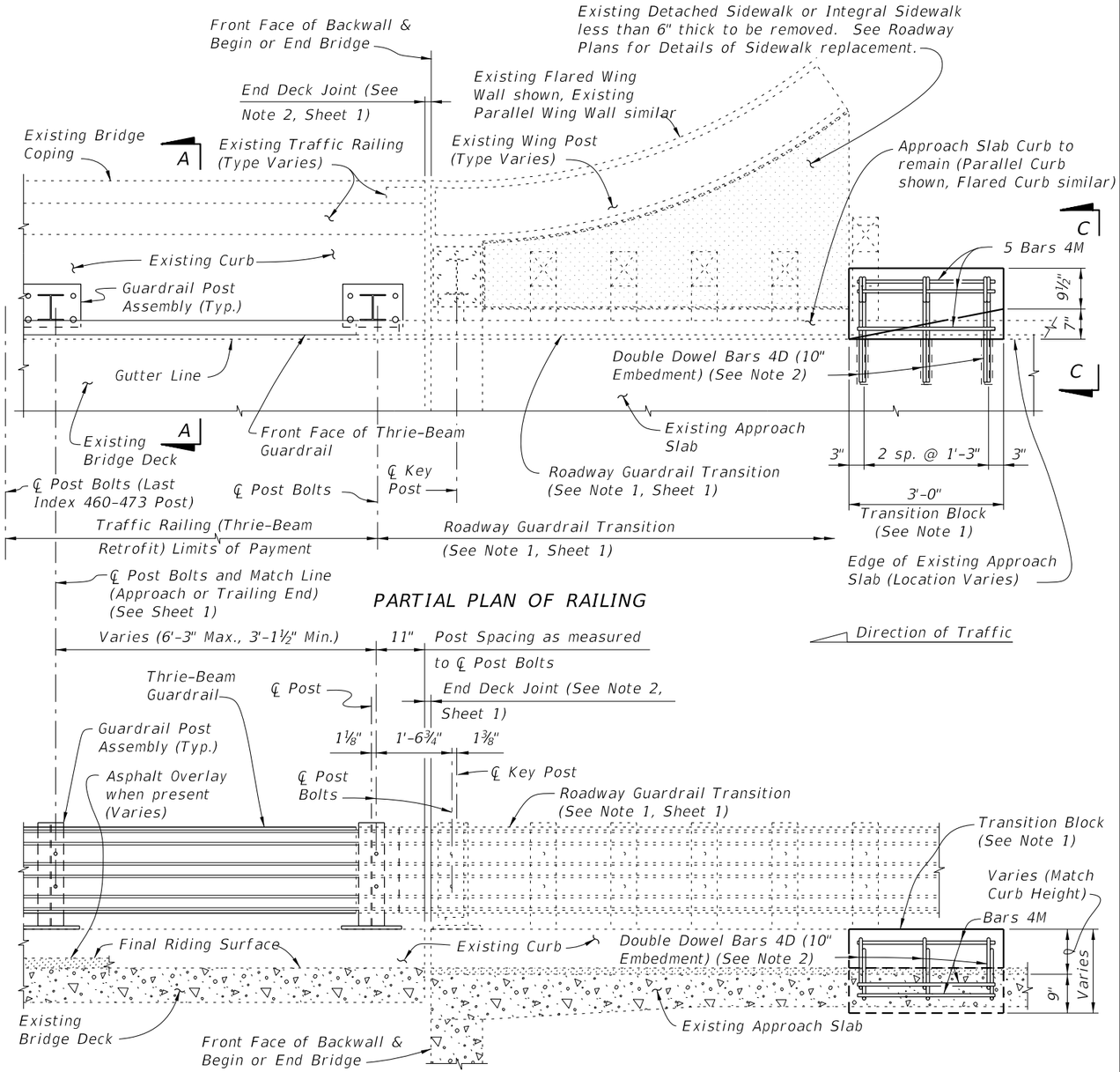
SCHEME 1

RAILING END TREATMENT FOR PERPENDICULAR OR ANGLED WING WALLS

SCHEME 1 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab does not have a curb, see Roadway Plans. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEME 2

RAILING END TREATMENT FOR PARALLEL OR FLARED CURBS WITH DETACHED SIDEWALKS OR INTEGRAL SIDEWALK LESS THAN 6" THICK

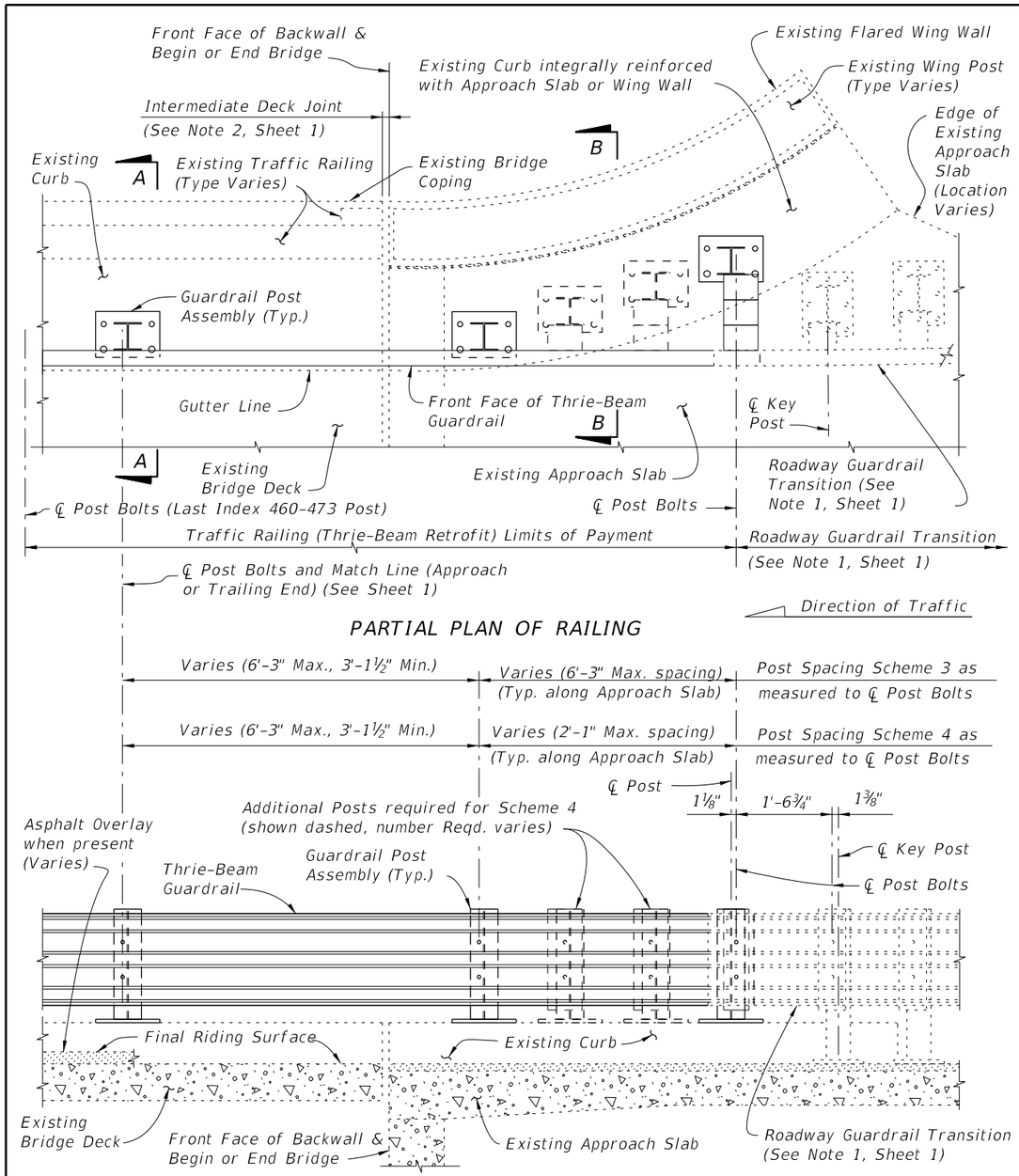
SCHEME 2 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic and on bridges with flared Approach Slab Curbs.

2. Field bend or tilt Dowel Bars 4D and Bars 4M within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

10/24/2018 2:54:03 PM

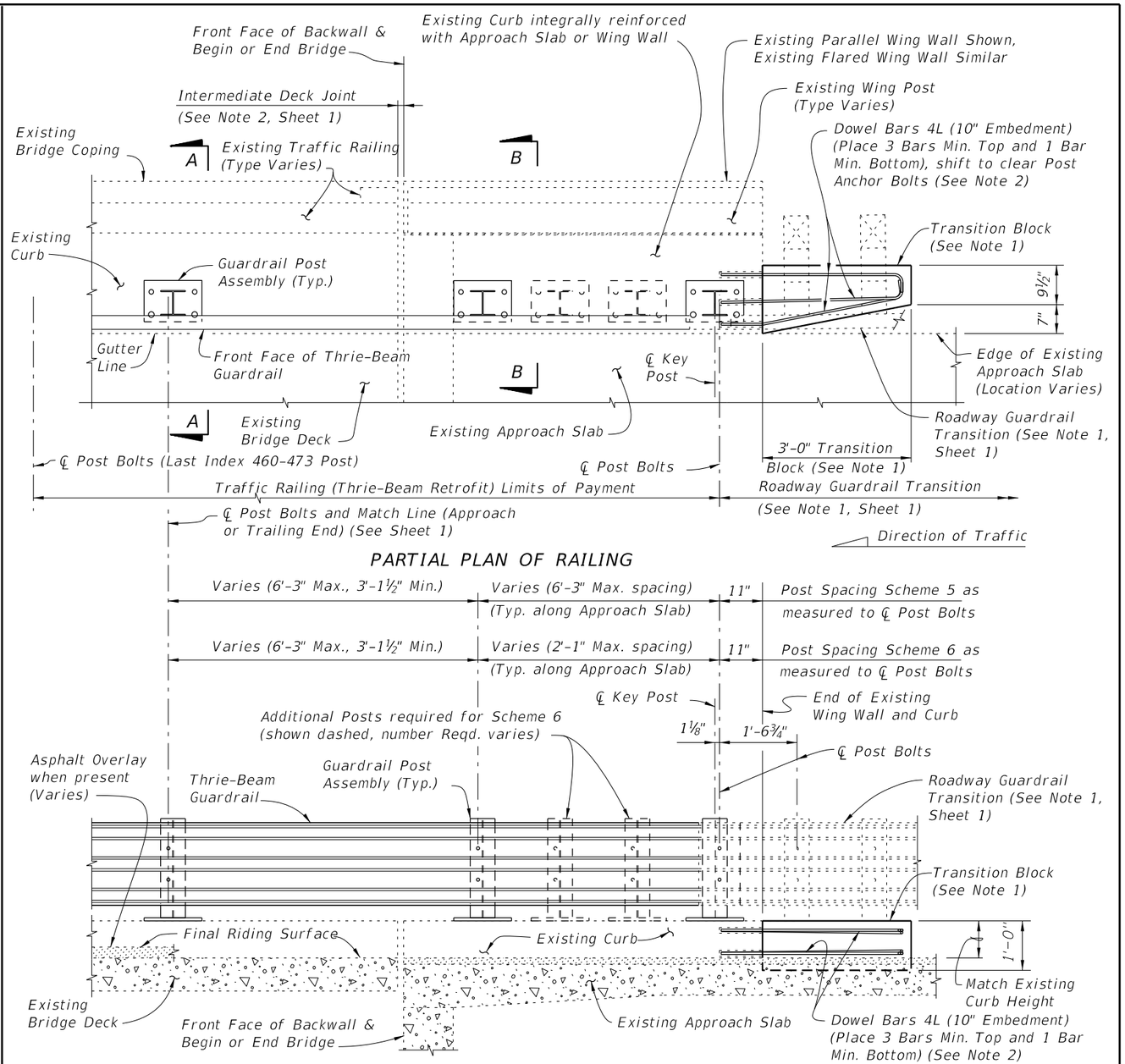
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 2	INDEX	SHEET
01/01/08						460-473	3 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 3 AND 4
RAILING END TREATMENT FOR FLARED INTEGRAL CURBS



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 5 AND 6
RAILING END TREATMENT FOR PARALLEL INTEGRAL CURBS

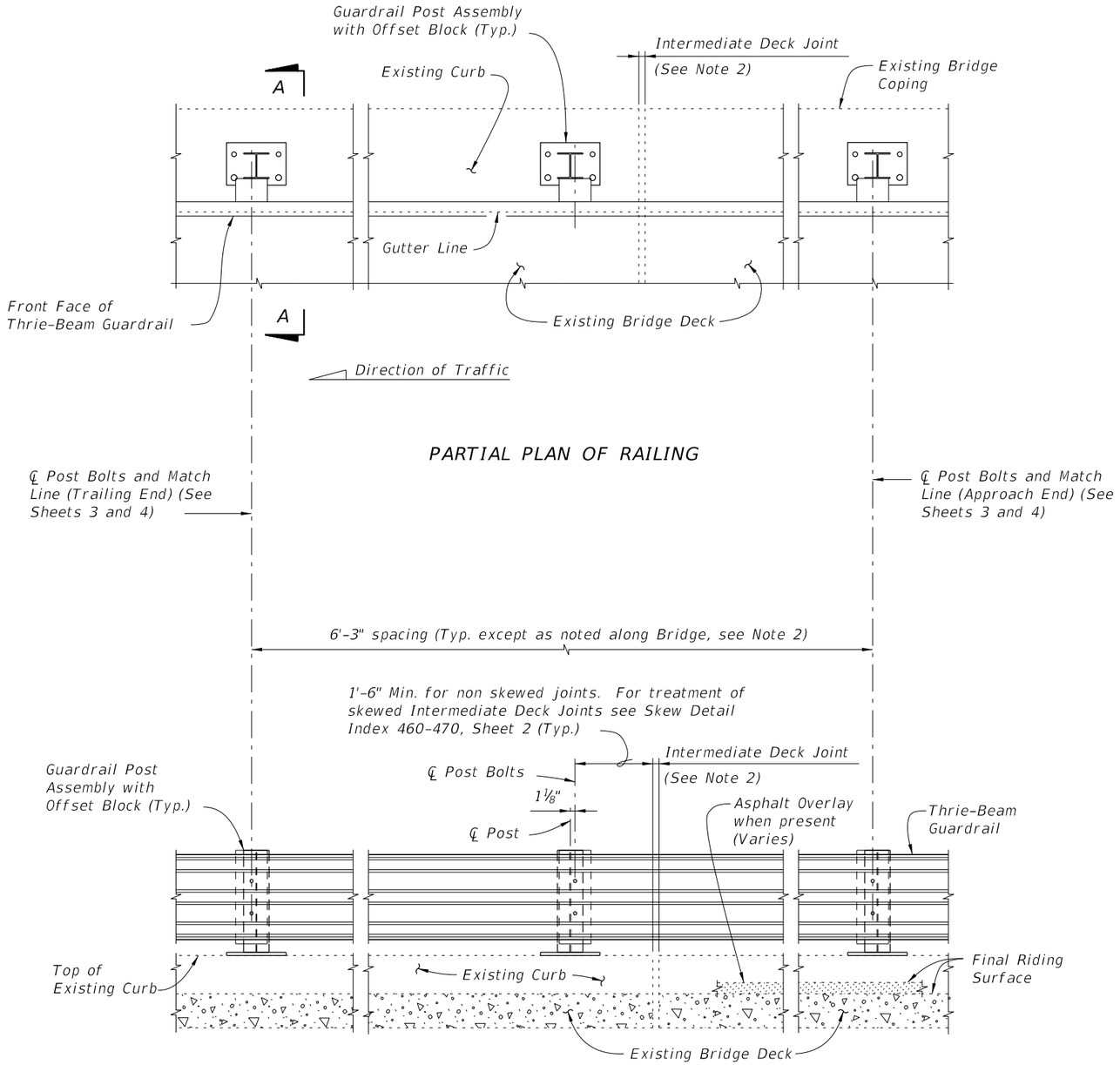
SCHEMES 5 AND 6 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

10/24/2018 2:54:04 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE STRONG CURB TYPE 2	INDEX	SHEET
01/01/08						460-473	4 of 4



PARTIAL ELEVATION OF INSIDE FACE OF RAILING

TYPICAL TREATMENT OF RAILING ALONG BRIDGE

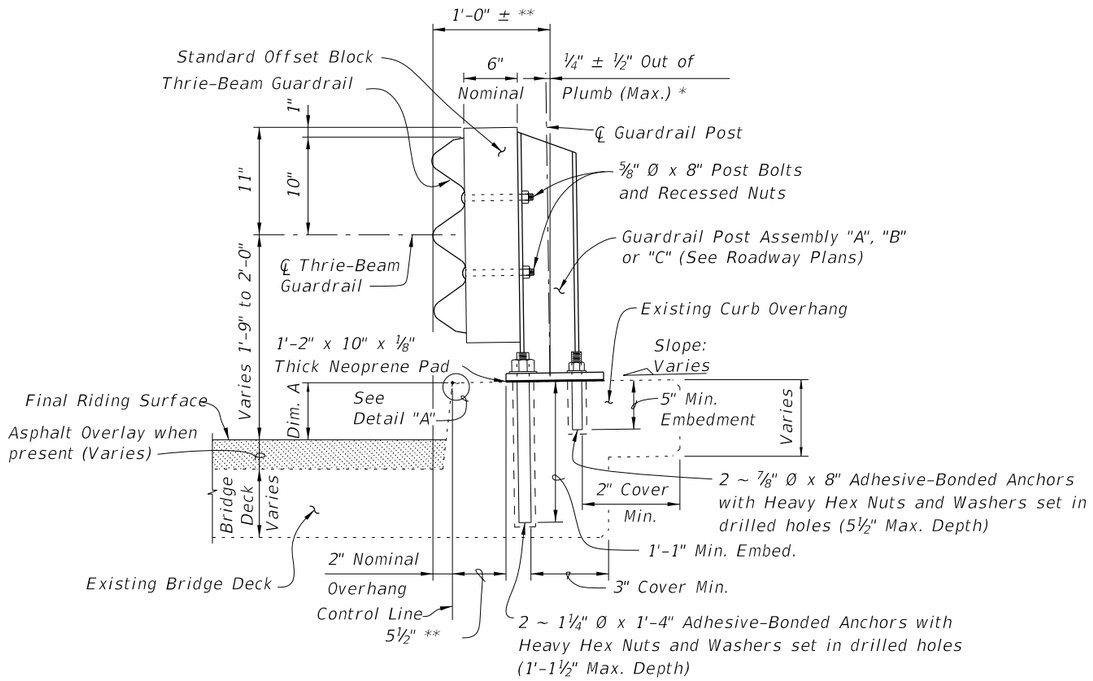
NOTES:

1. On approach end provide Index 536-002 (as shown) or other site specific treatment, see Roadway Plans. For treatment of trailing end see Roadway Plans.
2. Actual joint dimension and orientation vary. For Intermediate Deck Joints use the Modified Post Spacing at Intermediate Deck Joints Detail, Index 460-470, Sheet 2, as required.
3. Areas where existing structure has been removed shall match adjoining areas and shall be finished flat by grouting or grinding as required. Exposed existing reinforcing steel shall be burned off 1" below existing concrete and grouted over.

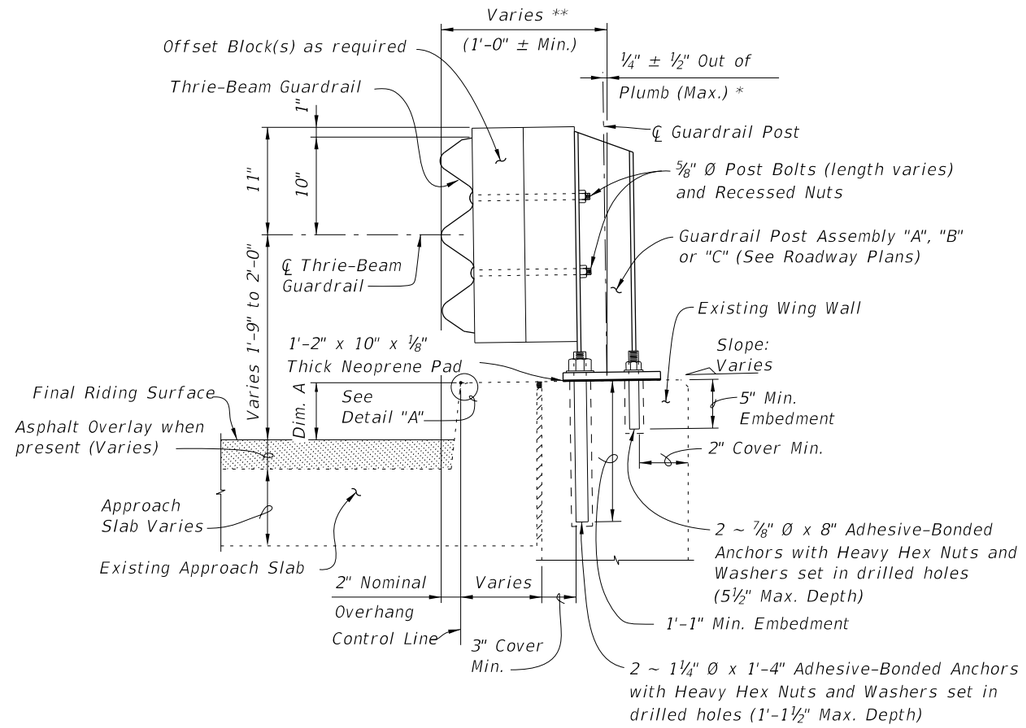
CROSS REFERENCES:
For Match Line see Sheets 3 & 4.
For Section A-A see Sheet 2.
For Traffic Railing Notes and Details see Index 460-470.

10/24/2018 2:54:05 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) INTERMEDIATE CURB	INDEX	SHEET
01/01/08						460-474	1 of 4



SECTION A-A
TYPICAL SECTION THRU RAILING ON BRIDGE DECK

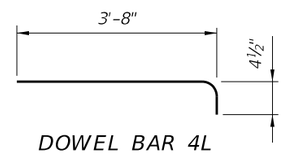


SECTION B-B (SCHEME 2)
TYPICAL SECTION THRU RAILING ALONG APPROACH SLAB

* Shim with washers around Anchor Bolts and Anchors as required to maintain tolerance.

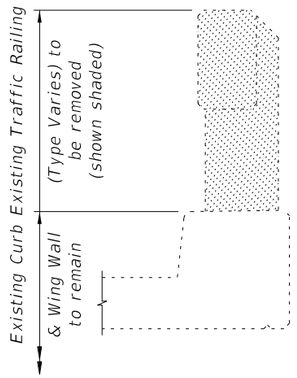
** Offset may vary ± 1" for Adhesive-Bonded Anchors to clear existing curb reinforcing and provide minimum edge clearance. Offset shall be consistent along length of bridge.

BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
L	4	4'-1"
BAR BENDING DIAGRAM		

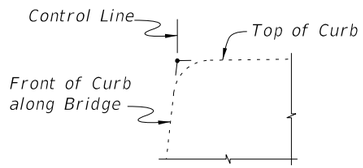


DOWEL BAR 4L

NOTE: All bar dimensions are out to out.



TYPICAL SECTION THRU EXISTING TRAFFIC RAILING SHOWING LIMITS OF REMOVAL (BRIDGE DECK SHOWN, WING WALL SIMILAR)

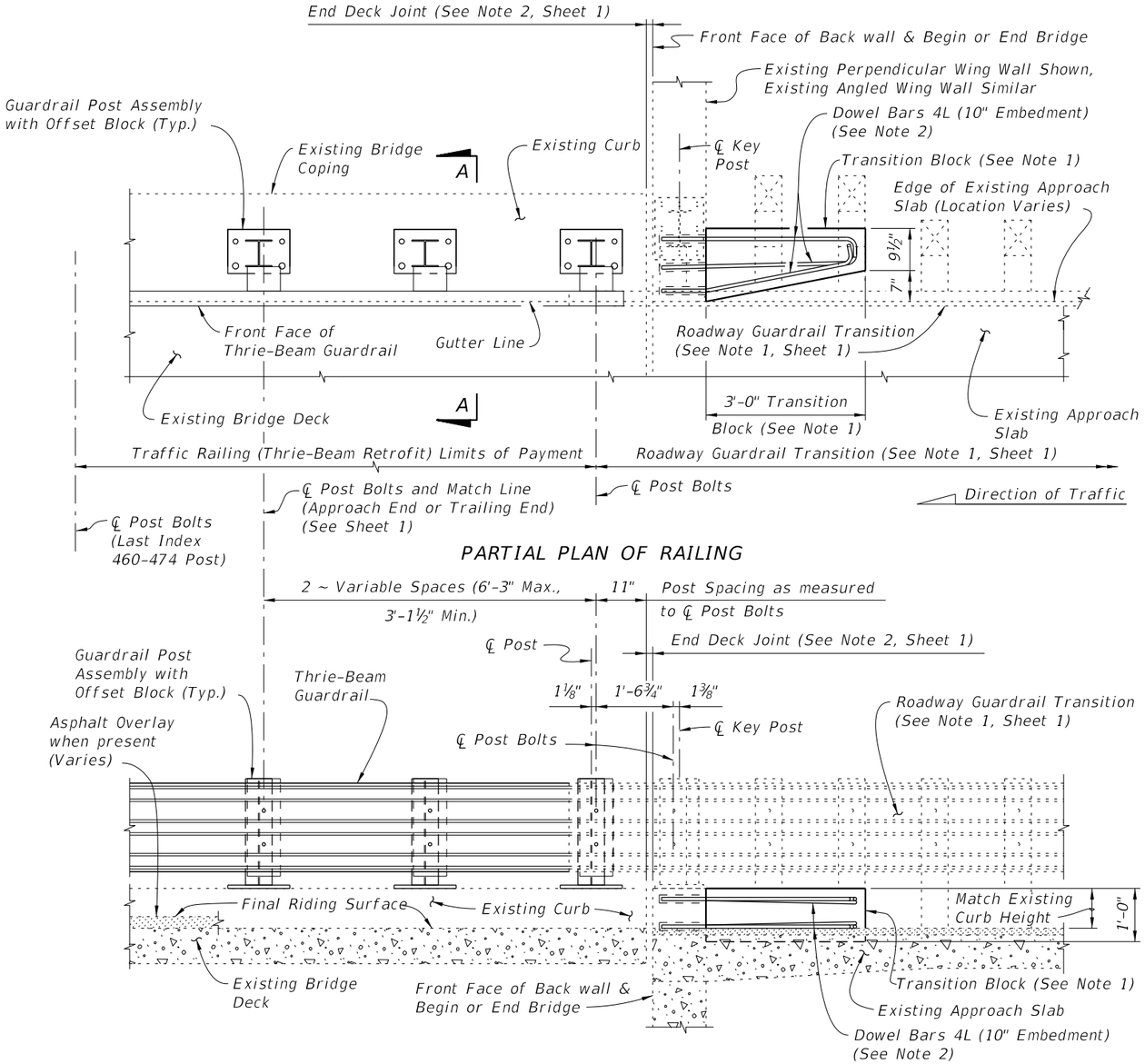


DETAIL "A"

CROSS REFERENCES:
For location of Section A-A see Sheet 1 and 3.
For location of Section B-B see Sheet 3
For application of Dim. A see Post Dimension Table on Index 460-470, Sheet 3.

10/24/2018 2:54:06 PM

LAST REVISION	REVISION	DESCRIPTION:				
07/01/08			FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) INTERMEDIATE CURB	INDEX 460-474 / SHEET 2 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING

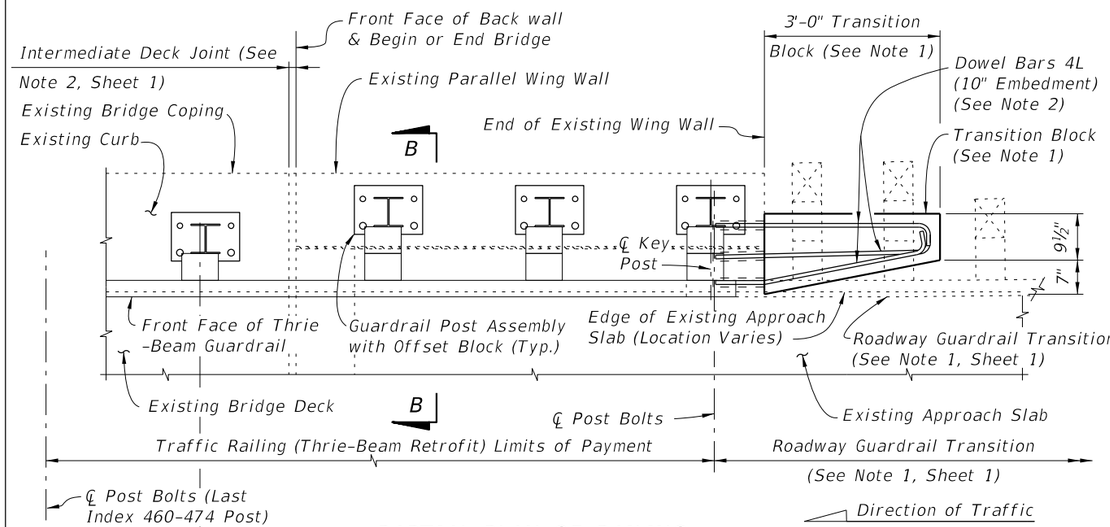
SCHEME 1

RAILING END TREATMENT FOR PERPENDICULAR OR ANGLED WING WALLS

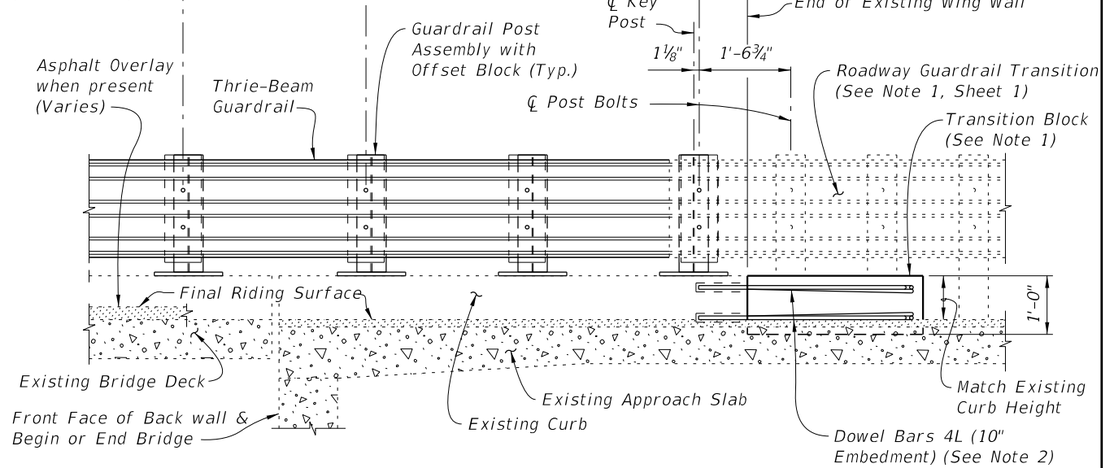
SCHEME 1 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab does not have a curb, see Roadway Plans. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.



PARTIAL PLAN OF RAILING



PARTIAL ELEVATION OF INSIDE FACE OF RAILING

SCHEME 2

RAILING END TREATMENT FOR PARALLEL WING WALLS

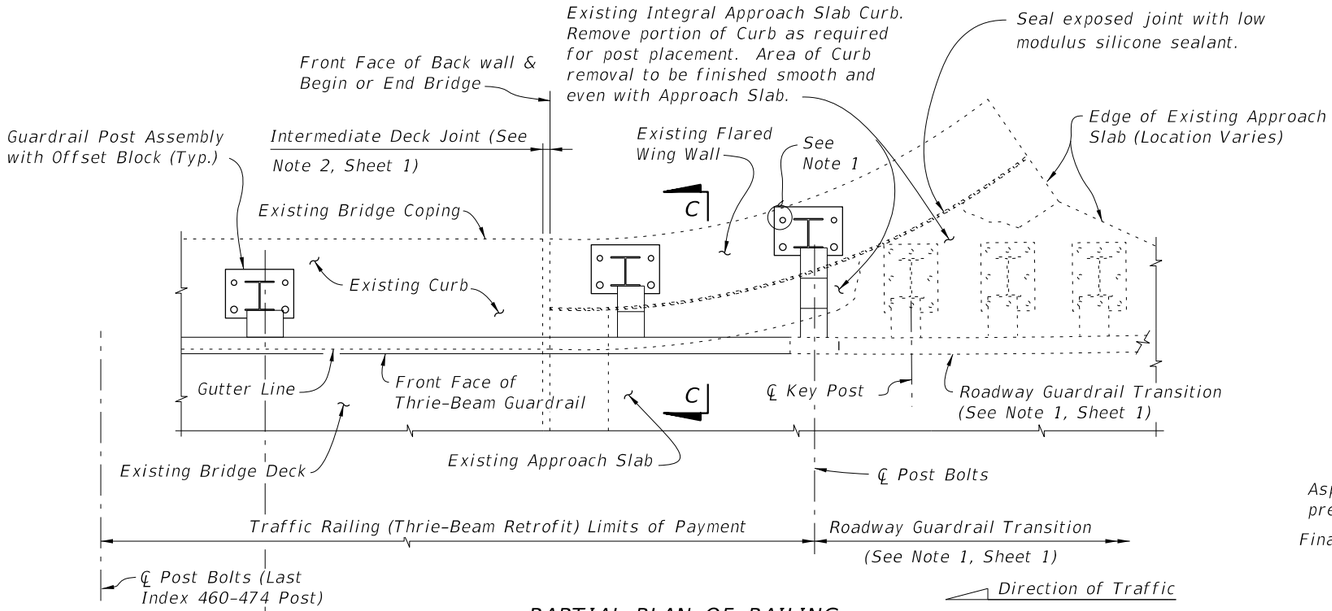
SCHEME 2 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

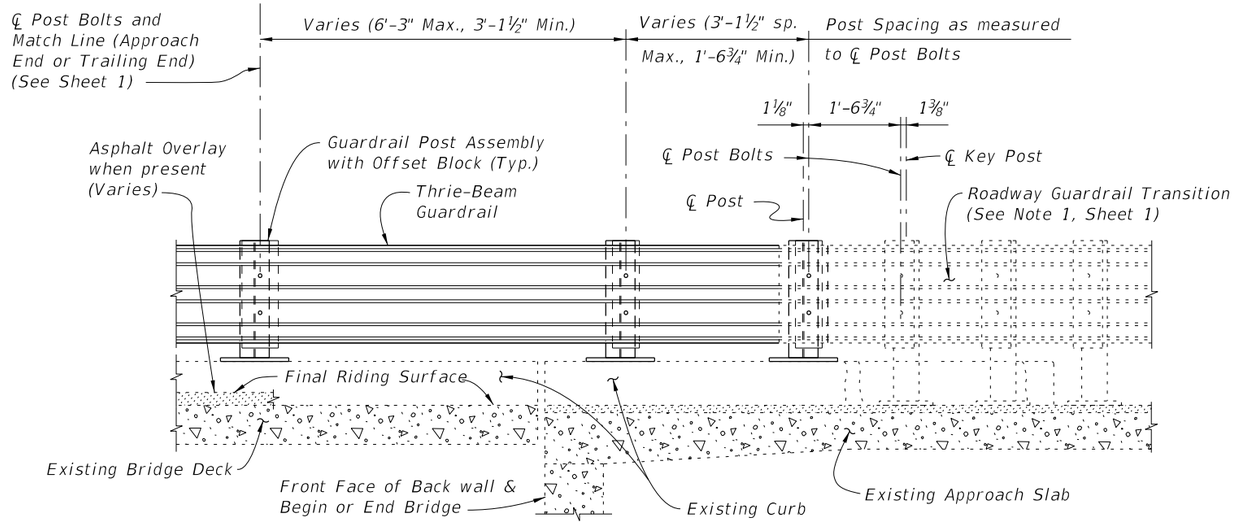
2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

10/24/2018 2:54:09 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/08			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) INTERMEDIATE CURB	460-474	3 of 4

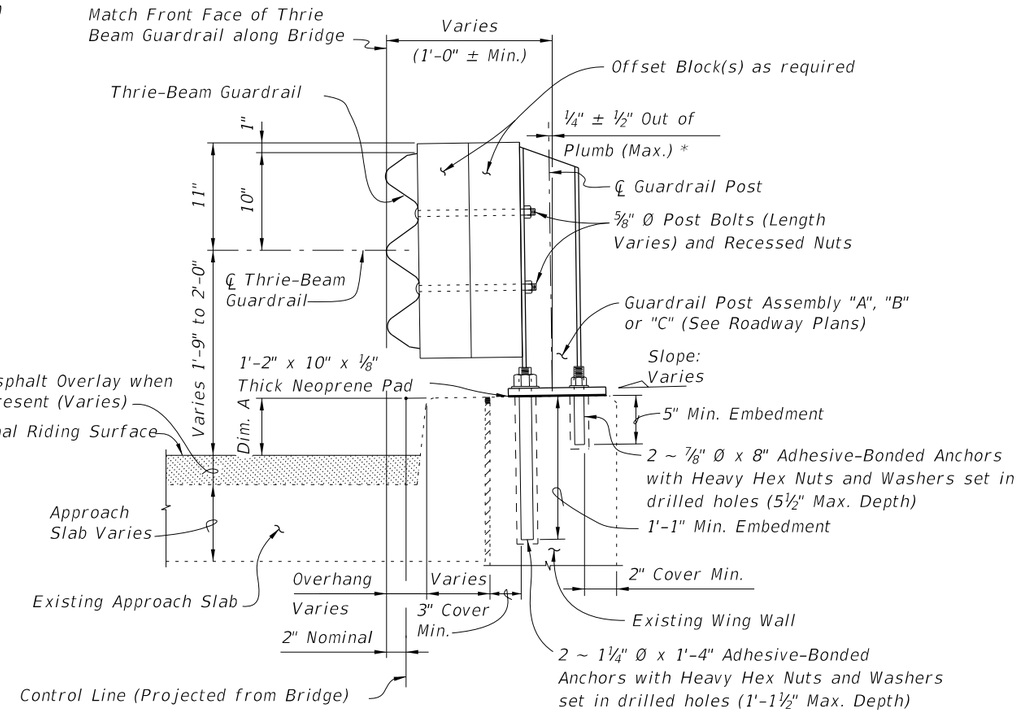


PARTIAL PLAN OF RAILING



PARTIAL ELEVATION OF INSIDE FACE OF RAILING

SCHEME 3
RAILING END TREATMENT FOR FLARED WING WALLS



SECTION C-C (SCHEME 3)
TYPICAL SECTION THRU RAILING ALONG APPROACH SLAB

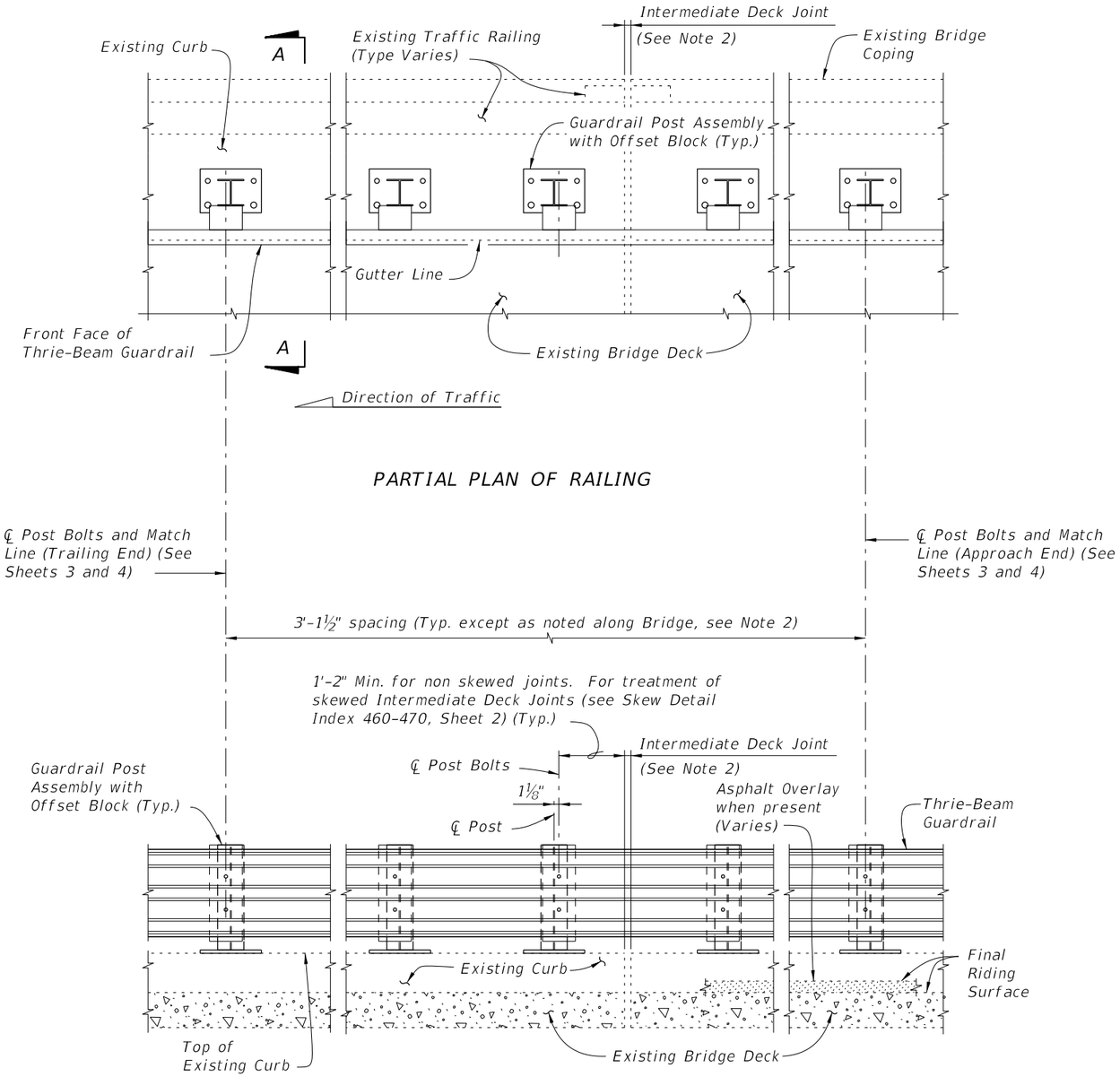
SCHEME 3 NOTE:

1. A single ⅞" Ø x 8" Adhesive-Bonded Anchor may be omitted as shown when 2" clear cover cannot be provided (see Section C-C).

CROSS REFERENCE:
For application of Dim. A see Post Dimension Table on Index 460-470, Sheet 3.

10/24/2018 2:54:11 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/09			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) INTERMEDIATE CURB	460-474	4 of 4



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Traffic Railing not shown for clarity)

TYPICAL TREATMENT OF RAILING ALONG BRIDGE

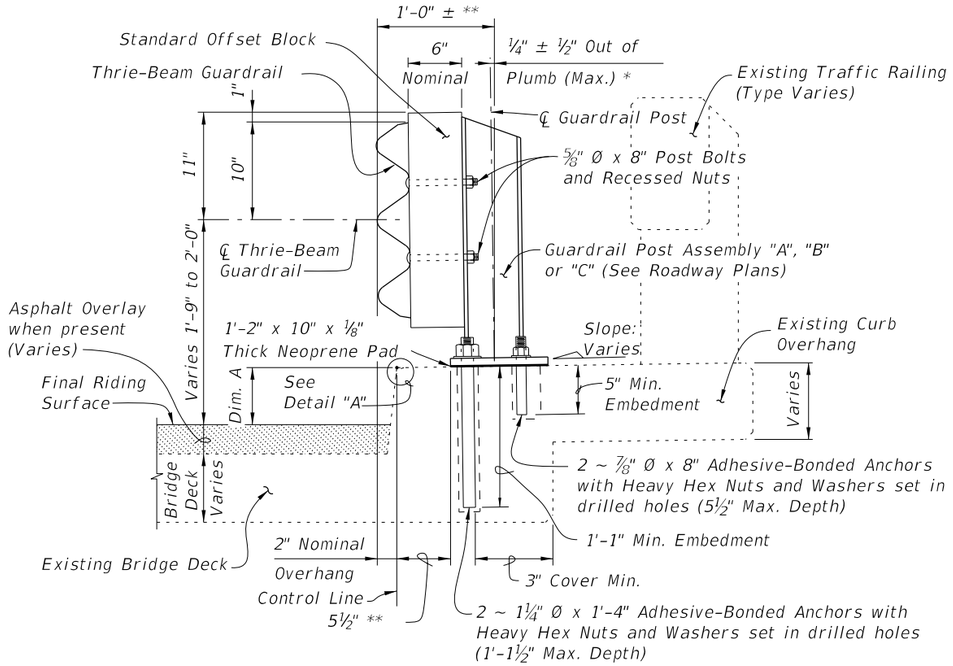
NOTES:

1. On approach end provide Index 536-002 (as shown) or other site specific treatment, see Roadway Plans. For treatment of trailing end see Roadway Plans.
2. Actual joint dimension and orientation vary. For Intermediate Deck Joints use the Modified Post Spacing at Intermediate Deck Joints Detail, Index 460-470, Sheet 2, as required.
3. Areas where existing structure has been removed shall match adjoining areas and shall be finished flat by grouting or grinding as required. Exposed existing reinforcing steel shall be burned off 1" below existing concrete and grouted over.

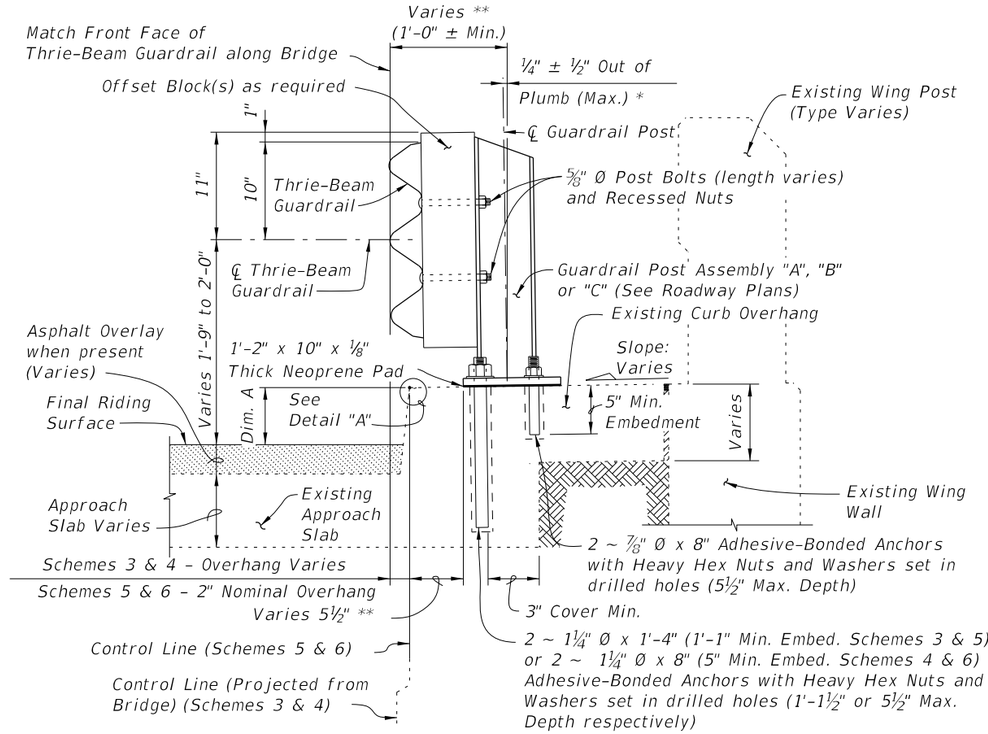
CROSS REFERENCES:
For Section A-A see Sheet 2.
For Traffic Railing Notes and Details see Index 460-470.

10/24/2018 2:54:12 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 1	INDEX	SHEET
01/01/08						460-475	1 of 4



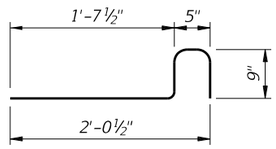
SECTION A-A
TYPICAL SECTION THRU RAILING ON BRIDGE DECK



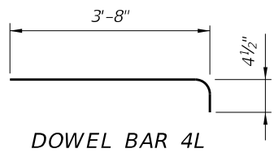
SECTION B-B
TYPICAL SECTION THRU RAILING ALONG APPROACH SLAB
(SCHEMES 5 AND 6 SHOWN, SCHEMES 3 AND 4 SIMILAR)

BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
D	4	3'-7"
L	4	4'-1"
M	4	2'-8"

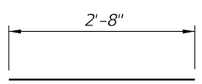
BAR BENDING DIAGRAMS



DOWEL BAR 4D



DOWEL BAR 4L

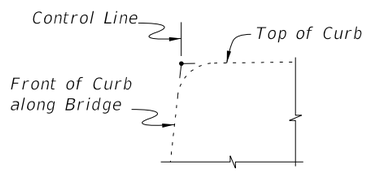


BAR 4M

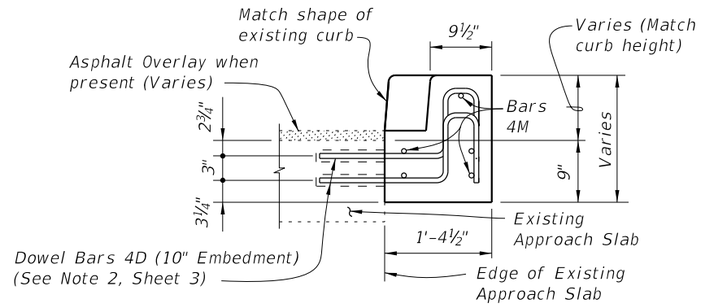
NOTE: All bar dimensions are out to out.

* Shim with washers around Anchors as required to maintain tolerance.

** Offset may vary ± 1" for Adhesive-Bonded Anchors to clear existing curb reinforcing and provide minimum edge clearance. Offset shall be consistent along length of bridge.



DETAIL "A"



VIEW C-C

CROSS REFERENCES:
For location of Section A-A see Sheet 1, 3 & 4.
For location of Section B-B see Sheet 4.
For location of View C-C see Sheet 3.
For application of Dim. A see Post Dimension Table on Index 460-470, Sheet 3.

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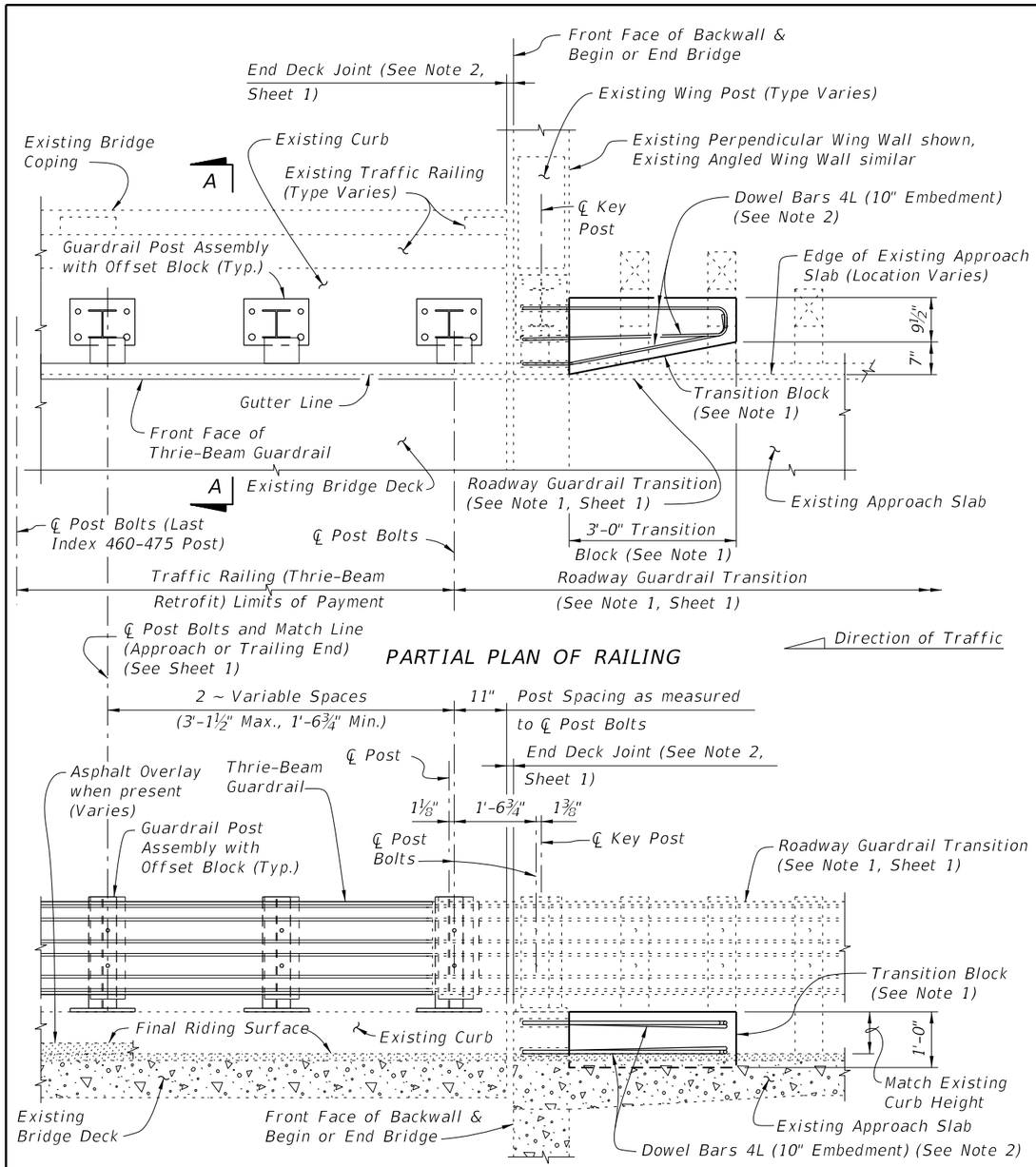
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/08			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 1	460-475	2 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

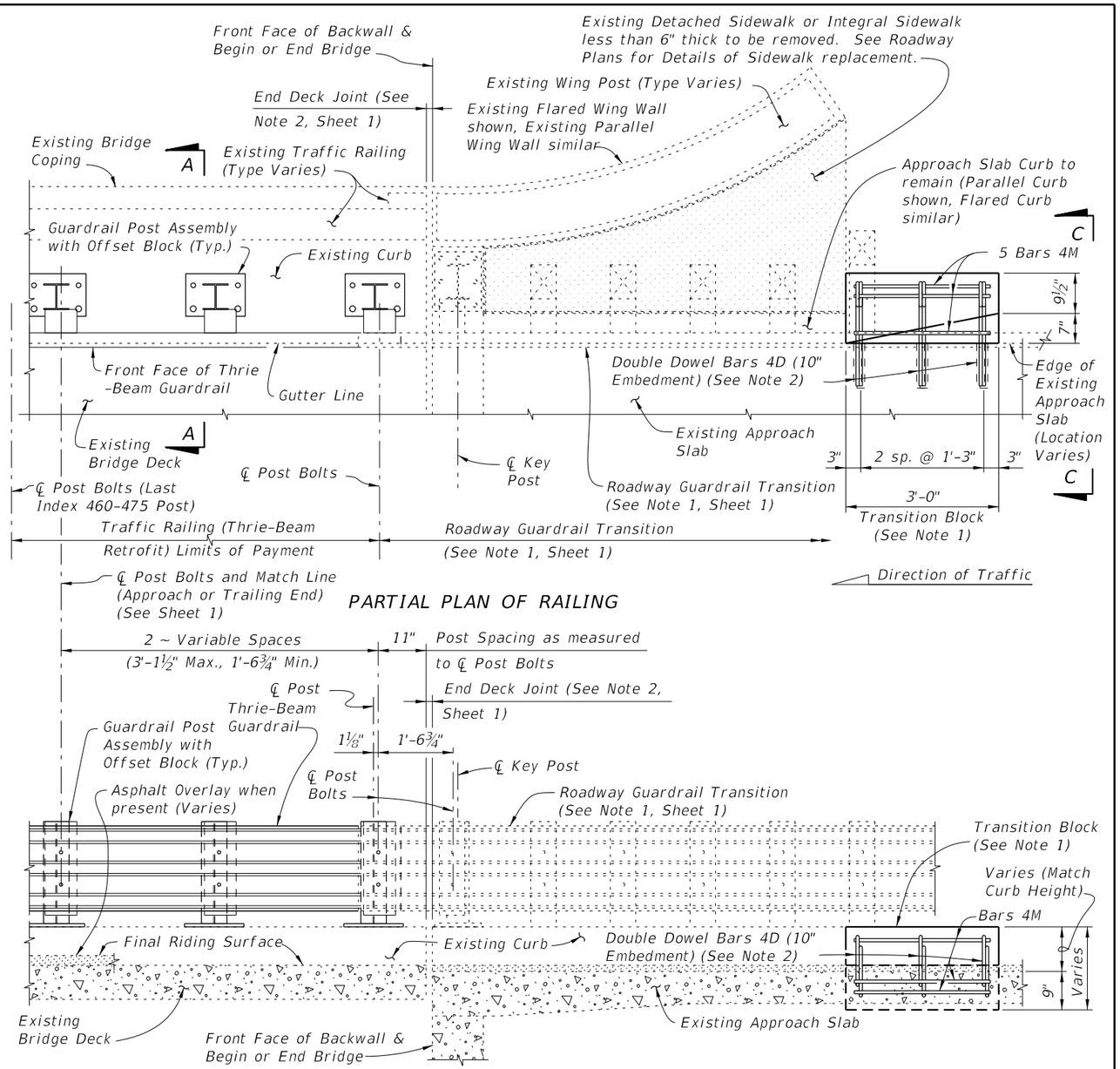
SCHEME 1

RAILING END TREATMENT FOR PERPENDICULAR OR ANGLED WING WALLS

SCHEME 1 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab does not have a curb, see Roadway Plans. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEME 2

RAILING END TREATMENT FOR PARALLEL OR FLARED CURBS WITH DETACHED SIDEWALKS OR INTEGRAL SIDEWALKS LESS THAN 6" THICK

SCHEME 2 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic and on bridges with flared Approach Slab Curbs.

2. Field bend or tilt Dowel Bars 4D and Bars 4M within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

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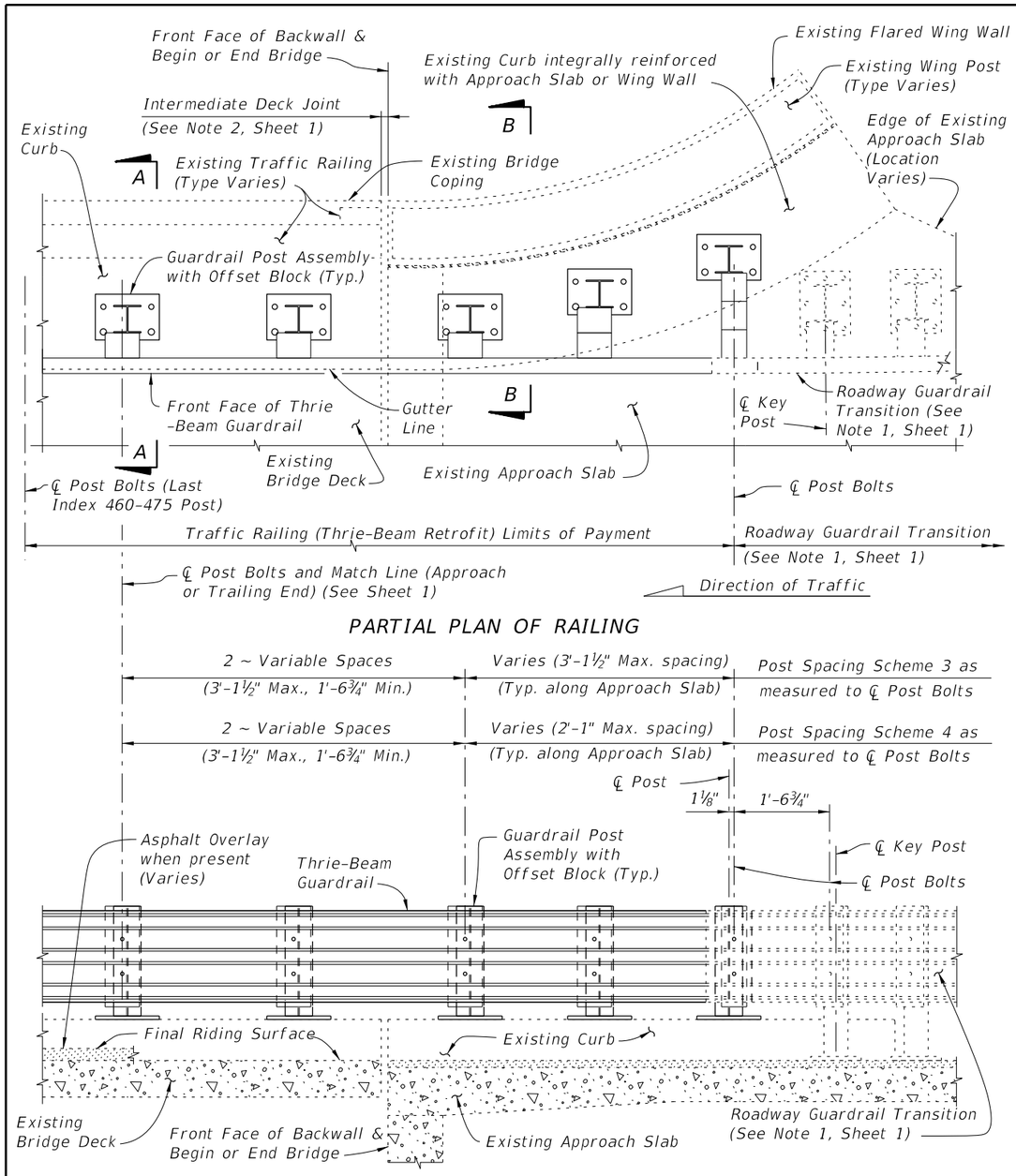
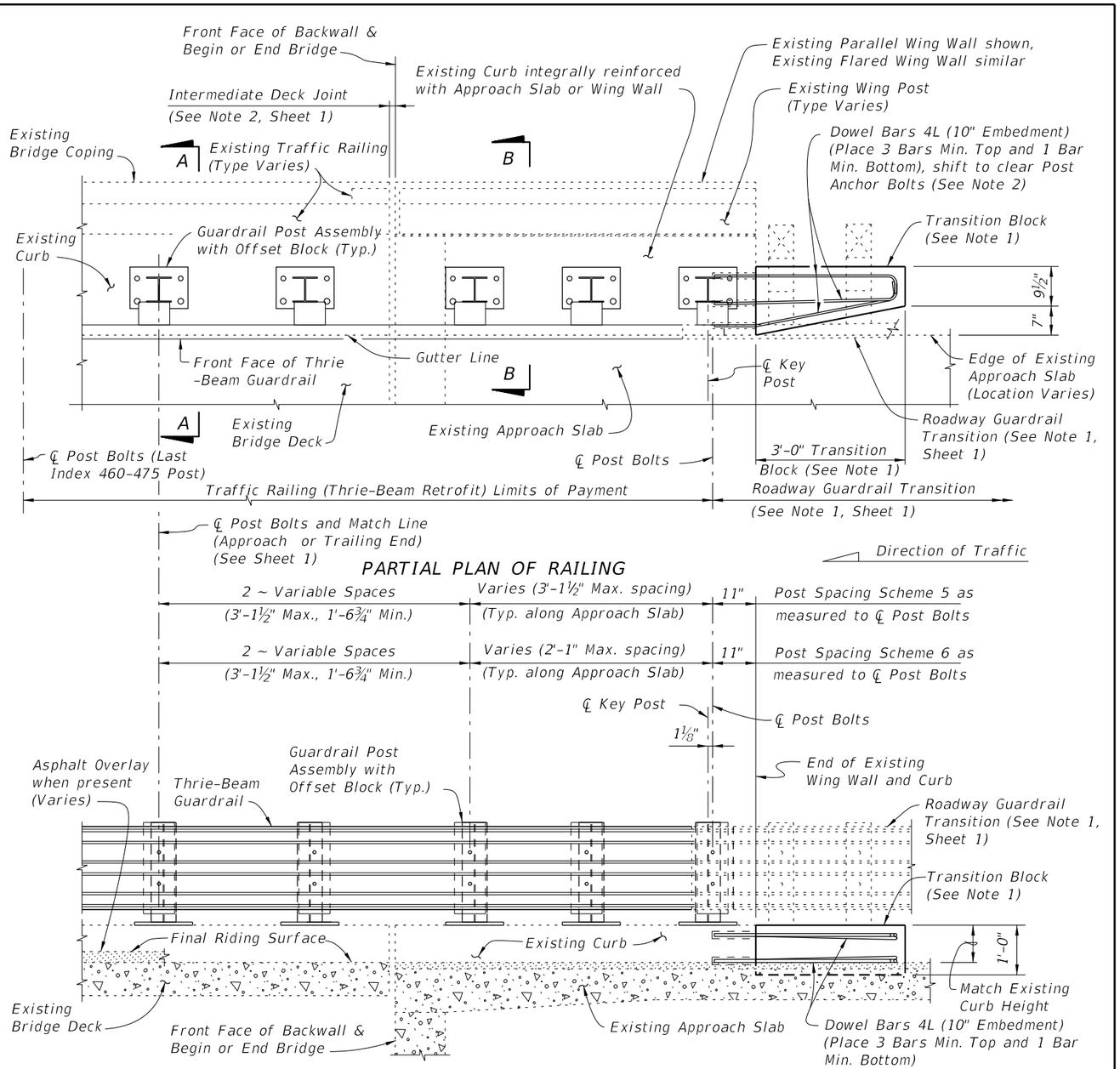
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 1	INDEX	SHEET
01/01/08						460-475	3 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 3 AND 4
RAILING END TREATMENT FOR FLARED INTEGRAL CURBS



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 5 AND 6
RAILING END TREATMENT FOR PARALLEL INTEGRAL CURBS

SCHEMES 5 AND 6 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

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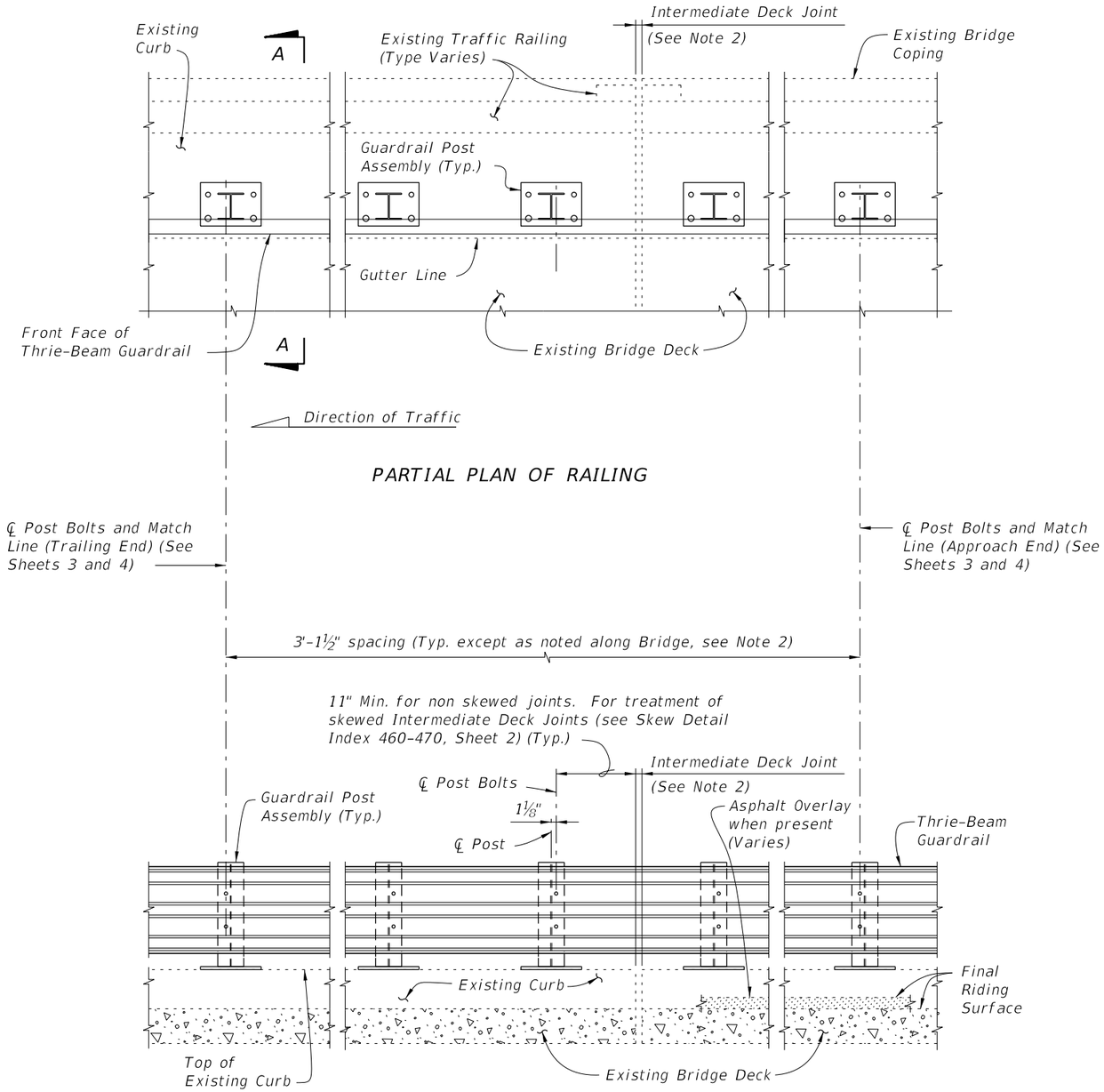
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/08			FDOT	FY 2019-20 STANDARD PLANS	460-475	4 of 4

TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 1



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Traffic Railing not shown for clarity)

TYPICAL TREATMENT OF RAILING ALONG BRIDGE

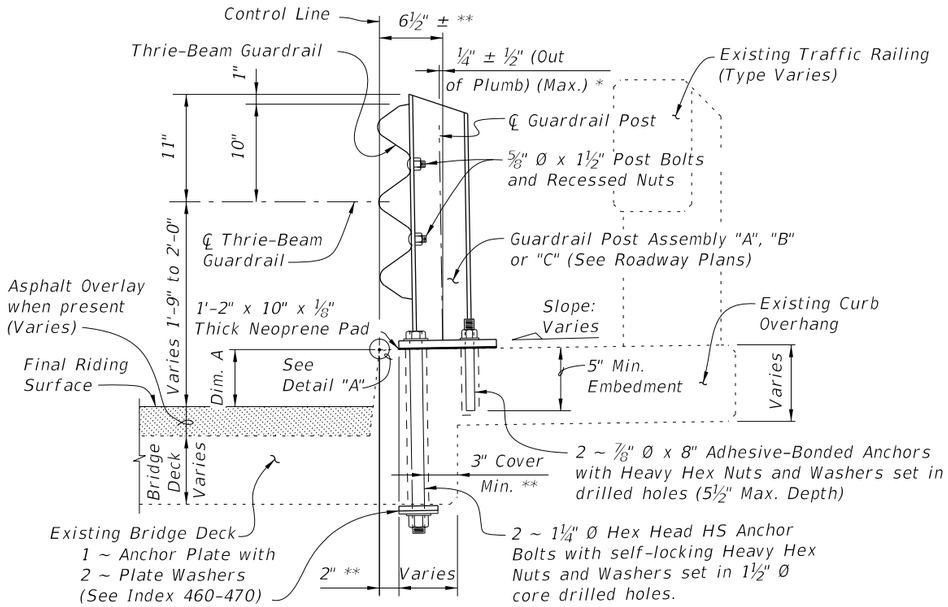
NOTES:

1. On approach end provide Index 536-002 (as shown) or other site specific treatment, see Roadway Plans. For treatment of trailing end see Roadway Plans.
2. Actual joint dimension and orientation vary. For Intermediate Deck Joints use the Modified Post Spacing at Intermediate Deck Joints Detail, Index 460-470, Sheet 2, as required.
3. Areas where existing structure has been removed shall match adjoining areas and shall be finished flat by grouting or grinding as required. Exposed existing reinforcing steel shall be burned off 1" below existing concrete and grouted over.

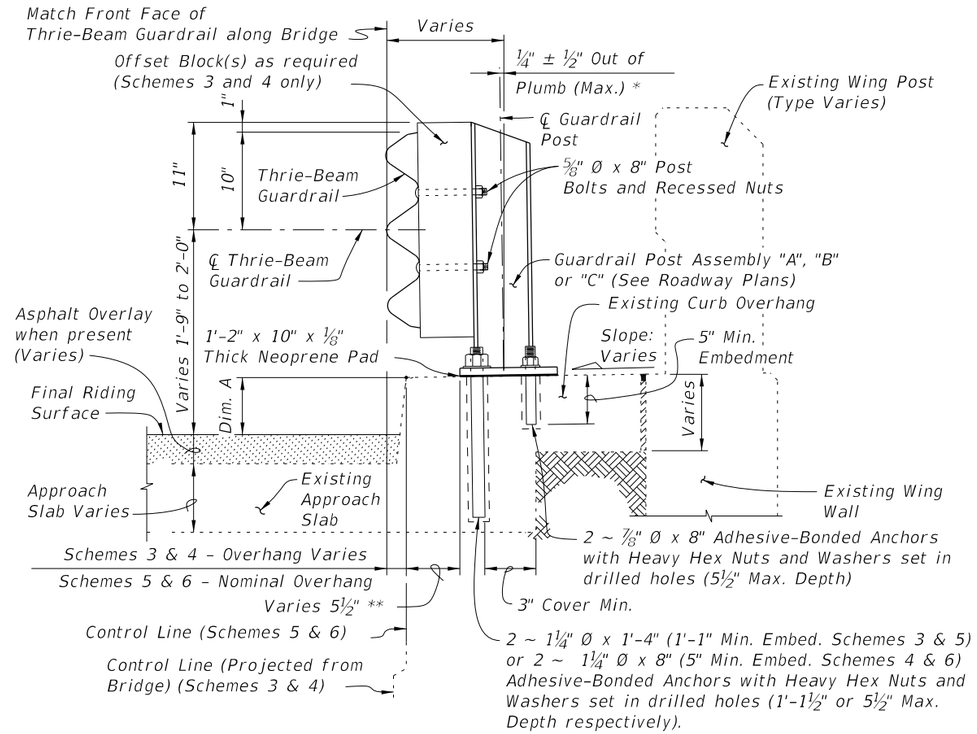
CROSS REFERENCES:
For Section A-A see Sheet 2.
For Traffic Railing Notes and Details see Index 460-470.

10/24/2018 2:54:15 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 2	INDEX	SHEET
01/01/08						460-476	1 of 4



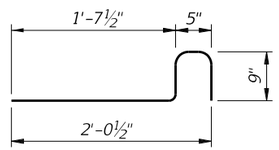
SECTION A-A
TYPICAL SECTION THRU RAILING ON BRIDGE DECK



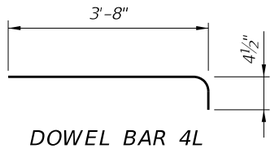
SECTION B-B
TYPICAL SECTION THRU RAILING ALONG APPROACH SLAB
(SCHEMES 5 AND 6 SHOWN, SCHEMES 3 AND 4 SIMILAR)

BILL OF REINFORCING STEEL		
MARK	SIZE	LENGTH
D	4	3'-7"
L	4	4'-1"
M	4	2'-8"

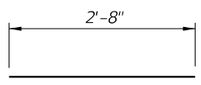
BAR BENDING DIAGRAMS



DOWEL BAR 4D



DOWEL BAR 4L

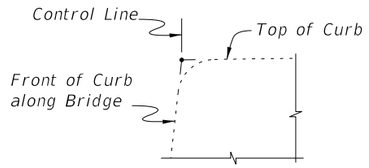


BAR 4M

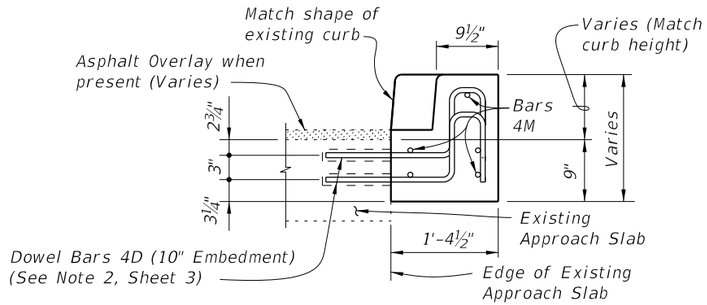
NOTE: All bar dimensions are out to out.

* Shim with washers around Anchors as required to maintain tolerance.

** Offset may vary ± 1" for Adhesive-Bonded Anchors to clear existing curb reinforcing and provide minimum edge clearance. Offset shall be consistent along length of bridge.



DETAIL "A"

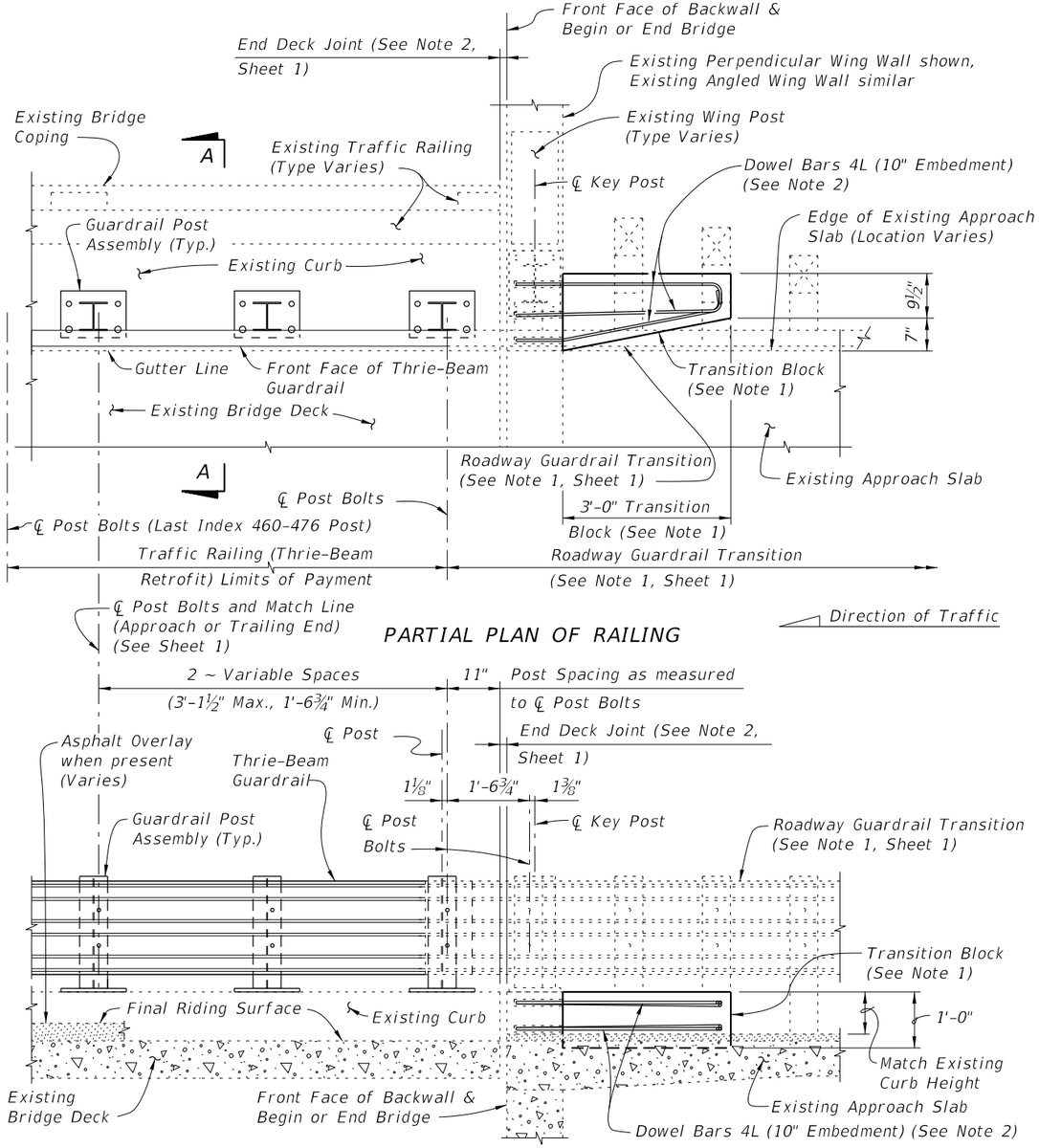


VIEW C-C

CROSS REFERENCES:
For location of Section A-A see Sheet 1, 3 & 4.
For location of Section B-B see Sheet 4.
For location of Section C-C see Sheet 3.
For application of Dim. A see Post Dimension Table on Index 460-470, Sheet 3.

10/24/2018 2:54:16 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 2	INDEX	SHEET
07/01/08						460-476	2 of 4



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

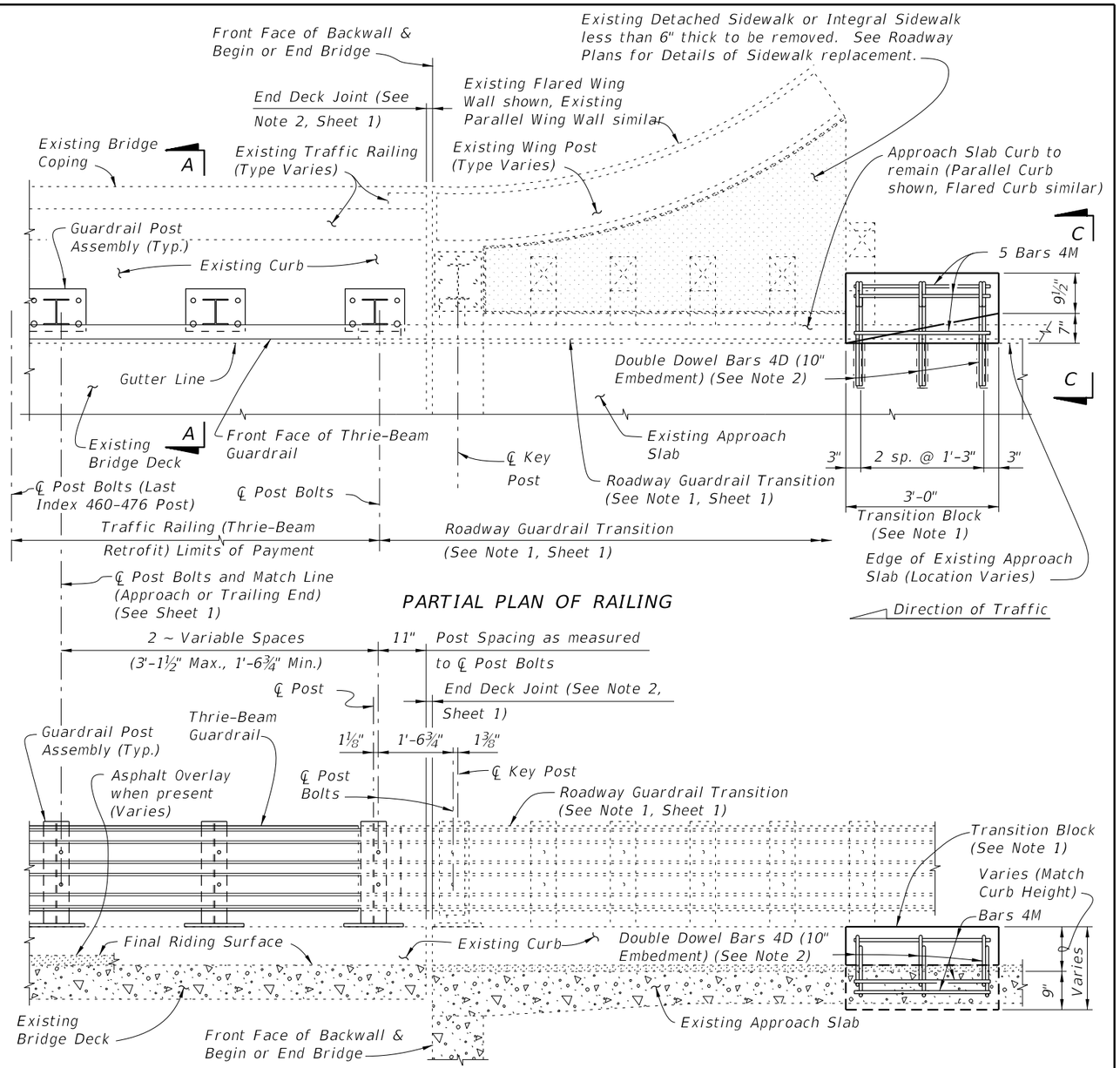
SCHEME 1

RAILING END TREATMENT FOR PERPENDICULAR OR ANGLED WING WALLS

SCHEME 1 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab does not have a curb, see Roadway Plans. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.



PARTIAL PLAN OF RAILING

PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEME 2

RAILING END TREATMENT FOR PARALLEL OR FLARED CURBS WITH DETACHED SIDEWALKS OR INTEGRAL SIDEWALK LESS THAN 6" THICK

SCHEME 2 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic and on bridges with flared Approach Slab Curbs.

2. Field bend or tilt Dowel Bars 4D and Bars 4M within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

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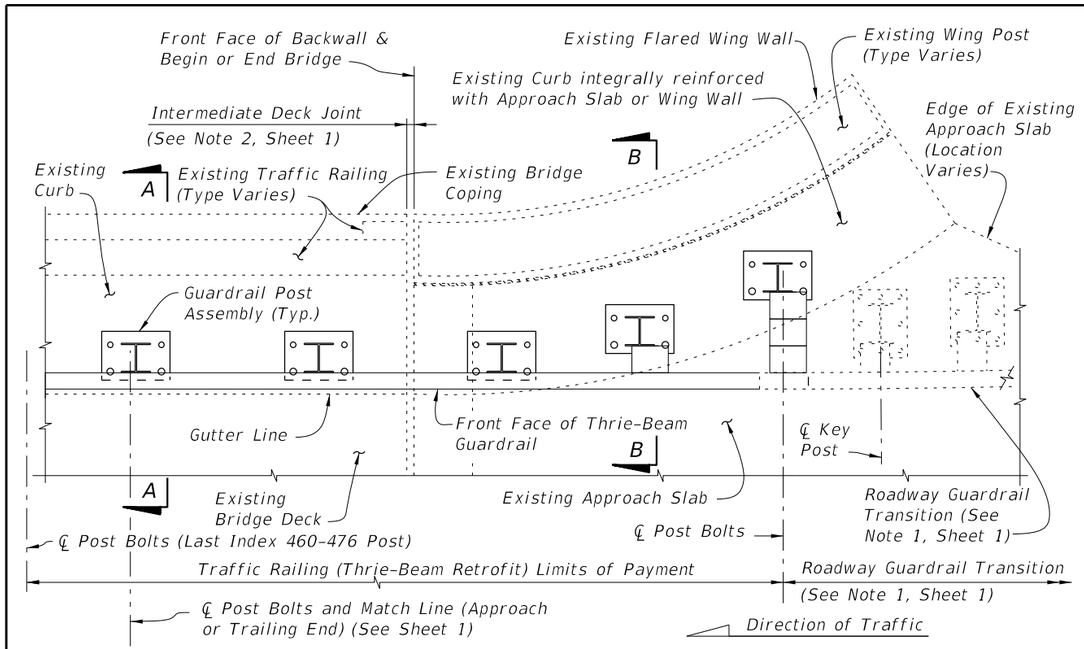
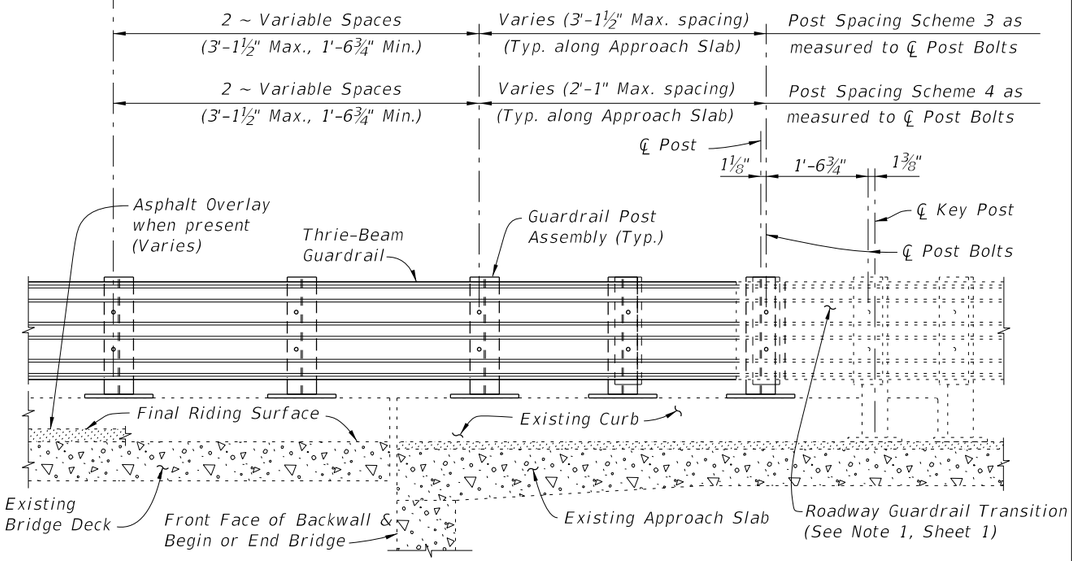
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 2	INDEX	SHEET
01/01/08						460-476	3 of 4

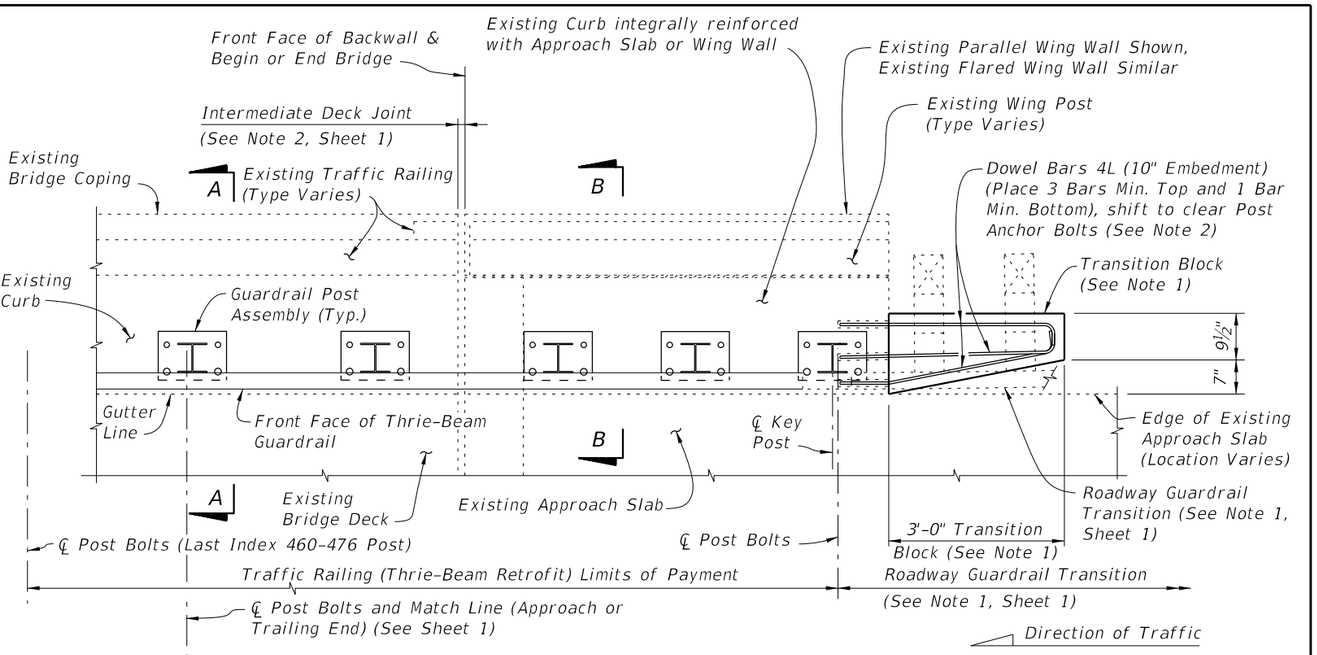


PARTIAL PLAN OF RAILING

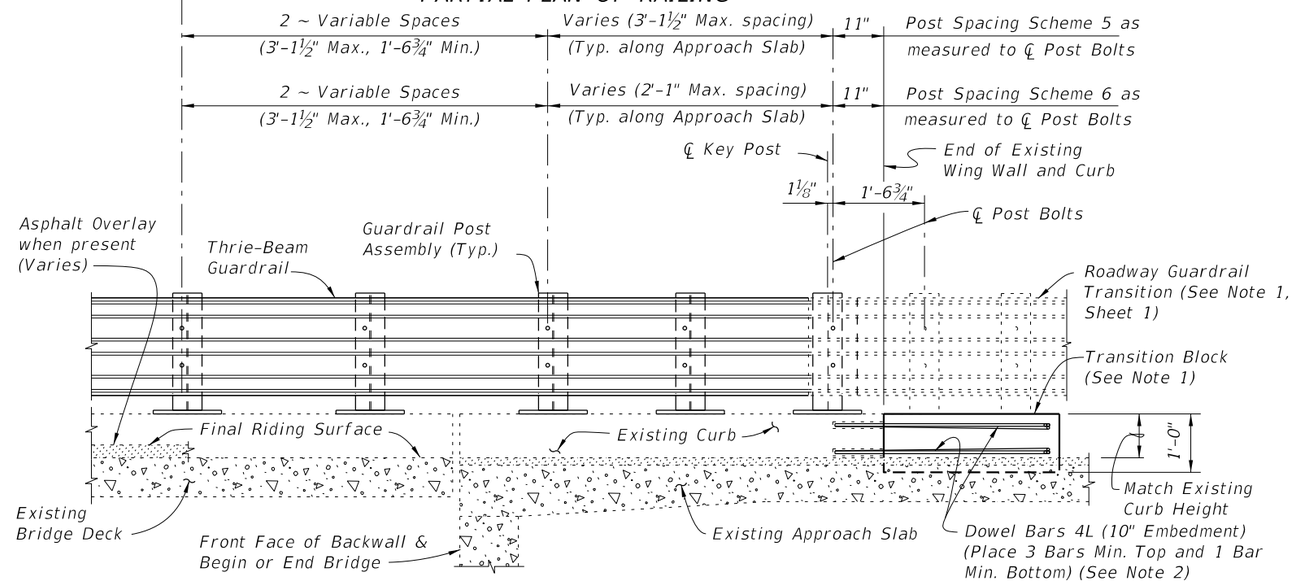


PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 3 AND 4
RAILING END TREATMENT FOR FLARED INTEGRAL CURBS



PARTIAL PLAN OF RAILING



PARTIAL ELEVATION OF INSIDE FACE OF RAILING
(Existing Wing Post and Traffic Railing not shown for clarity)

SCHEMES 5 AND 6
RAILING END TREATMENT FOR PARALLEL INTEGRAL CURBS

SCHEMES 5 AND 6 NOTES:

1. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of Transition Block or Curb shall match existing bridge curb. Transition Block may be omitted on trailing ends with no opposing traffic.

2. Field bend Dowel Bars 4L within Transition Block as required to maintain 2" top and side clearance and 3" bottom clearance.

10/24/2018 2:54:18 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
01/01/08			FDOT	FY 2019-20 STANDARD PLANS	460-476	4 of 4

TRAFFIC RAILING - (THRIE-BEAM RETROFIT) WIDE CURB TYPE 2

TRAFFIC RAILING RETROFIT NOTES

See Index 536-001 for component details, geometric layouts and associated notes not fully detailed herein.

CONCRETE: Concrete for Transition Blocks shall be Class II (Bridge Deck).

THRIE-BEAM PANEL: Steel Thrie-Beam Elements shall meet the requirements for Class B (10 Gauge) Guardrail of AASHTO M 180, Type II (Zinc coated). The minimum panel length for Thrie-Beam Elements shall be 12'-6". Field drilled holes for Post connections shall be ¾" by 2½" slotted holes.

BOLTS, NUTS AND WASHERS: Bolts, nuts and round washers shall be in accordance with AASHTO M180. Plate Washers shall be in accordance with ASTM A36 or ASTM A709 Grade 36.

COATINGS: All Nuts, Bolts, Anchors, and Washers shall be hot-dip galvanized in accordance with the Specifications.

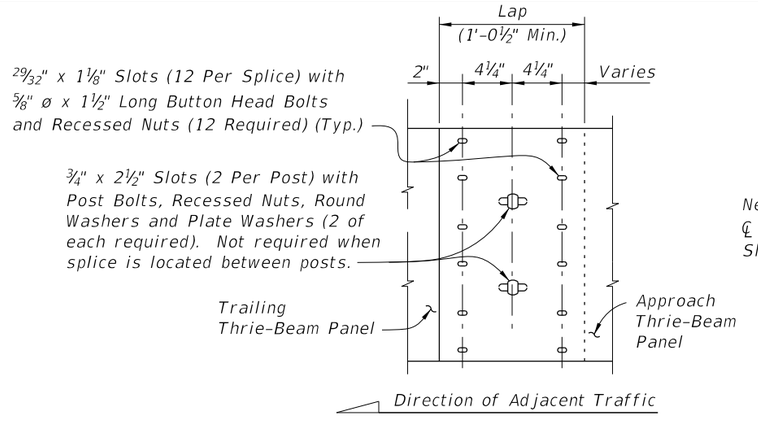
BRIDGES ON CURVED ALIGNMENTS: The details presented herein are shown for bridges on tangent alignments. Details for bridges on horizontally curved alignments are similar.

THRIE-BEAM EXPANSION SECTION: Thrie-Beam Expansion Sections shall be installed at locations shown in the Plans. Install nuts for splice bolts finger-tight at 2½" slots in thrie-beam expansion sections. Nuts shall fully engage bolts with a minimum of one bolt thread extending beyond the nuts. Distort the first thread on the outside of the nut to prevent loosening. Tighten bolts in 3¾" slots at guardrail post(s) that lie between the slotted expansion splice and bridge deck joint so that the bolt heads are in full contact with thrie-beam elements, but not so tight as to impede movement due to expansion.

WOOD BLOCKS: All wood blocks, including required wedge shaped blocks shall be Pressure Treated Lumber in accordance with Specifications Section 955. Bolt holes in blocks to be centered (±¼").

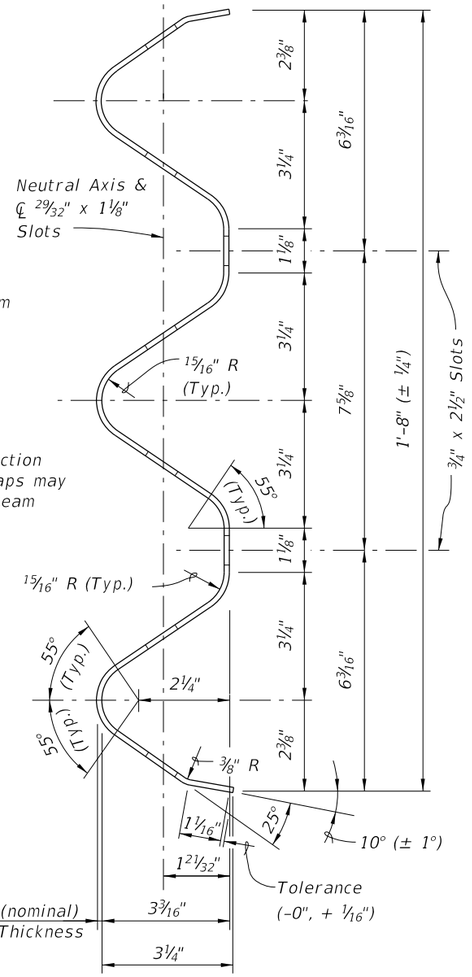
BRIDGE NAME PLATE: If a portion of the existing Traffic Railing is to be removed that carries the bridge name, number and or date, or if the installation of the Traffic Railing (Thrie-Beam Retrofit) will obscure the bridge name, number and or date, then replace the information that has been removed or obscured, with 3" tall black lettering on white nonreflective sheeting applied to the top of the adjacent guardrail. The information must be clearly visible from the right side of the approaching travel lane. The sheeting and adhesive backing shall comply with Specification Section 994 and may comprise of individual decals of letters and numbers.

PAYMENT: Payment will be made under Thrie-Beam Panel Retrofit which shall include all materials and labor required to fabricate and install the retrofit railing. Transition Blocks and Curbs, Bridge Name Plate and Barrier Delineators, where required, will not be paid for directly but shall be considered incidental work.

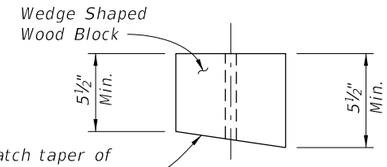


THRIE-BEAM PANEL SPLICE

NOTE: All Thrie Beam Panels shall be lapped in the direction of adjacent traffic. At the Contractor's option, laps may be extended. Field drill holes in Trailing Thrie-Beam Panel as required.



TYPICAL SECTION THRU CLASS B (10 GAUGE) THRIE-BEAM PANEL (EXPANSION SECTION SIMILAR)



PLAN VIEW

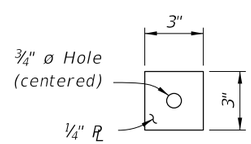
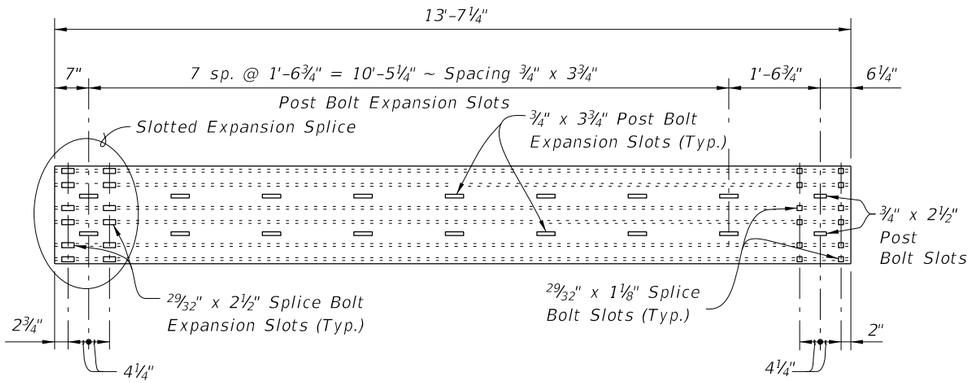
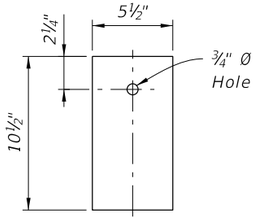


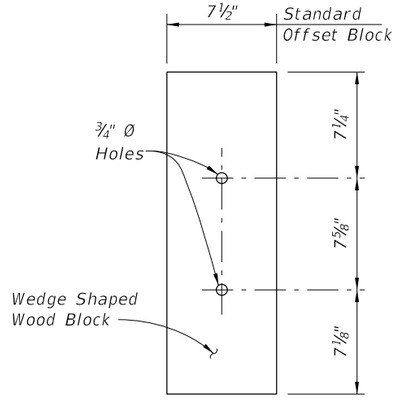
PLATE WASHER DETAIL



THRIE-BEAM EXPANSION SECTION

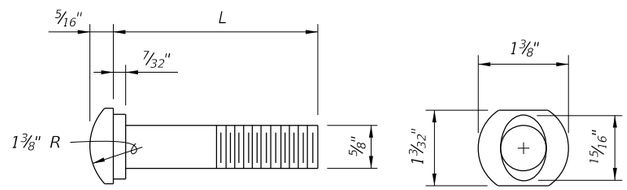


1" WOOD BLOCK



FRONT VIEW

WEDGE SHAPED BLOCK DETAIL



⅝" OVAL SHOULDER BUTTON HEAD BOLT

L (in)	THREAD LENGTH (in)	APPLICATION
1½	Full Length	Splice Bolt
14	4	Post Bolt

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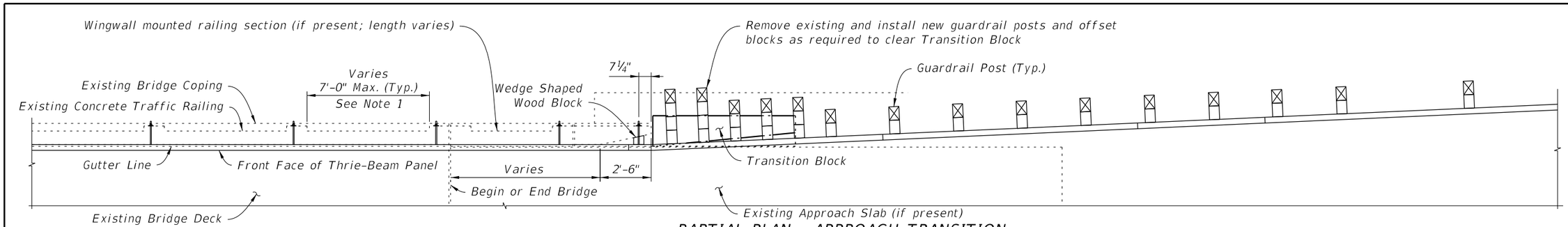
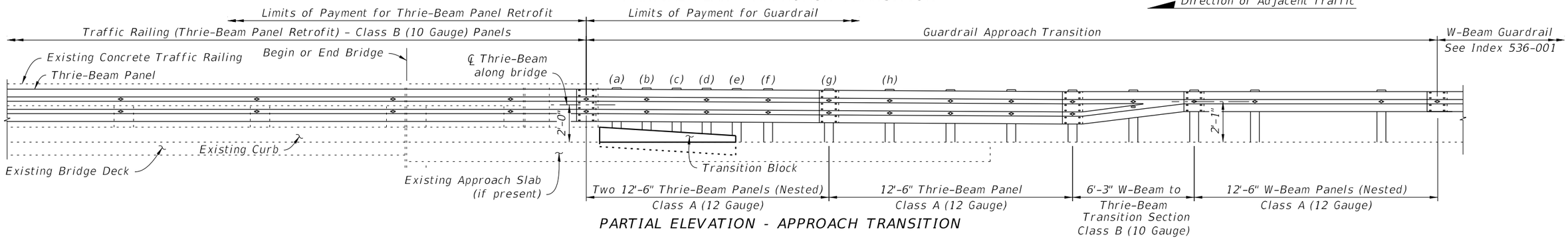
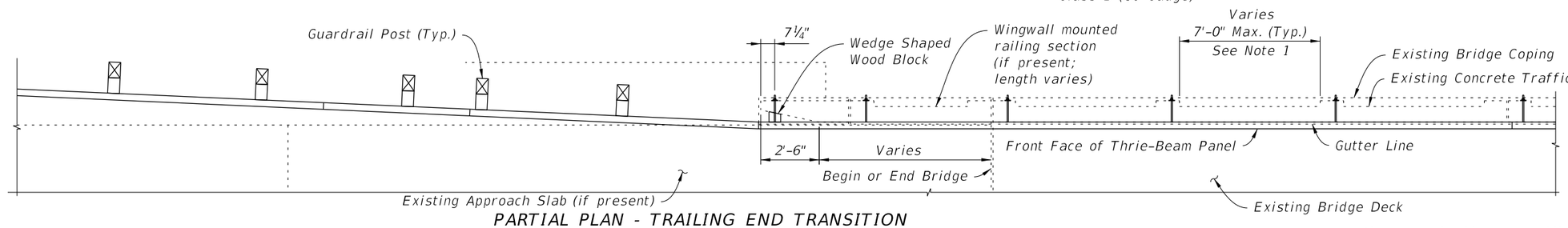


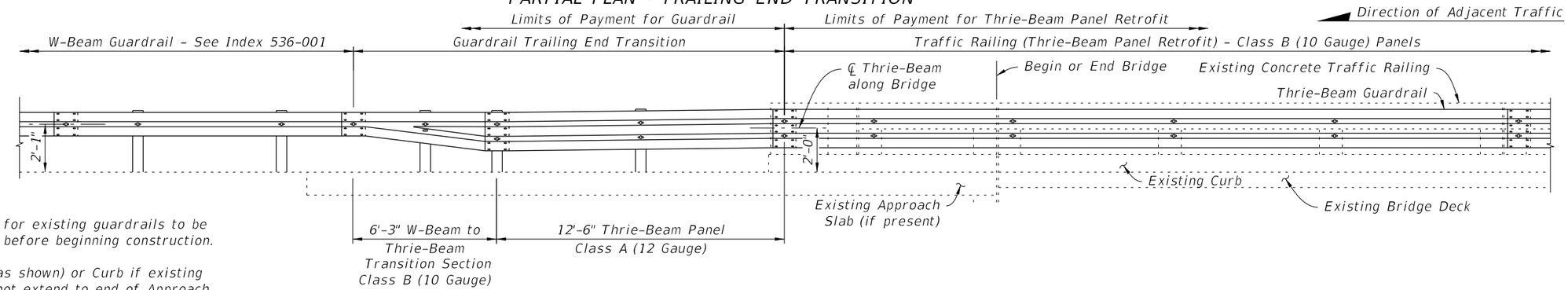
PARTIAL PLAN - APPROACH TRANSITION



PARTIAL ELEVATION - APPROACH TRANSITION



PARTIAL PLAN - TRAILING END TRANSITION



PARTIAL ELEVATION - TRAILING END TRANSITION

NOTES:

1. Dimensions and elevations for existing guardrails to be verified by the Contractor before beginning construction.
2. Provide Transition Block (as shown) or Curb if existing Approach Slab Curb does not extend to end of Approach Slab. Shape and height of the traffic face of Transition Block or Curb shall match existing bridge curb. See Sheet 4 for Transition Block details. Block may be omitted on trailing ends with no opposing traffic.
3. Do not bolt nested rails to the blocks and posts at posts (a), (c) & (e).

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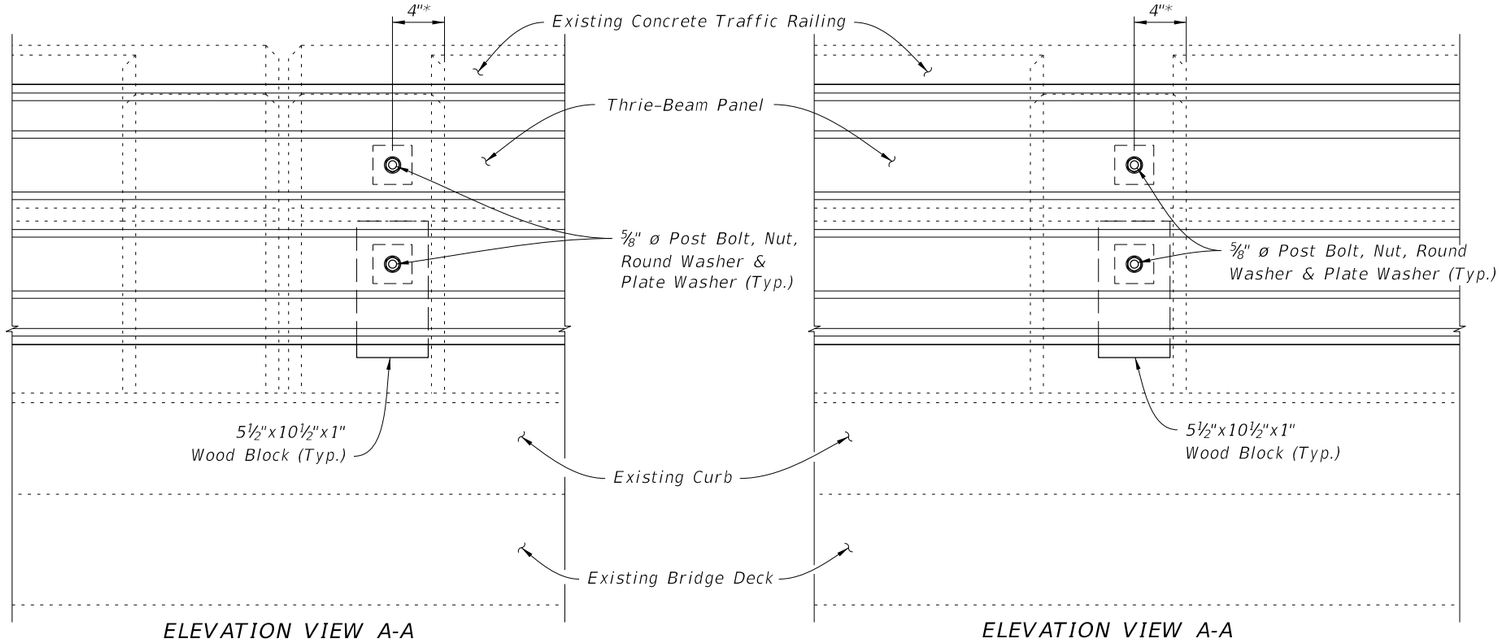
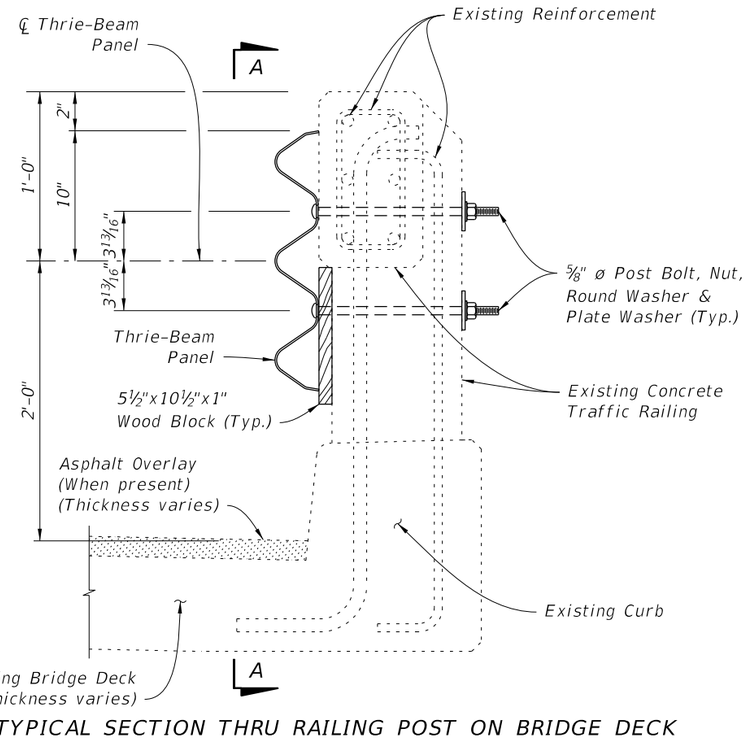


ELEVATION VIEW A-A
(At Double Posts)

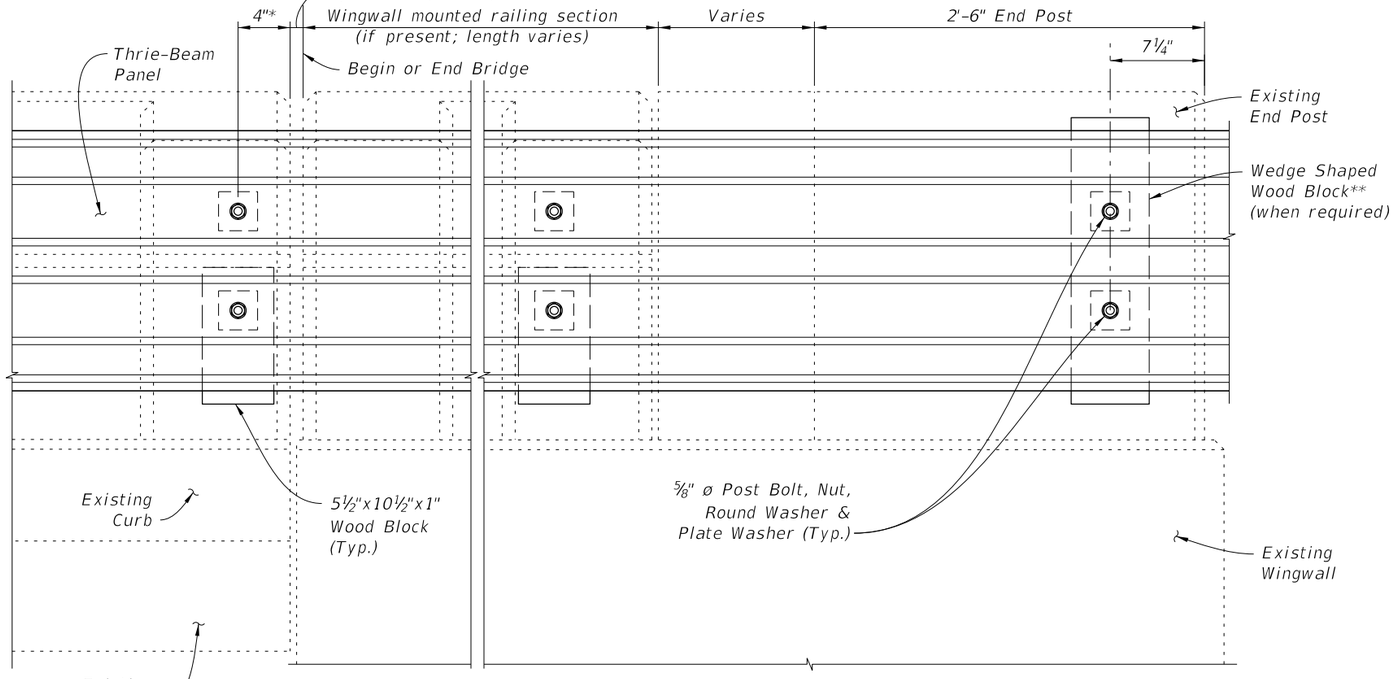
(View at Intermediate Double Posts shown; View at Expansion Joints similar)

ELEVATION VIEW A-A
(At Single Post)

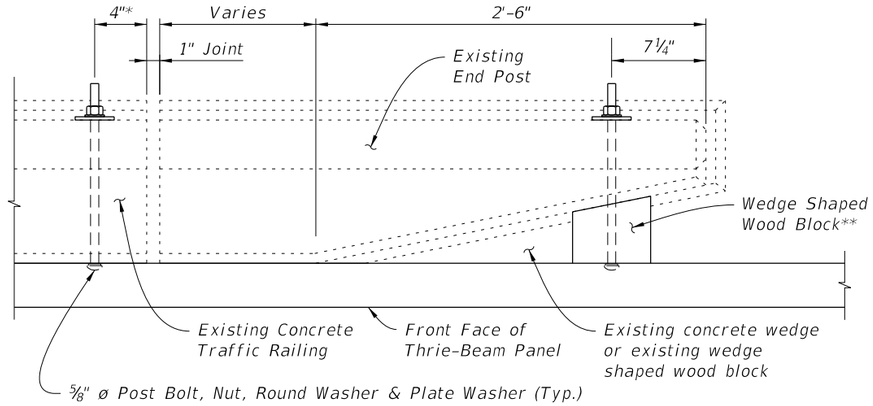
* Measured from edge of existing Post. Bolts may be installed at either side of any Post.



TYPICAL SECTION THRU RAILING POST ON BRIDGE DECK



ELEVATION VIEW A-A
(At End Post)



PLAN OF END POST

NOTES:

1. Post Bolts shall be 5/8" ø x 14" long set in 7/8" ø core drilled holes, see Sheet No. 1.
2. Shift Post Bolt holes minimally inward toward center of posts if existing reinforcement is encountered during drilling of holes. If reinforcement is still encountered, notify the Engineer before proceeding with drilling.
3. Post Bolt spacing not to exceed 8'-0" (± 1").

** For End Posts with an existing wedge shaped wood block, remove existing wood block and replace with new Wedge Shaped Wood Block (See Sheet 1 for notes and details).

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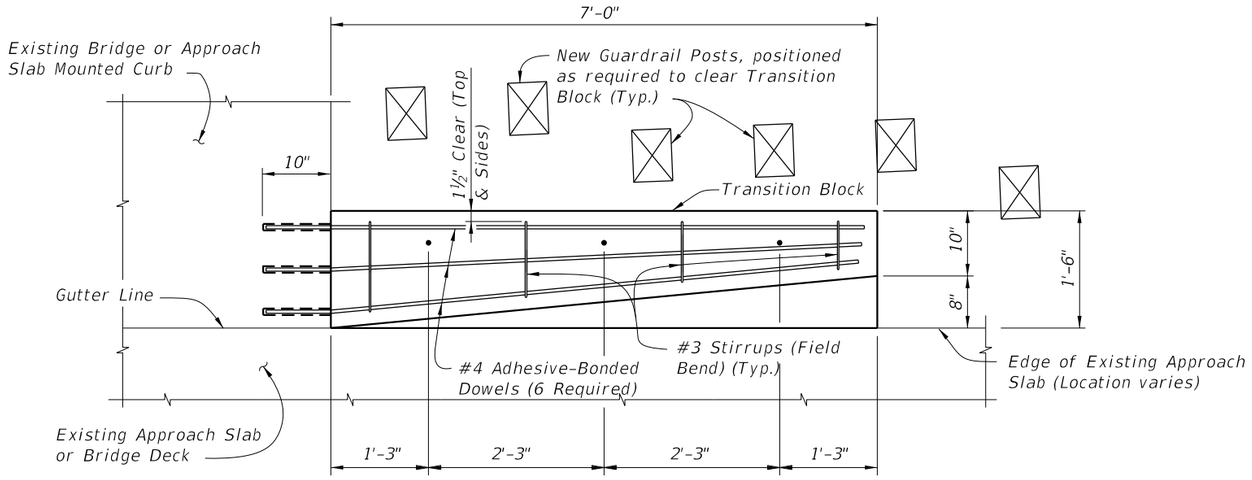
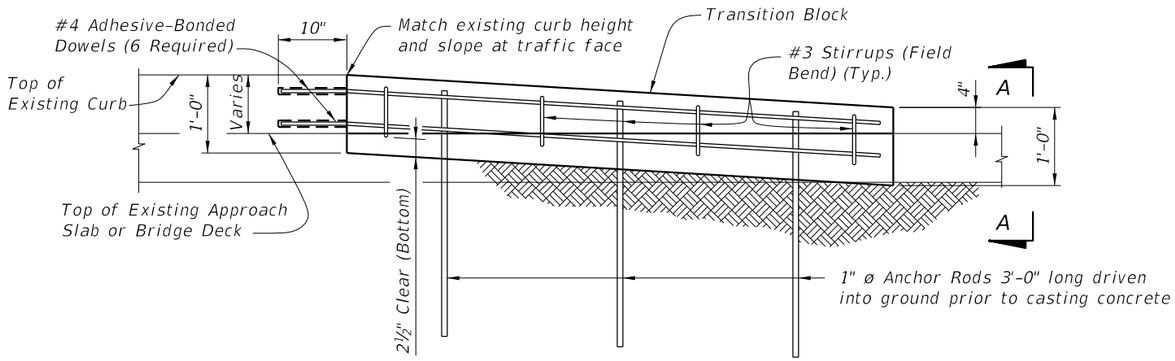
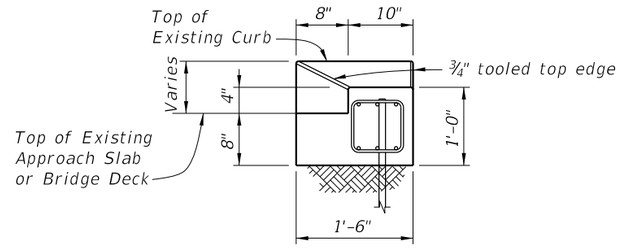


PLAN VIEW OF TRANSITION BLOCK
(GUARDRAIL NOT SHOWN FOR CLARITY)

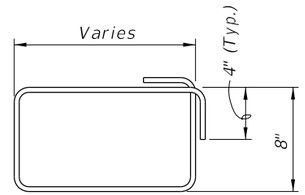


ELEVATION OF TRANSITION BLOCK
(GUARDRAIL AND POSTS NOT
SHOWN FOR CLARITY)

ESTIMATED QUANTITIES PER TRANSITION BLOCK		
ITEM	UNIT	QUANTITY
Concrete Class II (Bridge Deck)	CY	0.4
Reinforcing Steel	LB	61
Guardrail (Reset)	LF	12.5



END VIEW A-A



#3 STIRRUP (FIELD BEND)

NOTES:

ANCHOR RODS: Steel Anchor Rods shall be ASTM A36, ASTM A709 Grade 36 or ASTM A615 Grade 60 hot-dip galvanized in accordance with Specification Section 962.

ADHESIVE-BONDED DOWELS: Adhesive Bonding Material Systems for Dowels shall comply with Specification Section 937 (Type HV) and be installed in accordance with Specification Section 416.

Adhesive Bonded Dowels are shown installed in an existing curb or sidewalk integrally reinforced with Approach Slab, Wingwall or Bridge Deck. For installations in existing detached curbs or sidewalks, install dowels in available sound concrete.

Shift bars (as needed) to install six dowels into existing bridge or approach slab mounted curb.

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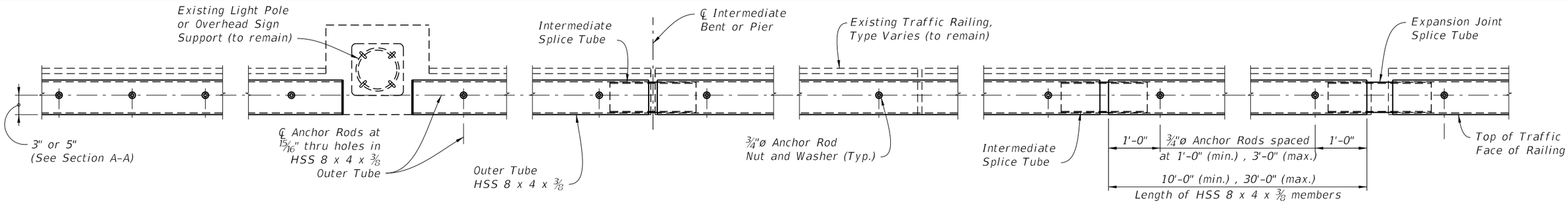
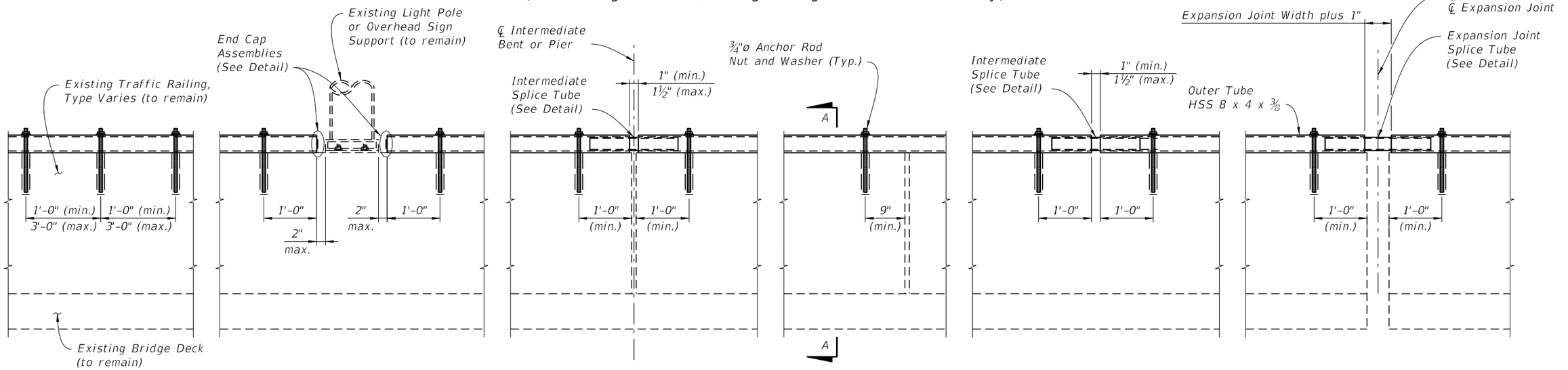


AT INTERMEDIATE (TYPICAL) LOCATIONS | AT LIGHT POLES AND OVERHEAD SIGN SUPPORTS | AT INTERMEDIATE BENTS OR PIERS WITH CONTINUOUS DECK | AT INTERMEDIATE OPEN JOINTS IN RAILING | AT OUTER TUBE SPLICE LOCATIONS | AT BRIDGE DECK EXPANSION JOINTS

PLAN
(Reinforcing Steel in Existing Railing not shown for clarity)



AT INTERMEDIATE (TYPICAL) LOCATIONS | AT LIGHT POLES AND OVERHEAD SIGN SUPPORTS | AT INTERMEDIATE BENTS OR PIERS WITH CONTINUOUS DECK | AT INTERMEDIATE OPEN JOINTS IN RAILING | AT OUTER TUBE SPLICE LOCATIONS | AT BRIDGE DECK EXPANSION JOINTS

ELEVATION
(Reinforcing Steel in Existing Railing not shown for clarity)
(Railing on Bridge Deck shown, Railing on Approach Slab and Retaining Wall similar)

GENERAL NOTES

HSS TUBES: HSS Tubes shall be ASTM A500 Grade B.

END CAPS AND END TAPER ASSEMBLIES: Steel plate for End Caps and End Taper Assemblies shall be ASTM A709 Grade 36.

ANCHOR RODS, NUTS AND WASHERS: Adhesive Bonded anchors shall be fully shall be threaded rods in accordance with ASTM F1554 Grade 36 or ASTM A193 Grade B7. All Nuts shall be single self-locking hex nuts and in accordance with ASTM A563 or ASTM A194. Flat Washers shall be in accordance with ASTM F436. After the nuts have been snug tightened, distort the anchor rod threads to prevent removal of the nuts. Coat distorted threads and the exposed trimmed ends of anchor rods with a galvanizing compound in accordance with the Specifications.

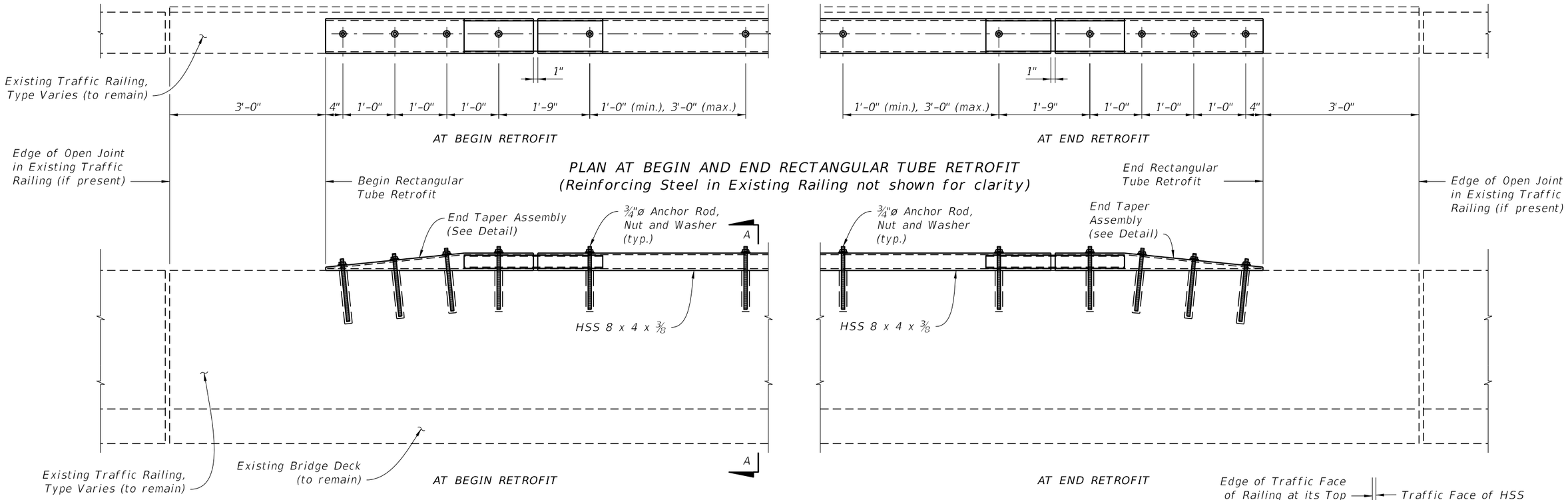
COATINGS: Galvanize all Anchor Rods, Nuts, Bolts, Washers and HSS Tube Assemblies in accordance with the Specifications. Hot-dip HSS Tubes and Tube Assemblies after fabrication.

ADHESIVE-BONDED ANCHORS AND DOWELS: Adhesive Bonding Material Systems for Anchor Rods shall comply with Specification Section 937 and be installed in accordance with Specification Section 416. The field testing proof loads required by Specification Section 416 shall be 10,000 lbs.

INSTALLATIONS ON CURVED ALIGNMENTS AND GRADES: The details presented in this Standard are shown for installations on tangent alignments and constant grades except as shown in the Offset Detail for Retrofit Installations on Horizontally Curved Alignments. Details for installations on horizontally curved alignments and or vertically curved profiles are similar. Straight sections of HSS Tube may be installed in a chorded manner within the offset limit shown in the Offset Detail for Retrofit Installations on Horizontally Curved Alignments. Shop bend HSS Tubes for use on horizontally curved alignments where the offset limit shown cannot be met using straight sections of HSS Tube. Straight and horizontally curved sections of HSS Tube may be field bent during installation for use on vertically curved profiles.

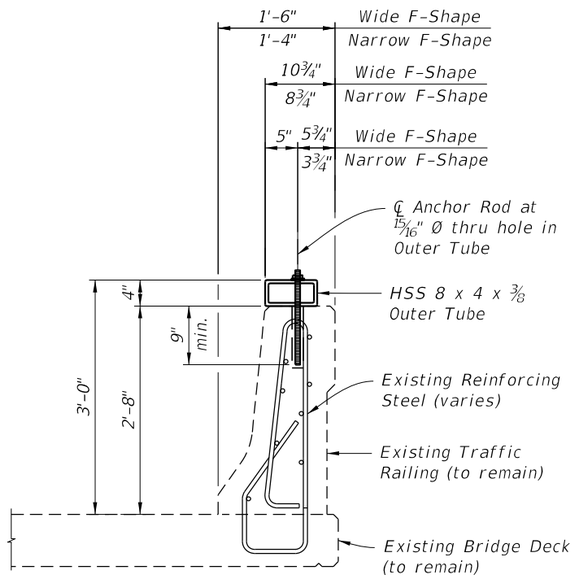
SHOP DRAWINGS: Submit shop drawings and obtain approval prior to fabrication in accordance with Specification Section 5. Show project specific geometry (line and grade) and bolt hole, expansion joint and splice locations. Include other project specific details as required.

PAYMENT: Payment will be made under Metal Traffic Railing (Rectangular Tube Retrofit) which shall include all materials and labor required to fabricate and install the Rectangular Tube Retrofit.

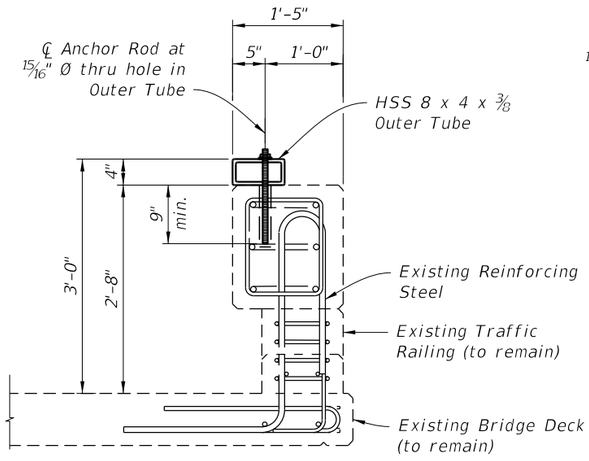


PLAN AT BEGIN AND END RECTANGULAR TUBE RETROFIT
(Reinforcing Steel in Existing Railing not shown for clarity)

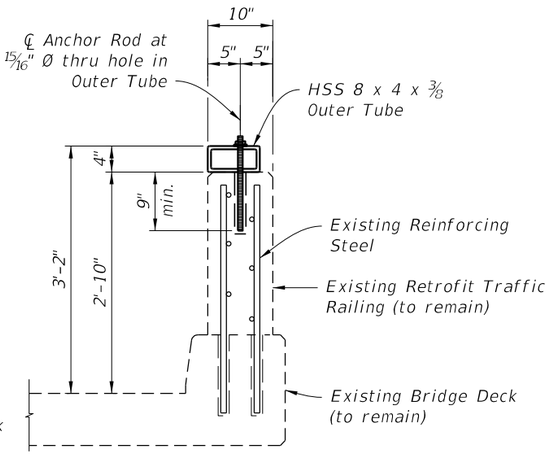
ELEVATION AT BEGIN AND END RECTANGULAR TUBE RETROFIT
(Reinforcing Steel in Existing Railing not shown for clarity)
(Railing on Bridge Deck shown, Railing on Approach Slab and Retaining Wall similar)



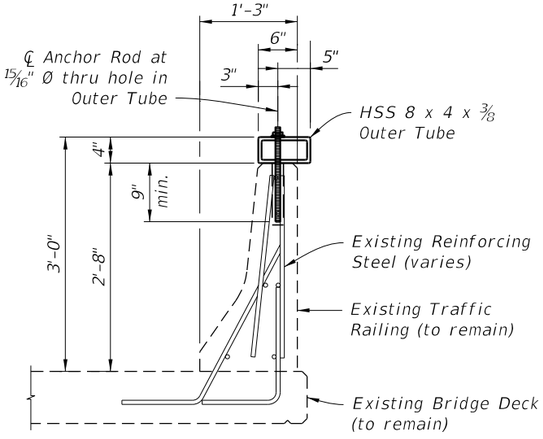
SECTION A-A
F-Shape Traffic Railing



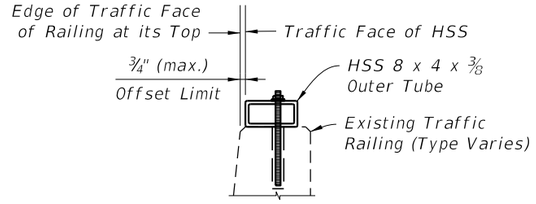
SECTION A-A
Corral Shape Traffic Railing



SECTION A-A
Vertical Face Retrofit Traffic Railing



SECTION A-A
New Jersey Shape Traffic Railing



OFFSET DETAIL FOR INSTALLATIONS ON HORIZONTAL CURVES

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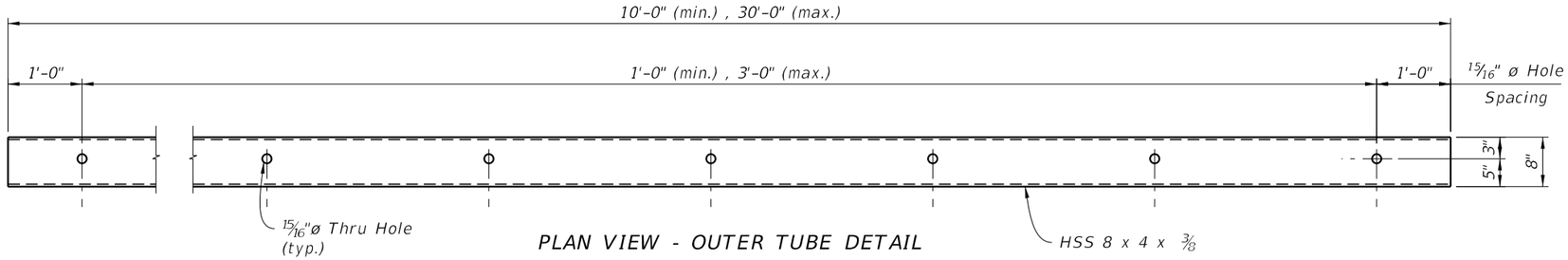
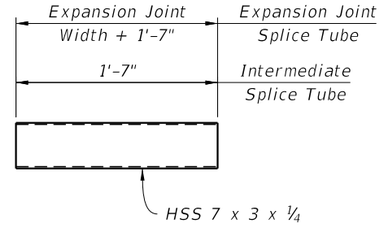
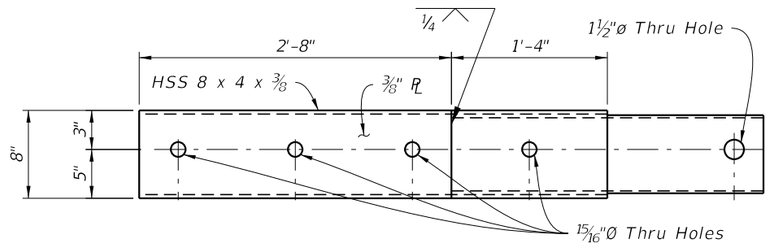
11/01/17			FDOT FY 2019-20 STANDARD PLANS	TRAFFIC RAILING - (RECTANGULAR TUBE RETROFIT)	460-490	2 of 3



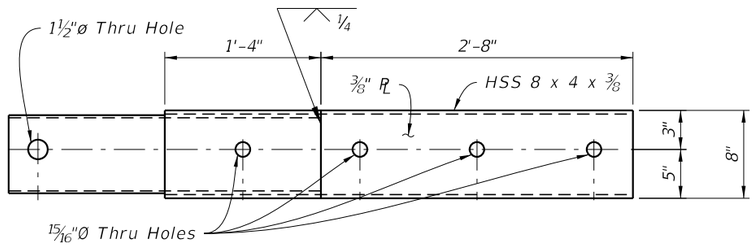
PLAN VIEW - OUTER TUBE DETAIL



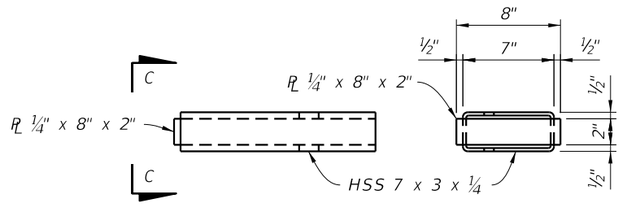
SPLICE TUBE DETAIL



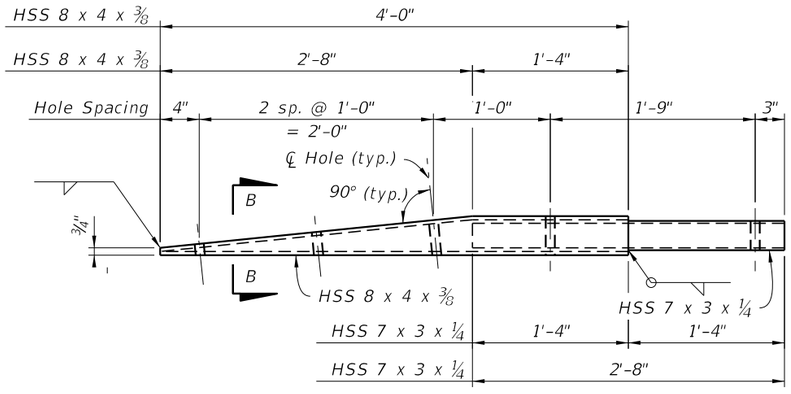
PLAN



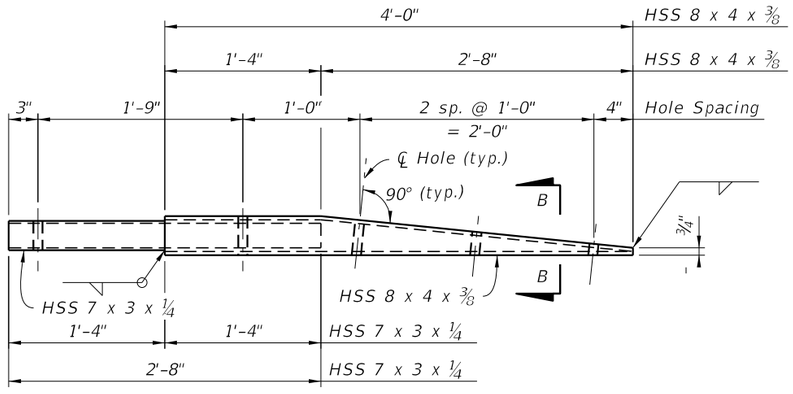
PLAN



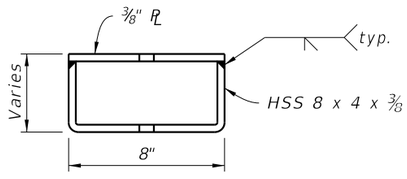
ELEVATION VIEW C-C



ELEVATION

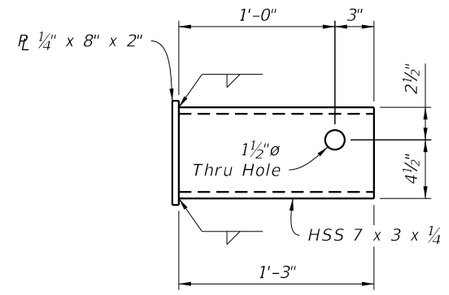


ELEVATION



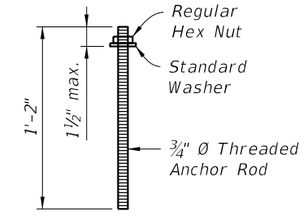
SECTION B-B

TAPERED END ASSEMBLY DETAIL



PLAN

END CAP ASSEMBLY DETAIL



ANCHOR RODS

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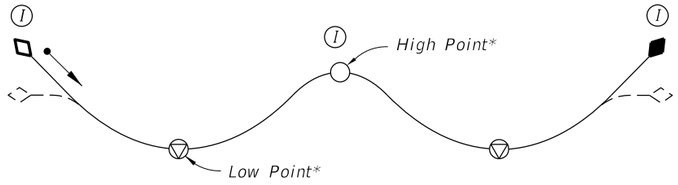
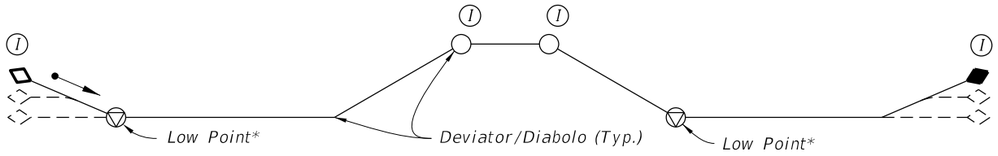
TYPICAL PROFILES FOR TENDONS WITH FLEXIBLE FILLER



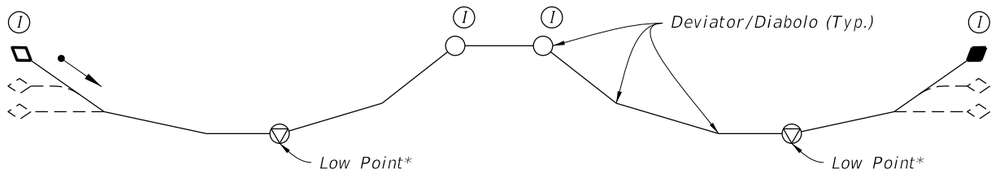
Profile F1

(2 Span Profile shown; Profiles for 3 or more Spans similar)



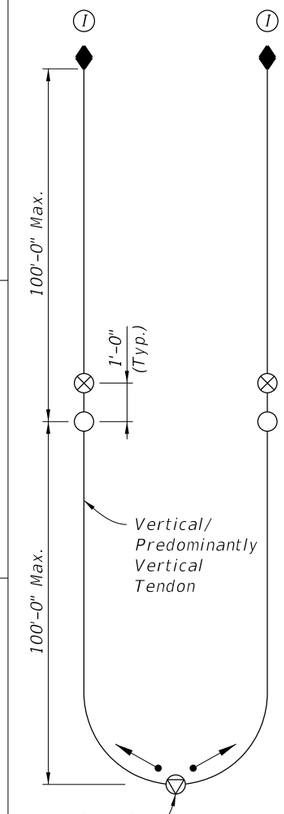
Profile F2

(2 Span Profile shown; Profiles for 3 or more Spans similar)

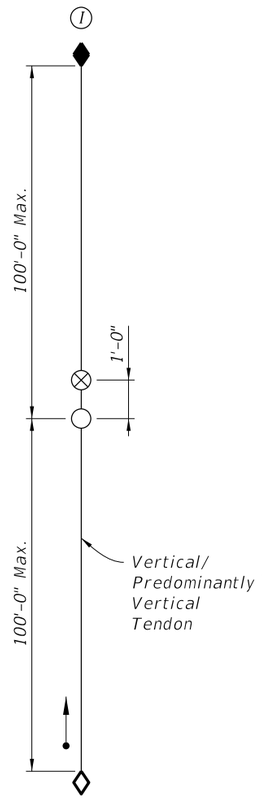


Profile F3

(2 Span Profile shown; Profiles for 3 or more Spans similar)



Profile F8

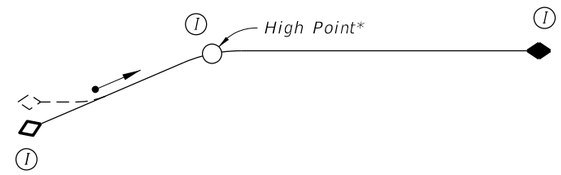


Profile F9

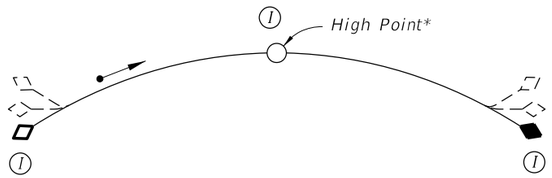
LEGEND:

- Strand, Wire or Bar Tendon
- Anchorage with Filler Inlet at lower end of Tendon
- Anchorage with Filler Outlet at higher end of Tendon
- Alternate tendon profile immediately adjacent to Anchorage
- Supplementary Filler Inlet
- Filler Port / Outlet
- Drain (See Specifications Section 462 for additional Drain location requirements)
- Direction of Filler Flow
- I Inspection Location

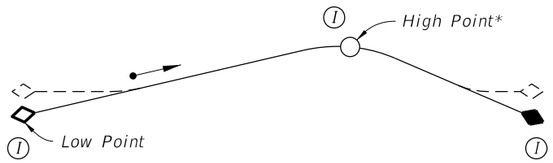
* Adjust location to coincide with the true high or low point(s) of the tendon.



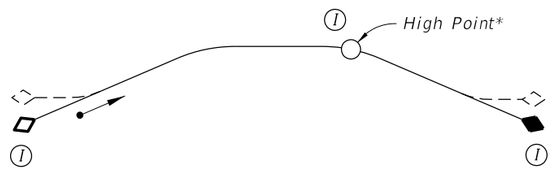
Profile F12



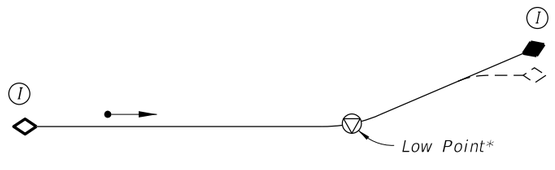
Profile F4



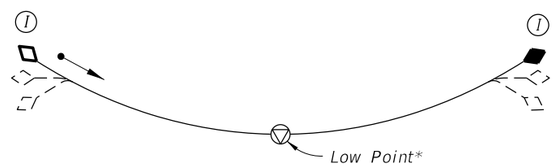
Profile F6



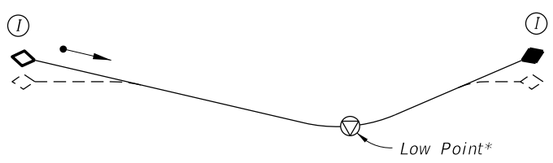
Profile F10



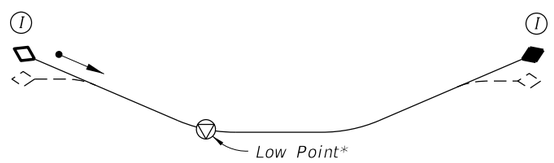
Profile F13



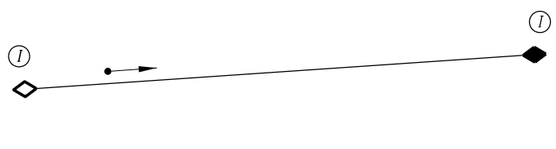
Profile F5



Profile F7



Profile F11



Profile F14

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LAST REVISION	REVISION	DESCRIPTION:	FY 2019-20 STANDARD PLANS	POST-TENSIONING TENDON PROFILES	INDEX	SHEET
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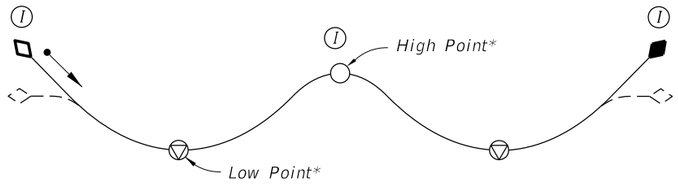
TYPICAL PROFILES FOR TENDONS WITH GROUT FILLER

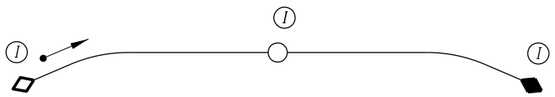


Profile G1

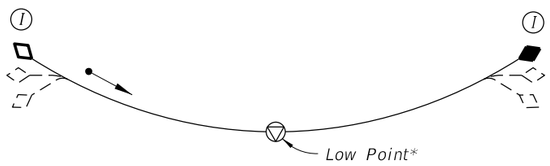
(2 Span Profile shown; Profiles for 3 or more Spans similar)

Profile G2

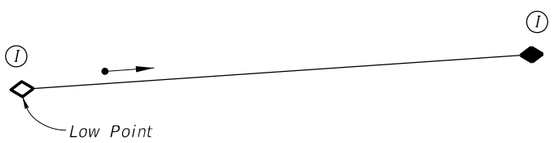
(Profile for Single Cell Box shown; Profiles for Multiple Cell Boxes similar)



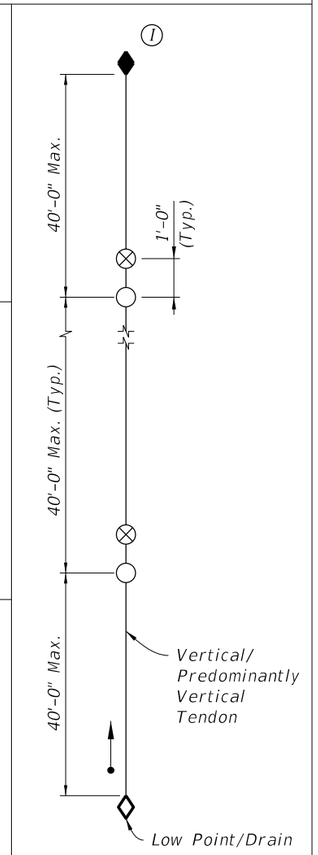
Profile G3



Profile G4



Profile G5



Profile G6

NOTE: See Sheet 1 of 2 for Typical Profiles for Tendons with Flexible Filler and for Legend of Symbols.

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LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2019-20 STANDARD PLANS	POST-TENSIONING TENDON PROFILES	INDEX	SHEET
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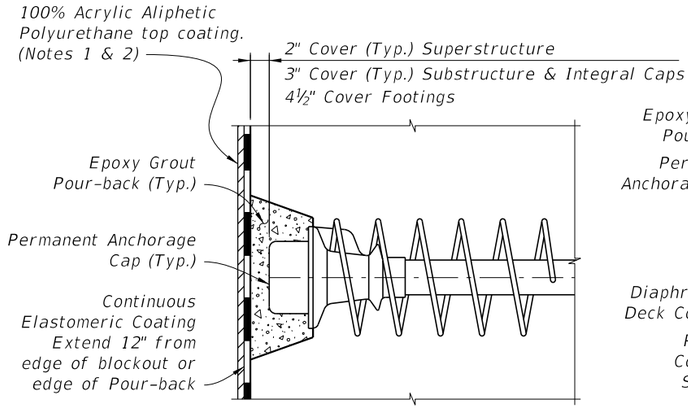
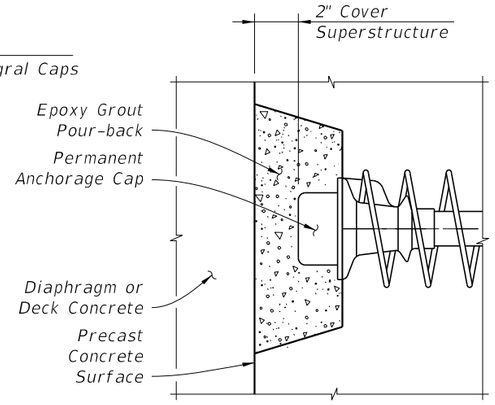
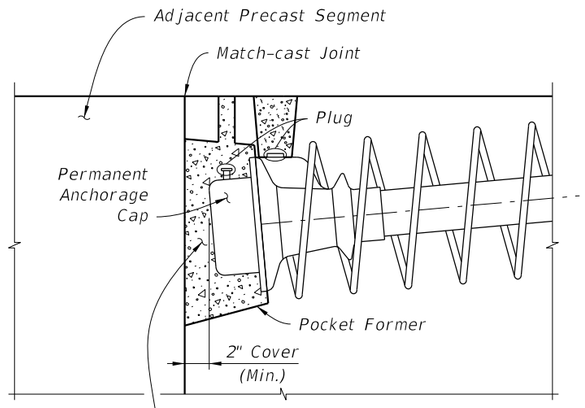


TYPE 1

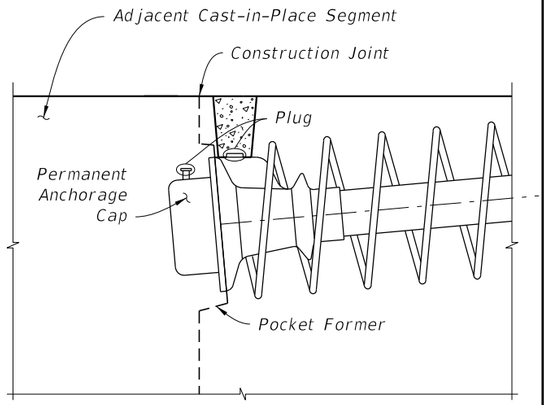


TYPE 2



Epoxy Grout Pour-back placed after permanent tendons anchored in adjacent segment have been stressed

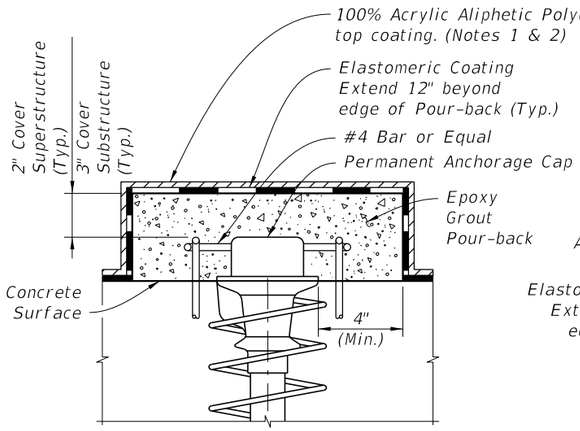
TYPE 3A



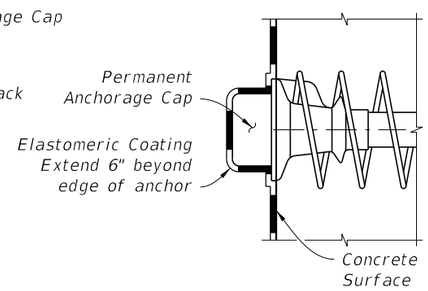
TYPE 3B

Notes:

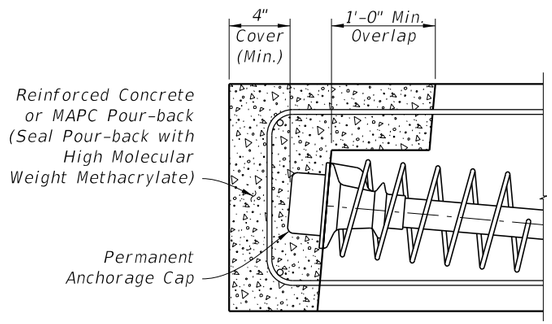
1. Meet the requirements of Specification Section 975-5.
2. Extend top coat 1" beyond limits of Elastomeric Coating.



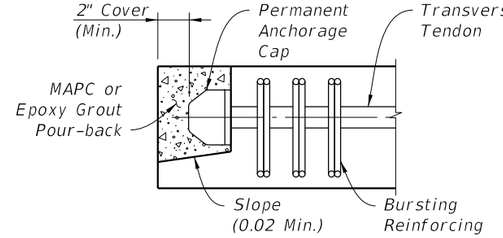
TYPE 4



TYPE 5



TYPE 6

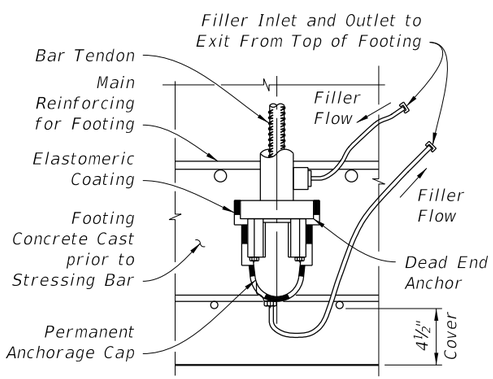


TYPE 7

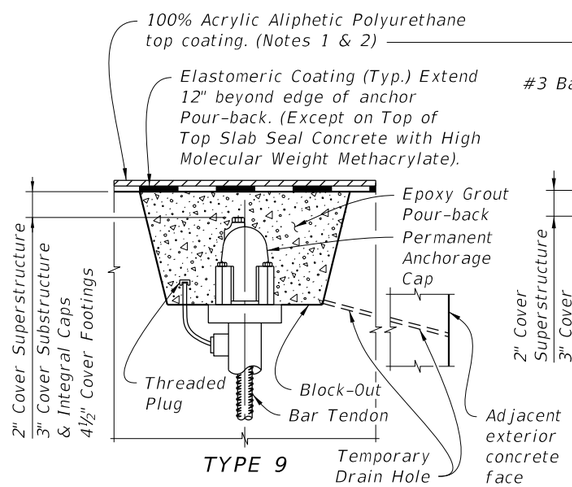
Type 7 Notes:

1. Traffic or Pedestrian/Bicycle Railing not shown for clarity.
2. Where Pour-back is not protected by Traffic or Pedestrian/Bicycle Railing, Coat Pour-back with High Molecular Weight Methacrylate.

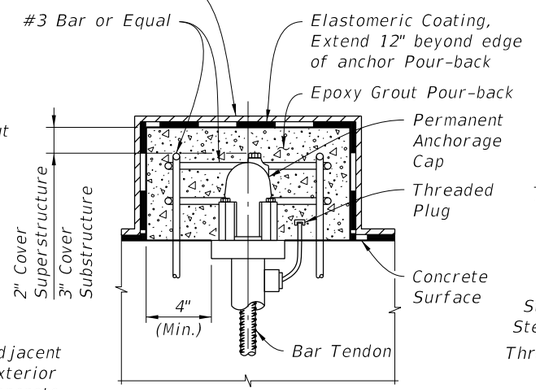
ANCHORAGE PROTECTION FOR STRAND TENDONS



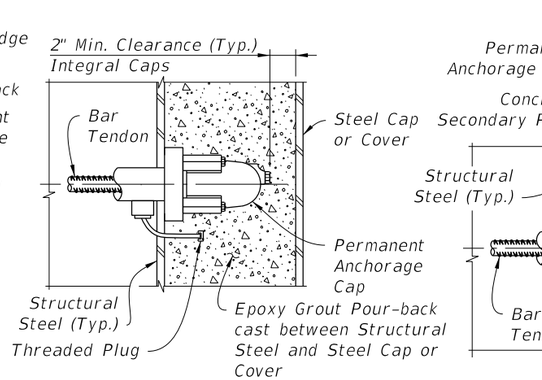
TYPE 8



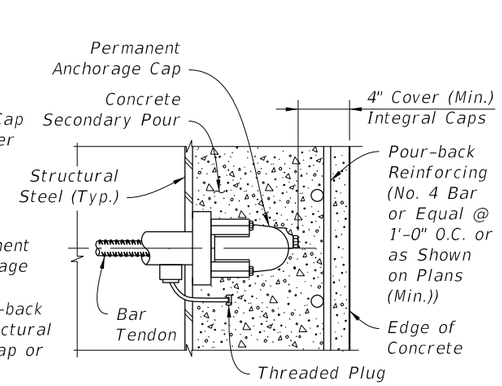
TYPE 9



TYPE 10



TYPE 11
(Shear Studs not Shown for Clarity)



TYPE 12
(Shear Studs not Shown for Clarity)

ANCHORAGE PROTECTION FOR BAR TENDONS

LAST REVISION	REVISION	DESCRIPTION:				
11/01/18			FDOT FY 2019-20 STANDARD PLANS	POST-TENSIONING ANCHORAGE PROTECTION	INDEX 462-002	SHEET 1 of 1

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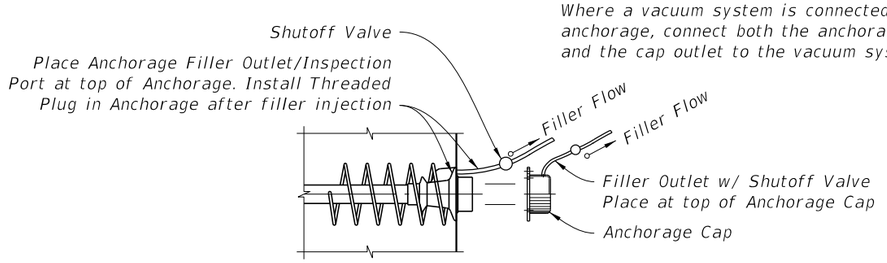
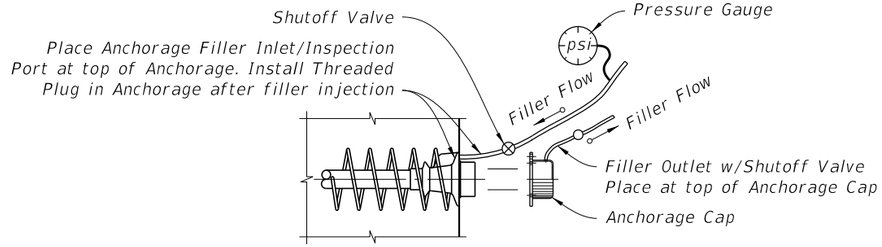
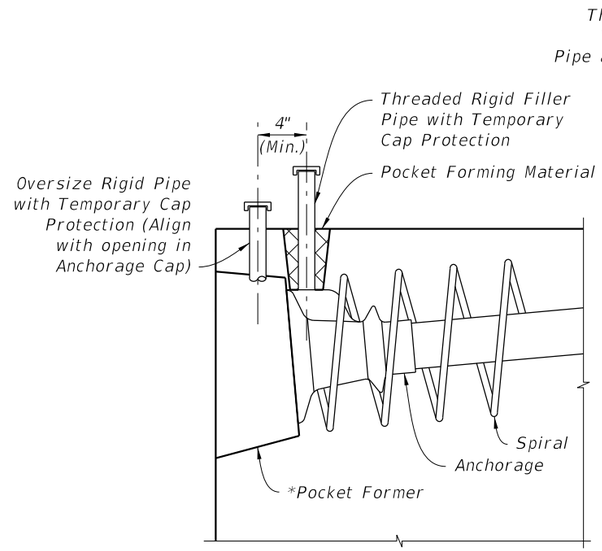
NOTE:
Where a vacuum system is connected to an anchorage, connect both the anchorage outlet and the cap outlet to the vacuum system.



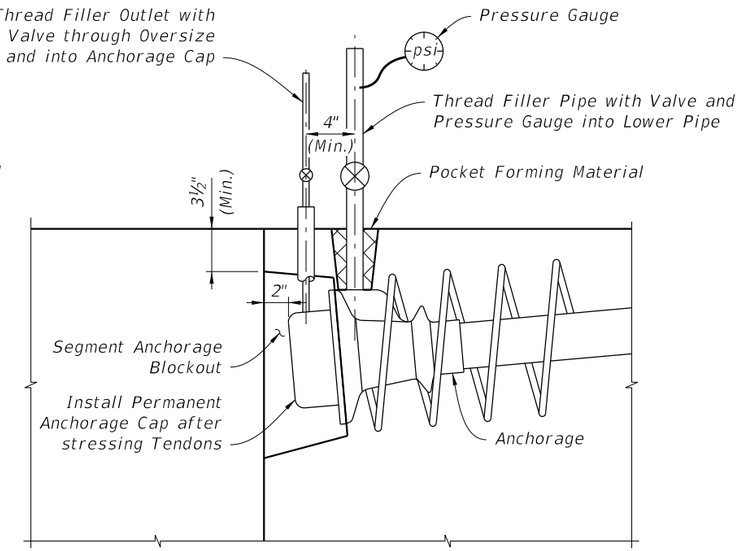
FACE INSPECTED
ANCHORAGE WITH FILLER OUTLET



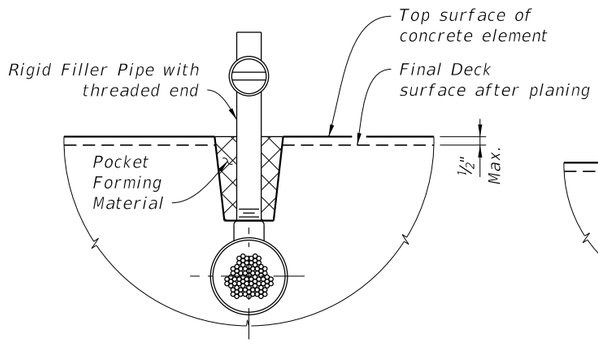
FACE INSPECTED
ANCHORAGE WITH FILLER INLET



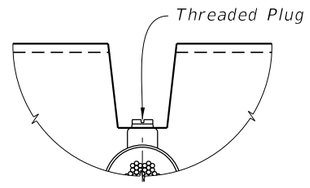
1 INSTALLATION & SHIPPING



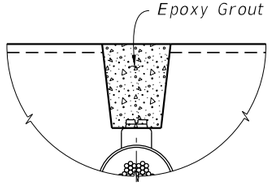
2 FILLER INJECTION



1 FILLER OUTLET CONNECTION TO DUCT



2 POCKET PREPARATION

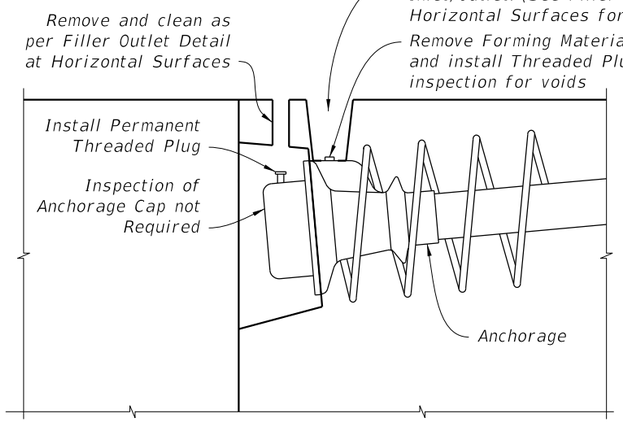


3 FILLING POCKET

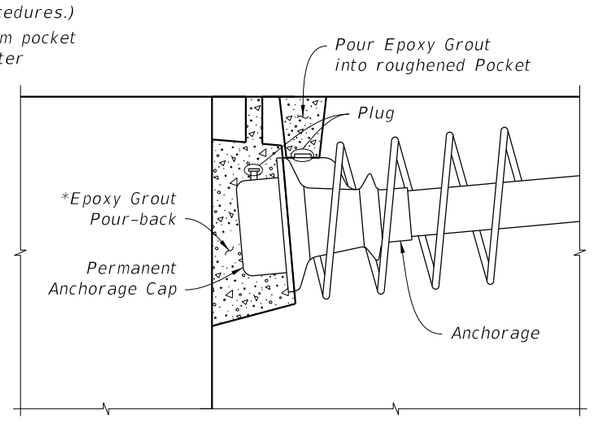
PROCEDURE:

1. After filler injection is completed, Remove Pocket Forming Material and Rigid Filler Pipe.
2. Inspect Tendon for voids as necessary.
3. Vacuum inject as required. If grout is used, allow grout to cure. If flexible filler is used, replace filler displaced by inspection. Remove pipe used for vacuum injecting.
4. Clean threads and rethread as required.
5. Install Threaded Plug into Outlet to form a tight fit.
6. Clean and roughen sides of pocket.
7. Fill Pocket with Epoxy Grout.

FILLER OUTLET DETAIL AT HORIZONTAL SURFACES



3 INSPECTION



4 PROTECTION

TOP INSPECTED ANCHORAGE WITH FILLER INLET INSTALLATION, FILLER INJECTION, INSPECTION & PROTECTION

NOTES:

1. Holes used for the Inspection and Filler Inlets/Outlets may be formed using tapered pipes or mandrels.
2. Where a vacuum system is connected to an anchorage, connect both the anchorage outlet and the cap outlet to the vacuum system.

* Round ◯ Pocket Former – Gravity fed placement of epoxy grout acceptable
Modified Square ⬠ Pocket Former – Gravity fed placement of epoxy grout acceptable
Square ☐ Pocket Former – Vacuum epoxy grouting required

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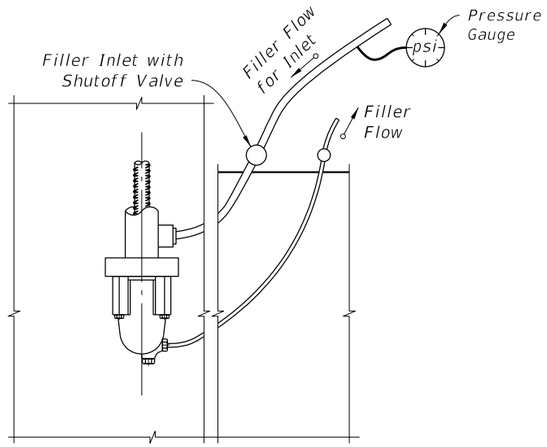
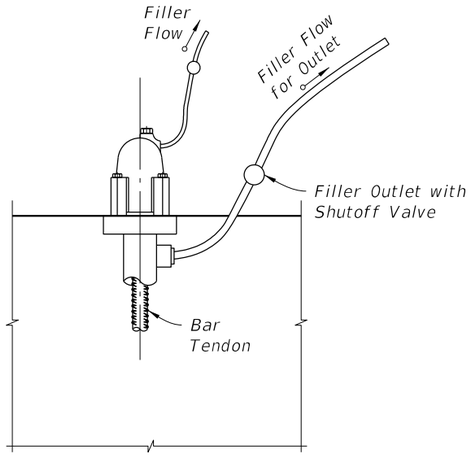
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/18			FY 2019-20 STANDARD PLANS	POST-TENSIONING ANCHORAGE AND TENDON FILLING DETAILS	462-003	1 of 2



INLET END

(EMBEDDED ANCHORAGE SHOWN; ANCHORAGE AT CONCRETE SURFACE SIMILAR)

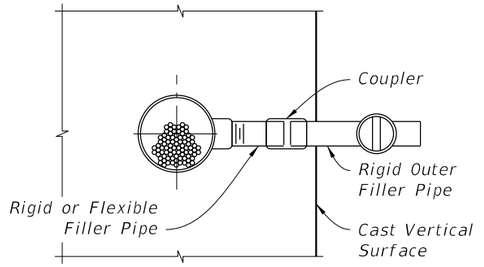


OUTLET END

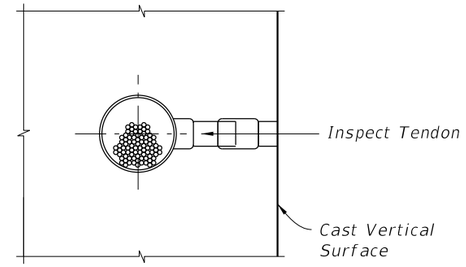
NOTES:
1. Anchor or Nut to allow for flow of Filler into Cap.
2. Where a vacuum system is connected to an anchorage, connect both the anchorage outlet and the cap outlet to the vacuum system.

FILLER INLET AND OUTLET DETAILS FOR BAR TENDONS

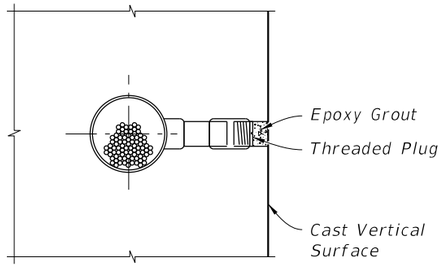
(VERTICALLY ORIENTED TENDON SHOWN; HORIZONTALLY ORIENTED TENDON SIMILAR)



1 FILLER OUTLET CONNECTION TO TENDON



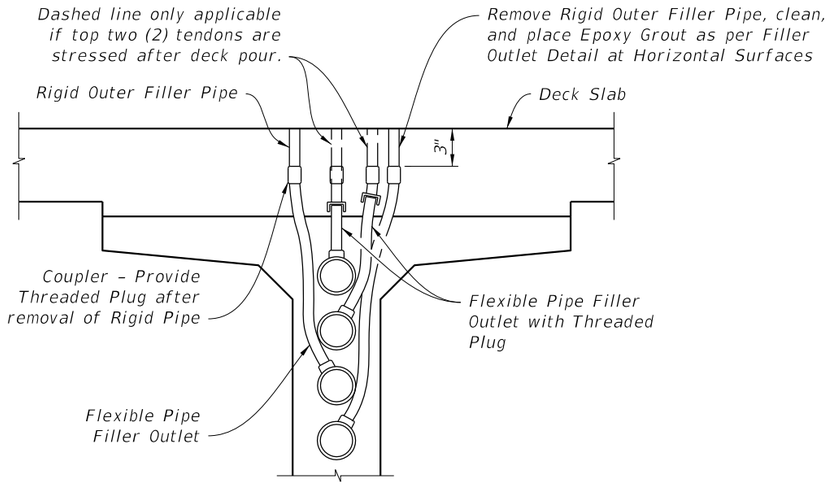
2 POCKET PREPARATION



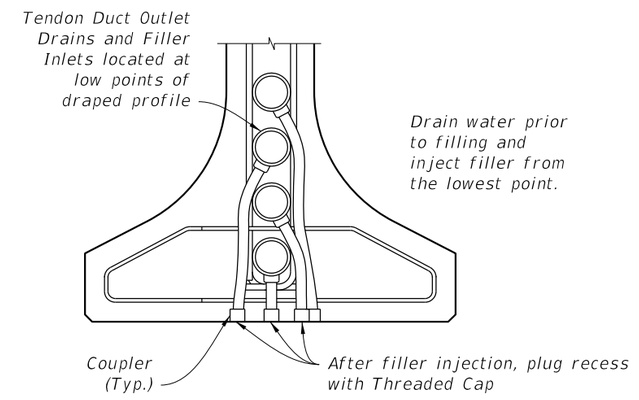
3 FILLING POCKET

PROCEDURE:
1. Remove Rigid Filler Pipe or drill Grout in flexible pipe.
2. Inspect tendon for voids.
3. Vacuum inject as required. If grout is used, allow grout to cure. If flexible filler is used, replace filler displaced by inspection. Remove pipe used for vacuum injecting.
4. Install Threaded Plug into Outlet to form a tight fit.
5. Over-ream hole (¼" Ø over-ream). Clean and roughen sides.
6. Fill pocket with epoxy grout.

FILLER OUTLET DETAIL AT VERTICAL SURFACES



TENDONS AT HIGH POINTS AND
3' FROM HIGH POINTS (FILLER OUTLET)



TENDONS AT LOW POINTS
(FILLER INLET / DRAIN)

FILLER INLET AND OUTLET DETAILS FOR I-GIRDERS

DETAILS FOR C.I.P. BOXES WITH INTERNAL TENDONS SIMILAR. WEB REINFORCING NOT SHOWN FOR CLARITY.

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LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2019-20 STANDARD PLANS	POST-TENSIONING ANCHORAGE AND TENDON FILLING DETAILS	INDEX 462-003	SHEET 2 of 2

GENERAL NOTES:

U.S. COAST GUARD NOTIFICATION: Notify the local office of the U.S. Coast Guard at least 30 days prior to beginning of construction of the Fender System.

14" SQUARE PRESTRESSED CONCRETE PILES – Provide 14" Square Prestressed Concrete Piles of sufficient length to achieve a minimum embedment of 20' into soil having a blow count greater than or equal to 6 (N ≥ 6). Pile splices and build-ups are not permitted. Use only 14" Square Prestressed Concrete Piles with 8 – ½" diameter Low Relaxation Strands fabricated in accordance with Index 455-014.

PLASTIC LUMBER AND STRUCTURAL COMPOSITE LUMBER WALES: Provide only Plastic Lumber (Thermoplastic Structural Shapes) and Structural Composite Lumber (Reinforced Thermoplastic Structural Shapes) Wales in accordance with Specification Section 973. Wales shall be continuous and spliced only at locations shown on the plans.

PLASTIC LUMBER DECKING FOR CATWALKS: Provide Plastic Lumber decking for catwalks when called for in the Plans in accordance with Specification Section 973.

Install Plastic Lumber Decking according to manufacturer's recommendations using stainless steel #10 x 3" (minimum) deck screws.

FIBERGLASS OPEN GRATING FOR CATWALKS: Provide Fiberglass Open Grating for catwalks when called for in the Plans. Fiberglass Open Grating shall be a heavy duty design suitable for exterior installations. Maximum gap opening on the walkway surface shall be 1½". Design live loads and deflections shall be a 50 psf uniformly distributed load with a maximum deflection of ⅜" or L/120 at the center of a simple span and a concentrated load of 250 pounds with a maximum deflection of ¼" at the center of a simple span. Color of Fiberglass Open Grating shall be gray or black.

Install Fiberglass Open Grating according to manufacturer's recommendations using stainless steel hardware, screws, bolts, nuts and washers. Attach Fiberglass Open Grating to Wales and Deck Supports at a 2'-0" maximum spacing so as to resist pedestrian live loads and uplift forces from wind, buoyancy and wave action.

CLEARANCE GAUGE AND LIGHT: Clearance Gauge to be furnished and installed by the Contractor. Clearance Gauge width and numeral height is dependant on visibility distance. The required visibility distance shall be determined by the United States Coast Guard District Commander. Provide and install Clearance Gauge Light in accordance with Specification Section 510 and Index 510-001.

NAVIGATION LIGHTS: Provide and install Navigation Lights in accordance with Specification Section 510, Index 510-001 and/or project specific details. Provide and maintain Temporary Navigation Lights during construction until permanent Navigation Lights are operational.

BOLTS, THREADED BARS, NUTS, SCREWS AND WASHERS: Furnish stainless steel Bolts in accordance with ASTM F593 Type 316. Furnish stainless steel Threaded Bars in accordance with ASTM A193 Grade B8M. Furnish stainless steel Nuts in accordance with ASTM F594 Type 316. Furnish stainless steel Screws in accordance with ASTM F593 Type 305. Furnish stainless steel Washers compatible with Bolts, Threaded Rods and Nuts under heads and nuts. Torque Nuts on 1" diameter Bolts and Threaded Bars to 150 lb-ft. Keep threads on Bolts, Threaded Bars and Nuts free from dirt, coarse grime and sand to prevent galling and seizing during tightening.

SPLICE PLATES: Furnish Splice Plates in accordance with ASTM A240 Type 316.

WIRE ROPE: Provide wire rope meeting one of the following requirements:

1. ½" diameter 6x19, 6x25 or 6x37 class IWRC Type 316 stainless steel wire rope with a minimum breaking strength of 18,000 lbs.

2. ½" diameter 6x19 galvanized wire rope with ultraviolet ray resistant polypropylene impregnation having an outside diameter of 5/8" with a minimum breaking strength of 22,000 lbs. Protect all ends with heat shrinkable end caps compatible with the rope's polypropylene that provide an effective water-tight seal.

FENDER SYSTEM ENERGY CAPACITY:
Energy Capacity = 38 ft-k

GENERAL NOTES

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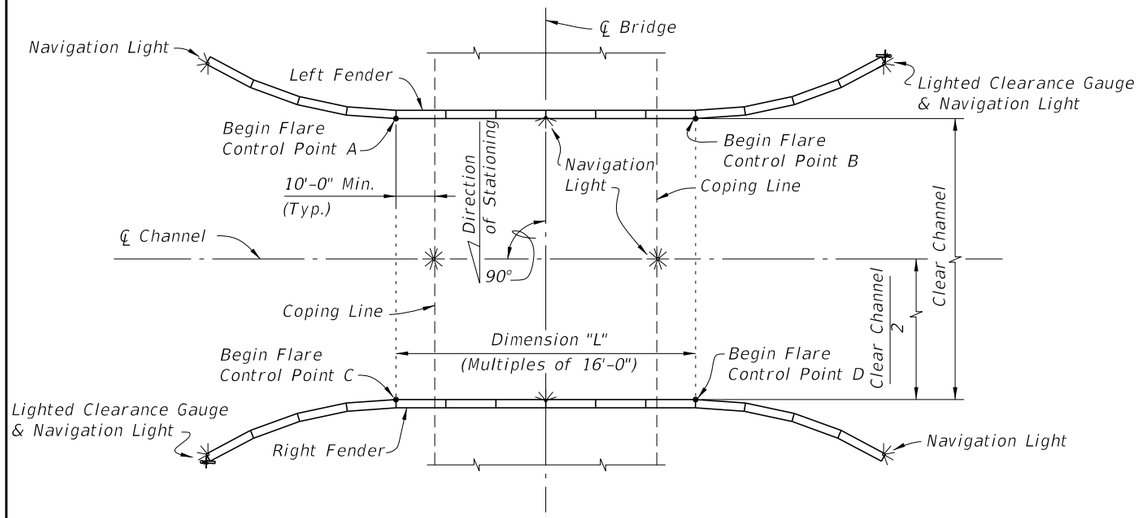
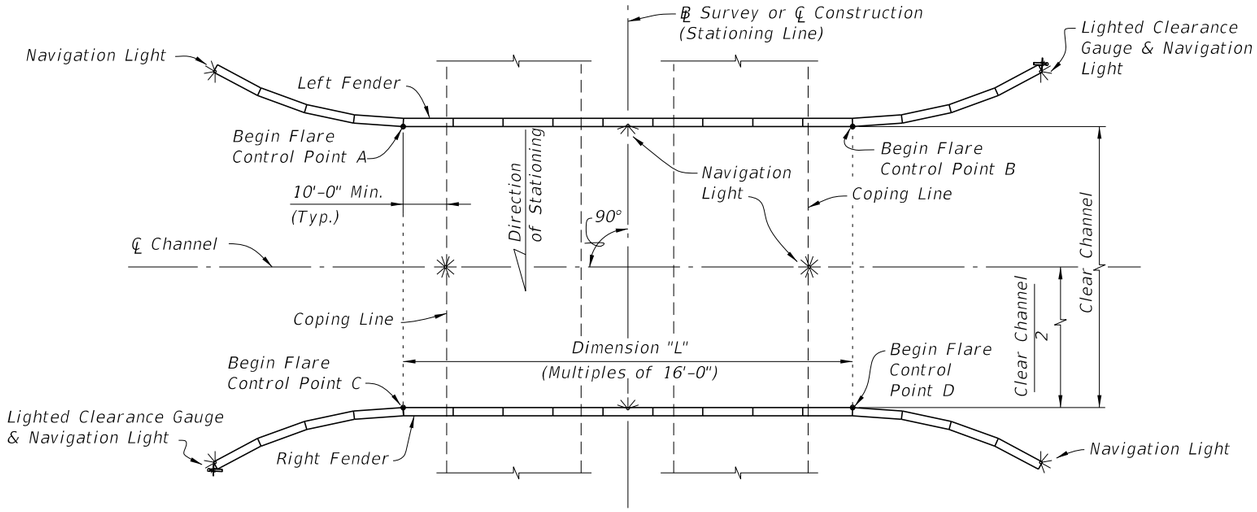
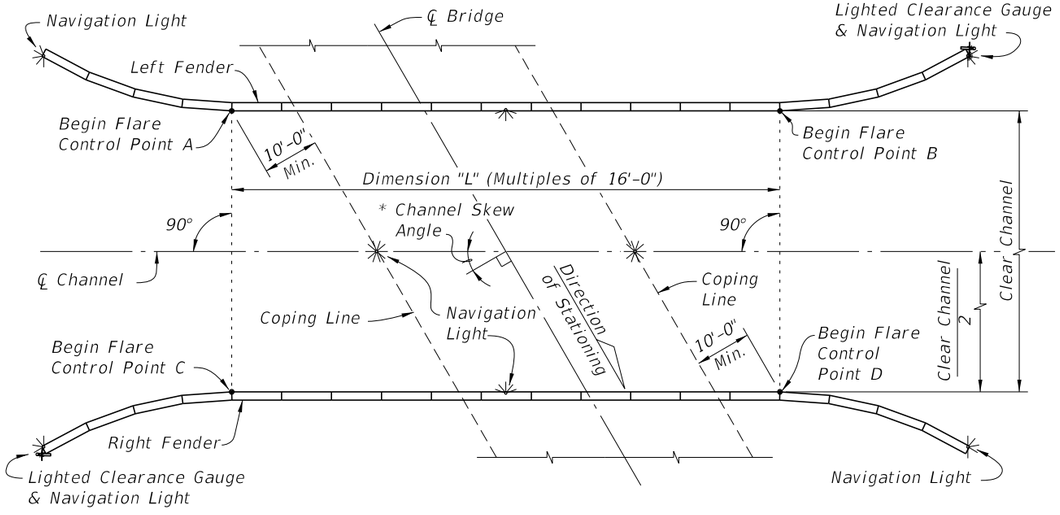
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/14			FY 2019-20 STANDARD PLANS	FENDER SYSTEM - PRESTRESSED CONCRETE PILES & FRP WALES	471-030	1 of 7



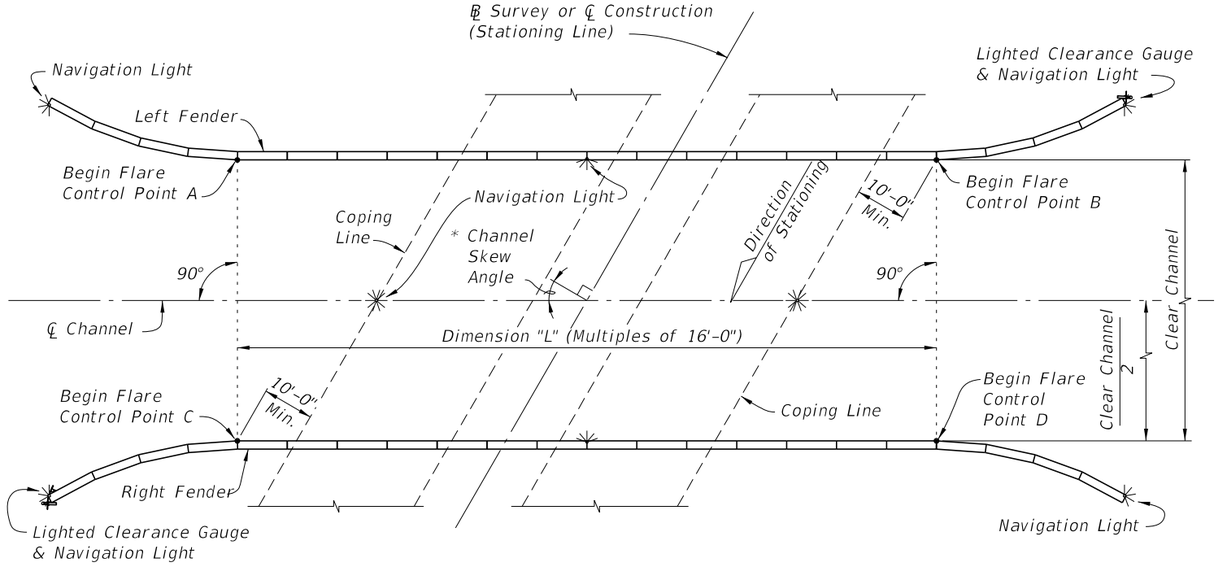
SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF SINGLE FIXED BRIDGE WITH NONSKEWED CHANNEL



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF DUAL FIXED BRIDGES WITH NONSKEWED CHANNEL (PARALLEL DUAL FIXED BRIDGES SHOWN, NONPARALLEL DUAL FIXED BRIDGES SIMILAR)



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF SINGLE FIXED BRIDGE WITH SKEWED CHANNEL



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF DUAL FIXED BRIDGES WITH SKEWED CHANNEL (PARALLEL DUAL FIXED BRIDGES SHOWN, NONPARALLEL DUAL FIXED BRIDGES SIMILAR)

* See Structures Plans, Plan and Elevation and Foundation Layout Sheets for magnitude and orientation of Channel Skew Angle.

CROSS REFERENCES:
For Stations and Offsets of referenced Control Points A, B, C and D, Dimension "L" and Clear Channel Width see Fender System Table of Variables in Structures Plans.
For Navigation Light Details see Design Standards Index 510-001.

LAYOUT GEOMETRY

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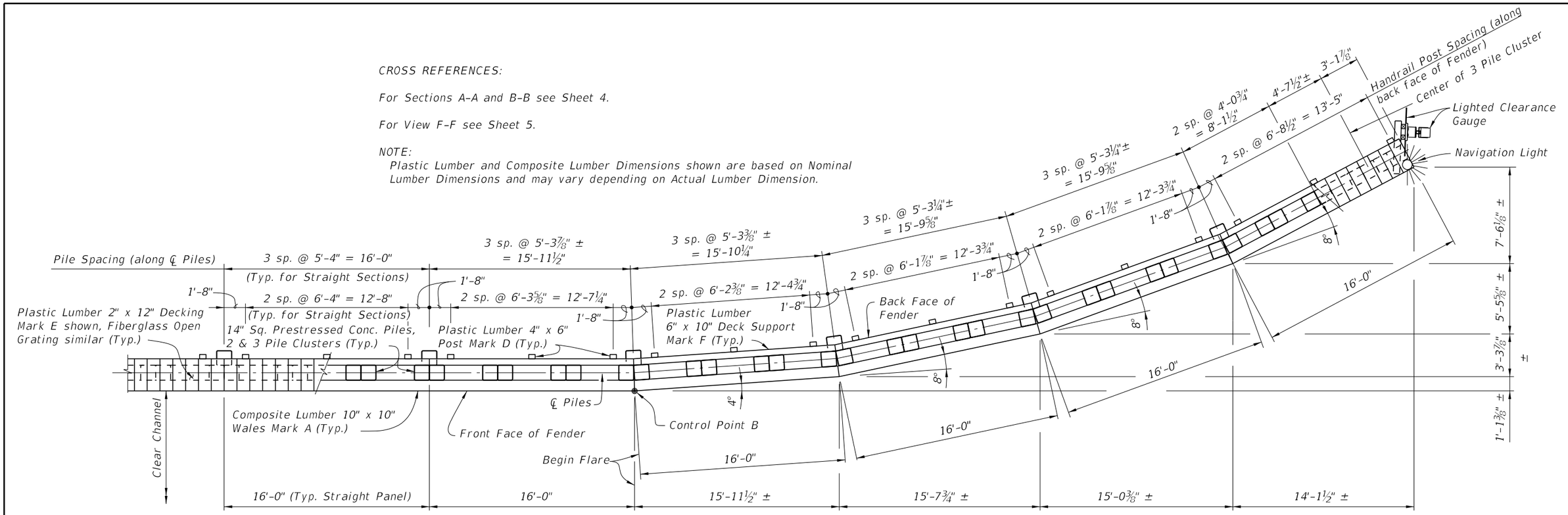
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/11			FY 2019-20 STANDARD PLANS	FENDER SYSTEM - PRESTRESSED CONCRETE PILES & FRP WALES	471-030	2 of 7

CROSS REFERENCES:

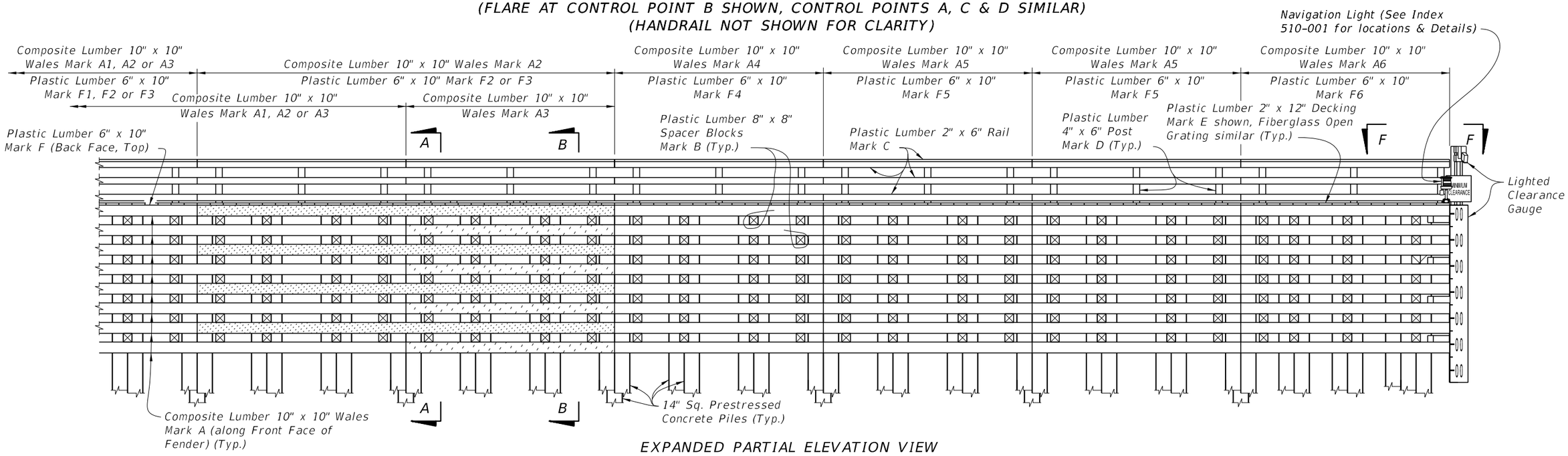
For Sections A–A and B–B see Sheet 4.

For View F–F see Sheet 5.

NOTE:
Plastic Lumber and Composite Lumber Dimensions shown are based on Nominal Lumber Dimensions and may vary depending on Actual Lumber Dimension.



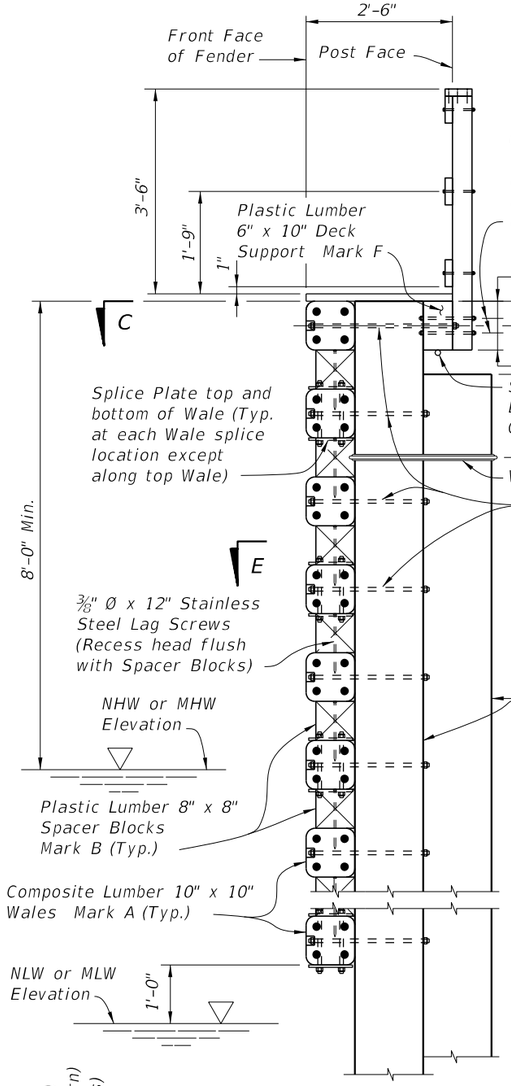
PARTIAL PLAN VIEW (TYPICAL FLARE)
(FLARE AT CONTROL POINT B SHOWN, CONTROL POINTS A, C & D SIMILAR)
(HANDRAIL NOT SHOWN FOR CLARITY)



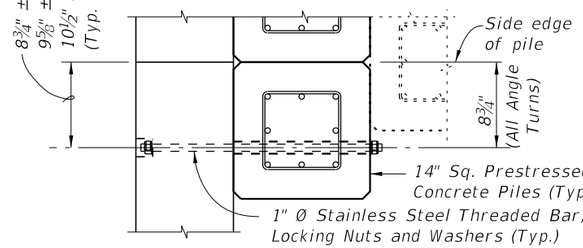
EXPANDED PARTIAL ELEVATION VIEW

10/24/2018 2:54:38 PM

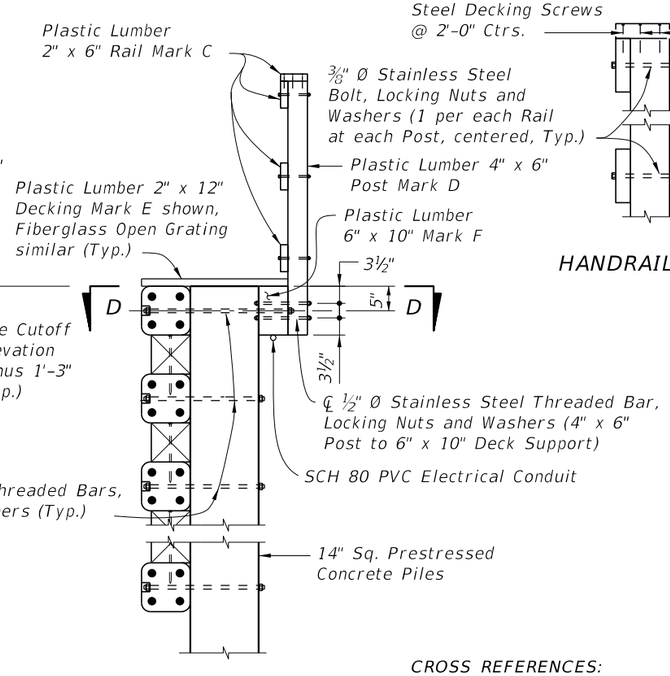
LAST REVISION	REVISION	DESCRIPTION:				
01/11/17			FY 2019-20 STANDARD PLANS	FENDER SYSTEM - PRESTRESSED CONCRETE PILES & FRP WALES	INDEX 471-030	SHEET 3 of 7



SECTION A-A



DETAIL "B" (SHOWING THREADED BAR LOCATION/RELATIONSHIP TO PILE PRESTRESSING STRANDS)

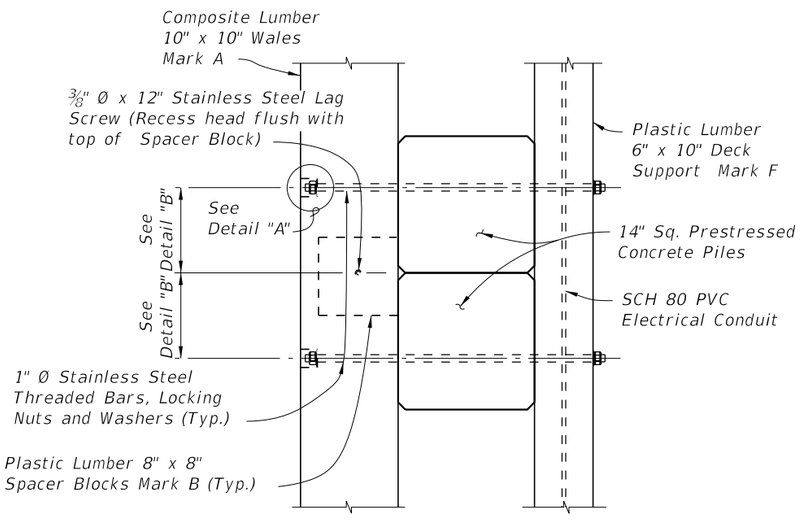


SECTION B-B

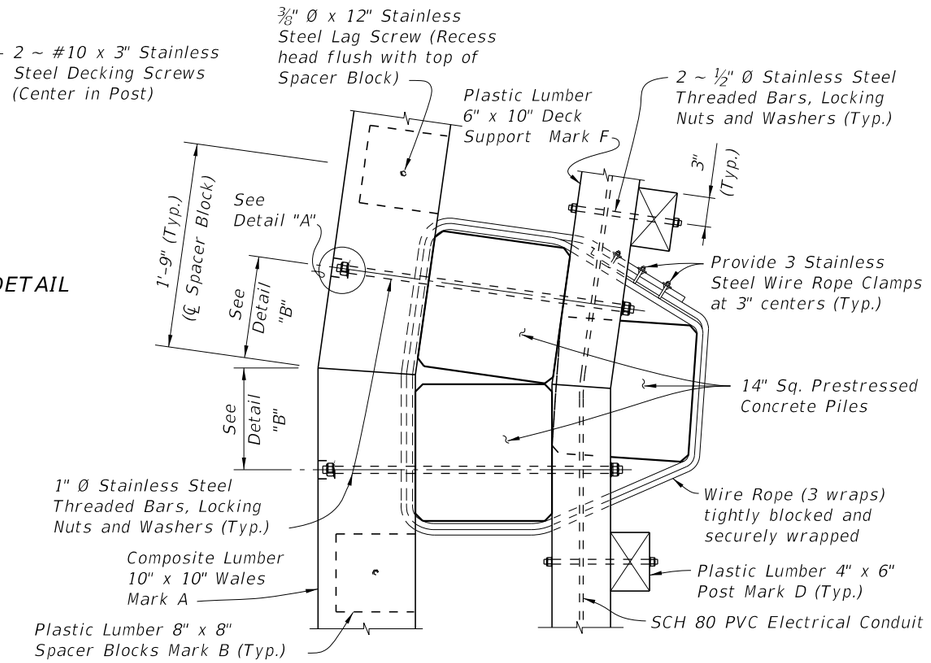
HANDRAIL DETAIL

CROSS REFERENCES:
For location of Sections A-A and B-B see Sheet 3.

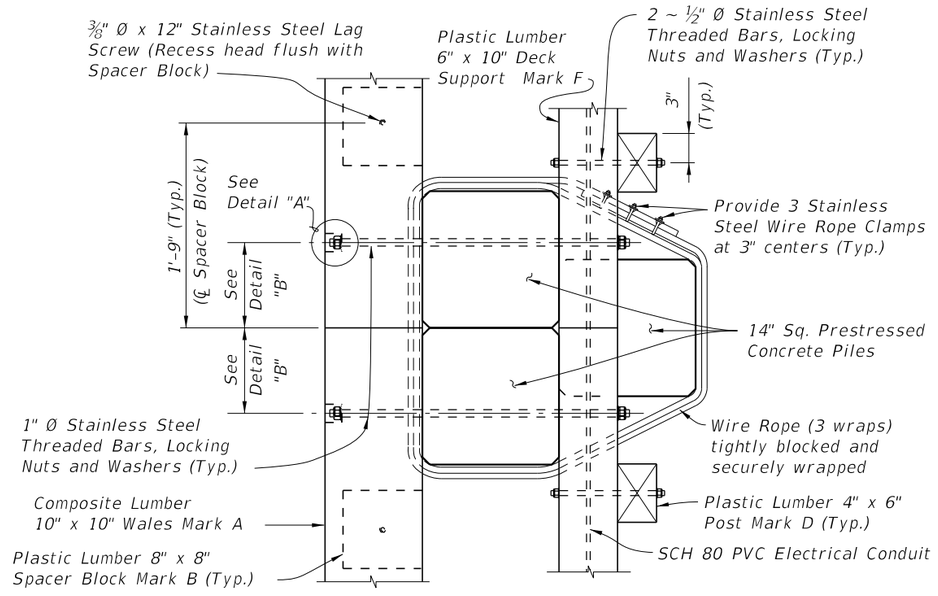
For Section E-E and Detail "A" see Sheet 5.



SECTION D-D
TYPICAL AT INTERMEDIATE PILES



SECTION C-C
TYPICAL FLARED SECTION
(8° TURN SHOWN, 4° TURN SIMILAR)



SECTION C-C
TYPICAL STRAIGHT SECTION

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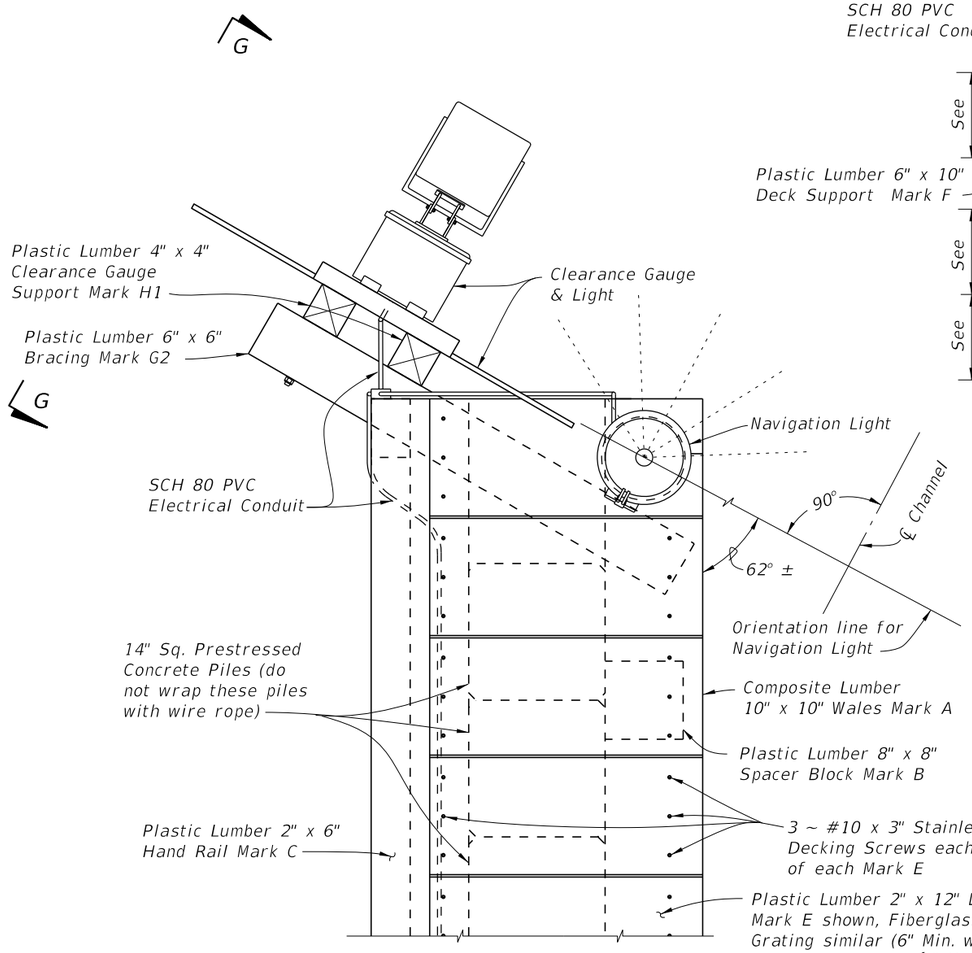
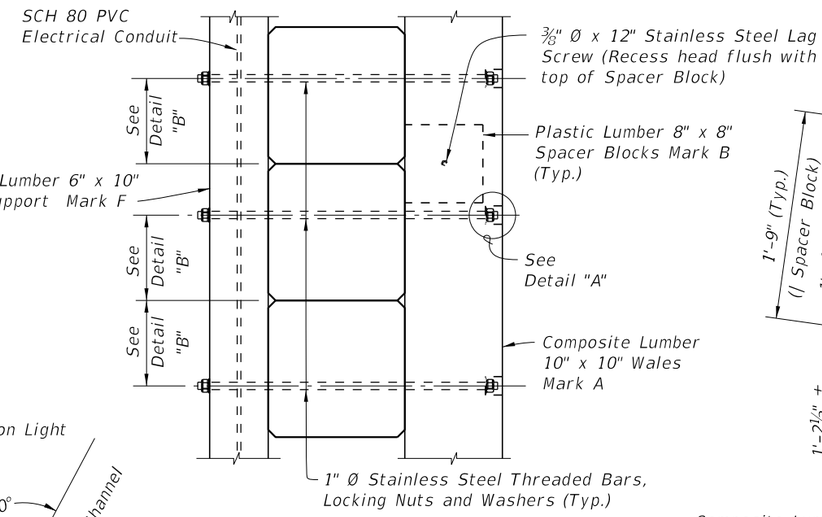
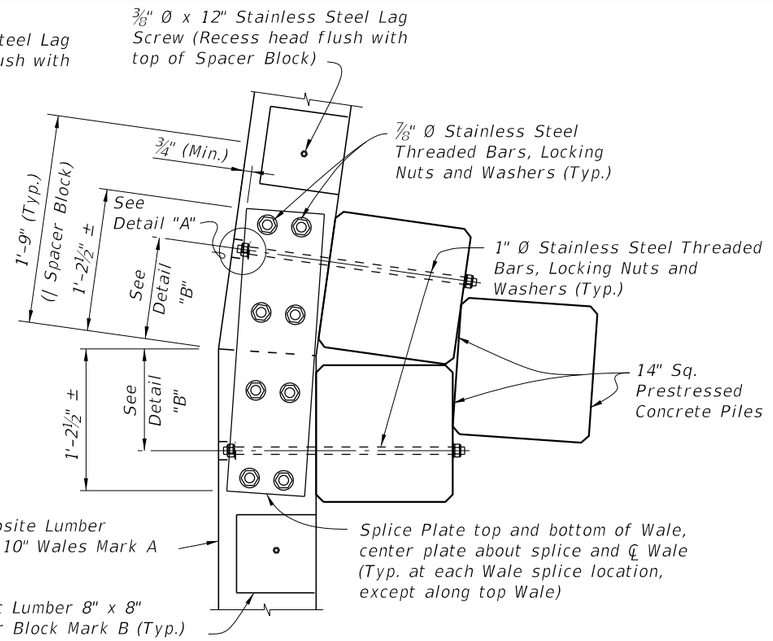
LAST REVISION	REVISION	DESCRIPTION:				
01/01/12			FY 2019-20 STANDARD PLANS	FENDER SYSTEM - PRESTRESSED CONCRETE PILES & FRP WALES	INDEX 471-030	SHEET 4 of 7



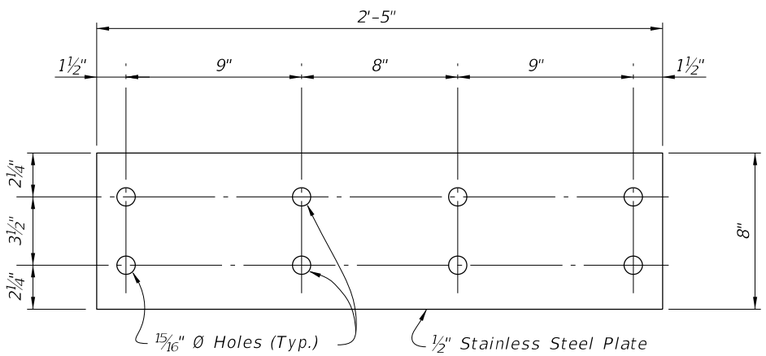
VIEW F-F
(SHOWING FENDER END WITH CLEARANCE GAUGE)



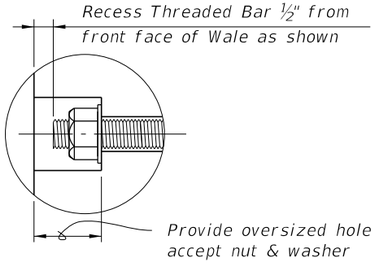
PARTIAL VIEW F-F
(SHOWING FENDER END; DECKING AND HANDRAIL NOT SHOWN FOR CLARITY)



SECTION E-E
TYPICAL FLARED SECTION
(8° TURN SHOWN, 4° TURN SIMILAR)



SPLICE PLATE DETAIL



DETAIL "A"

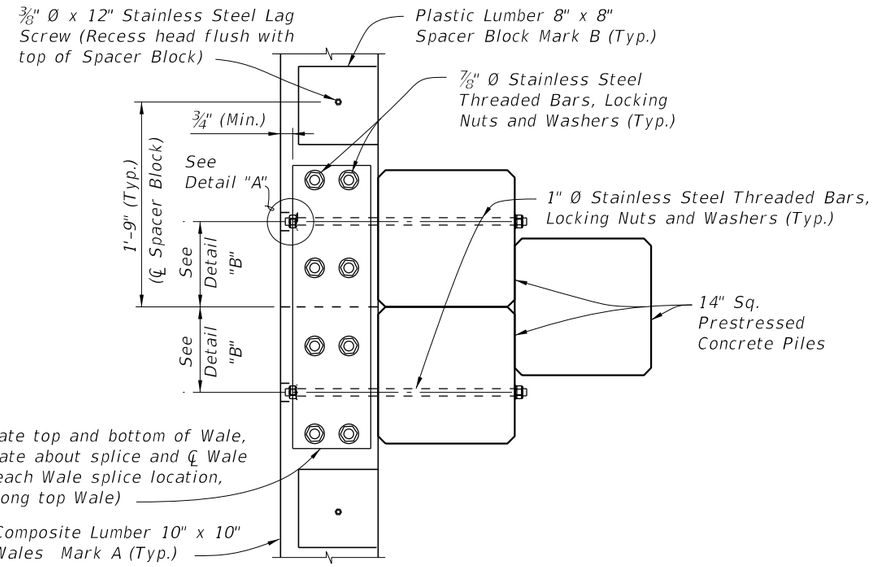
CROSS REFERENCES:

For Navigation Lights and SCH 80 PVC Electrical Conduit Details see Index 510-001.

For View G-G and Clearance Gauge Details see Sheet 4.

For Detail "B" and location of Section E-E see Sheet 2.

For location of View F-F see Sheet 1.



SECTION E-E
TYPICAL STRAIGHT SECTION

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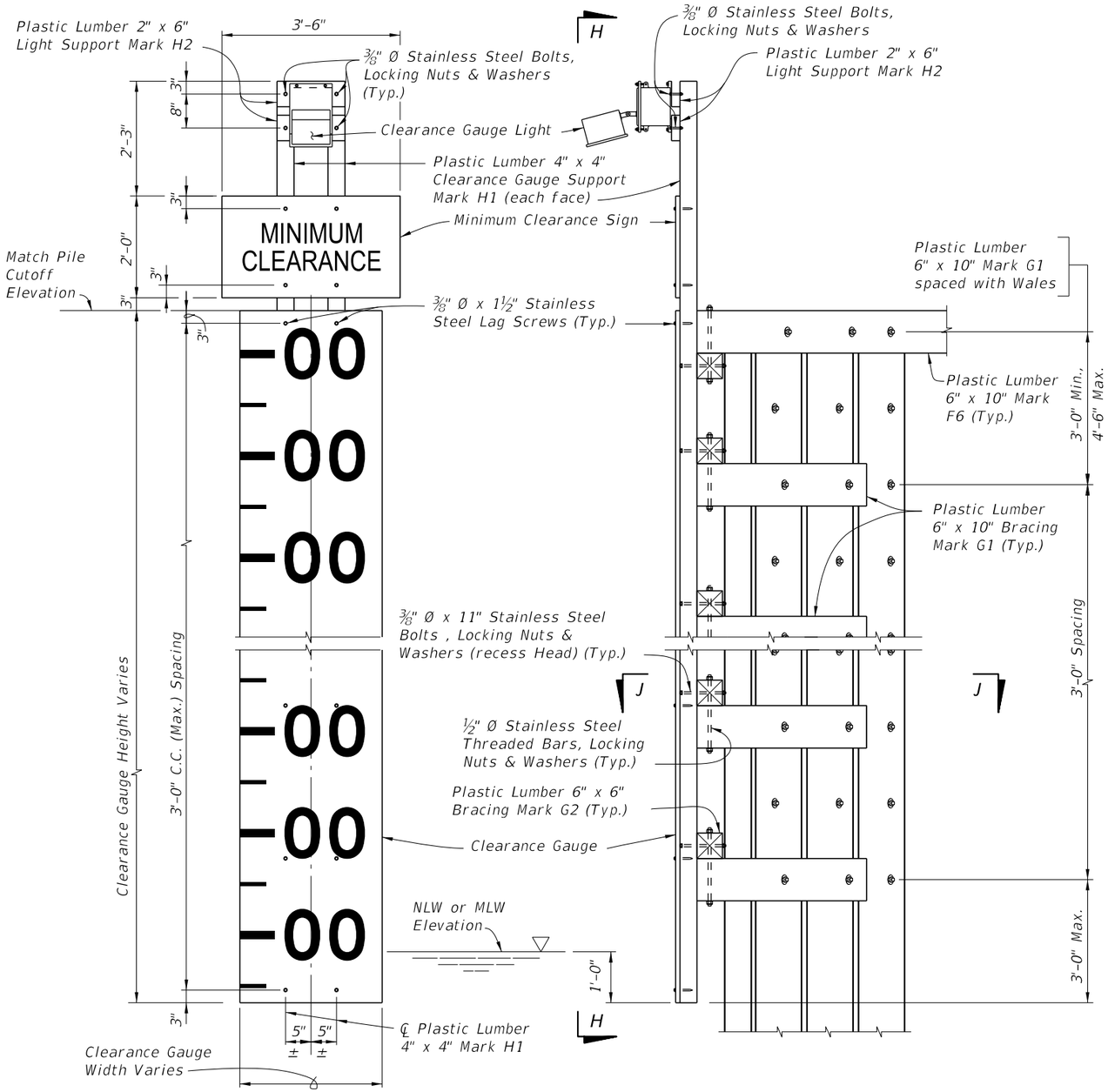
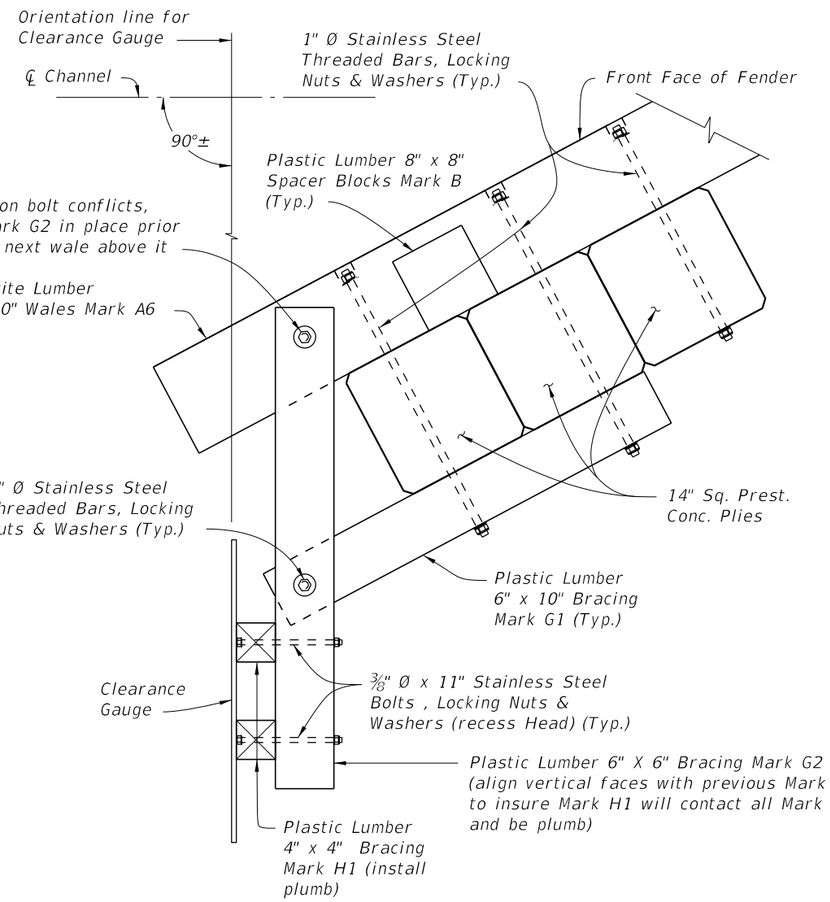
LAST REVISION	REVISION	DESCRIPTION:				
07/01/11			FDOT	FY 2019-20 STANDARD PLANS	FENDER SYSTEM - PRESTRESSED CONCRETE PILES & FRP WALES	INDEX 471-030 / SHEET 5 of 7



VIEW H-H
(WALES, PILES AND BRACING
NOT SHOWN FOR CLARITY)

VIEW G-G
(WALES, DECKING AND HANDRAIL
NOT SHOWN FOR CLARITY)



SECTION J-J

CROSS REFERENCES:

For Estimated Structural Composite and Plastic Lumber Bill of Materials Quantities and Fender System Table of Variables see Structures Plans.

For location of View G-G see Sheet 5.

CLEARANCE GAUGE DETAILS

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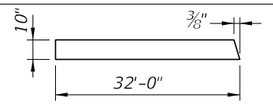
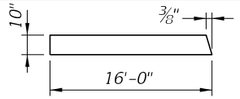
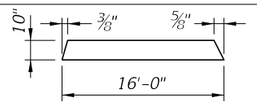
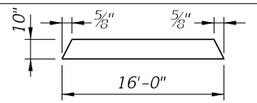
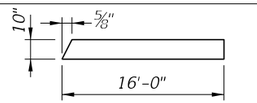
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2019-20 STANDARD PLANS	FENDER SYSTEM - PRESTRESSED CONCRETE PILES & FRP WALES	INDEX	SHEET
01/01/12						471-030	6 of 7

* STRUCTURAL COMPOSITE LUMBER BILL OF MATERIALS

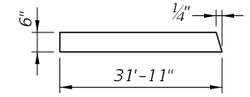
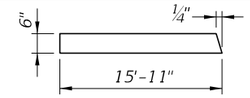
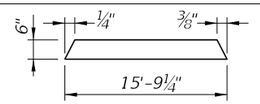
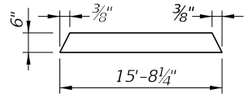
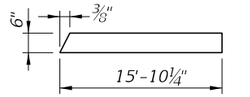
MARK	SIZE (NOMINAL)	DIMENSIONS	BOARD FT. PER EACH	NO. REQD.	QUANTITY
A1	10" X 10" COMPOSITE LUMBER	32'-0" (STRAIGHT)	266.6		
A2	10" X 10" COMPOSITE LUMBER		266.6		
A3	10" X 10" COMPOSITE LUMBER		133.3		
A4	10" X 10" COMPOSITE LUMBER		133.3		
A5	10" X 10" COMPOSITE LUMBER		133.3		
A6	10" X 10" COMPOSITE LUMBER		133.3		

See Estimated Structural Composite and Plastic Lumber Bill of Materials Table in Structures Plans

* All Plastic Lumber and Composite Lumber Dimensions and Quantities shown are based on Nominal Lumber Dimensions and may vary depending on Actual Lumber Dimension.

** Provide Fiberglass Open Grating in lieu of 2" X 12" Plastic Lumber when called for in the Plans. Mounting hardware shall be Stainless Steel, install per Manufacturer's recommendations. See Structures Plans for Notes and Details.

* PLASTIC LUMBER BILL OF MATERIALS

MARK	SIZE (NOMINAL)	DIMENSIONS	BOARD FT. PER EACH	NO. REQD.	QUANTITY
B	8" X 8" PLASTIC LUMBER	8" (STRAIGHT)	3.6		
C	2" X 6" PLASTIC LUMBER	16'-0" (STRAIGHT) (Trim & Miter Ends as required)	16.0		
D	4" X 6" PLASTIC LUMBER	4'-4" (STRAIGHT)	8.7		
** E	2" X 12" PLASTIC LUMBER	2'-6" (STRAIGHT) (Miter as required, 6" Min. width)	5.0		
F1	6" X 10" PLASTIC LUMBER	32'-0" (STRAIGHT)	160.0		
F2	6" X 10" PLASTIC LUMBER		159.6		
F3	6" X 10" PLASTIC LUMBER		79.6		
F4	6" X 10" PLASTIC LUMBER		78.8		
F5	6" X 10" PLASTIC LUMBER		78.4		
F6	6" X 10" PLASTIC LUMBER		79.3		
G1	6" X 10" PLASTIC LUMBER	3'-8" (STRAIGHT)	18.3		
G2	6" X 6" PLASTIC LUMBER	4'-1" (STRAIGHT)	12.3		
H1	4" X 4" PLASTIC LUMBER	PILE CUTOFF ELEV. MINUS NLW OR MLW ELEV. PLUS 5'-6" (STRAIGHT)	1.3 PER LF EACH		
H2	2" X 6" PLASTIC LUMBER	1'-2" (STRAIGHT)	1.2		

See Estimated Structural Composite and Plastic Lumber Bill of Materials Table in Structures Plans

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