COMPONENT PLAN SETS
- ROADWAY PLANS
- SIGNING AND PAVEMENT MARKING PLANS
- LIGHTING PLANS
- LANDSCAPE PLANS
- STRUCTURAL PLANS
- IRRIGATION PLANS (TO BE INCLUDED IN FUTURE SUBMITTAL)

CITY OF NAPLES

STRUCTURAL PLANS

COLLIER COUNTY

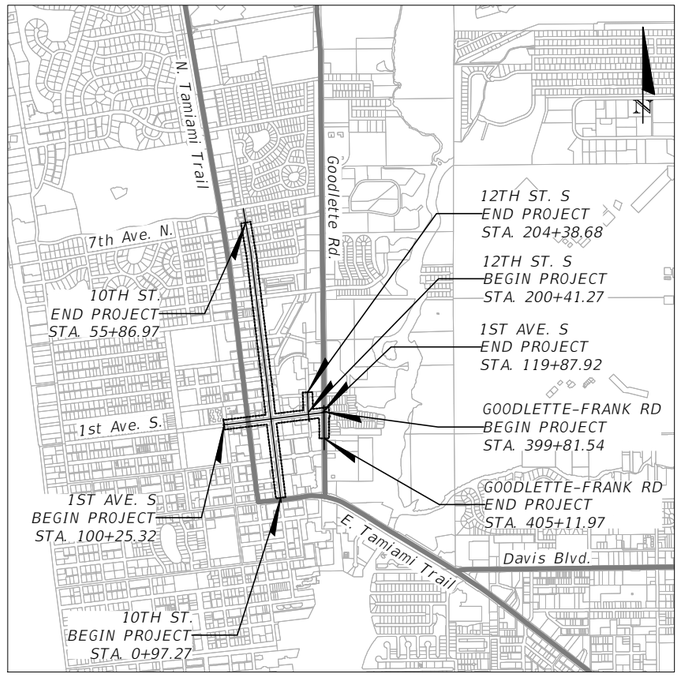
1ST AVE. S, 12TH ST. S, AND 10TH ST. STREETSCAPE DESIGN PROJECT & ENGINEERING SERVICES

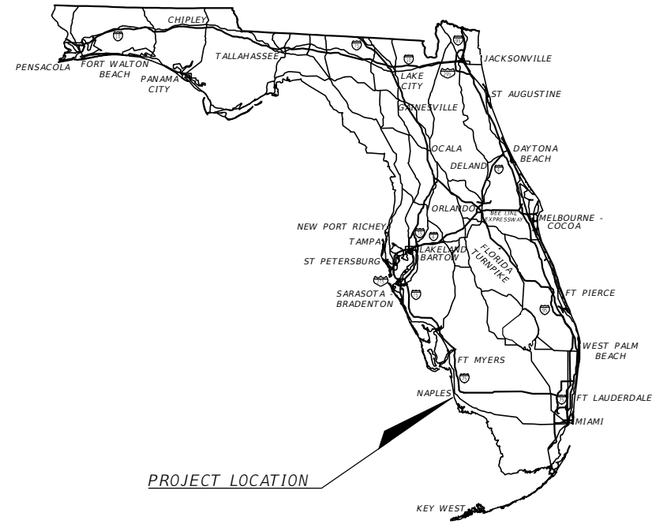
INDEX OF SHEETS

STANDARD PLANS

SHEET NO.	SHEET DESCRIPTION
400-289	CONCRETE BOX CULVERT DETAILS
400-291	PRECAST CONCRETE BOX CULVERTS - SUPPLEMENTAL DETAILS
400-292	STANDARD PRECAST CONCRETE BOX CULVERTS
415-001	BAR BENDING DETAILS (STEEL)

* TO BE INCLUDED IN FUTURE SUBMITTAL





60% SUBMITTAL
APRIL, 2026

STRUCTURAL PLANS
ENGINEER OF RECORD:

ROLANDO CORSA, PE, CBI
P.E. NO.: 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES PROJECT MANAGER:

DANIEL OHRENSTEIN, P.E., PTOE

GOVERNING STANDARD PLANS:
Florida Department of Transportation, FY-2026-27 Standard plans for Road and Bridge Construction and applicable Interim Revisions (Irs).

Standard Plans for Road Construction and associated Irs are available at the following website:
http://www.fdot.gov/design/Standardplans.shtm

GOVERNING STANDARD SPECIFICATIONS:
Florida Department of Transportation, FY-2026-27 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks

FISCAL YEAR	SHEET NO.
2027	B-01

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

ROLANDO CORSA
LICENSE
No.73191
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

THIS ITEM HAS BEEN DIGITALLY
SIGNED AND SEALED BY:

ON THE DATE ADJACENT TO THE SEAL

SIGNATURE MUST BE VERIFIED
ON ANY ELECTRONIC COPIES.

ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL, 33635
ROLANDO CORSA. P.E. NO. 73191

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
B-01	KEY SHEET
B-02	SIGNATURE SHEET
BQ1-1	SUMMARY OF STRUCTURE QUANTITIES
B-03	GENERAL NOTES
B1-01	PRECAST CULVERT PLAN
B1-02	PRECAST CULVERT PROFILE
B1-03	PRECAST CULVERT SECTIONS AND DETAILS
B1-04	C-I-P END OF CULVERT DETAILS
B1-05	TEMPORARY CRITICAL WALL DETAILS*
B1-06	BOX CULVERT DATA TABLE*
B1-07	REINFORCING BAR LIST*
B1-08	BRIDGE CULVERT LOAD RATING SUMMARY*

* TO BE INCLUDED IN FUTURE SUBMITTAL

REVISIONS		
DATE	DESCRIPTION	DATE

ENGINEER OF RECORD
ROLANDO CORSA, P.E., C.B.I.
P.E. LICENSE NUMBER 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES

PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

SIGNATURE SHEET

SHEET NO.
B-02

SUMMARY OF STRUCTURE QUANTITIES			
PAY ITEM NO.	PAY ITEM DESCRIPTION	UNIT	QUANTITY
0120-1	REGULAR EXCAVATION	CY	6,073
0400-4-1	CONCRETE CLASS IV, CULVERTS	CY	508
0415-1-1	REINFORCING STEEL- ROADWAY	LB	101,648
0455-133-2	SHEET PILING STEEL, TEMP-CRITICAL	SF	34,808
0530-3-4	RIPRAP, RUBBLE, F&I, DITCH LINING	TN	36
0530-74	BEDDING STONE	TN	159

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ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES

PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

SUMMARY OF STRUCTURE QUANTITIES

SHEET NO.

BQ1-1

GENERAL NOTES

SPECIFICATIONS

1. DESIGN:
   AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION AND ALL SUBSEQUENT INTERIMS.
   FDOT STRUCTURES MANUAL (JANUARY 2026) AND SUBSEQUENT STRUCTURES DESIGN BULLETINS.
2. FDOT DESIGN MANUAL (JANUARY 2026).

DESIGN LOADINGS

1. DEAD LOADS:
   UNIT WEIGHT OF REINFORCED CONCRETE: 150 PCF
   UNIT WEIGHT OF SOIL: 120 PCF
2. LIVE LOADS:
   HL-93 WITH DYNAMIC LOAD ALLOWANCE
   FL-120 (PERMIT LOAD)

DESIGN METHODOLOGY

LOAD AND RESISTANCE FACTOR DESIGN (LRFD) METHOD USING STRENGTH, SERVICE, EXTREME EVENT AND FATIGUE LIMIT STATES.

CONCRETE

CONCRETE AND CONSTITUENT MATERIALS SHALL MEET THE REQUIREMENTS OF SECTION 346 AND 400 OF THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2026, AND SUPPLEMENTS THERETO.

FINAL MIX DESIGN SHALL BE SUBMITTED TO ARCOS BRIDGE, INC. FOR APPROVAL PRIOR TO POURING PRECAST AND CAST-IN-PLACE CONCRETE.

MATERIALS

1. CONCRETE:

CLASS OF CONCRETE	MIN. 28-DAY COMP. STRENGTH (PSI)	LOCATION OF CONCRETE
IV	F'c = 5,500	CONCRETE CULVERT

2. REINFORCING STEEL:
   GRADE 60 CARBON STEEL PER FDOT SPECIFICATIONS, SECTION 931 FOR PRECAST CULVERT, AND C.I.P. HEADWALLS, WINGWALLS, TOE SLABS, AND CUTOFF WALLS.

ENVIRONMENTAL CLASSIFICATION

APPLIES TO CULVERT STRUCTURES.

1. SUBSTRUCTURE: EXTREMELY AGGRESSIVE FOR CONCRETE AND STEEL.

CONCRETE COVER

CONCRETE CULVERT: 3-INCHES

PLAN DIMENSIONS

ALL DIMENSIONS IN THESE PLANS ARE MEASURED IN FEET EITHER HORIZONTALLY OR VERTICALLY UNLESS OTHERWISE NOTED.

VERTICAL DATUM

ALL ELEVATIONS ARE IN FEET AND REFER TO NAVD 1988 DATUM.

UTILITIES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL CALL SUNSHINE AT (800) 432-4770 AND ANY OTHER LOCAL UTILITIES TO VERIFY EXISTING UTILITIES AT SITE OF CONSTRUCTION. IF ANY EXISTING UTILITIES CONFLICT WITH PROPOSED CONSTRUCTION METHODS, MATERIALS, OR EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

CONTRACTOR SHALL COORDINATE THE TEMPORARY DE-ENERGIZING AND GROUNDING OF THE EXISTING OVERHEAD POWER LINES AS REQUIRED WITH THE UTILITY OWNER PRIOR TO COMMENCEMENT OF WORK.

SUBSURFACE INFORMATION

REFER TO GEOTECHNICAL REPORT BY UES DATED APRIL 1, 2026.

CULVERT SOIL PROPERTIES

ANGLE OF INTERNAL FRICTION:	30 DEGREES
COEFFICIENT OF FRICTION (SLIDING):	0.4
MOIST UNIT SOIL WEIGHT:	115 PCF
SUBMERGED UNIT WEIGHT OF SOIL:	52 PCF
NET ALLOWABLE BEARING PRESSURE:	2500 PSF (5000 PSF NOMINAL, LRFD)

PRECAST CONCRETE

FABRICATION, HANDLING, AND STORAGE OF THE PRECAST CULVERT SHALL FOLLOW FDOT SPECIFICATIONS 410 AS APPLICABLE.

SHOP DRAWINGS

PROVIDE PRECAST CULVERT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL.

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REVISIONS		
DATE	DESCRIPTION	DATE

ENGINEER OF RECORD
ROLANDO CORSA, P.E., C.B.I.
P.E. LICENSE NUMBER 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES

PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

GENERAL NOTES

SHEET NO. B-03

1" = 30'

STA. 404+76.97
57.20' (L) OFFSET
TO ℄ OF CULVERT

1.5' RUBBLE RIPRAP (DITCH LINING) WITH 6" BEDDING STONE AND D-2 FILTER FABRIC PER FDOT SPECIFICATION 530

45.5'

1.5'

10'

6.3'

1'

17.5'
WW
(TYP.)

RIGHT-OF-WAY

401 GOODLETTE RD. 402 403 S 00° 25' 26" E 404 405

(13) 8' LONG (9x6) PRECAST 4-SIDED CULVERTS + (12) 1/2" JOINTS = 104.5'

9'

STA. 404+76.97
55.00' (R) OFFSET
TO ℄ OF CULVERT

CULVERT 2
TOTAL LENGTH = 112.2'

STA. 400+43.95
65.00' (R) OFFSET
TO ℄ OF CULVERT

S1-34

RIGHT-OF-WAY

421.5 LF OF TEMPORARY
CRITICAL CANTILEVER PZ-27
STEEL SHEET PILE WALL

STA. 404+66.97
65.00' (R) OFFSET
TO ℄ OF CULVERT

5'

9'

5'

30'
DRAINAGE
EASEMENT

(1)
7'-7 15/16"
+ (1) 1/2"
JOINT =
7.7'

S-G1

471 LF OF TEMPORARY
CRITICAL CANTILEVER PZ-27
STEEL SHEET PILE WALL

(52) 8' LONG (9x6) PRECAST 4-SIDED CULVERTS + (51) 1/2" JOINTS = 418.1'

(1) 4'-10 1/4" + (1)
1/2" JOINT = 4.9'

CULVERT 1 TOTAL LENGTH = 423'

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REVISIONS		
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ROLANDO CORSA, P.E., C.B.I.
P.E. LICENSE NUMBER 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

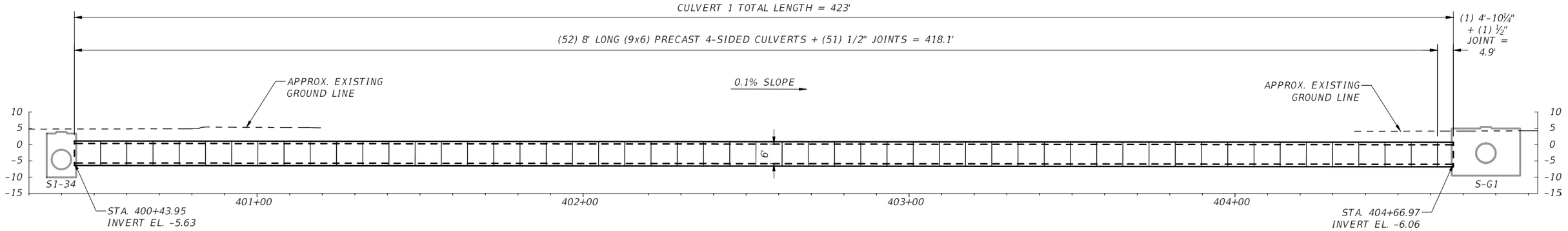
CITY OF NAPLES

PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

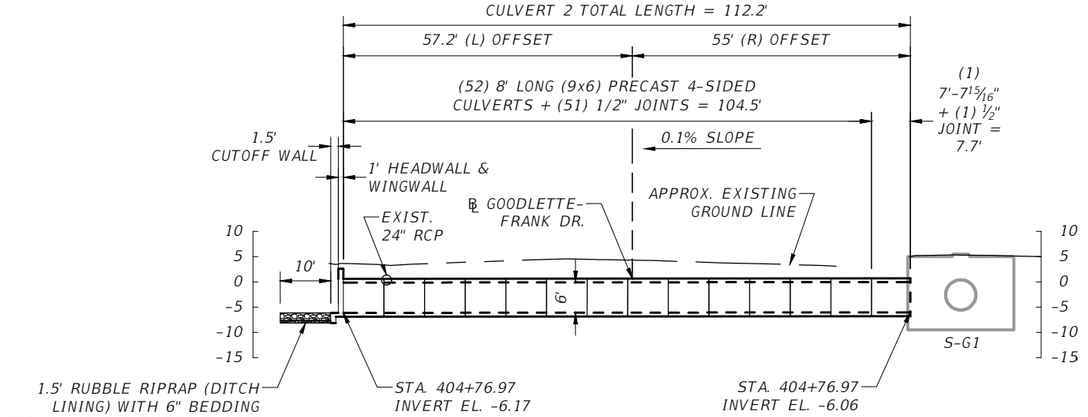
PRECAST CULVERT PLAN

SHEET NO. B1-01

Rolando Corsa 4/10/2026 8:00:22 AM C:\Users\rcors\OneDrive\Desktop\Drawings\60%\Backup Files\B1-01_Precast Culvert Plan.dwg



9x6 PRECAST CULVERT PROFILE
ADJACENT TO GOODLETTE-FRANK RD.



9x6 PRECAST CULVERT PROFILE
CROSSING GOODLETTE-FRANK RD.
@ STA. 404+76.97

(LOOKING UPSTATION)

REVISIONS		
DATE	DESCRIPTION	DATE

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ROLANDO CORSA, P.E., C.B.I.
P.E. LICENSE NUMBER 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES	
PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

PRECAST CULVERT PROFILE

SHEET NO.
B1-02

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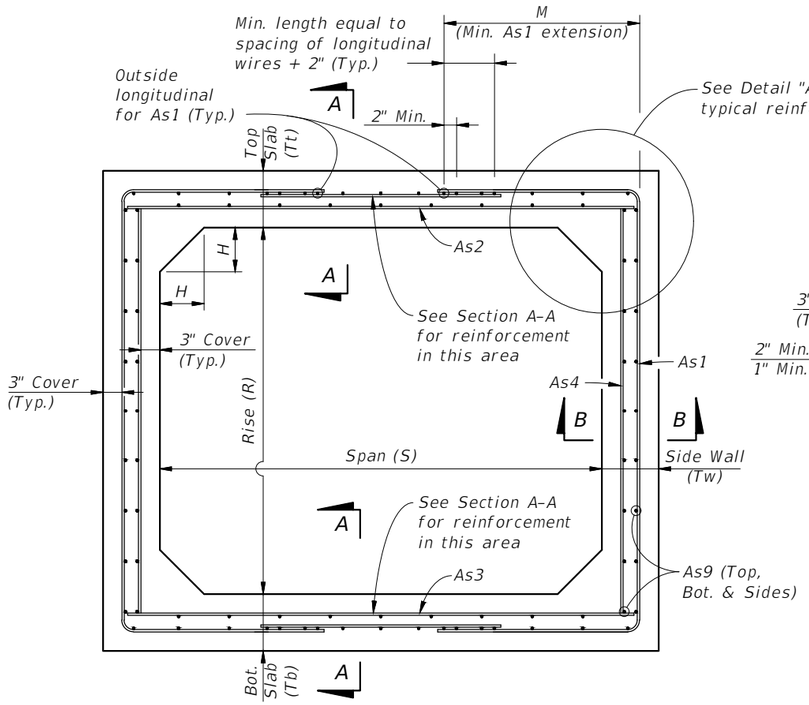
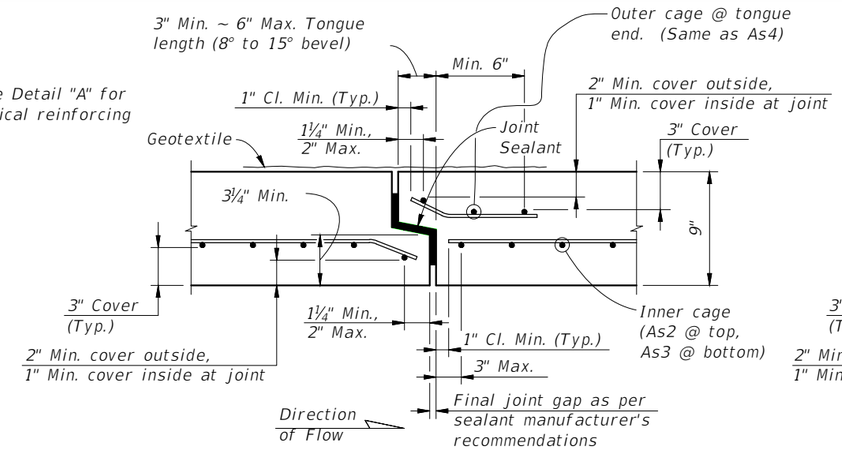
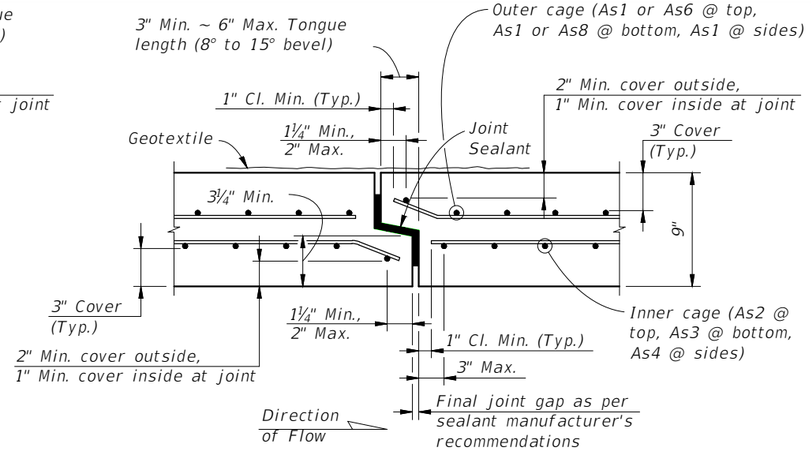


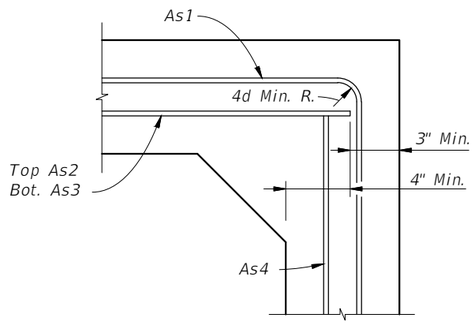
TYPICAL BOX SECTION (TYPE 2)
DESIGN EARTH COVER 2' OR GREATER
(Option 1 Reinforcing Configuration Shown)



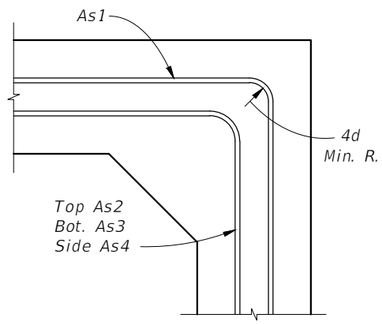
SECTION A-A



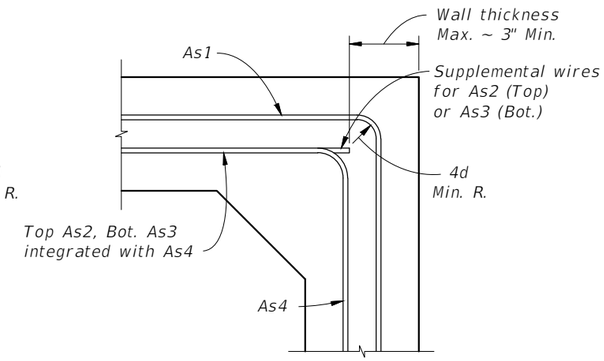
SECTION B-B
TYPICAL SECTION THRU JOINT



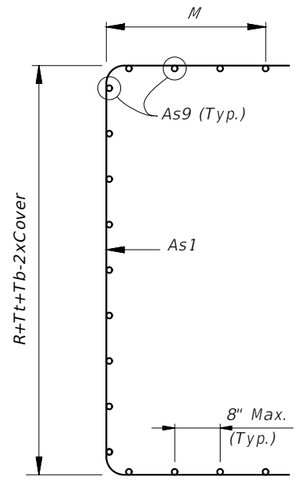
DETAIL "A"
(OPTION 1)



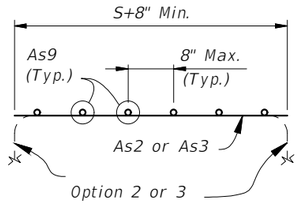
DETAIL "A"
(OPTION 2)



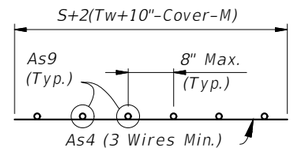
DETAIL "A"
(OPTION 3)



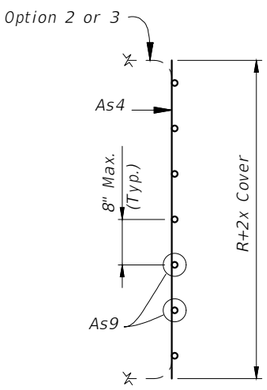
WWR PIECE NO. 1
(2 Reqd. per segment)



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)

NOTES:

1. *Work this Sheet with Index 400-291.*
2. *See Table this sheet for dimensions and areas of reinforcement.*
3. *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 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".*
4. *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.*
5. *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".*
6. *For alternate reinforcing configuration Options 2 and 3 shown in Detail "A", 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.*

TABLE - STANDARD PRECAST BOX CULVERT DESIGN (3" COVER) - 9' SPAN

SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS				DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.)								As1 EXT. LENGTH (M) (in.)
	TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)		As1	As2	As3	As4	As5	As7	As8	As9	
9' x 6'	9	9	9	8	5' - 10'	0.65	0.68	0.69	0.11	-	-	-		49

REVISIONS		
DATE	DESCRIPTION	DATE

ENGINEER OF RECORD
ROLANDO CORSA, P.E., C.B.I.
P.E. LICENSE NUMBER 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES

PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

PRECAST CULVERT SECTIONS AND DETAILS

SHEET NO. B1-03

Rolando Corsa 4/7/2026 4:25:30 PM C:\Users\rcors\OneDrive\Desktop\Drawings\60%\Backup Files\B1-03_Precast Culvert Sections and Details.dwg

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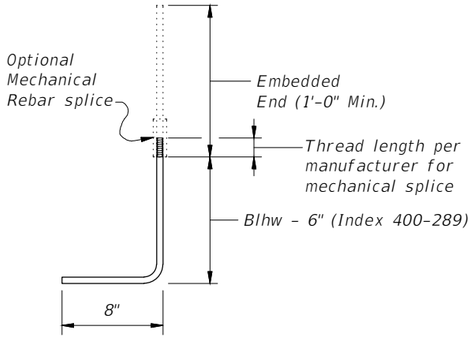
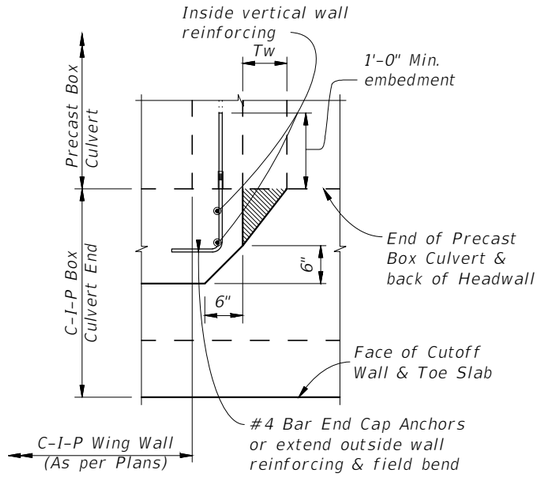
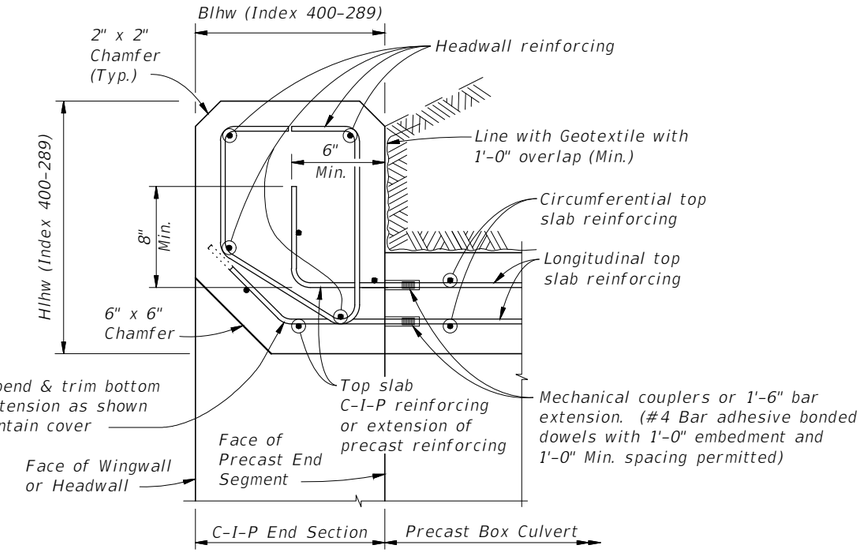


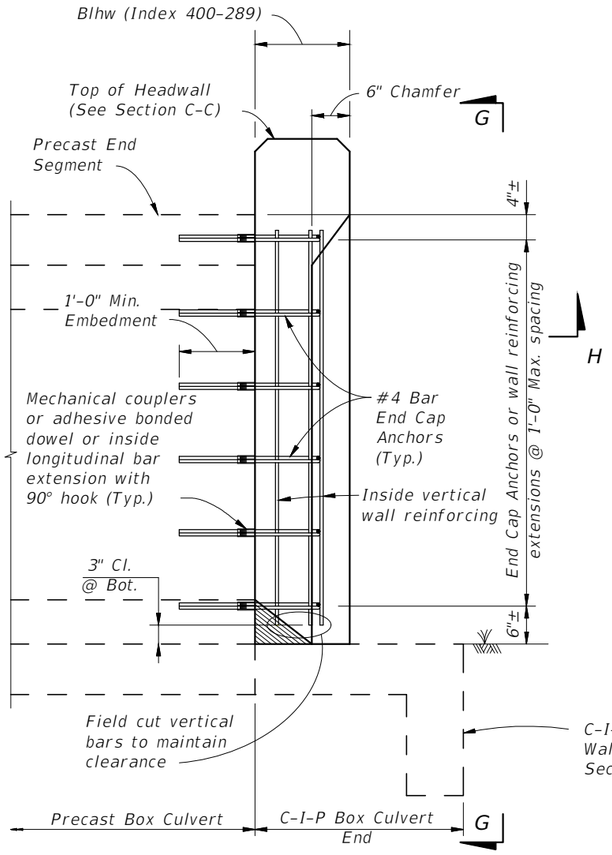
#4 BAR END CAP ANCHOR
BAR BEND DIAGRAM



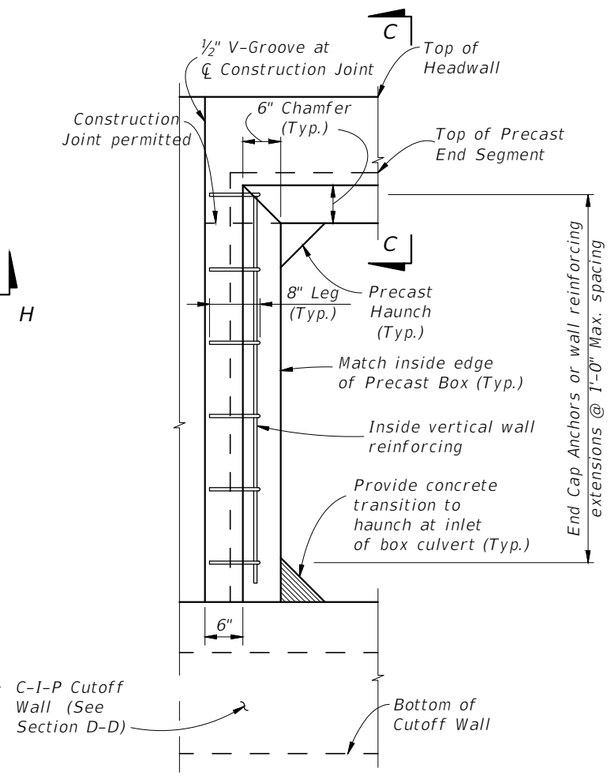
SECTION H-H



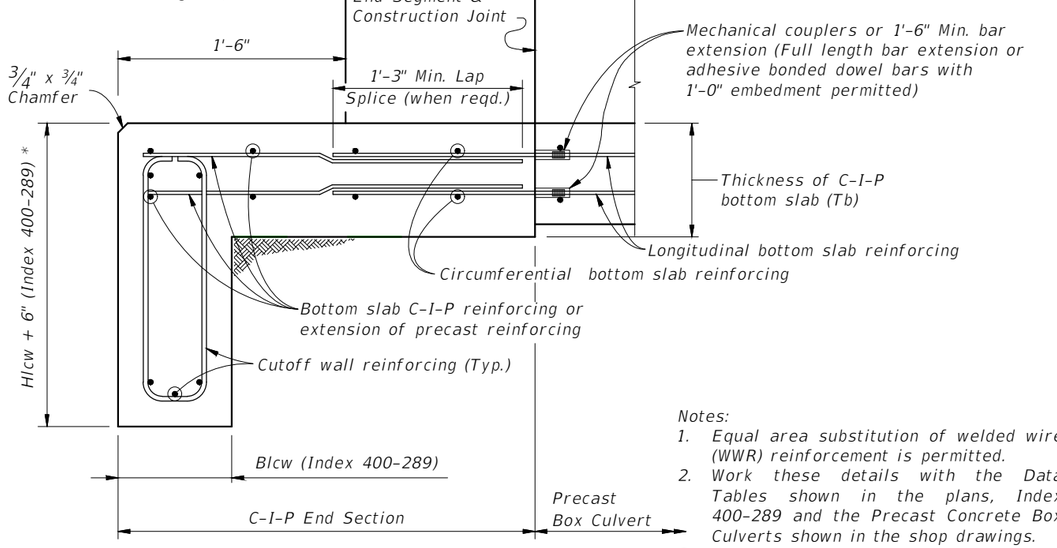
SECTION C-C
C-I-P HEADWALL DETAILS AND CONNECTION TO PRECAST BOX



SECTION F-F



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



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.

Notes:
1. Equal area substitution of welded wire (WWR) reinforcement is permitted.
2. Work these details with the 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.

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REVISIONS		
DATE	DESCRIPTION	DATE

ENGINEER OF RECORD
ROLANDO CORSA, P.E., C.B.I.
P.E. LICENSE NUMBER 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES	
PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

C-I-P END OF CULVERT DETAILS

SHEET NO. B1-04

BOX CULVERT DATA TABLES

TO BE INCLUDED IN FUTURE SUBMITTAL

BOX, HEADWALL AND CUTOFF WALL DATA TABLE (inches unless shown otherwise) — Table Date 7-01-09

LOCATION	STRUCTURE NUMBER	BOX									HEADWALL AND CUTOFF WALL									
		Wc(ft)	Hc(ft)	Tt	Tw	Tb	Ti	#cells	Lc(ft)	Cover	Blhw	Hlhw	Brhw	Hrhw	Blcw	Hlcw	Brcw	Hrcw	SL(deg)	SR(deg)
ALONG GOODLETTE RD.	1																			
ACROSS GOODLETTE RD.	2																			

LEFT SIDE WINGWALLS DATA TABLE (inches unless shown otherwise) — Table Date 01-01-11

STRUCTURE NUMBER	LEFT END WINGWALL									LEFT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)
1																		
2																		

RIGHT SIDE WINGWALLS DATA TABLE (inches unless shown otherwise) — Table Date 01-01-11

STRUCTURE NUMBER	RIGHT END WINGWALL									RIGHT BEGIN WINGWALL								
	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)	Rt	Rw	Rh	Rd	SW(deg)	β (deg)	He(ft)	Hs(ft)	Lw(ft)
1																		
2																		

ESTIMATED CONCRETE QUANTITIES (CY) — Table Date 7-01-13

STRUCTURE NUMBER	BOX								LEFT END WINGWALL			LEFT BEGIN WINGWALL			RIGHT END WINGWALL			RIGHT BEGIN WINGWALL		
	Left Cutoff Wall	Right Cutoff Wall	Bottom Slab	Walls	Top Slab	Left Head Wall	Right Head Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total	Footing	Wall	Sub Total
1																				
2																				

MAIN STEEL REINFORCEMENT SPACING (inches) — Table Date 7-01-09

STRUCTURE NUMBER	BOX														HEADWALLS		CUTOFF WALLS	
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115, 116...	803	806	809	812
1																			
2																			

WINGWALL STEEL REINFORCEMENT SPACING (inches) — Table Date 7-01-09

STRUCTURE NUMBER	LEFT END WINGWALL							LEFT BEGIN WINGWALL							RIGHT END WINGWALL							RIGHT BEGIN WINGWALL						
	401 407(8)	402 (403)	404 (405)	406	409	410	411	501 507(8)	502 (503)	504 (505)	506	509	510	511	601 607(8)	602 (603)	604 (605)	606	609	610	611	701 707(8)	702 (703)	704 (705)	706	709	710	711
1																											
2																											

WINGWALL NOTE: Bar designations in "( )" are only required for variable height wingwalls.

NOTES [Notes Date 7-01-14]:

1. Environmental Class: EXTREMELY AGGRESSIVE
2. Reinforcing Steel, Grade: 60
3. Concrete Class: IV f'c = 5.5 ksi
4. Soil Properties:
   Friction Angle: 30 DEG.
   Modulus of Subgrade Reaction: N/A
   Nominal Bearing Resistance: 5 ksi
5. Work this Drawing with Standard Plans Index 400-289 and Structural Sheets
6. Settlement criteria for Precast Box Culvert option (Index 400-291):
   Long Term Differential Settlement (ΔY) = 0.083 ft.
   Effective Length for Settlement (L) = 113 ft.

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REVISIONS		
DATE	DESCRIPTION	DATE

ENGINEER OF RECORD
ROLANDO CORSA, P.E., C.B.I.
P.E. LICENSE NUMBER 73191
ARCOS BRIDGE, INC.
8112 CHAMPIONS FOREST WAY
TAMPA, FL 33635

CITY OF NAPLES	
PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

BOX CULVERT DATA TABLE

SHEET NO. B1-06

MARK		LENGTH		NO	TYP	STY		B			C			D			E			F			H			J			K			N	Ø
SIZE	DES	FT	IN	BARS	BAR	A	G	FT	IN	FR	FT	IN	FR	FT	IN	FR	FT	IN	FR	FT	IN	FR	FT	IN	FR	FT	IN	FR	FT	IN	FR	NO	ANG

TO BE INCLUDED IN FUTURE SUBMITTAL

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REVISIONS		
DATE	DESCRIPTION	DATE

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TAMPA, FL 33635

CITY OF NAPLES

PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

REINFORCING BAR LIST

SHEET NO.

B1-07

Load Rating Summary Details for Concrete Bridge Culverts (Box and Three-Sided Culvert)

Table Date 07-01-15

Table 2 - LRFR

Level	Limit State	Vehicle	Weight (tons)	Load Factors			Moment (Strength)					Shear (Strength)					Comments: Wheel load distribution method if other than LRFD. Other appropriate comments.
				LL	DC	DW	Unfactored Ratio	Rating Factor	Tons	Location	Dimension	Unfactored Ratio	Rating Factor	Tons	Location	Dimension	
Design Load Rating	Strength I (Inv)	HL-93	N/A	1.75	1.25	1.50	.	.	N/A	.	.	.	.	N/A	.	.	.
Design Load Rating	Strength I (Op)	HL-93	N/A	1.35	1.25	1.50	.	.	N/A	.	.	.	.	N/A	.	.	.
Permit Load Rating	Strength II	FL120	60.0	1.35	1.25	1.50	.	.	.	.	.	.	.	.	.	.	.

General Notes:
1. This table is based on the requirements established in the January 2026 "Structures Manual".

Table 2 Notes:
1. Permit capacity is determined by using the permit vehicle in all lanes.
2. Does the depth of fill above the top slab exceed the span length between the inside faces of the end walls (Bridge Culvert Total Span Length)? ☐ Yes ☒ No

   If Yes then the live load may be neglected per LRFD 3.6.1.2.6.
3. Software used in rating: FDOT LRFD Box Culvert V6.0. Release Date 09/20/2024

Abbreviations:

DL - Dead Load (LFR)

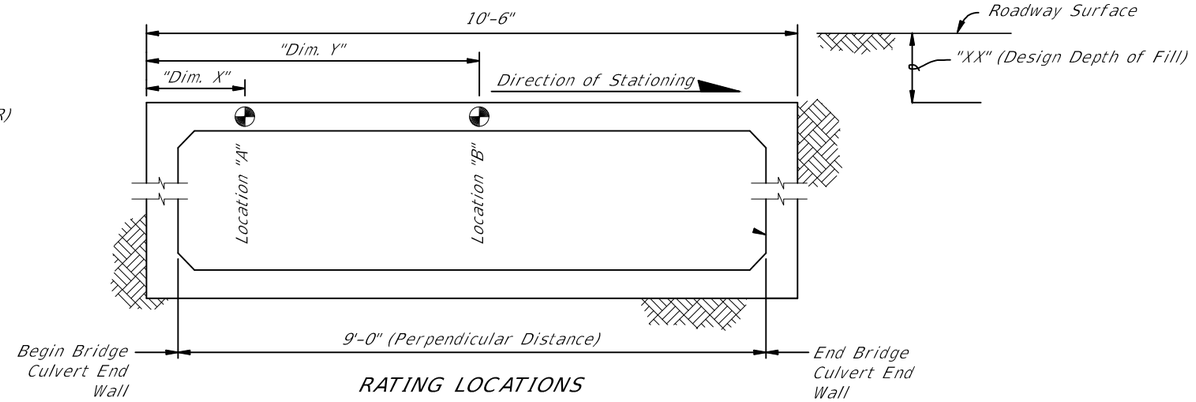
DC - Component Dead Load (LRFR)

DW - Wearing Surface & Utility Dead Load (LRFR)

LL - Live Load

Inv - Inventory

Op - Operating



RATING LOCATIONS

TO BE INCLUDED IN FUTURE SUBMITTAL

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REVISIONS		
DATE	DESCRIPTION	DATE

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P.E. LICENSE NUMBER 73191
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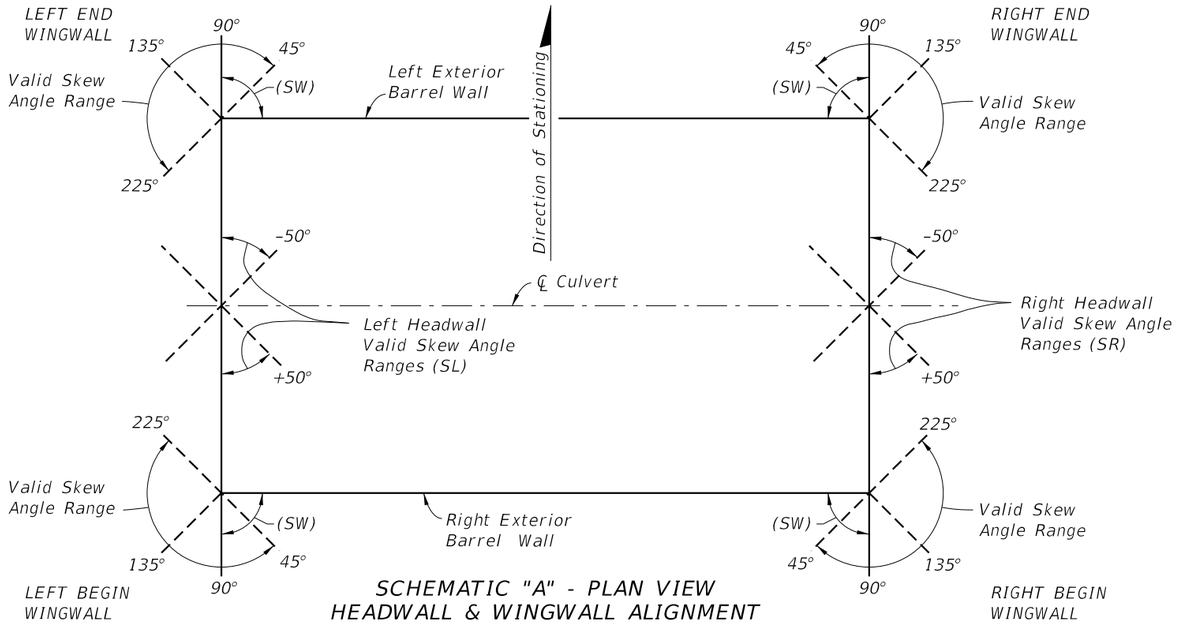
TAMPA, FL 33635

CITY OF NAPLES	
PROJECT NAME	CITY PROJECT ID
1st Ave. S, 12th St. S, and 10th St. Streetscape Design Project & Engineering Services	CN23-019

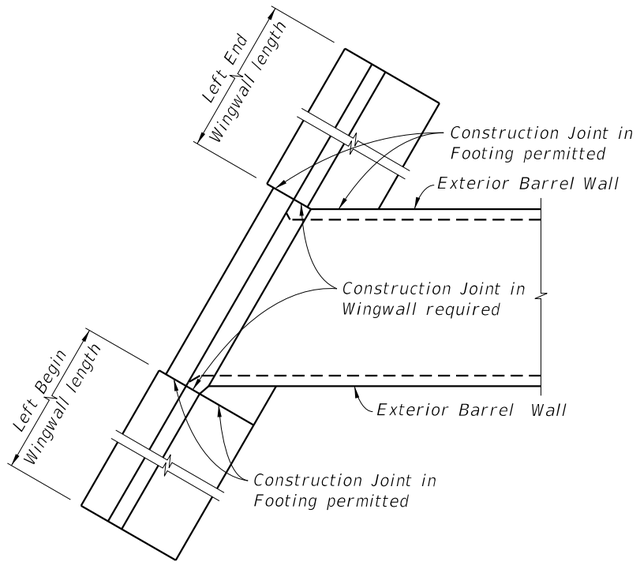
BRIDGE CULVERT LOAD RATING SUMMARY

SHEET NO. B1-08



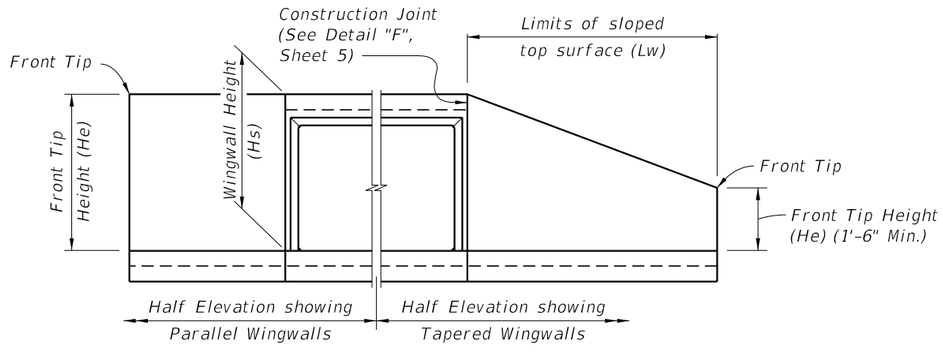
SCHEMATIC "A" - PLAN VIEW
HEADWALL & WINGWALL ALIGNMENT

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.

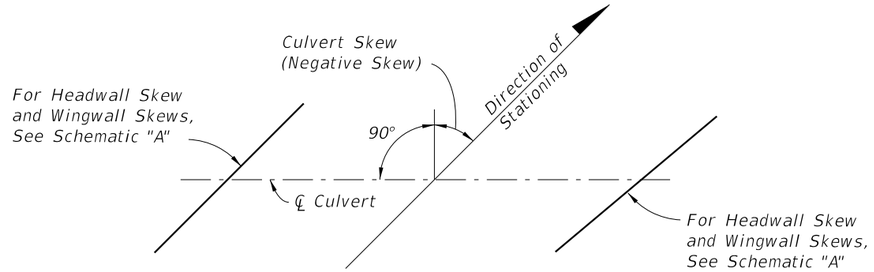
CONSTRUCTION LOADING: It is the construction Contractor's responsibility to provide for supporting construction loads that exceed AASHTO HL-93, and any construction load applied prior to 2 feet of compacted fill placed above the top slab.

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)		BAR SIZE	SPLICE (CLASS B)	
	CLASS II (3400 psi)	CLASS IV (5500 psi)		CLASS II (3400 psi)	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.

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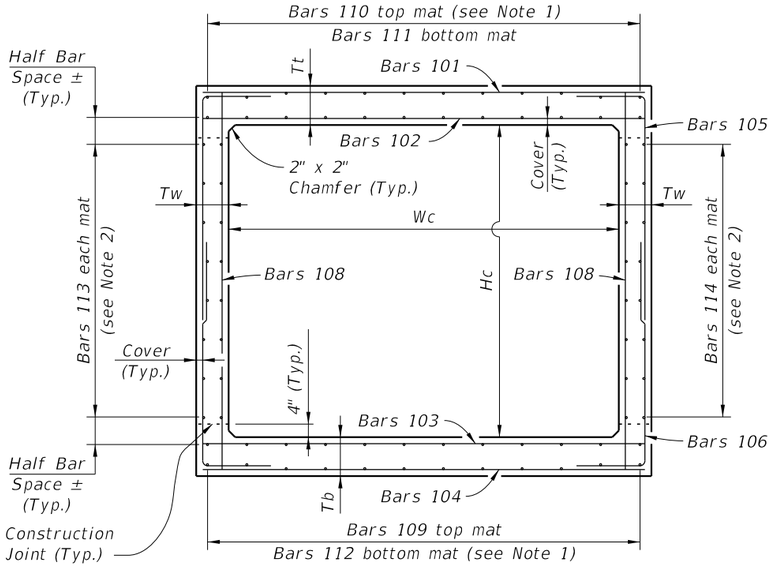
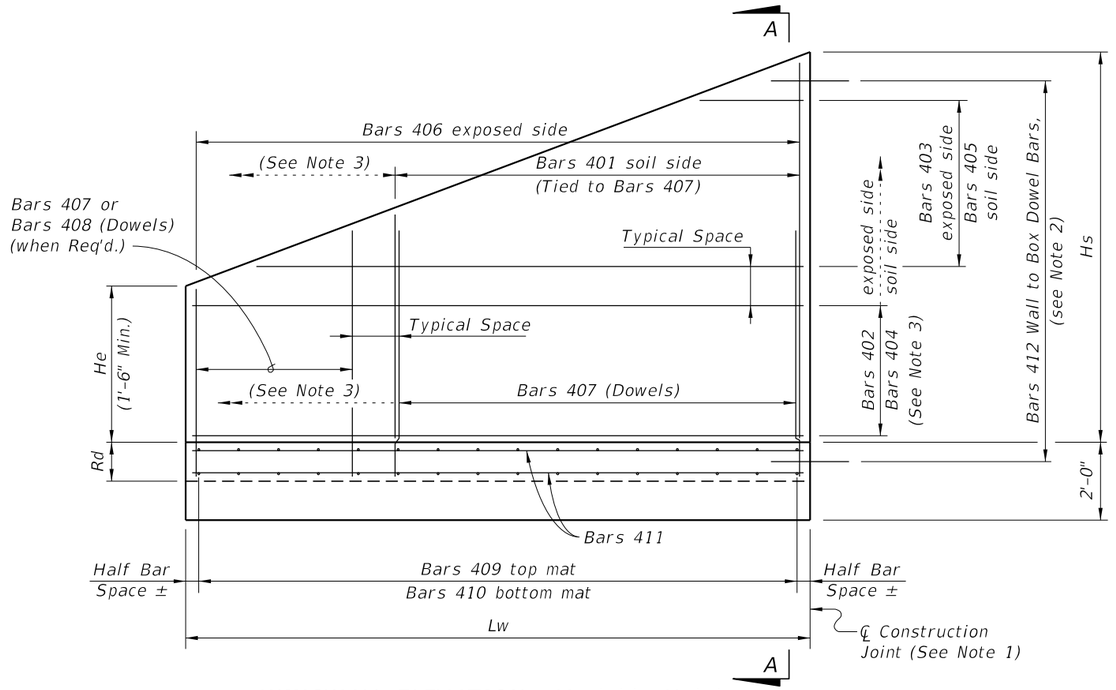
LAST REVISION	REVISION	DESCRIPTION:				
11/01/16			FDOT FY 2026-27 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX 400-289	SHEET 1 of 8



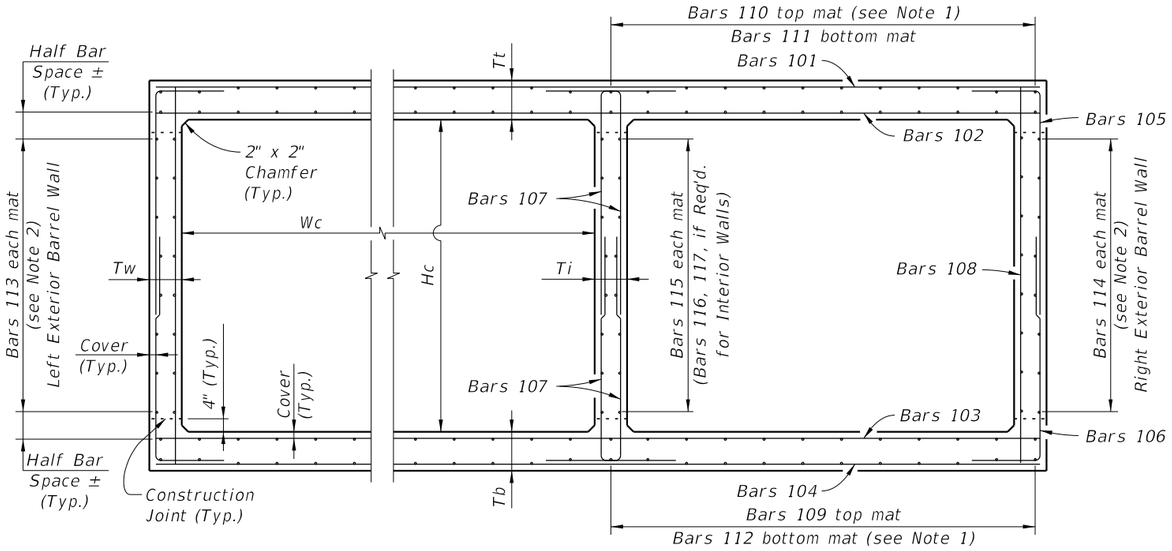
TYPICAL SECTION THRU SINGLE BARREL CULVERT

CULVERT BARREL NOTES:

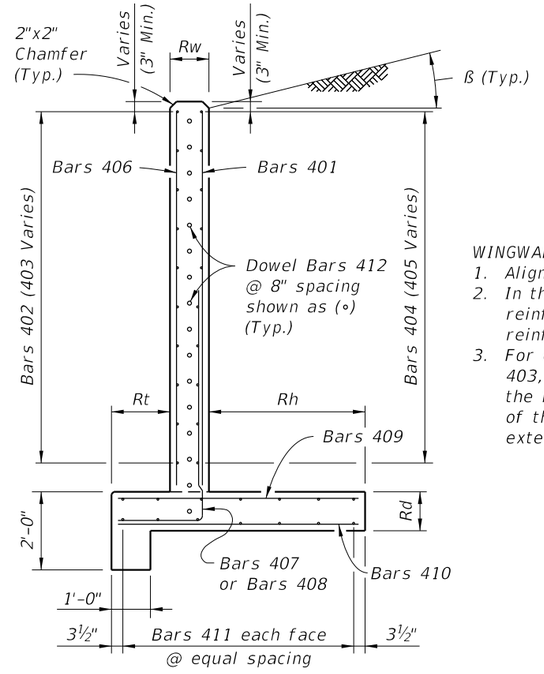
1. *Space Bars 110 and 112 with a bar in each corner, and at the ℄ of interior walls (for multiple barrel culverts only), and the remaining bars placed at equal spacing shown in the Contract Plans. Adjust last bar spacing when required.*
2. *Place Bars 113 and 114 at spacing shown in the Contract Plans 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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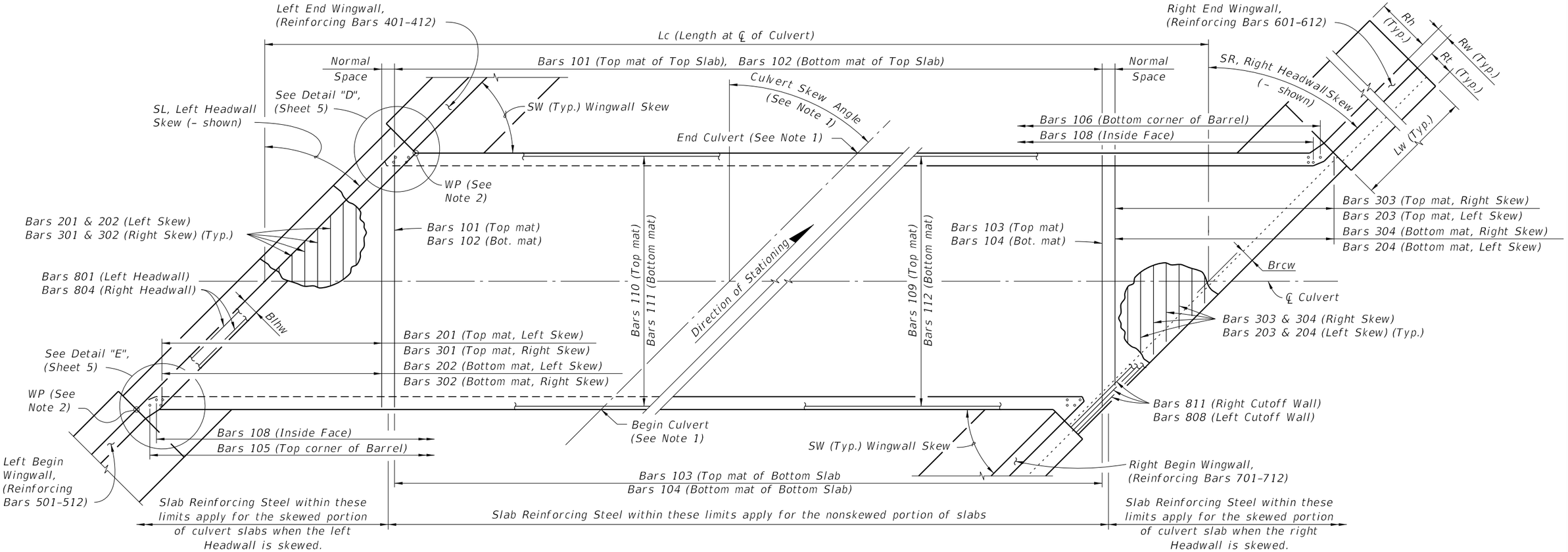
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/13			FY 2026-27 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	400-289	2 of 8

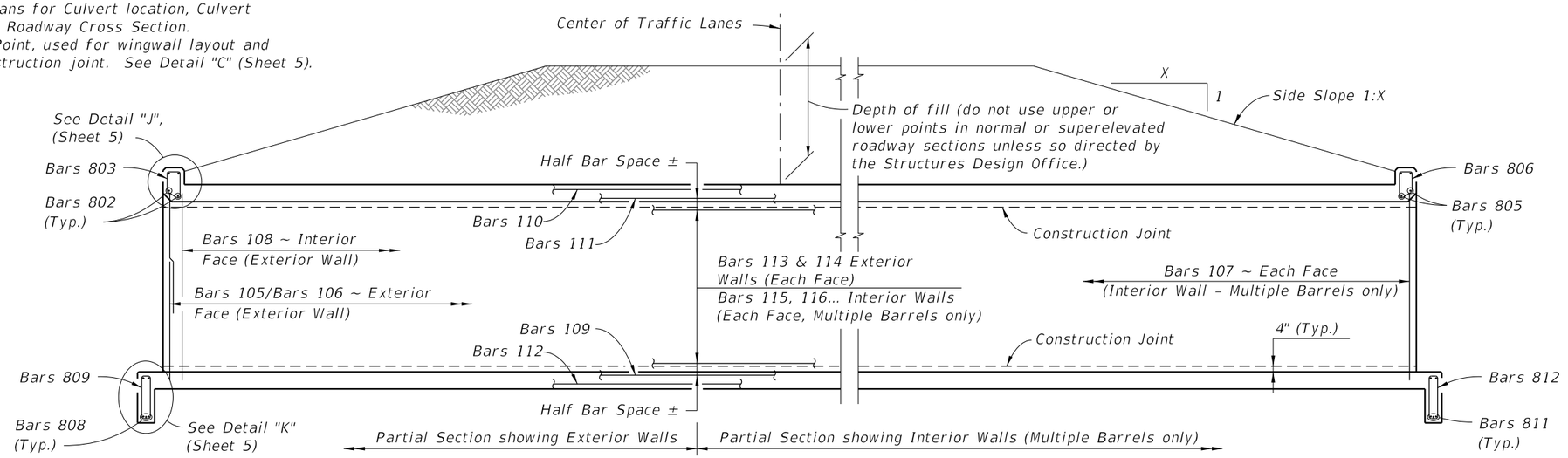


PARTIAL PLAN TOP SLAB
(Left Side, Left Skew)

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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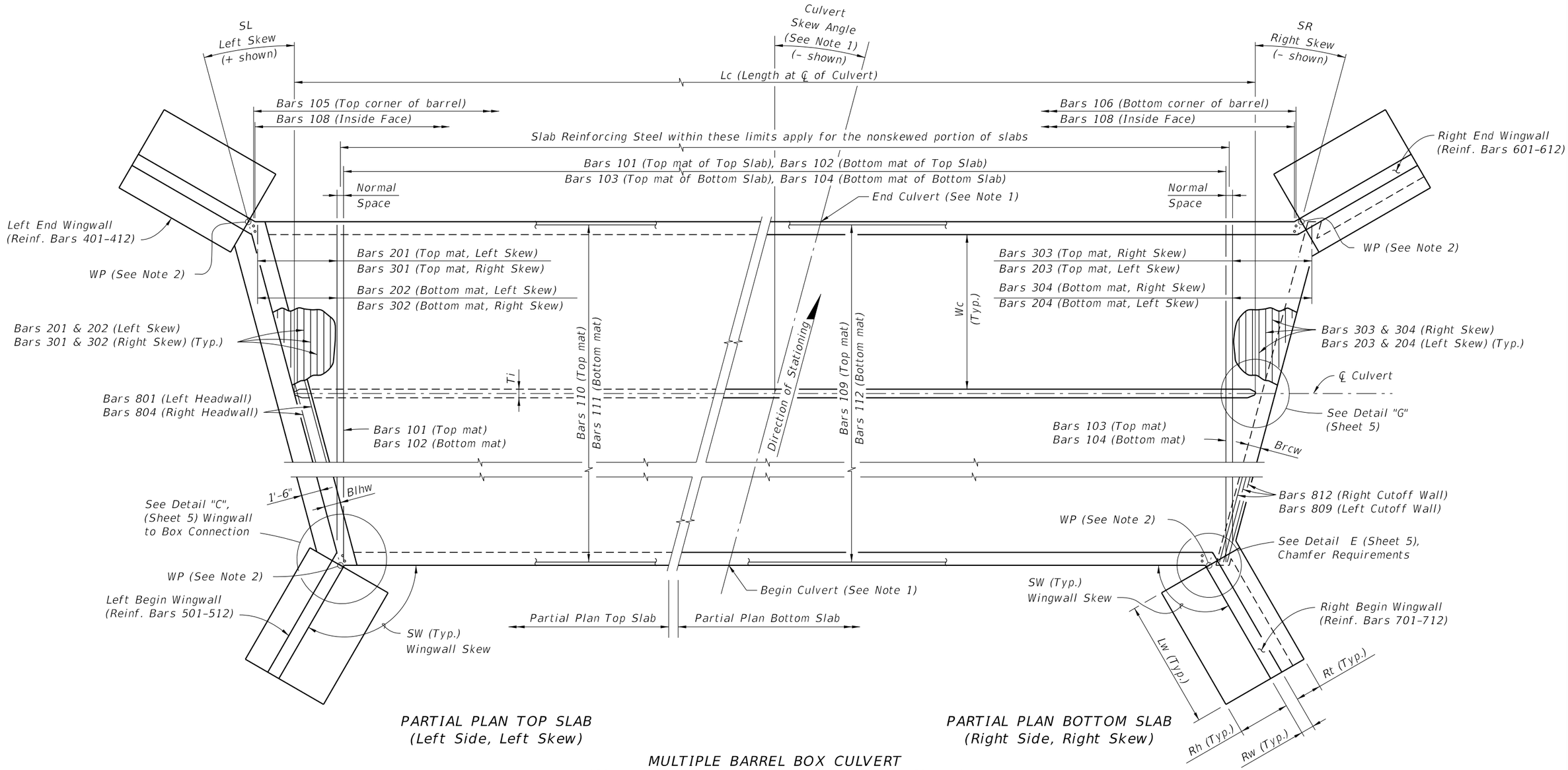
LAST REVISION	REVISION	DESCRIPTION:				
01/01/07			FDOT FY 2026-27 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX 400-289	SHEET 3 of 8



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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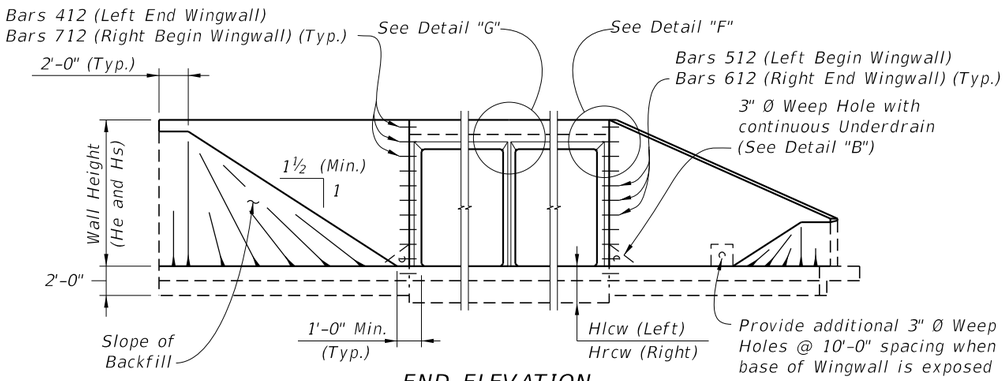
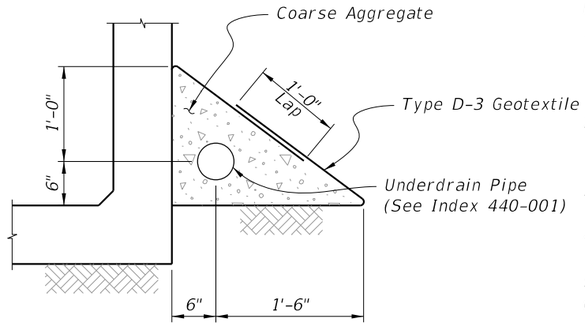
LAST REVISION	REVISION	DESCRIPTION:				
01/01/07			FY 2026-27 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX 400-289	SHEET 4 of 8



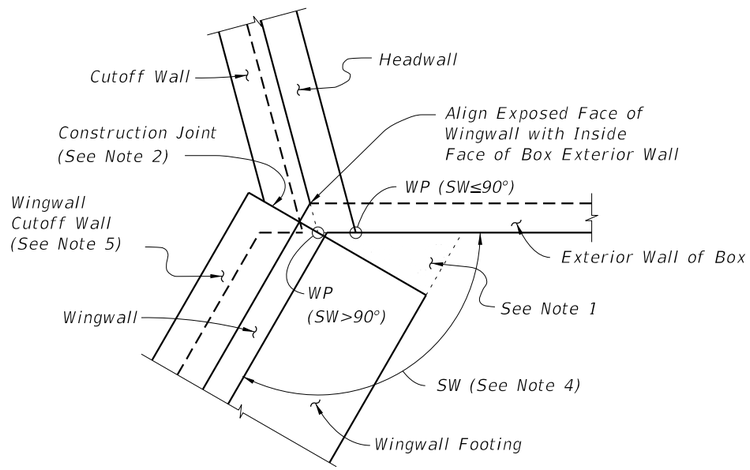
END ELEVATION
(Showing Constant Height And Variable Height Wingwalls)



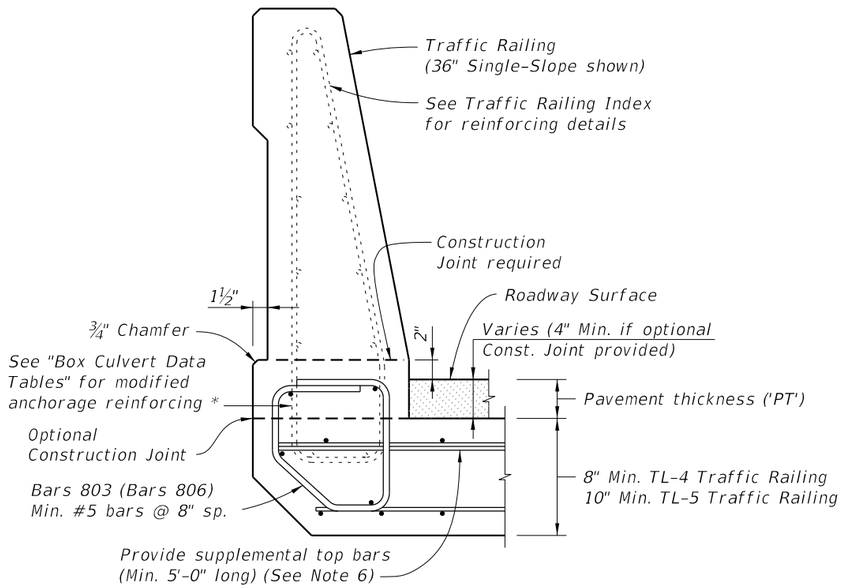
DETAIL "B"
UNDERDRAIN DETAIL
(Similar to Type II ~ Index 440-001)

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 Headwall 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.

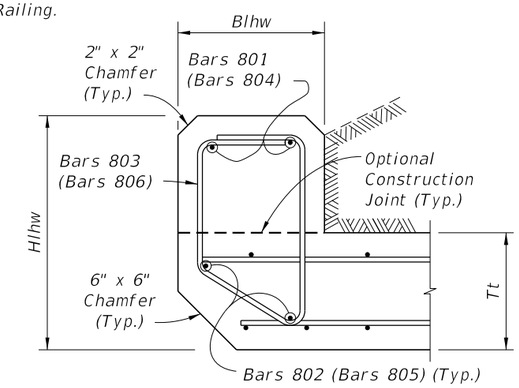
* Included in the cost of the Traffic Railing.



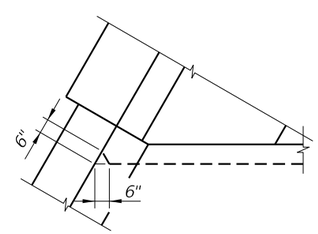
DETAIL "C" - PLAN VIEW
WINGWALL TO BOX CONNECTION
(Left Begin Corner Shown, Other Corners Similar)



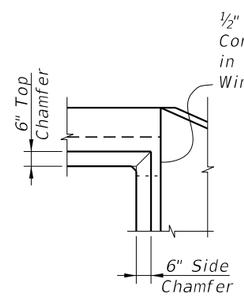
DETAIL "I"
TRAFFIC RAILING ATTACHMENT TO HEADWALL



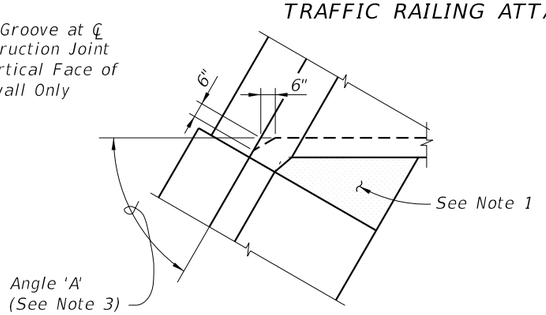
DETAIL "J"
LEFT HEADWALL SECTION
(Right Headwall similar)



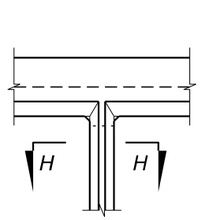
DETAIL "D"



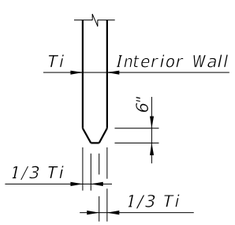
DETAIL "F"



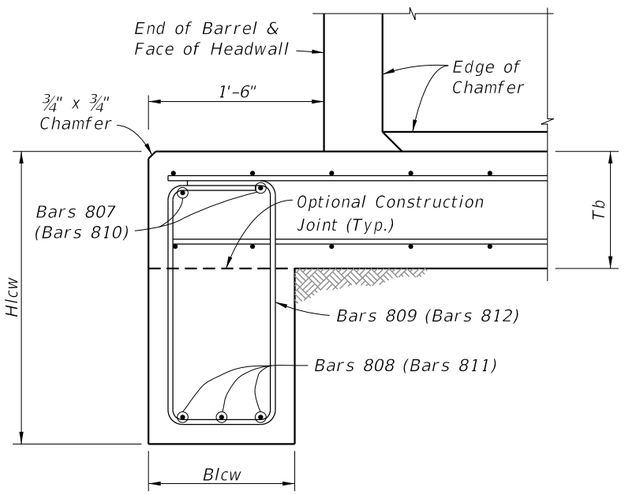
DETAIL "E"



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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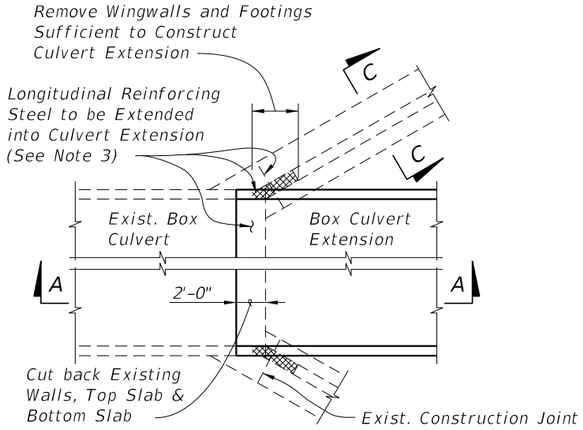
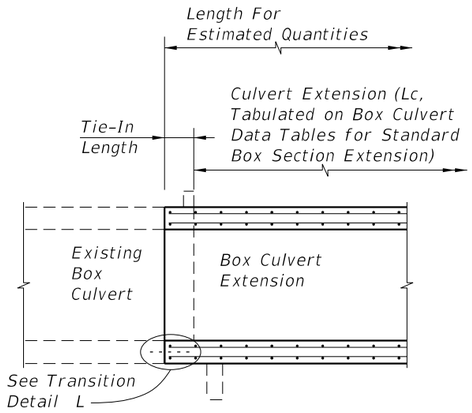
LAST REVISION	REVISION	DESCRIPTION:				
11/01/23			FY 2026-27 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX 400-289	SHEET 5 of 8

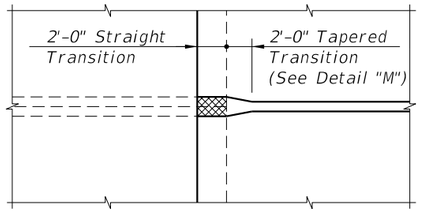


OUTSIDE WALLS OF BOXES

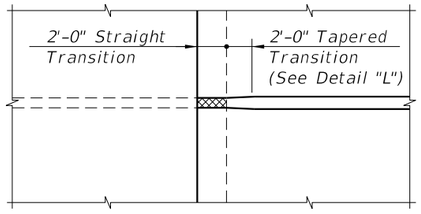


SECTION A-A

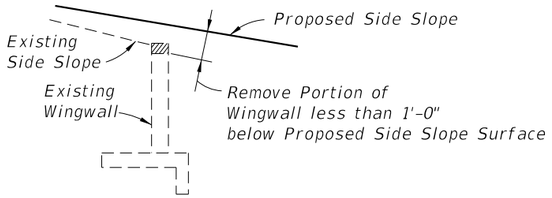
FLARED WINGWALL



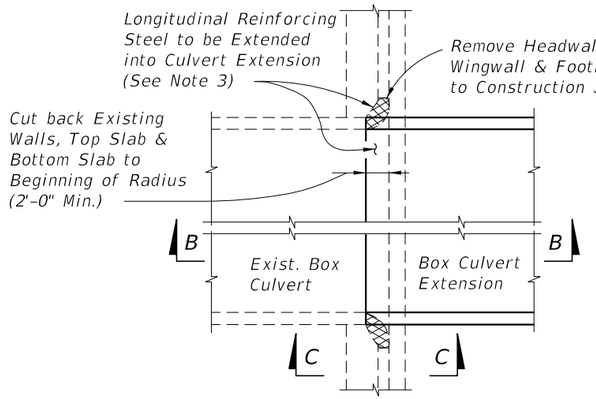
INTERIOR DOUBLE WALLS OF BOXES



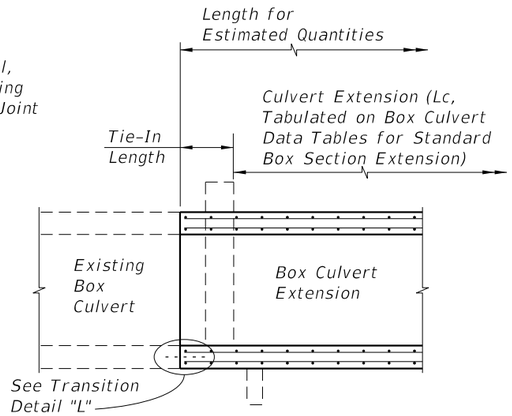
INTERIOR SINGLE WALLS OF BOXES



SECTION C-C



OUTSIDE WALLS OF BOXES



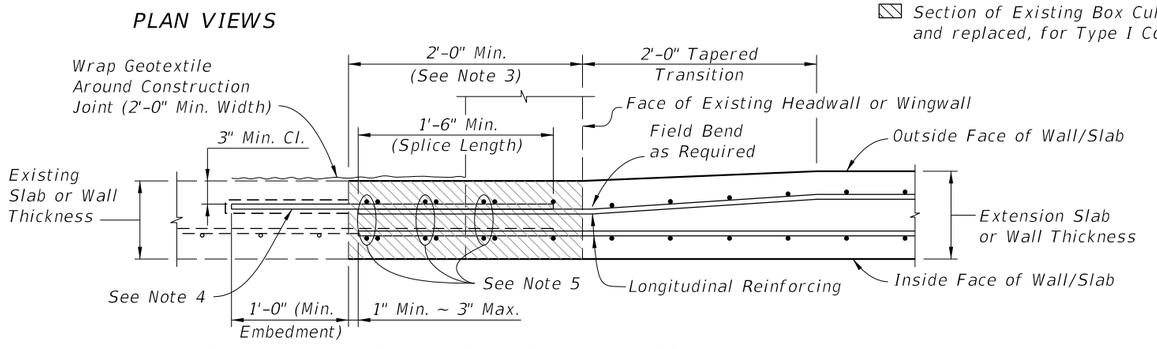
SECTION B-B

STRAIGHT WINGWALL

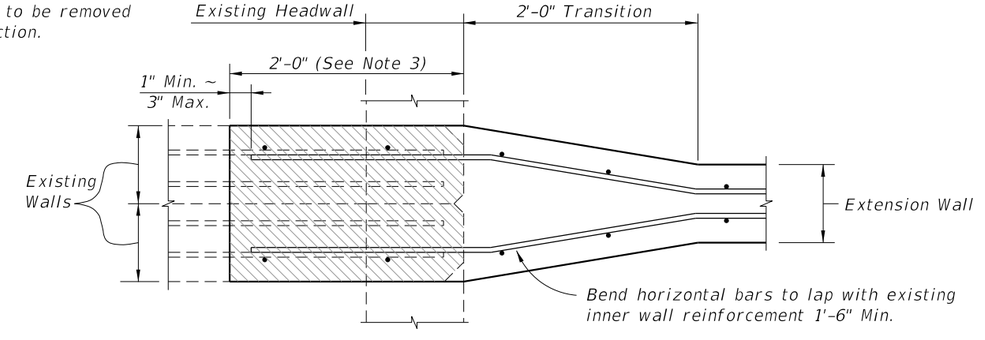
NOTES:

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)

10/6/2025 2:18:56 PM

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
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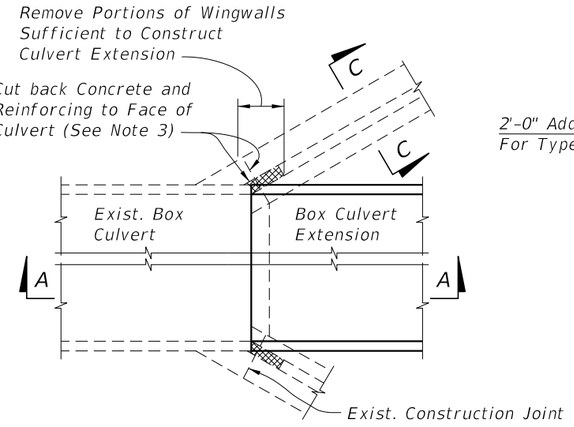
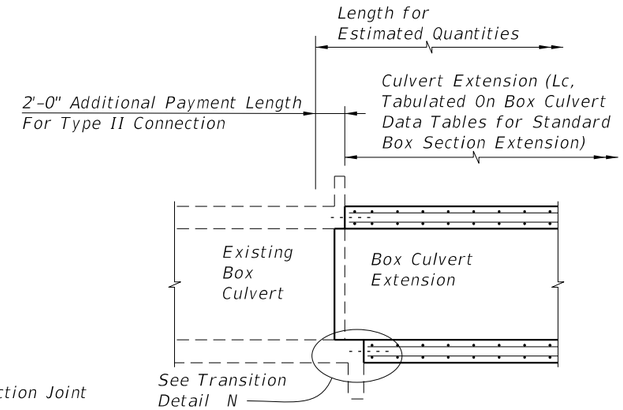
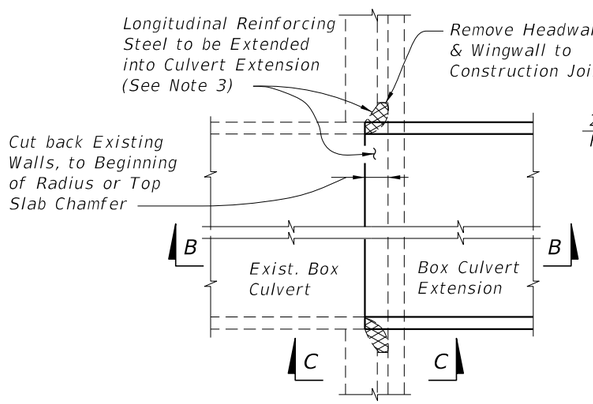


OUTSIDE WALLS OF BOXES

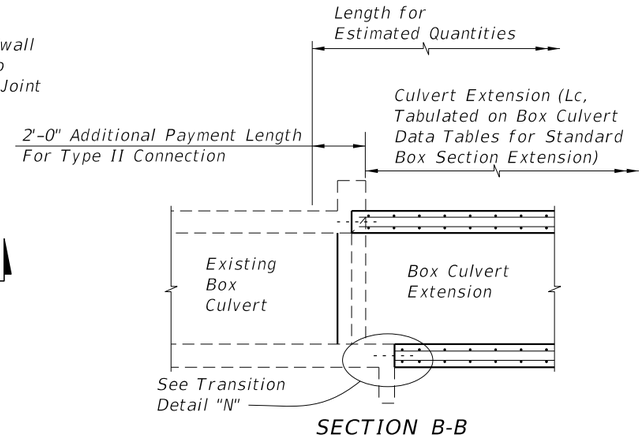


SECTION A-A

FLARED WINGWALL

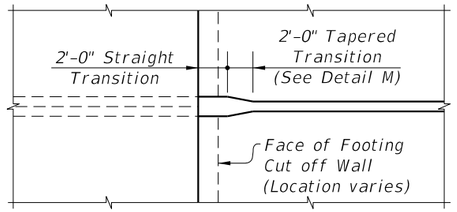


OUTSIDE WALLS OF BOXES

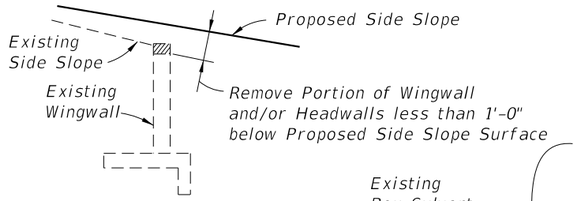


SECTION B-B

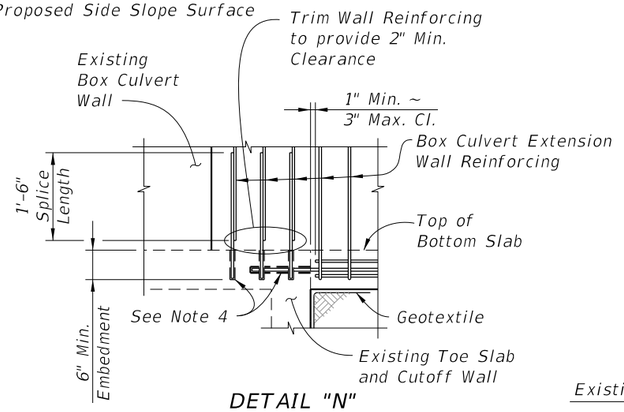
STRAIGHT WINGWALL



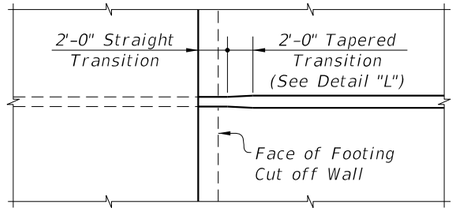
INTERIOR DOUBLE WALLS OF BOXES



SECTION C-C

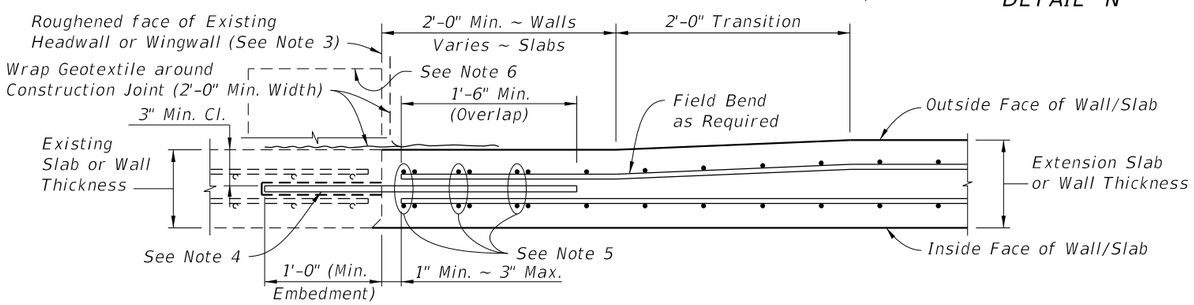


DETAIL "N"

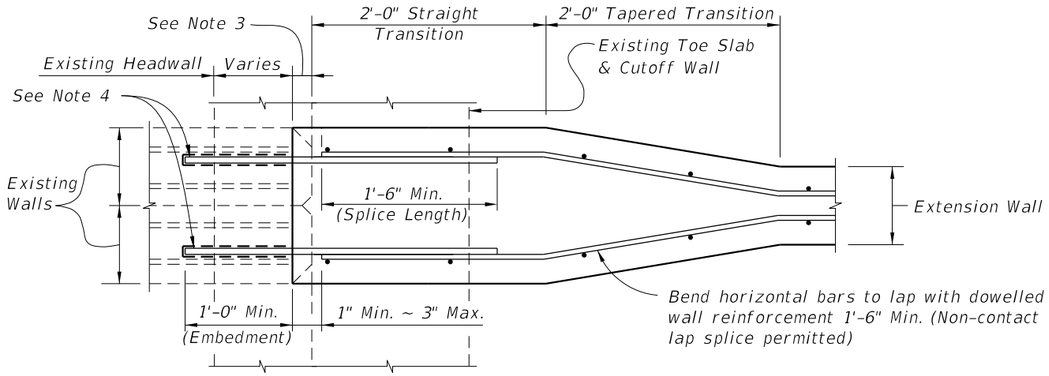


INTERIOR SINGLE WALLS OF BOXES

PLAN VIEWS



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



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

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.

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

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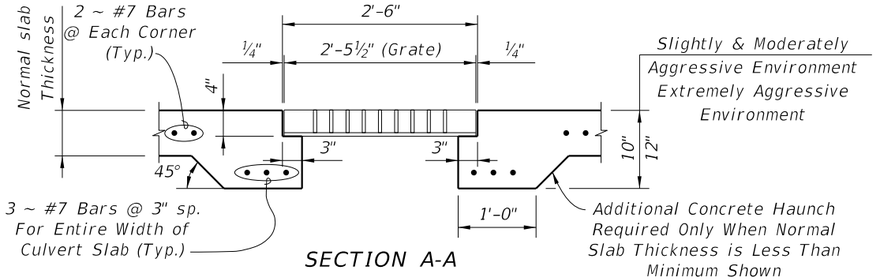
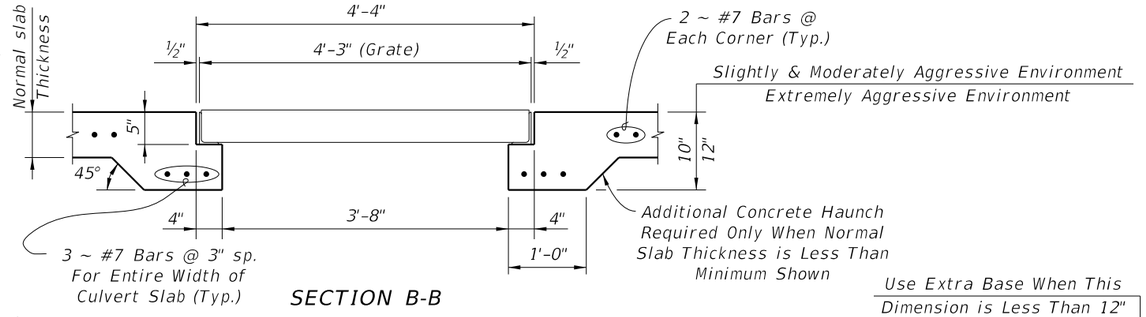
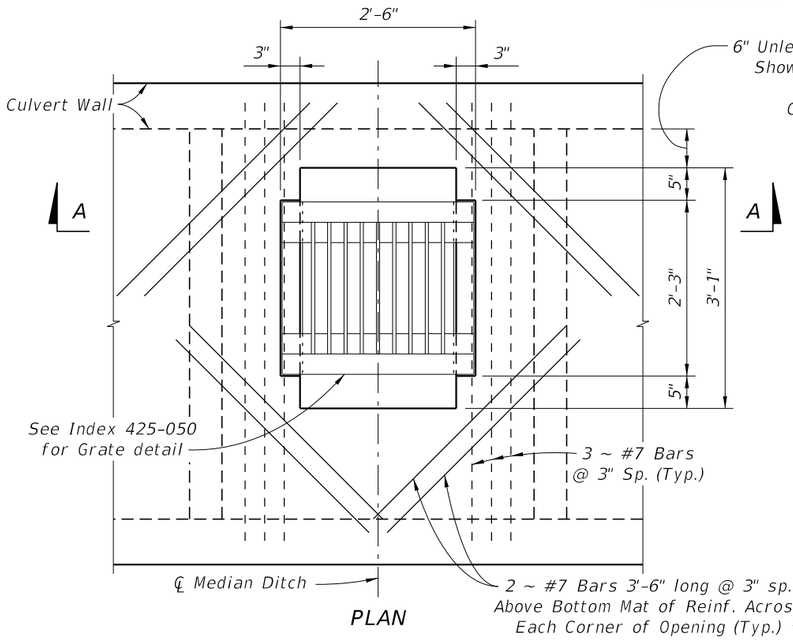
11/01/23			FDOT FY 2026-27 STANDARD PLANS	CONCRETE BOX CULVERT DETAILS	INDEX 400-289	SHEET 7 of 8



SECTION A-A

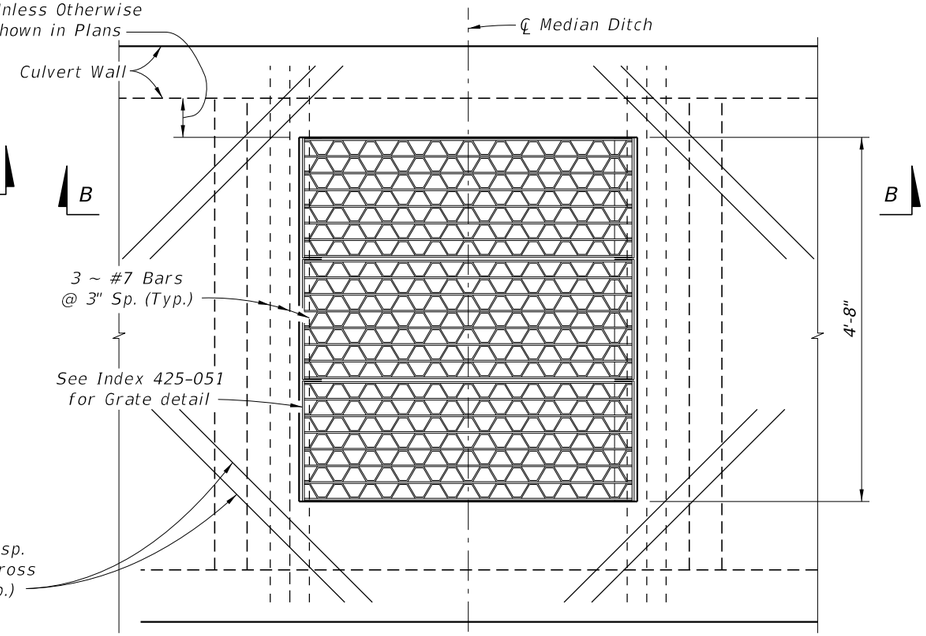


SECTION B-B



PLAN

INLET TYPE A GRATE



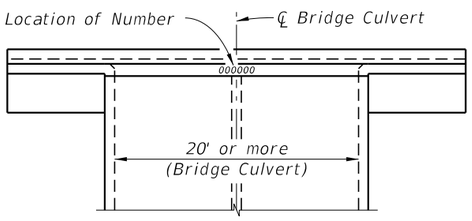
PLAN

INLET TYPE B GRATE

NOTES:

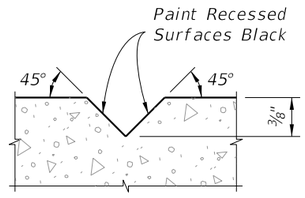
1. Cost of Steel Grating to be included in cost of Box Culvert.
2. All reinforcing shall be 2" clear for Slightly and Moderately Aggressive Environments, and 3" clear for Extremely Aggressive Environments.

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).

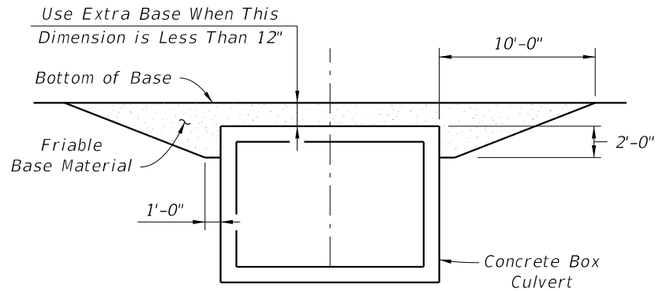
TOP VIEW OF HEADWALL



SECTION THRU RECESSED V-GROOVE TO FORM INSCRIBED FIGURES

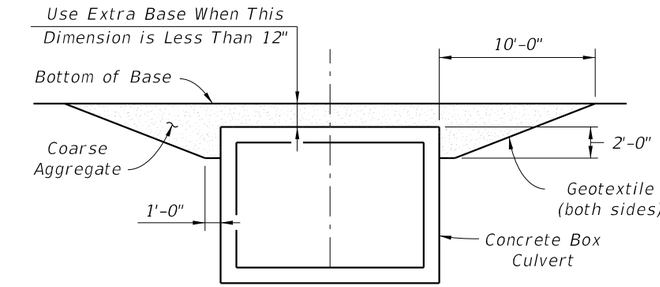
Black Plastic Figures 3" in height as approved by the Engineer may be used in lieu of numbers formed by ⅜" V-Grooves. V-Grooves shall be formed by preformed figures.

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 Geotextile (see Specification Section 514). The cost of furnishing and installing the coarse aggregate and geotextile 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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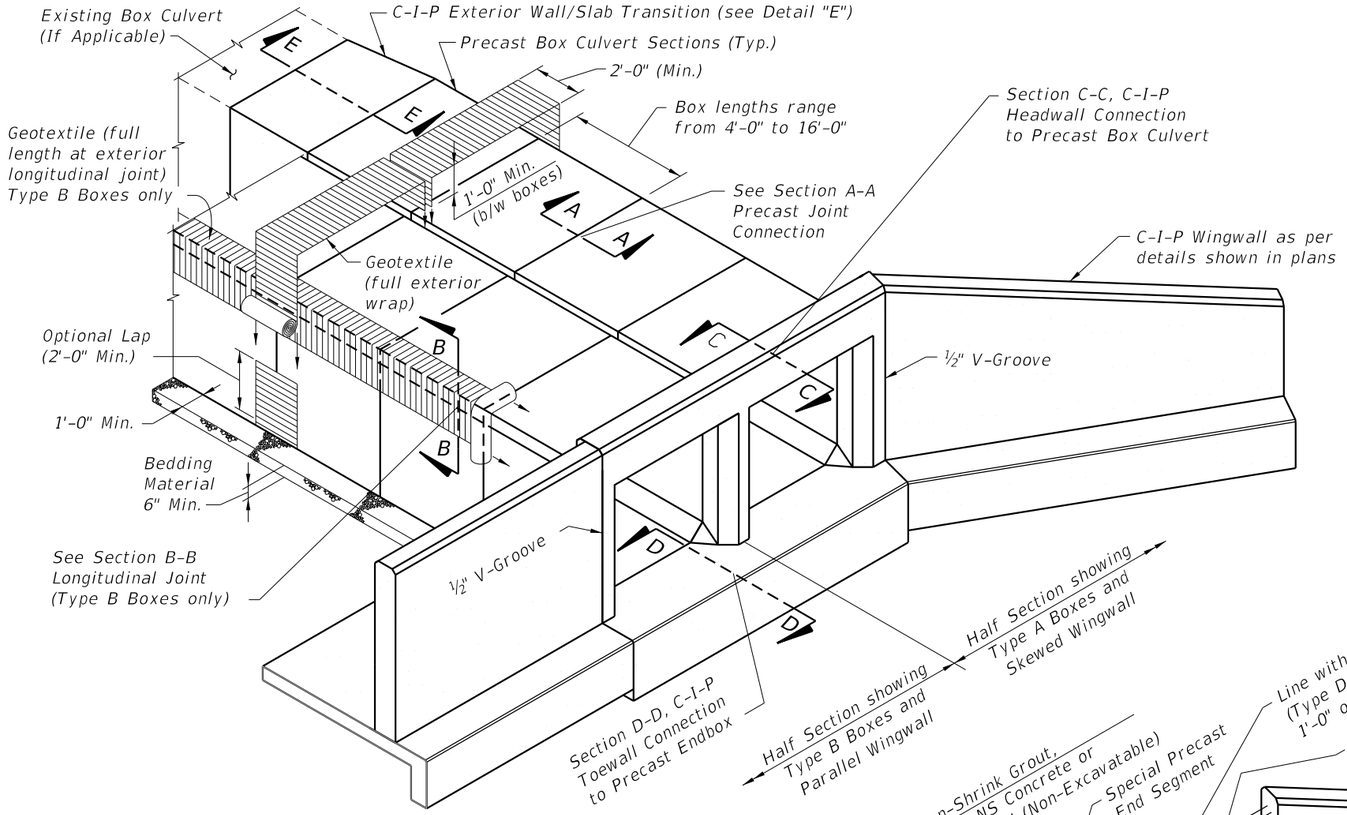
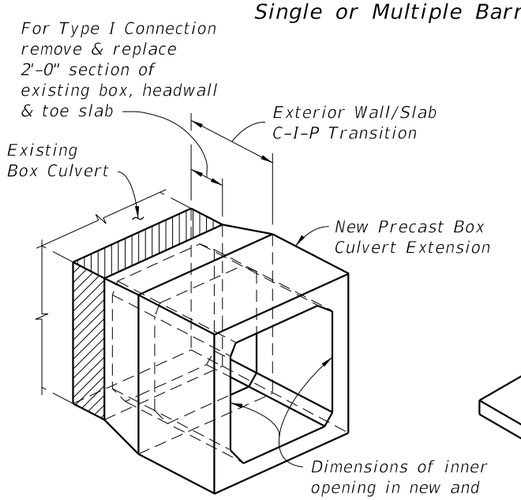
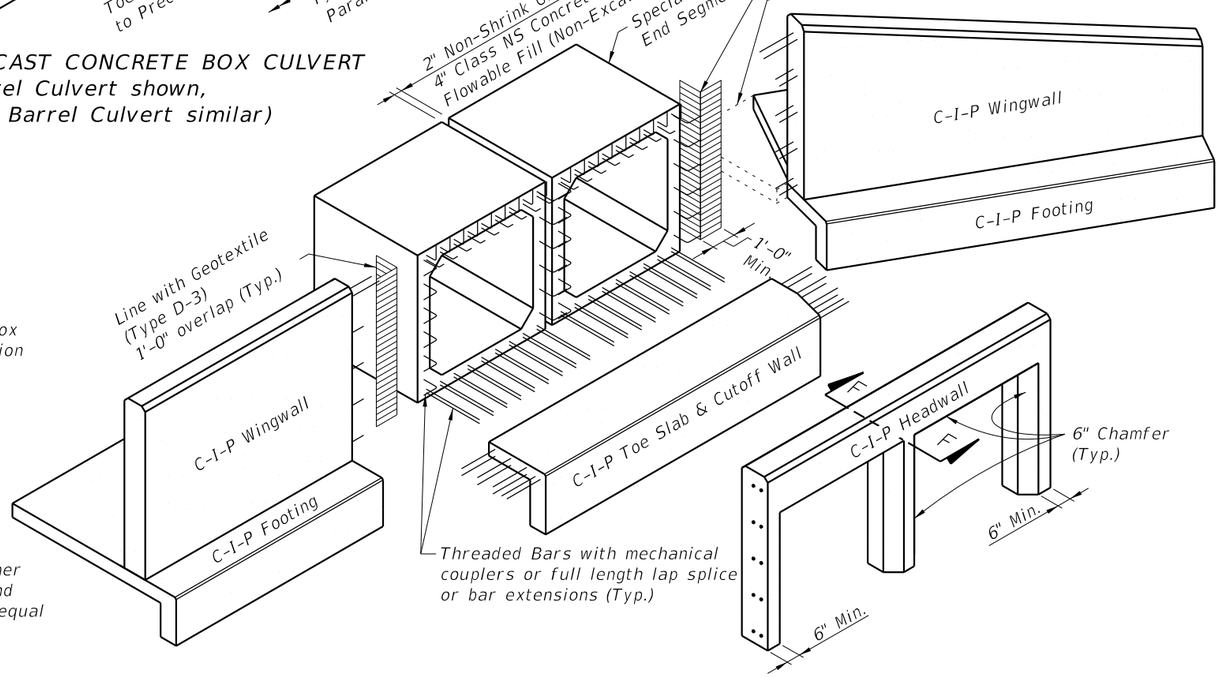


ISOMETRIC VIEW OF PRECAST CONCRETE BOX CULVERT
(Double Barrel Culvert shown, Single or Multiple Barrel Culvert similar)

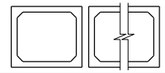
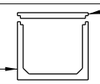
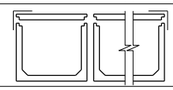
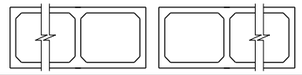


DETAIL E
PICTORIAL VIEW OF EXTERIOR WALL/SLAB TRANSITION



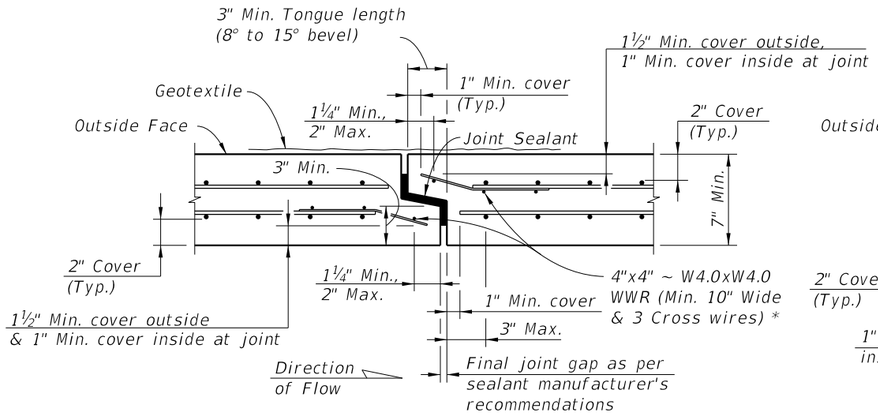
EXPLODED VIEW OF CONNECTIONS AT END OF CULVERT
(Double Barrel Culvert shown, Single or Multiple Barrel Culvert similar)

PERMITTED PRECAST ALTERNATE BOX SECTIONS

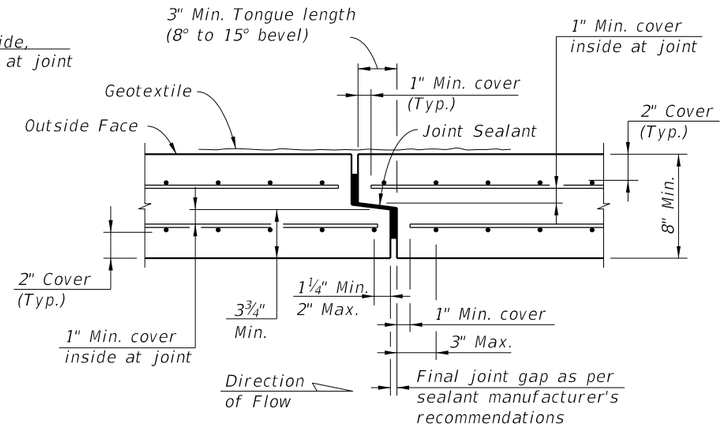
TYPE	DESCRIPTION	SINGLE BARREL	MULTIPLE BARRELS	DESIGN NOTES
A	Single Cell Monolithic (Four Sided)			Index 400-292 or Contractor Design
B	Single Cell Two-Piece (Four Sided)			Contractor Design
C	Multicell Monolithic	Not Applicable		Contractor Design

GENERAL NOTES:

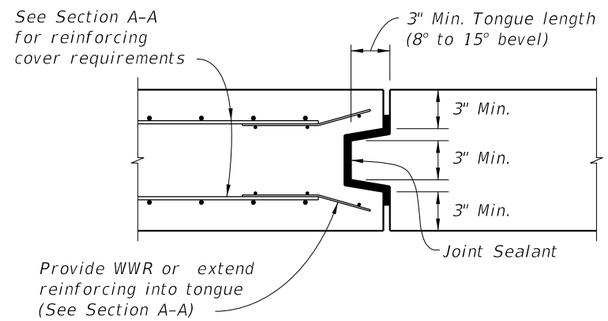
1. Specifications:
   - General:
     - FDOT Standard Specifications for Road and Bridge Construction, Section 410 (current edition, and supplements thereto).
   - Concrete (Precast):
     - Class III or Class II Modified (5,000 psi) for slightly aggressive environments.
     - Class IV (5,500 psi) for 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.



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

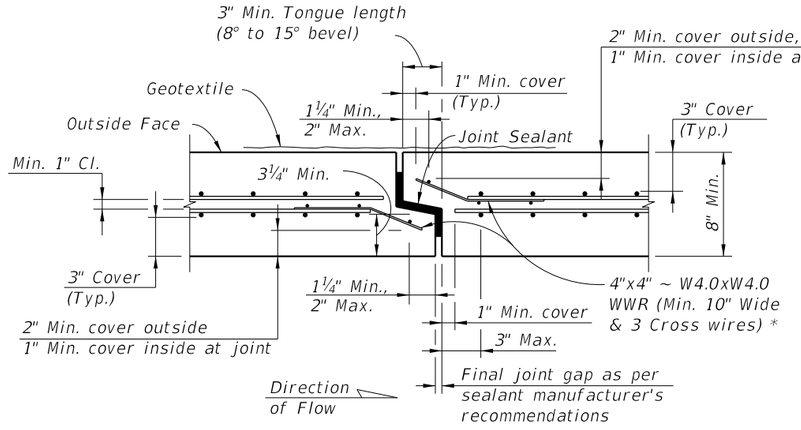


SECTION A-A
(2" Cover - Thick Wall Detail)



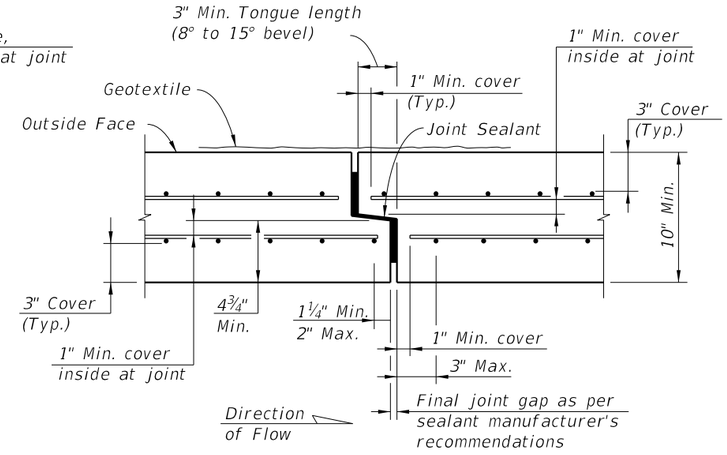
ALTERNATE BOTTOM SLAB TRANSVERSE JOINT
TYPICAL SECTION
(DOUBLE-SIDED TONGUE & GROOVE JOINT)
(All reinforcing not shown for clarity)

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".

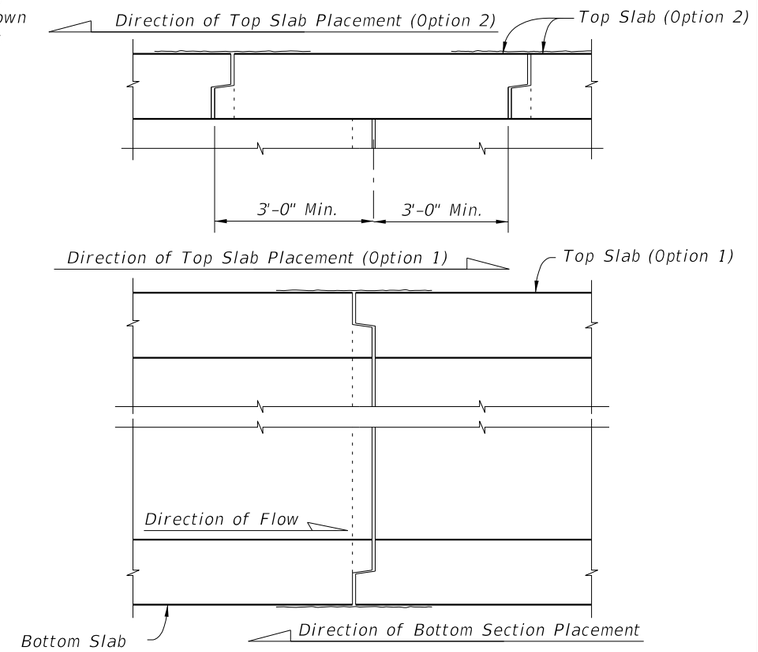


SECTION A-A
(3" Cover - Thin Wall Detail)

* *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.*



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



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

PRECAST SEGMENT TO SEGMENT TONGUE & GROOVE TRANSVERSE JOINTS

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

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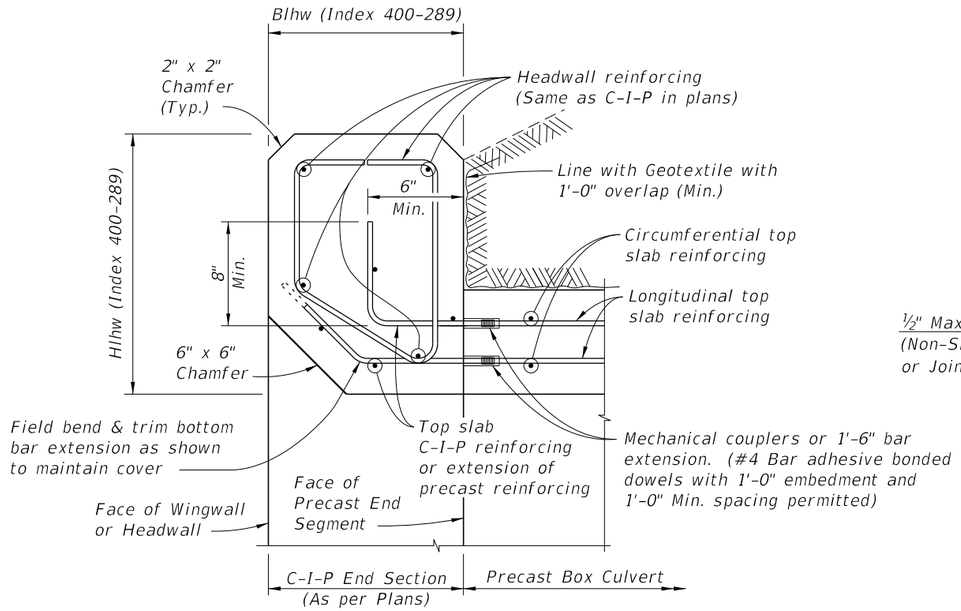
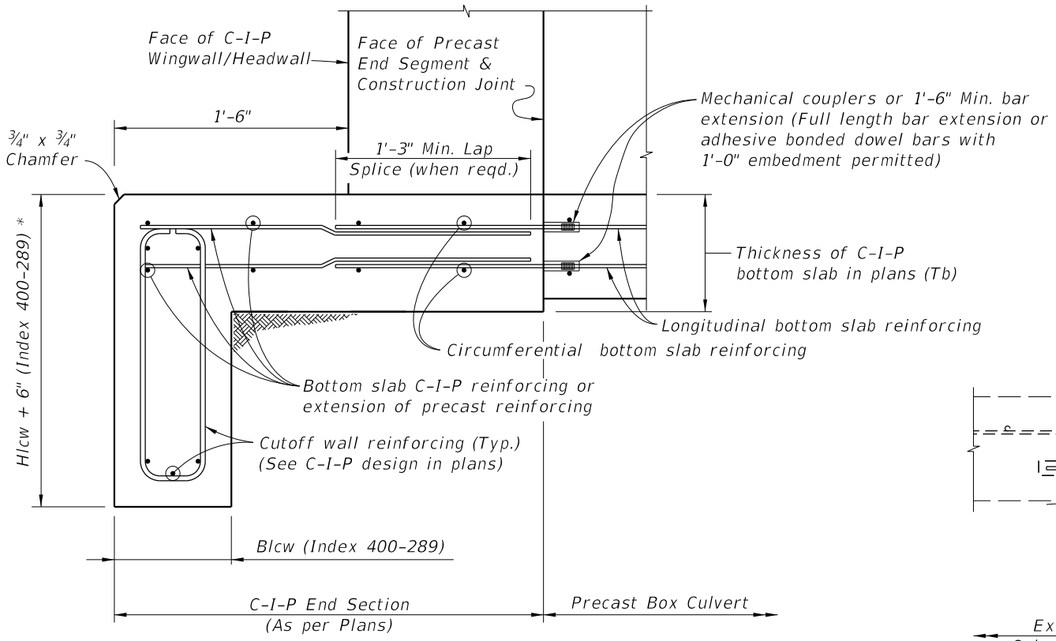
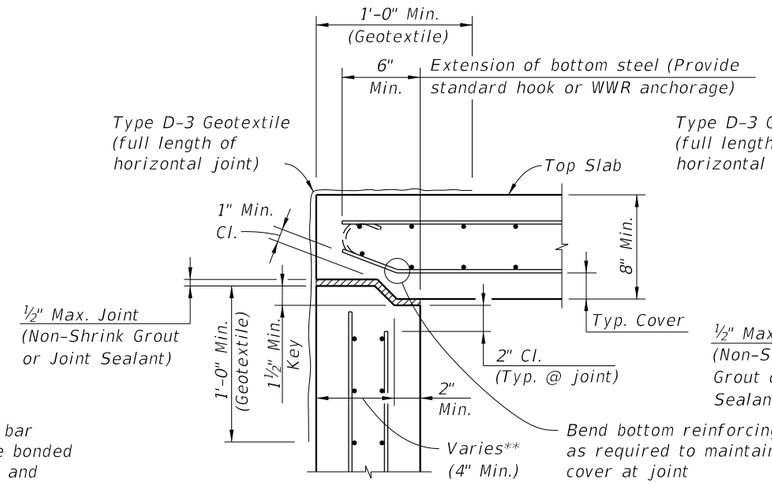


SECTION C-C
C-I-P HEADWALL DETAILS AND CONNECTION TO PRECAST BOX

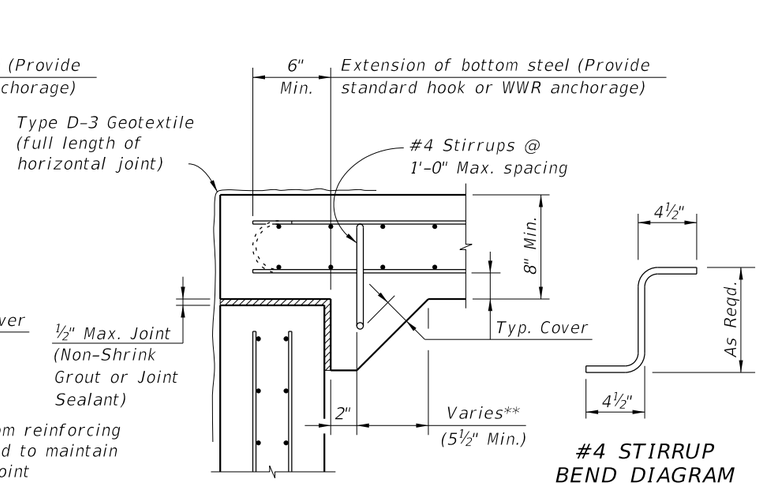


SECTION D-D
C-I-P TOE SLAB & CUTOFF WALL DETAILS
AND CONNECTION TO PRECAST BOX

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



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

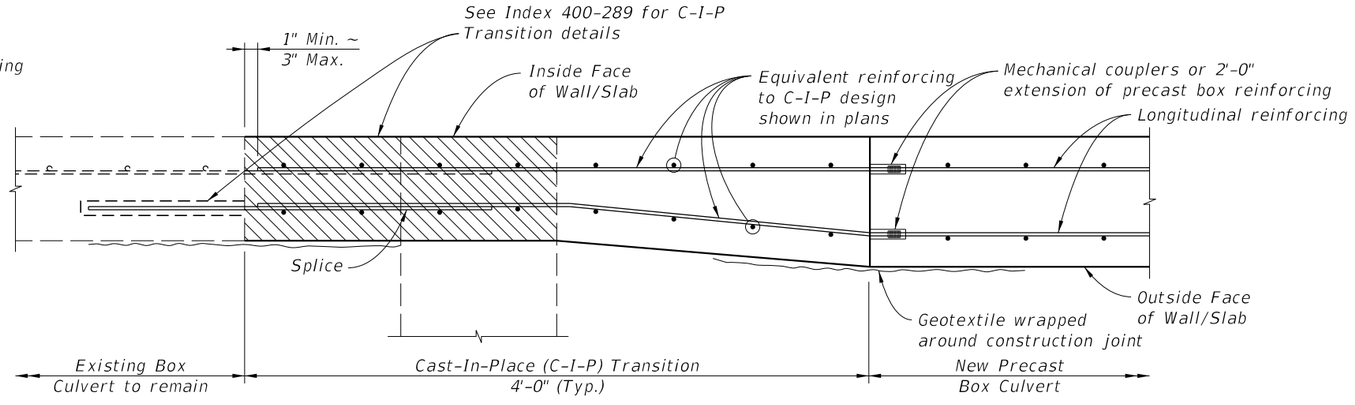


SECTION B-B
TOP SLAB TO WALL JOINT
(HAUNCHED JOINT)

#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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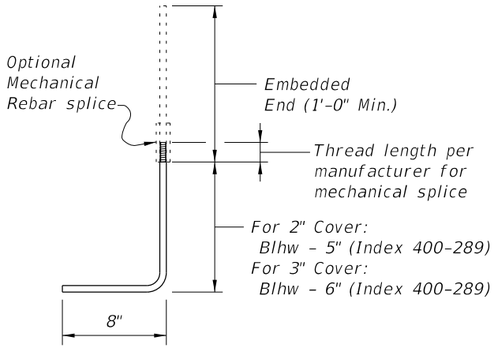
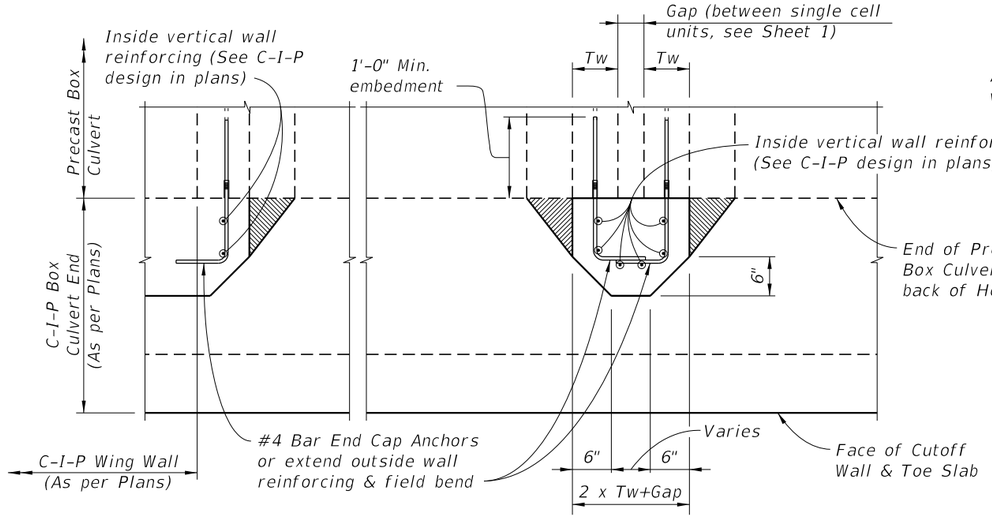
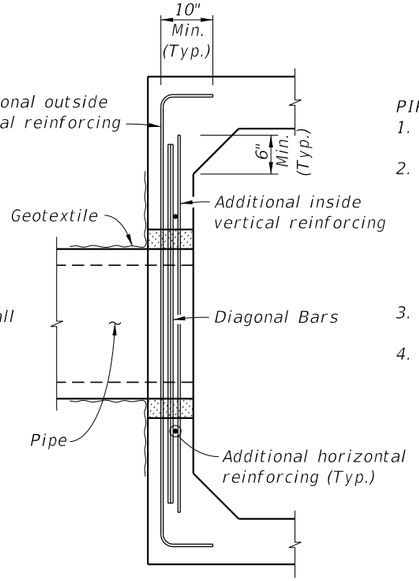


#4 BAR END CAP ANCHOR BAR BEND DIAGRAM



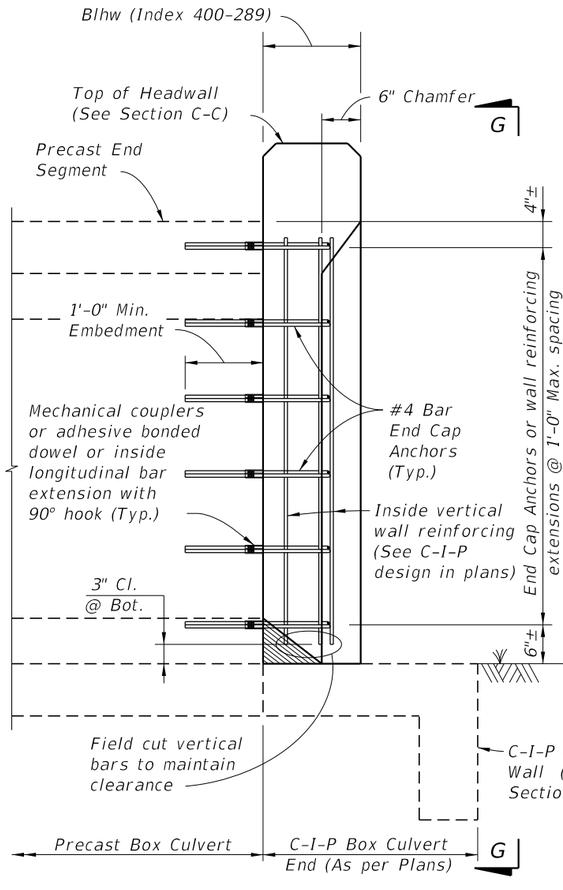
SECTION H-H



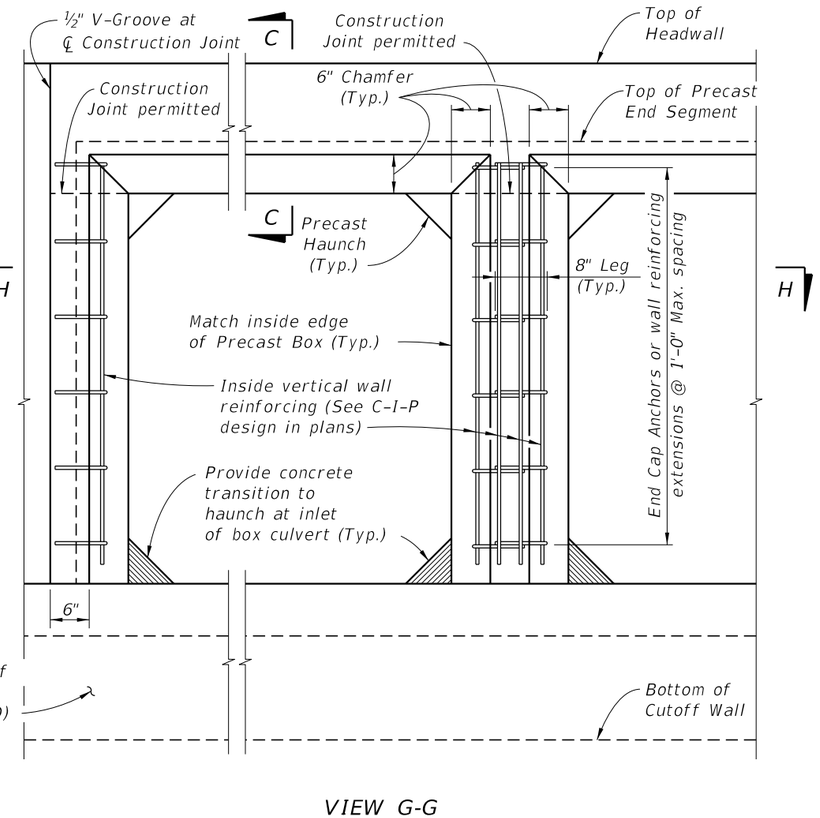
SECTION I-I
(Showing additional blockout reinforcing only)

PIPE BLOCKOUT NOTES:

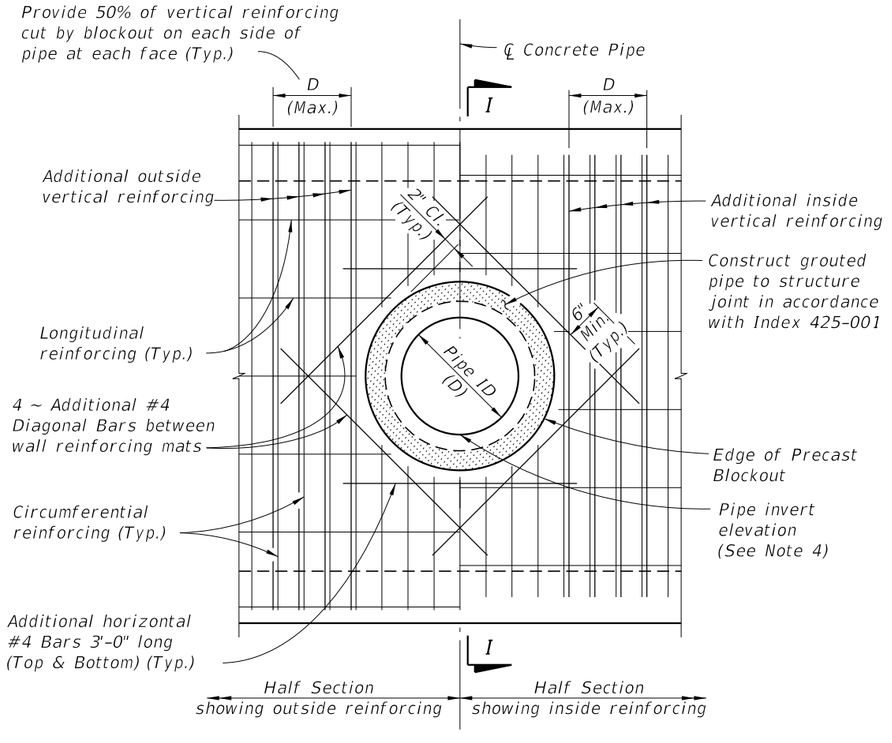
1. Cut box culvert reinforcement as required to maintain 2" cover.
2. For Precast Sections construct opening a minimum of 1'-6" away from any box to box joint, except opening may be a minimum of 1'-0" away from joint when at least 2'-0" of clearance to the box to box joint is provided on the opposite 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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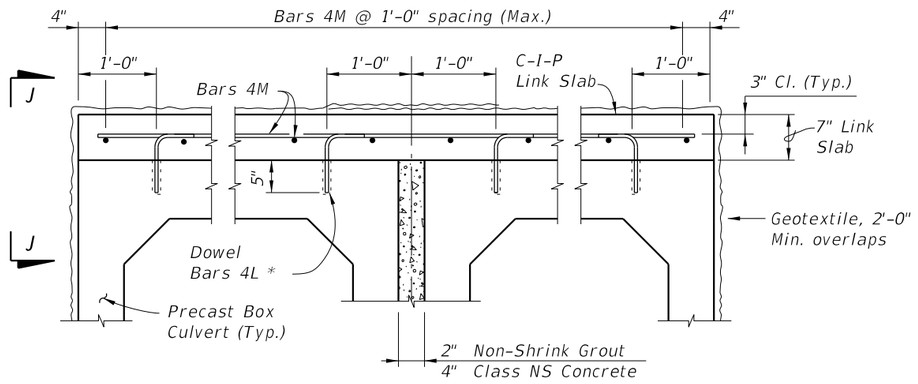
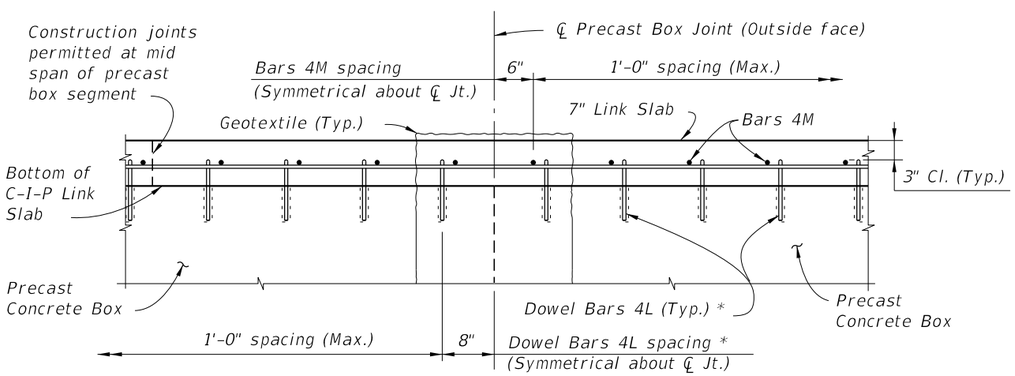


LINK SLAB TYPICAL SECTION
(Multiple Barrel Culvert shown, Single Barrel Culvert similar)

* 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.



VIEW J-J

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.)

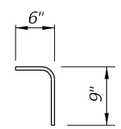
2. *Extend Link Slab to back face of headwalls and to limits of existing box culverts for extensions.*

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

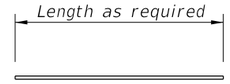
NOTE: Estimated quantities are based the plan area of precast box slabs, and are provided for information only. No additional payment will be made for Link Slabs where these are required for the precast box culverts.

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

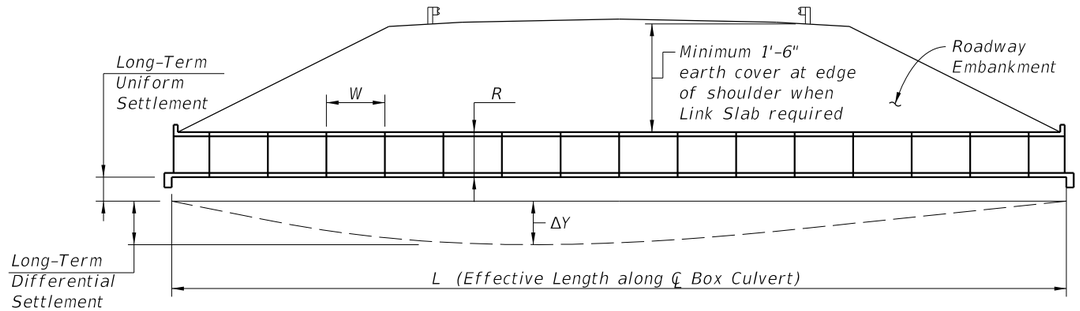


BAR 4M

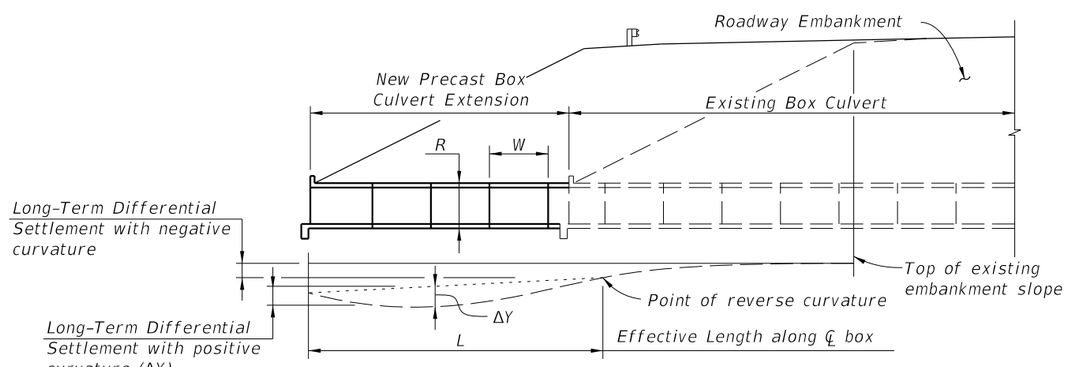
NOTES:
1. All bar dimensions are out to out.
2. Lap splice length for Bars 4M is 1'-4" minimum.

DESIGN NOTE:

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



SCHEMATIC LONGITUDINAL SECTION (NEW CONSTRUCTION)



SCHEMATIC LONGITUDINAL SECTION (WIDENING)

DIFFERENTIAL SETTLEMENT COUNTERMEASURES FOR PRECAST BOX CULVERTS

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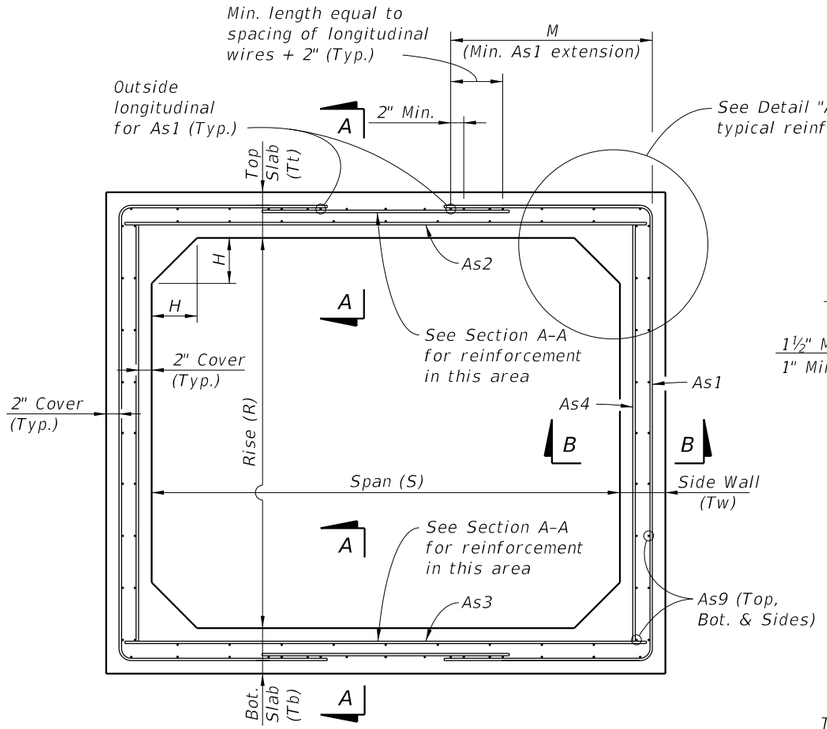
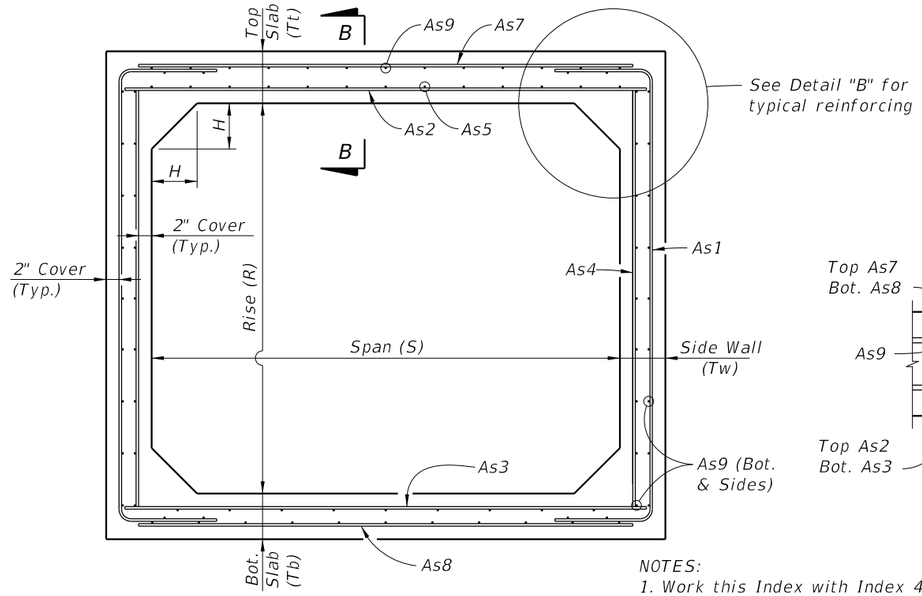
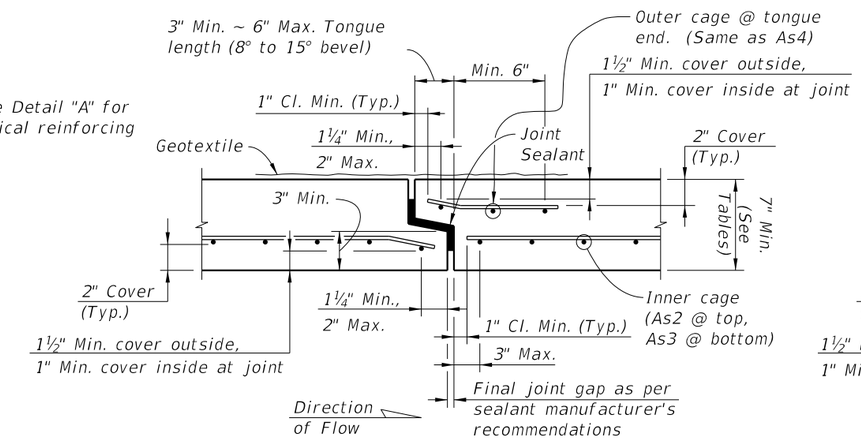


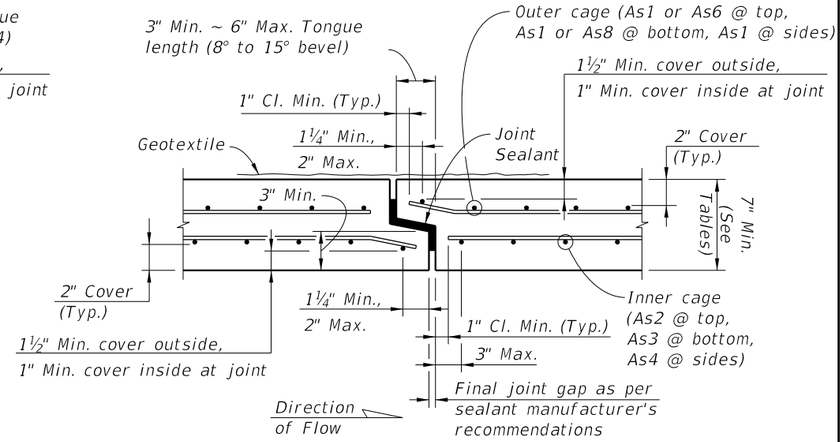
TYPICAL BOX SECTION (TYPE 2)
DESIGN EARTH COVER 2' OR GREATER
(Option 1 Reinforcing Configuration Shown)



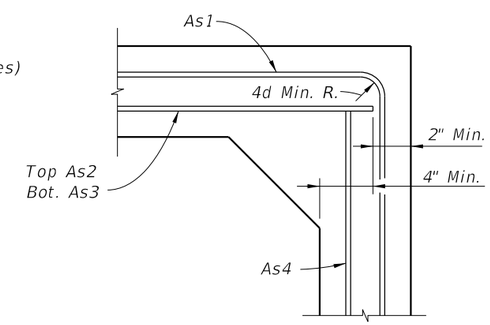
TYPICAL BOX SECTION (TYPE 1)
DESIGN EARTH COVER LESS THAN 2'
(Option 1 Reinforcing Configuration Shown)



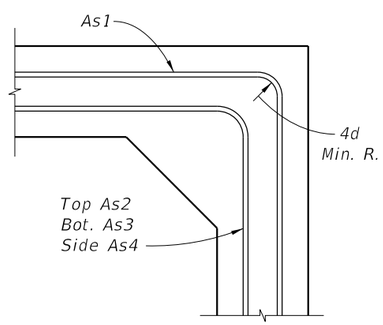
SECTION A-A



SECTION B-B
TYPICAL SECTION THRU JOINT



DETAIL "A"
(OPTION 1)



DETAIL "A"
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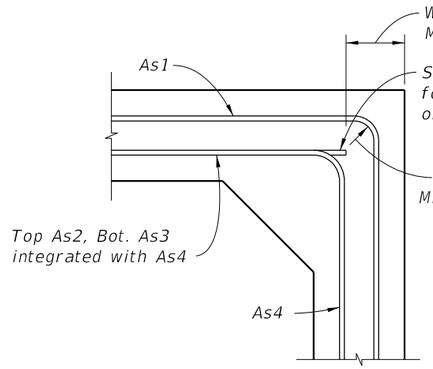
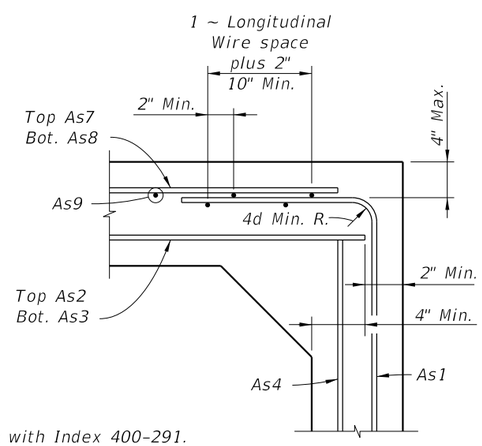
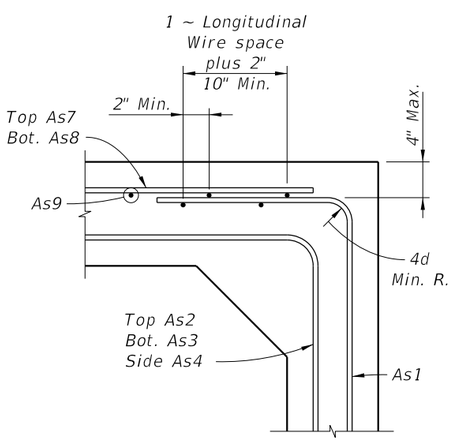


DETAIL "A"
(OPTION 3)



DETAIL "B"
(OPTION 1)



DETAIL "B"
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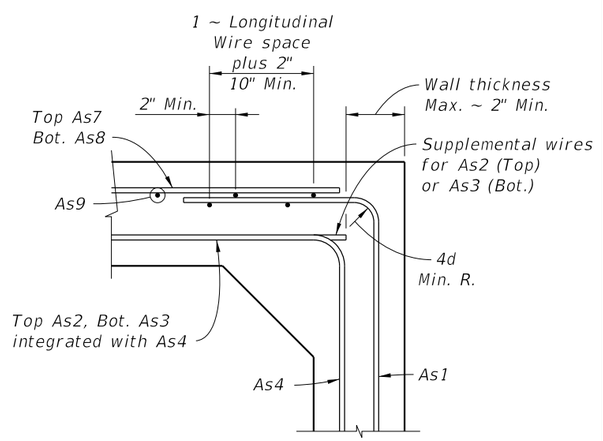

DETAIL "B"
(OPTION 3)

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

STANDARD PRECAST BOX CULVERT WITH 2" CONCRETE COVER

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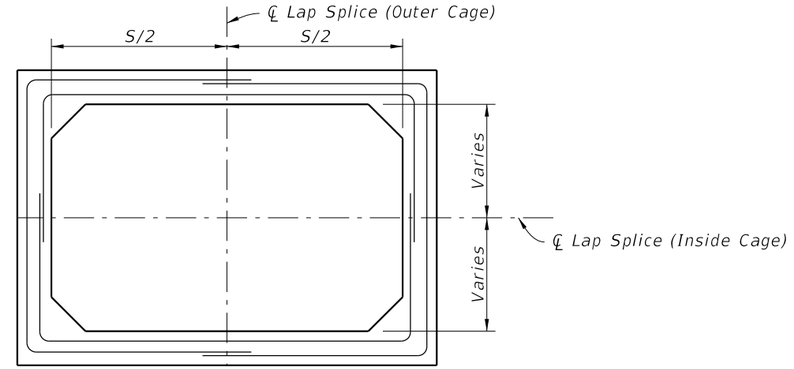
GENERAL NOTES:

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 Reading 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

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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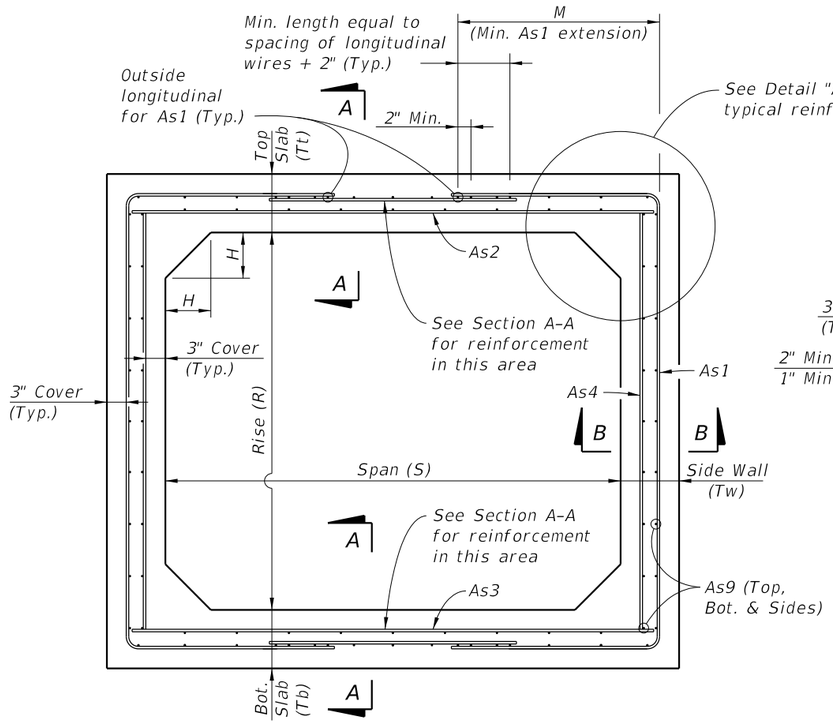
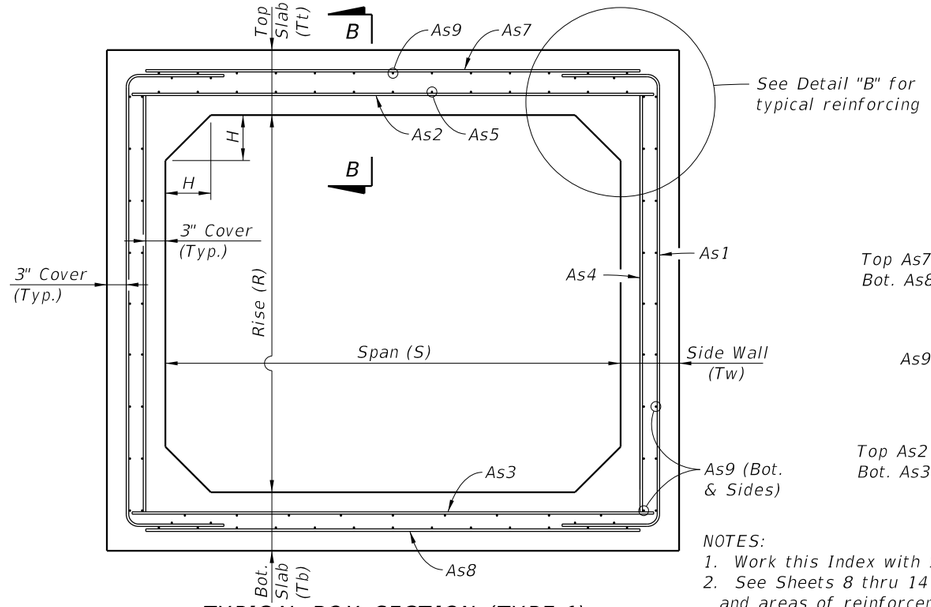
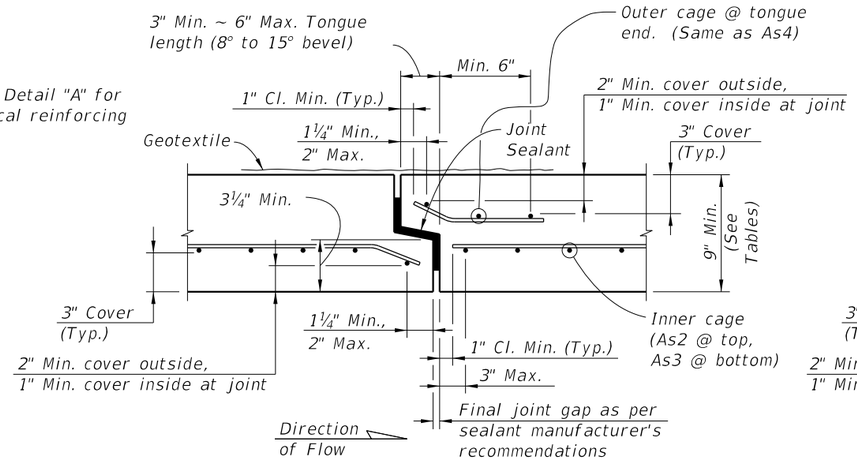


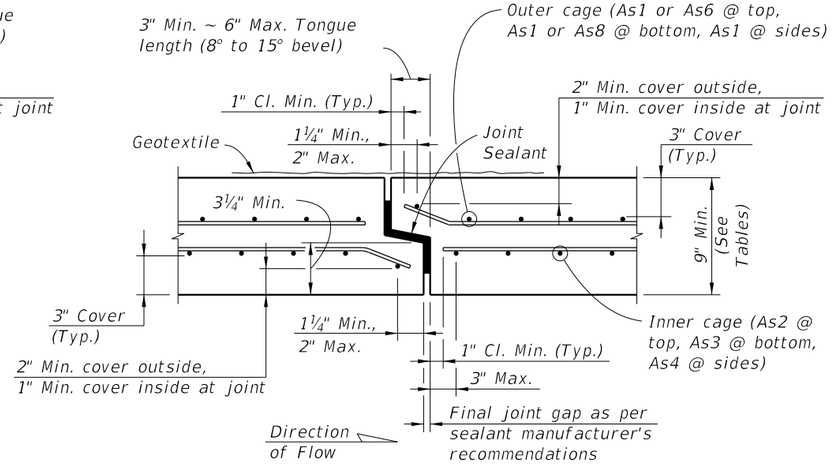
TYPICAL BOX SECTION (TYPE 2)
DESIGN EARTH COVER 2' OR GREATER
(Option 1 Reinforcing Configuration Shown)



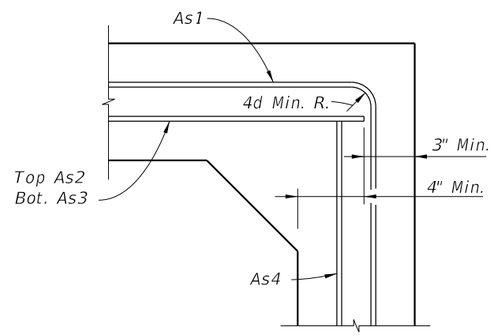
TYPICAL BOX SECTION (TYPE 1)
DESIGN EARTH COVER LESS THAN 2'
(Option 1 Reinforcing Configuration Shown)



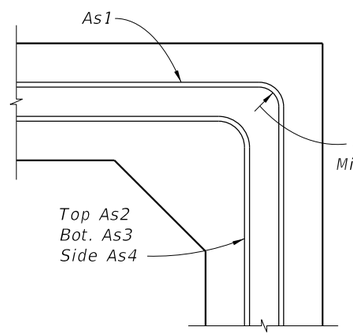
SECTION A-A



SECTION B-B
TYPICAL SECTION THRU JOINT



DETAIL "A"
(OPTION 1)



DETAIL "A"
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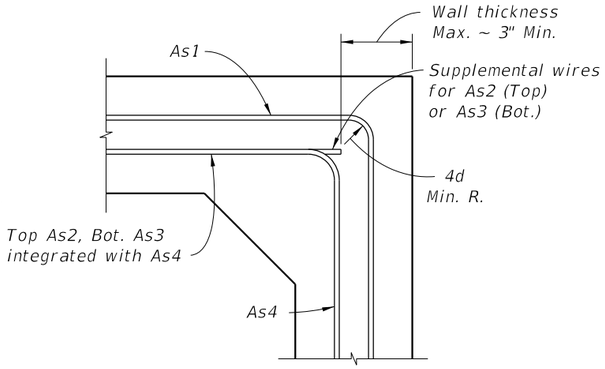

DETAIL "A"
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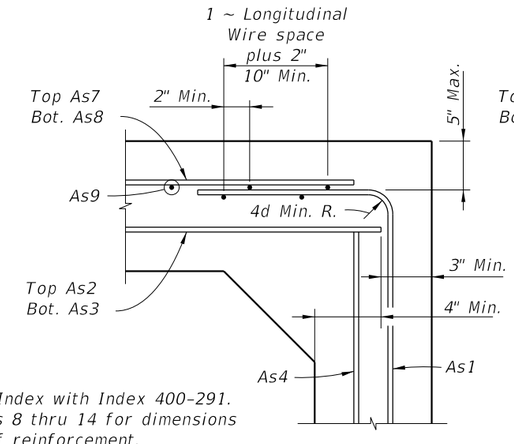

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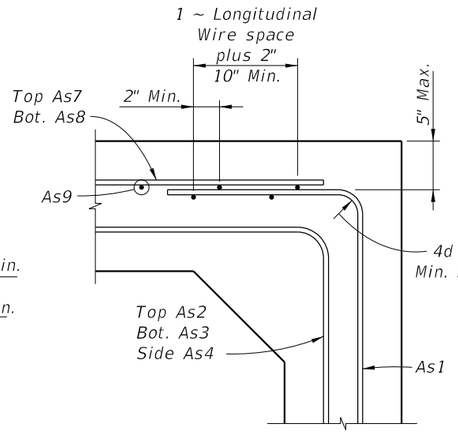
(OPTION 1)



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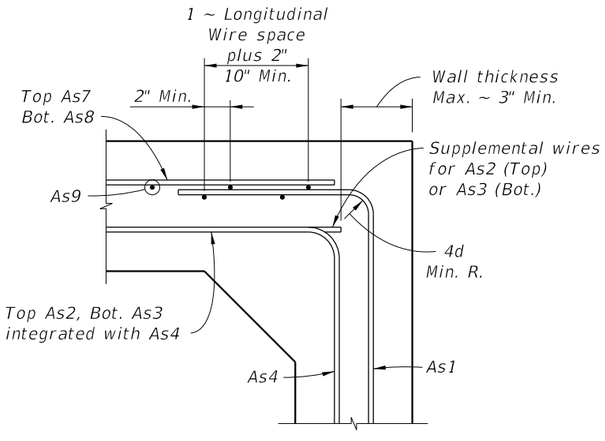

DETAIL "B"
(OPTION 3)

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:			INDEX	SHEET
11/01/23			FDOT FY 2026-27 STANDARD PLANS	STANDARD PRECAST CONCRETE BOX CULVERTS	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

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) x (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	0.33' - <2'	0.52	0.66	0.57	0.22	0.24	0.42	0.52	See General Note 5	-
				to	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
				12	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	25'	1.25	1.24	1.14	0.11	-	-	-		41
	10	10.5	9	12	30'	1.31	1.29	1.21	0.11	-	-	-		41
8' x 5'	9	9	9	4	0.33' - <2'	0.51	0.69	0.60	0.22	0.25	0.40	0.51		-
				to	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
				12	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	25'	1.20	1.33	1.23	0.11	-	-	-		41
	10	10.5	9	12	30'	1.26	1.38	1.30	0.11	-	-	-		41
8' x 6'	9	9	9	4	0.33' - <2'	0.51	0.72	0.64	0.22	0.26	0.39	0.51		-
				to	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
				12	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	25'	1.18	1.42	1.32	0.11	-	-	-		41
	10	10.5	9	12	30'	1.26	1.46	1.39	0.11	-	-	-		41
8' x 7'	9	9	9	4	0.33' - <2'	0.52	0.74	0.67	0.22	0.26	0.40	0.52		-
				to	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
				12	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	25'	1.21	1.51	1.41	0.11	-	-	-		41
	10	10.5	9	12	30'	1.31	1.53	1.47	0.11	-	-	-		41
8' x 8'	9	9	9	4	0.33' - <2'	0.55	0.77	0.70	0.22	0.27	0.41	0.55		-
				to	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
				12	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	25'	1.28	1.59	1.50	0.11	-	-	-		41
	10	10.5	9	12	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) x (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	0.33' - <2'	0.42	0.56	0.49	0.24	0.24	0.32	0.41	See General Note 5	-
				to	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
				12	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	0.33' - <2'	0.40	0.58	0.52	0.24	.034	0.31	0.40		-
				to	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
				12	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	0.33' - <2'	0.40	0.60	0.55	0.24	0.24	0.30	0.40		-
				to	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
				12	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	0.33' - <2'	0.41	0.63	0.58	0.24	0.24	0.30	0.41		-
				to	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
				12	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	0.33' - <2'	0.44	0.64	0.60	0.24	0.24	0.31	0.44		-
				to	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
				12	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 to 12	20'	1.26	1.32	1.28	0.11	-	-	-		44
	10	10.5	9		25'	1.39	1.41	1.32	0.11	-	-	-		44
	11	11.5	9		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 to 12	20'	1.25	1.40	1.38	0.11	-	-	-		44
	10	10.5	9		25'	1.37	1.49	1.40	0.11	-	-	-		44
	11	11.5	9		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 to 12	20'	1.27	1.49	1.47	0.11	-	-	-		44
	10	10.5	9		25'	1.38	1.57	1.48	0.11	-	-	-		44
	11	11.5	9		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 to 12	20'	1.27	1.56	1.45	0.11	-	-	-		44
	10	10.5	9		25'	1.45	1.65	1.57	0.11	-	-	-		44
	11	11.5	9		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 to 12	20'	1.37	1.64	1.54	0.13	-	-	-		49
	10	10.5	9		25'	1.56	1.73	1.65	0.13	-	-	-		44
	11	11.5	9.5		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 12	25'	1.21	1.27	1.19	0.12	-	-	-		44
	11	11.5	10		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 12	25'	1.18	1.35	1.28	0.12	-	-	-		44
	11	11.5	10		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 12	25'	1.18	1.43	1.36	0.12	-	-	-		44
	11	11.5	10		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 12	25'	1.21	1.50	1.44	0.12	-	-	-		44
	11	11.5	10		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 12	25'	1.28	1.56	1.52	0.12	-	-	-		44
	11	11.5	10		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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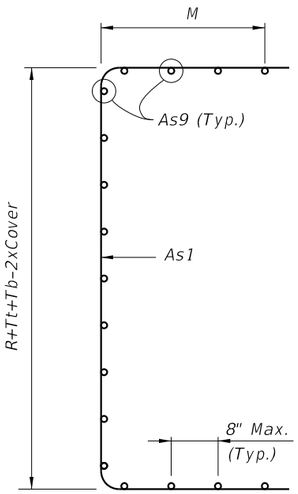
TABLE 16 - STANDARD PRECAST BOX CULVERT DESIGNS (3" COVER) - 12' SPANS

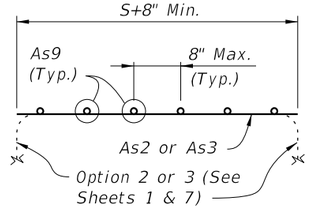
SPAN x RISE (S) (R) (Ft.)	SLAB / WALL THICKNESS TOP (Tt) (in.)	BOT. (Tb) (in.)	SIDE (Tw) (in.)	HAUNCH (H) (in.)	DESIGN EARTH COVER ABOVE TOP SLAB	REINFORCEMENT AREAS (sq. in./Ft.) As1	As2	As3	As4	As5	As7	As8	As9	As1 EXT. LENGTH (M) (in.)
12' x 4'	12	12	12	4 to 12	0.33' – <2'	0.59	0.64	0.51	0.29	0.29	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)



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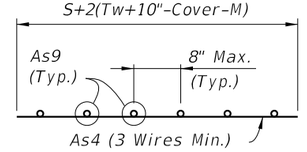
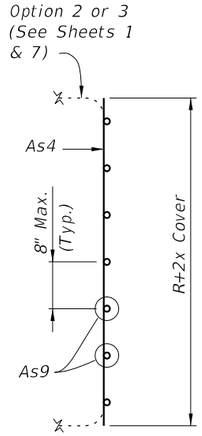
(2 Reqd. per segment)

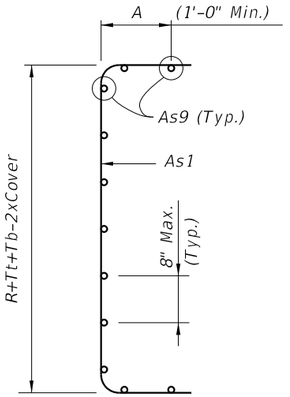


WWR PIECE NO. 4
(Tongue Reinforcement)
(4 Reqd. per segment)

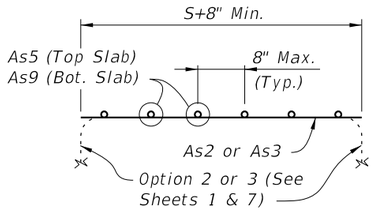


WWR PIECE NO. 3
(2 Reqd. per segment)

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



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



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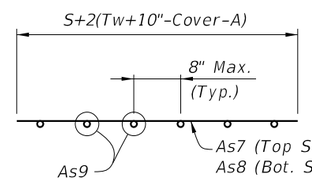
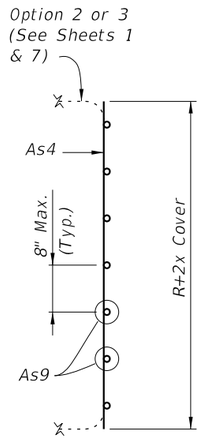


WWR PIECE NO. 4
(2 Reqd. per segment)



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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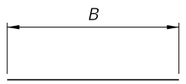
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
07/01/13			FY 2026-27 STANDARD PLANS	STANDARD PRECAST CONCRETE BOX CULVERTS	400-292	14 of 14



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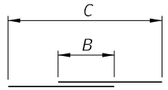
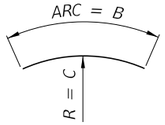


No. of Laps = N

TYPE 2



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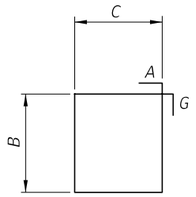

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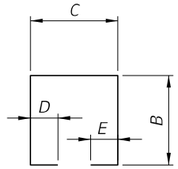

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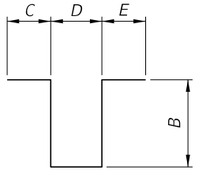

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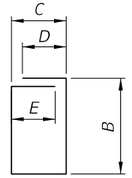

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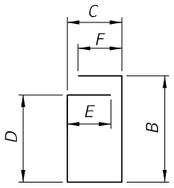

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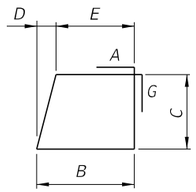
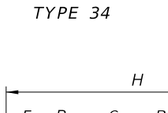


TYPE 9



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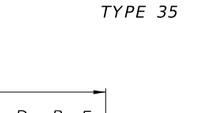
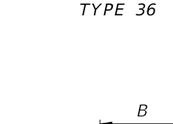


TYPE 1 1



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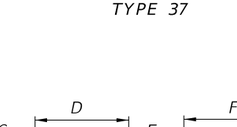

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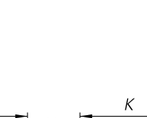

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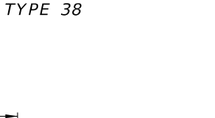

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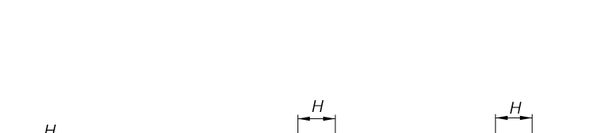

TYPE 16

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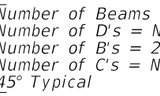
Number of D's = N–1
Number of B's = 2N–2
Number of C's = N–2
45° Typical

TYPE 17



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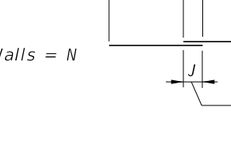

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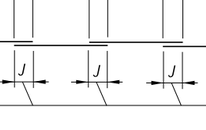

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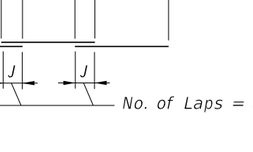
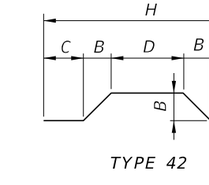
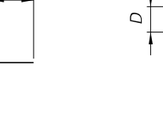


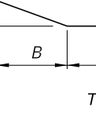
TYPE 21



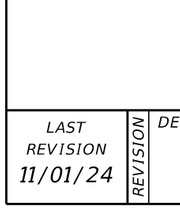
TYPE 22



TYPE 23



TYPE 24



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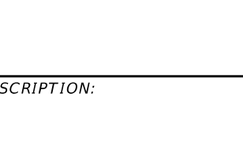
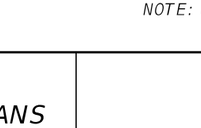


TYPE 26

TYPE 27

TYPE 28

TYPE 29



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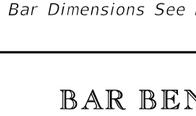
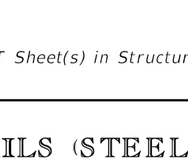


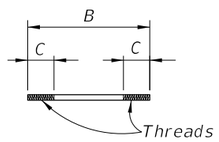
TYPE 31

TYPE 32

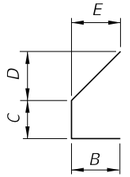


Style 6 = No Hook

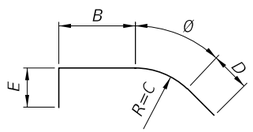
TYPE 33



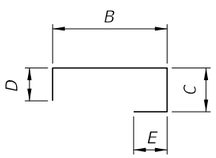
TYPE 34



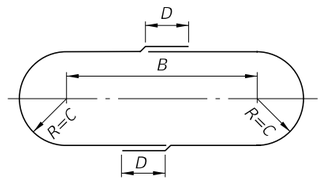
TYPE 35



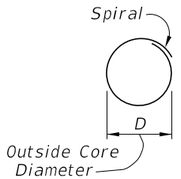
TYPE 36



TYPE 37



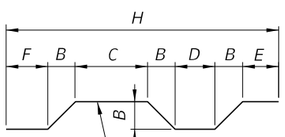
TYPE 38



TYPE 39

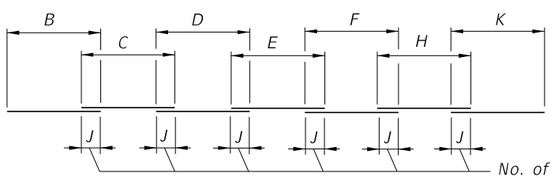
C = Pitch
B = Overall Height
N = Total number of closed turns at Top and Bottom of columns

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)



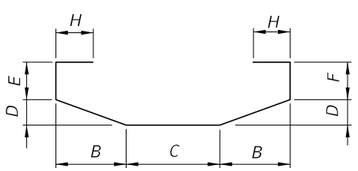
Number of Beams or Walls = N
Number of D's = N–1
Number of B's = 2N–1
Number of C's = N–1
45° Typical

TYPE 40



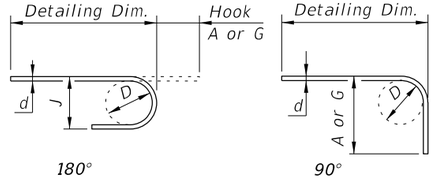
TYPE 41

TYPE 42



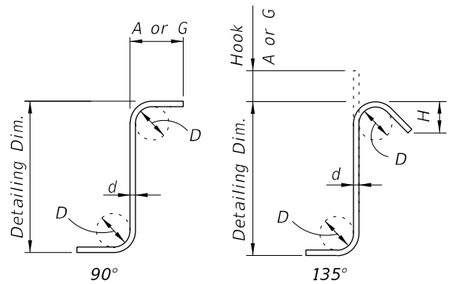
TYPE 43

HOOK DETAILS



180° 90°

BAR SIZE	D	180° HOOKS A OR G	180° HOOKS J	90° HOOKS 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



STIRRUPS (TIES SIMILAR)

STIRRUP & TIE HOOK DIMENSIONS

BAR SIZE	D	90° HOOKS A or G	135° HOOKS A or G	135° HOOKS 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.

10/6/2025 2:28:43 PM

LAST REVISION	REVISION	DESCRIPTION:				
11/01/24			FDOT FY 2026-27 STANDARD PLANS	BAR BENDING DETAILS (STEEL)	INDEX 415-001	SHEET 1 of 1