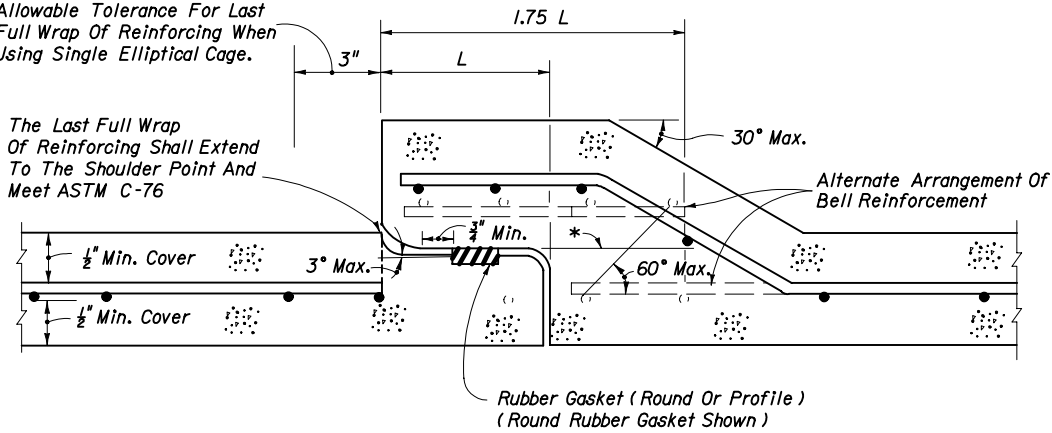


**SCHEDULE OF BELL REINFORCEMENT**  
Classes II, III, IV, V; Wall A, B, C

Nominal Pipe Diameter	Design Bell Reinforcement	Maximum Reinforcement Under Tolerance
	SQ. IN. PER FOOT	SQ. IN. PER FOOT
15"	0.07	0.010
18"	0.07	0.010
24"	0.09	0.010
30"	0.12	0.010
36"	0.14	0.010
42"	0.16	0.010
48"	0.19	0.011
54"	0.21	0.012
60"	0.23	0.0135
66"	0.26	0.015
72"	0.28	0.0165
78"	0.30	0.018
84"	0.33	0.0195
90"	0.35	0.021
96"	0.37	0.0225
102"	0.40	0.024
108"	0.42	0.0255

Allowable Tolerance For Last Full Wrap Of Reinforcing When Using Single Elliptical Cage.

The Last Full Wrap Of Reinforcing Shall Extend To The Shoulder Point And Meet ASTM C-76

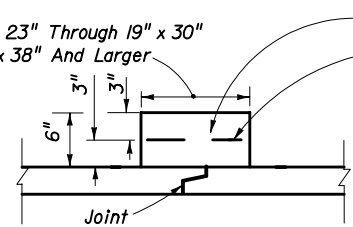


\*All circumferential steel located above this line within 1.75 L is defined as bell reinforcement.

ROUND RUBBER GASKET SHOWN

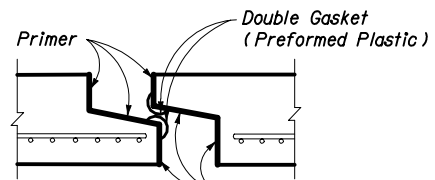
**DETAIL OF BELL & SPIGOT CONCRETE PIPE JOINT USING ROUND OR PROFILE RUBBER GASKET**

12" For Pipes 14" x 23" Through 19" x 30"  
24" For Pipes 24" x 38" And Larger



**CONCRETE JACKET**

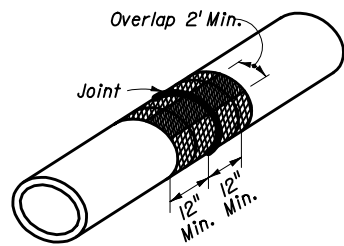
Any Wire Mesh Arrangement Which Provides 0.126 Square Inches Of Steel Area Per Linear Foot Both Ways May Be Used; Provided The Wires Are Spaced A Minimum Of 2" And/Or A Maximum Of 6" On Centers



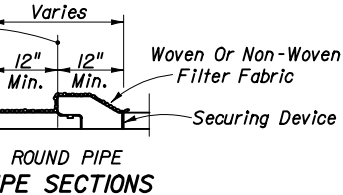
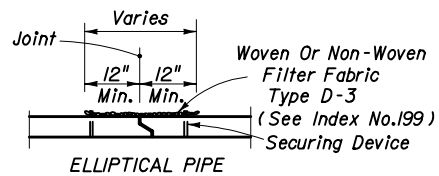
**PREFORMED PLASTIC JOINT (BEFORE PULL-UP)**

Cost of concrete jacket or filter fabric jacket to be included in cost of elliptical concrete pipe culverts.

**ELLIPTICAL CONCRETE PIPE JOINTS**



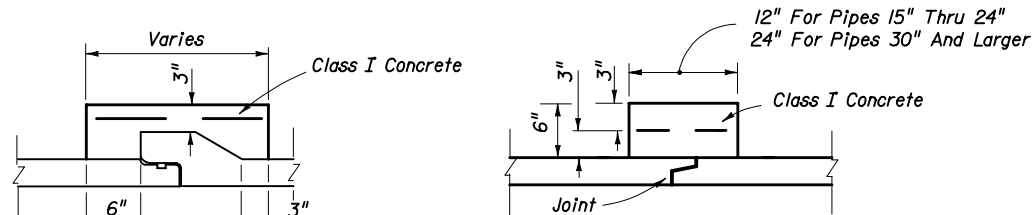
ELLIPTICAL PIPE SHOWN ISOMETRIC VIEW



ROUND PIPE PIPE SECTIONS

Cost of filter fabric jacket to be included in cost of pipe culverts.

FOR ALL PIPE TYPES - CONCRETE PIPE SHOWN  
**FILTER FABRIC JACKET**

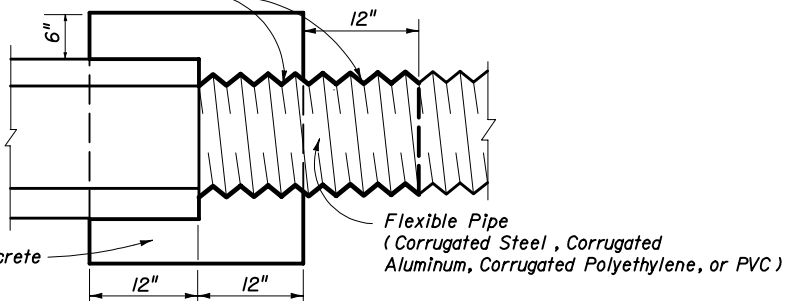


**BELL AND SPIGOT**

**TONGUE & GROOVE**

**DISSIMILAR JOINTS**

Bituminous Coating Required For CMP (Any Suitable Bituminous Material May Be Field Applied) Bituminous Coating To Extend 12" Beyond Concrete Collar

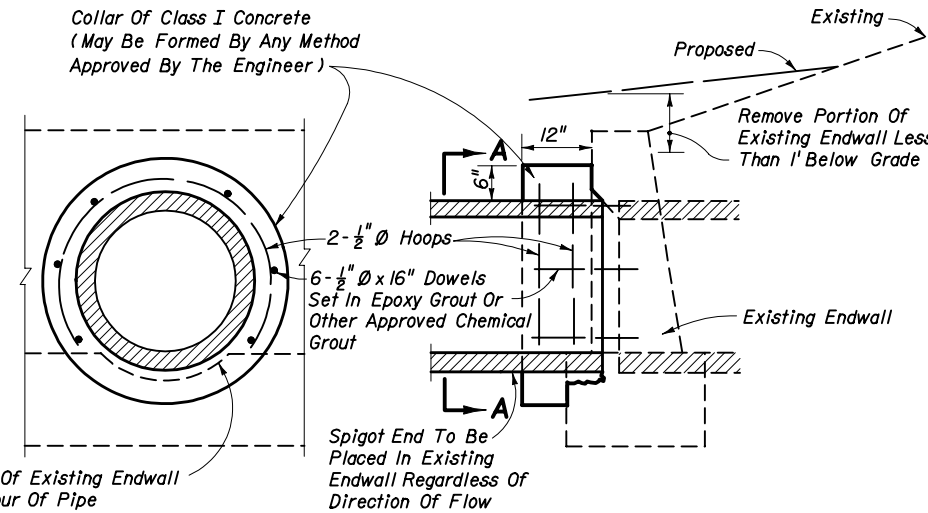


Note: Cost of concrete and bituminous coating to be included in contract unit price for either new pipe or Mitered End Section. A concrete jacket shall not be used to join:  
(a) metal pipe of dissimilar materials  
(b) flexible pipe when the minimum cover required in accordance with Index No. 205 cannot be obtained.

**DISSIMILAR TYPES**

**CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE AND CONCRETE PIPES WITH DISSIMILAR JOINTS**

Collar Of Class I Concrete (May Be Formed By Any Method Approved By The Engineer)

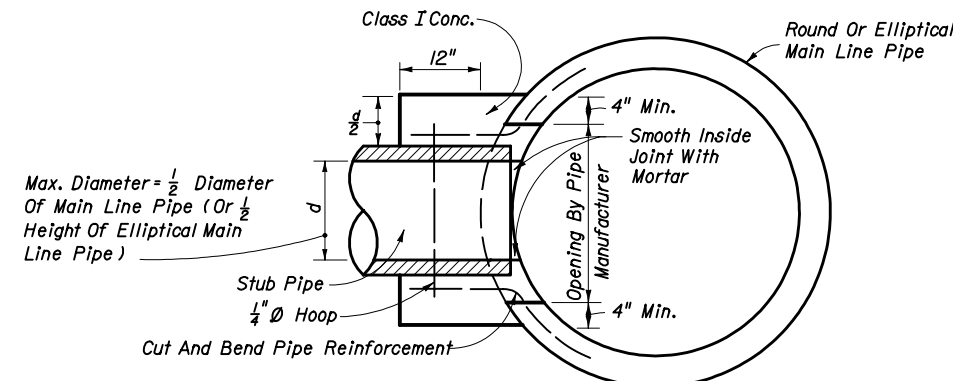


**SECTION AA**

**LONGITUDINAL SECTION**

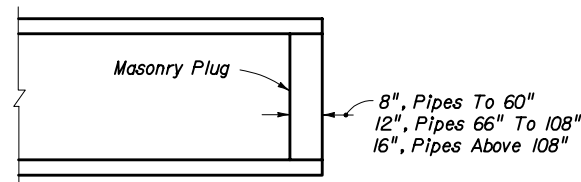
Note: Cost for removal and disposal of portions of top and toe of existing endwall and cost of concrete, reinforcing steel and construction of collar to be included in the contract unit price for pipe culvert.

**CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS**



Cost of concrete and steel to be included in contract unit price for pipe culvert.

**CONCRETE COLLAR FOR JOINING MAINLINE PIPE AND STUB PIPE**



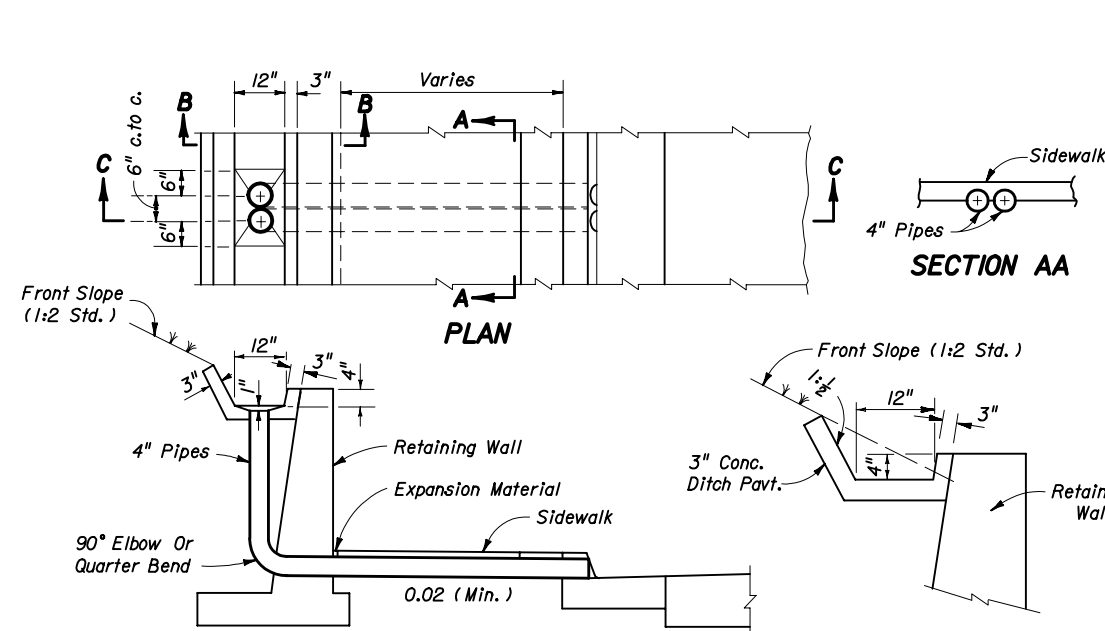
Note: Unless otherwise called for in the plans, the cost of plugging pipes to be included in contract unit price for new pipe.

**PIPE PLUG**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

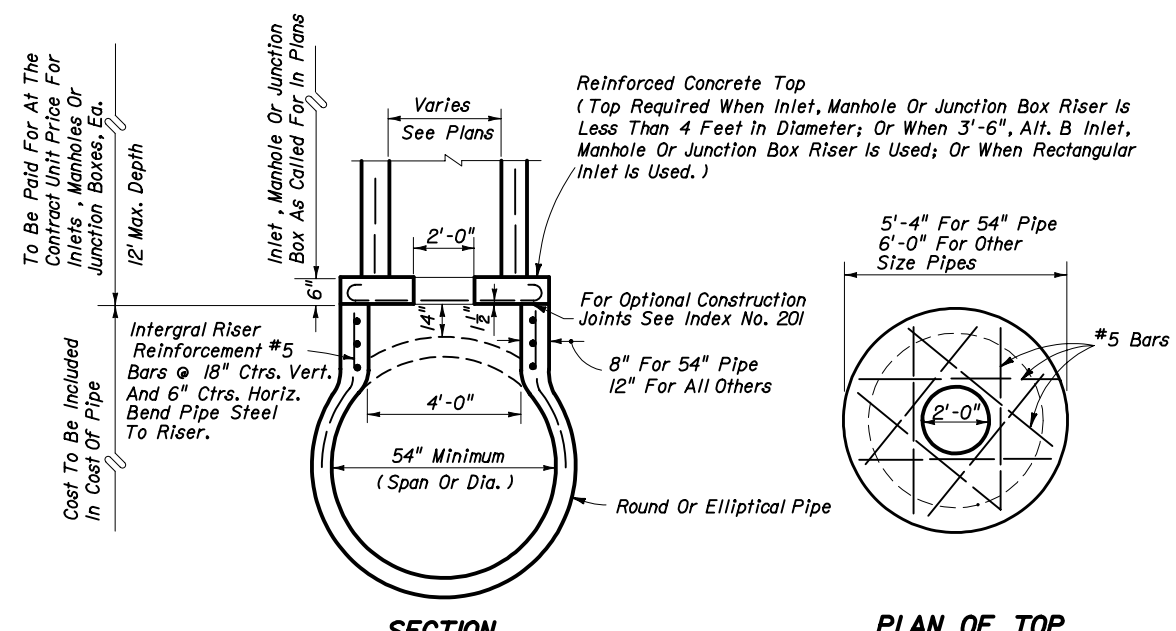
**MISCELLANEOUS DRAINAGE DETAILS**

Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By	HSD 01/85			
Checked By	JBW/JVG 09/85	04	1 of 4	280

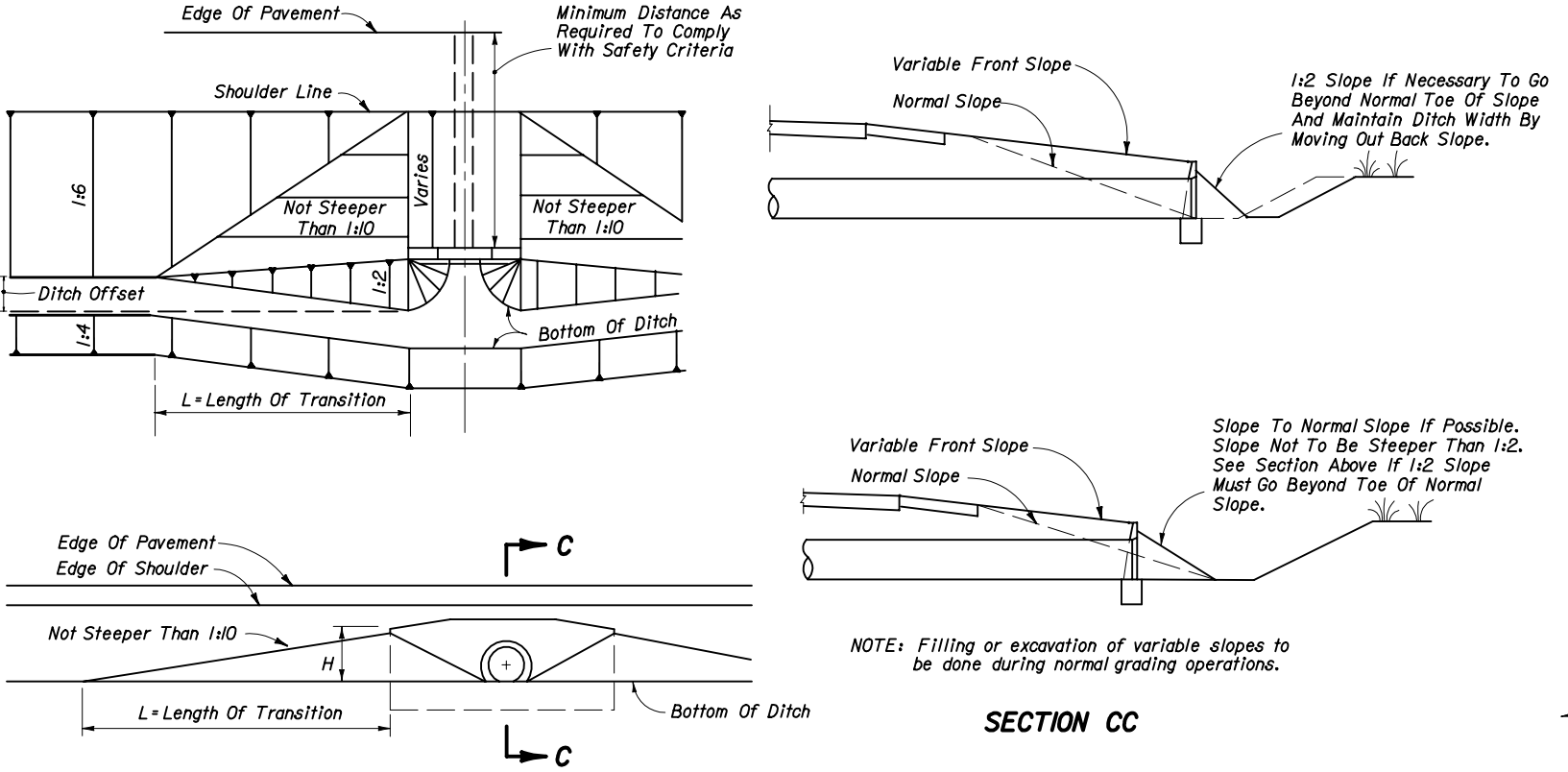
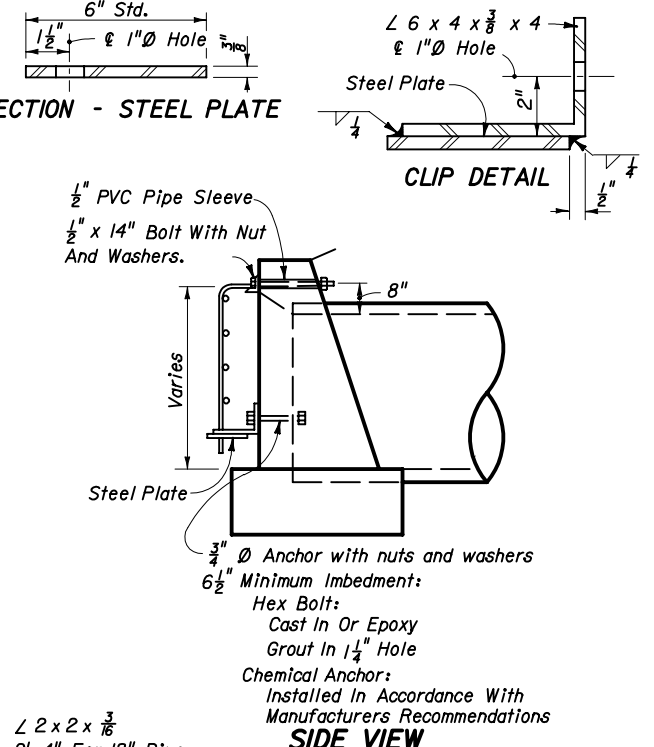


**CONCRETE GUTTER AND DRAINS AT RETAINING WALLS**

Note: Either cast iron pipe or PVC pipe, Schedule 40, may be used. Pipe to be paid for under the contract unit price for either Cast Iron Pipe For Roof Drains (4"), LF, or Polyvinyl Chloride Pipe Culvert (4"), LF.



**INLETS, MANHOLES OR JUNCTION BOXES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE**

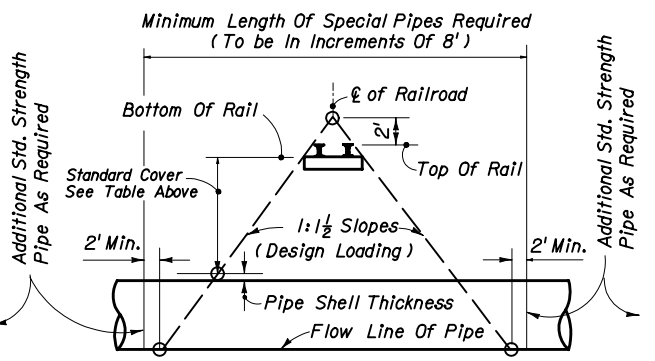


**METHOD FOR SETTING LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES**

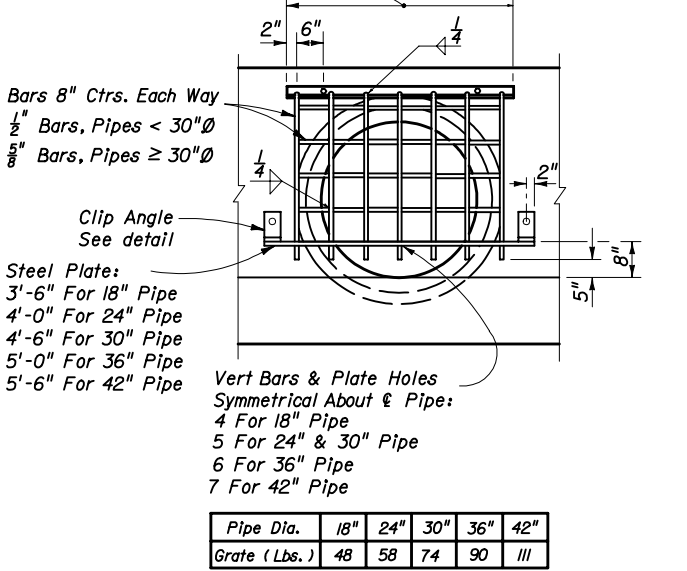
Use Larger Value Of Either:  
 1.  $L = 10 \times H$  (No Maximum)  
 2.  $L = 10 \times \text{Ditch Offset}$  (Maximum  $L = 100'$ )

RAILROAD COMPANY	CLEARANCE BELOW BOTTOM OF RAIL (FEET)	STRENGTH ASTM (C76) CLASS
Apalachicola Northern	4.0	IV
Atlanta And St. Andrews Bay	4.0	IV
Florida East Coast	5.5*	IV
Burlington Northern Railroad	S-TRK M/L 4.5 5.5	IV
CSX Transportation, Inc.	5.5	IV
Southern Railway System		
Georgia Southern And Florida	5.5	V
Live Oak Perry And South Georgia	5.5	V
St. Johns River Terminal	5.5	V

\*Clearance is for casing pipe. All subgrade carrier pipelines and wirelines will be installed within a casing pipe which will extend from Right-of-Way line to Right-of-Way line.



**METHOD FOR DETERMINING THE LENGTH OF SPECIAL PIPE REQUIRED UNDER RAILROADS**



**GUARD AT PIPE ENDS**

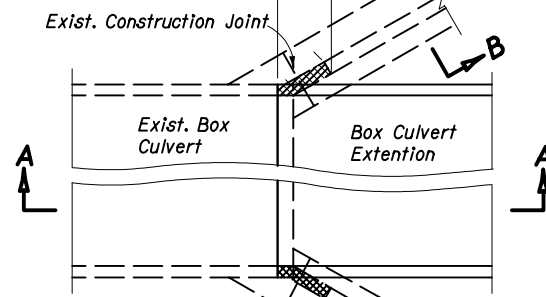
Note: Guards to be constructed only at locations specifically called for in plans. Guard, plate & clips, bolts, nuts and sleeves to be included in the contract unit price for Endwall Grate, LB.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

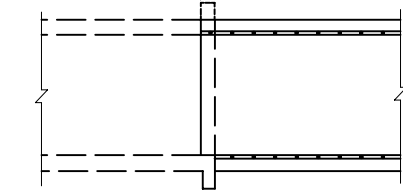
**MISCELLANEOUS DRAINAGE DETAILS**

Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
		00	2 of 4	280

Remove Headwall, Outside Wall And Wingwall From Inside Face Of Headwall Sufficient To Construct Culvert Extension. Longitudinal Reinforcing Steel To Be Cleaned, Straightened And Extended Into Culvert Extension.

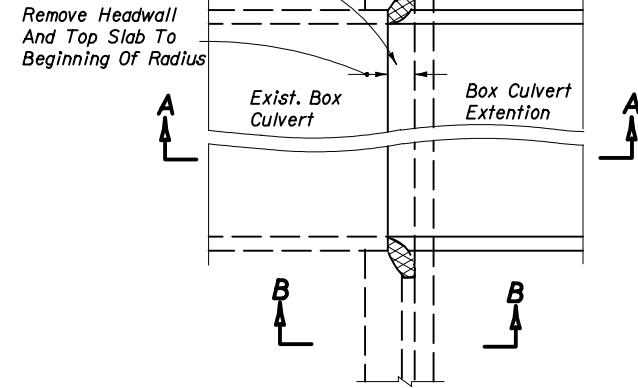


Tie-In Length  
Length For Manually Estimated Or Computerized Quantities (Coding And Printout Lengths)  
Culvert Extension (Length Tabulated On Drainage Structures And Summary Sheet For Standard Box Section Extension)



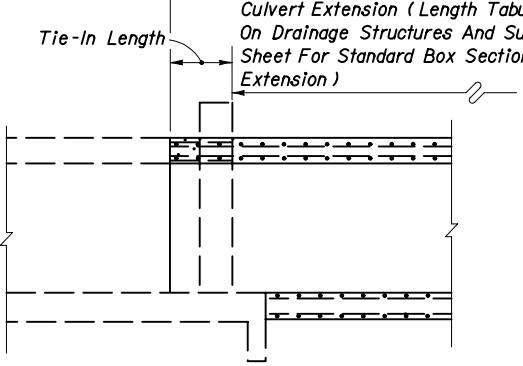
SECTION AA

Longitudinal Reinforcing Steel In Top Slab And Wall Return To Be Cleaned, Straightened And Extended Into Culvert Extension.  
Remove Wall And Headwall To Construction Joint



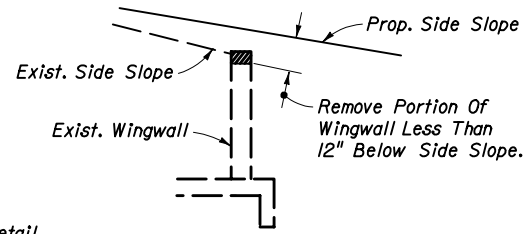
OUTSIDE WALLS-SINGLE, DOUBLE, TRIPLES, & QUADRUPLE BOXES

Length For Manually Estimated Or Computerized Quantities (Coding And Printout Lengths)  
Tie-In Length  
Culvert Extension (Length Tabulated On Drainage Structures And Summary Sheet For Standard Box Section Extension)

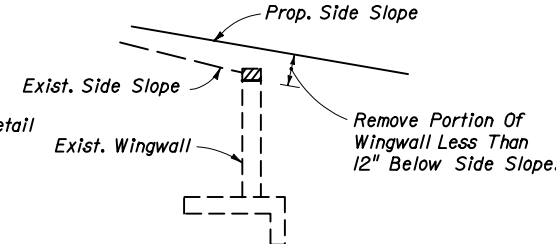


SECTION AA

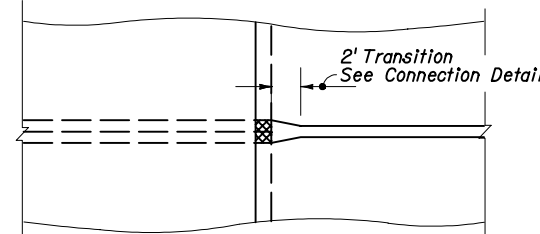
OUTSIDE WALLS-SINGLE, DOUBLE, TRIPLES, & QUADRUPLE BOXES



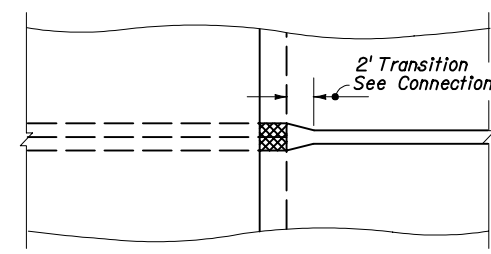
SECTION BB



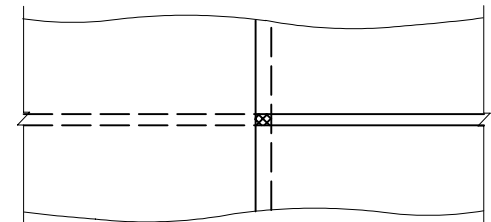
SECTION BB



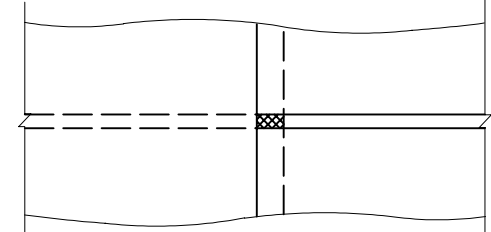
CENTER WALL-QUADRUPLE BOXES



CENTER WALL-QUADRUPLE BOXES



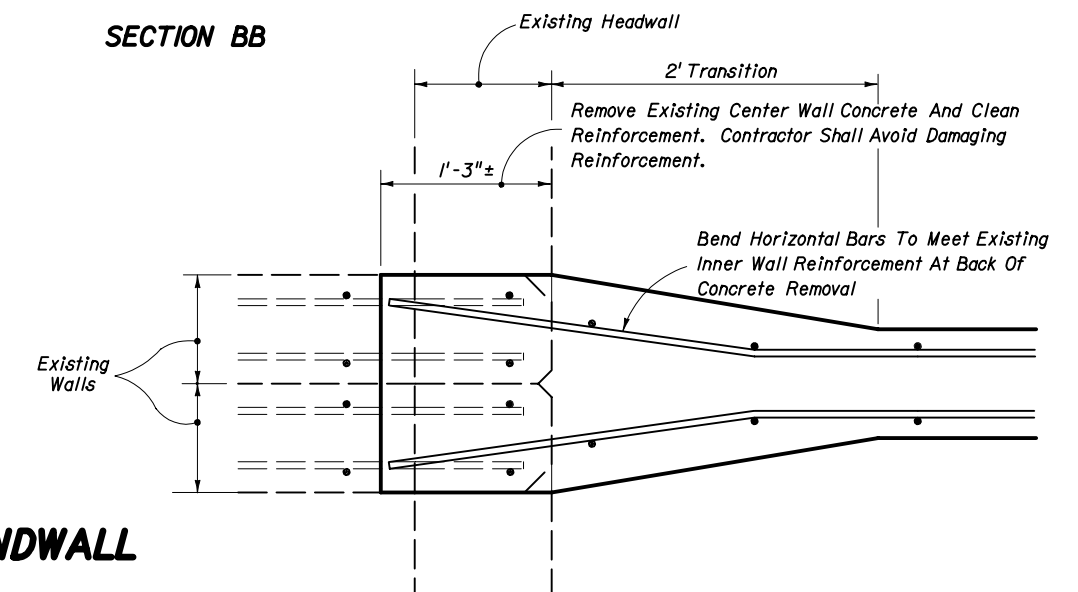
INTERIOR WALLS-DOUBLE & TRIPLE BOXES  
INTERMEDIATE WALLS-QUADRUPLE BOXES



INTERIOR WALLS-DOUBLE & TRIPLE BOXES  
INTERMEDIATE WALLS-QUADRUPLE BOXES

PLAN VIEWS

STRAIGHT ENDWALL



CONNECTION AT CENTER WALL OF QUADRUPLE CULVERTS

PLAN VIEWS

FLARED ENDWALL

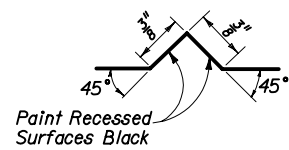
NOTE: The computerized printout for reinforcing steel does not include the additional lengths needed for extension and overlaps or connections to the horizontal reinforcement in the interior walls of double, triple and quadruple existing concrete box culverts; the cost for additional reinforcement and the thickened concrete wall in the transitional area shall be included in the costs for constructing the tie-in.

Cost for removal and disposal of material from existing headwalls, wingwalls and the top slab, and cost of cleaning, straightening and extending longitudinal reinforcing steel shall be included in the cost for concrete and steel of the culvert extension.

For concrete box culvert details, see Index No. 290.

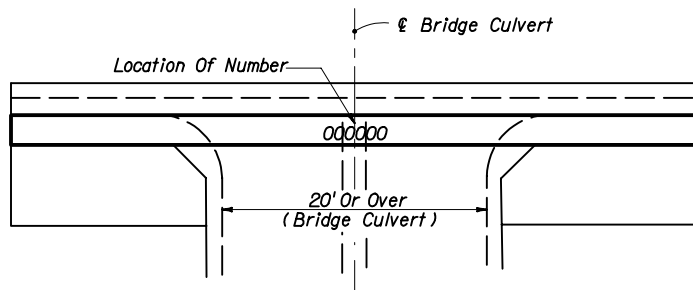
CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
MISCELLANEOUS DRAINAGE DETAILS				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	3 of 4	280



Black Plastic Figures 3" in height as approved by the Engineer may be used in lieu of numbers formed by  $\frac{3}{8}$ " V Grooves. "V" Grooves shall be formed by preformed figures.

**SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED FIGURES**

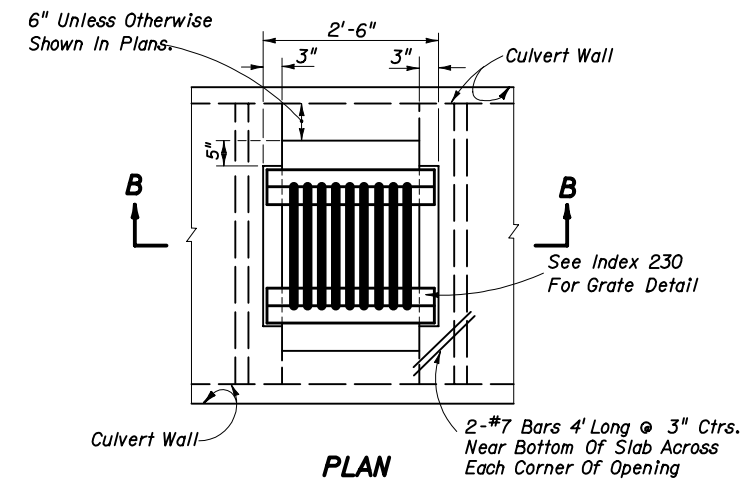
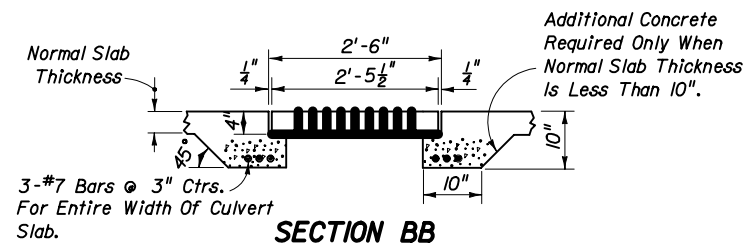


The number is to be placed in the center of the top surface of all bridge culvert headwalls.

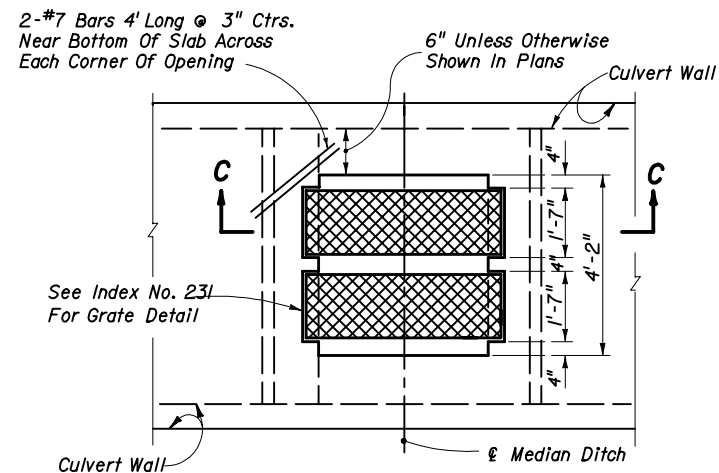
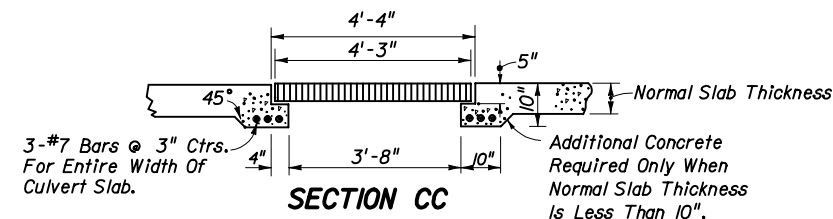
For Bridge Number See Plan-Profile Sheets.

**TOP VIEW OF HEADWALL**

**BRIDGE CULVERT NUMBER LOCATION**



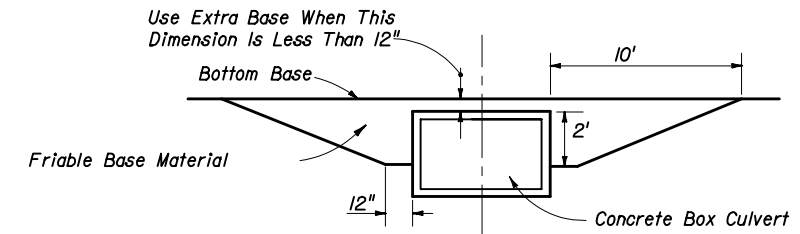
**INLET TYPE A GRATE**



**PLAN  
INLET TYPE B GRATE**

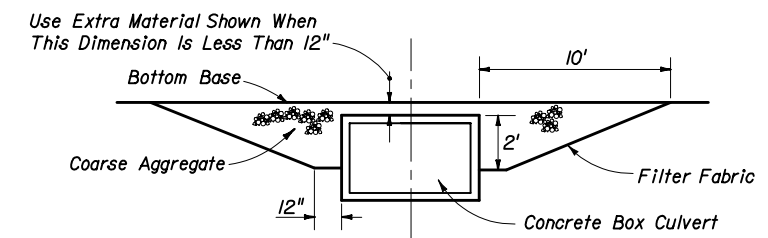
NOTE: 1. Cost of Steel Grating to be included in cost of Box Culvert.  
2. All steel shall be 1/4" clear.

**INLET IN TOP OF BOX CULVERT**



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

**FRIABLE BASE**



The coarse aggregate shall be placed in 6 inch lifts and compacted sufficiently as to be firm and unyielding. The coarse aggregate shall be gravel or stone meeting the requirements of Section 901-2 or 901-3 respectively. The gradation shall meet Section 901-6, Grades 4, 467, 5, 56, or 57 unless restricted in the plans. The filter fabric shall be Type D-3 (See Index No. 199). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the Box Culvert.

**ASPHALTIC CONCRETE BASE**

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

**EXTRA BASE FOR CROSS BOX CULVERTS UNDER FLEXIBLE PAVEMENT**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
<b>MISCELLANEOUS DRAINAGE DETAILS</b>				
Names	Dates	Approved By		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	4 of 4	280