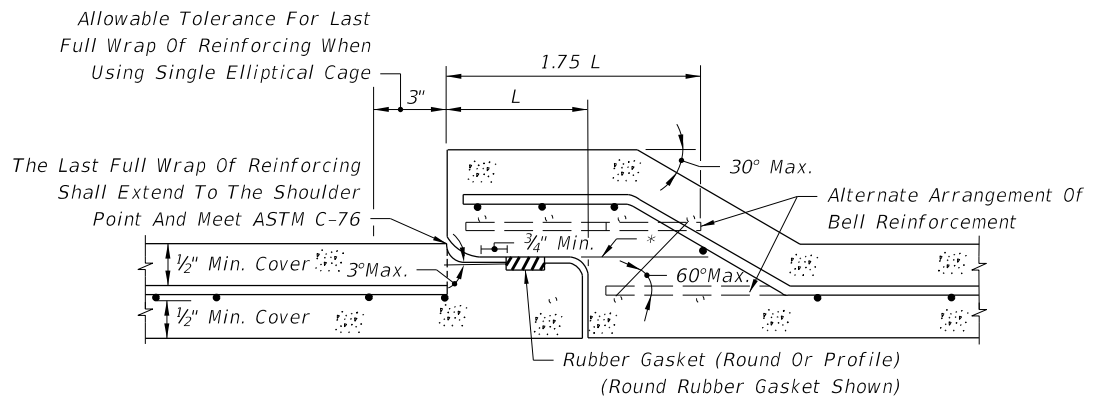


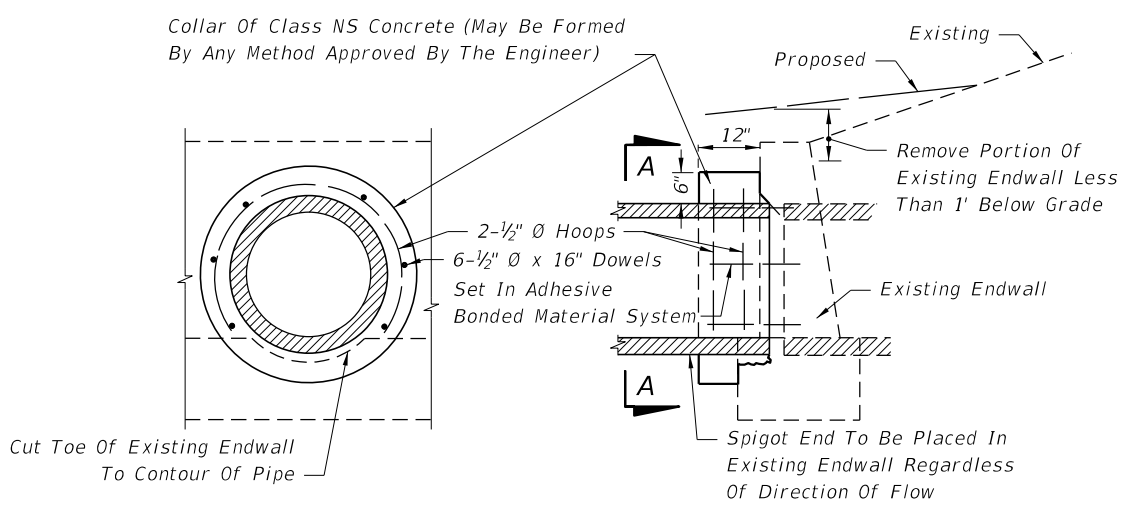
**SCHEDULE OF BELL REINFORCEMENT**  
Classes II,III,IV,V; Wall A,B,C

Nominal Pipe Diameter	Design Bell Reinforcement in <sup>2</sup> per foot	Maximum Reinforcement Under Tolerance in <sup>2</sup> 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



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

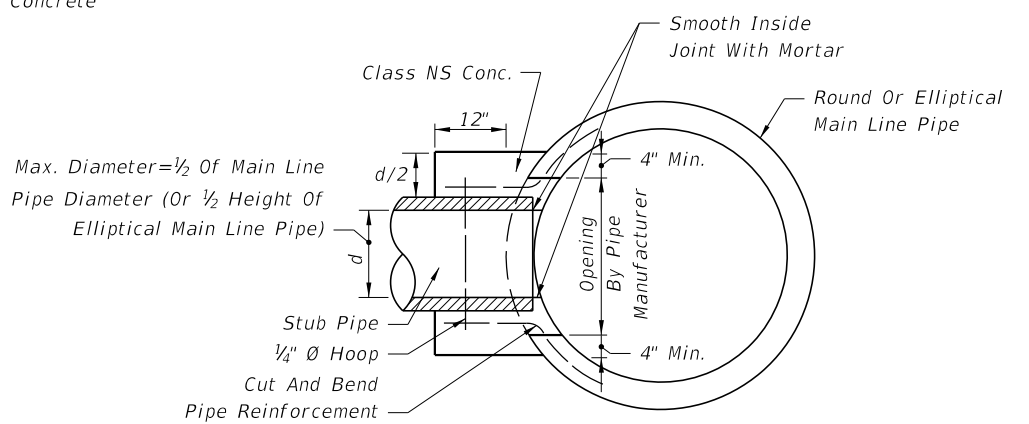
**ROUND RUBBER GASKET SHOWN  
DETAIL OF BELL & SPIGOT CONCRETE PIPE JOINT  
USING ROUND OR PROFILE RUBBER GASKET**



**SECTION AA LONGITUDINAL SECTION**

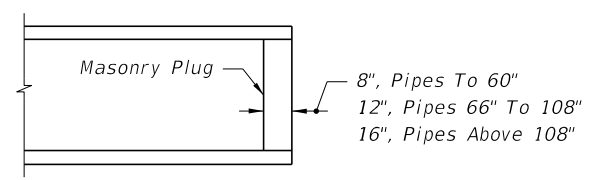
Note: Cost for removal and disposal of portions of top and toe of existing endwall and cost of concrete, reinforcing steel and construction of collar to be included in the contract unit price for pipe culvert.

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



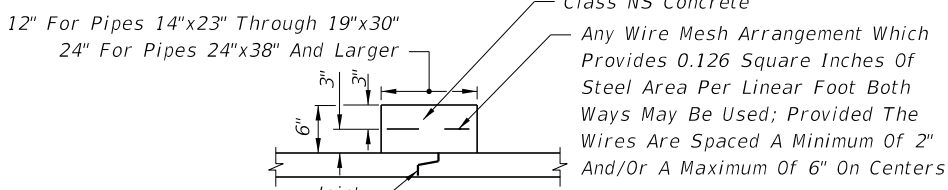
**CONCRETE COLLAR FOR JOINING MAINLINE PIPE AND STUB PIPE**

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

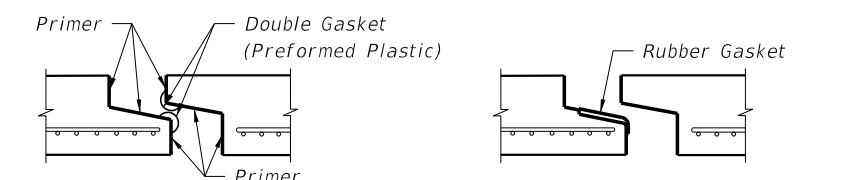


Note: Unless otherwise called for in the plans, the cost of plugging pipes to be included in contract unit price for new pipe.

**PIPE PLUG**



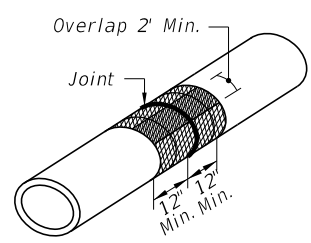
**CONCRETE JACKET**



**PREFORMED PLASTIC JOINT PROFILE RUBBER GASKET (BEFORE PULL-UP)**

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

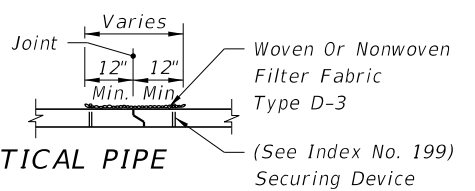
**ELLIPTICAL CONCRETE PIPE JOINTS**



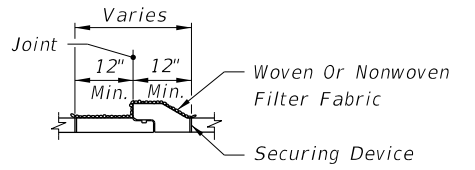
**ELLIPTICAL PIPE SHOWN ISOMETRIC VIEW**

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

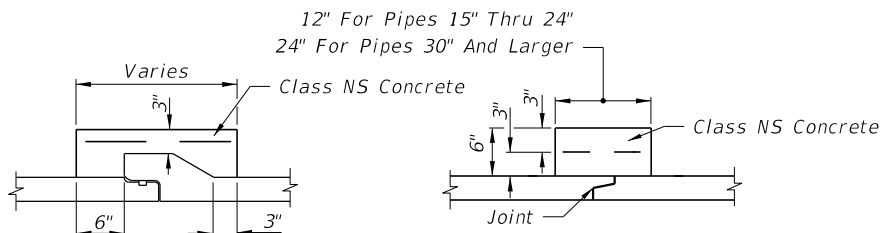
**FOR ALL PIPE TYPES - CONCRETE PIPE SHOWN FILTER FABRIC JACKET**



**ELLIPTICAL PIPE**



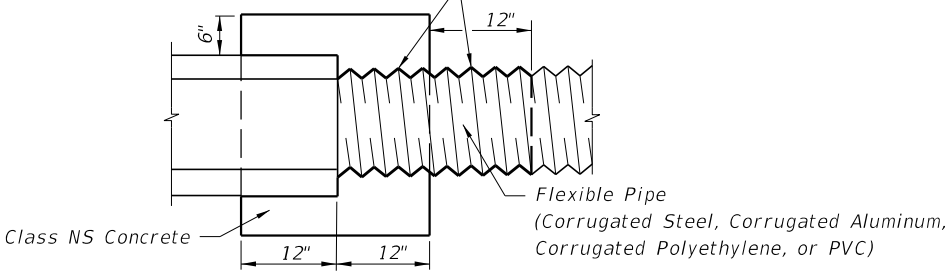
**ROUND PIPE PIPE SECTIONS**



**BELL AND SPIGOT TONGUE & GROOVE DISSIMILAR JOINTS**

Note: For reinforcement see elliptical pipe concrete jacket. (All Pipe Sizes)

Bituminous Coating Required For CMP (Any Suitable Bituminous Material May Be Field Applied) Bituminous Coating To Extend 12 inch 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.

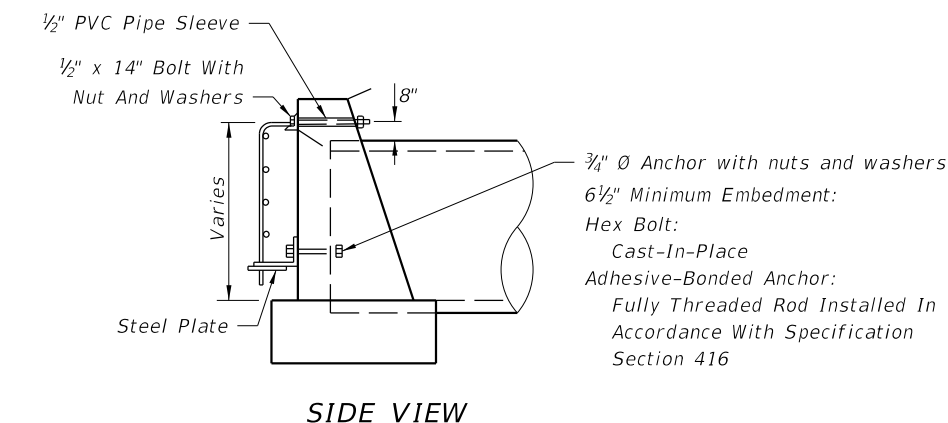
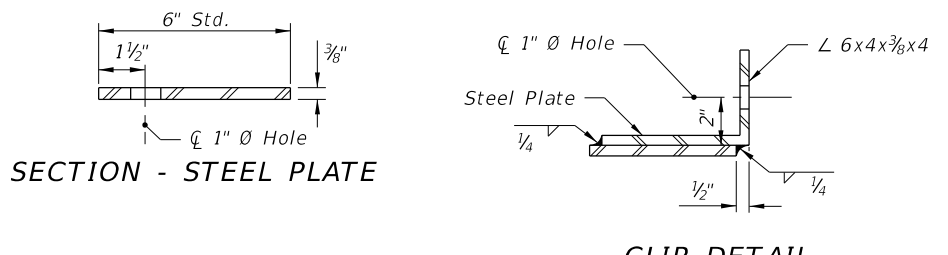
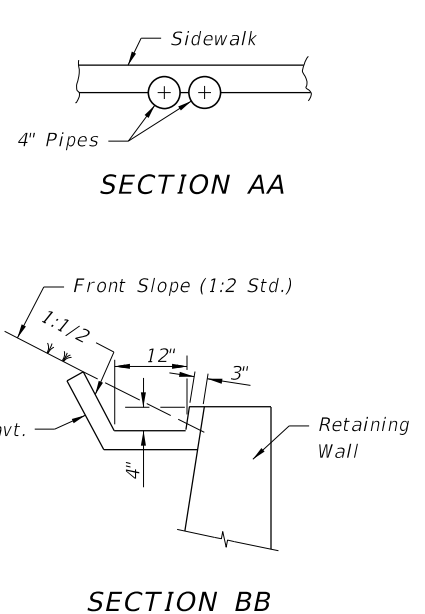
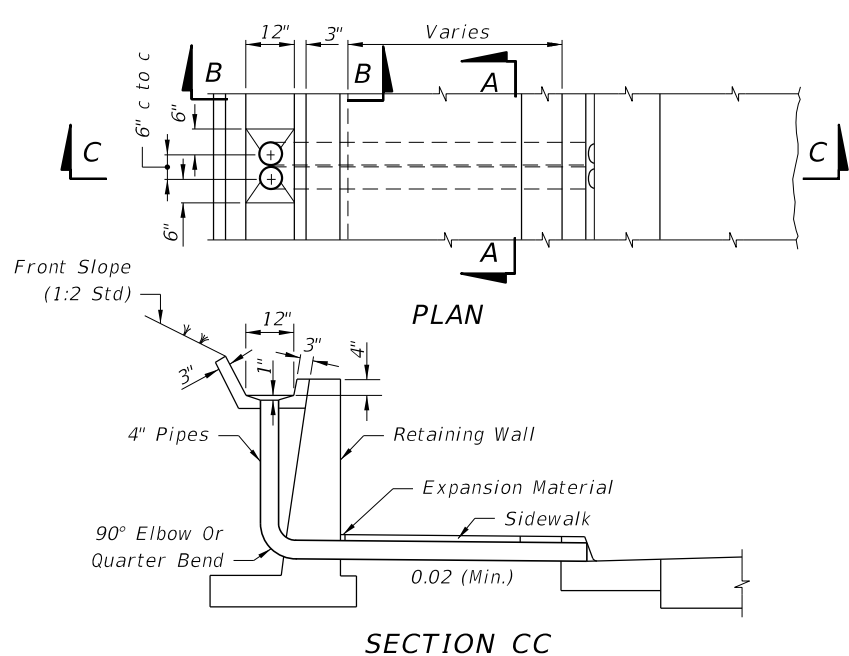
Alternate connection must be approved by the State Drainage Engineer.

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**

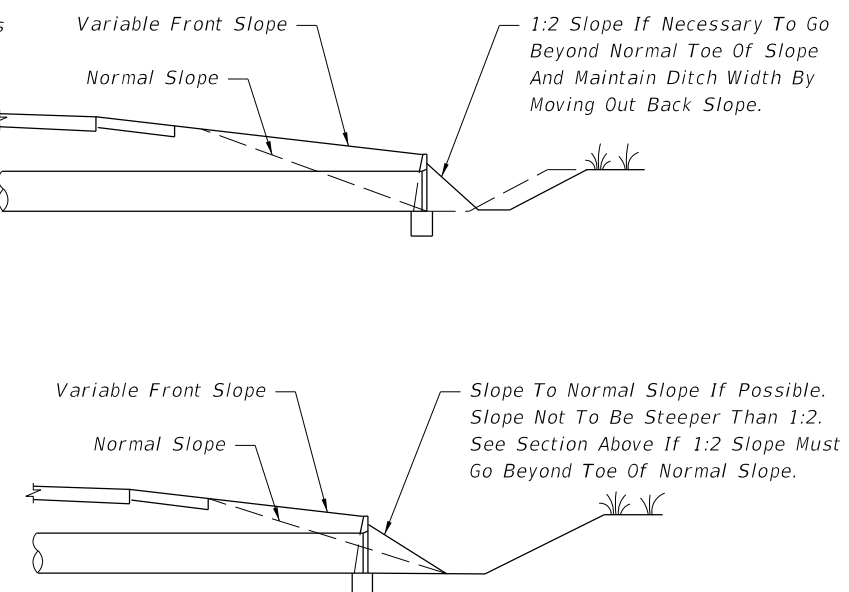
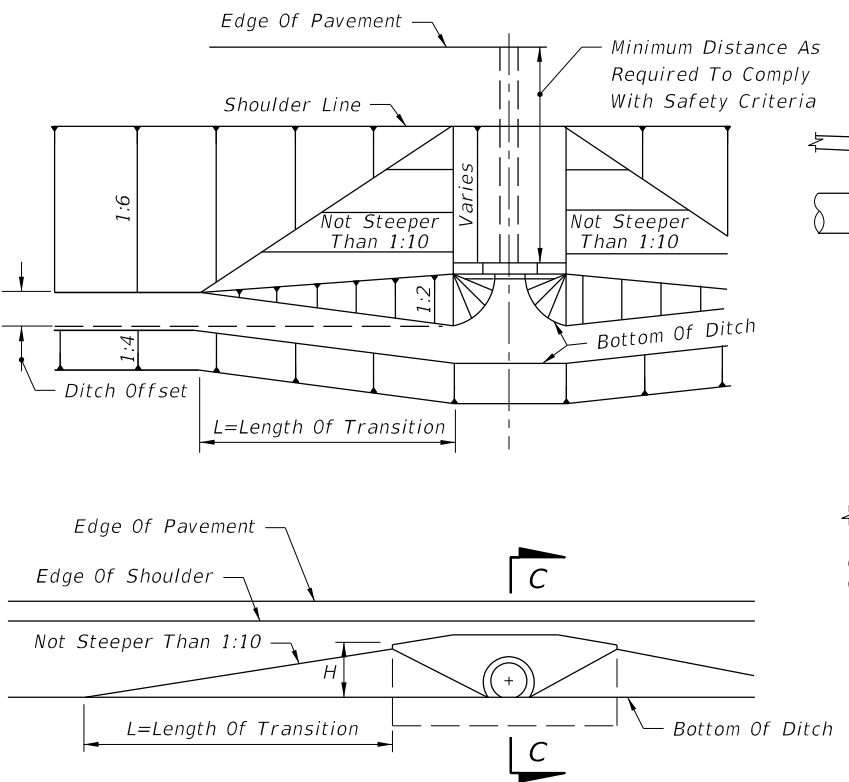
**CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE AND CONCRETE PIPES WITH DISSIMILAR JOINTS**

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12/30/2011



Note: PVC pipe, Schedule 40, to be paid for under the contract unit price for Polyvinyl Chloride Pipe Culvert (4"), LF.

### CONCRETE GUTTER AND DRAINS AT RETAINING WALLS

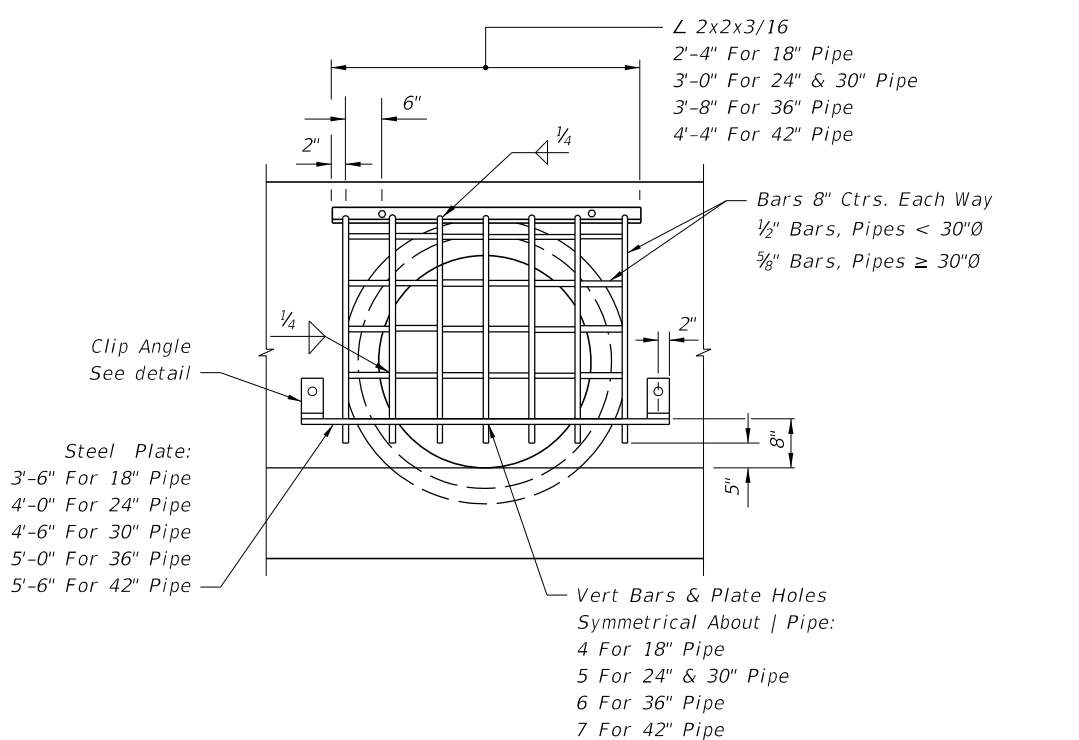


NOTE: Filling or excavation of variable slopes to be done during normal grading operations.

SECTION CC

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

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



Pipe Dia.	18"	24"	30"	36"	42"
Grate (Lbs.)	48	58	74	90	111

FRONT VIEW

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 Reinforcing Steel (Miscellaneous).

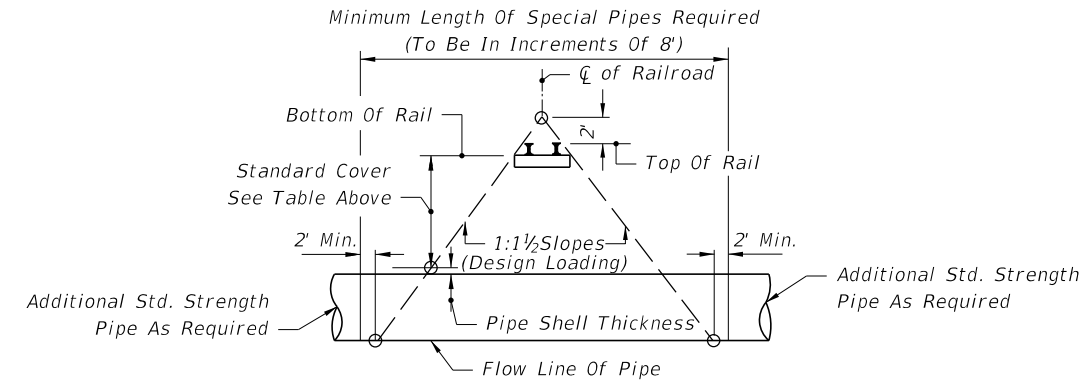
### GUARD AT PIPE ENDS

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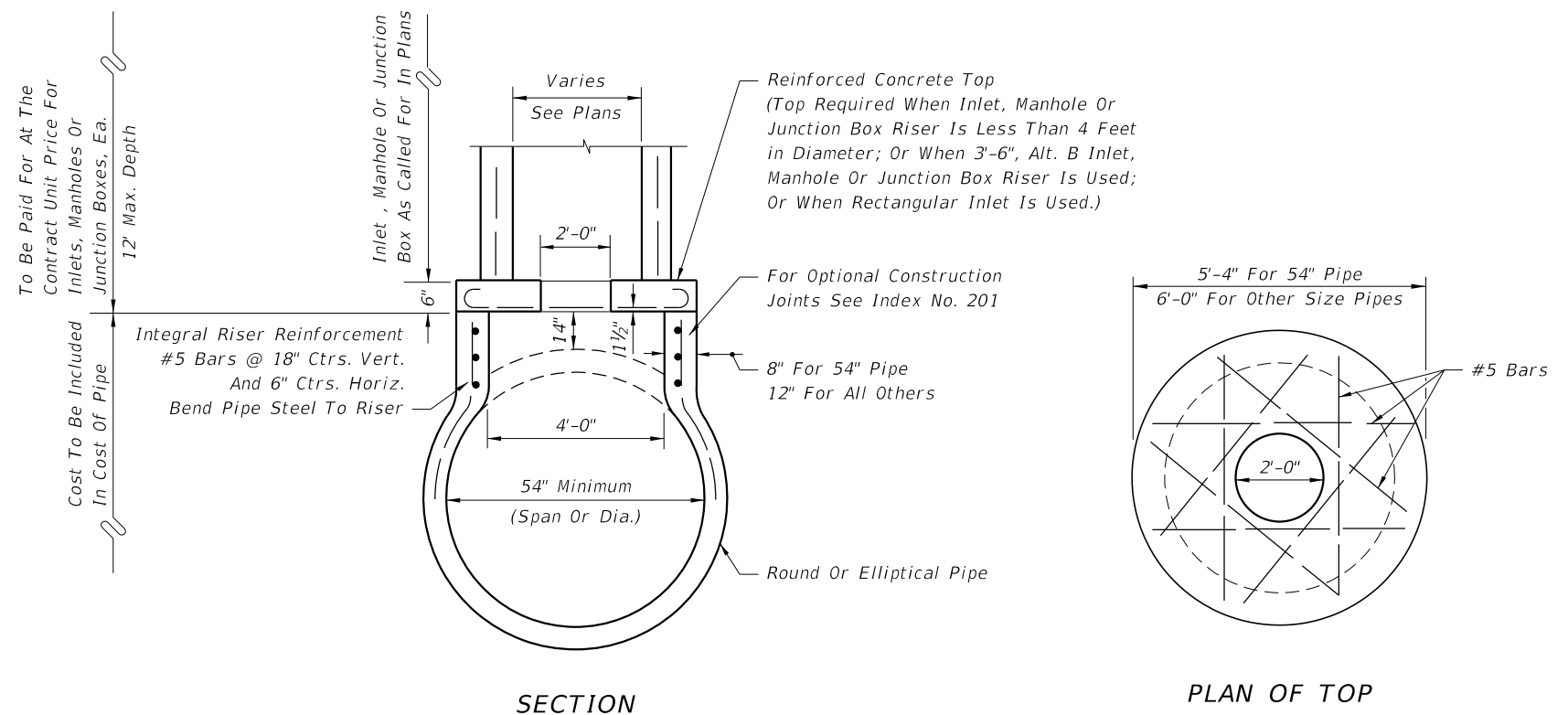
RAILROAD COMPANY	CLEARANCE BELOW BOTTOM OF RAIL (FEET) <sup>(2)</sup>	STRENGTH
		ASTM (C76) CLASS
Alabama & Gulf Coast Railway (Rail America)	5.5	IV
AN Railway & Bay Line Railroad (Genesee & Wyoming)	5.5 / 4.5 <sup>(1)</sup>	V
CSX Transportation	5.5	V
First Coast Railroad (Genesee & Wyoming)	5.5 / 4.5 <sup>(1)</sup>	V
Florida Midland, Central, and Northern Railroads (Pinsly Railroad)	5.5	V
Florida East Coast (FEC) Railway Company	5.5	IV
Florida West Coast Railroad Company	5.5	V
Georgia & Florida Railway, Inc.	5.5	V
Norfolk Southern (NS) Railway Corporation	5.5 / 4.5 <sup>(1)</sup>	V
Port of Palm Beach District Railroad	5.5	IV
Seminole Gulf Railway (LP)	6.0	V
South Central Florida Express	6.0	V
Talleyrand Terminal Railroad (Genesee & Wyoming)	5.5 / 4.5 <sup>(1)</sup>	V
South Florida Regional Transportation Authority (Tri-County Commuter Rail)	5.5	V

(1) - Distance Standard for Yard and Industrial Tracks

(2) - 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**



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

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LAST REVISION	DESCRIPTION:	 <b>FDOT DESIGN STANDARDS</b> FY 2012/2013	<b>MISCELLANEOUS DRAINAGE DETAILS</b>	INDEX NO.	SHEET NO.
07/01/07				280	3