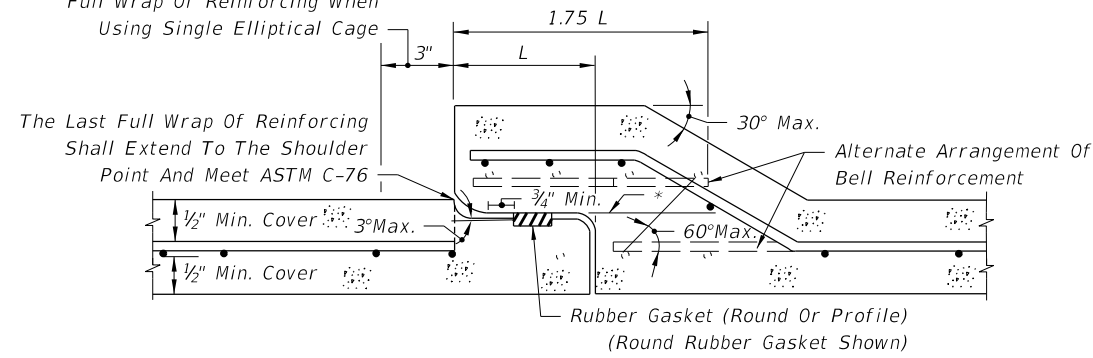


SCHEDULE OF BELL REINFORCEMENT
Classes II,III,IV,V; Wall A,B,C

Nominal Pipe Diameter	Design Bell Reinforcement in ² per foot	Maximum Reinforcement Under Tolerance in ² 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

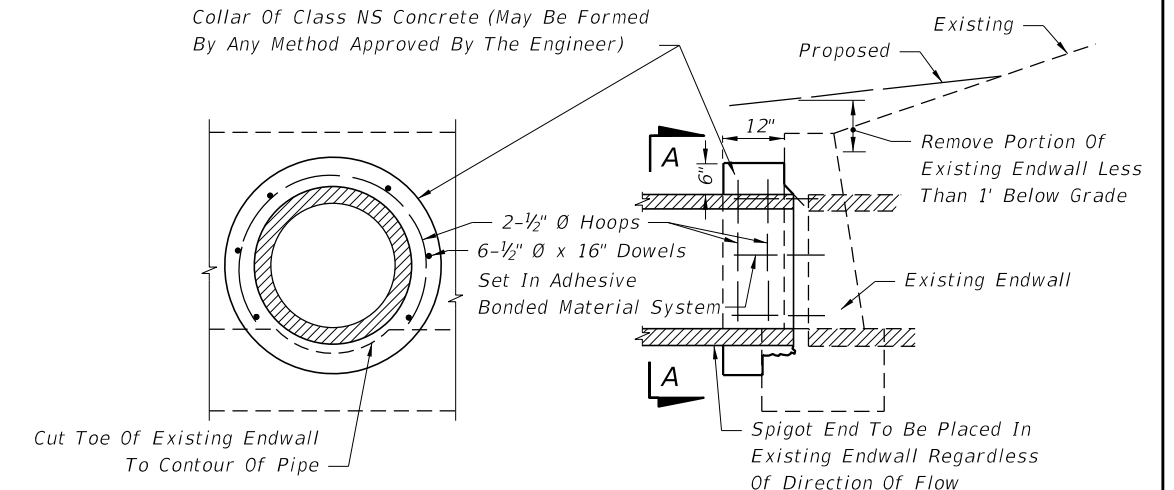
Allowable Tolerance For Last Full Wrap Of Reinforcing When Using Single Elliptical Cage



* 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**

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



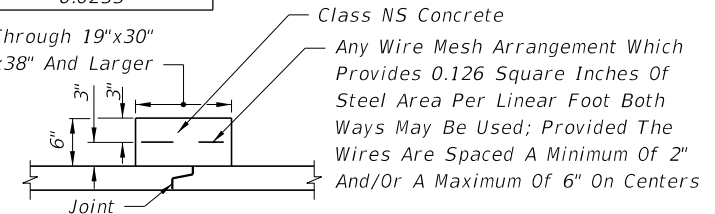
SECTION AA

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.

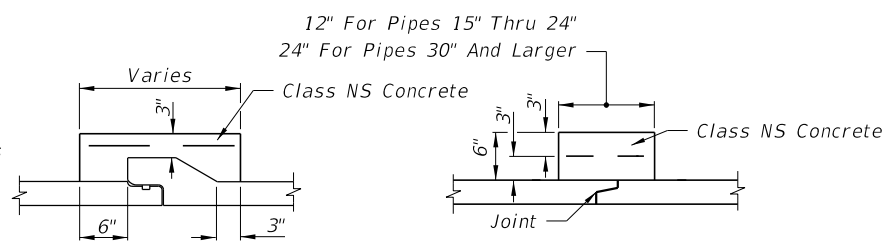
CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS

12" For Pipes 14"x23" Through 19"x30"
24" For Pipes 24"x38" And Larger



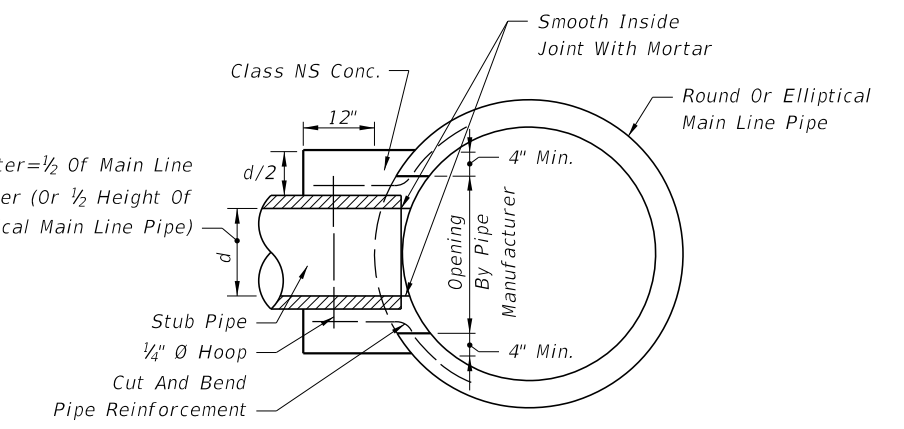
CONCRETE JACKET

12" For Pipes 15" Thru 24"
24" For Pipes 30" And Larger



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

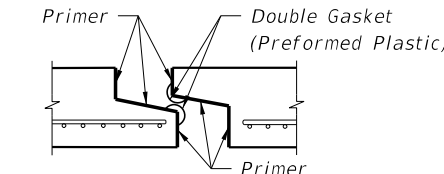
Note: For reinforcement see elliptical pipe concrete jacket. (All Pipe Sizes)



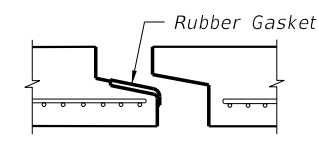
Max. Diameter = 1/2 Of Main Line Pipe Diameter (Or 1/2 Height Of Elliptical Main Line Pipe)

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

CONCRETE COLLAR FOR JOINING MAINLINE PIPE AND STUB PIPE



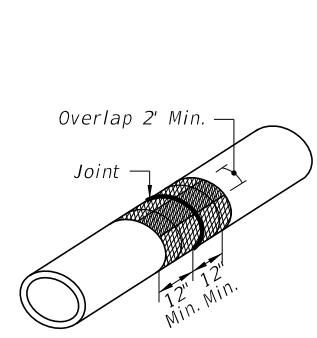
**PREFORMED PLASTIC JOINT
(BEFORE PULL-UP)**



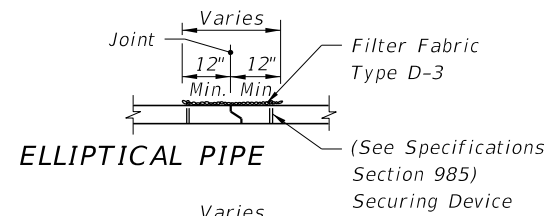
**PROFILE RUBBER GASKET
(BEFORE PULL-UP)**

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

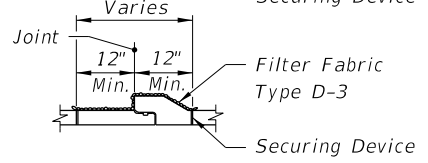
ELLIPTICAL CONCRETE PIPE JOINTS



ELLIPTICAL PIPE SHOWN ISOMETRIC VIEW



ELLIPTICAL PIPE

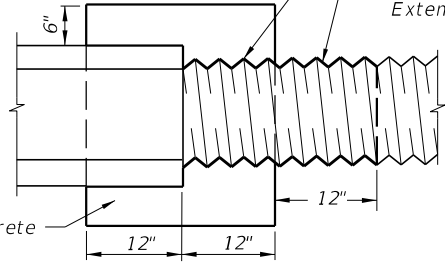


ROUND PIPE PIPE SECTIONS

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

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

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



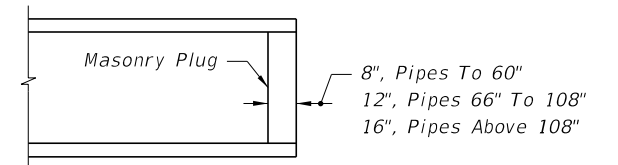
Note: Cost of concrete and bituminous coating to be included in contract unit price for either new pipe or Mitered End Section.

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

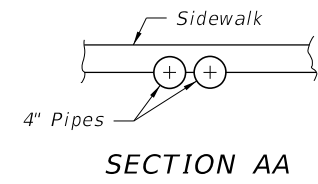
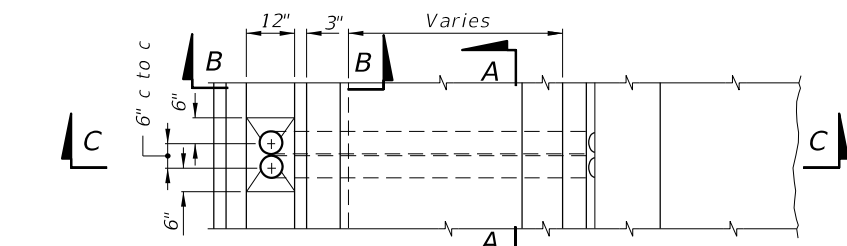
CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE AND CONCRETE PIPES WITH DISSIMILAR JOINTS



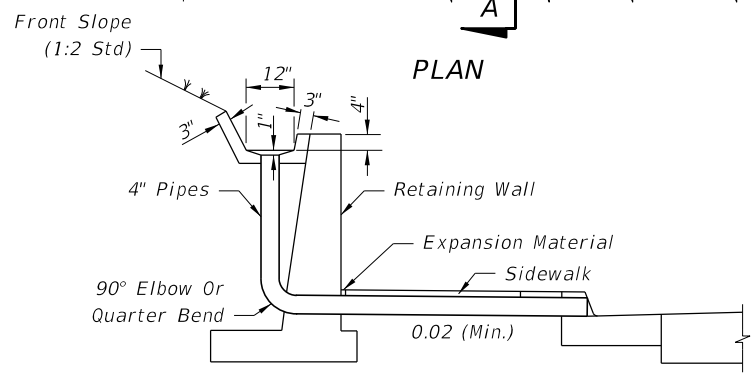
PIPE PLUG

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

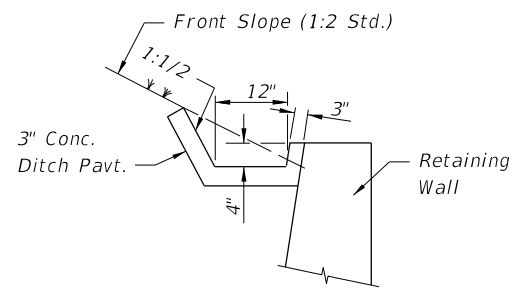
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SECTION AA



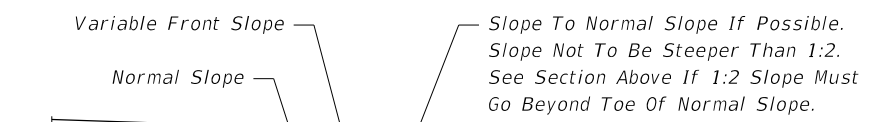
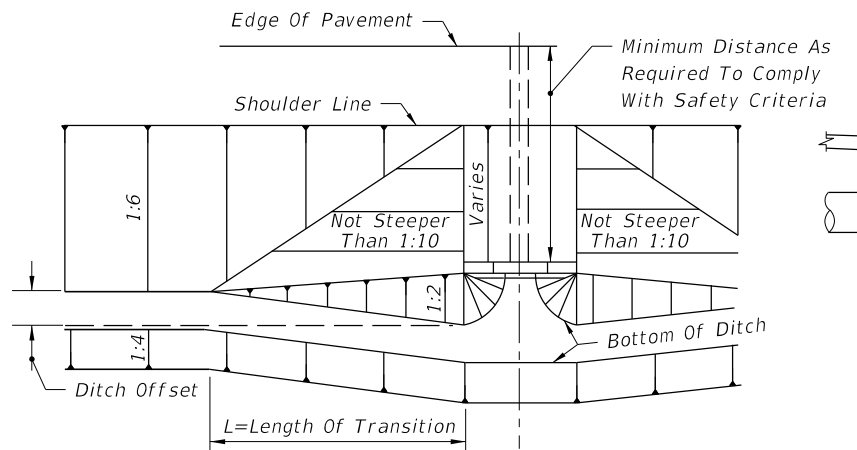
SECTION CC



SECTION BB

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

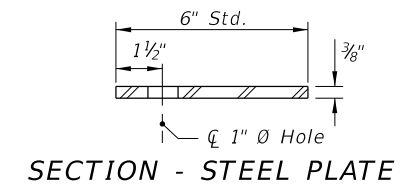


NOTE: Filling or excavation of variable slopes to be done during normal grading operations.

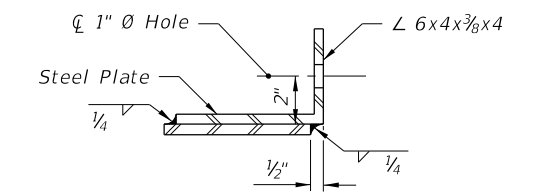
SECTION CC

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

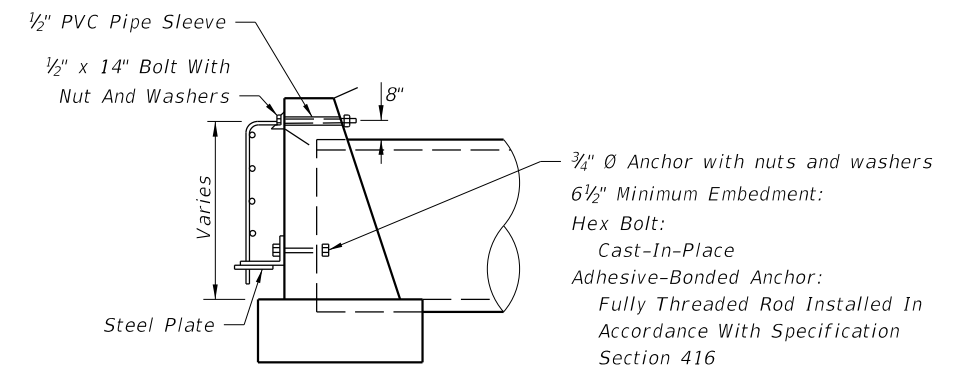
METHOD FOR SETTING LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES



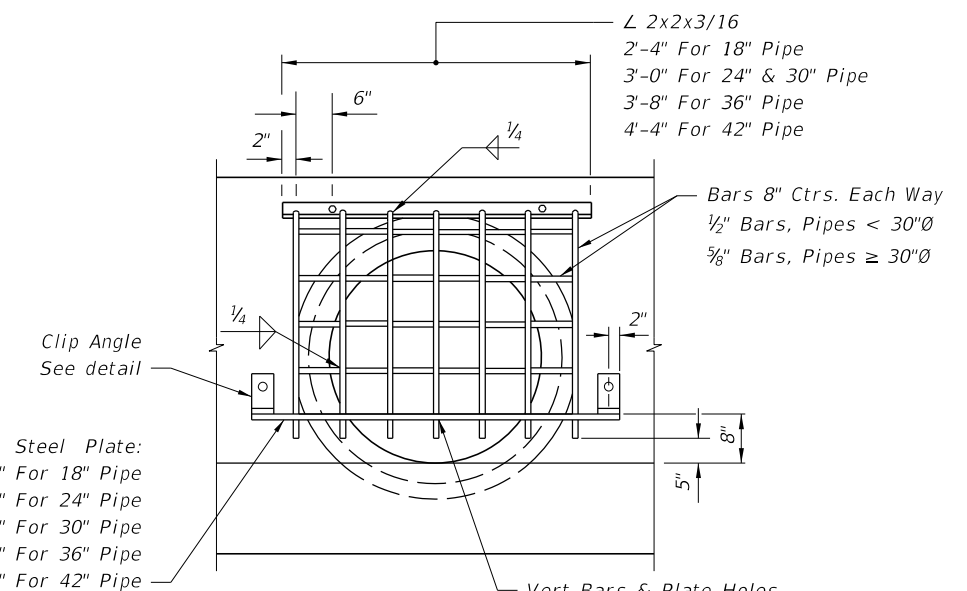
SECTION - STEEL PLATE



CLIP DETAIL



SIDE VIEW



FRONT VIEW

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

Note: Guards to be constructed only at locations specifically called for in plans.

GUARD AT PIPE ENDS

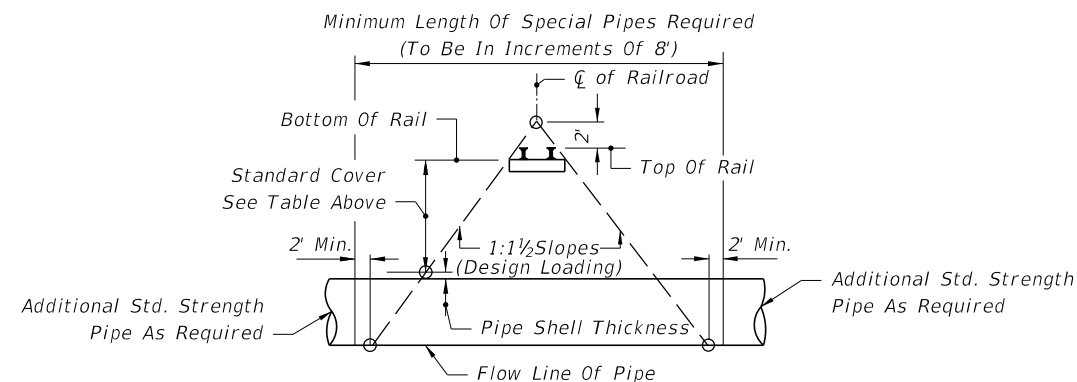
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LAST REVISION 11/01/16	DESCRIPTION:	 FY 2017-18 DESIGN STANDARDS	MISCELLANEOUS DRAINAGE DETAILS	INDEX NO. 280	SHEET NO. 2 of 3
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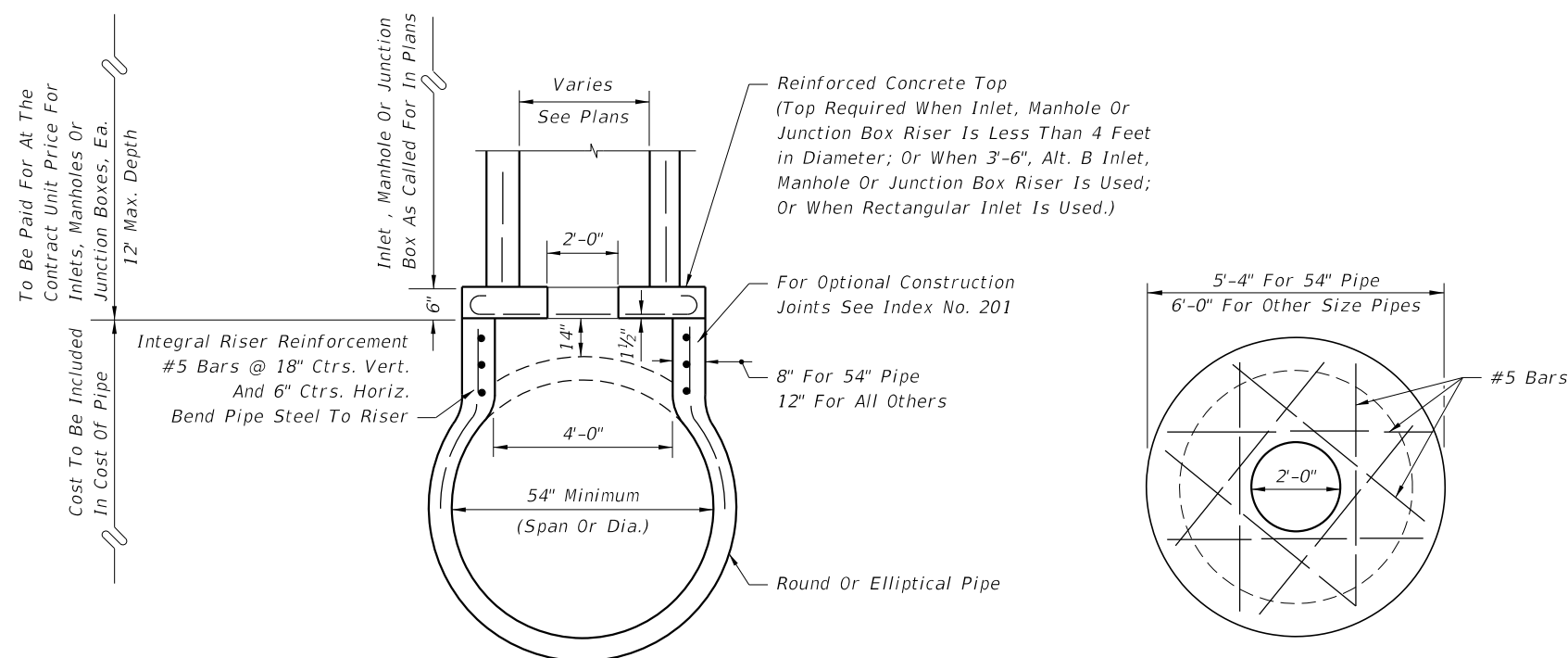
RAILROAD COMPANY	CLEARANCE BELOW BOTTOM OF RAIL (FEET) ⁽²⁾	STRENGTH
		ASTM (C76) CLASS
Alabama & Gulf Coast Railway (Rail America)	5.5	IV
AN Railway & Bay Line Railroad (Genesee & Wyoming)	5.5 / 4.5 ⁽¹⁾	V
CSX Transportation	5.5	V
First Coast Railroad (Genesee & Wyoming)	5.5 / 4.5 ⁽¹⁾	V
Florida Midland, 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 ⁽¹⁾	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 ⁽¹⁾	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



SECTION

PLAN OF TOP

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

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LAST REVISION 07/01/07	DESCRIPTION:
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FY 2017-18
DESIGN STANDARDS

MISCELLANEOUS DRAINAGE DETAILS

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280

SHEET NO.
3 of 3