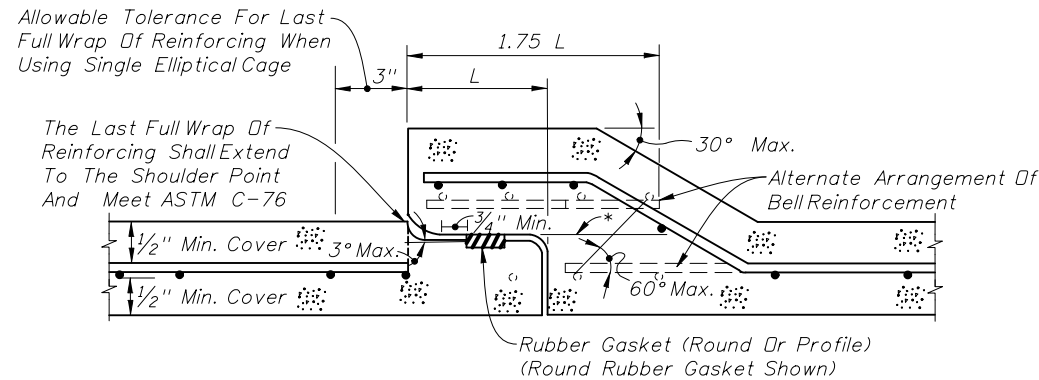


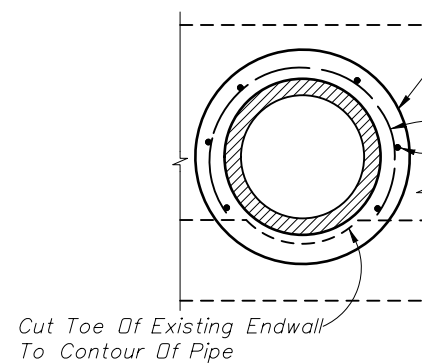
SCHEDULE OF BELL REINFORCEMENT Classes II,III,IV,V; Wall A,B,C		
Nominal Pipe Diameter	Design Bell Reinforcement in ² per foot	Maximum Reinforcement Under Tolerance in ² per foot
15"	0.07	0.010
18"	0.07	0.010
24"	0.09	0.010
30"	0.12	0.010
36"	0.14	0.010
42"	0.16	0.010
48"	0.19	0.011
54"	0.21	0.012
60"	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



*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)

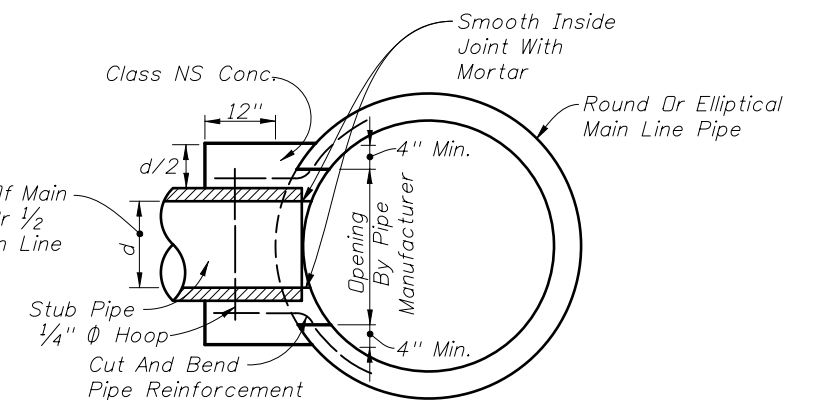


SECTION AA

LONGITUDINAL SECTION

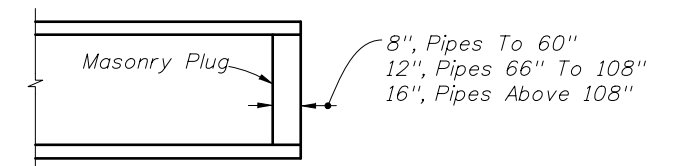
Note: Cost for removal and disposal of portions of top and toe of existing endwall and cost of concrete, reinforcing steel and construction of collar to be included in the contract unit price for pipe culvert.

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



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

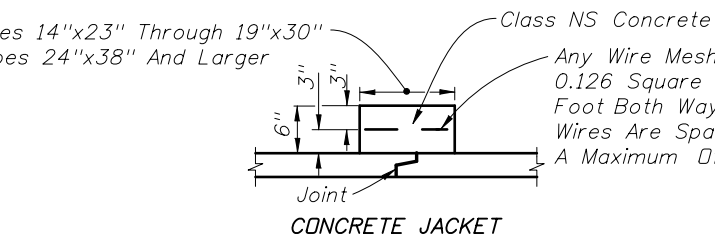
**CONCRETE COLLAR FOR JOINING
MAINLINE PIPE AND STUB PIPE**



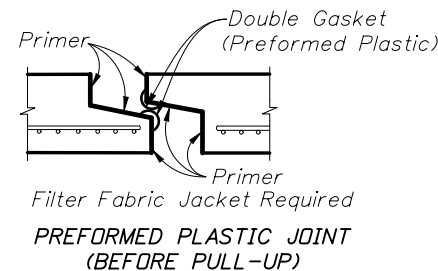
Note: Unless otherwise called for in the plans, the cost of plugging pipes to be included in contract unit price for new pipe.

PIPE PLUG

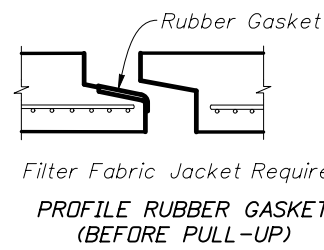
12" For Pipes 14"x23" Through 19"x30"
24" For Pipes 24"x38" And Larger



CONCRETE JACKET



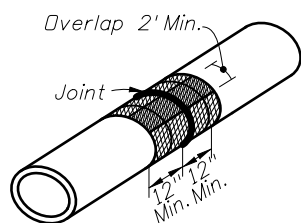
PREFORMED PLASTIC JOINT
(BEFORE PULL-UP)



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

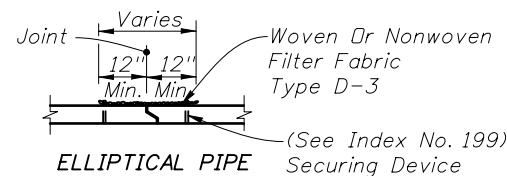


ELLIPTICAL PIPE SHOWN
ISOMETRIC VIEW

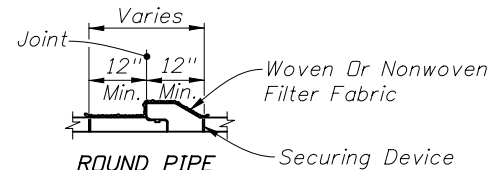
Cost of filter fabric jacket to be included in cost of pipe culverts.

FOR ALL PIPE TYPES - CONCRETE PIPE SHOWN

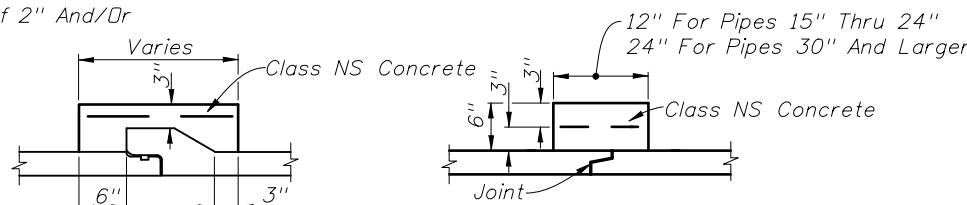
FILTER FABRIC JACKET



ELLIPTICAL PIPE



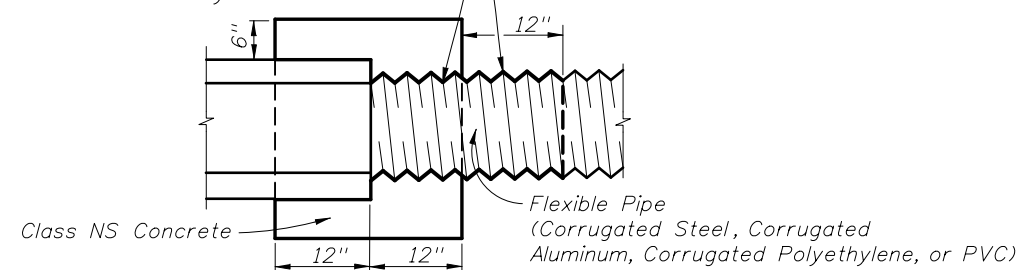
ROUND PIPE
PIPE SECTIONS



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

**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.

Alternate connection must be approved by the State Drainage Engineer.

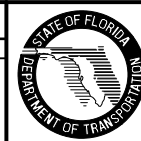
- A concrete jacket shall not be used to join:
- (a) metal pipe of dissimilar materials
 - (b) flexible pipe when the minimum cover required in accordance with Index No. 205 cannot be obtained

DISSIMILAR TYPES

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

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/11	MTP	Changed the Concrete Collar designation from Class I to Class NS.			



2010 Interim Design Standard

MISCELLANEOUS DRAINAGE DETAILS

Interim Date 01/01/11	Sheet No. 1 of 3
Index No. 280	