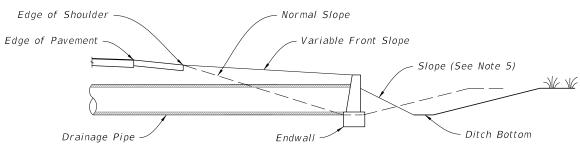


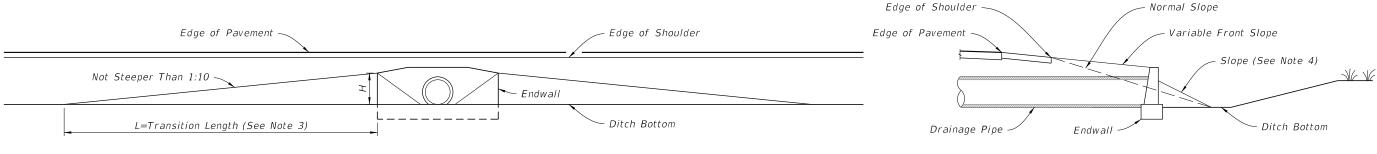
### NOTES:

- 1. Fill or excavate variable slopes during normal grading operations.
- 2. Minimum distance as required to comply with safety criteria.
- 3. Use Larger Value Of Either: L=10xH (No Maximum) L=10xDitch Offset (Maximum L=100')
- 4. Slope to normal slope if possible. Slope not to be steeper than 1:2. See side elevation (extended) below if 1:2 slope must go beyond toe of normal slope.
- 5. 1:2 slope if necessary to go beyond normal toe of slope and maintain ditch width by moving out back slope.



SIDE ELEVATION (EXTENDED)

SIDE ELEVATION (TYPICAL)



FRONT SLOPES AT DRAINAGE STRUCTURES:

	TABLE OF CONTENTS:						
Sheet	Description						
1	Limits of Variable Front Slopes at Drainage Structures						
2	Round and Elliptical Concrete Pipe Joint						
3	Geotextile Jacket, Concrete Jacket, and Pipe Plug						
4	Concrete Collars						
5	Single Pipe End Guard						
6	Double Pipe End Guard						
7	Retaining Wall Concrete Gutter and Drains						

LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES

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DESCRIPTION:

FDOT

END ELEVATION

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MISCELLANEOUS DRAINAGE DETAILS

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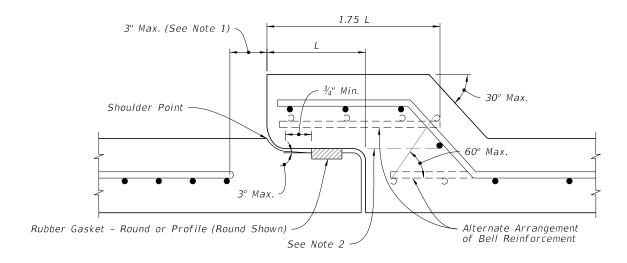
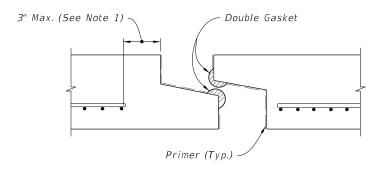


TABLE 1 SCHEDULE OF BELL REINFORCEMENT Classes II, III, IV, AND V; Wall A, B, AND C						
Nominal Pipe Diameter	Design Bell Reinforcement	Maximum Reinforcement Under Tolerance				
	in² per foot	in² per foot				
15"	0.07	0.010				
18"	0.07	0.010				
24"	0.09	0.010				
30"	0.12	0.010				
<i>36</i> "	0.14	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				
7 <i>2</i> "	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				

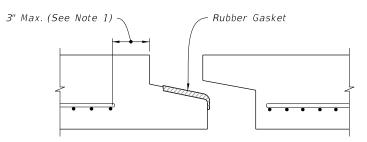
# NOTES:

- 1. Locate the last full wrap of reinforcement within 3 inches of the spigot shoulder and meet ASTM C76 for round pipe.
- 2. All circumferential steel located above this line and within the 1.75 L is defined as bell reinforcement.

ROUND CONCRETE PIPE JOINT DETAIL



### PREFORMED PLASTIC JOINT



PROFILE RUBBER GASKET

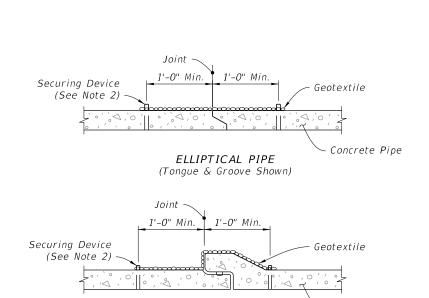
## NOTES:

- 1. Locate the last full wrap of reinforcement within 3 inches of the spigot shoulder and meet ASTM C507 for elliptical pipe.
- 2. Type D-3 Geotextile Jacket is required on both type of joints.
- 3. Details shown before joint is homed.

= ELLIPTICAL CONCRETE PIPE JOINT DETAIL=

ROUND AND ELLIPTICAL CONCRETE PIPE JOINT

DESCRIPTION:

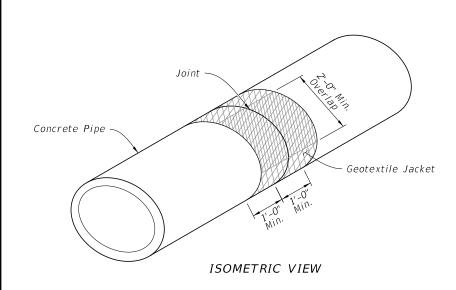


SECTION VIEW

ROUND PIPE

(Bell & Spigot Shown)

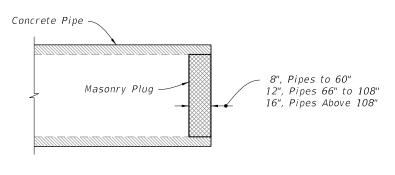
Concrete Pipe

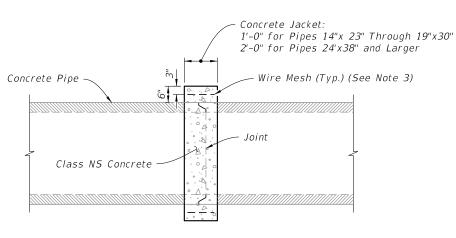


(For All Pipe Types - Concrete Elliptical Pipe Shown)

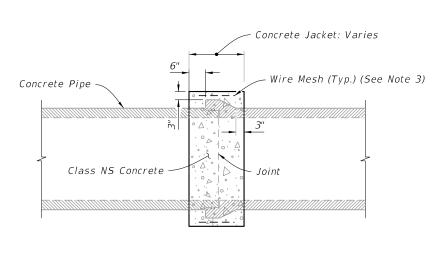
=  $GEOTEXTILE\,$  JACKET=

= PIPE PLUG =



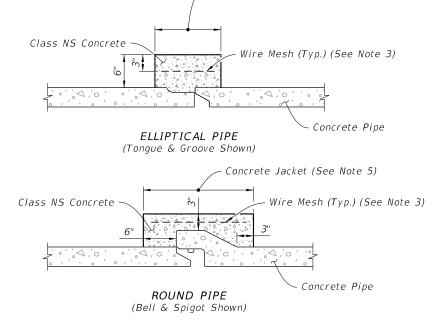


ELLIPTICAL PIPE



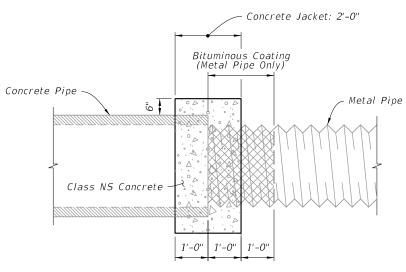
ROUND PIPE

SIMILAR TYPES (Only When Called For In The Plans)



Concrete Jacket (See Note 6)

#### DISSIMILAR JOINTS



CONCRETE AND METAL PIPE SHOWN (Others Similar) DISSIMILAR TYPES

### CONCRETE JACKET =

#### NOTES:

- 1. Alternate connection must be approved by the Engineer.
- 2. Install Type D-3 geotextile in accordance with Specification 514. Install securing device to hold the geotextile jacket on to the pipe.
- 3. 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.
- 4. Do not use a concrete jacket to join dissimilar metal pipes.
- 5. 12" for pipes 15" through 24"; 24" for pipes 30" and larger.
- 6. 12" for pipes 14" x 23" through 19" x 30"; 24" for pipes 24" x 38" and larger.

GEOTEXTILE JACKET, CONCRETE JACKET, AND PIPE PLUG

11/01/23

DESCRIPTION:

FDOT

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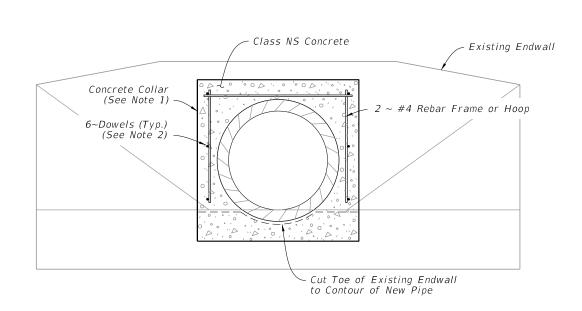
MISCELLANEOUS DRAINAGE DETAILS

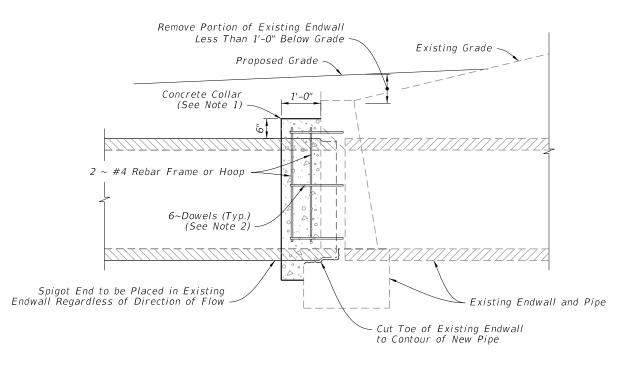
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END ELEVATION SIDE ELEVATION

EXTENSION OF EXISTING PIPE CULVERTS =

### NOTES:

- 1. The collar may be formed by any method approved by the Engineer.
- 2. Install  $\frac{1}{2}$ "x16" dowels in adhesive bond material.

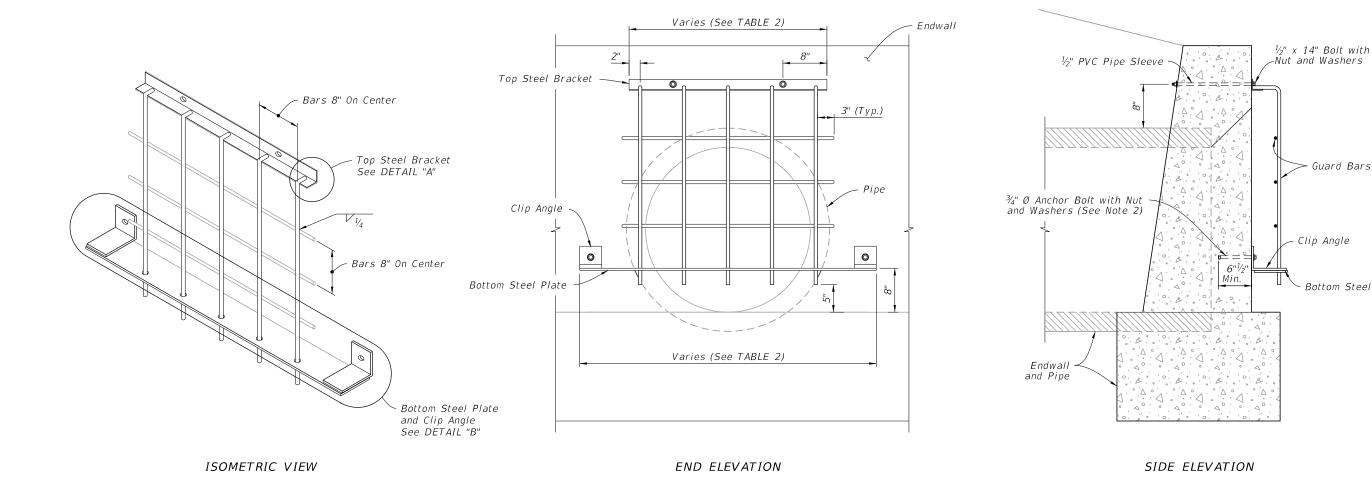
CONCRETE COLLARS

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FDOT

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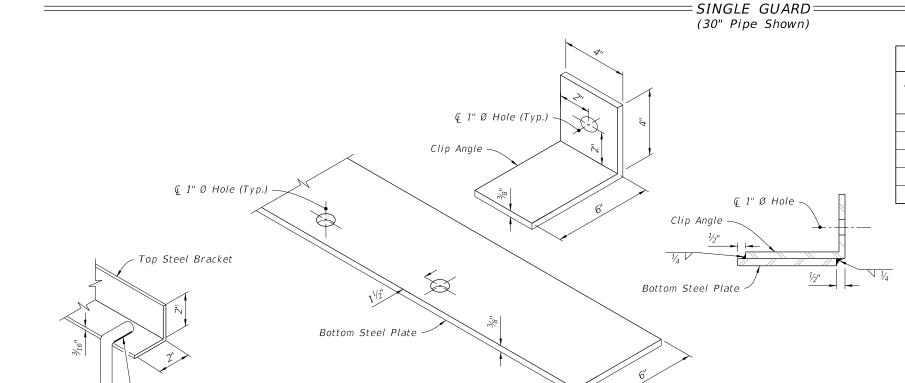


TABLE 2 - SINGLE GUARD									
Pipe Dia. (in)	Top Steel Bracket	Bottom Steel Plate	Number of Holes	Number of Vert. Bars	Vertical Bars Size	Number of Horiz. Bars	Horizontal Bars Size	Weight Ibs.	
18	2'-4"	3'-6"	4	4	1/2"	1	1/2"	48	
24	3'-0"	4'-0"	5	5	1/2"	2	1/2"	58	
30	3'-0"	4'-6"	5	5	5/8"	3	5/8"	74	
36	3'-8"	5'-0"	6	6	5/8"	4	5/8"	90	
42	4'-4"	5'-6"	7	7	5/8"	5	5/8"	111	

# NOTES:

- 1. Construct guards only at locations specifically called for in Plans.
- 2. Anchor Bolts (Galvanized): Use C-I-P Hex Head bolts or fully threaded adhesive anchors, installed in accordance with Specification 416.

SINGLE PIPE END GUARD

→ Guard Bars

Bottom Steel Plate

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Vertical Bar (Typ.

= DETAIL "A" ===

DESCRIPTION:

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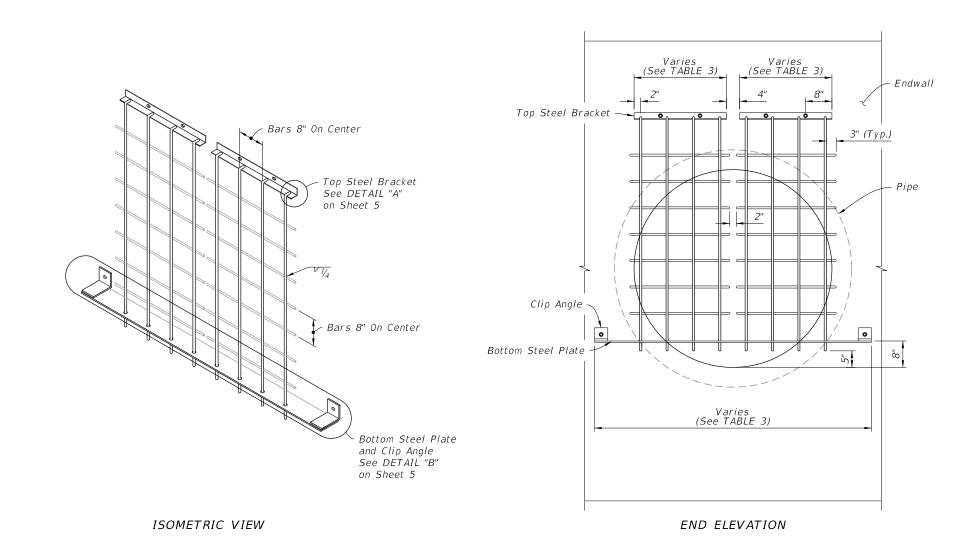
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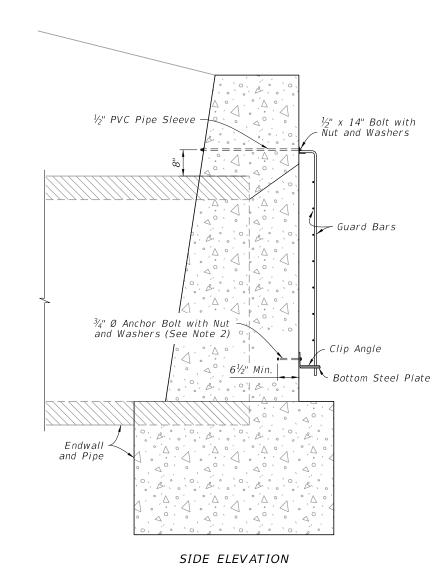
DETAIL "B'

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DOUBLE GUARD (60" Pipe Shown)

## NOTES:

- 1. Construct guards only at locations specifically called for in Plans.
- 2. Anchor Bolts (Galvanized): Use C-I-P Hex Head bolts or fully threaded adhesive anchors, installed in accordance with Specification 416.

	TABLE 3 - DOUBLE GUARD									
Pipe Dia. (in)	Top Steel Bracket Grate 1	ket   Bracket   Steel   of Total   Vert. Bars   Vert. Bars   Vert.Cal   Horiz. Bars   Bars Size				Weight Ibs.				
48	2'-4"	2'-4"	6'-0"	8	4	4	5/8"	5	5/8"	127
54	2'-4"	2'-4"	6'-6"	8	4	4	3/4"	6	5/8"	157
60	2'-4"	2'-4"	7'-0"	8	4	4	3/4"	7	5/8"	172

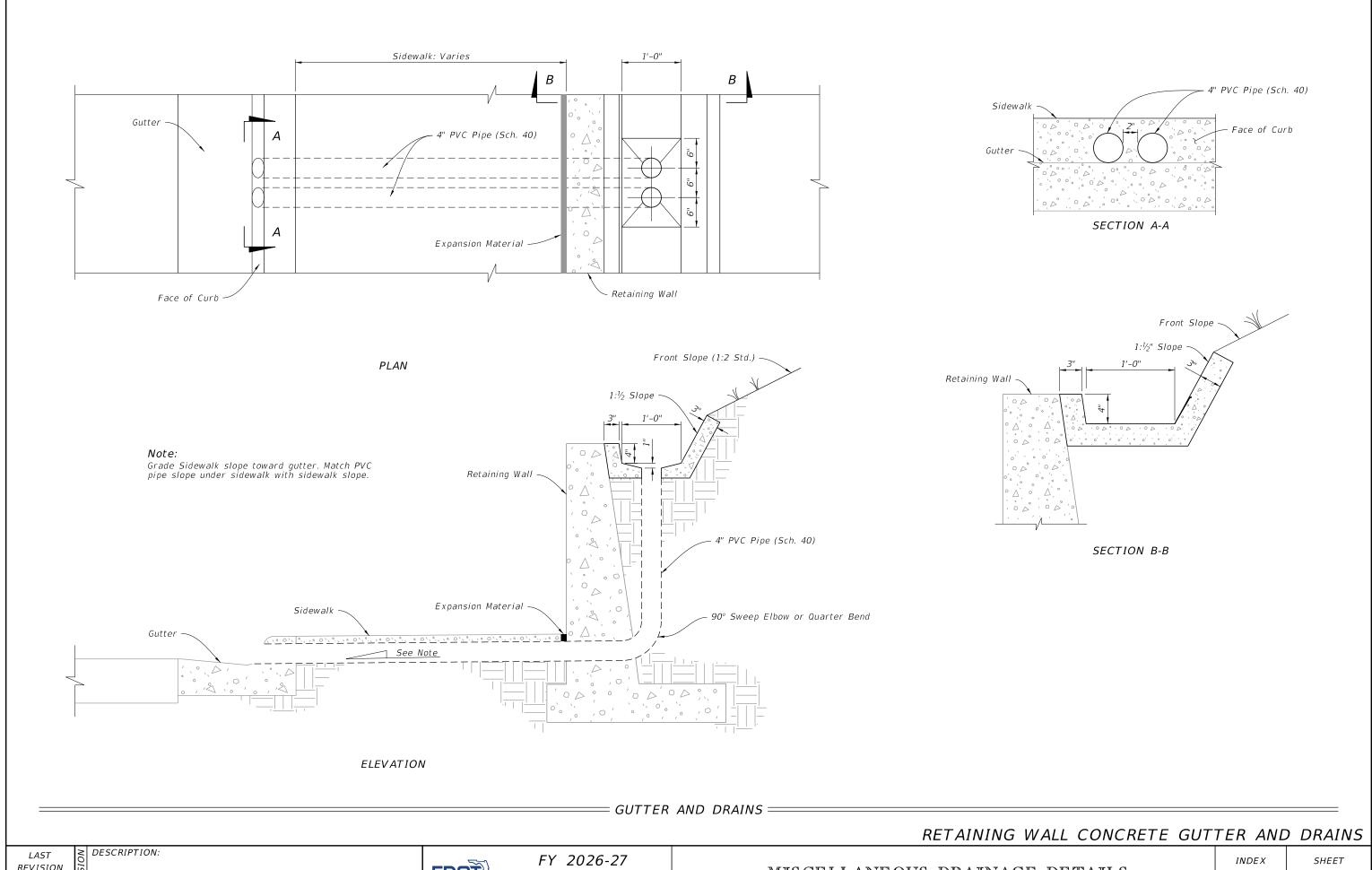
DOUBLE PIPE END GUARD

LAST REVISION 11/01/20

DESCRIPTION:

FDOT

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REVISION 11/01/20

FDOT