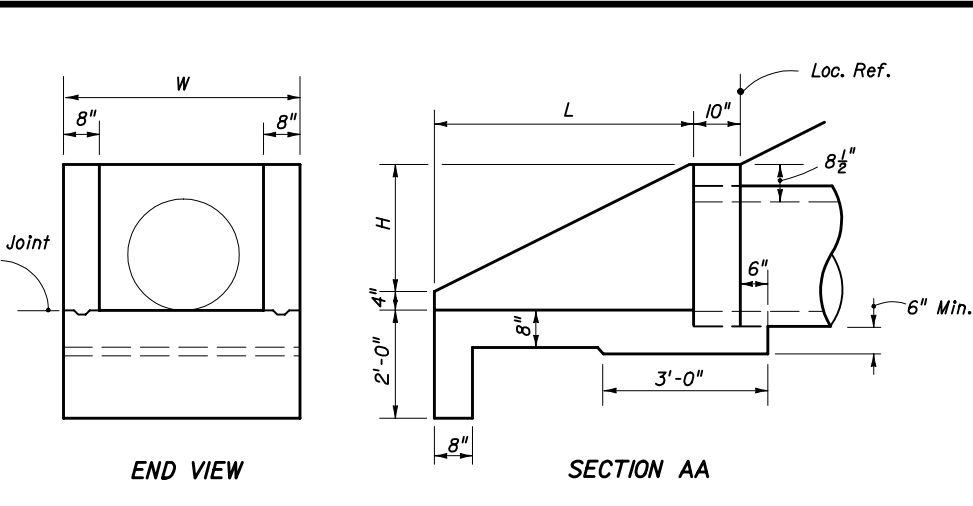


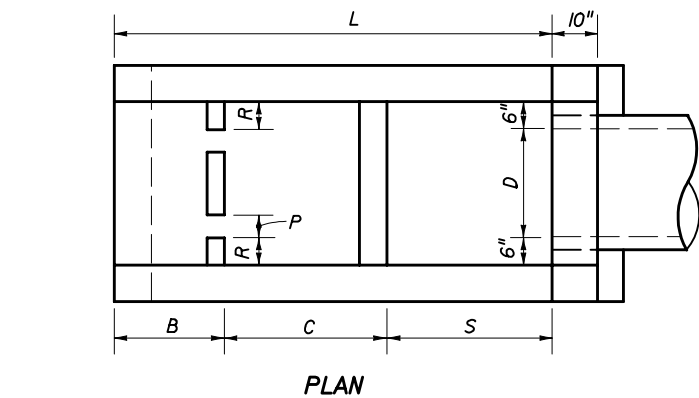
END VIEW

SECTION AA



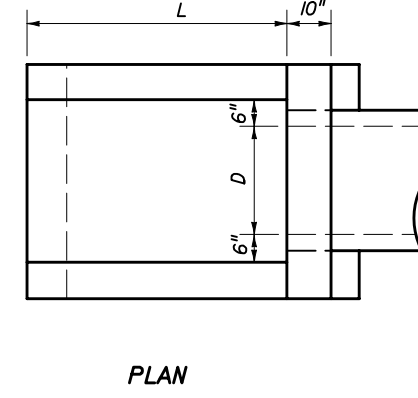
END VIEW

SECTION AA



PLAN

DIMENSIONAL DETAILS

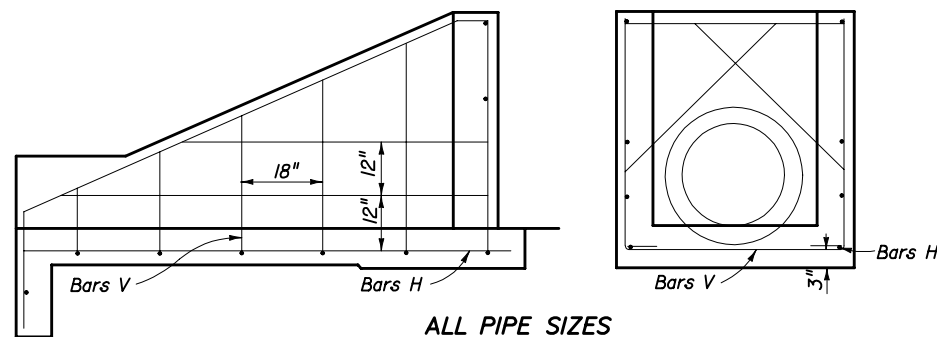


PLAN

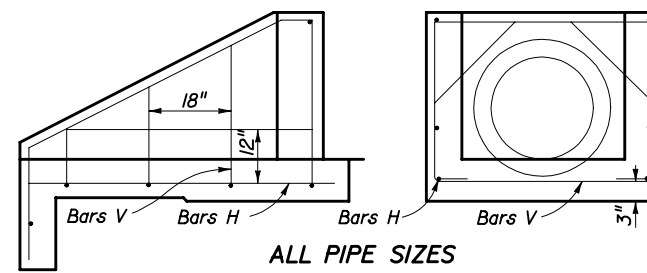
DIMENSIONAL DETAILS

GENERAL NOTES

1. Baffles to be constructed only when called for in plans.
2. When steel grating is required on endwall see Sheet 3 of 3 for details.
3. All reinforcing No. 4 bars with 2" clearance except as noted.
4. All angles, channels and bars shall be ASTM A242/A242M, A572/A572M or A588/A588M Grade 50 steel, when designated Alternate G in the plans galvanized in accordance with Section 962-7 of the Standard Specifications.
5. Channel section C 3 x 6 may be substituted for C 4 x 5.4 channel.
6. Precasting of this endwall will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer. Use Index No. 201 for opening and grouting details.
7. Concrete meeting the requirements of ASTM C-478 (4000 psi) may be used in lieu of Class I concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
8. Sodding shall be in accordance with Index No. 281, and paid for under the contract unit price for Sodding, SY.
9. Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY and Reinforcing Steel (Roadway), LB. Cost of grates to be paid for under the contract unit price for Endwall Grate, LB, plan quantity. Cost of galvanized bolts and nuts to be included in the bid price for the grate.



ALL PIPE SIZES  
SIDE VIEW AND BACKWALL SECTION  
REINFORCING DETAIL



ALL PIPE SIZES  
SIDE VIEW AND BACKWALL SECTION  
REINFORCING DETAIL

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL														
Pipe Size		X Baffle							Y Baffle Reinf. Steel		Concrete Class I Cu. Yd.	Reinf. Steel Lbs.		
D	Area Sq. Ft.	L	H	W	S	B	C	P	Q	R			Bar M	Bar N
15"	1.23	5'-9"	2'-3 1/2"	3'-7"	2'-3"	1'-3"	2'-3"	4"	4"	4"	2 #4	1 #4	1.61	72
18"	1.77	6'-6"	2'-5"	3'-10"	2'-6"	1'-6"	2'-6"	4"	4"	5"	3 #4	2 #4	1.89	86
24"	3.14	8'-0"	2'-8"	4'-4"	3'-0"	2'-0"	3'-0"	5"	5"	6"	4 #4	3 #4	2.52	108
30"	4.91	9'-6"	2'-11"	4'-10"	3'-6"	2'-6"	3'-6"	5"	5"	7"	4 #4	4 #4	3.34	131

WITH BAFFLES

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL						
Pipe Size		L	H	W	Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
D	Area Sq. Ft.	L	H	W	Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
15"	1.23	3'-3"	1'-7 1/2"	3'-7"	0.89	39
18"	1.77	3'-9"	1'-10 1/2"	3'-10"	1.05	43
24"	3.14	4'-9"	2'-4 1/2"	4'-4"	1.40	55
30"	4.91	5'-9"	2'-10 1/2"	4'-10"	1.88	64

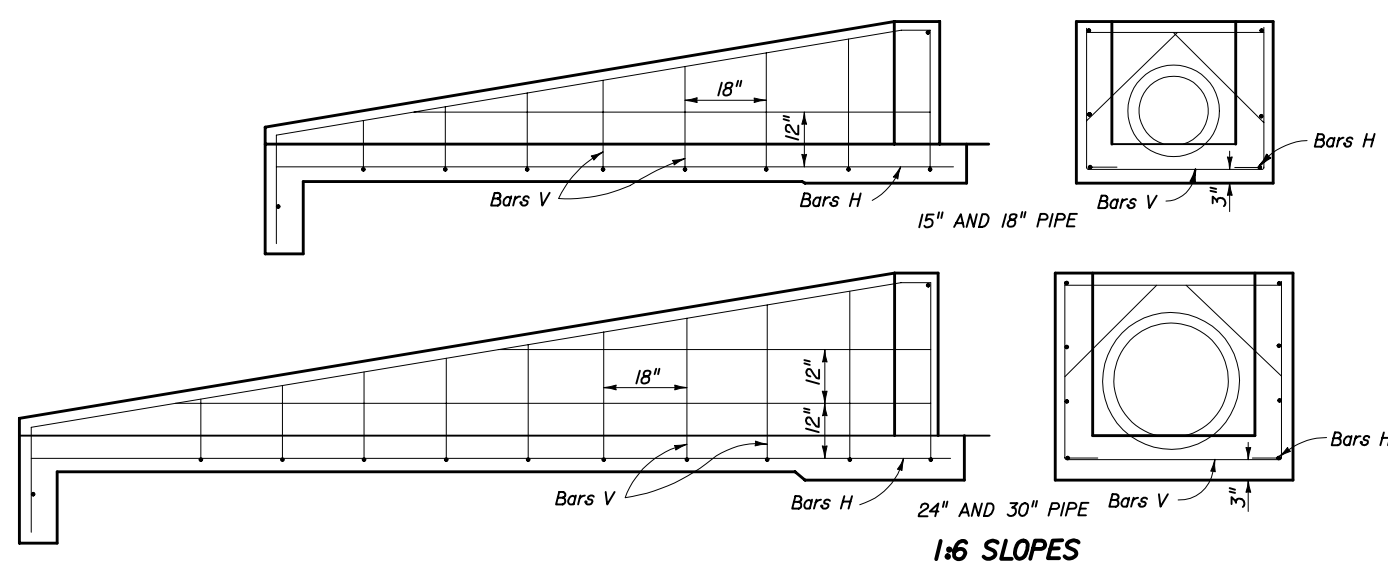
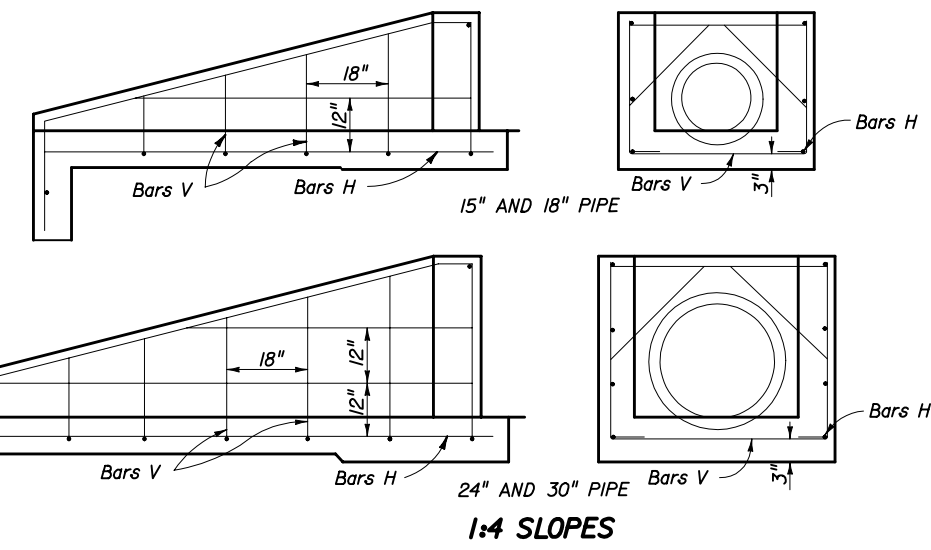
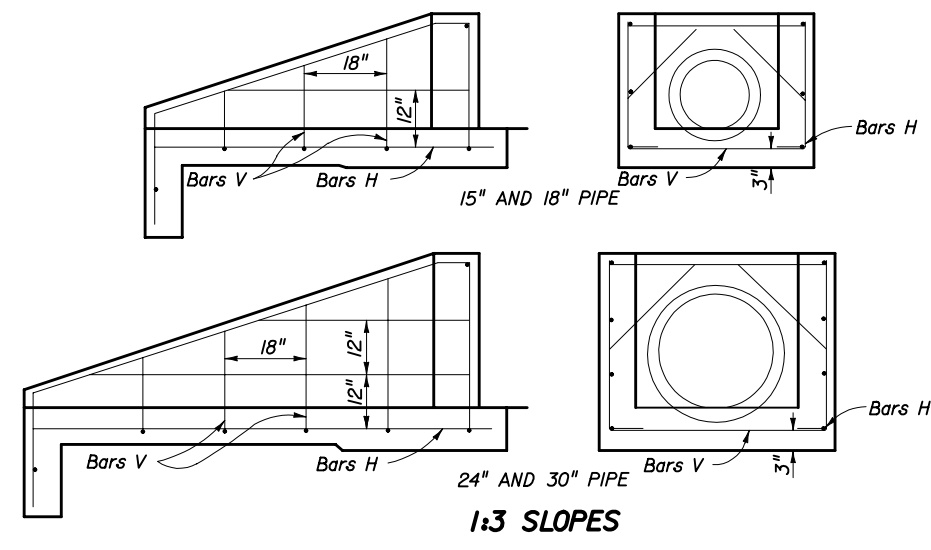
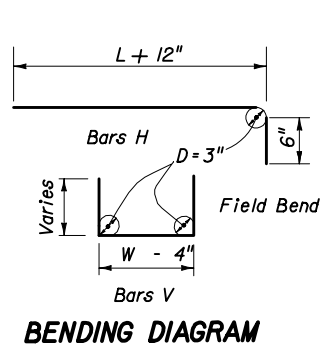
WITHOUT BAFFLES

ENDWALLS FOR 2:1 SLOPES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

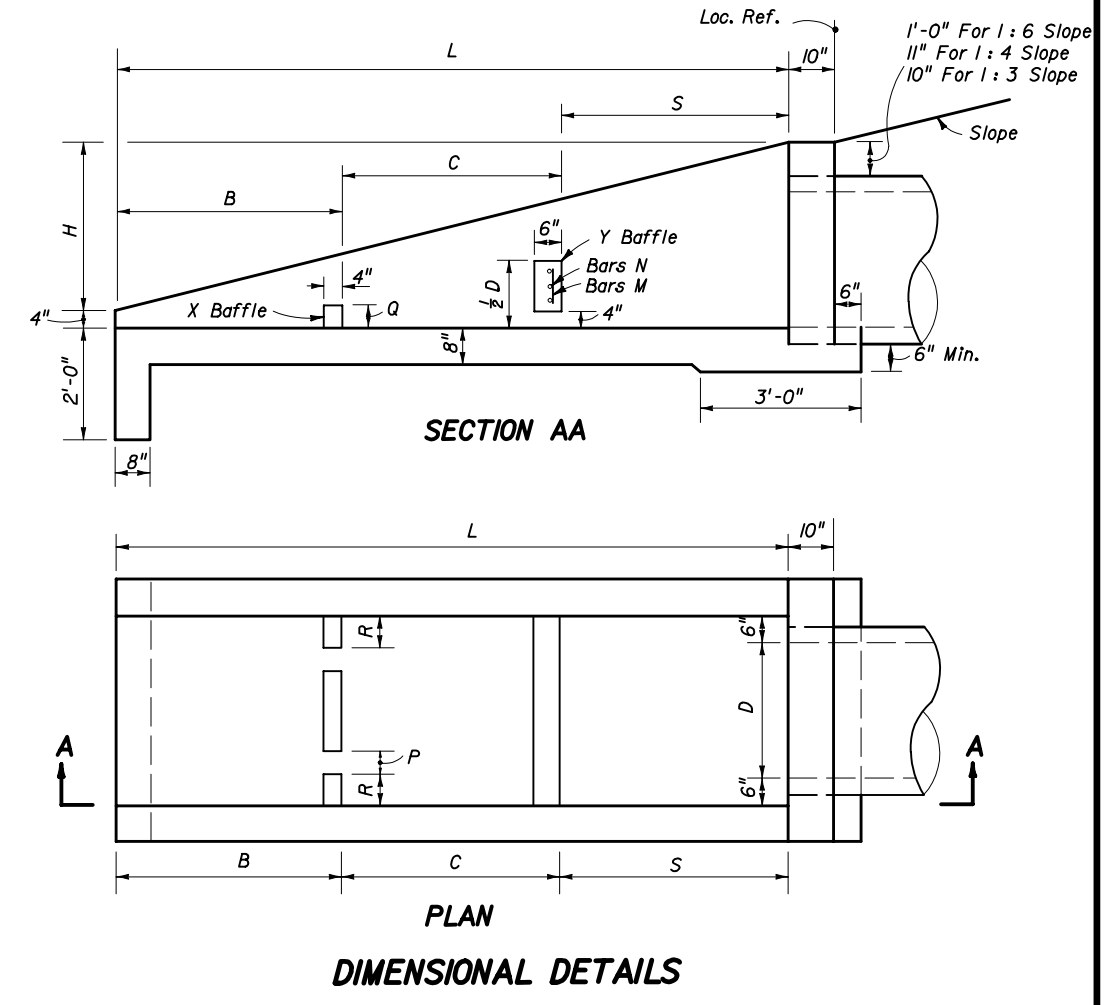
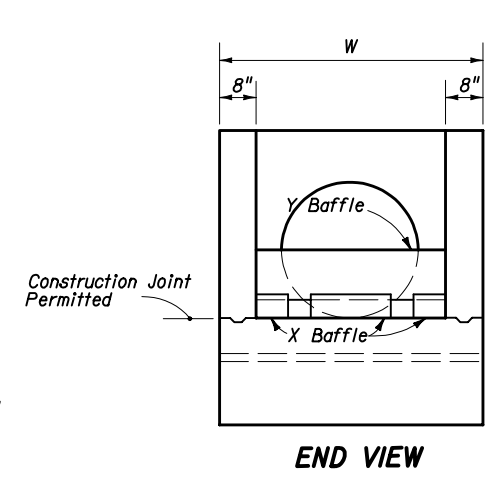
**U-TYPE CONCRETE ENDWALLS  
BAFFLES AND GRATE OPTIONAL  
15" TO 30" PIPE**

Names	Dates	Approved By			
Designed By		State Drainage Engineer			
Drawn By	dde 09/85				
Checked By					
Revision	00				Sheet No.



**SIDE VIEWS AND BACKWALL SECTIONS REINFORCING DETAILS**

**ENDWALLS WITH AND WITHOUT BAFFLES FOR 1:3, 1:4 AND 1:6 SLOPES**



**DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL**

Rate Of Slope	Pipe Size		Baffle Locations (When Required)			Concrete Class I Cu. Yd.	Reinf. Steel Lbs.	
	D	Area Sq. Ft.	L	H	W			
1:3	15"	1.23	5'-3"	1'-9"	3'-7"	1'-9" 1'-9" 1'-9"	1.19	51
	18"	1.77	6'-0"	2'-0"	3'-10"	2'-0" 2'-0" 2'-0"	1.42	56
	24"	3.14	7'-6"	2'-6"	4'-4"	2'-6" 2'-6" 2'-6"	1.94	77
	30"	4.91	9'-0"	3'-0"	4'-10"	3'-0" 3'-0" 3'-0"	2.54	96
1:4	15"	1.23	7'-4"	1'-10"	3'-7"	2'-6" 2'-6" 2'-4"	1.54	64
	18"	1.77	8'-4"	2'-1"	3'-10"	2'-10" 2'-10" 2'-8"	1.84	71
	24"	3.14	10'-4"	2'-7"	4'-4"	3'-6" 3'-6" 3'-4"	2.53	92
	30"	4.91	12'-4"	3'-1"	4'-10"	4'-2" 4'-2" 4'-0"	3.34	124
1:6	15"	1.23	11'-6"	1'-11"	3'-7"	3'-10" 3'-10" 3'-10"	2.19	89
	18"	1.77	13'-0"	2'-2"	3'-10"	4'-4" 4'-4" 4'-4"	2.63	103
	24"	3.14	16'-0"	2'-8"	4'-4"	5'-4" 5'-4" 5'-4"	3.59	143
	30"	4.91	19'-0"	3'-2"	4'-10"	6'-4" 6'-4" 6'-4"	4.81	180

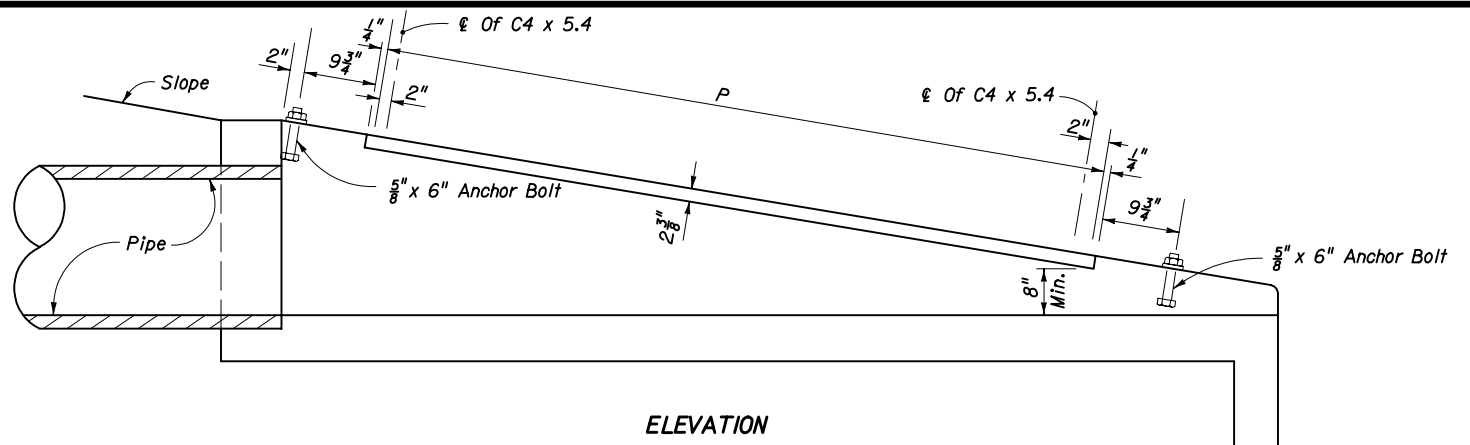
**DIMENSIONS AND QUANTITIES FOR BAFFLES**

Pipe Size D	X Baffle			Y Baffle Reinf. Steel	Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
	P Width	Q Height	R Length			
15"	4"	4"	4"	2-#4 1-#4	0.10	4
18"	4"	4"	5"	3-#4 2-#4		8
24"	5"	5"	6"	4-#4 3-#4		12
30"	5"	5"	7"	4-#4 4-#4		16

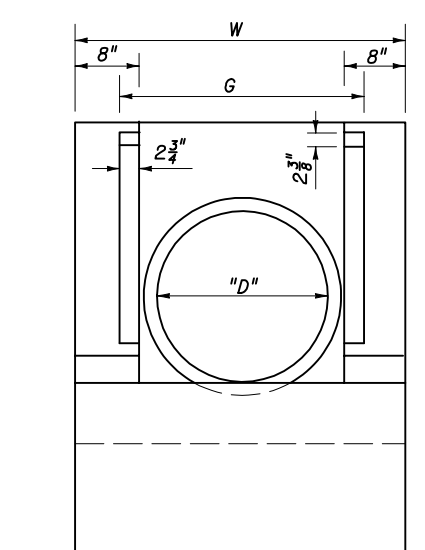
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**U-TYPE CONCRETE ENDWALLS BAFFLES AND GRATE OPTIONAL 15" TO 30" PIPE**

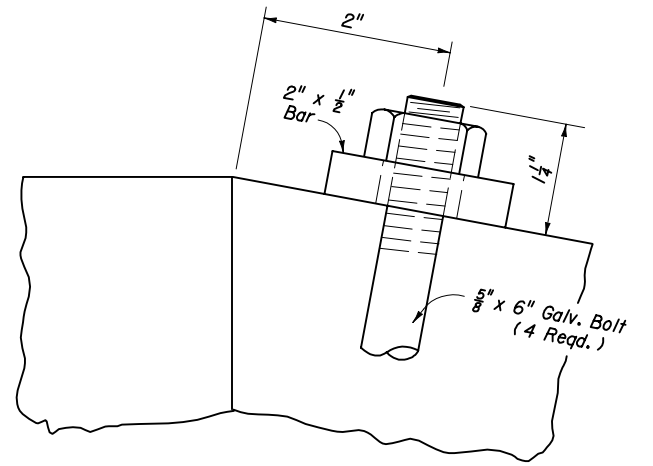
Designed By	Names	Dates	Approved By
Drawn By	ddc	9/85	State Drainage Engineer
Checked By			
	Revision	00	Sheet No. 2 of 3
	Index No.		261



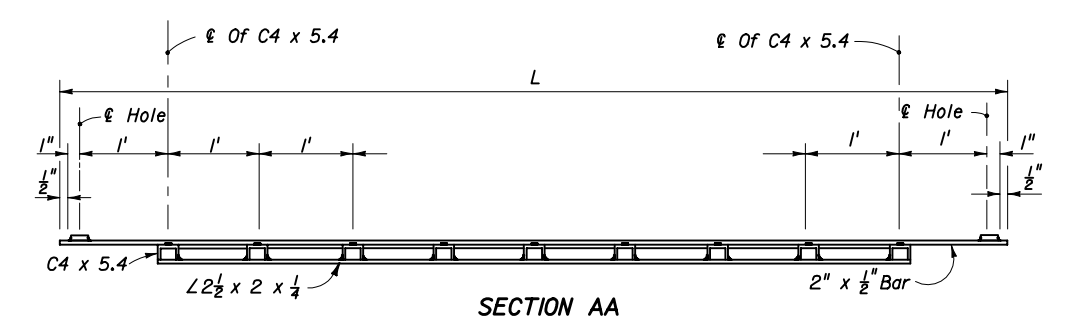
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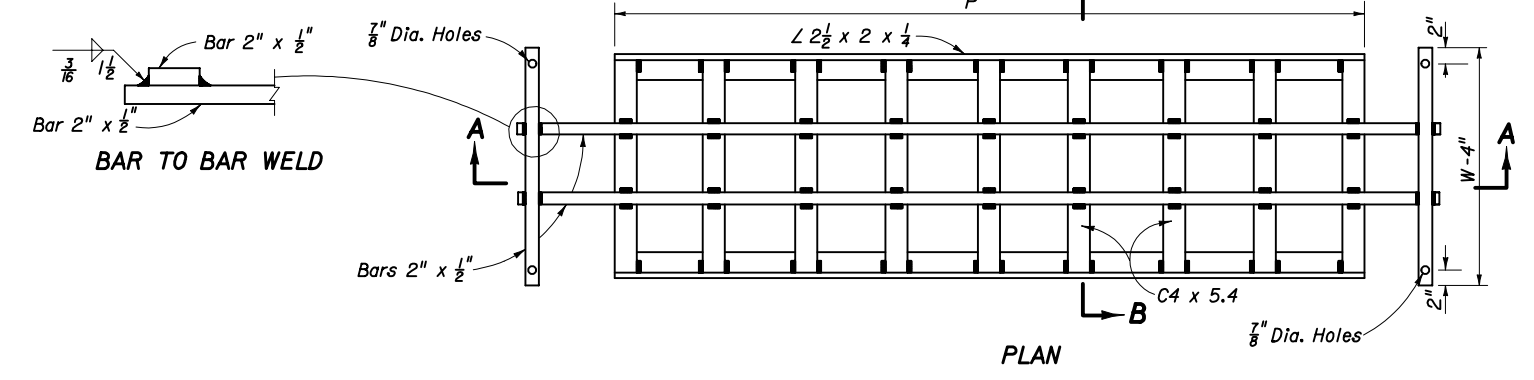
END VIEW



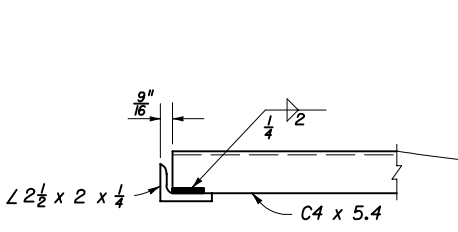
ANCHOR BOLT DETAIL



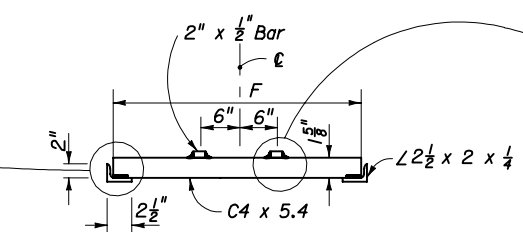
SECTION AA



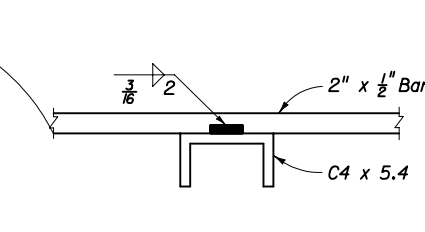
PLAN



CHANNEL TO ANGLE WELD



SECTION BB



BAR TO CHANNEL WELD

### STEEL GRATE

### MOUNTING FOR STEEL GRATE

#### STEEL GRATING USE CRITERIA

1. Grates to be used on pipe culvert endwalls located within the designated clear zone. Positive debris control shall be provided at all upgradient openings. Grates shall not be used unless one or more of the following conditions exist:

- A. Drainage area to culvert consists of median or infield areas or areas where debris and/or drift is negligible.
- B. Runoff to culvert is by sheet flow or in such ill defined channels that debris transport is not considered a major problem.
- C. Runoff to culvert is minor except on an infrequent basis (10 to 15 year frequency); for example a drainage basin in flat sandy terrain with normally low ground water table.
- D. Areas where culvert blockage with resultant backwater would not seriously affect roadway embankment, traffic operation or upland property.

2. Steel grating to be used only where called for in plans.

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRATE

Rate Of Slope	Size Pipe " D "	G	2 Each Bars @ 3.4 Lbs./L.F.			(X) Channels @ 5.4 Lbs./L.F.			2 Angles @ 3.62 Lbs./L.F.		Total Weight Lbs.
			L	W-4"	Lbs.	(X)	F	Lbs.	P	Lbs.	
1:6	15"	2' - 8 1/2"	9' - 3"	3' - 3"	85	8	2' - 6 7/8"	111	7' - 4"	53	249
	18"	2' - 11 1/2"	10' - 3"	3' - 6"	94	9	2' - 9 7/8"	137	8' - 4"	62	292
	24"	3' - 5 1/2"	13' - 3"	4' - 0"	117	12	3' - 3 7/8"	215	11' - 4"	82	414
	30"	3' - 11 1/2"	16' - 3"	4' - 6"	141	15	3' - 9 7/8"	310	14' - 4"	104	555
1:4	15"	2' - 8 1/2"	6' - 3"	3' - 3"	65	5	2' - 6 7/8"	70	4' - 4"	32	167
	18"	2' - 11 1/2"	7' - 3"	3' - 6"	73	6	2' - 9 7/8"	92	5' - 4"	39	204
	24"	3' - 5 1/2"	9' - 3"	4' - 0"	90	8	3' - 3 7/8"	144	7' - 4"	53	287
	30"	3' - 11 1/2"	11' - 3"	4' - 6"	107	10	3' - 9 7/8"	206	9' - 4"	68	381
1:3	15"	2' - 8 1/2"	4' - 3"	3' - 3"	51	3	2' - 6 7/8"	42	2' - 4"	17	110
	18"	2' - 11 1/2"	5' - 3"	3' - 6"	60	4	2' - 9 7/8"	61	3' - 4"	24	145
	24"	3' - 5 1/2"	6' - 3"	4' - 0"	70	5	3' - 3 7/8"	90	4' - 4"	31	191
	30"	3' - 11 1/2"	8' - 3"	4' - 6"	87	7	3' - 9 7/8"	145	6' - 4"	46	278

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

### U-TYPE CONCRETE ENDWALLS BAFFLES AND GRATE OPTIONAL 15" TO 30" PIPE

Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By CDP	07/71	Revision	Sheet No. 3 of 3	Index No. 261
Checked By				