


# ORIGINATION FORM

Proposed Revisions to a Standard Plans Index  
(Please provide all information – Incomplete forms will be returned)

## Contact Information:

Date: May 7, 2018  
Originator: Rick Jenkins  
Phone: (850) 414-4355  
Email: Rick.Jenkins@dot.state.fl.us

## Standard Plans:

Index Number: 430-011  
Sheet Number (s): 1 of 1  
Index Title: U-Type Concrete Endwalls - Baffles and Grate  
Optional - 15" to 30" Pipe 

## Summary of the changes:

Added Sheets and Reorganized information. Moved pay item notes to Specifications. Updated Bar notations.

## Commentary / Background:

The Standard Specifications are the appropriate location for pay item and payment information. Details were broken out to additional pages to provide clarification and declutter the Index.

Reinforcing bars were renamed to better differentiate between horizontal, vertical, diagonal, and bent bars.

## Other Affected Offices / Documents: (Provide name of responsible personnel)

- | Yes                                 | No                                  |  |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Other Standard Plans –                   |
| <input type="checkbox"/>            | <input type="checkbox"/>            | FDOT Design Manual –                     |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Basis of Estimates Manual – Rick Jenkins |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Standard Specifications –                |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Approved Product List –                  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Construction – Jason Russell             |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Maintenance –                            |

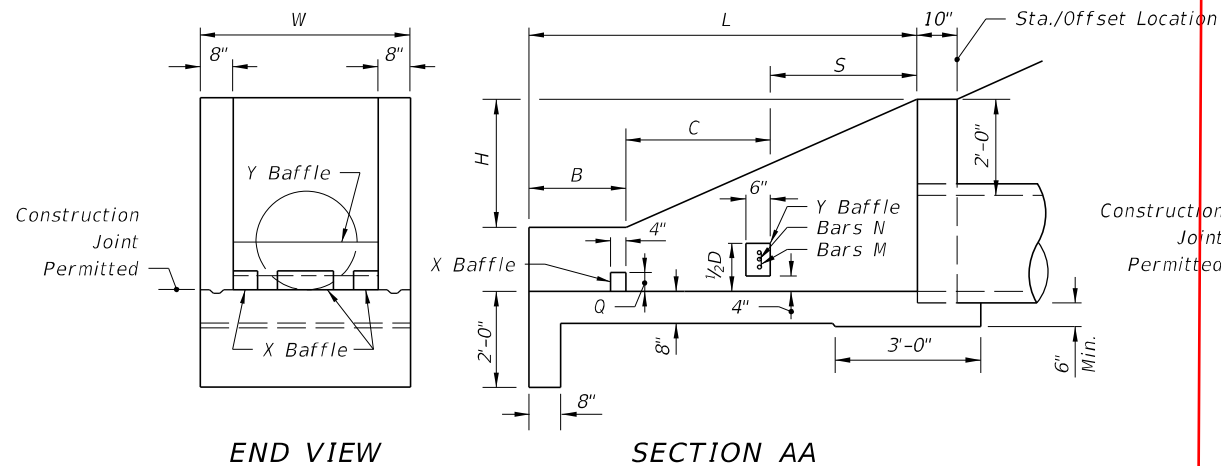
## Origination Package Includes: (Email or hand deliver package to Derwood Sheppard)

- | Yes                                 | N/A                      |   |
|-------------------------------------|--------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Redline Mark-ups                          |
| <input type="checkbox"/>            | <input type="checkbox"/> | Proposed Standard Plan Instructions (SPI) |
| <input type="checkbox"/>            | <input type="checkbox"/> | Revised SPI                               |
| <input type="checkbox"/>            | <input type="checkbox"/> | Other Support Documents                   |

## Implementation:

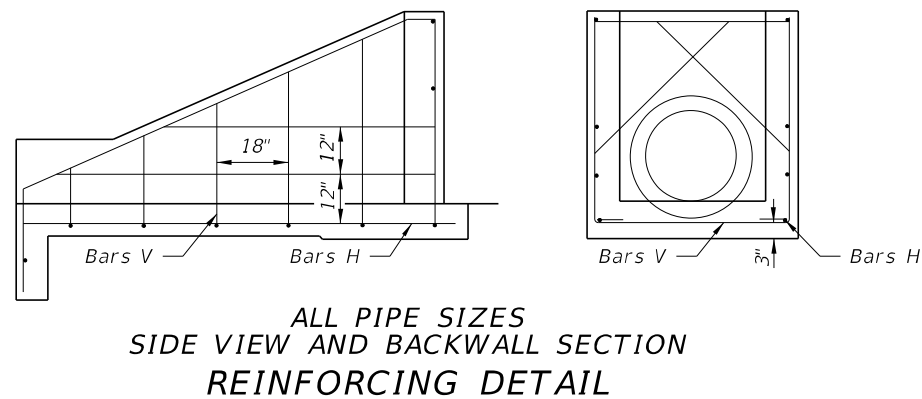
- Design Bulletin (Interim)  DCE Memo  Program Mgmt. Bulletin  FY-Standard Plans (Next Release)

Contact the Roadway Design Office for assistance in completing this form



SHEET 2

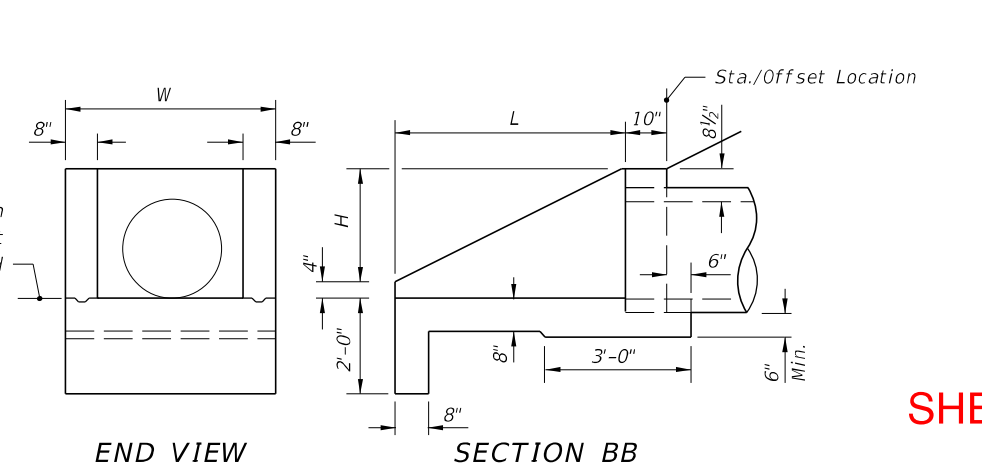
END VIEW  
SECTION AA  
PLAN  
DIMENSIONAL DETAILS



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

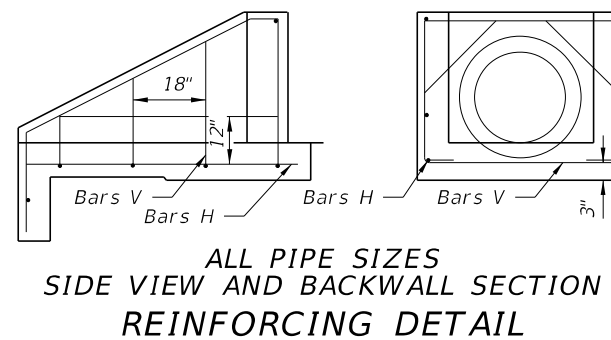
Pipe Size		L	H	W	S	B	C	X Baffle			Y Baffle Reinf. Steel		Class I Conc. Cu. Yd.	Reinf. Steel Lbs.
D	Area Sq. Ft.							P	Q	R	Bar M	Bar N		
15"	1.23	5'-9"	2'-3 1/2"	3'-7"	2'-3"	1'-3"	2'-3"	4"	4"	4"	2 #4	1 #4	1.61	72
18"	1.77	6'-6"	2'-5"	3'-10"	2'-6"	1'-6"	2'-6"	4"	4"	5"	3 #4	2 #4	1.89	86
24"	3.14	8'-0"	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



SHEET 3

END VIEW  
SECTION BB  
PLAN  
DIMENSIONAL DETAILS



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

Pipe Size		L	H	W	Class I Conc. Cu. Yd.	Reinf. Steel Lbs.
D	Area Sq. Ft.					
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 1:2 SLOPES

GENERAL NOTES

SHEET 1

- Baffles to be constructed only when called for in plans.
- When steel grating is required on endwall see Sheet 3 of 3 for details.
- All reinforcing No. 4 bars with 2" clearance except as noted.
- 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 galvanize in accordance with Section 975 and 425-3.2 of the Standard Specifications. **Moved to Specifications**
- Channel section C 3x6 may be substituted for C 4x5.4 channel.
- 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 425-001 for opening and grouting details.
- Concrete shall be Class I, except ASTM C478 (4000 psi) concrete may be substituted for precast items manufactured in plants meeting the requirements of Section 449 of the Specifications.
- Sodding shall be in accordance with Index 524-001, and paid for under the contract unit price for Performance Turf, SY. **Moved to Specifications**
- Endwall to be paid for under the contract unit price for U-Endwall, Each. Payment shall include cost of concrete, reinforcing steel, and when called for in the plans, steel grating, baffles and accessories. Quantities shown are for estimating purposes only.

RENUMBERED

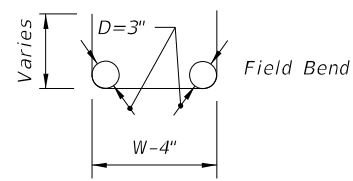
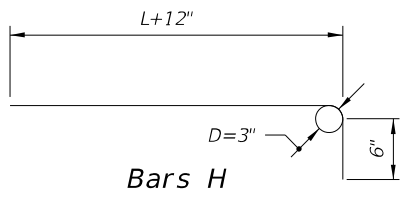
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LAST REVISION	DESCRIPTION:
11/01/17	
11/01/19	

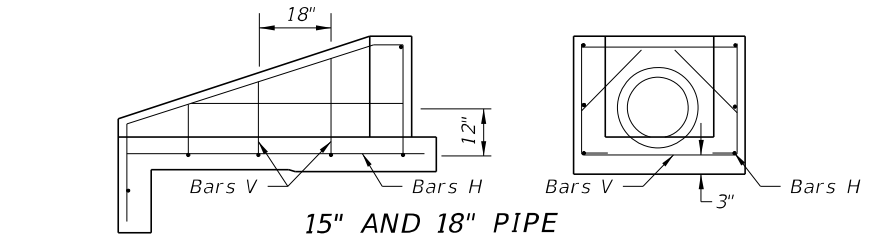

**FY 2019-20  
STANDARD PLANS**

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

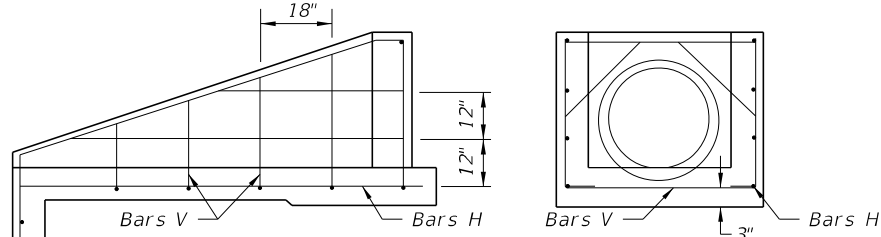
INDEX	SHEET
430-011	1 of 3



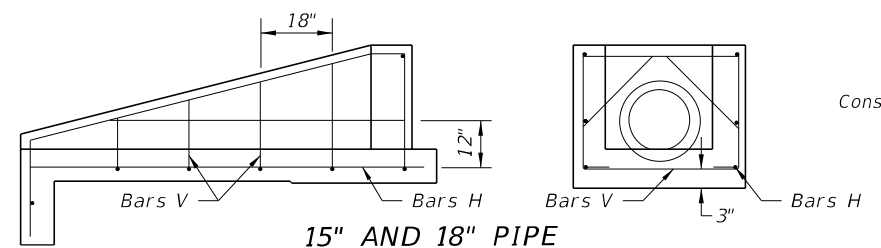
**Bars V**  
BENDING DIAGRAM  
**SHEET 3**



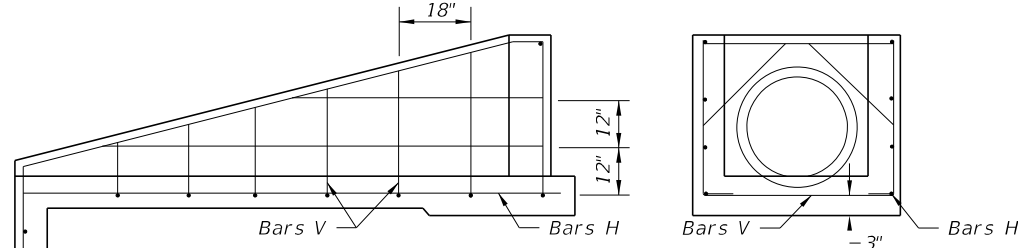
15" AND 18" PIPE



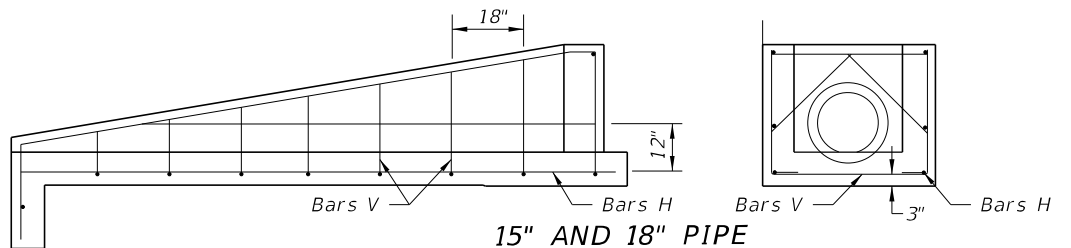
24" AND 30" PIPE  
1:3 SLOPES



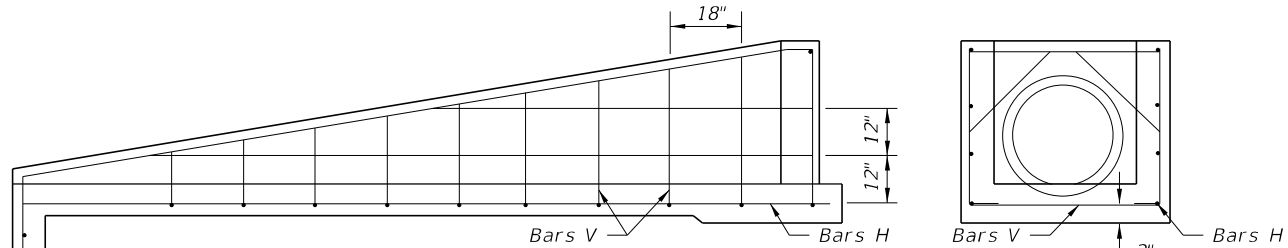
15" AND 18" PIPE



24" AND 30" PIPE  
1:4 SLOPES

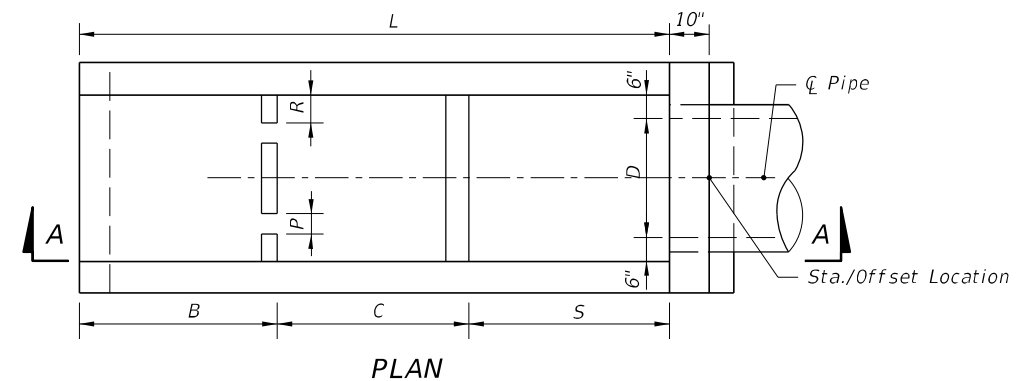


15" AND 18" PIPE

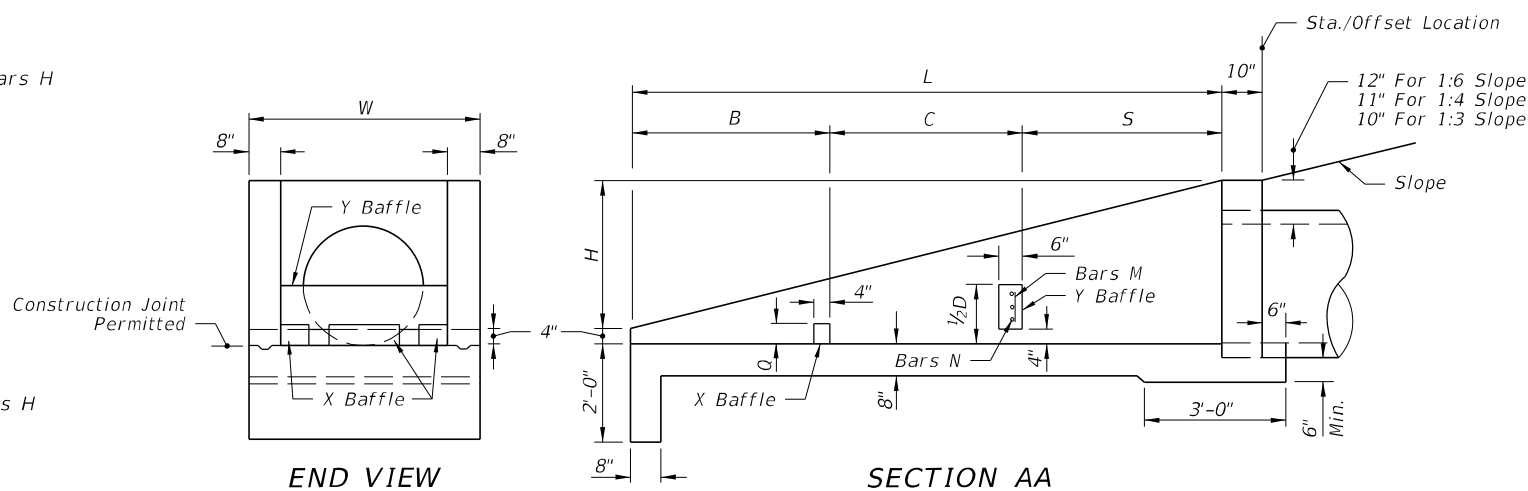


24" AND 30" PIPE  
1:6 SLOPES

SIDE VIEWS AND BACKWALL SECTIONS  
REINFORCING DETAILS

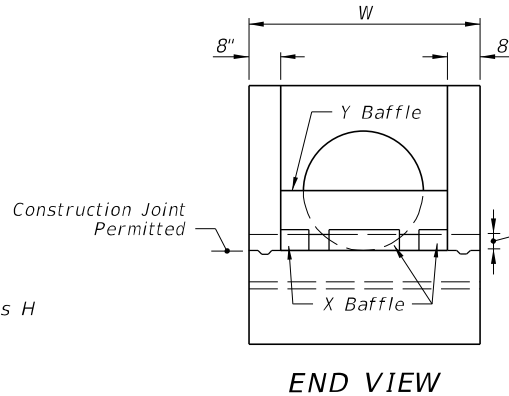


PLAN



SECTION AA

DIMENSIONAL DETAILS



END VIEW

**NEW SHEET 4**

DIMENSIONS AND QUANTITIES FOR BAFFLES							
Pipe Size D	X Baffle			Ybaffle Reinf. Steel		Class I Concrete Cu. Yd.	Reinf. Steel Lbs
	P Width	Q Height	R Length	Bar M	Bar N		
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

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL												
Rate Of Slope	Pipe Size		L	H	W	Baffle Locations (When Required)			Class I Concrete Cu. Yd.	Reinf. Steel Lbs.		
	D	Area (Sq. Ft.)				S	B	C				
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		
1:6	30"	4.91	12'-4"	3'-1"	4'-10"	4'-2"	4'-2"	4'-0"	3.34	124		
	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

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

**RENUMBERED**

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LAST REVISION	DESCRIPTION:
11/01/17	11/01/19

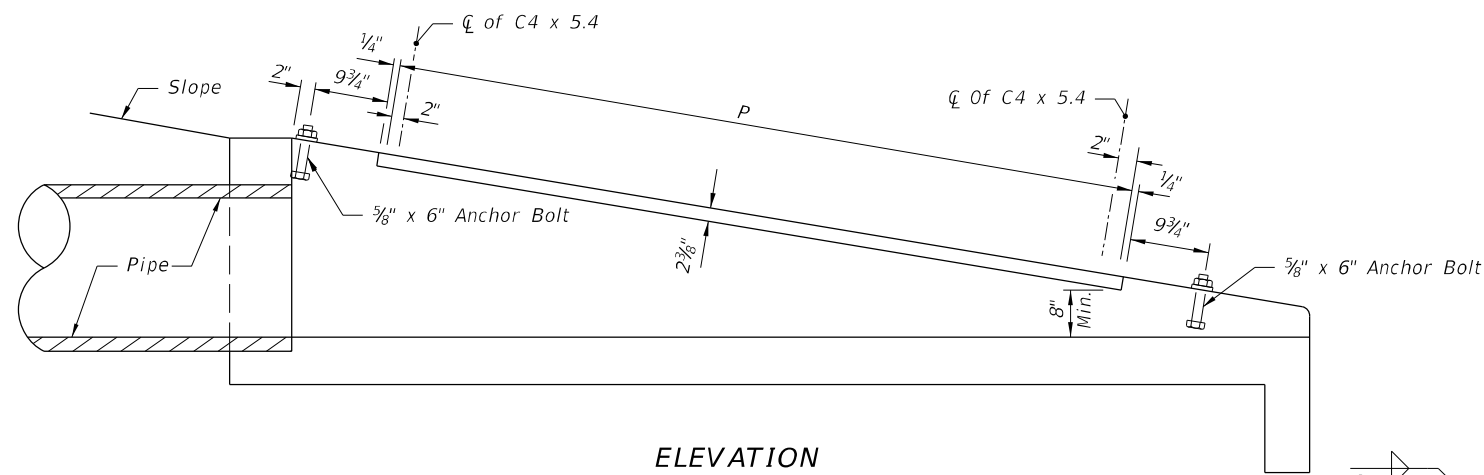


FY 2019-20  
STANDARD PLANS

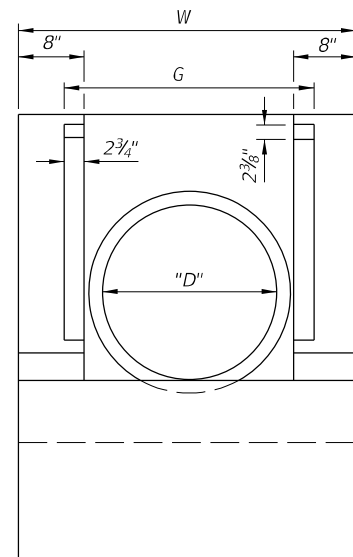
U-TYPE CONCRETE ENDWALLS BAFFLES  
& GRATE OPTIONAL 15" TO 30" PIPE

INDEX  
430-011

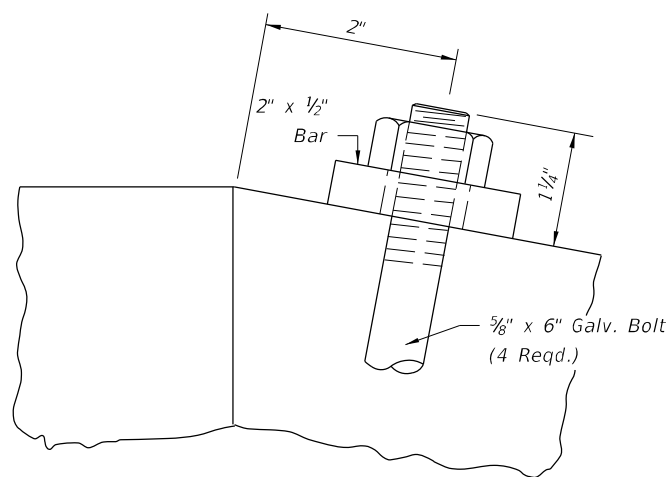
SHEET  
2 of 3



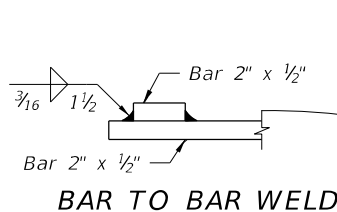
ELEVATION



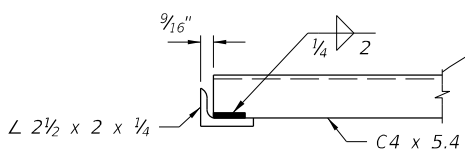
END VIEW



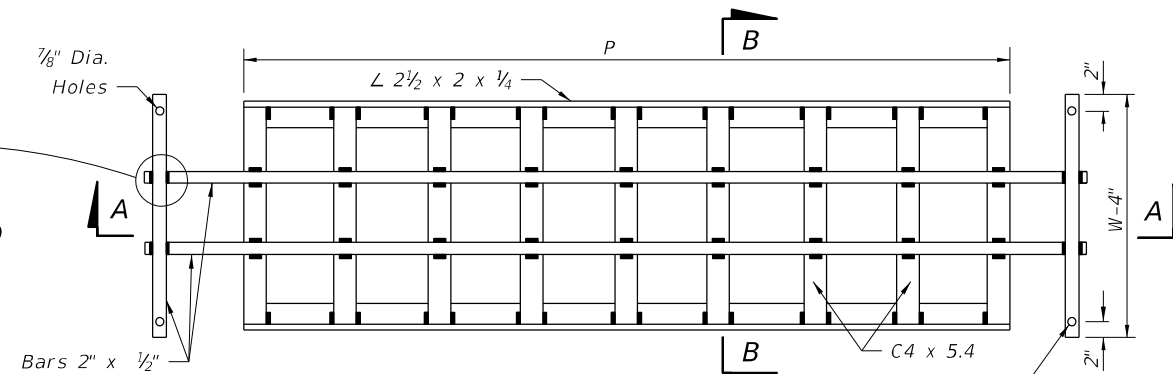
ANCHOR BOLT DETAIL



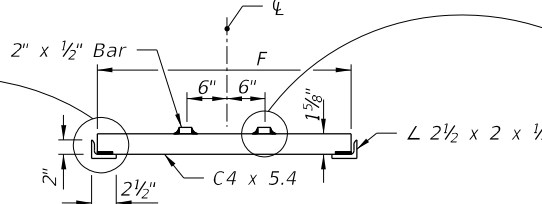
BAR TO BAR WELD



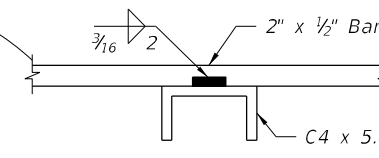
CHANNEL TO ANGLE WELD



PLAN



SECTION BB



BAR TO CHANNEL WELD

MOUNTING FOR STEEL GRATE

STEEL GRATE

STEEL GRATING USE CRITERIA

- Provide positive debris control at all upgradient openings. Do not install grates unless one or more of the following conditions exist:
  - Pipe culvert endwalls are located within the designated clear zone.
  - Drainage area to culvert consists of median or infield areas or areas where debris and/or drift is negligible.
  - Runoff to culvert is by sheet flow or in such ill defined channels that debris transport is not considered a major problem.
  - 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.
  - Areas where culvert blockage with resultant backwater would not seriously affect roadway embankment, traffic operation or upland property.
- Steel grating to be used only where called for in plans.

SPI/Design Manual

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRATE

Rate Of Slope	Size Pipe D	G	2 Each Bars @ 3.4 lb/ft			(X) Channels @ 5.4 lb/ft			2 Angles @ 3.62 lb/ft		Total Weight (lb)
			L	W-4"	lb	(X)	F	lb	P	lb	
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

NEW SHEET 5

RENUMBERED

4/0/24/2018 8:55:20 AM

LAST REVISION	DESCRIPTION
11/01/17	
11/01/19	



FY 2019-20  
STANDARD PLANS

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

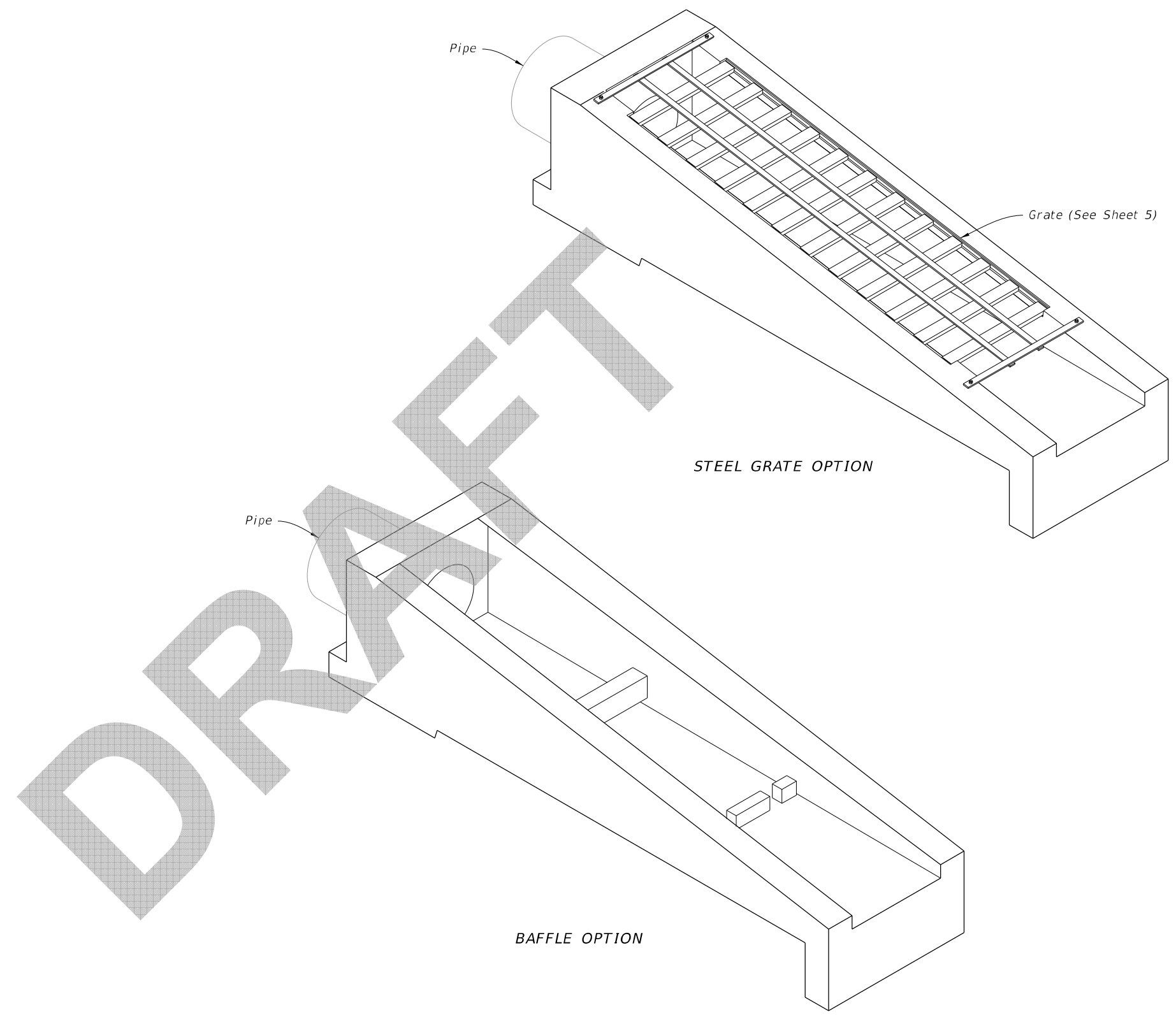
INDEX  
430-011

SHEET  
3 of 3

**GENERAL NOTES:**

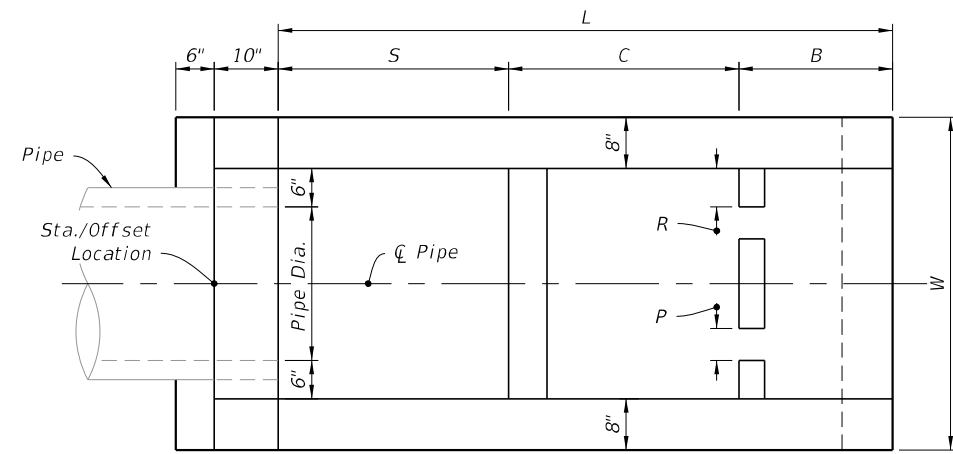
1. Use Class I concrete
2. Construct Baffles only when called for in Plans.
3. See Sheet 5 when steel grating is required on endwall.
4. All reinforcing #4 bars with 2" clearance except as noted.
5. Channel section C 3x6 may be substituted for C 4x5.4 channel.
6. Endwall may be cast in place or precast concrete. Construct precast units to dimensions shown, or as shown in approved shop drawings. Submit requests for shop drawing approvals to the Engineer. Use Index 425-001 for opening and grouting details.
7. Quantities shown are for estimating purposes only.

TABLE OF CONTENTS:	
Sheet	Description
1	General Notes and Contents
2	Endwalls for 1:2 Slopes With Baffles
3	Endwalls for 1:2 Slopes Without Baffles and Bending Bar Diagram
4	Endwalls for 1:3, 1:4, and 1:6 Slopes
5	Steel Grate Option

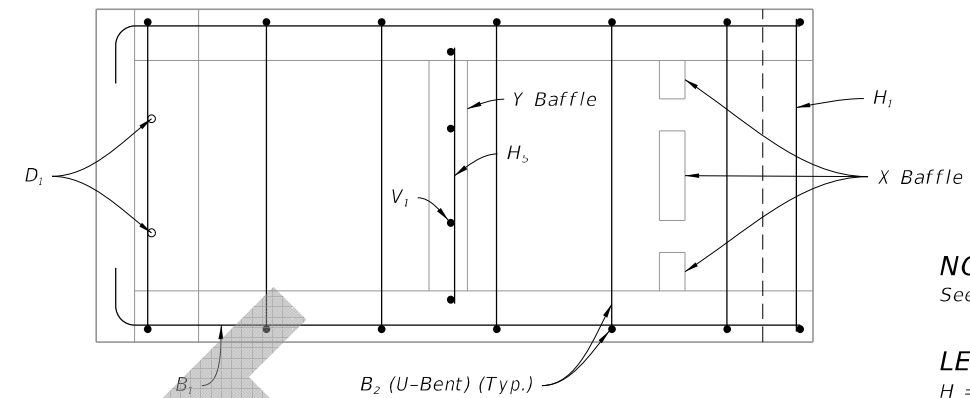


U-TYPE CONCRETE ENDWALLS

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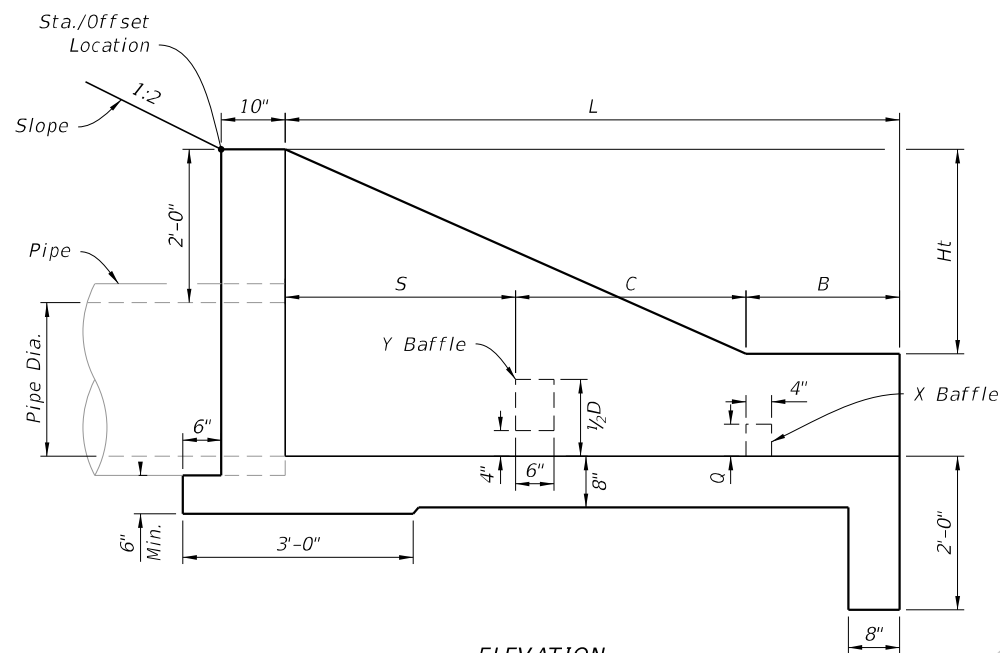
PLAN



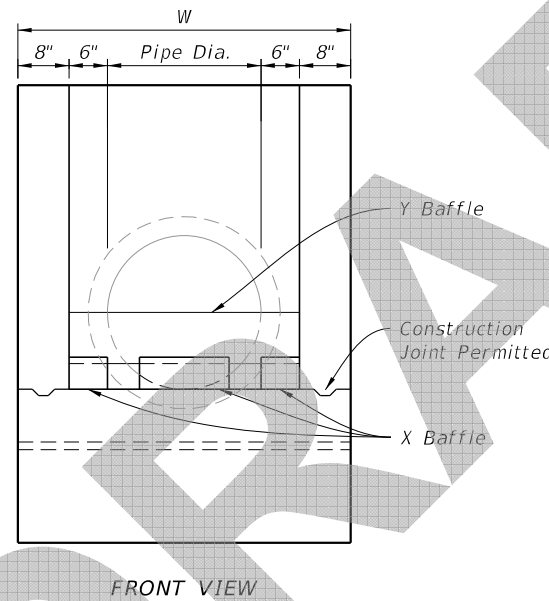
PLAN

**NOTE:**  
See Sheet 3 for Bar Bending Diagram.

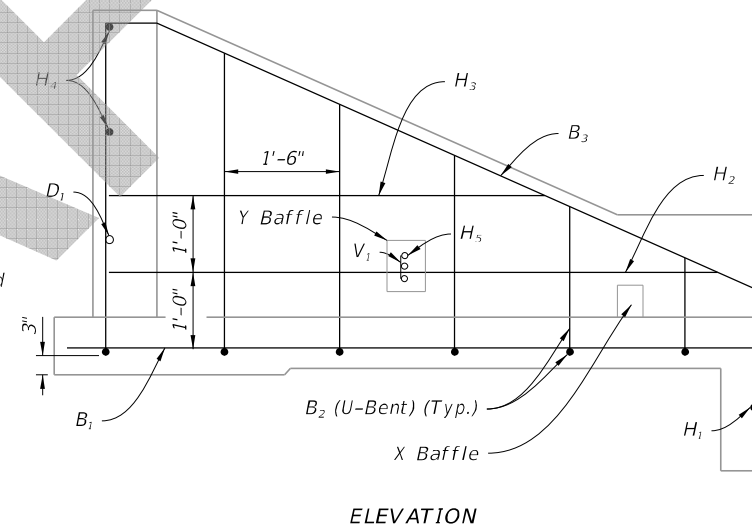
**LEGEND:**  
H = Horizontal Bars  
V = Vertical Bars  
B = Bent Bars  
D = Dowels or Diagonal Bars



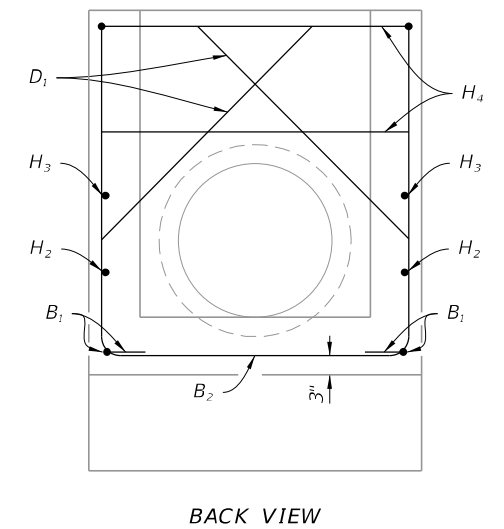
ELEVATION



FRONT VIEW



ELEVATION



BACK VIEW

DIMENSIONAL DETAILS


REINFORCING DETAILS

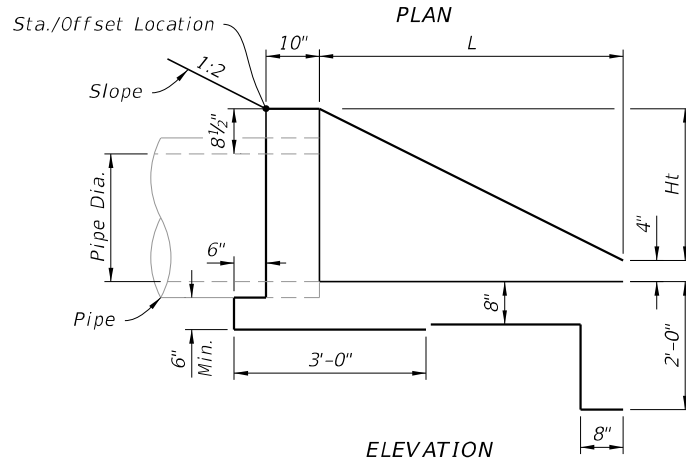
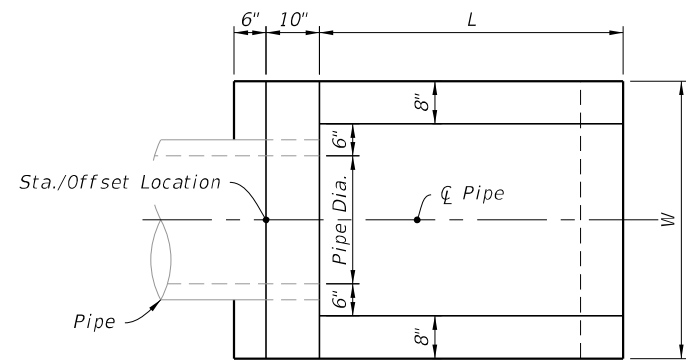
DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL

Pipe		L	Ht	W	S	B	C	X Baffle			Y Baffle Reinf. Steel		Class I Conc. Cu. Yd.	Reinf. Steel lbs.
Dia.	Area Sq. Ft.							P	Q	R	Bars V <sub>1</sub>	Bars H <sub>5</sub>		
15"	1.23	5'-9"	2'-3½"	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

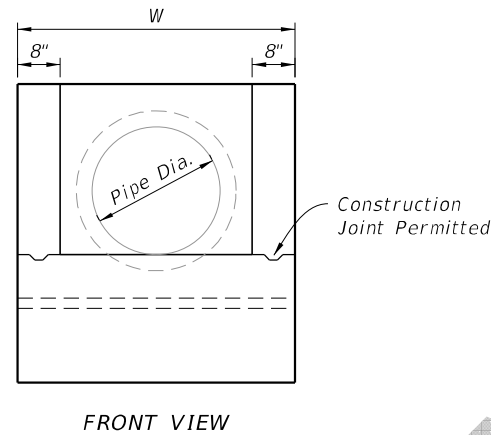
ENDWALLS FOR 1:2 SLOPES WITH BAFFLES

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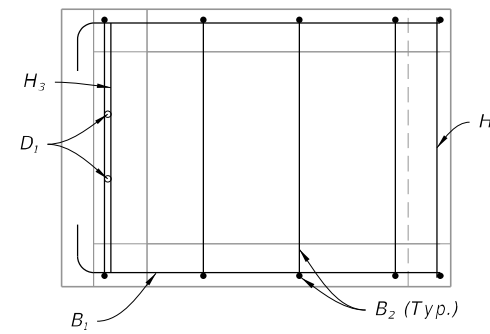
LAST REVISION 11/01/19	REVISION	DESCRIPTION:	 FY 2020-21 STANDARD PLANS	U-TYPE CONCRETE ENDWALLS BAFFLES & GRATE OPTIONAL 15" TO 30" PIPE	INDEX 430-011	SHEET 2 of 5
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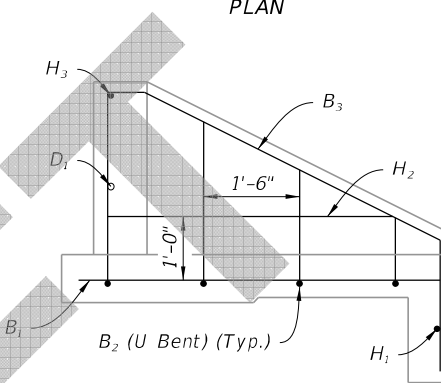
DIMENSIONAL DETAILS



FRONT VIEW

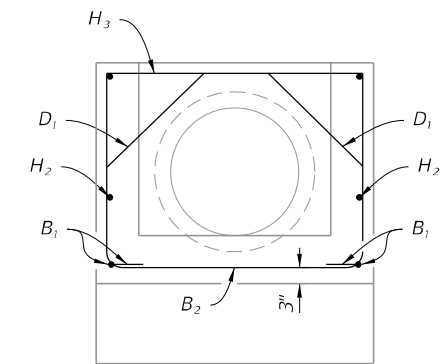


PLAN



SIDE VIEW

**LEGEND:**  
 H = Horizontal Bars  
 V = Vertical Bars  
 B = Bent Bars  
 D = Dowels or Diagonal Bars

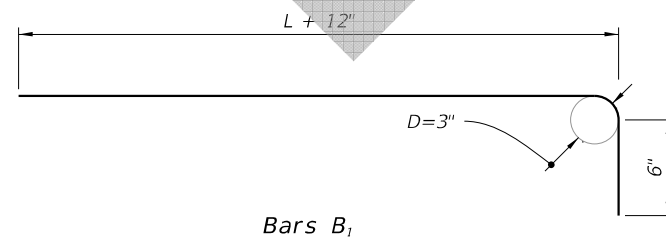


BACKWALL SECTION

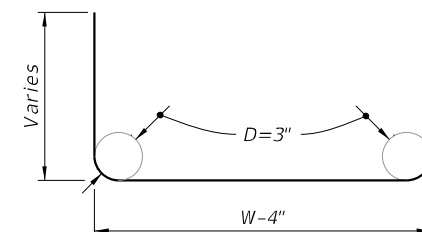
REINFORCING DETAILS

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL						
Pipe		L	Ht	W	Class I Conc. Cu. Yd.	Reinf. Steel lbs.
Dia.	Area Sq. Ft.					
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

ENDWALL WITHOUT BAFFLES



Bars B<sub>1</sub>




Bars B<sub>2</sub>

BENDING DIAGRAM

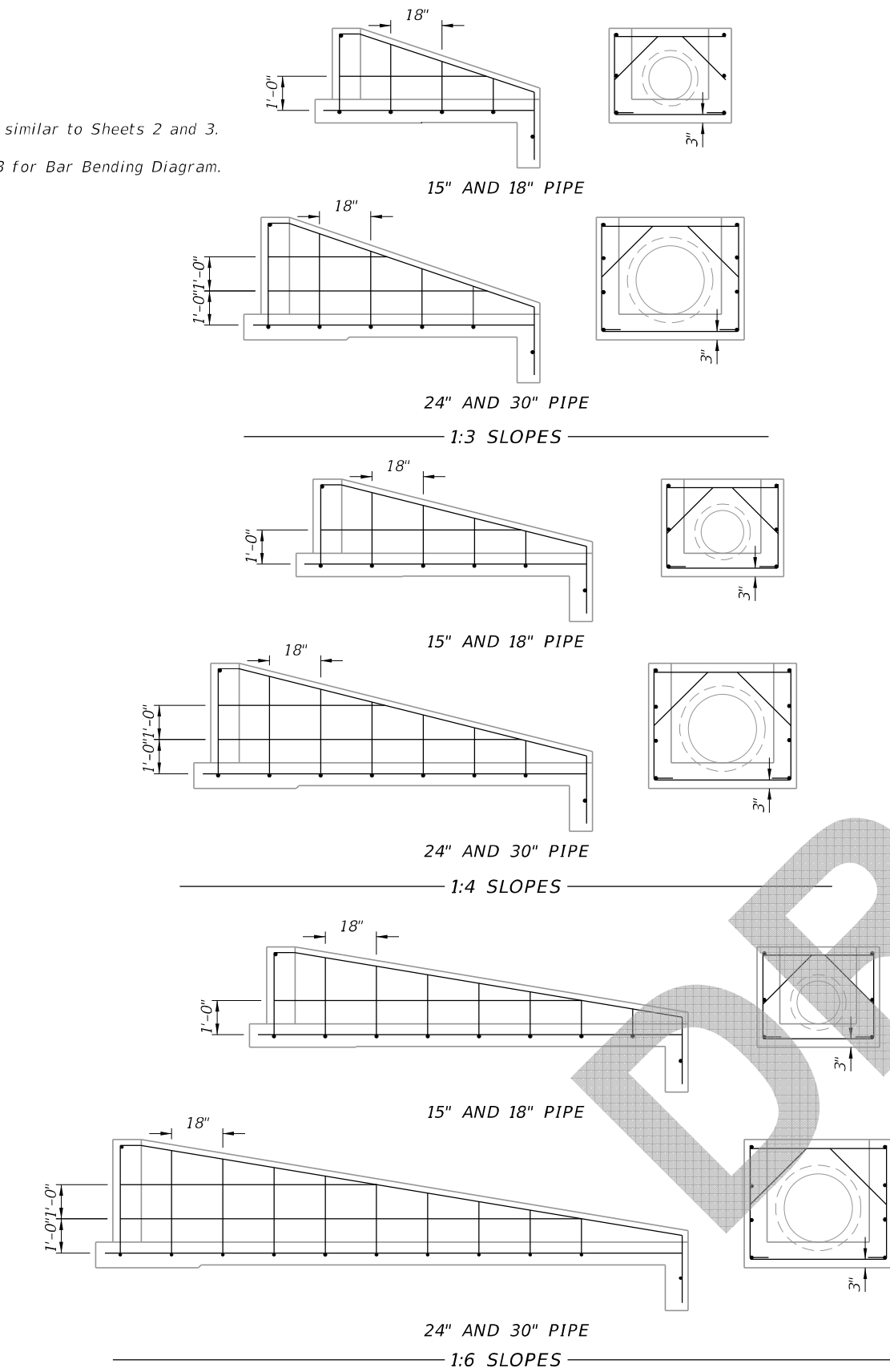
ENDWALLS FOR 1:2 SLOPES WITHOUT BAFFLES AND BAR BENDING DIAGRAM

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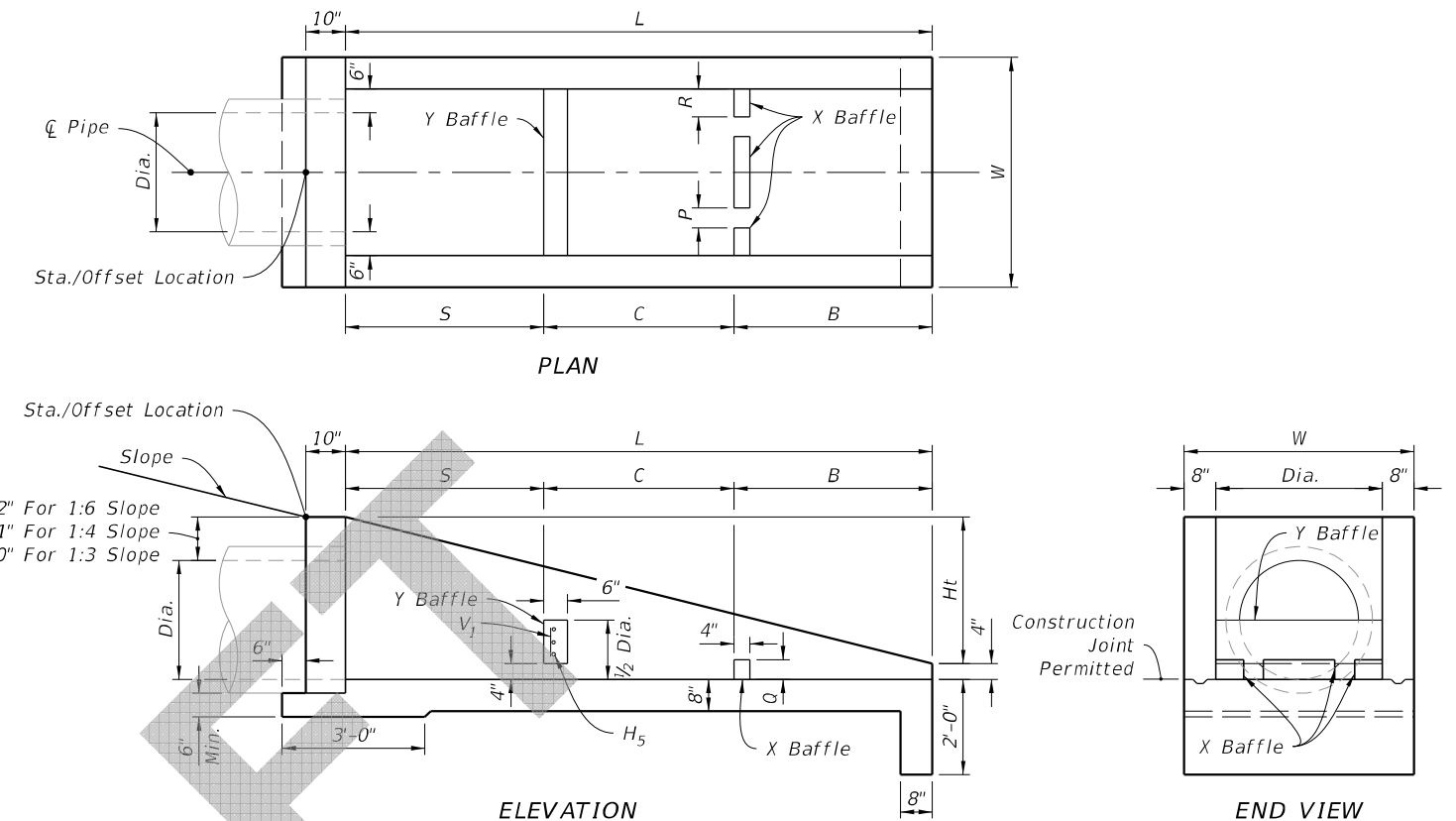
LAST REVISION 11/01/19	DESCRIPTION:	 FY 2020-21 STANDARD PLANS	U-TYPE CONCRETE ENDWALLS BAFFLES & GRATE OPTIONAL 15" TO 30" PIPE	INDEX 430-011	SHEET 3 of 5
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**NOTE:**

1. Reinforcing similar to Sheets 2 and 3.
2. See Sheet 3 for Bar Bending Diagram.



**REINFORCING DETAILS**  
(Side Views And Backwall Sections Shown)



**DIMENSIONAL DETAILS**

Pipe Dia.	X Baffle			Y Baffle Reinf. Steel		Class I Concrete Cu. Yd.	Reinf. Steel lbs.
	P Width	Q Height	R Length	Bar V <sub>1</sub>	Bar H <sub>5</sub>		
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

Rate Of Slope	Pipe		L	Ht	W	Baffle Locations (When Required)			Class I Concrete Cu. Yd.	Reinf. Steel lbs.
	Dia.	Area (Sq. Ft.)				S	B	C		
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

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

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

INDEX  
**430-011**  
SHEET  
**4 of 5**

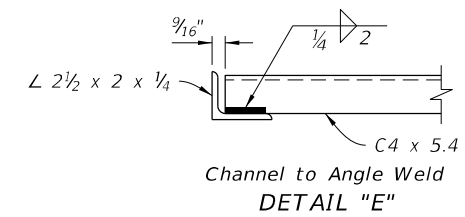
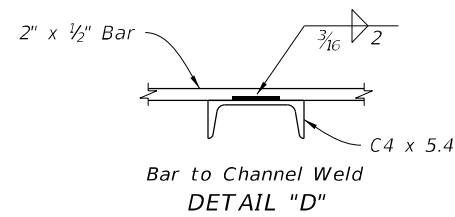
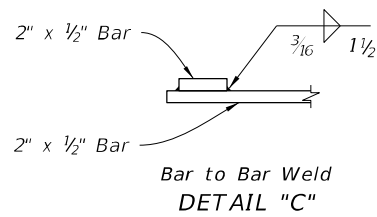
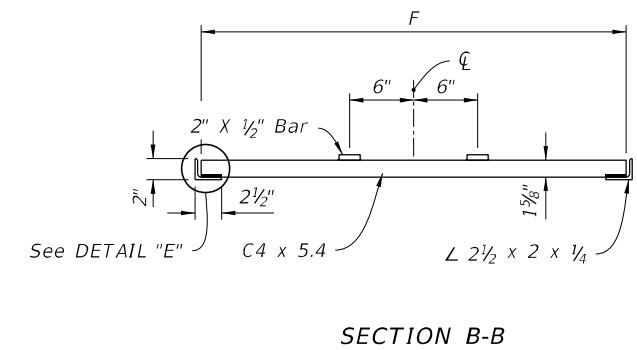
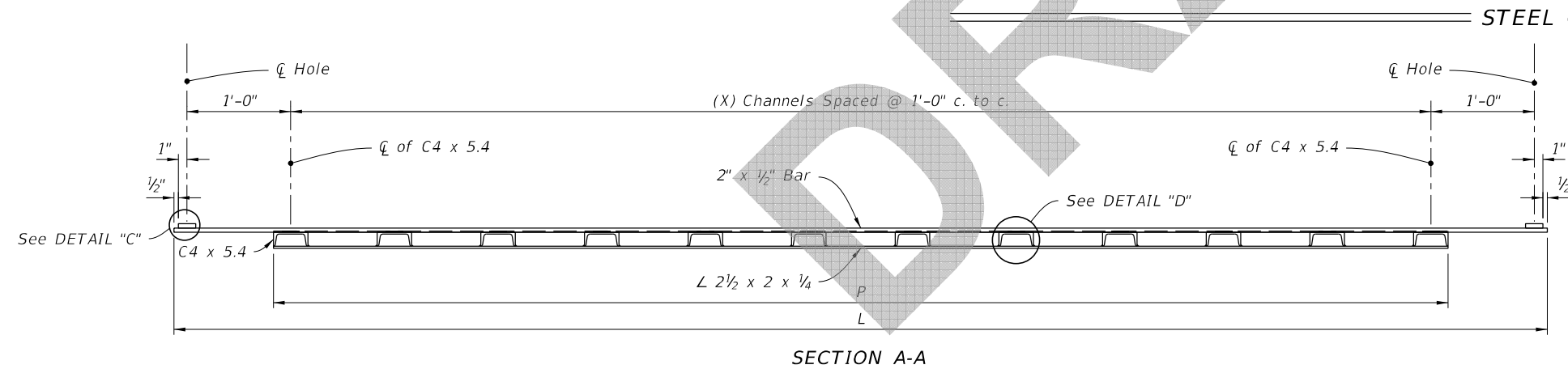
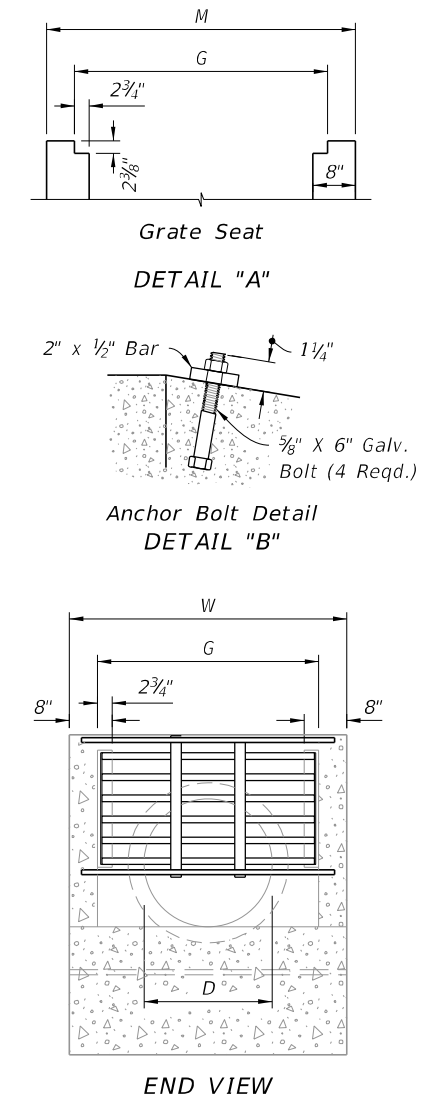
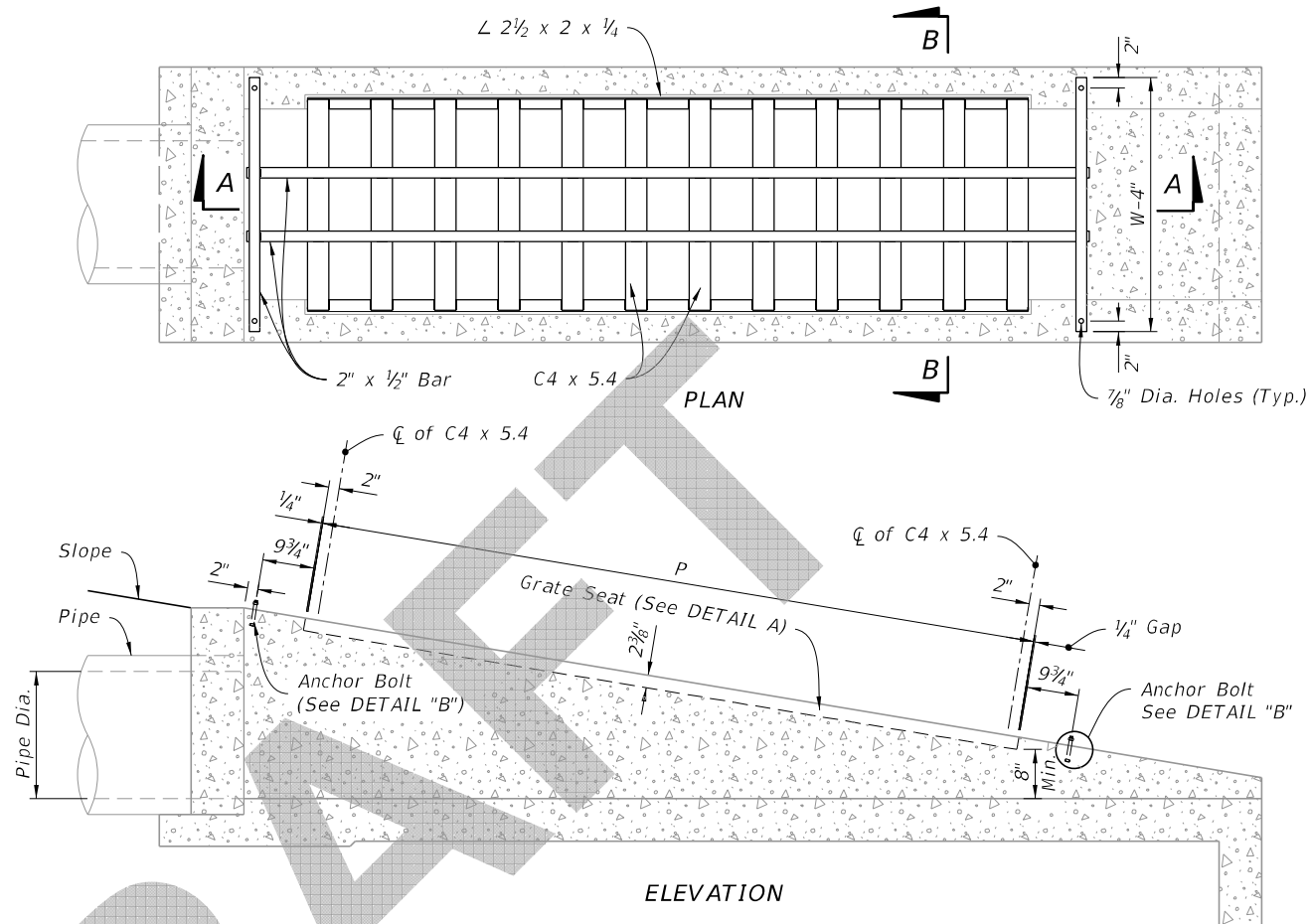
**FDOT**  
FY 2020-21  
STANDARD PLANS

LAST REVISION	DESCRIPTION:
11/01/19	

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TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRATE											
Rate of Slope	Size Dia.	G	2 Each Bars @ 3.4 lb/ft			(X) Channels @ 5.4 lb/ft			2 Angles @ 3.62 lb/ft		Total Weight (lb)
			L	W-4"	lbs	(X)	F	lbs	P	lb	
1:3	15"	2' -8 1/2"	4'-3"	3'-3"	51	3	2' -6 1/8"	42	2'-4"	17	110
	18"	2' -11 1/2"	5'-3"	3'-6"	60	4	2' -9 1/8"	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
1:4	15"	2' -8 1/2"	6'-3"	3'-3"	65	5	2' -6 1/8"	70	4'-4"	32	167
	18"	2' -11 1/2"	7'-3"	3'-6"	73	6	2' -9 1/8"	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
1:6	15"	2' -8 1/2"	11'-3"	4'-6"	107	10	3' -9 1/8"	206	9'-4"	68	381
	18"	2' -11 1/2"	10'-3"	3'-6"	94	9	2' -9 1/8"	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 1/8"	310	14'-4"	104	555



STEEL GRATE DETAILS

STEEL GRATE OPTION

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LAST REVISION 11/01/19	DESCRIPTION:	FDOT	FY 2020-21 STANDARD PLANS	U-TYPE CONCRETE ENDWALLS BAFFLES & GRATE OPTIONAL 15" TO 30" PIPE	INDEX 430-011	SHEET 5 of 5
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