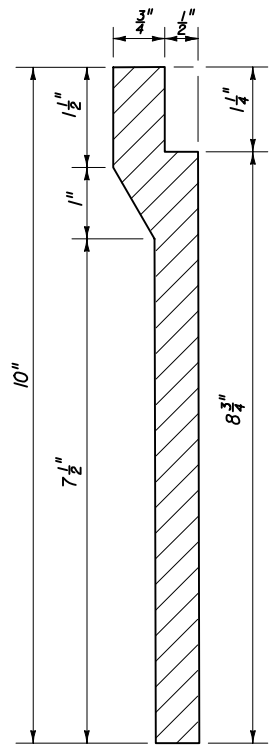
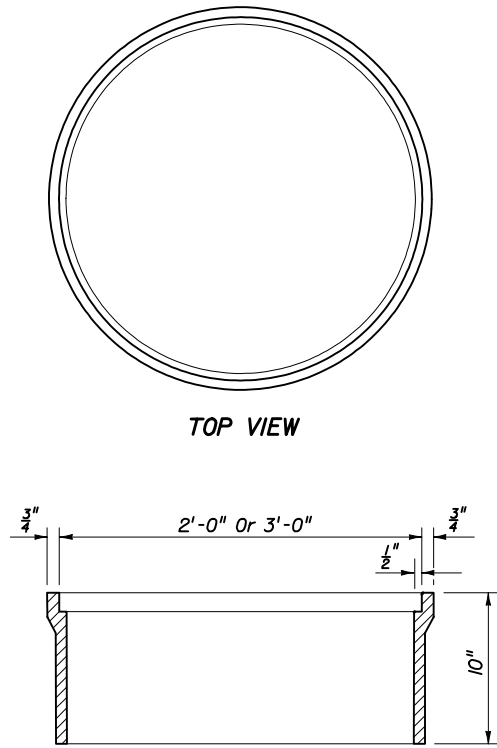


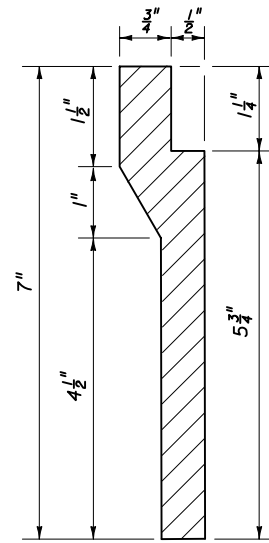
**SECTION TYPE I**  
For Manholes



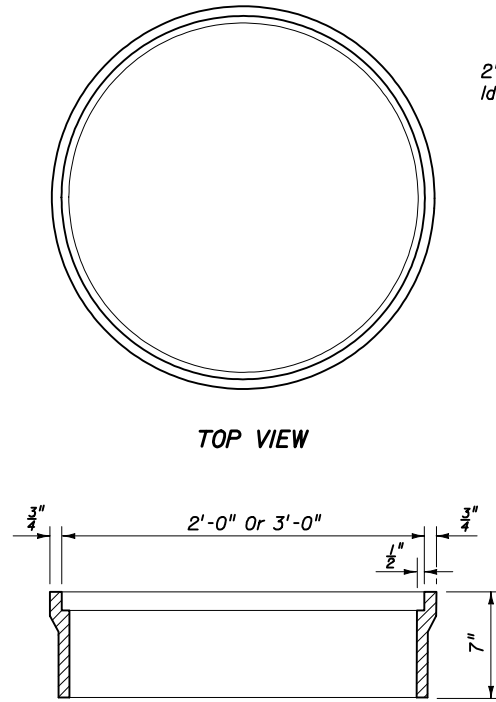
**WALL SECTION TYPE II**



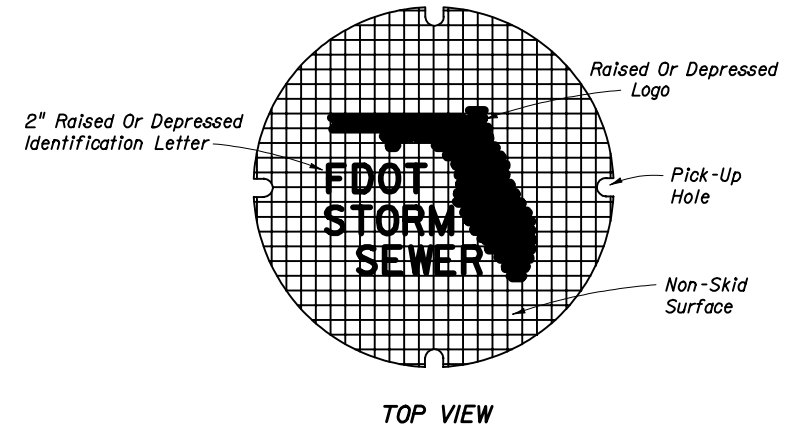
**SECTION TYPE II**  
For Curb Inlets Types 1, 2, 3, & 4



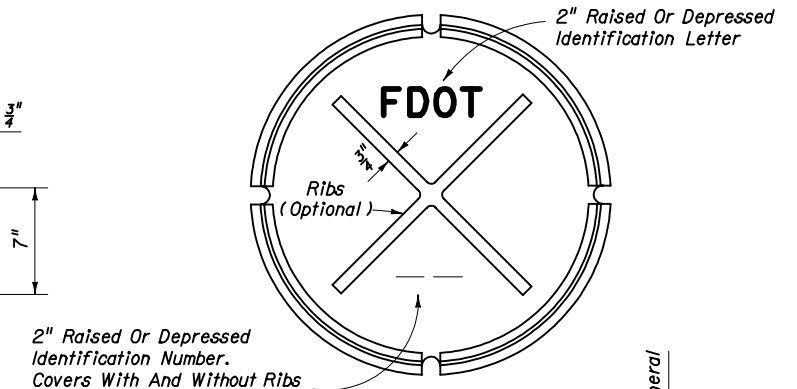
**WALL SECTION TYPE III**



**SECTION TYPE III**  
For Curb Inlets Types 7 & 8



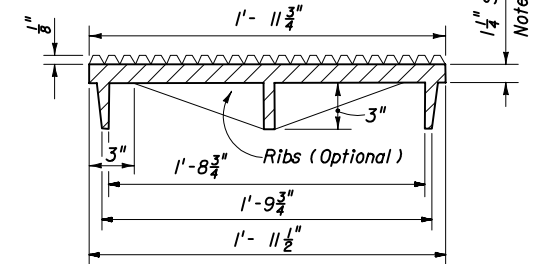
**TOP VIEW**



**BOTTOM VIEW**

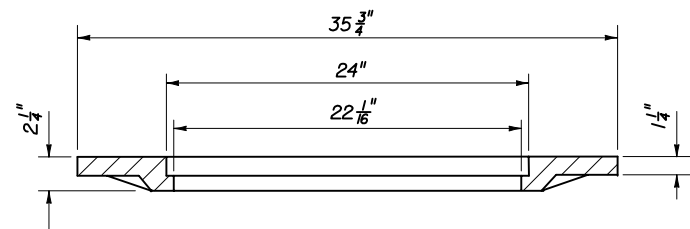
2" Raised Or Depressed Identification Number. Covers With And Without Ribs Shall Bear The Same Product Identification Number.

1/4" See General Note No. 1

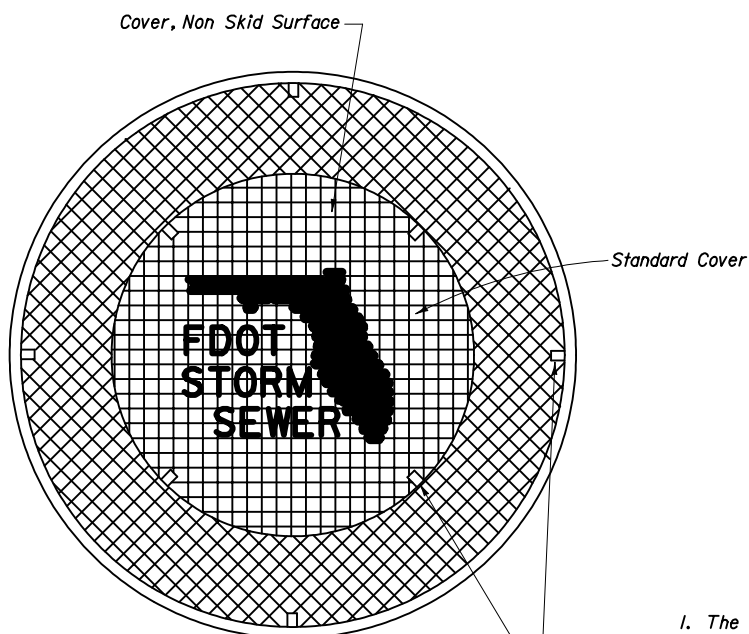


**SECTION**

**COVER FOR ALL FRAMES**



**2-PIECE COVER**



For Use With Types I, II And III Frames With 3'-0" Opening

**2-PIECE COVER**

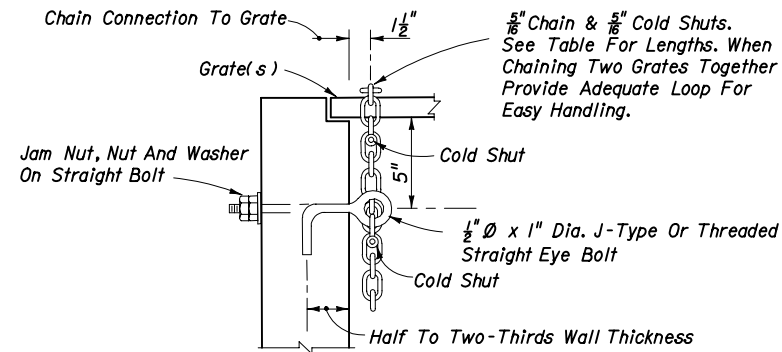
**CAST IRON FRAMES**

Frame Type	WEIGHT OF CASTINGS					
	2' OPENING		3' OPENING			
	Frame	Cover (Std.)	Frame	2-Piece Cover		
			Inside	Outside	Total	
I	155 Lbs.	190 Lbs.	220 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.
II	145 Lbs.	190 Lbs.	255 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.
III	90 Lbs.	190 Lbs.	180 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.

**NOTES (FRAMES, AND COVER)**

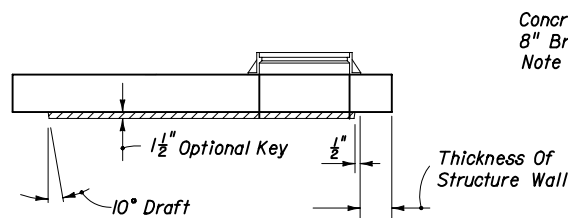
- The standard cover is to be used for all frames Types I, II, III and the 2-piece Cover, and is the replacement cover for all previous frames with 1/2" deep seats (traffic type). The 185 lb. cover (non-traffic type), 1984 Roadway and Traffic Design Standards Index No. 201, is the replacement cover for existing frames with 1/2" deep seats. Installation of frames with 1/2" deep seats is not permitted.
- Use the 2'-0" cover, unless the 2-piece cover is called for in the plans. Consider using the 2-piece cover where depths exceed 5' and manual entry may be required for cleaning.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
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Drawn By	HSD	06/82	State Drainage Engineer		
Checked By	JBW	06/82	Revision	Sheet No.	Index No.
			04	1 of 6	201

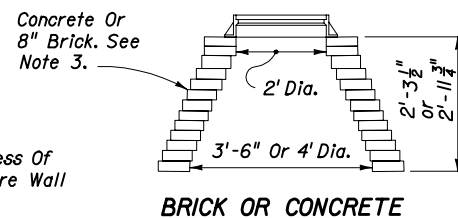


Note: When Alternate G grate is specified, the chain, bolt, nuts, washer and cold shuts shall be galvanized in accordance with the specifications for the grate.

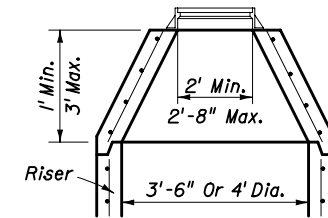
Cost of eye bolt and chain to be included in the contract unit price for inlets.



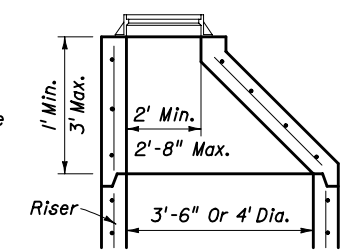
SECTION  
Note: See Slab Designs Index No. 200.  
TYPE 7



BRICK OR CONCRETE



PRECAST CONCENTRIC CONE



PRECAST ECCENTRIC CONE

TYPE 8

## MANHOLE TOPS

### NOTES (TOPS)

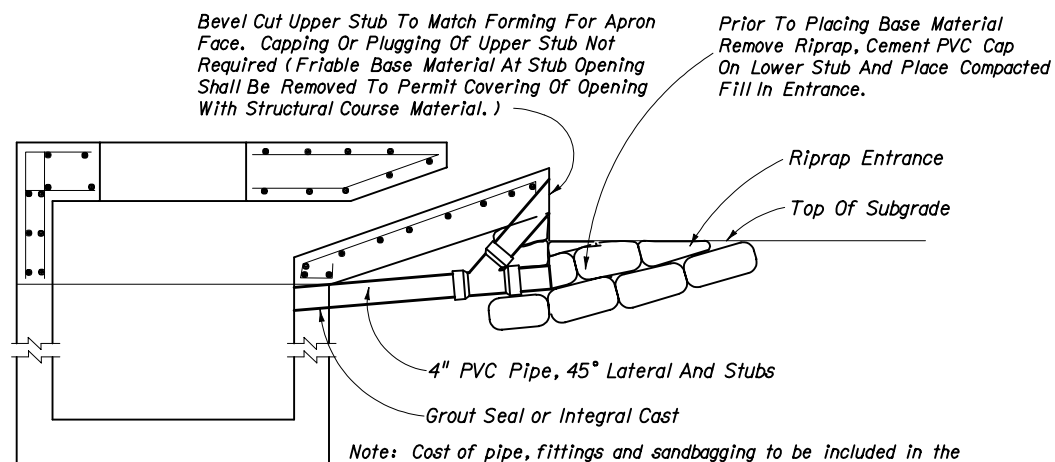
- Manhole top Type 7 slabs shall be of Class II concrete. Concrete as specified in ASTM C478 may be used for precast units; see General Note No. 3.
- Manhole top Type 7 slabs may be of cast-in-place or precast construction. The optional key is for precast tops and in lieu of dowels. Frame and slab openings are to be omitted when top is used over a junction box. Frames can be adjusted with one to six courses of brick.
- Manhole top Type 8 may be of cast-in-place or precast concrete construction or brick construction. For concrete construction, the concrete and steel reinforcement shall be the same as the supporting wall unit. An eccentric cone may be used.
- Manhole tops shall be secured to structures by optional construction joints as shown on Sheet 3 of 6.
- Substitution of manhole top Type 8 for manhole top Type 7 is allowed provided that minimum dimensions shown above are not reduced.

### DESIGN NOTES

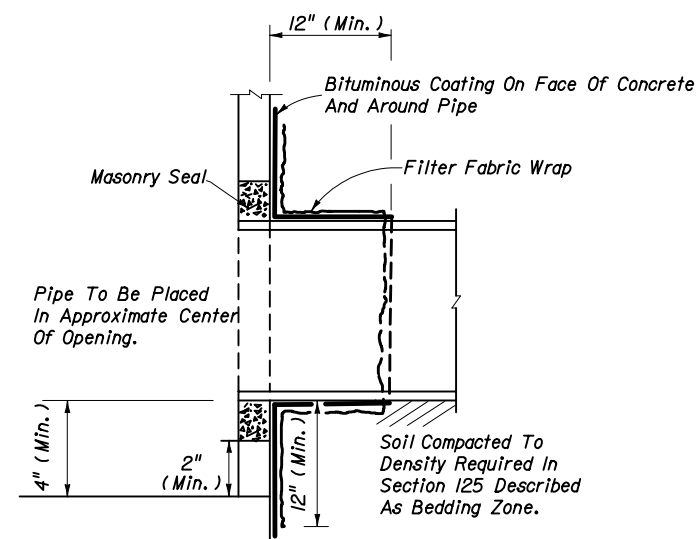
- Manhole top Type 8 should be specified in the plans when depths shown above can be maintained.

EYE BOLT AND CHAIN REQUIREMENTS				
Index Number	Inlet Type	Eye Bolts	Length Of Chain	Handling & Remarks
217	(MB) 1	1	4'-0"	Slide & Spin
	(MB) 2	1	4'-0"	Slide & Spin
	(MB) 3	2	2 @ 4'-0"	Slide & Spin
	(MB) 4	2	2 @ 4'-0"	Slide & Spin
	(MB) 5	2	2 @ 4'-0"	Slide & Spin
218	(BW)	1	3'-8"	Slide Or Slide & Spin
219	(BW, RGD)	1	4'-0"	Slide & Spin
220	S	1	4'-0"	Slide & Spin
221	V	1	4'-0"	Slide & Spin
230	A	1	3'-0"	Slide
231	B	1	5'-0"	Slide & Spin
232	C	1	2'-6"	Slide & Spin
	D	1	2'-6"	Slide & Spin
	E	2	2 @ 2'-6"	Slide & Spin
	H	2	2 @ 2'-6"	Flip Ctr. Grate and Slide & Spin Single Free Grate
233	F	1	3'-6"	Flip Or Slide & Spin
	G	1	6'-0"	Slide
			2'-0"	Lifting Loop
234	J	1	4'-0"	Slide & Spin

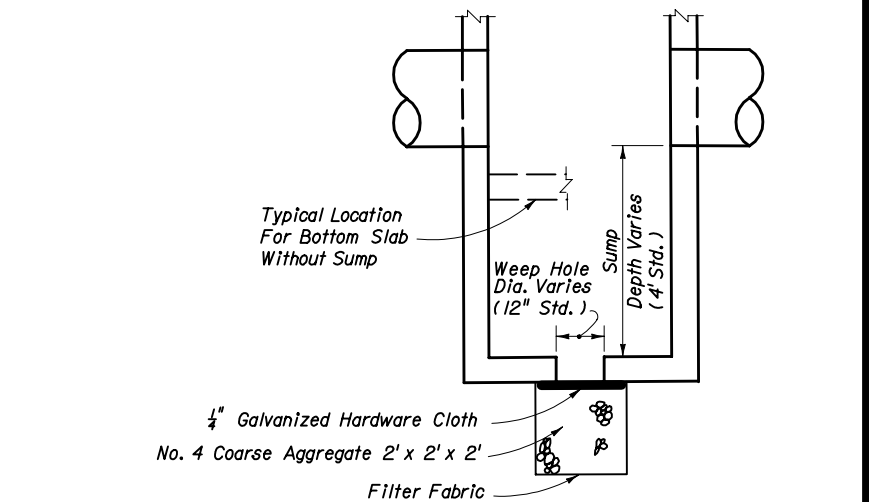
## EYE BOLT AND CHAIN FOR LOCKING GRATES TO INLETS



## TEMPORARY DRAINS FOR SUBGRADE AND BASE

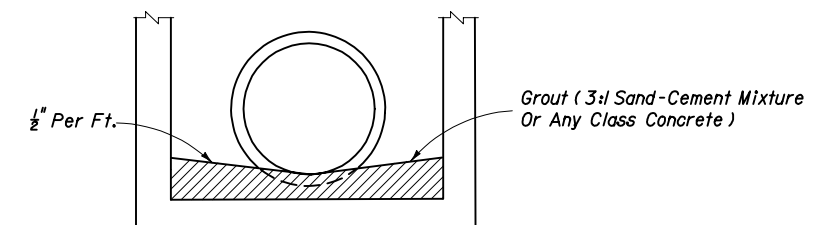


## FILTER FABRIC WRAP ON GROUTED PIPE TO STRUCTURE JOINT



NOTE: Sump bottom appropriate for all manhole and inlet types. Sumps are to be constructed in inlet and manholes connected to French Drains unless excluded in the plans. At other locations, sump is to be constructed only where called for in the plans. Weep hole to be constructed in sump bottom only where called for in the plans. Cost of sump bottom and weep hole to be included in the contract unit price for inlet or manhole.

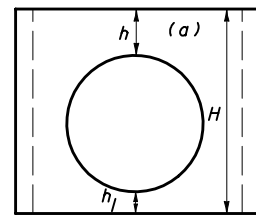
## SUMP BOTTOM



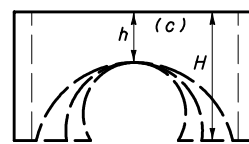
FOR ALL STRUCTURES UNLESS EXCLUDED BY SPECIAL DETAIL

## ALL PIPE TYPES DRAINAGE STRUCTURE INVERT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
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Designed By	HLB	04/75	State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	LMF	04/75	04	2 of 6
				201

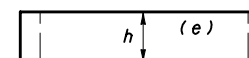


**When**  $h_j < 0.75h$  (min.) **Then (Req'd)**  $h \geq 0.4H$   
 $h_j \geq 0.75h$  (min.)  $h \geq h$  (min.)



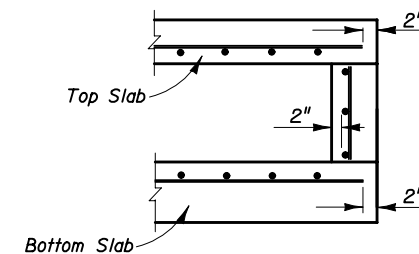
$h_{min} \leq h \leq 0.4H$

Segments may be inverted. Maximum opening for pipe shall be the pipe OD plus 6". If h can not be attained, then a top or bottom slab must be attached to the segment as shown below.



$h \geq h$  (min.)

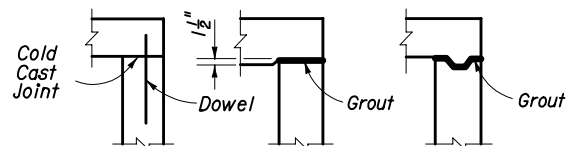
Minimum Value For h	
h (min.)	Box Or Riser Diameter
1'-0"	3'-6" & 4'-0"
1'-6"	5'-0" & 6'-0"
2'-0"	>6'-0"



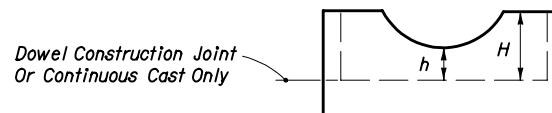
( NOTE: NOT APPLICABLE AROUND MANHOLE AND RISER OPENINGS )

### REBAR STRAIGHT END EMBEDMENT FOR TOP AND BOTTOM SLABS

### SEPARATE RISER SEGMENTS WITH CONSTRUCTION JOINTS OTHER THAN DOWEL OPTION



TOP SLABS TO WALLS

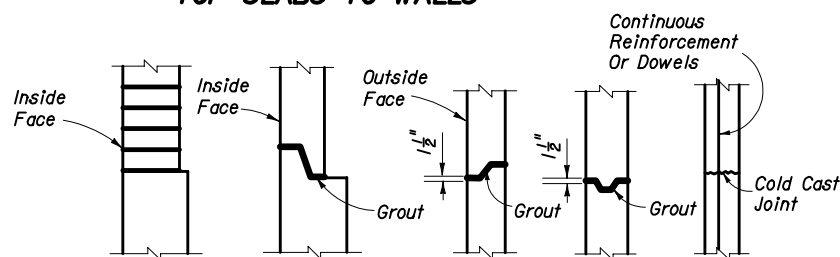


$h \geq \text{zero}$   
 ( h min Tabulated Above Do Not Apply )

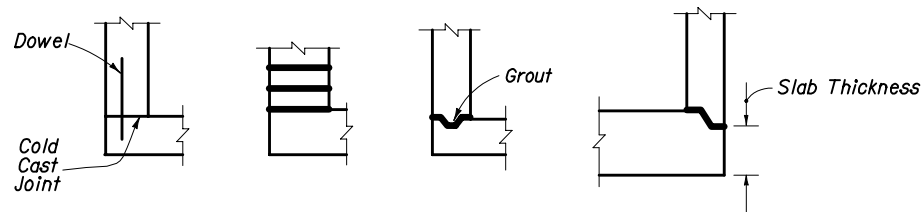
### TOP OR BOTTOM SEGMENT FOR DOWEL CONSTRUCTION JOINTS OR CONTINUOUS CAST SEGMENTS

### COMPARATIVE SIDE VIEWS

### MINIMUM DIMENSIONS FOR BOX AND RISER SEGMENTS



WALL JOINTS



BOTTOM SLABS TO WALLS

- One or more types of joints may be used in a single structure, except brick wall structure. Brick wall construction is permitted on circular units only.
- All grouted joints are to have a maximum thickness of 1".
- Keyways are to be a minimum of 1/2" deep.
- Joint dowels are to be #4 bars, 12" long with a minimum of 6 bars per joint approximately evenly spaced for circular structures or 2 bars per side at approximate quarter points for rectangular. Bars are to be placed approximately 6" into fresh concrete leaving the remainder to extend into the secondary cast. Welded wire fabric may be substituted for the dowels bar in accordance with the equivalent steel area table on Sheet 4.
- Minimum cover on reinforcing bars is 1 1/2".
- Joints between wall segments and between wall segments and top or bottom slabs may be sealed either by preformed plastic gasket material using the procedures given in Section 430-7.3 or by grout.
- Approved product inserts may be used in lieu of dowel embedment.

### OPTIONAL CONSTRUCTION JOINTS


### GENERAL NOTES

- For square or rectangular precast drainage structures, either deformed or smooth welded wire fabric may be used provided:
  - The smooth welded wire fabric shall comply with ASTM A185, and deformed welded wire fabric shall comply with ASTM A497.
  - Width and length of the unit is four times the spacing of the cross wires.
  - Wire fabric shall be continuous around the box, spliced at quarter points with overlap of not less than the spacing of the cross wires plus 2".
- For equivalent steel areas for precast drainage structures, see Sheet 4.
- Horizontal steel in the walls of rectangular structures shall be lapped a minimum of 24 bar diameter at corners.
- Welding of splices and laps is permitted. The requirements and restrictions placed on welding in AASHTO M259 shall apply.
- Rebar straight end embedment or peripheral reinforcement may be used in lieu of ACI standard hooks for top and bottom slabs except when hooks are specifically called for in plans or standard drawings.
- Concrete as specified in ASTM C478, (4000 psi) may be used in lieu of Class I and Class II concrete in precast items manufactured in plants which are under the 'Standard Operating Procedures For The Inspection Of Precast Drainage Products'.
- Maximum opening for pipe shall be the pipe OD plus 6". Mortar used to seal the pipe into the opening will be of such a mix that shrinkage will not cause leakage into or out of the structure.
- For pay item purposes, the height used to determine if a drainage structure is less than or greater than 10 feet shall be computed using (a) the elevation of the top of the manhole lid, (b) the grate elevation or the theoretical gutter grade elevation of an inlet, or (c) the outside top elevation of a junction box less the flow line elevation of the lowest pipe or to top of sump floor.

The "UTILITY PIPES THRU STORM SEWER STRUCTURES" Details Have Been Moved To Index No. 307 "MISCELLANEOUS UTILITY DETAILS".

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

### SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS

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Designed By	HLB	04/75	 State Drainage Engineer			
Drawn By						
Checked By	LWF	04/75				
Revision		Sheet No.		Index No.		
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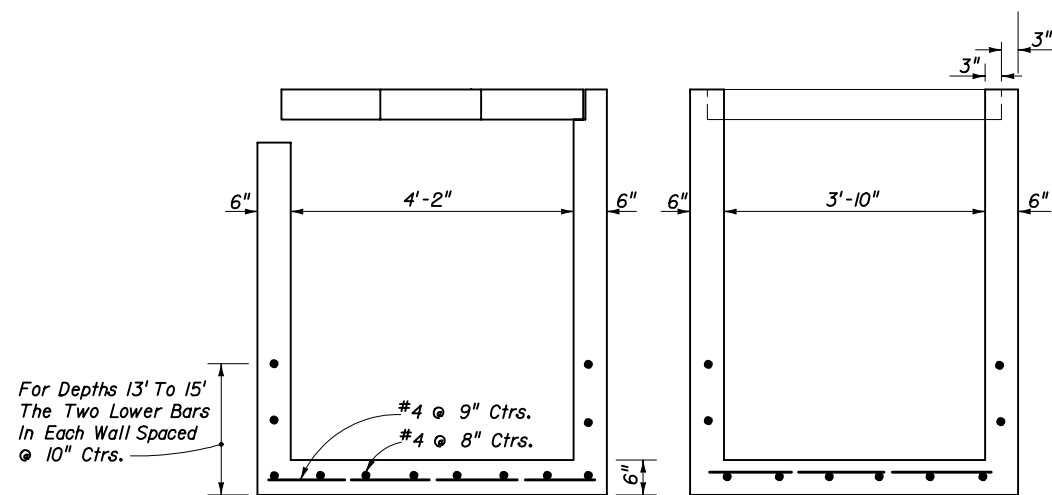
**NOTES FOR THIN-WALL PRECAST OPTIONS**

1. The details on Sheets 4, 5 & 6 are optional for precast inlet construction up to depths of 15'. These inlets can be used with Alt. "B" Bottoms, Index No. 200. Cast-in-place construction must adhere to the details contained on the referenced indexes.
2. Only the dimensions and reinforcement changes or other modifications are indicated. For all other dimensions and details, the referenced index drawings apply. When these precast units are used in conjunction with Alt "B" Structure Bottoms, Index No. 200, the interior dimensions of an Alt. "B" Bottom can be adjusted to reflect these inlet interior dimensions.
3. Concrete which meets the requirements of ASTM C478 shall be used for structures constructed to these details.
4. Reinforcement can be either deformed bar reinforcement or welded wire fabric. Bar reinforcement other than 40 ksi may be used, however only two grades are recognized; Grade 40 and Grade 60. Welded wire fabric, including deformed welded wire fabric, will be recognized as having a design strength of 65 ksi. The area of reinforcement required may be reduced in accordance with the Equivalent Steel Area Table provided. For bars and spacings not given, the steel area required can be determined by the following equations:

$$\text{Grade 60 Steel Area} = A_s 60 = \frac{60}{40} \times A_s 40$$

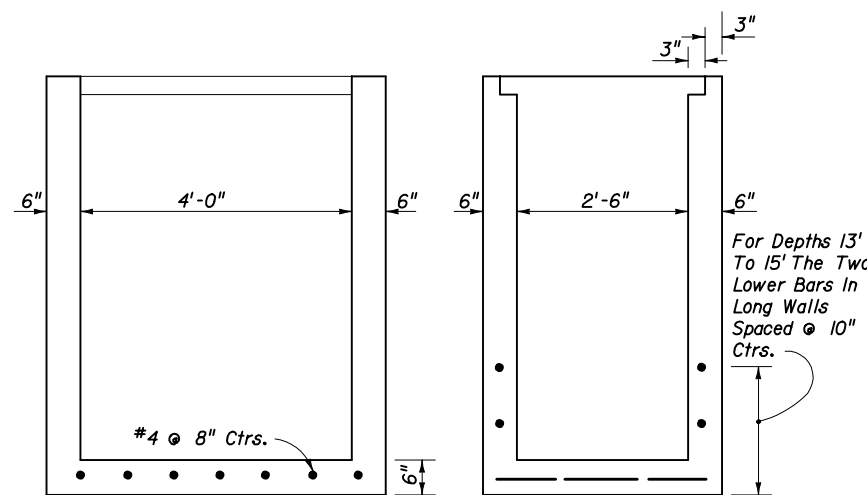
$$\text{Welded Wire Fabric Steel Area} = A_s 65 = \frac{65}{40} \times A_s 40$$

In no case will fabric with wires smaller than W3.1 or spacings greater than 8" be permitted. Bar reinforcement shall show the minimum yield designation grade mark of either the number 60 or one (1) grade mark line to be acceptable at the higher value. Maximum bar spacing shall not be greater than two (2) times the slab thickness with a maximum spacing of 12" or three (3) times the wall thickness, with a maximum spacing of 18".



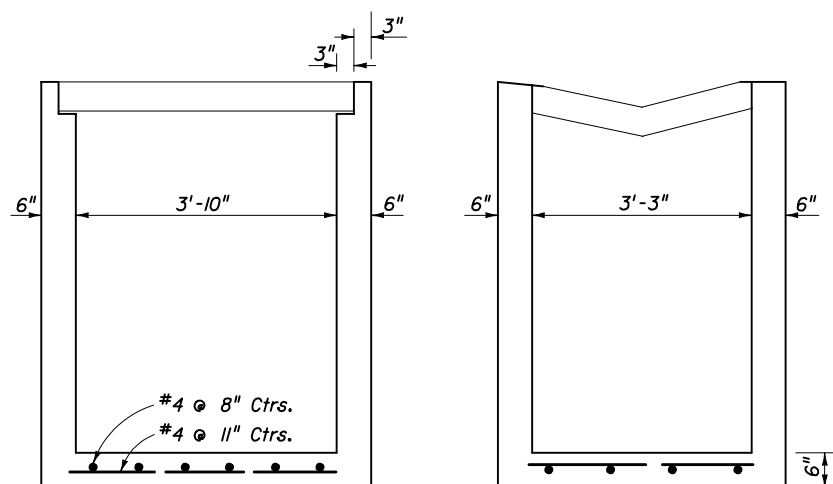
PARTIAL SECTION AA      PARTIAL SECTION BB

**DITCH BOTTOM INLET TYPE B  
INDEX NO. 231**



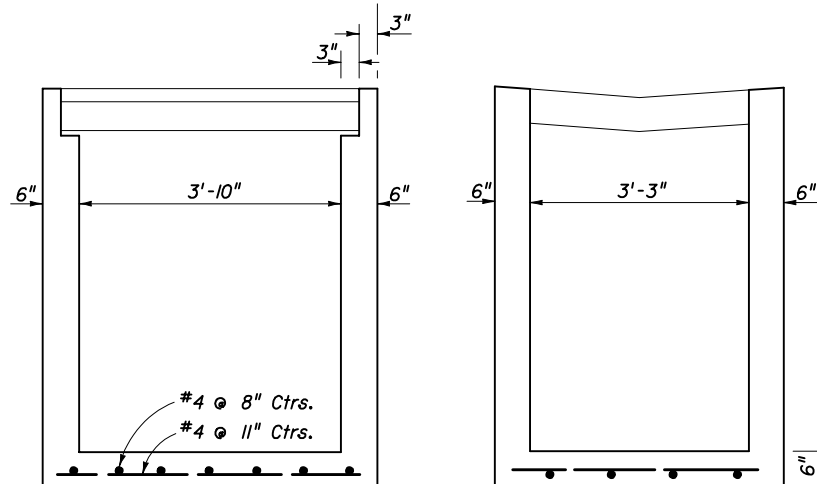
PARTIAL SECTION AA      PARTIAL SECTION BB

**DITCH BOTTOM INLET TYPE F  
INDEX NO. 233**



PARTIAL SECTION AA      PARTIAL SECTION BB

**GUTTER INLET TYPE S  
INDEX NO. 220**



PARTIAL SECTION AA      PARTIAL SECTION BB

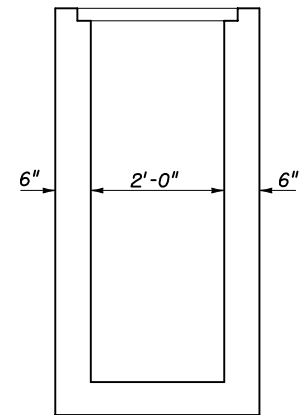
**GUTTER INLET TYPE V  
AND DITCH BOTTOM INLET TYPE J  
INDEX NO. 221 & 234**

EQUIVALENT STEEL AREA TABLE					
GRADE 40 REINFORCING BAR		EQUIVALENT GRADE 60 REINFORCING BAR		EQUIVALENT 65 KSI WELDED WIRE FABRIC	
Bar Size & Spacing	Steel Area	Bar Size & Spacing	Min. Steel Area	Style Designation	Min. Steel Area
#4 @ 12" CCEW	0.20	#3 @ 9 1/2" CCEW	.1333	3" x 3" - W3.1 x W3.1 or 4" x 4" - W4.5 x W4.5 or 6" x 6" - W6.5 x W6.5	.1230
#4 @ 9" CCEW	0.267	#4 @ 13 1/2" CCEW or #3 @ 7" CCEW	.1778	3" x 3" - W4.5 x W4.5 or 4" x 4" - W5.5 x W5.5 or 6" x 6" - W8.5 x W8.5	.1641
#6 @ 6" CCEW	0.88	#5 @ 6" CCEW or #6 @ 9" CCEW	.5867	4" x 4" - W20 x W20 or 6" x 6" - W30 x W30	.5415
#7 @ 6" CCEW	1.20	#6 @ 6 1/2" CCEW or #7 @ 9" CCEW	.80	4" x 4" - W26 x W26	.7385

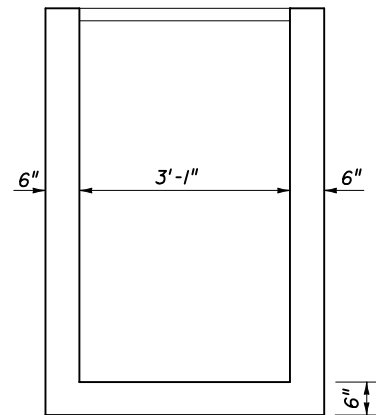
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

**SUPPLEMENTARY DETAILS FOR  
MANHOLES AND INLETS**

Names	Dates	Approved By		
Designed By	EGR/JGW	09/86	State Drainage Engineer	
Drawn By	WPH/dde	09/86	Revision	Sheet No.
Checked By	EGR	09/86	04	4 of 6
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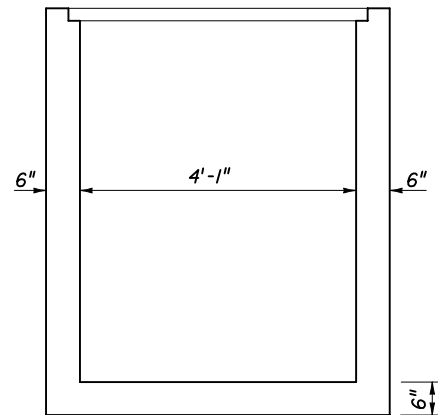


PARTIAL SECTION BB

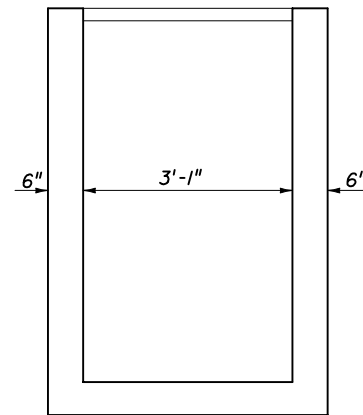


PARTIAL SECTION CC

DITCH BOTTOM INLET C  
INDEX NO. 232

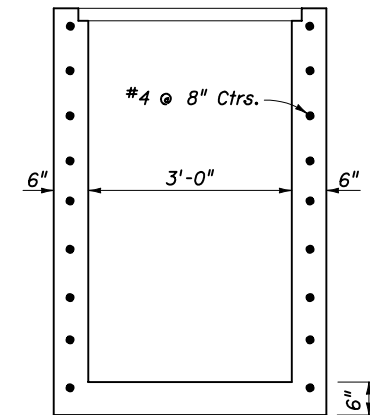


PARTIAL SECTION BB

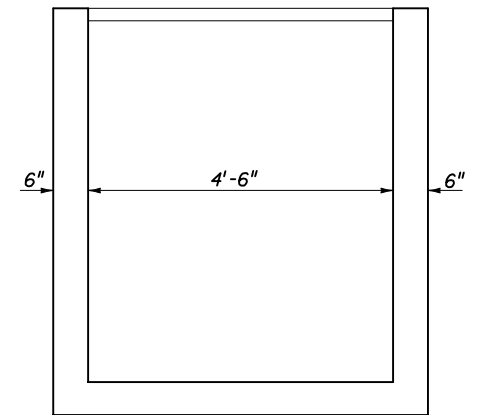


PARTIAL SECTION CC

DITCH BOTTOM INLET D  
INDEX NO. 232

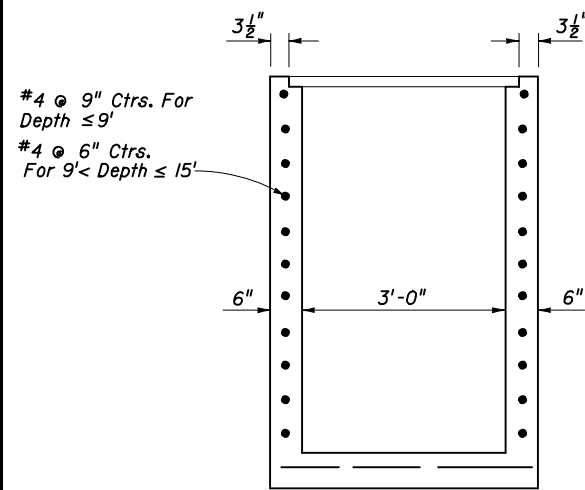


PARTIAL SECTION BB

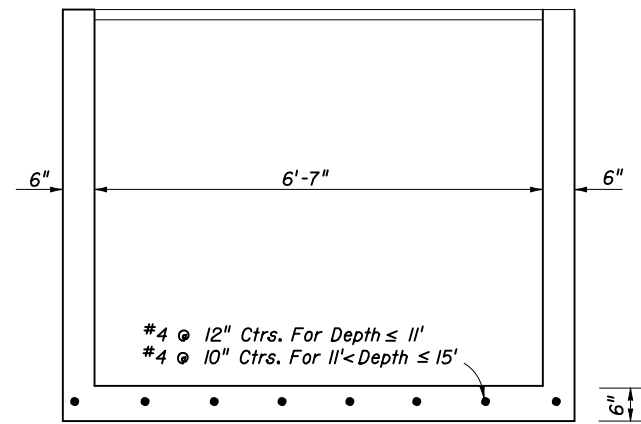


PARTIAL SECTION CC

DITCH BOTTOM INLET E  
INDEX NO. 232

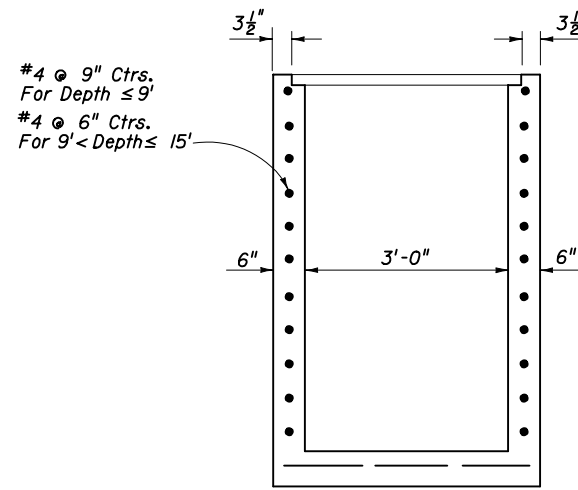


PARTIAL SECTION BB

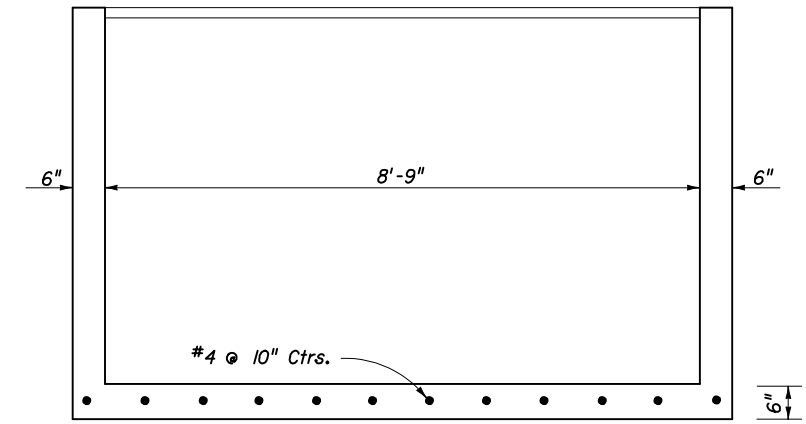


PARTIAL SECTION CC

DITCH BOTTOM INLET H (3-GRATE)  
INDEX NO. 232



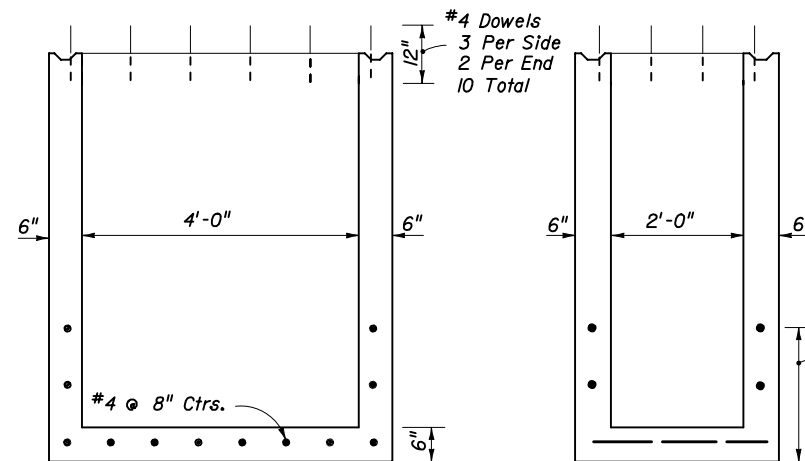
PARTIAL SECTION BB



PARTIAL SECTION CC

DITCH BOTTOM INLET H (4-GRATE)  
INDEX NO. 232

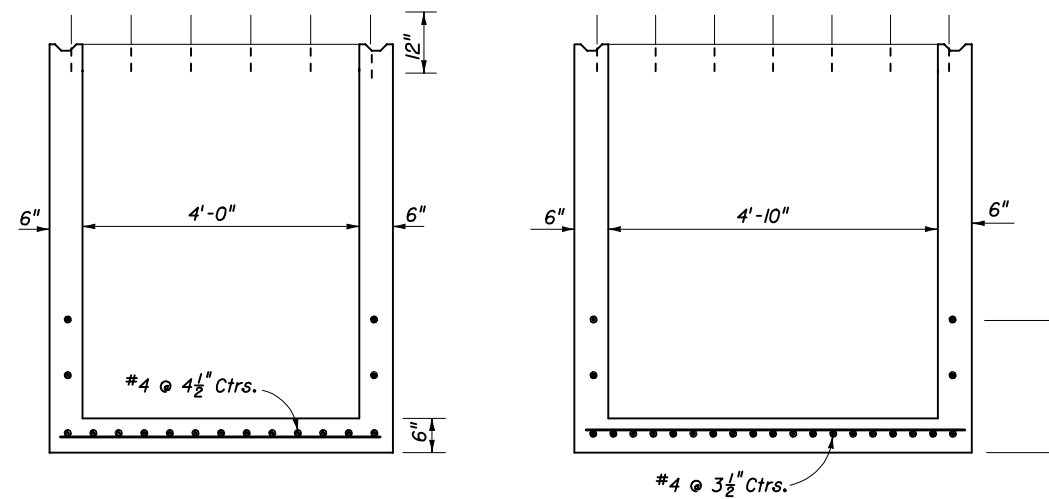
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
<b>SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS</b>				
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Designed By	EGR/JGW	09/86	State Drainage Engineer	
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PARTIAL SECTION AA

PARTIAL SECTION BB

MEDIAN BARRIER INLET TYPES 1 & 2

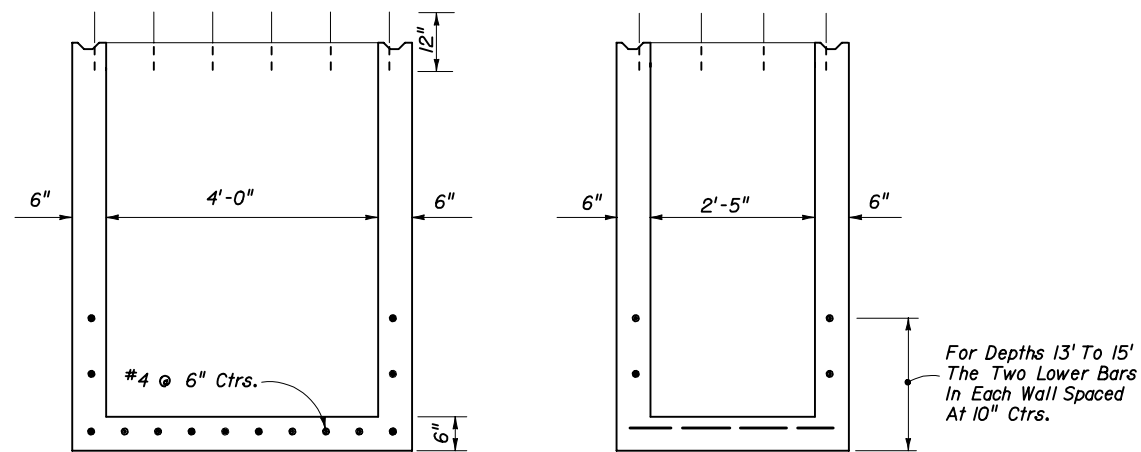


PARTIAL SECTION AA

PARTIAL SECTION BB

MEDIAN BARRIER INLET TYPES 3, 4, & 5

**INDEX NO. 217**

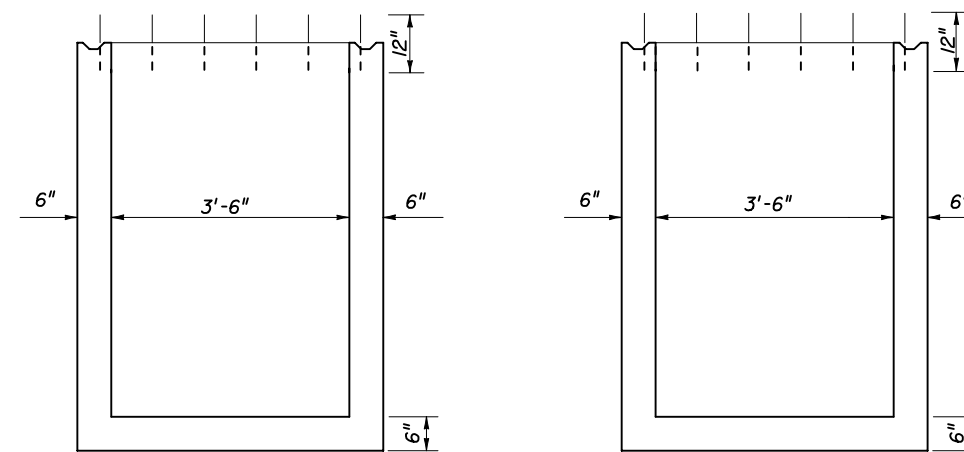


PARTIAL SECTION AA

PARTIAL SECTION BB

BARRIER WALL (RIGID) (C & G)

**INDEX NO. 219**




PARTIAL SECTION AA

PARTIAL SECTION BB

STRUCTURE BOTTOM TYPE P

**INDEX NO. 200**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
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Names	Dates	Approved By 		
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