

Unless specified otherwise, the contractor has the option to either install a precast circular structure or construct a rectangular structure.

All plate and edge armor steel to be ASTM A 36, galvanized after fabrication.

Remove center grate before constructing concrete barrier.

Cast frames into intake top so tops of grates are 1/4" below Form Grade Elevation. Bolt intake frames together on both sides with four 1/2" x 4" bolts.

For joint details, refer to PV-101.

- ① Trowel smooth and place two layers of 30-pound roofing felt to prevent bond.
- ② Leave 3-inch opening through barrier over the intake.
- ③ Vary slope of top to match elevation of adjacent pavement.
- ④ 12-inch minimum wall height above all pipes.

Possible Contract Item:

Barrier Intake, SW-547

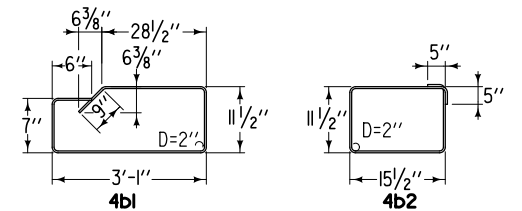
Possible Tabulation:

I04-5B

 Iowa Department of Transportation	REVISION
	3   10-16-12
<b>STANDARD ROAD PLAN</b>	<b>SW-547</b>
SHEET 1 of 7	
<small>REVISIONS: Modified notes to indicate circular structure is to be precast.</small>	
<i>Deanna McFalls</i> <small>APPROVED BY DESIGN METHODS ENGINEER</small>	
<b>TRIPLE-GRATE BARRIER INTAKE</b>	

LID REINFORCING BAR LIST - EPOXY-COATED (CIRCULAR OPTION)						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
5al	Lid, Longit. & Transverse		28	9'-8"	282	
4bl	Lid Hoop		12	8'-3"	66	
4b2	Lid Hoop		4	5'-4"	14	
EPOXY COATED REINFORCING STEEL - TOTAL					362	

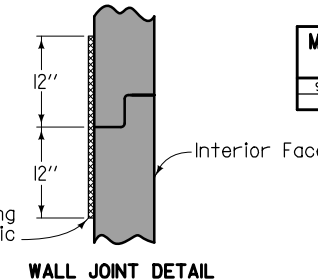
**LID BENT BAR DETAILS (CIRCULAR OPTION)**



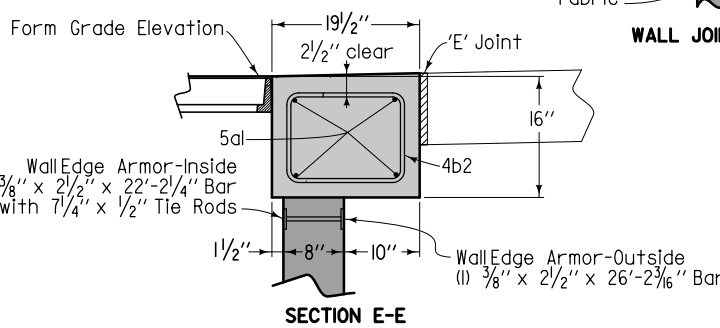
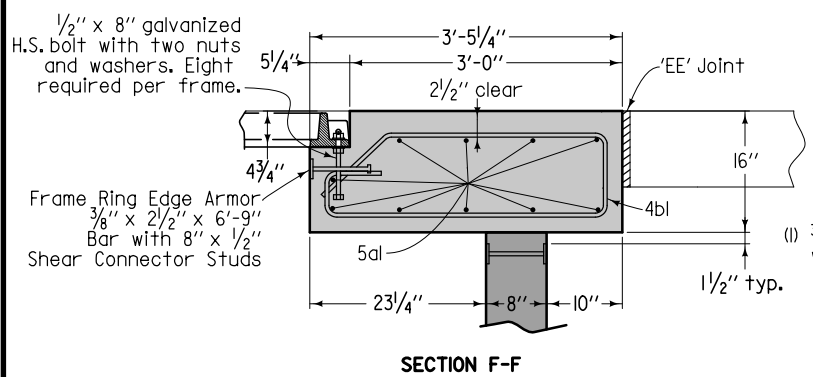
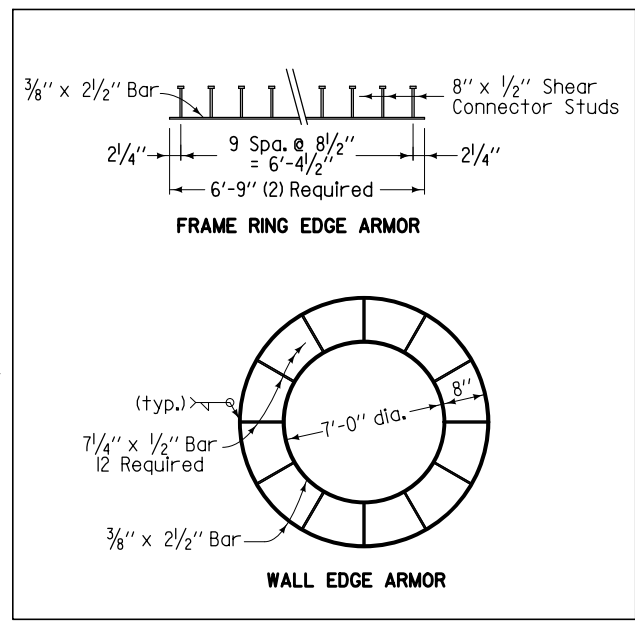
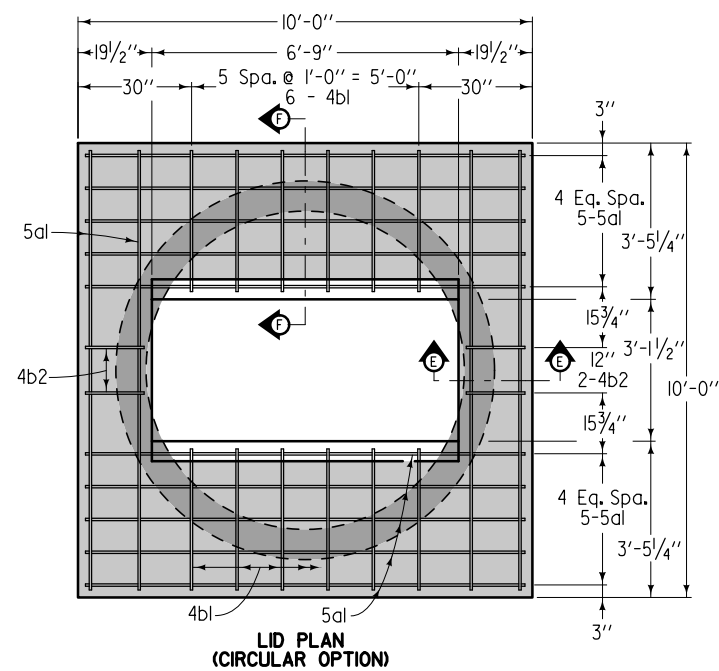
LID QUANTITY SUMMARY (CIRCULAR OPTION)	
Concrete	3.8 CY
Epoxy Coated Reinforcing Steel	362 LB

• Based on Minimum thickness = 16"

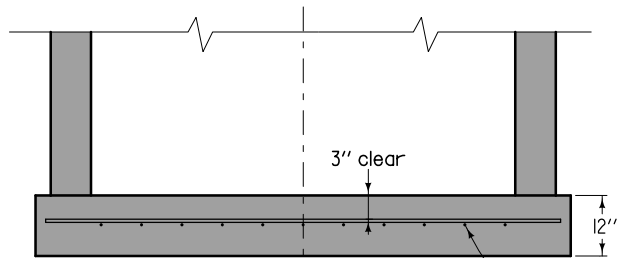
Maximum Pipe Diameter for Pipes at:		
90° Separation	180° Separation	
36	48	



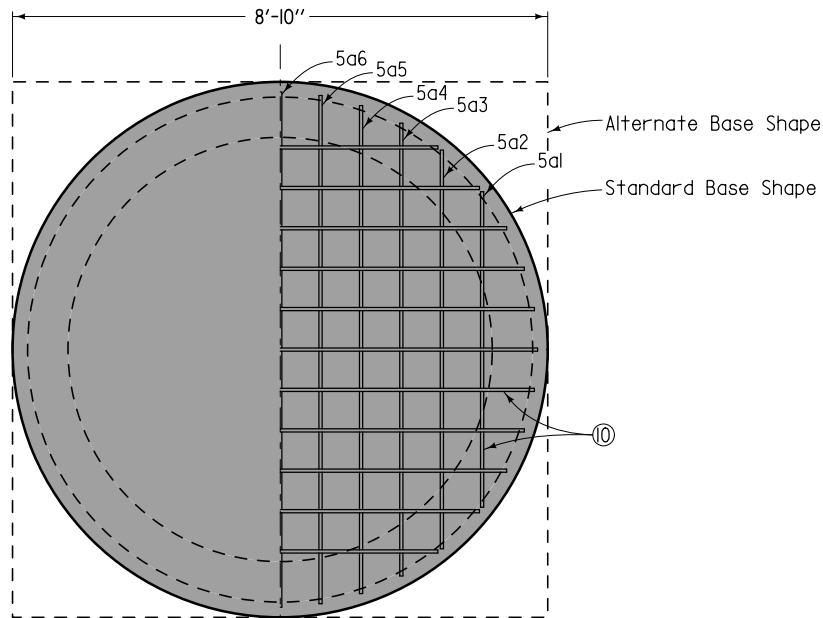
<p>Iowa Department of Transportation</p> <p><b>STANDARD ROAD PLAN</b></p> <p>REVISIONS: Modified notes to indicate circular structure to be precast.</p> <p><i>Deanna McFist</i> APPROVED BY DESIGN METHODS ENGINEER</p>	<p>REVISION</p> <p>3 10-16-12</p>
	<p><b>SW-547</b></p> <p>SHEET 2 of 7</p>
	<p><b>TRIPLE-GRATE BARRIER INTAKE</b></p>



**LID (CIRCULAR OPTION)**



PART SECTION A-A



BASE PLAN  
(CIRCULAR OPTION)

BASE (CIRCULAR OPTION)

**BASE REINFORCING BAR LIST - EPOXY-COATED  
(CIRCULAR OPTION)**


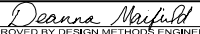
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Base, Longit. & Transverse	---	4	5'-3"	22
5a2	Base, Longit. & Transverse	---	4	6'-7"	27
5a3	Base, Longit. & Transverse	---	4	7'-6"	31
5a4	Base, Longit. & Transverse	---	4	8'-0"	33
5a5	Base, Longit. & Transverse	---	4	8'-4"	35
5a6	Base, Longit. & Transverse	---	2	8'-6"	18
EPOXY COATED REINFORCING STEEL - TOTAL					166

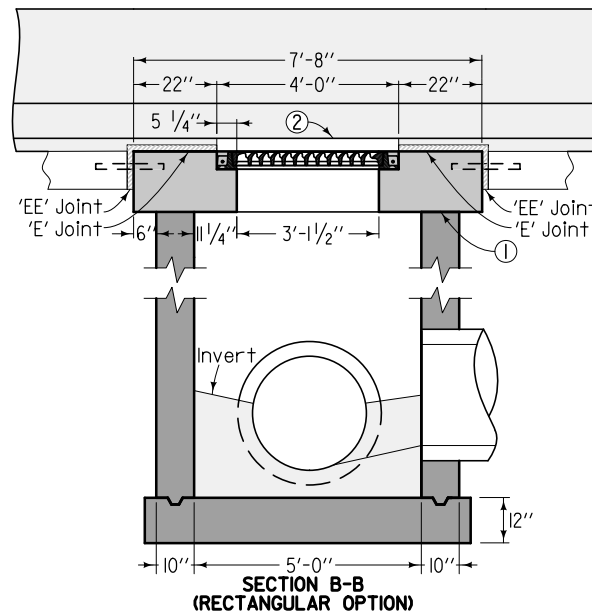
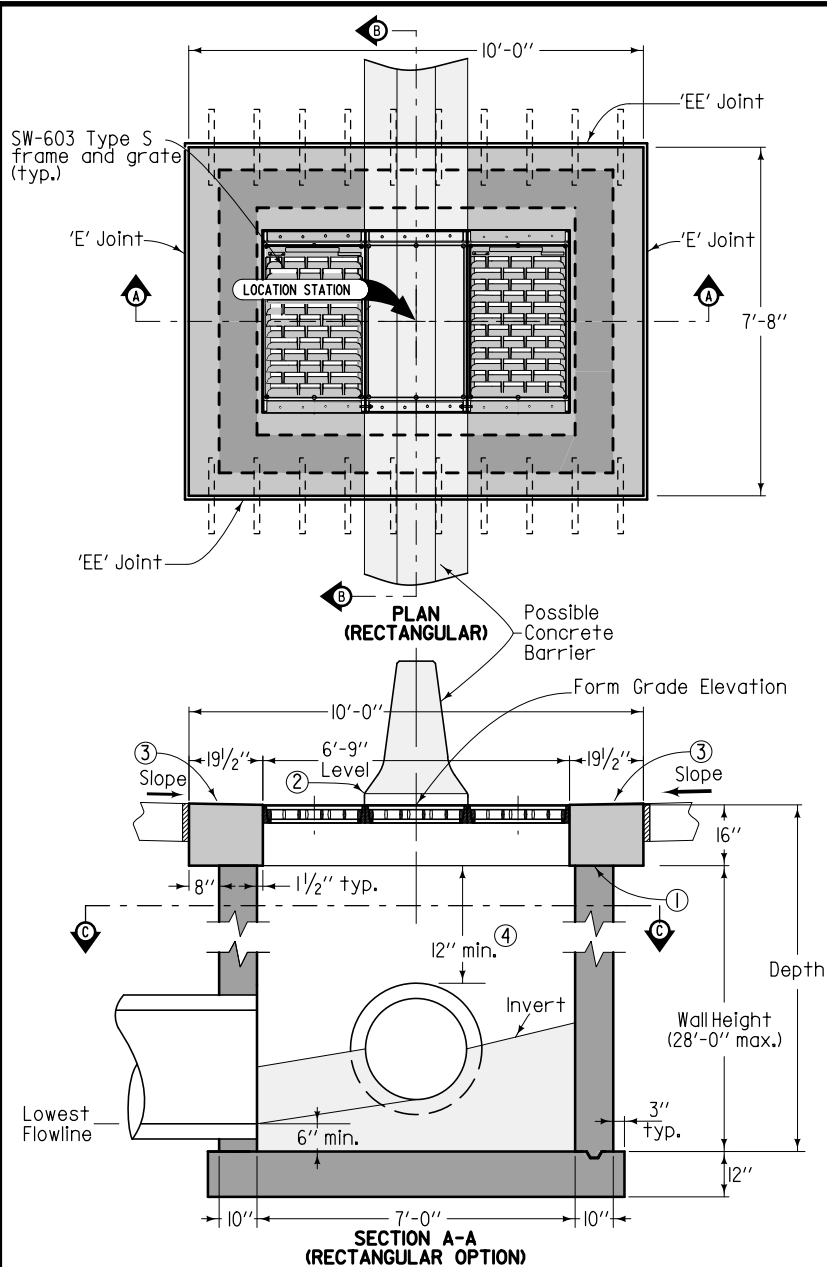
**BASE QUANTITY SUMMARY  
(CIRCULAR OPTION)**

Concrete	2.3 CY *
Epoxy Coated Reinforcing Steel	166 LB *

\* Based on Standard Base Shape

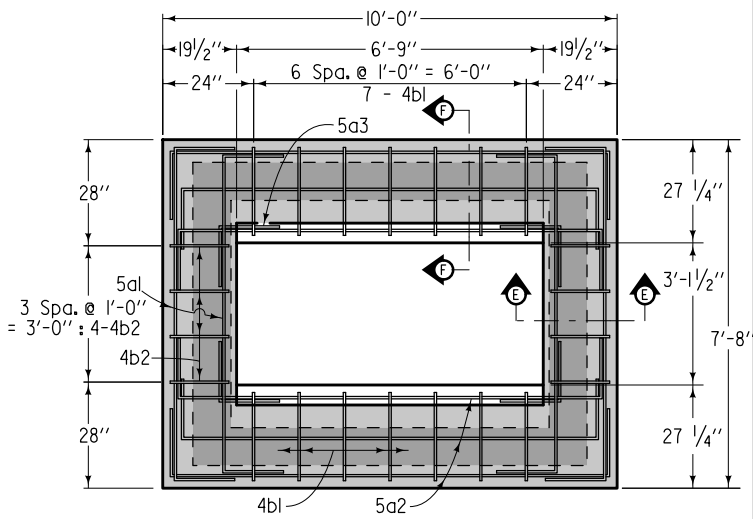
⑩ #5 at 8-inch centers each direction or equivalent welded wire fabric.

 Iowa Department of Transportation	REVISION
	3 10-16-12
<b>STANDARD ROAD PLAN</b>	<b>SW-547</b>
SHEET 3 of 7	
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 APPROVED BY DESIGN METHODS ENGINEER	
<b>TRIPLE-GRATE BARRIER INTAKE</b>	

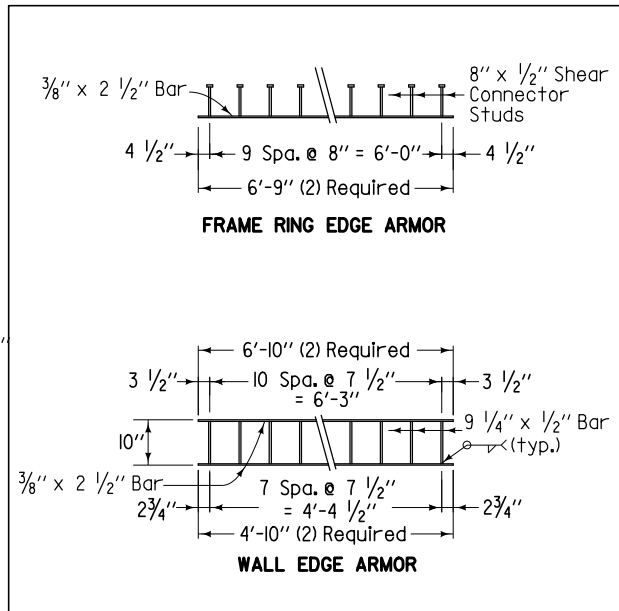


- ① Trowel smooth and place two layers of 30-pound roofing felt to prevent bond.
- ② Leave 3-inch opening through barrier over the intake.
- ③ Vary slope of top to match elevation of adjacent pavement.
- ④ 12-inch minimum wall height above all pipes.

<p>Iowa Department of Transportation</p>	REVISION	
	3	10-16-12
<b>STANDARD ROAD PLAN</b>	<b>SW-547</b>	
SHEET 4 of 7		
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<b>TRIPLE-GRATE BARRIER INTAKE</b>		



**LID PLAN  
(RECTANGULAR OPTION)**

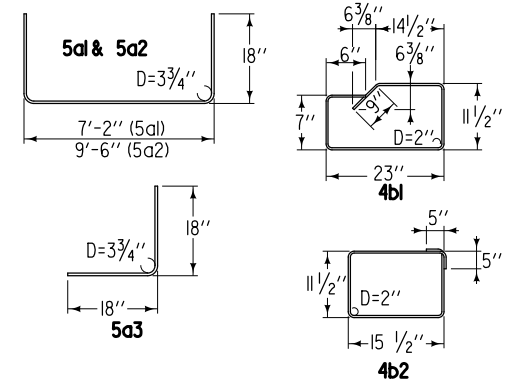


**FRAME RING EDGE ARMOR**

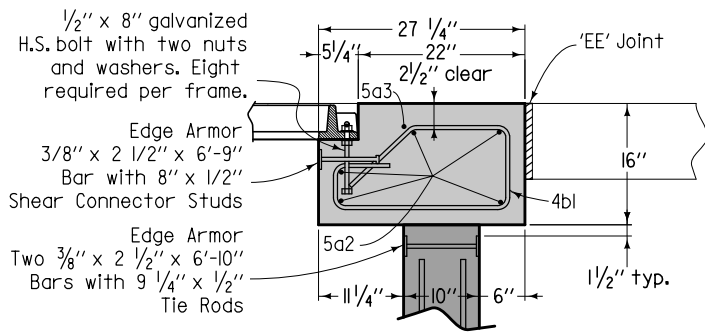
**WALL EDGE ARMOR**

LID REINFORCING BAR LIST - EPOXY-COATED (RECTANGULAR OPTION)					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	Lid, Longitudinal	U	8	10'-2	85
5a2	Lid, Transverse	U	10	12'-6	130
5a3	Lid, Interior, Corners	J	4	3'-0	13
4b1	Lid Hoop	U	14	5'-11	55
4b2	Lid Hoop	U	8	5'-4	29
EPOXY COATED REINFORCING STEEL - TOTAL					312

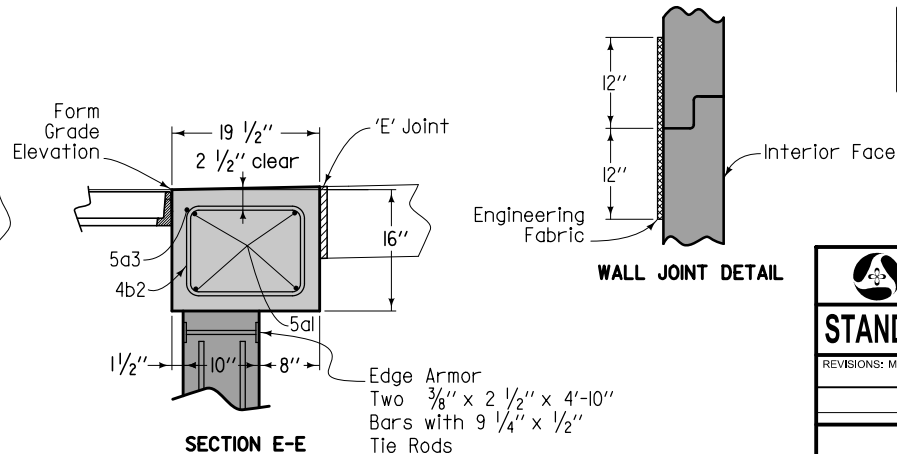
**LID BENT BAR DETAILS (RECTANGULAR OPTION)**



NOTE: ALL DIMENSIONS SHOWN OUT TO OUT. D = PIN DIAMETER



**SECTION F-F**



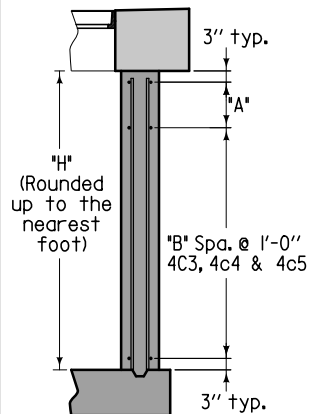
**SECTION E-E**

**WALL JOINT DETAIL**

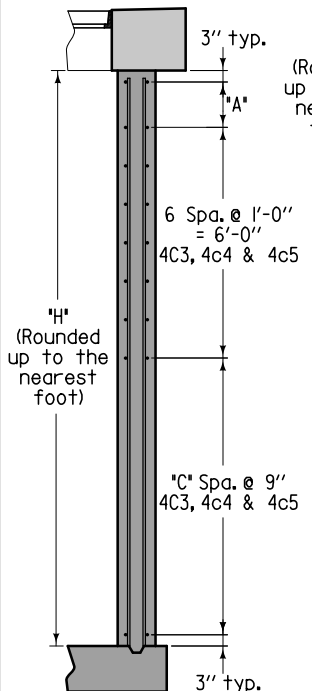
LID QUANTITY SUMMARY (RECTANGULAR OPTION)	
Concrete	2.7 CY
Epoxy Coated Reinforcing Steel	312 LB

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	<p><b>SW-547</b></p> <p>SHEET 5 of 7</p>
	<p><b>TRIPLE-GRATE BARRIER INTAKE</b></p>

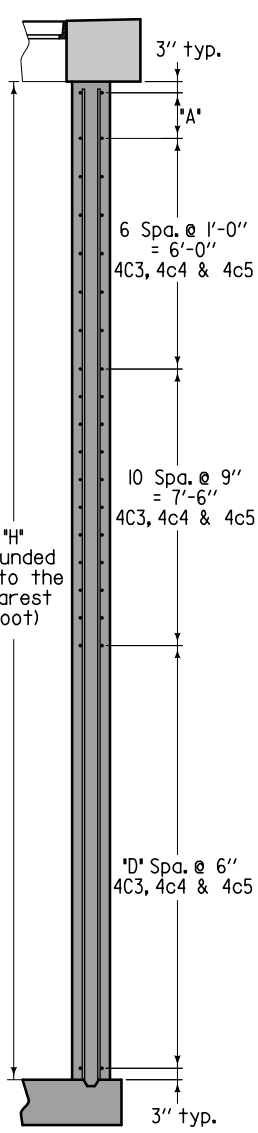
**LID (RECTANGULAR OPTION)**



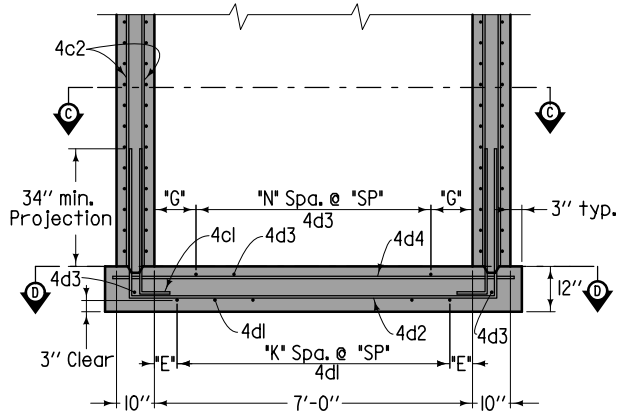
**PART SECTION A-A**  
(Where H = 3' to 7')



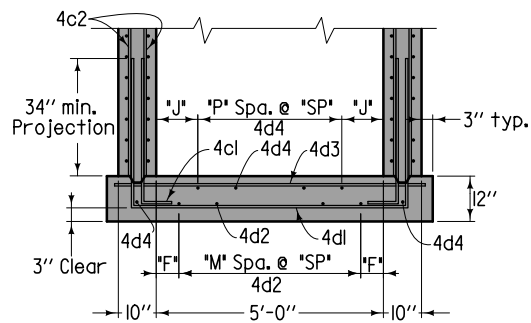
**PART SECTION A-A**  
(Where H = 8' to 15')



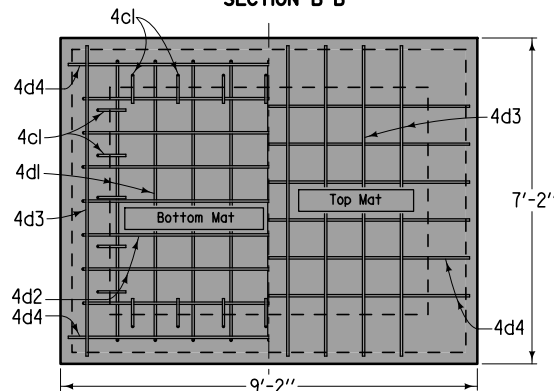
**PART SECTION A-A**  
(Where H = 16' to 28')



**SECTION A-A**

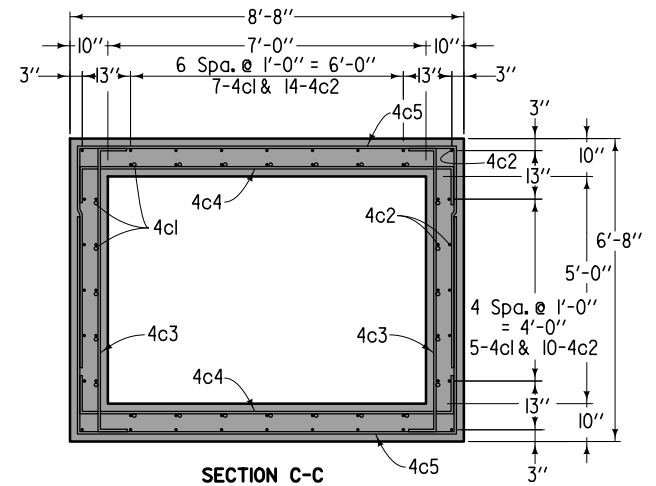


**SECTION B-B**

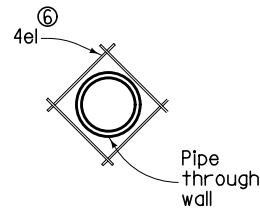


**SECTION D-D**  
BASE REINFORCING

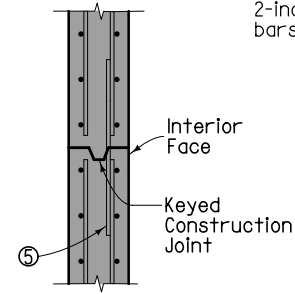
**WALLS (RECTANGULAR OPTION)**



**SECTION C-C**



**PIPE REINFORCING**



**C.I.P. Wall**  
CONSTRUCTION JOINT

- ⑤ Install one set of 4r1 x 3'-0" dowel bars @ 12-inch spacing at any wall joints. Twenty-eight 4r1 bars required per joint, total weight = 56 lbs.
- ⑥ 4e1 bar length to be pipe diameter plus 12 inches. Place 4e1 bar inside of vertical reinforcing. Shift main reinforcing bars as required for pipe entrance. Field cut bars to maintain 3-inch clearance from bottom and 2-inch clearance from face of walls. Eight 4e1 bars required per pipe entrance.

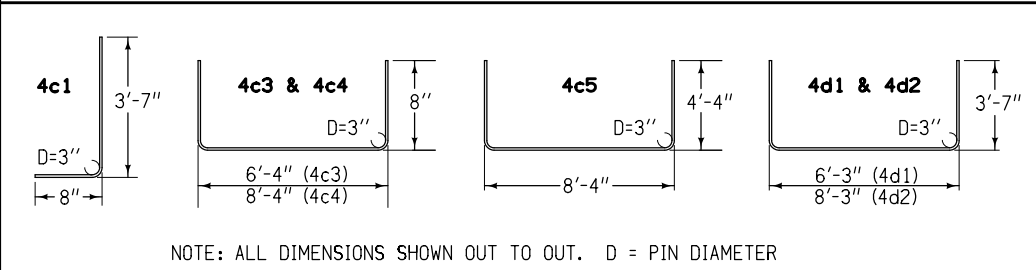
 Iowa Department of Transportation	REVISION	
	3	10-16-12
<b>STANDARD ROAD PLAN</b>	<b>SW-547</b>	
SHEET 6 of 7		
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<b>TRIPLE-GRATE BARRIER INTAKE</b>		

VARIABLE DIMENSIONS AND QUANTITIES FOR RECTANGULAR OPTION

Dimensions												Bar List																Quantities																	
"H" (Ft.)	"A" (In.)	"E" (In.)	"F" (In.)	"G" (In.)	"J" (In.)	4c1		4c2		4c3 (8)			4c4 (8)			4c5 (8)			4d1		4d2		4d3		4d4		Concrete - Cu. Yds.				Steel Total lbs. (9)														
						No.	L	No.	L	No. of Spaces			No. of Spaces			No. of Spaces			No.	L	SP	"K"	No.	L	SP	"M"	No.	L	SP	"N"		No.	L	SP	"P"	No.	L	Base	Lid	Walls	Total				
3	6	2"	0"	7"	5"	24	4'-3"	--	--	2	--	--	8	7'-8"	2	--	--	8	9'-8"	2	--	--	8	17'-0"	10"	8	9	13'-5"	10"	6	7	15'-5"	10"	7	10	6'-10"	10"	5	8	8'-10"	2.4	2.7	2.5	7.7	810
4	6	2"	0"	7"	5"	24	4'-3"	52	3'-10"	3	--	--	10	7'-8"	3	--	--	10	9'-8"	3	--	--	10	17'-0"	10"	8	9	13'-5"	10"	6	7	15'-5"	10"	7	10	6'-10"	10"	5	8	8'-10"	2.4	2.7	3.4	8.5	989
5	6	2"	0"	7"	5"	24	4'-3"	52	4'-10"	4	--	--	12	7'-8"	4	--	--	12	9'-8"	4	--	--	12	17'-0"	10"	8	9	13'-5"	10"	6	7	15'-5"	10"	7	10	6'-10"	10"	5	8	8'-10"	2.4	2.7	4.2	9.4	1,068
6	6	2"	0"	7"	5"	24	4'-3"	52	5'-10"	5	--	--	14	7'-8"	5	--	--	14	9'-8"	5	--	--	14	17'-0"	10"	8	9	13'-5"	10"	6	7	15'-5"	10"	7	10	6'-10"	10"	5	8	8'-10"	2.4	2.7	5.1	10.2	1,150
7	6	2"	2"	6"	6"	24	4'-3"	52	6'-10"	6	--	--	16	7'-8"	6	--	--	16	9'-8"	6	--	--	16	17'-0"	8"	10	11	13'-5"	8"	7	8	15'-5"	8"	9	12	6'-10"	8"	6	9	8'-10"	2.4	2.7	5.9	11.0	1,273
8	9	2"	2"	6"	6"	24	4'-3"	52	7'-10"	6	1	--	18	7'-8"	6	1	--	18	9'-8"	6	1	--	18	17'-0"	8"	10	11	13'-5"	8"	7	8	15'-5"	8"	9	12	6'-10"	8"	6	9	8'-10"	2.4	2.7	6.8	11.9	1,353
9	12	2"	2"	6"	6"	24	4'-3"	52	8'-10"	6	2	--	20	7'-8"	6	2	--	20	9'-8"	6	2	--	20	17'-0"	8"	10	11	13'-5"	8"	7	8	15'-5"	8"	9	12	6'-10"	8"	6	9	8'-10"	2.4	2.7	7.6	12.7	1,434
10	6	2"	2"	6"	6"	24	4'-3"	52	9'-10"	6	4	--	24	7'-8"	6	4	--	24	9'-8"	6	4	--	24	17'-0"	8"	10	11	13'-5"	8"	7	8	15'-5"	8"	9	12	6'-10"	8"	6	9	8'-10"	2.4	2.7	8.4	13.6	1,562
11	9	2"	2"	6"	6"	24	4'-3"	52	10'-10"	6	5	--	26	7'-8"	6	5	--	26	9'-8"	6	5	--	26	17'-0"	8"	10	11	13'-5"	8"	7	8	15'-5"	8"	9	12	6'-10"	8"	6	9	8'-10"	2.4	2.7	9.3	14.4	1,641
12	12	2"	2"	6"	6"	24	4'-3"	52	11'-10"	6	6	--	28	7'-8"	6	6	--	28	9'-8"	6	6	--	28	17'-0"	8"	10	11	13'-5"	8"	7	8	15'-5"	8"	9	12	6'-10"	8"	6	9	8'-10"	2.4	2.7	10.1	15.3	1,722
13	6	2"	2"	6"	6"	24	4'-3"	52	12'-10"	6	8	--	32	7'-8"	6	8	--	32	9'-8"	6	8	--	32	17'-0"	8"	10	11	13'-5"	8"	7	8	15'-5"	8"	9	12	6'-10"	8"	6	9	8'-10"	2.4	2.7	11.0	16.1	1,849
14	9	0"	0"	3"	3"	24	4'-3"	52	13'-10"	6	9	--	34	7'-8"	6	9	--	34	9'-8"	6	9	--	34	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	11.8	17.0	2,050
15	12	0"	0"	3"	3"	24	4'-3"	52	14'-10"	6	10	--	36	7'-8"	6	10	--	36	9'-8"	6	10	--	36	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	12.7	17.8	2,129
16	12	0"	0"	3"	3"	24	4'-3"	52	15'-10"	6	10	2	40	7'-8"	6	10	2	40	9'-8"	6	10	2	40	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	13.5	18.6	2,256
17	12	0"	0"	3"	3"	24	4'-3"	52	16'-10"	6	10	4	44	7'-8"	6	10	4	44	9'-8"	6	10	4	44	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	14.4	19.5	2,383
18	12	0"	0"	3"	3"	24	4'-3"	52	17'-10"	6	10	6	48	7'-8"	6	10	6	48	9'-8"	6	10	6	48	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	15.2	20.3	2,509
19	12	0"	0"	3"	3"	24	4'-3"	52	18'-10"	6	10	8	52	7'-8"	6	10	8	52	9'-8"	6	10	8	52	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	16.0	21.2	2,636
20	12	0"	0"	3"	3"	24	4'-3"	52	19'-10"	6	10	10	56	7'-8"	6	10	10	56	9'-8"	6	10	10	56	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	16.9	22.0	2,763
21	12	0"	0"	3"	3"	24	4'-3"	52	20'-10"	6	10	12	60	7'-8"	6	10	12	60	9'-8"	6	10	12	60	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	17.7	22.9	2,888
22	12	0"	0"	3"	3"	24	4'-3"	52	21'-10"	6	10	14	64	7'-8"	6	10	14	64	9'-8"	6	10	14	64	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	18.6	23.7	3,015
23	12	0"	0"	3"	3"	24	4'-3"	52	22'-10"	6	10	16	68	7'-8"	6	10	16	68	9'-8"	6	10	16	68	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	19.4	24.6	3,141
24	12	0"	0"	3"	3"	24	4'-3"	52	23'-10"	6	10	18	72	7'-8"	6	10	18	72	9'-8"	6	10	18	72	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	20.3	25.4	3,269
25	12	0"	0"	3"	3"	24	4'-3"	52	24'-10"	6	10	20	76	7'-8"	6	10	20	76	9'-8"	6	10	20	76	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	21.1	26.3	3,395
26	12	0"	0"	3"	3"	24	4'-3"	52	25'-10"	6	10	22	80	7'-8"	6	10	22	80	9'-8"	6	10	22	80	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	22.0	27.1	3,521
27	12	0"	0"	3"	3"	24	4'-3"	52	26'-10"	6	10	24	84	7'-8"	6	10	24	84	9'-8"	6	10	24	84	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	22.8	27.9	3,647
28	12	0"	0"	3"	3"	24	4'-3"	52	27'-10"	6	10	26	88	7'-8"	6	10	26	88	9'-8"	6	10	26	88	17'-0"	6"	14	15	13'-5"	6"	10	11	15'-5"	6"	13	16	6'-10"	6"	12	15	8'-10"	2.4	2.7	23.7	28.8	3,774

- ⑦ A = First bar spacing at top of wall. Minimum spacing is 3 inches. Maximum spacing is 12 inches. Adjust as necessary.
- ⑧ See Section A-A on sheet 2 for spacing.
- ⑨ Quantity includes 312 lbs. for lid.

BENT BAR DETAILS (RECTANGULAR OPTION)



NOTE: ALL DIMENSIONS SHOWN OUT TO OUT. D = PIN DIAMETER

<p>Iowa Department of Transportation</p>	REVISION
	3 10-16-12
<b>STANDARD ROAD PLAN</b>	<b>SW-547</b>
SHEET 7 of 7	
REVISIONS: Modified notes to indicate circular structure is to be precast.	
<p>APPROVED BY DESIGN METHODS ENGINEER</p>	
<b>TRIPLE-GRATE BARRIER INTAKE</b>	

REINFORCEMENT (RECTANGULAR OPTION)