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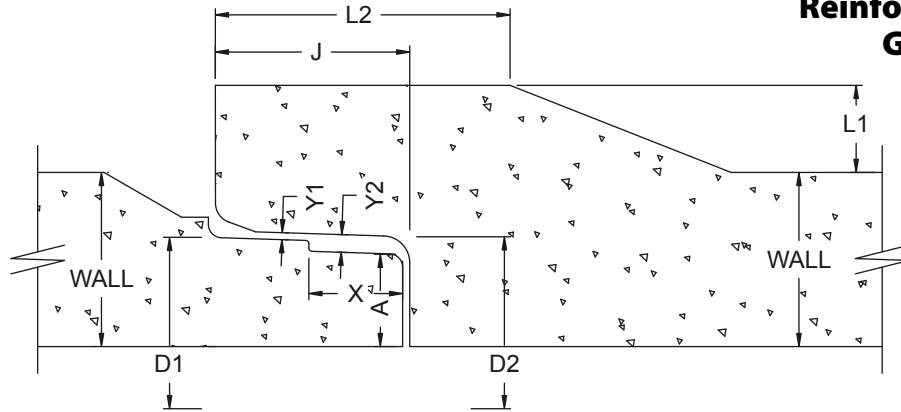
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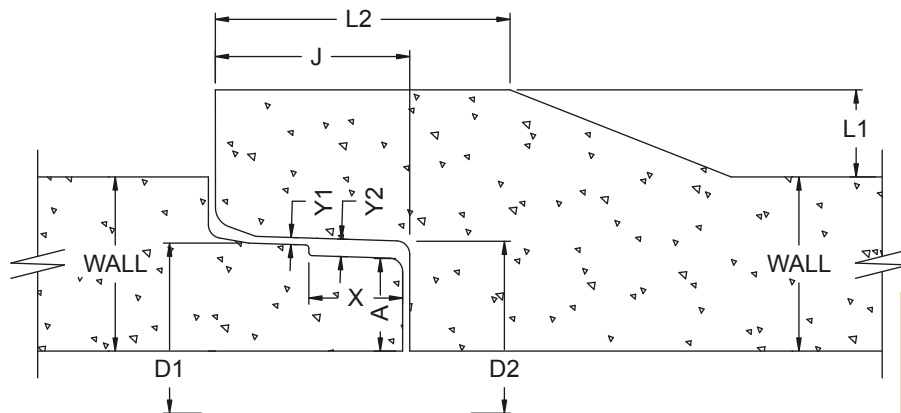
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**Reinforced Concrete Pipe
 Gasket Joint Details
 12" to 36"
 - "C" and "B" Wall**



SECTION VIEW - 27" PIPE AND SMALLER

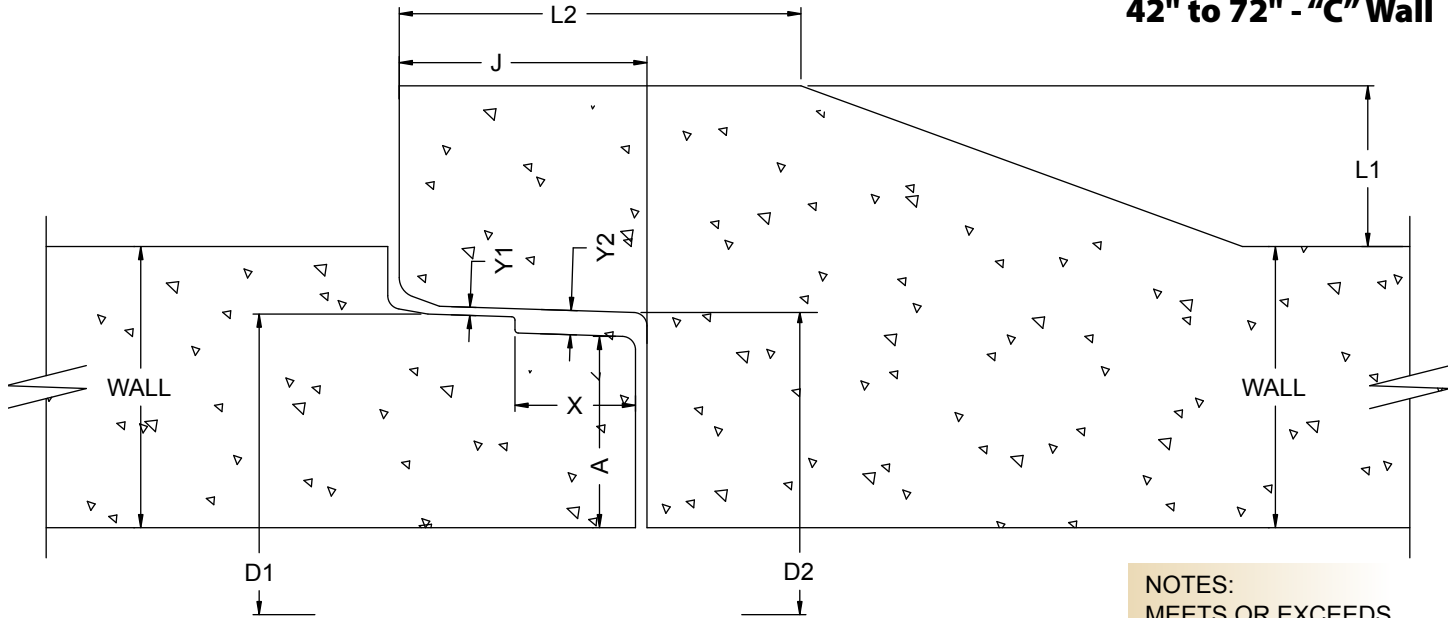


SECTION VIEW - 30" TO 36" PIPE

NOTES:
 MEETS OR EXCEEDS
 THE REQUIREMENTS
 OF ASTM C-76 AND
 ASTM C-443

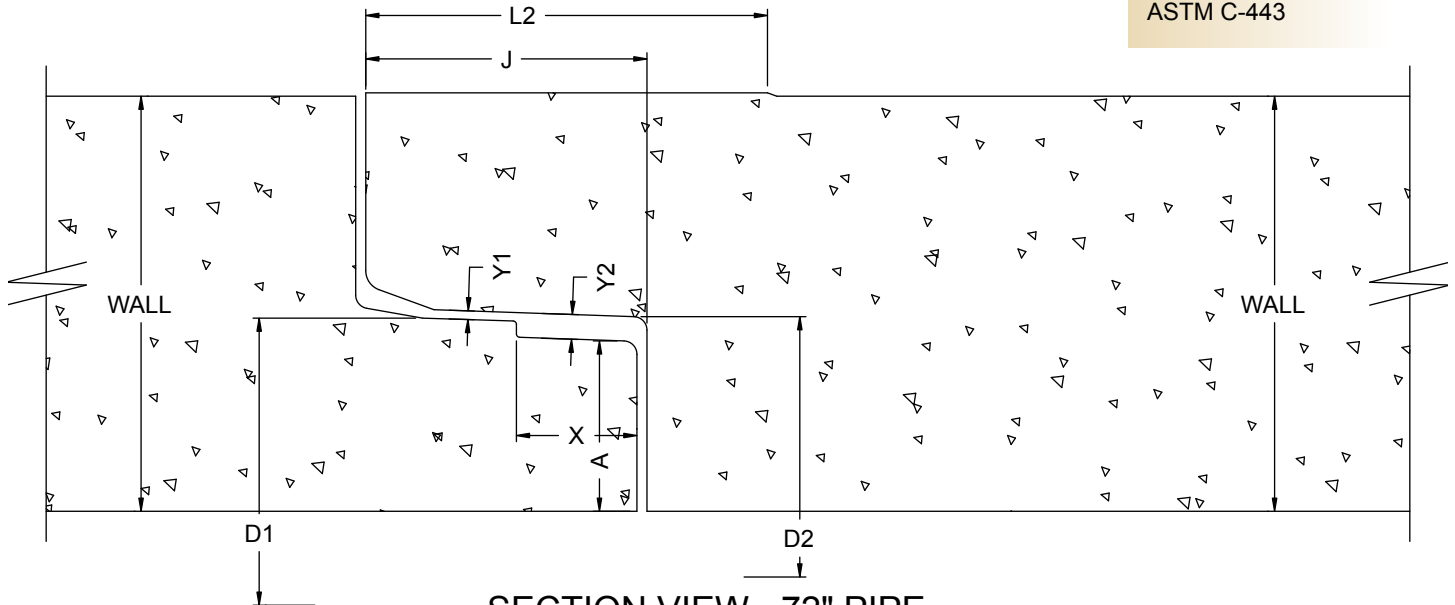
SINGLE OFFSET JOINT FOR RC PIPE								C WALL			
ID	A	D1	D2	J	X	Y1	Y2	WALL	L1	L2	WT./FT.
12"	1.40"	15.155"	15.223"	3 ⁵ / ₈ "	1.750"	0.126"	0.326"	2 ³ / ₄ "	1 ¹ / ₄ "	5 ¹ / ₂ "	140 lbs.
15"	1.65"	18.655"	18.723"	3 ⁵ / ₈ "	1.750"	0.126"	0.326"	3"	1 ⁷ / ₁₆ "	5 ¹ / ₄ "	180 lbs.
18"	1.84"	22.030"	22.098"	3 ⁵ / ₈ "	1.750"	0.126"	0.326"	3 ¹ / ₄ "	1 ⁵ / ₈ "	5 ¹ / ₂ "	230 lbs.
21"	2.16"	25.672"	25.724"	3 ⁷ / ₈ "	1.750"	0.126"	0.326"	3 ¹ / ₂ "	1 ¹³ / ₁₆ "	5 ³ / ₄ "	280 lbs.
24"	2.35"	29.047"	29.099"	3 ⁷ / ₈ "	1.750"	0.126"	0.326"	3 ³ / ₄ "	2"	6"	340 lbs.
27"	2.61"	32.564"	32.608"	4"	1.750"	0.126"	0.326"	4"	2"	6"	410 lbs.
30"	2.66"	35.892"	35.976"	4"	1.750"	0.126"	0.326"	4 ¹ / ₄ "	2"	5 ¹ / ₂ "	480 lbs.
33"	2.91"	39.400"	39.476"	4 ¹ / ₈ "	1.750"	0.126"	0.326"	4 ¹ / ₂ "	2 ¹ / ₈ "	6"	510 lbs.
36"	3.16"	42.900"	42.976"	4 ¹ / ₈ "	1.750"	0.126"	0.326"	4 ³ / ₄ "	2 ³ / ₈ "	7"	630 lbs.
SINGLE OFFSET JOINT FOR RC PIPE								B WALL			
ID	A	D1	D2	J	X	Y1	Y2	WALL	L1	L2	WT./FT.
12"	1.40"	15.155"	15.223"	3 ⁵ / ₈ "	1.750"	0.126"	0.326"	2"	2"	5 ¹ / ₂ "	110 lbs.
15"	1.65"	18.655"	18.723"	3 ⁵ / ₈ "	1.750"	0.126"	0.326"	2 ¹ / ₄ "	2 ³ / ₁₆ "	5 ¹ / ₄ "	150 lbs.
18"	1.84"	22.030"	22.098"	3 ⁵ / ₈ "	1.750"	0.126"	0.326"	2 ¹ / ₂ "	2 ³ / ₈ "	5 ¹ / ₂ "	190 lbs.
21"	2.16"	25.672"	25.724"	3 ⁷ / ₈ "	1.750"	0.126"	0.326"	2 ³ / ₄ "	2 ⁹ / ₁₆ "	5 ³ / ₄ "	240 lbs.
24"	2.35"	29.047"	29.099"	3 ⁷ / ₈ "	1.750"	0.126"	0.326"	3"	2 ³ / ₄ "	6"	315 lbs.
27"	2.61"	32.564"	32.608"	4"	1.750"	0.126"	0.326"	3 ¹ / ₄ "	2 ³ / ₄ "	6"	380 lbs.
30"	2.66"	35.892"	35.976"	4"	1.750"	0.126"	0.326"	3 ¹ / ₂ "	2 ³ / ₄ "	5 ¹ / ₂ "	384 lbs.
36"	3.16"	42.900"	42.976"	4 ¹ / ₈ "	1.750"	0.126"	0.326"	4"	3 ¹ / ₈ "	7"	524 lbs.

**Reinforced Concrete Pipe
 Gasket Joint Details
 42" to 72" - "C" Wall**



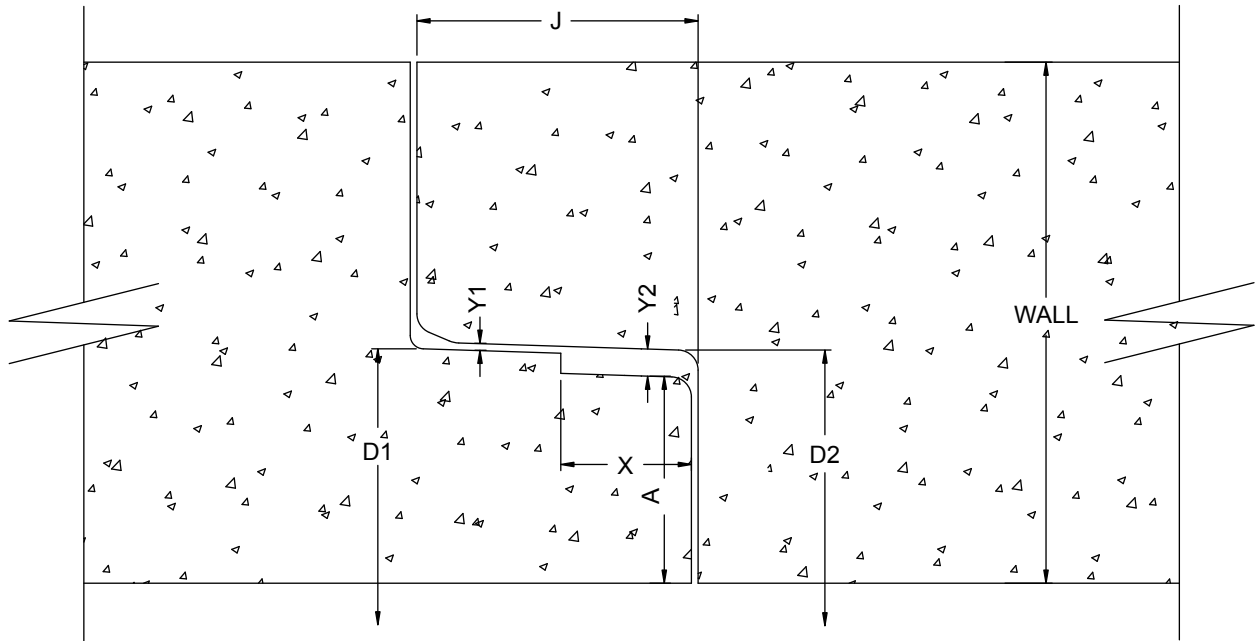
SECTION VIEW - 42" TO 66" PIPE

NOTES:
 MEETS OR EXCEEDS
 THE REQUIREMENTS
 OF ASTM C-76 AND
 ASTM C-443



SECTION VIEW - 72" PIPE

SINGLE OFFSET JOINT FOR RC PIPE								C WALL			
ID	A	D1	D2	J	X	Y1	Y2	WALL	L1	L2	WT./FT.
42"	3.56"	49.977"	50.021"	4 ⁵ / ₈ "	2.250"	0.146"	0.446"	5 ¹ / ₄ "	3"	7 ¹ / ₂ "	810 lbs.
48"	4.07"	56.987"	57.023"	4 ³ / ₄ "	2.250"	0.146"	0.446"	5 ³ / ₄ "	3 ³ / ₈ "	7 ¹ / ₂ "	1010 lbs.
54"	4.06"	62.979"	63.007"	5"	2.250"	0.146"	0.446"	6 ¹ / ₄ "	2 ⁷ / ₈ "	7 ¹ / ₂ "	1230 lbs.
60"	4.06"	68.971"	69.007"	5"	2.250"	0.146"	0.446"	6 ³ / ₄ "	2 ³ / ₈ "	7 ¹ / ₂ "	1470 lbs.
66"	4.06"	74.971"	75.007"	5"	2.250"	0.146"	0.446"	7 ¹ / ₄ "	2"	7 ¹ / ₂ "	1740 lbs.
72"	3.18"	79.214"	79.250"	5 ¹ / ₄ "	2.250"	0.146"	0.446"	7 ³ / ₄ "	1 ¹ / ₁₆ "	7 ¹ / ₂ "	2010 lbs.

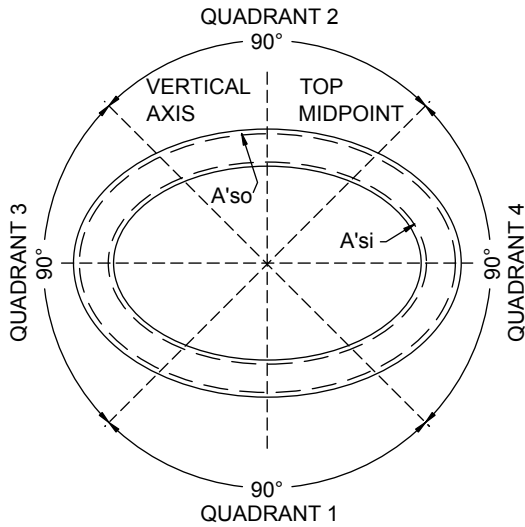
**Reinforced Concrete Pipe
 Gasket Joint Details
 84" to 144"**


84" TO 144" PIPE - SINGLE OFFSET JOINT

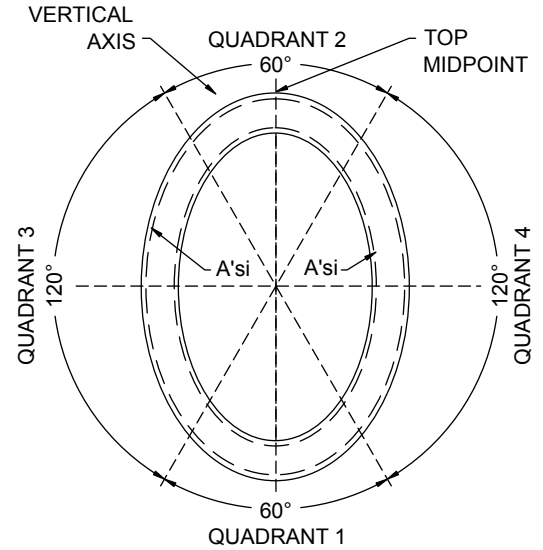
B WALL JOINT PROPERTIES - SINGLE OFFSET											
ID	A	D1	D2	J	X	Y1	Y2	WALL	L1	L2	WEIGHT/FT
84"	3.25"	91.504"	91.500"	5 ¹ / ₄ "	2 ³ / ₄ "	0.146"	0.500"	8"	STRAIGHT WALL		2480
96"	3.63"	104.254"	104.250"	5 ¹ / ₄ "	2 ³ / ₄ "	0.146"	0.500"	9"	STRAIGHT WALL		3080
108"	3.93"	116.922"	116.864"	5 ⁷ / ₈ "	2 ³ / ₄ "	0.146"	0.500"	10"	STRAIGHT WALL		3955
120"	4.21"	128.753"	128.721"	6"	2 ⁵ / ₈ "	0.150"	0.500"	11"	STRAIGHT WALL		4875
144"	4.96"	154.253"	154.221"	6"	2 ⁵ / ₈ "	0.150"	0.500"	12"	STRAIGHT WALL		6680

NOTES:
 MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-443

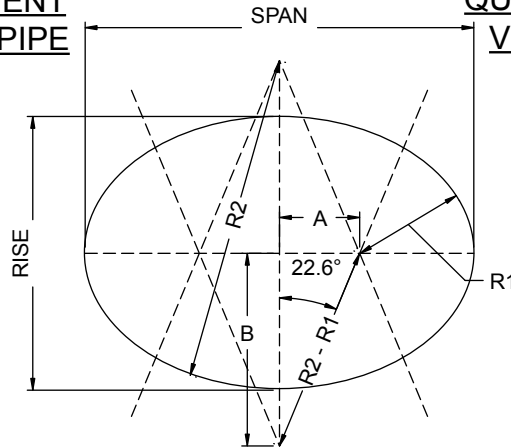
ASTM C-507
Equivalent Elliptical Pipe



QUADRANT REINFORCEMENT
HORIZONTAL ELLIPTICAL PIPE



QUADRANT REINFORCEMENT
VERTICAL ELLIPTICAL PIPE

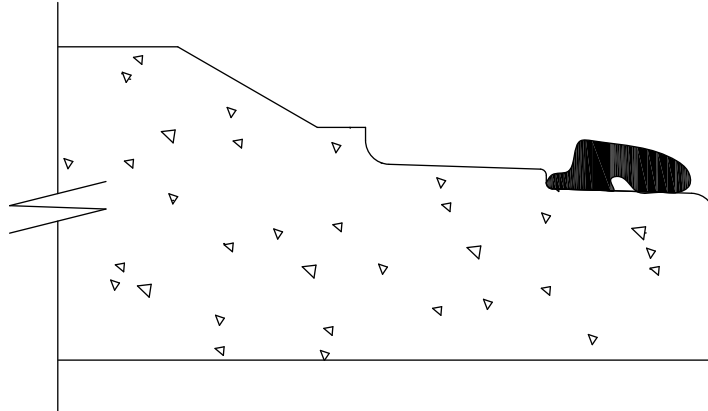


SYMETRICAL ABOUT AXES

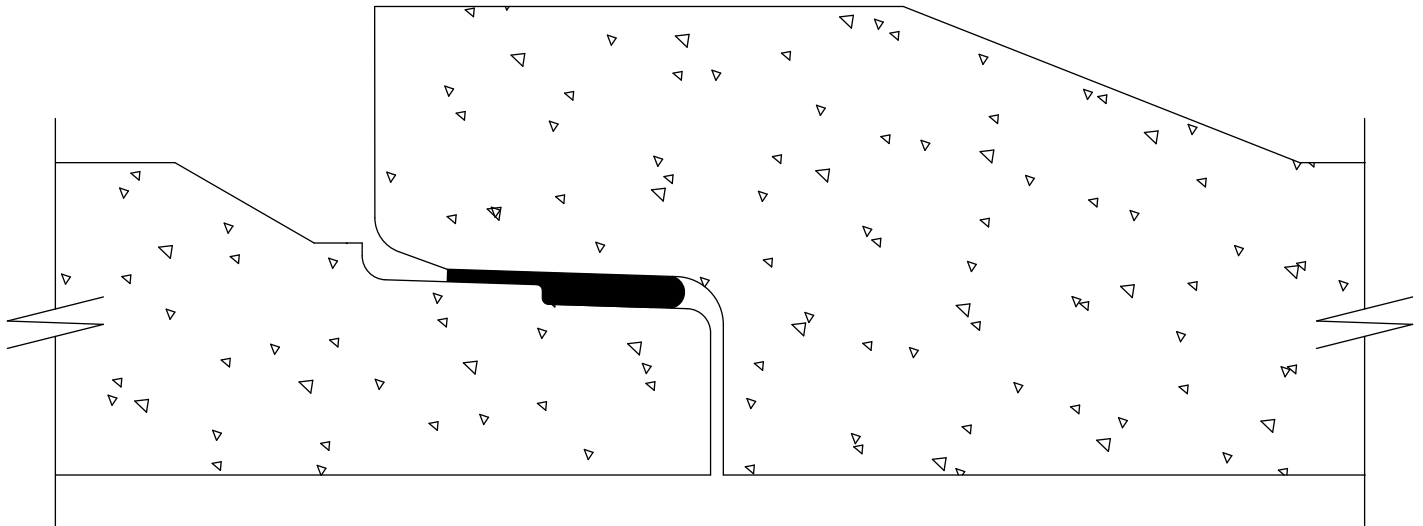
ASTM C-507 EQUIVALENT ELLIPTICAL PIPE - WITH GASKET JOINT

EQUIVALENT ROUND ID	RISE X SPAN, INCHES	FULL FLOW WATER AREA, FT	RISE, INCHES	SPAN, INCHES	A, INCHES	B, INCHES	R1, INCHES	R2, INCHES	° DEGREES	WALL THICKNESS INCHES	WEIGHT PER FOOT
18"	14 X 23	1.83	14 ¹ / ₄	22 ³ / ₄	5 ³ / ₈	12 ⁷ / ₈	6	20	22.6	2 ³ / ₄	195
24"	19 X 30	3.28	19 ¹ / ₄	30 ¹ / ₄	6 ⁷ / ₈	16 ⁵ / ₈	8 ¹ / ₄	26 ¹ / ₄	22.6	3 ³ / ₄	300
30"	24 X 38	5.10	24	37 ³ / ₄	8 ⁵ / ₈	20 ³ / ₄	10 ¹ / ₄	32 ³ / ₄	22.6	3 ³ / ₄	430
36"	29 X 45	7.36	28 ³ / ₄	45 ¹ / ₂	10 ¹ / ₂	24 ⁷ / ₈	12 ¹ / ₄	39 ¹ / ₄	22.6	4 ¹ / ₂	625
42"	34 X 53	10.2	34	53 ¹ / ₄	12 ¹ / ₈	29	14 ¹ / ₂	46	22.6	5	850
48"	38 X 60	12.9	38 ³ / ₄	60	18 ¹ / ₂	32 ³ / ₈	16 ¹ / ₂	51 ¹ / ₂	22.6	5 ¹ / ₂	1090
54"	43 X 68	16.7	43 ¹ / ₂	68	15 ¹ / ₄	36 ³ / ₄	18 ³ / ₄	58 ¹ / ₂	22.6	6	1350
60"	48 X 76	20.5	48 ¹ / ₄	75 ¹ / ₂	17	40 ⁷ / ₈	20 ³ / ₄	65	22.6	6 ¹ / ₂	1475
72"	58 X 91	29.4	57 ³ / ₄	90 ¹ / ₂	20 ¹ / ₂	49 ⁹ / ₈	24 ³ / ₄	78	22.6	7 ¹ / ₂	2040
90"	72 X 113	46.1	72 ¹ / ₂	113	25 ¹ / ₂	61	31	97 ¹ / ₄	22.6	9	3050

**Pre-Lubricated Gasket Profile
for RCP, Elliptical Pipe,
and Manholes**



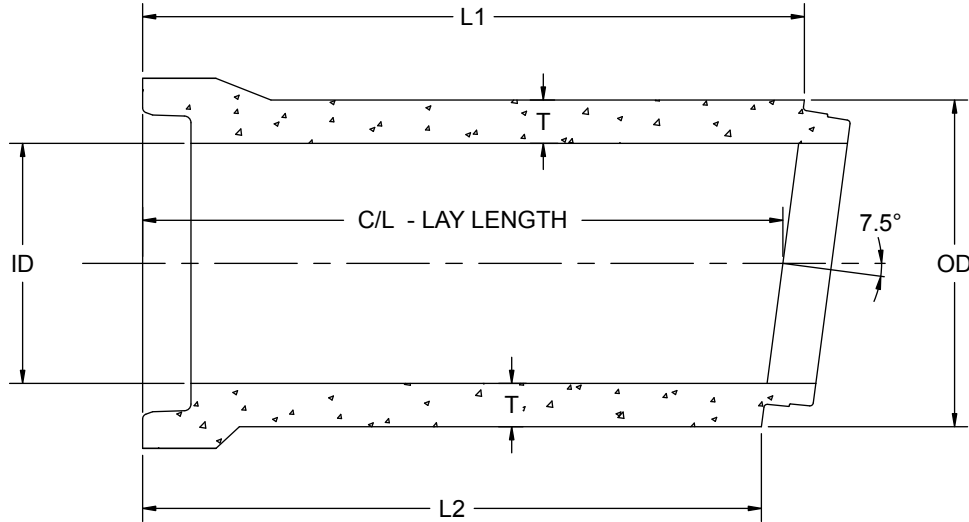
TYPICAL PRE-LUBRICATED GASKET PROFILE



TYPICAL PRE-LUBRICATED GASKET PROFILE

NOTE:
ALL GASKETS MEET OR EXCEED THE PHYSICAL
PROPERTY REQUIREMENTS OF ASTM C-443,
ASTM C-425 AND ASTM C-361

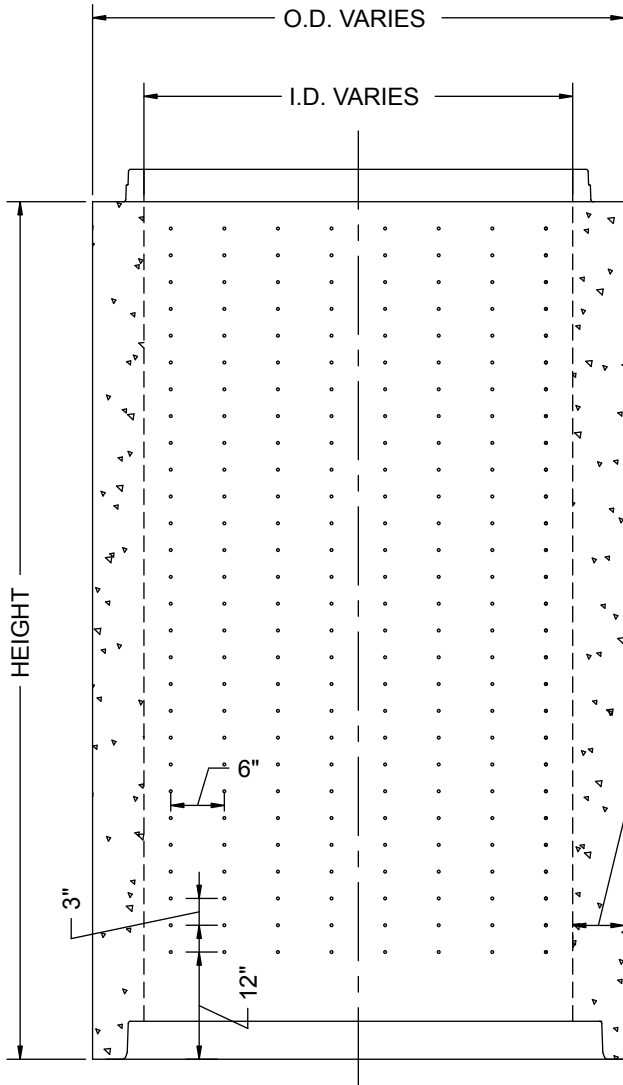
**Reinforced Concrete Pipe
 Mitered - 7-1/2° Bend**



MITERED LONG BEND SINGLE OFFSET JOINT PROPERTIES									
ID	WEIGHT PER SECTION	T	OD	L1	L2	C/L LAY LENGTH	CURVE RADIUS	BEND ANGLE	WALL TYPE
12"	560 lbs	2½"	17"	4'-1⅛"	3'-10⅞"	4'-0"	30'-6"	7.5°	C
15"	720 lbs	3"	21"	4'-1⅜"	3'-10⅝"	4'-0"	30'-6"	7.5°	C
18"	920 lbs	3¼"	24½"	4'-1⅝"	3'-10⅜"	4'-0"	30'-6"	7.5°	C
21"	1120 lbs	3½"	28"	4'-1⅜"	3'-10⅜"	4'-0"	30'-6"	7.5°	C
24"	1360 lbs	3¾"	31½"	4'-2⅛"	3'-9⅛"	4'-0"	30'-6"	7.5°	C
27"	1640 lbs	4"	35"	4'-2⅝"	3'-9⅛"	4'-0"	30'-6"	7.5°	C
30"	1920 lbs	4¼"	38½"	4'-2⅞"	3'-9⅛"	4'-0"	30'-6"	7.5°	C
33"	2040 lbs	4½"	42"	4'-2⅞"	3'-9⅜"	4'-0"	30'-6"	7.5°	C
36"	2520 lbs	4¾"	45½"	4'-3"	3'-9"	4'-0"	30'-6"	7.5°	C
42"	3240 lbs	5¼"	52½"	4'-3½"	3'-8⅞"	4'-0"	30'-6"	7.5°	C
48"	4040 lbs	5¾"	59½"	4'-3⅝"	3'-8⅞"	4'-0"	30'-6"	7.5°	C
54"	4920 lbs	6"	66"	4'-4⅜"	3'-7⅝"	4'-0"	30'-6"	7.5°	C
60"	5880 lbs	6¾"	73½"	4'-4⅞"	3'-7⅝"	4'-0"	30'-6"	7.5°	C
66"	7500 lbs	7¼"	79½"	4'-4⅝"	3'-7⅝"	4'-0"	30'-6"	7.5°	C
72"	8040 lbs	7¾"	87½"	4'-5"	3'-7"	4'-0"	30'-6"	7.5°	C
84"	9920 lbs	8"	100"	4'-6⅞"	3'-5⅞"	4'-0"	30'-6"	7.5°	C
96"	12,320 lbs	9"	114"	4'-7"	3'-5"	4'-0"	30'-6"	7.5°	C

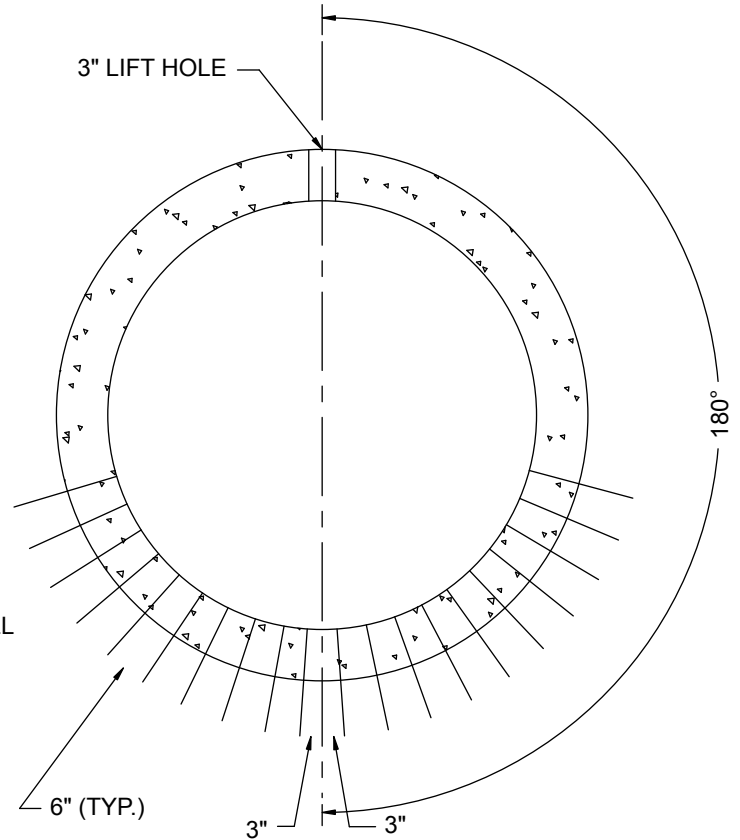
NOTES:
 MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-443

ASTM C-444
Reinforced Concrete
Perforated Pipe
12" to 144"



SECTION VIEW

5/16" HOLES: 3" O.C. VERTICAL
6" O.C. HORIZONTAL - 20 ROWS WIDE.



TOP VIEW

NOTES:

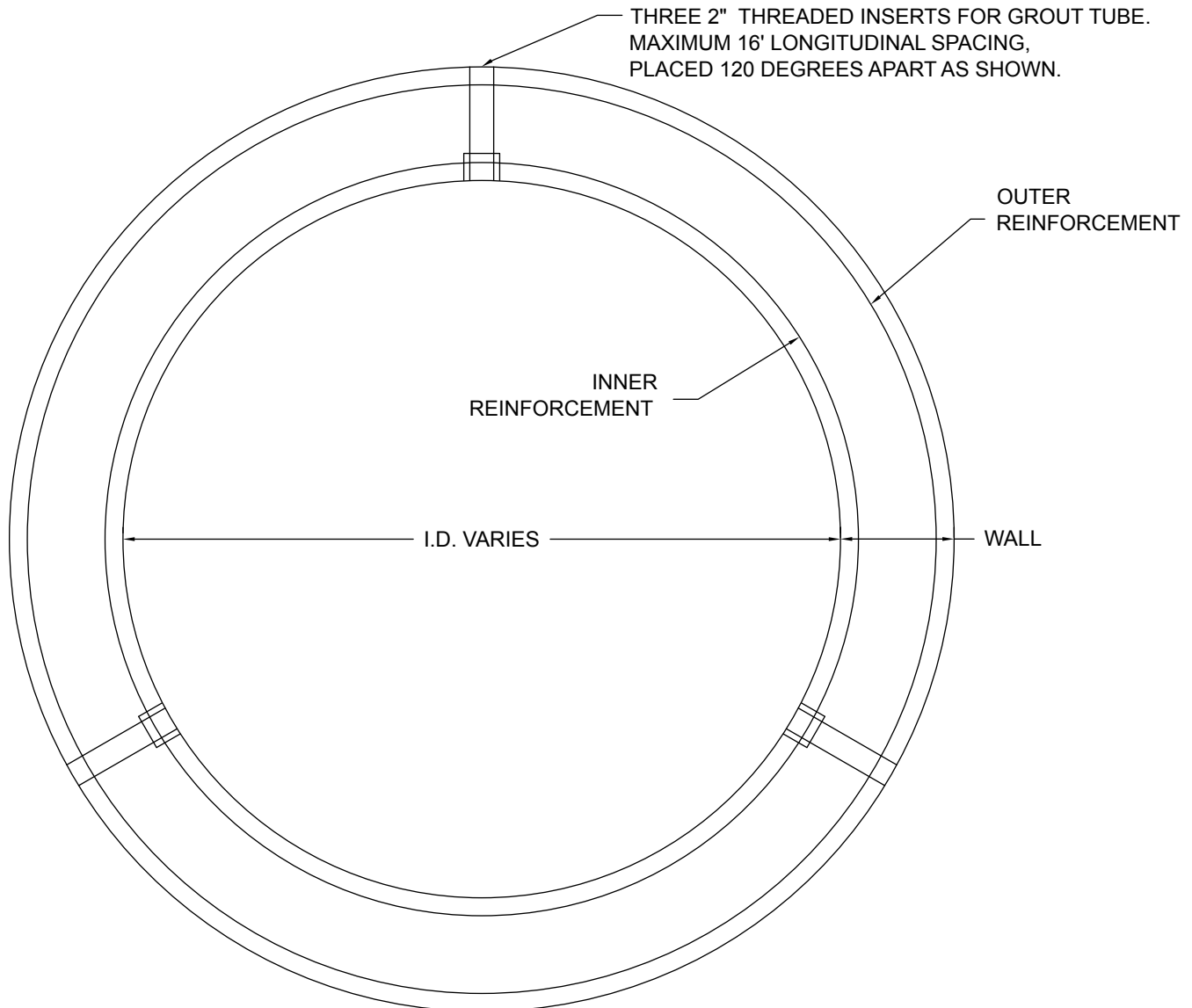
SEE JOINT DETAILS FOR SPECIFICATIONS.

AVAILABLE IN 12" TO 144" I.D. SIZES.

HOLE SIZE AND SPACING VARIABLE BY PROJECT SPECIFICATIONS.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76, ASTM C-443 AND ASTM C-444.

**Reinforced Concrete
Jacking Pipe
36" to 96"**



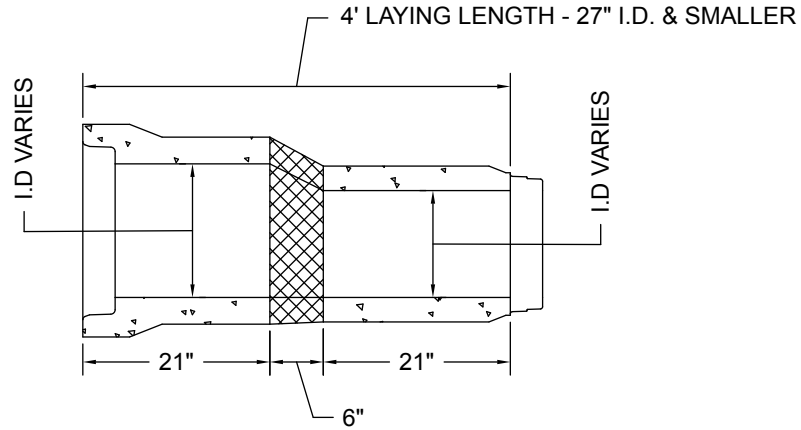
TOP VIEW

JACKING PIPE I.D. & O.D.

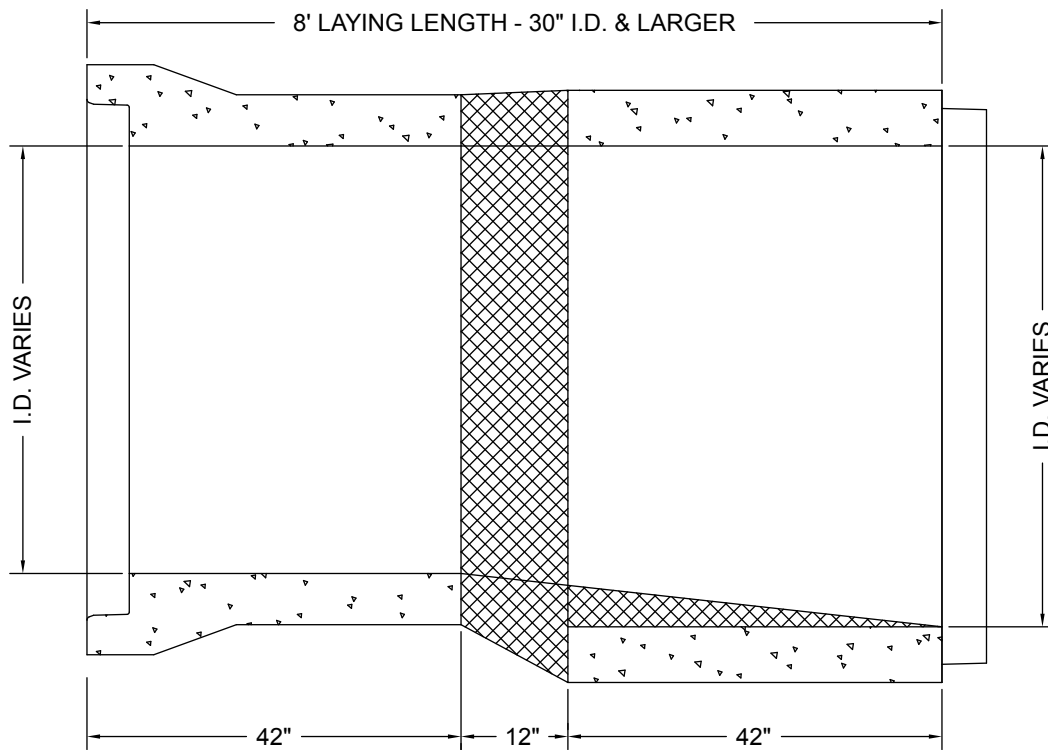
SIZE	INSIDE DIAMETER	WALL THICKNESS	OUTSIDE DIAMETER
36" JACKING PIPE	36"	7 1/2"	51"
42" JACKING PIPE	42"	8"	58"
48" JACKING PIPE	48"	8 1/2"	65"
54" JACKING PIPE	54"	9"	72"
60" JACKING PIPE	60"	9 1/2"	79"
66" JACKING PIPE	66"	10"	86"
72" B- WALL	72"	7"	86"
72" C- WALL	72"	7 3/4"	87 1/2"
84" B- WALL	84"	8"	100"
96" B- WALL	96"	9"	114"

NOTES:
JOINT WILL COMPLY
FOR RUBBER GASKETS
PER: ASTM C-443.

**Reinforced Concrete Pipe
Increases and Reducers**



SECTION VIEW - 27" AND SMALLER



SECTION VIEW - 30" AND LARGER

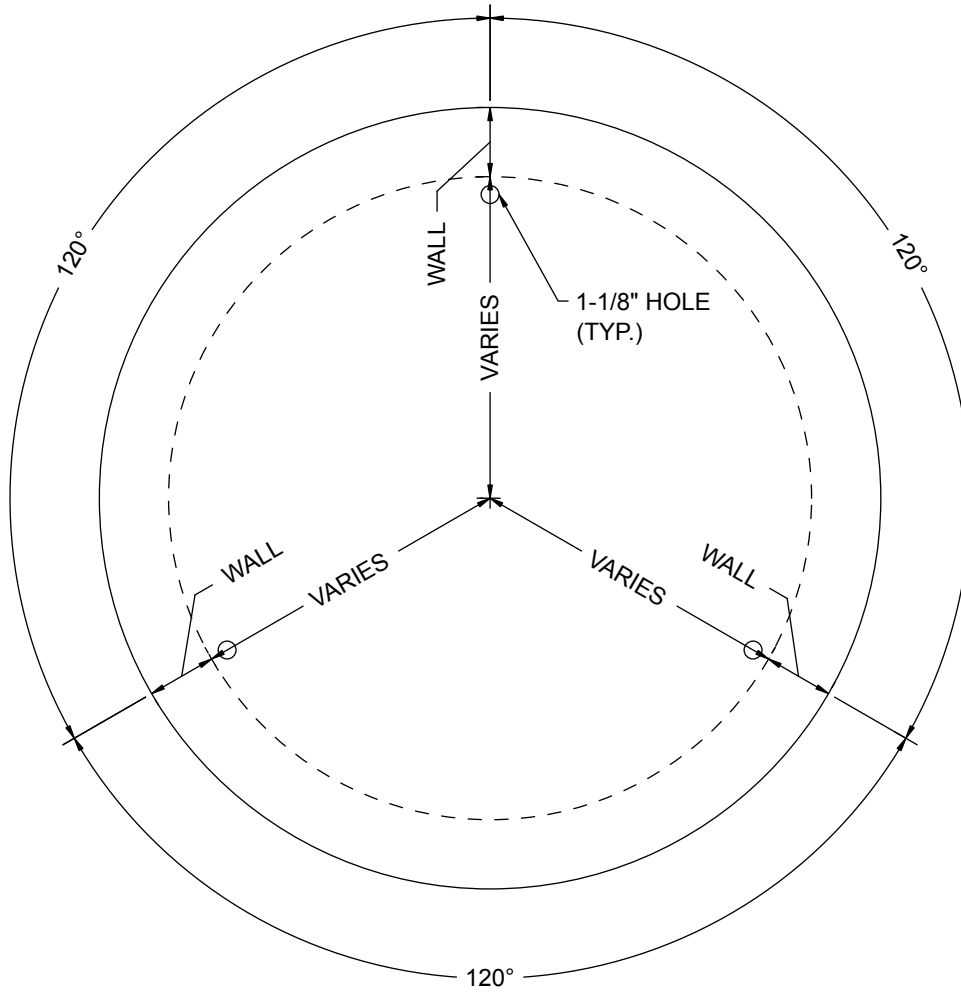
NOTES:

SEE PIPE JOINT DETAILS FOR SPECIFICATIONS.

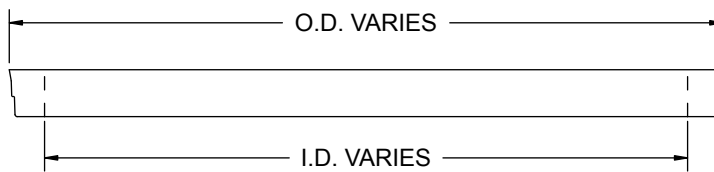
SPECIALLY FABRICATED FOR REQUIRED REDUCTIONS OR INCREASE.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-443.

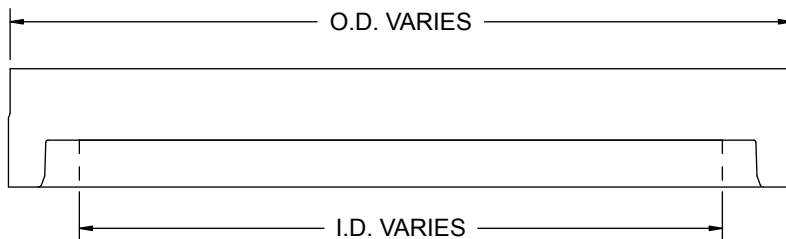
**Reinforced Concrete Pipe
Bell and Spigot Plugs**



TOP VIEW



BELL PLUG SECTION VIEW



SPIGOT PLUG SECTION VIEW

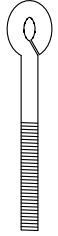
NOTES:

SEE JOINT DETAILS FOR SPECIFICATIONS.

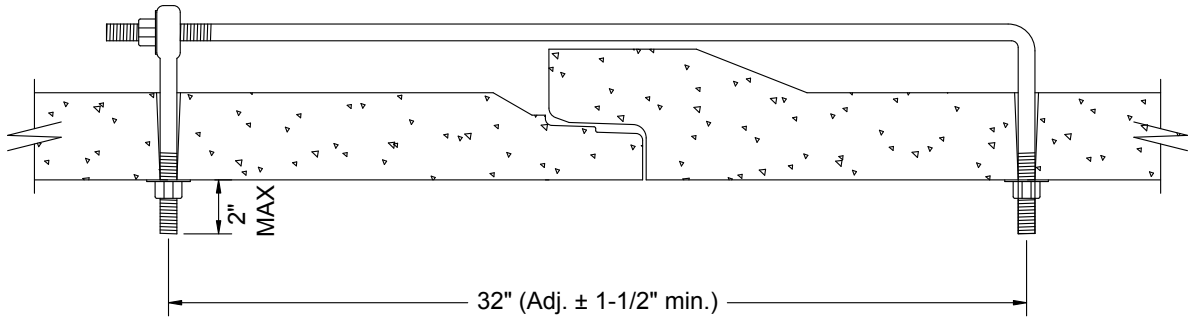
BELL & SPIGOT DIMENSIONS VARY BY PIPE SIZE.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-443

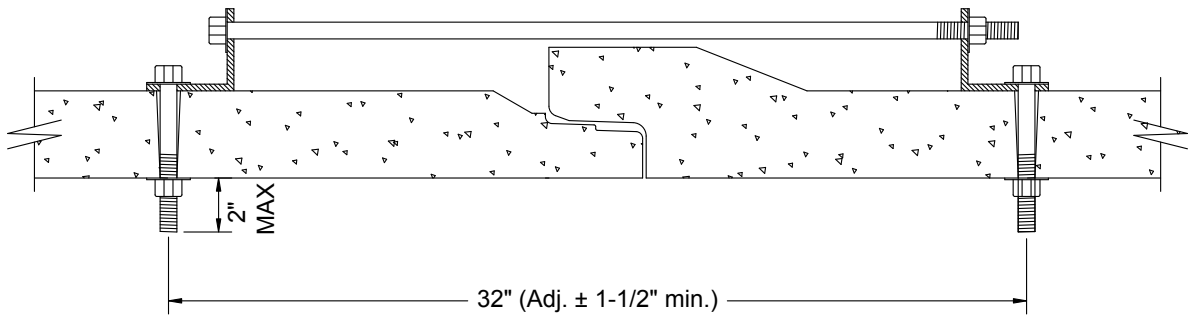
**Reinforced Concrete Pipe
Joint Ties**



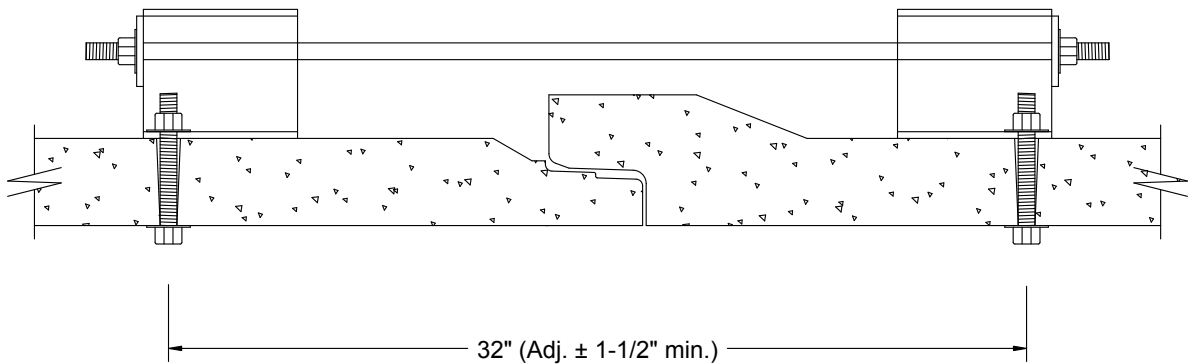
1 PIECE
FORMED
EYE BOLT



PIPE TIE - ADJUSTABLE/ GALVANIZED OR PAINTED

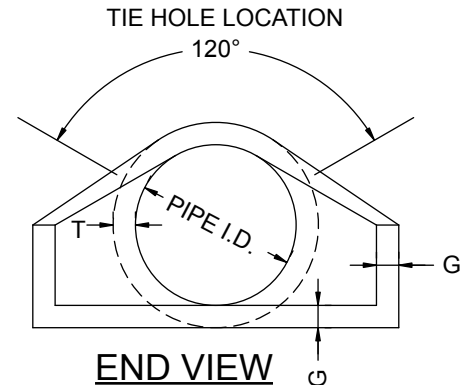
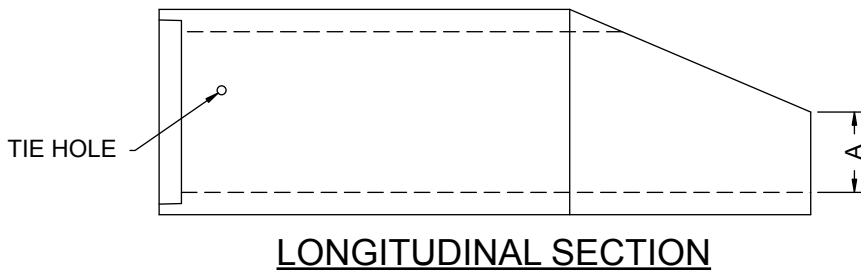
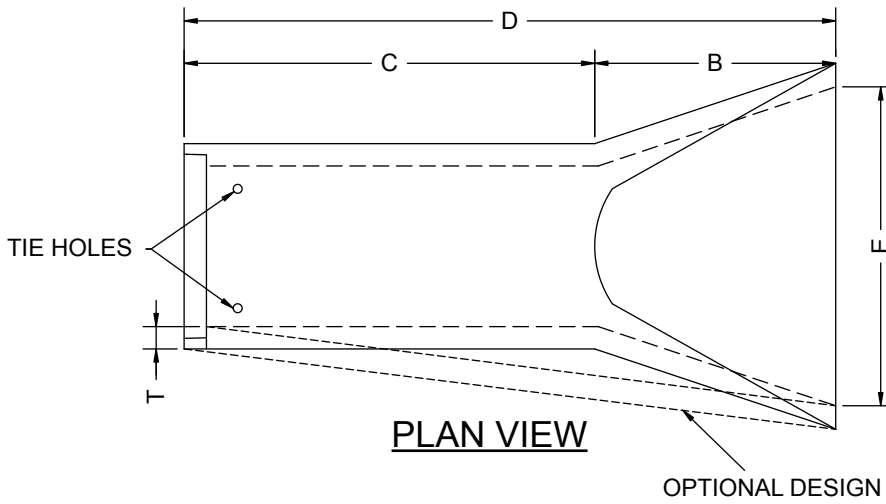


PIPE TIE - HEAVY DUTY/ GALVANIZED OR PAINTED



WASHINGTON COUNTY, MN STANDOFF CULVERT TIE/ GALVANIZED

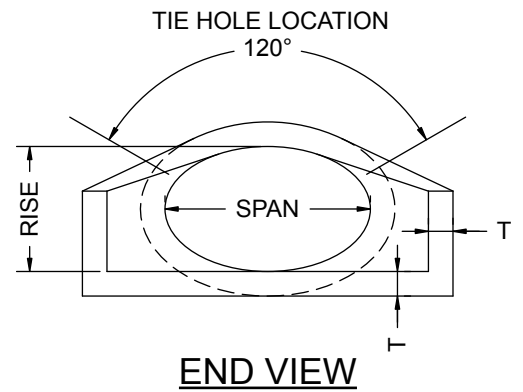
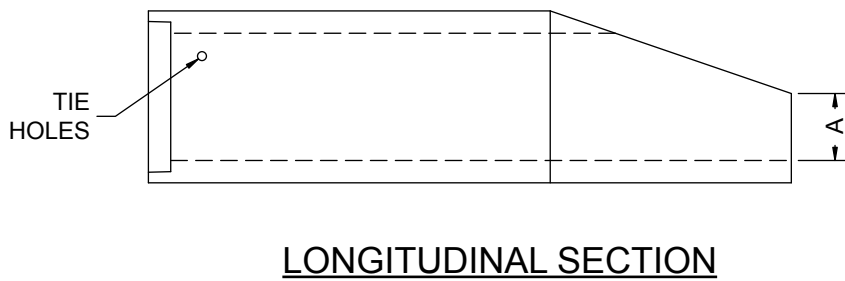
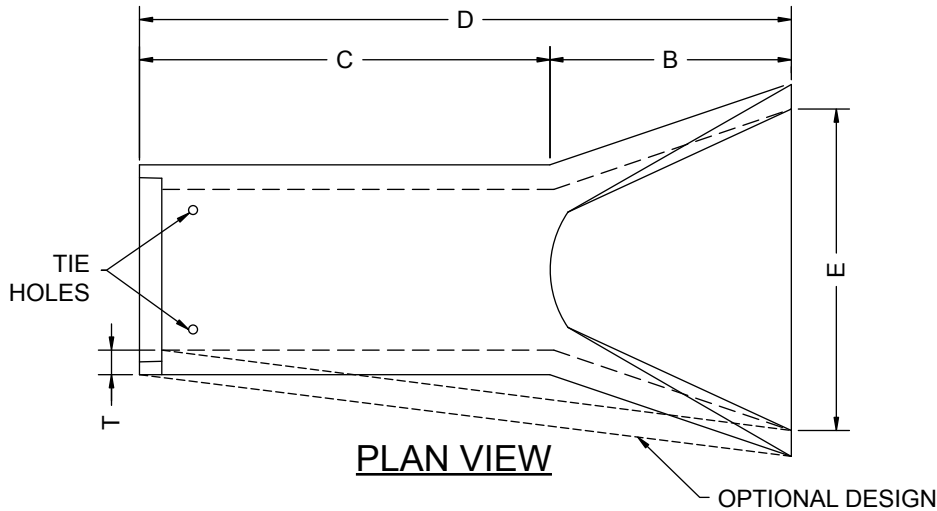
Reinforced Concrete Aprons 12" to 84"



DIMENSIONS IN INCHES							
ID (in)	T	A	B	C	D	E	G
12	2	4	24	48 ⁷ / ₈	72 ⁷ / ₈	24	2
15	2 ¹ / ₄	6	27	46	73	30	2 ¹ / ₄
18	2 ¹ / ₂	9	27	46	73	36	2 ¹ / ₂
21	2 ³ / ₄	9	36	37 ¹ / ₂	73 ¹ / ₂	42	2 ³ / ₄
24	3	9 ¹ / ₂	43 ¹ / ₂	30	73 ¹ / ₂	48	3
27	3 ¹ / ₄	10 ¹ / ₂	49 ¹ / ₂	24	73 ¹ / ₂	54	3 ¹ / ₄
30	3 ¹ / ₂	12	54	19 ³ / ₄	73 ¹ / ₂	60	3 ¹ / ₂
33	3 ³ / ₄	13 ¹ / ₂	58 ¹ / ₂	19 ³ / ₄	73 ¹ / ₂	66	3 ³ / ₄
36	4	15	63	34 ³ / ₄	97 ³ / ₄	72	4
42	4 ¹ / ₂	21	63	35	98	78	4 ¹ / ₂
48	5	24	72	26	98	84	5
54	5 ¹ / ₂	27	65	33 ¹ / ₄	98 ¹ / ₄	90	5 ¹ / ₂
60	6	35	60	39	99	96	5
66	6 ¹ / ₂	35 ¹ / ₂	69	30	99	102	5
72	7	36	78	21	99	108	6
84	8	37	96	39	99	120	6

NOTES:
 MEETS OR EXCEEDS
 THE REQUIREMENTS
 OF ASTM C-76 AND
 ASTM C-443

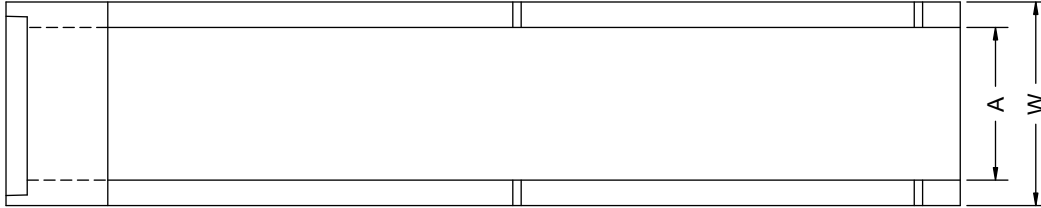
**Reinforced Concrete
 Elliptical Aprons
 18" to 60" Equivalent**



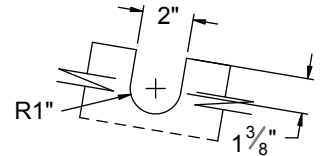
DIMENSIONS IN INCHES								
EQUIVALENT DIAMETER	SPAN	RISE	T	A	B	C	D	E
18	23	14	2 ³ / ₄	7 ¹ / ₂	27	45	72	36
24	30	19	3 ¹ / ₄	8 ¹ / ₂	39	33	72	48
30	38	24	3 ³ / ₄	9 ¹ / ₂	54	18	72	60
36	45	29	4 ¹ / ₂	11 ¹ / ₈	60	24	84	72
42	53	34	5	15 ³ / ₄	60	36	96	78
48	60	38	5 ¹ / ₂	21	60	36	96	84
54	68	43	6	25 ¹ / ₂	60	36	96	90
60	76	48	6 ¹ / ₂	30	60	36	96	96

NOTES:
 MEETS OR EXCEEDS
 THE REQUIREMENTS
 OF ASTM C-443 AND
 ASTM C-507

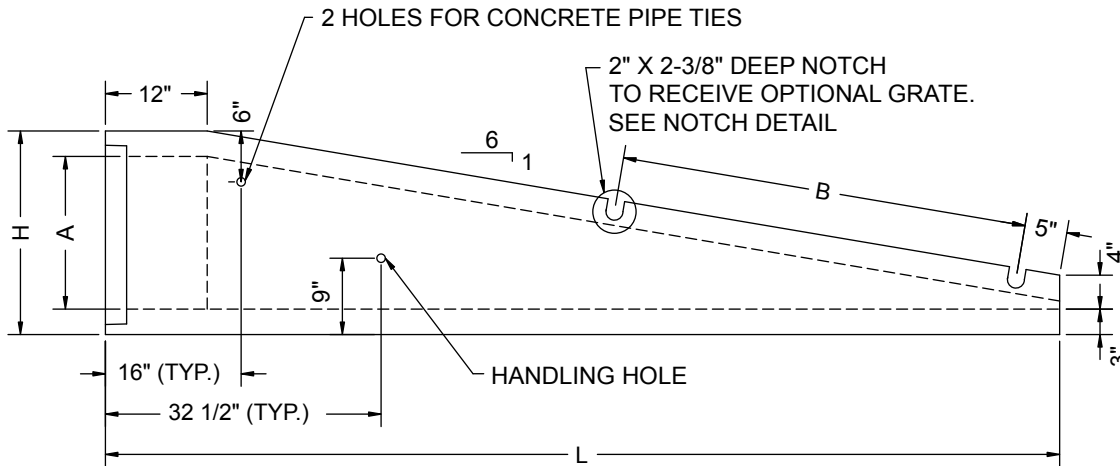
**Reinforced Concrete
 Safety Aprons
 15" to 24"**



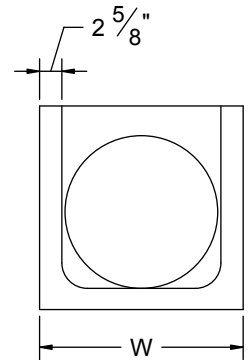
TOP VIEW



NOTCH DETAIL



LONGITUDINAL SECTION



END VIEW

1:6 SLOPES				
I.D. A	B C.L. to C.L.	H	L	W
15"	4' - 0"	24"	9' - 4 1/2"	24"
18"	4' - 0"	24"	9' - 4 1/2"	24"
24"	6' - 0"	30"	12' - 4"	30"

1:4 SLOPES				
I.D. A	B C.L. to C.L.	H	L	W
24"	4' - 0"	30"	8' - 5"	30"

SPECIFICATION NOTES:

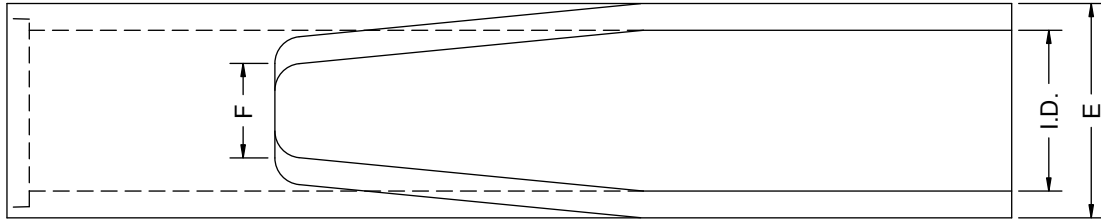
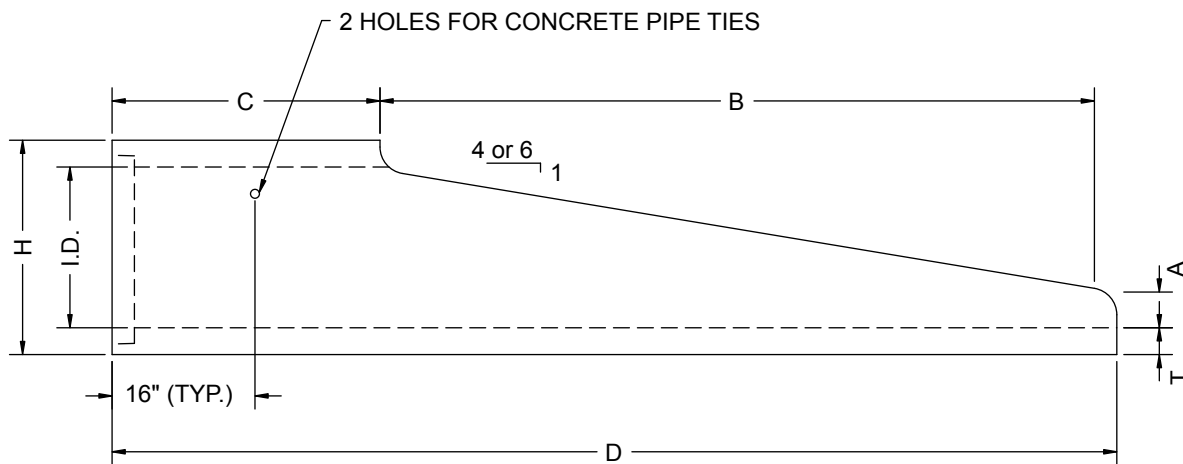
REINFORCING STEEL AND CONCRETE PER ASHTO M170.

OPTIONAL GALVANIZED BARS ALSO AVAILABLE.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-443.

STEEL DESIGN IN ACCORDANCE WITH A.S.T.M. C-478 0.12 SQ. IN./FT.

ALL REINFORCING DESIGNED FOR 1" MINIMUM COVER.

**Reinforced Concrete
 Safety Aprons
 12" to 24"**

TOP VIEW

LONGITUDINAL SECTION

1:6 SLOPES								
I.D.	T	A	B	C	D	E	F	H
12"	2"	4"	42"	30"	72"	16"	6"	16"
15"	2 $\frac{1}{4}$ "	4"	60"	24"	84"	19 $\frac{1}{2}$ "	8"	19 $\frac{1}{2}$ "
18"	2 $\frac{1}{2}$ "	4"	81"	15"	96"	23"	10"	23"
24"	3"	4"	120"	24"	144"	30"	11"	30"

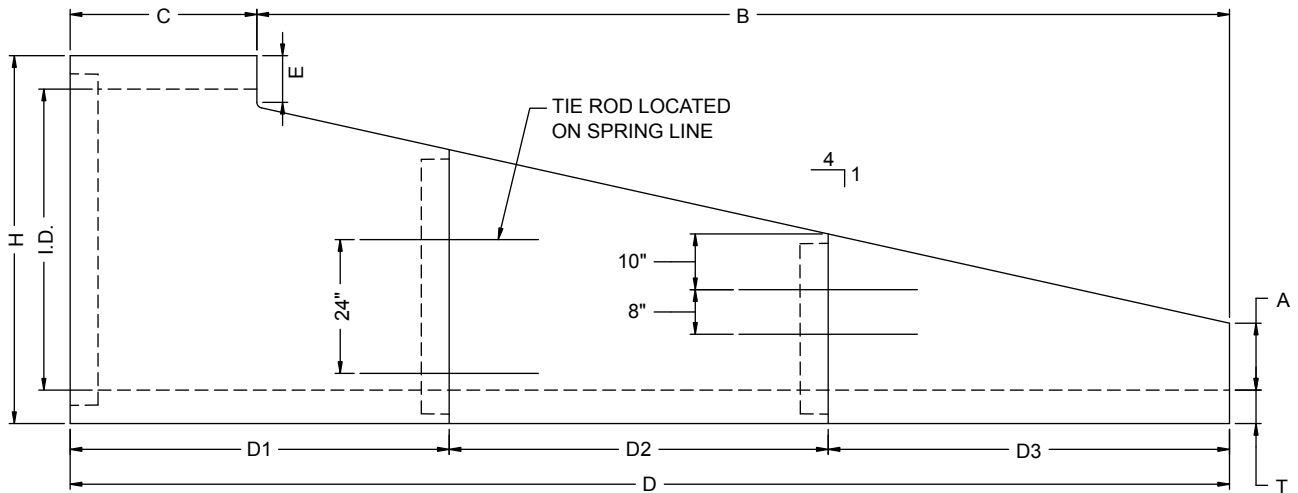
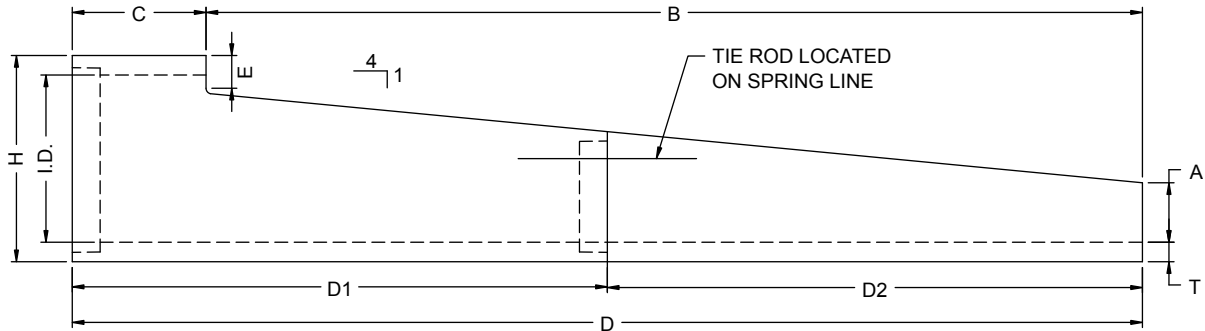
1:4 SLOPES								
I.D.	T	A	B	C	D	E	F	H
18"	2 $\frac{1}{2}$ "	4"	46"	26"	72"	23"	10"	23"
24"	3"	4"	72"	24"	96"	30"	11"	30"

SPECIFICATION NOTES:

REINFORCEMENT AND CONCRETE CONFORMS TO MN STANDARD RCP CLASS 2.

OPTIONAL GALVANIZED BARS ALSO AVAILABLE.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-443.

**Reinforced Concrete
 Safety Aprons
 30" to 72"**


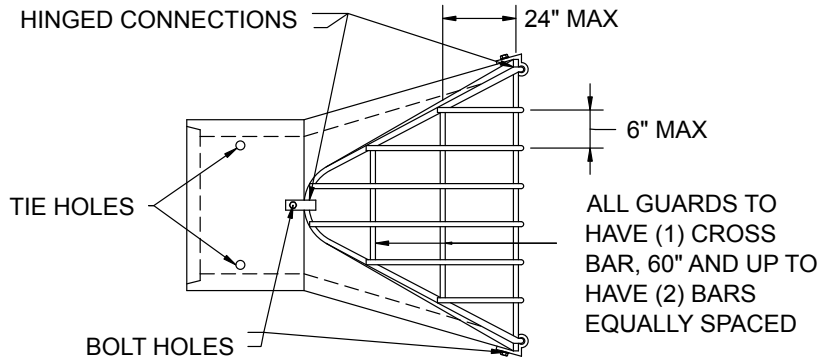
2 PIECE SLOPED SAFETY APRONS									
I.D.	T	A	B	C	D	D1	D2	E	H
30"	3½"	9⅝"	72"	24"	102"	102"	None	5⅞"	37"
36"	4"	12"	87"	15"	102"	102"	None	6¼"	44"
42"	4½"	12"	110½"	33½"	144"	72"	72"	6⅞"	51"
48"	5"	12"	134½"	33½"	168"	96"	72"	7⅞"	58"
54"	5½"	12"	136½"	33½"	192"	96"	96"	7⅞"	65"

3 PIECE SLOPED SAFETY APRONS										
I.D.	T	A	B	C	D	D1	D2	D3	E	H
60"	6"	12"	182½"	33½"	216"	72"	72"	72"	8⅜"	72"
72"	7"	12"	230½"	33½"	264"	96"	96"	72"	9⅜"	86"

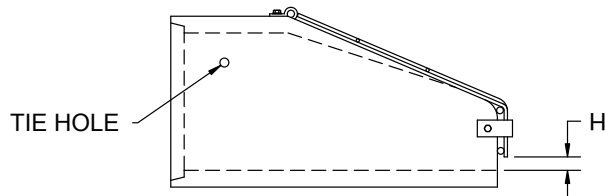
SPECIFICATION NOTES:

- REINFORCEMENT AND CONCRETE CONFORMS TO MN STANDARD RCP CLASS 2.
- OPTIONAL GALVANIZED BARS ALSO AVAILABLE.
- MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-443.

**Galvanized Trash Guards
 12" to 84" RCP and
 18" to 60" Equivalent Elliptical**

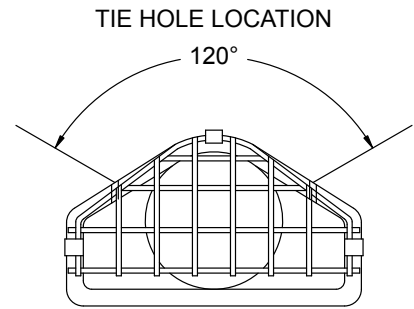


TOP VIEW



HOT DIP GALVANIZED PER
 MNDOT 3392 OR ASTM-A153

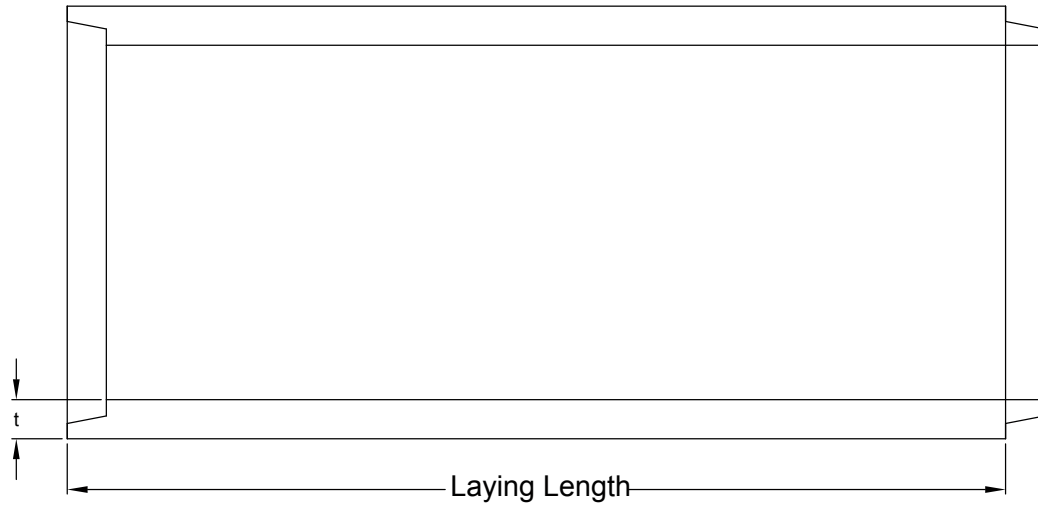
LONGITUDINAL SECTION



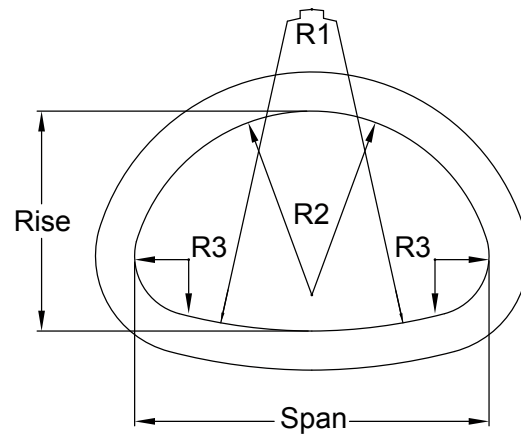
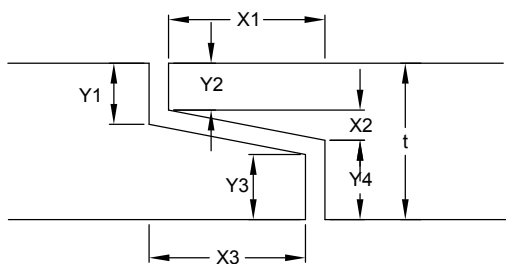
END VIEW

PIPE SIZE	HOLE ID	BOLT ID	BAR SIZE	H	PIPE SIZE	EQUIVALENT ID	HOLE ID	BOLT ID	BAR SIZE	H
12"	3/4"	5/8"	3/4"	2 1/2"	14" x 23"	18"	3/4"	5/8"	3/4"	3"
15"	3/4"	5/8"	3/4"	3"	19" x 30"	24"	3/4"	5/8"	3/4"	4"
18"	3/4"	5/8"	3/4"	4"	24" x 38"	30"	7/8"	3/4"	1"	5"
21"	7/8"	3/4"	1"	4"	29" x 45"	36"	7/8"	3/4"	1"	5"
24"	7/8"	3/4"	1"	4"	34" x 53"	42"	7/8"	3/4"	1"	6"
27"	7/8"	3/4"	1"	5"	38" x 60"	48"	7/8"	3/4"	1"	6"
30"	7/8"	3/4"	1"	5"	43" x 68"	54"	7/8"	3/4"	1"	6"
33"	7/8"	3/4"	1"	5"	48" x 76"	60"	7/8"	3/4"	1"	7"
36"	7/8"	3/4"	1"	5"						
42"	7/8"	1"	1"	6"						
48"	7/8"	1"	1 1/4"	6"						
54"	1 1/8"	1"	1 1/4"	6"						
60"	1 1/8"	1"	1 1/4"	7"						
66"	1 1/8"	1"	1 1/4"	7"						
72"	1 1/8"	1"	1 1/4"	7"						
84"	1 1/8"	1"	1 1/4"	7"						

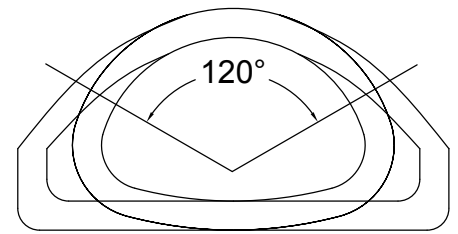
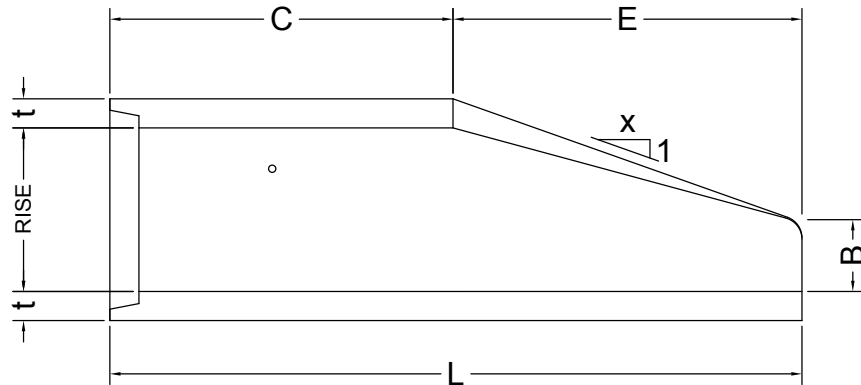
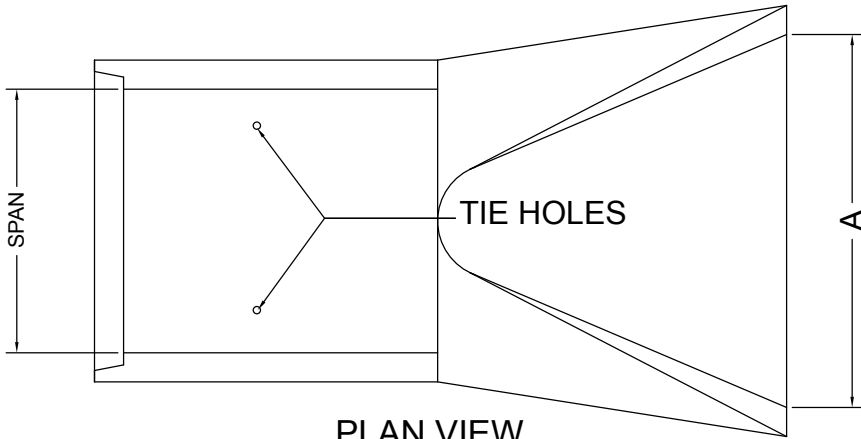
ASTM C-506
Reinforced Concrete
Arch Pipe



TONGUE & GROOVE JOINT DETAIL

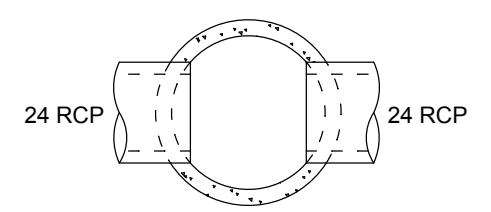
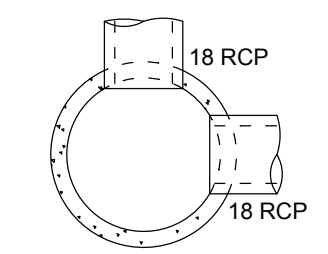
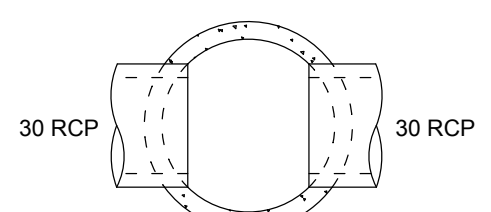
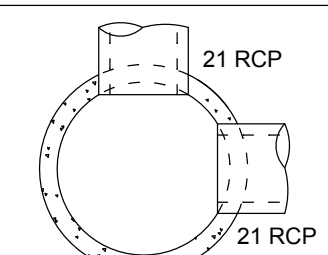
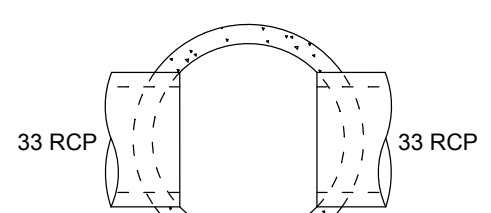
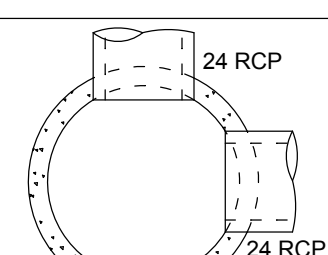
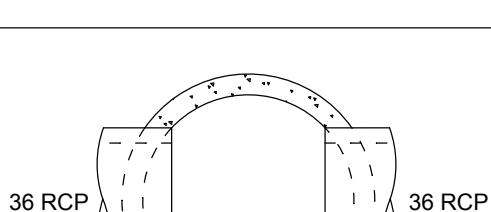
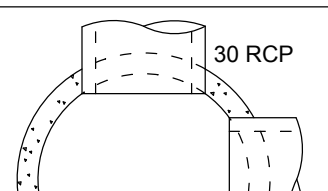
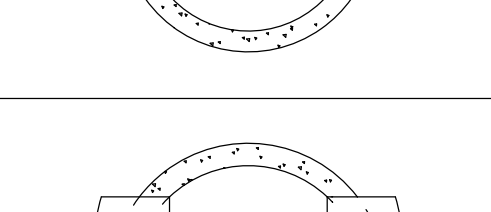
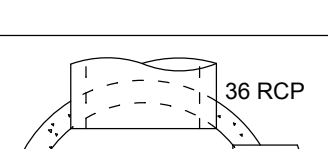


ASTM C-506 REINFORCED CONCRETE ARCH PIPE															
NOMINAL SPAN (IN)	EQUIV. DIA. (IN)	WATER AREA (SQ. FT.)	RISE (IN)	SPAN (IN)	"t" (IN)	X1, X3 (IN)	X2 (IN)	Y1 (IN)	Y2 (IN)	Y3 (IN)	Y4 (IN)	R1 (IN)	R2 (IN)	R3 (IN)	WEIGHT (LBS/FT)
22	18	1.7	13.5	22.0	2.5	2	.375	1.375	1.125	0.75	1.00	27.5	13.75	5.25	194
29	24	2.8	18.0	28.5	3.5	3	.500	1.625	1.375	1.38	1.63	40.7	14.75	4.63	329
36	30	4.4	22.5	36.3	4.0	4	.625	1.813	1.563	1.56	1.81	51.0	18.75	6.13	485
44	36	6.4	26.6	43.8	4.5	4	.750	2.000	1.750	1.75	2.00	62.0	22.50	6.50	643
51	42	8.8	31.3	51.1	4.5	4	.750	2.000	1.750	1.75	2.00	73.0	26.25	7.75	740
58	48	11.4	36.0	58.5	5.0	5	.750	2.250	2.000	2.00	2.25	84.0	30.00	8.88	973
65	54	14.0	40.0	65.0	5.5	5	.750	2.500	2.250	2.25	2.50	92.5	33.38	10.00	1184
73	60	17.7	45.0	73.0	6.0	5	.750	3.313	2.750	1.94	2.50	105.0	37.50	11.00	1440
88	72	25.6	54.0	88.0	7.0	6	1.00	3.813	3.250	2.81	2.75	126.0	45.00	13.31	1988
102	84	34.6	62.0	102.0	8.0	6	1.00	4.125	3.500	2.88	3.50	162.5	52.00	14.50	2490

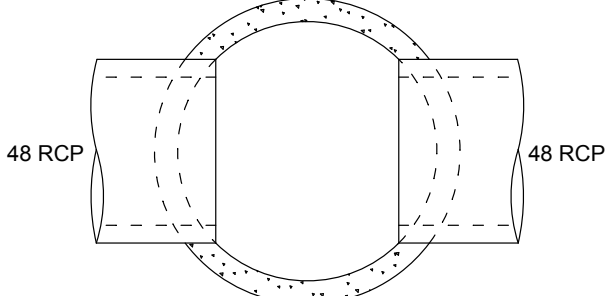
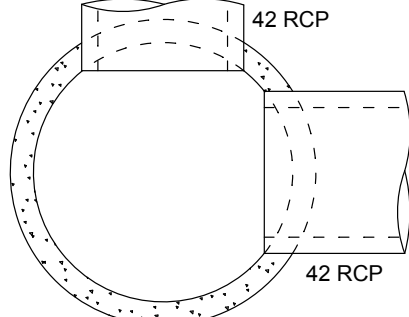
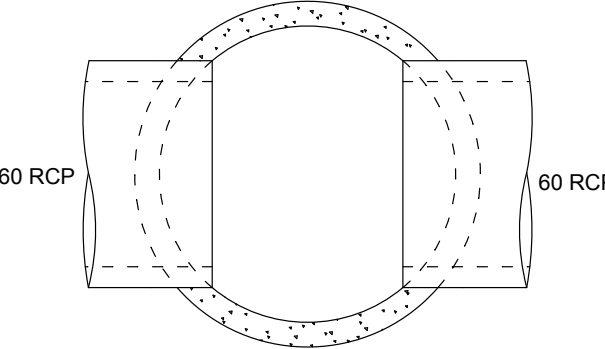
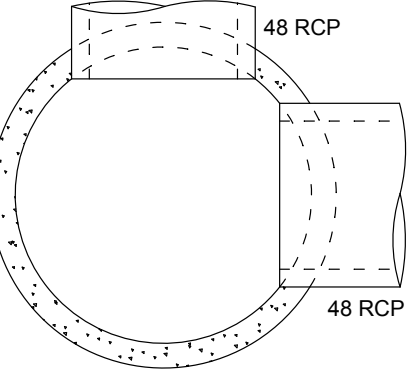
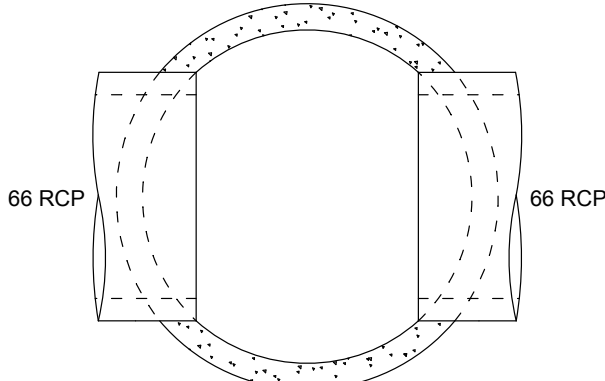
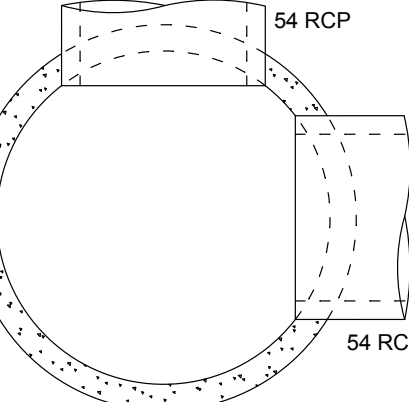
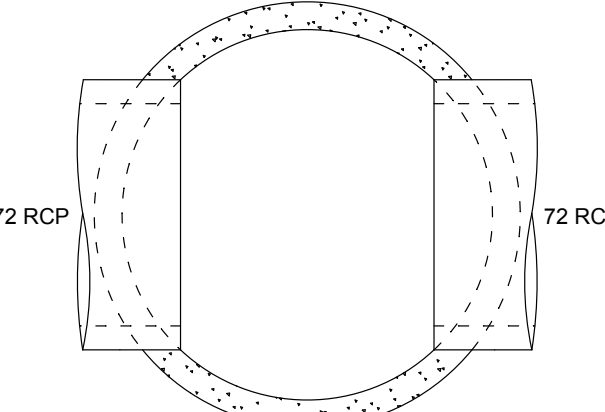
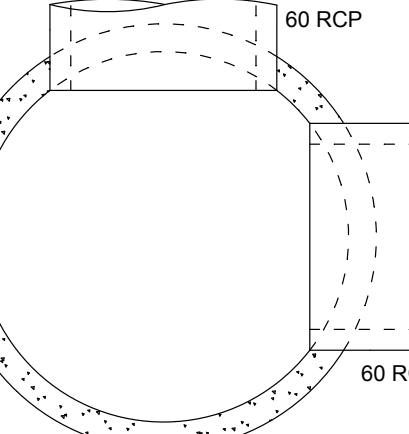
**Reinforced Concrete
 Arch Pipe Apron**


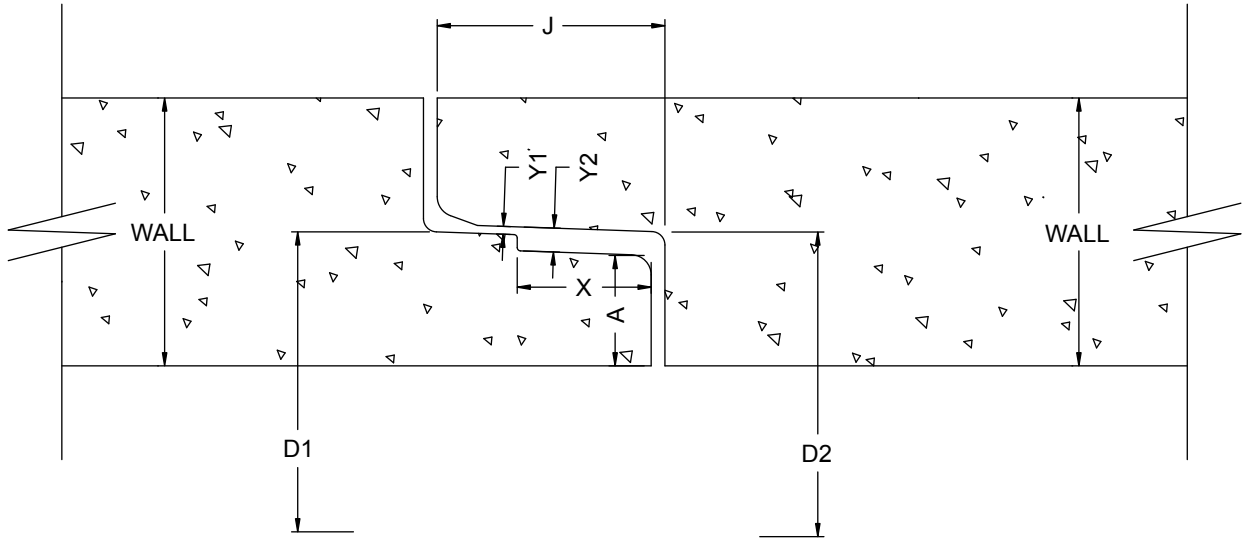
ARCH PIPE APRON											
NOMINAL SPAN (IN)	EQUIV. DIA. (IN)	RISE (IN)	SPAN (IN)	SLOPE (X)	"t" (IN)	A (IN)	B (IN)	C (FT)	E (FT)	L (FT)	WEIGHT PER SECTION (LBS)
22	18	13.5	22.0	3	2.5	35.5	8.50	3.7	2.2	0.75	1140
29	24	18.0	28.5	3	3.5	48.0	8.25	2.6	3.1	1.38	1630
36	30	22.5	36.3	3	4.0	59.3	9.50	3.6	4.0	1.56	3270
44	36	26.6	43.8	3	4.5	72.0	12.0	2.8	4.8	1.75	4310
51	42	31.3	51.1	3	4.5	76.5	18.5	2.7	4.9	1.75	5060
58	48	36.0	58.5	3	5.0	83.3	22.3	2.6	4.9	2.00	6260
65	54	40.0	65.0	3	5.5	102.0	25.5	3.2	4.8	2.25	7780
73	60	45.0	73.0	3	6.0	94.0	30.5	2.7	4.8	1.94	10400
88	72	54.0	88.0	2	7.0	120.0	30.0	3.3	5.0	2.81	13600
102	84	62.0	102.0	2	8.0	144.0	28.5	1.6	6.9	2.88	18000

**Reinforced Concrete Structure
 Sizing Chart 48" to 72"**

MANHOLE DIAMETER	MAXIMUM PIPE SIZE FOR PRECAST STRUCTURES	
	STRAIGHT	RIGHT ANGLE
48"	 <p>24 RCP 24 RCP</p>	 <p>18 RCP 18 RCP</p>
54"	 <p>30 RCP 30 RCP</p>	 <p>21 RCP 21 RCP</p>
60"	 <p>33 RCP 33 RCP</p>	 <p>24 RCP 24 RCP</p>
66"	 <p>36 RCP 36 RCP</p>	 <p>30 RCP 30 RCP</p>
72"	 <p>42 RCP 42 RCP</p>	 <p>36 RCP 36 RCP</p>

Reinforced Concrete Structure Sizing Chart 84" to 120"

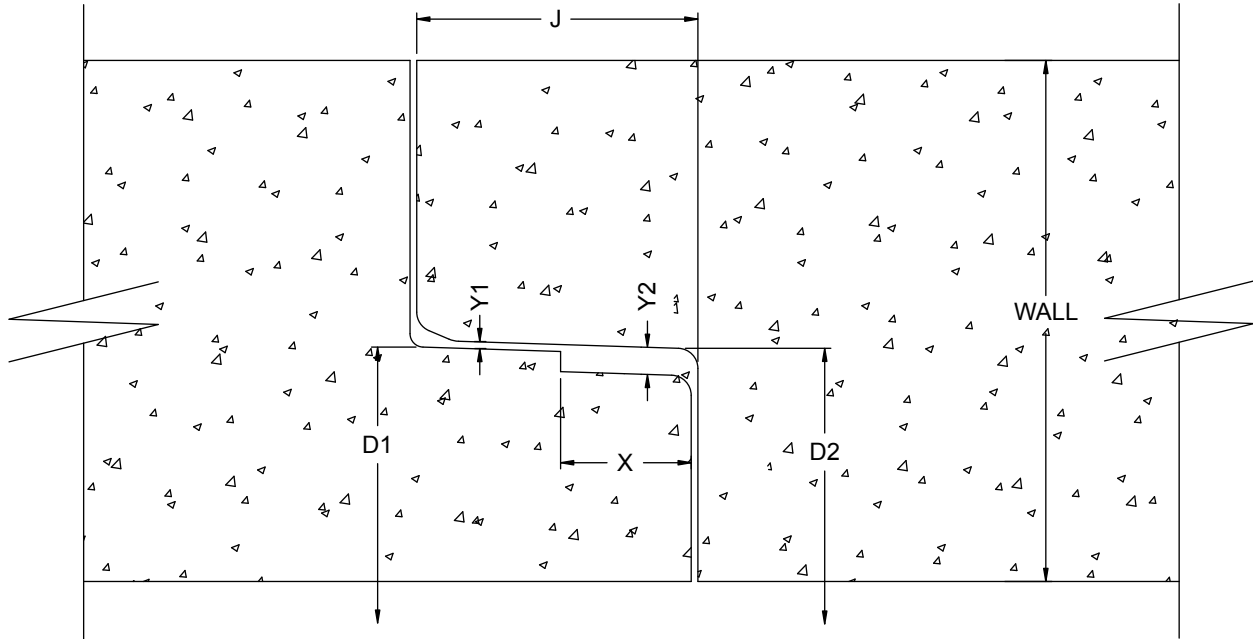
MANHOLE DIAMETER	MAXIMUM PIPE SIZE FOR PRECAST STRUCTURES	
	STRAIGHT	RIGHT ANGLE
84"	 <p>48 RCP</p>	 <p>42 RCP</p> <p>42 RCP</p>
96"	 <p>60 RCP</p>	 <p>48 RCP</p> <p>48 RCP</p>
108"	 <p>66 RCP</p>	 <p>54 RCP</p> <p>54 RCP</p>
120"	 <p>72 RCP</p>	 <p>60 RCP</p> <p>60 RCP</p>

**Reinforced Concrete Manhole
 Gasket Joint Details
 48" to 72" - "B" Wall**


SECTION VIEW - 48" TO 72" MANHOLE

SINGLE OFFSET JOINT FOR MANHOLES - B WALL									
ID	A	D1	D2	J	X	Y1	Y2	WALL	WT./FT.
48"	2.04"	52.918"	52.966"	4 ¹ / ₄ "	2.50"	0.146"	0.446"	5"	880
54"	2.07"	58.972"	57.028"	4 ¹ / ₄ "	2.50"	0.146"	0.446"	5 ¹ / ₂ "	1088
60"	2.14"	65.154"	65.175"	4 ³ / ₄ "	2.50"	0.146"	0.446"	6"	1300
66"	2.39"	71.671"	71.675"	5"	2.50"	0.146"	0.446"	6 ¹ / ₂ "	1570
72"	2.53"	77.949"	77.953"	5"	2.50"	0.146"	0.446"	7"	1840

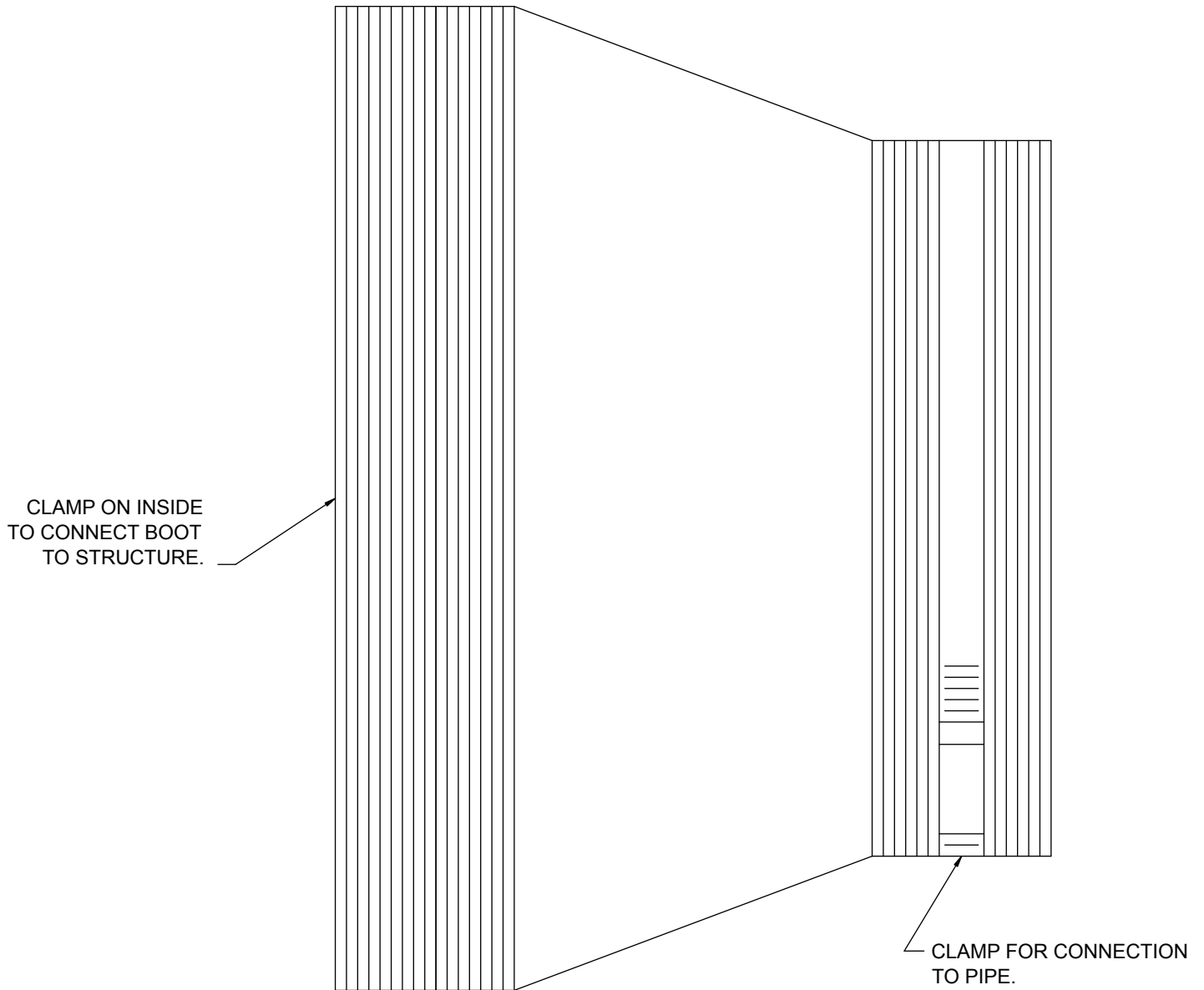
NOTES:
 MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-443 AND ASTM C-478

**Reinforced Concrete Manhole
 Gasket Joint Details
 84" to 144" – "B" Wall**

84" TO 144" MANHOLES - SINGLE OFFSET JOINT

B WALL JOINT PROPERTIES - SINGLE OFFSET											
ID	A	D1	D2	J	X	Y1	Y2	WALL	L1	L2	WEIGHT/FT
84"	3.25"	91.504"	91.500"	5 ¹ / ₄ "	2 ³ / ₄ "	0.146"	0.500"	8"	STRAIGHT WALL		2480
96"	3.63"	104.254"	104.250"	5 ¹ / ₄ "	2 ³ / ₄ "	0.146"	0.500"	9"	STRAIGHT WALL		3080
108"	3.93"	116.922"	116.864"	5 ⁷ / ₈ "	2 ³ / ₄ "	0.146"	0.500"	10"	STRAIGHT WALL		3955
120"	4.21"	128.753"	128.721"	6"	2 ⁵ / ₈ "	0.150"	0.500"	11"	STRAIGHT WALL		4875
144"	4.96"	154.253"	154.221"	6"	2 ⁵ / ₈ "	0.150"	0.500"	12"	STRAIGHT WALL		6680

NOTES:
 MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-443 AND ASTM C-478

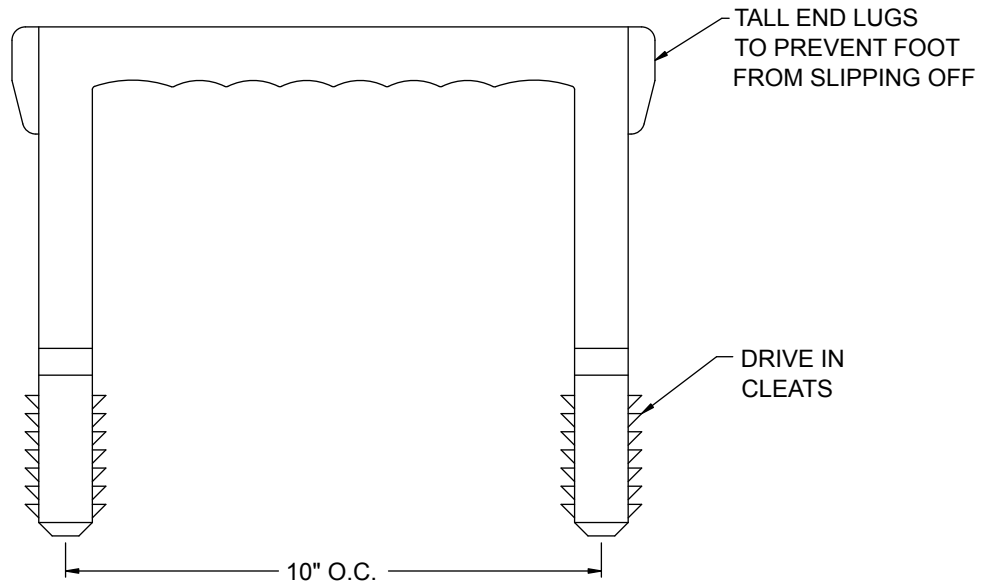
Rubber Watertight Pipe to Structure Boot



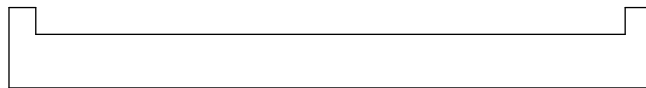
NOTE:

ALL BOOTS ARE MADE OF CORROSION RESISTANT RUBBER WITH ALL STAINLESS STEEL COMPONENTS WHICH MEET OR EXCEED ALL REQUIREMENTS OF ASTM C-923, ASTM C-1478 AND ASTM C-1244.

**Polypropylene
Manhole Steps**



POLYPROPYLENE STEP - TOP VIEW



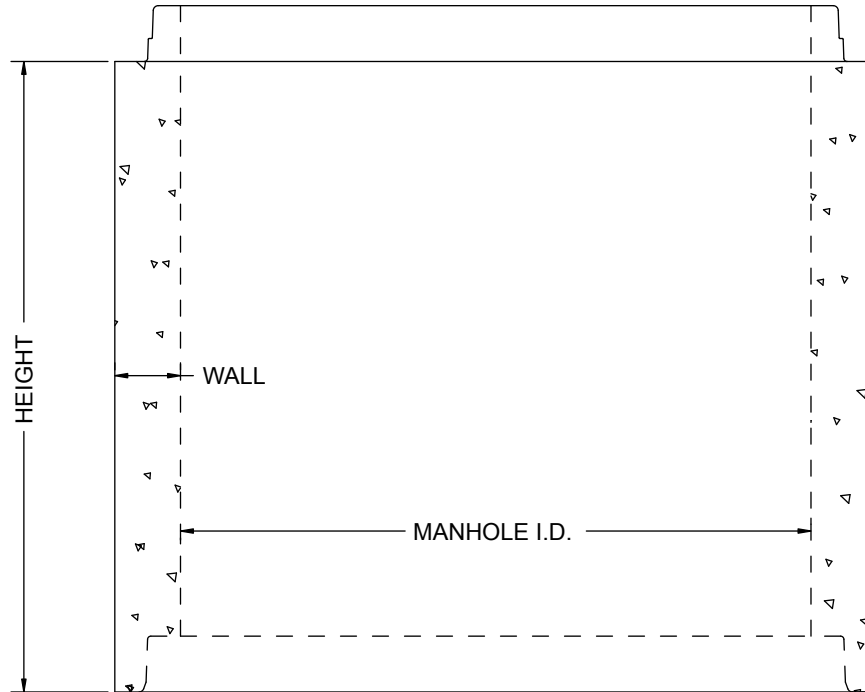
POLYPROPYLENE STEP - FRONT VIEW

NOTES:

ALL POLYPROPYLENE STEPS MEET THE REQUIREMENTS OF ASTM C-478 AND AASHTO M-199.

STEPS CAN BE DRIVEN INTO TWO PARALLEL 1" ID DRILLED HOLES - 3- 1/2" DEEP.

Reinforced Concrete Tongue and Groove Manhole Risers



SECTION VIEW

STOCK TONGUE & GROOVE RISERS FOR MANHOLES	
MANHOLE I.D.	HEIGHT
48" to 96"	12"
48" to 96"	16"
48" to 144"	24"
48"	32"
48" to 144"	36"
48" to 144"	48"
48" to 144"	60"
48" to 144"	72"
54" to 120"	84"
54" to 120"	96"

NOTES:

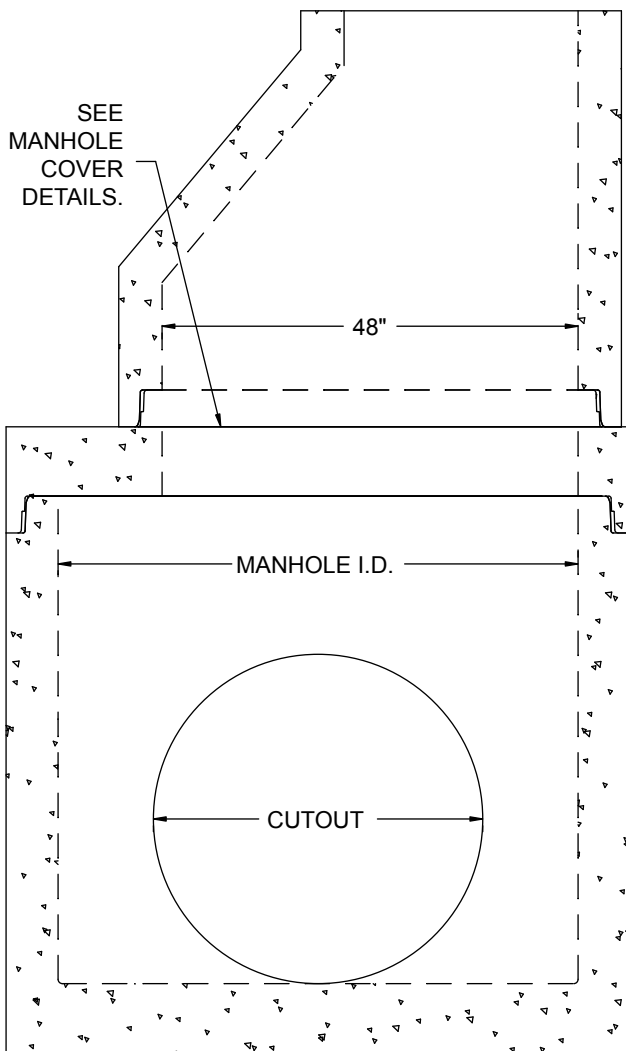
SEE MANHOLE JOINT DETAIL FOR SPECIFICATIONS.

12" AND 16" HEIGHTS WITH FLAT TOP ARE ALSO STOCK ITEMS.

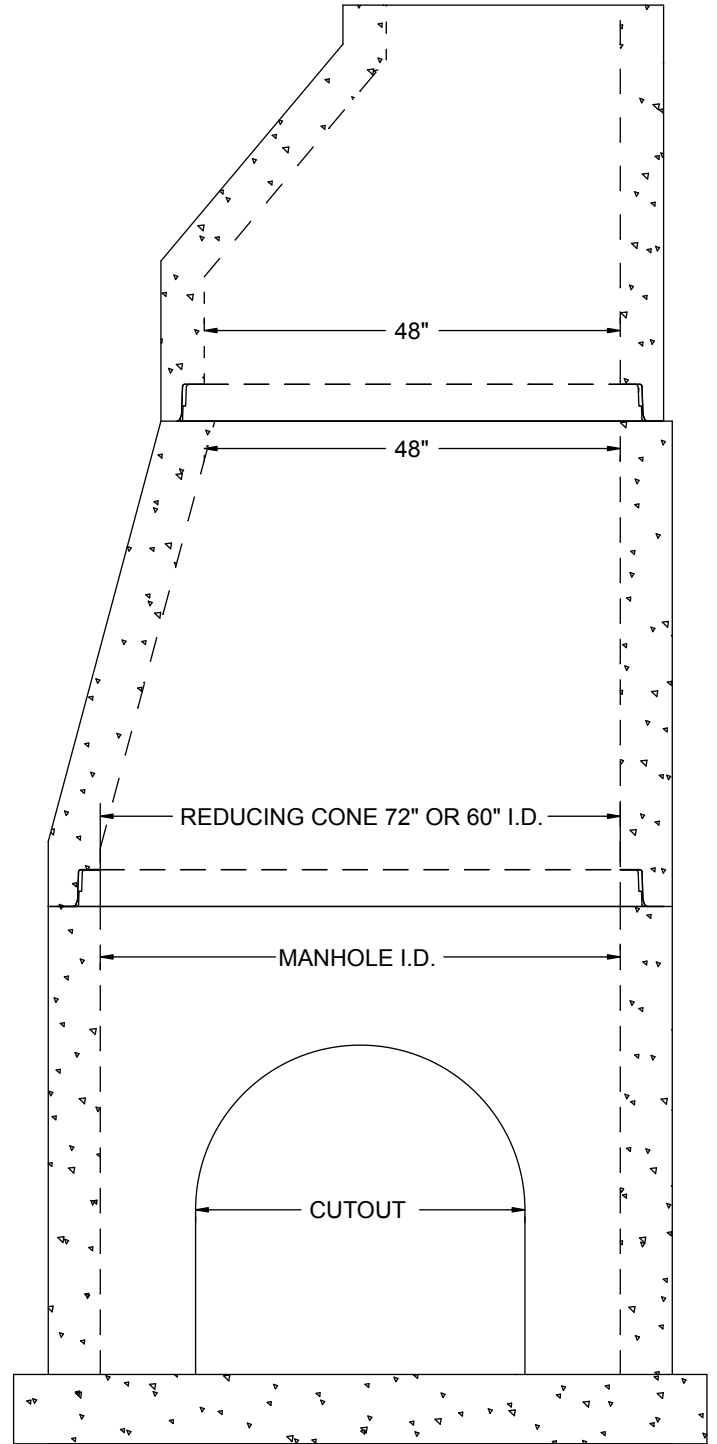
SPECIAL FLAT TOP HEIGHTS AVAILABLE IN 2" INCREMENTS.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-443 AND ASTM C-478

**Reduction Manholes
Sanitary or Storm**



SECTION VIEW



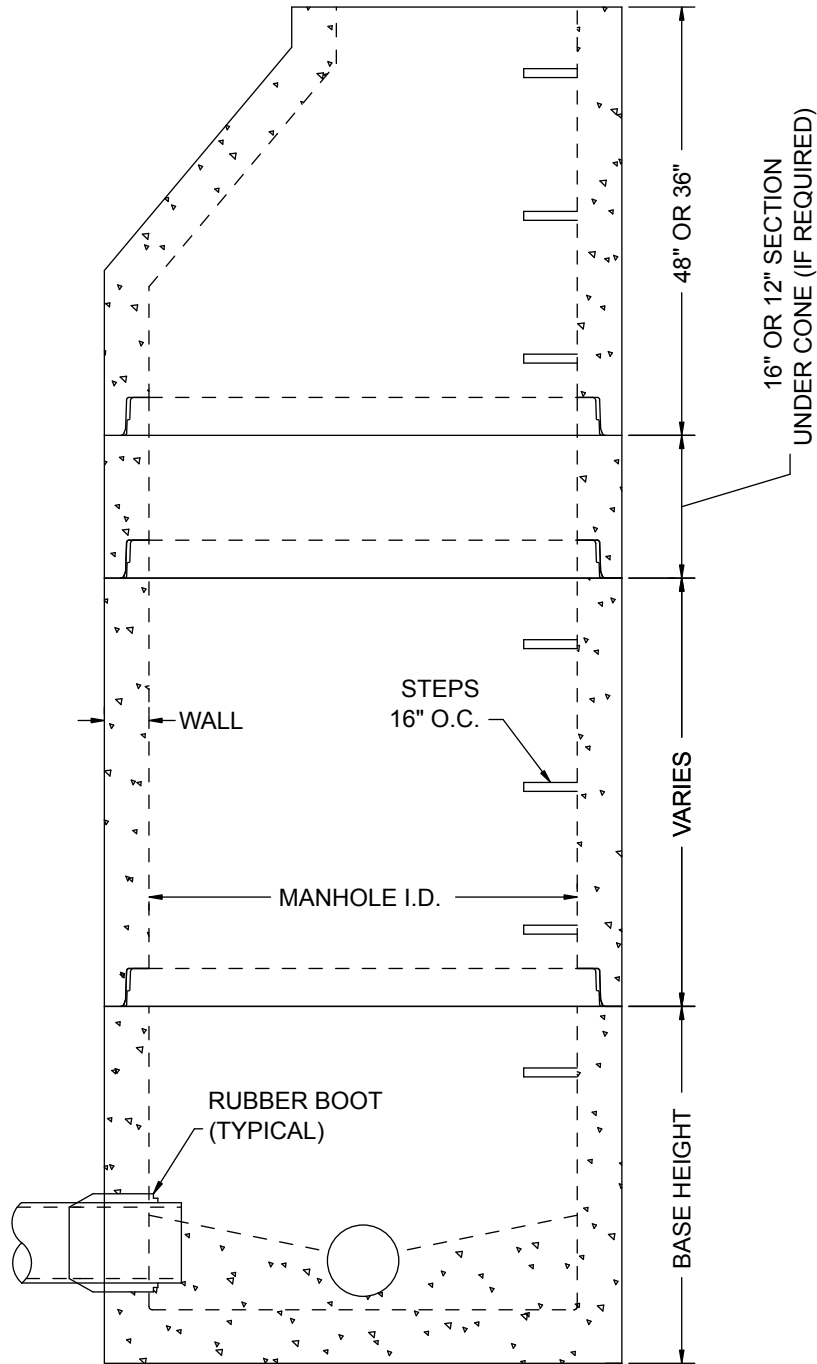
SECTION VIEW

NOTES:

PRECAST REINFORCED CONES AND RISER SECTIONS CONFORM TO ASTM C-478 AND ASTM C-443.

SEE DETAILS FOR JOINT AND SLAB INFORMATION.

**Typical Sanitary Manhole
with Poured Invert**



SECTION VIEW

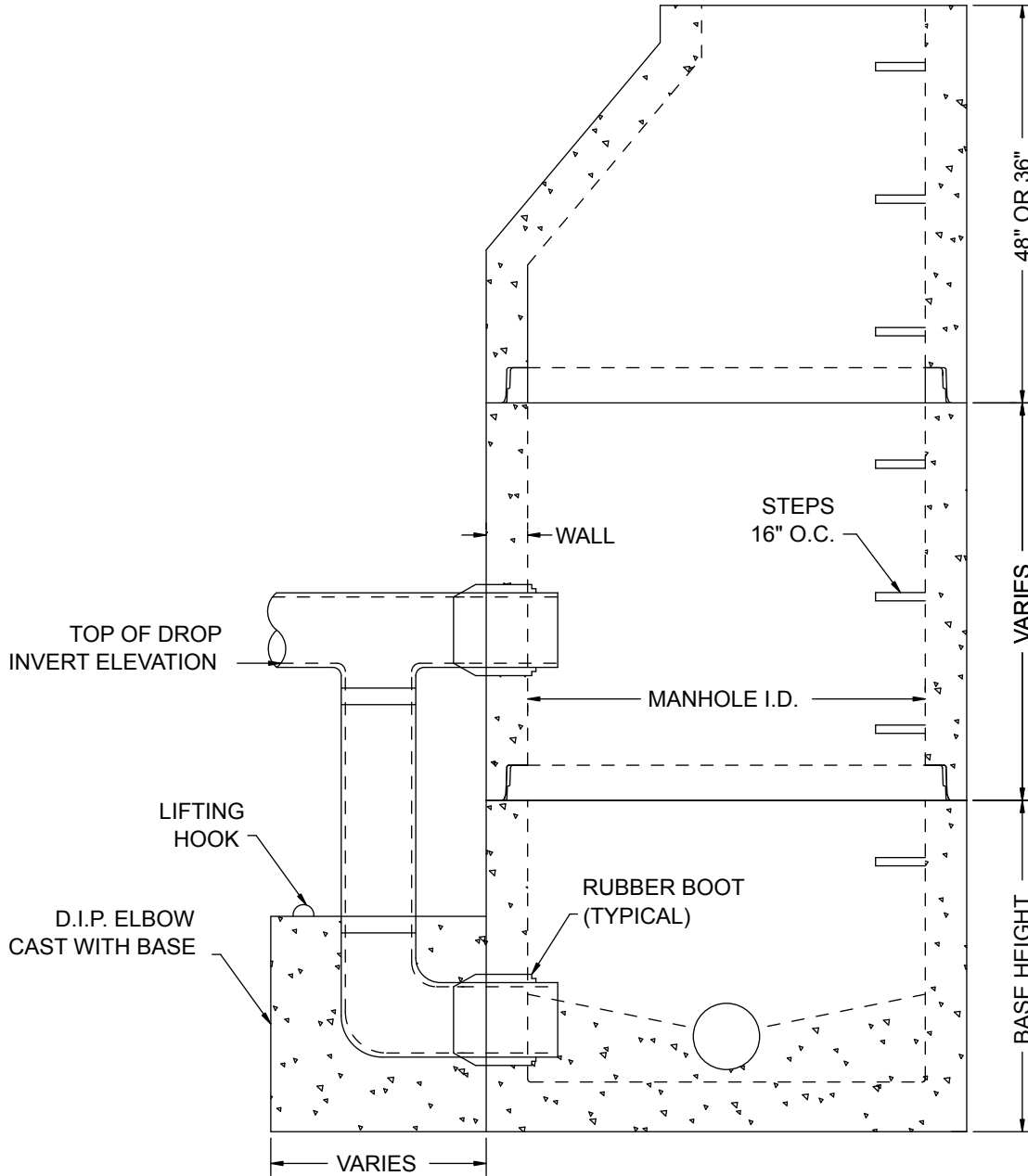
NOTES:

PRECAST REINFORCED CONES AND RISER SECTIONS CONFORM TO ASTM C-478 AND ASTM C-443.

SEE DETAILS FOR JOINT INFORMATION.

POURED INVERT AVAILABLE IN VARYING SIZES AND CONFIGURATIONS.

Sanitary Outside Drop Manhole with Poured Invert



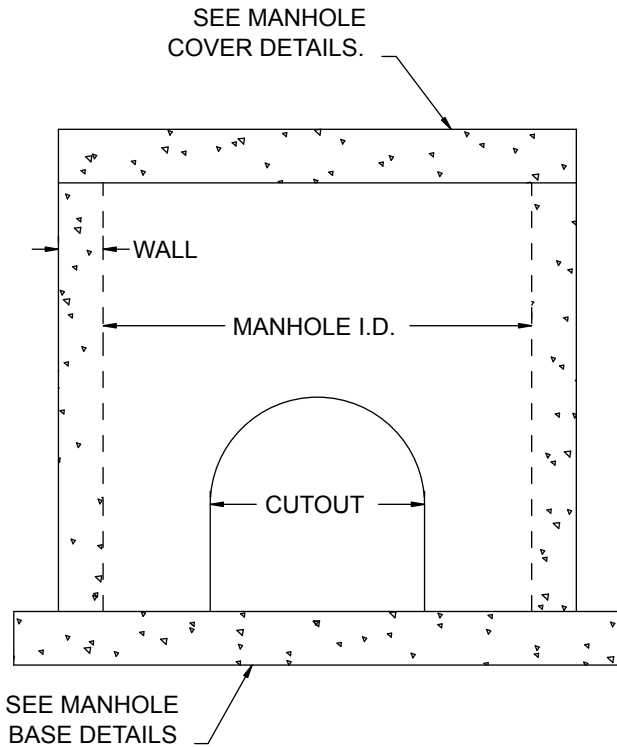
SECTION VIEW

NOTES:

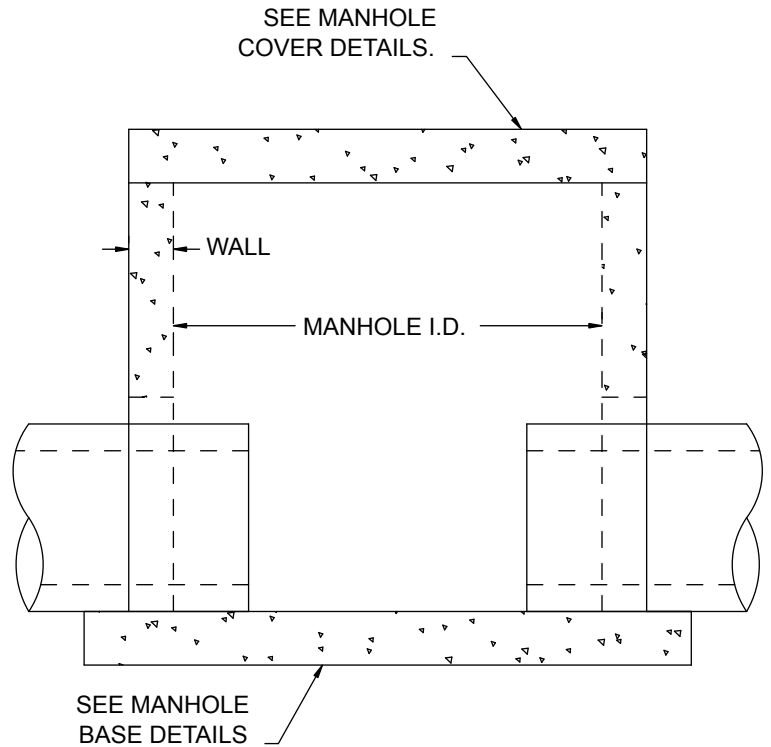
PRECAST REINFORCED CONES AND RISER SECTIONS CONFORM TO ASTM C-478 AND ASTM C-443.

SEE DETAILS FOR JOINT INFORMATION.

Reinforced Concrete Storm Base Sections with Flat Top and Cutouts



FRONT SECTION VIEW



SIDE SECTION VIEW

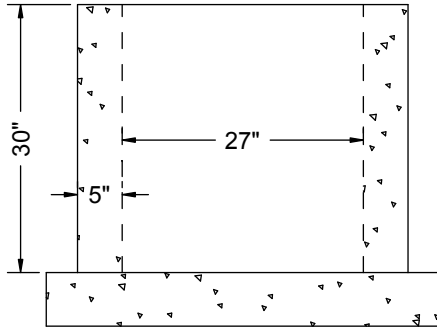
WALL THICKNESS FOR STORM MANHOLES		
MANHOLE I.D.	WALL	WT./FT.
48"	5"	880
54"	5½"	1088
60"	6"	1300
66"	6½"	1570
72"	7"	1840
84"	8"	2480
96"	9"	3080
108"	10"	3955
120"	11"	4875
144"	12"	5900

CUTOUT SIZES FOR RC PIPE	
RCP PIPE I.D.	CUTOUT SIZE
12"	20"
15"	24"
21"	28"
24"	32"
27"	36"
30"	43"
33"	46"
36"	48"
42"	57"
48"	64"
54"	72"
60"	78"
66"	84"
72"	90"

NOTES:
 SEE MANHOLE JOINT DETAIL FOR SPECIFICATIONS.
 SPECIAL FLAT TOP HEIGHTS AVAILABLE IN 2"
 INCREMENTS. ALSO AVAILABLE WITH TONGUE & GROOVE
 BOTTOM SECTIONS FOR TALLER STRUCTURES. MEETS
 OR EXCEEDS THE REQUIREMENTS OF ASTM C-443 AND
 ASTM C-478.

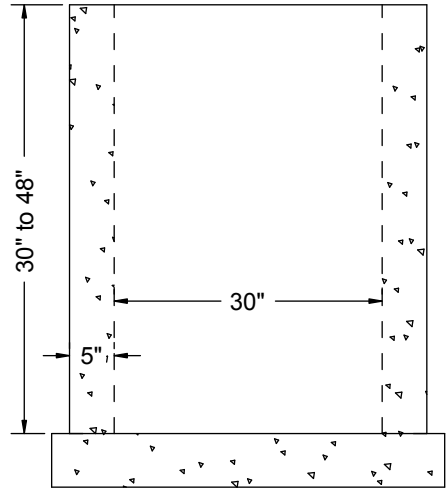
Catch Basins 27", 30", 48" Type "G" and Type "F" Cones and 2x3 Boxes

NOTE:
 SEE BASE SLAB DETAILS FOR SPECIFICATIONS.
 ALL STRUCTURES MEET OR EXCEED THE REQUIREMENTS OF ASTM C-478.



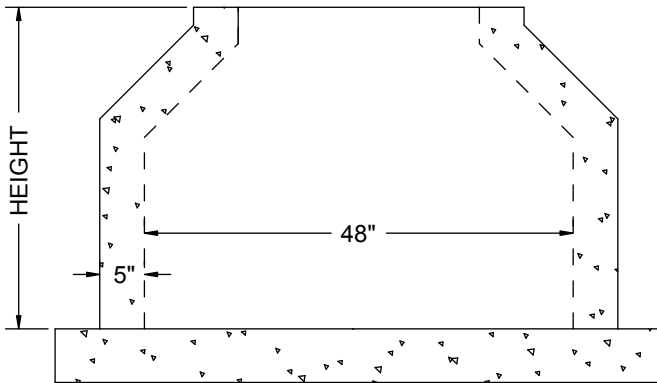
27" I.D. CATCH BASIN

AVAILABLE ONLY
 IN 30" HEIGHT.



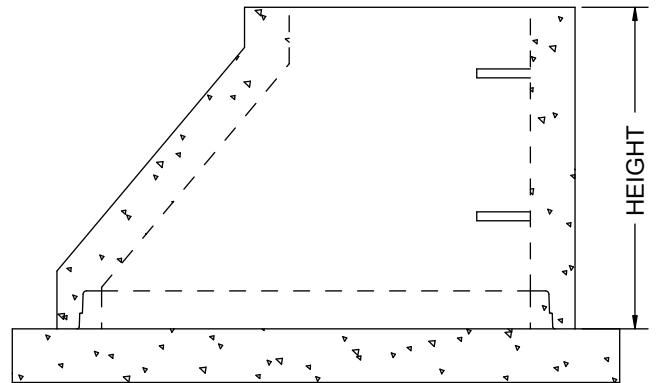
30" I.D. CATCH BASIN

AVAILABLE IN 2" INCREMENTS
 FROM 30" TO 48" IN HEIGHT.



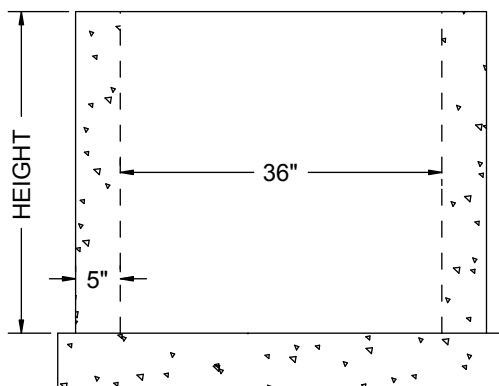
48" I.D. TYPE "G" CONE

AVAILABLE IN 36", 42"
 AND 48" IN HEIGHT.

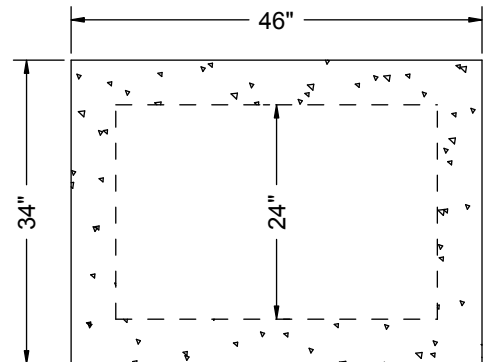


48" I.D. TYPE "F" CONE

AVAILABLE IN 36", 42", 48", 54", 60",
 66" AND 72" IN HEIGHT.



2x3 BOX - FRONT SECTION VIEW

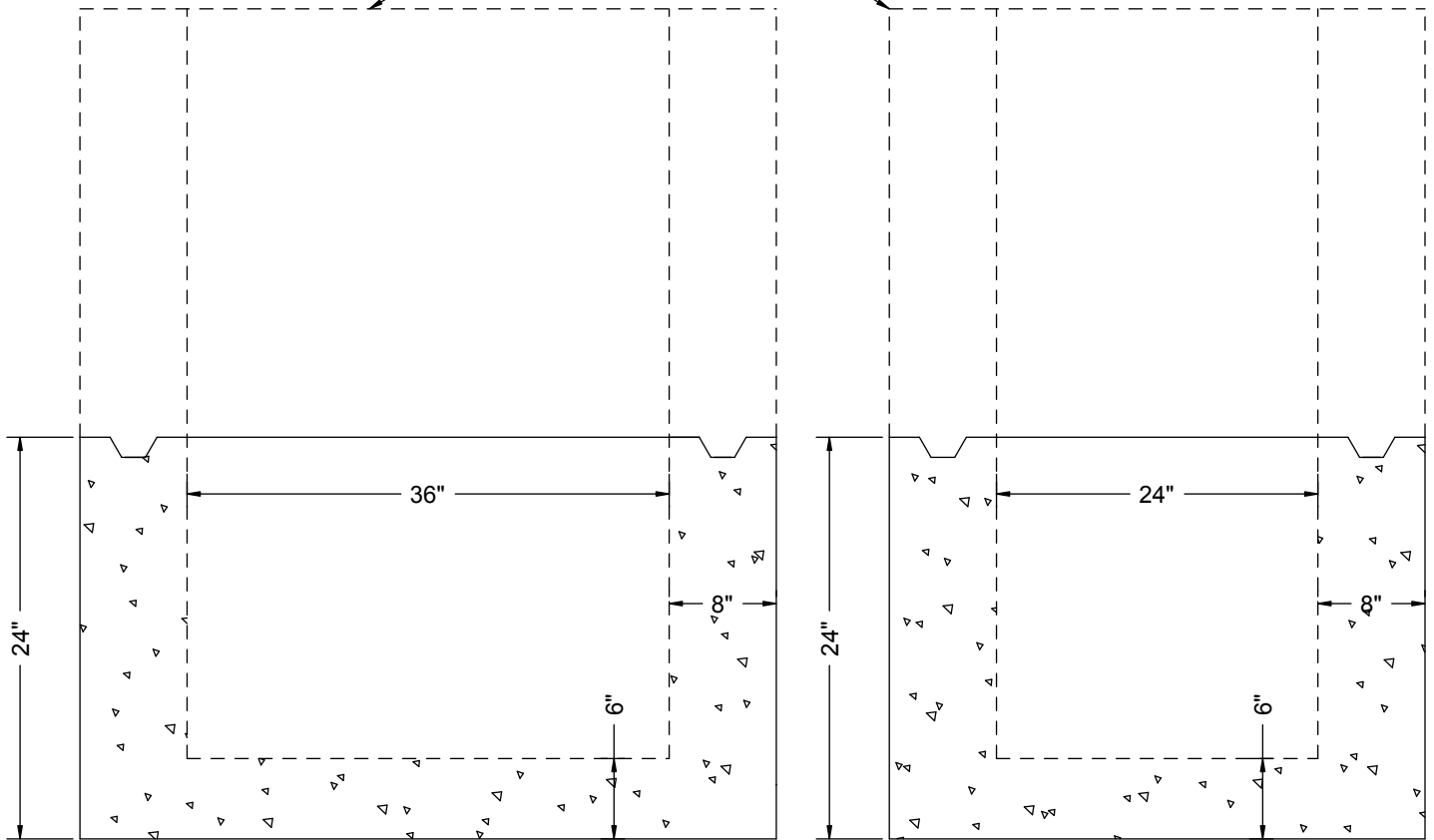


2x3 BOX - TOP VIEW

IN STOCK SIZES AVAILABLE IN 24", 30", 36", 42" AND 48" IN HEIGHT, WITH 24" END OR SIDE CUTOUT.
 SPECIAL SIZES AVAILABLE IN 27", 33", 39", AND 45" IN HEIGHT, WITH VARIABLE END AND/OR SIDE CUTOUT.

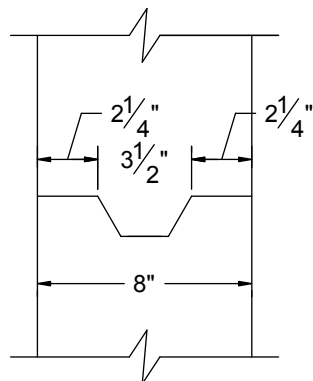
St. Paul, MN
Type 7A Sump
Catch Basin

TOP SECTION
POURED BY CONTRACTOR
IN THE FIELD.



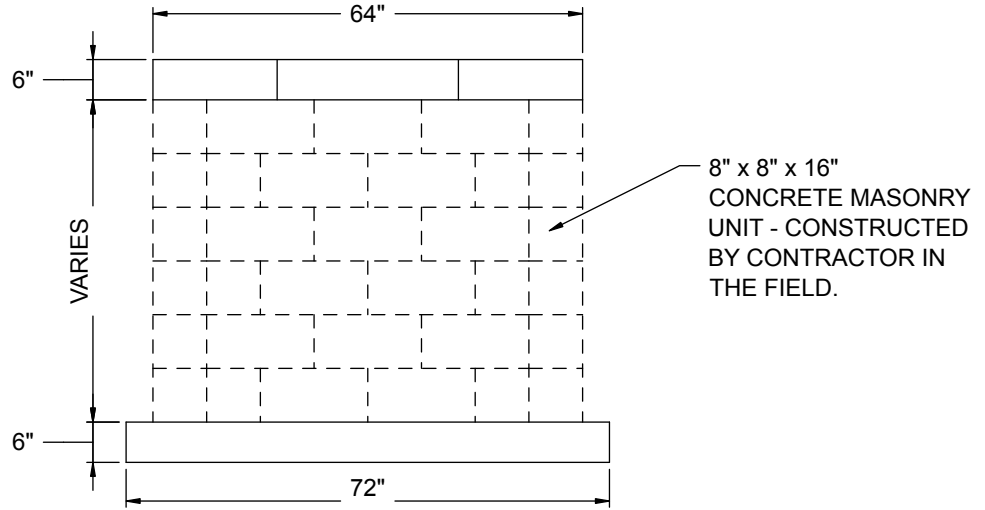
FRONT SECTION VIEW

SIDE SECTION VIEW

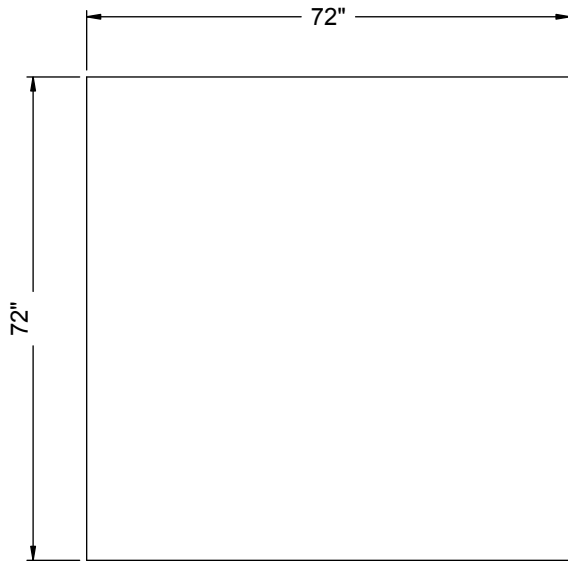


JOINT DETAIL

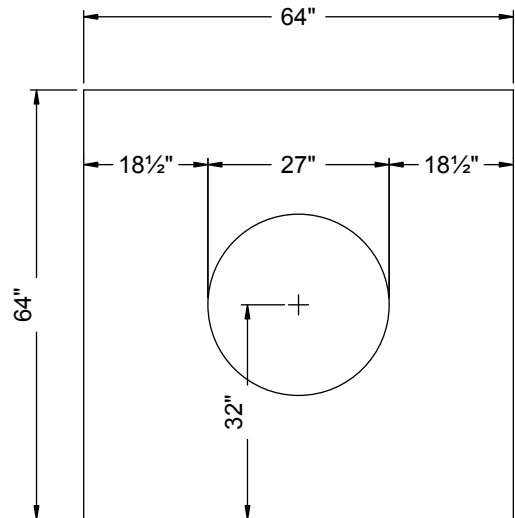
NOTE:
MEETS OR EXCEEDS THE
REQUIREMENTS OF
ASTM C-478.



FRONT SECTION VIEW

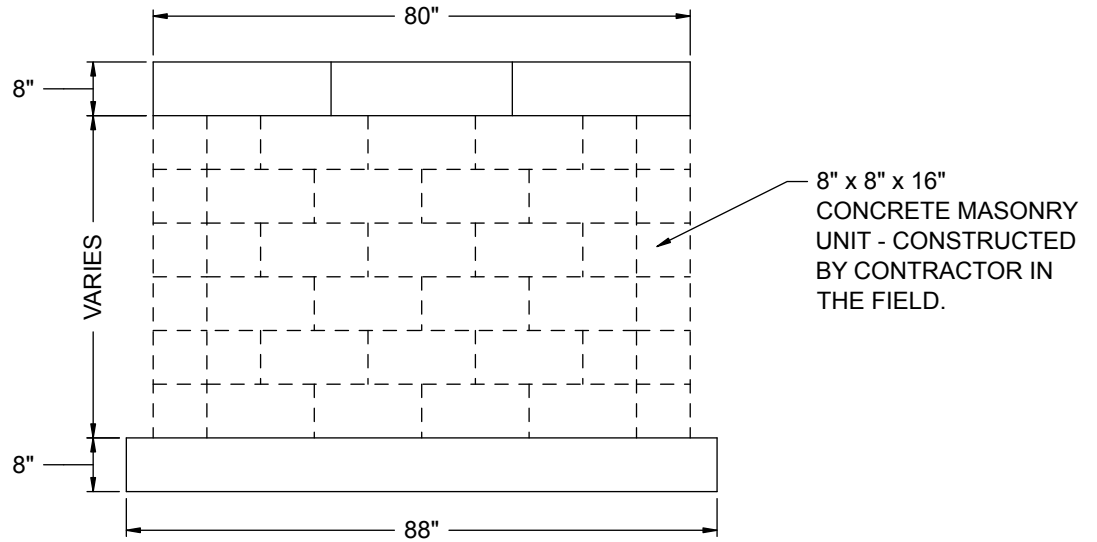


PLAN VIEW - BASE SLAB

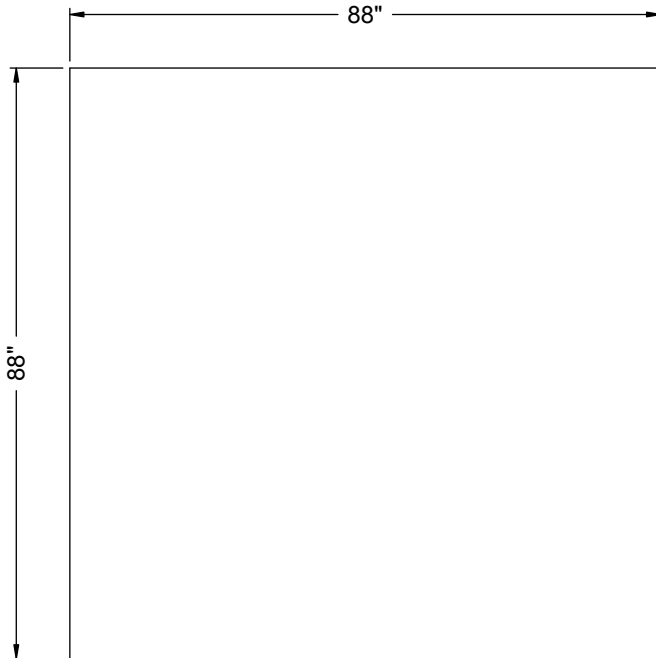


PLAN VIEW - TOP SLAB

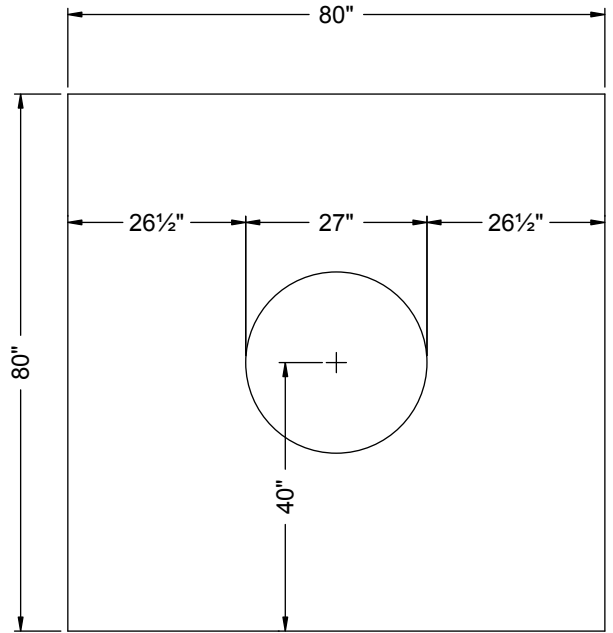
St. Paul, MN
Type 4A Manhole



FRONT SECTION VIEW

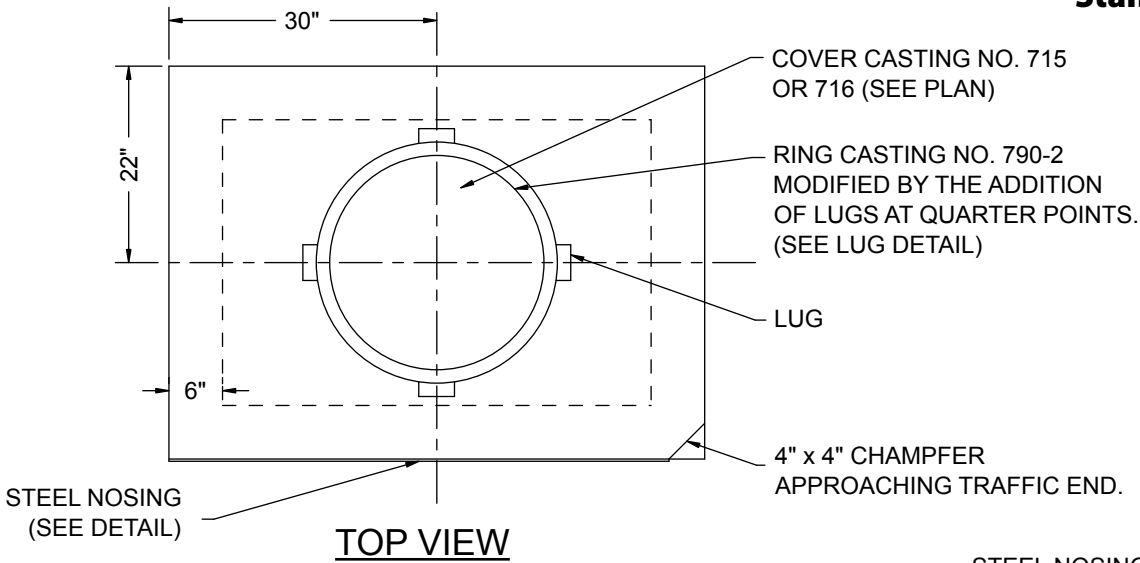


PLAN VIEW - BASE SLAB

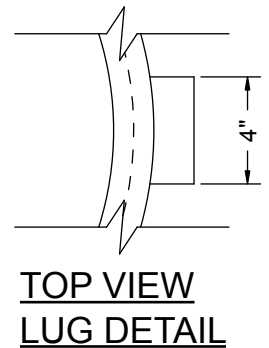
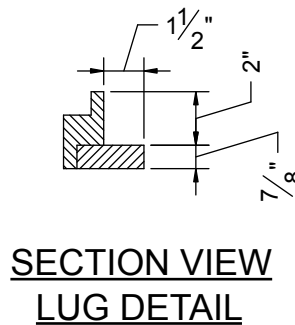
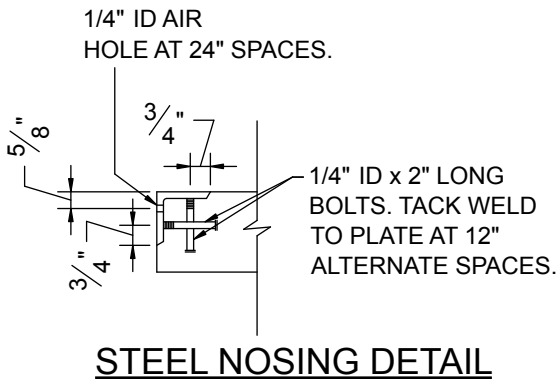
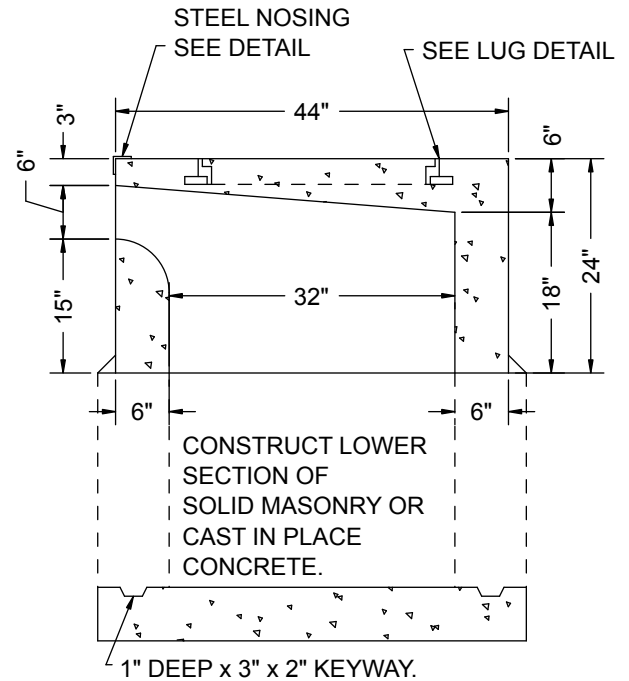
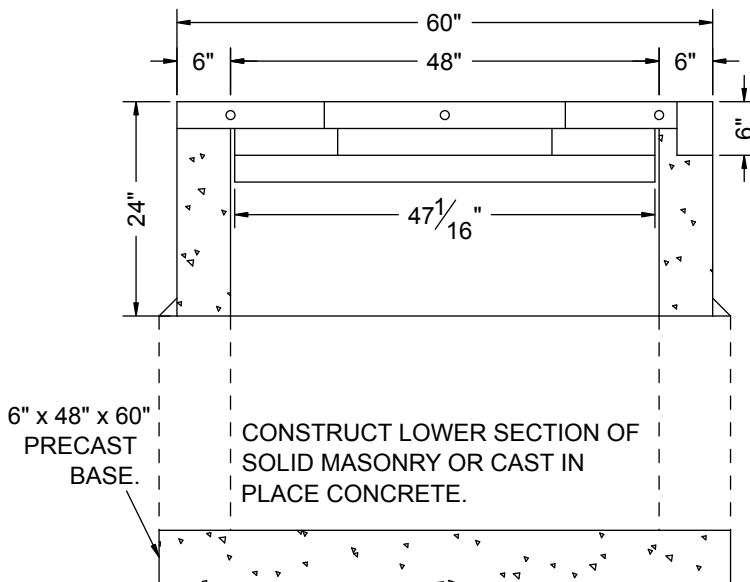


PLAN VIEW - TOP SLAB

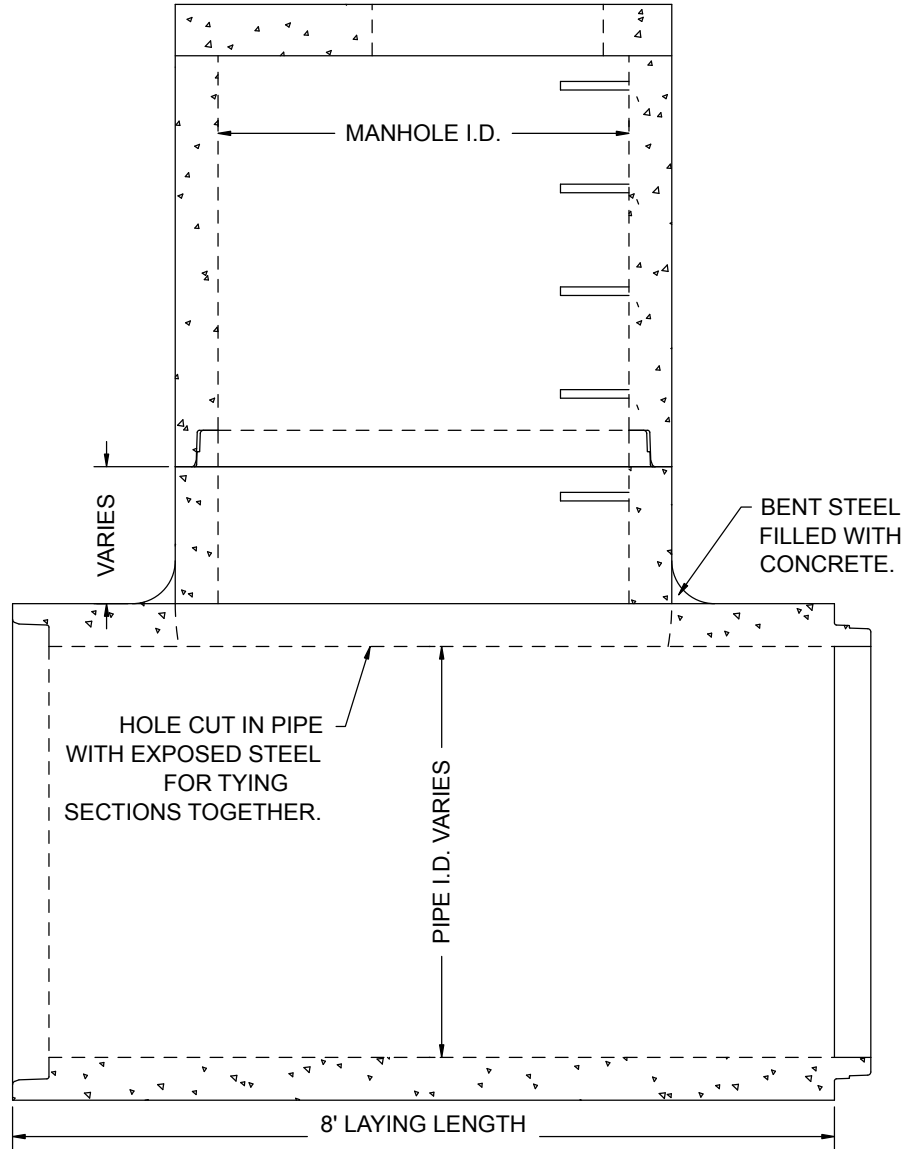
State of MN LP Catch Basin
Standard Plate #4021



MEETS OR
EXCEEDS THE
REQUIREMENTS
OF ASTM C-478.



**Typical Reinforced Concrete
"T" Manhole**



SECTION VIEW

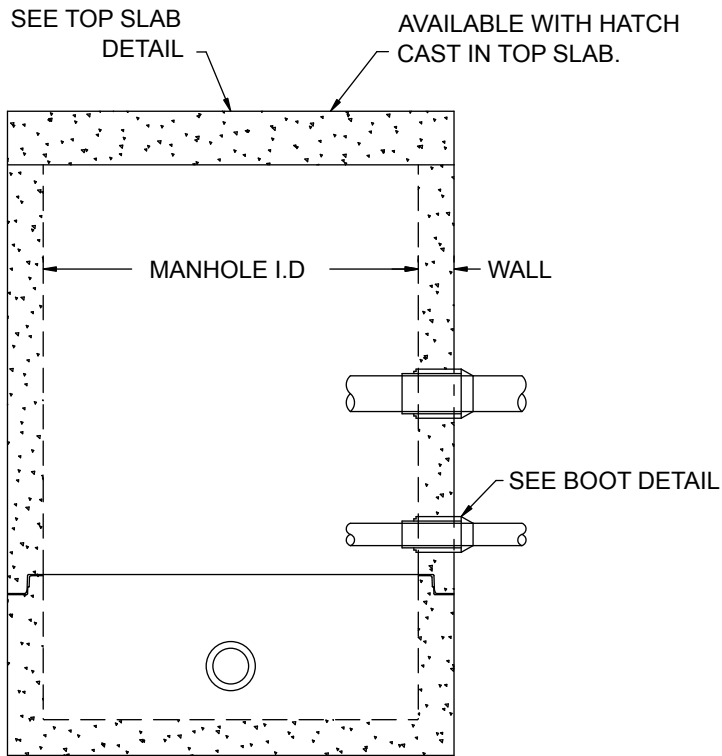
NOTES:

SEE JOINT DETAILS FOR SPECIFICATIONS.

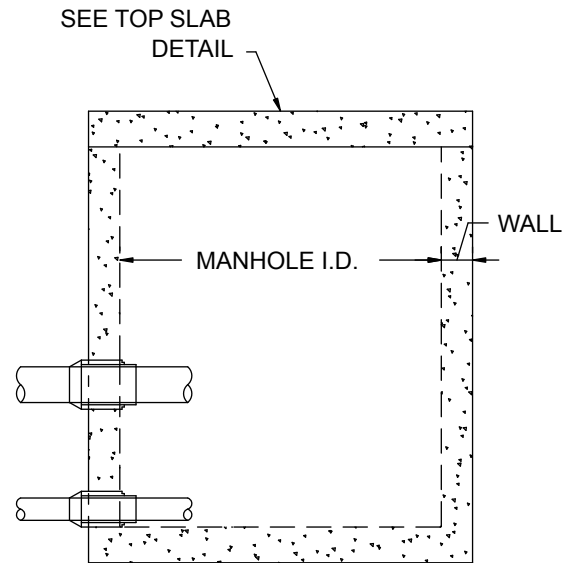
AVAILABLE WITH VARYING PIPE & MANHOLE SIZE COMBINATIONS.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76, ASTM C-443 AND ASTM C-478.

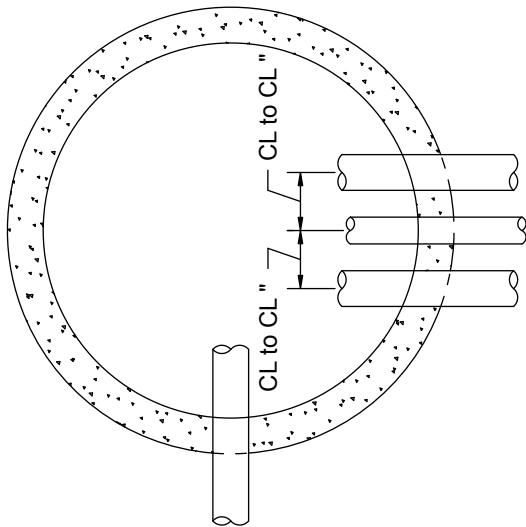
**Lift Stations and
 Valve Manholes**



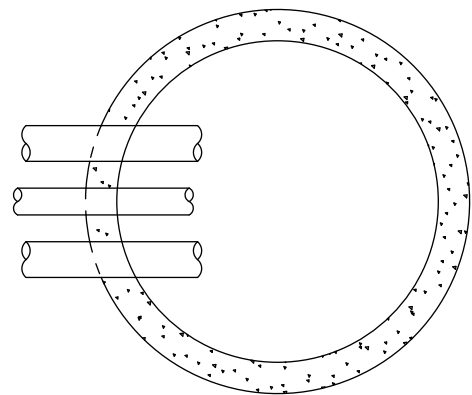
LIFT STATION - SECTION VIEW



VALVE MH - SECTION VIEW



LIFT STATION - TOP VIEW

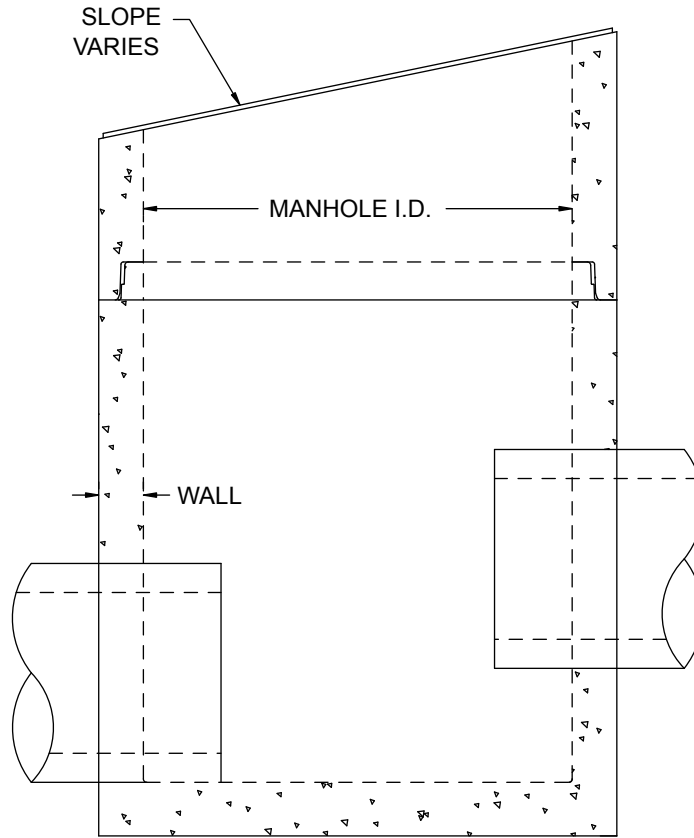


VALVE MH - TOP VIEW

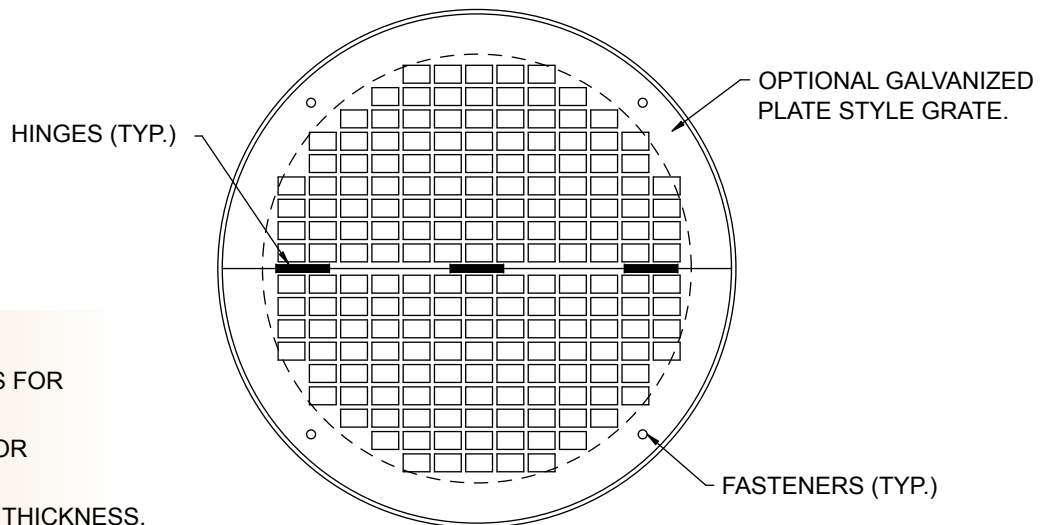
NOTES:

- SEE MANHOLE JOINT DETAILS FOR SPECIFICATIONS.
- AVAILABLE WITH VARYING THICKNESS TOP SLABS AND POURED BOTTOMS.
- MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-443 AND ASTM C-478.

**Sloped Top Pond Skimmer
Structures 48" to 144"**



FRONT SECTION VIEW



TOP VIEW

NOTES:

SEE MANHOLE JOINT DETAILS FOR SPECIFICATIONS.

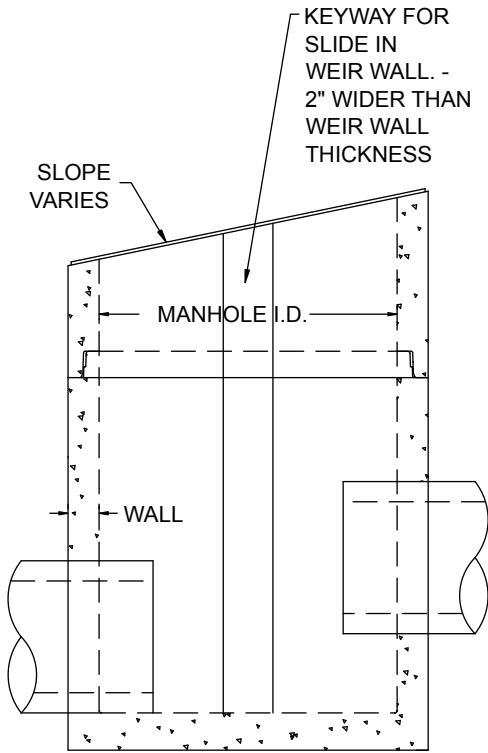
AVAILABLE WITH BASE SLAB OR POURED BOTTOM.

SEE RISER DETAIL FOR WALL THICKNESS.

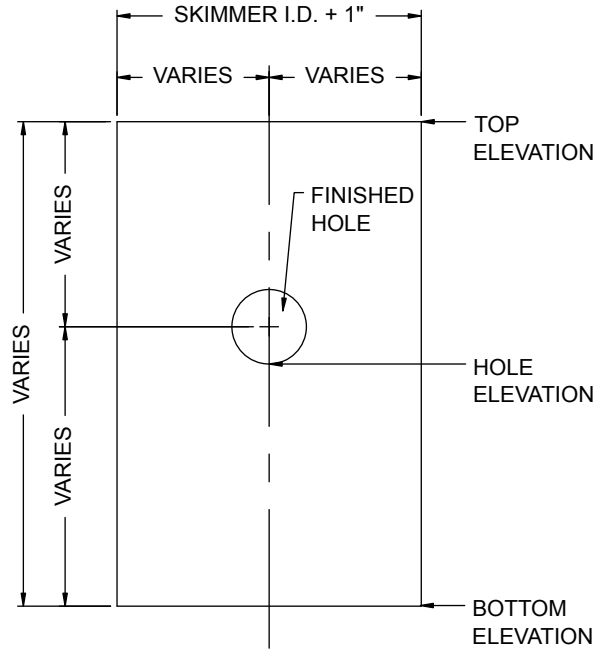
AVAILABLE WITH OPTIONAL SKIMMER GRATE.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-443 AND ASTM C-478.

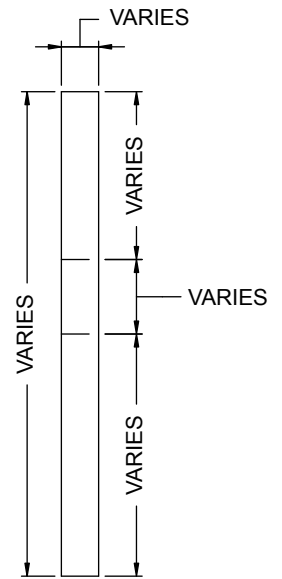
**Sloped Top Pond Skimmer
 Structures 48" to 144"
 with Slide in Weir Wall**



FRONT SECTION VIEW
POND SKIMMER



FRONT ELEVATION
WEIR WALL



SIDE ELEVATION
WEIR WALL

NOTES:

SLIDE IN WEIR WALLS AVAILABLE IN VARYING SIZES AND CONFIGURATIONS TO MEET PROJECT SPECIFICATIONS.

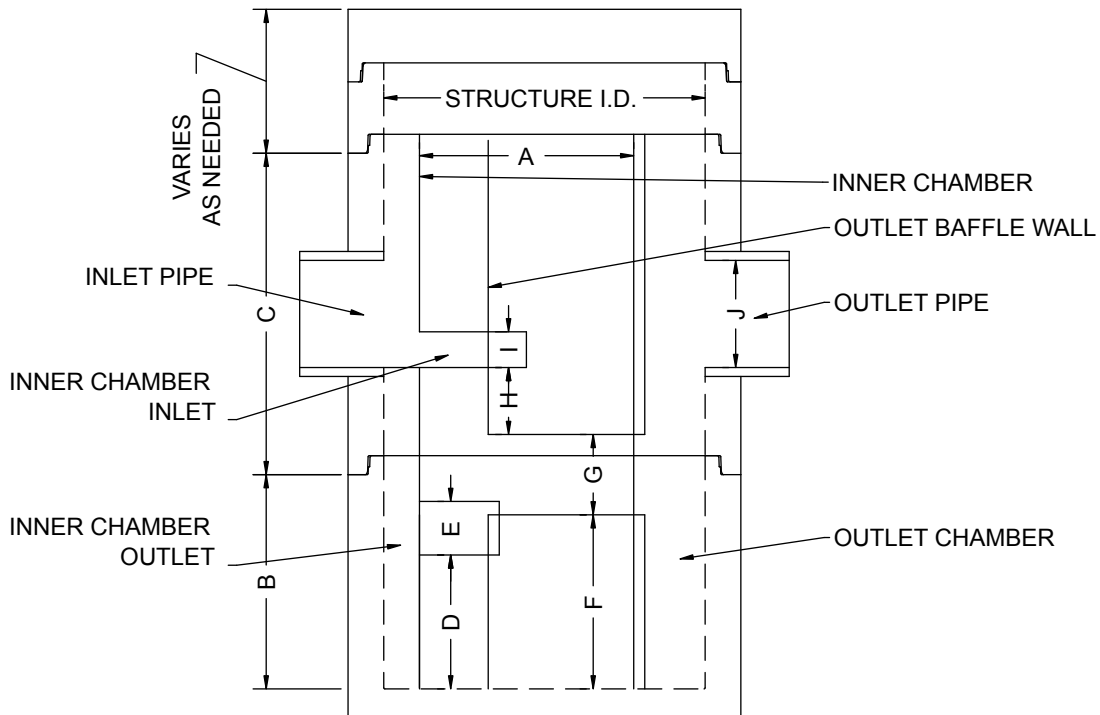
SEE MANHOLE JOINT AND RISER DETAILS.

AVAILABLE WITH BASE SLAB OR POURED BOTTOM.

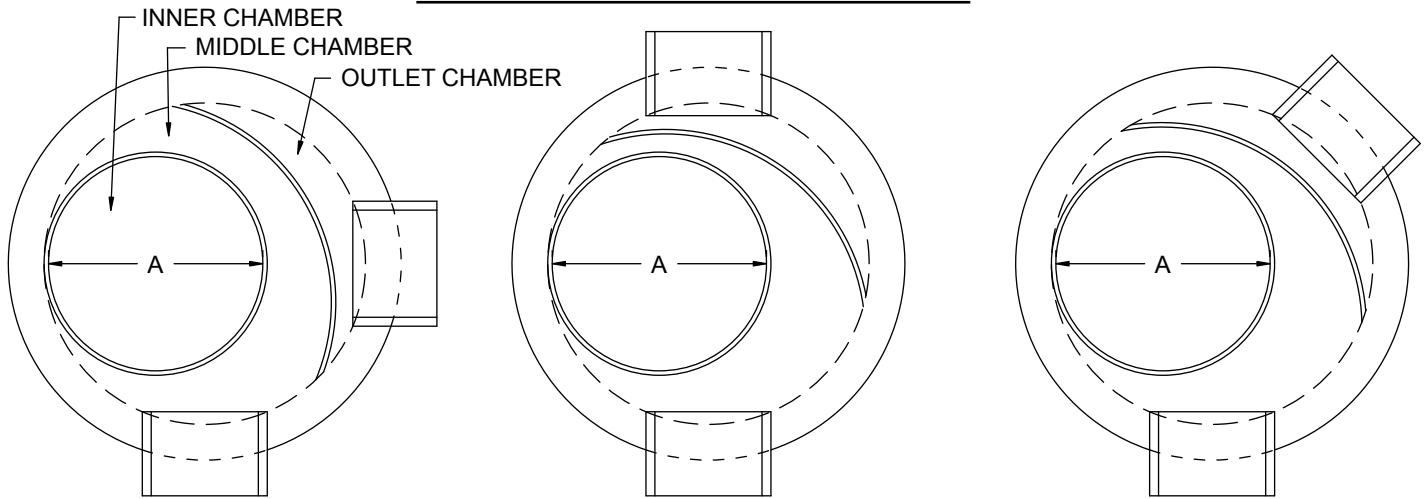
AVAILABLE WITH OPTIONAL SKIMMER GRATE.

MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-443 AND ASTM C-478.

Hydroguard Stormwater Treatment Structure



HYDROGUARD - SECTION VIEW



RIGHT 90° BEND

TOP VIEW

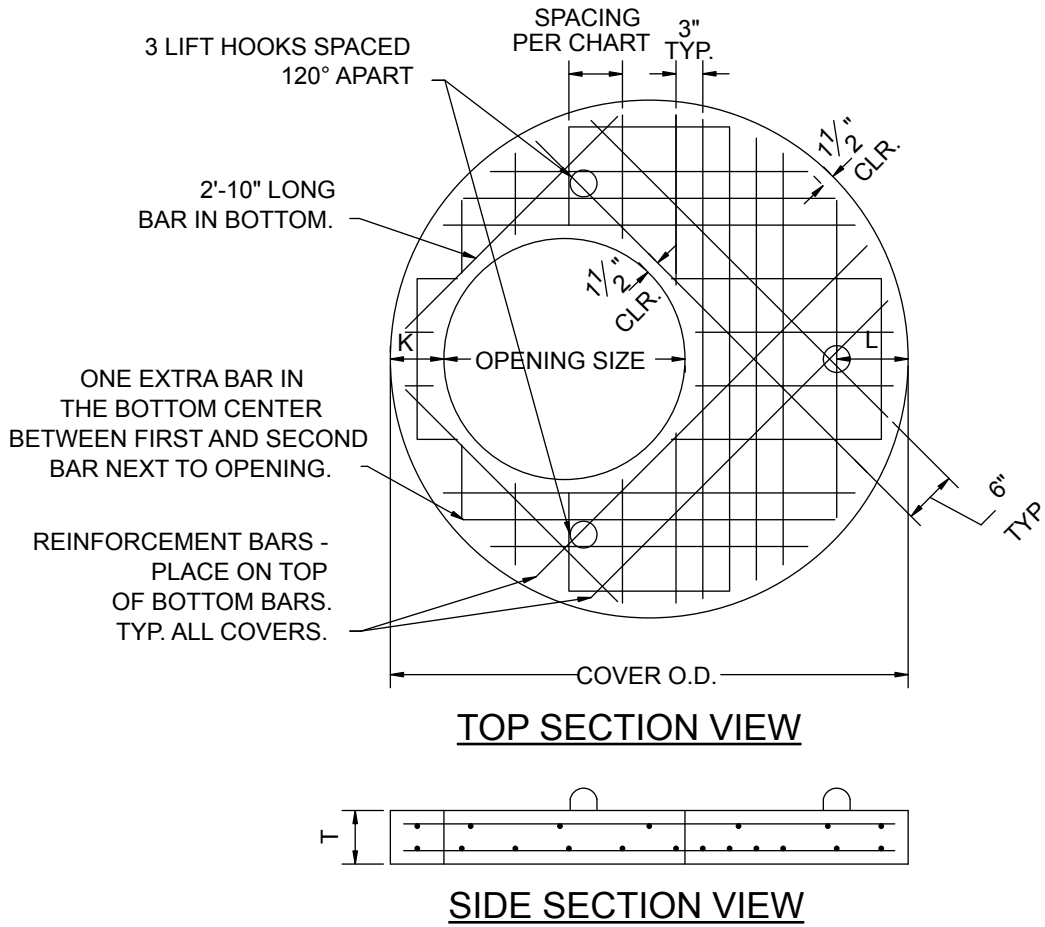
RIGHT < 45° BEND

STRUCTURE I.D.	A - I.D.	B	C	D	E	F	G	H	I	J	PERMANENT POOL VOLUME
48"	30"	36"	60"	30"	6"	36"	12"	12"	5"	15"	450 US GALLONS
72"	48"	48"	72"	30"	12"	39"	18"	15"	8"	24"	1200 US GALLONS
96"	60"	48"	84"	30"	16"	43"	22"	15"	11"	30"	2400 US GALLONS
120"	78"	60"	84"	30"	20"	47"	26"	18"	14"	36"	4300 US GALLONS
144"	96"	48"	84"	30"	24"	48"	36"	18"	16"	48"	7000 US GALLONS

NOTES:

STRUCTURE EFFICIENTLY REMOVES SUSPENDED SOLIDS (AND ASSOCIATED METALS, NUTRIENTS AND BACTERIA), OIL, AND TRASH FROM STORMWATER RUNOFF FULFILLING THE REQUIREMENTS OF MOST NPDES PERMITS AND CLEAN WATER ACT REQUIREMENTS. TECHNICAL INFORMATION AND SIZING AVAILABLE ON REQUEST. MEETS OR EXCEEDS THE REQUIREMENTS OF ASTM C-76 AND ASTM C-478.

**Manhole or Catch Basin
 Top Slab with 27" Opening
 58" to 168" Outer Diameter**

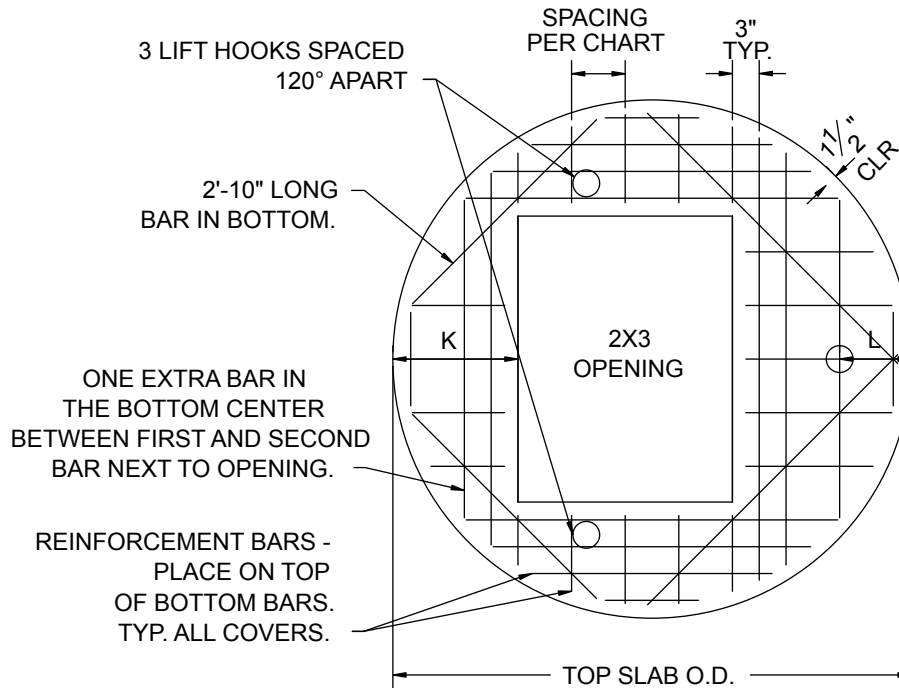


CB or MH I.D.	TOP SLAB O.D.	OPENING SIZE	T	K	L	TOP BARS EACH WAY	BOTTOM BARS EACH WAY	WEIGHT
48"	58"	27"	6"	6"	8"	NONE	# 5 @ 6"	1095
54"	65"	27"	8"	6"	8"	# 4 @ 10"	# 5 @ 8"	1940
60"	72"	27"	8"	7"	9"	# 4 @ 10"	# 5 @ 7"	2470
66"	79"	27"	8"	7"	9"	# 4 @ 10"	# 5 @ 7"	3055
72"	86"	27"	8"	8"	10"	# 4 @ 10"	# 5 @ 6"	3695
84"	100"	27"	8"	9"	11"	# 4 @ 10"	# 5 @ 5"	5140
96"	114"	27"	8"	9"	11"	# 4 @ 10"	# 6 @ 6"	6800
108"	128"	27"	12"	10"	12"	# 4 @ 10"	# 5 @ 6"	13,010
120"	142"	27"	12"	11"	13"	# 4 @ 10"	# 5 @ 6"	16,155
144"	168"	27"	12"	12"	14"	# 4 @ 10"	# 5 @ 6"	23,320

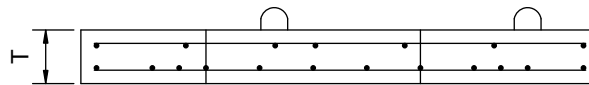
NOTES:

- AASHTO HS 25 LOADING.
- REINFORCEMENT PER MN SPEC. 3301 GRADE 60.
- ANY STEEL REINFORCEMENT THAT IS WELDED DURING FABRICATION MEETS THE REQUIREMENTS OF ASTM A706.
- TOP LAYER OF STEEL NOT REQUIRED FOR 58" O.D. COVERS.
- COVERS AVAILABLE WITH CONCENTRIC CUTOUTS AS WELL AS SPECIALTY SIZES AND THICKNESS NOT LISTED.

**Manhole or Catch Basin
 Top Slab with 2x3 Opening
 58" to 168" Outer Diameter**



TOP SECTION VIEW



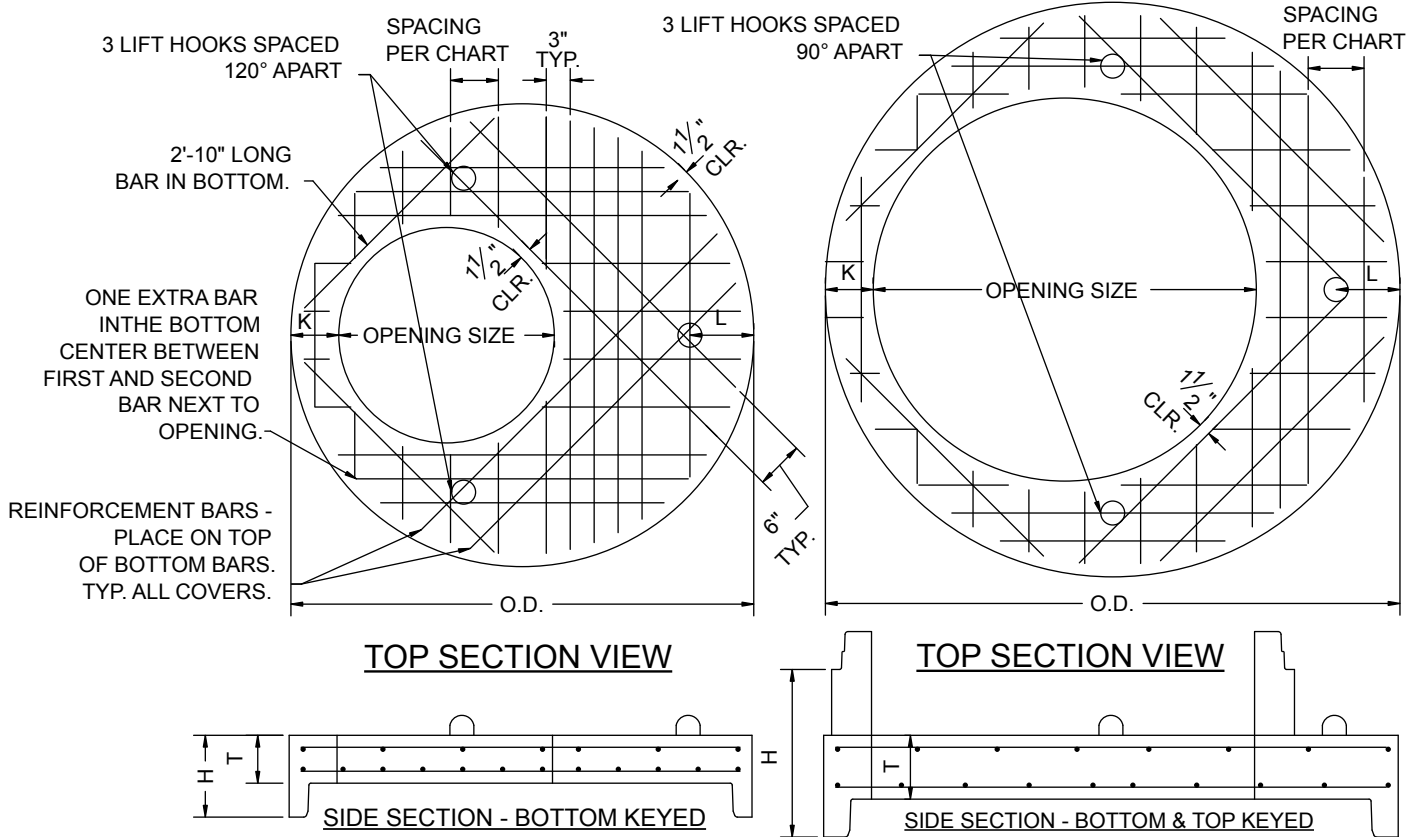
SIDE SECTION VIEW

CB or MH I.D.	TOP SLAB O.D.	OPENING SIZE	T	K	L	TOP BARS EACH WAY	BOTTOM BARS EACH WAY	WEIGHT
48"	58"	2 X 3	6"	14"	8"	NONE	# 5 @ 6"	945
54"	65"	2 X 3	8"	14½"	8"	# 4 @ 10"	# 5 @ 8"	1735
60"	72"	2 X 3	8"	15"	9"	# 4 @ 10"	# 5 @ 7"	2265
66"	79"	2 X 3	8"	15½"	9"	# 4 @ 10"	# 5 @ 7"	2850
72"	86"	2 X 3	8"	16"	10"	# 4 @ 10"	# 5 @ 6"	3490
84"	100"	2 X 3	8"	17"	11"	# 4 @ 10"	# 5 @ 5"	4935
96"	114"	2 X 3	8"	18"	11"	# 4 @ 10"	# 6 @ 6"	6595
108"	128"	2 X 3	12"	19"	12"	# 4 @ 10"	# 5 @ 6"	12,705
120"	142"	2 X 3	12"	20"	13"	# 4 @ 10"	# 5 @ 6"	15,850
144"	168"	2 X 3	12"	21"	14"	# 4 @ 10"	# 5 @ 6"	23,040

NOTES:

AASHTO HS 25 LOADING.
 REINFORCEMENT PER MN SPEC. 3301 GRADE 60. ANY STEEL REINFORCEMENT THAT IS WELDED DURING FABRICATION MEETS THE REQUIREMENTS OF ASTM A706.
 TOP LAYER OF STEEL NOT REQUIRED FOR 58" O.D. COVERS.
 COVERS AVAILABLE WITH CONCENTRIC CUTOUTS AS WELL AS SPECIALTY SIZES AND THICKNESS NOT LISTED.

Manhole or Catch Basin Keyed Top Slab
58" to 168" Outer Diameter



CB or MH I.D.	TOP SLAB O.D.	OPENING SIZE	T	H	K	L	TOP BARS EACH WAY	BOTTOM BARS EACH WAY	WEIGHT
48"	58"	27"	6"	13"	6"	8"	NONE	# 5 @ 6"	1655
54"	65"	27"	8"	13"	6"	8"	# 4 @ 10"	# 5 @ 8"	2175
60"	72"	27"	8"	13"	7"	9"	# 4 @ 10"	# 5 @ 7"	2755
66"	79"	27"	8"	13"	8"	10"	# 4 @ 10"	# 5 @ 7"	3395
72"	86"	27"	8"	13"	8"	10"	# 4 @ 10"	# 5 @ 6"	4095
84"	100"	27"	8"	13"	9"	11"	# 4 @ 10"	# 5 @ 5"	5670
96"	114"	27"	8"	13"	9"	11"	# 4 @ 10"	# 6 @ 6"	7480
108"	128"	27"	12"	17"	10"	12"	# 4 @ 10"	# 5 @ 6"	13,865
120"	142"	27"	12"	17"	11"	13"	# 4 @ 10"	# 5 @ 6"	17,195
144"	168"	27"	12"	17"	12"	14"	# 4 @ 10"	# 5 @ 6"	26,000
54"	65"	48"	8"	21"	6"	7"	# 4 @ 10"	# 5 @ 8"	2065
60"	72"	48"	8"	21"	7"	8"	# 4 @ 10"	# 5 @ 7"	2645
66"	79"	48"	8"	21"	8"	9"	# 4 @ 10"	# 5 @ 7"	3285
72"	86"	48"	8"	21"	8"	9"	# 4 @ 10"	# 5 @ 6"	3985
84"	100"	48"	8"	21"	9"	10"	# 4 @ 10"	# 5 @ 5"	5560
96"	114"	48"	8"	21"	9"	11"	# 4 @ 10"	# 6 @ 6"	7370
108"	128"	48"	12"	21"	10"	11"	# 4 @ 10"	# 5 @ 6"	13,025
120"	142"	48"	12"	21"	11"	12"	# 4 @ 10"	# 5 @ 6"	16,355
144"	168"	48"	12"	21"	12"	13"	# 4 @ 10"	# 5 @ 6"	26,000

NOTES:

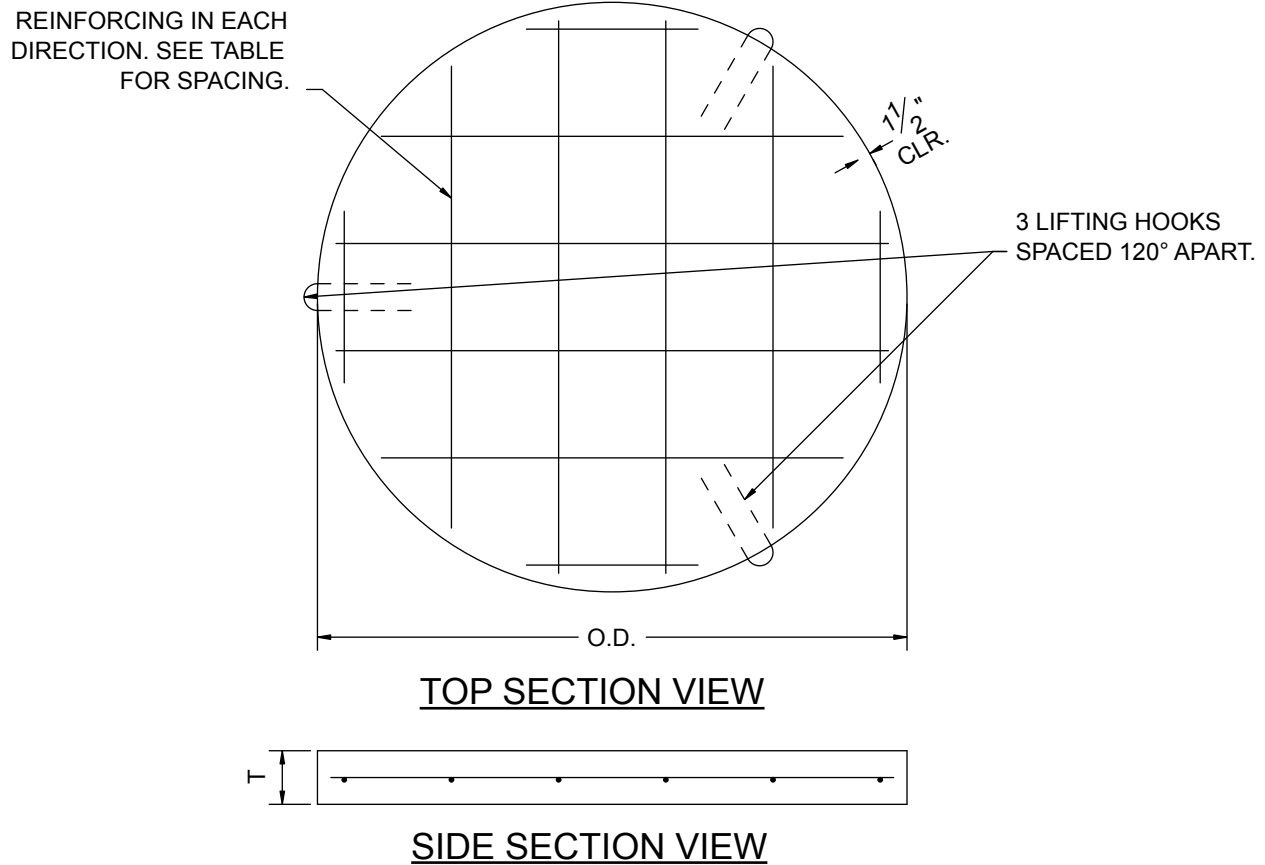
AASHTO HS 25 LOADING.

REINFORCEMENT PER MN SPEC. 3301 GRADE 60. ANY STEEL REINFORCEMENT THAT IS WELDED DURING FABRICATION MEETS THE REQUIREMENTS OF ASTM A706.

TOP LAYER OF STEEL NOT REQUIRED FOR 58" O.D. COVERS.

COVERS AVAILABLE WITH CONCENTRIC CUTOUTS AS WELL AS SPECIALTY SIZES AND THICKNESS NOT LISTED.

**Manhole or Catch Basin
 Base Slab
 44" to 180" Outer Diameter**



CB or MH I.D.	BASE O.D.	T	BAR #	SPACING	WEIGHT
27"	39"	5"	4	12"	520
30"	44"	6"	4	12"	805
24" x 36"	38" x 50"	6"	4	12"	1005
48"	66"	6"	4	12"	1810
54"	72"	8"	4	12"	2875
60"	80"	8"	4	12"	3550
66"	86"	8"	4	12"	4295
72"	94"	8"	4	12"	4900
84"	108"	8"	4	8"	6465
96"	120"	8"	4	8"	7980
108"	132"	12"	4	8"	14,485
120"	146"	12"	4	8"	17,715
144"	180"	12"	4	6"	27,480

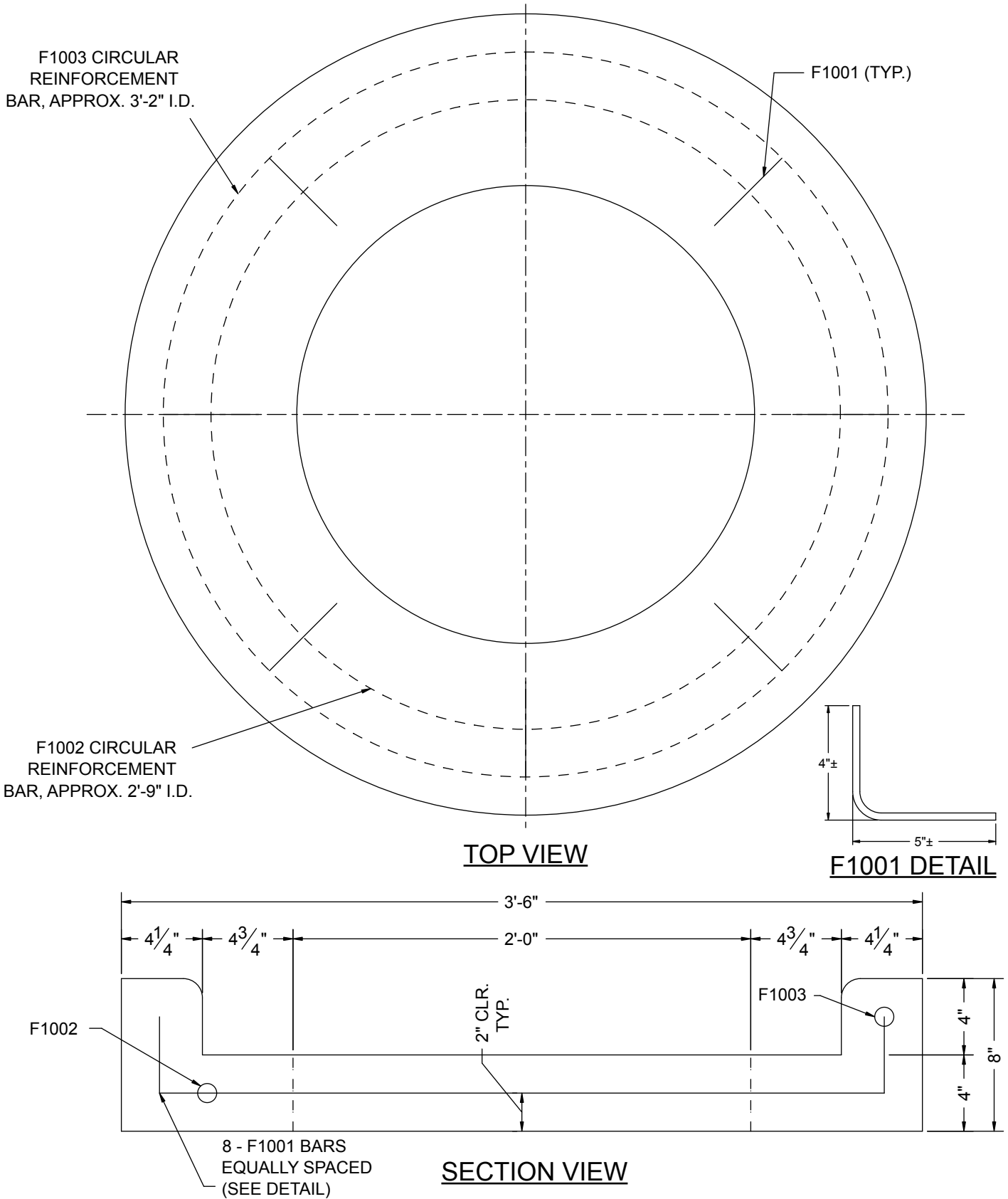
NOTES:

AASHTO HS 25 LOADING.

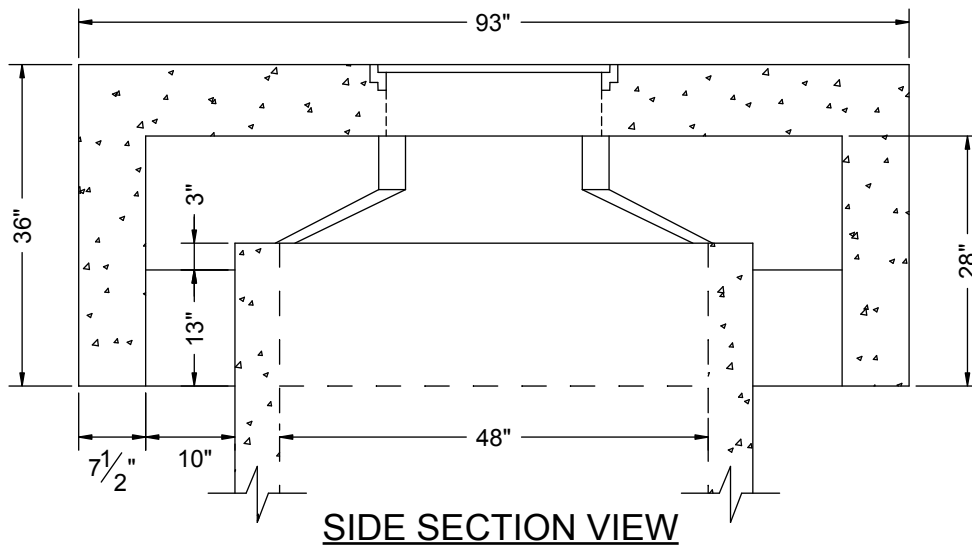
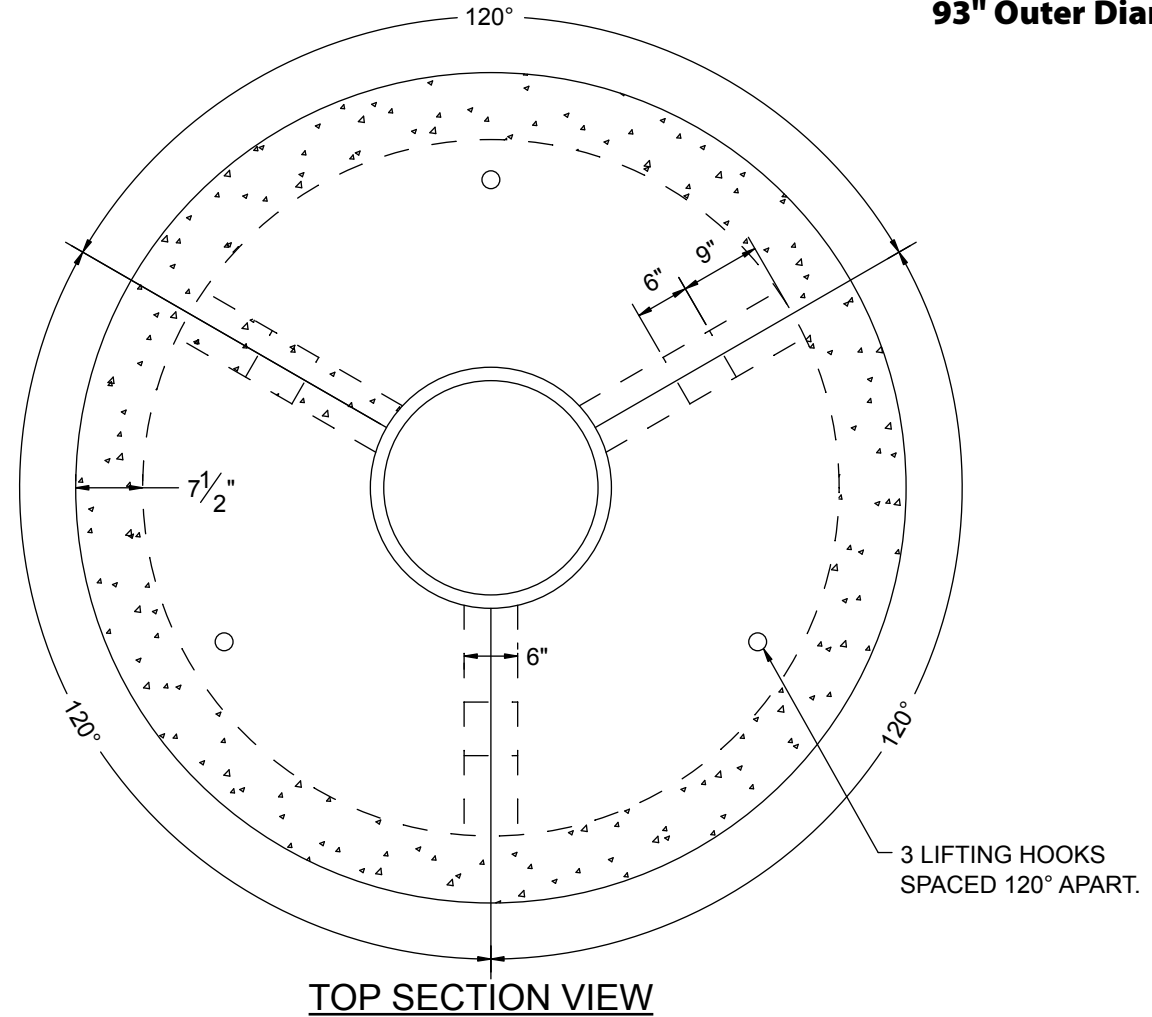
REINFORCEMENT PER MN SPEC. 3301 GRADE 60. ANY STEEL REINFORCEMENT THAT IS WELDED DURING FABRICATION MEETS THE REQUIREMENTS OF ASTM A706.

BASE SLABS AVAILABLE WITH SPECIALTY SIZES AND THICKNESS NOT LISTED.

**Stool Grate Reinforced
Concrete Frame**



**Reinforced Concrete
Cap Skimmer
93" Outer Diameter**



NOTE:

SEE MNDOT STANDARD PLATE NO. 4108F FOR DETAILS FOR FRAME 790-2
CAST IN SLAB.

