

PLAN

NOTES:

STACK SECTIONS SHALL BE ACCORDING TO STANDARD PLAN R-1-SERIES UNLESS OTHERWISE NOTED ON THIS PLAN.

STACK SECTIONS SHALL BE LOCATED ON LEFT OR RIGHT SIDE OF SEWER AS SPECIFIED ON THE PLANS.

GRANULAR MATERIAL CLASS III SHALL BE USED IN BACKFILLING AROUND ALL STRUCTURES THAT FALL WITHIN 1:1 INFLUENCE LINES FROM THE EDGE OF PAVEMENT OR BACK OF CURB.

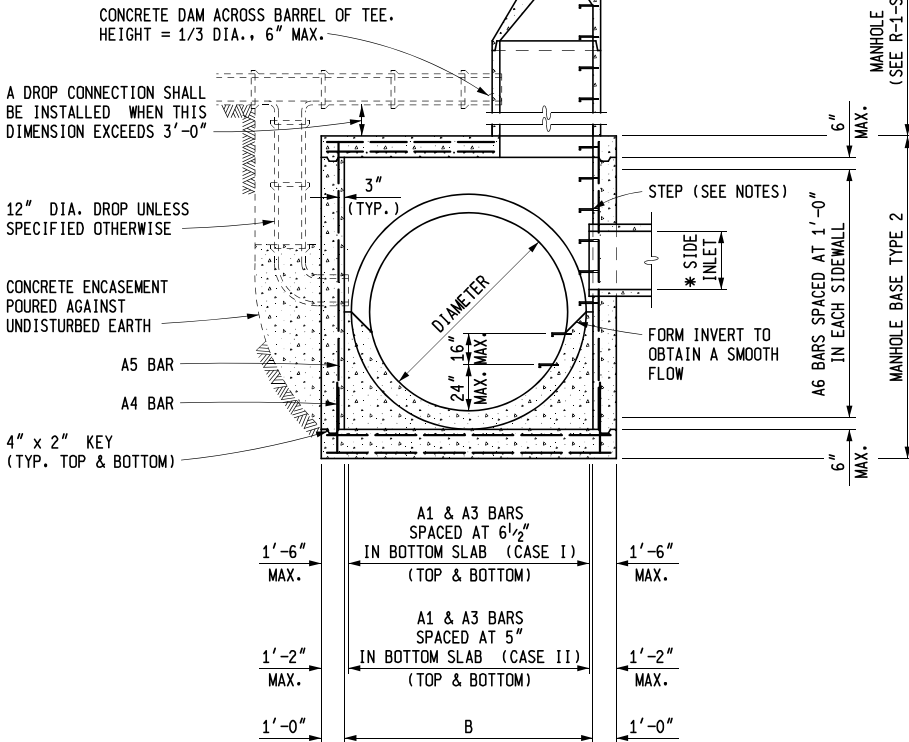
STEPS SHALL BE OF AN APPROVED DESIGN AND MADE FROM CAST IRON, ALUMINUM, OR PLASTIC COATED STEEL. RUNGS SHALL BE A MINIMUM OF 10" IN CLEAR LENGTH, DESIGNED TO PREVENT THE FOOT FROM SLIPPING OFF THE END. THE MINIMUM HORIZONTAL PULL OUT LOAD SHALL BE 400 LBS. THE MINIMUM VERTICAL LOAD SHALL BE 800 LBS.

ALL SIZES, FLOW LINES OF PIPES, AND ELEVATIONS FOR TOP AND BOTTOM OF STRUCTURES SHALL BE DETERMINED FROM THE PLANS AND CONSTRUCTION REQUIREMENTS.

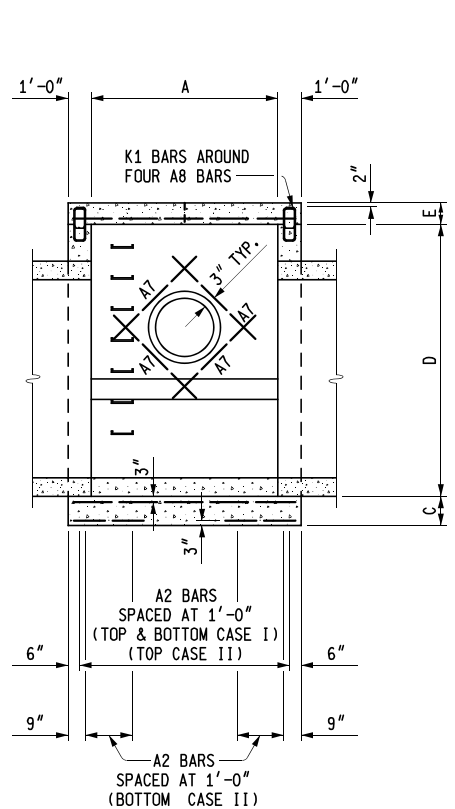
NO DEDUCTIONS HAVE BEEN MADE IN CONCRETE QUANTITIES FOR SIDE INLETS.

CONCRETE GRADE AS SPECIFIED IN THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

* (CASE I) 24" DIA. OR LESS
 (CASE II) 27" DIA. TO 60" DIA.



SECTION A - A



SECTION B - B

MDOT
 Michigan Department of Transportation

PREPARED BY
 DESIGN DIVISION

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
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 Oct 14 2021 12:30 PM

APPROVED BY: _____
 DIRECTOR, BUREAU OF FIELD SERVICES

Bradley C. Wiefersich Bradley C. Wiefersich
 Oct 14 2021 11:00 AM

APPROVED BY: _____
 DIRECTOR, BUREAU OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

MANHOLE BASE TYPE 2

4-7-2022 F.H.W.A. APPROVAL	7-27-2021 PLAN DATE	R-4-E	SHEET 1 OF 4
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DIMENSIONS						
CASE I (SIDE INLET 24" DIAMETER OR LESS)						
SEWER DIAMETER	MANHOLE DEPTH	A	B	C	D	E
48" - 60"	8' OR LESS	4'-0"	6'-0"	1'-0"	7'-0"	10"
66" - 78"	8' OR LESS	4'-0"	7'-10"	1'-1"	8'-10"	10"
84" - 96"	8' OR LESS	4'-0"	9'-6"	1'-2"	10'-6"	10"
102" - 108"	8' OR LESS	4'-0"	10'-8"	1'-3"	11'-8"	10"

CONCRETE QUANTITIES						
CASE I (SIDE INLET 24" DIAMETER OR LESS)						
SEWER DIAMETER	MANHOLE DEPTH	BOTTOM SLAB (CYD)	WALLS (CYD)	TOP SLAB (CYD)	INVERT (CYD)	TOTAL (CYD)
48"	8' OR LESS	1.30	4.63	1.09	1.19	8.2
54"	8' OR LESS	1.30	4.28	1.09	1.20	7.9
60"	8' OR LESS	1.30	3.89	1.09	1.18	7.5
66"	8' OR LESS	1.77	6.30	1.43	2.02	11.5
72"	8' OR LESS	1.77	5.83	1.43	2.01	11.0
78"	8' OR LESS	1.77	5.32	1.43	1.98	10.5
84"	8' OR LESS	2.27	7.78	1.74	2.95	14.7
90"	8' OR LESS	2.27	7.20	1.74	2.93	14.1
96"	8' OR LESS	2.27	6.57	1.74	2.88	13.5
102"	8' OR LESS	2.70	8.25	1.96	3.67	16.6
108"	8' OR LESS	2.70	7.55	1.96	3.61	15.8

DIMENSIONS						
CASE II (27" DIAMETER THROUGH 60" DIAMETER SIDE INLET)						
SEWER DIAMETER	MANHOLE DEPTH	A	B	C	D	E
48" - 60"	8' OR LESS	8'-0"	6'-0"	1'-0"	7'-0"	11"
	OVER 8' TO 15'	8'-0"	6'-0"	1'-2"	7'-0"	1'-1"
	OVER 15' TO 25'	8'-0"	6'-0"	1'-5"	7'-0"	1'-4"
66" - 78"	8' OR LESS	8'-0"	7'-10"	1'-1"	8'-10"	11"
	OVER 8' TO 15'	8'-0"	7'-10"	1'-2"	8'-10"	1'-1"
	OVER 15' TO 25'	8'-0"	7'-10"	1'-5"	8'-10"	1'-4"
84" - 96"	8' OR LESS	8'-0"	9'-6"	1'-2"	10'-6"	11"
	OVER 8' TO 15'	8'-0"	9'-6"	1'-2"	10'-6"	1'-1"
	OVER 15' TO 25'	8'-0"	9'-6"	1'-5"	10'-6"	1'-4"
102" - 108"	8' OR LESS	8'-0"	10'-8"	1'-3"	11'-8"	11"
	OVER 8' TO 15'	8'-0"	10'-8"	1'-3"	11'-8"	1'-1"
	OVER 15' TO 25'	8'-0"	10'-8"	1'-5"	11'-8"	1'-4"

CONCRETE QUANTITIES						
CASE II (27" DIAMETER THROUGH 60" DIAMETER SIDE INLET)						
SEWER DIAMETER	MANHOLE DEPTH	BOTTOM SLAB (CYD)	WALLS (CYD)	TOP SLAB (CYD)	INVERT (CYD)	TOTAL (CYD)
48"	8' OR LESS	2.33	6.66	2.29	2.38	13.7
	OVER 8' TO 15'	2.72	6.66	2.71	2.38	14.5
	OVER 15' TO 25'	3.31	6.66	3.33	2.38	15.7
54"	8' OR LESS	2.33	6.31	2.29	2.40	13.3
	OVER 8' TO 15'	2.72	6.31	2.71	2.40	14.1
	OVER 15' TO 25'	3.31	6.31	3.33	2.40	15.4
60"	8' OR LESS	2.33	5.92	2.29	2.35	12.9
	OVER 8' TO 15'	2.72	5.92	2.71	2.35	13.7
	OVER 15' TO 25'	3.31	5.92	3.33	2.35	14.9
66"	8' OR LESS	3.19	8.70	2.91	4.03	18.8
	OVER 8' TO 15'	3.44	8.70	3.44	4.03	19.6
	OVER 15' TO 25'	4.17	8.70	4.24	4.03	21.1
72"	8' OR LESS	3.19	8.24	2.91	4.03	18.4
	OVER 8' TO 15'	3.44	8.24	3.44	4.03	19.2
	OVER 15' TO 25'	4.17	8.24	4.24	4.03	20.7
78"	8' OR LESS	3.19	7.73	2.91	3.96	17.8
	OVER 8' TO 15'	3.44	7.73	3.44	3.96	18.6
	OVER 15' TO 25'	4.17	7.73	4.24	3.96	20.1
84"	8' OR LESS	4.08	10.40	3.48	5.90	23.9
	OVER 8' TO 15'	4.08	10.40	4.11	5.90	24.5
	OVER 15' TO 25'	4.96	10.40	5.06	5.90	26.3
90"	8' OR LESS	4.08	9.81	3.48	5.86	23.2
	OVER 8' TO 15'	4.08	9.81	4.11	5.86	23.9
	OVER 15' TO 25'	4.96	9.81	5.06	5.86	25.7
96"	8' OR LESS	4.08	9.18	3.48	5.76	22.5
	OVER 8' TO 15'	4.08	9.18	4.11	5.76	23.1
	OVER 15' TO 25'	4.96	9.18	5.06	5.76	25.0
102"	8' OR LESS	4.86	10.85	3.87	7.34	26.9
	OVER 8' TO 15'	4.86	10.85	4.58	7.34	27.6
	OVER 15' TO 25'	5.51	10.85	5.63	7.34	29.3
108"	8' OR LESS	4.86	10.14	3.87	7.23	26.1
	OVER 8' TO 15'	4.86	10.14	4.58	7.23	26.8
	OVER 15' TO 25'	5.51	10.14	5.63	7.23	28.5

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

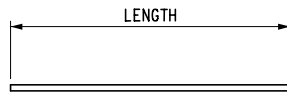
MANHOLE BASE TYPE 2

4-7-2022
F.H.W.A. APPROVAL

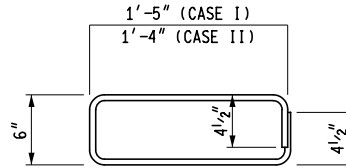
7-27-2021
PLAN DATE

R-4-E

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A BARS



K BARS

BAR DETAILS

STEEL REINFORCEMENT QUANTITIES															
CASE I (SIDE INLET 24" DIAMETER OR LESS)															
SEWER DIAMETER		48" - 60"			66" - 78"			84" - 96"			102" - 108"				
BAR	BAR SIZE	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)		
A1	#7	12	5'-6"	132	15	5'-6"	165	18	5'-6"	198	20	5'-6"	221		
A2	#5	12	7'-6"	95	12	9'-4"	119	12	11'-0"	140	12	12'-2"	155		
A3	#7	12	5'-6"	132	15	5'-6"	165	18	5'-6"	198	20	5'-6"	221		
A4	#7	24	1'-6"	72	24	1'-7"	76	24	1'-8"	80	24	1'-9"	84		
A5	#7	24	7'-7"	365	24	9'-5"	453	24	11'-1"	533	24	12'-3"	589		
A6	#5	14	5'-6"	82	18	5'-6"	105	22	5'-6"	128	24	5'-6"	140		
A7	#5	4	3'-0"	13	4	3'-0"	13	4	3'-0"	13	4	3'-0"	13		
A8	#7	12	7'-6"	180	12	9'-4"	225	12	11'-0"	265	12	12'-2"	293		
A9	#4	4	2'-6"	7	4	4'-4"	12	4	6'-0"	17	4	7'-2"	20		
A10	#6	8	5'-6"	66	12	5'-6"	99	15	5'-6"	123	17	5'-6"	140		
A12	#5	4	3'-0"	13	4	3'-0"	13	4	3'-0"	13	4	3'-0"	13		
K1	#4	10	4'-2"	29	12	4'-2"	35	14	4'-2"	41	16	4'-2"	47		
TOTAL STEEL WEIGHT				1186					1480					1749	1936

STEEL REINFORCEMENT QUANTITIES															
CASE II (27" DIAMETER THROUGH 60" DIAMETER SIDE INLET)															
SEWER DIAMETER		48" - 60"			66" - 78"			84" - 96"			102" - 108"				
BAR	BAR SIZE	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)	NUMBER REQUIRED	LENGTH	WEIGHT (LBS)		
A1	#8	15	9'-6"	369	19	9'-6"	467	23	9'-6"	566	26	9'-6"	639		
A2	#5	16	7'-6"	127	16	9'-4"	158	16	11'-0"	187	16	12'-2"	206		
A3	#8	30	3'-0"	233	38	3'-0"	295	46	3'-0"	357	52	3'-0"	404		
A4	#7	42	3'-0"	253	42	3'-0"	253	42	3'-0"	253	42	3'-0"	253		
A5	#7	42	7'-8"	646	42	9'-6"	800	42	11'-2"	940	42	12'-4"	1039		
A6	#5	14	9'-6"	141	18	9'-6"	181	22	9'-6"	222	24	9'-6"	242		
A7	#5	4	5'-0"	21	4	5'-0"	21	4	5'-0"	21	4	5'-0"	21		
A8	#5	20	7'-6"	159	20	9'-4"	198	20	11'-0"	233	20	12'-2"	258		
A9	#5	4	2'-6"	11	4	4'-4"	18	4	6'-0"	25	4	7'-2"	30		
A10	#8	8	9'-6"	197	12	9'-6"	295	15	9'-6"	369	17	9'-6"	418		
A11	#8	9	4'-6"	105	9	4'-6"	105	9	4'-6"	105	9	4'-6"	105		
A12	#5	4	3'-0"	13	4	3'-0"	13	4	3'-0"	13	4	3'-0"	13		
K1	#4	10	4'-0"	28	12	4'-0"	34	14	4'-0"	39	16	4'-0"	45		
TOTAL STEEL WEIGHT				2303					2838					3330	3673

MICHIGAN DEPARTMENT OF TRANSPORTATION
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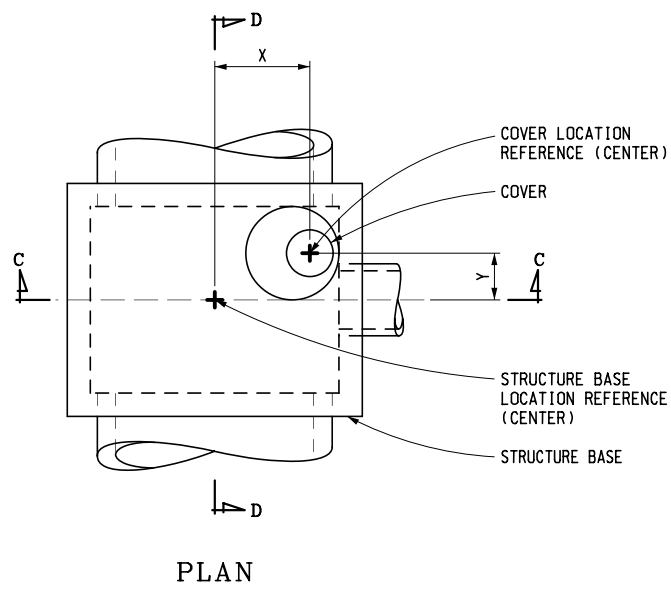
MANHOLE BASE TYPE 2

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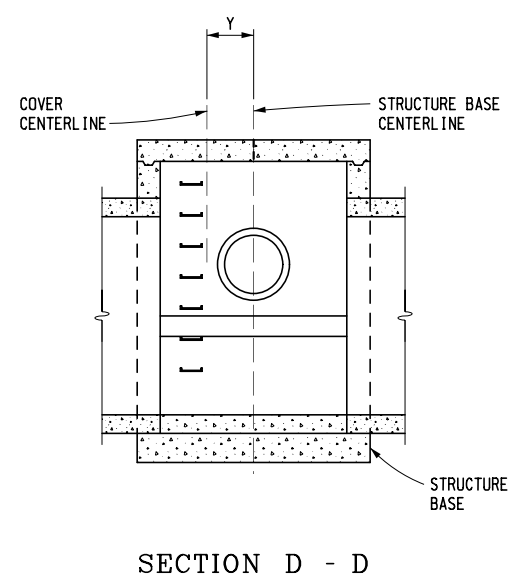
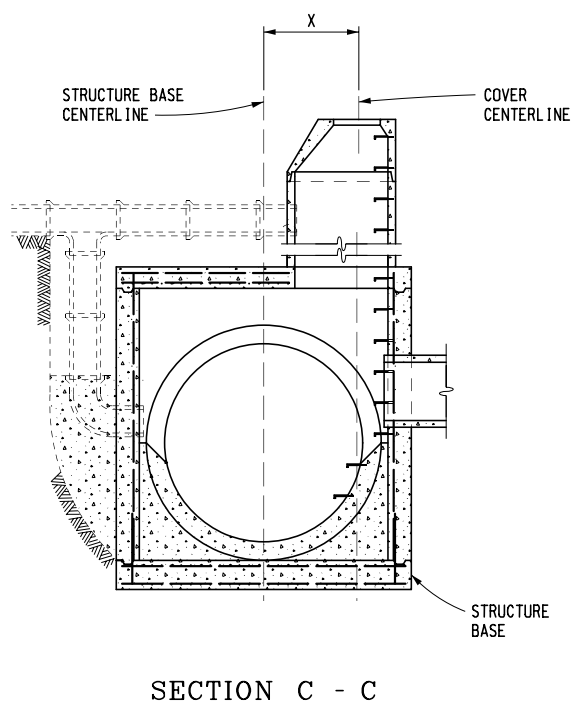
R-4-E

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OFFSET DIMENSIONS			
CASE I			
SEWER DIAMETER	X		Y
	24" OPENING	27" OPENING	
48" - 60"	21"	19½"	0"
66" - 78"	32"	30½"	0"
84" - 96"	42"	40½"	0"
102" - 108"	49"	47½"	0"

OFFSET DIMENSIONS			
CASE II			
SEWER DIAMETER	X		Y
	24" OPENING	27" OPENING	
48" - 60"	21"	19½"	24"
66" - 78"	32"	30½"	24"
84" - 96"	42"	40½"	24"
102" - 108"	49"	47½"	24"



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MANHOLE BASE TYPE 2

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