

## NOTES

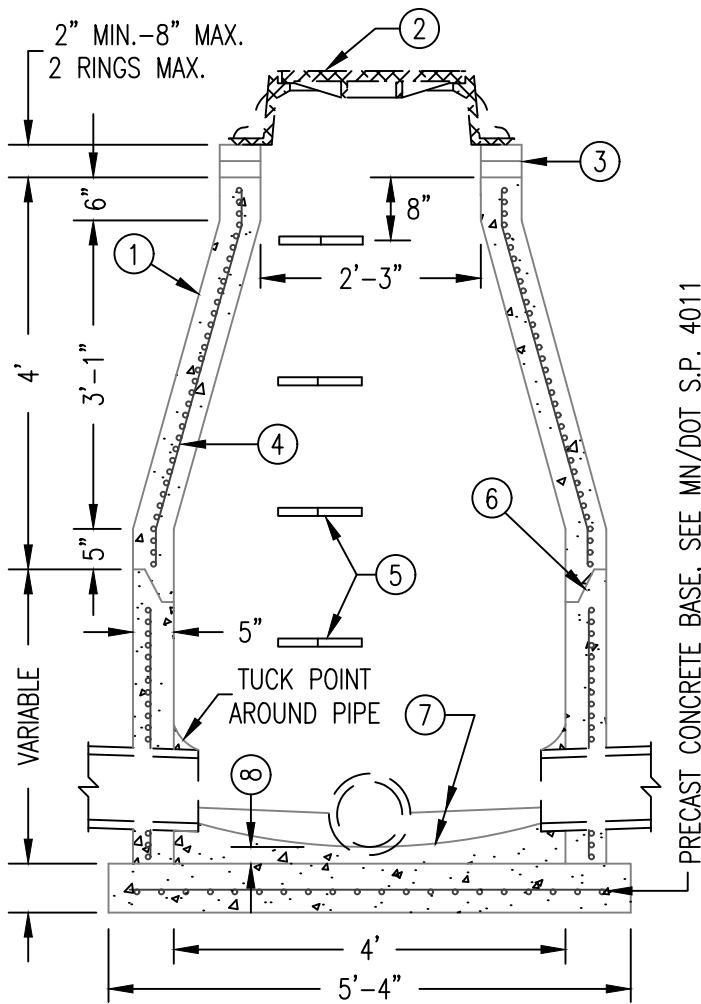
- ① REFER TO PLANS AND S.D.P. 1-11 & 1-12 FOR TYPE OF FRAME, GRATE AND CURB BOX.
- ② CONCRETE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13, AND FULLY MORTARED.
- ③ IF THE HORIZONTAL ALIGNMENT IS OFFSET BY MORE THAN 2", IN ANY DIRECTION, THE STRUCTURE SHALL BE REALIGNED AS AN INCIDENTAL EXPENSE.
- ④ REINFORCING SHALL BE A MINIMUM OF SINGLE LINE STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ. IN. PER FOOT OF HEIGHT.
- ⑤ PROVIDE CONCRETE FILLETS TO FIT BOTTOM PORTION OF STRUCTURE AND TO DIRECT THE FLOW TO OUTLET AT MINIMUM SLOPE OF 1/4" PER FOOT. MINIMUM CONCRETE THICKNESS AT OUTLET 1 1/2".
- ⑥ SEE S.D.P. 2-01, 2-05 AND 2-06 FOR CURB, GUTTER AND REINFORCEMENT DETAILS AT CATCH BASINS.
- ⑦ SEE S.D.P. 1-08 FOR SUBDRAIN DETAILS AT CATCH BASINS.
- ⑧ A PROTECTIVE COATING SHALL BE APPLIED TO ALL MORTARED JOINTS AROUND PIPE AND CONCRETE ADJUSTING RINGS WITH A 4" OVERLAP ON PRECAST. ALL GROUTING AND CLEANUP SHALL BE DONE PRIOR TO COATING.
9. NO STEPS REQUIRED.

DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA

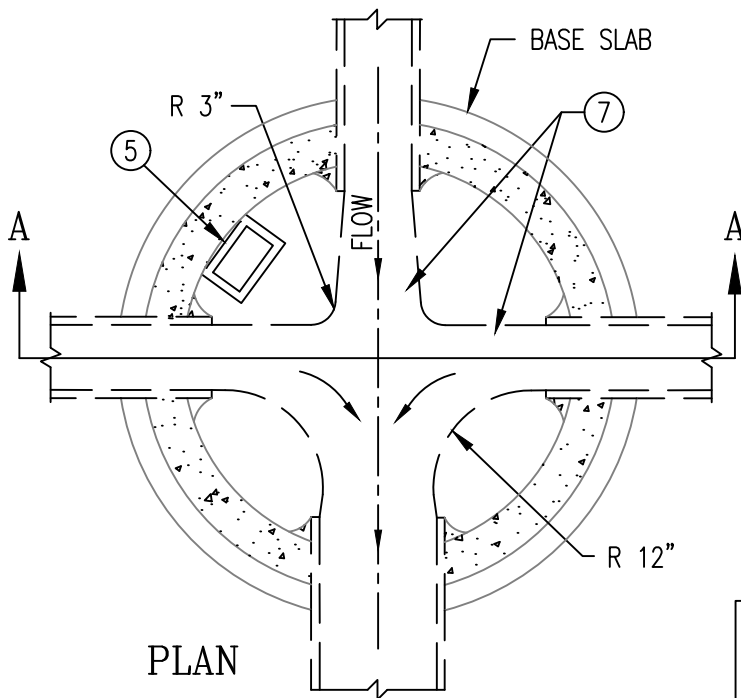
## STRUCTURE TYPE 1

*Dylan S. Dahl*  
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-01	REV. N
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SECTION A-A




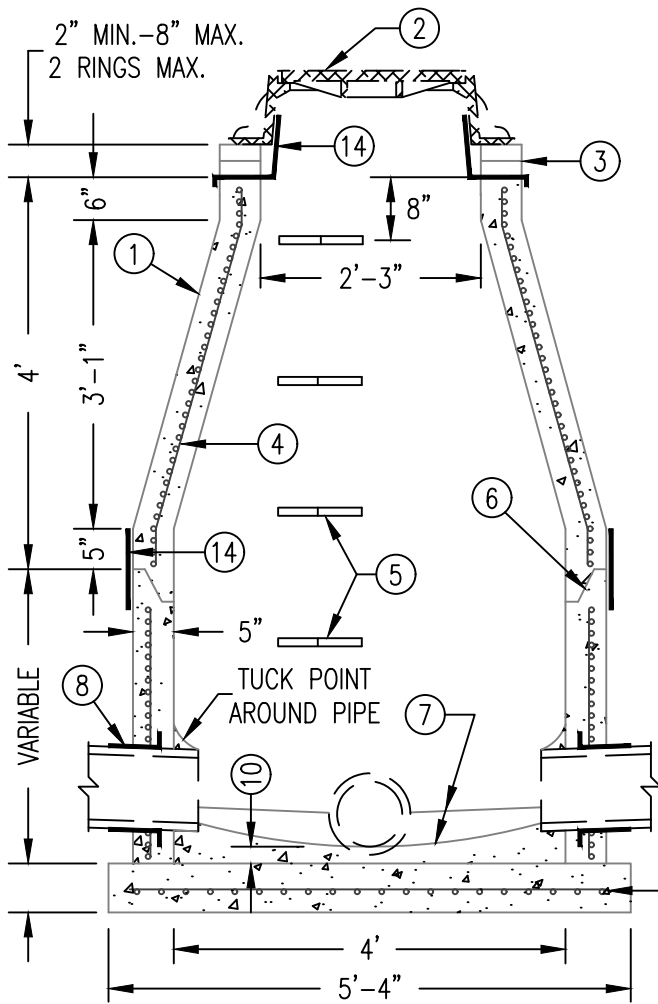
PLAN

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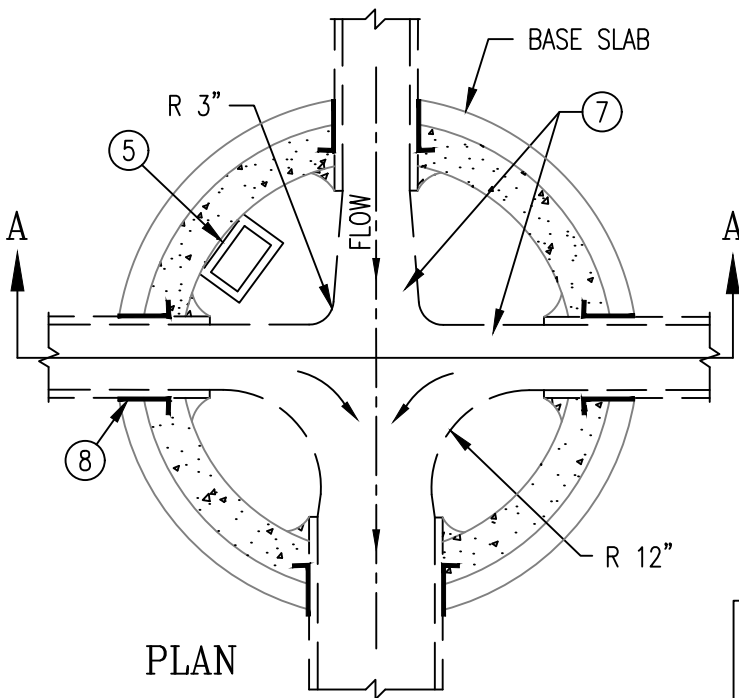
- ① CONE SHALL BE CONCENTRIC. REFER TO MN/DOT S.P. 4005.
- ② REFER TO PLANS AND S.D.P. 1-11 AND 1-12 FOR CASTING REQUIRED. CASTING SHALL BE BOLTED TO CONCRETE IN NON-PAVED AREAS.
- ③ HDPE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13.
- ④ REINFORCING SHALL BE A MIN. OF A SINGLE LINE STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ. IN. PER FOOT OF HEIGHT.
- ⑤ STEPS ARE SPACED 16" O.C. MAXIMUM AND SHALL CONFORM TO MN/DOT S.P. 4180. STEPS SHALL BE ORIENTED ON THE UPSTREAM LEFT SIDE AS SHOWN.
- ⑥ ALL JOINTS TO BE GASKETED. REFER TO MN/DOT SPEC. 3726.
- ⑦ PROVIDE CONCRETE FILLETS TO FIT BOTTOM PORTION OF PIPE TO DIRECT FLOW TO OUTLET AT 1/4" PER FT. MINIMUM SLOPE. SHAPE CHANNELS TO HAVE SMOOTH ROUND INVERTS. DEPTH OF CHANNELS SHALL NOT BE LESS THAN 1/2 THE PIPE SIZE.
- ⑧ MINIMUM CONCRETE THICKNESS AT LOWEST INVERT SHALL BE 1 1/2".
9. MAXIMUM PIPE SIZE:  
24" FOR STRAIGHT THRU TO 135°  
18" FOR 90° BEND
10. FOR INLET STRUCTURES IN PAVED AREAS, A PROTECTIVE COATING SHALL BE APPLIED TO ALL MORTARED JOINTS AROUND PIPE.

PRECAST CONCRETE BASE, SEE MN/DOT S.P. 4011

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>STRUCTURE TYPE 2</b> <b>(STORM SEWER)</b>			
 CITY ENGINEER			
SHT 1 OF 2 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-02	REV. L



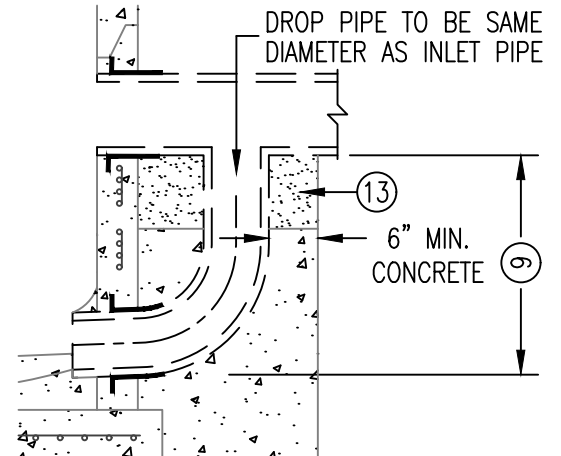
SECTION A-A



PLAN

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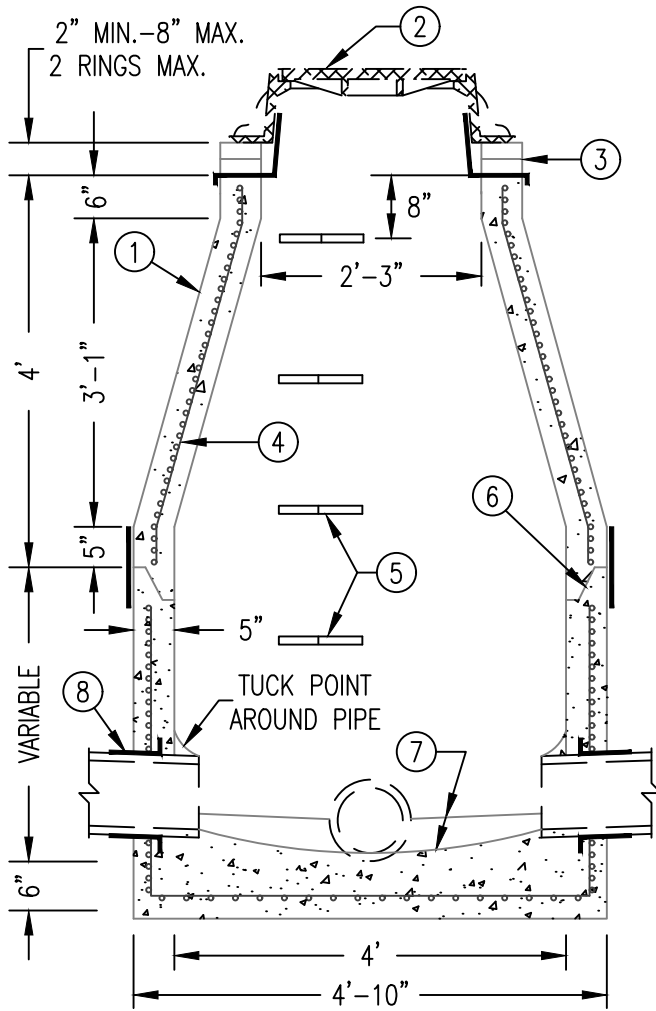
- ① CONE SHALL BE CONCENTRIC. REFER TO MN/DOT S.P. 4005.
- ② REFER TO PLANS AND S.D.P. 1-11 AND 1-12 FOR CASTING REQUIRED. CASTING SHALL BE BOLTED TO STRUCTURE IN NON-PAVED AREAS.
- ③ HDPE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13.
- ④ REINFORCING SHALL BE A MINIMUM OF A SINGLE LINE STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ. IN. PER FOOT OF HEIGHT.
- ⑤ STEPS ARE SPACED 16" O.C. MAXIMUM AND SHALL CONFORM TO MN/DOT S.P. 4180. STEPS SHALL BE ORIENTED ON THE UPSTREAM LEFT SIDE AS SHOWN.
- ⑥ ALL JOINTS TO BE GASKETED. REFER TO MN/DOT SPEC. 3726.
- ⑦ PROVIDE CONCRETE FILLETS TO FIT BOTTOM PORTION OF PIPE TO DIRECT FLOW TO OUTLET AT 1/4" PER FT. MINIMUM SLOPE. SHAPE CHANNELS TO HAVE SMOOTH ROUND INVERTS. DEPTH OF CHANNELS SHALL NOT BE LESS THAN 1/2 THE PIPE SIZE.
- ⑧ FOR WATER TIGHT SEAL REFER TO MN/DOT S.P. 4007.
- ⑨ DROP INLET USED FOR SAN. SEWER DROPS GREATER THAN 1.0 FT.
- ⑩ MINIMUM CONCRETE THICKNESS AT LOWEST INVERT SHALL BE 1 1/2".
11. STRUCTURE TYPE 3 OR 3A REQUIRED FOR NEW SANITARY SEWER CONSTRUCTION.
12. MAXIMUM PIPE SIZE:  
24" FOR STRAIGHT THRU TO 135°  
18" FOR 90° BEND
- ⑬ DROP PIPE TO BE ENCASED IN GROUT IF FLEXIBLE PIPE, OR GRANULAR ENCASEMENT IF RIGID PIPE IS USED. USE ENCASEMENT BLOCK AS REQUIRED.



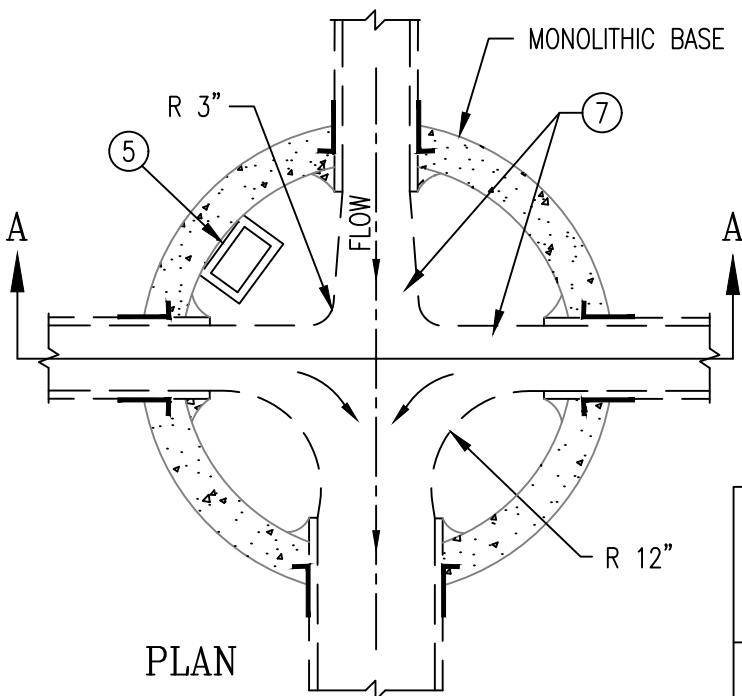
TYPE 2A FOR DROP-INLET

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>STRUCTURE TYPES</b> <b>2 AND 2A (SANITARY SEWER)</b>			
<i>Dylan S. Dahl</i> CITY ENGINEER			
SHT 2 OF 2 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-02	REV. L

⑭ SEE S.D.P. 1-07 FOR MANHOLE WATERPROOFING.



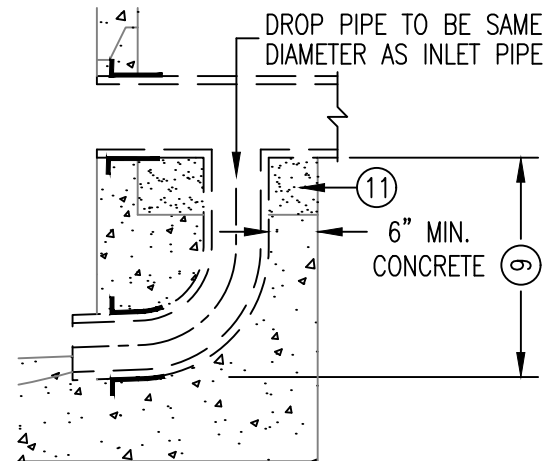
SECTION A-A




PLAN

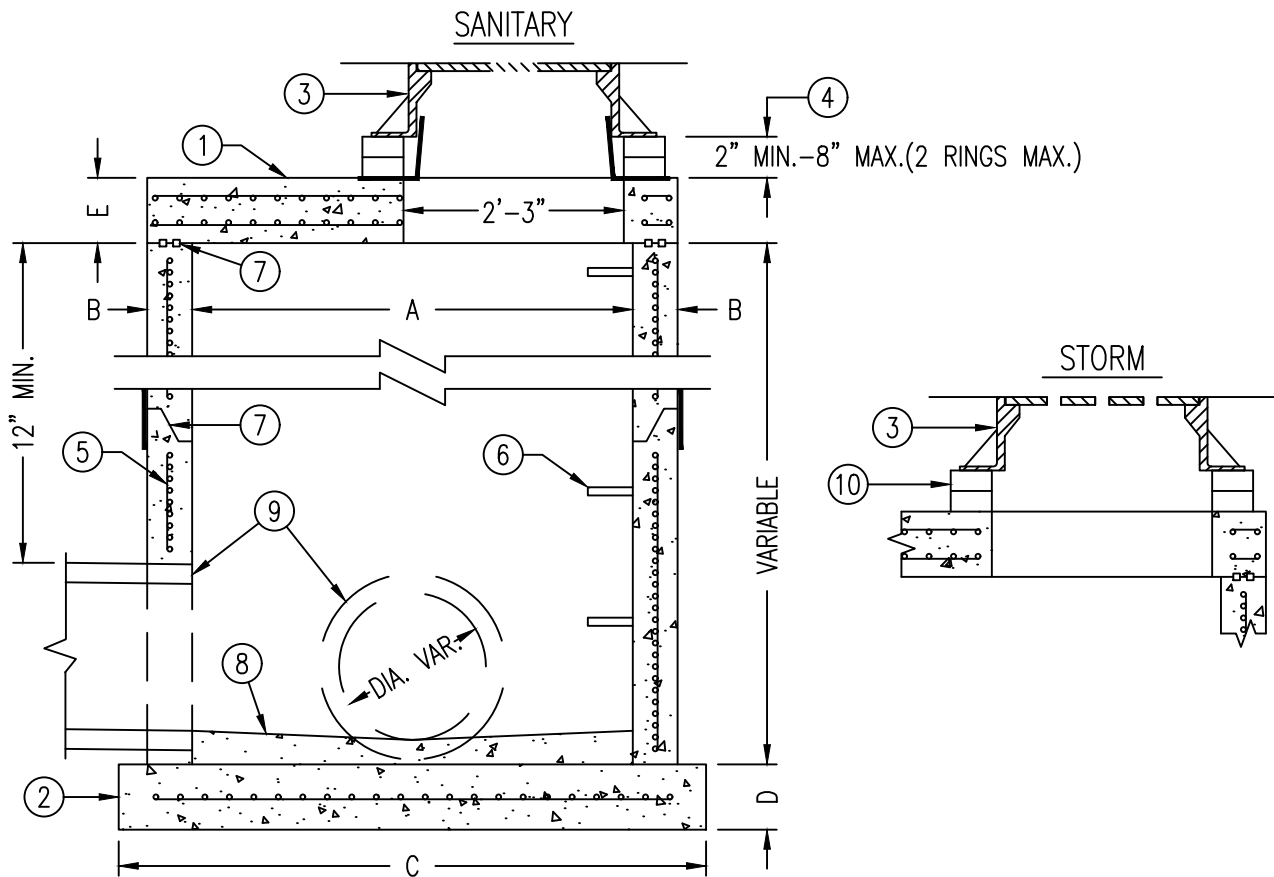
NOTES

- ① CONE SHALL BE CONCENTRIC. REFER TO MN/DOT S.P. 4005.
- ② REFER TO PLANS AND S.D.P. 1-11 AND 1-12 FOR CASTING REQUIRED. CASTING SHALL BE BOLTED TO CONCRETE IN NON-PAVED AREAS.
- ③ HDPE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13, AND WATERPROOFING PER S.D.P. 1-07.
- ④ REINFORCING SHALL BE A MINIMUM OF A SINGLE LINE STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ. IN. PER FOOT OF HEIGHT.
- ⑤ STEPS ARE SPACED 16" O.C. MAXIMUM AND SHALL CONFORM TO MN/DOT S.P. 4180. STEPS SHALL BE ORIENTED ON THE UPSTREAM LEFT SIDE AS SHOWN.
- ⑥ ALL JOINTS TO BE GASKETED. REFER TO MN/DOT SPEC. 3726.
- ⑦ PROVIDE CONCRETE FILLETS TO FIT BOTTOM PORTION OF PIPE TO DIRECT FLOW TO OUTLET AT 1/4" PER FT. MINIMUM SLOPE. SHAPE CHANNELS TO HAVE SMOOTH ROUND INVERTS. DEPTH OF CHANNELS SHALL NOT BE LESS THAN 1/2 THE PIPE SIZE.
- ⑧ FOR WATER TIGHT SEAL REFER TO MN/DOT S.P. 4007.
- ⑨ DROP INLET USED FOR SANITARY SEWER DROPS GREATER THAN 1.0 FT.
10. MAXIMUM PIPE SIZE:  
24" FOR STRAIGHT THRU TO 135°  
18" FOR 90° BEND
- ⑪ DROP PIPE TO BE ENCASED IN GROUT IF FLEXIBLE PIPE, OR GRANULAR ENCASEMENT IF RIGID PIPE IS USED. USE ENCASEMENT BLOCK AS REQUIRED.



TYPE 3A FOR DROP-INLET

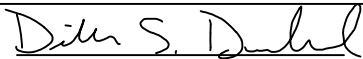
DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>STRUCTURE TYPES 3 AND 3A</b> <b>(SANITARY SEWER)</b>			
 CITY ENGINEER			
SHT 1 OF 1 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-03	REV. M

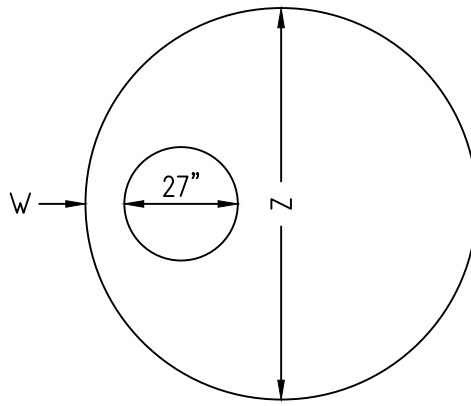


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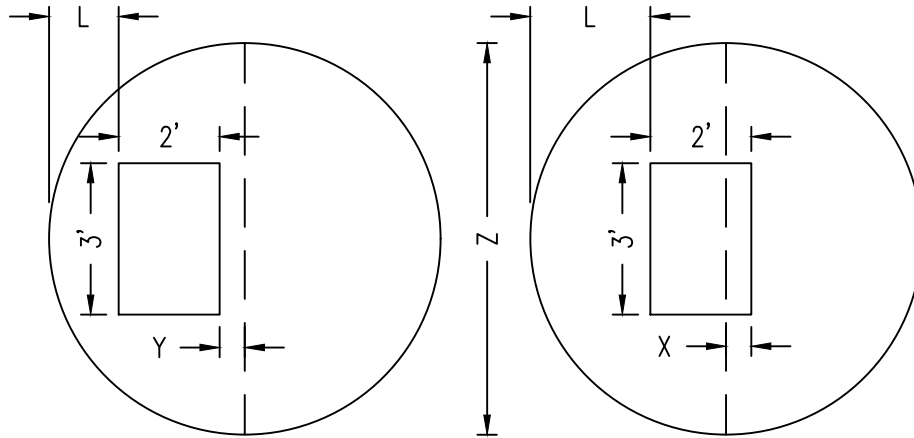
- ① MANHOLE COVER SHALL CONFORM TO MN/DOT S.P. 4020.
- ② MANHOLE BASE SHALL CONFORM TO MN/DOT S.P. 4011.
- ③ REFER TO PLANS AND S.D.P. 1-11 AND 1-12 FOR CASTING REQUIRED. CASTING SHALL BE BOLTED TO CONCRETE IN NON-PAVED AREAS.
- ④ HDPE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13, AND WATERPROOFING FOR SANITARY MANHOLES PER S.D.P. 1-07.
- ⑤ REINFORCING SHALL BE A MINIMUM OF A SINGLE LINE STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ. IN. PER FOOT OF HEIGHT.
- ⑥ STEPS ARE SPACED AT 16" O.C. MAXIMUM AND SHALL CONFORM TO MN/DOT S.P. 4180. STEPS SHALL BE ORIENTED ON THE UPSTREAM LEFT SIDE.
- ⑦ ALL JOINTS TO BE GASKETED, WITH 2 ROWS AT TOP SLAB. REFER TO MN/DOT SPEC. 3726.
- ⑧ PROVIDE CONCRETE FILLETS TO FIT BOTTOM PORTION OF PIPE TO DIRECT FLOW TO OUTLET AT 1/4" PER FT. MINIMUM SLOPE. MINIMUM CONCRETE THICKNESS AT LOWEST INVERT SHALL BE 1 1/2".
- ⑨ WATERTIGHT SEAL PER MN/DOT S.P. 4007. REQUIRED FOR SANITARY SEWER USE.
- ⑩ FOR STORM SEWER MANHOLE CATCH BASINS - A PROTECTIVE COATING SHALL BE APPLIED TO ALL MORTARED JOINTS AROUND PIPE AND CONCRETE ADJUSTING RINGS WITH A 4" OVERLAP ON PRECAST. ALL GROUTING AND CLEANUP SHALL BE DONE PRIOR TO COATING.

SEE SHEET 2 FOR MANHOLE DIMENSIONS

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
<b>STRUCTURE TYPE 4 (XX in.)</b>			
 CITY ENGINEER			
SHT 1 OF 2 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-04	REV. L



MANHOLE TOP SLAB



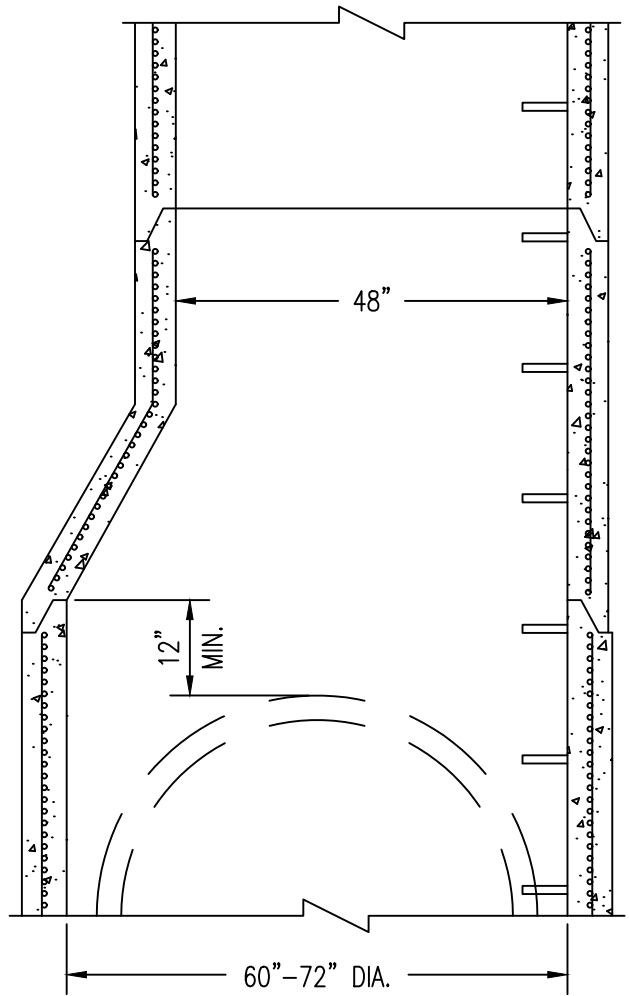
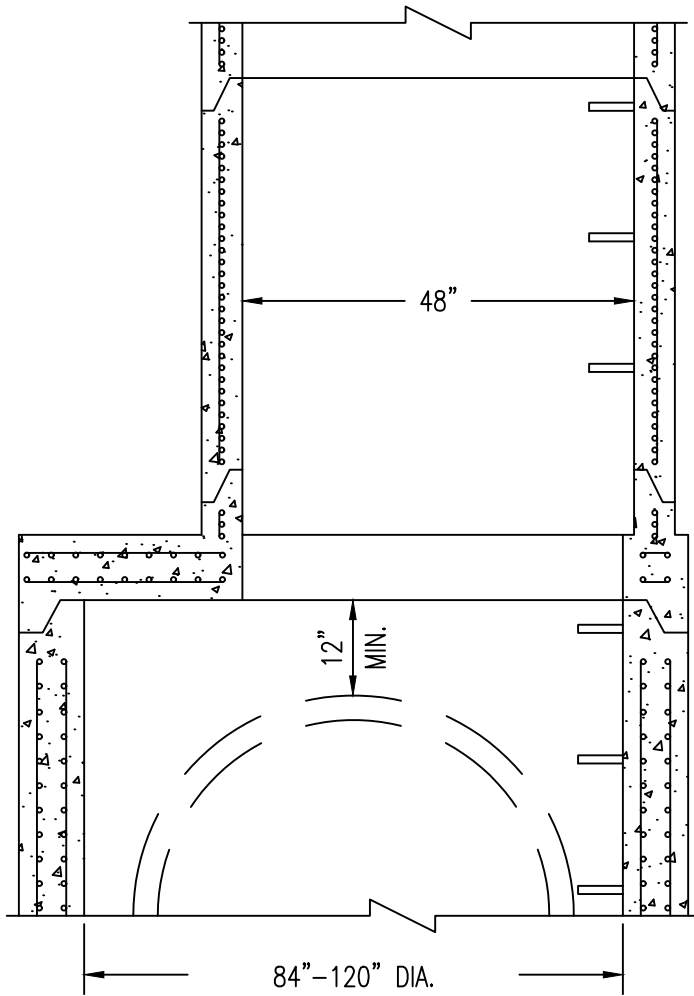
ALTERNATE TOP SLAB FOR MANHOLE

MANHOLE TOP SLAB					MANHOLE DIMENSIONS					MAXIMUM PIPE SIZE	
L	W	X	Y	Z	A	B	C	D	E	135°-180°	90°
14"	6"	9"	-	58"	48"	5"	64"	6"	6"	27"	18"
14.5"	6"	6"	-	65"	54"	5.5"	72"	8"	8"	33"	21"
15"	7"	3"	-	72"	60"	6"	78"	8"	8"	36"	24"
15.5"	7"	0"	-	79"	66"	6.5"	85"	8"	8"	42"	30"
16"	8"	-	3"	86"	72"	7"	92"	8"	8"	42"	33"
16.5"	8"	-	6"	93"	78"	7.5"	100"	8"	8"	48"	36"
17"	9"	-	9"	100"	84"	8"	106"	8"	8"	54"	42"
17.5"	9"	-	12"	107"	90"	8.5"	114"	8"	8"	60"	42"
18"	9"	-	15"	114"	96"	9"	120"	8"	8"	60"	42"
18.5"	9"	-	18"	121"	102"	9.5"	127"	8"	8"	60"	48"
18"	10"	-	21"	126"	108"	10"	132"	9"	12"	60"	54"
22"	11"	-	24"	140"	120"	10"	146"	12"	12"	60"	60"

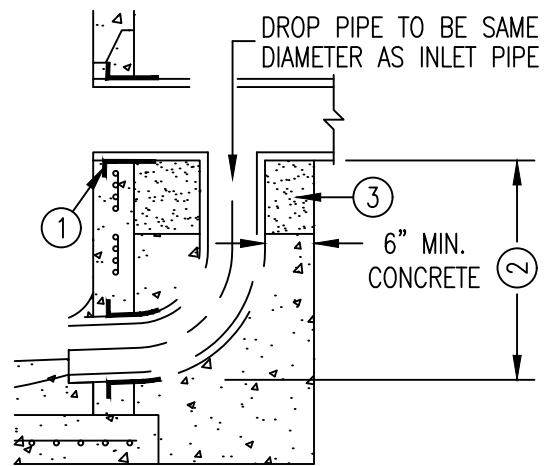
DEPARTMENT OF PUBLIC WORKS  
 CITY OF ROCHESTER, MINNESOTA  
**STRUCTURE TYPE 4 (XX in.)  
 MANHOLE DIMENSIONS**

*Dimitri S. Dandil*  
 CITY ENGINEER

SHT 2 OF 2 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-04	REV. L
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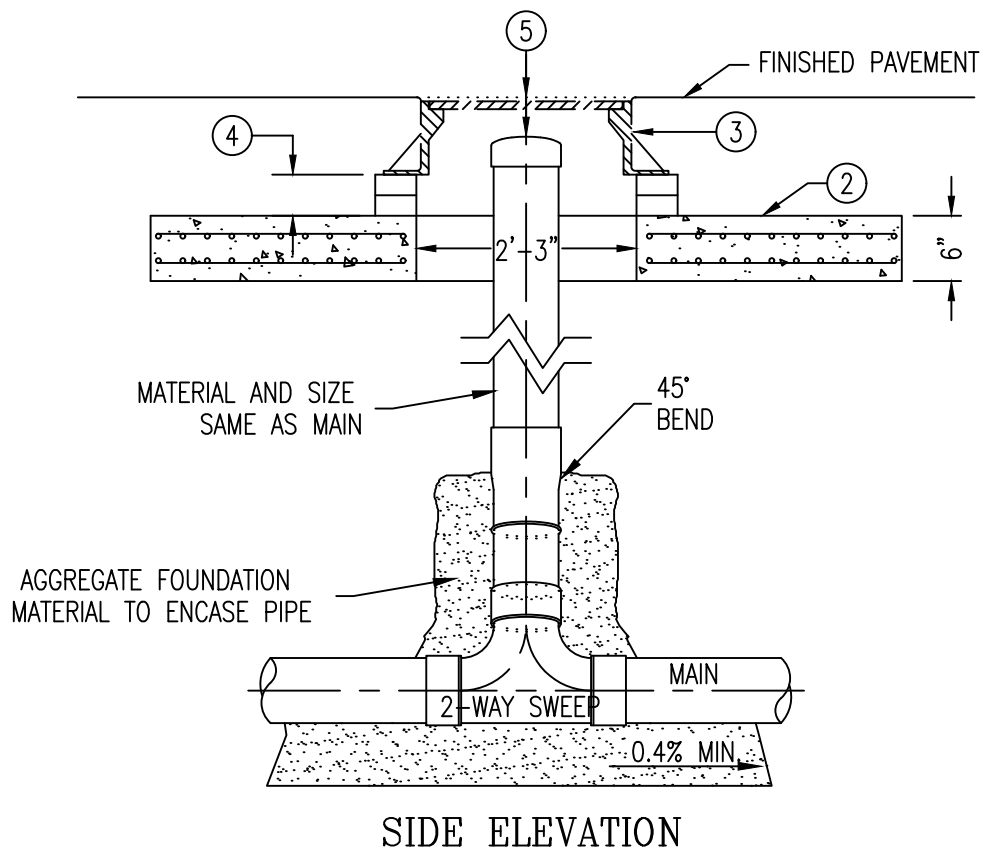
- ① FOR WATER TIGHT SEAL REFER TO MN/DOT S.P. 4007.
- ② DROP INLET USED FOR SAN. SEWER DROPS GREATER THAN 1.0 FT.
- ③ DROP PIPE TO BE ENCASED IN GROUT IF FLEXIBLE PIPE, OR GRANULAR ENCASEMENT IF RIGID PIPE IS USED. USE ENCASEMENT BLOCK AS REQUIRED.



TYPE 5A FOR DROP-INLET

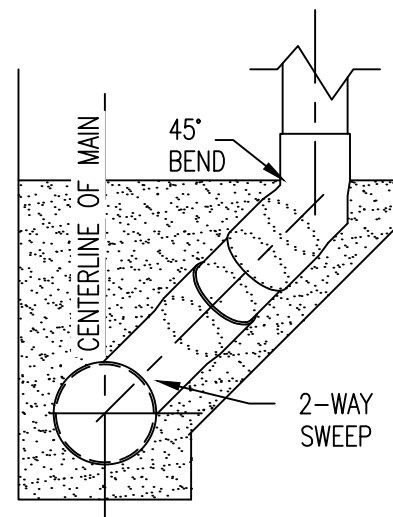
DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>STRUCTURE TYPE 5 &amp; 5A</b> <b>(XX in.) REDUCTION MANHOLE</b>			
<i>Dexter S. Dahl</i> CITY ENGINEER			
SHT 1 OF 1 SHTS	DATE REVISED 1/1/23	PLATE NO. 1-05	REV. E

SEE CITY STANDARD PLATES 1-02 THRU 1-04 FOR MANHOLE DETAILS



NOTES

1. 48" STRUCTURE SHALL BE USED WHENEVER THE CLEANOUT FALLS INTO PAVEMENT AREAS.
- ② MANHOLE COVER SHALL CONFORM TO MN/DOT S.P. 4020.
- ③ REFER TO PLANS AND S.D.P. 1-11 AND 1-12 FOR CASTING REQUIRED. CASTING SHALL BE BOLTED TO CONCRETE IN FIELD APPLICATIONS.
- ④ HDPE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13, AND BE FULLY MORTARED.
- ⑤ CLEANOUT CAP IS TO BE A MINIMUM OF 4" AND A MAXIMUM OF 6" BELOW THE FINISHED PAVEMENT GRADE.
6. SET TOP OF RING CASTING TO 1/2" BELOW THE FINISHED PAVEMENT.

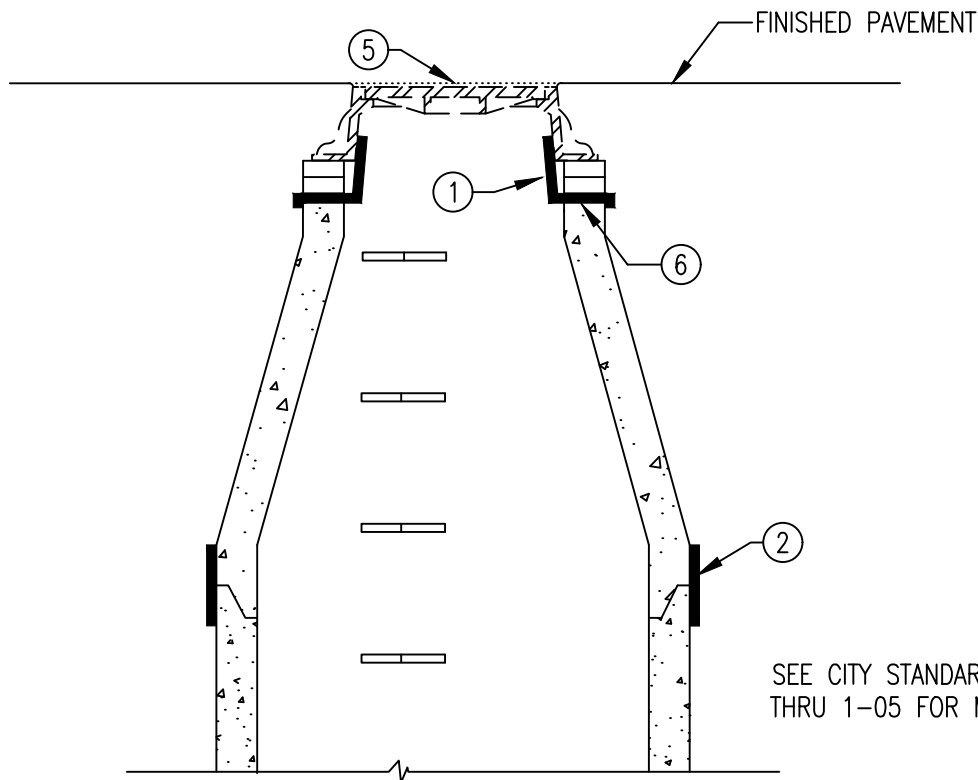


DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA  
**STRUCTURE TYPE 6  
(CLEANOUT)**

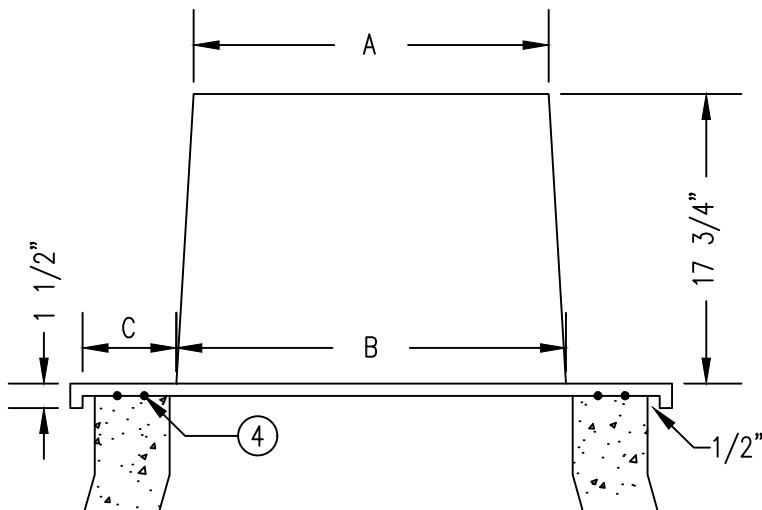
*Dylan S. Dahl*  
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-06	REV. G
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SEE CITY STANDARD PLATES 1-02  
THRU 1-05 FOR MANHOLE DETAILS.



SIZE CHART		
A	B	C
21 3/4	23 7/8	5 3/4
21 3/4	23 7/8	7 1/4
21 3/8	23 7/8	9 1/4
24 1/2	25 3/4	6 1/2

SIZE USED IS DEPENDENT ON MATERIAL  
THAT MANHOLE IS CONSTRUCTED OUT OF.

## INTERNAL WATER BARRIER

### NOTES

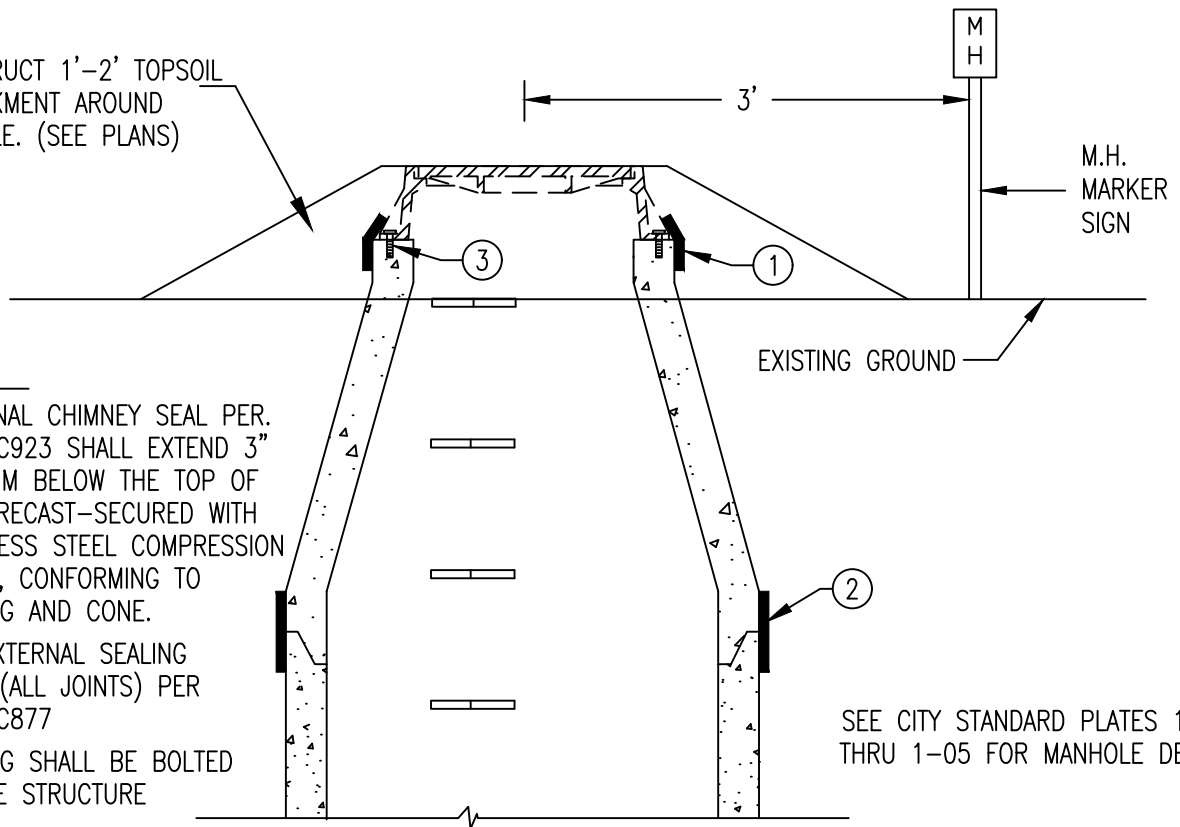
- ① INTERNAL WATER BARRIER PER ASTM D4976 OR D790. MUST MATCH PRE-CAST CONE DIAMETER.
- ② 12" EXTERNAL WATER BARRIER WRAP (ALL JOINTS) PER ASTM C877
3. TRIM TOP OF SEAL TO 1" BELOW CASTING LID. CASTING SHALL NOT REST ON SEAL.
- ④ PLACE 2 ROWS OF SEALANT ON TOP OF CONE SECTION AND BENEATH SEAL.
- ⑤ FOR NEW STRUCTURES, SET EITHER 1/2" BELOW THE FLEXIBLE PAVEMENT OR FLUSH WITH THE RIGID PAVEMENT SURFACE.
- ⑥ CAULK ALL JOINTS EXCEPT BETWEEN WATER BARRIER AND 1ST RING.

DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA  
**MANHOLE WATERPROOFING  
PAVED AREAS**

*Dimitri S. Dandl*  
CITY ENGINEER

SHT 1 OF 2 SHTS	DATE REVISED 1/1/24	PLATE NO. 1-07	REV. F
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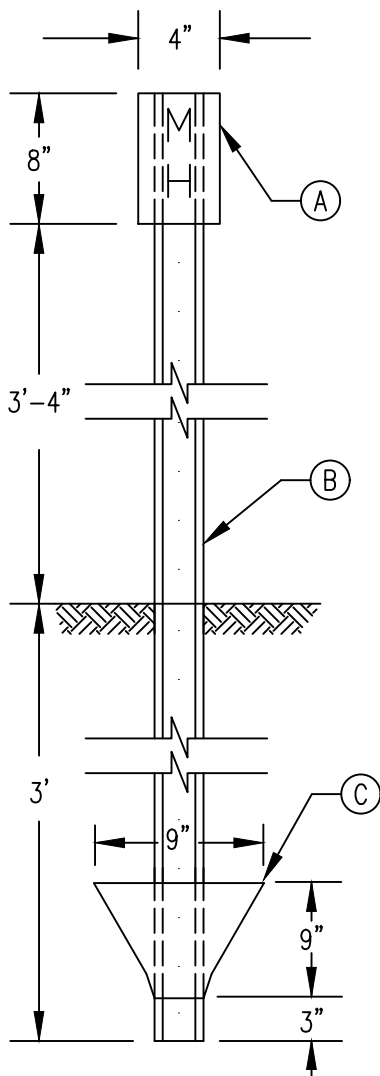
CONSTRUCT 1'-2' TOPSOIL EMBANKMENT AROUND MANHOLE. (SEE PLANS)



**NOTES**

- ① EXTERNAL CHIMNEY SEAL PER. ASTM C923 SHALL EXTEND 3" MINIMUM BELOW THE TOP OF THE PRECAST—SECURED WITH STAINLESS STEEL COMPRESSION BANDS, CONFORMING TO CASTING AND CONE.
- ② 12" EXTERNAL SEALING WRAP (ALL JOINTS) PER ASTM C877
- ③ CASTING SHALL BE BOLTED TO THE STRUCTURE

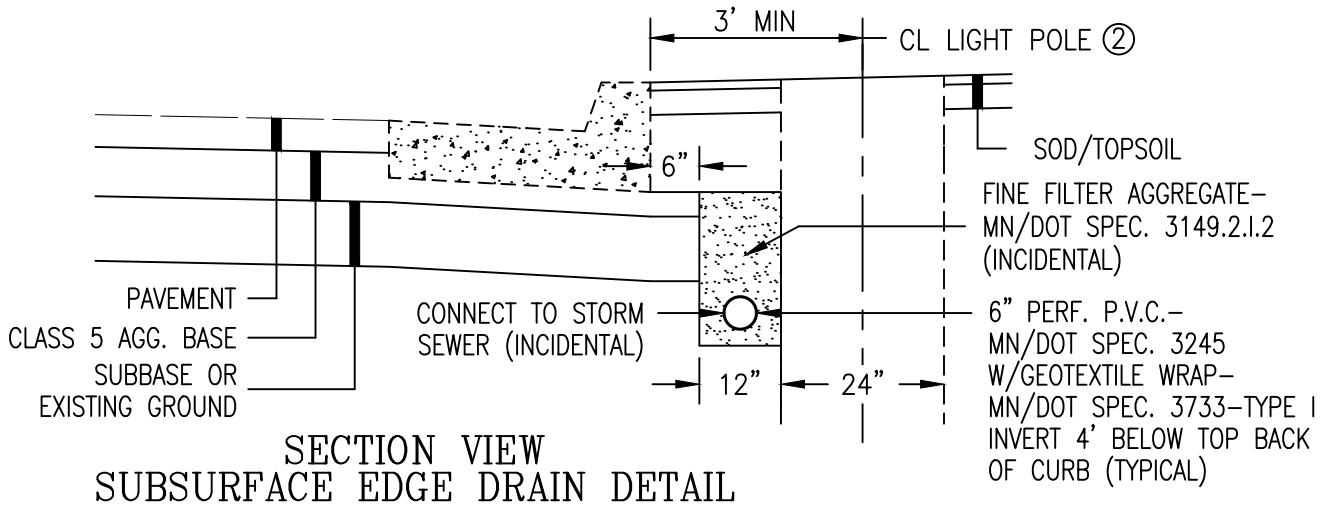
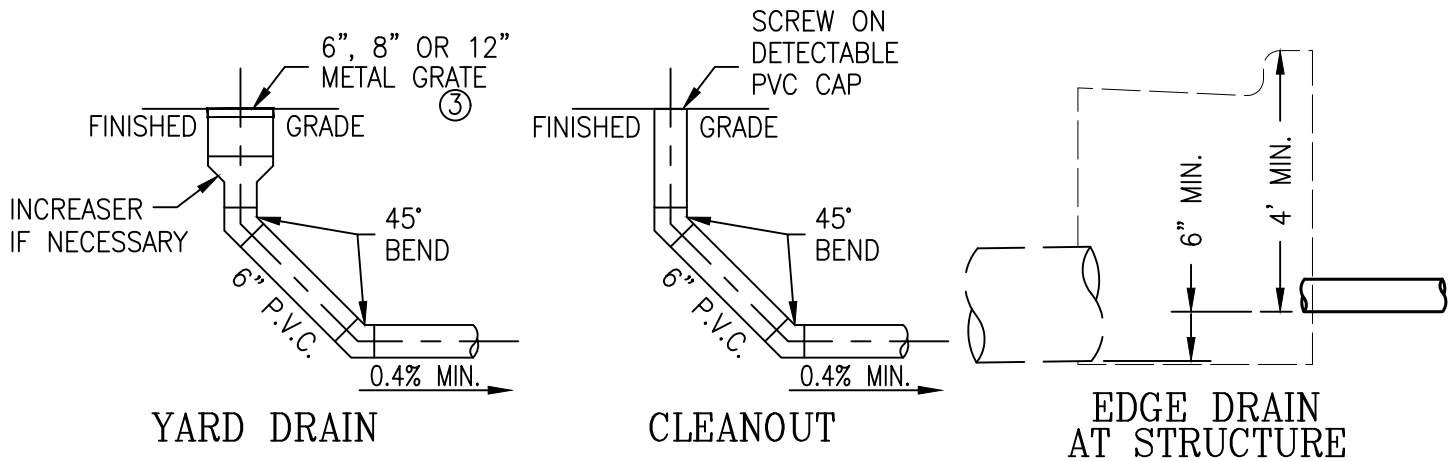
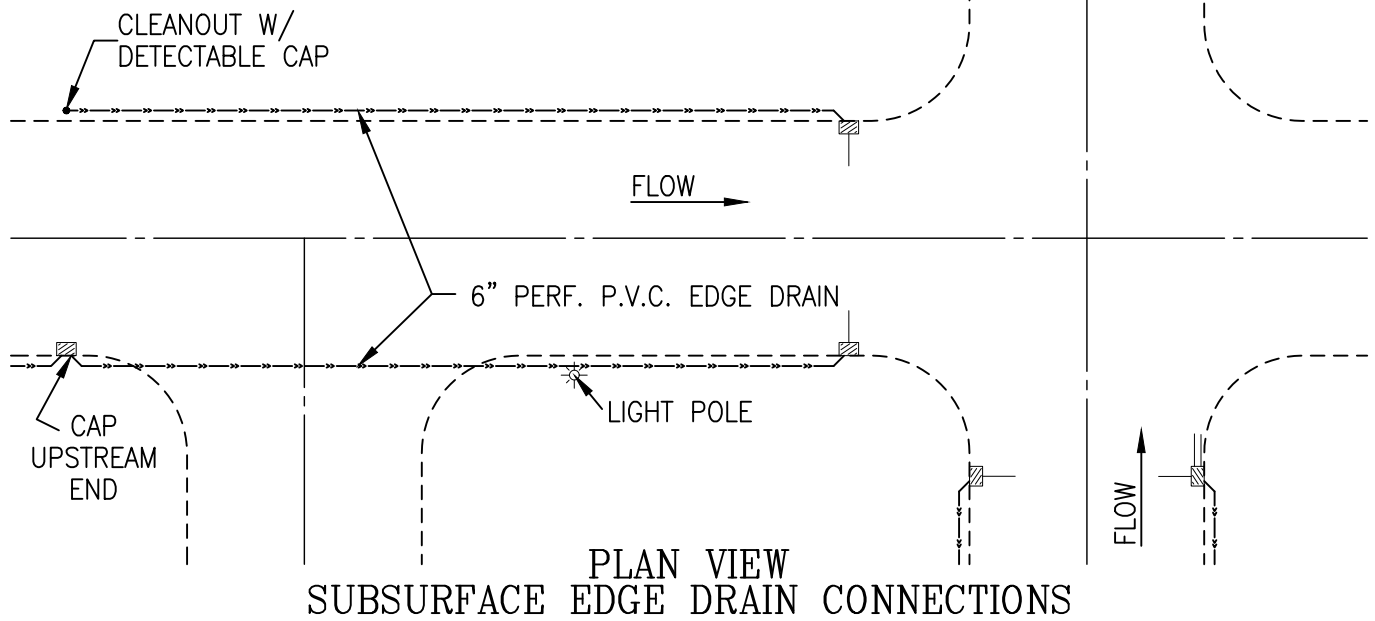
SEE CITY STANDARD PLATES 1-02 THRU 1-05 FOR MANHOLE DETAILS.



**NOTES**

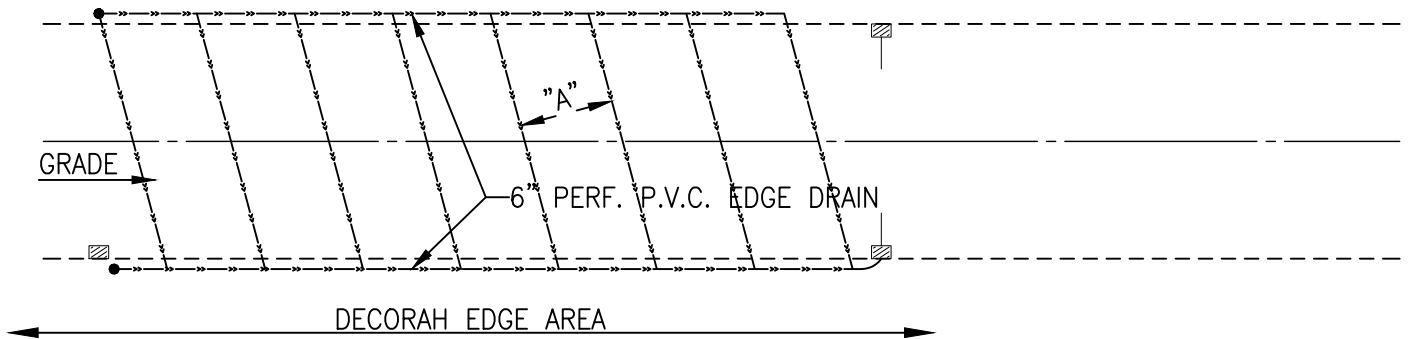
- Ⓐ 2 SHEET ALUMINUM SIGNS BOLTED TO POST. SIGNS SHALL READ "M.H." IN 2 INCH BLACK OR WHITE LETTERS ON GREEN REFLECTORIZED BACKGROUND.
- Ⓑ FLANGED CHANNEL SIGN POSTS SHALL BE A MINIMUM OF 2.75 POUNDS PER FOOT, AND SHALL MEET MN/DOT SPEC. 3401.
- Ⓒ 1/8" SHEET STEEL SHALL BE ASTM A1011, GRADE D SHALL BE BOLTED OR WELDED TO CHANNEL.
- D. INSTALL MARKER WHEN MANHOLE IS PLACED OUTSIDE OF THE ROADWAY.

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>MANHOLE WATERPROOFING          NON-PAVED AREAS</b>			
 CITY ENGINEER			
SHT 2 OF 2 SHTS	DATE REVISED 1/1/24	PLATE NO. 1-07	REV. F

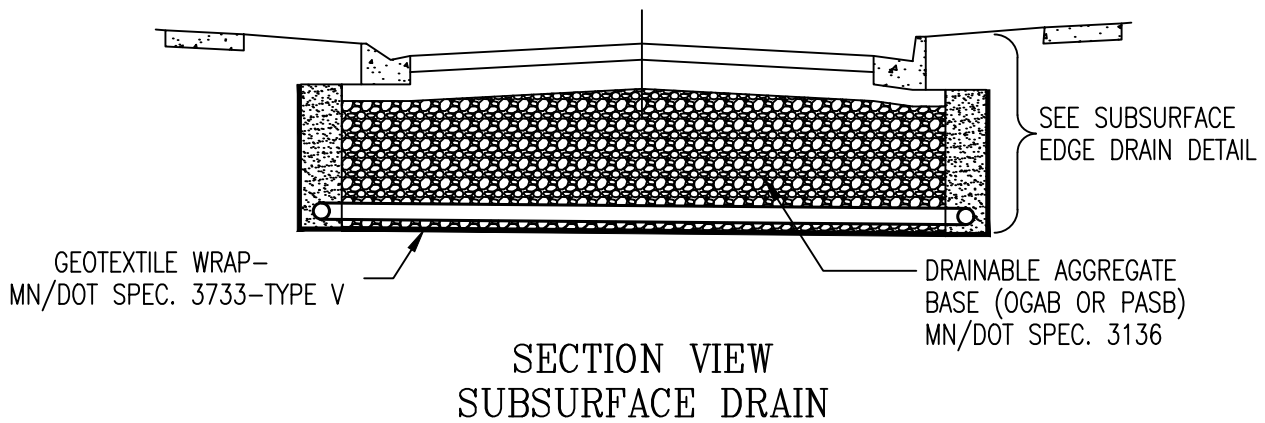


1. THE UPSTREAM ENDS OF THE PERFORATED PIPE SHALL BE CAPPED WITH A DETECTABLE CAP. THE CAPS ARE INCIDENTAL. PLACE PERFORATED PIPE WITH THE PERFORATIONS DOWN.
- ② IF LIGHT POLE IS LESS THAN 3 FT., CONTRACTOR SHALL POT HOLE TO VERIFY PIPE LOCATION. REFERENCE RPU-SL9FD01
- ③ REFER TO SDP 1-11 & 1-12 FOR CASTING REQUIRED.

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
<b>SUBSURFACE EDGE DRAINS</b>			
<i>Dimitri S. Danilov</i> CITY ENGINEER			
SHT 1 OF 2 SHTS	DATE REVISED 5/1/23	PLATE NO. 1-08	REV. 1



PLAN VIEW  
FULL ROADWAY SUBSURFACE DRAIN

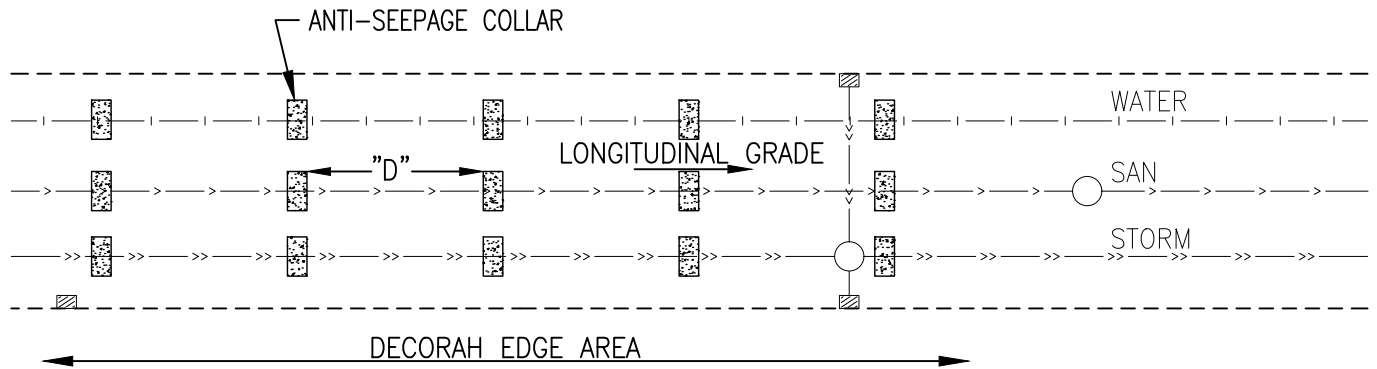


SECTION VIEW  
SUBSURFACE DRAIN

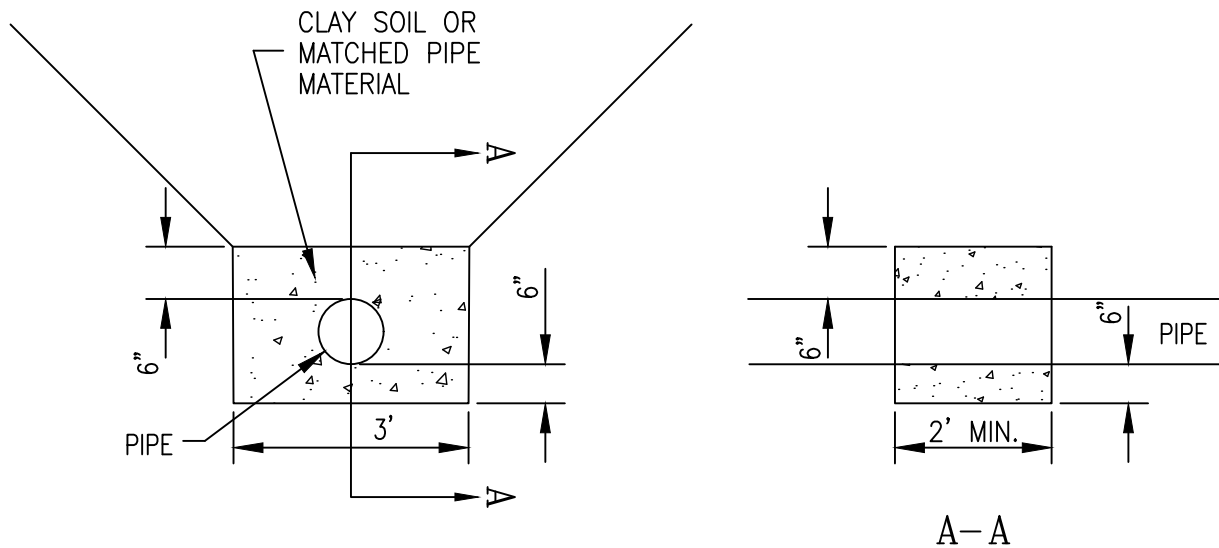
RECOMMENDED SPACING BETWEEN SUBSURFACE DRAIN PIPES	
LONGITUDINAL GRADE	"A"
0% TO 3%	60'
3% TO 5%	40'
5% TO 10%	20'

NOTES  
FOR COLLECTOR OR ARTERIAL ROADWAYS

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
<b>DECORAH EDGE ROADWAY DETAIL</b>			
<i>Dale S. Dahl</i> CITY ENGINEER			
SHT 2 OF 2 SHTS	DATE REVISED 5/1/23	PLATE NO. 1-08	REV. 1



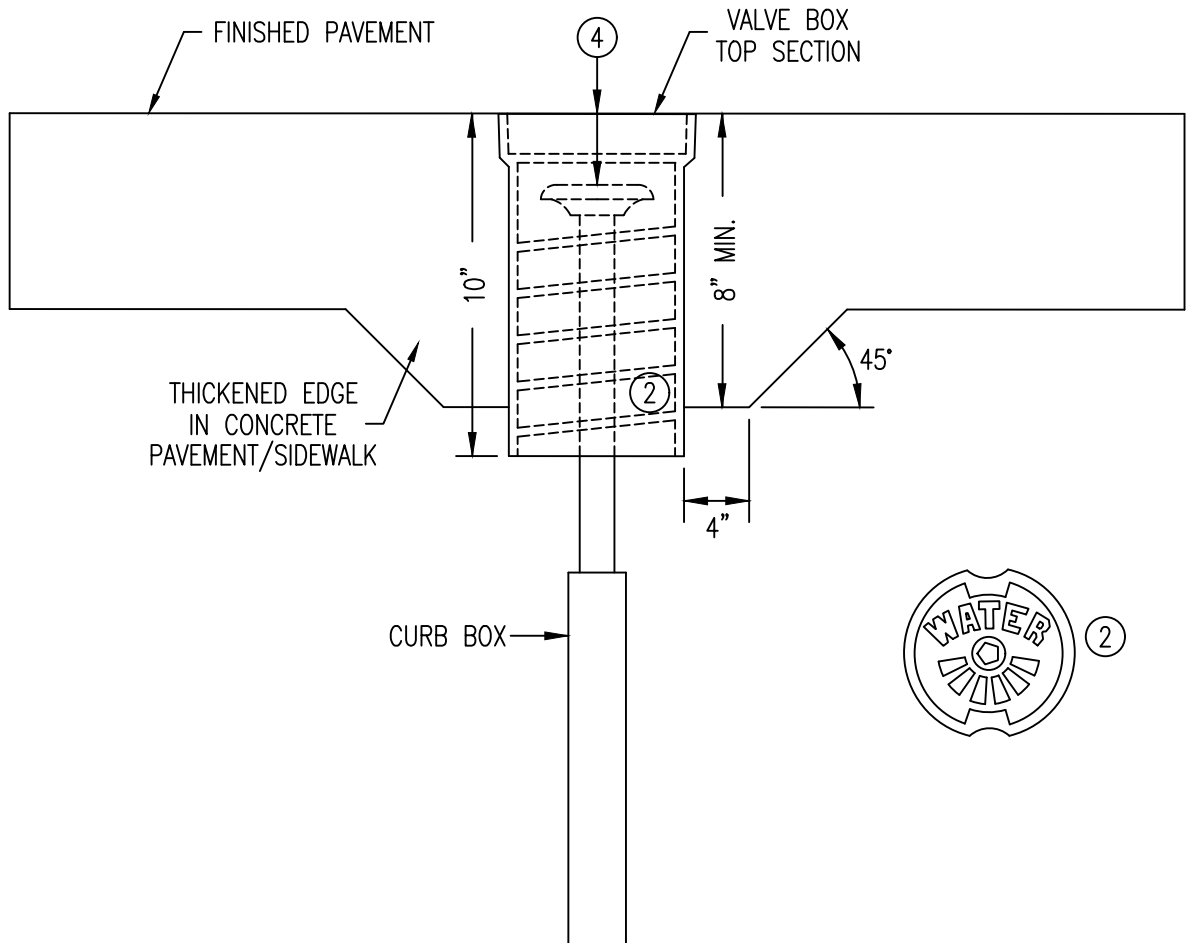
PLAN VIEW  
UNDERGROUND UTILITIES



SECTION VIEW  
ANTI-SEEPAGE COLLAR

RECOMMENDED SPACING BETWEEN ANTI-SEEPAGE COLLAR	
LONGITUDINAL GRADE	"D"
0% TO 3%	100'
3% TO 5%	50'
5% TO 10%	25'

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
DECORAH EDGE UTILITY DETAIL			
<i>Donald Nelson</i> ASST. CITY ENGINEER		<i>Reed W. Fries</i> DIRECTOR	
SHT 1 OF 1 SHTS	DATE REVISED 12/1/11	PLATE NO. 1-09	REV. B



## NOTES

1. A VALVE BOX TOP SECTION SHALL BE USED AS A CURB BOX COVER WHENEVER THE CURB BOX FALLS INTO NEW OR REPLACED CONCRETE SIDEWALK, DRIVE APPROACH, OR BITUMINOUS PAVEMENT AREAS.
2. VALVE BOX TOP SECTION SHALL BE OF THE SCREW TYPE, HAVE A MINIMUM INSIDE SHAFT DIAMETER OF 5 1/4", AND HAVE A CAP WITH THE WORD "WATER" PLAINLY MARKED ON TOP.
3. VALVE BOX COVER SHALL BE OF THE LOCKING TYPE.
4. CURB BOX RISER CAP IS TO BE A MINIMUM OF 4" AND A MAXIMUM OF 6" BELOW THE FINISHED PAVEMENT GRADE.
5. CURB BOX RISER ADJUSTMENT, AND THE FURNISHING & INSTALLATION OF VALVE BOX TOP SECTION AND COVER, SHALL BE INCLUDED IN PAYMENT FOR CURB BOX COVER.

DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA

## CURB BOX COVER

*Douglas Nelson* ASST. CITY ENGINEER  
*Reed W. Fries* DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED 1/20/17	PLATE NO. 1-10	REV. D
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CASTINGS - STRUCTURE TYPE 1

TYPE	DESCRIPTION	NEENAH REF. NO.	EAST JORDAN REF. NO.	GRATE SLOTS	REMARKS
VB	3' CURB INLET FRAME, GRATE & BOX	R-3067-VB	7030M4	BI-DIRECTIONAL VANE	LOW POINT ONLY
A	3' DRIVEWAY INLET FRAME & GRATE	R-3290-A	7034M	PARALLEL (BICYCLE SAFE)	USE FOR BATTERFACE CURB
TB		R-3501-TB		BI-DIRECTIONAL VANE	USE FOR DRIVEOVER CURB
L	3' CURB INLET FRAME, GRATE & BOX	R-3067-L	7030	PERPENDICULAR VANE	

CASTINGS - OTHER STRUCTURES

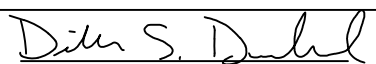
TYPE	DESCRIPTION	NEENAH REF. NO.	EAST JORDAN REF. NO.	COVER/GRATE	REMARKS
1	9" FRAME & COVER-GASKETED	R-1916-C	1058	SELF-SEALING, BOLTED LID	USED IN FLOOD PRONE AREAS & IN CONCRETE PAVING
2	9" FRAME & COVER-GASKETED	R-1733-B	1205	INDENTED TOP	
3	7" FRAME & COVER-GASKETED	R-1642	1625	INDENTED TOP	USED ON EXISTING STRUCTURE WITH HEIGHT CONSTRAINT
4	7" FRAME & COVER	R-1740-B	1324	INDENTED TOP	USED FOR P.R.V. MANHOLES
5	9" FRAME & GRATE	R-1733-B	1205	FLAT GRATE	PAVEMENT DRAIN
6	DITCH GRATE-STOOL TYPE-TALL	R-4341-A	6488	STOOL GRATE	HEAVY DUTY - LARGE OPENING
7	DITCH GRATE-STOOL TYPE-SHORT	R-4342	6489N	STOOL GRATE	LIGHT DUTY - SMALL OPENING
8	POND SKIMMER GRATE			1/2" STEEL PLATE	HOT DIPPED GALVANIZED, NOT SUBJECT TO H2O LOADING
9	6", 8" OR 12" YARD DRAIN GRATE	R-4040		FLAT GRATE	USED ON SMALL YARD DRAINS

C O V E R

G R A T E

NOTES:

- CASTINGS SHALL BE ACCORDING TO MN/DOT SPEC 3321.1-2 SUPPLIED BY FOUNDRIES THAT ARE APPROVED ON THE MN/DOT APPROVED/QUALIFIED PRODUCTS LIST
- ALL CASTINGS SHALL COMPLY WITH AASHTO M-306
- ALL CASTINGS SHALL COMPLY WITH U.S. CODE OF FEDERAL REGULATIONS 23CFR635.410, THE "BUY AMERICAN STEEL & IRON" REGULATION
- ALL STORM SEWER CASTINGS SHALL INCLUDE IMPRINT FISH STAMP AND "DUMP NO WASTE"

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
CASTING REFERENCE NUMBERS			
 CITY ENGINEER			
SHT 1 OF 1 SHTS	DATE REVISED 1/1/23	PLATE NO. 1-11	REV. 0

CASTINGS - STRUCTURE TYPE 1

TYPE	DESCRIPTION	A	B	C	D	E	F	G	Y	Z
VB	3' CURB INLET FRAME, GRATE & BOX	43	31	1 7/8	4	6	11 5/16	5 3/4	35 1/4	17 3/4
A	3' DRIVEWAY INLET FRAME & GRATE	43	31	2	4	6			35 3/4	23 3/4
TB	3' DRIVEWAY INLET FRAME & GRATE	43		1 7/8	4 25/32	8 1/8			35 1/2	26 29/32
L	3' CURB INLET FRAME, GRATE & BOX	43	31	1 7/8	4	6	11 5/16	5 3/4	35 1/4	17 3/4

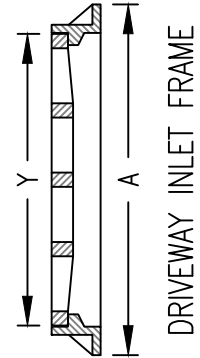
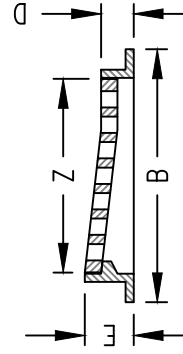
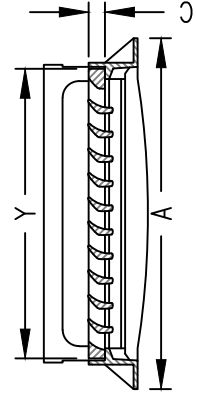
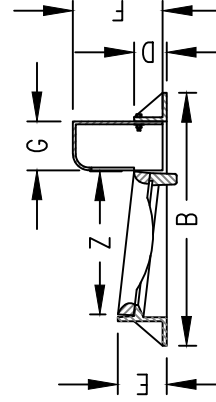
CASTINGS - STRUCTURE TYPE 1

TYPE	MINIMUM OPENING	GRATE SLOTS	REMARKS
VB	2.7 SQ. FT.	BI-DIRECTIONAL VANE	LOW POINT ONLY
A	2.6 SQ. FT.	PARALLEL (BICYCLE SAFE)	USE IN DRIVE APPROACH WITH BATTERFACE CURB
TB	3.1 SQ. FT.	BI-DIRECTIONAL VANE	USE IN DRIVE APPROACH WITH DRIVEOVER CURB
L	2.1 SQ. FT.	PERPENDICULAR VANE	

ALL DIMENSIONS ARE MINIMUM AND IN INCHES UNLESS OTHERWISE NOTED.

NOTES:

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- ALL CASTINGS SHALL COMPLY WITH U.S. CODE OF FEDERAL REGULATIONS 23CFR635.410, THE "BUY AMERICAN STEEL & IRON" REGULATION
- ALL STORM SEWER CASTINGS SHALL INCLUDE IMPRINT FISH STAMP AND "DUMP NO WASTE"



DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA  
**STANDARD CASTINGS  
ASSEMBLIES**

*Diana S. Dahl*  
CITY ENGINEER



CASTINGS – OTHER STRUCTURES

TYPE	DESCRIPTION	L	M	N	O	P	Q
1	9" FRAME & COVER-GASKETED	23	1 1/2	21	36	9	
2	9" FRAME & COVER-GASKETED	25 3/4	7/8	24	35 7/16	9	
3	7" FRAME & COVER-GASKETED	26	1 1/2	24 1/8	35 7/8	6 15/16	
4	7" FRAME & COVER	32	1 1/2	30	46	7	
5	9" FRAME & GRATE	25 3/4	7/8	24	35 7/16	9	
6	DITCH GRATE-STOOL TYPE-TALL	23	1 1/2		33		8 3/4
7	DITCH GRATE-STOOL TYPE-SHORT	23	1 1/2		33		6 3/4
8	POND SKIMMER GRATE	1/2" STEEL PLATE					1/2
9	YARD DRAIN GRATE	8-14 3/4		2-2 1/2			

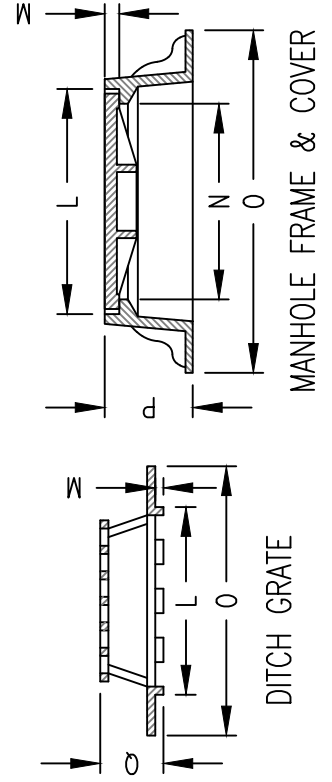
ALL DIMENSIONS ARE  
MINIMUM AND IN  
INCHES UNLESS  
OTHERWISE NOTED.

CASTINGS – OTHER STRUCTURES

TYPE	MINIMUM OPENING	REMARKS
1		BOLTED LID, USED IN FLOOD PRONE AREAS & IN CONCRETE PAVING
2		WITH TWO CI PICK HOLES
3		WITH TWO CI PICK HOLES
4		USED FOR P.R.V. MANHOLES
5	1.3 SQ. FT.	PAVEMENT DRAIN
6	2.5 SQ. FT.	HEAVY DUTY – LARGE OPENING
7	1.73 SQ. FT.	LIGHT DUTY – SMALL OPENING
8	7.61 SQ. FT.	HOT DIPPED GALVANIZED, NOT SUBJECT TO H2O LOADING
9	0.1-0.5 SQ. FT.	LIGHT DUTY

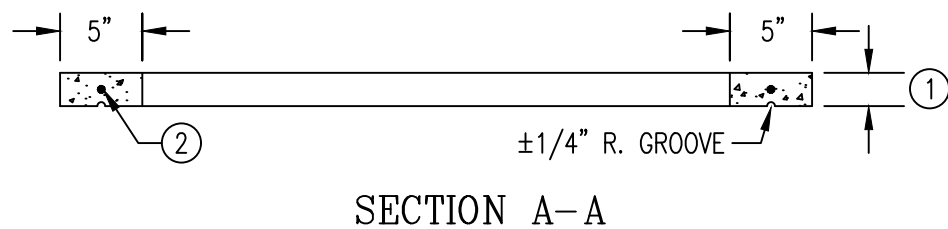
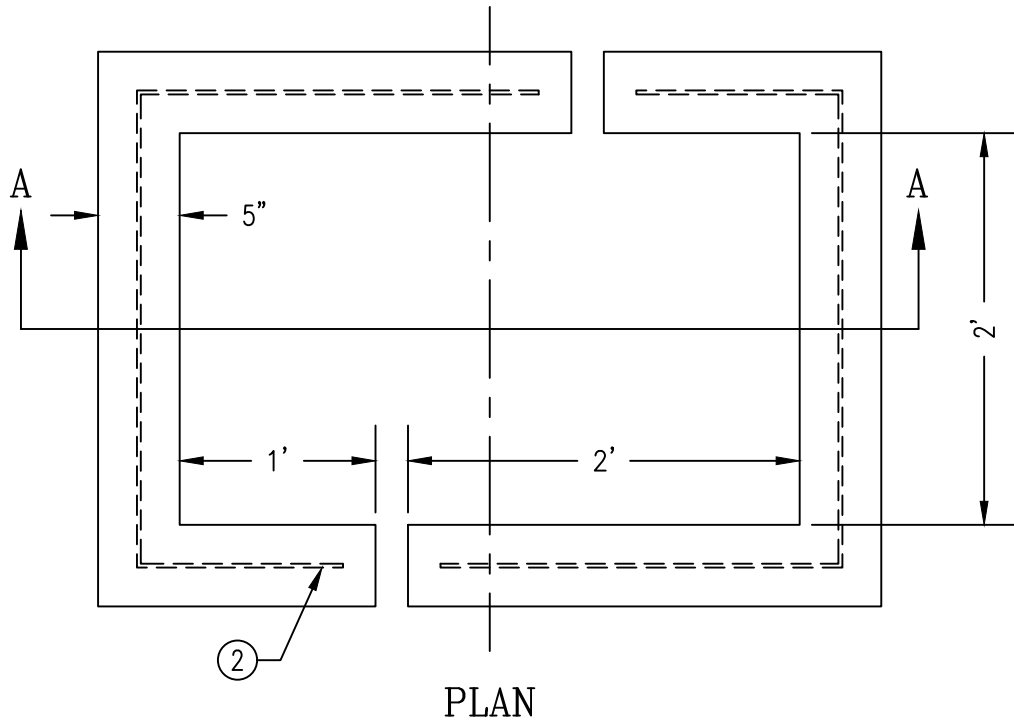
NOTES:

- CASTINGS SHALL BE ACCORDING TO MN/DOT SPEC. 3321.1-2 SUPPLIED BY FOUNDRIES THAT ARE APPROVED ON THE MN/DOT APPROVED/QUALIFIED PRODUCTS LIST
- ALL CASTINGS SHALL COMPLY WITH AASHTO M-306
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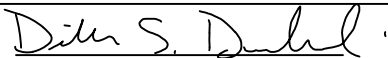
DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA  
**STANDARD CASTING  
ASSEMBLIES**

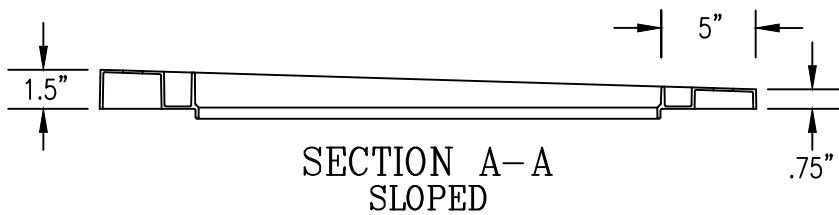
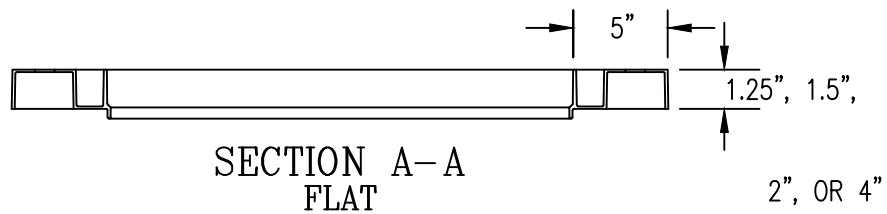
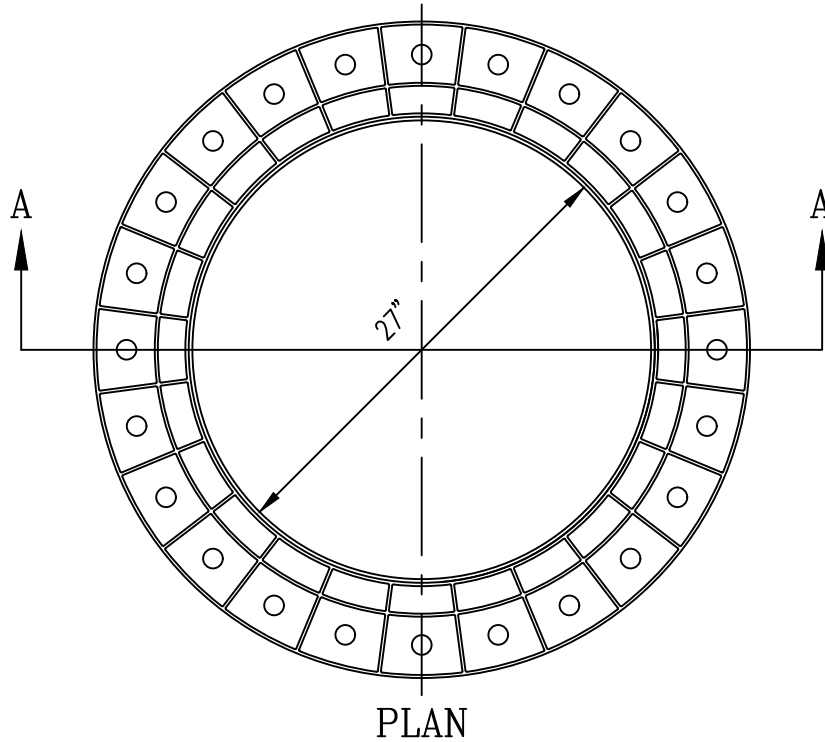
*Diana S. Dahl*  
CITY ENGINEER



NOTES

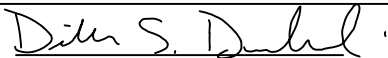
- ① VARIABLE THICKNESS OF 2" MINIMUM AND 9" MAXIMUM ON NEW DRAINAGE STRUCTURES AND 12" MAXIMUM WITH 3 RINGS FOR RECONSTRUCTING INPLACE STRUCTURES
- ② REINFORCEMENT SHALL BE A SINGLE HOOP OF #8 GAGE STEEL WIRE
- 3. SEE MN/DOT S.P. 4010

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>CONCRETE STRUCTURE          ADJUSTING RINGS</b>			
 CITY ENGINEER			
SHT 1 OF 2 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-13	REV. H



NOTES

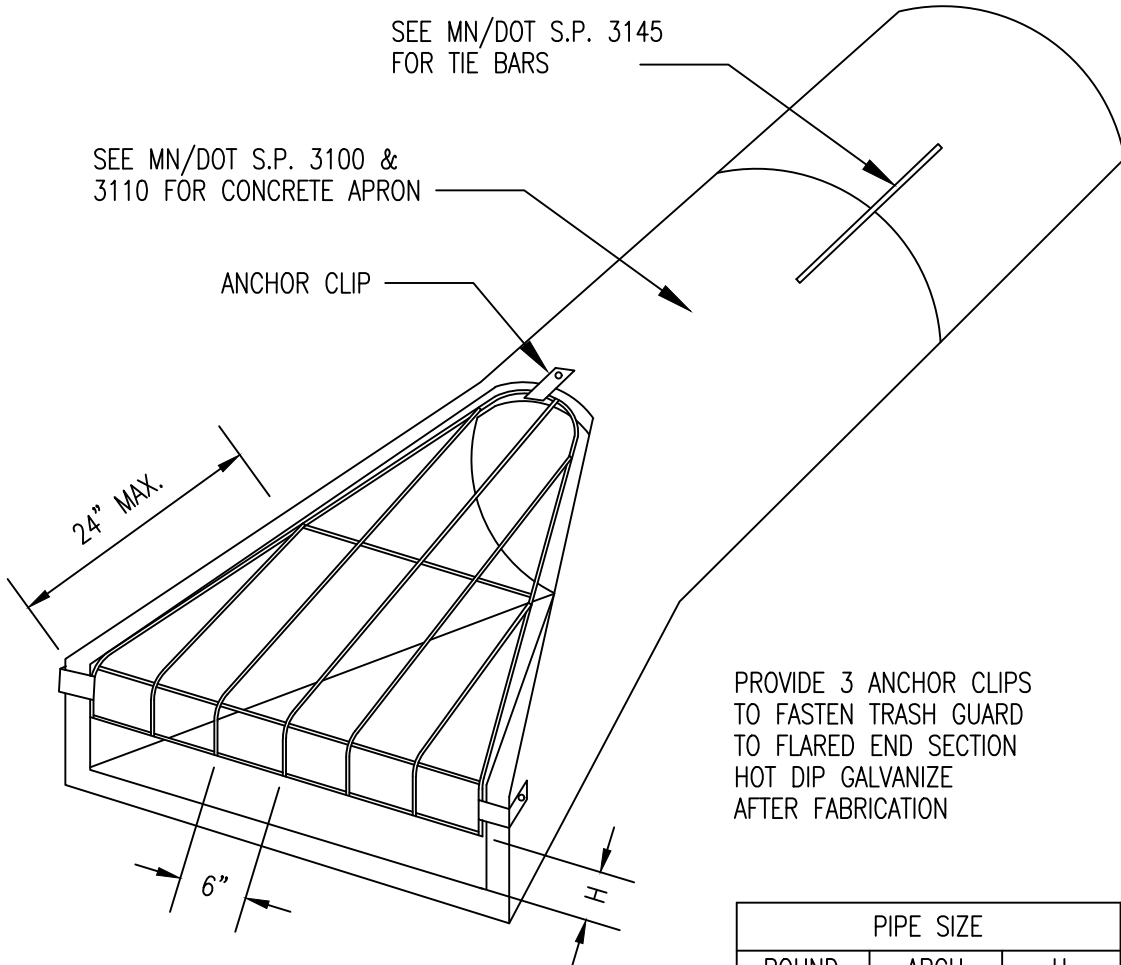
1. RING SHALL BE MOLDED FROM HIGH DENSITY POLYETHYLENE MATERIAL AS DEFINED IN ASTM D4976.
2. USE SLOPED RINGS TO MATCH GRADE ANGLE.
3. VARIABLE THICKNESS OF AT LEAST 2 AND NOT MORE THAN 6 STANDARD 2" RINGS ON NEW AND RECONSTRUCTION OF INPLACE DRAINAGE STRUCTURES

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>HIGH DENSITY POLYETHYLENE          (HDPE) ADJUSTING RINGS</b>			
 CITY ENGINEER			
SHT 2 OF 2 SHTS	DATE REVISED 1/26/24	PLATE NO. 1-13	REV. H

SEE MN/DOT S.P. 3145  
FOR TIE BARS

SEE MN/DOT S.P. 3100 &  
3110 FOR CONCRETE APRON

ANCHOR CLIP



PROVIDE 3 ANCHOR CLIPS  
TO FASTEN TRASH GUARD  
TO FLARED END SECTION  
HOT DIP GALVANIZE  
AFTER FABRICATION

ANCHOR BOTH SIDES

PIPE SIZE		
ROUND	ARCH	H
12"		2 1/2"
15"		3"
18"-24"	22"-29"	4"
27"-36"	36"-44"	5"
42"-54"	51"-65"	6"
60"-72"	73"-88"	7"
78"-90"		8"

BAR SIZES									
STANDARD DESIGN					HEAVY DESIGN				
PIPE SIZE		HOLE DIA. REQ'D	BOLT DIA.	BAR SIZE	PIPE SIZE		HOLE DIA. REQ'D	BOLT DIA.	BAR SIZE
ROUND	ARCH				ROUND	ARCH			
12"-24"	22"-29"	3/4"	5/8"	5/8"	12"-18"	22"	3/4"	5/8"	3/4"
27"-48"	36"-59"	7/8"	3/4"	3/4"	21"-42"	29"-51"	7/8"	3/4"	1"
54"-90"	65"-88"	1 1/8"	1"	1"	48"-90"	59"-88"	1 1/8"	1"	1 1/4"

BOLT LENGTH = PIPE WALL THICKNESS + 2 1/2"

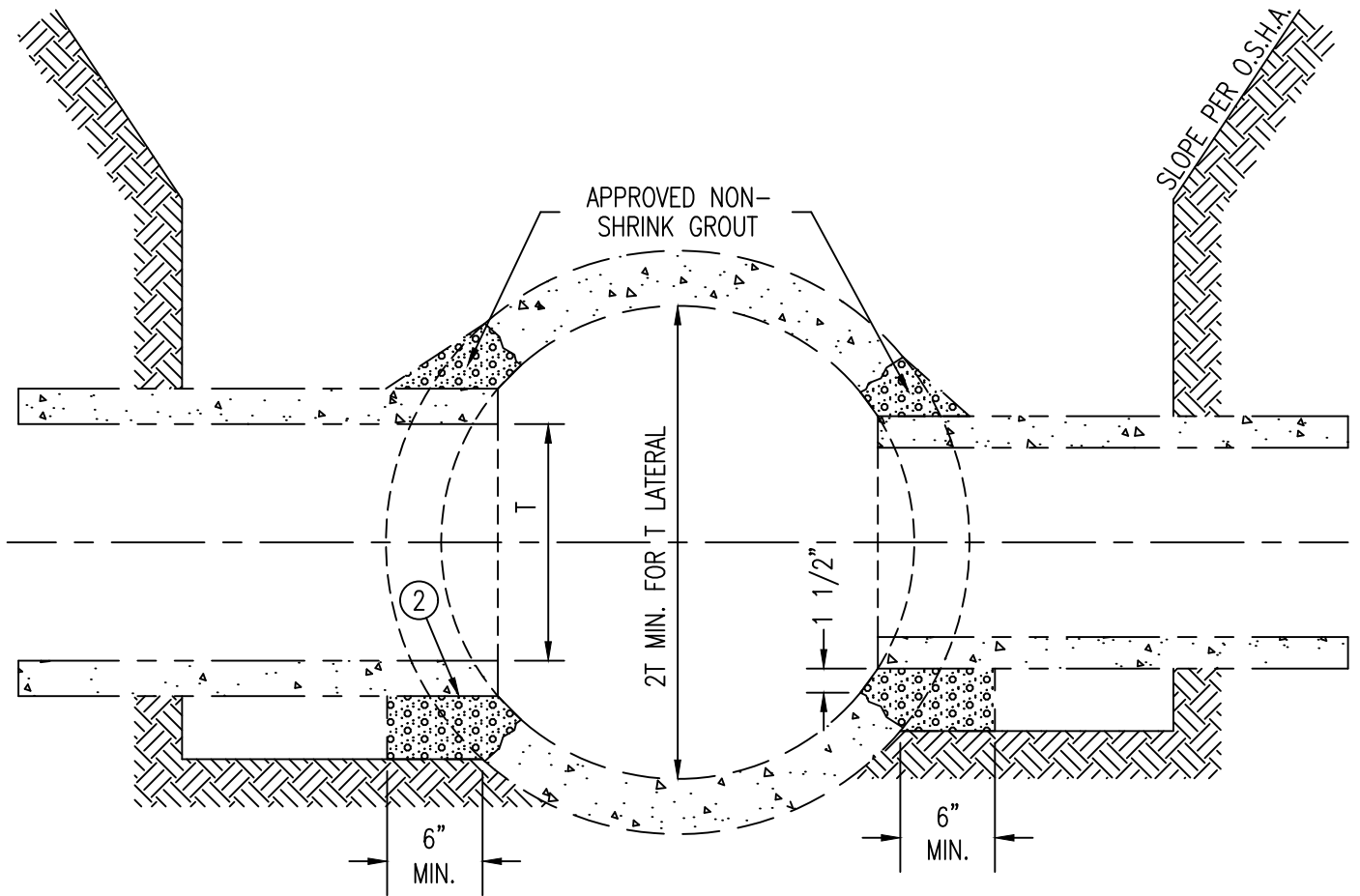
NOTE:  
TRASH GUARDS ARE REQUIRED ON ALL  
INLETS AND AS DIRECTED FOR OUTLETS.

DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA

### TRASH GUARD FOR FLARED END SECTIONS

*Douglas Nelson* ASST. CITY ENGINEER      *Keith W. Frenn* DIRECTOR

SHT 1 OF 1 SHTS	DATE REVISED 1/20/17	PLATE NO. 1-14	REV. A
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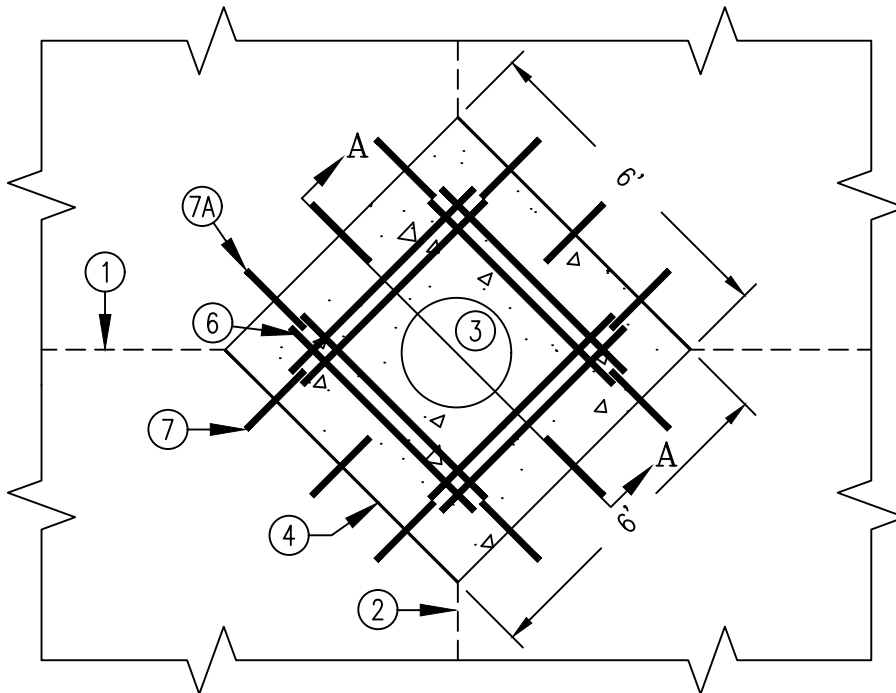


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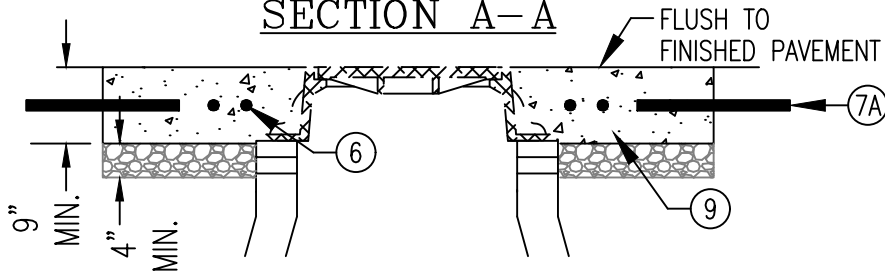
1. MANHOLE REQUIRED WHERE LATERAL PIPE OR CONNECTING PIPE EXCEEDS 1/2 MAIN PIPE DIAMETER.
- ② LATERAL PIPE SHALL NOT EXTEND INTO THE CROSS SECTION OF MAIN PIPE BEYOND THAT REQUIRED FOR FULL WALL SUPPORT.

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA <b>BLIND-TIE FIELD CONNECTION          FOR R.C.P. STORM SEWER</b>			
<i>Douglas L. Nelson</i> ASST. CITY ENGINEER		<i>Reed W. Frenn</i> DIRECTOR	
SHT 1 OF 1 SHTS	DATE REVISED 12/1/11	PLATE NO. 1-15	REV. B

# CONCRETE PAVEMENT



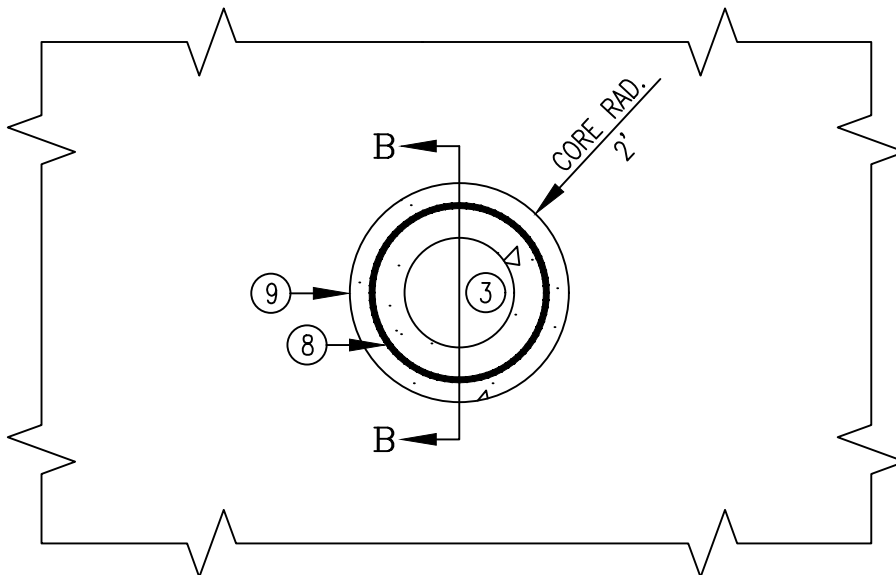
## SECTION A-A



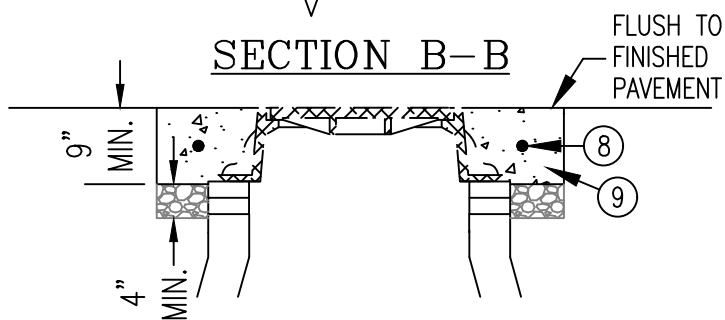
## NOTES

- ① LONGITUDINAL JOINT
- ② TRANSVERSE JOINT
- ③ MANHOLE LID
- ④ 1/2" EXPANSION JOINT
- 5 ALL DOWEL AND REINFORCEMENT BARS TO BE EPOXY COATED.
- ⑥ REINFORCEMENT TWO NO. 5 BARS 5'-6" LONG, 5" SPACE EACH SIDE
- ⑦ 1" DOWEL BAR 18" LONG
- ⑦A #4 TIE BAR 18" LONG
- ⑧ REINFORCEMENT ONE NO. 3 BAR
- ⑨ RESTORED CONCRETE PAVEMENT HIGH-EARLY MIX AND AGGREGATE BASE.

# BITUMINOUS PAVEMENT



## SECTION B-B



DEPARTMENT OF PUBLIC WORKS  
CITY OF ROCHESTER, MINNESOTA  
**PAVEMENT RESTORATION**  
**(CONCRETE & BITUMINOUS STREET)**

*Dimitri S. Dabel*  
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 4/15/22	PLATE NO. 1-16	REV. C
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