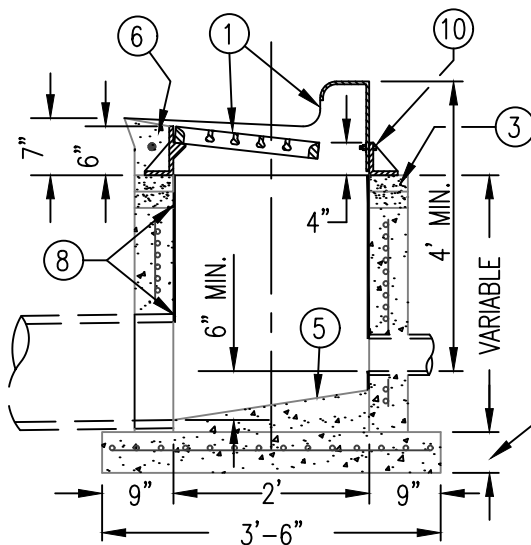
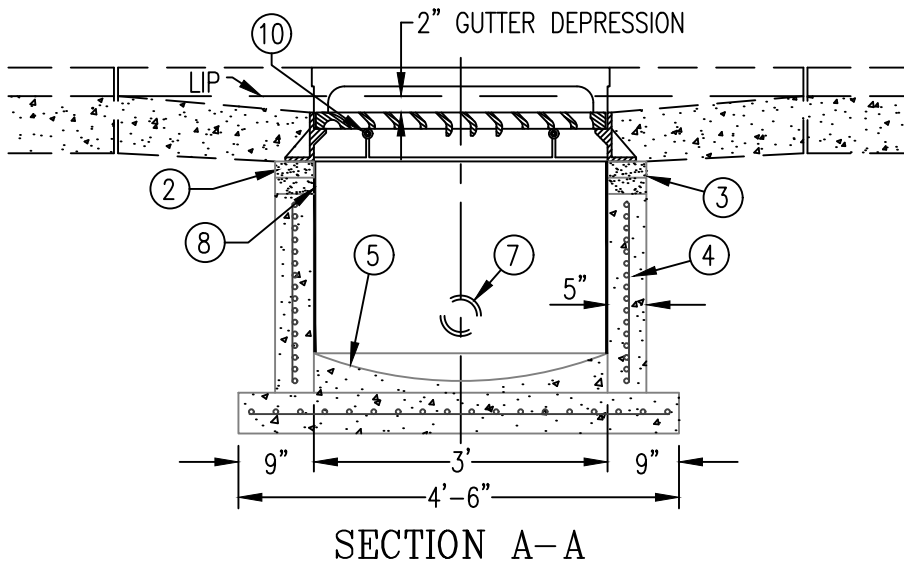
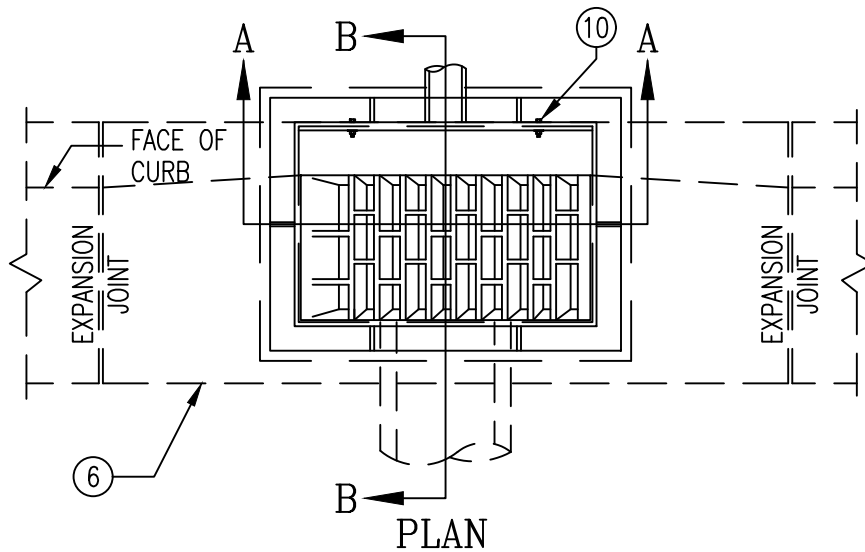




NOTES

- 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.
- ⑩ INLET FRAME BOLT HOLES SHALL BE FULLY MORTARED.

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

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

STRUCTURE TYPE 1

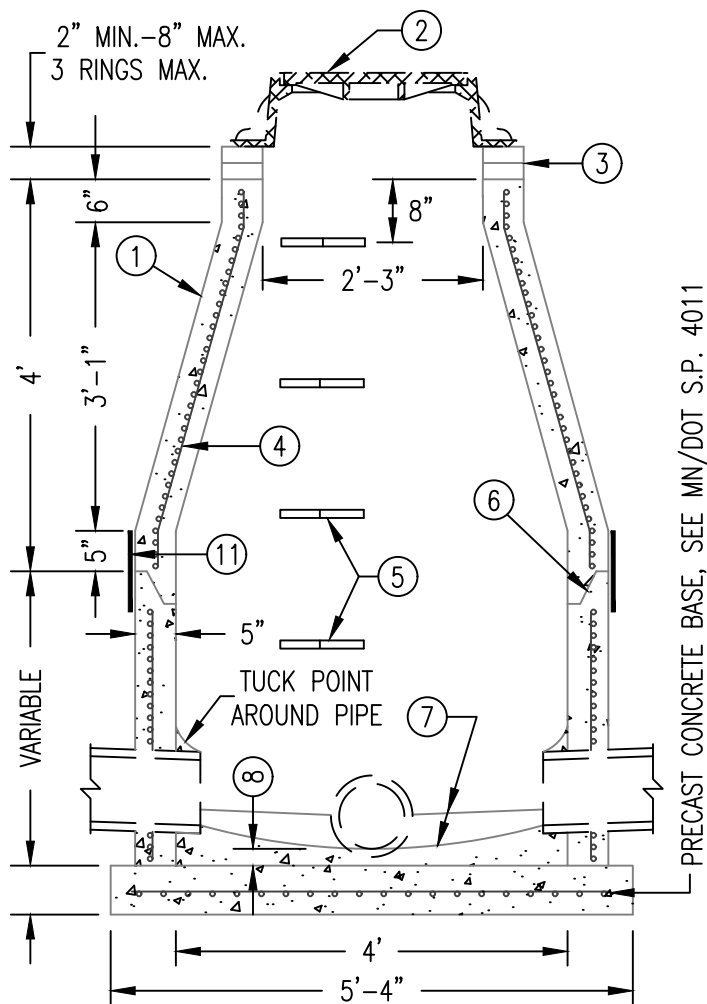
Dale S. Dahl
CITY ENGINEER

SHT 1 OF 1 SHTS

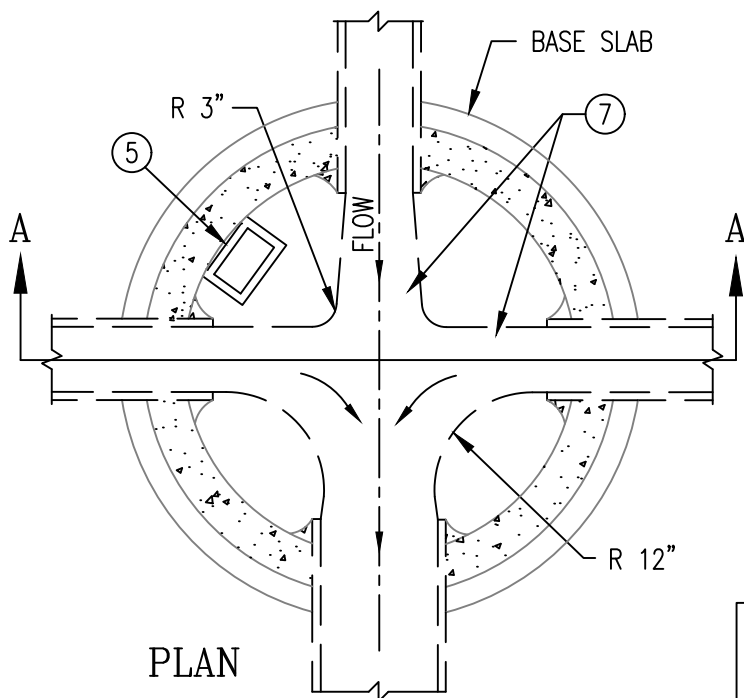
DATE REVISED
2/2/26

PLATE NO.
1-01

REV.
0



SECTION A-A



PLAN

NOTES

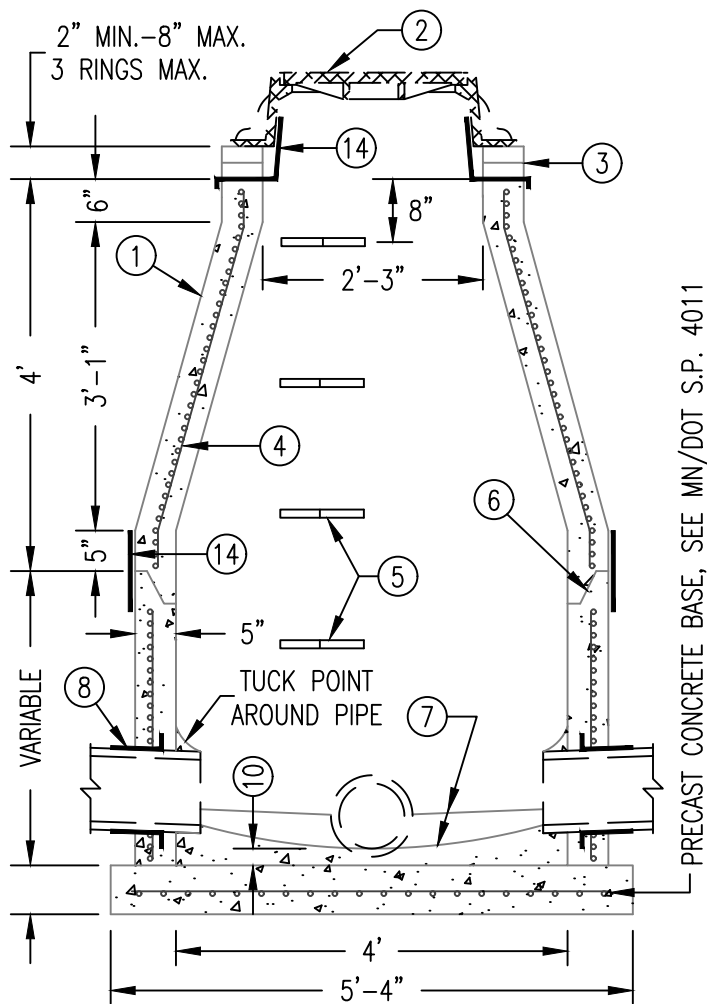
- ① CONE SHALL BE CONCENTRIC. REFER TO MN/DOT S.P. 4005.
- ② REFER TO PLANS AND S.D.P. 1-11 AND 1-12 FOR CASTING REQUIRED. CASTING SHALL BE BOLTED TO CONCRETE IN NON-PAVED AREAS.
- ③ HDPE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13.
- ④ REINFORCING SHALL BE A MIN. OF A SINGLE LINE STEEL WIRE FABRIC HAVING 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.

- ⑪ SEE S.D.P. 1-07 FOR MANHOLE WATERPROOFING.

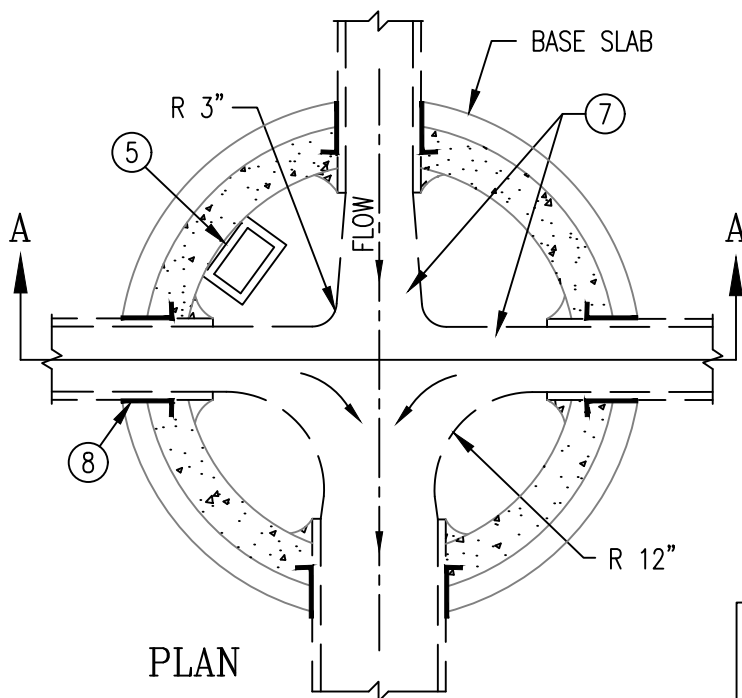
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA
STRUCTURE TYPE 2
(STORM SEWER)

Dan S. Dahl
CITY ENGINEER

SHT 1 OF 2 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-02	REV. N
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SECTION A-A

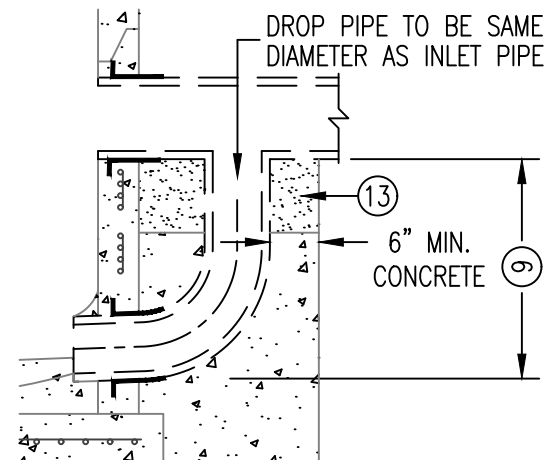


PLAN

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

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 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.



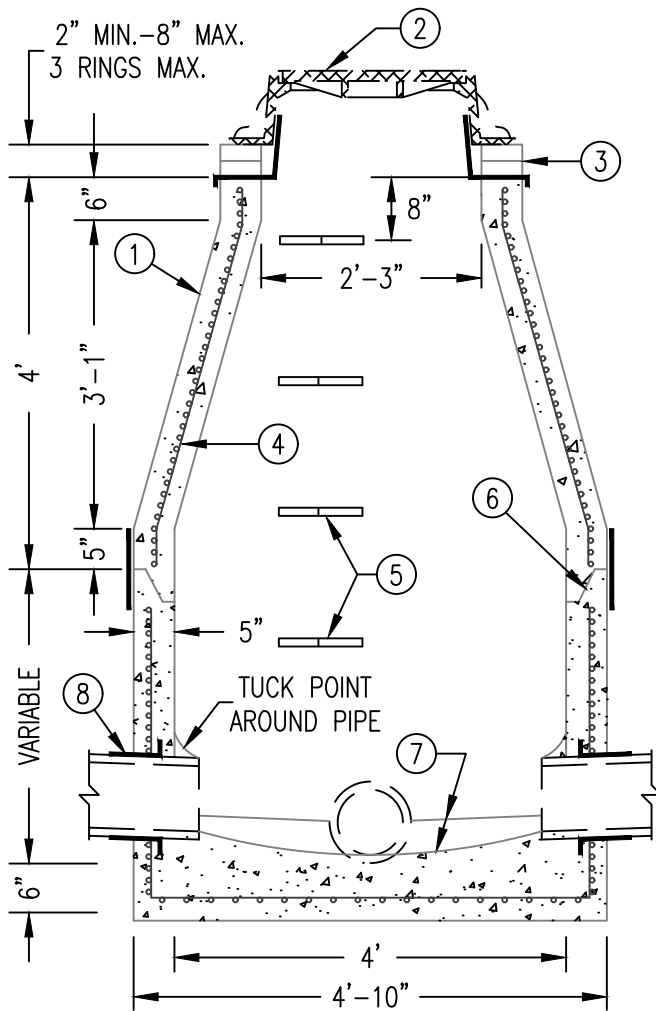
TYPE 2A FOR DROP-INLET

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA
STRUCTURE TYPES

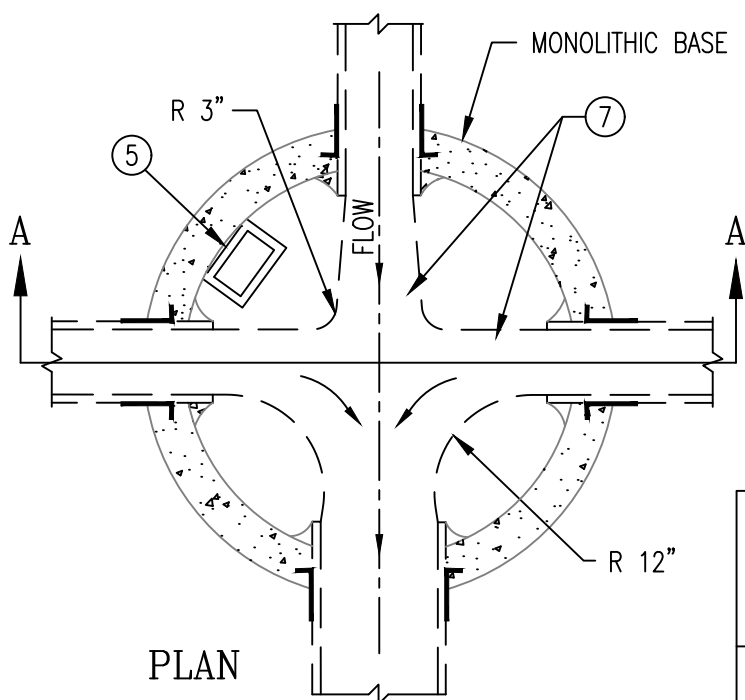
2 AND 2A (SANITARY SEWER)

Dan S. Dahl
CITY ENGINEER

SHT 2 OF 2 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-02	REV. N
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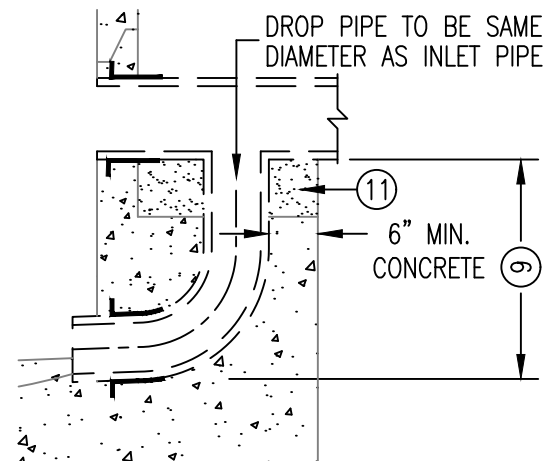
SECTION A-A



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.

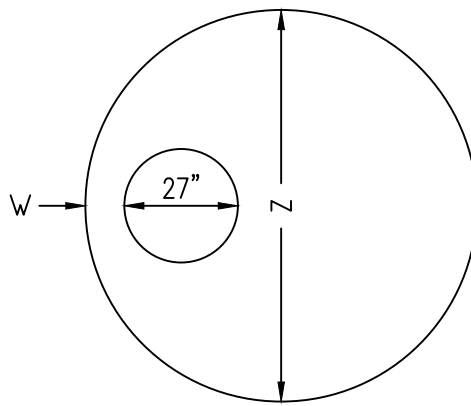


TYPE 3A FOR DROP-INLET

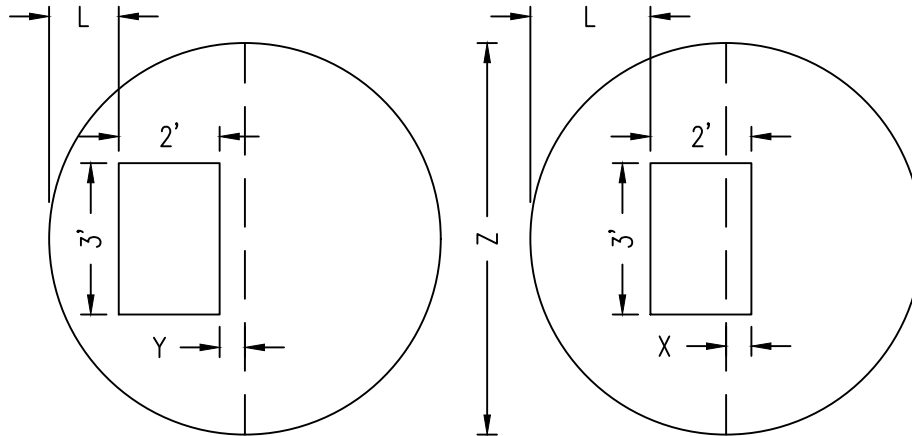
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA
STRUCTURE TYPES 3 AND 3A
(SANITARY SEWER)

Dan S. Dahl
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 1/1/25	PLATE NO. 1-03	REV. N
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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

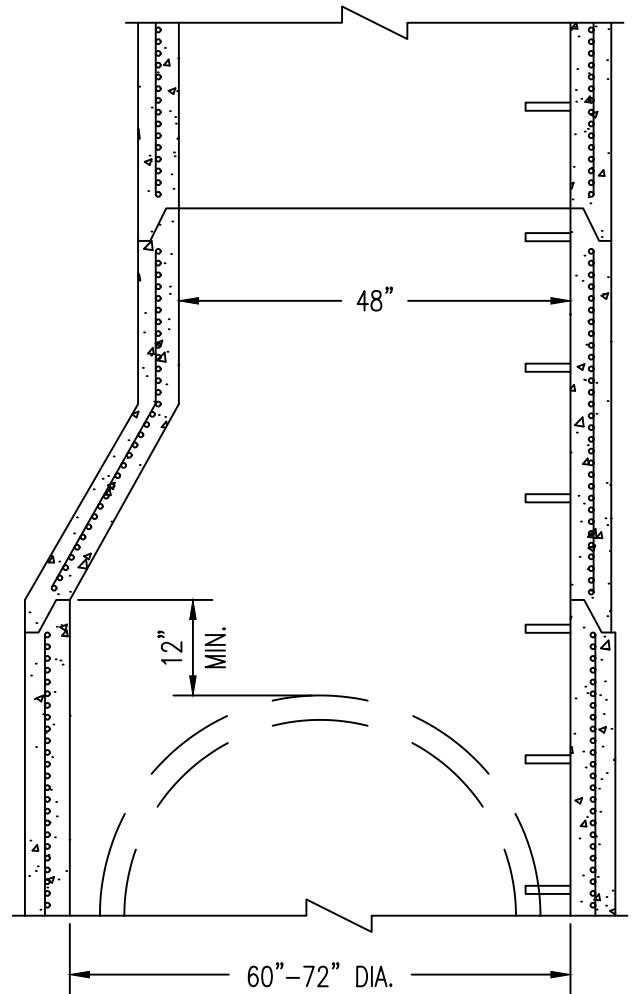
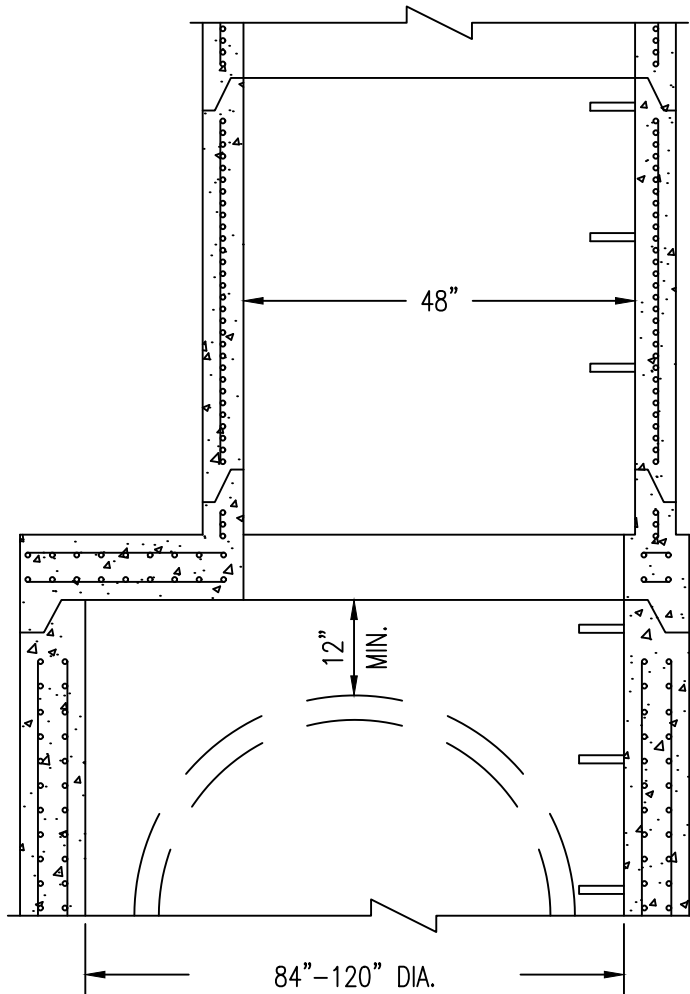
Dan S. Dahl
CITY ENGINEER

SHT 2 OF 2 SHTS

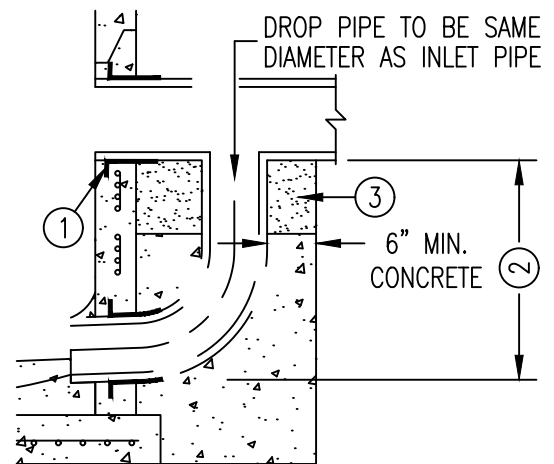
DATE REVISED
1/1/25

PLATE NO.
1-04

REV.
M

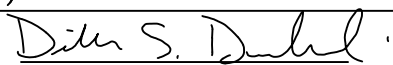


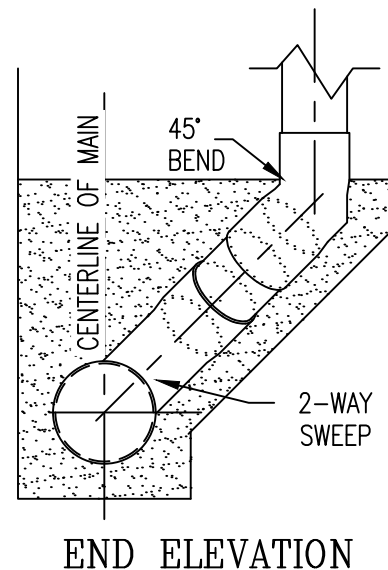
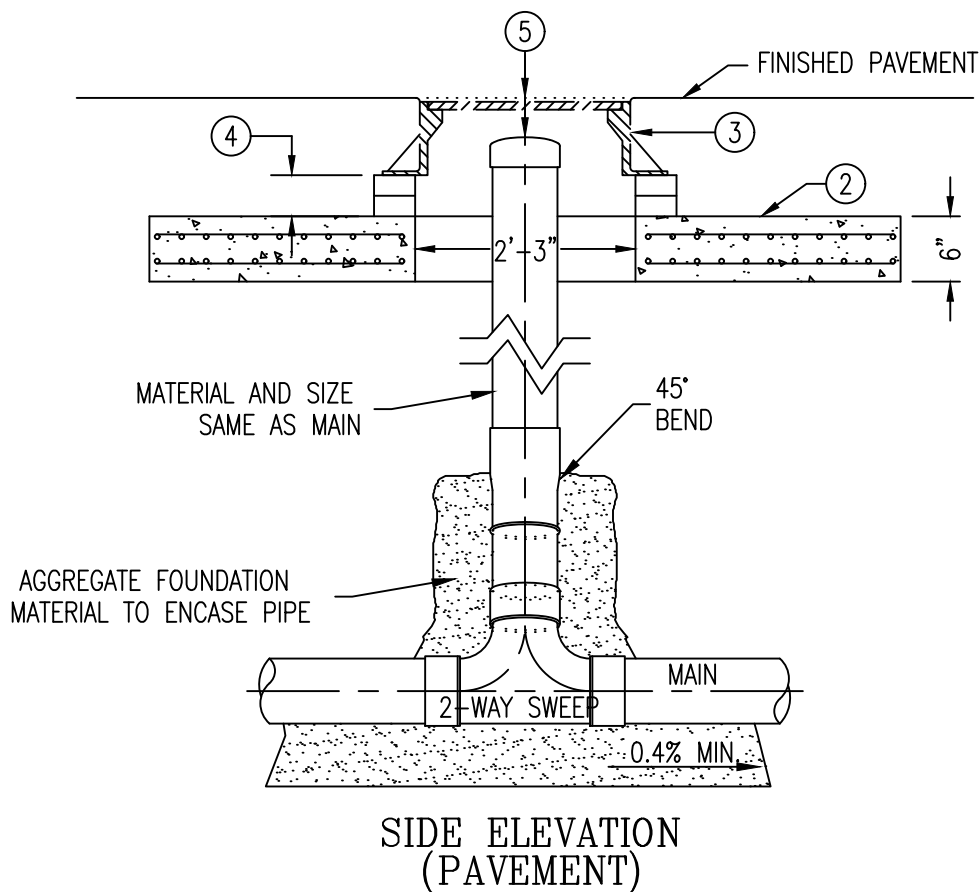
- ① FOR WATER TIGHT SEAL REFER TO MN/DOT S.P. 4007.
- ② DROP INLET USED FOR SAN. SEWER DROPS GREATER THAN 1.0 FT.
- ③ DROP PIPE TO BE ENCASED IN GROUT IF FLEXIBLE PIPE, OR GRANULAR ENCASEMENT IF RIGID PIPE IS USED. USE ENCASEMENT BLOCK AS REQUIRED.



TYPE 5A FOR DROP-INLET

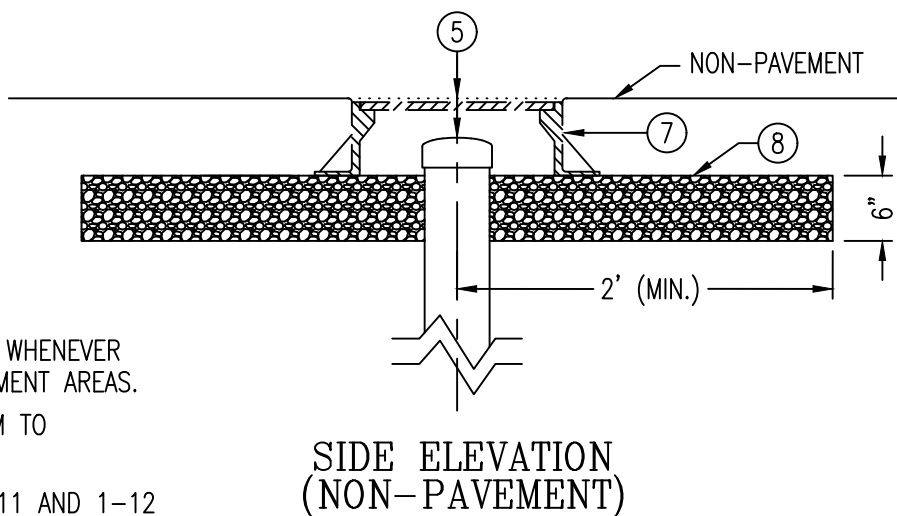
SEE CITY STANDARD PLATES 1-02 THRU
1-04 FOR MANHOLE DETAILS

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
STRUCTURE TYPE 5 & 5A (XX in.) REDUCTION MANHOLE			
 CITY ENGINEER			
SHT 1 OF 1 SHTS	DATE REVISED 1/1/23	PLATE NO. 1-05	REV. E



NOTES

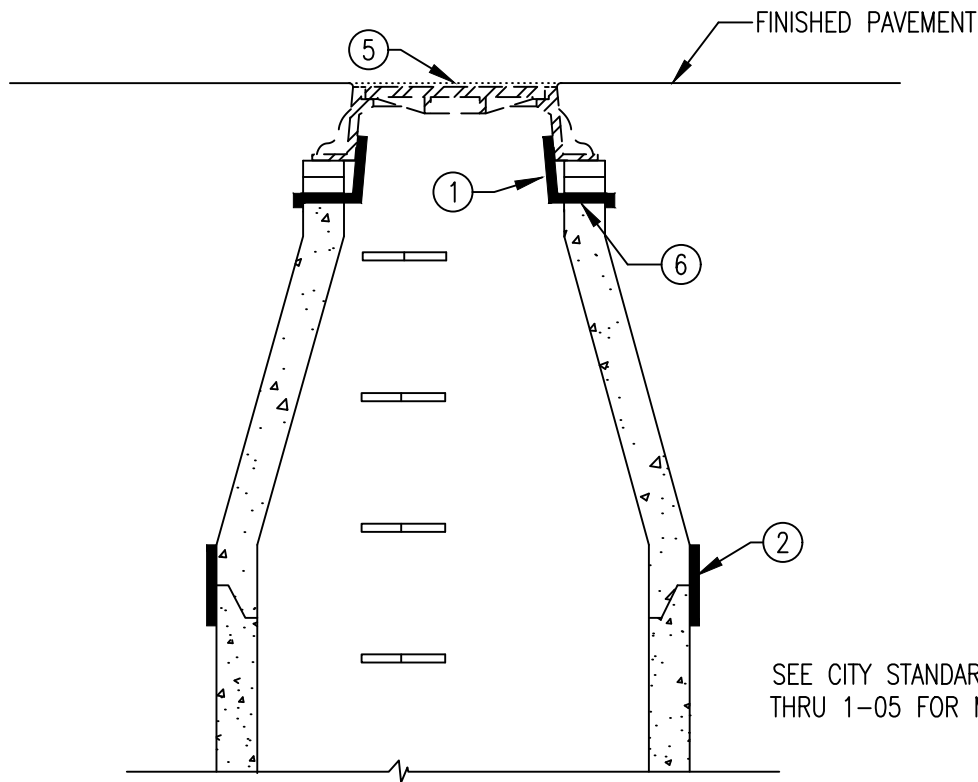
1. 48" STRUCTURE SHALL BE USED WHENEVER THE CLEANOUT FALLS INTO PAVEMENT AREAS.
- ② MANHOLE COVER SHALL CONFORM TO MN/DOT S.P. 4020.
- ③ REFER TO PLANS AND S.D.P. 1-11 AND 1-12 FOR CASTING REQUIRED.
- ④ HDPE ADJUSTING RINGS SHALL BE PER S.D.P. 1-13.
- ⑤ CLEANOUT CAP IS TO BE A MINIMUM OF 4" AND A MAXIMUM OF 6" BELOW THE FINISHED GRADE.
6. REFERENCE S.D.P. 1-16 FOR CASTING ELEVATION REQUIREMENTS.
- ⑦ NEENAH R-1976, EAST JORDAN, OR APPROVED EQUAL.
- ⑧ INSTALL 6" AGGREGATE BASE, MINIMUM 2' RADIUS AROUND CLEANOUT.



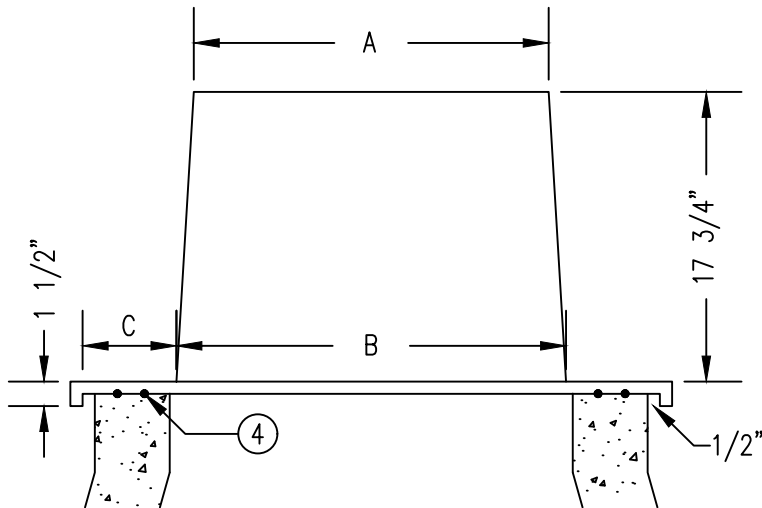
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA
**STRUCTURE TYPE 6
(CLEANOUT)**

Dale S. Dahl
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-06	REV. 1
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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.

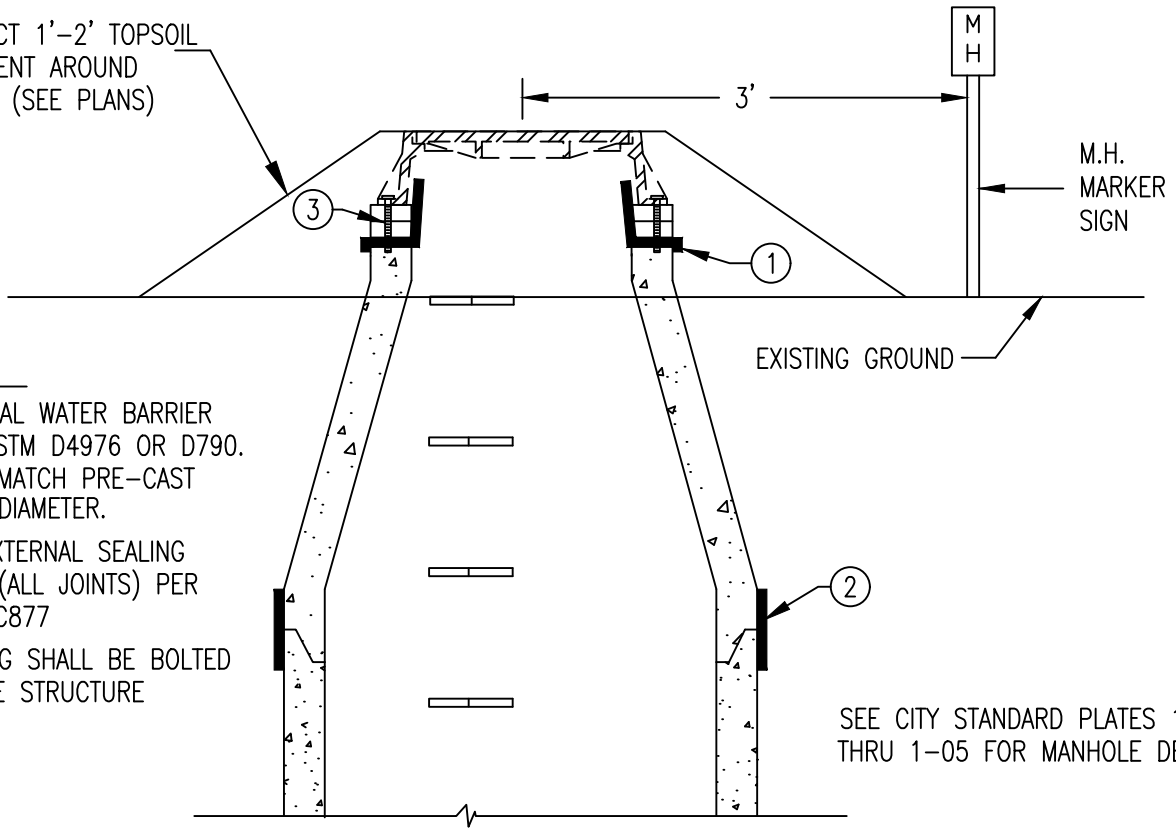
INTERNAL WATER BARRIER

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 REFERENCE S.D.P 1-16 FOR
CASTING ELEVATION REQUIREMENTS.
- ⑥ CAULK ALL JOINTS EXCEPT BETWEEN WATER
BARRIER AND 1ST RING.

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
MANHOLE WATERPROOFING PAVED AREAS			
<i>Dan S. Dahl</i> CITY ENGINEER			
SHT 1 OF 2 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-07	REV. H

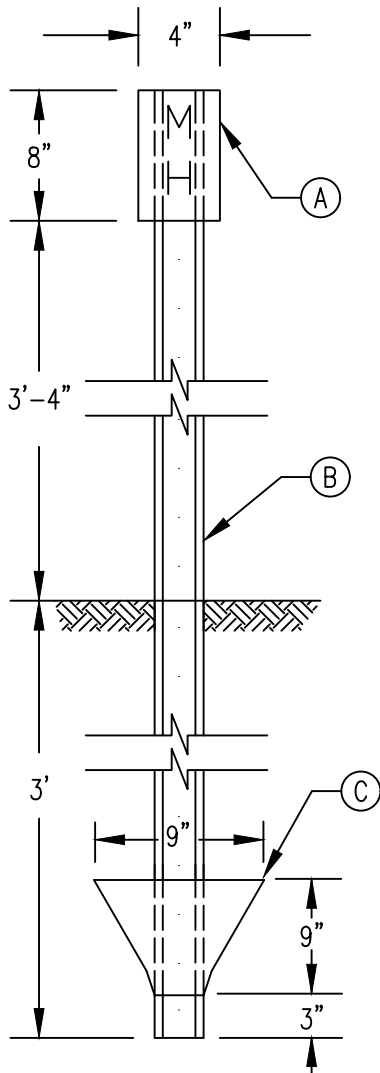
CONSTRUCT 1'-2' TOPSOIL EMBANKMENT AROUND MANHOLE. (SEE PLANS)



NOTES

- ① INTERNAL WATER BARRIER PER ASTM D4976 OR D790. MUST MATCH PRE-CAST CONE DIAMETER.
- 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.



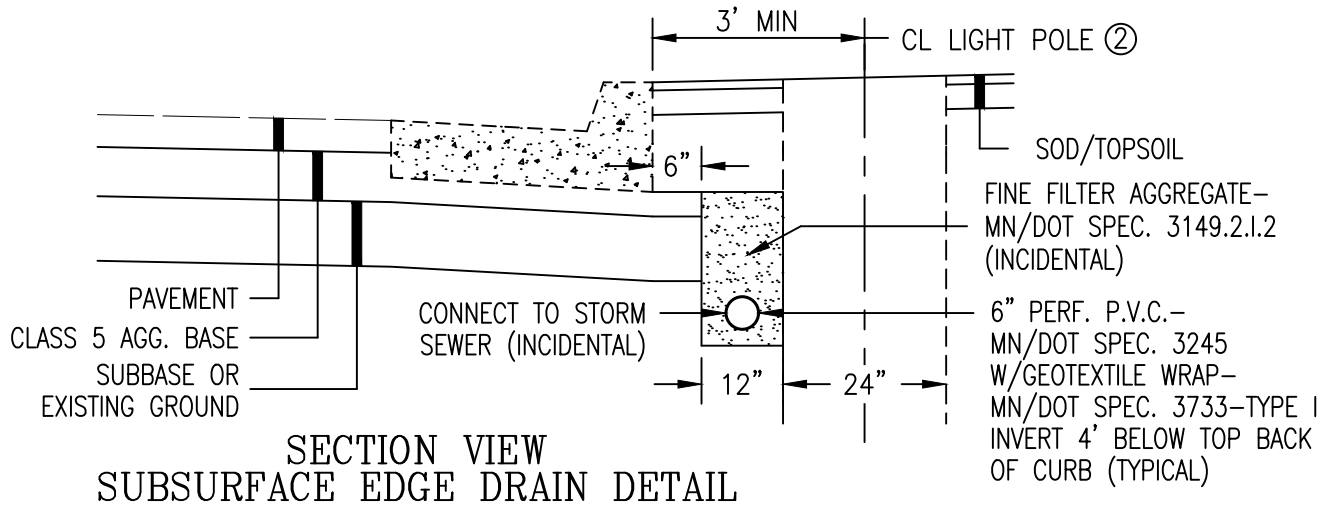
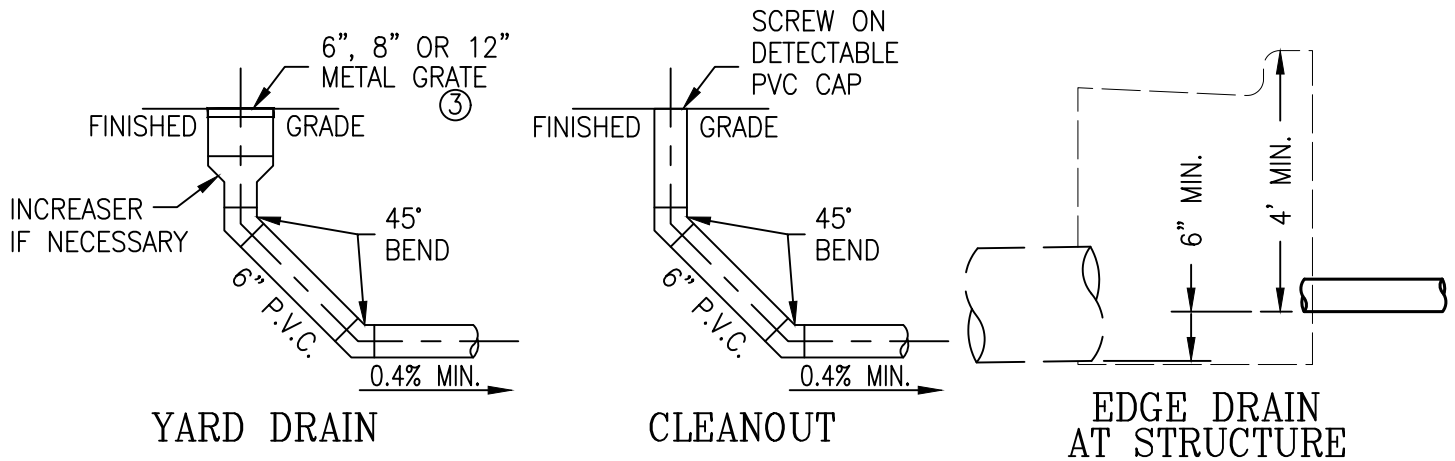
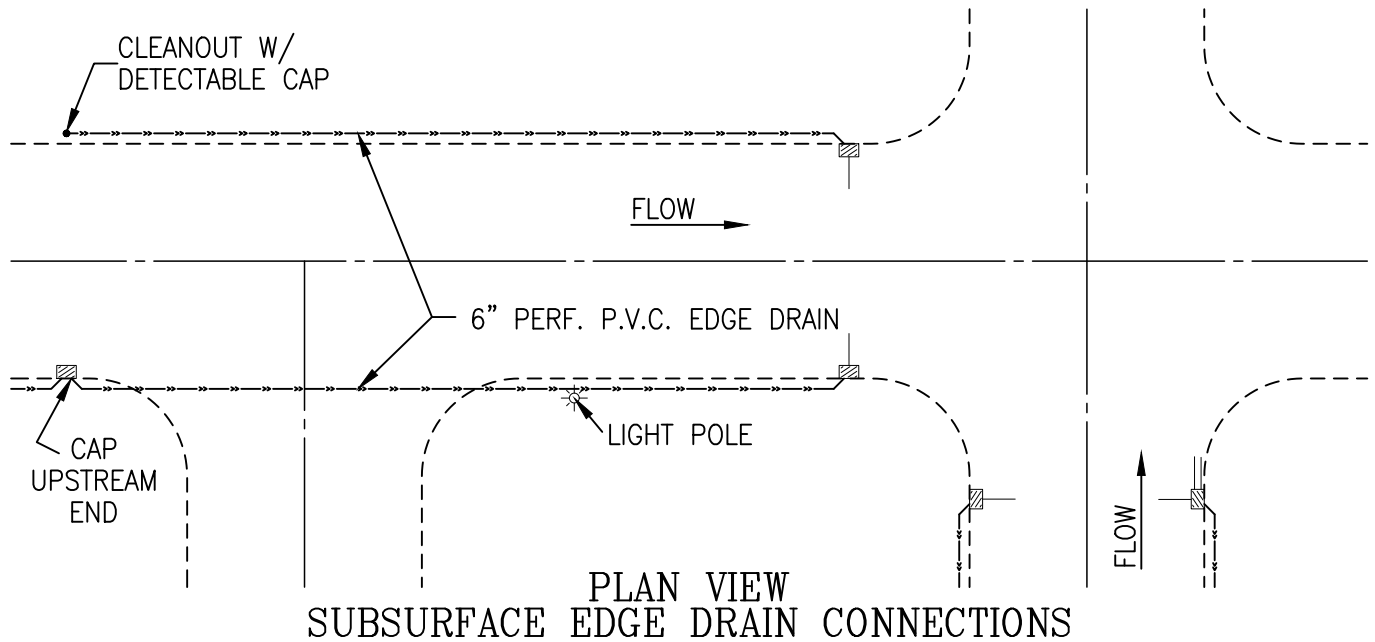
NOTES

- ① 2 SHEET ALUMINUM SIGNS BOLTED TO EACH SIDE OF POST. SIGNS SHALL READ "M.H." IN 2 INCH BLACK OR WHITE LETTERS ON GREEN REFLECTORIZED BACKGROUND.
- ② FLANGED CHANNEL SIGN POSTS SHALL BE A MINIMUM OF 2.75 POUNDS PER FOOT, AND SHALL MEET MN/DOT SPEC. 3401.
- ③ 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.

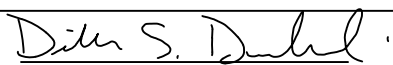
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA
**MANHOLE WATERPROOFING
NON-PAVED AREAS**

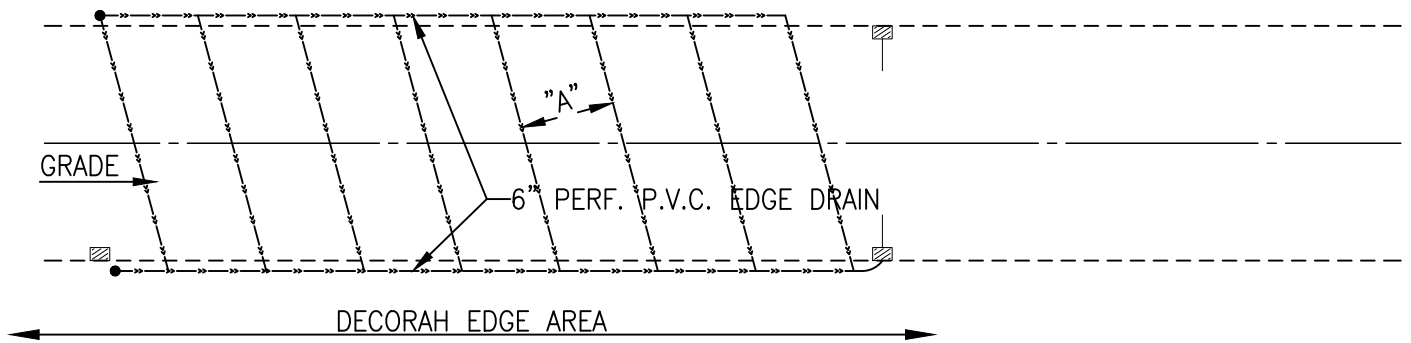
Dale S. Dahl
CITY ENGINEER

SHT 2 OF 2 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-07	REV. H
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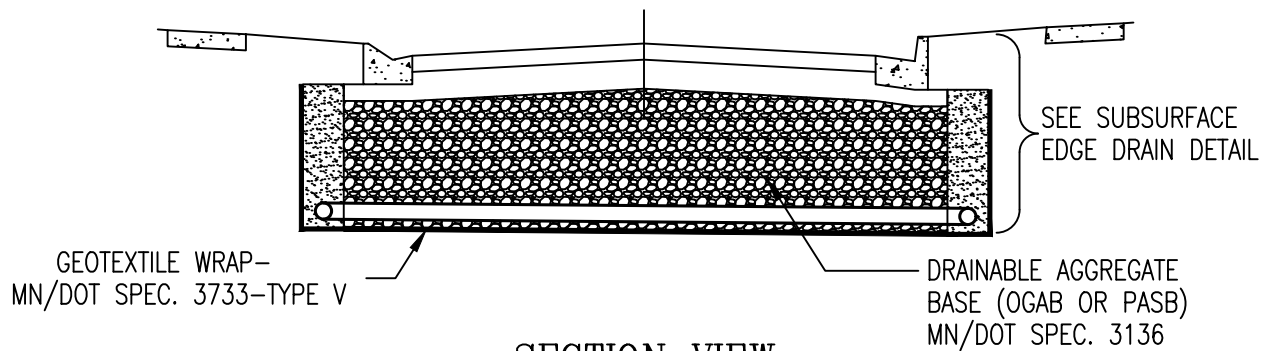


1. THE UPSTREAM ENDS OF THE PERFORATED PIPE SHALL BE CAPPED WITH A DETECTABLE CAP. THE CAPS ARE INCIDENTAL. PLACE PERFORATED PIPE WITH THE PERFORATIONS DOWN.
- ② IF LIGHT POLE IS LESS THAN 3 FT., CONTRACTOR SHALL POT HOLE TO VERIFY PIPE LOCATION. REFERENCE RPU-SL9FD01
- ③ REFER TO SDP 1-11 & 1-12 FOR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

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA			
SUBSURFACE EDGE DRAINS			
 CITY ENGINEER			
SHT 1 OF 2 SHTS	DATE REVISED 5/1/23	PLATE NO. 1-08	REV. 1



PLAN VIEW
FULL ROADWAY SUBSURFACE DRAIN

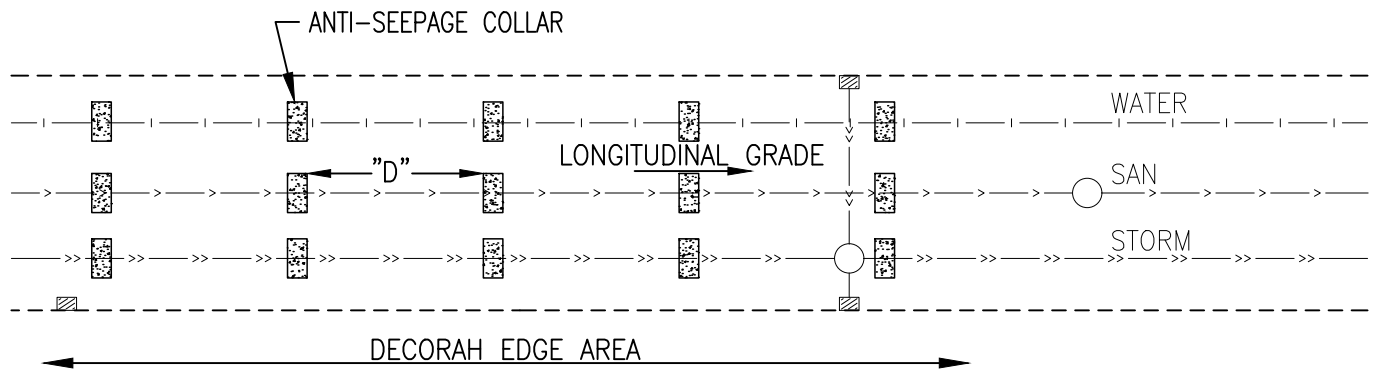


SECTION VIEW
SUBSURFACE DRAIN

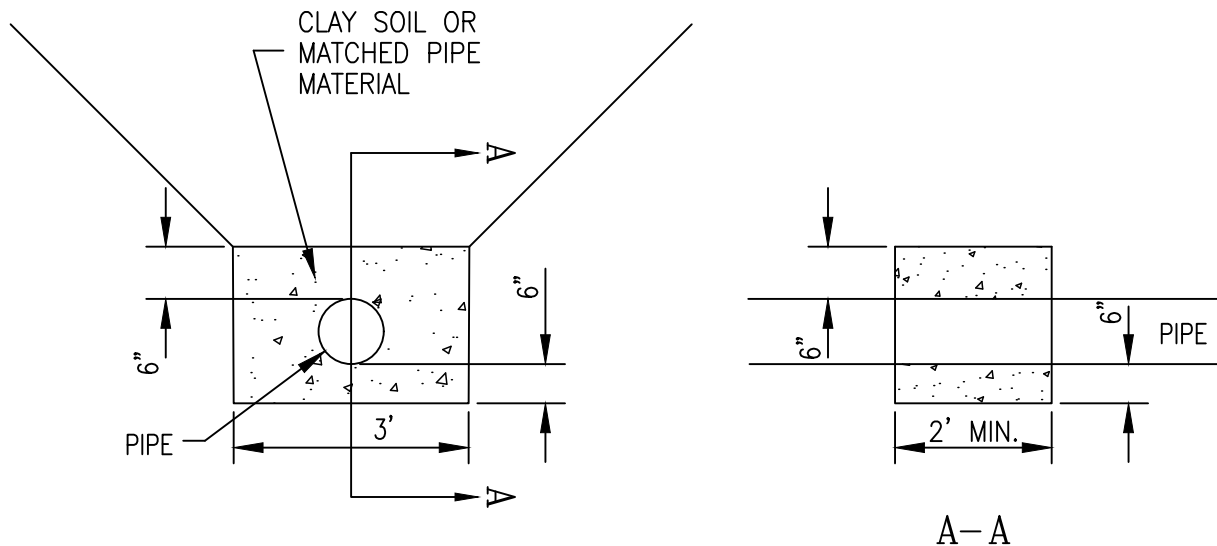
RECOMMENDED SPACING BETWEEN SUBSURFACE DRAIN PIPES	
LONGITUDINAL GRADE	"A"
0% TO 3%	60'
3% TO 5%	40'
5% TO 10%	20'

NOTES
FOR COLLECTOR OR ARTERIAL ROADWAYS

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



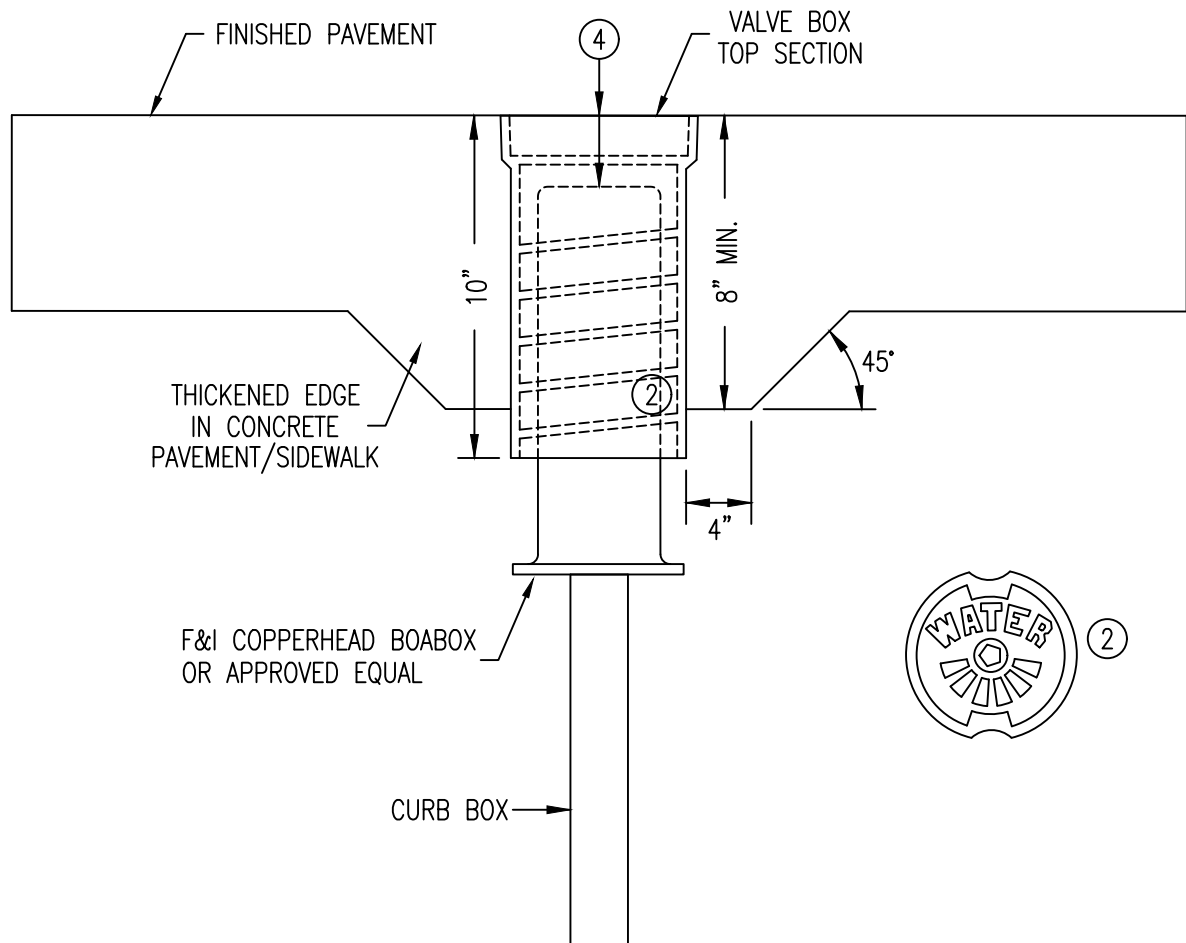
PLAN VIEW
UNDERGROUND UTILITIES



SECTION VIEW
ANTI-SEEPAGE COLLAR

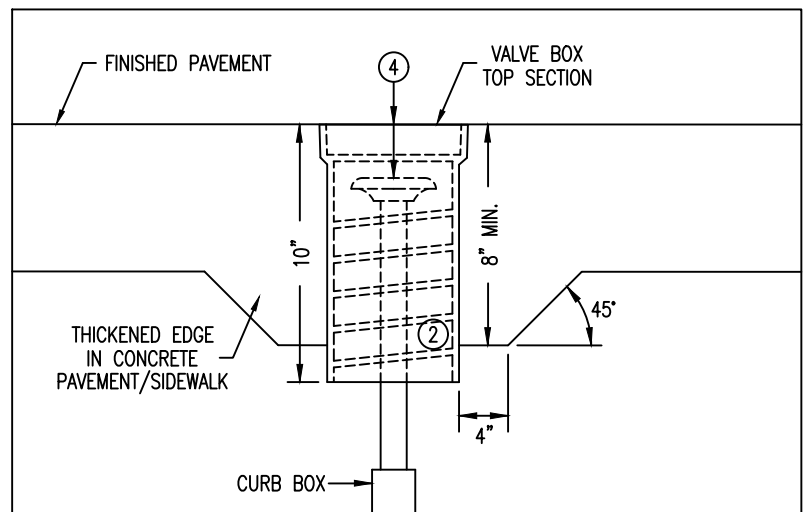
RECOMMENDED SPACING BETWEEN ANTI-SEEPAGE COLLAR	
LONGITUDINAL GRADE	"D"
0% TO 3%	100'
3% TO 5%	50'
5% TO 10%	25'

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 TOP OF BOABOX / 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.



FOR WATER SERVICES USING ALL COPPER PIPE

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

CURB BOX COVER

Dan S. Dahl
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 1/1/25	PLATE NO. 1-10	REV. E
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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	7" FRAME & COVER-GASKETED	R-1916-F	1058	SELF-SEALING, BOLTED LID	USED IN FLOOD PRONE & NON-PAVED AREAS
2	9" FRAME & COVER-GASKETED	R-1733-B	1205	INDENTED TOP	USED IN ALL PAVEMENT AREAS
3	7" FRAME & COVER-GASKETED	R-1733	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 (R-2390-C)	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

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

Dale S. Dahl
CITY ENGINEER

SHT 1 OF 1 SHTS

DATE REVISED
2/2/26

PLATE NO.
1-11

REV.
Q

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
VB	2.7 SQ. FT.	BI-DIRECTIONAL VANE
A	2.6 SQ. FT.	PARALLEL (BICYCLE SAFE)
TB	3.1 SQ. FT.	BI-DIRECTIONAL VANE
L	2.1 SQ. FT.	PERPENDICULAR VANE

REMARKS

LOW POINT ONLY

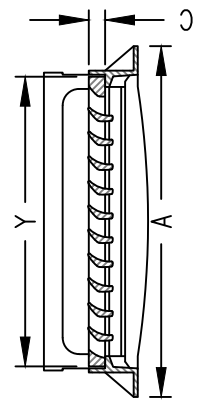
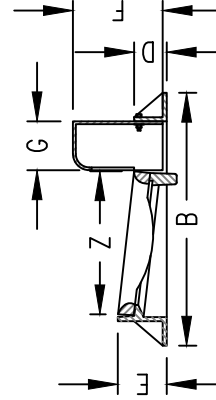
USE IN DRIVE APPROACH WITH BATTERFACE CURB

USE IN DRIVE APPROACH WITH DRIVEOVER CURB

ALL DIMENSIONS ARE MINIMUM AND IN INCHES UNLESS OTHERWISE NOTED.

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"



CURB INLET FRAME

DRIVEWAY INLET FRAME

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

Daniel S. Dahl
CITY ENGINEER

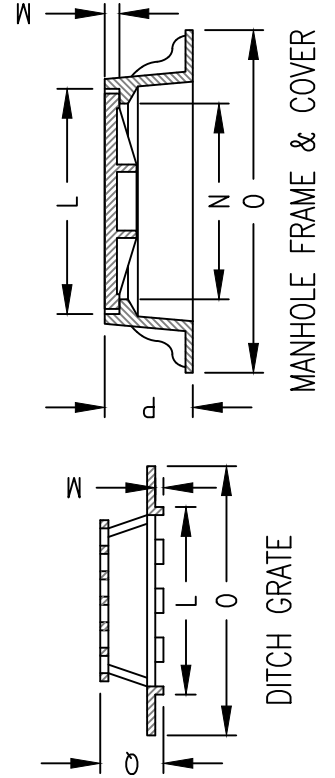
CASTINGS – OTHER STRUCTURES								
TYPE	DESCRIPTION	L	M	N	O	P	Q	
1	9" FRAME & COVER-GASKETED	23	1 1/2	21	36	9		
2	9" FRAME & COVER-GASKETED	25 3/4	7/8	24	35 7/16	9		
3	7" FRAME & COVER-GASKETED	26	1 1/2	24 1/8	35 7/8	6 15/16		
4	7" FRAME & COVER	32	1 1/2	30	46	7		
5	9" FRAME & GRATE	25 3/4	7/8	24	35 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					

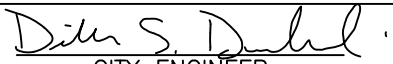
ALL DIMENSIONS ARE
MINIMUM AND IN
INCHES UNLESS
OTHERWISE NOTED.

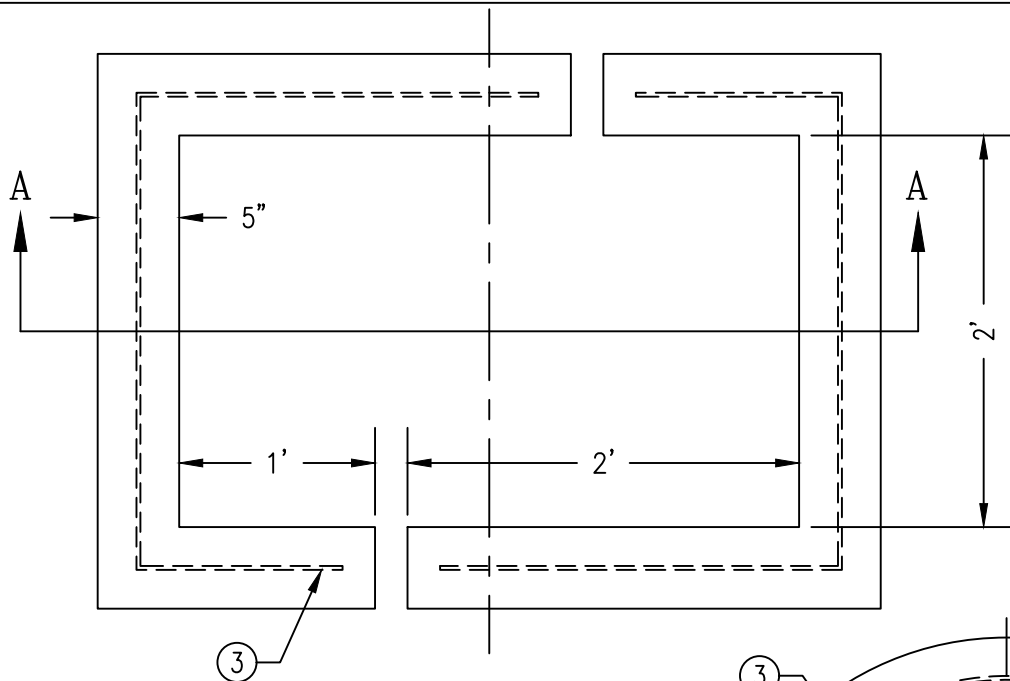
CASTINGS – OTHER STRUCTURES		
TYPE	MINIMUM OPENING	REMARKS
1		BOLTED LID, USED IN FLOOD PRONE AREAS & IN CONCRETE PAVING
2		WITH TWO CI PICK HOLES
3		WITH TWO CI PICK HOLES
4		USED FOR P.R.V. MANHOLES
5	1.3 SQ. FT.	PAVEMENT DRAIN
6	2.5 SQ. FT.	HEAVY DUTY – LARGE OPENING
7	1.73 SQ. FT.	LIGHT DUTY – SMALL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

NOTES:

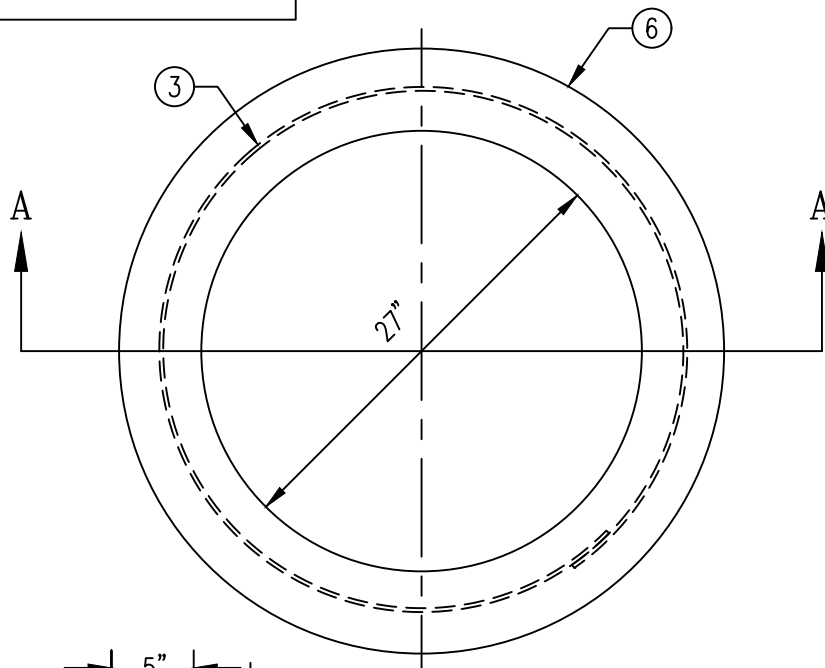
- CASTINGS SHALL BE ACCORDING TO MN/DOT SPEC. 3321.1-2 SUPPLIED BY FOUNDRIES THAT ARE APPROVED ON THE MN/DOT APPROVED/QUALIFIED PRODUCTS LIST
- ALL CASTINGS SHALL COMPLY WITH AASHTO M-306
- ALL CASTINGS SHALL COMPLY WITH U.S. CODE OF FEDERAL REGULATIONS 23CFR635.410, THE "BUY AMERICAN STEEL & IRON REGULATION"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



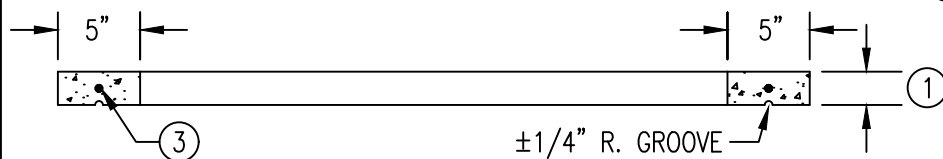
DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA STANDARD CASTING ASSEMBLIES			
 CITY ENGINEER			
SHT 2 OF 2 SHTS	DATE REVISED 1/1/23	PLATE NO. 1-12	REV. G



PLAN



PLAN



±1/4" R. GROOVE

NOTES

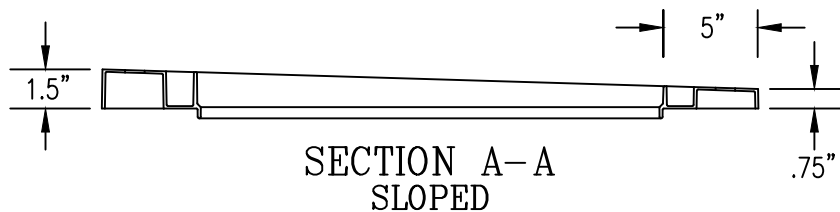
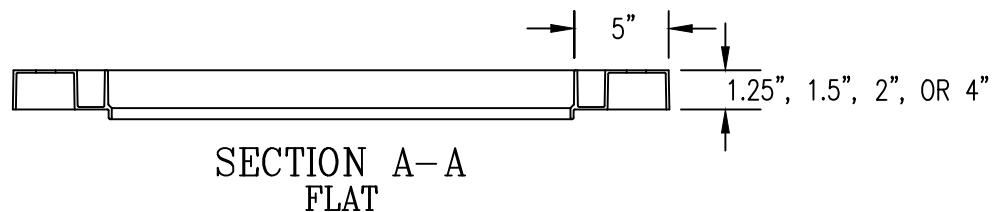
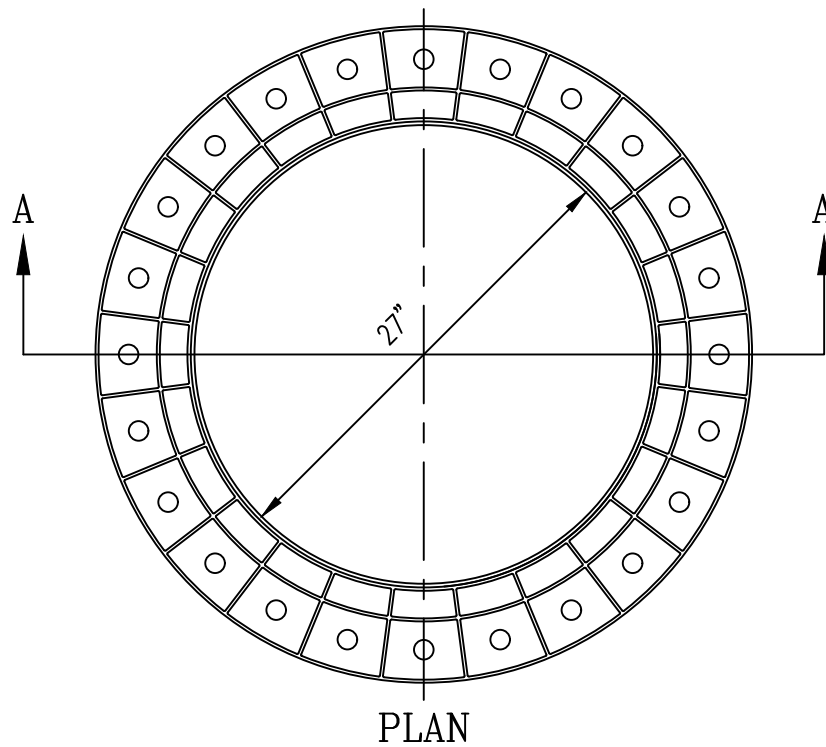
SECTION A-A

- ① VARIABLE THICKNESS OF AT LEAST 1 AND NOT MORE THAN 3 STANDARD 2"-6" RINGS WITH MAXIMUM ADJUSTMENT OF 8" ON NEW STRUCTURES. MAXIMUM ADJUSTMENT OF 12" ON RECONSTRUCTION OF INPLACE STRUCTURES.
2. IF ADDITIONAL ADJUSTMENT >12" IS REQUIRED ON RECONSTRUCTION OF INPLACE STRUCTURES, CONTRACTOR TO INSTALL A PRE-CAST RISER. TO BE APPROVED BY AN AUTHORIZED CITY REPRESENTATIVE PRIOR TO INSTALL.
- ③ REINFORCEMENT SHALL BE A SINGLE HOOP OF #8 GAGE STEEL WIRE
4. SEE MN/DOT S.P. 4010 FOR STRENGTH REQUIREMENTS AND ADDITIONAL INFORMATION
5. MORTAR JOINTS SHALL BE MAXIMUM 1/2" THICK
- ⑥ SHALL ONLY BE USED IN CONCRETE ROADWAYS USING PAVING MACHINES

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA CONCRETE STRUCTURE ADJUSTING RINGS

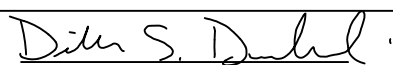
Dale S. Dahl
CITY ENGINEER

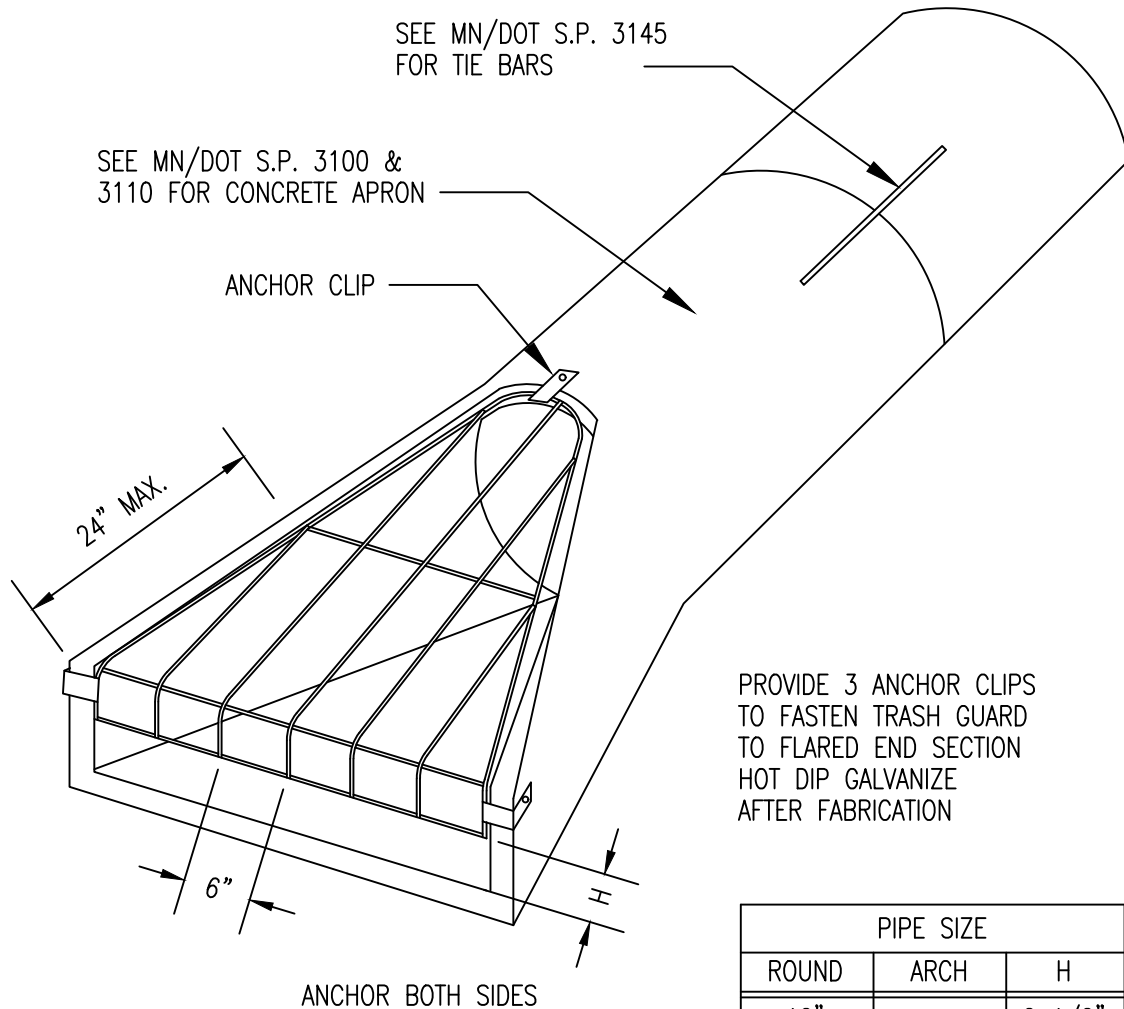
SHT 1 OF 2 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-13	REV. J
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NOTES

1. RING SHALL BE MOLDED FROM HIGH DENSITY POLYETHYLENE MATERIAL AS DEFINED IN ASTM D4976.
2. VARIABLE THICKNESS OF AT LEAST 2 AND NOT MORE THAN 3 STANDARD 1.25"–4" RINGS WITH MAXIMUM ADJUSTMENT OF 8" ON NEW STRUCTURES. MAXIMUM ADJUSTMENT OF 12" ON RECONSTRUCTION OF INPLACE STRUCTURES.
3. IF ADDITIONAL ADJUSTMENT >12" IS REQUIRED ON RECONSTRUCTION OF INPLACE STRUCTURES, CONTRACTOR TO INSTALL A PRE-CAST RISER. TO BE APPROVED BY AN AUTHORIZED CITY REPRESENTATIVE PRIOR TO INSTALL.
4. MAXIMUM (4) SLOPED RINGS TO MATCH GRADE. SHIMS NOT PERMITTED.
5. APPLY SEALANT PER MANUFACTURER'S REQUIREMENTS.
6. CUT THE LIP OF THE BOTTOM RING AS NECESSARY TO ALLOW IT TO SIT FLUSH AND ALIGN ON THE MANHOLE ASSEMBLY.

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

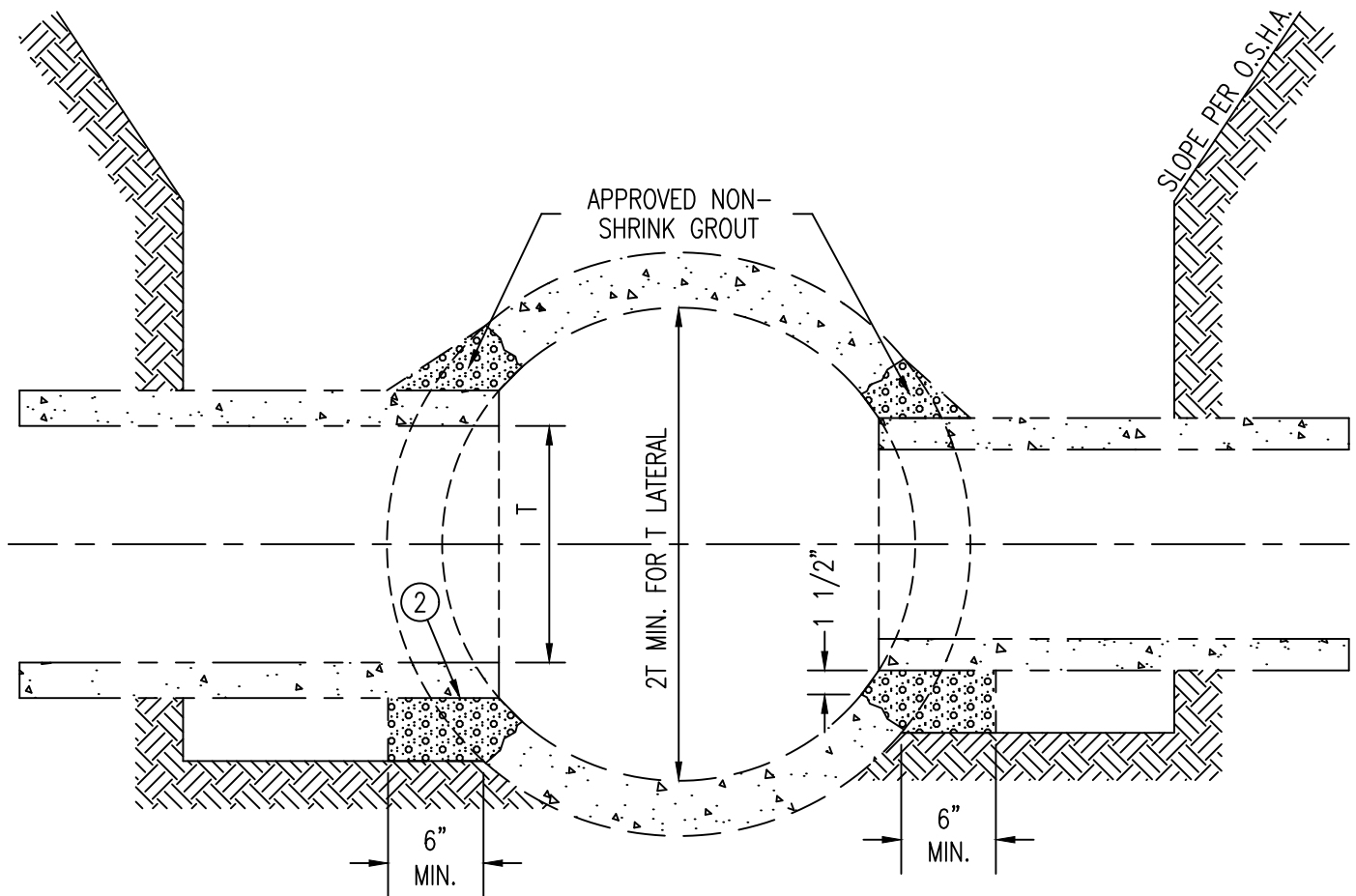


PIPE SIZE		
ROUND	ARCH	H
12"		2 1/2"
15"		3"
18"-24"	22"-29"	4"
27"-36"	36"-44"	5"
42"-54"	51"-65"	6"
60"-72"	73"-88"	7"
78"-90"		8"

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			
<i>Douglas Nelson</i> ASST. CITY ENGINEER		<i>Keith W. Fenne</i> DIRECTOR	
SHT 1 OF 1 SHTS	DATE REVISED 1/20/17	PLATE NO. 1-14	REV. A



NOTES

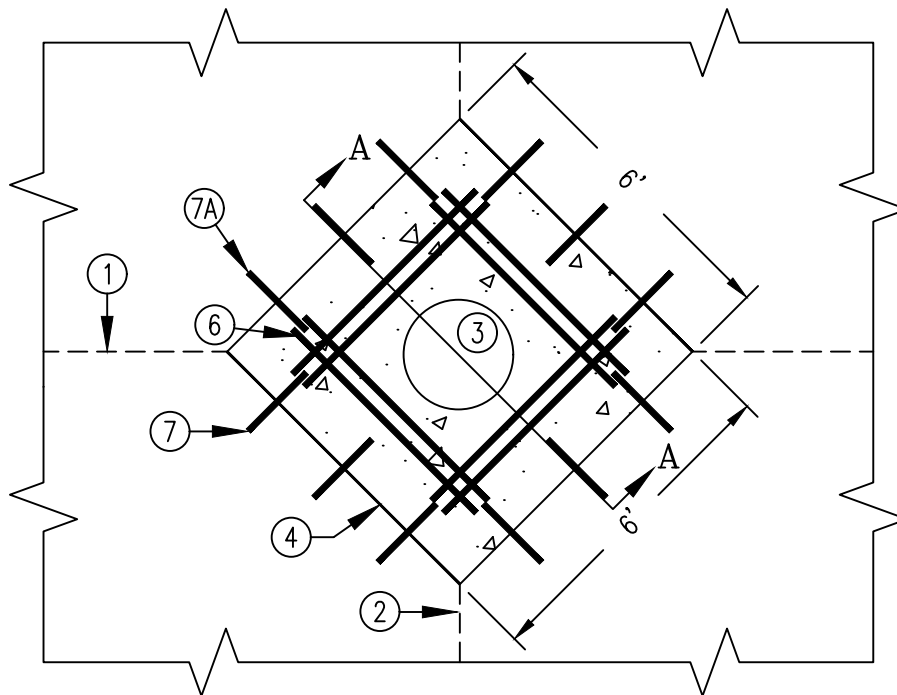
1. MANHOLE REQUIRED WHERE LATERAL PIPE OR CONNECTING PIPE EXCEEDS 1/2 MAIN PIPE DIAMETER.
- ② LATERAL PIPE SHALL NOT EXTEND INTO THE CROSS SECTION OF MAIN PIPE BEYOND THAT REQUIRED FOR FULL WALL SUPPORT.
3. BLIND-TIE FIELD CONNECTIONS MUST BE CORE DRILLED INTO STORM SEWER MAIN.

DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA
**BLIND-TIE FIELD CONNECTION
FOR R.C.P. STORM SEWER**

Dale S. Dahl
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-15	REV. C
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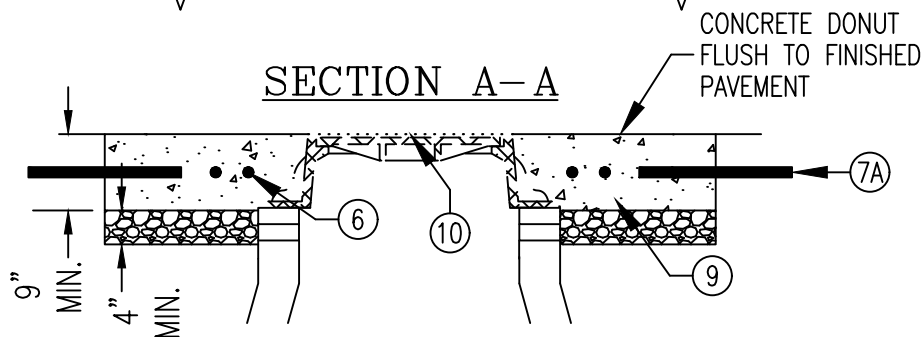
CONCRETE PAVEMENT



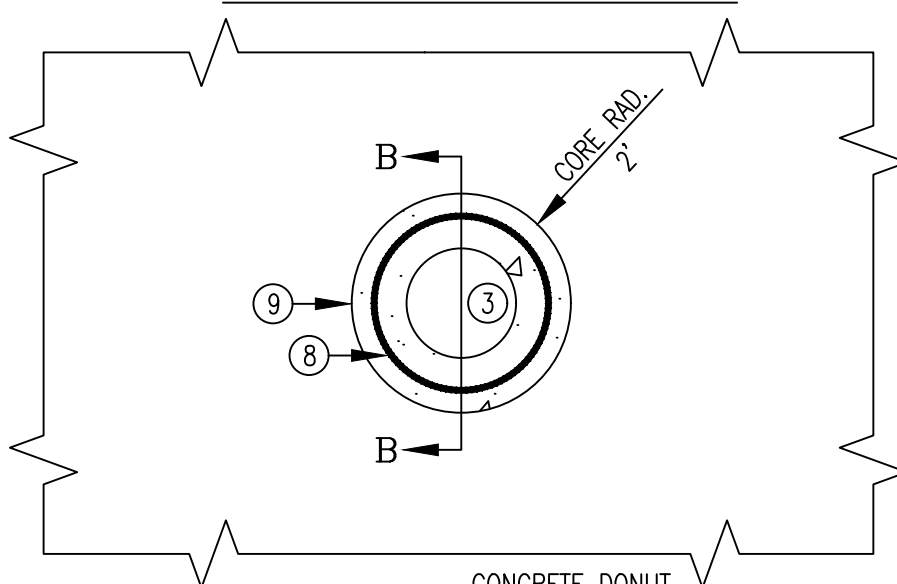
NOTES

- 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 AGGREGATE BASE, CONCRETE PAVEMENT (HIGH EARLY MIX) AND CURING COMPOUND.
- ⑩ SET TOP OF CASTING 0 - 1/2" BELOW THE FLEXIBLE PAVEMENT OR FLUSH WITH THE RIGID PAVEMENT SURFACE

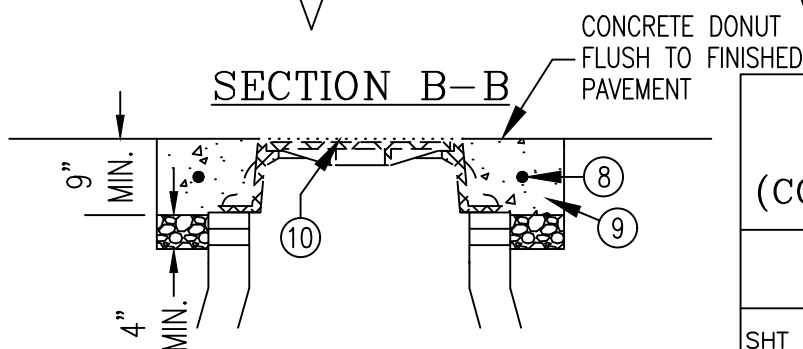
SECTION A-A



BITUMINOUS PAVEMENT



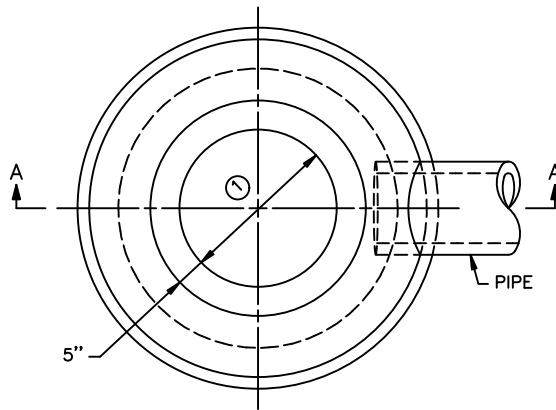
SECTION B-B



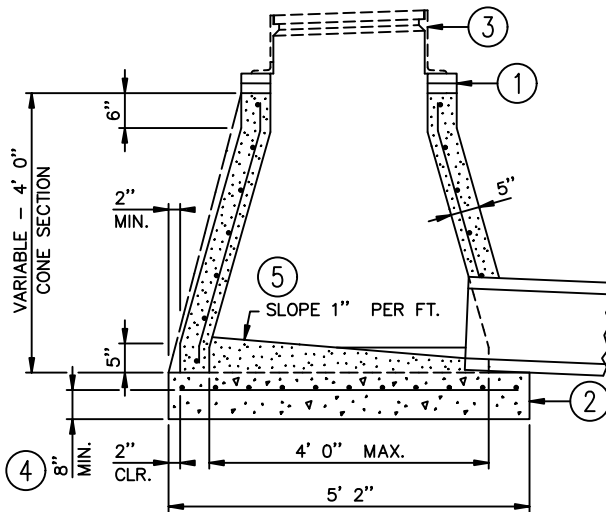
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA
PAVEMENT RESTORATION
(CONCRETE & BITUMINOUS STREET)

Dale S. Dahl
CITY ENGINEER

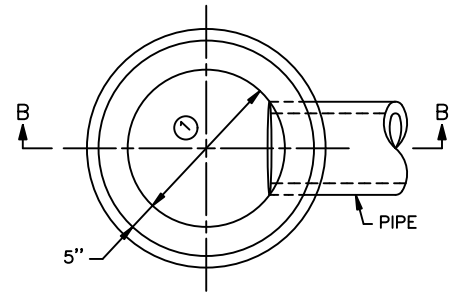
SHT 1 OF 1 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-16	REV. D
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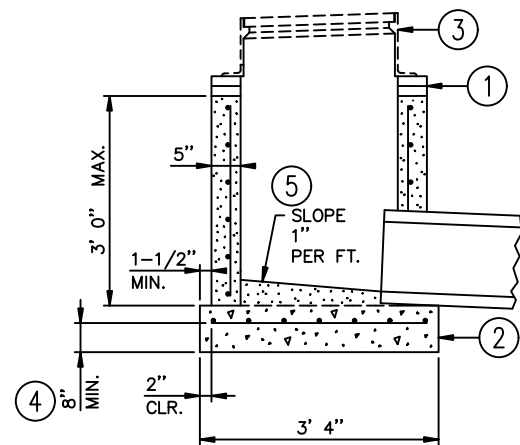
TOP VIEW
REINFORCEMENT NOT SHOWN



SECTION A-A
STRUCTURE TYPE G ⑥



TOP VIEW
REINFORCEMENT NOT SHOWN



SECTION B-B
STRUCTURE TYPE H ⑦

NOTES

- ① REFER TO S.D.P. 1-13 (SHEET 1).
CONCRETE ADJUSTING RINGS REQUIRED.
- 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 8" PRECAST CONCRETE BASE. 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 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".
- ⑥ STRUCTURE TYPE G TO BE USED AS AN AREA
INLET OUTSIDE OF ROADWAY.
- ⑦ STRUCTURE TYPE H TO BE USED AS AN AREA
INLET OUTSIDE OF ROADWAY (LEAD STRUCTURE
ONLY).

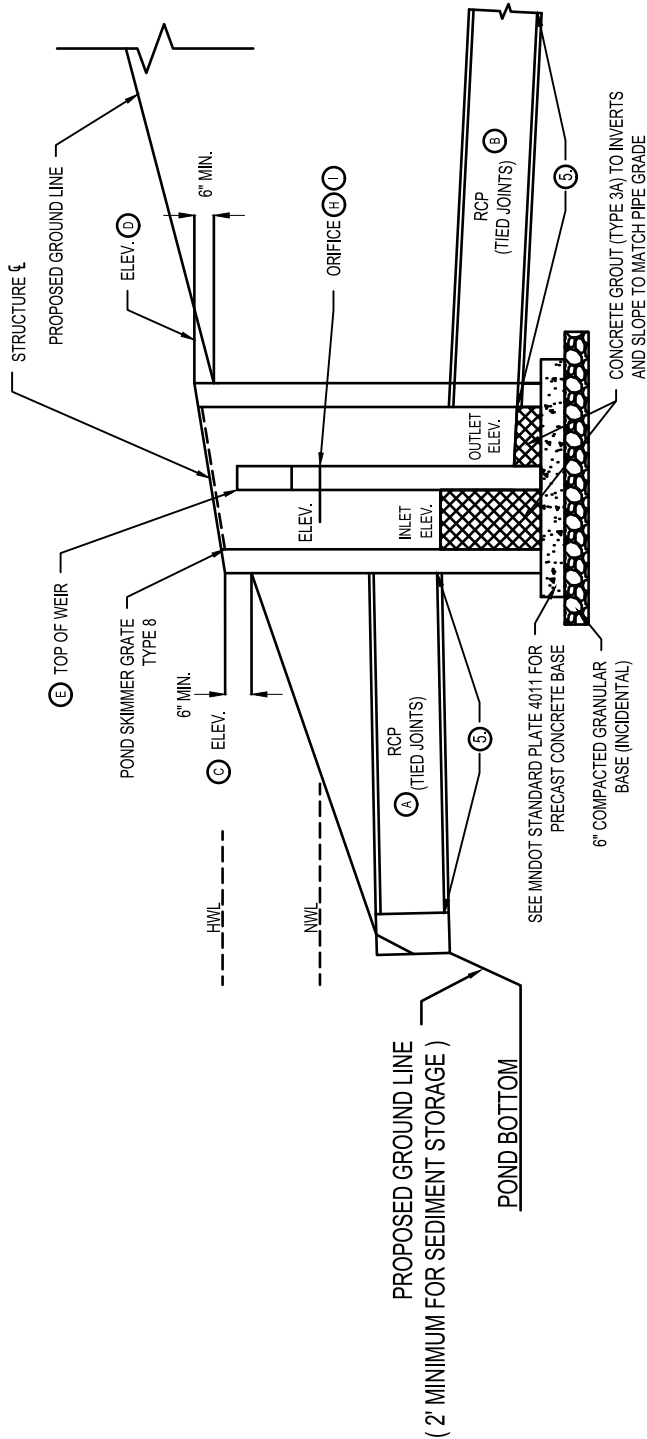
DEPARTMENT OF PUBLIC WORKS
CITY OF ROCHESTER, MINNESOTA

STRUCTURE TYPES G AND H

Dan S. Dahl
CITY ENGINEER

SHT 1 OF 1 SHTS	DATE REVISED 1/1/25	PLATE NO. 1-17	REV. A
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STRUCTURE NAME	STRUCTURE (DIA)	NWL ELEV.	POND BOTTOM ELEV.	HWL ELEV.	A		B		C	D	E	F	G	H	I
					PIPE		PIPE								
					DIA. (IN)	INLET INVERT ELEV.	DIA. (IN)	OUTLET INVERT ELEV.							
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—



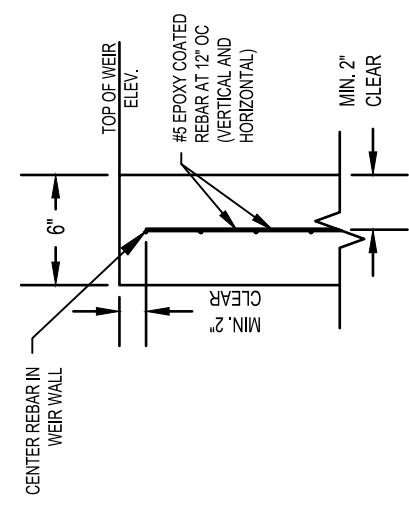
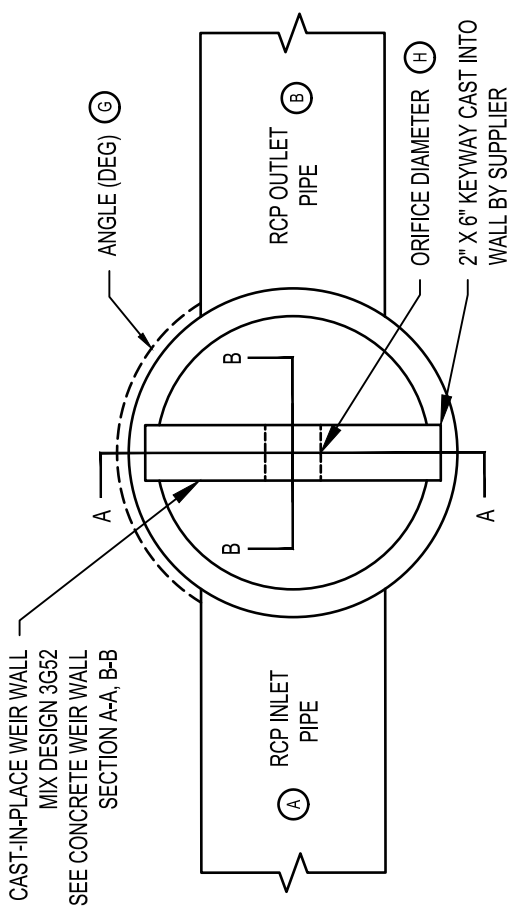
POND OUTLET STRUCTURE

NOT TO SCALE

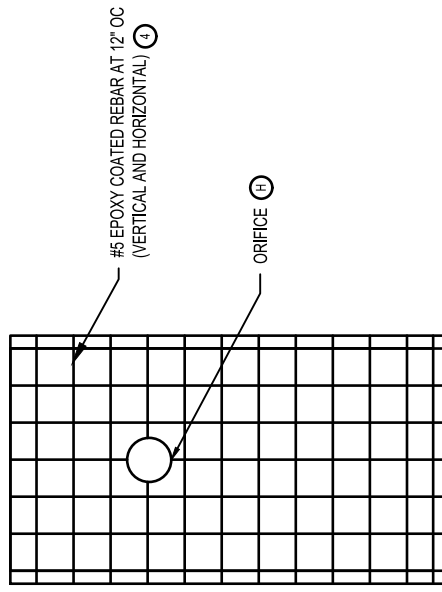
NOTES:

1. ALL REBAR SIZES ARE ENGLISH UNLESS OTHERWISE NOTED.
2. ADJUST REBAR LOCATION AT ORIFICE.
3. 6" THICK WEIR WALL MUST BE CAST IN PLACE.
4. DRILL AND GROUT REBAR INTO MANHOLE STRUCTURE.
5. REFER TO STORM SHEETS FOR INVERT ELEVATIONS. MAINTAIN MINIMUM ADVERSE GRADE OF 1%.
6. ALL PIPE CONNECTIONS INTO STRUCTURES MUST BE GROUTED OUTSIDE AND INSIDE WITH AN APPROVED NON-SHRINK GROUT.

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA POND OUTLET CONTROL STRUCTURES			
<i>Dan S. Dahl</i> CITY ENGINEER			
SHT 1 OF 2 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-18	REV. A

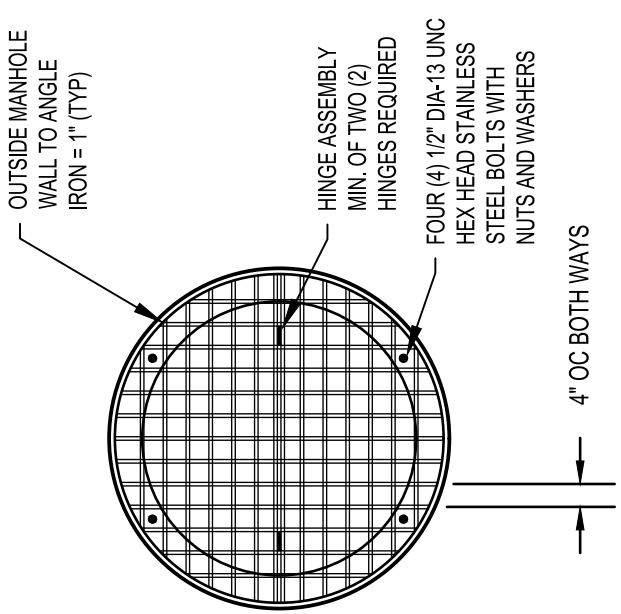


CONCRETE WEIR WALL SECTION B-B



CONCRETE WEIR WALL SECTION A-A

OUTLET CONTROL STRUCTURE TOP VIEW
NOT TO SCALE



TWO-PIECE POND SKIMMER GRATE (MIN. 1/2\"/>

- NOTES:
1. GRATE TO BE MADE IN TWO (2) PIECES
 2. ALL METAL SHALL BE HOT-DIPPED GALVANIZED
 3. 6\"/>
- ④ DRILL AND GROUT REBAR INTO MANHOLE STRUCTURE.

DEPARTMENT OF PUBLIC WORKS CITY OF ROCHESTER, MINNESOTA POND OUTLET CONTROL STRUCTURES			
<i>Dale S. Dahl</i> CITY ENGINEER			
SHT 2 OF 2 SHTS	DATE REVISED 2/2/26	PLATE NO. 1-18	REV. A