

Appendix D

Standard Plates (Sewer Appurtenances)

STANDARD PLATES

Sewers & Appurtenances

Castings

Plate Number	Description
<u>2201E</u>	Frame Casting "A"
<u>2202D</u>	Cover Castings "B"
<u>2203</u>	Cover Casting "D"
<u>2207C</u>	Manhole Adaptor Ring

Catch Basins

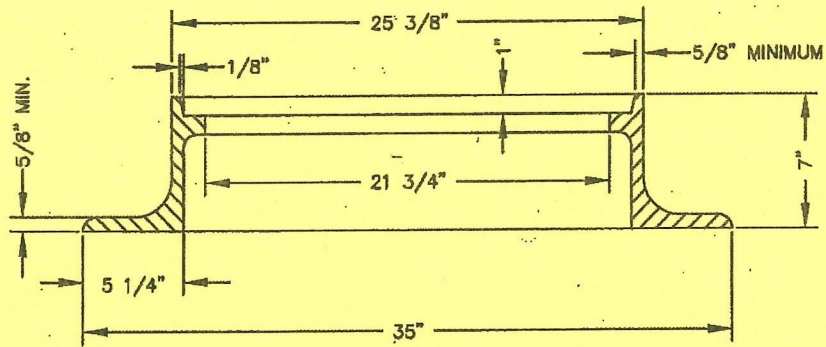
Plate Number	Description
<u>2003D</u>	Catch Basin Type 2A
<u>2004D</u>	Catch Basin Type 2B
<u>2007E</u>	Catch Basin Type 3C
<u>2015G</u>	Catch Basin Type 7A
<u>2211</u>	Catch Basin Type 7A Details
<u>2212</u>	Catch Basin Type 7A Modified

Manholes

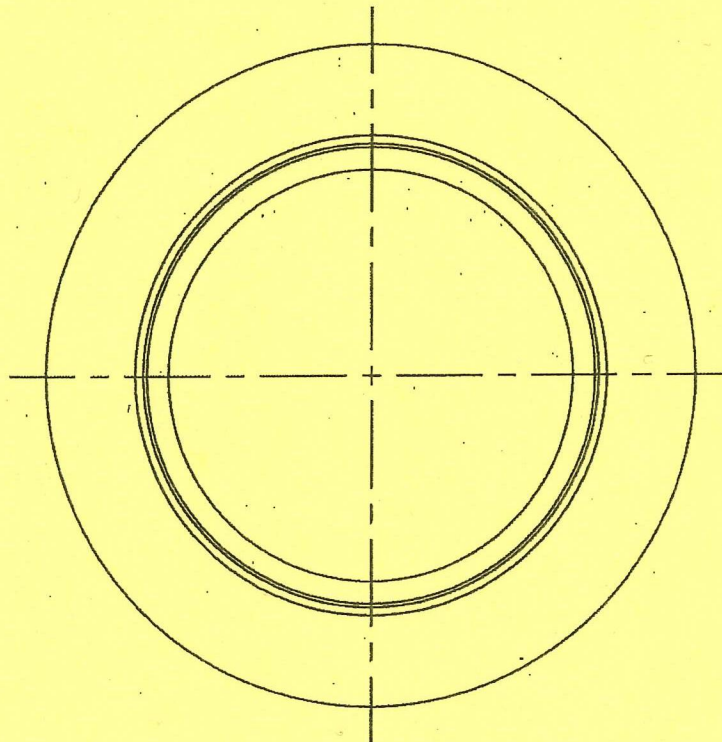
Plate Number	Description
<u>2101D</u>	Manhole Design Type I
<u>2102D</u>	Manhole Design Type II
<u>2103E</u>	Manhole Design Type III & III-S
<u>2104E</u>	Manhole Design Type IV
<u>2105E</u>	Manhole Design Type V & V-S
<u>2106E</u>	Manhole Design Type VI
<u>2107C</u>	Manhole Design Type VII
<u>2109C</u>	Manhole Design Type VI-CT
<u>2110C</u>	Manhole Design Type IV-A
<u>2111B</u>	Manhole Design Type IV Precast

Miscellaneous Sewer

Plate Number	Description
<u>2301D</u>	Outside Drop
<u>2303B</u>	Standpipe for V.C.P. Sewer
<u>2304B</u>	Standpipe for R.C.P. Sewer
<u>2306E</u>	Reconnection of House Services
<u>2307B</u>	Special Joint for Jacked Pipe
<u>2308C</u>	Construction Joint
<u>2309C</u>	Catch Basin Connection
<u>2310C</u>	Typical Fill Section
<u>2311B</u>	Anchor Clamp Detail
<u>2312C</u>	House Service Connection to Sandrock Tunnel
<u>2317C</u>	Class "D" Pipe Bedding
<u>2318C</u>	Concrete Saddle for Pipe Crossings
<u>2319D</u>	Saddle Connection of House Services
<u>2320B</u>	Concrete Piers for Pipe Crossings
<u>2321</u>	Manhole Adjust
<u>2322</u>	Manhole Reconstruct



SECTION



PLAN

NOTES:

1. FRAME CASTING 'A' TO BE USED WITH COVER CASTINGS 'B' OR 'D', SEE STANDARD PLATES 2202D AND 2203.
2. CASTING SHALL BE CONSTRUCTED OF UNPAINTED GRAY IRON MEETING ASTM-A-48, CLASS 35B OR BETTER AND SHALL CONFORM TO AASHTO DESIGNATION M306-89 AND MnDOT SPECIFICATION 3321.
3. THE MANUFACTURERS NAME SHALL BE CAST ON AN EXPOSED SURFACE OF THE CASTING.
4. CASTING SHALL BE NEENAH FOUNDRY CO. NO. R-1678-A OR APPROVED EQUAL.

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Joseph J. Mueller
JOSEPH J. MUELLER

Date 5-4-10 Lic. No. 13942

APPROVED

Joseph J. Mueller
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

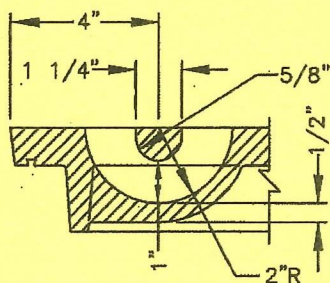
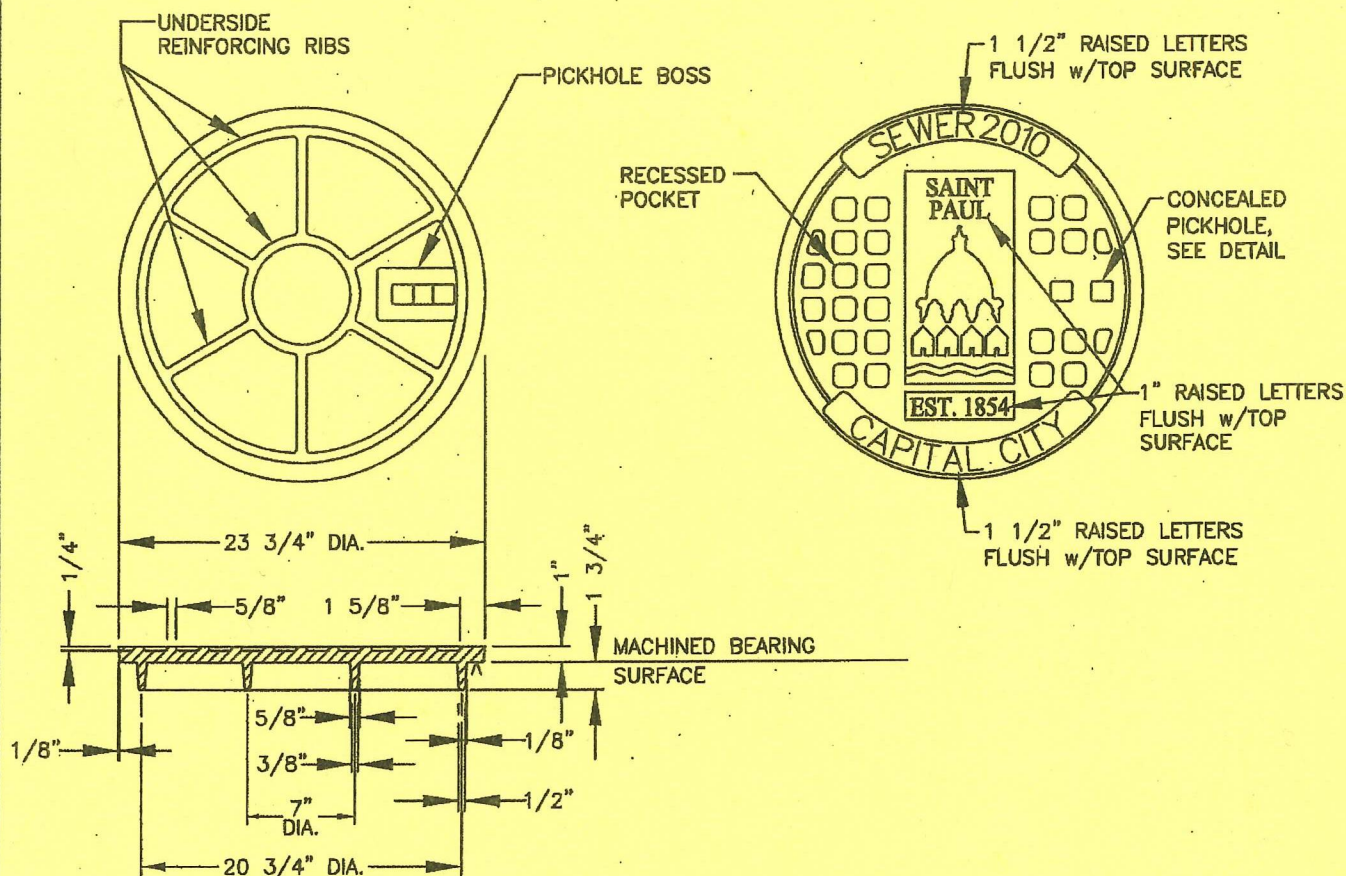
FRAME CASTING "A"

Date of
Revision

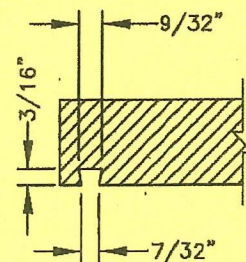
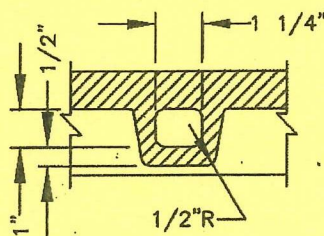
MAY
2010

Standard
Plate
No.

2201E



CONCEALED PICKHOLE DETAIL



DOVETAIL GROVE DETAIL

NOTES:

1. CASTING "B" SHALL BE USED WITH FRAME CASTING "A" (STD. PLATE 2201E).
2. CASTING SHALL BE CONSTRUCTED OF UNPAINTED GRAY IRON MEETING ASTM A-48, CLASS 35B OR BETTER AND SHALL CONFORM TO AASHTO DESIGNATION M306-89 AND MnDOT SPECIFICATION 3321.
3. CASTING "B" TO BE SUPPLIED WITH SELF-SEALING GASKET OF POLYISOPRENE (40 DUROMETER) SET IN DOVETAIL GROVE PER DETAIL ONLY WHEN SPECIFICALLY IDENTIFIED IN THE PLANS.
4. EACH CASTING SHALL BEAR AN IDENTIFICATION MARK, RECESSED FLUSH, INDICATING THE SOURCE OF MANUFACTURE, WHICH MARK SHALL EITHER BE A SYMBOL NOT OVER 1 1/2 INCHES IN GREATEST DIMENSION OR IN LETTER FORM NO GREATER THAN 3/4 INCH IN HEIGHT AND 2 INCHES IN LENGTH. LOCATION OF IDENTIFICATION MARKS BY THE ENGINEER.

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DEPARTMENT OF PUBLIC WORKS

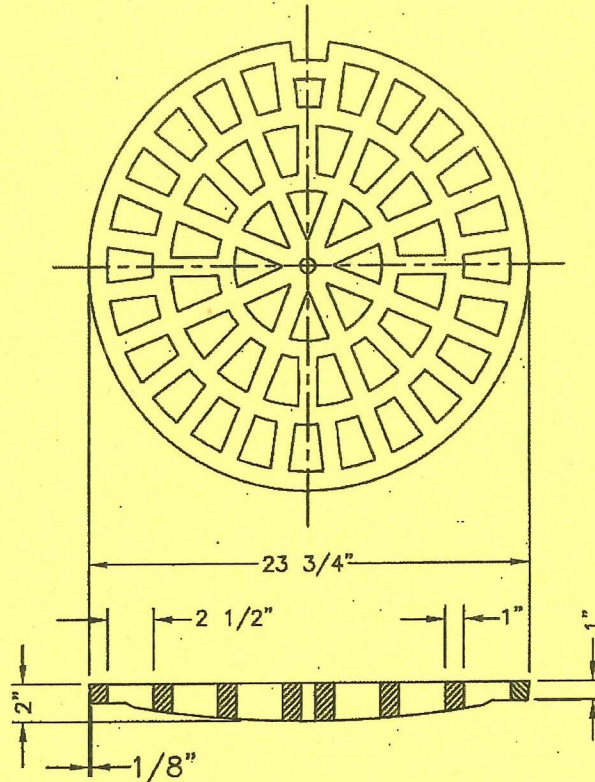
COVER CASTING "B"

Date of
Revision

MAY
2010

Standard
Plate
No.

2202D



NOTE:

OPENINGS IN COVER
TO BE ALIGNED RADIALLY

NOTES:

1. CASTING "D" SHALL BE USED WITH FRAME CASTING "A" (STD. PLATE 2201E).
2. CASTING SHALL BE CONSTRUCTED OF UNPAINTED GRAY IRON MEETING ASTM A-48, CLASS 35B OR BETTER AND SHALL CONFORM TO AASHTO DESIGNATION M306-89 AND MnDOT SPECIFICATION 3321.
3. EACH CASTING SHALL BEAR AN IDENTIFICATION MARK, RECESSED FLUSH, INDICATING THE SOURCE OF MANUFACTURE, WHICH MARK SHALL EITHER BE A SYMBOL NOT OVER 1 1/2 INCHES IN GREATEST DIMENSION OR IN LETTER FORM NO GREATER THAN 3/4 INCH IN HEIGHT AND 2 INCHES IN LENGTH. LOCATION OF IDENTIFICATION MARKS BY THE ENGINEER.

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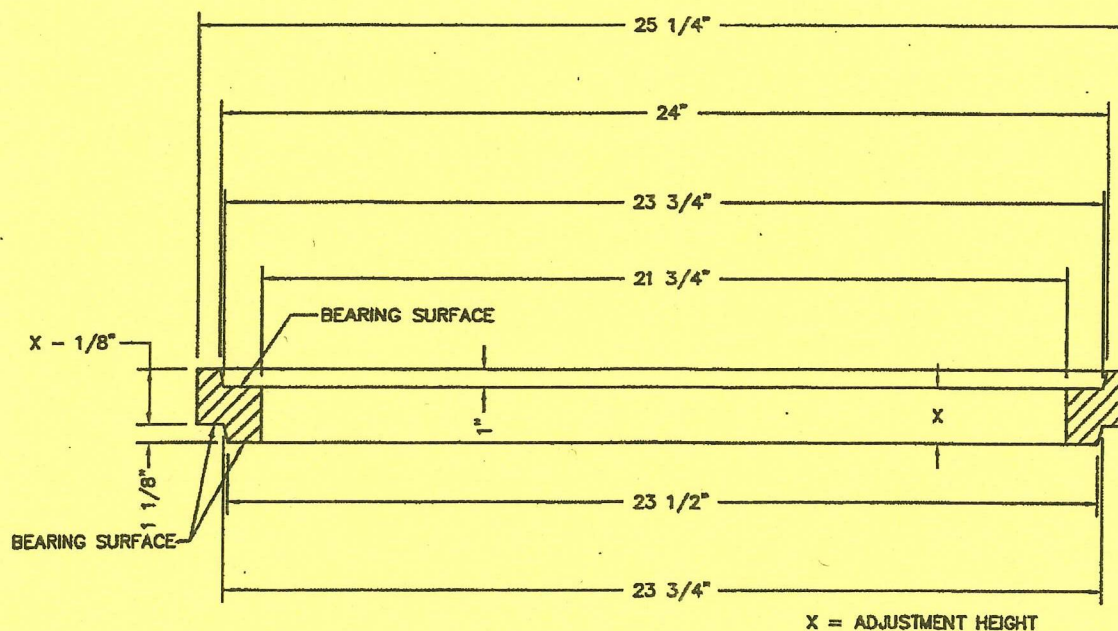
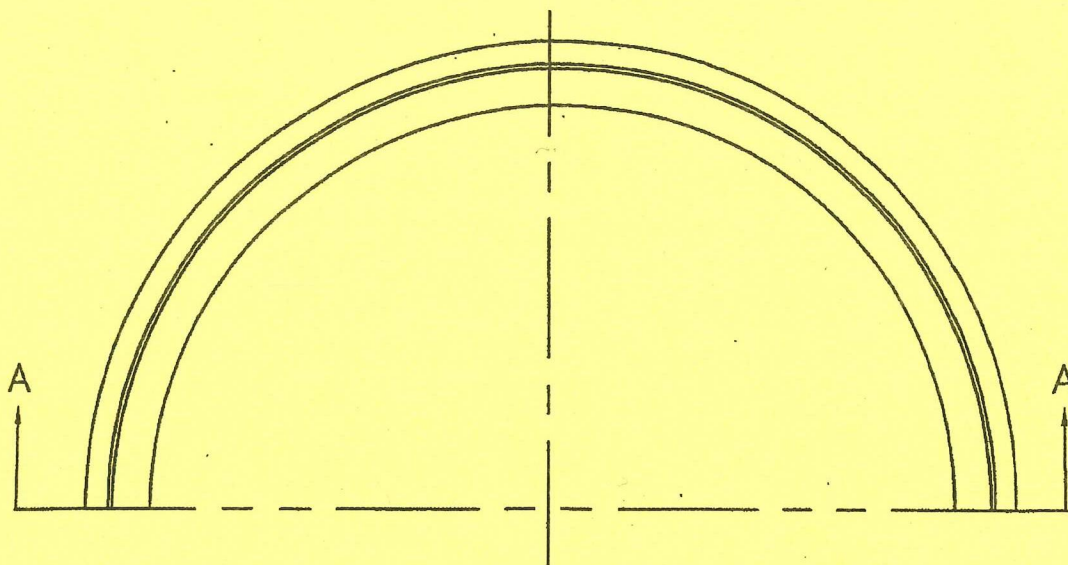
Date 5-4-10 Lic. No. 13942

APPROVED _____
John E. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
COVER CASTING "D"

Date of
Revision
MAY
2010

Standard
Plate
No.
2203



SECTION A-A

NOTES:

1. ADJUSTMENT HEIGHTS SHALL BE IN 1/2" INCREMENTS FROM 1 1/2" TO 3"
2. CASTING SHALL BE CONSTRUCTED OF UNPAINTED GRAY IRON MEETING ASTM A-48, CLASS 35B OR BETTER AND SHALL CONFORM TO AASHTO DESIGNATION M306-89.
3. ALL BEARING SURFACES SHALL BE MACHINED TO A TRUE SURFACE.

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Joseph J. Mueller
 JOSEPH J. MUELLER
 Date 9-2-02 Lic. No. 13942

APPROVED _____
Al J. [Signature]
 CITY ENGINEER

CITY OF ST. PAUL
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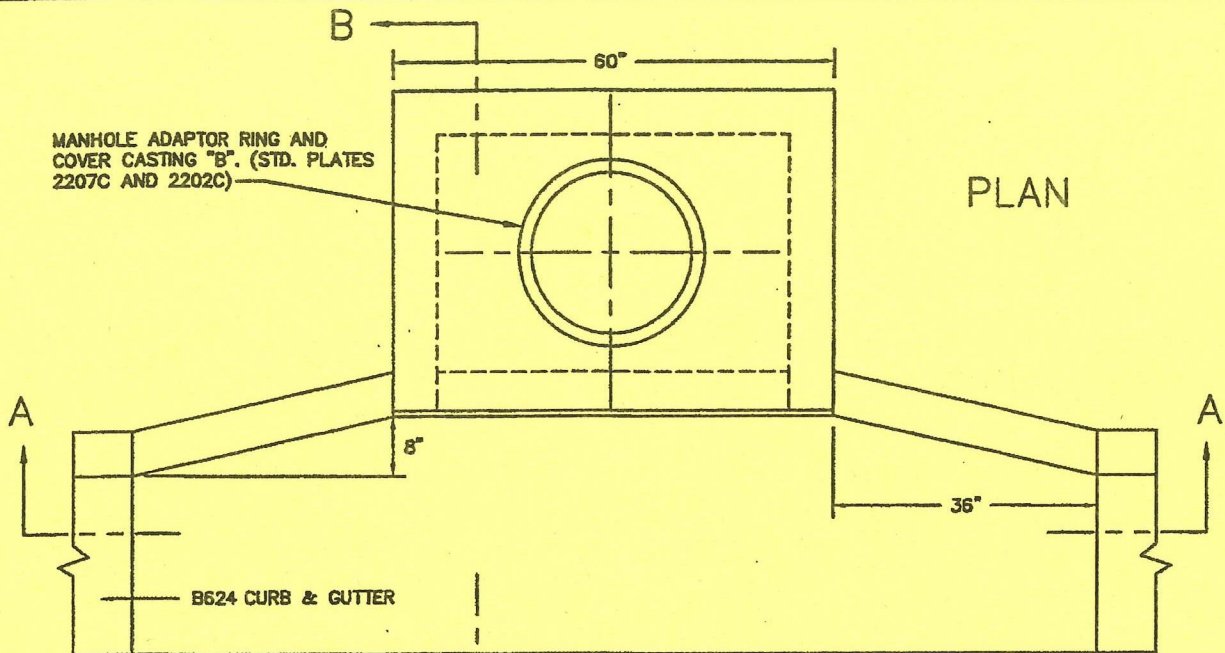
MANHOLE ADAPTOR RING

Date of
 Revision
 JULY
 2002

Standard
 Plate
 No.
 2207C

MANHOLE ADAPTOR RING AND COVER CASTING "B". (STD. PLATES 2207C AND 2202C)

PLAN



SHIM PRECAST UNIT AS REQ. TO MATCH GUTTER GRADE. 1/2" MORTAR JOINT.

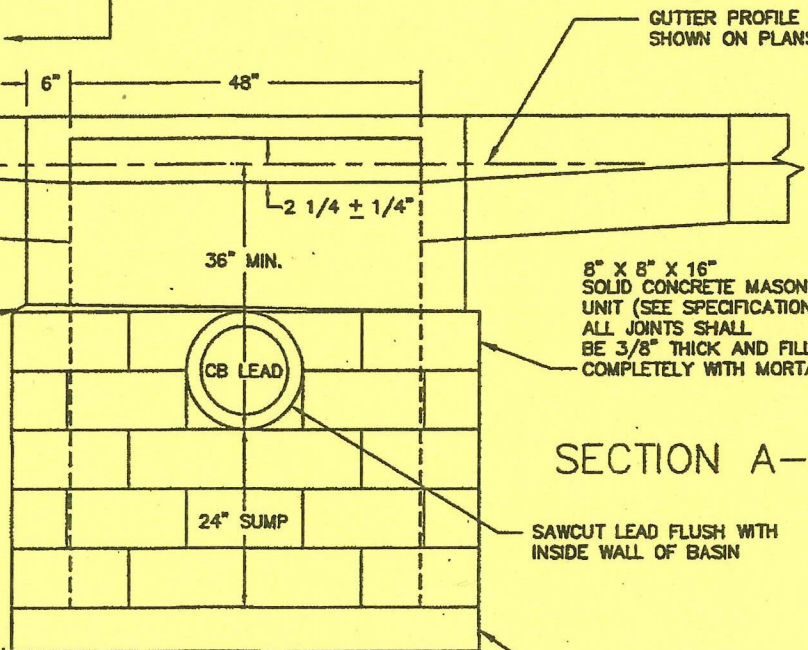
GUTTER PROFILE AS SHOWN ON PLANS

8" X 8" X 16" SOLID CONCRETE MASONRY UNIT (SEE SPECIFICATIONS). ALL JOINTS SHALL BE 3/8" THICK AND FILLED COMPLETELY WITH MORTAR.

SECTION A-A

NOTES:

1. PRECAST UNIT SHALL CONFORM TO MN/DOT STD. PLATE 4021 EXCEPT FOR MANHOLE RING AND COVER
2. FOR USE WITH B624 CURB & GUTTER
3. TO BE USED ONLY WHERE MAJOR UTILITY CONFLICT PROHIBITS USE OF TYPE 7A CATCH BASIN



SAWCUT LEAD FLUSH WITH INSIDE WALL OF BASIN

MN/DOT STD. PLATE 4021 OPTION 1 STEEL NOSING

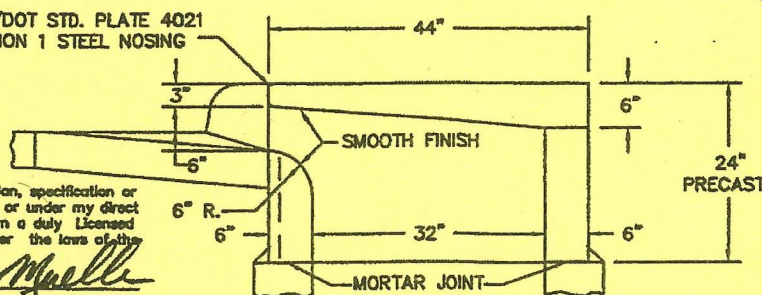
6" X 5'-4" X 4'-0" PRECAST BASE

SECTION B-B

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

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JOSEPH J. MUELLER

Date 9-2-02 Lic. No. 13942



APPROVED

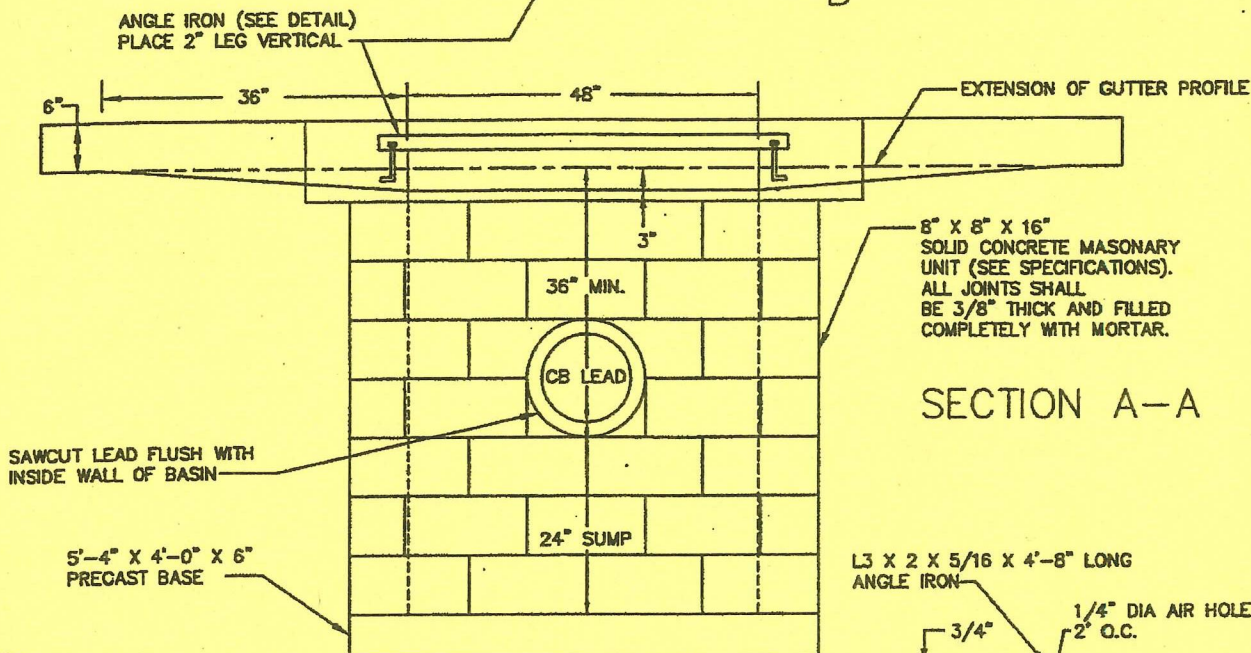
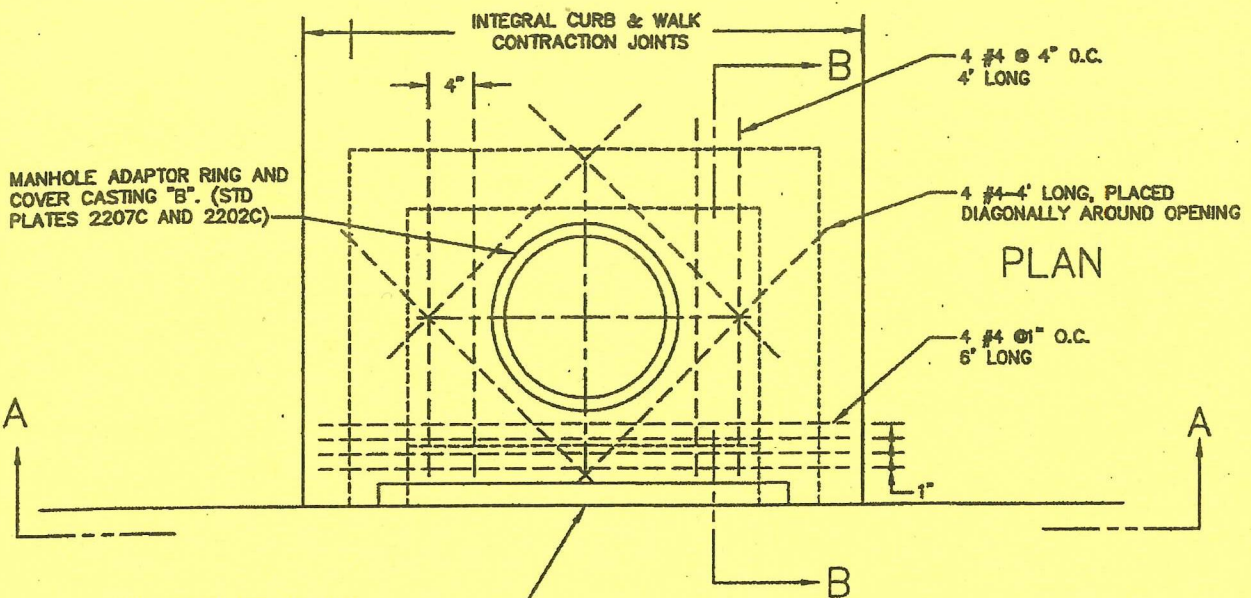
Joseph J. Mueller
CITY ENGINEER

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DEPARTMENT OF PUBLIC WORKS

CATCH BASIN, TYPE 2A

Date of Revision
JULY 2002

Standard Plate No.
2003D



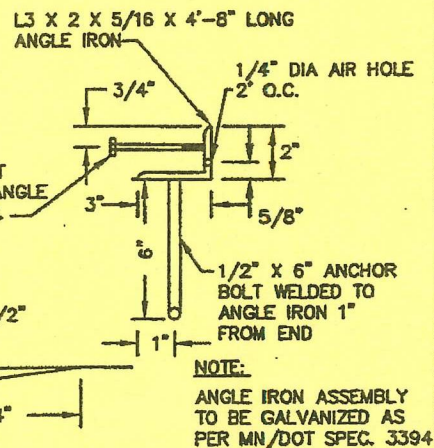
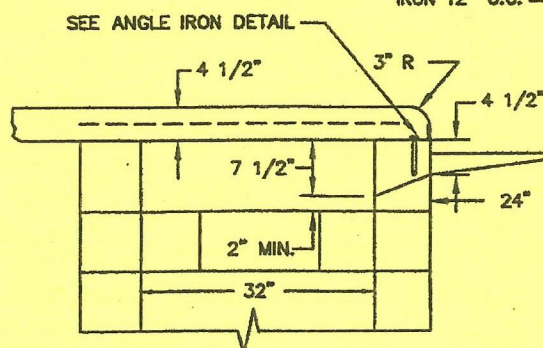
NOTES:

1. REINFORCING STEEL TO BE GRADE 60 FUSION BONDED EPOXY COATED PER ASTM A775
2. MINIMUM CLEAR DISTANCE TO REBAR=1"
3. REMOVE ALL FORMWORK FROM INTERIOR OF CATCHBASIN
4. FOR USE WITH INTEGRAL CURB & WALK
5. TO BE USED ONLY WHERE MAJOR UTILITY CONFLICT PROHIBITS USE OF TYPE 7A CATCH BASIN

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JOSEPH J. MUELLER

Date 9-2-02 Lic. No. 13942



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Al J. [Signature]
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CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN, TYPE 2B

Date of
Revision
JULY
2002

Standard
Plate
No.
2004D

APPROVED
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
CATCH BASIN, TYPE 7A

Date of
Revision
MAY
2010

Standard
Plate
No.
2015G

Date: 5-4-10 Lic. No. 13942

JOSEPH J. MUELLER

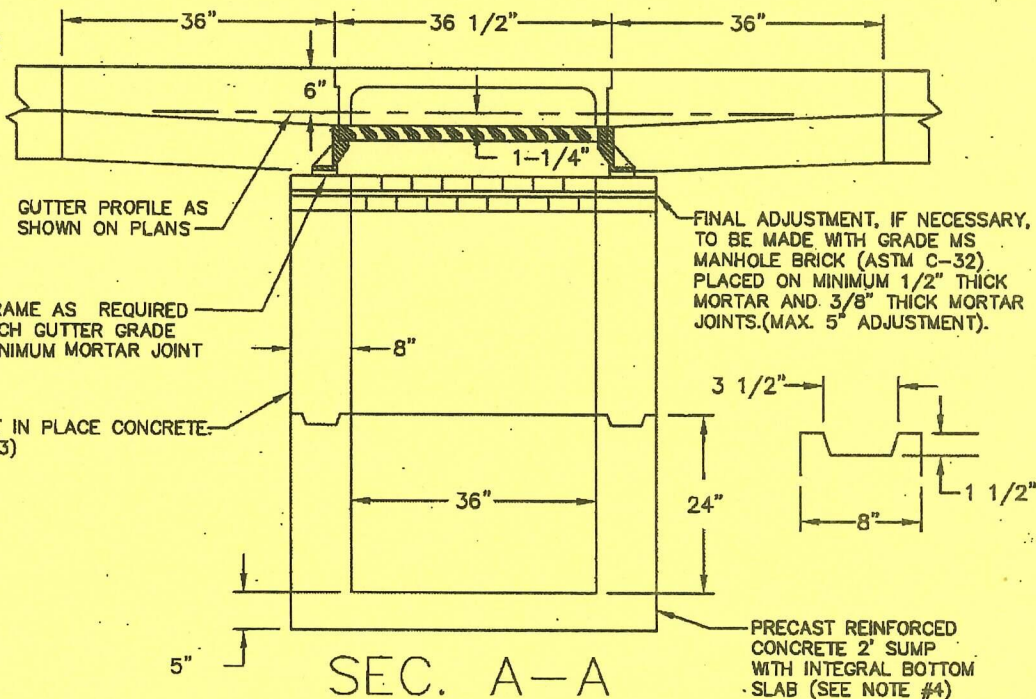
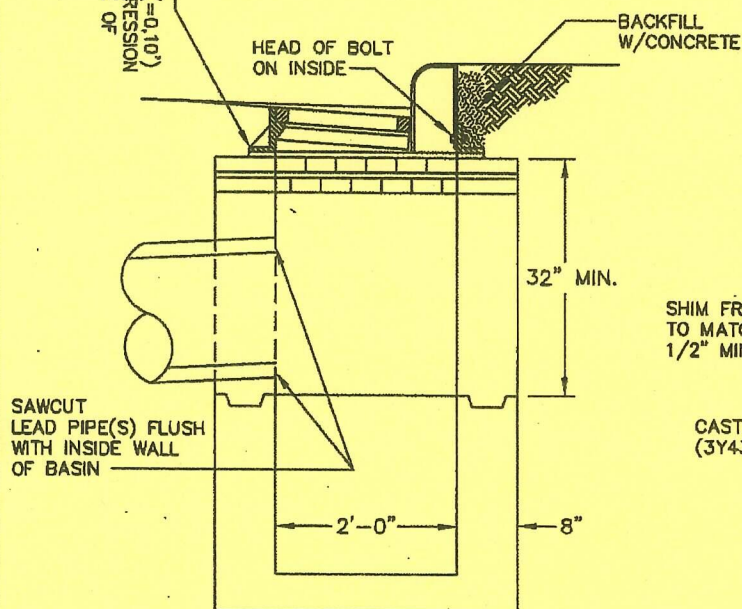
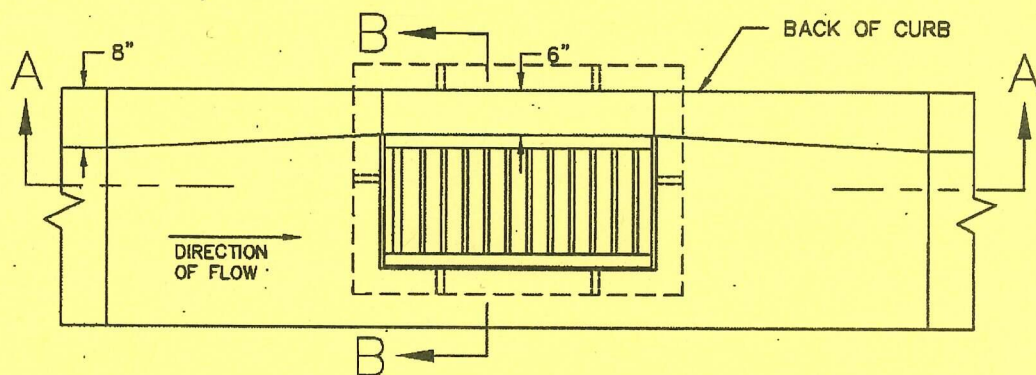
SHIM FRAME TO
PROVIDE 1 1/4" (=0.10")
GUTTER LINE DEPRESSION
AND MATCH EDGE OF
GUTTER

SAWCUT
LEAD PIPE(S) FLUSH
WITH INSIDE WALL
OF BASIN

SEC. B-B

NOTES:

1. TAPER & FLOW LINE DEPRESSION SHOWN APPLY TO B-624 CURB. NO TAPER IS REQUIRED WHEN USED WITH INTEGRAL CURB & WALK (STD PLATE 1300D)
2. FRAME CASTING SHALL MATCH INSIDE OPENING OF BASIN. NO OFFSET WILL BE ALLOWED.
3. FRAME, GRATE AND CURB BOX AS PER STD. PL. 2211 OR AS NOTED IN THE PLANS.
4. AT THE CONTRACTORS OPTION, THE BOTTOM SLAB AND/OR SUMP MAY ALSO BE CAST IN PLACE CONCRETE.
5. ALL CAST IN PLACE CONCRETE SHALL BE MN/DOT MIX 3Y43 WITH 15% TYPE C FLYASH SUBSTITUTED FOR CEMENT AS PER MN/DOT 2461 AND SHALL BE RODDED IN PLACE OR MECHANICALLY VIBRATED TO ASSURE DENSITY AND ELIMINATE HONEYCOMBING.
6. SEE STANDARD PLATE 3108 FOR USE WITH MOUNTABLE CURB.

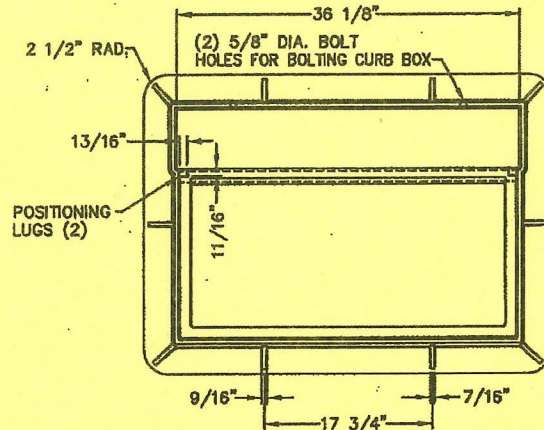
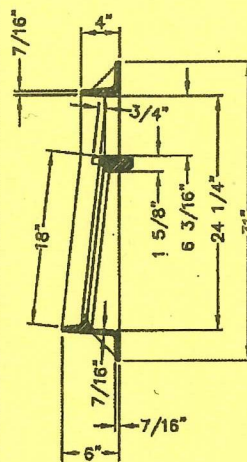


NOTES:

1. CASTING SHALL BE CONSTRUCTED OF UNPAINTED GRAY IRON MEETING ASTM A-48, CLASS 35B OR BETTER AND SHALL CONFORM TO AASHTO DESIGNATION M306-89 AND MnDOT SPECIFICATION 3321.
2. EACH CASTING SHALL BEAR AN IDENTIFICATION MARK, RECESSED FLUSH, INDICATING THE SOURCE OF MANUFACTURE, WHICH MARK SHALL EITHER BE A SYMBOL NOT OVER 1 1/2 INCHES IN GREATEST DIMENSION OR IN LETTER FORM NO GREATER THAN 3/4 INCH IN HEIGHT AND 2 INCHES IN LENGTH. LOCATION OF IDENTIFICATION MARKS BY THE ENGINEER.
3. GRATE SHALL BE AS DETAILED UNLESS NOTED OTHERWISE ON THE PLANS.
4. SEE STANDARD PLATE NO. 2015G FOR CATCH BASIN STRUCTURE DETAILS.

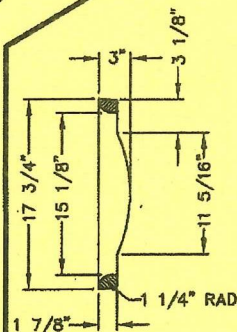
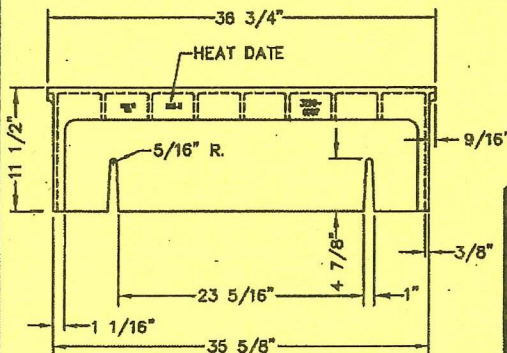
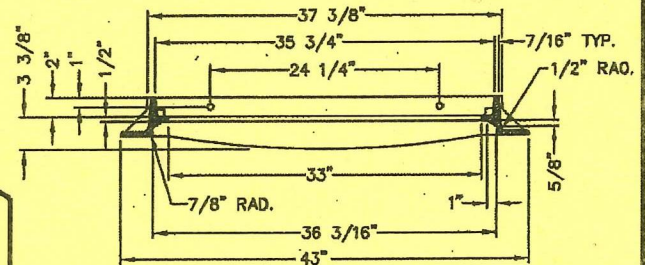
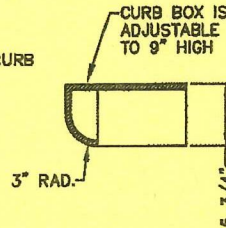
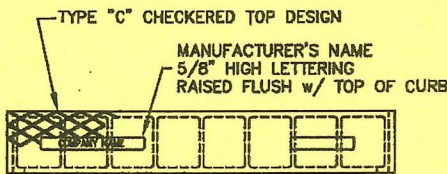
FRAME DETAIL

APPROXIMATE WEIGHT: 207#



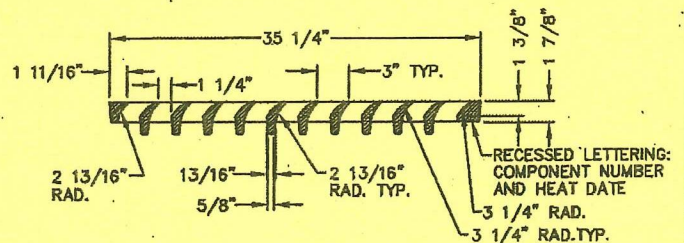
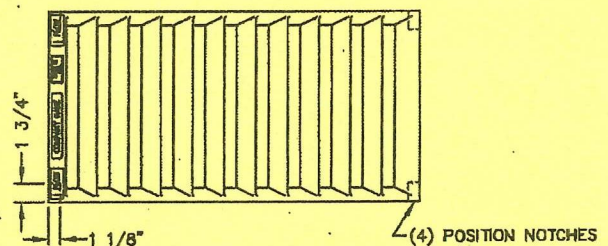
CURB BOX DETAIL

APPROXIMATE WEIGHT: 100#



GRATE DETAIL

FREE OPEN AREA = 347 SQUARE INCHES
APPROXIMATE WEIGHT: 132#



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Joseph J. Mueller
JOSEPH J. MUELLER
Date 5-4-10 Lic. No. 13942

APPROVED
[Signature]
CITY ENGINEER

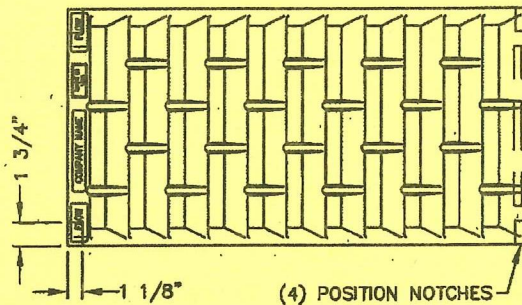
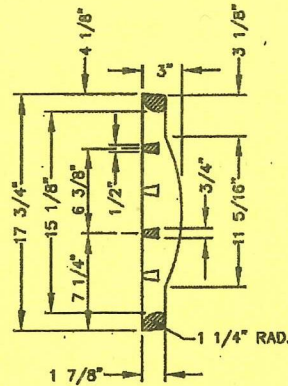
CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
TYPE 7A CATCH BASIN
CASTING DETAILS

Date of Revision
MAY 20010

Standard Plate No.
2211

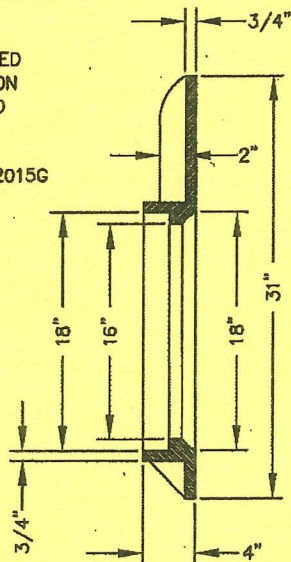
GRATE DETAIL

FREE OPEN AREA = 308 SQUARE INCHES
APPROXIMATE WEIGHT: 146#



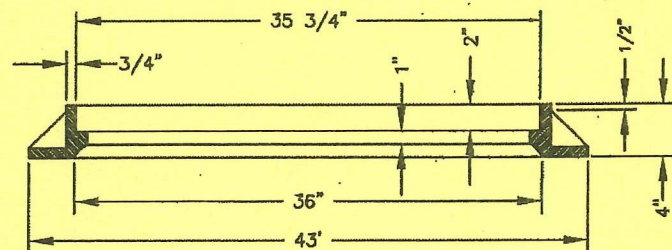
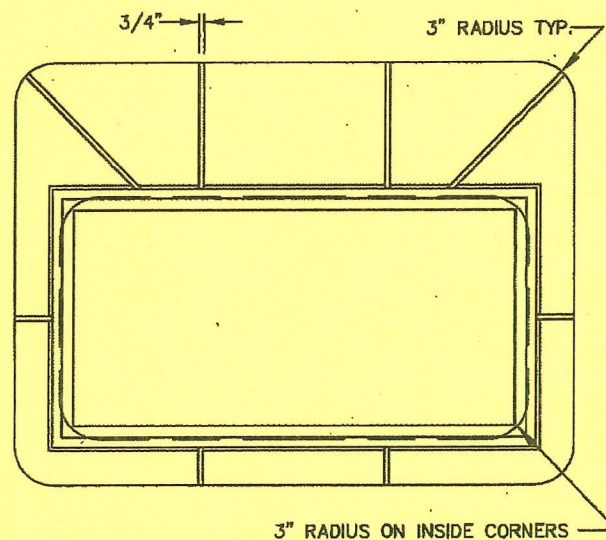
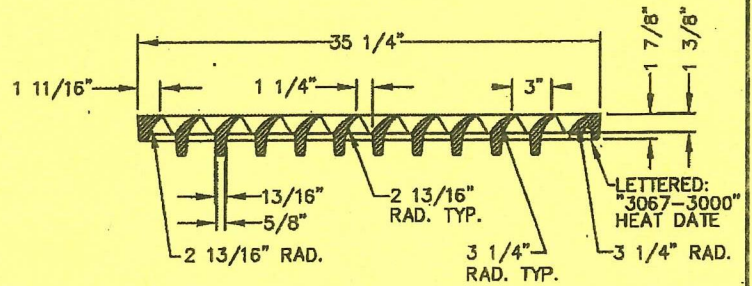
NOTES:

1. CASTING SHALL BE CONSTRUCTED OF UNPAINTED GRAY IRON MEETING ASTM A-48, CLASS 35B OR BETTER AND SHALL CONFORM TO AASHTO DESIGNATION M306-89 AND MnDOT SPECIFICATION 3321.
2. EACH CASTING SHALL BEAR AN IDENTIFICATION MARK, RECESSED FLUSH, INDICATING THE SOURCE OF MANUFACTURE, WHICH MARK SHALL EITHER BE A SYMBOL NOT OVER 1 1/2 INCHES IN GREATEST DIMENSION OR IN LETTER FORM NO GREATER THAN 3/4 INCH IN HEIGHT AND 2 INCHES IN LENGTH. LOCATION OF IDENTIFICATION MARKS BY THE ENGINEER.
3. FRAME TO BE USED AT DRIVEWAY LOCATIONS OR WHERE DESIGNATED IN THE PLANS.
4. GRATE SHALL BE AS DETAILED UNLESS NOTED OTHERWISE ON THE PLANS AND DETERMINED TO BE BICYCLE SAFE.
5. SEE STANDARD PLATE NO. 2015G FOR CATCH BASIN STRUCTURE DETAILS.



FRAME DETAIL

APPROXIMATE WEIGHT: 207#



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Date 5-4-10 Lic. No. 13942

APPROVED
John P. Hyl
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
MODIFIED TYPE 7A CATCH
BASIN CASTING DETAILS

Date of
Revision
MAY
2010

Standard
Plate
No.
2212

DETAIL WATERTIGHT CONNECTIONS

INTEGRALLY CAST
SLEEVE SEAL
(LOCK JOINT OR EQUAL)

EXTERNAL STAINLESS STEEL
TAKE UP CLAMPS

CORED SLEEVE SEAL
(KOR-N-SEAL OR EQUAL)

INTERNAL EXPANDING
LOCKING BAND (NON-
MAGNETIC STAINLESS
STEEL)

INTEGRALLY CAST
GASKET
(A-LOCK OR EQUAL)

SEE DETAIL OF REQUIRED
WATERTIGHT CONNECTIONS

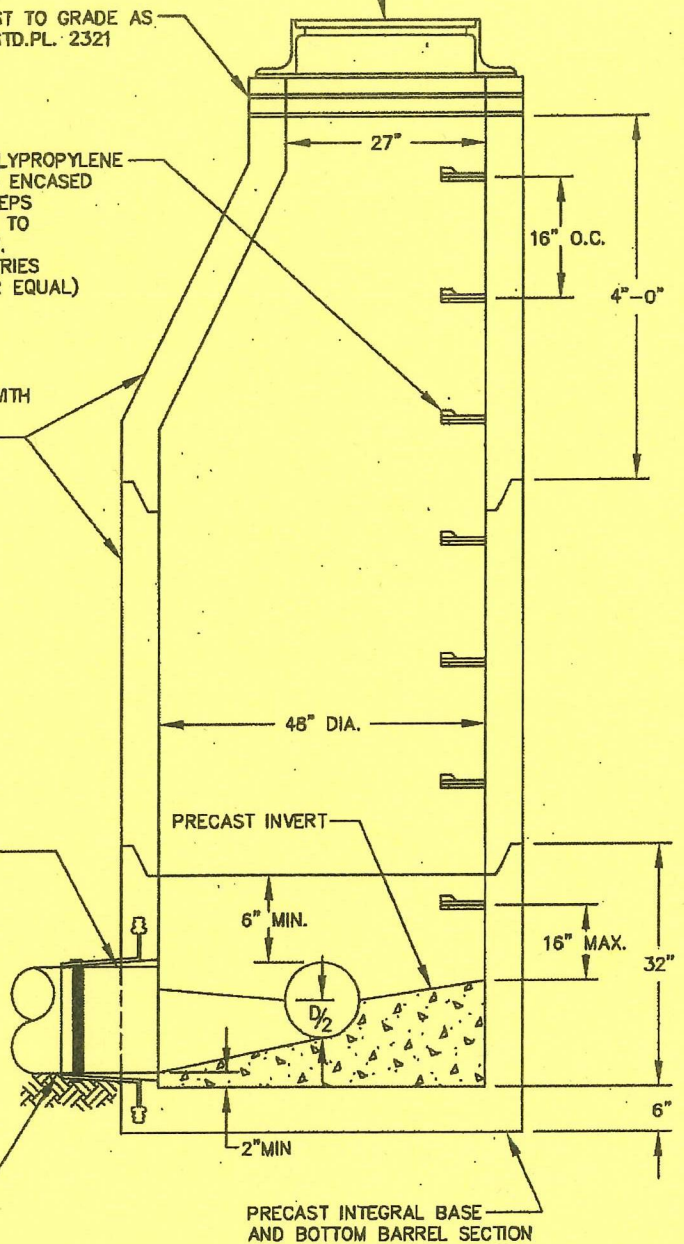
PIPE SHALL REST ON
UNDISTURBED EARTH
AND NOT BEAR
DIRECTLY ON MANHOLE

ADJUST TO GRADE AS
PER STD.PL. 2321

12" WIDE POLYPROPYLENE
(ASTM 2146) ENCASED
MANHOLE STEPS
CONFORMING TO
ASTM C-487.
(M.A. INDUSTRIES
PS-I-PF, OR EQUAL)

ECCENTRIC CONE WITH
PRECAST RISER
SECTIONS AS REQ.

CASTINGS A & B
(UNLESS NOTED OTHERWISE)
STD. PLATES 2201E & 2202D



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Date 5-4-10 Lic. No. 13942

NOTES:

1. FOR CONSTRUCTION OF NEW
SANITARY SEWER UP TO 18" I.D.
2. PRECAST RISER SECTIONS TO
MEET ASTM C-478
3. JOINTS BETWEEN PRECAST SECTIONS
SHALL USE O-RING RUBBER GASKET
CONFORMING TO ASTM C-443
4. WATERTIGHT PIPE CONNECTIONS
SHALL MEET ASTM C-923 &
C-443 AND ALLOW FOR
10" DEFLECTION IN ANY DIRECTION.

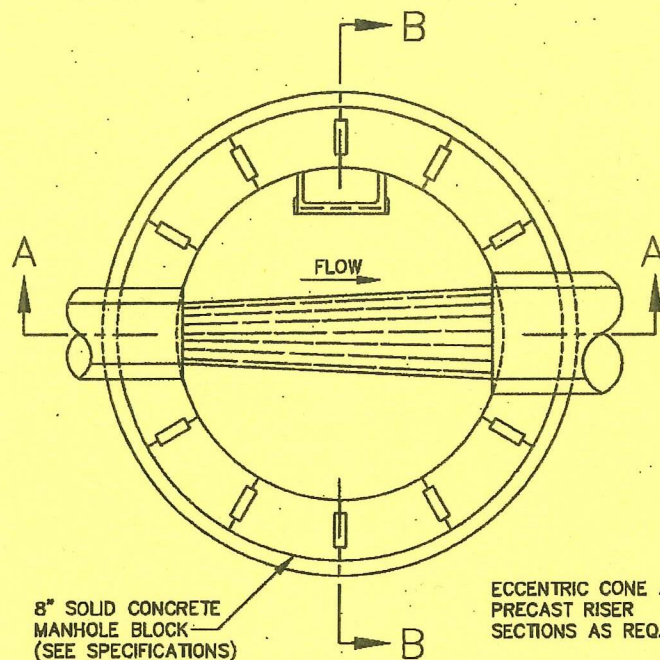
APPROVED *7/19/20*
J.P. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

MANHOLE, DESIGN TYPE I

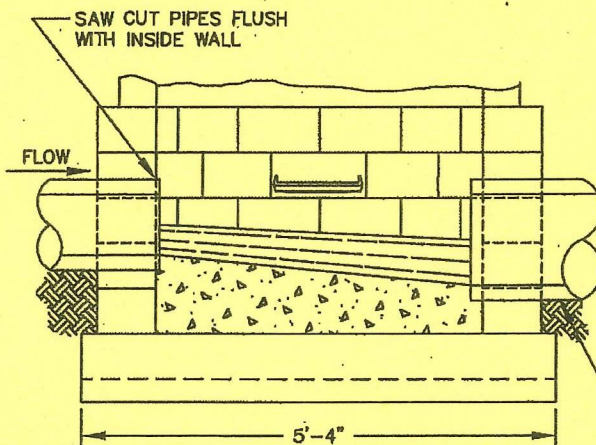
Date of
Revision
MAY
2010

Standard
Plate
No.
2101D

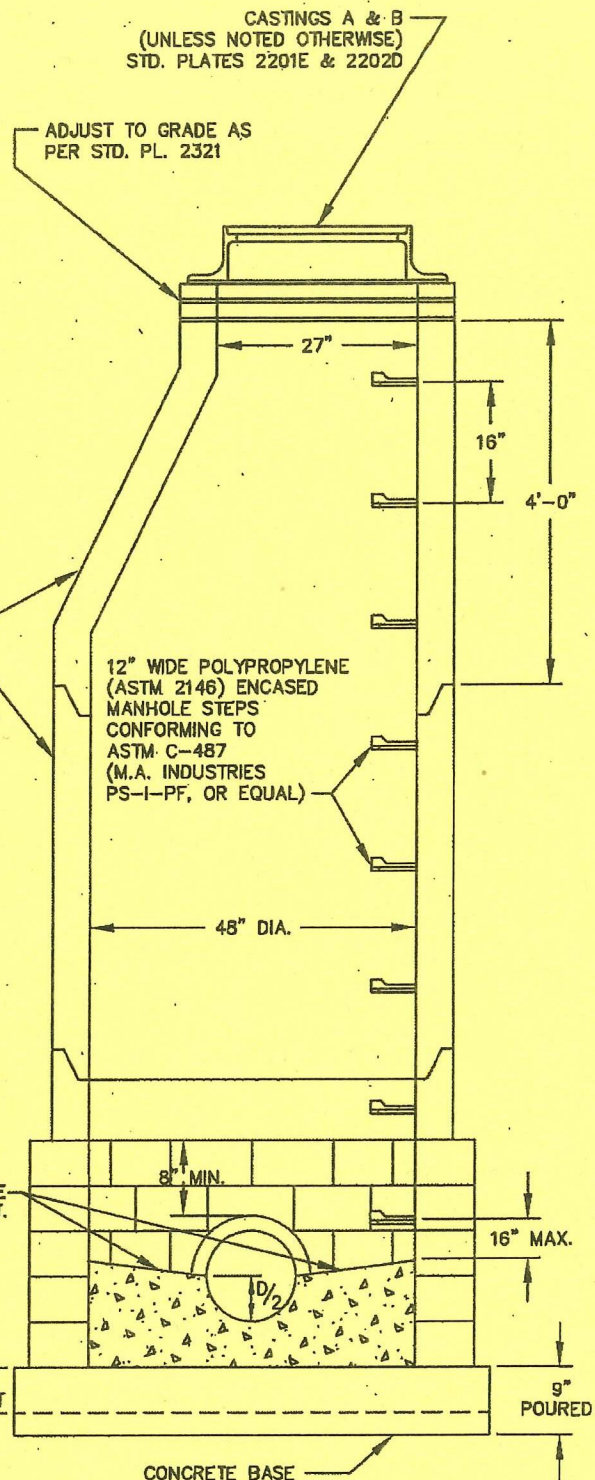


NOTES:

1. THIS MANHOLE FOR USE WITH 21" I.D. AND SMALLER PIPE
2. PRECAST RISER SECTION TO MEET ASTM C-478
3. JOINTS BETWEEN PRECAST SECTIONS SHALL USE O-RING RUBBER GASKET CONFORMING TO ASTM C-443
4. BASE SHALL BE PRECAST WHENEVER POSSIBLE. CAST IN PLACE BASE MAY BE USED IF NECESSARY. CAST IN PLACE BASE AND/OR INVERT SHALL BE MN/DOT 3Y43 CONCRETE.



SECTION A-A



SECTION B-B

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JOSEPH J. MUELLER
Date 5-4-10 Lic. No. 13942

PIPE SHALL REST ON UNDISTURBED EARTH AND NOT BEAR DIRECTLY ON SLAB

APPROVED

J. M. M.
CITY ENGINEER

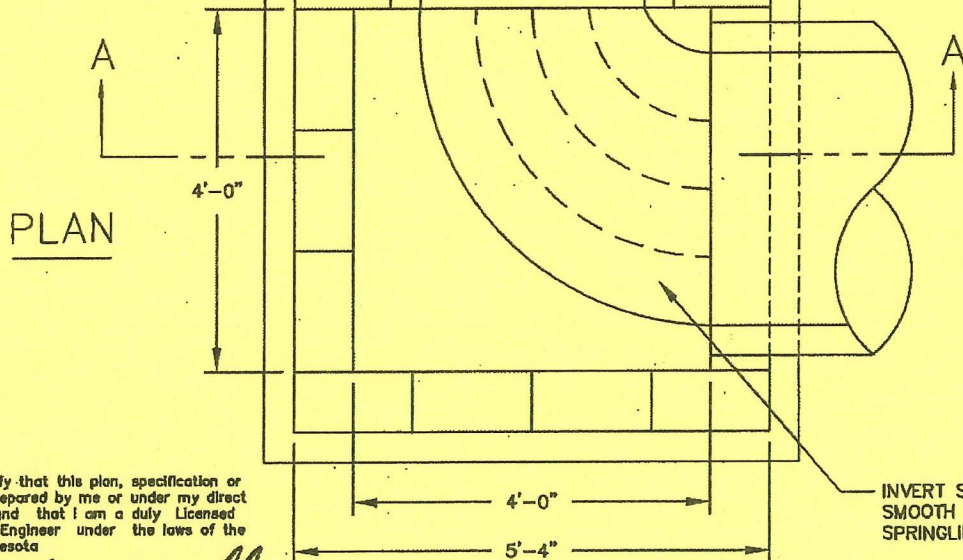
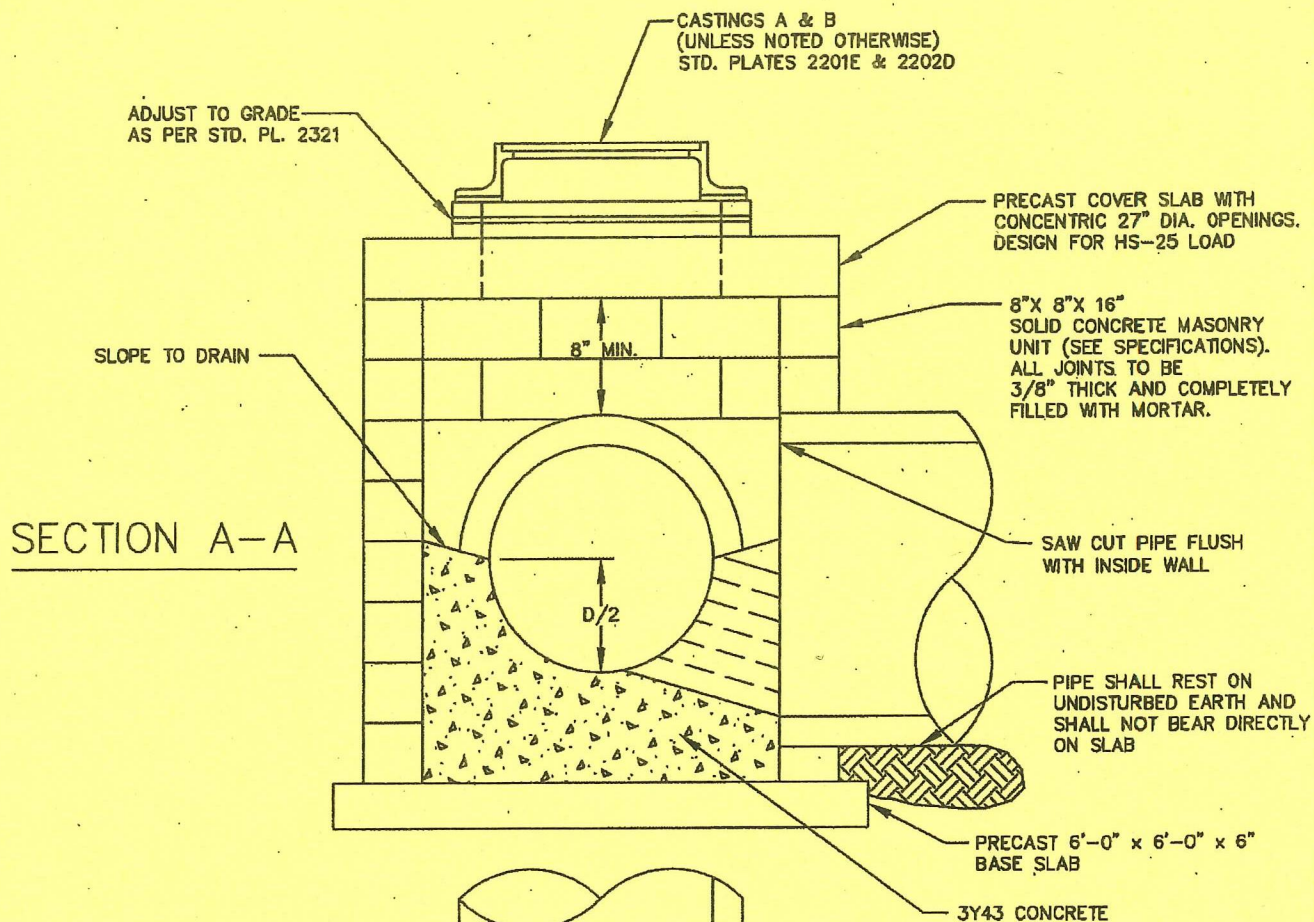
CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

MANHOLE, DESIGN TYPE II

Date of Revision
MAY 2010

Standard Plate No.
2102D

2103E



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Joseph J. Mueller
JOSEPH J. MUELLER

Date 5-4-10 Lic. No. 13942

NOTE:
FOR USE ON STORM SEWER 36" I.D. OR LESS
WITH A MAXIMUM DEPTH TO PIPE INVERT OF 9'

APPROVED

John P. Mue
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

MANHOLE, TYPE IV

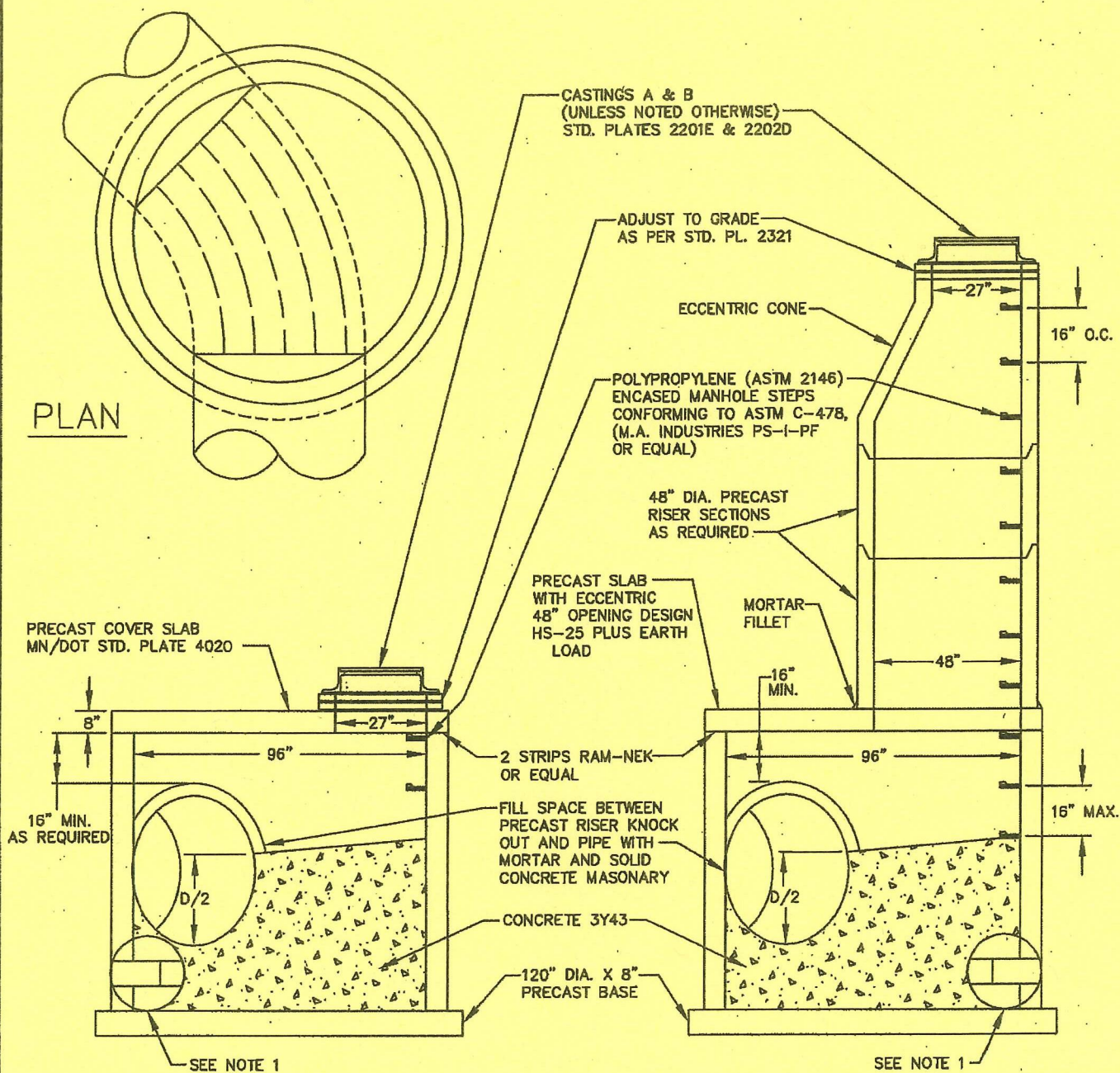
Date of
Revision

MAY
2010

Standard
Plate
No.

2104E

PLAN



TYPE V

FOR USE WHEN MANHOLE DEPTH IS 12' OR LESS

TYPE V-S

FOR USE WHEN MANHOLE DEPTH EXCEEDS 12 FEET

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Joseph J. Mueller
JOSEPH J. MUELLER

Date 5-4-10 Lic. No. 13942

NOTES:

1. THIS PORTION OF MANHOLE MAY BE CONSTRUCTED OF 8" SOLID CONCRETE MANHOLE BLOCK (SEE SPECIFICATIONS). ALL JOINTS TO BE COMPLETELY FILLED WITH MORTAR 3/8" THICK.
2. PRECAST RISER TO MEET ASTM C-478
3. TONGUE AND GROVE PRECAST RISER SECTION JOINTS TO USE O-RING RUBBER GASKET CONFORMING TO ASTM C-443
4. SAW CUT PIPES FLUSH WITH INTERIOR WALL OF MANHOLE

APPROVED

John J. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

MANHOLE, TYPE V & V-S

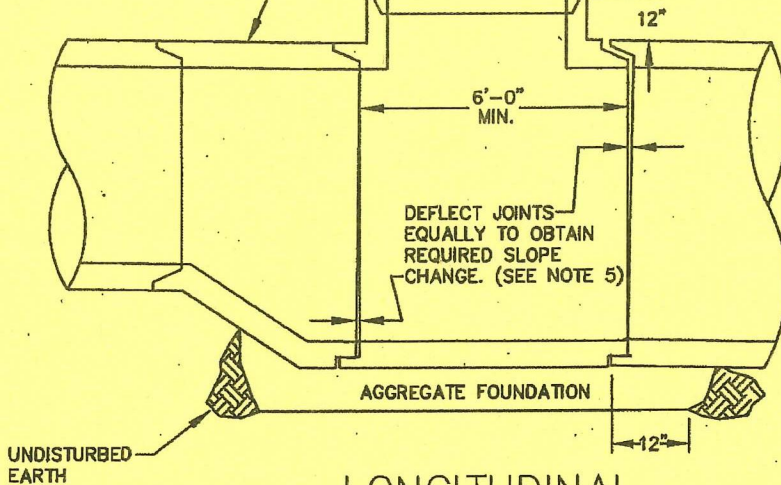
Date of
Revision

MAY
2010

Standard
Plate
No.

2105E

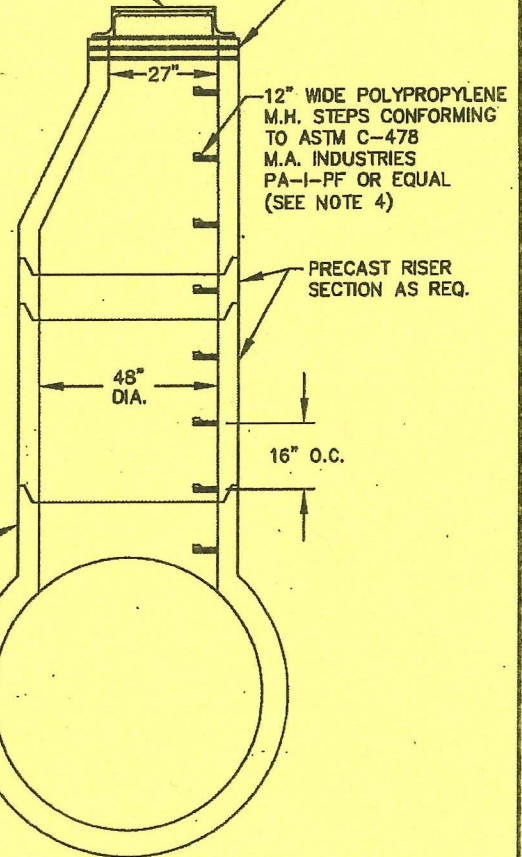
ECCENTRIC INCREASER PIPE
(IF REQUIRED)
MN/DOT STD. PLATE 3002



LONGITUDINAL
SECTION

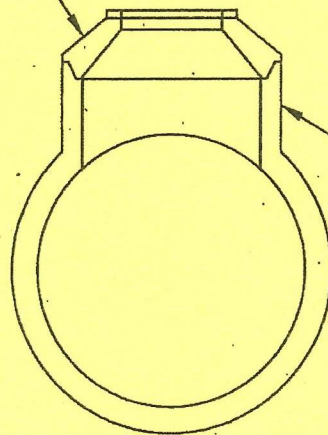
ADJUST TO GRADE
AS PER STD. PL. 2321

CASTINGS A & B
(UNLESS NOTED OTHERWISE)
STD. PLATES 2201E & 2202D



TRANSVERSE
SECTIONS

SHORT CONE
MN/DOT STD. PLATE 4010



NOTES:

1. THIS MANHOLE FOR USE ON STRAIGHT RUNS OF MAINLINE SEWER. 42" AND LARGER SLOPE CHANGE CAN BE ACCOMPLISHED BY DEFLECTING JOINTS AS NOTED HEREIN. DIAMETER CHANGE CAN BE ACCOMPLISHED WITH ASSOCIATED ECCENTRIC INCREASER.
2. PRECAST RISER SECTIONS TO MEET ASTM C-478
3. JOINTS SHALL USE O-RING RUBBER GASKET TO CONFORMING TO ASTM C-443
4. MANHOLE STEPS NOT REQUIRED WHERE DEPTH OF COVER IS LESS THAN 6'.
5. MAXIMUM JOINT DEFLECTION FROM "HOME" IS 3/4" FOR 42" I.D. AND 1" FOR 48" I.D. OR GREATER CORRESPONDING MAXIMUM SLOPE CHANGE PER JOINT IS:

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Joseph M. Mueller
JOSEPH M. MUELLER
Date 5-4-10 Lic. No. 13942

PIPE I.D.	42"	48"	54"	60"	66"	72"	84"	90"	96"
MAX. SLOPE CHANGE / JOINT	1.78	2.08	1.85	1.66	1.51	1.38	1.19	1.11	1.04 %

APPROVED

Joseph M. Mueller
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

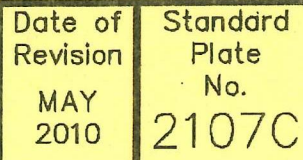
MANHOLE, TYPE VI

Date of
Revision

MAY
2010

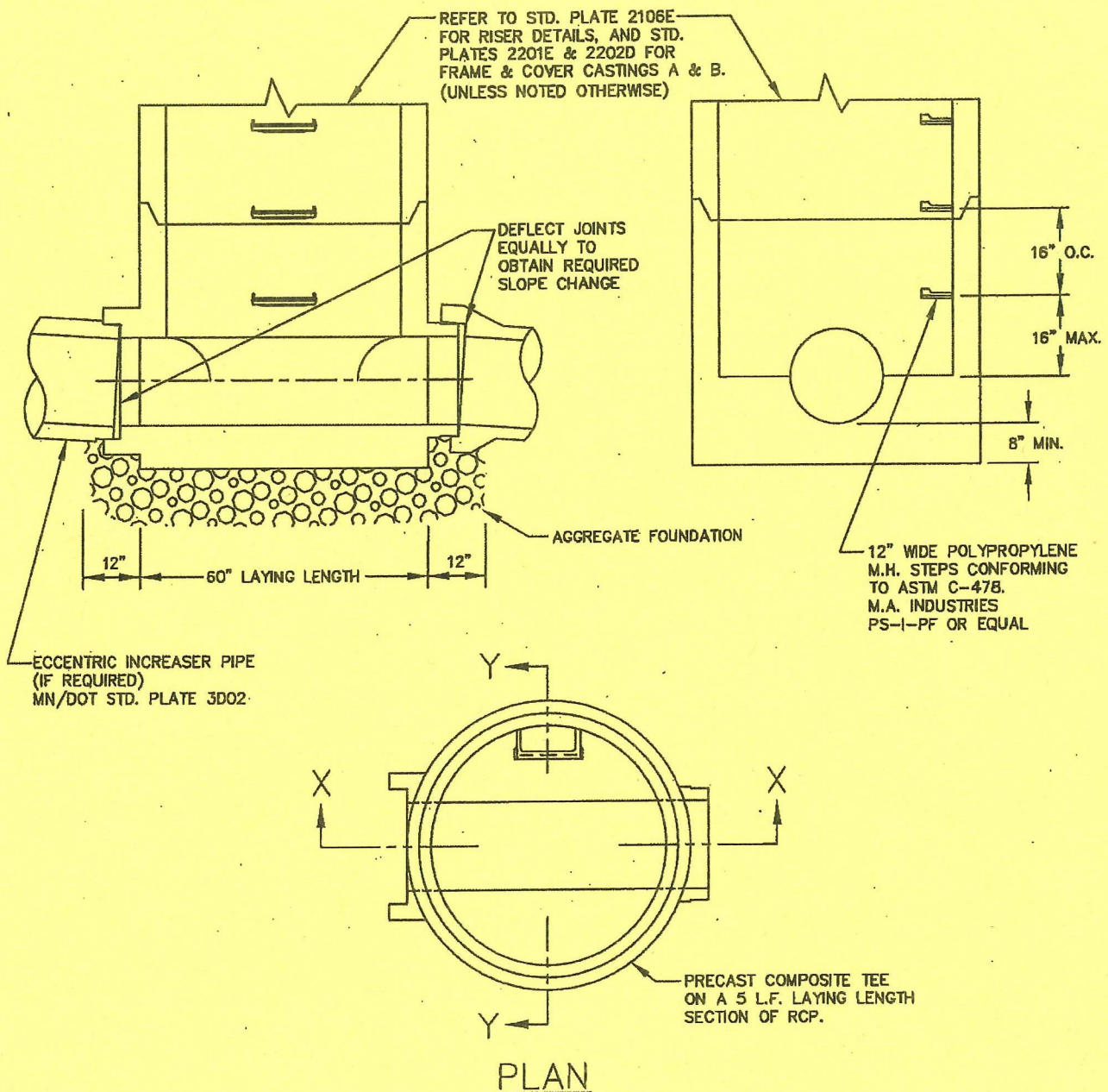
Standard
Plate
No.

2106E



SECTION X-X

SECTION Y-Y



NOTES:

1. THIS MANHOLE FOR USE ON STRAIGHT RUNS OF MAINLINE SEWER 12\"/> I.D. SLOPE CHANGE CAN BE ACCOMPLISHED BY DEFLECTING JOINTS AS NOTED HEREIN. DIAMETER CHANGE CAN BE MADE WITH ASSOCIATED ECCENTRIC EXPANSION.
2. PRECAST RISER SECTIONS TO MEET ASTM C-478
3. JOINTS SHALL USE O-RING RUBBER GASKETS CONFORMING TO ASTM C-443
4. MAXIMUM JOINT DEFLECTION FROM "HOME" IS 3/4\"/>. CORRESPONDING MAXIMUM SLOPE CHANGE PER JOINT IS:

PIPE I.D.	12"	15"	18"	21"	24"	27"	30"	36"
SLOPE CHANGE/JOINT	6.2	5.0	4.1	3.6	3.1	2.7	2.5	2.0 %

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Joseph J. Mueller
JOSEPH J. MUELLER
Date 5-4-10 Lic. No. 13942

APPROVED

John H. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

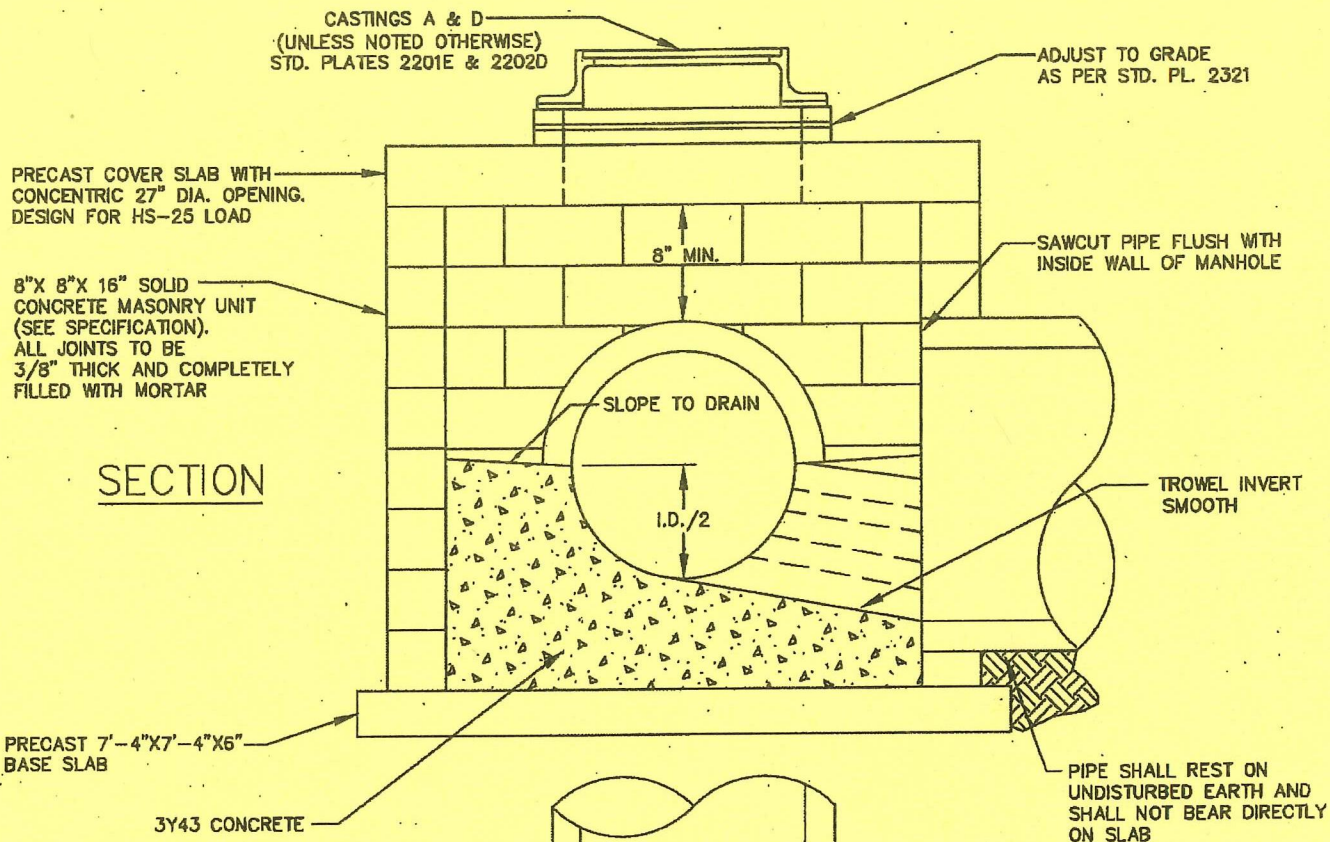
MANHOLE, TYPE VI-CT

Date of
Revision

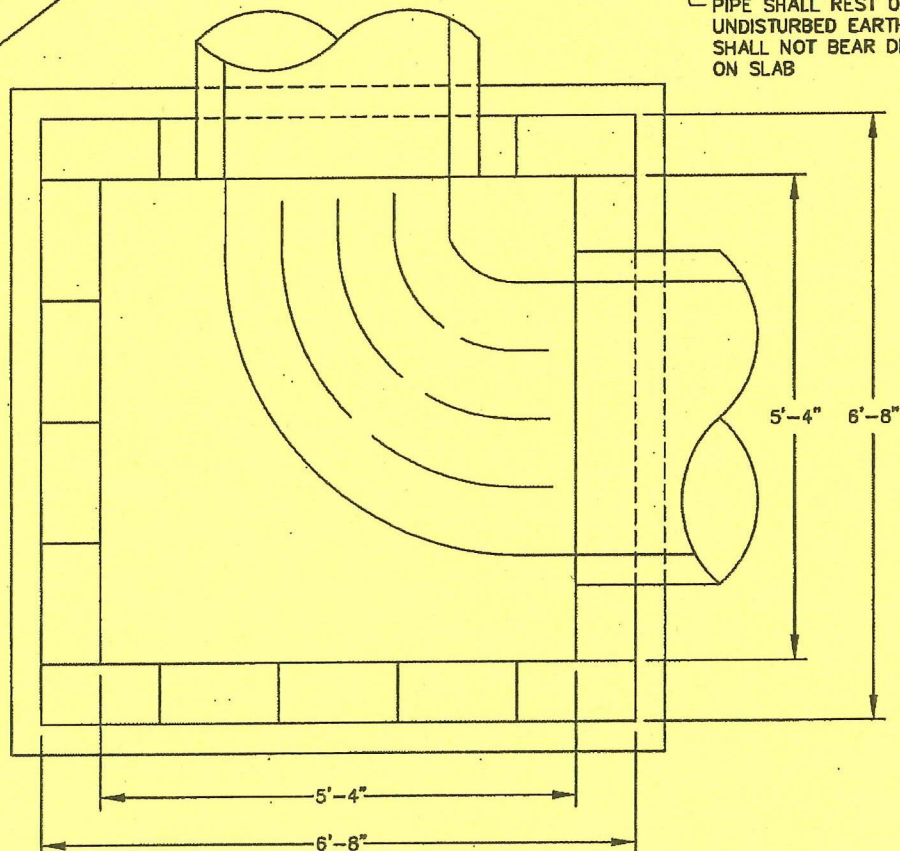
MAY
2010

Standard
Plate
No.

2109C



PLAN



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Joseph J. Mueller
JOSEPH J. MUELLER
Date 5-4-10 Lic. No. 13942

NOTE:
THIS MANHOLE FOR USE ON SEWER
MAINS 42" & 48" IN DIA. WHERE DEPTH
TO PIPE INVERT IS 9' OR LESS.

APPROVED

J. P. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

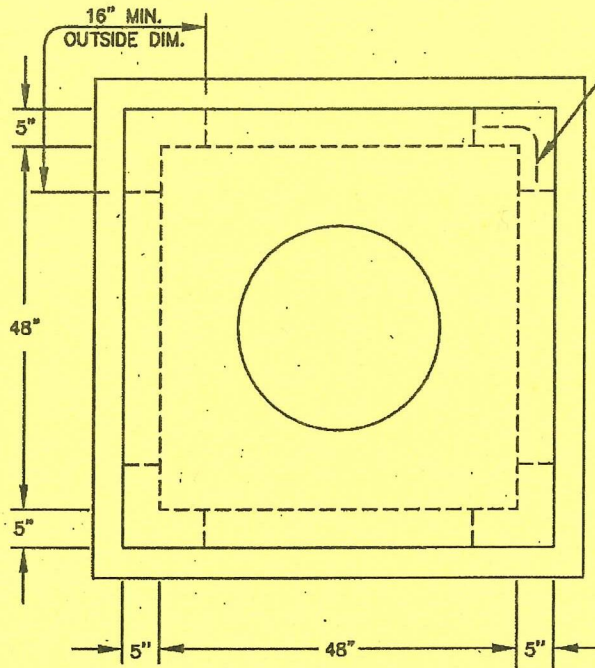
MANHOLE, TYPE IV-A

Date of
Revision

MAY
2010

Standard
Plate
No.

2110C



REINFORCING EXTENDING TO
1" MIN. CLR. AT CORNERS
OR CONTINUOUS REINF.
AROUND CORNERS

REINFORCING

TWO LAYERS
INSIDE AREA = $3/16$ SQ.IN/FT
OUTSIDE AREA = $3/16$ SQ.IN/FT

1 IN. MINIMUM CLEARANCE

CIRCUMFERENTIAL REINFORCING
SPACING NOT TO EXCEED 2 IN.

LONGITUDINAL REINFORCING
SPACING NOT TO EXCEED 8 IN.

CASTINGS A & D
(UNLESS NOTED OTHERWISE)
STD. PLATES 2201E & 2202D

ADJUST TO GRADE
AS PER STD. PL. 2321

56" X 56" X 8"
PRECAST COVER WITH CONCENTRIC
27" DIA.

9" MIN.

CUTOUTS AS REQUIRED

66" X 66" X 8"
PRECAST BASE SLAB
REINF. = #4 @ 12" O.C. E.W.
OR CONTRACTORS OPTIONAL
CAST-IN-PLACE BASE SLAB

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report was prepared by me or under my direct
supervision and that I am a duly Licensed
Professional Engineer under the laws of the
State of Minnesota

Joseph J. Mueller
JOSEPH J. MUELLER

Date 5-4-10 Lic. No. 13942

NOTE:

FOR USE ON STORM SEWER 36" I.D. OR LESS
WITH A MAXIMUM DEPTH TO PIPE INVERT OF 9 FT.

APPROVED

John H. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

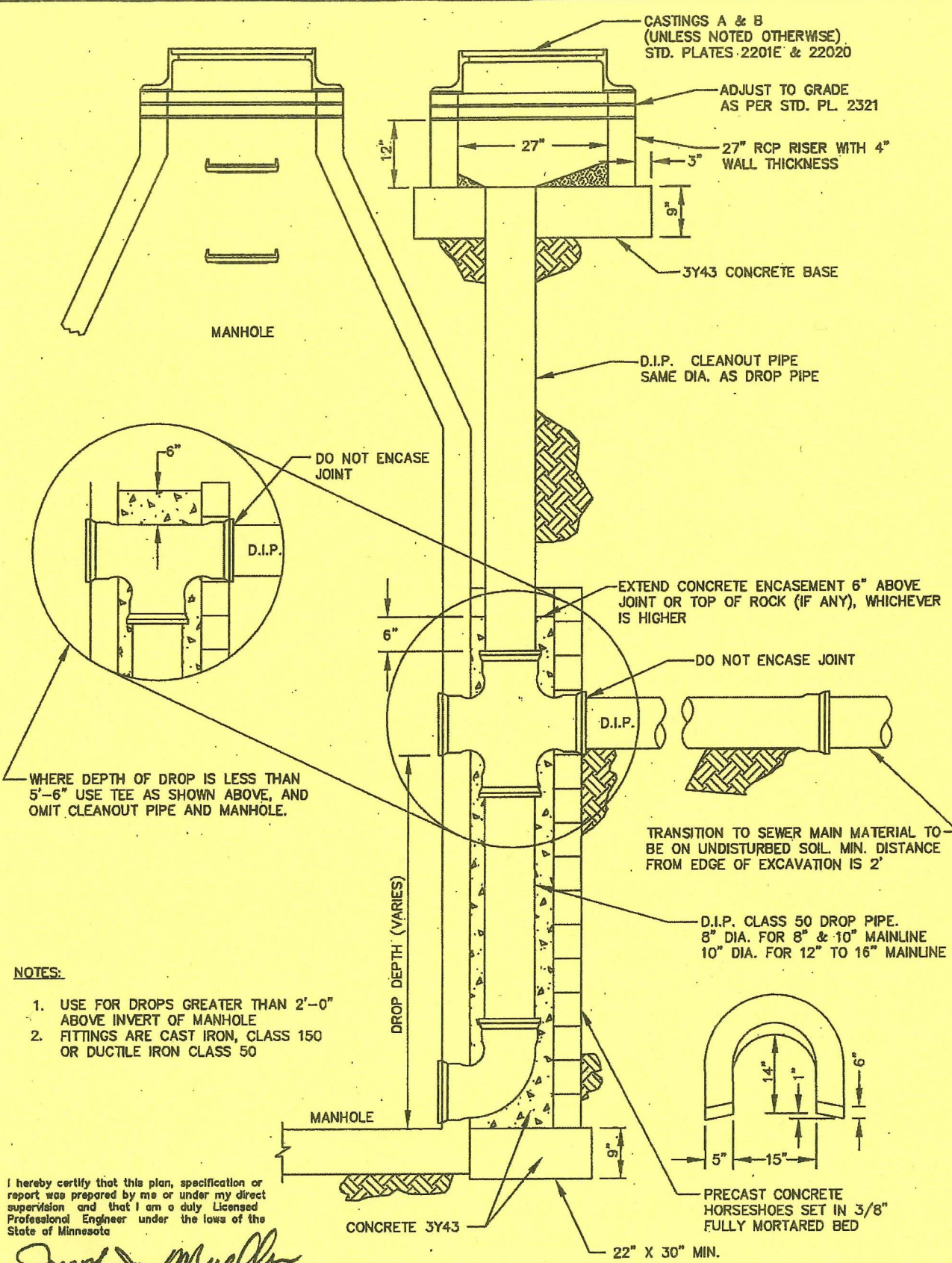
MANHOLE, TYPE IV PRECAST

Date of
Revision

MAY
2010

Standard
Plate
No.

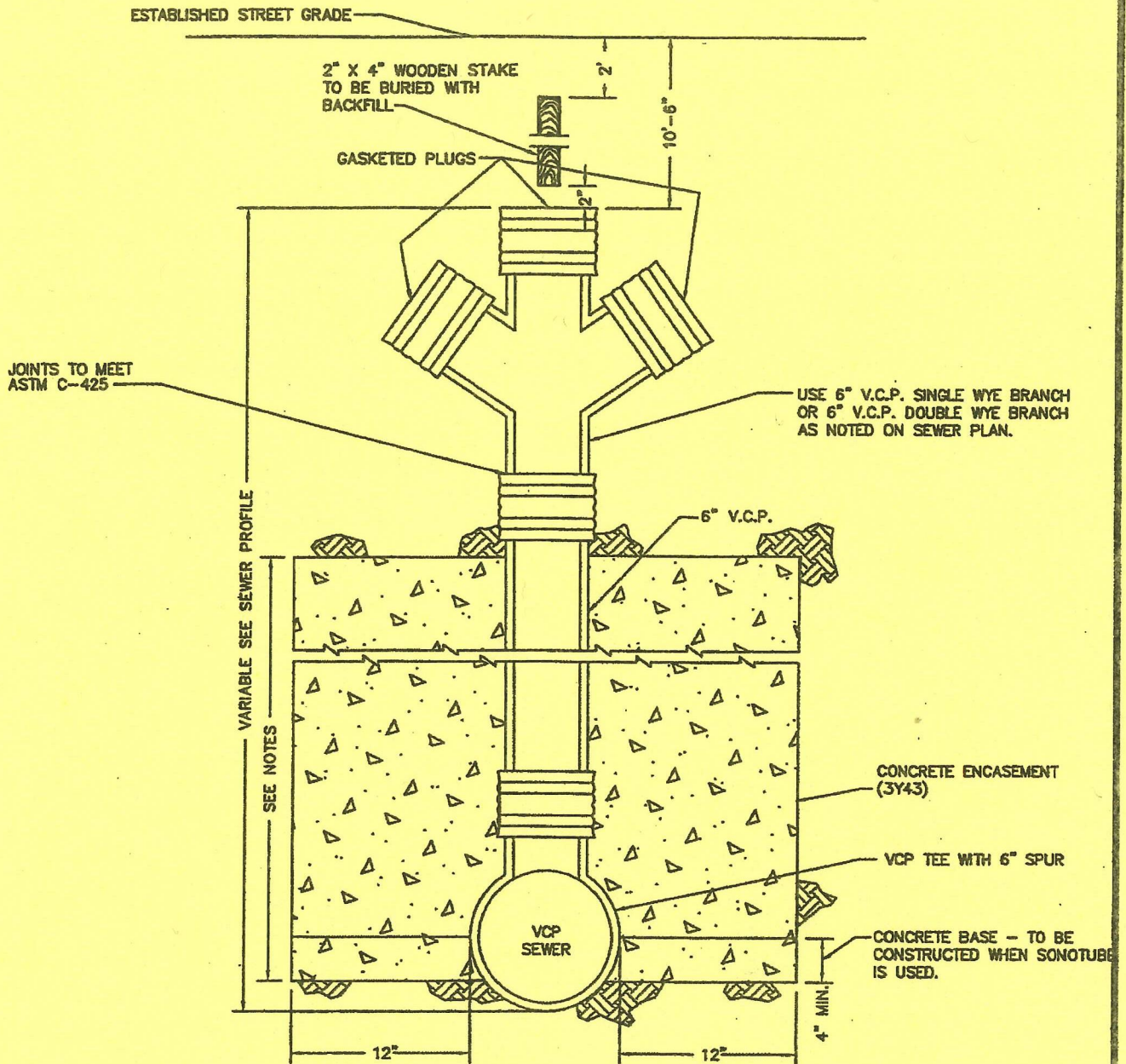
2111B



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Joseph J. Mueller
JOSEPH J. MUELLER
Date 5-4-10 Lic. No. 13942

APPROVED <i>Julius H. [Signature]</i> CITY ENGINEER	CITY OF ST. PAUL DEPARTMENT OF PUBLIC WORKS OUTSIDE DROP	Date of Revision MAY 2010	Standard Plate No. 2301D
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NOTES:

1. CONCRETE ENCASEMENT TO EXTEND 4' ABOVE INVERT OR UP TO SPURS ON WYE BRANCH, WHICHEVER IS LESS
2. SONOTUBE OR APPROVED EQUAL MAY BE USED AS FORM FOR CONCRETE ENCASEMENT.
3. CONCRETE ENCASEMENT SHALL EXTEND AT LEAST 1' UPSTREAM & 1' DOWNSTREAM FROM THE OUTSIDE OF THE VERTICAL STANDPIPE.

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Joseph E. Mueller
JOSEPH E. MUELLER
Date 9-2-02 Lic. No. 13942

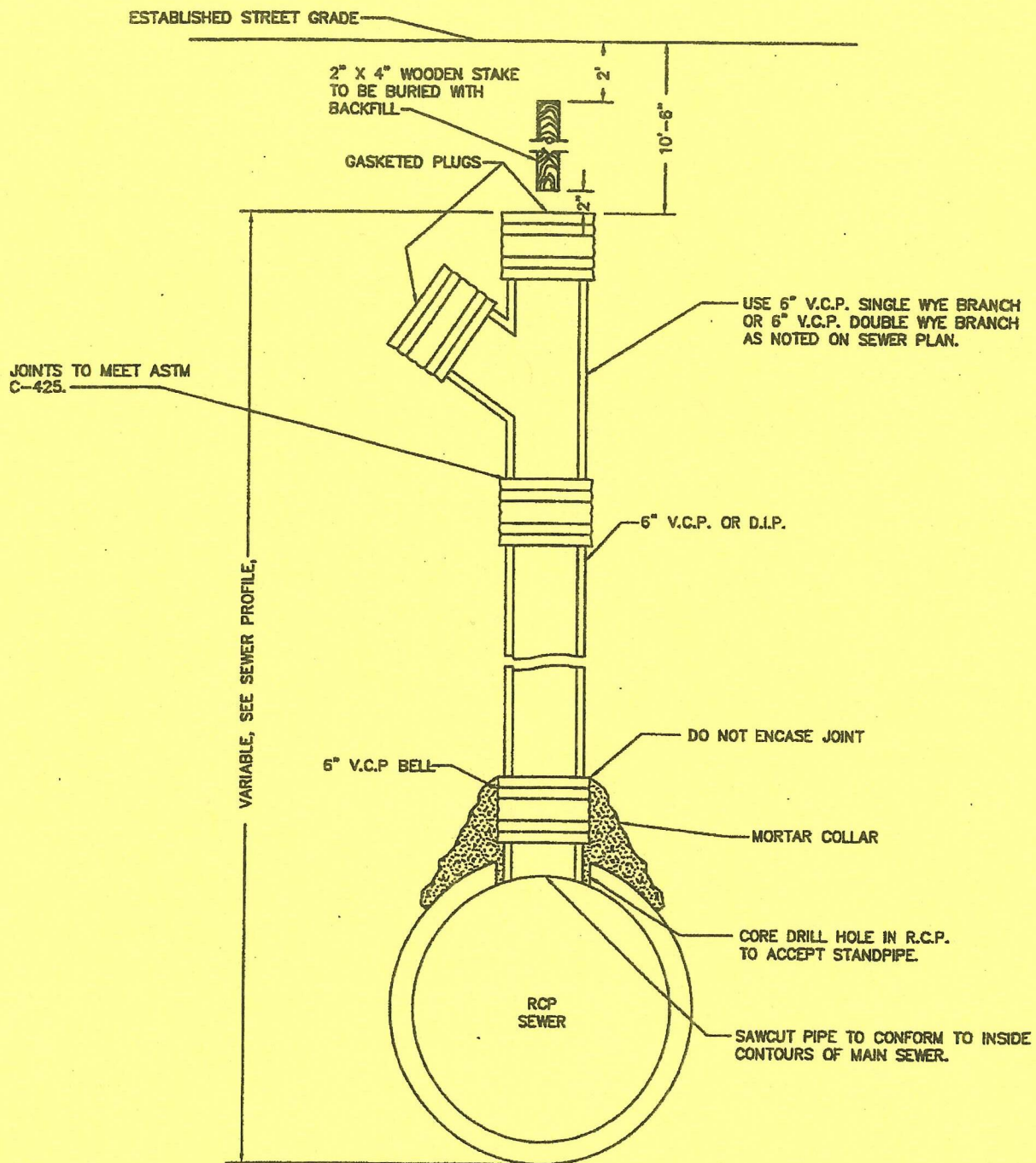
APPROVED

[Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
STANDPIPE
FOR V.C.P. SEWER

Date of
Revision
JULY
2002

Standard
Plate
No.
2303B



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Joseph J. Mueller
JOSEPH J. MUELLER

Date 9-2-02 Lic. No. 13942

APPROVED _____

Al J. [Signature]

CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

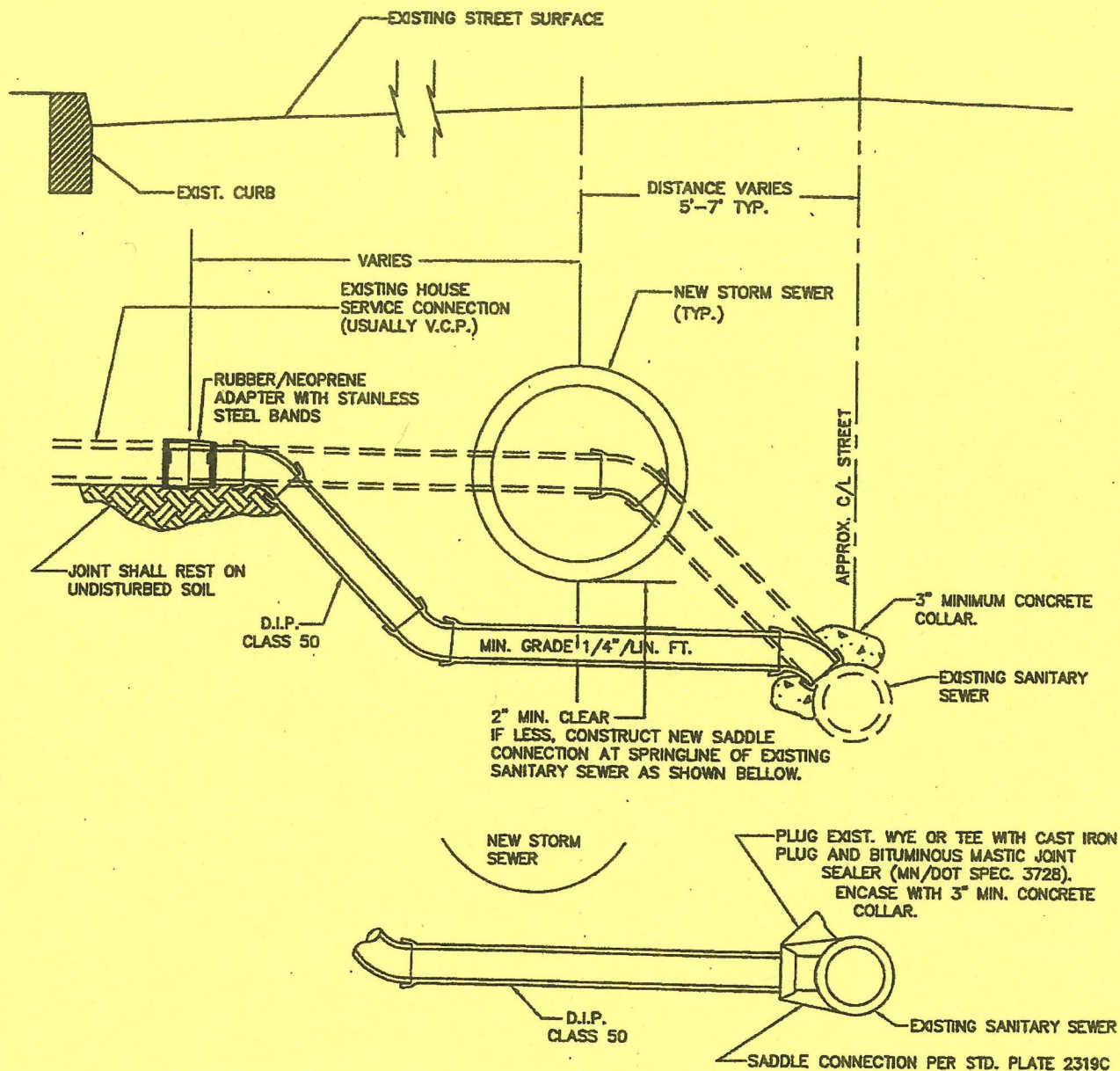
STANDPIPE FOR R.C.P. SEWER

Date of
Revision

JULY
2002

Standard
Plate
No.

2304B



NOTES:

1. THIS DETAIL APPLIES TO HOUSE SERVICE CONNECTION CHANGES WHERE EXISTING MAIN SEWER REMAINS IN SERVICE.
2. FOR COUPLING D.I.P. TO EXIST. V.C.P. WYE, THE JOINT SHALL BE PACKED WITH BITUMINOUS MASTIC JOINT SEALER (RAM-NEK, KENT-SEAL, OR EQUAL) AND ENCASED IN CONCRETE.
3. WHERE C.I.P. REPLACEMENT SERVICE IS JOINTED WITH THE EXISTING SERVICE, REMOVE EXISTING PIPE TO A SPIGOT END, OR NEATLY TRIM AND SQUARE OFF END TO THE ENGINEER'S APPROVAL.
4. RUBBER/NEOPRENE ADAPTER WITH STAINLESS STEEL TIGHTENING BANDS, MEETING THE LATEST REQUIREMENTS OF ASTM C594, TYPE A, SHALL BE USED TO JOIN THE REPLACEMENT SERVICE TO THE EXISTING SERVICE.
5. DIAMETER OF THE REPLACEMENT SERVICE SHALL BE NOT LESS THAN THAT OF THE EXISTING SERVICE OR 6", WHICHEVER IS GREATER.
6. NO BEND SHARPER THAN 1/8 BEND (45°) MAY BE USED AND ALL BENDS SHALL BE THE LONG RADIUS TYPE. REPLACEMENT SERVICE MAY EXTEND INTO BOULEVARD AREA AS NECESSARY.
7. IF NEW SADDLE CONNECTION IS REQUIRED, THE MATERIAL COST OF SADDLE SHALL BE INCIDENTAL.

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Joseph J. Mueller
JOSEPH J. MUELLER
Date 9-2-02 Lic. No. 13942

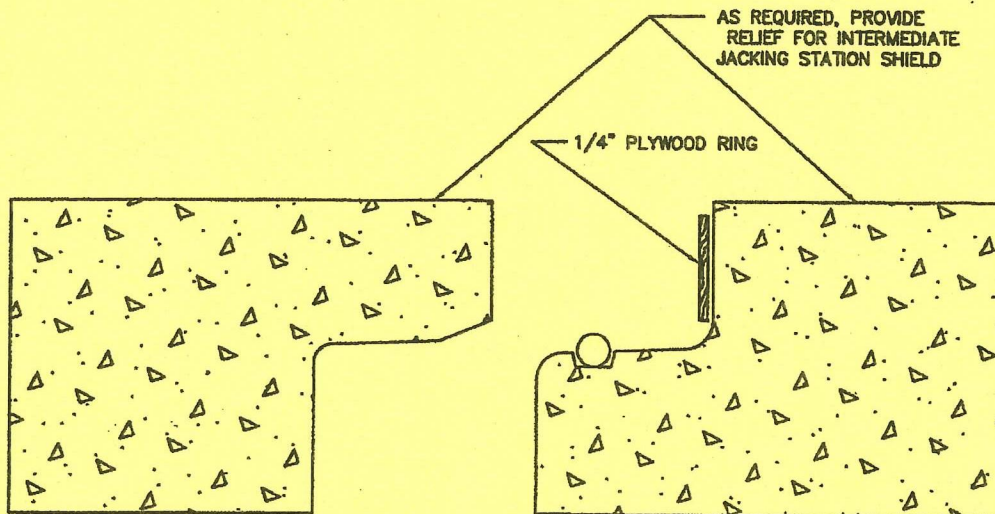
APPROVED

Al J. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
RECONNECTION OF
HOUSE SERVICES

Date of
Revision
JULY
2002

Standard
Plate
No.
2306E



DIRECTION OF JACKING —————

NOTES:

1. GASKETED JOINT SHALL MEET THE REQUIREMENTS OF, AND BE COMPATIBLE WITH, THE JOINT SHOWN IN MN/DOT STD. PLATE 3006.
2. 1/4" PLYWOOD RING SHALL BE CONTINUOUS FOR THE ENTIRE CIRCUMFERENCE OF THE PIPE.
3. GASKET AND JOINT SHALL BE LUBRICATED AND JOINED AS PER MANUFACTURERS RECOMMENDATIONS.

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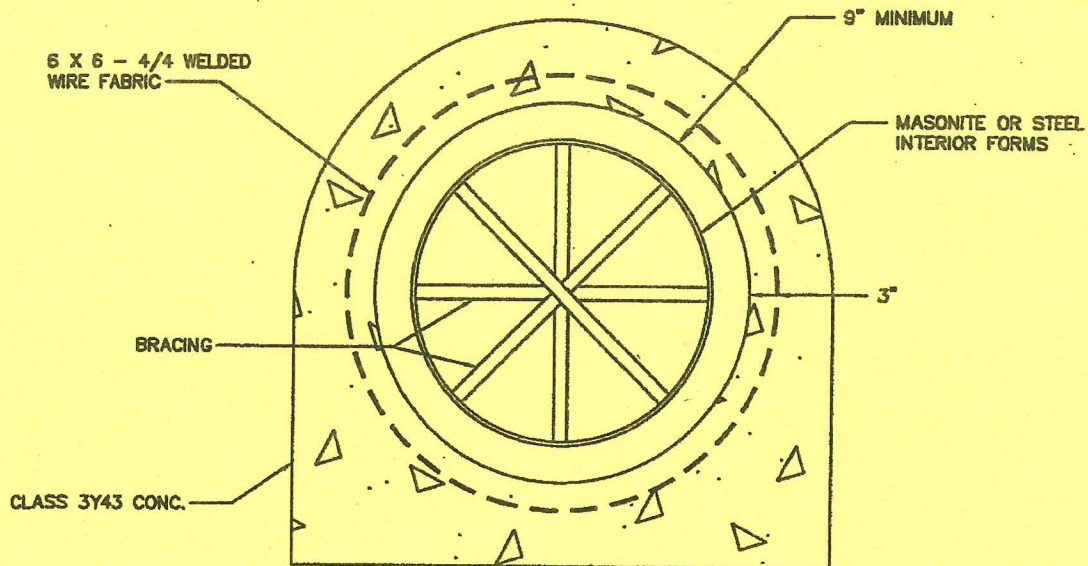
Joseph J. Mueller
JOSEPH J. MUELLER
Date 9-2-02 Lic. No. 13942

APPROVED _____
Al J. [Signature]
CITY ENGINEER

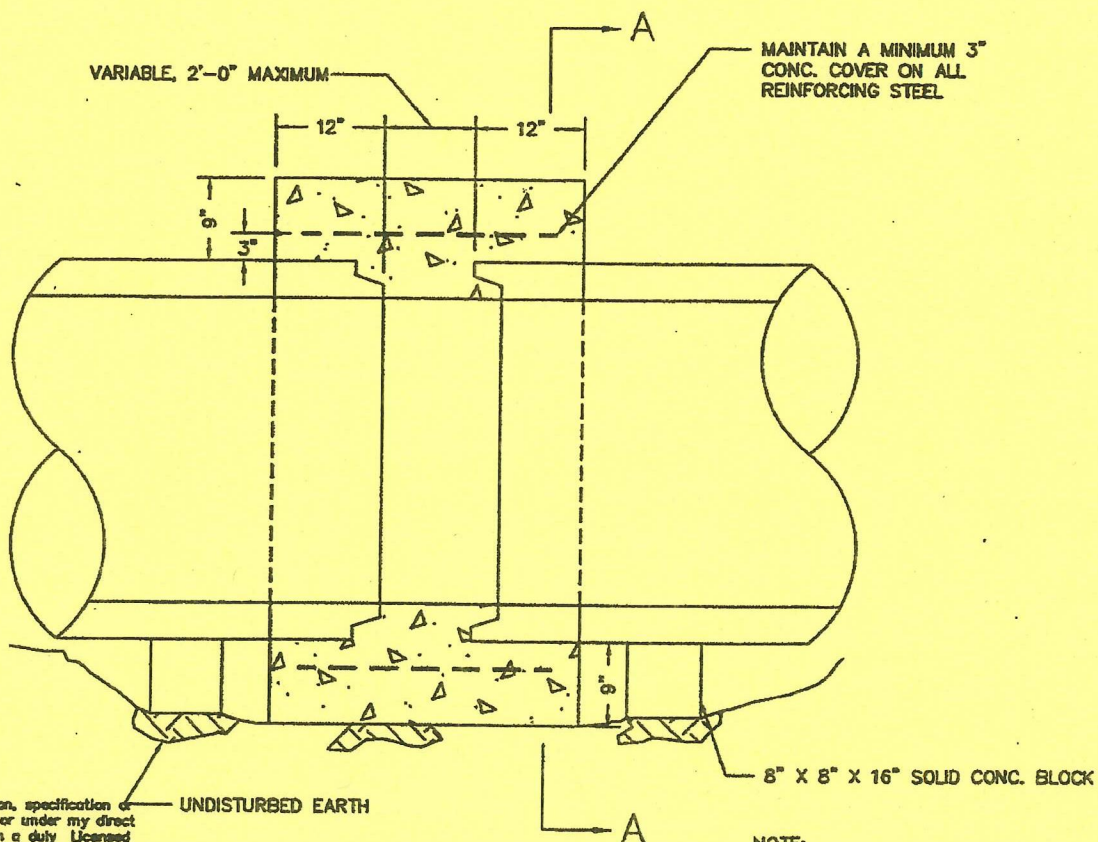
CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
SPECIAL JOINT
FOR JACKED PIPE

Date of
Revision
JULY
2002

Standard
Plate
No.
2307B



SECTION A-A



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Joseph D. Mueller
 JOSEPH D. MUELLER
 Date 9-2-02 Lic. No. 13942

LONGITUDINAL SECTION

NOTE:

FOR USE ON 33" AND LARGER RCP.

APPROVED _____

[Signature]
 CITY ENGINEER

CITY OF ST. PAUL
 DEPARTMENT OF PUBLIC WORKS

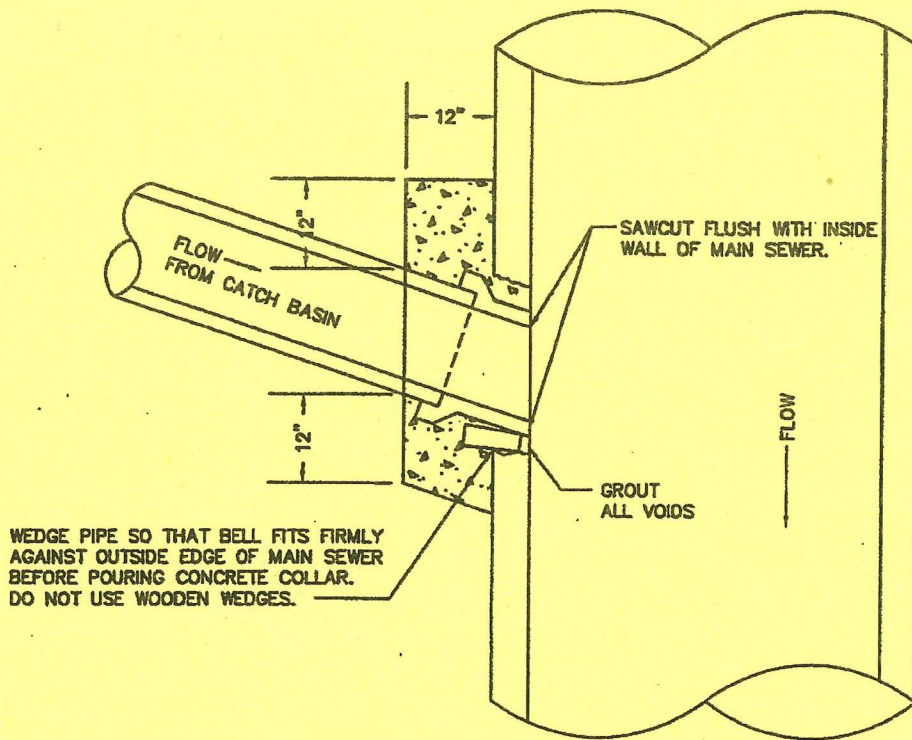
CONSTRUCTION JOINT

Date of
 Revision

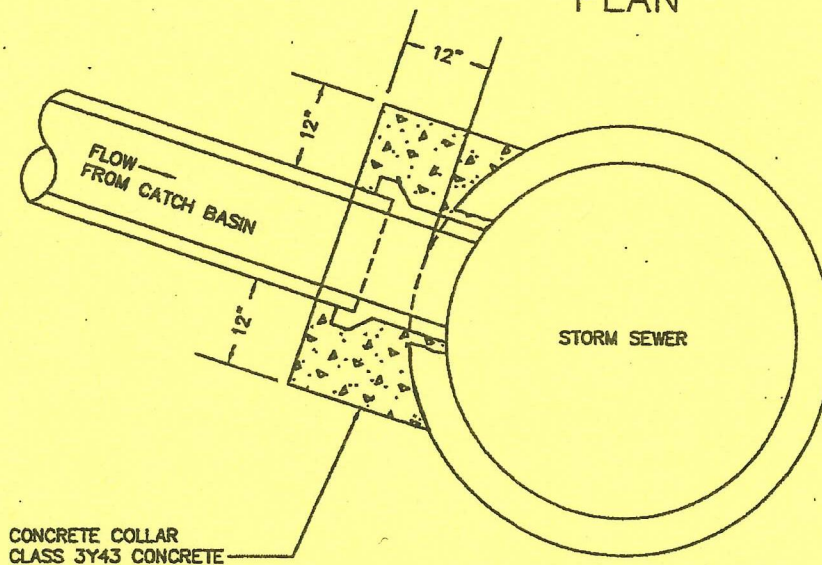
JULY
 2002

Standard
 Plate
 No.

2308C



PLAN



SECTION

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Joseph J. Mueller
JOSEPH J. MUELLER

Date 9-2-02 Lic. No. 13942

NOTE:

THIS CONSTRUCTION FOR USE IN CONNECTING CATCH BASIN LEADS TO MAIN SEWER WHEN THE OUTSIDE DIAMETER OF THE CATCH BASIN LEAD IS LESS THAN HALF THE INSIDE DIAMETER OF THE MAIN SEWER. MINIMUM MAIN SEWER DIA. IS 36".

APPROVED

Al J. [Signature]

CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN CONNECTION

Date of
Revision

JULY
2002

Standard
Plate
No.

2309C

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Joseph A. Muller
JOSEPH A. MULLER

Date 9-20-2002 No. 13942

APPROVED

W. J. [Signature]

CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

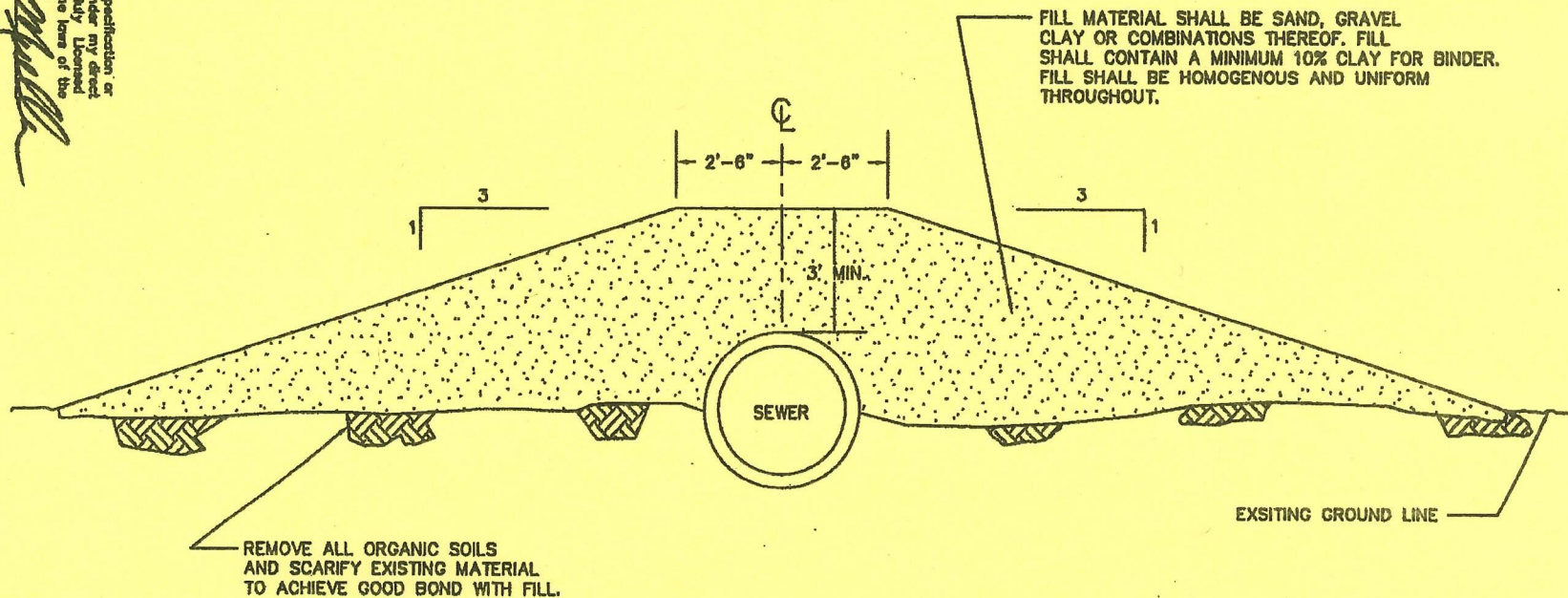
TYPICAL FILL SECTION

Date of
Revision

JULY
2002

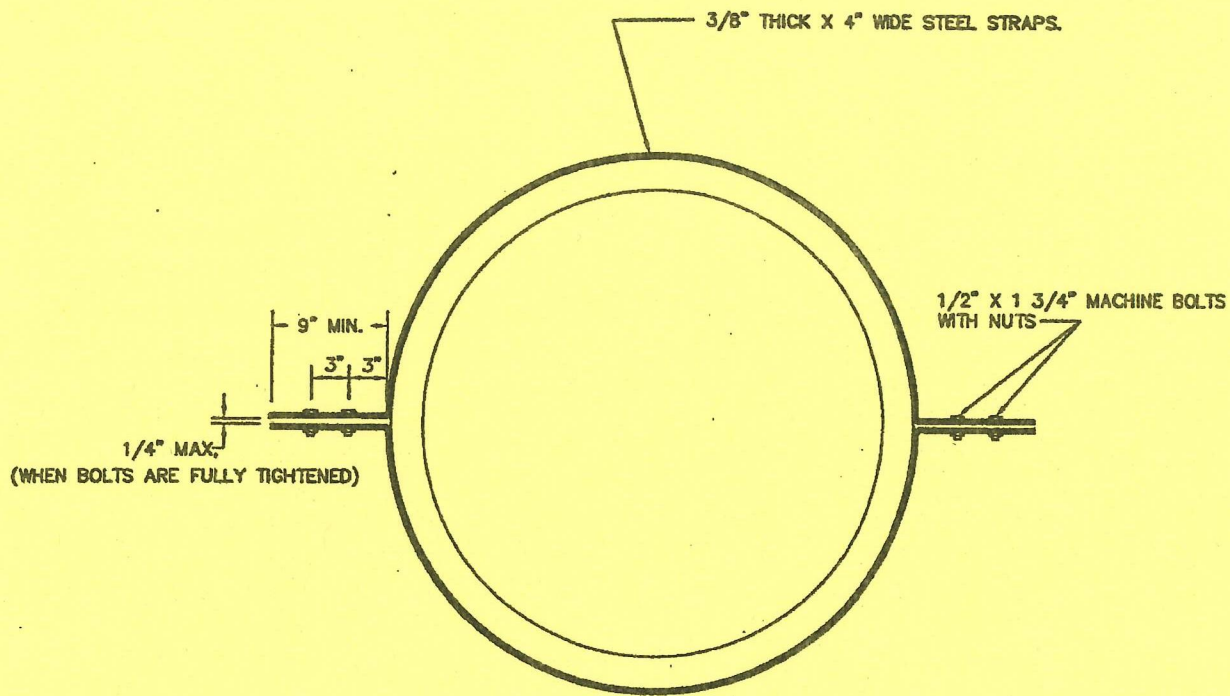
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2310C

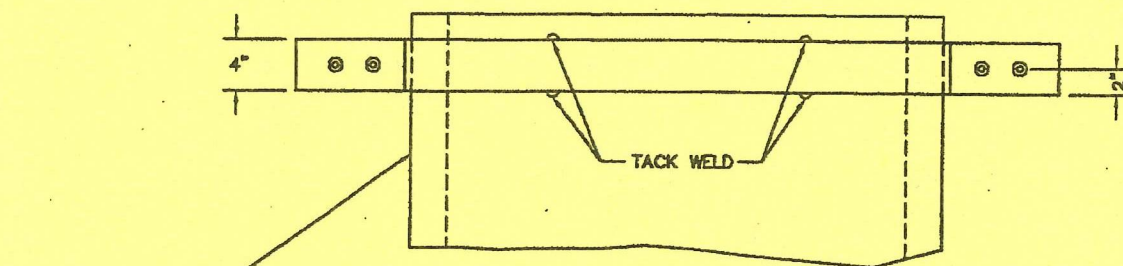


NOTES:

1. FOR EMBANKMENT COMPACTION SEE SPECIAL PROVISIONS.
2. MODIFY SIDE SLOPES AS NECESSARY TO CONFINE FILL SECTION WITHIN EXSTING STREET OR EASEMENT LIMITS. MAXIMUM SLOPES SHALL BE 2:1.
3. SEE SPECIAL PROVISIONS FOR RESTORATION OF EMBANKMENT SURFACE.
4. THE MINIMUM COVER OF FILL OVER THE PIPE SHALL BE 3'-0" UNLESS OTHERWISE STATED IN THE SPECIAL PROVISIONS.
5. THE MINIMUM TOP WIDTH OF THE FILL SECTION SHALL BE 5'-0" UNLESS OTHERWISE NOTED IN THE SPECIAL PROVISIONS.



PLAN



STANDPIPE

ELEVATION

NOTES:

1. TYPE AND SIZE OF STANDPIPE AS SHOWN ON PLANS.
2. STEEL STRAPS SHALL BE BENT TO FIT SNUGLY AROUND STANDPIPE.
3. TACK WELD STRAPS TO STANDPIPE AT MINIMUM OF 4 EQUALLY SPACED LOCATIONS ON BOTH TOP AND BOTTOM OF STRAPS.
4. STEEL STRAP SHALL MEET ASTM A-242 FOR HIGH STRENGTH, LOW ALLOY, STRUCTURAL STEEL.

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Joseph J. Mueller
JOSEPH J. MUELLER
Date 9-2-02 Lic. No. 13942

APPROVED

[Signature]

CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

ANCHOR CLAMP DETAIL

Date of
Revision

JULY
2002

Standard
Plate
No.

2311B

APPROVED _____
CITY ENGINEER

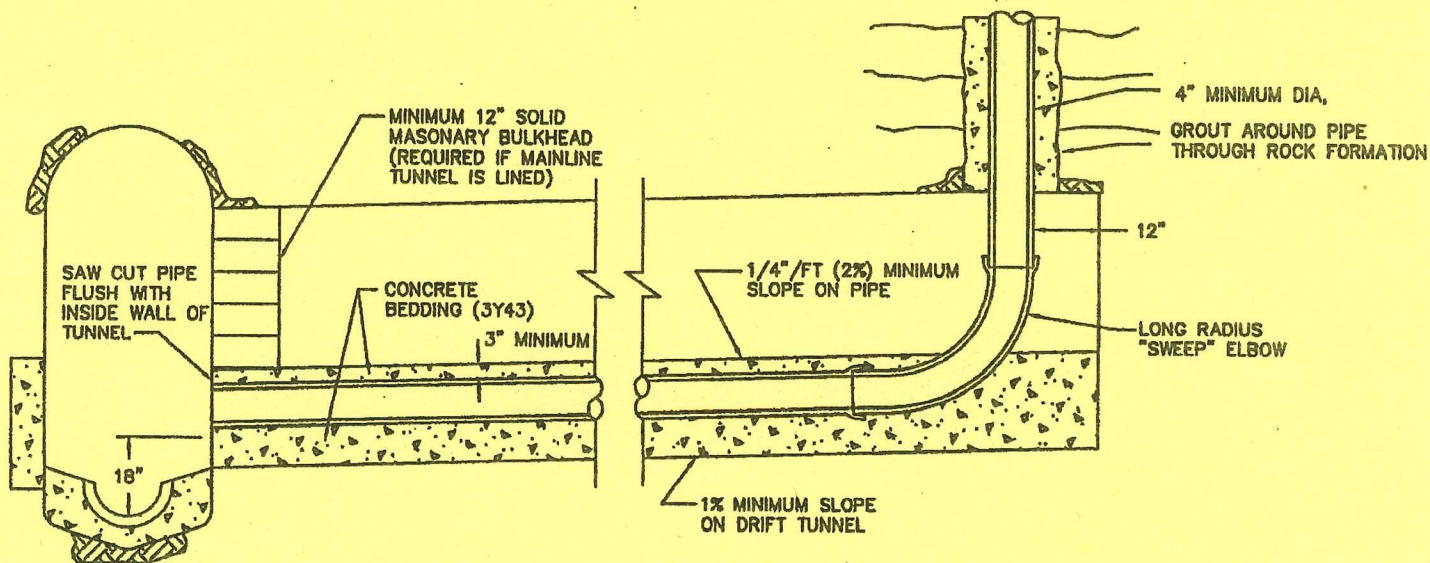
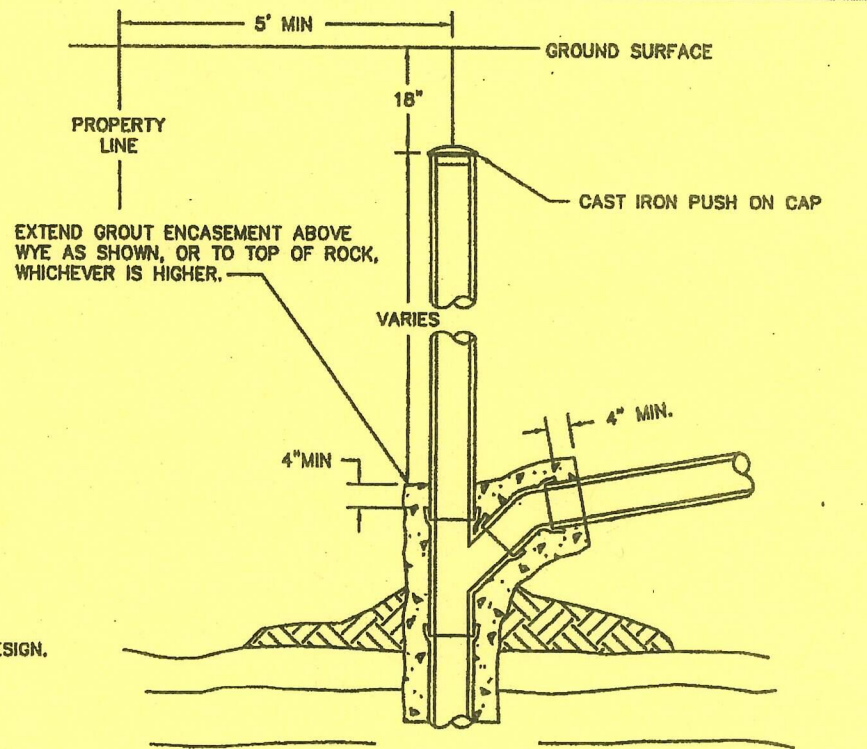
CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
HOUSE SERVICE CONNECTION
TO SANDROCK TUNNEL

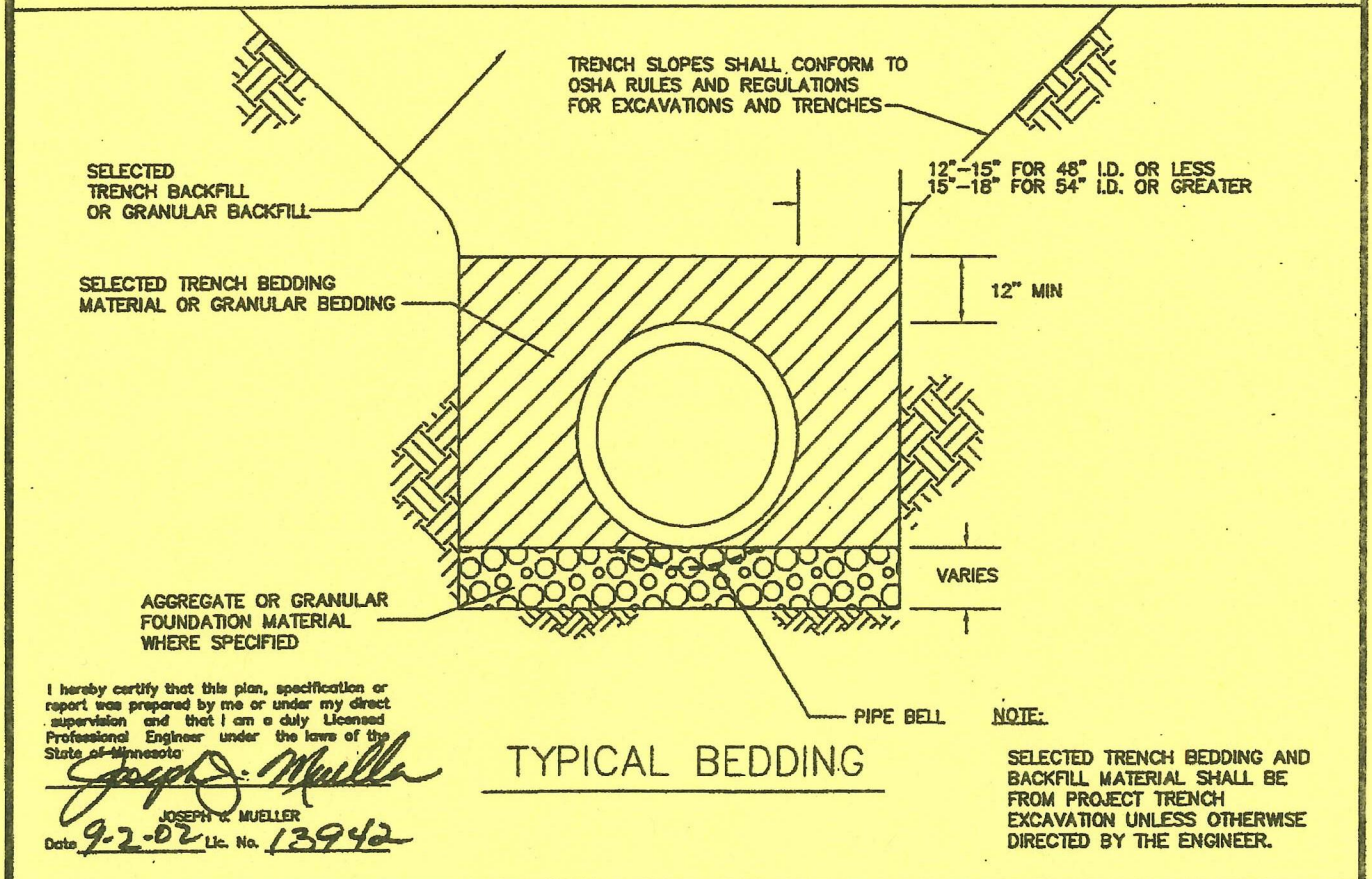
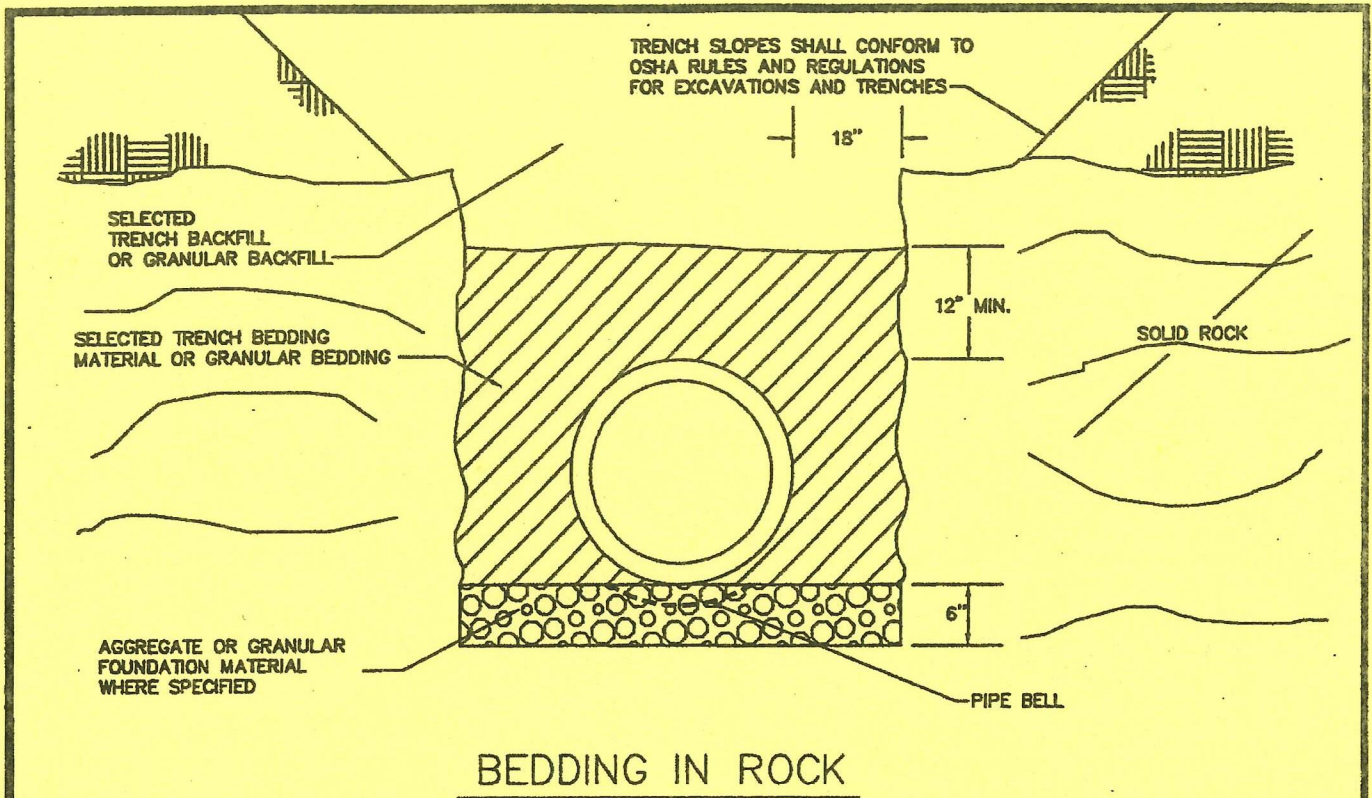
Date of Revision
JULY 2002
Standard Plate No.
2312C

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Joseph Mueller
JOSEPH MUELLER
Date 9-2-02 Lic. No. 13942

NOTES:

1. REFER TO SPECIFICATIONS AND INSTRUCTIONS TO HOUSE DRAIN CONTRACTORS FOR FURTHER INFORMATION AND DETAILS
2. THIS PLATE IS FOR USE WITH SANITARY HOUSE CONNECTIONS FROM 4" TO 8" IN DIAMETER. STORM SEWER CONNECTIONS OR CONNECTIONS LARGER THAN 8" WILL REQUIRE A DIFFERENT DESIGN.





APPROVED _____

CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

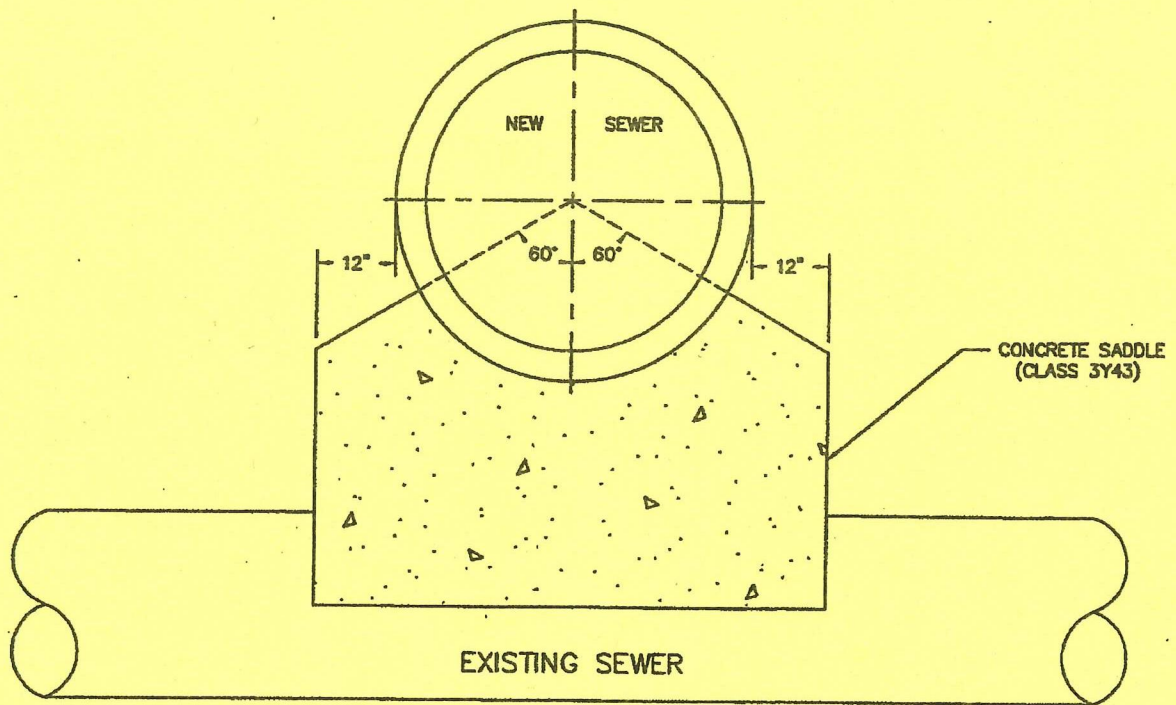
CLASS 'D' PIPE BEDDING

Date of
Revision

JULY
2002

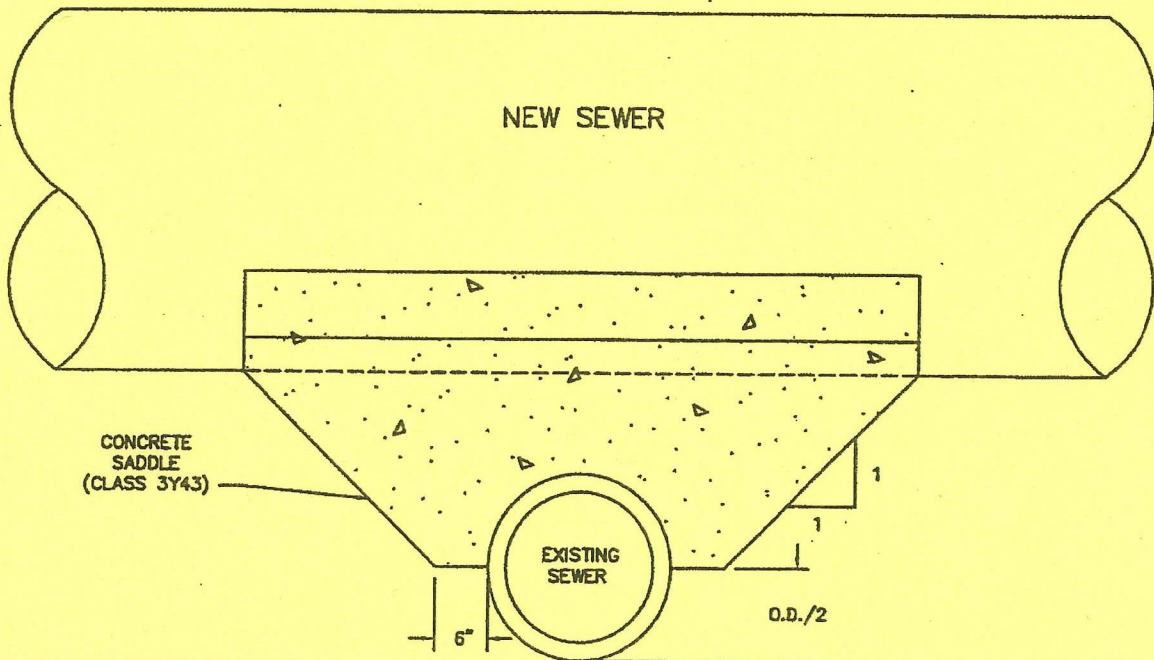
Standard
Plate
No.

2317C



SECTION A-A

A ←



ELEVATION

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Joseph J. Mueller
JOSEPH J. MUELLER
Date 9-2-02 Lic. No. 13942

NOTE:

THIS TYPE OF CROSSING SHALL NOT BE USED TO CROSS WATERMAINS.

APPROVED _____

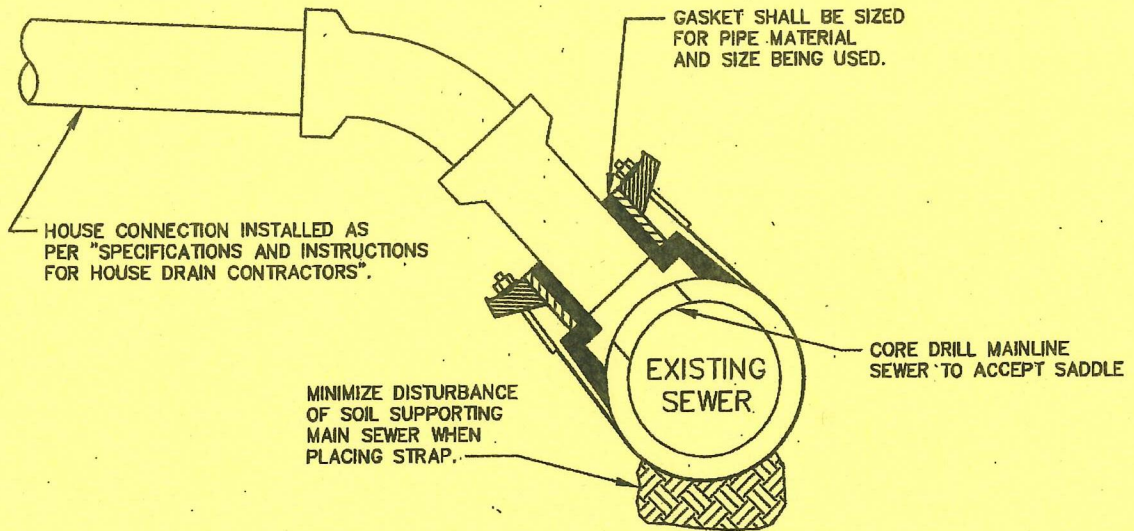
Al J. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
CONCRETE SADDLE
FOR PIPE CROSSINGS

Date of
Revision
JULY
2002

Standard
Plate
No.
2318C

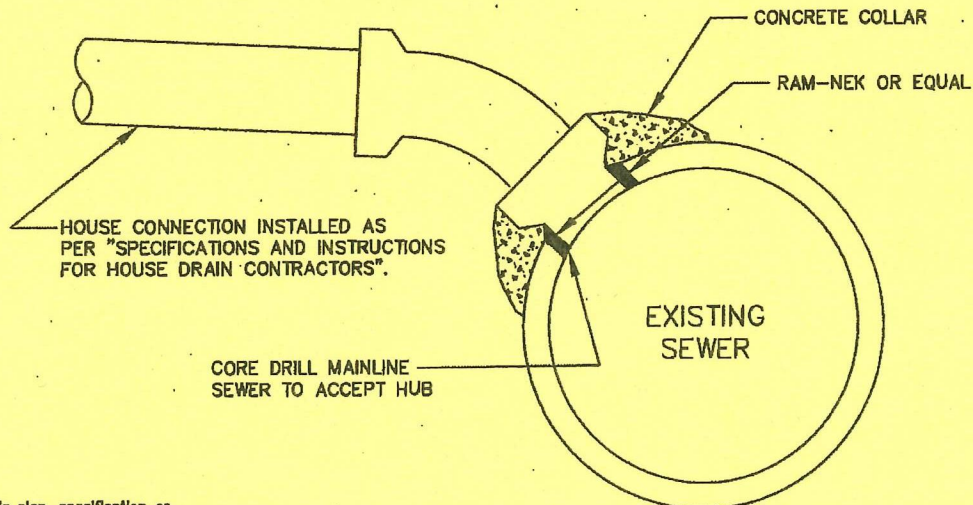
PUBLIC SEWER O.D. 25" OR LESS



NOTES:

1. NEW SEWER SERVICE TO BE CONNECTED WITH ROMAC INDUSTRIES, INC. STYLE "CB" SADDLE OR APPROVED EQUAL.
2. SEWER SERVICE WYE REPLACEMENT TO BE CONNECTED WITH FERNCO INC. FLEXIBLE TAP SADDLE OR APPROVED EQUAL.
3. ALL SEWER SERVICE SADDLES TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

PUBLIC SEWER O.D. GREATER THAN 25"



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Joseph J. Mueller
JOSEPH J. MUELLER
Date 5-4-10 Lic. No. 13942

NOTES:

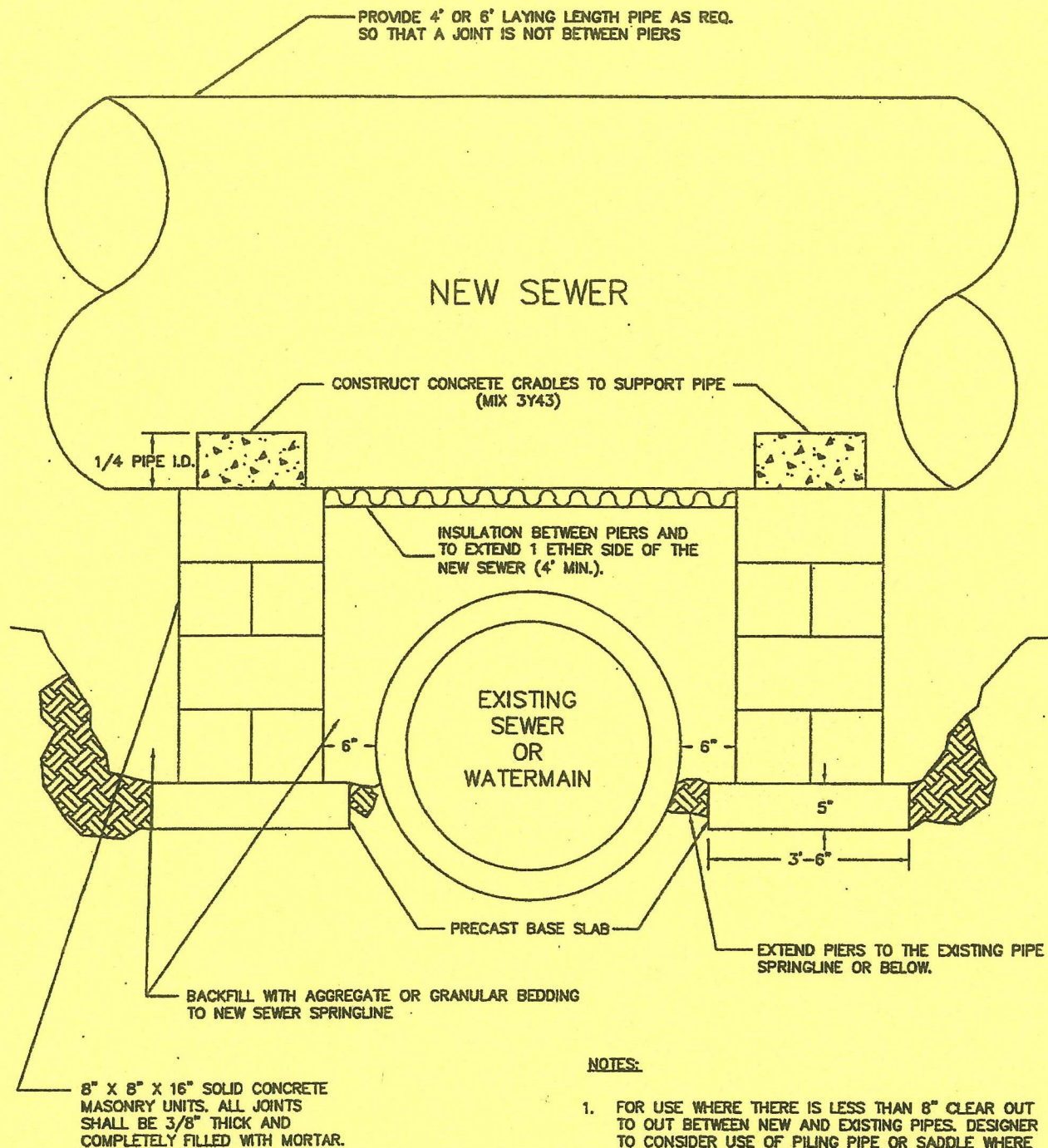
1. THE HUB SHALL BE SAWCUT TO CONFORM TO THE INTERIOR OF THE PIPE
2. GROUT THE HUB WITH A MINIMUM 3" CONCRETE COLLAR. DO NOT ENCASE HUB JOINT TO SERVICE PIPE.

APPROVED _____
John P. Meyer
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
SADDLE CONNECTION OF
HOUSE SERVICES

Date of
Revision
MAY
2010

Standard
Plate
No.
2319D



NOTES:

1. FOR USE WHERE THERE IS LESS THAN 8" CLEAR OUT TO OUT BETWEEN NEW AND EXISTING PIPES. DESIGNER TO CONSIDER USE OF PILING PIPE OR SADDLE WHERE ALLOWABLE SPAN EXCEEDS DISTANCE BETWEEN PIERS.
2. INSULATION SHALL BE DOW HI-40 OR AN APPROVED EQUAL.
3. WIDTH OF PIERS SHALL BE A MINIMUM OF 16" + O.D. OF NEW SEWER IN FT.

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Joseph J. Mueller
JOSEPH J. MUELLER
Date 9-2-02 Lic. No. 13942

APPROVED _____
Al J. [Signature]
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS
CONCRETE PIERS
FOR PIPE CROSSINGS

Date of
Revision
JULY
2002

Standard
Plate
No.
2320B

CASTINGS A & D
(UNLESS NOTED OTHERWISE)
STD. PLATES 2201E & 2202D

SHIM FRAME TO MATCH GRADE,
1/2" MIN. MORTAR THICKNESS.

ADJUSTMENT TO BE MADE WITH
GRADE MS MANHOLE BRICK (ASTM
C-32) PLACED ON A MINIMUM 1/2"
THICK MORTAR AND 3/8" MORTAR
JOINTS. (MAXIMUM 6"
ADJUSTMENT) WITH
A 3" MORTAR COLLAR AROUND THE
OUTSIDE OF ADJUSTMENT BRICKS.

ADJUST MANHOLE 0" TO 6"

CASTINGS A & D
(UNLESS NOTED OTHERWISE)
STD. PLATES 2201E & 2202D

SHIM FRAME TO MATCH GRADE,
1/2" MIN. MORTAR THICKNESS.

ADJUSTMENT TO BE MADE WITH
GRADE MS MANHOLE BRICK (ASTM
C-32) PLACED ON A MINIMUM 1/2"
THICK MORTAR AND 3/8" MORTAR
JOINTS. (MAXIMUM 2"
ADJUSTMENT) WITH
A 3" MORTAR COLLAR AROUND THE
OUTSIDE OF ADJUSTMENT BRICKS.

VARIES 5" TO 15"

27" DIA.

CAST IN PLACE
CONCRETE
(3Y43)

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Professional Engineer under the laws of the
State of Minnesota

Joseph J. Mueller
JOSEPH J. MUELLER
Date 5-4-10 Lic. No. 13942

NOTES:

1. MAY BE USE FOR ADJUSTMENTS
OF LESS THAN 7" WITH APPROVAL
OF THE ENGINEER.
2. SEE MANHOLE RECONSTRUCTION
STANDARD PLATE FOR ADJUSTMENTS
GREATER THAN 17".

ADJUST MANHOLE 7" TO 17"

APPROVED

John P. Meyer
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

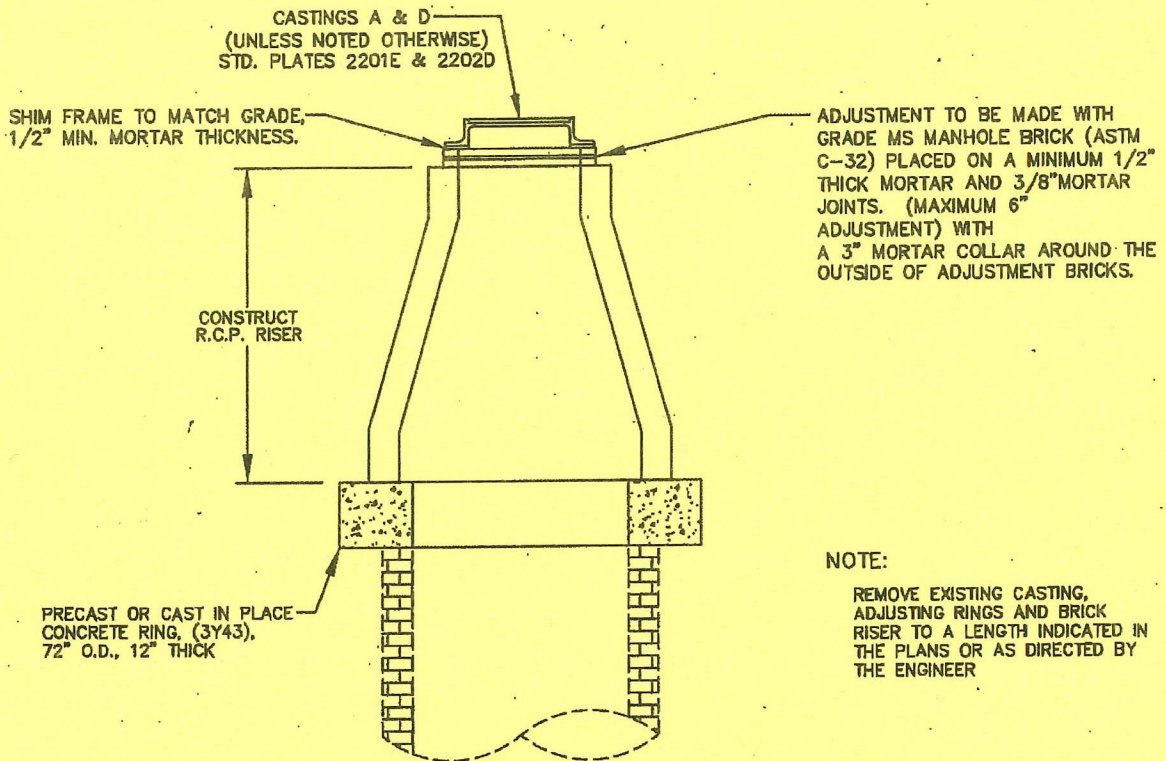
MANHOLE, ADJUST

Date of
Revision

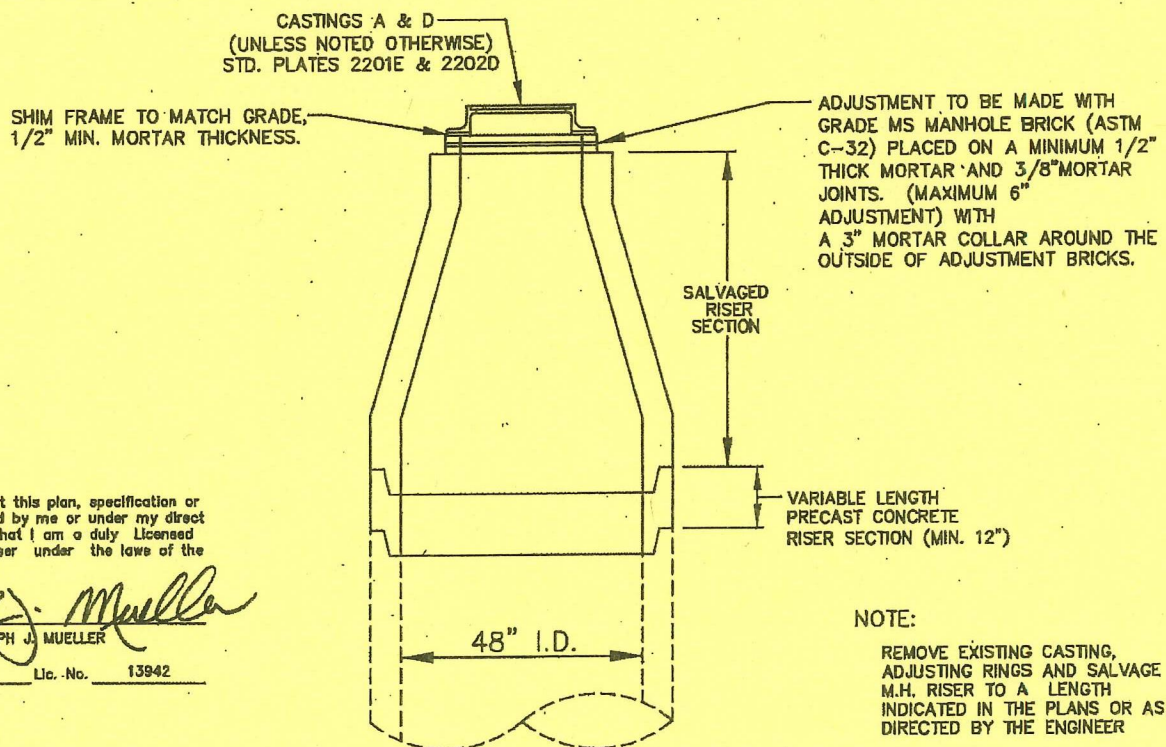
MAY
2010

Standard
Plate
No.

2321



BRICK MANHOLE RECONSTRUCTION (OR MANHOLE ADJUSTMENT OF 18" OR GREATER)



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Joseph J. Mueller
JOSEPH J. MUELLER

Date 5-4-10 Lic. No. 13942

PRECAST CONCRETE MANHOLE RECONSTRUCTION (OR MANHOLE ADJUSTMENT OF 18" OR GREATER)

APPROVED

Joseph J. Mueller
CITY ENGINEER

CITY OF ST. PAUL
DEPARTMENT OF PUBLIC WORKS

MANHOLE, RECONSTRUCT

Date of
Revision

MAY
2010

Standard
Plate
No.

2322

