

PLAN FOR  
PRIVATE SANITARY AND STORM SEWER IMPROVEMENTS  
& PUBLIC WATER MAIN IMPROVEMENTS  
SAINT LUKE'S EAST - FLEX FACILITY EXPANSION

CITY OF LEE'S SUMMIT, MISSOURI

INDEX OF SHEETS

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GENERAL NOTES

- ALL WORKMANSHIP AND MATERIALS SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF CITY OF LEE'S SUMMIT, MISSOURI.
- LINEAL FOOT MEASUREMENTS SHOWN ON THE PLANS ARE HORIZONTAL MEASUREMENTS, NOT SLOPE MEASUREMENTS. ALL PAYMENTS SHALL BE MADE ON HORIZONTAL MEASUREMENTS.
- THE UTILITY LOCATIONS SHOWN ON THESE PLANS ARE TAKEN FROM UTILITY COMPANY RECORDS AND ARE APPROXIMATE ONLY. THEY DO NOT CONSTITUTE ACTUAL FIELD LOCATIONS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL ADHERE TO THE PROVISIONS OF THE SENATE BILL NUMBER 583, 78TH GENERAL ASSEMBLY OF THE STATE OF MISSOURI. THE BILL REQUIRES THAT ANY PERSON OR FIRM DOING EXCAVATION ON PUBLIC RIGHT-OF-WAY DO SO ONLY AFTER GIVING NOTICE TO, AND OBTAINING INFORMATION FROM, UTILITY COMPANIES. STATE LAW REQUIRES 48 HOURS ADVANCE NOTICE. THE NAMES AND TELEPHONE NUMBERS OF UTILITY COMPANIES, EVEN IF ONLY REMOTELY INVOLVED WITH THIS PROJECT ARE AS FOLLOWS:

ELECTRIC	KANSAS CITY POWER & LIGHT CO.	888-474-5275
GAS	MISSOURI GAS ENERGY	816-756-5252
WATER	CITY OF LEE'S SUMMIT	816-969-1940
TELEPHONE AT&T		800-464-7928
SEWER	CITY OF LEE'S SUMMIT	816-969-1940
CABLE TV	TIME WARNER	816-358-8833
	COMCAST	816-833-3400

THE CONTRACTOR MAY ALSO UTILIZE THE FOLLOWING TOLL FREE PHONE NUMBER PROVIDED BY "MISSOURI ONE CALL SYSTEM, INC.": 1-(800)-DIG RITE. THIS PHONE NUMBER IS APPLICABLE ANYWHERE WITHIN THE STATE OF MISSOURI. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL NOTIFY ALL THOSE COMPANIES WHICH HAVE FACILITIES IN THE NEAR VICINITY OF THE CONSTRUCTION TO BE PERFORMED.

- PRIOR TO ORDERING PREFRABRICATED STRUCTURES, SHOP DRAWINGS SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR APPROVAL.
- THE CONTRACTOR SHALL PROTECT ALL MAJOR TREES FROM DAMAGE. NO TREE SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER, UNLESS SHOWN OTHERWISE.
- CLEARING AND GRUBBING OPERATIONS AND DISPOSAL OF ALL DEBRIS SHALL BE PERFORMED BY THE CONTRACTOR IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND ORDINANCES.
- ALL MANHOLES, CATCH BASINS, UTILITY VALVES AND METER PITS TO BE ADJUSTED OR REBUILT TO GRADE AS REQUIRED. ALL EXISTING UTILITIES SHALL BE ADJUSTED AS REQUIRED
- ALL EXCESS AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF AT A LOCATION OFF SITE PROVIDED BY THE CONTRACTOR.
- SUBGRADE SOIL FOR ALL CONCRETE STRUCTURES, REGARDLESS OF THE TYPE OR LOCATION, SHALL BE FIRM, DENSE AND THOROUGHLY COMPACTED AND CONSOLIDATED; SHALL BE FREE FROM MUCK AND MUD; AND SHALL BE SUFFICIENTLY STABLE TO REMAIN FIRM AND INTACT UNDER THE FEET OF THE WORKMEN OR MACHINERY ENGAGED IN SUBGRADE SURFACING, LAYING REINFORCING STEEL, AND DEPOSITING CONCRETE THEREON. IN ALL CASES WHERE SUBSOIL IS MUCKY OR WORKS INTO MUD OR MUCK DURING SUCH OPERATION, A SEAL COURSE OF EITHER CONCRETE OR ROCK SHALL BE PLACED BELOW SUBGRADE TO PROVIDE A FIRM BASE FOR WORKING AND FOR PLACING THE FLOOR SLAB.
- ALL EXCAVATION SHALL BE UNCLASSIFIED. NO SEPARATE PAYMENT WILL BE MADE FOR ROCK EXCAVATION.

NOTE:

BY USE OF THESE PLANS THE CONTRACTOR AGREES THAT HE/SHE SHALL BE SOLELY RESPONSIBLE FOR THE SAFETY OF THE CONSTRUCTION WORKERS AND OF THE PUBLIC.

NOTE:

"ALL CONSTRUCTION SHALL CONFORM TO THE SPECIFICATIONS SET FORTH BY THE KANSAS CITY CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION AND THE CITY OF LEE'S SUMMIT, MISSOURI, WHICHEVER IS MORE STRICT."

SPECIFICATIONS

ALL WORK PERFORMED AND MATERIALS FURNISHED WITHIN PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CITY OF LEE'S SUMMIT, MISSOURI. THE CONSTRUCTION AND MATERIALS FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH THE CURRENT SPECIFICATIONS OF THE "AMERICAN PUBLIC WORKS ASSOCIATION, KANSAS CITY METROPOLITAN CHAPTER" AND ARE HEREBY MADE THE SPECIFICATIONS FOR THIS SET OF PLANS BY REFERENCE AS THOUGH FULLY SET FORTH HEREIN.



GENERAL LOCATION

FLOOD NOTE:

THIS PROPERTY LIES WITHIN FLOOD ZONE X, DEFINED AS AREAS OF DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON THE FLOOD INSURANCE RATE MAP, PREPARED BY THE FEDERAL EMERGENCY AGENCY'S NATIONAL FLOOD INSURANCE PROGRAM FOR LEE'S SUMMIT, JACKSON COUNTY, MISSOURI, MAP NUMBER 29095C0285F AND DATED SEPTEMBER 29, 2006.

PROJECT BENCHMARKS

BENCHMARK 1 ELEV.: 982.17  
SET 5 PUNCH HOLES IN THE TOP OF A SOUTHWEST FLANGE BOLT ON A FIRE HYDRANT IN THE SOUTHEAST QUADRANT OF SOUTH RING ROAD AND DRIVE ENTRANCE SOUTHWEST OF THE HELICOPTER PAD.

BENCHMARK 2 ELEV.: 983.85  
SET 5 PUNCH HOLES IN THE TOP OF A SOUTHWEST FLANGE BOLT ON A FIRE HYDRANT IN THE SOUTHEAST QUADRANT OF SOUTH RING ROAD AND PARK LOT E TO 50± DUE SOUTH OF THE SOUTHWEST CORNER OF MEDICAL OFFICE BUILDING.

LEGAL DESCRIPTION:

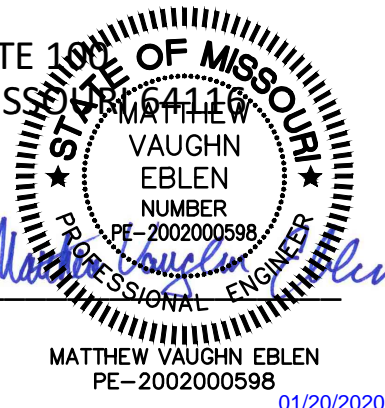
ALL OF LOT 1, SAINT LUKES HOSPITAL OF LEE'S SUMMIT LOTS 1 & 2, A SUBDIVISION OF LAND IN THE CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI.

PREPARED & SUBMITTED BY:

McCLURE

1700 SWIFT STREET, SUITE 100  
NORTH KANSAS CITY, MISSOURI 64116

ENGINEER



DATE

ACCEPTED BY:

DATE



SCALE: 1"=500'  
500 250 0 500

DESIGN ENGINEER

MATT EBLEN  
1700 SWIFT AVE, SUITE 100  
NORTH KANSAS CITY, MO  
913-307-2588  
MEBLEN@MECRESULTS.COM

SUMMARY OF QUANTITIES

ITEM DESCRIPTION	UNITS	QUANTITY
8" PVC PIPE (SDR-26)	L.F.	448
4'-0" I.D. SANITARY MANHOLE	EACH	3
15" R.C.P. (CLASS III)	L.F.	82
18" R.C.P. (CLASS III)	L.F.	110
30" R.C.P. (CLASS III)	L.F.	506
4'x4' CURB INLET	EACH	1
5'x4' CURB INLET	EACH	2
5'x5' CURB INLET	EACH	1
6'x5' CURB INLET	EACH	1
8'x5' CURB INLET	EACH	2
4'x4' AREA INLET	EACH	2
11'x3' CURB INLET CONVERTED TO JUNCTION BOX	EACH	1
STREET REPAIR & CURB REPLACEMENT	L.F.	48
CONNECTION TO EXISTING STRUCTURE	EACH	5
8" PVC C900 PIPE	L.F.	375
CONNECTIONS TO EXISTING	EACH	2
8"x6" TEE	EACH	2
8"x6" TEE AND FIRE HYDRANT	EACH	3
6" GATE VALVE	EACH	5
8" GATE VALVE	EACH	2
90° HORIZONTAL BEND	EACH	1
45° HORIZONTAL BEND	EACH	2
11 1/2° HORIZONTAL BEND	EACH	1
22 1/2° HORIZONTAL BEND	EACH	1
8" SOLID SLEEVE	EACH	2



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SAINT LUKE'S FLEX FACILITY EXPANSION PRIVATE  
SANITARY SEWER, PRIVATE STORM SEWER &  
PUBLIC WATER MAIN IMPROVEMENTS  
LEE'S SUMMIT, MISSOURI

COVER SHEET

ISSUE DATE  
11-18-2019  
REVISIONS  
PER CITY COMMENTS 01-17-2020

ENGINEER DESIGNED BY

DRAWN BY CHECKED BY

McCLURE PROJECT No.

SHEET NO.

C300



STA. 0+00, LINE 1 = EXIST. SANITARY MANHOLE ~ INSTALL 181.15 L.F. 8" PVC PIPE (SDR-26) (SE). DISCONNECT AND ABANDON EXIST. SANITARY SEWER TO EAST. BEGIN LINE 1  
N100147.044, E2822392.572

MANHOLE 1-A  
STA. 1+81.15, LINE 1 ~ CONST. 4'-0" I.D. SANITARY MANHOLE. INSTALL 76.52 L.F. 8" PVC PIPE (SDR-26) (E).  
N1009968.654, E2822424.064

MANHOLE 1-B  
STA. 2+57.67, LINE 1 ~ CONST. 4'-0" I.D. SANITARY MANHOLE. INSTALL 190.13 L.F. 8" PVC PIPE (SDR-26) (NE).  
N1009943.979, E2822496.491

MANHOLE 1-C  
STA. 4+47.80, LINE 1 ~ CONST. 4'-0" I.D. SANITARY MANHOLE OVER EXIST. 8" SANITARY SEWER AND EXIST. 6" SANITARY SEWER SERVICE LINE. DISCONNECT AND ABANDON EXISTING SANITARY SEWER TO THE WEST.  
END LINE 1  
N1009978.252, E2822683.498

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LEGEND	
C&G	CURB & GUTTER
ESMT	EASEMENT
MS	METAL SIGN
FO	FIBER OPTIC
RCP	REINFORCED CONCRETE PIPE
SAN	SANITARY SEWER
WM	WATER METER
DWS	DOMESTIC WATER SERVICE
UTELE	UNDERGROUND TELEPHONE
T-UTEL	UNDERGROUND TELEPHONE
UPOWR	UNDERGROUND POWER
IRW	IRRIGATION
IR-COND	CONDUIT
LPCB	LIGHT POLE CONCRETE BASE
ETP	ELECTRIC TRANSFORMER
FPW	FIRE PROTECTION WATER
UP	UNDERGROUND POWER
T	TRANSFORMER



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SAINT LUKE'S FLEX FACILITY EXPANSION PRIVATE  
SANITARY SEWER, PRIVATE STORM SEWER &  
PUBLIC WATER MAIN IMPROVEMENTS  
LEE'S SUMMIT, MISSOURI  
SANITARY SEWER PLAN & PROFILE



ISSUE DATE 11-18-2019	
REVISIONS	01-17-2020
PER CITY COMMENTS	

ENGINEER	DESIGNED BY
DRAWN BY	CHECKED BY
McCLURE PROJECT No.	

SHEET No.  
**C301**





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SANITARY SEWER, PRIVATE STORM SEWER &  
PUBLIC WATER MAIN IMPROVEMENTS  
LEE'S SUMMIT, MISSOURI

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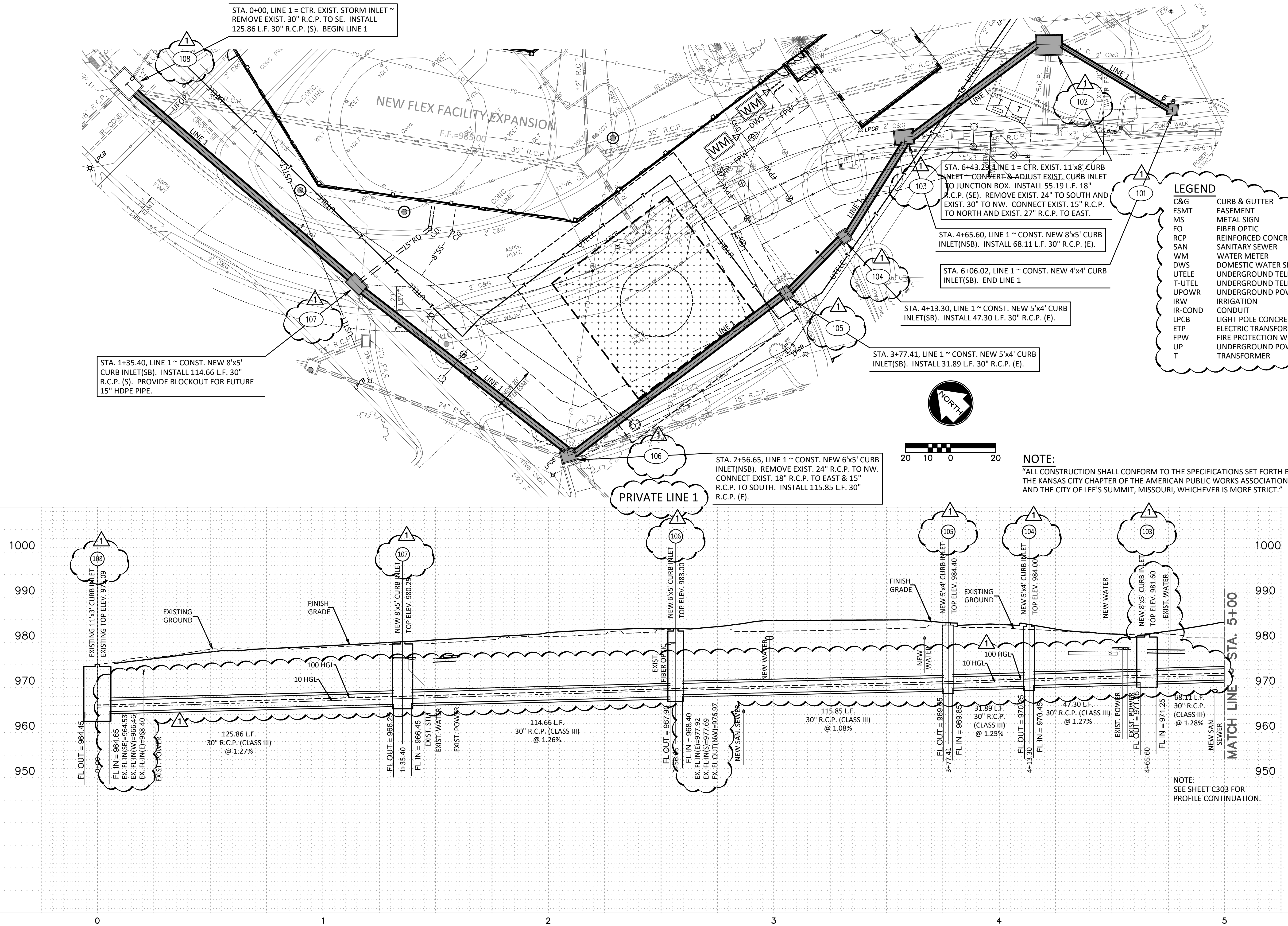
STORM SEWER PLAN & PROFILE (1)



ISSUE DATE		
11-18-2019		
REVISIONS		
1	PER CITY COMMENTS	01-17-2020

ENGINEER	DESIGNED BY
DRAWN BY	CHECKED BY
McCLURE PROJECT No.	

SHEET NO.  
**C302**





STA. 0+00, LINE 2 = STA. 0+00, LINE 3 = CTR.  
EXIST. JUNCTION BOX ~ INSTALL 57.52 L.F. 15"  
R.C.P.(SW). INSTALL 36.58 L.F. 15" R.C.P. (S).  
BEGIN LINES 2 & 3

STA. 0+00, LINE 4 = CTR. EXIST. 11'x3' CURB  
INLET ~ INSTALL 54.69 L.F. 18" R.C.P. (SW) &  
CONST. 48 L.F. STREET & CURB REPAIR.  
BEGIN LINE 4

STA. 0+57.87, LINE 4 ~ CONST. NEW 4'x4'  
AREA INLET (OPENING TO SW). END LINE 4

STA. 0+41.46, LINE 3 ~ CONST. NEW  
5'x5' CURB INLET(NSB). END LINE 3

REMOVE EXISTING 15" R.C.P.  
AND EXISTING CURB INLET

STA. 0+60.92, LINE 2 ~ CONST. NEW 4'x4'  
AREA INLET (OPENINGS TO E & W). END  
LINE 2

LEGEND

C&G	CURB & GUTTER
ESMT	EASEMENT
MS	METAL SIGN
FO	FIBER OPTIC
RCP	REINFORCED CONCRETE PIPE
SAN	SANITARY SEWER
WM	WATER METER
DWS	DOMESTIC WATER SERVICE
UTELE	UNDERGROUND TELEPHONE
T-UTELE	UNDERGROUND TELEPHONE
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IRW	IRRIGATION
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LPCB	LIGHT POLE CONCRETE BASE
ETP	ELECTRIC TRANSFORMER
FPW	FIRE PROTECTION WATER
UP	UNDERGROUND POWER
T	TRANSFORMER

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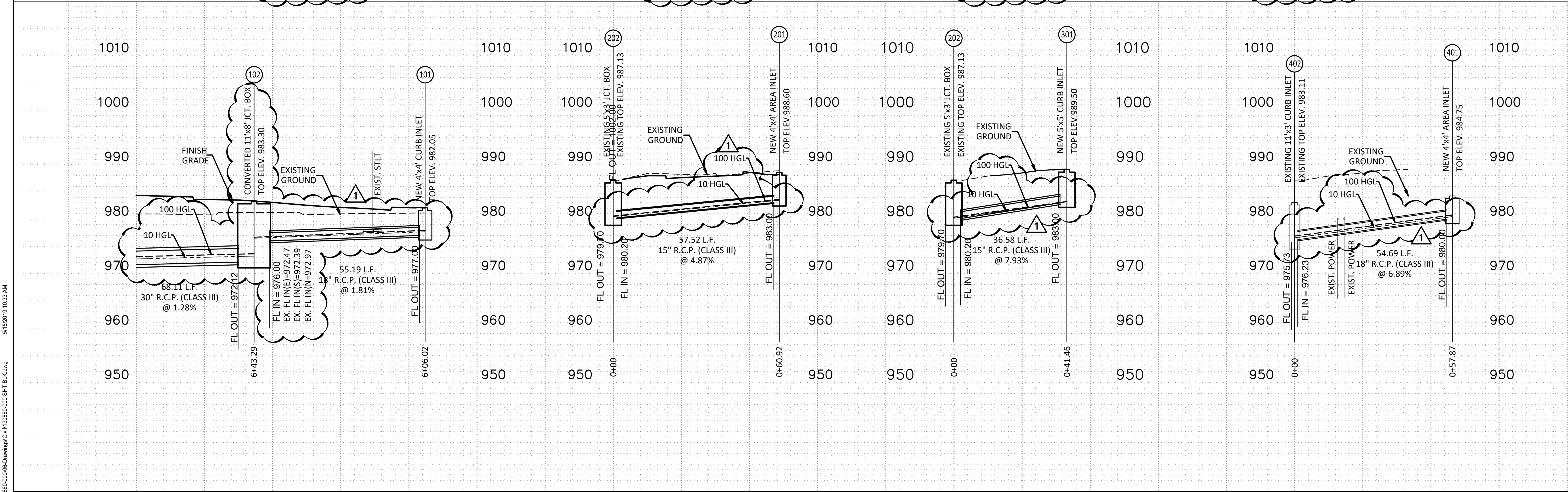
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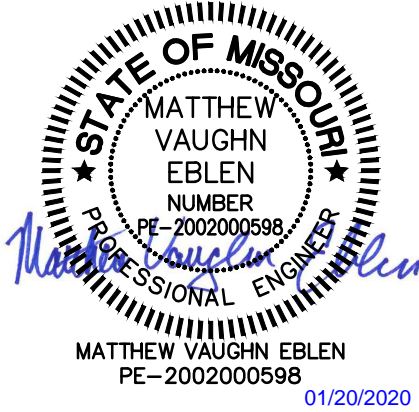
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SAINT LUKE'S FLEX FACILITY EXPANSION PRIVATE  
SANITARY SEWER, PRIVATE STORM SEWER &  
PUBLIC WATER MAIN IMPROVEMENTS  
LEE'S SUMMIT, MISSOURI  
STORM SEWER PLAN & PROFILES (2)

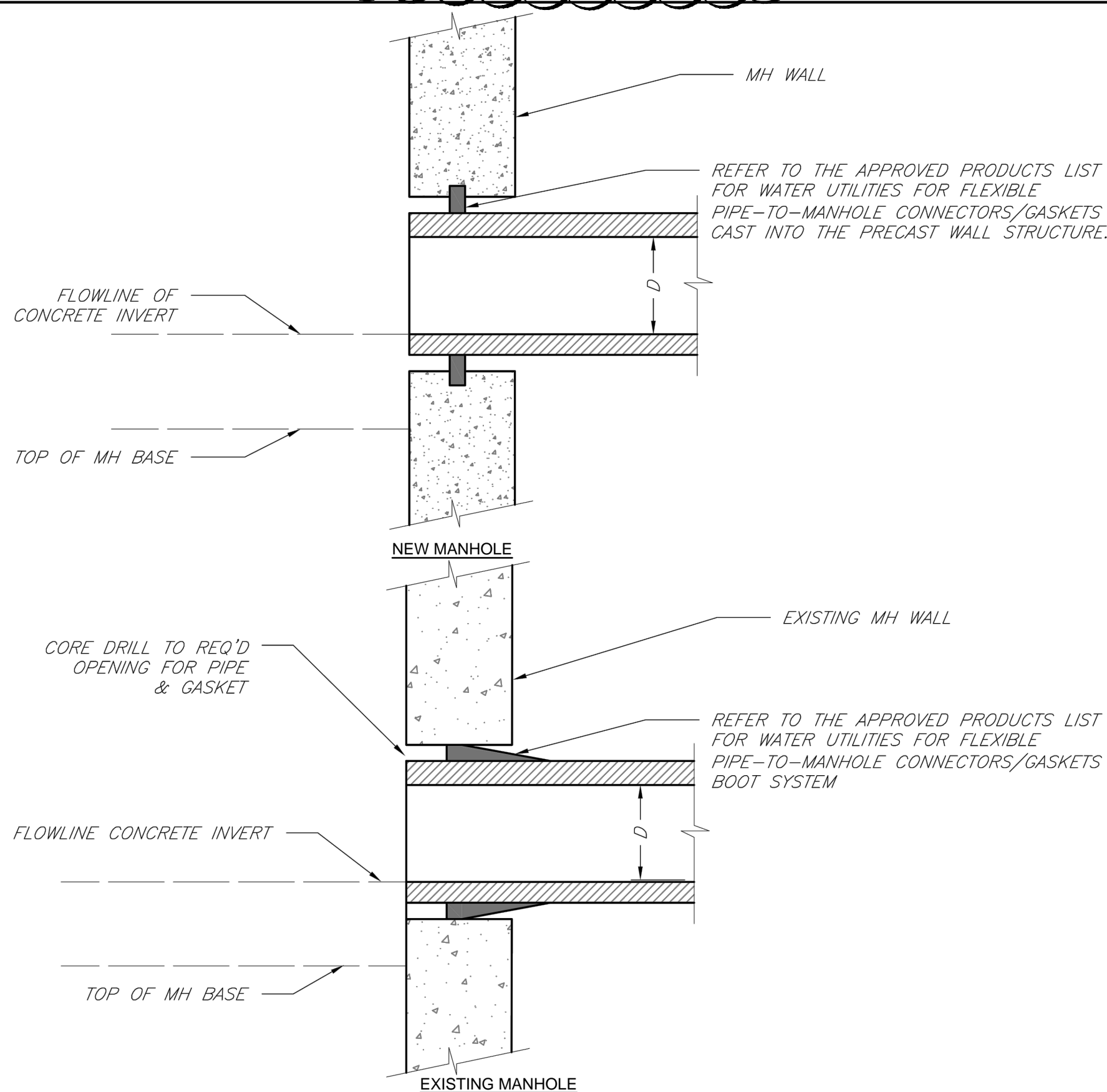


ISSUE DATE	11-18-2019
REVISIONS	
PER CITY COMMENTS	01-17-2020

ENGINEER	DESIGNED BY
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McCLURE PROJECT No.	

SHEET NO.  
**C303**



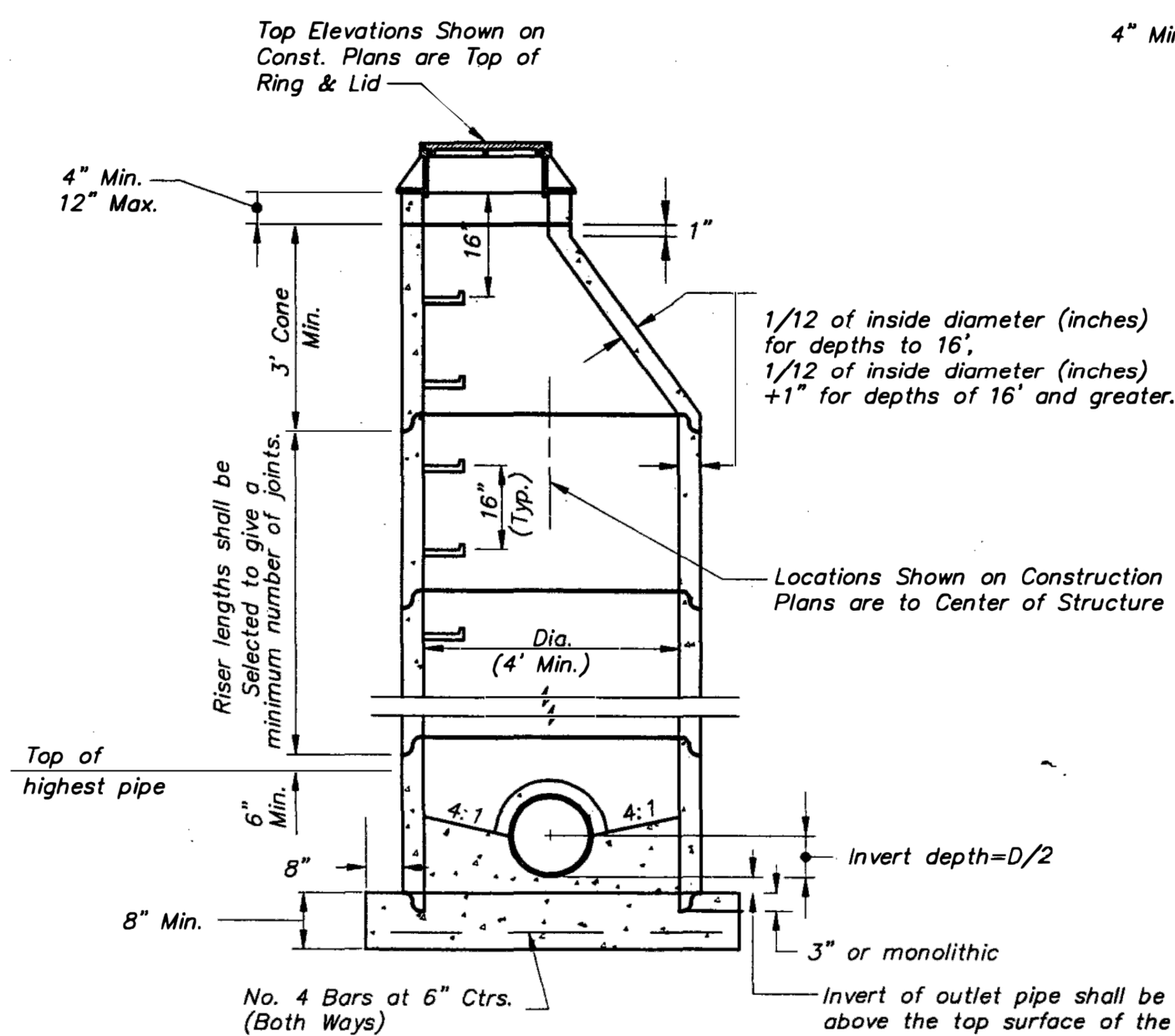


LEE'S SUMMIT  
MISSOURI  
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

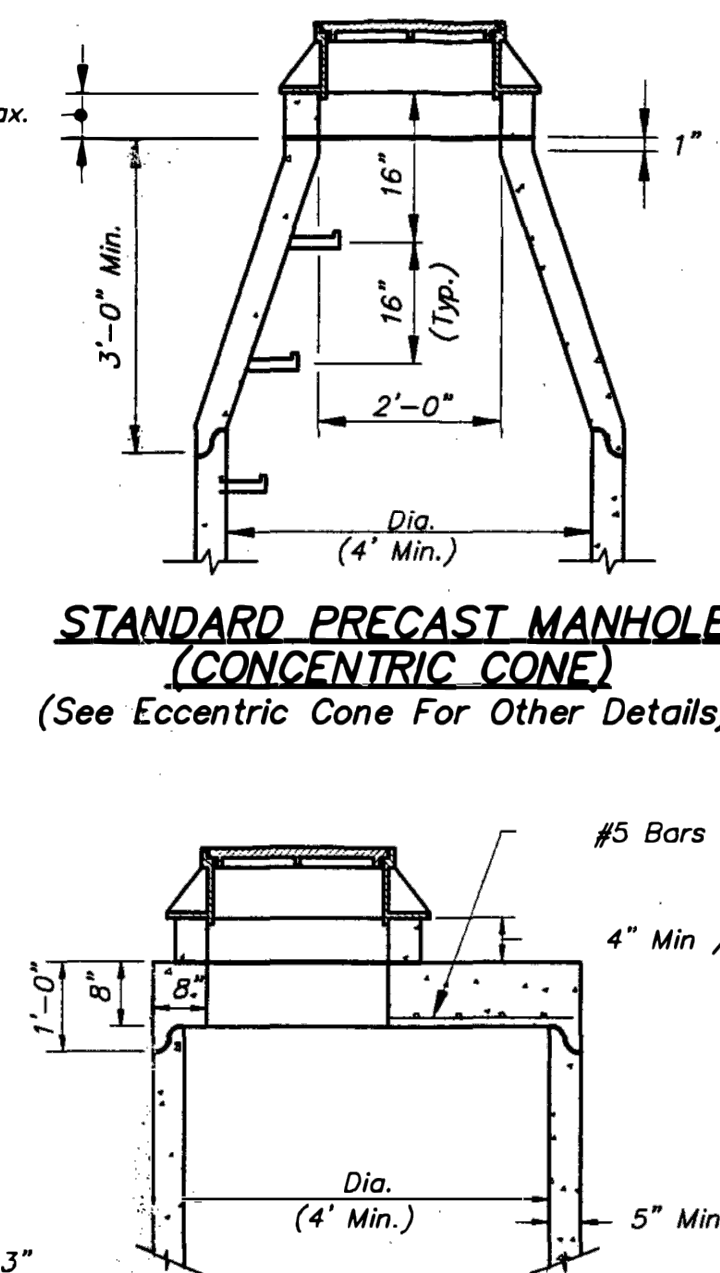
MANHOLE WALL CONNECTIONS

LS

Date: 02/13  
Drawn By: JN  
Checked By: DL  
FILE: SAN-5  
Rev: 1/14  
Rev:



STANDARD PRECAST MANHOLE  
(ECCENTRIC CONE)



STANDARD PRECAST MANHOLE  
(SHALLOW TYPE)  
(See Eccentric Cone For Other Details)

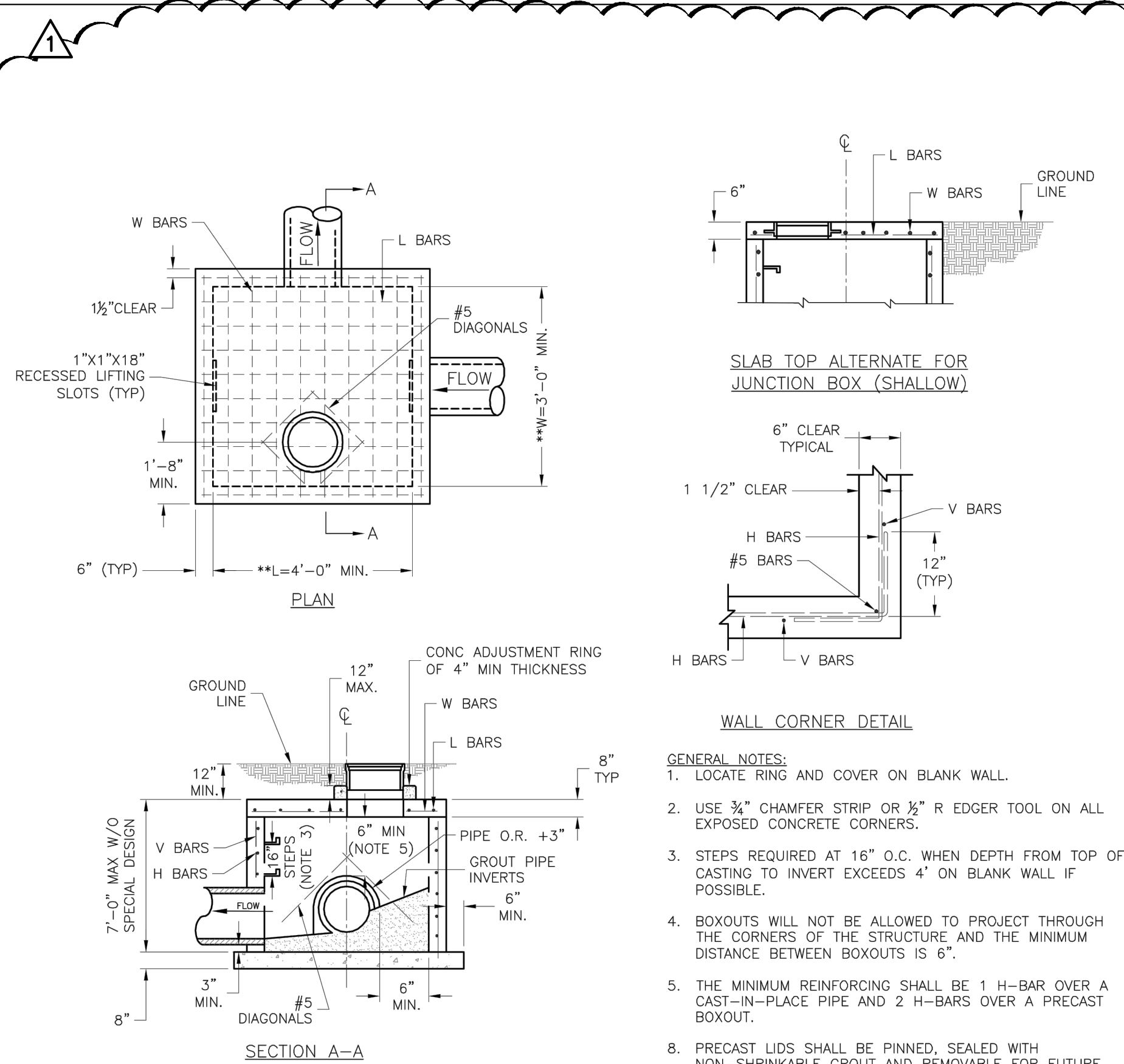
GENERAL NOTES:

- All manholes are to be precast concrete and of Eccentric Cone type unless otherwise specified.
- Manhole top adjustments shall be accomplished by the use of concrete adjustment rings.
- Top of manhole casting shall be set flush and on same slope as finished surface or as directed by the Engineer.
- Reinforcement in all sections shall equal or exceed A.S.T.M. C-478 specifications.
- The engineer shall designate modifications for manholes with special designs.
- The inside diameter of the manhole shall be 4'-0" for pipe diameters from 12" thru 24", 5'-0" for pipe diameters from 27" thru 36", and 6'-0" for pipe diameters 42" thru 48".
- Clearance Tolerance of Pipe Openings: The Maximum Allowable Pipe Opening on a Horizontal Axis Shall be the Outside Diameter of the Pipe Plus 12". The Maximum Allowable Pipe Opening on Vertical Axis Shall be the Outside Diameter Plus 8". The Minimum Clearance Between the Outside Surface of an Installed pipe and the Concrete of the Manhole Shall be 2".
- Installation of Pipe Openings: All required pipe openings shall be plant cast in manhole units. Field alterations of openings will be permitted provided walls are scored with a masonry saw to a depth sufficient to sever reinforcing steel. A chipping hammer may then be used to remove the concrete. Minimum distance between any two adjacent pipes shall be 4".
- No direct payment for shaping floor or connecting pipes as shown on plans.
- Ring & Cover to be Neenah R-1736, Clay & Bailey #2008, Deeter #1316, or approved equal. (Casting may vary by municipality, refer to plans & contract documents.)
- Sanitary Sewers shall be coated and conform to Section 2600.

AMERICAN PUBLIC WORKS ASSOCIATION  
KANSAS CITY  
METROPOLITAN CHAPTER

MANHOLE  
DETAILS

STANDARD DRAWING  
NUMBER MH - 1  
ADOPTED:  
APRIL 17, 1996



REINFORCING		
BAR SIZE	BAR SIZE	SPACING (IN.)
H	4	12
V	4	12
L	5	6
W	5	6

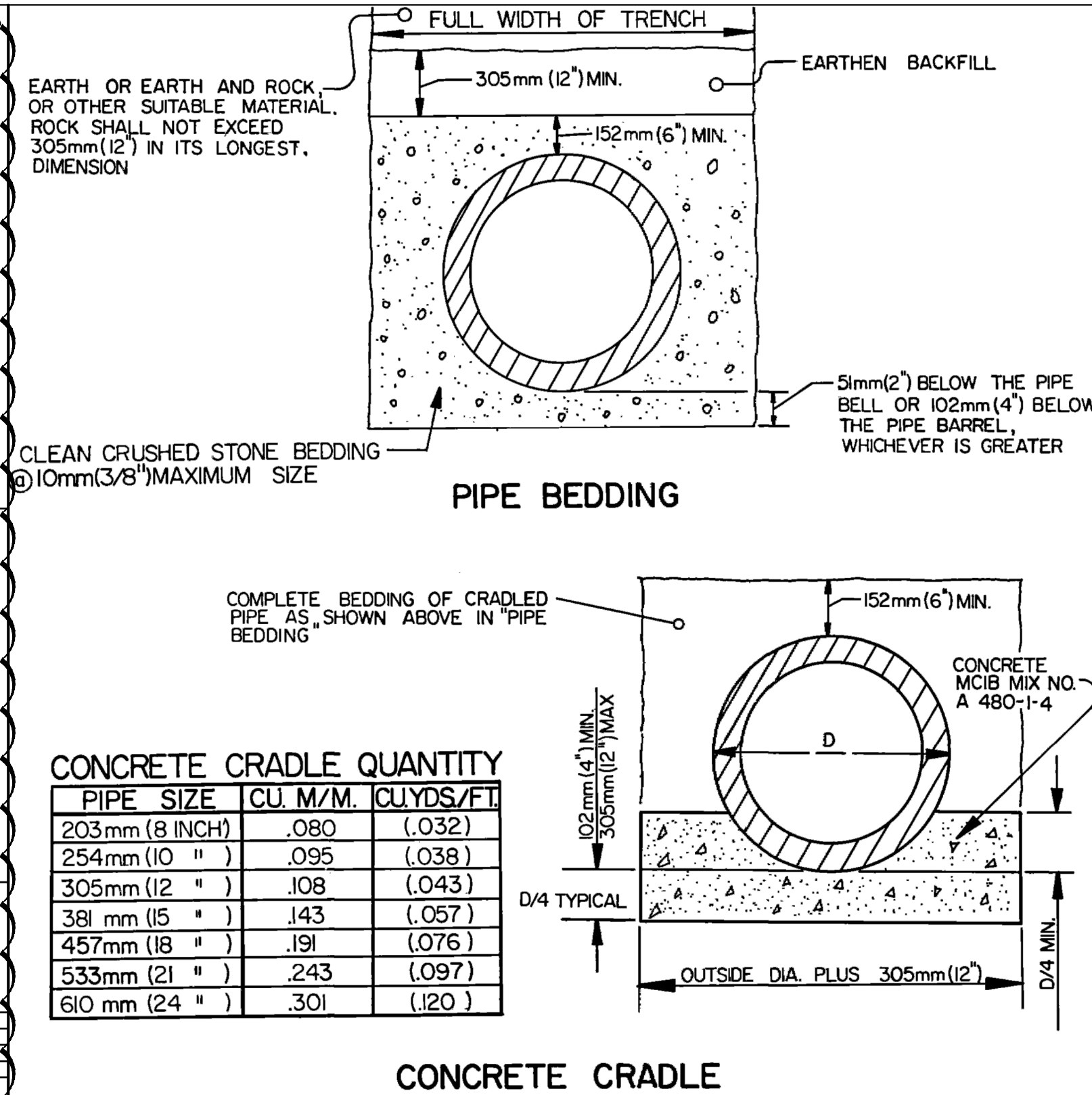
\*\*INCREASE IN MULTIPLES OF 6" (7'-0") MAX WITHOUT SPECIAL DESIGN. (SEE PROJECT PLANS FOR DETAILS)

- GENERAL NOTES:
- LOCATE RING AND COVER ON BLANK WALL.
  - USE 3/4" CHAMFER STRIP OR 3/4" R EDGER TOOL ON ALL EXPOSED CONCRETE CORNERS.
  - STEPS REQUIRED AT 16" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 4' ON BLANK WALL IF POSSIBLE.
  - BOXOUTS WILL NOT BE ALLOWED TO PROJECT THROUGH THE CORNERS OF THE STRUCTURE AND THE MINIMUM DISTANCE BETWEEN BOXOUTS IS 6".
  - THE MINIMUM REINFORCING SHALL BE 1 H-BAR OVER A CAST-IN-PLACE PIPE AND 2 H-BARS OVER A PRECAST BOXOUT.
  - PRECAST LIDS SHALL BE PINNED, SEALED WITH NON-SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
  - REINFORCING OF COVERS IN STREETS REQUIRE SPECIAL DESIGN.
  - FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.

LEE'S SUMMIT  
MISSOURI  
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

STANDARD DETAILS  
CITY OF LEE'S SUMMIT, MO  
LEE'S SUMMIT, JACKSON COUNTY, MO

STM-3



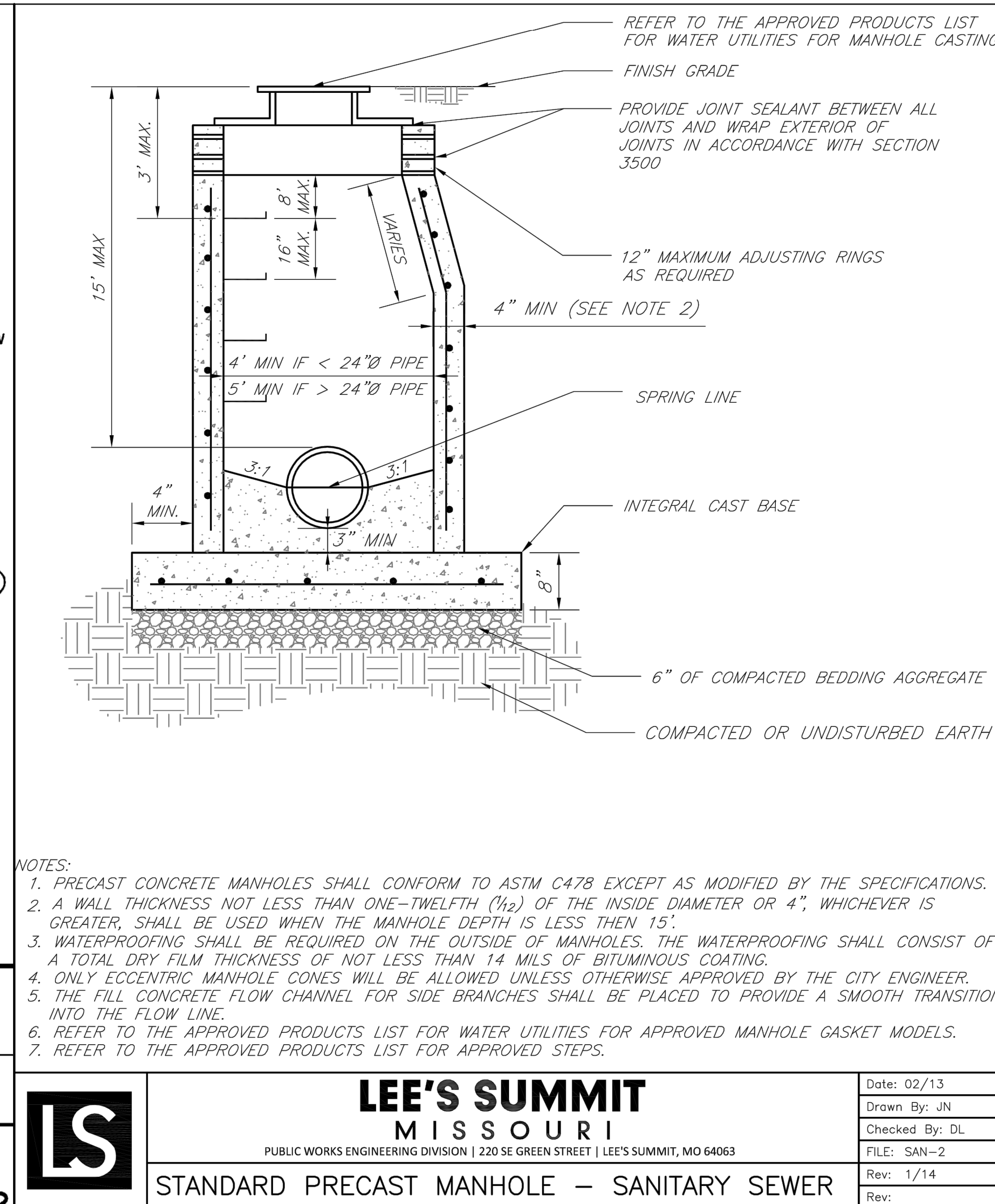
PIPE SIZE	CU. M/M.	CU.YDS/FT.
203mm (8 INCH)	.080	(.032)
254mm (10 " )	.095	(.038)
305mm (12 " )	.108	(.043)
381 mm (15 " )	.143	(.057)
457mm (18 " )	.191	(.076)
533mm (21 " )	.243	(.097)
610 mm (24 " )	.301	(.120 )

THIS DRAWING SUPERSEDES  
STANDARD DRAWING PB  
ENTRY NO. 81801  
REVISED 9-19-75

ADOPTED  
DIRECTOR OF PUBLIC WORKS  
DATE  
ENTRY NO. 780891  
PIPE BEDDING  
& CRADLE FOR  
SANITARY SEWER PIPE  
STANDARD  
PLAN  
PB-2

KANSAS CITY, MISSOURI  
DEPARTMENT OF  
PUBLIC WORKS  
ENGINEERING  
DIVISION

APPROVED  
CITY ENGINEER  
DATE



- NOTES:
- PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478 EXCEPT AS MODIFIED BY THE SPECIFICATIONS.
  - A WALL THICKNESS NOT LESS THAN ONE-TWELFTH (1/12) OF THE INSIDE DIAMETER OR 4", WHICHEVER IS GREATER, SHALL BE USED WHEN THE MANHOLE DEPTH IS LESS THAN 15'.
  - WATERPROOFING SHALL BE REQUIRED ON THE OUTSIDE OF MANHOLES. THE WATERPROOFING SHALL CONSIST OF A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 14 MILS OF BITUMINOUS COATING.
  - ONLY ECCENTRIC MANHOLE CONES WILL BE ALLOWED UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
  - THE FILL CONCRETE FLOW CHANNEL FOR SIDE BRANCHES SHALL BE PLACED TO PROVIDE A SMOOTH TRANSITION INTO THE FLOW LINE.
  - REFER TO THE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR APPROVED MANHOLE GASKET MODELS.
  - REFER TO THE APPROVED PRODUCTS LIST FOR APPROVED STEPS.

LEE'S SUMMIT  
MISSOURI  
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

STANDARD PRECAST MANHOLE - SANITARY SEWER

Date: 02/13  
Drawn By: JN  
Checked By: DL  
FILE: SAN-2  
Rev: 1/14  
Rev:

SAINT LUKE'S FLEX FACILITY EXPANSION PRIVATE  
SANITARY SEWER, PRIVATE STORM SEWER &  
PUBLIC WATER MAIN IMPROVEMENTS  
LEE'S SUMMIT, MISSOURI  
SANITARY & STORM SEWER DETAILS

STATE OF MISSOURI  
MATTHEW VAUGHN  
EBLEN  
NUMBER  
PE-2002000598  
PROFESSIONAL ENGINEER  
01/20/2020

ISSUE DATE  
11-18-2019  
REVISIONS  
PER CITY COMMENTS  
01-17-2020

ENGINEER  
DESIGNED BY  
DRAWN BY  
CHECKED BY  
McCLURE PROJECT No.  
SHEET NO.  
C304

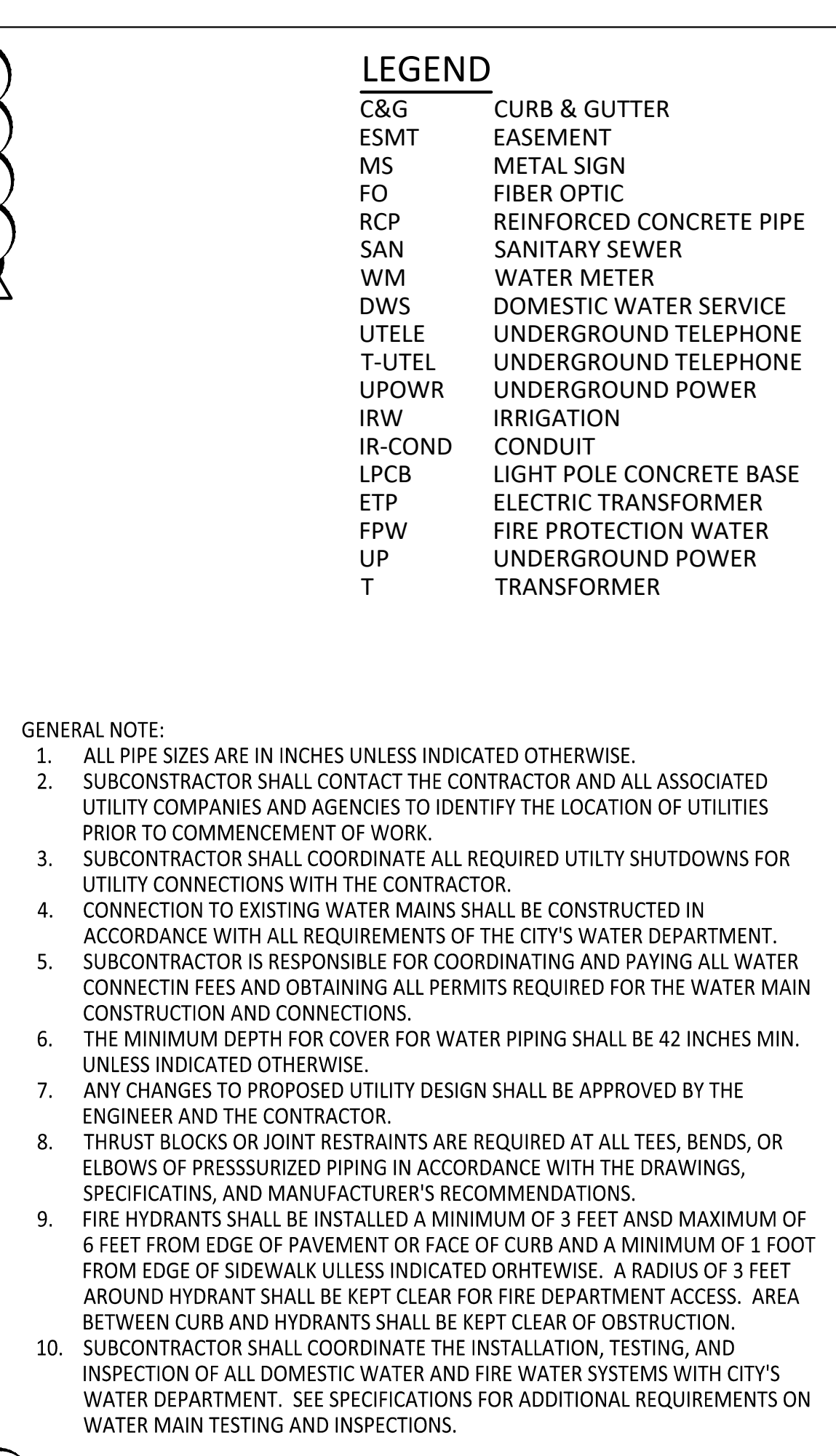
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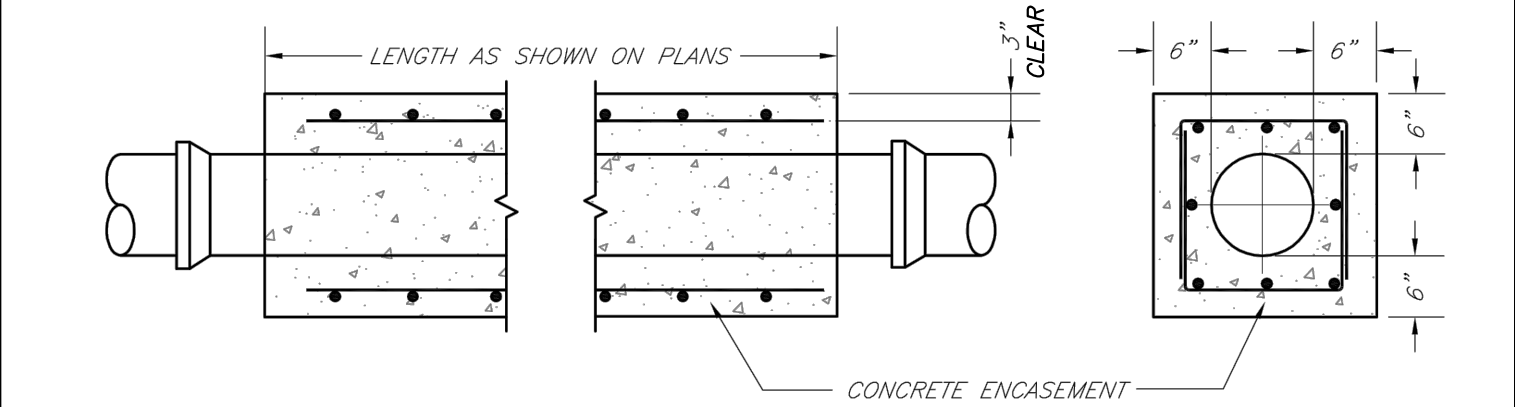












- NOTES:
1. INTERMEDIATE BELLS SHALL BE ENCASED.
  2. REINFORCING STEEL SHALL BE #4 @ 12" O.C. EACH WAY WITH A MINIMUM REBAR LAP OF 12".
  3. THIS DETAIL IS FOR PIPES 12" AND SMALLER.

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LEE'S SUMMIT

MISSOURI

PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

WATER PIPE ENCASEMENT

Date: 02/13

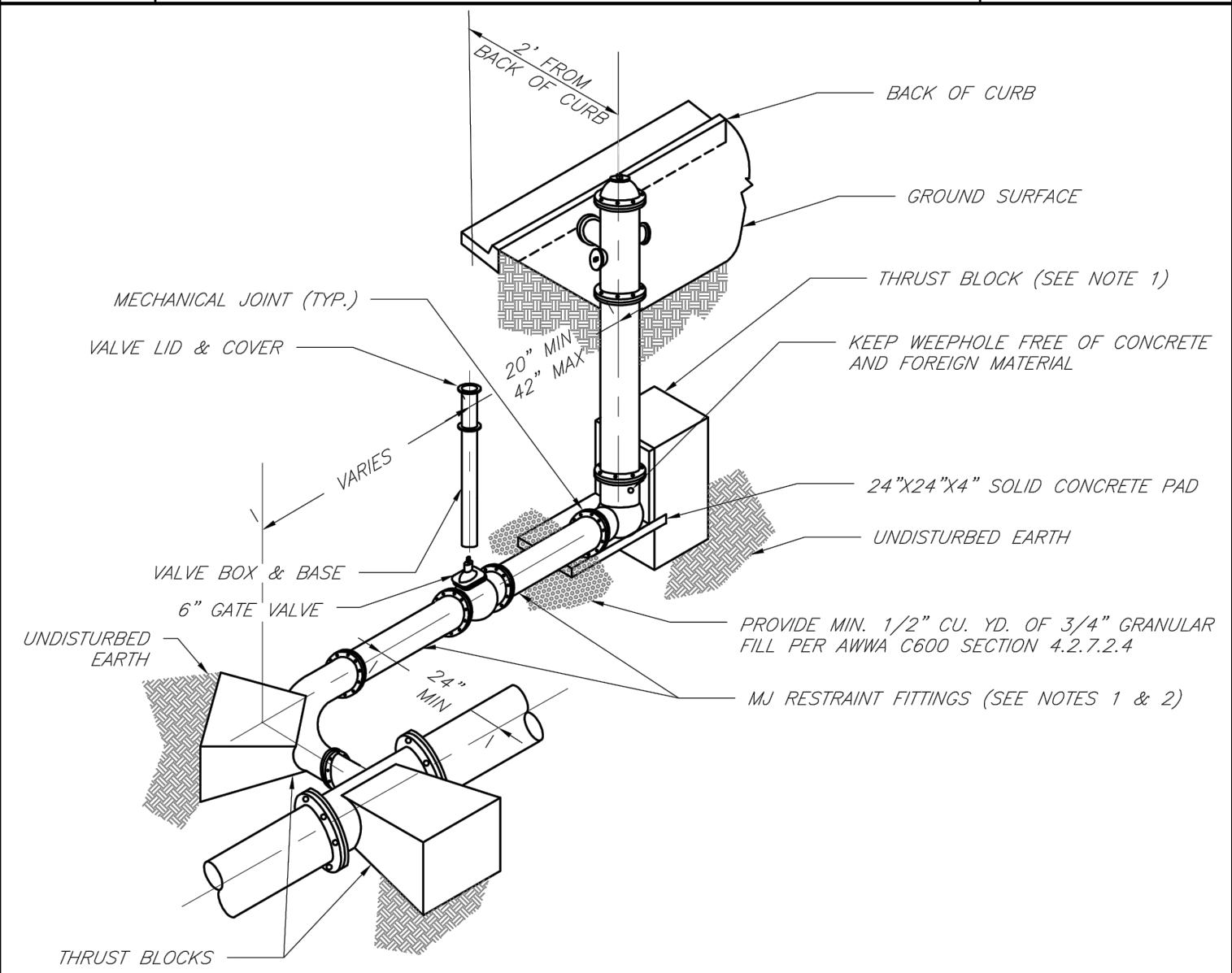
Drawn By: JN

Checked By: DL

FILE: WAT-4

Rev: 1/14

Rev:



- NOTES:
1. WHEN RETAINER GLANDS ARE USED IN LIEU OF MECHANICAL JOINT (MJ) RESTRAINT FITTINGS, HORIZONTAL THRUST BLOCKS ARE REQUIRED.
  2. GATE VALVE MAY BE BOLTED DIRECTLY TO MJ RESTRAINT TEE.
  3. SEE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR FIRE HYDRANT, VALVES, VALVE BOX LID, AND COVER.
  4. BOTTOM HYDRANT FLANGE SHALL BE 2" TO 6" ABOVE FINISHED GRADE.
  5. FOR STREETS WITHOUT CURBS FIRE HYDRANTS SHALL BE PLACED WITHIN 1 FOOT OF THE R/W LINE, BUT NOT MORE THAN 10' FROM EDGE OF PAVEMENT. FIRE HYDRANT SHALL NOT BE PLACED IN BOTTOM OF DITCH.
  6. HYDRANT SHALL BE ROTATED AS DIRECTED BY INSPECTOR.

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HYDRANT WITH 90 DEGREE BEND

Date: 02/13

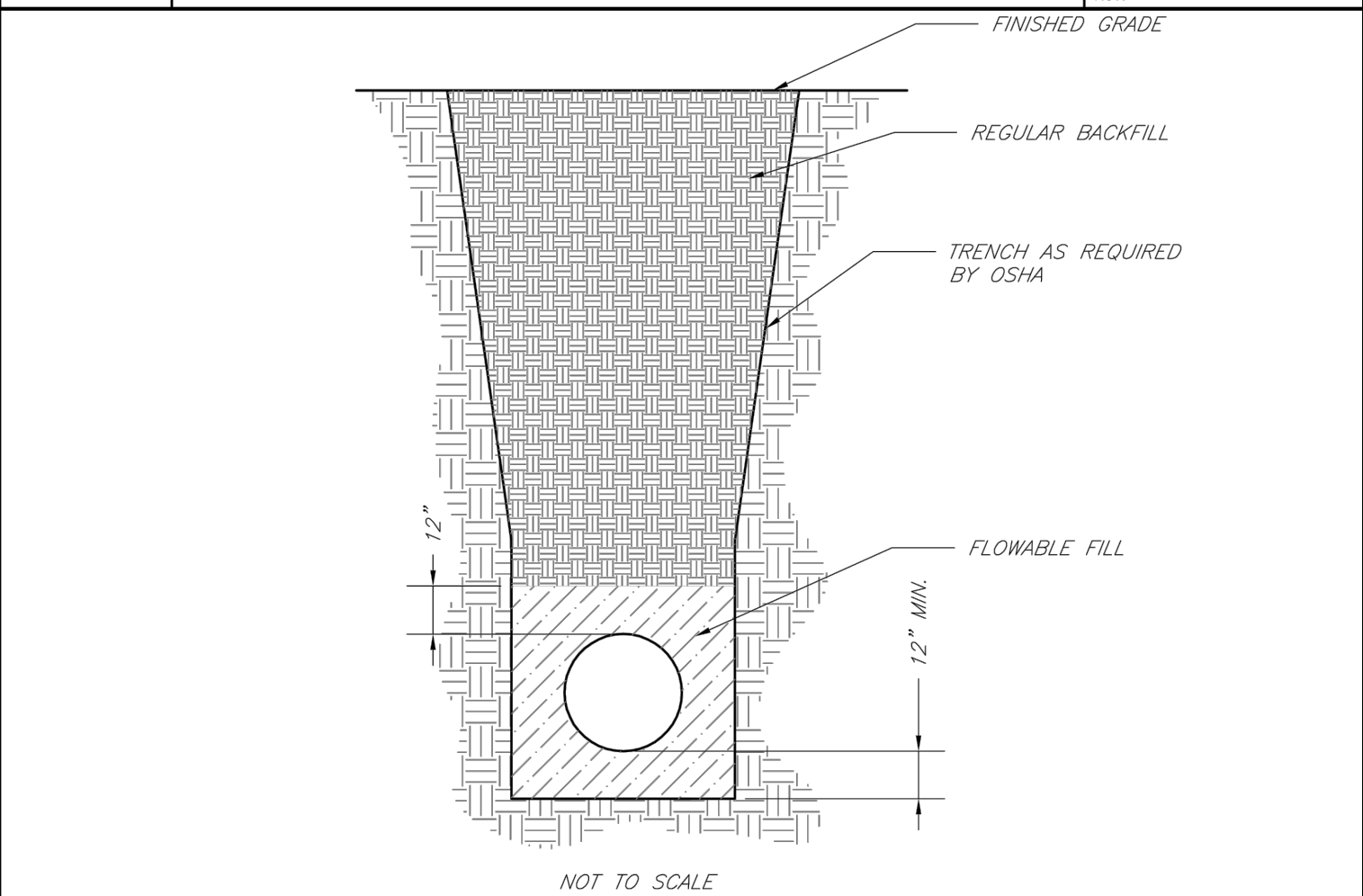
Drawn By: JN

Checked By: DL

FILE: WAT-8

Rev: 1/14

Rev:



- NOTES:
1. FLOWABLE FILL SHALL MEET THE REQUIREMENTS OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL.
  2. REGULAR BACKFILL ABOVE THE TRENCH CHECK SHALL BE FREE OF DEBRIS, ORGANIC MATTER, AND STONES > 6" IN ANY DIMENSION.
  3. TOP OF FLOWABLE BACKFILL SHALL EXTEND 12" ABOVE THE TOP OF THE PIPE.
  4. LENGTH OF TRENCH CHECK SHALL BE A MINIMUM OF 12".

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TRENCH CHECK

Date: 02/13

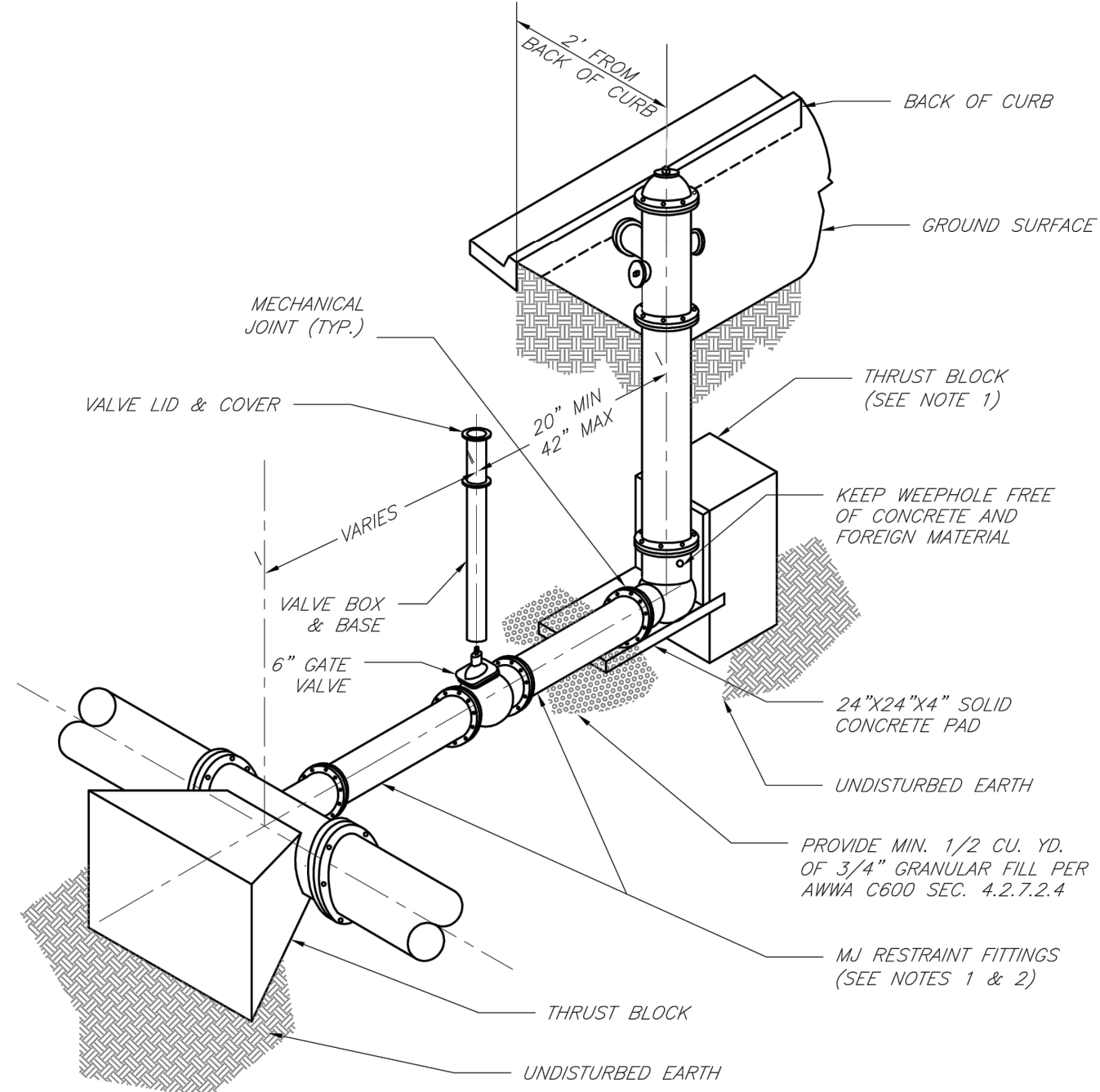
Drawn By: JN

Checked By: DL

FILE: WAT-6

Rev: 1/14

Rev:



- NOTES:
1. WHEN RETAINER GLANDS ARE USED IN LIEU OF MECHANICAL JOINT (MJ) RESTRAINT FITTINGS, HORIZONTAL THRUST BLOCKS ARE REQUIRED.
  2. GATE VALVE MAY BE BOLTED DIRECTLY TO MJ RESTRAINT TEE.
  3. SEE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR FIRE HYDRANT, VALVES, VALVE BOX LID, AND COVER.
  4. BOTTOM HYDRANT FLANGE SHALL BE 2" TO 6" ABOVE FINISHED GRADE.
  5. FOR STREETS WITHOUT CURBS FIRE HYDRANTS SHALL BE PLACED WITHIN 1 FOOT OF THE R/W LINE, BUT NOT MORE THAN 10' FROM EDGE OF PAVEMENT. FIRE HYDRANT SHALL NOT BE PLACED IN BOTTOM OF DITCH.
  6. HYDRANT SHALL BE ROTATED AS DIRECTED BY INSPECTOR.

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HYDRANT INSTALLATION — STRAIGHT SET

Date: 02/13

Drawn By: JN

Checked By: DL

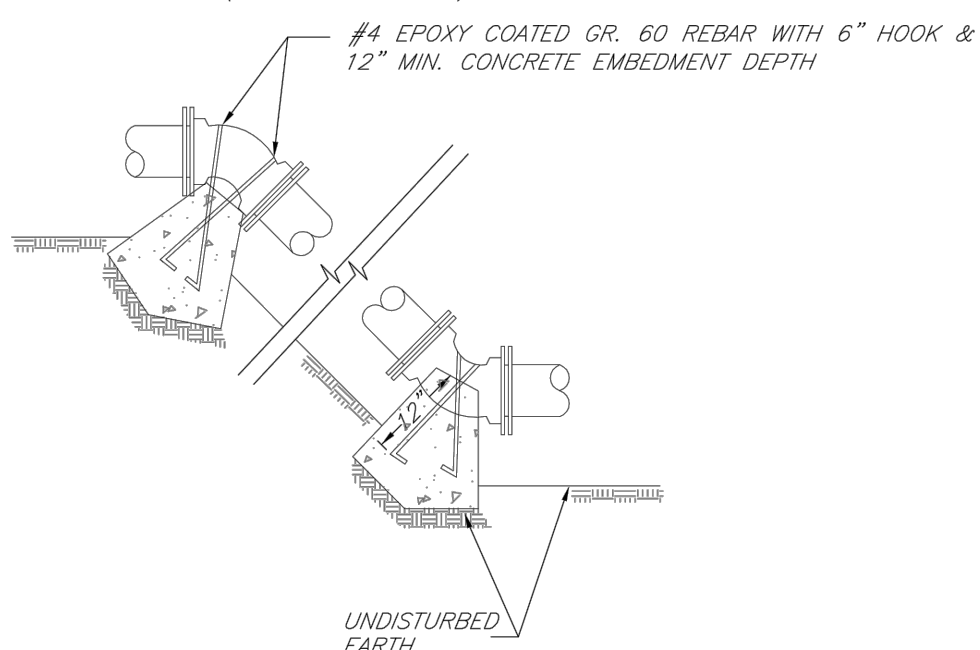
FILE: WAT-7

Rev: 1/14

Rev:

REQUIRED CONCRETE VOLUME (CUBIC FEET — CF)									
NOM. DIA. (INCHES)	180 TEE, PLUG	90 BEND	45 BEND	22.5 BEND	11.25 BEND				
6	50.5	71.4	38.6	19.7	9.9				
8	89.9	126.9	68.7	35.0	17.6				
10	140.2	198.3	107.3	54.7	27.5				
12	202.0	REST. JT.	154.6	78.8	39.6				
14	REST. JT.	REST. JT.	210.4	107.3	53.9				
16	REST. JT.	REST. JT.	REST. JT.	140.1	70.4				
18	REST. JT.	REST. JT.	REST. JT.	177.3	89.1				
20	REST. JT.	REST. JT.	REST. JT.	REST. JT.	110.0				
24	REST. JT.	REST. JT.	REST. JT.	REST. JT.	158.4				

- NOTES:
1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.
  2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.
  3. BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
  4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



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VERTICAL THRUST BLOCKS

Date: 02/13

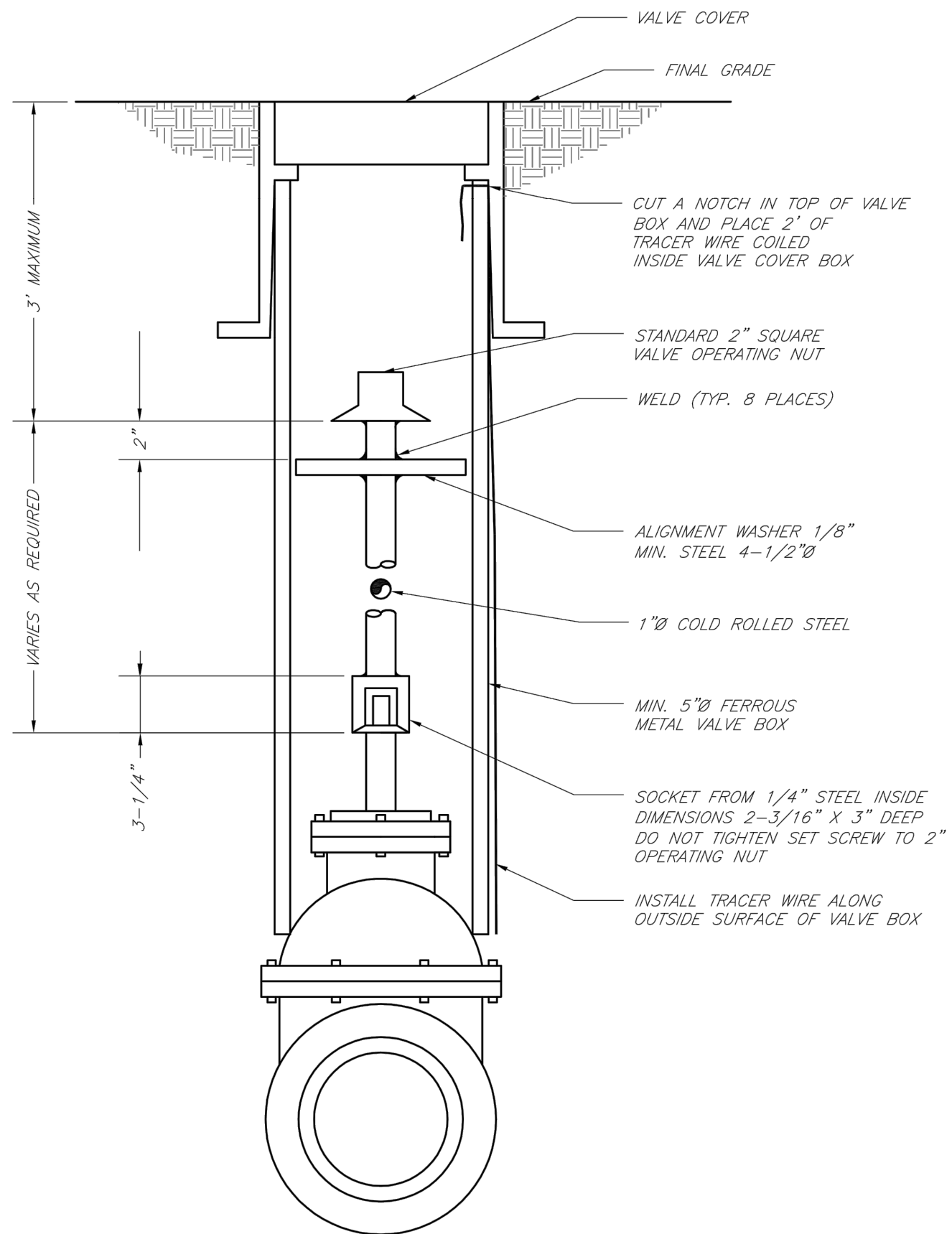
Drawn By: JN

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FILE: WAT-2

Rev: 1/14

Rev:



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VALVE STEM EXTENSION AND VALVE BOX

Date: 02/13

Drawn By: JN

Checked By: DL

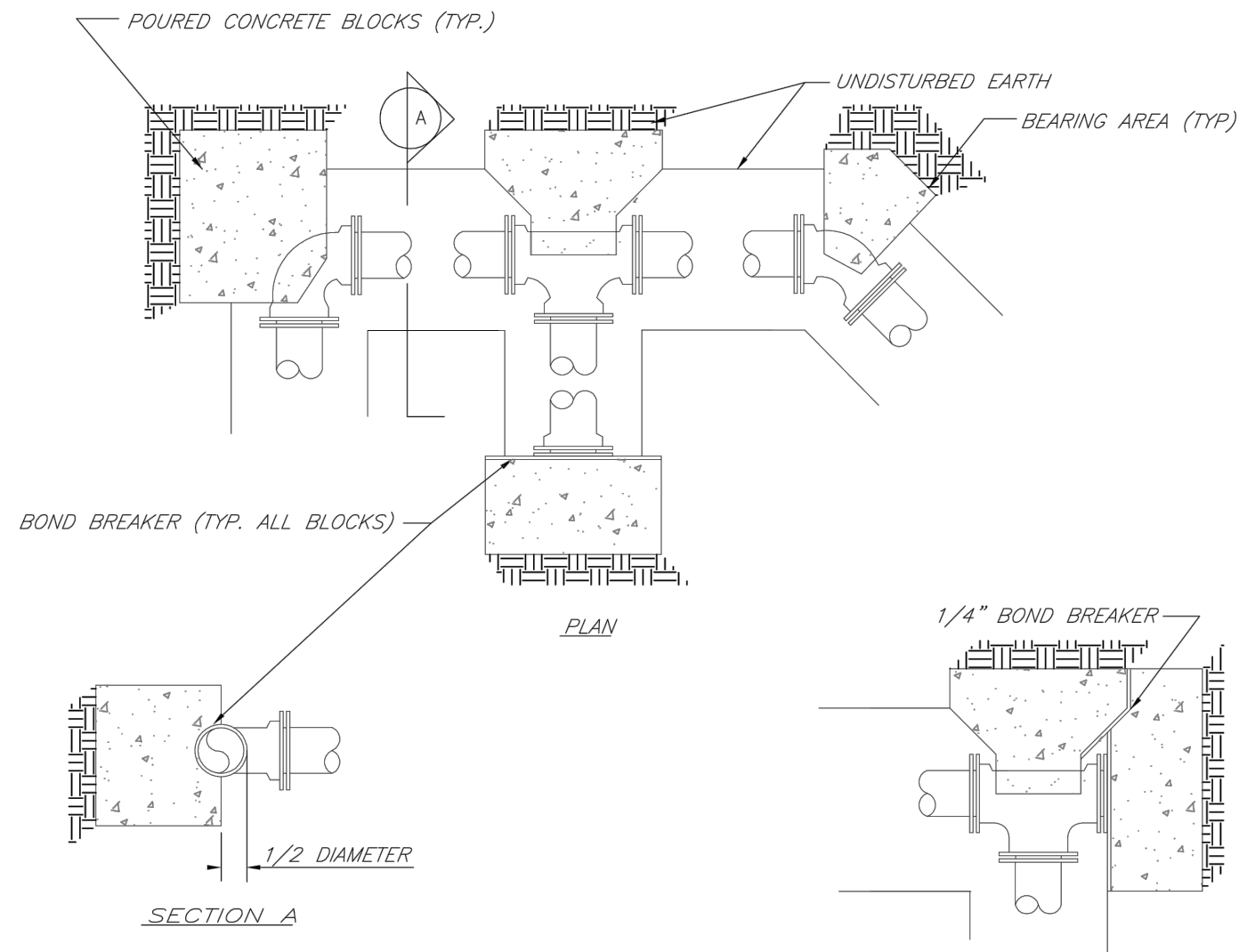
FILE: WAT-9

Rev: 1/14

Rev:

REQUIRED CONCRETE BEARING AREA (SQUARE FEET — SF)									
NOM. DIA. (INCHES)	180 TEE, PLUG	90 BEND	45 BEND	22.5 BEND	11.25 BEND				
6	4.7	6.7	4.0	4.0	4.0				
8	8.4	11.8	6.4	4.0	4.0				
10	13.1	18.5	10.0	5.1	4.0				
12	18.8	26.7	14.4	7.4	4.0				
14	25.7	36.3	19.6	10.0	5.0				
16	33.5	47.4	25.6	13.1	6.6				
18	42.4	REST. JT.	32.5	16.5	8.3				
20	REST. JT.	REST. JT.	40.1	20.4	10.3				
24	REST. JT.	REST. JT.	REST. JT.	29.4	14.8				

- NOTES:
1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.
  2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.
  3. BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
  4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



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HORIZONTAL THRUST BLOCKS

Date: 02/13

Drawn By: JN

Checked By: DL

FILE: WAT-1

Rev: 1/14

Rev:

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SANITARY SEWER, PRIVATE STORM SEWER &  
PUBLIC WATER MAIN IMPROVEMENTS  
LEE'S SUMMIT, MISSOURI  
STANDARD WATER LINE DETAILS



ISSUE DATE  
11-18-2019  
REVISIONS

ENGINEER  
DESIGNED BY  
DRAWN BY  
CHECKED BY

McClure PROJECT No.

SHEET NO.

C402