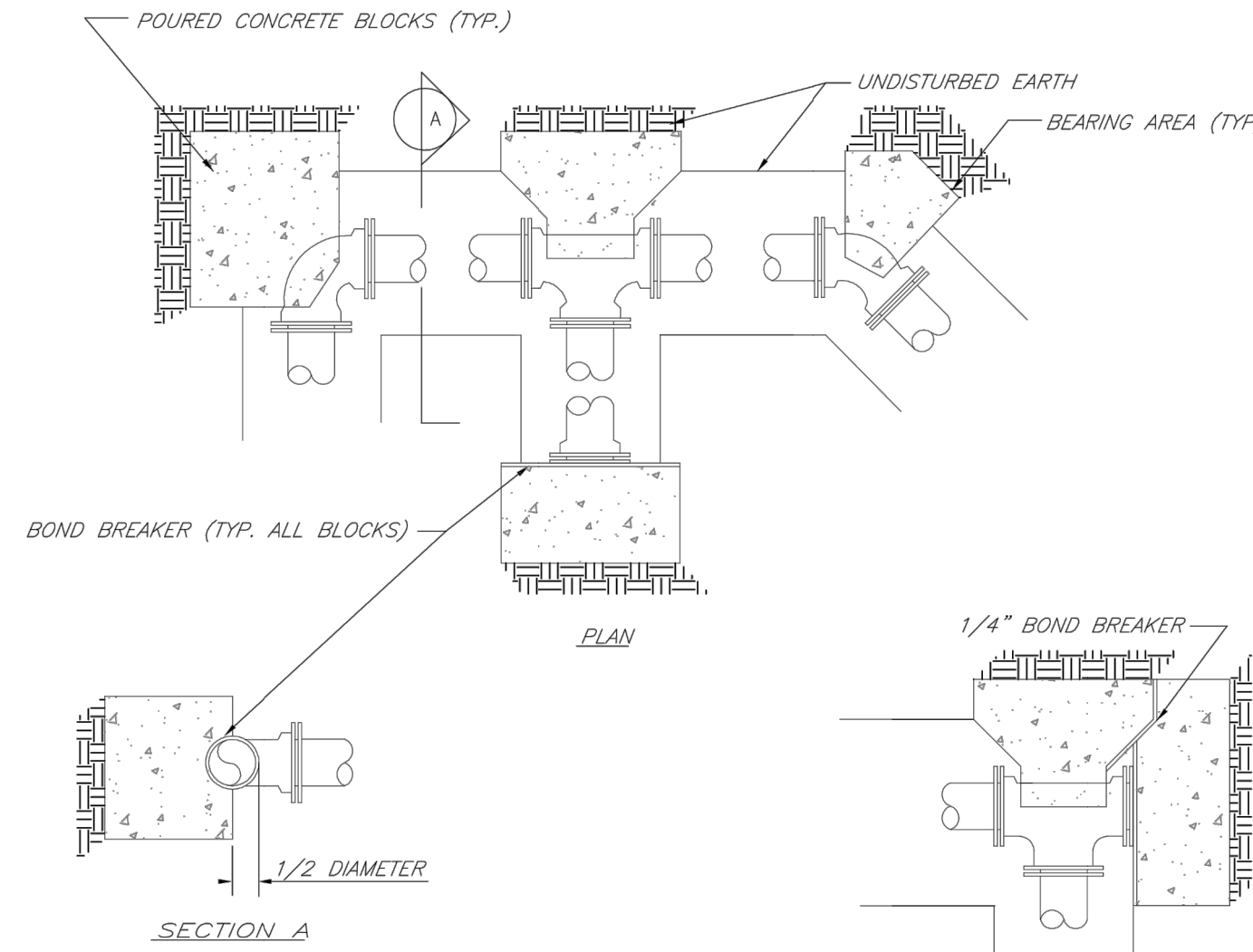


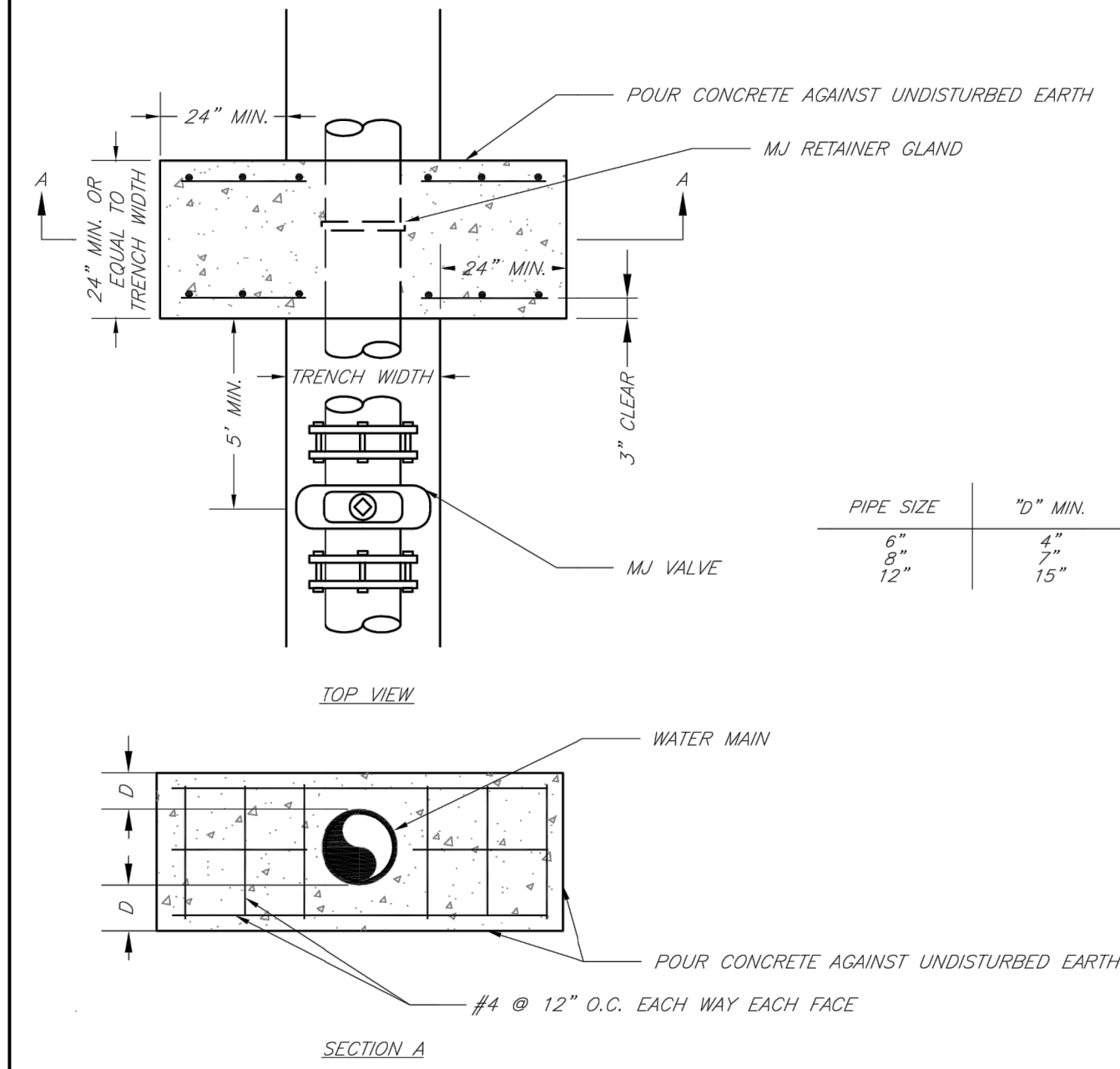
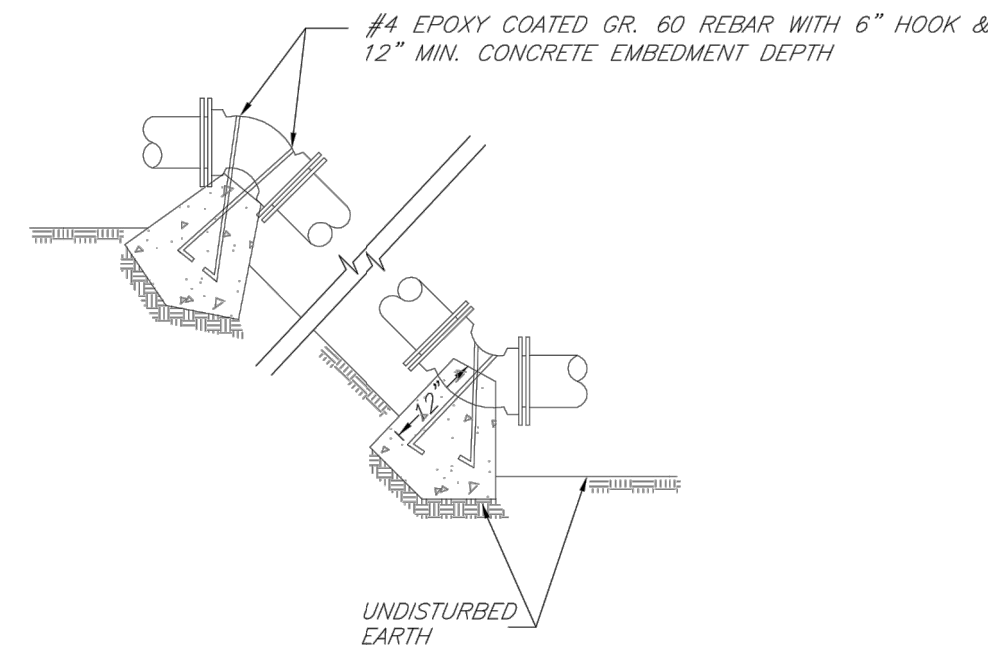
REQUIRED CONCRETE BEARING AREA (SQ. FEET - SF)							
NOM. DIA. (INCHES)	TEE, FLUG	BEND	BEND	BEND	BEND	BEND	BEND
6	4.7	6.7	4.0	4.0	4.0	4.0	4.0
8	8.4	11.8	6.4	4.0	4.0	4.0	4.0
10	13.1	18.5	10.0	5.1	4.0	4.0	4.0
12	18.8	26.7	14.4	7.4	4.0	4.0	4.0
14	25.7	36.3	19.6	10.0	5.0	4.0	4.0
16	33.5	47.4	25.6	13.1	6.6	4.0	4.0
18	42.4	60.2	32.5	16.5	8.3	4.0	4.0
20	REST. JT.	REST. JT.	40.1	20.4	10.3	4.0	4.0
24	REST. JT.	REST. JT.	REST. JT.	29.4	14.8	4.0	4.0

- 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.



REQUIRED CONCRETE VOLUME (CUBIC FEET - CF)							
NOM. DIA. (INCHES)	TEE, FLUG	BEND	BEND	BEND	BEND	BEND	BEND
6	50.5	71.4	38.6	19.7	9.9	9.9	9.9
8	89.8	126.9	62.7	35.0	17.6	17.6	17.6
10	140.2	198.3	107.3	54.7	27.5	27.5	27.5
12	202.0	REST. JT.	154.6	76.8	39.6	39.6	39.6
14	REST. JT.	REST. JT.	210.4	107.3	53.9	53.9	53.9
16	REST. JT.	REST. JT.	REST. JT.	140.1	70.4	70.4	70.4
18	REST. JT.	REST. JT.	REST. JT.	177.3	89.1	89.1	89.1
20	REST. JT.	REST. JT.	REST. JT.	REST. JT.	110.0	110.0	110.0
24	REST. JT.	REST. JT.	REST. JT.	REST. JT.	158.4	158.4	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.



NOTE:
 THIS DETAIL NOT TO BE USED FOR PIPE GREATER THAN 12"

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

HORIZONTAL THRUST BLOCKS

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

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

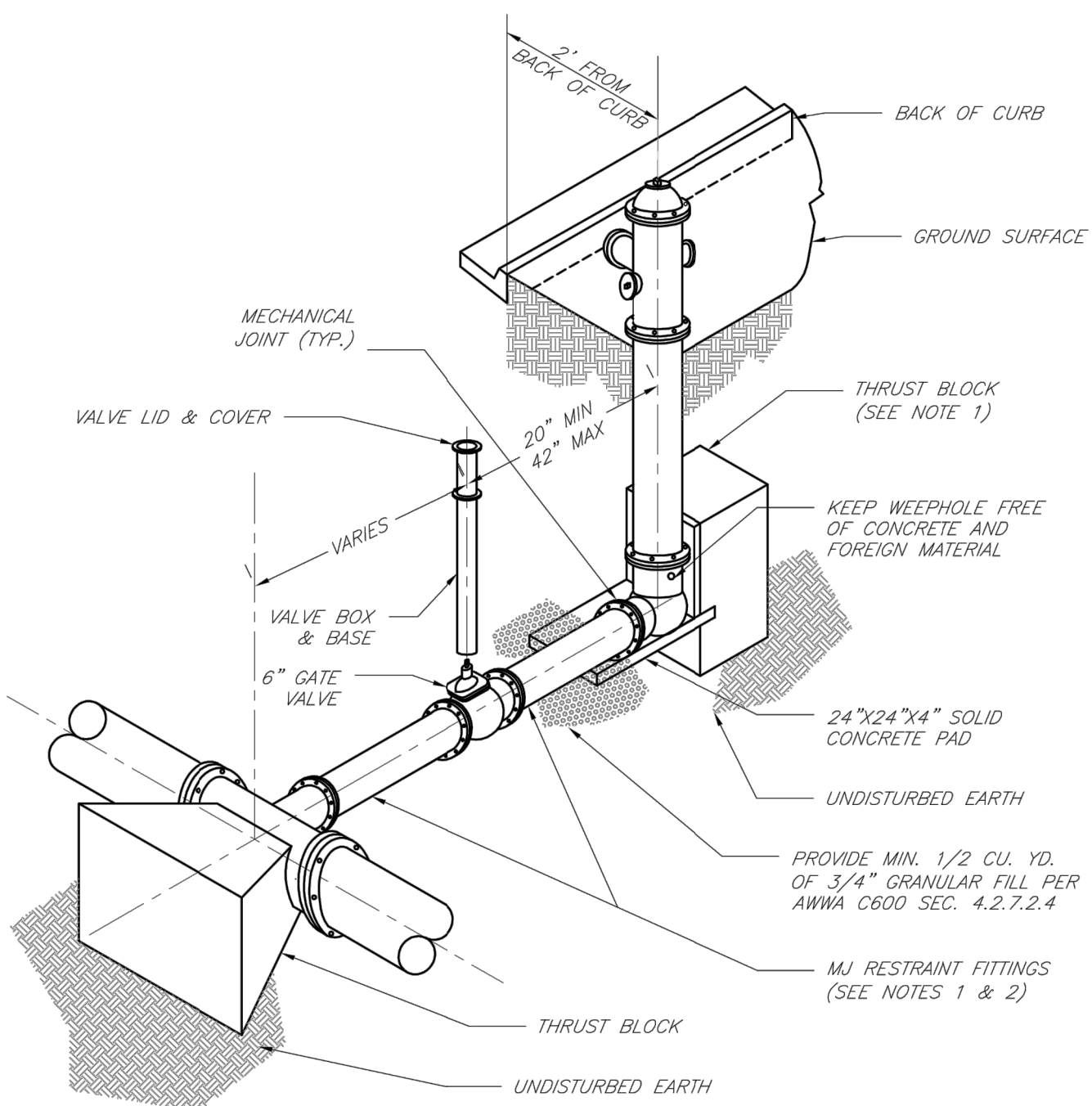
VERTICAL THRUST BLOCKS

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

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STRADDLE BLOCK

Date: 02/13
 Drawn By: JN
 Checked By: DL
 FILE: WAT-3
 Rev: 1/14

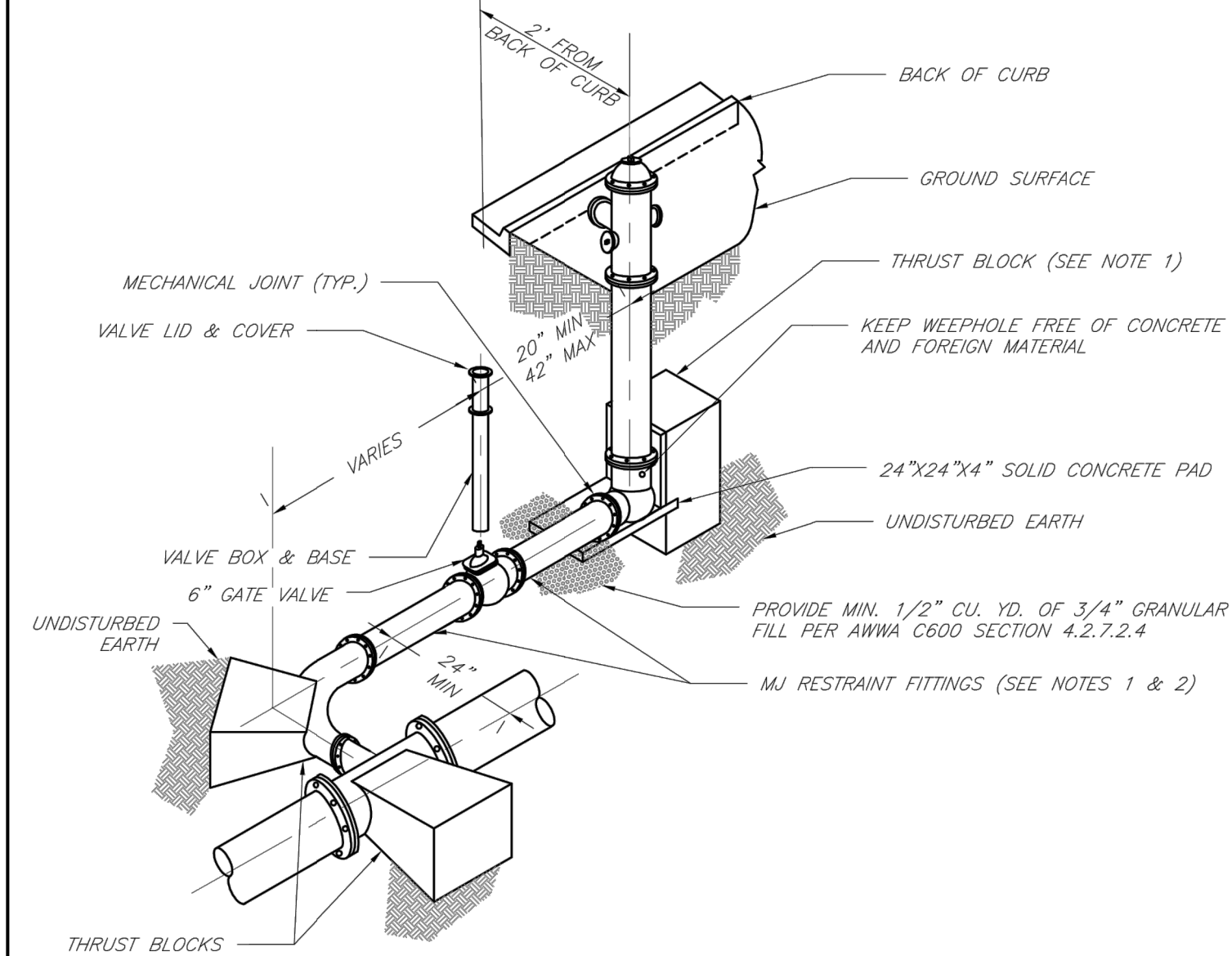


- NOTES:
 1. WHEN RETAINER GLANDS ARE USED IN LIEU OF MECHANICAL JOINT (MJ) RESTRAINT FITTINGS, HORIZONTAL THRUST BLOCKS ARE REQUIRED.
 2. GATE VALVE MAY BE BOLTED DIRECTLY TO MJ RESTRAINT TEE.
 3. SEE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR FIRE HYDRANT, VALVES, VALVE BOX LID, AND COVER.
 4. 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

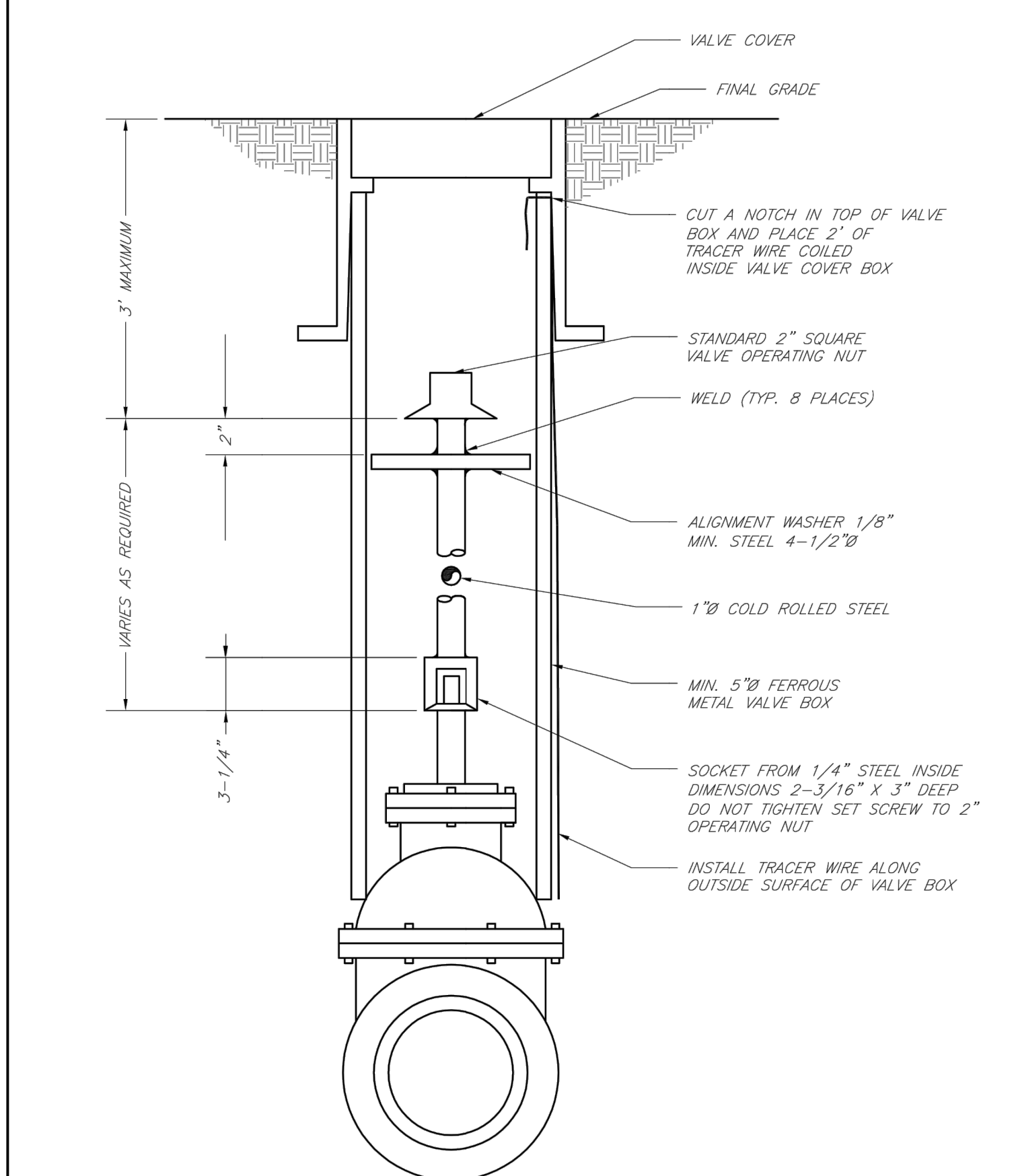


- NOTES:
 1. WHEN RETAINER GLANDS ARE USED IN LIEU OF MECHANICAL JOINT (MJ) RESTRAINT FITTINGS, HORIZONTAL THRUST BLOCKS ARE REQUIRED.
 2. GATE VALVE MAY BE BOLTED DIRECTLY TO MJ RESTRAINT TEE.
 3. SEE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR FIRE HYDRANT, VALVES, VALVE BOX LID, AND COVER.
 4. 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.

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

HYDRANT WITH 90 DEGREE BEND

Date: 02/13
 Drawn By: JN
 Checked By: DL
 FILE: WAT-8
 Rev: 1/14



LEE'S SUMMIT MISSOURI
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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

REVISIONS

2/8/19	Bid Set
REV 2/12/19	
REV 5/7/19	
REV 5/30/19	