

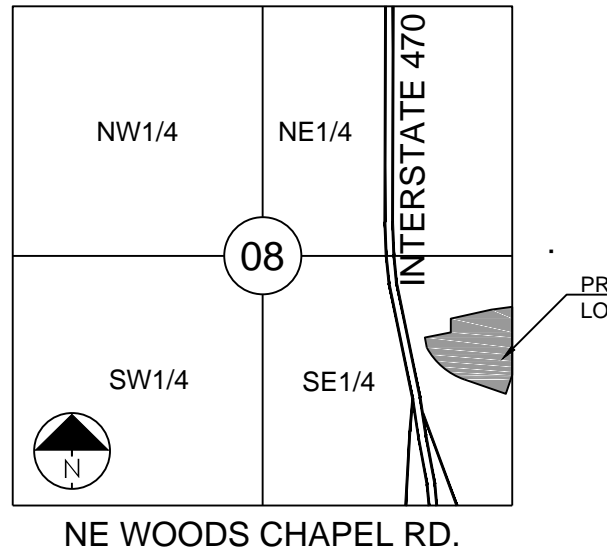
# WATER MAIN PLANS FOR COLEMAN EQUIPMENT

IN THE CITY OF LEE'S SUMMIT  
JACKSON COUNTY, MISSOURI

**LEGEND:**

A/E	- ACCESS EASEMENT
BC	- BACK OF CURB
B/B	- BACK TO BACK
BM	- BENCHMARK
BL or B.L.	- BUILDING LINE
CO	- CLEANOUT
TJB	- TELEPHONE JUNCTION BOX
C&G	- CURB AND GUTTER
D/E	- DRAINAGE EASEMENT
E/E	- ELECTRICAL EASEMENT
EL	- ELEVATION
FL	- FLOW LINE
G/E	- GAS LINE EASEMENT
HDPE	- HIGH-DENSITY POLYETHYLENE
L/E	- LANDSCAPE EASEMENT
MSFE	- MINIMUM SERVICEABLE FLOOR ELEVATION
PVC	- POLYVINYL CHLORIDE
P/L	- PROPERTY LINE
PUB/E	- PUBLIC EASEMENT
RCP	- REINFORCED CONCRETE PIPE
ROW or R/W	- RIGHT-OF-WAY
S/E	- SANITARY SEWER EASEMENT
SL	- SERVICE LINE
S/W	- SIDEWALK
TE	- TOP ELEVATION
U/E	- UTILITY EASEMENT
WSE	- WATER SURFACE ELEVATION
W/E	- WATERLINE EASEMENT

	ASPHALT PAVEMENT - EXISTING
	ASPHALT PAVEMENT - PROPOSED
	CONCRETE PAVEMENT - EXISTING
	ASPHALT PAVEMENT - EXISTING
	CONCRETE SIDEWALK - EXISTING
	CONCRETE SIDEWALK - PROPOSED
	CURB & GUTTER
	CURB & GUTTER - EXISTING
	TREELINE
	EXISTING LOT AND R/W LINES
	EXISTING PLAT LINES
	PROPERTY LINES
	RIGHT-OF-WAY
	SANITARY SEWER MAIN
	SANITARY SEWER MAIN - EXIST.
	STORM SEWER
	STORM SEWER - EXISTING
	CABLE TV - EXISTING
	FIBER OPTIC CABLE - EXISTING
	TELEPHONE LINE - EXIST.
	ELECTRIC LINE - EXISTING
	OVERHEAD POWER LINE - EXIST.
	UNDERGROUND ELECTRIC - EX.
	GAS LINE - EXISTING
	WATERLINE - EXISTING
	LIGHT - EXISTING
	EXISTING MANHOLE
	CLEANOUT
	EXISTING SANITARY MANHOLE
	PROPOSED SANITARY MANHOLE
	EXISTING AREA INLET
	EXISTING CURB INLET
	EXISTING GRATE INLET
	EXISTING JUNCTION BOX
	EXISTING STORM MANHOLE
	FIRE HYDRANT
	TEE FITTING
	WATER VALVE
	BEND FITTING



SECTION 09-48N-31W

**LOCATION MAP**  
SCALE 1" = 2000'

**UTILITY CONTACTS:**

MISSOURI DEPARTMENT OF  
TRANSPORTATION (MODOT)

Steve Holloway  
600 NE Colbern Road  
Lee's Summit, MO 64086  
(816) 607-2186

MISSOURI GAS ENERGY (MGE)

Brent Jones  
3025 SE Clover Drive  
Lee's Summit, MO 64082  
(816) 399-9633  
brent.jones@spireenergy.

KANSAS CITY POWER & LIGHT  
COMPANY (KCP&L)

Ron DeJarnette  
1300 SE Hamblin Road  
Lee's Summit, MO 64081  
Office: (816) 347-4316  
Cell: (816) 810-5234  
ron.dejarnette@kcpl.com

CITY OF LEES SUMMIT PUBLIC WORKS

Dena Mezger  
220 SE Green Street  
Lee's Summit, MO 64063  
(816) 969-1800

AT&T

Mark Manion or Marty Loper  
500 E. 8th Street, Room 370  
Kansas City, MO 64106  
(816) 275-2341 or (816) 275-1550

COMCAST CABLE

Barbara Brown  
3400 W. Duncan Road  
Blue Springs, MO 64015  
(816) 795-2255

PUBLIC WATER SUPPLY DISTRICT

Mark Schaufler  
220 SE Green Street  
Lee's Summit, MO 64063  
(816) 969-1900

**GENERAL NOTES:**

1. ALL CONSTRUCTION TO FOLLOW THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL AS ADOPTED BY ORDINANCE 5813.
2. ALL WORKMANSHIP AND MATERIALS SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF THE ENGINEERING DEPARTMENT OF THE CITY OF LEE'S SUMMIT, MISSOURI.
3. LINEAL FOOT MEASUREMENTS SHOWN ON THE PLANS ARE HORIZONTAL MEASUREMENTS, NOT SLOPE MEASUREMENTS. ALL PAYMENTS SHALL BE MADE ON HORIZONTAL MEASUREMENTS.
4. NO GEOLOGICAL INVESTIGATION HAS BEEN PERFORMED ON THE SITE.
5. THE UTILITY LOCATIONS SHOWN ON THESE PLANS ARE TAKEN FROM UTILITY COMPANY RECORDS AND APPARENT FIELD LOCATIONS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
6. 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 CONTRACTOR MAY ALSO UTILIZE THE FOLLOWING TO OBTAIN FIRST 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.
7. PRIOR TO ORDERING PRECAST STRUCTURES, SHOP DRAWING SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR APPROVAL.
8. THE CONTRACTOR SHALL PROTECT ALL MAJOR TREES FROM DAMAGE. NO TREE SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER, UNLESS SHOWN OTHERWISE.
9. ALL EROSION AND SEDIMENTATION DISPOSITIONS AND DISPOSAL OF ALL DEBRIS THEREFROM SHALL BE PERFORMED BY THE CONTRACTOR IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND ORDINANCES.
10. ALL WASTE MATERIAL RESULTING FROM THE PROJECT SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR, OR AS DIRECTED BY THE OWNER AT NO ADDITIONAL COST.
11. ALL EXCAVATIONS SHALL BE UNCLASSIFIED. NO SEPARATE PAYMENT WILL BE MADE FOR ROCK EXCAVATION.
12. THE CONTRACTOR SHALL CONTROL THE EROSION AND SILTATION DURING ALL PHASED OF CONSTRUCTION, AND SHALL KEEP THE STREETS CLEAN OF MUD AND DEBRIS.
13. THE CONTRACTOR SHALL CONTACT PUBLIC WORKS INSPECTIONS AT: 816-969-1800 TO OBTAIN A PUBLIC WORKS CONSTRUCTION PERMIT. A MINIMUM 48 HOUR NOTICE SHALL BE GIVEN PRIOR TO PERMIT ISSUANCE.
14. THE CONTRACTOR SHALL CONTACT THE CITY'S EROSION CONTROL SPECIALIST AT: 816-969-1800 PRIOR TO ANY LAND DISTURBANCE.
15. THE CONTRACTOR SHALL CONTACT THE RIGHT OF WAY INSPECTOR AT 816-969-1800 PRIOR TO ANY LAND DISTURBANCE ACTIVITIES WITHIN THE RIGHT OF WAY. THESE ACTIVITIES MAY REQUIRE A PERMIT.
16. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TRAFFIC HANDLING MEASURES NECESSARY TO ENSURE THAT THE GENERAL PUBLIC IS PROTECTED AT ALL TIMES. TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM CONTROLLED DEVICES (2003 EDITION).
17. ALL SANITARY SEWER LATERALS SHALL HAVE A TRENCH CHECK, CONSISTING OF FLOWABLE BACKFILL, INSTALLED DURING CONSTRUCTION. TRENCH CHECK SHALL EXTEND TO BOTTOM OF TRENCH, TO WIDTH OF TRENCH, TO 12 INCHES ABOVE PIPE, FOR A MINIMUM LENGTH OF 12 INCHES. TRENCH CHECK SHALL BE LOCATED AT LEAST 5 FEET FROM SANITARY MAIN.

### EARTHWORK:

1. PRIOR TO EARTHWORK ACTIVITIES, PRE-DISTURBANCE EROSION AND SEDIMENT CONTROL DEVICES SHALL BE IN PLACE PER THE STORM WATER POLLUTION PREVENTION PLAN AND/OR THE EROSION AND SEDIMENT CONTROL PLAN PREPARED FOR THIS SITE.
2. ALL BACKFILL MATERIAL SHALL BE PLACED IN MAXIMUM 6-INCH LIFTS AND COMPACTED TO 95-PERCENT OF MAXIMUM DENSITY AS DEFINED USING A STANDARD PROCTOR TEST (AASHTO T99/ASTM 698).
3. BACKFILL MATERIALS SHALL NOT INCLUDE ORGANIC MATTER, DEBRIS OR TOPSOIL.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REDISTRIBUTING THE TOPSOIL OVER PROPOSED TURF AND LANDSCAPED AREAS TO A MINIMUM DEPTH OF 6-INCHES BELOW FINAL GRADE.
5. ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE. UNLESS NOTED OTHERWISE THE FOLLOWING GRADES SHALL APPLY:
  - A. TURF AREAS - 2.5% MINIMUM, 4H:1V MAXIMUM
  - ALL DISTURBED AREAS SHALL BE FERTILIZED, SEEDED AND MULCHED IMMEDIATELY AFTER EXCAVATION ACTIVITIES HAVE CEASED. SEEDING SHALL BE PER THE EROSION AND SEDIMENT CONTROL PLAN AND/OR LANDSCAPE PLAN. IF NOT SPECIFIED SEEDING SHALL BE PER APWA SECTION 2400, LATEST EDITION, UNLESS OTHERWISE NOTED. SEEDING SHALL BE SUBSIDIARY TO THE CONTRACT PRICE FOR PIPE INSTALLATION.
7. CONTRACTOR SHALL ADHERE TO THE REPORTING REQUIREMENTS OUTLINED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED FOR THIS PROJECT. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PROPERLY MAINTAINED AND KEPT CLEAN OF SILT AND DEBRIS AND IN GOOD WORKING ORDER. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS REQUIRED.

**UTILITIES:**

1. EXISTING UTILITIES HAVE BEEN SHOWN TO THE GREATEST EXTENT POSSIBLE BASED UPON INFORMATION PROVIDED TO THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE RESPECTIVE UTILITY COMPANIES AND FIELD LOCATING UTILITIES PRIOR TO CONSTRUCTION AND IDENTIFYING ANY POTENTIAL CONFLICTS. ALL CONFLICTS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ANY REQUIRED UTILITY RELOCATIONS. UTILITIES DAMAGED THROUGH THE NEGLIGENCE OF THE CONTRACTOR SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. CONTRACTOR SHALL VERIFY FLOW-LINES AND STRUCTURE TOPS PRIOR TO CONSTRUCTION, AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES. PROVIDE SHOP DRAWINGS FOR ALL PRECAST AND MANUFACTURED UTILITY STRUCTURES FOR REVIEW BY THE ENGINEER PRIOR TO CONSTRUCTION OF THE STRUCTURES.
4. UTILITY SEPARATION: WATERLINES SHALL HAVE A MINIMUM OF 10 FEET HORIZONTAL AND 2 FEET VERTICAL SEPARATION FROM ALL SANITARY AND STORM SEWER LINES. IF MINIMUM SEPARATIONS CAN NOT BE OBTAINED, CONCRETE ENCASEMENT OF THE SANITARY OR STORM SEWER LINE SHALL BE REQUIRED 10 FEET IN EACH DIRECTION OF THE CONFLICT.
5. PAYMENT FOR TRENCHING, PIPE EMBEDMENT, FLOWABLE FILL, BACKFILL MATERIALS, CLEAN UP, SEEDING, SODDING AND ANY OTHER ITEMS NECESSARY FOR THE CONSTRUCTION OF THE UTILITY LINE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE UTILITY INSTALLATION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING RESPECTIVE UTILITY COMPANIES 48-HOURS IN ADVANCE FOR THE INSPECTION OF ANY PROPOSED UTILITY MAIN EXTENSION OR SERVICE LINE OR SERVICE CONNECTION TO ANY EXISTING MAIN.
7. EXCESS SOILS SHALL BE IMMEDIATELY PLACED ONSITE ADJACENT TO THE TRENCH, AND COMPACTED TO PREVENT SATURATION AND EXCESS SEDIMENT RUNOFF. UNSUITABLE MATERIALS, ROCK AND SHALE, ASPHALT, CONCRETE, TREES, BRUSH ETC. SHALL BE PROPERLY DISPOSED OF OFFSITE. MATERIALS MAY BE WASTED ONSITE AT THE DIRECTION OF THE OWNER OR HIS APPOINTED REPRESENTATIVE.

Sheet List Table	
Sheet Number	Sheet Title
W0.0	WATER COVER
W1.0	GENERAL LAYOUT
W2.0	PLAN AND PROFILE
W3.0	DETAILS
W3.1	DETAILS

**PREPARED AND SUBMITTED BY:**

SCHLAGEL & ASSOCIATES, P.A.

**APPROVED BY:**

CITY ENGINEER  
APPROVED FOR ONE YEAR FROM THIS DATE

**OWNER/DEVELOPER:**

COLEMAN EQUIPMENT  
-  
24000 W 43RD STREET  
BONNER SPRINGS, KANSAS 66012  
p 913-422-3040  
f -  
-



**SCHLAGEL & ASSOCIATES, P.A.**  
 Engineers • Planners • Surveyors • Landscape Architects  
 14920 West 107th Street • Lenexa, Kansas 66215  
 (913) 492-5159 • Fax: (913) 492-8400  
 WWW.SCHLAGELASSOCIATES.COM  
 Missouri State Certificate of Authority  
 #E2002003900 • # IAC2011005237 #LS2000000850-F

**COLEMAN EQUIPMENT  
WATER MAIN PLANS**

**4101 NE LAKEWOOD WAY  
LEE'S SUMMIT, MISSOURI**

DRAWN BY:		REVISION DATE:	DESCRIPTION:
###		A	
		A	
CHECKED BY:		A	
		A	
###		A	
		A	
DATE PREPARED:		A	
		A	
		A	
PROJ. NUMBER:		A	
		A	
17-019		A	

WATER COVER

SHEET

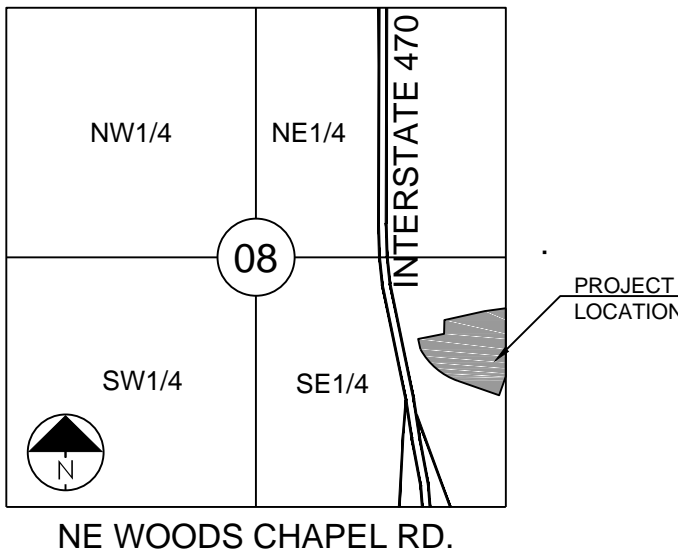
W0.0  
OF

### PROJECT BENCHMARK:

ELEVATIONS BASED ON ALTA SURVEY BY R.L. BUFORD & ASSOCIATES  
PROVIDED BY OWNER. ALTA SURVEY ELEVATIONS BASED ON  
NATIONAL GEODETIC SURVEY MARKER NO JE1870.

ALTA SURVEY CONTROL BENCHMARK: CHISELED "S" ON NE CORNER OF CURB INLET NEAR THE SOUTHWESTERLY PROPERTY LINE OF THE PROPERTY. ELEV. 986.78'





SECTION 09-48N-31W

LOCATION MAP  
SCALE 1" = 2000'

UTILITY INFORMATION & CONTACTS:

Missouri Gas Energy  
Attn: Lucas Walls  
3025 Southeast Clover Drive  
Lee's Summit, Missouri 64082  
Phone: (816) 969-2218  
Email: lucas.walls@sug.com

Kansas City Power & Light  
Attn: Phillip Ingram  
1300 Hamblen Road  
Lee's Summit, Missouri 64081  
Phone: (816) 347-4339  
Email: phillip.ingram@kcpl.com

Sewer and Water - City of Lee's Summit  
220 SE Green Street  
Lee's Summit, Missouri 64063  
Phone: (816) 969-1900  
Email: publicworks@cityofs.net

AT&T  
Attn: Herb Upshaw  
9444 Nail Avenue  
Overland Park, Kansas 66207  
Phone: (913) 383-4929  
Email: hu4112@att.com

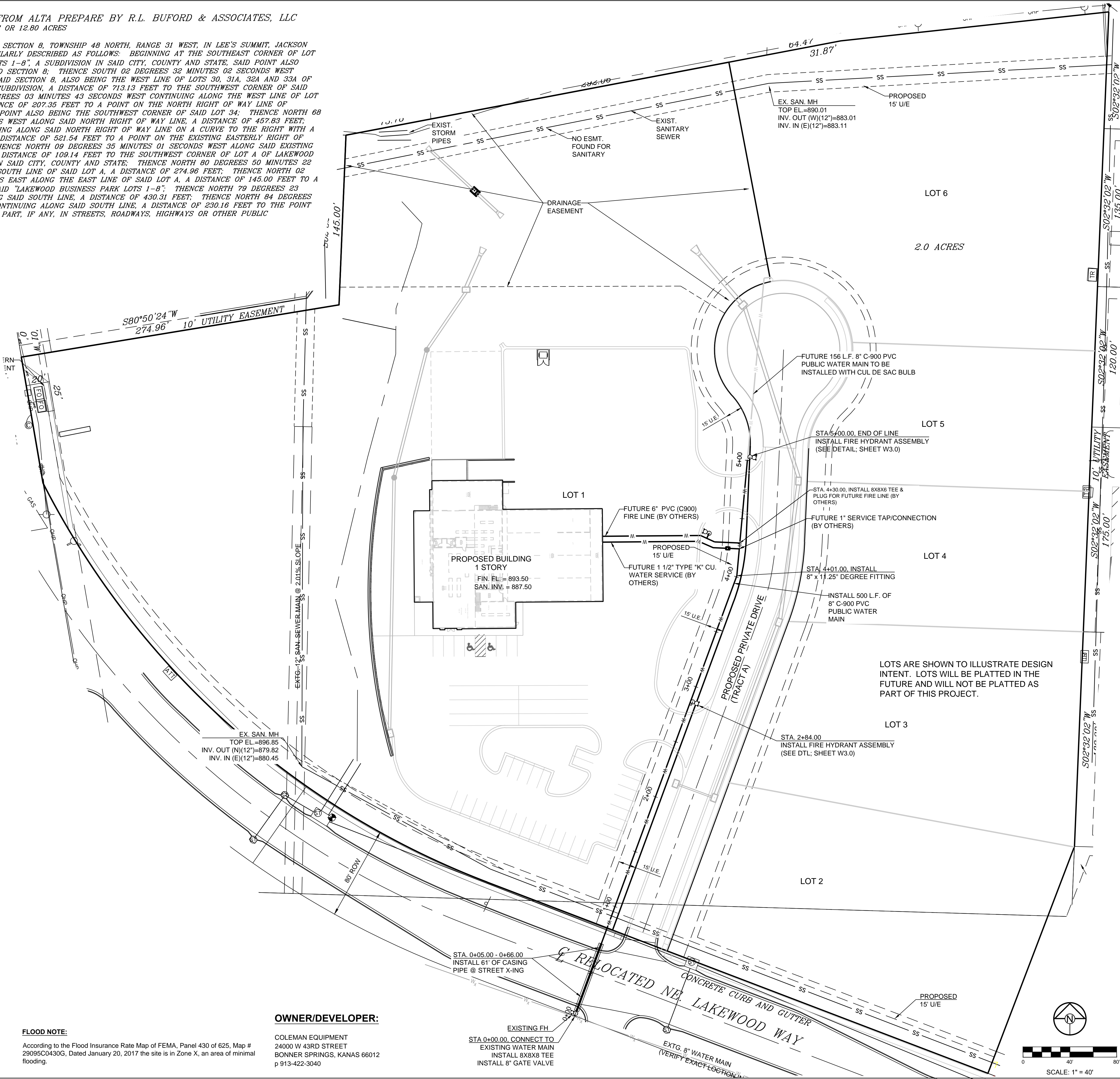
811  
Missouri One Call - 1-800-344-7483

UTILITY STATEMENT:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDON. THE SURVEYOR FURTHER DOES NOT WARRANTY THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

PROPERTY DESCRIPTION FROM ALTA PREPARE BY R.L. BUFORD & ASSOCIATES, LLC  
CONTAINING 557,618 SQUARE FEET OR 12.80 ACRES

PART OF THE SOUTHEAST 1/4 OF SECTION 8, TOWNSHIP 48 NORTH, RANGE 31 WEST, IN LEE'S SUMMIT, JACKSON COUNTY, MISSOURI, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHEAST CORNER OF LOT 5, "LAKEWOOD BUSINESS PARK LOTS 1-8", A SUBDIVISION IN SAID CITY, COUNTY AND STATE, SAID POINT ALSO BEING ON THE EAST LINE OF SAID SECTION 8; THENCE SOUTH 02 DEGREES 32 MINUTES 02 SECONDS WEST ALONG THE SAID EAST LINE OF SAID SECTION 8, ALSO BEING THE WEST LINE OF LOTS 30, 31A, 32A AND 33A OF SAID LAKEWOOD BUSINESS PARK SUBDIVISION, A DISTANCE OF 713.13 FEET TO THE SOUTHWEST CORNER OF SAID LOT 33A; THENCE SOUTH 21 DEGREES 03 MINUTES 43 SECONDS WEST CONTINUING ALONG THE WEST LINE OF LOT 34 OF SAID SUBDIVISION, A DISTANCE OF 207.35 FEET TO A POINT ON THE NORTH RIGHT OF WAY LINE OF RELOCATED LAKEWOOD WAY, SAID POINT ALSO BEING THE SOUTHWEST CORNER OF SAID LOT 34; THENCE NORTH 68 DEGREES 56 MINUTES 17 SECONDS WEST ALONG SAID NORTH RIGHT OF WAY LINE, A DISTANCE OF 457.83 FEET; THENCE NORTHWESTERLY CONTINUING ALONG SAID NORTH RIGHT OF WAY LINE ON A CURVE TO THE RIGHT WITH A RADIUS OF 710.00 FEET, AN ARC DISTANCE OF 521.54 FEET TO A POINT ON THE EXISTING EASTERLY RIGHT OF WAY LINE OF I-470 HIGHWAY; THENCE NORTH 09 DEGREES 35 MINUTES 01 SECONDS WEST ALONG SAID EXISTING EASTERLY RIGHT OF WAY LINE, A DISTANCE OF 109.14 FEET TO THE SOUTHWEST CORNER OF LOT A OF LAKEWOOD BUSINESS PARK, A SUBDIVISION IN SAID CITY, COUNTY AND STATE; THENCE NORTH 80 DEGREES 50 MINUTES 22 SECONDS EAST ALONG THE SAID SOUTH LINE OF SAID LOT A, A DISTANCE OF 274.96 FEET; THENCE NORTH 02 DEGREES 32 MINUTES 02 SECONDS EAST ALONG THE EAST LINE OF SAID LOT A, A DISTANCE OF 145.00 FEET TO A POINT ON THE SOUTH LINE OF SAID "LAKEWOOD BUSINESS PARK LOTS 1-8"; THENCE NORTH 79 DEGREES 25 MINUTES 29 SECONDS EAST ALONG SAID SOUTH LINE, A DISTANCE OF 430.31 FEET; THENCE NORTH 84 DEGREES 00 MINUTES 15 SECONDS EAST CONTINUING ALONG SAID SOUTH LINE, A DISTANCE OF 230.16 FEET TO THE POINT OF BEGINNING, SUBJECT TO THAT PART, IF ANY, IN STREETS, ROADWAYS, HIGHWAYS OR OTHER PUBLIC RIGHT-OF-WAYS.



FLOOD NOTE:

According to the Flood Insurance Rate Map of FEMA, Panel 430 of 625, Map # 29095C0430G, Dated January 20, 2017 the site is in Zone X, an area of minimal flooding.

OWNER/DEVELOPER:

COLEMAN EQUIPMENT  
24000 W 43RD STREET  
BONNER SPRINGS, KANSAS 66012  
p 913-422-3040

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#E2002003600-F #LAC20100237 #LS200200859-F

**COLEMAN EQUIPMENT  
WATER MAIN PLANS**  
4101 NE LAKEWOOD WAY  
LEE'S SUMMIT, MISSOURI

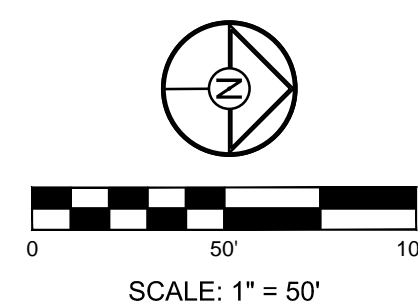
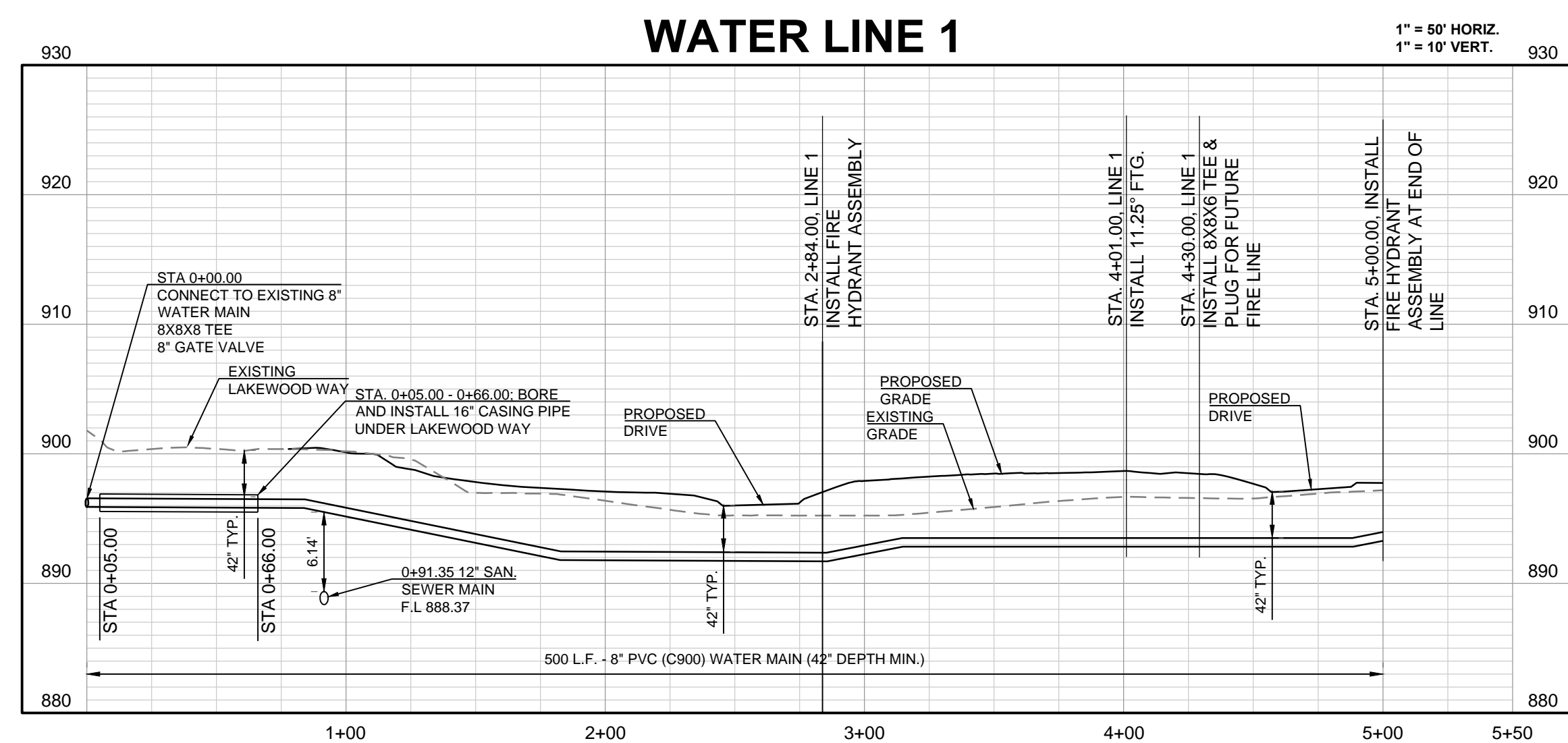
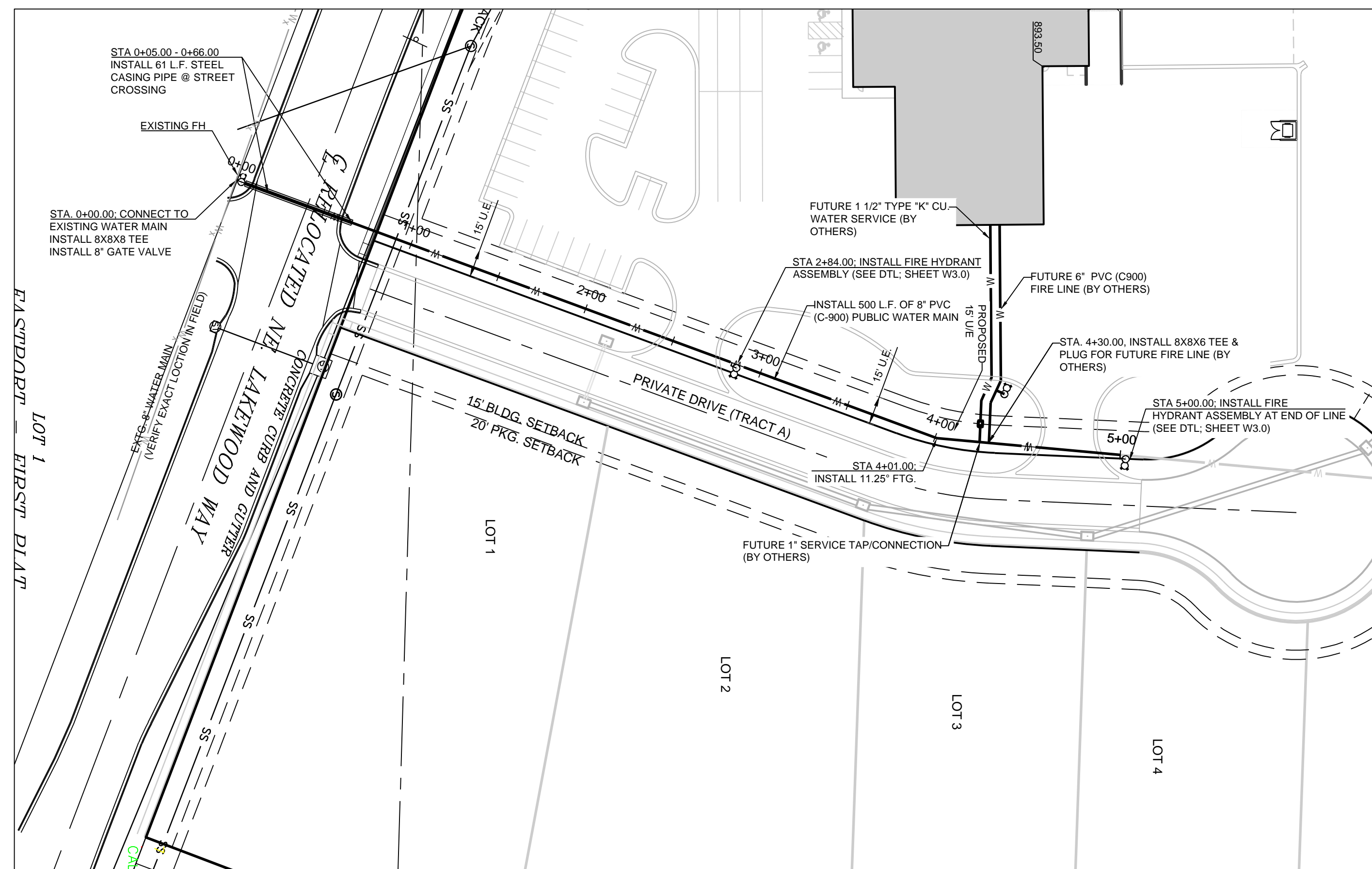
REVISION DATE	DESCRIPTION
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CHECKED BY:	SCH
DATE PREPARED:	
PROJ. NUMBER:	17-019

**GENERAL LAYOUT**

SHEET  
**W1.0**  
OF



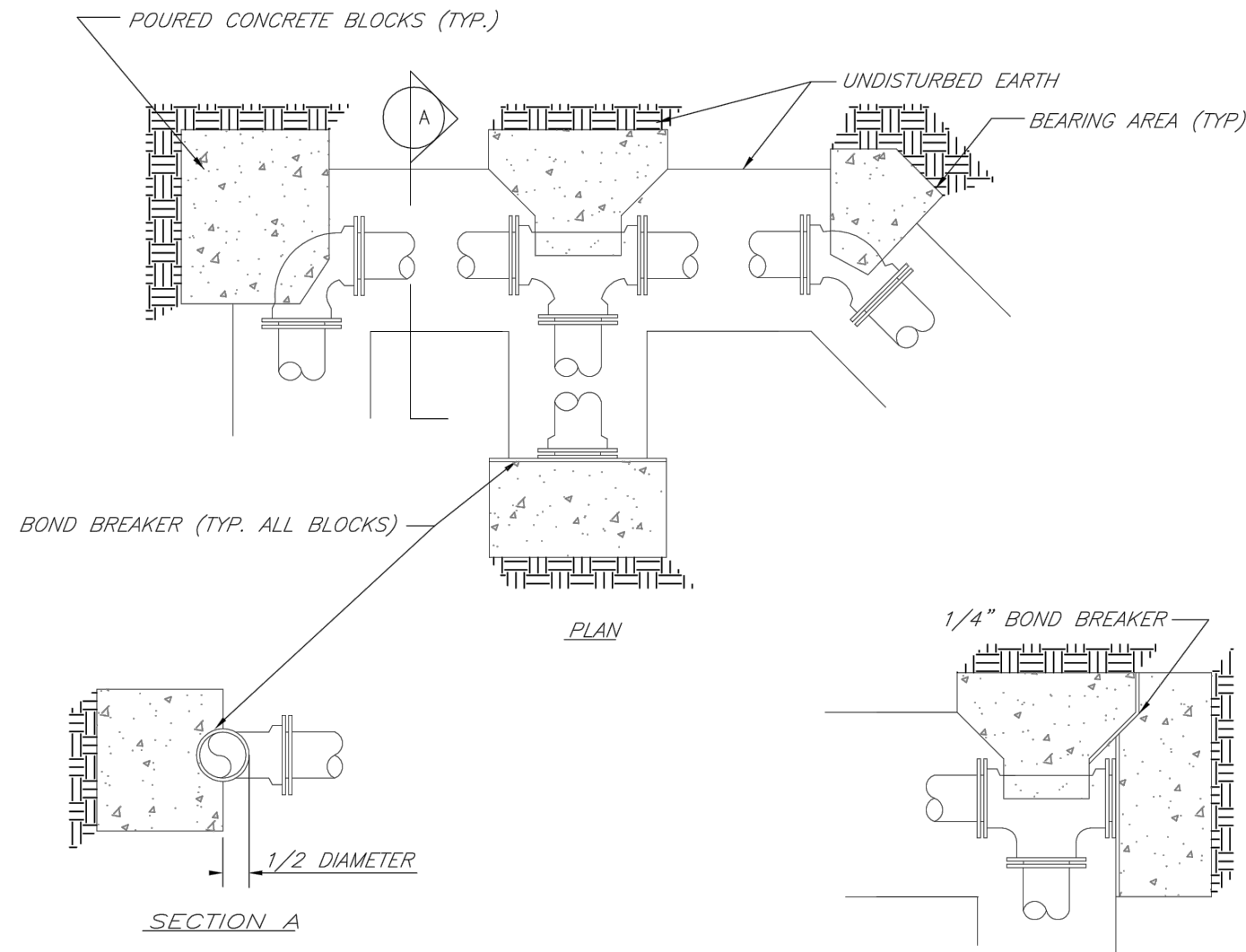


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		2/1	
CHECKED BY:		3/1	
SCH		4/1	
DATE PREPARED:		5/1	
		6/1	
		7/1	
PROJ. NUMBER:		8/1	
17-019		9/1	



REQUIRED CONCRETE BEARING AREA (SQUARE FEET - SF)					
NOM. DIA. (INCHES)	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

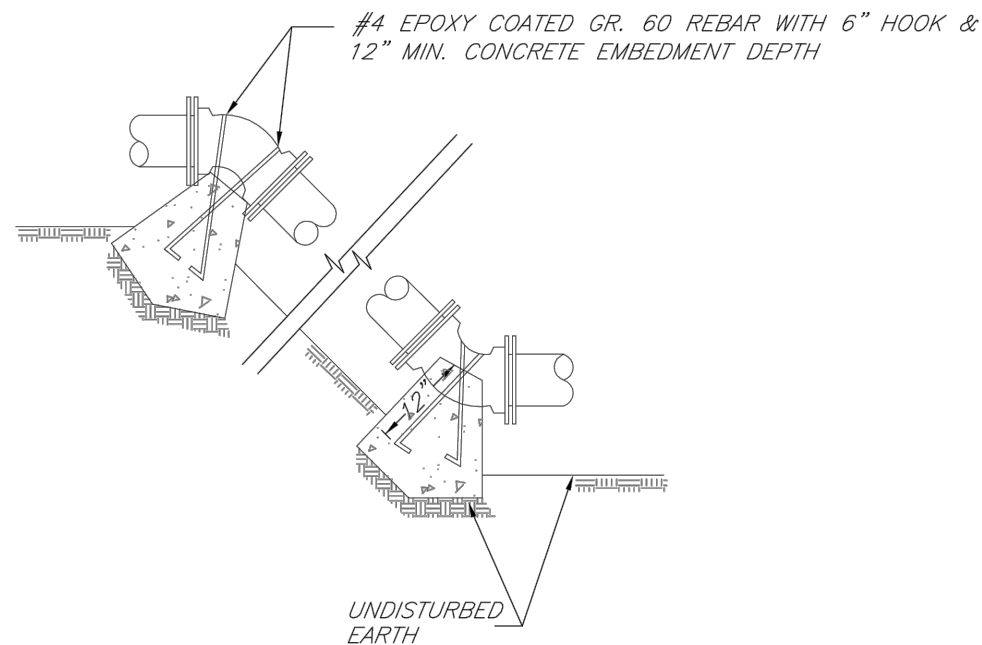
NOTES:  
1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.  
2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.  
3. BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.  
4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



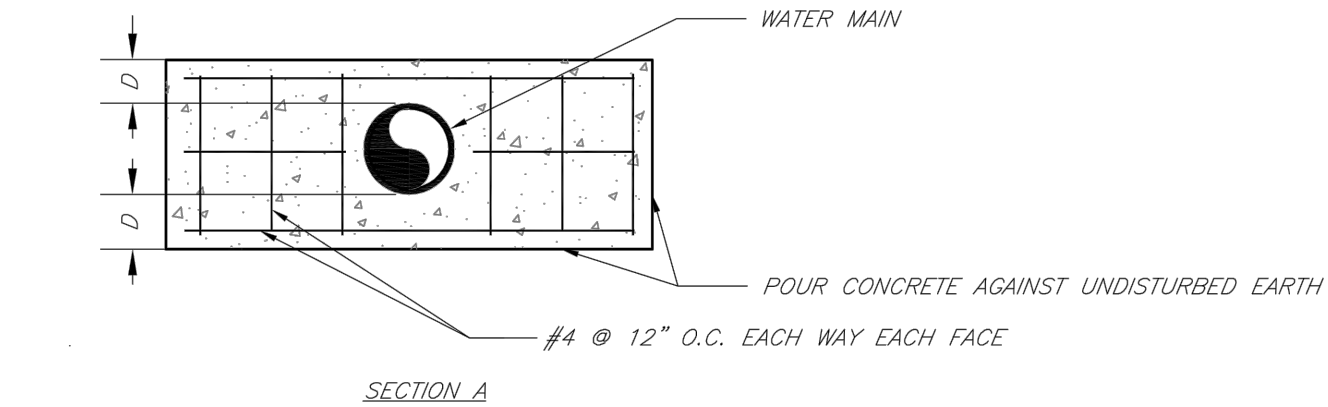
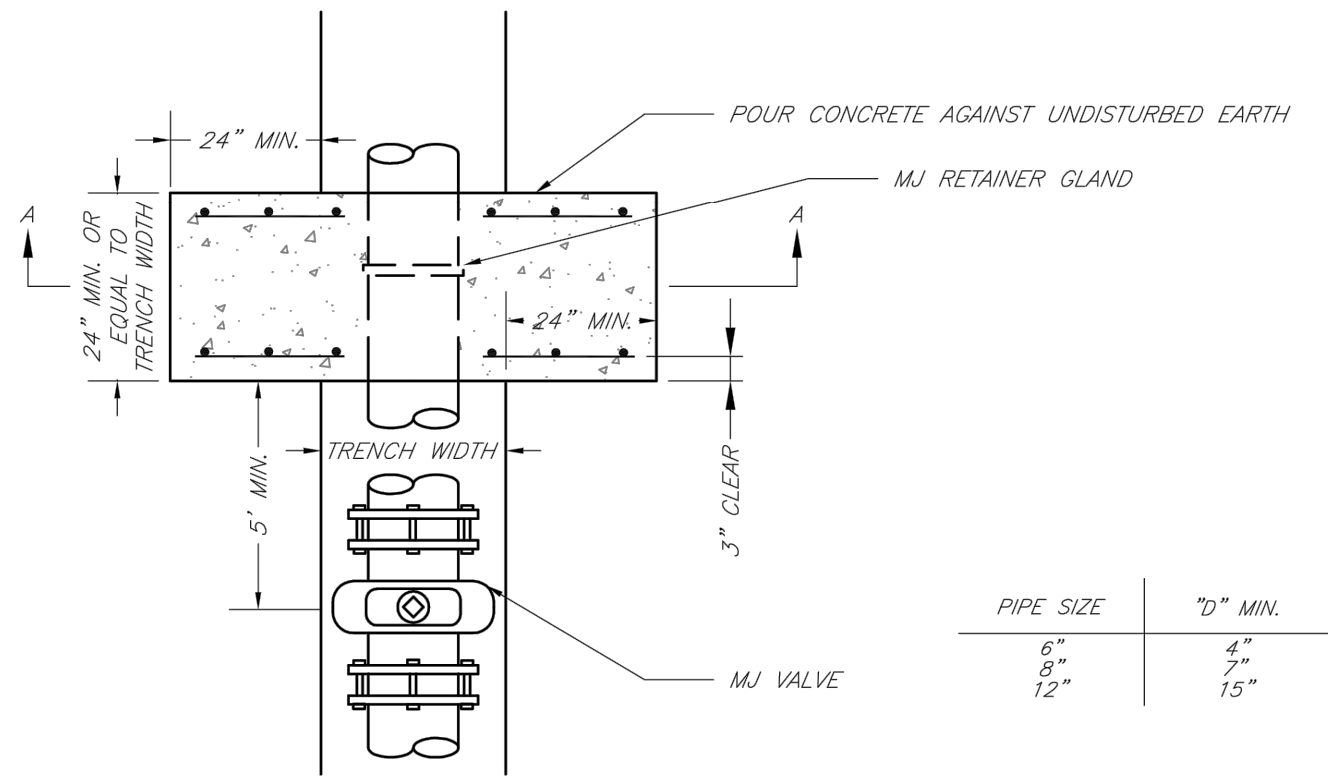
	<b>LEE'S SUMMIT</b> MISSOURI		Date: 02/13
	PUBLIC WORKS ENGINEERING DIVISION   220 SE GREEN STREET   LEE'S SUMMIT, MO 64063		Drawn By: JN
	HORIZONTAL THRUST BLOCKS		Checked By: DL
			FILE: WAT-1
			Rev: 1/14

REQUIRED CONCRETE VOLUME (CUBIC FEET - CF)					
NOM. DIA. (INCHES)	TEE, PLUG	90 BEND	45 BEND	22.5 BEND	11.25 BEND
6	50.5	71.4	38.6	19.7	9.9
8	89.8	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 MUST BE AGAINST UNDISTURBED SOIL.  
4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.

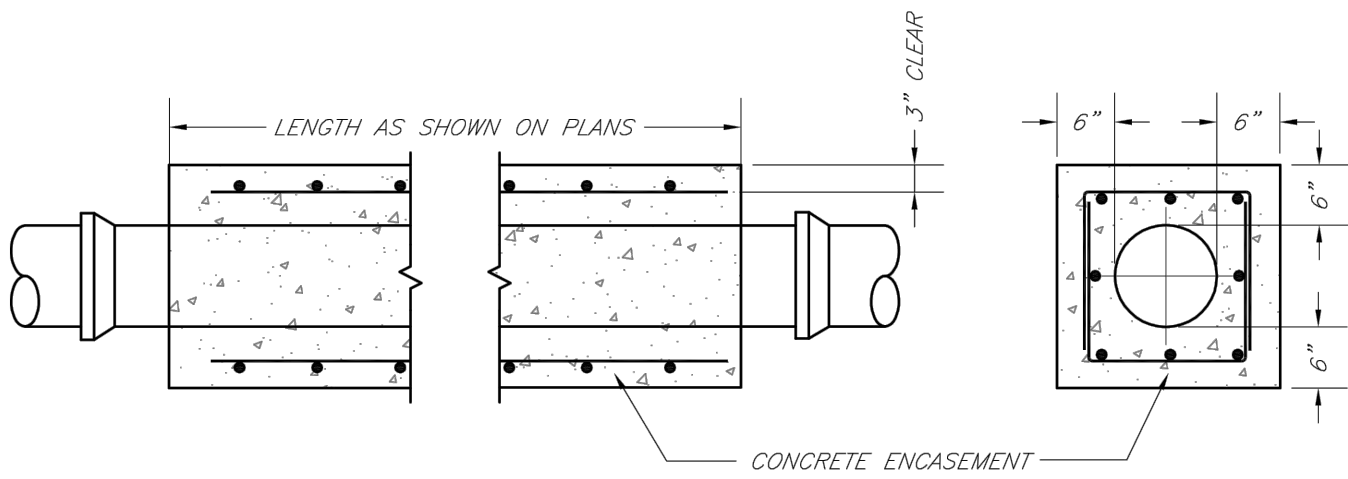


	<b>LEE'S SUMMIT</b> MISSOURI		Date: 02/13
	PUBLIC WORKS ENGINEERING DIVISION   220 SE GREEN STREET   LEE'S SUMMIT, MO 64063		Drawn By: JN
	VERTICAL THRUST BLOCKS		Checked By: DL
			FILE: WAT-2
			Rev: 1/14



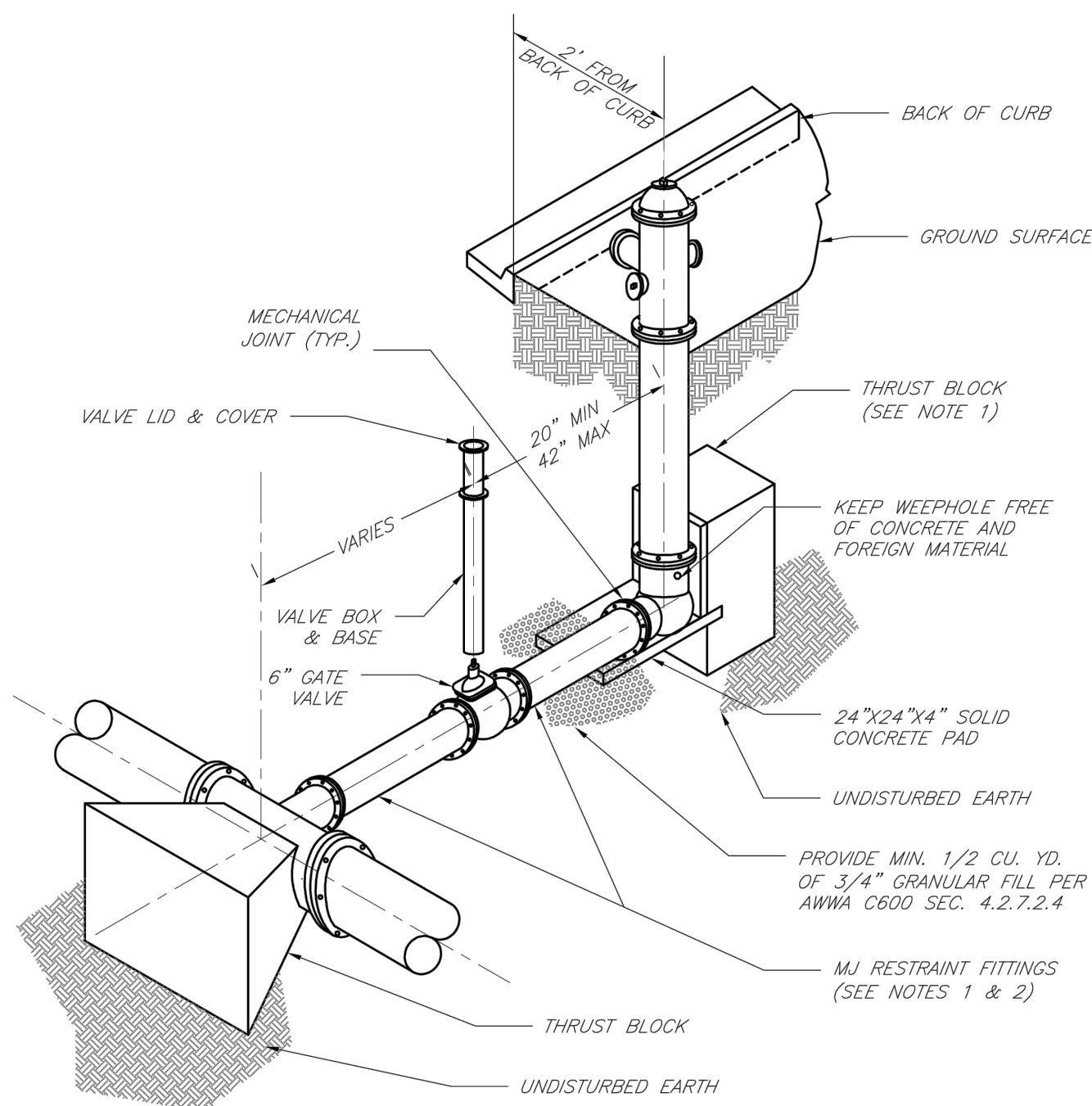
NOTE:  
THIS DETAIL NOT TO BE USED FOR PIPE GREATER THAN 12"

	<b>LEE'S SUMMIT</b> MISSOURI		Date: 02/13
	PUBLIC WORKS ENGINEERING DIVISION   220 SE GREEN STREET   LEE'S SUMMIT, MO 64063		Drawn By: JN
	STRADDLE BLOCK		Checked By: DL
			FILE: WAT-3
			Rev: 1/14



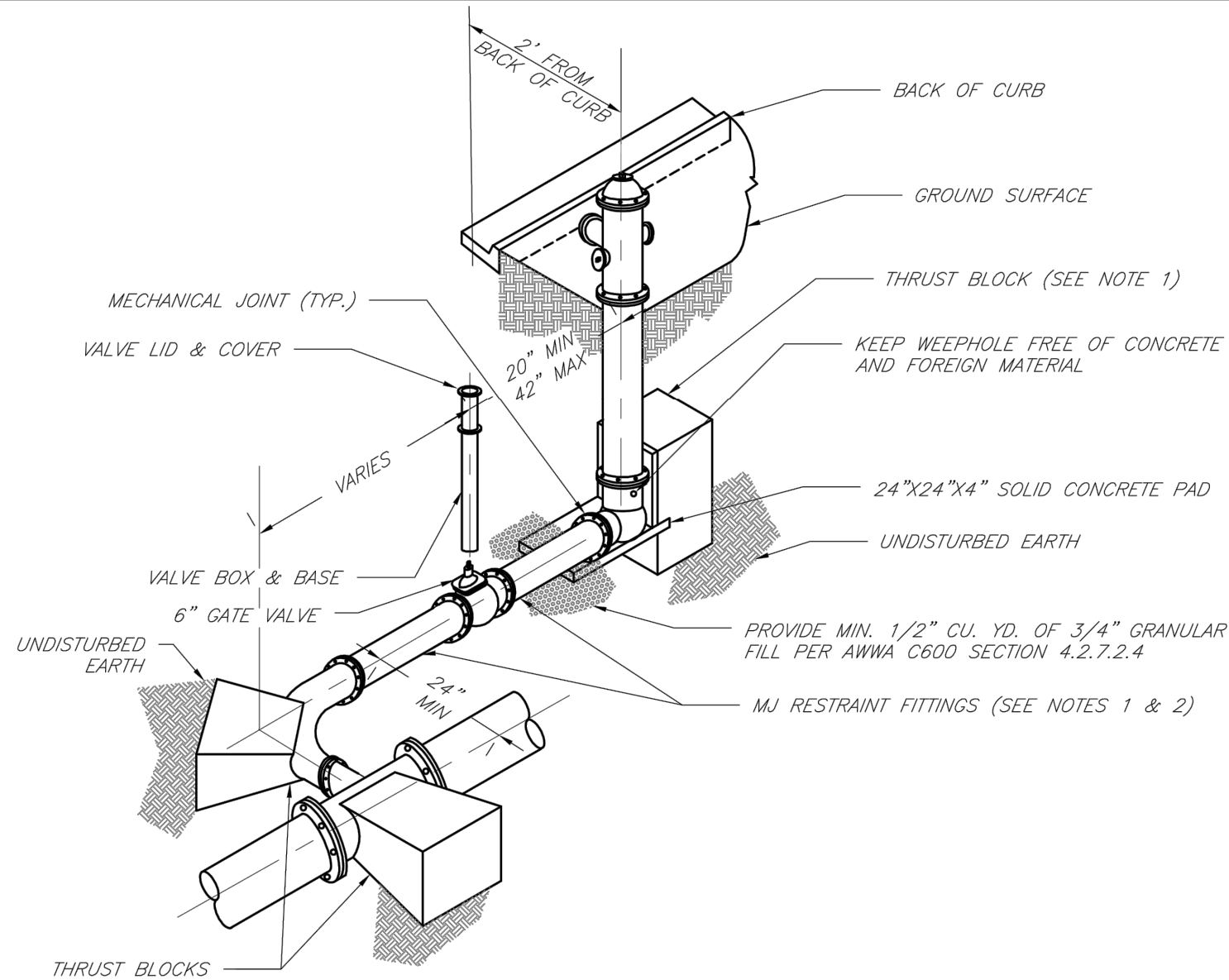
- NOTES:  
1. INTERMEDIATE BELLS SHALL BE ENCASED.  
2. REINFORCING STEEL SHALL BE #4 @ 12" O.C. EACH WAY WITH A MINIMUM REBAR LAP OF 12".  
3. THIS DETAIL IS FOR PIPES 12" AND SMALLER.

	<b>LEE'S SUMMIT</b> MISSOURI		Date: 02/13
	PUBLIC WORKS ENGINEERING DIVISION   220 SE GREEN STREET   LEE'S SUMMIT, MO 64063		Drawn By: JN
	WATER PIPE ENCASEMENT		Checked By: DL
			FILE: WAT-4
			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.

	<b>LEE'S SUMMIT</b> MISSOURI		Date: 02/13
	PUBLIC WORKS ENGINEERING DIVISION   220 SE GREEN STREET   LEE'S SUMMIT, MO 64063		Drawn By: JN
	HYDRANT INSTALLATION - STRAIGHT SET		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.

	<b>LEE'S SUMMIT</b> MISSOURI		Date: 02/13
	PUBLIC WORKS ENGINEERING DIVISION   220 SE GREEN STREET   LEE'S SUMMIT, MO 64063		Drawn By: JN
	HYDRANT WITH 90 DEGREE BEND		Checked By: DL
			FILE: WAT-8
			Rev: 1/14

REVISION DATE	DESCRIPTION
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DRAWN BY:	###
CHECKED BY:	###
DATE PREPARED:	-
PROJ. NUMBER:	17-019



