

HDR
MISSOURI CERTIFICATE OF
AUTHORITY #000856

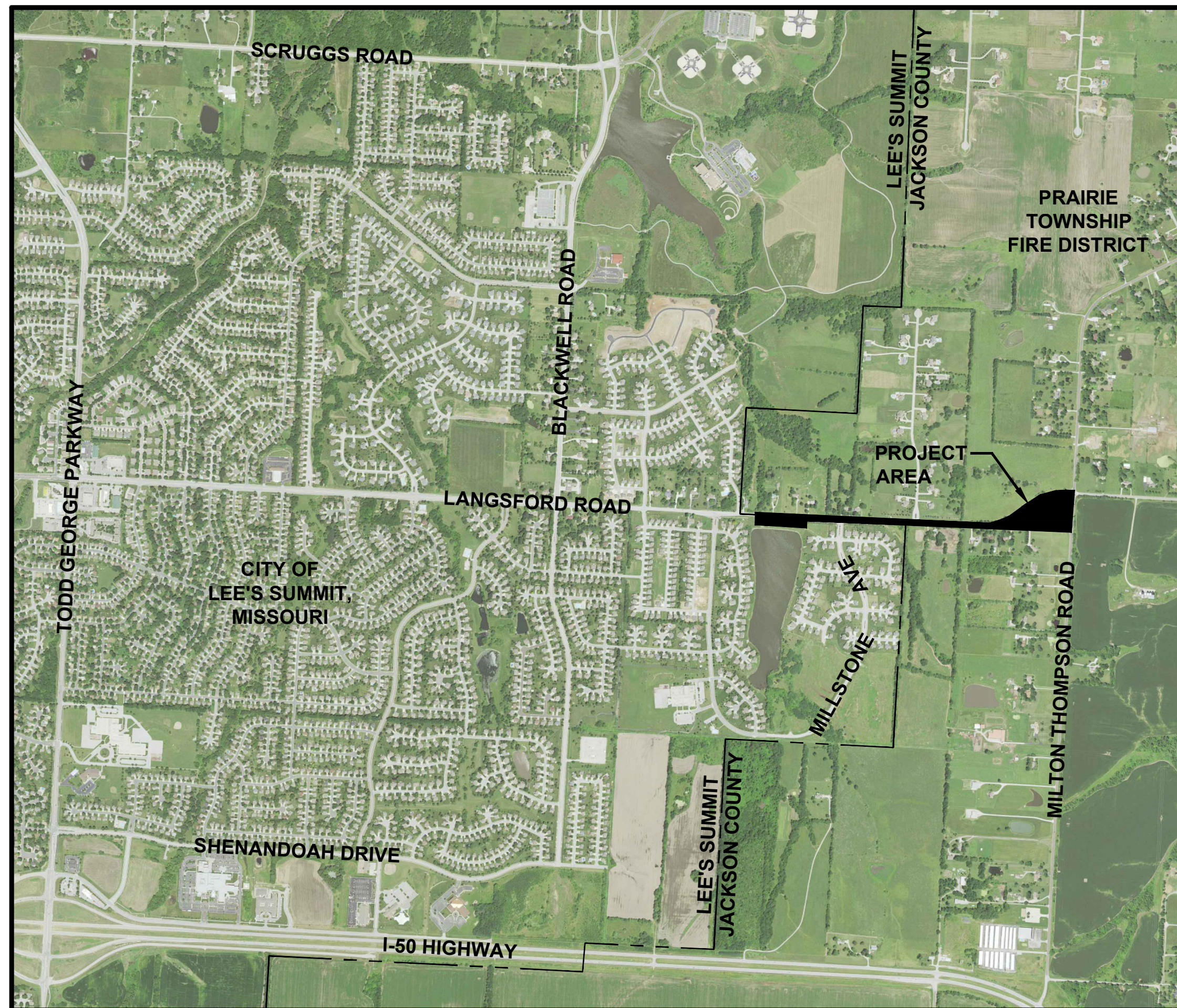
3741 NE TROON DRIVE
LEE'S SUMMIT, MO 64064
816-347-1100

Contract Drawings For

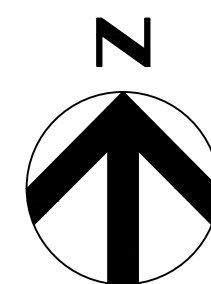
PRAIRIE TOWNSHIP FIRE DISTRICT GRINDER PUMP AND SEWER FORCE MAIN CONNECTION TO LEE'S SUMMIT

Project No.
00000000277870

Jackson County, Missouri
January 2017



LOCATION MAP
NOT TO SCALE



DRAWING INDEX

(00) GENERAL

- 00G000 COVER SHEET
- 00G001 GENERAL CIVIL LEGEND
- 00G002 PROCESS, MECHANICAL, ELECTRICAL & INSTRUMENTATION LEGEND
- 00G003 GENERAL NOTES
- 00G004 GENERAL LAYOUT/SURVEY CONTROL & PROPERTY OWNERSHIP MAP

(05) STANDARD DETAILS

- 05C501 CIVIL DETAILS
- 05C502 CIVIL DETAILS
- 05D501 PIPING DETAILS

(10) SITE PLANNING

- 10C001 SITE PLANS

(20) FORCEMAIN PIPING

- 20C801 PLAN & PROFILE STA 1+00.00 TO STA 11+00.00
- 20C802 PLAN & PROFILE STA 11+00.00 TO STA 22+00.00
- 20C803 PLAN & PROFILE STA 22+00.00 TO STA 32+53.88

(30) GRAVITY PIPING

- 30C801 GRAVITY PIPING - PLAN & PROFILES

(40) PUMP STATION

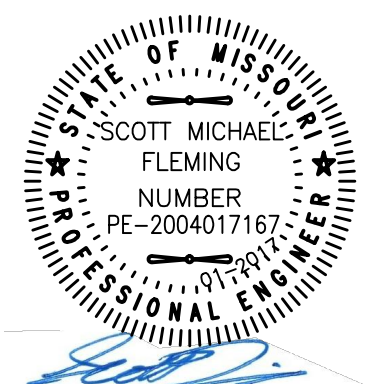
- 40U101 STRUCTURAL, PROCESS & ELECTRICAL PLANS AND SECTION
- 40U501 STRUCTURAL, PROCESS & ELECTRICAL DETAILS
- 40E601 ELECTRICAL ONE-LINE DIAGRAMS (Not in this Submittal)
- 40E602 CONTROLS ONE-LINE DIAGRAMS (Not in this Submittal)
- 40E631 CONTROLS SCHEMATIC DIAGRAM (Not in this Submittal)

UTILITIES:

SEWER - JACKSON COUNTY PUBLIC WORKS:	816-881-4530
SEWER/WATER - LEE'S SUMMIT WATER UTILITIES:	816-969-1900
WATER - TRI-COUNTY WATER AUTHORITY:	816-796-4100
ELECTRIC - KC POWER & LIGHT:	1-888-544-4852
GAS - MISSOURI GAS ENERGY:	816-969-2200
CABLE/PHONE - TIME WARNER CABLE:	816-200-1935
CABLE/PHONE - COMCAST CABLE COMMUNICATIONS:	1-800-934-6489
CABLE - GOOGLE FIBER:	1-877-454-6959
TELEPHONE - AT&T:	816-525-3235



UTILITY NOTES:
VISUAL INDICATIONS OF UTILITIES ARE AS SHOWN. UNDERGROUND LOCATIONS SHOWN, AS FURNISHED BY THEIR LESSORS, ARE APPROXIMATE AND SHOULD BE VERIFIED IN THE FIELD AT THE TIME OF CONSTRUCTION. FOR ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES IN MISSOURI, CALL 1-800-344-7483.



LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
MO PE-200401767

PIPING SYMBOLOGY			ELECTRICAL			INSTRUMENTATION IDENTIFICATION LETTERS																																																																																																																																																																																																																																																																																
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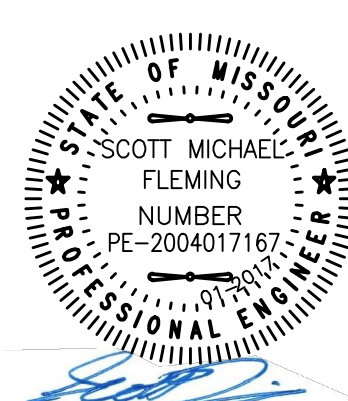


HDR
MISSOURI CERTIFICATE OF AUTHORITY #: 000856
3741 NE TROON DRIVE
LEE'S SUMMIT, MO 64064
816-347-1100

ISSUE	DATE	DESCRIPTION
3	01-2017	ISSUED FOR MDNR
2	09-09-16	CLIENT REVIEW
1	07-20-16	CLIENT REVIEW

PROJECT MANAGER SCOTT FLEMING

PROJECT NUMBER 0000000277870



LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
PE-200401767



PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT

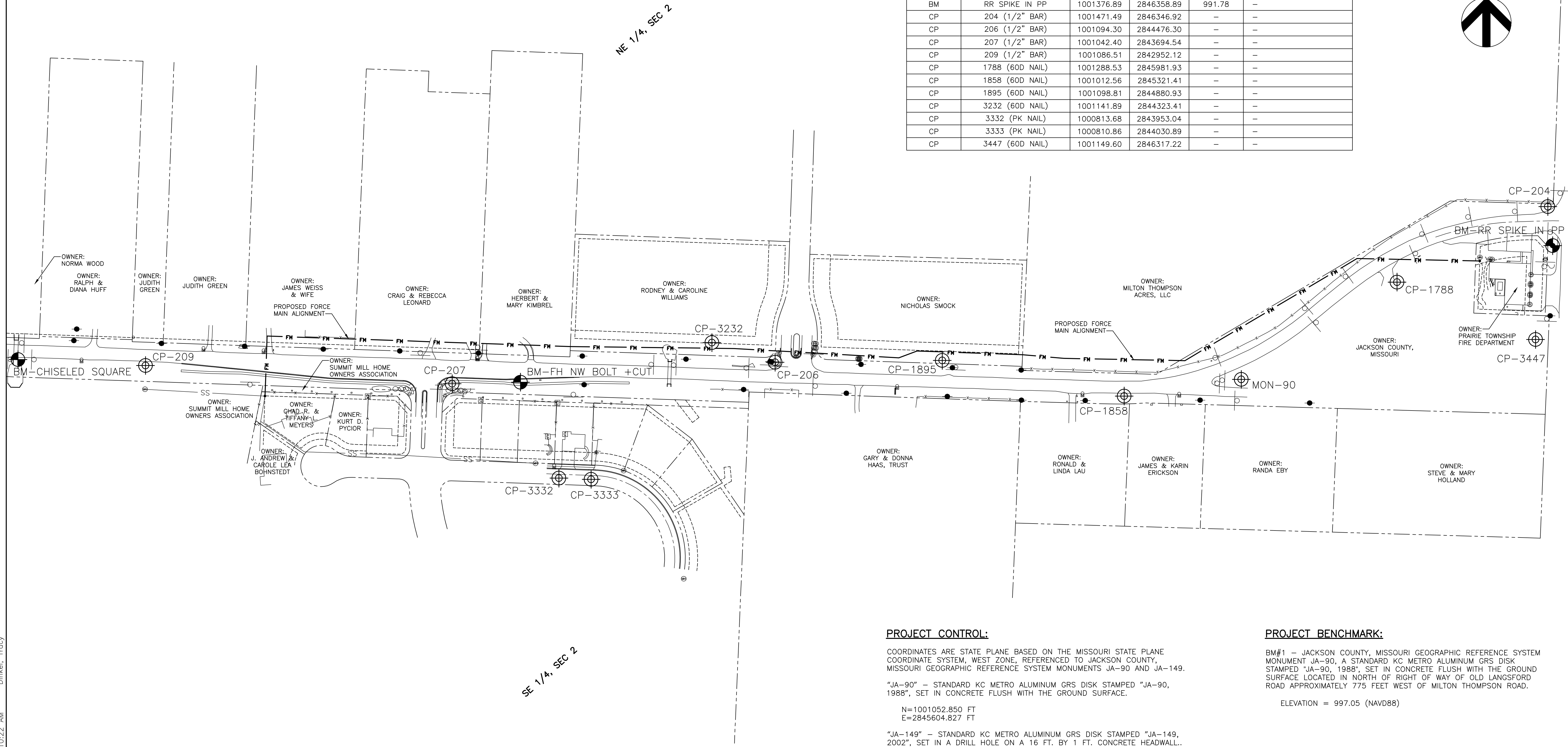
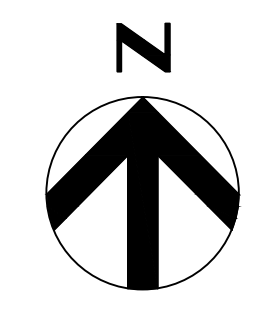
PROCESS, MECHANICAL, ELECTRICAL
AND INSTRUMENTATION LEGEND



FILENAME 00G002.dwg
SCALE NONE

SHEET
00G002

CONTROL POINT INFORMATION						
TYPE	DESCRIPTION	NORTHING	EASTING	ELEVATION	NOTES	
MON	45 (GPS JA-45 MON)	994990.35	2834265.61	1046.26	SW OF PROJECT LIMITS	
MON	89 (GPS JA-89 MON)	1000983.05	2856081.51	1002.62	EAST OF PROJECT LIMITS	
MON	90 (GPS JA-90 MON)	1001052.85	2845604.83	997.05	-	
MON	149 (GPS JA-149 MON)	1008007.41	2840462.76	957.68	NW OF PROJECT LIMITS	
BM	CHISELED SQUARE	1001100.89	2842643.59	952.54	-	
BM	FH NW BOLT +CUT	1001046.11	2843859.93	975.64	-	
BM	RR SPIKE IN PP	1001376.89	2846358.89	991.78	-	
CP	204 (1/2" BAR)	1001471.49	2846346.92	-	-	
CP	206 (1/2" BAR)	1001094.30	2844476.30	-	-	
CP	207 (1/2" BAR)	1001042.40	2843694.54	-	-	
CP	209 (1/2" BAR)	1001086.51	2842952.12	-	-	
CP	1788 (60D NAIL)	1001288.53	2845981.93	-	-	
CP	1858 (60D NAIL)	1001012.56	2845321.41	-	-	
CP	1895 (60D NAIL)	1001098.81	2844880.93	-	-	
CP	3232 (60D NAIL)	1001141.89	2844323.41	-	-	
CP	3332 (PK NAIL)	1000813.68	2843953.04	-	-	
CP	3333 (PK NAIL)	1000810.86	2844030.89	-	-	
CP	3447 (60D NAIL)	1001149.60	2846317.22	-	-	



PROJECT CONTROL:

COORDINATES ARE STATE PLANE BASED ON THE MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE, REFERENCED TO JACKSON COUNTY, MISSOURI GEOGRAPHIC REFERENCE SYSTEM MONUMENTS JA-90 AND JA-149.

"JA-90" - STANDARD KC METRO ALUMINUM GRS DISK STAMPED "JA-90, 1988", SET IN CONCRETE FLUSH WITH THE GROUND SURFACE.

N=1001052.850 FT
E=2845604.827 FT

"JA-149" - STANDARD KC METRO ALUMINUM GRS DISK STAMPED "JA-149, 2002", SET IN A DRILL HOLE ON A 16 FT. BY 1 FT. CONCRETE HEADWALL.

N=1008007.410 FT
E=2840462.757 FT

PROJECT BENCHMARK:

BM#1 - JACKSON COUNTY, MISSOURI GEOGRAPHIC REFERENCE SYSTEM MONUMENT JA-90, A STANDARD KC METRO ALUMINUM GRS DISK STAMPED "JA-90, 1988", SET IN CONCRETE FLUSH WITH THE GROUND SURFACE LOCATED IN NORTH OF RIGHT OF WAY OF OLD LANGSFORD ROAD APPROXIMATELY 775 FEET WEST OF MILTON THOMPSON ROAD.

ELEVATION = 997.05 (NAVD88)

006004.dwg 1/18/2017 10:22 AM Dinkel, Tracy

SE 1/4, SEC 2

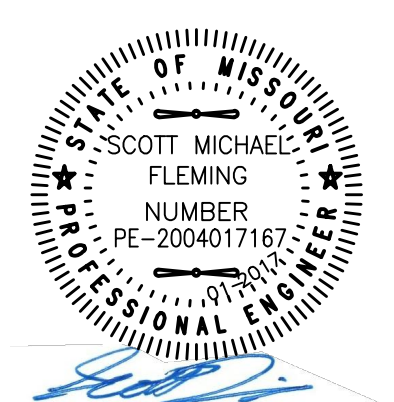
NE 1/4, SEC 2



HDR
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LEE'S SUMMIT, MO 64064
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3	01-20-17	ISSUED FOR MDNR
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PROJECT MANAGER	SCOTT FLEMING
PROJECT NUMBER	0000000277870

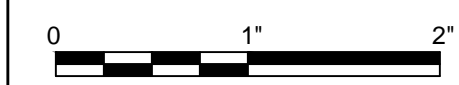


LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
PE-200401767



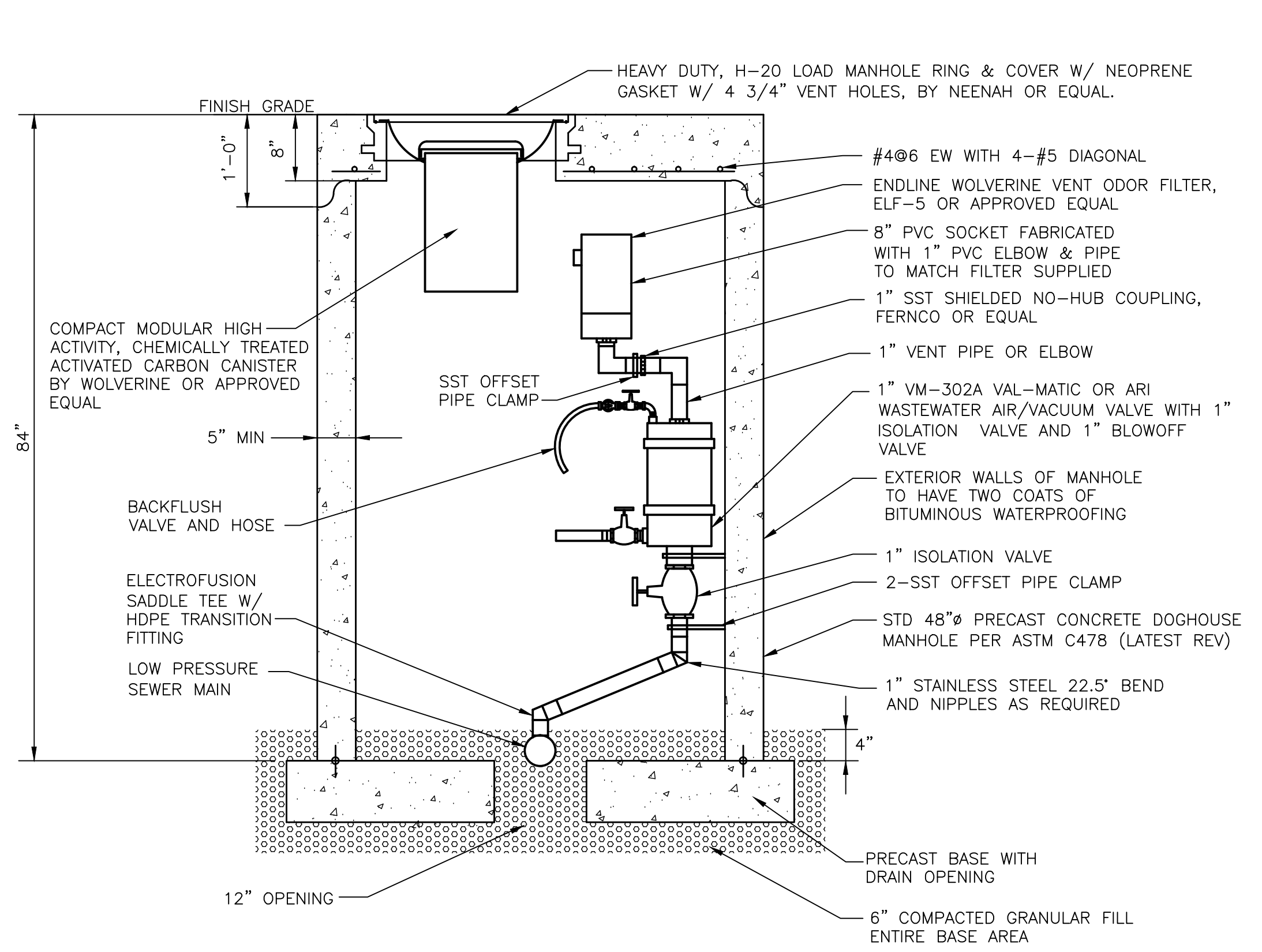
**PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT**

GENERAL LAYOUT/SURVEY CONTROL AND PROPERTY MAP



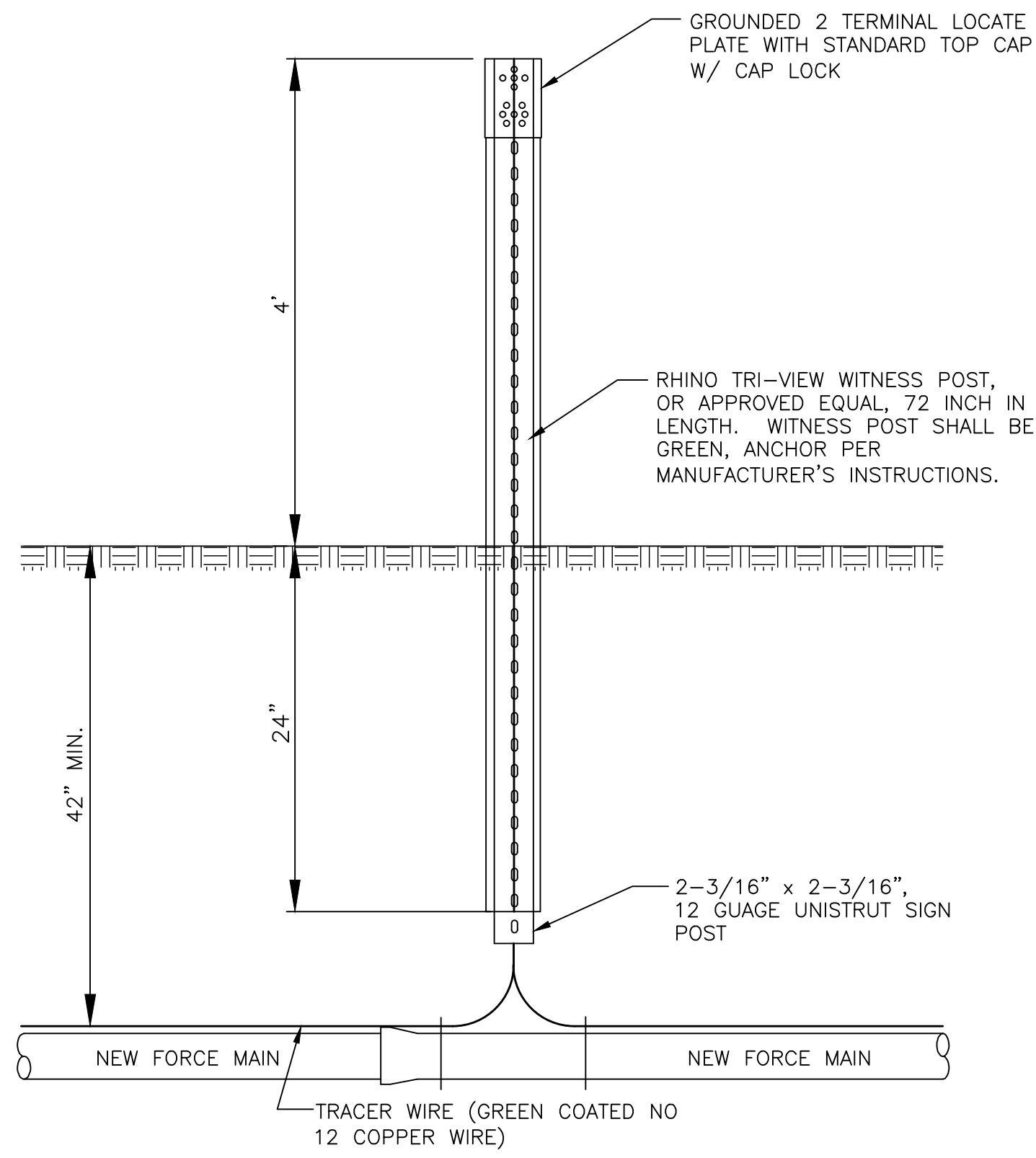
FILENAME | 00G004.dwg
SCALE | 1" = 120'

SHEET
00G004

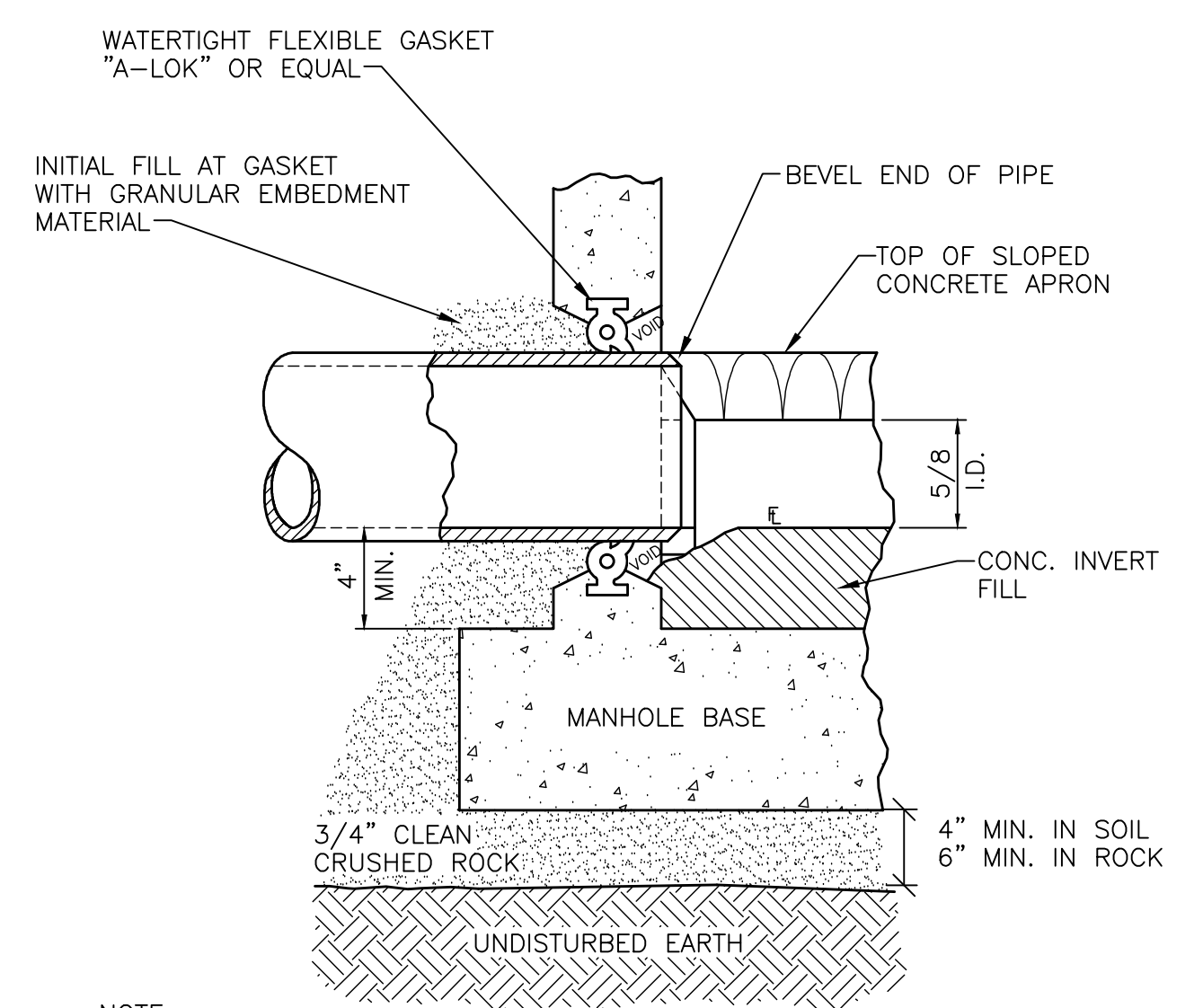


NOTE:
 1. WASTEWATER AIR/VACUUM VALVE AND ALL ACCESSORIES SHALL BE BY THE MANUFACTURER.
 2. INTERIOR WALLS SHALL BE LINED WITH PROTECTIVE EPOXY COATING, SEE SPECIFICATION 40 05 52.

AUTOMATIC AIR RELEASE VALVE ASSEMBLY
 NOT TO SCALE

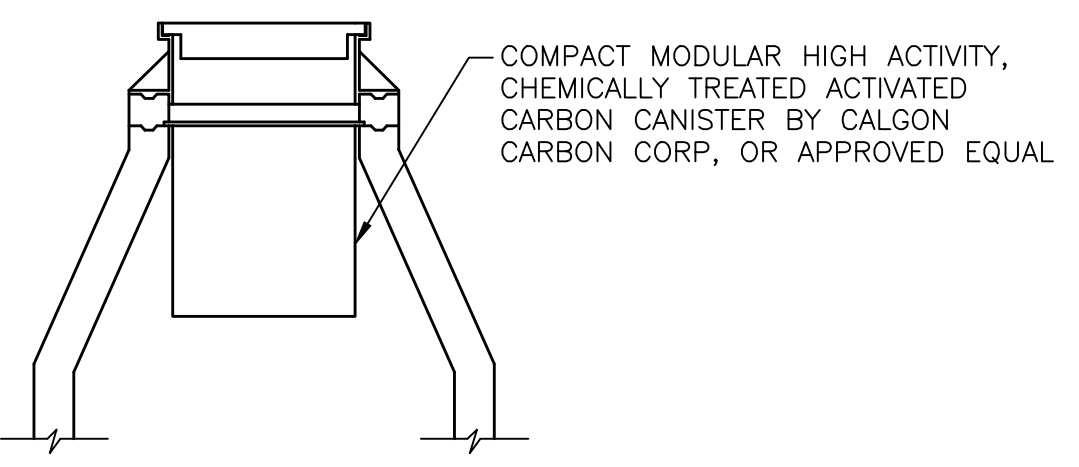


WITNESS POST WITH TRACER WIRE ACCESS BOX
 NOT TO SCALE



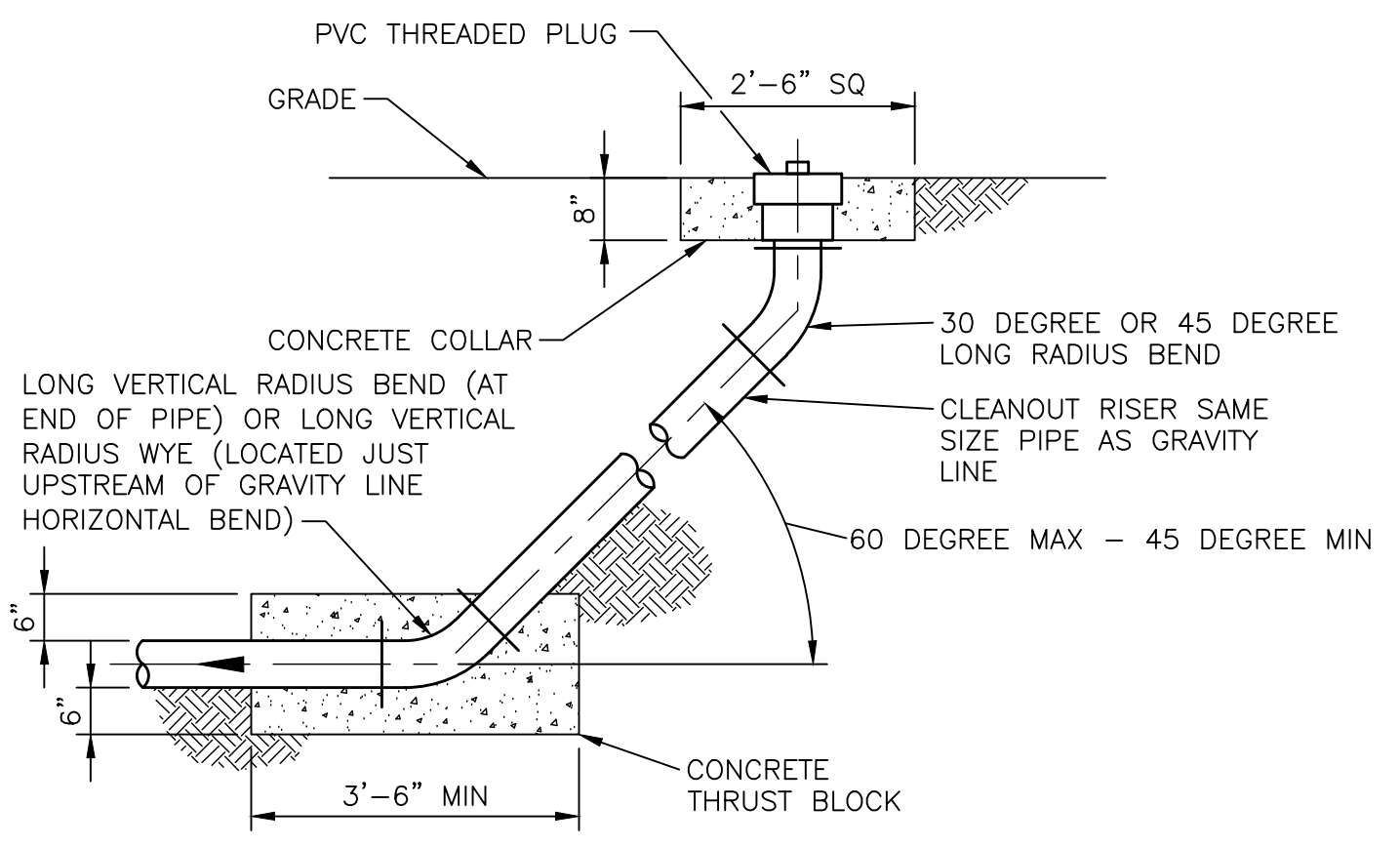
NOTE:
 1. BITUMINOUS COATING ON EXTERIOR SURFACE OF MANHOLE SHALL NOT COME IN CONTACT WITH PIPE GASKET.
 2. FOR CAST-IN-PLACE CONCRETE MANHOLES OR PRE-CAST WITH BOX-OUTS, THE PIPE GASKET SHALL BE A RUBBER LABYRINTH WATERSTOP WITH STAINLESS STEEL CLAMPING BANDS LOCATED AT CENTER OF WALL AND THE SPACE BETWEEN PIPE & WALL COMPLETELY GROUTED WITH NONSHRINKING MORTAR.
 3. PIPE MAY PROJECT 1\"/>

(PIPE GASKET DETAIL) MANHOLE GASKET
 NOT TO SCALE

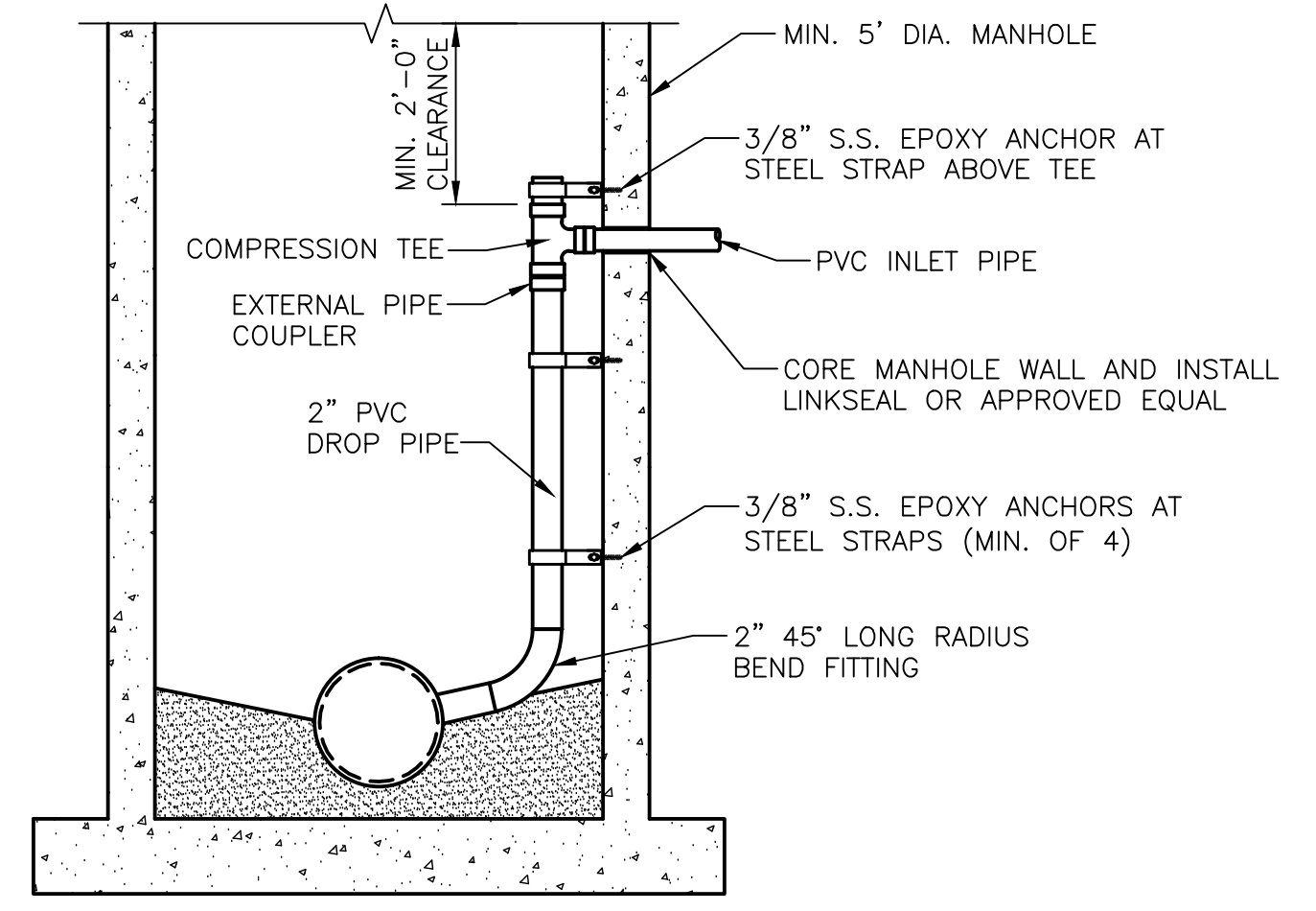


NOTES:
 1. COMPACT MODULAR HIGH ACTIVITY, CHEMICALLY TREATED ACTIVATED CARBON CANISTER BY CALGON CARBON CORP, OR APPROVED EQUAL SHALL BE INSTALLED IN THE RECEIVING MANHOLES AND THE NEXT DOWNSTREAM MANHOLE (TOTAL OF 2) IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

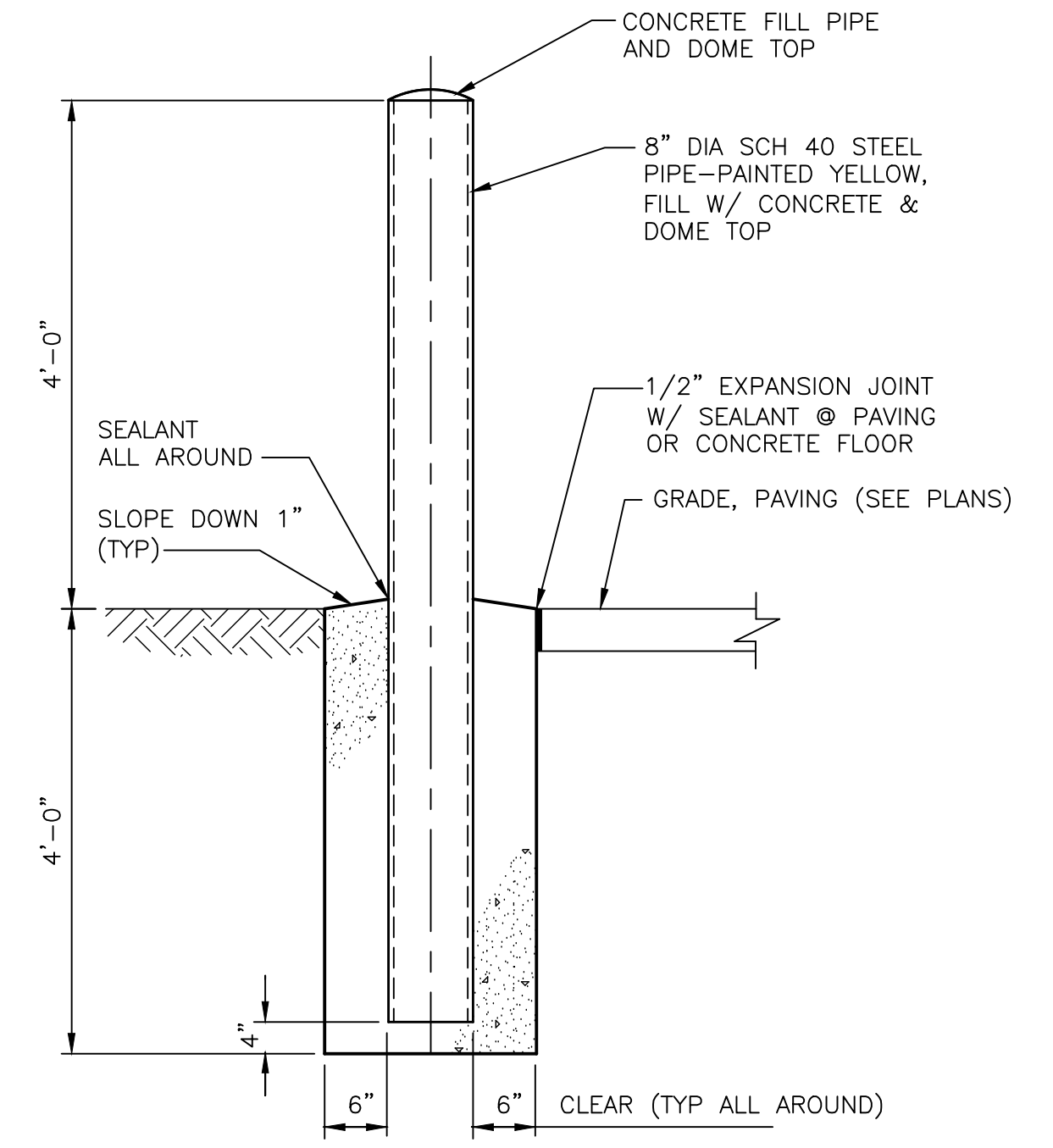
LOW PRESSURE SEWER MAIN CARBON CANNISTER AT RECEIVING MANHOLE
 NOT TO SCALE



CLEANOUT DETAIL

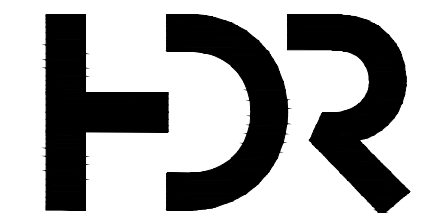


INSIDE DROP MANHOLE DETAIL
 NOT TO SCALE



BOLLARD DETAIL
 NOT TO SCALE

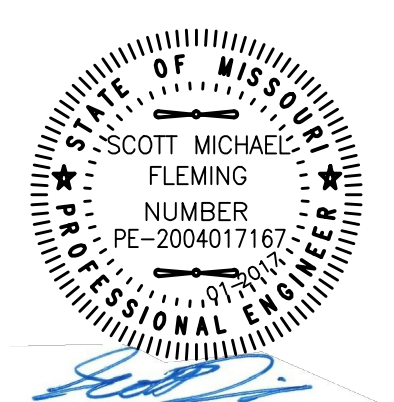
05C501.dwg 1/18/2017 10:23 AM Dinkel, Tracy



HDR
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PROJECT NUMBER	0000000277870



LICENSEE:
 SCOTT M FLEMING
 PROJECT MANAGER
 PE-200401767



**PRAIRIE TOWNSHIP FIRE DISTRICT
 GRINDER PUMP AND SEWER
 FORCE MAIN CONNECTION
 TO LEE'S SUMMIT**



STANDARD CIVIL DETAILS

FILENAME 05C501.dwg
 SCALE AS NOTED

SHEET
05C501

GENERAL NOTES:

- CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO PREVENT EROSION OF EARTHWORK AND DEPOSITION OF SEDIMENTS INTO WATER COURSES OR DRAINAGE SWALES.
- DURING CONSTRUCTION, ACCESS TO LOCAL BUSINESSES AND RESIDENCES SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL COORDINATE WITH INDIVIDUAL BUSINESSES AND RESIDENCES FOR THE CLOSURE OF DRIVEWAYS, PARKING AREAS AND SECTIONS OF COMMERCIAL STREET. ROAD CLOSURE FOR SEWER MAIN REPAIR SHALL BE LIMITED TO A SINGLE SEVEN (7) CONSECUTIVE DAY PERIOD. ROAD SURFACE RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS AFTER SEWER MAIN REPAIR.
- PRIOR TO ANY STREET CLOSURE OR BLOCKAGE, THE FIRE, POLICE, AND AMBULANCE DEPARTMENTS AS WELL AS THE POST OFFICE SHALL BE NOTIFIED 48 HOURS IN ADVANCE.
- CONTRACTOR SHALL LIMIT CONSTRUCTION SETUP/STAGING AND ALL OTHER ACTIVITY TO THE LIMITS OF ROAD RIGHT-OF-WAY AND PROPERTY OWNED BY THE CITY.
- PUBLIC NOTIFICATION - THE CONTRACTOR SHALL MAKE EVERY EFFORT TO MAINTAIN SEWER SERVICE USAGE THROUGHOUT THE DURATION OF THE PROJECT. IN THE EVENT THAT A CONNECTION WILL BE OUT OF SERVICE, THE LONGEST PERIOD OF NO SERVICE SHALL BE 8 HOURS. A PUBLIC NOTIFICATION PROGRAM SHALL BE IMPLEMENTED, AND SHALL AS A MINIMUM, REQUIRE THE CONTRACTOR TO BE RESPONSIBLE FOR CONTACTING EACH HOME OR BUSINESS CONNECTED TO THE SANITARY SEWER AND INFORMING THEM OF THE WORK TO BE CONDUCTED, AND WHEN THE SEWER WILL BE OFF-LINE. THE CONTRACTOR SHALL ALSO PROVIDE THE FOLLOWING:
 - WRITTEN NOTICE TO BE DELIVERED TO EACH HOME OR BUSINESS THE DAY PRIOR TO THE BEGINNING OF WORK BEING CONDUCTED ON THE SECTION, AND A LOCAL TELEPHONE NUMBER OF THE CONTRACTOR THEY CAN CALL TO DISCUSS THE PROJECT OR ANY POTENTIAL PROBLEMS.
 - PERSONAL CONTACT WITH ANY HOME OR BUSINESS, WHICH CANNOT BE CONNECTED WITHIN THE TIME STATED IN THE WRITTEN NOTICE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE LOCATIONS OF ALL BRANCH SERVICE LATERAL CONNECTIONS BEFORE BEGINNING THE INSTALLATION OF THE CIPP.

SEDIMENT FENCE NOTES:

A) INSTALLATION:

- THE HEIGHT OF SEDIMENT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE AND SHALL NOT EXCEED 34 INCHES ABOVE THE GROUND SURFACE.
- THE FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE UNAVOIDABLE, FILTER CLOTH SHALL BE SECURELY SPLICED TOGETHER ONLY AT SUPPORT POSTS, WITH A MAX 6-INCH OVERLAP.
- DIG A TRENCH AT LEAST 6 INCHES DEEP AND 4 INCHES WIDE ALONG THE FENCE ALIGNMENT.
- DRIVE POSTS AT LEAST 24 INCHES INTO THE GROUND ON THE DOWNSLOPE SIDE OF THE TRENCH. SPACE POSTS A MAXIMUM OF 6 FEET APART.
- EXTRA-STRENGTH SEDIMENT FENCE FABRIC SHALL BE USED. POSTS FOR THIS TYPE OF FABRIC SHALL BE PLACED A MAXIMUM OF 6 FEET APART. THE SEDIMENT FABRIC SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING A MINIMUM OF ONE INCH LONG, HEAVY-DUTY WIRE STAPLES OR TIE-WIRES, AND EIGHT INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
- PLACE THE BOTTOM 1 FOOT OF FABRIC IN THE MINIMUM-OF-6-INCH DEEP TRENCH, LAPPING TOWARD THE UPSLOPE SIDE. BACKFILL WITH COMPACTED EARTH OR GRAVEL.
- IF A SEDIMENT FENCE IS TO BE CONSTRUCTED ACROSS A DITCH LINE OR SWALE, IT MUST BE OF SUFFICIENT LENGTH TO ELIMINATE ENDFLOW, AND THE PLAN CONFIGURATION SHALL RESEMBLE AN ARC OR HORSESHOE, PLACED ON A CONTOUR, WITH THE ENDS ORIENTED UPSLOPE. EXTRA-STRENGTH SEDIMENT FABRIC SHALL BE USED WITH A MAXIMUM 3-FOOT SPACING OF POSTS.
- TO REDUCE MAINTENANCE, EXCAVATE A SHALLOW SEDIMENT STORAGE AREA IN THE UPSLOPE SIDE OF THE FENCE. PROVIDE GOOD ACCESS IN AREAS OF HEAVY SEDIMENTATION FOR CLEAN OUT AND MAINTENANCE.
- SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

B) TROUBLESHOOTING:

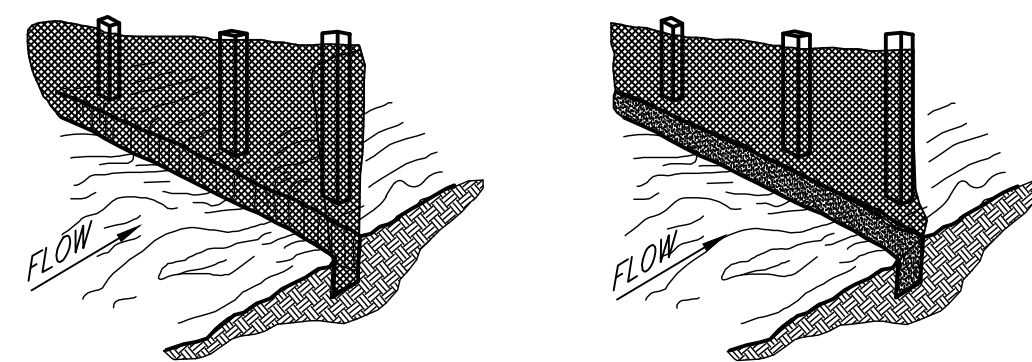
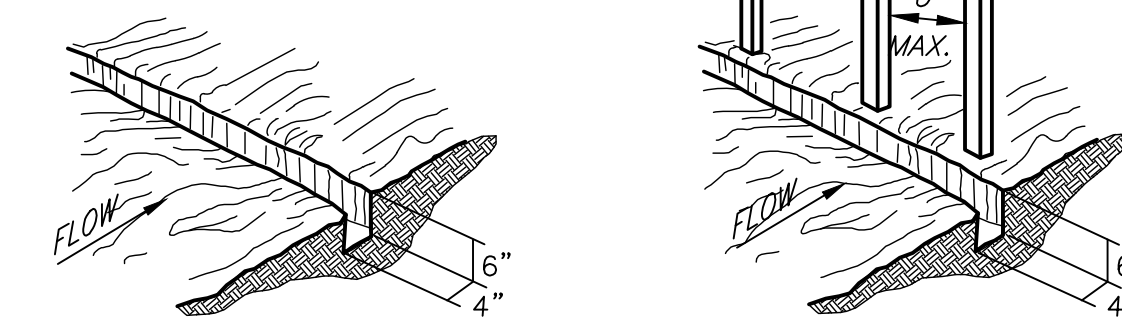
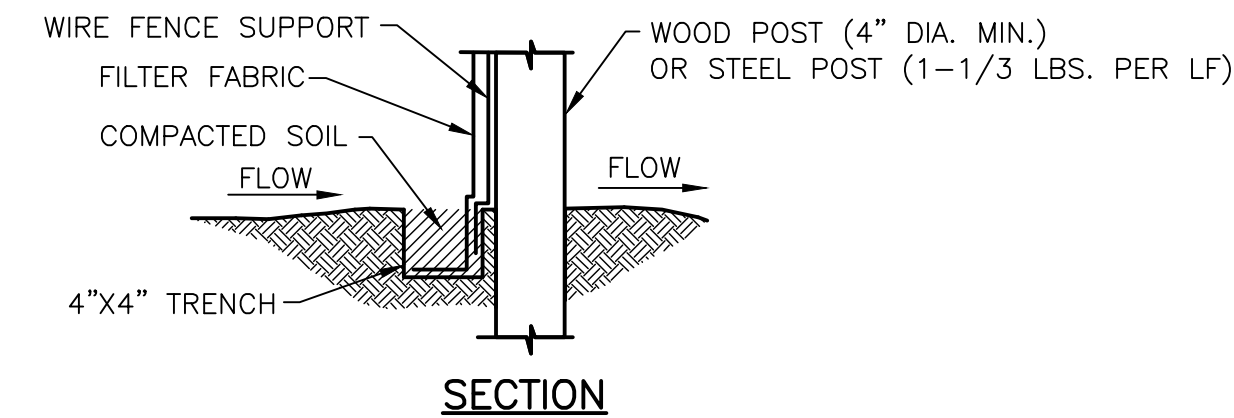
- DETERMINE THE EXACT LOCATION OF UNDERGROUND UTILITIES, BEFORE FENCE INSTALLATION SO UTILITIES ARE NOT DISTURBED.
- GRADE ALIGNMENT OF FENCE AS NEEDED TO PROVIDE A BROAD, NEARLY LEVEL AREA UPSTREAM OF FENCE TO ALLOW SEDIMENT COLLECTION AREA.

C) INSPECTION MAINTENANCE:

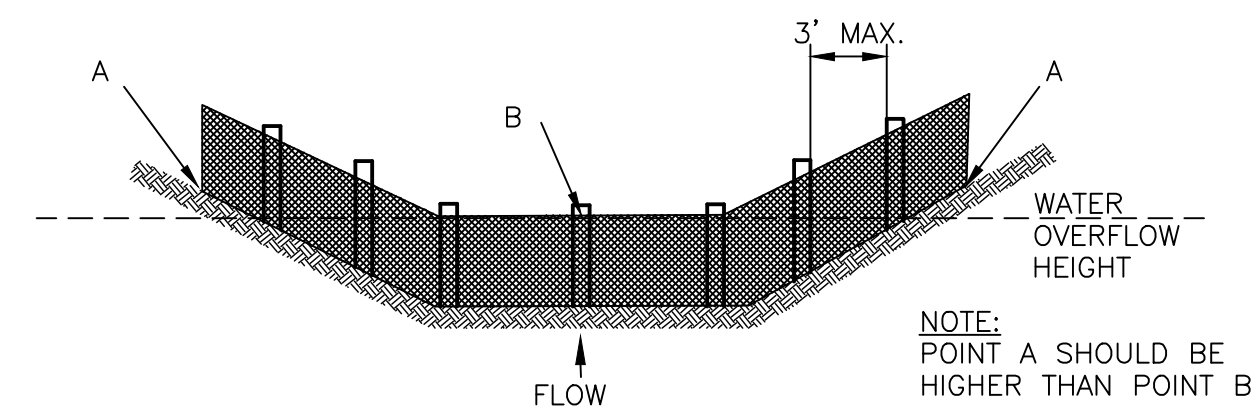
- INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
- SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
- REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. AVOID DAMAGING OR UNDERMINING THE FENCE DURING CLEANOUT. SEDIMENT ACCUMULATION SHOULD NOT EXCEED 1/2 THE HEIGHT OF THE FENCE.
- REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS, AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY AND COMPLETELY STABILIZED.

SEDIMENT FENCE

- EXCAVATE A 6"x4" TRENCH.
- SET THE STAKES ALONG THE DOWN SLOPE SIDE OF THE TRENCH.
- STAPLE GEOTEXTILE MATERIAL TO STAKES AND EXTEND IT INTO AND AROUND THE BOTTOM OF THE TRENCH.
- BACKFILL AND COMPACT THE EXCAVATED SOIL OVER THE GEOTEXTILE IN THE TRENCH.



SHEET FLOW INSTALLATION (PERSPECTIVE VIEW)
NOT TO SCALE



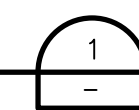
DRAINAGEWAY INSTALLATION (FRONT ELEVATION)
NOT TO SCALE

EROSION CONTROL FENCE NOTES:

- THE MAXIMUM SLOPE LENGTH ABOVE THE FENCE SHOULD BE LESS THAN 100 FEET.
- NO DITCH OR DRAINAGE WAY WITH AN AREA GREATER THAN 5 ACRES SHALL BE ENCLOSED ABOVE A SILT FENCE.
- NO SILT FENCE SHALL BE CONSTRUCTED IN A LIVE STREAM OR DRAINAGE WAY WITH EXPECTED FLOWS.
- THE FILTER FABRIC SHALL HAVE A MINIMUM FILTERING EFFICIENCY OF 75%. A MINIMUM TENSILE STRENGTH OF 30 LBS. PER LINEAR INCH AND A FLOW RATE OF 0.3 GALLONS PER SQUARE FOOT PER MINUTE. THE FILTER FABRIC SHALL ALSO HAVE ULTRAVIOLET RAY INHIBITORS TO ASSURE A LIFE USE EXPECTANCY OF 6 MONTHS AT 0 TO 100 DEGREES FAHRENHEIT.
- THE FILTER FABRIC SHALL BE 36 INCHES OR LESS IN HEIGHT, WITH JOINTS AT EVERY POST AVOIDING OVERLAP IF POSSIBLE (6" MIN. OVERLAP IF NECESSARY) AND POSTS SPACED EVERY 10 FEET WITH WIRE MESH SUPPORT OR 6 FEET WITHOUT SUPPORT, MAKING SURE THAT A MIN. OF 8" OF FABRIC IS BURIED IN THE 4"x4" TRENCH.
- THE SILT FENCE SHALL BE INSPECTED AFTER EVERY RAINFALL TO DETERMINE IF ANY PART OF THE FENCE NEEDS TO BE REPAIRED OR REPLACED. IF IT IS DETERMINED THAT THE FENCE NEEDS ANY REPAIR OR REPLACEMENT THIS SHALL BE DONE IMMEDIATELY.
- SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH RAINFALL OR BEFORE THEY ACCUMULATE TO 1/2 OF THE FENCE HEIGHT.
- EROSION CONTROL FENCE SHALL BE INSTALLED AT GRADING LIMITS OF PUMP STATION SITES.
- EROSION CONTROL FENCE SHALL BE INSTALLED ALONG WEST SIDE OF LAGOON ENCLOSURE SITES AT SUN VALLEY ESTATES AND HILLVIEW ACRES.
- EROSION CONTROL FENCE SHALL BE INSTALLED ON THE DOWNSIDE OF ANY SLOPE GREATER THAN 2% ON FORCE MAIN CONSTRUCTION.
- THE FINAL LOCATION OF ALL EROSION CONTROL FENCE SHALL BE DETERMINED DURING A PROJECT SITE VISIT.

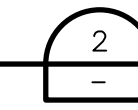
EROSION CONTROL FENCE INSTALLATION

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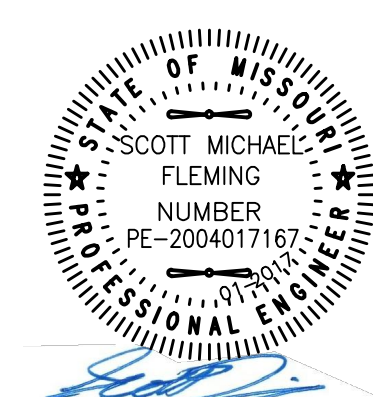


SEDIMENT FENCE DETAIL

NOT TO SCALE



PROJECT MANAGER SCOTT FLEMING



LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
PE-200401767



**PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT**

**STANDARD
CIVIL DETAILS**



FILENAME 05C502.dwg
SCALE AS NOTED

SHEET

05C502



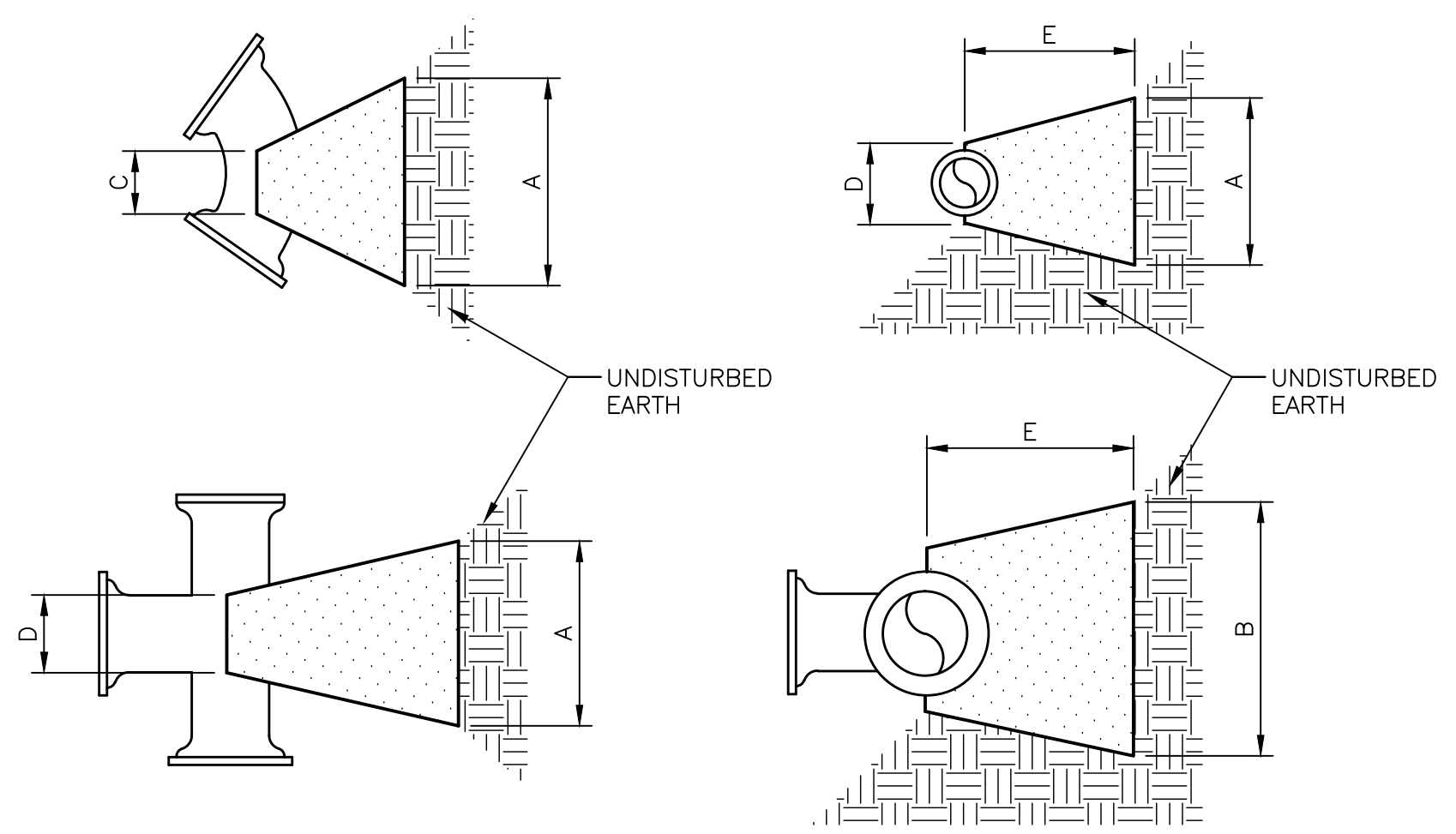
HDR
MISSOURI CERTIFICATE OF
AUTHORITY #: 000856
3741 NE TROON DRIVE
LEE'S SUMMIT, MO 64064
816-347-1100

ISSUE	DATE	DESCRIPTION
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2	09-09-16	CLIENT REVIEW
1	07-20-16	CLIENT REVIEW

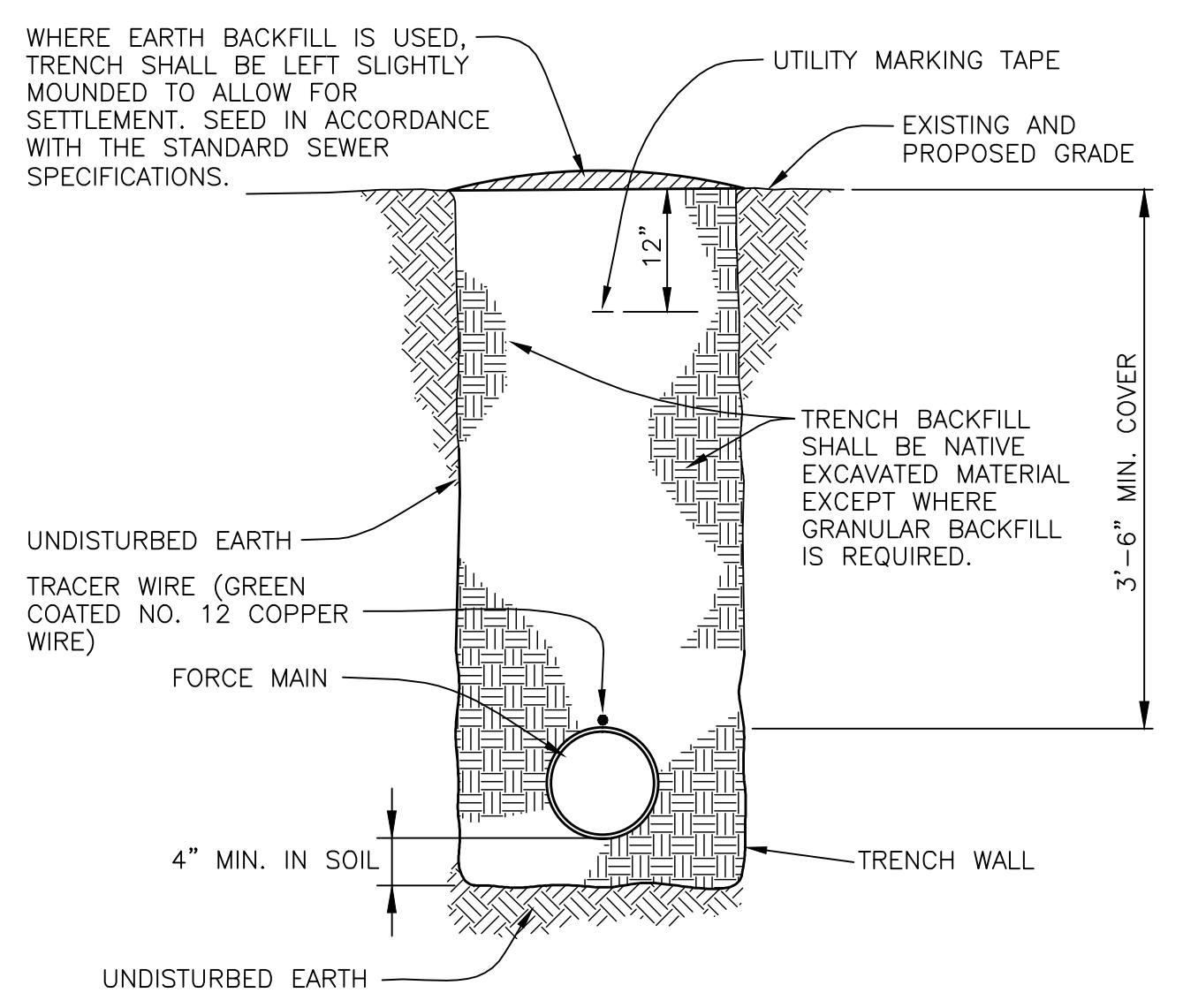
PROJECT NUMBER 0000000277870

PIPE SIZE	FITTING	DISTANCE IN INCHES				
		A	B	C	D	E
4" AND SMALLER	11.25 & 22.5'	9	9	8	8	6
	45'	18	9	8	8	12
	90'	21	12	8	8	12
	TEE/PLUG	15	12	8	8	12
6"	11.25 & 22.5'	12	12	8	10	12
	45'	27	12	8	10	12
	90'	33	18	8	10	12
8"	TEE/PLUG	24	18	8	10	12
	11.25 & 22.5'	18	15	8	10	12
	45'	33	15	8	10	18
10" & 12"	90'	42	24	8	10	18
	TEE/PLUG	30	24	8	10	18
	11.25 & 22.5'	27	24	12	12	18
14" & 16"	45'	51	24	12	12	24
	90'	63	36	12	12	30
	TEE/PLUG	45	36	12	12	24
14" & 16"	11.25 & 22.5'	33	33	12	16	18
	45'	69	33	12	16	30
	90'	84	48	12	16	36
	TEE/PLUG	60	48	12	16	30

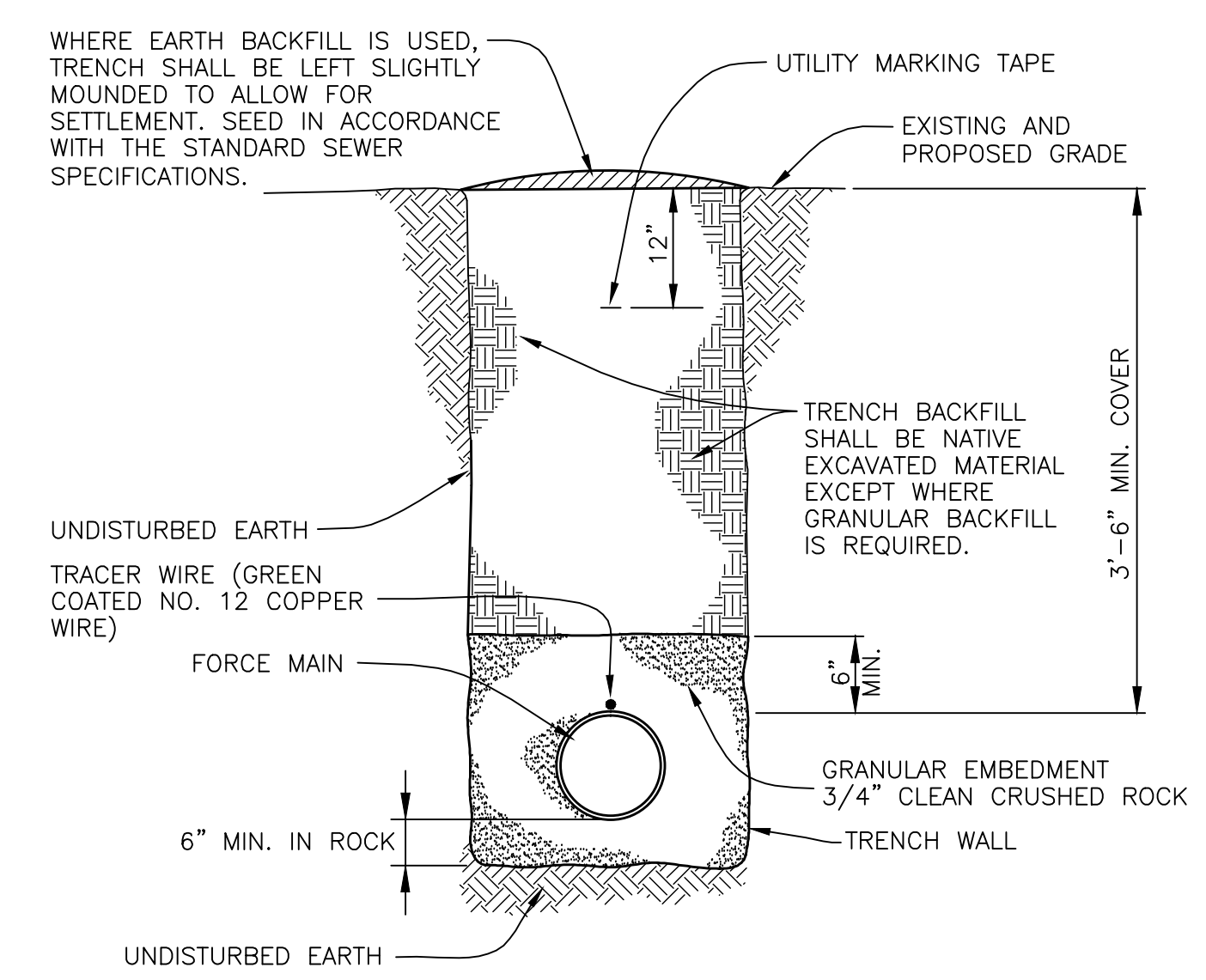
- NOTES:**
- THRUST BLOCKS ARE BASED ON A WORKING PRESSURE OF 100 PSI, PLUS 100% SURGE, AND 2000 PSF ALLOWABLE SOIL BEARING PRESSURE.
 - FOR PIPE SIZES NOT SHOWN USE DIMENSIONS FOR NEXT LARGER SIZE.
 - USE 3/8" PLYWOOD SEPARATOR BETWEEN BLOCKS AND PLUGS TO PROVIDE FOR FUTURE REMOVAL.



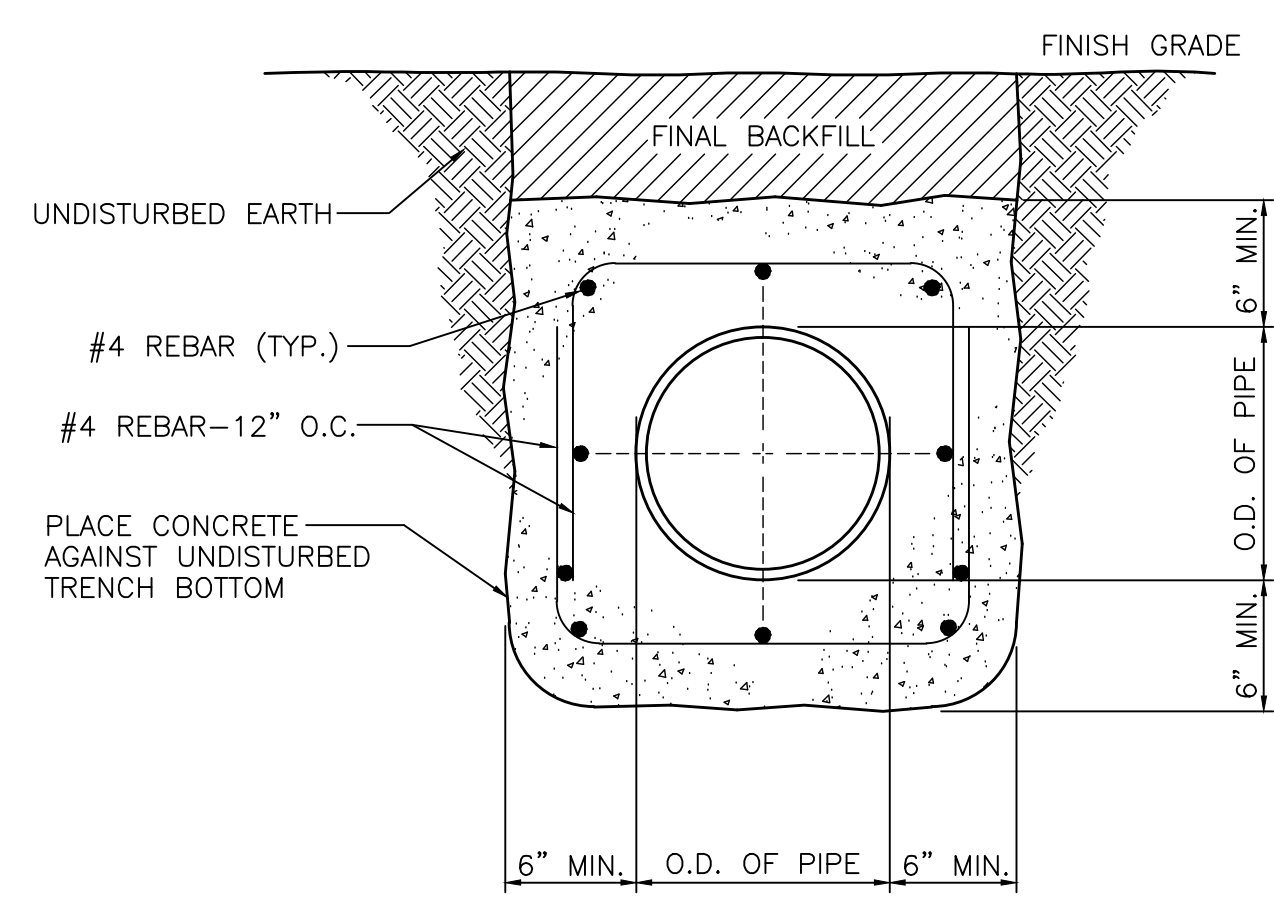
CONCRETE THRUST BLOCK
NOT TO SCALE



FORCEMAIN INSTALLATION IN SOIL
NOT TO SCALE



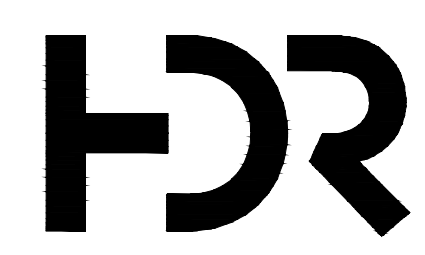
FORCEMAIN INSTALLATION IN ROCK
NOT TO SCALE



- NOTES:**
- FOR PIPE LARGER THAN 12" DIAMETER THE MINIMUM CONCRETE COVER SHALL BE 8" WITH # 5 REBAR @ 12" O.C. EACH WAY.
 - BRACE OR TIE THE PIPE TO PREVENT FLOTATION OR DEFLECTION, DURING CONCRETE PLACEMENT.
 - FOR ARCH ENCASEMENT OF PIPE, SUBSTITUTE GRANULAR EMBEDMENT MATERIAL FOR CONCRETE BELOW SPRINGLINE OF PIPE.

CONCRETE PIPE ENCASEMENT
NOT TO SCALE

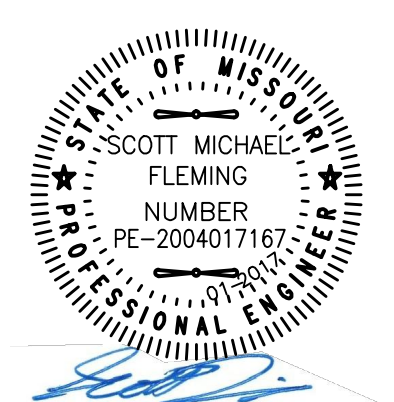
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HDR
MISSOURI CERTIFICATE OF AUTHORITY #: 000856
3741 NE TROON DRIVE
LEE'S SUMMIT, MO 64064
816-347-1100

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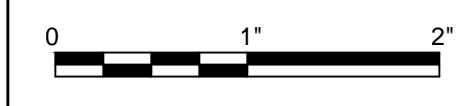
PROJECT MANAGER	SCOTT FLEMING
PROJECT NUMBER	0000000277870



LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
PE-200401767



**PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT**



FILENAME | 05D501.dwg
SCALE | AS NOTED

SHEET
05D501

- GENERAL NOTES:**
- SEE SHEETS 20C801 AND 20C802 FOR FORCEMAIN PIPING, AND SHEET 30C801 FOR GRAVITY SEWER PIPING.

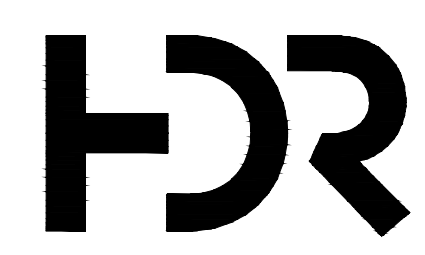


SITE PLAN - FORCEMAIN MANHOLE TIE-IN



SITE PLAN - PUMP STATION

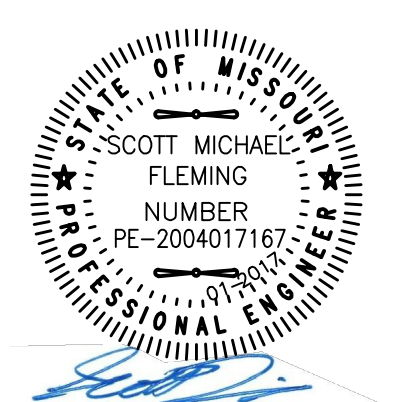
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1/18/2017 10:26 AM
Dinkel, Tracy



HDR
 MISSOURI CERTIFICATE OF AUTHORITY #: 000856
 3741 NE TROON DRIVE
 LEE'S SUMMIT, MO 64064
 816-347-1100

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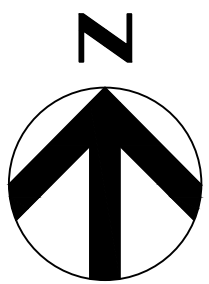
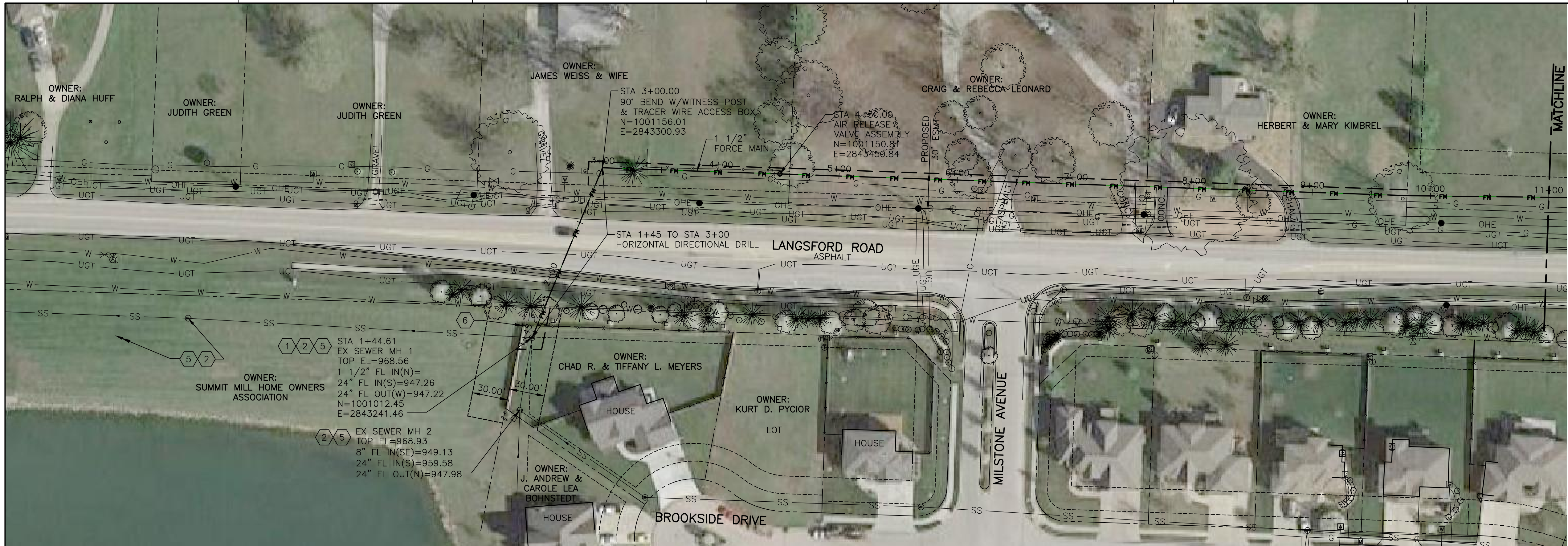


PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT



FILENAME | 10C001.dwg
 SCALE | 1" = 20'

SHEET
10C001

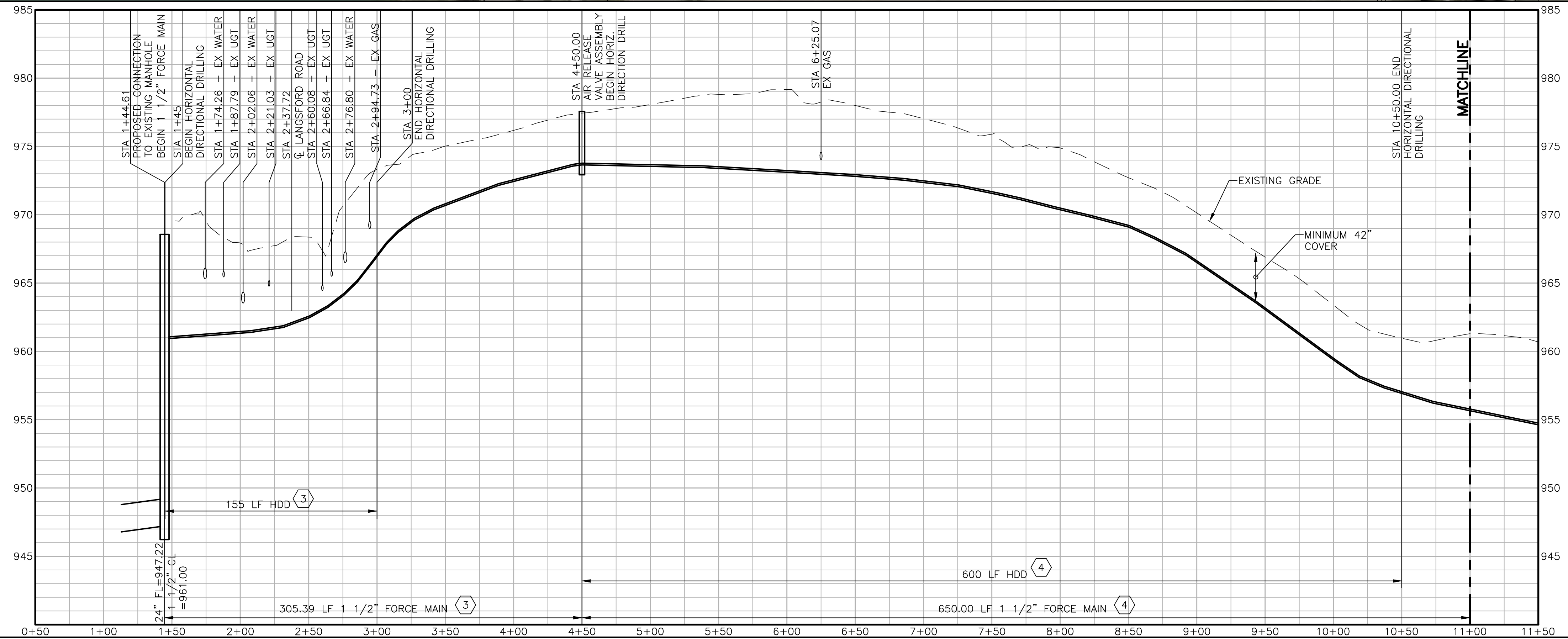


GENERAL NOTES:

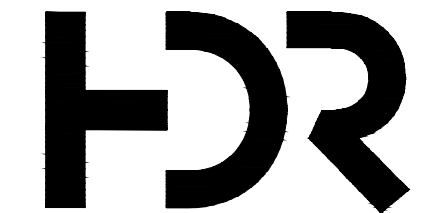
1. PROVIDE A MINIMUM OF 42" OF COVER OVER ALL PIPING.
2. ALL ROAD, DRIVEWAY AND DRAINAGE CROSSINGS SHALL BE HORIZONTALLY DIRECTIONALLY DRILLED (HDD).
3. CONTRACTOR SHALL PROVIDE ALL VERTICAL AND HORIZONTAL BENDS AS NEEDED TO MATCH ALIGNMENT SHOWN.
4. SEE SHEET 00C004 FOR SURVEY CONTROL AND PROPERTY OWNER INFORMATION.

KEYNOTES:

1. CONNECT 1 1/2" FORCE MAIN TO EXISTING SEWER MH 1 WITH AN INSIDE DROP. INSTALL CARBON CANISTER ODOR CONTROL AT EXISTING SEWER MH 1. SEE DETAILS 6/05C501 AND 4/05C501
2. INSTALL CARBON CANISTER ODOR CONTROL AT EXISTING SEWER MH. SEE DETAIL 4/05C501.
3. PROVIDE CONTINUOUS DOWNHILL SLOPE TO CONNECTION TO EXISTING SEWER MANHOLE.
4. PROVIDE CONTINUOUS POSITIVE SLOPE, NO INTERMEDIATE HIGH POINTS PERMITTED.
5. EPOXY COAT 4 MANHOLES, MH1, MH2 AND 2 MANHOLES DOWNSTREAM OF MH (TO WEST). EACH OF THESE MANHOLES IS 5' DIAMETER AND 22± DEEP. FOR A TOTAL OF APPROXIMATELY 88 VERTICAL FEET OF EPOXY COATING. (1385 SF)
6. REMOVE AND REINSTALL FENCE PANELS AND POSTS AS REQUIRED WITHIN TEMPORARY EASEMENT.



20C801.dwg 3/17/2017 9:42 AM Keyhill, Pat

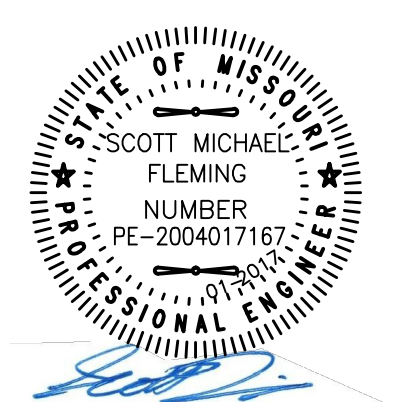


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PROJECT MANAGER SCOTT FLEMING

PROJECT NUMBER 0000000277870

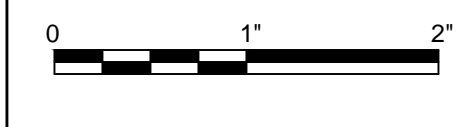


LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
PE-200401767



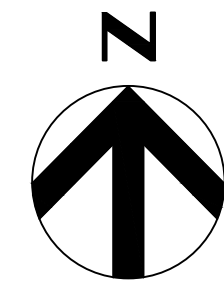
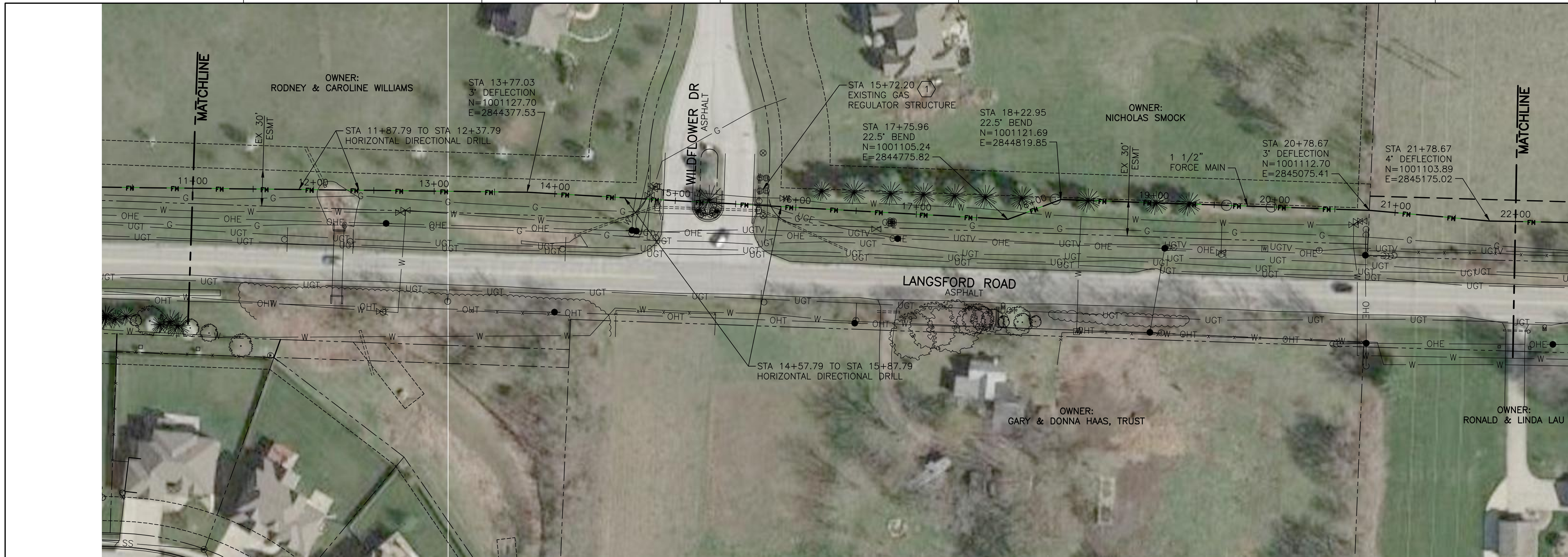
PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT

FORCEMAIN PIPING
PLAN & PROFILE
STA 1+00.00 TO STA 11+00.00



FILENAME 20C801.dwg
SCALE 1" = 50'

SHEET
20C801

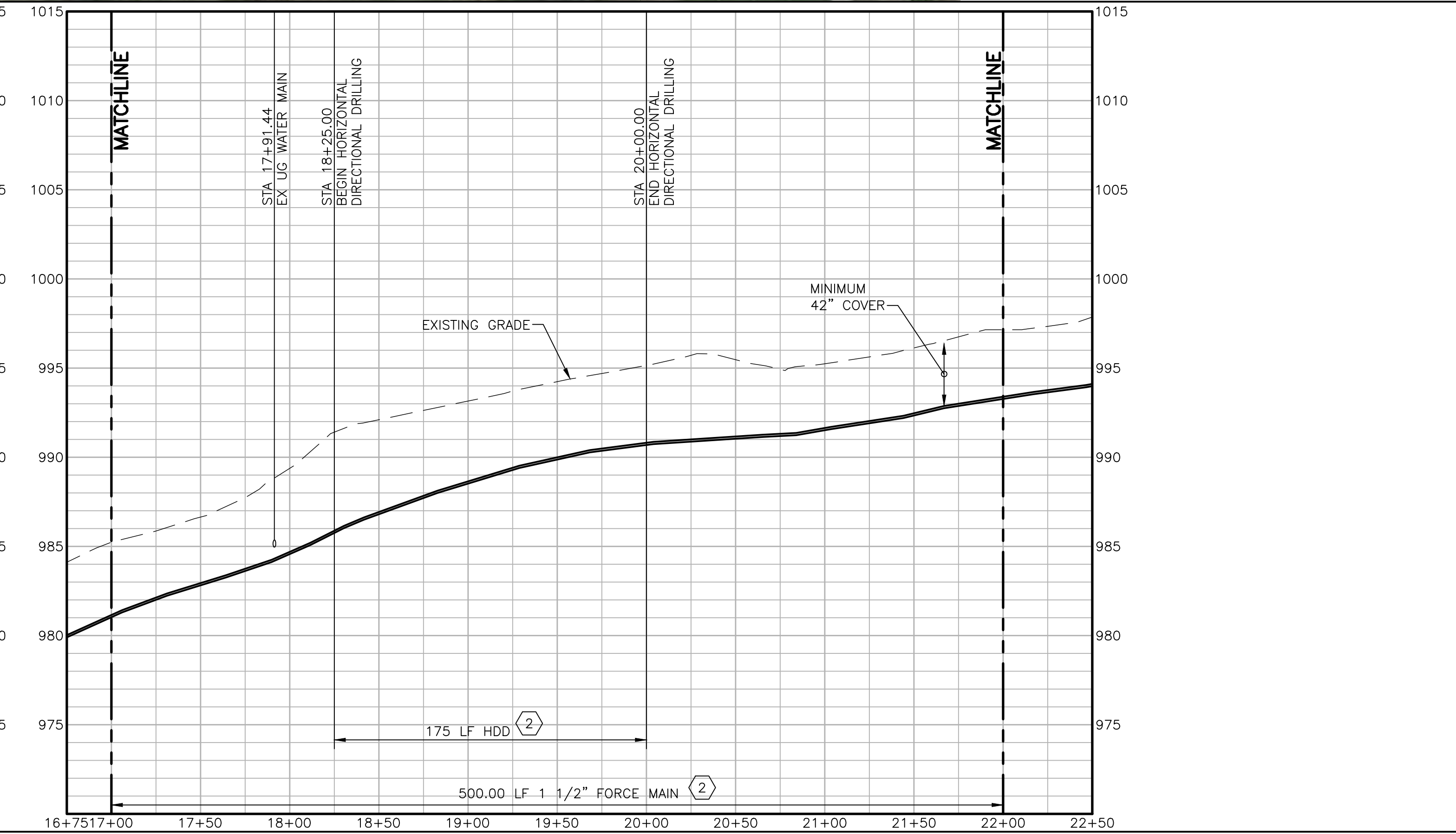
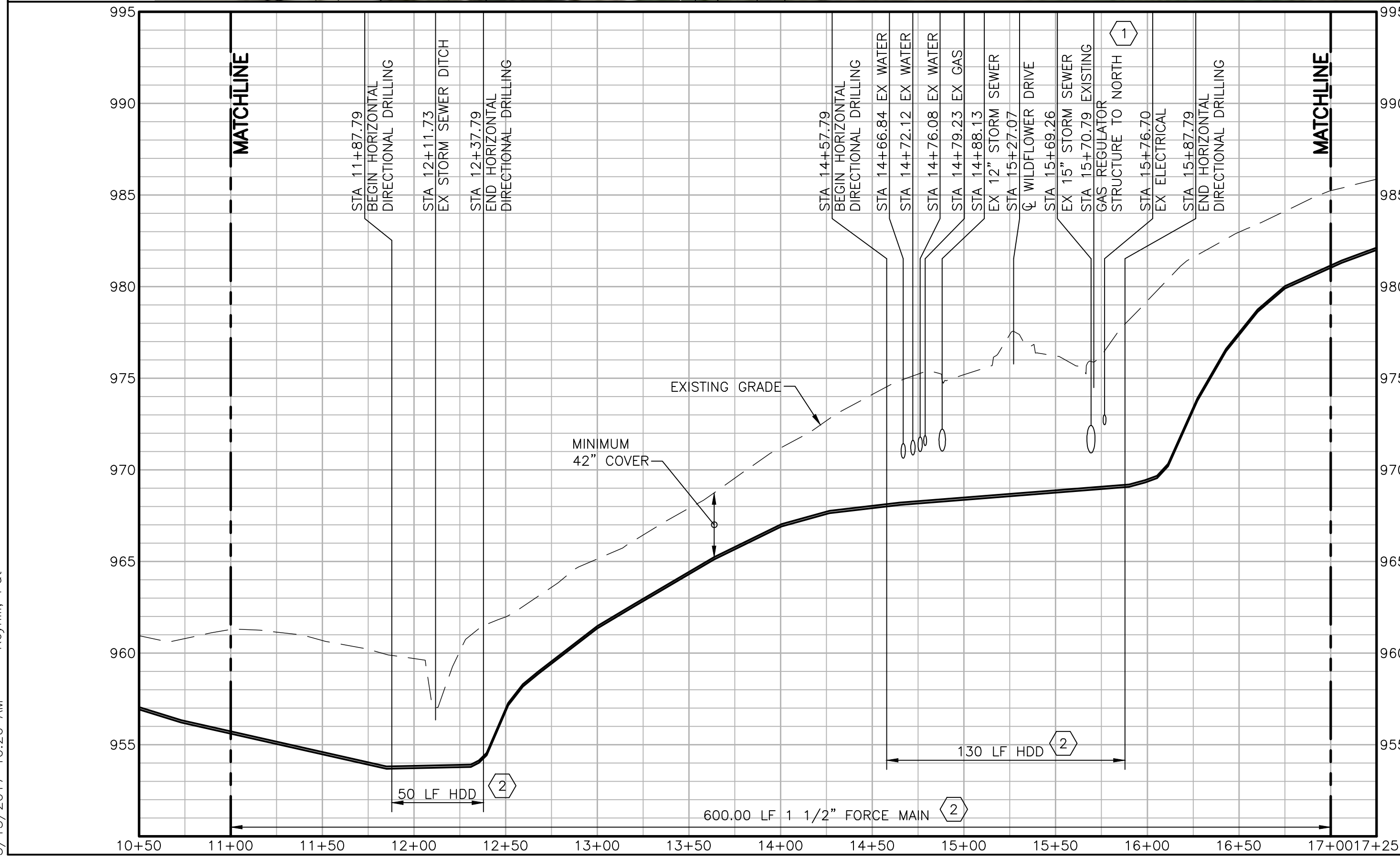


GENERAL NOTES:

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2. ALL ROAD, DRIVEWAY AND DRAINAGE CROSSINGS SHALL BE HORIZONTALLY DIRECTIONALLY DRILLED (HDD).
3. CONTRACTOR SHALL PROVIDE ALL VERTICAL AND HORIZONTAL BENDS AS NEEDED TO MATCH ALIGNMENT SHOWN.
4. SEE SHEET 00G004 FOR SURVEY CONTROL AND PROPERTY OWNER INFORMATION.

KEYNOTES:

1. CONTRACTOR TO COORDINATE WITH GAS COMPANY TO DETERMINE SIZE AND DEPTH OF GAS LINES AND MINIMUM DEPTH TO HDD BELOW.
2. PROVIDE CONTINUOUS POSITIVE SLOPE, NO INTERMEDIATE HIGH POINTS PERMITTED.



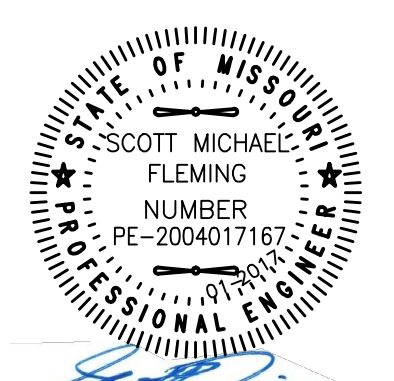
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HDR
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LEE'S SUMMIT, MO 64064
816-347-1100

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PROJECT MANAGER	SCOTT FLEMING
PROJECT NUMBER	0000000277870



LICENSEE:
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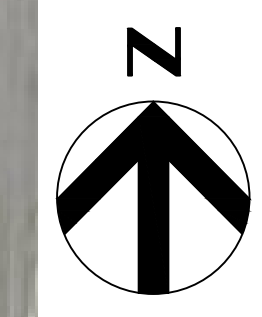
**PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT**

**FORCEMAIN PIPING
PLAN & PROFILE
STA 11+00.00 TO STA 22+00.00**



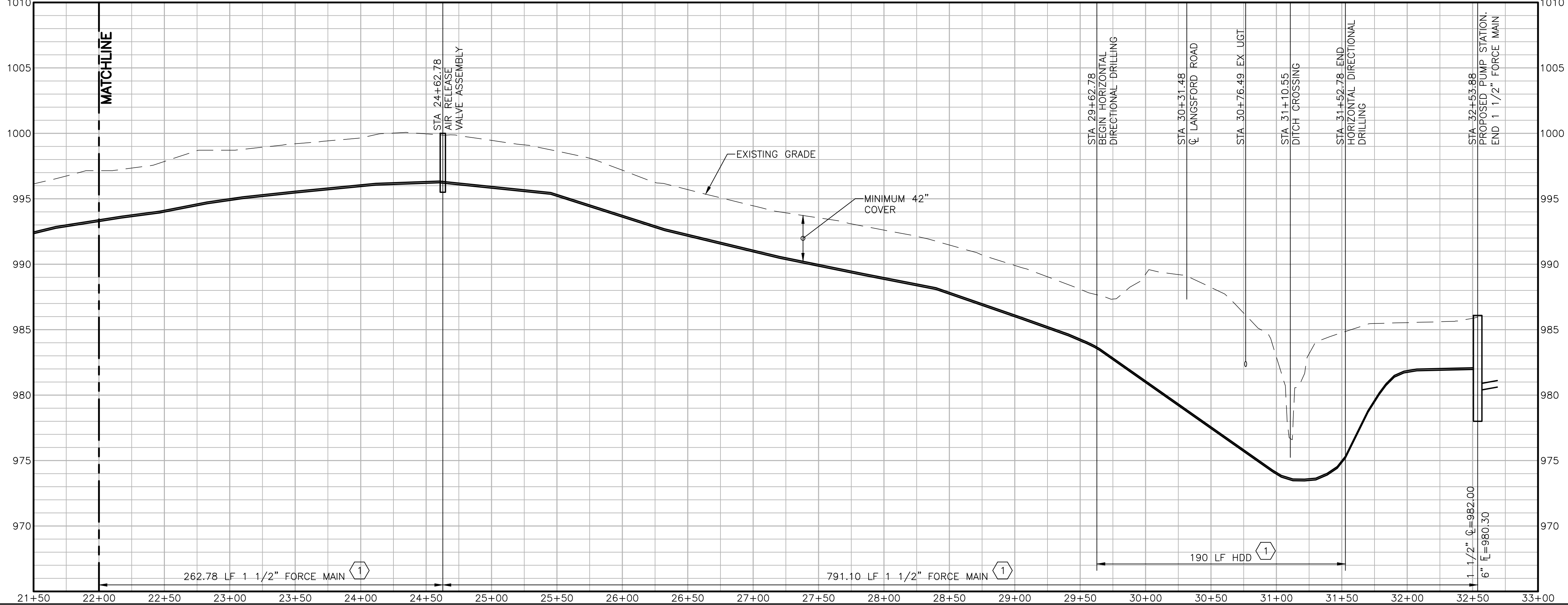
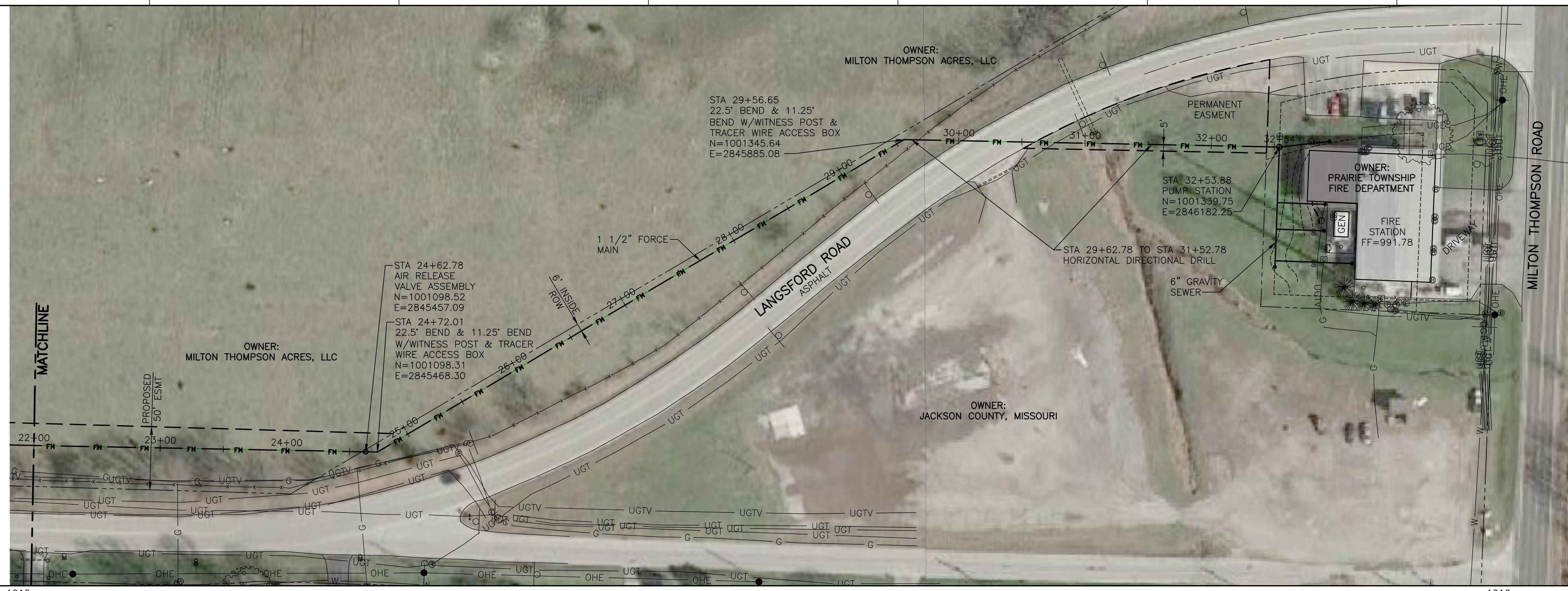
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SCALE | 1" = 50'

SHEET
20C802

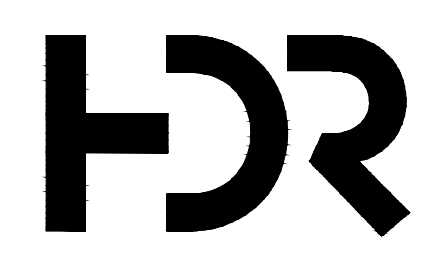


- GENERAL NOTES:**
1. PROVIDE A MINIMUM OF 42" OF COVER OVER ALL PIPING.
 2. ALL ROAD, DRIVEWAY AND DRAINAGE CROSSINGS SHALL BE HORIZONTALLY DIRECTIONALLY DRILLED (HDD).
 3. CONTRACTOR SHALL PROVIDE ALL VERTICAL AND HORIZONTAL BENDS AS NEEDED TO MATCH ALIGNMENT SHOWN.
 4. SEE SHEET 00G004 FOR SURVEY CONTROL AND PROPERTY OWNER INFORMATION.

- KEYNOTES:**
- 1 PROVIDE CONTINUOUS POSITIVE SLOPE, NO INTERMEDIATE HIGH POINTS PERMITTED.



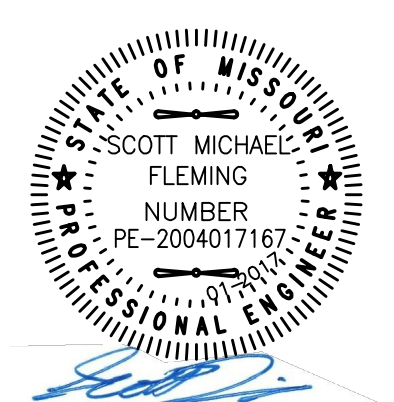
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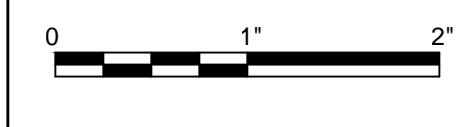
PROJECT MANAGER	SCOTT FLEMING
PROJECT NUMBER	0000000277870



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PROJECT MANAGER
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**PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT**



**FORCEMAIN PIPING
PLAN & PROFILE
STA 22+00.00 TO STA 32+60.08**

FILENAME | 20C803.dwg
SCALE | 1" = 50'

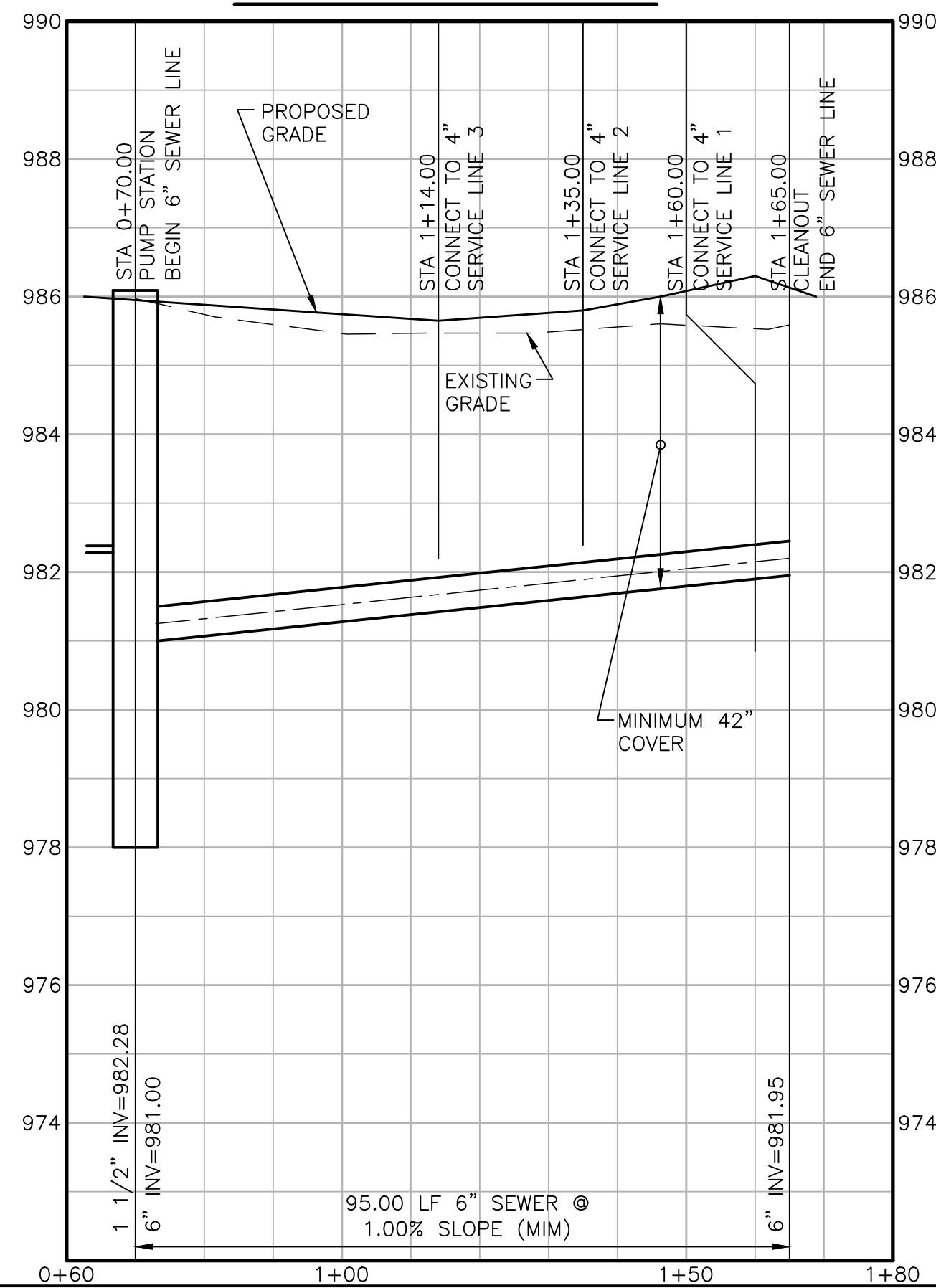
SHEET
20C803



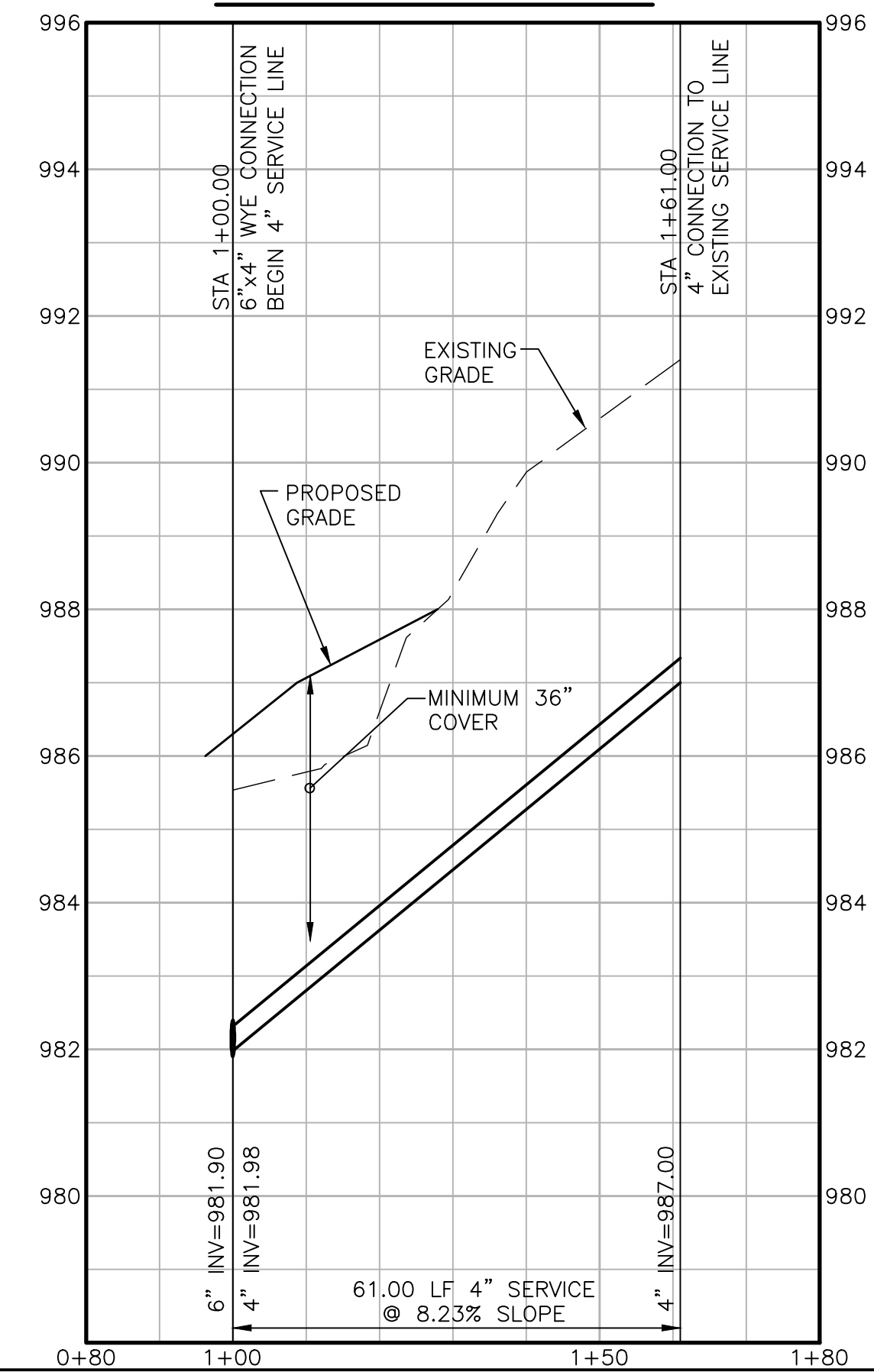
- GENERAL NOTES:**
1. PROVIDE A MINIMUM OF 42" OF COVER OVER ALL PIPING.
 2. CONTRACTOR SHALL VERIFY EXISTING SERVICE LINE LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION. NOTIFY ENGINEER AND OWNER OF ANY DEVIATIONS FROM COORDINATES AND ELEVATIONS SHOWN ON THIS SHEET.
 3. CONTRACTOR SHALL PROVIDE ALL VERTICAL AND HORIZONTAL BENDS AS NEEDED TO MATCH ALIGNMENT SHOWN.

- KEYNOTES:**
- 1 FIELD ROUTE EXISTING 2" FLOOR DRAIN TO NEW 4" SERVICE LINE.
 - 2 10' FEET WEST OF PUMP STATION INSTALL 1 1/2" VALVE CURB STOP AND CHECK VALVE, E-ONE MODEL NA0330P03 OR EQUAL, WITH VALVE BOX EXTENSION, E-ONE MODEL PB0930G04 OR EQUAL.

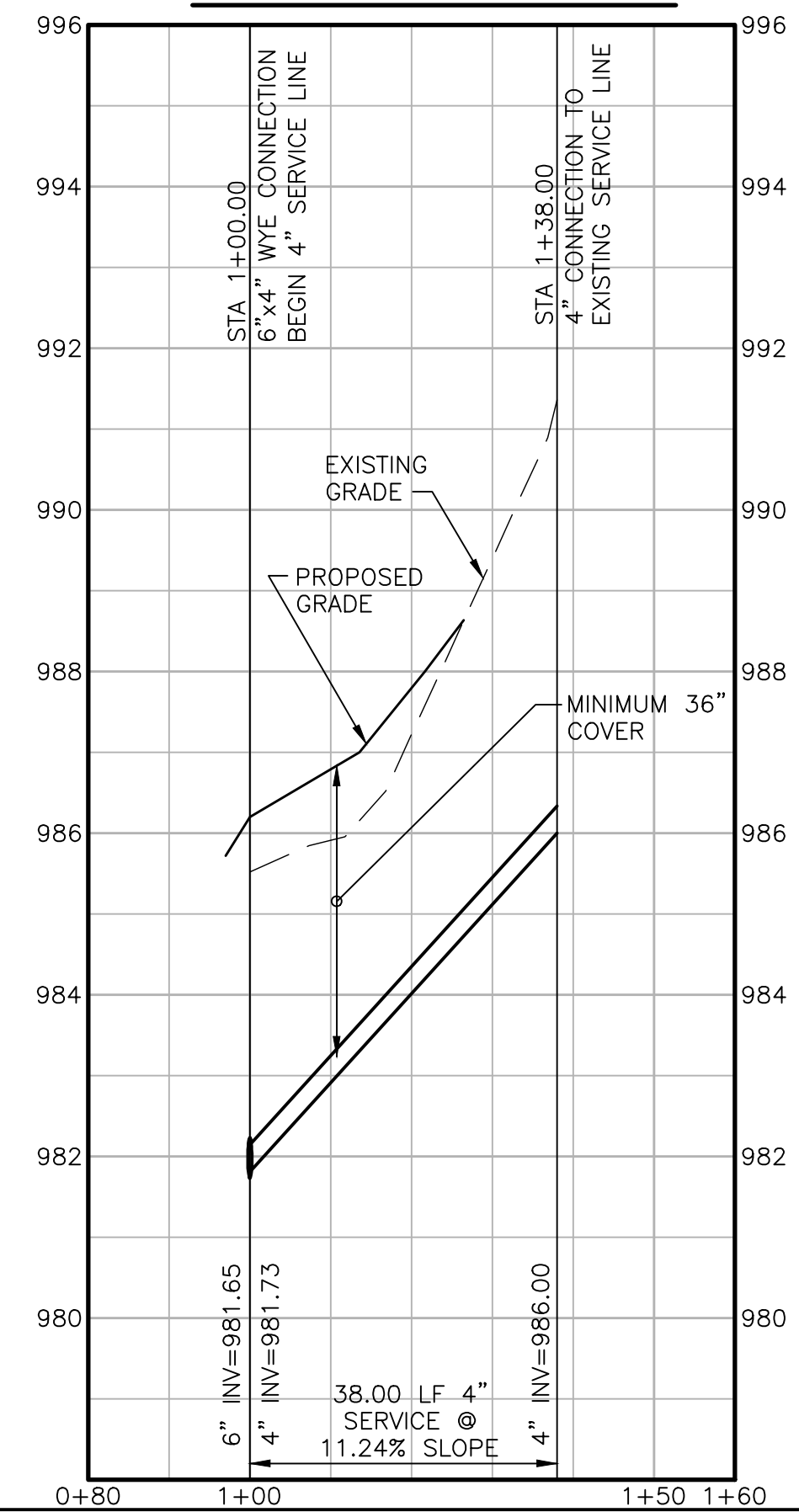
6" GRAVITY SEWER



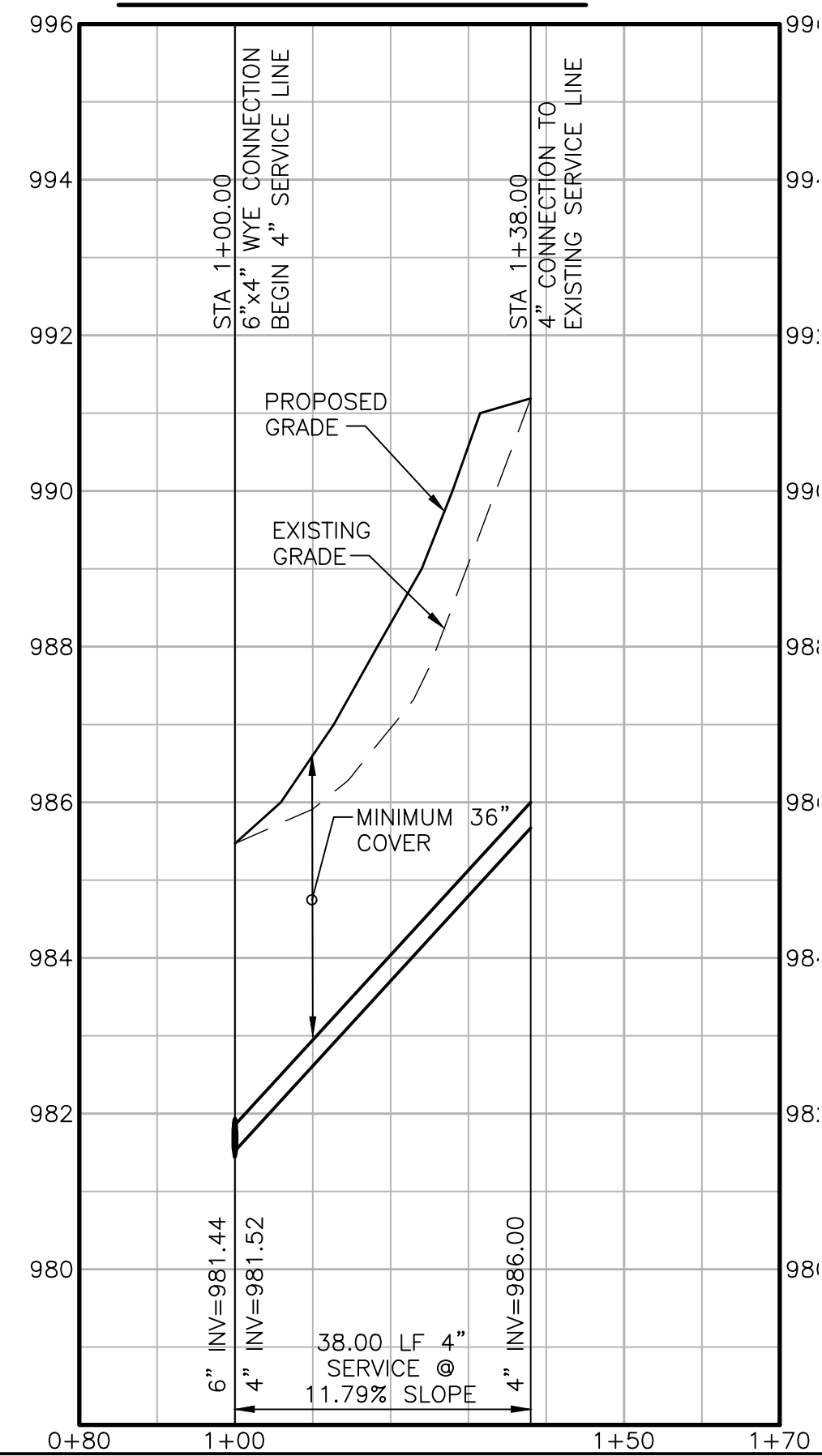
4" SERVICE LINE 1



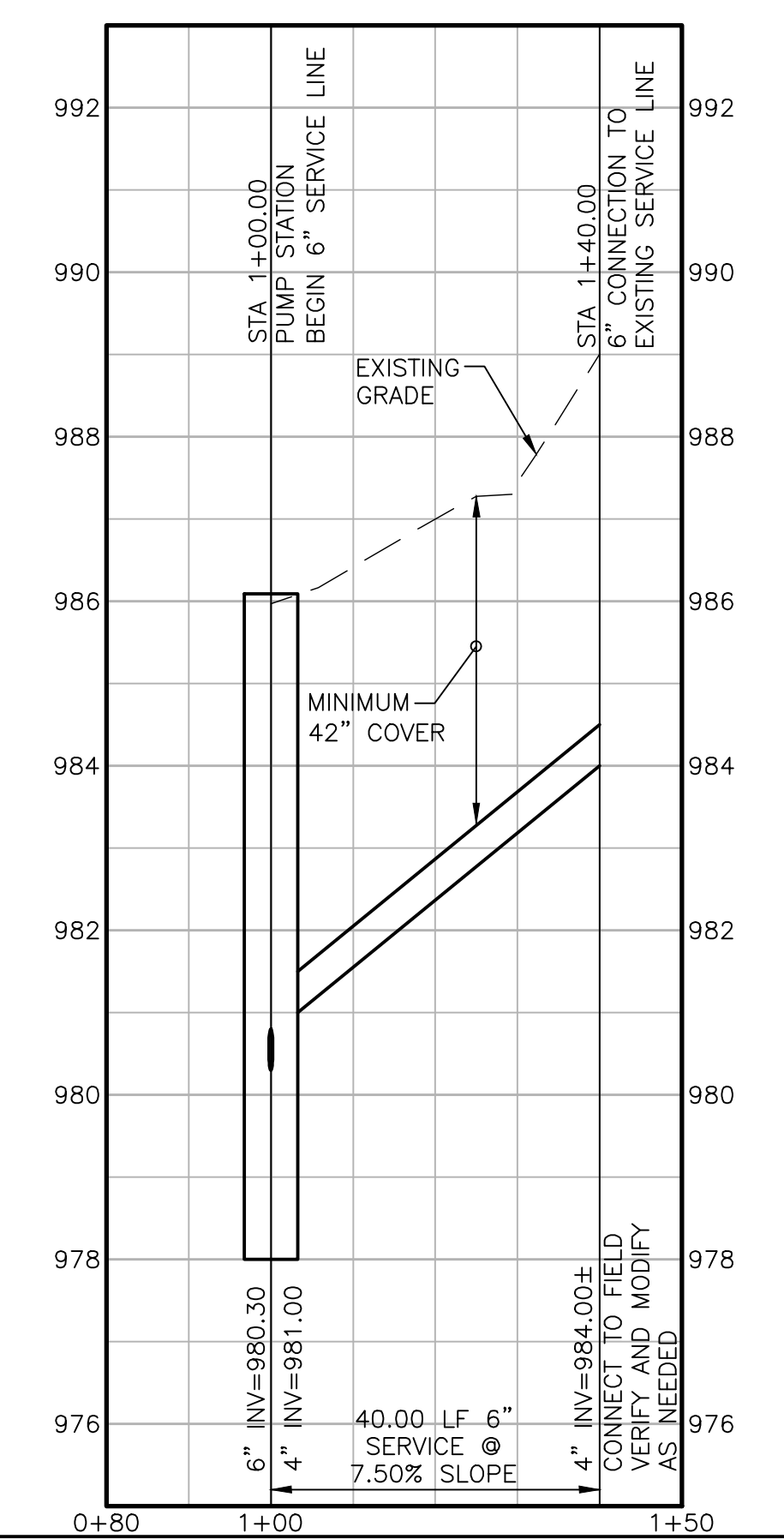
4" SERVICE LINE 2



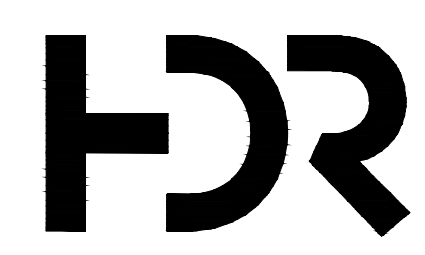
4" SERVICE LINE 3



6" SERVICE LINE 4



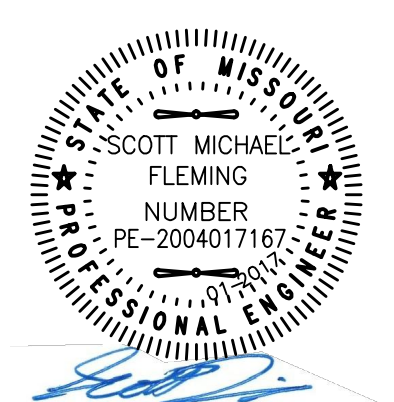
30c801.dwg 3/13/2017 10:27 AM Keyhill_Pat



HDR
MISSOURI CERTIFICATE OF AUTHORITY #: 000856
3741 NE TROON DRIVE
LEE'S SUMMIT, MO 64064
816-347-1100

ISSUE	DATE	DESCRIPTION
3	01-2017	ISSUED FOR MDNR
2	09-09-16	CLIENT REVIEW
1	07-20-16	CLIENT REVIEW

PROJECT MANAGER	SCOTT FLEMING
PROJECT NUMBER	0000000277870



LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
PE-200401767



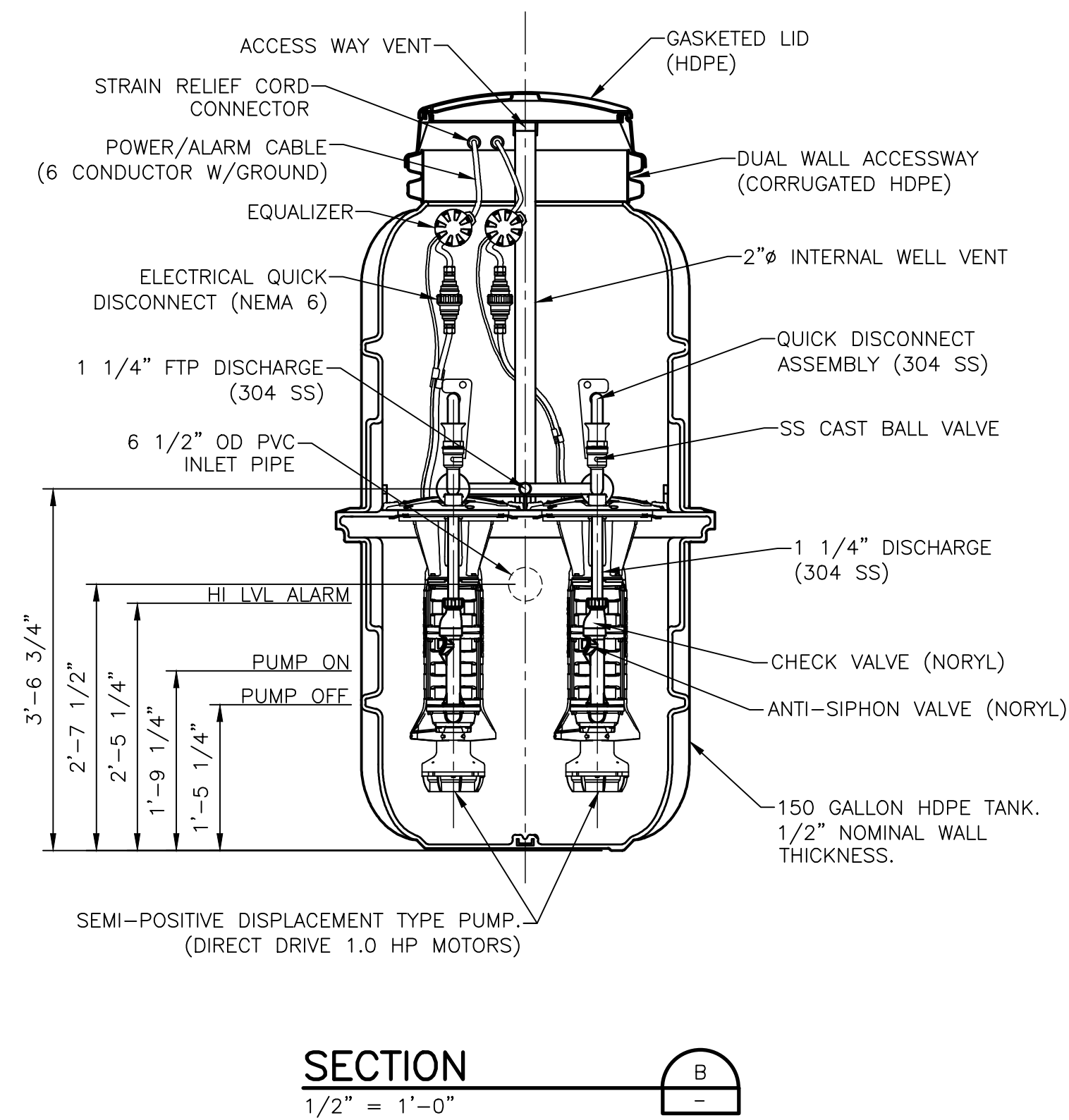
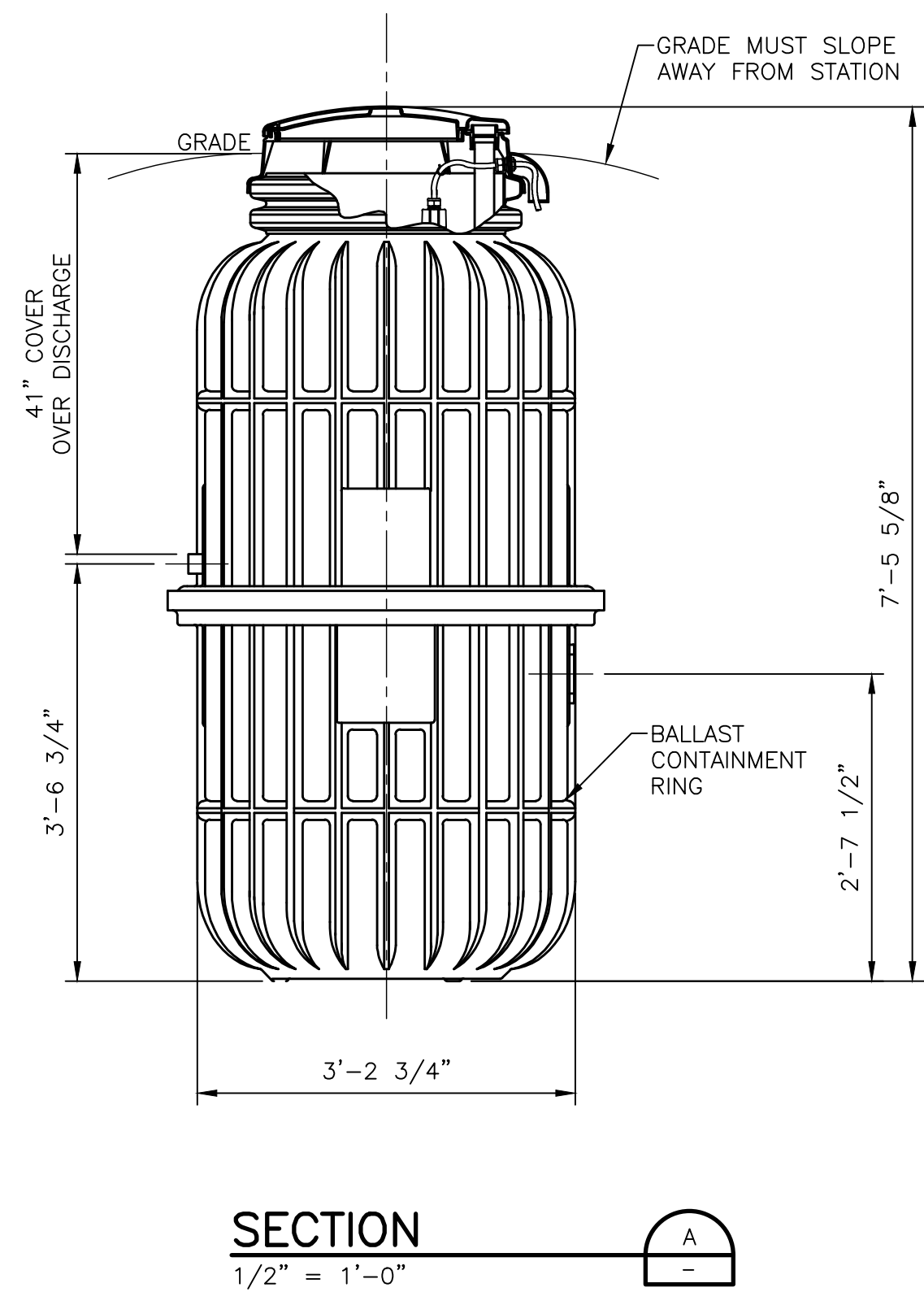
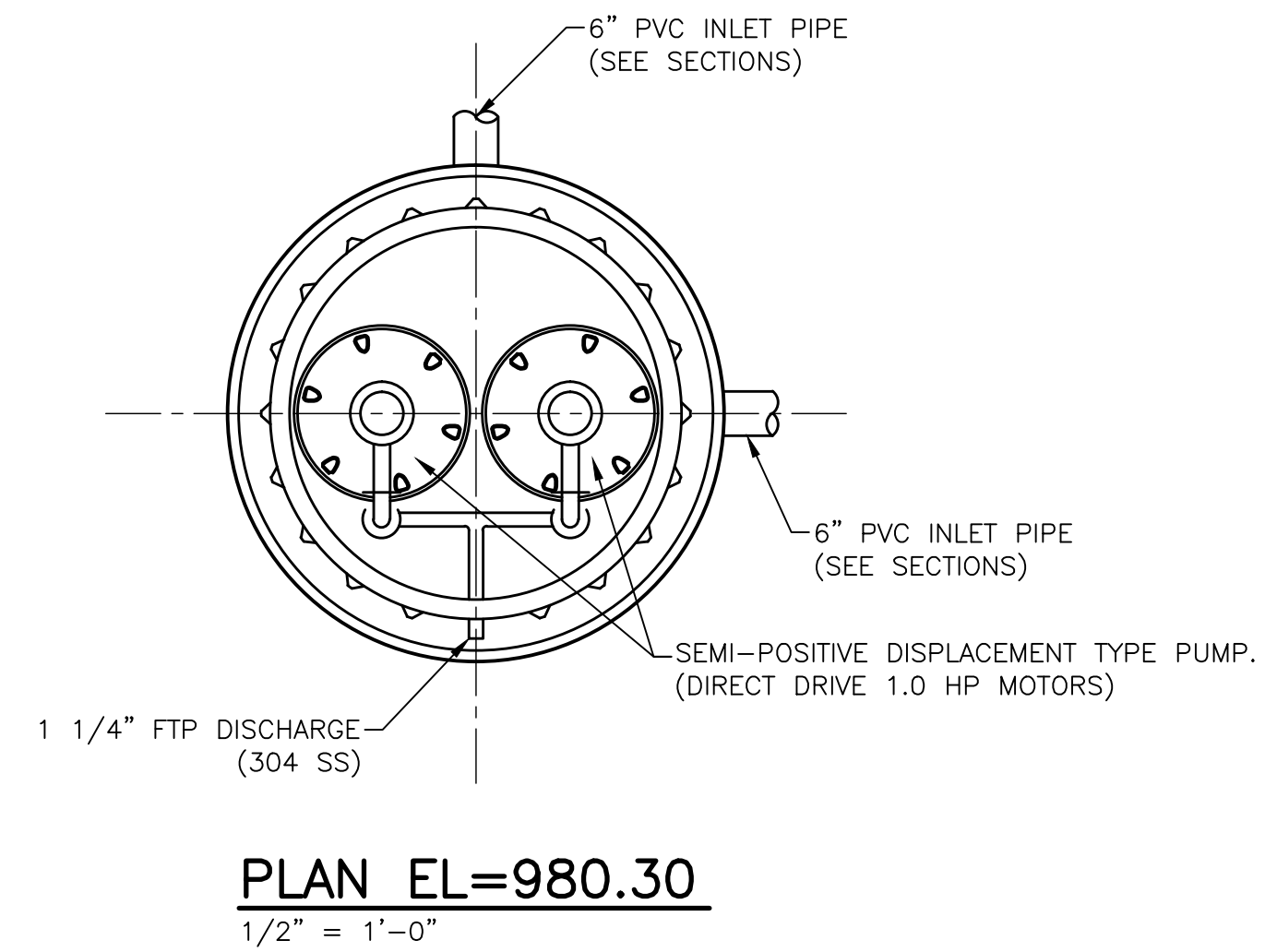
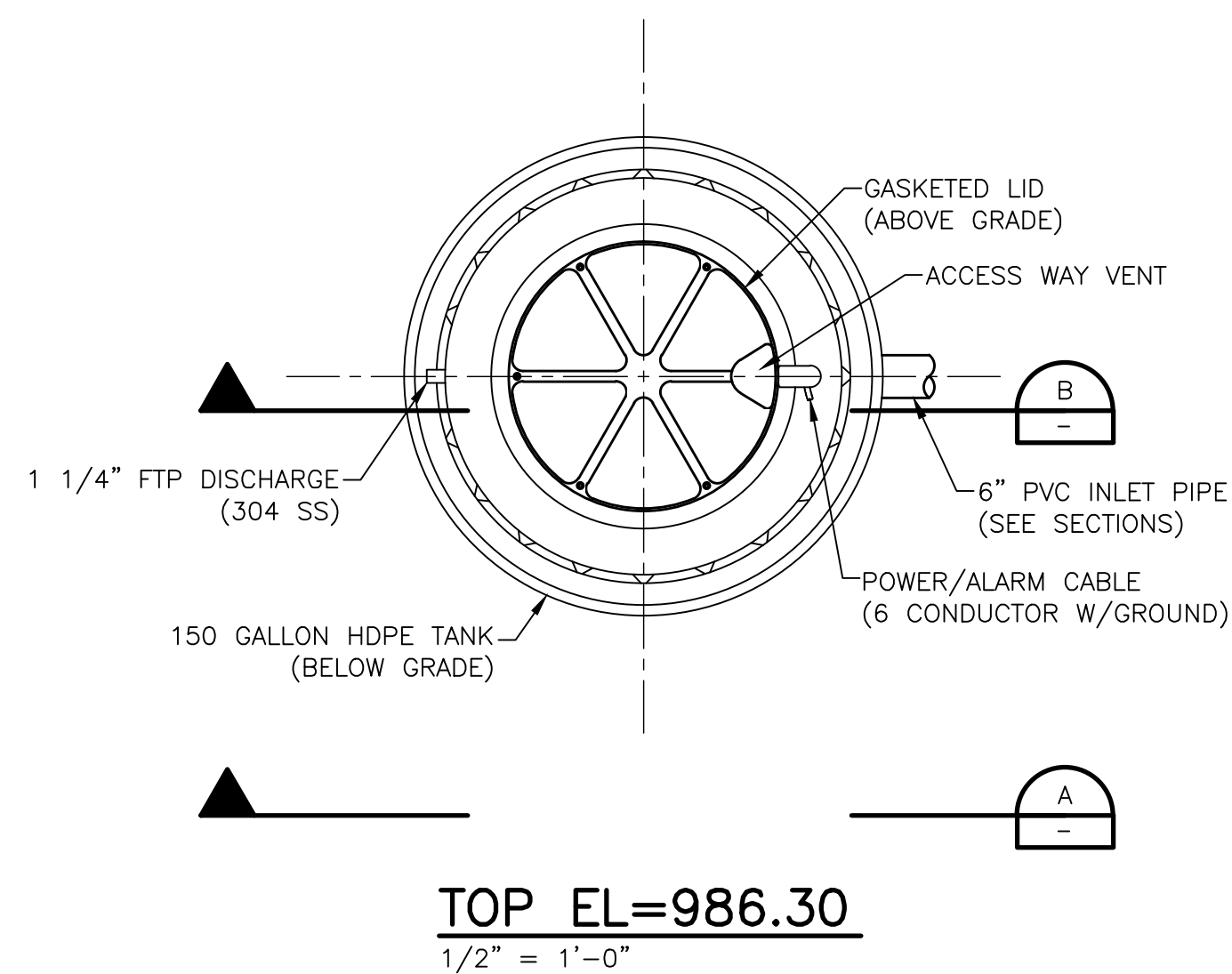
**PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT**



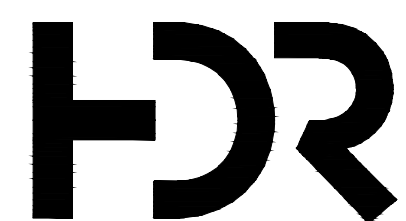
**GRAVITY PIPING
PLAN & PROFILES**

FILENAME | 30c801.dwg
SCALE | 1" = 20'

SHEET
30C801



40U101.dwg
 1/18/2017 10:29 AM
 Dinkel, Tracy



HDR
 MISSOURI CERTIFICATE OF AUTHORITY #: 000856
 3741 NE TROON DRIVE
 LEE'S SUMMIT, MO 64064
 816-347-1100

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PROJECT MANAGER	SCOTT FLEMING
PROJECT NUMBER	0000000277870



LICENSEE:
 SCOTT M FLEMING
 PROJECT MANAGER
 PE-200401767



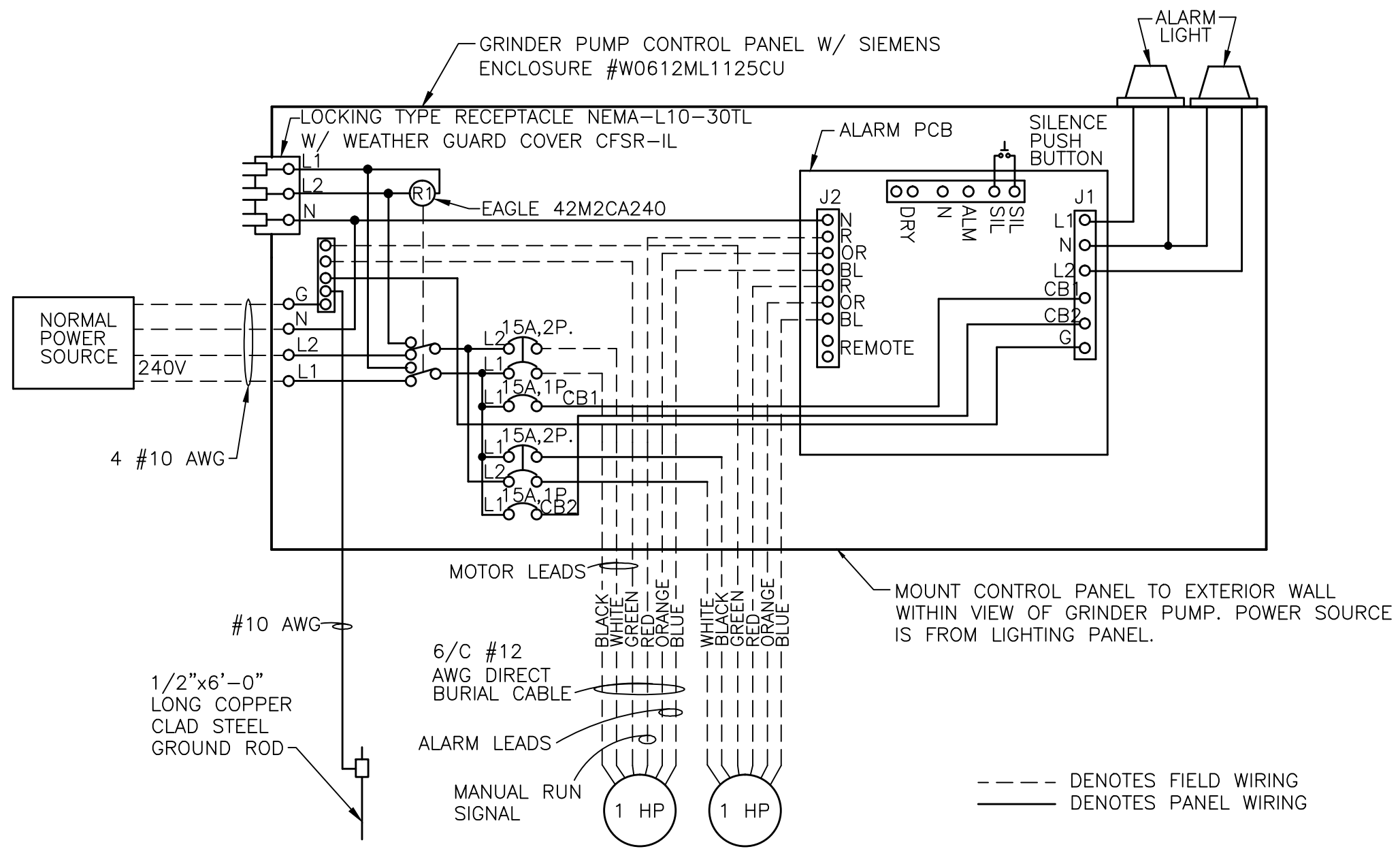
**PRAIRIE TOWNSHIP FIRE DISTRICT
 GRINDER PUMP AND SEWER
 FORCE MAIN CONNECTION
 TO LEE'S SUMMIT**

**PUMP STATION
 STRUCTURAL, PROCESS & ELECTRICAL
 PLANS AND SECTION**



FILENAME | 40U101.dwg
 SCALE | AS NOTED

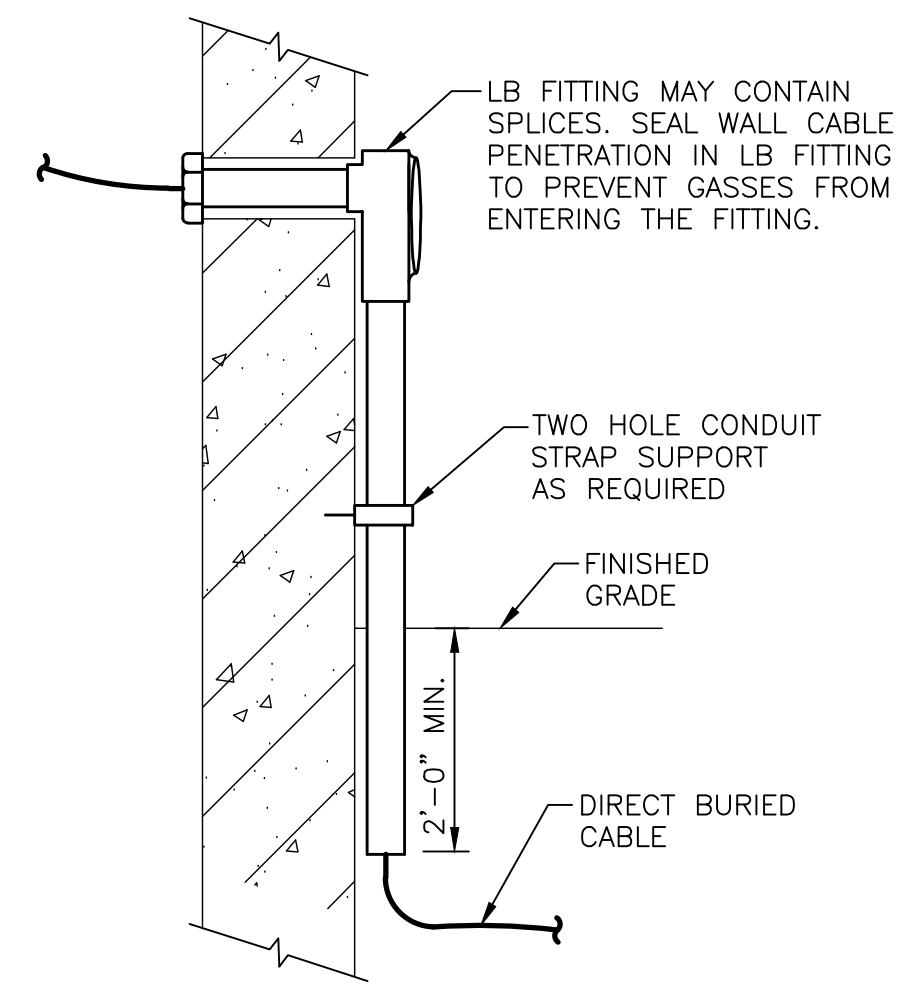
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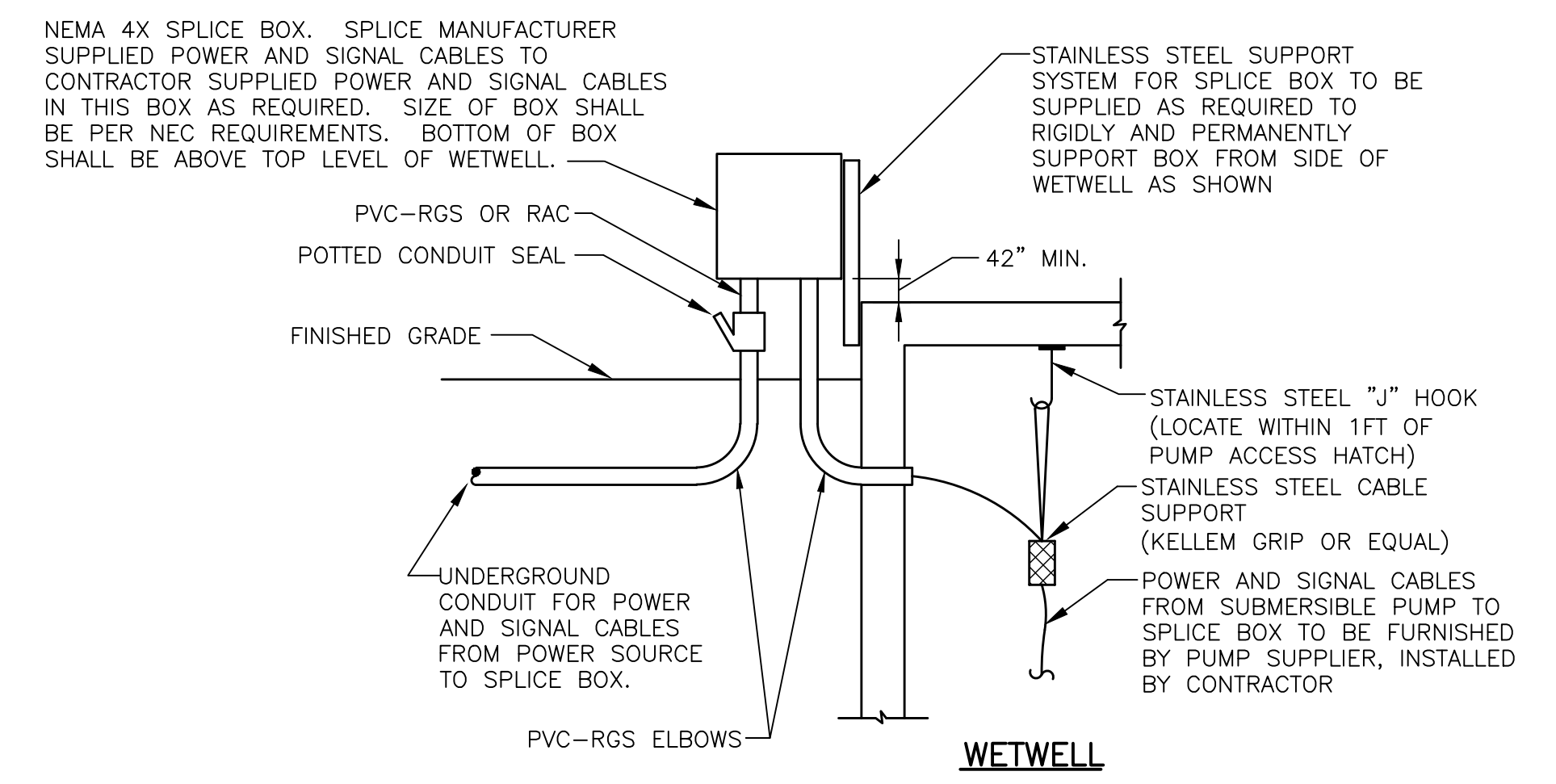
NOTES:

- CONNECT GRINDER PUMP CONTROL PANEL WITH 20A, 2P BREAKER IN LIGHTING PANEL. ABOVE SCHEMATIC IS A GENERAL REPRESENTATION UTILIZING 1 HP PUMPS, REQUIRING A 2-POLE, 20A BREAKER FOR 240V POWER. IF LARGER PUMPS ARE PROVIDED (2 HP MAX), CIRCUITS AND BREAKERS SHALL BE SIZED TO ACCOMMODATE, REQUIRING A 2-POLE 30A BREAKER FOR 240V POWER.
- PRAIRIE TOWNSHIP FIRE DISTRICT (PTFD) NORMAL POWER SOURCE IS FROM LIGHTING PANEL NO. 2. INSTALL TWO-POLE BREAKER IN AVAILABLE TWO-POLE CIRCUIT SPACE.
- DUPLEX GRINDER PUMP SHALL BE ENVIRONMENT ONE DH 152 SERIES OR APPROVED EQUAL.

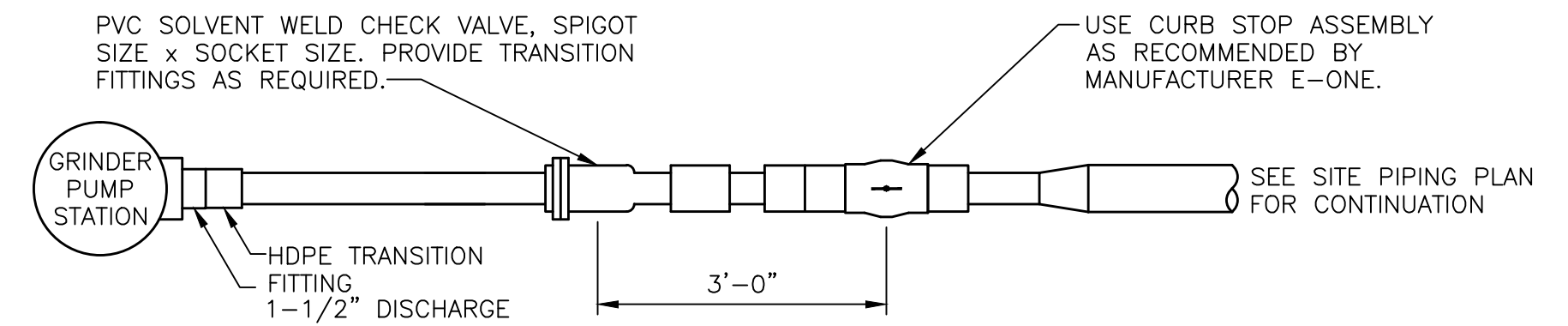
TYPICAL DUPLEX GRINDER PUMP WIRING DIAGRAM
NOT TO SCALE



MOTOR CABLE DIRECT BURY DETAIL
NOT TO SCALE



POWER AND SIGNAL CABLE INSTALLATION DETAIL
NOT TO SCALE

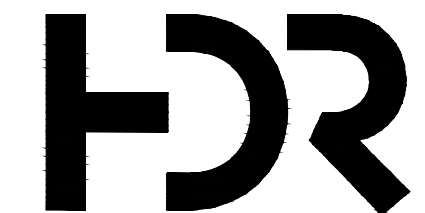


NOTES:

- DISCHARGE PIPE SHALL BE HDPE SDR 11. ALL PVC COMPONENTS SHALL BE SCHEDULE 80.
- DISCHARGE PIPING SHALL BE SUBJECT TO HYDROSTATIC TEST PER THE SPECIFICATIONS, EXCEPT THAT THE TEST DURATION SHALL BE 15 MINUTES.
- INSTALL THE CURB STOP ASSEMBLY ADJACENT TO (±3 FEET FROM) GRINDER PUMP.
- LATERAL KIT MEETING ABOVE REQUIREMENTS MAY BE USED IN LIEU OF CURB STOP ASSEMBLY DETAILED ABOVE.
- PUMP DISCHARGE PIPE SHALL BE MINIMUM OF 42" DEEP.

TYPICAL DUPLEX GRINDER PUMP CURB STOP VALVE ASSEMBLY
NOT TO SCALE

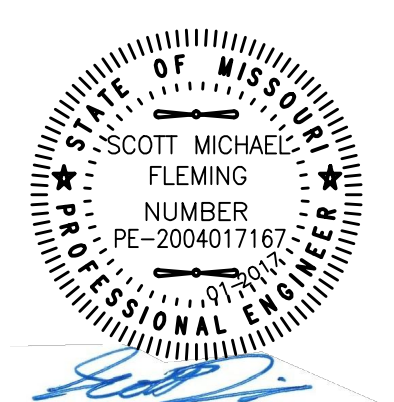
40U501.dwg 1/18/2017 10:30 AM Dinkel, Tracy



HDR
MISSOURI CERTIFICATE OF AUTHORITY #: 000856
3741 NE TROON DRIVE
LEE'S SUMMIT, MO 64064
816-347-1100

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1	07-20-16	CLIENT REVIEW

PROJECT MANAGER	SCOTT FLEMING
PROJECT NUMBER	0000000277870



LICENSEE:
SCOTT M FLEMING
PROJECT MANAGER
PE-200401767



**PRAIRIE TOWNSHIP FIRE DISTRICT
GRINDER PUMP AND SEWER
FORCE MAIN CONNECTION
TO LEE'S SUMMIT**

**PUMP STATION
STRUCTURAL, PROCESS & ELECTRICAL
DETAILS**



FILENAME 40U501.dwg
SCALE AS NOTED

SHEET
40U501