

REPLACE LAGOON

LONG BRANCH STATE PARK

MACON, MISSOURI

OWNER: STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

DESIGNER: Klingner & Associates, PC

PROJECT NUMBER: X2302-02

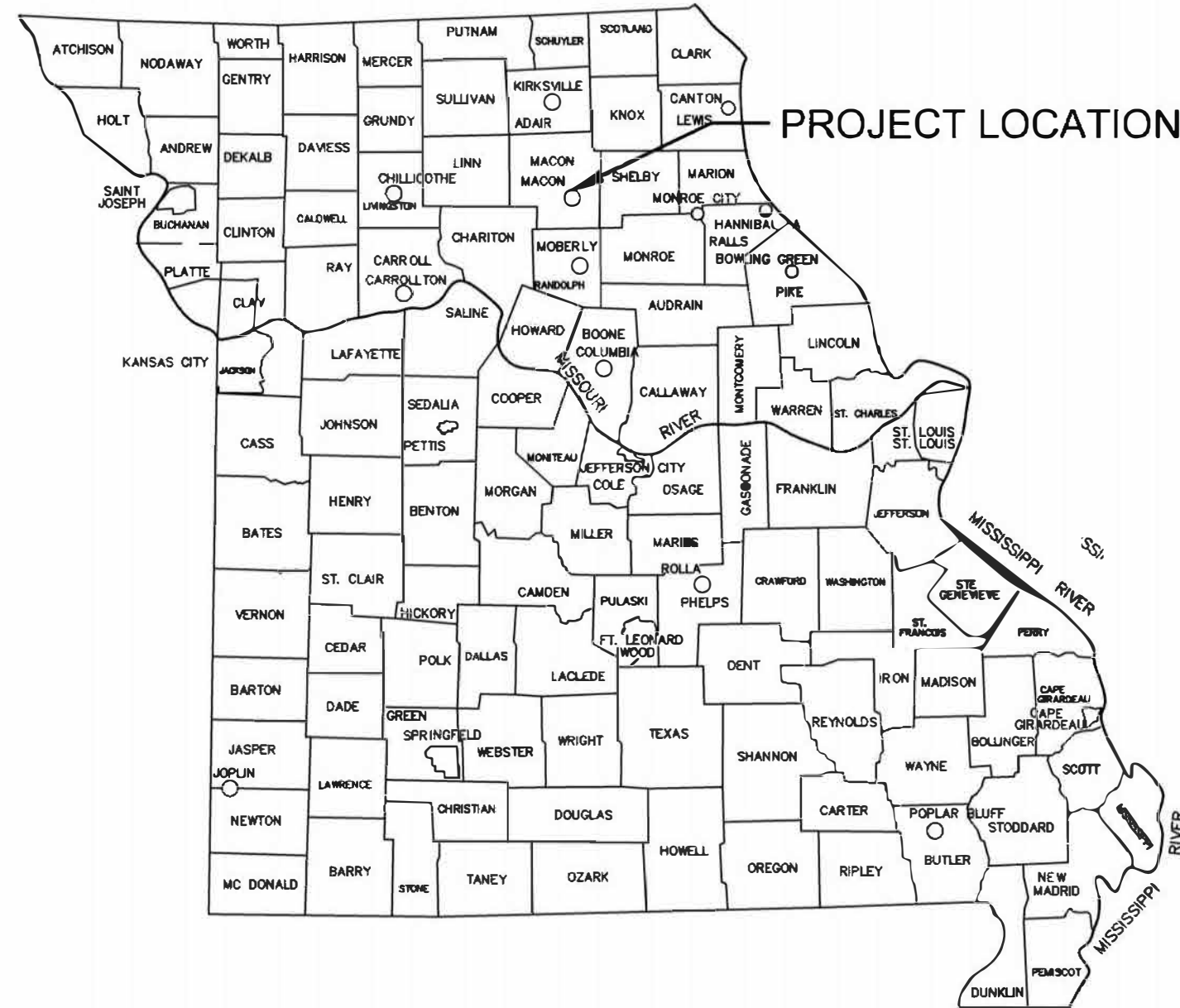
PROJECT
MANAGEMENT: OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

SITE NUMBER: 5601
ASSET NUMBER: 7815601020

SHEET NUMBER:

G001

1 OF 15 SHEETS
FEBRUARY 12, 2024



PROJECT LOCATION MAP
NTS

SHEET NUMBER	SHEET NAME	CURRENT REVISION DATE
G001	COVER SHEET	2/12/2024
G002	GENERAL NOTES AND LEGENDS	2/12/2024
C100	GENERAL SITE LAYOUT	2/12/2024
C101	LIFT STATION DETAILS AND FORCEMAIN RUN 1	2/12/2024
C102	FORCEMAIN RUNS 2 & 3	2/12/2024
C103	FORCEMAIN RUNS 4 & 5	2/12/2024
C104	FORCEMAIN RUNS 6 & 7	2/12/2024
C105	FORCEMAIN RUNS 8	2/12/2024
C200	LPP DETAILS - 1	2/12/2024
C201	LPP DETAILS - 2	2/12/2024
C500	MISCELLANEOUS DETAILS	2/12/2024
E501	ELECTRICAL DETAILS	2/12/2024
E502	ELECTRICAL DETAILS AND SCHEDULES	2/12/2024
E801	CTRL DIAGRAM - LIFT STATION	2/12/2024
E802	CTRL DIAGRAM - DOSING TANK	2/12/2024

THE CONTRACTOR(S) SHALL COMPLY WITH THE LATEST EDITION OF APPLICABLE CODES AND STANDARDS INCLUDING BUT NOT LIMITED TO:

- THE AMERICANS WITH DISABILITIES ACT (ADAAG)
- INTERNATIONAL BUILDING CODE (IBC)
- NATIONAL ELECTRIC CODE (NEC)
- INTERNATIONAL PLUMBING CODE (IPC)
- LIFE SAFETY CODE (NFPA 101)
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- AMERICAN CONCRETE INSTITUTE (ACI)
- MISSOURI DEPARTMENT OF TRANSPORTATION (MODOT)
- MISSOURI DEPARTMENT OF NATURAL RESOURCES (MODNR)

GENERAL NOTES

1. ALL DIMENSIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
2. ANY DISCREPANCIES BETWEEN SPECIFICATIONS, DRAWINGS, AND/OR SITE CONDITIONS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
3. ALL AREAS DESIGNATED TO REMAIN UNDISTURBED SHALL BE PROTECTED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STAKING THE LOCATION OF ALL PROPOSED IMPROVEMENTS, INCLUDING ROUGH AND FINISHED ELEVATIONS AND ALL OTHER PROPOSED IMPROVEMENTS INDICATED ON THE DRAWINGS.
5. THE CONTRACTOR SHALL VERIFY THAT ALL APPLICABLE LOCAL, STATE, & FEDERAL CODES ARE FOLLOWED. ALL APPLICABLE LOCAL AND STATE NOTIFICATIONS AND PERMITS SHALL BE ACQUIRED PRIOR TO CONSTRUCTION, INCLUDING ALL NECESSARY UTILITY CONNECTION PERMITS FROM THE RESPECTIVE UTILITIES.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND SERVICES REQUIRED DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL REFERENCE POINTS, BENCHMARKS, MONUMENTS, STAKES, AND PROPERTY CORNERS DURING CONSTRUCTION. REPLACEMENT OF LOST REFERENCE POINTS SHALL BE AT THE CONTRACTORS EXPENSE.
8. REMOVE ALL STRUCTURES, FOUNDATIONS, WALLS, PAVEMENTS, AND ALL OTHER ITEMS IN CONFLICT WITH PROPOSED IMPROVEMENTS IN ACCORDANCE WITH THE SPECIFICATIONS.
9. REFERENCES TO "STANDARD SPECIFICATIONS" SHALL MEAN THE MISSOURI DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION", LATEST ADDITION.
10. THE MEANS OF THE WORK AND THE SAFETY OF THE CONTRACTOR'S EMPLOYEES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
11. NO WORK SHALL BE PERFORMED BEYOND THE LIMITS OF CONSTRUCTION WITHOUT OWNER APPROVAL.
12. SITE CLEAN-UP SHALL BE PERFORMED ON A DAILY BASIS. SIDEWALKS, PARKING LOTS, ROADWAYS, AND THE PROJECT SITE SHALL BE KEPT CLEAN AT ALL TIMES. CONTROL DUST IN AND AROUND ALL WORK AND STAGING AREAS.
13. ALL OPEN EXCAVATIONS SHALL BE PROTECTED.
14. MAINTAIN POSITIVE DRAINAGE ON THE SITE THROUGHOUT THE PROJECT DURATION.
15. OWNER TO REMOVE BRUSH PILES.
16. IF A DISCREPANCY IN THE SPOT ELEVATIONS IS NOTED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CONSTRUCTING. IF THERE IS A DISCREPANCY BETWEEN THE SPOT ELEVATIONS AND CONTOURS, THE CONTOURS SHALL GOVERN.
17. IF SOIL OR GROUNDWATER IS ENCOUNTERED WHICH EMITS A PETROLEUM ODOR OR IS DISCOLORED THE CONTRACTOR SHALL STOP EXCAVATION AND NOTIFY THE OWNER IMMEDIATELY. THE OWNER WILL COORDINATE ENVIRONMENTAL EFFORTS TO HANDLE THE IMPACTED SOIL OR GROUNDWATER IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS. THE CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO ENSURE PUBLIC AND EMPLOYEE SAFETY.

UTILITY NOTES

1. THE LOCATION OF EXISTING UTILITIES IN CONSTRUCTION AREAS SHALL BE FIELD VERIFIED BY THE CONTRACTOR BY CONTACTING THE MISSOURI ONE CALL SYSTEM, INC. OR THE INDIVIDUAL UTILITIES NOT PARTICIPATING IN THIS SYSTEM. EXISTING UTILITIES TO REMAIN SHALL BE PROTECTED. ANY REPAIR OR RELOCATION REQUIRED, AS A RESULT OF DAMAGE BY CONSTRUCTION ACTIVITIES SHALL BE AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL PAY UTILITY PERMIT AND/OR INSPECTION FEES.
2. UTILITY TRENCHES WITHIN PAVEMENT AREAS SHALL BE BACKFILLED WITH APPROVED COMPACTED GRANULAR BACKFILL.
3. ALL ELECTRIC SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, CURRENT VERSION.
4. ADJUST ALL VALVES, MANHOLES, CASTINGS, GAS VENTS, ETC., TO MATCH THE NEW SURFACE. ADJUSTMENT SHALL BE COORDINATED WITH THE UTILITY COMPANIES AND THE COST FOR ALL ADJUSTMENTS SHALL BE INCIDENTAL TO THE CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. REPAIR ANY DAMAGE TO SAID STRUCTURES AND APPURTENANCES THAT OCCUR DURING CONSTRUCTION.
5. THE DRAWINGS INDICATE THE BEST KNOWLEDGE OF THE OWNER AND ENGINEER/ARCHITECT ON THE GENERAL LOCATION AND NATURE OF THE EXISTING AND OR PROPOSED UNDERGROUND UTILITIES IN THE AREA OF CONSTRUCTION. EXPLORATORY EXCAVATIONS AT THE SITE TO DETERMINE INSITU LOCATIONS WERE NOT CONDUCTED. QUALITY LEVEL D IN ACCORDANCE WITH CI/ASCE 38-02, STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA, WAS UTILIZED. REGARDLESS OF THE LEVEL OF INVESTIGATION, THE UTILITIES SHOWN SHOULD NOT BE CONSIDERED A WARRANTY OR GUARANTEE OF ACTUAL PRESENCE OR LOCATION AND THE CONTRACTOR REMAINS RESPONSIBLE FOR THE LOCATION, VERIFICATION, AND PROPER NOTIFICATION OF POTENTIAL UTILITIES.

QUALITY LEVELS: B

QUALITY LEVEL A - PROVIDES THE HIGHEST LEVEL OF ACCURACY. BY LOCATING OR POTHOLING UTILITIES IN ADDITION TO QUALITY LEVELS B, C, AND D TASKS. THE LOCATED UTILITY INFRASTRUCTURE IS SURVEYED AND MAPPED TO DEVELOP PLAN AND PROFILE INFORMATION.

QUALITY LEVEL B - INVOLVES DESIGNATING THE HORIZONTAL POSITION OF SUBSURFACE UTILITIES THROUGH SURFACE DETECTION METHODS AND RECORDING THE INFORMATION THROUGH A SURVEY METHOD. IN ADDITION TO QUALITY LEVEL C AND D TASKS.

QUALITY LEVEL C - INVOLVES SURVEYING VISIBLE SUBSURFACE UTILITY STRUCTURES SUCH AS MANHOLES, HAND-HOLES, UTILITY VALVES AND METERS, FIRE HYDRANTS, PEDESTALS AND UTILITY MARKERS, AND THEN CORRELATING THE INFORMATION WITH EXISTING UTILITY RECORDS TO CREATE COMPOSITE DRAWINGS. IN ADDITION TO QUALITY LEVEL D TASKS

QUALITY LEVEL D - INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS, THAT MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICE MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASE, CONSTRUCTION PLANS, ETC. DATABASES, CONSTRUCTION PLANS, ETC.

EROSION CONTROL NOTES

1. EROSION CONTROL SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, THE DETAILS IN THESE PLANS, AND THE MISSOURI DEPARTMENT OF NATURAL RESOURCES STANDARDS AND REQUIREMENTS FOR EROSION AND SEDIMENT CONTROL.
2. THE EROSION CONTROL SHOWN ON THIS SET OF PLANS SHALL BE CONSIDERED THE MINIMUM ACCEPTABLE FOR THIS PROJECT. THERE MAY BE ADDITIONAL EROSION CONTROL REQUIRED DUE TO THE VARIOUS CONSTRUCTION TECHNIQUES, WHICH MAY BE USED. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING AND MAINTAINING ALL THE RUNOFF FROM THE SITE, IN A MANNER WHICH KEEPS ALL SILT ON SITE.
3. A LAND DISTURBANCE PERMIT WILL NOT BE REQUIRED SINCE LESS THAN 1 ACRE OF LAND WILL BE DISTURBED BY GRADING OPERATIONS.
4. ALL INLET PROTECTION AND TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED UPON COMPLETION OF PAVING OPERATIONS AND FINAL STABILIZATION OF LANDSCAPED AND SEED AREAS.

ABBREVIATIONS

- FL FLOWLINE ELEVATION
- TC TOP OF CURB ELEVATION
- GL GUTTER LINE ELEVATION
- TG TOP OF GRATE ELEVATION
- STA STATION
- FES FLARED END SECTION
- SWI STORM WATER INLET
- FFE FINISH FLOOR ELEVATION
- HP HIGH POINT
- LP LOW POINT
- TW TOP OF WALL ELEVATION
- BW BOTTOM OF WALL ELEVATION
- DS DOWNSPOUT
- EP EDGE OF PAVEMENT
- (NIC) NOT IN CONTRACT
- (M) MATCH EXISTING

LEGEND

EXISTING	PROPOSED	
		PROPERTY LINE
		LOT LINE
		RIGHT OF WAY LINE
		CENTERLINE
		EASEMENT
		BUILDING SETBACK
		CONSTRUCTION LIMITS
		FENCE LINE
		CHAIN LINK FENCE
		FENCE W/ SQUARE POSTS
		STREAM
		STRUCTURE
		PAVEMENT MARKINGS
		EDGE OF PAVEMENT
		CURB AND GUTTER
		RAILROAD TRACKS
		WATER LINE
		FIRE PROTECTION
		GAS LINE
		OVERHEAD ELECTRIC
		UNDERGROUND ELECTRIC
		OVERHEAD TELEPHONE
		UNDERGROUND TELEPHONE
		CABLE TELEVISION
		FIBER OPTIC
		COMMUNICATION LINE
		STORM SEWER
		SANITARY SEWER
		FORCE MAIN
		COMBINED SEWER
		IRRIGATION SYSTEM
		MAST ARM SIGNAL (3 SIGNALS)
		MAST ARM SIGNALS (2 SIGNALS)
		UTILITY TRAFFIC SIGN
		SIGN
		MANHOLE
		STORM WATER INLET
		CATCH BASIN
		CLEANOUT
		CULVERT
		BOX CULVERT
		WATER VALVE
		FIRE HYDRANT
		POST INDICATOR VALVE
		WATER METER
		GAS VALVE
		GAS METER
		TELEPHONE PEDESTAL
		CABLE TV PEDESTAL
		ELECTRIC METER
		UTILITY POLE
		LIGHT STANDARD
		LIGHT POLE
		GUY WIRE
		SUMMIT / HIGH POINT
		CONTOURS
		INDEX CONTOURS
		DIRECTION OF DRAINAGE
		SPOT ELEVATION
		DECIDUOUS SHRUB
		DECIDUOUS TREE
		CONIFEROUS SHRUB
		CONIFEROUS TREE



NOTE
UTILITY INFORMATION IS FOR THE CONVENIENCE OF THE CONTRACTOR. BEFORE CONSTRUCTION BEGINS THE CONTRACTOR SHALL CONTACT MISSOURI ONE CALL SYSTEM, INC. AT 811 OR 1-800-344-7483 AND THE INDIVIDUAL UTILITIES NOT INCLUDED IN THIS SYSTEM FOR THE LOCATION OF ALL EXISTING UTILITIES.

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MISSOURI STATE CERTIFICATE OF AUTHORITY #000866

OFFICE OF ADMINISTRATION
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DEPARTMENT OF NATURAL
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STATE PARKS

REPLACE LAGOON

LONG BRANCH STATE
PARK 28615 VISITOR
CENTER RD MACON, MO
63552

PROJECT # X2302-02
SITE # 5601
ASSET # 7815601020

REVISION: _____
DATE: _____
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DATE: _____
ISSUE DATE: 02-12-2024

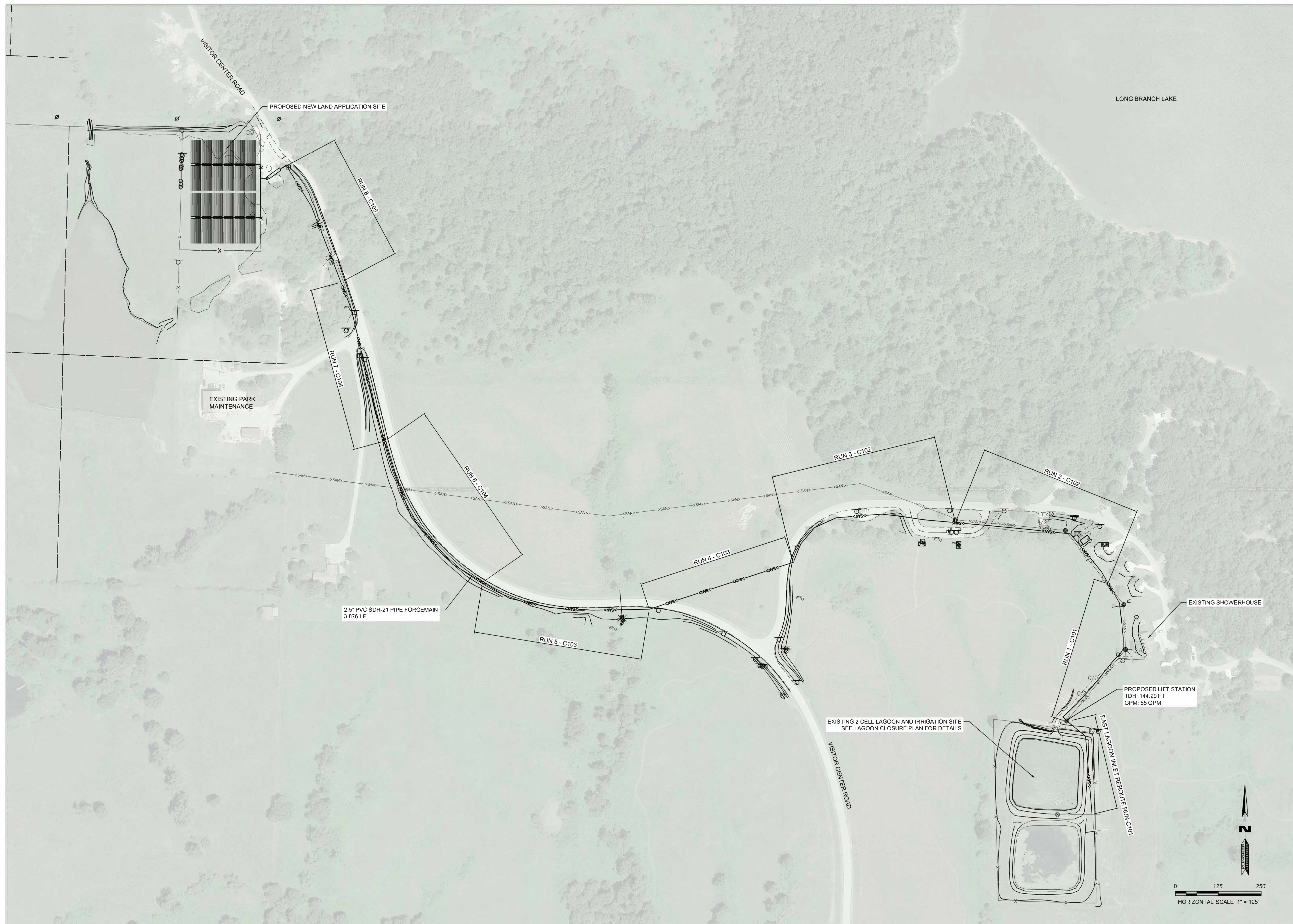
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CHECKED BY: JDH
DESIGNED BY: JDH

SHEET TITLE:

GENERAL NOTES AND
LEGENDS

SHEET NUMBER:

G002



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 DRAWING BY: JDH
 CHECKED BY: JDH
 DESIGNED BY: JDH

SHEET TITLE:

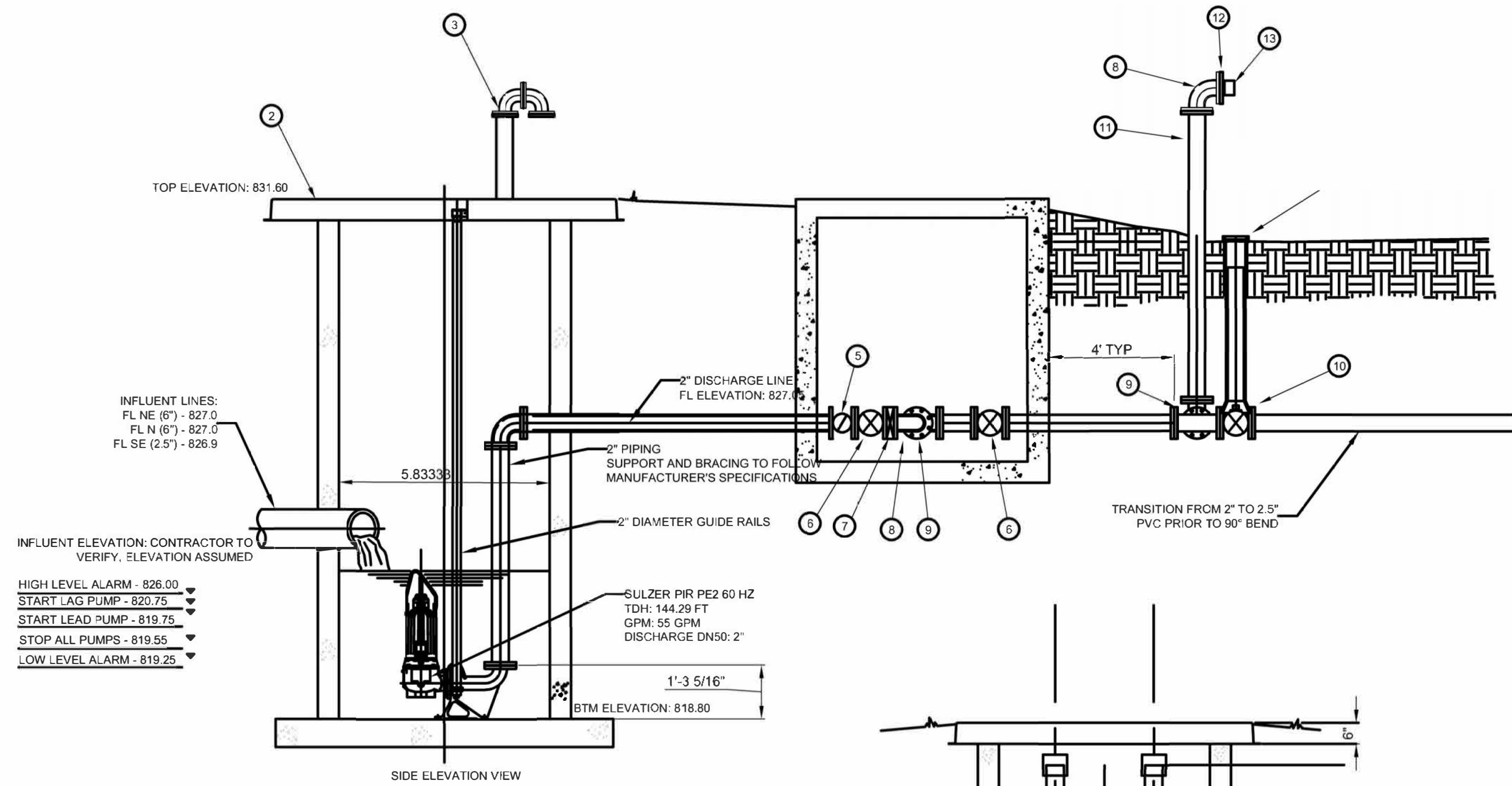
GENERAL SITE
 LAYOUT

SHEET NUMBER:

C100

LONG BRANCH LIFT STATION AND FORCEMAIN INFORMATION

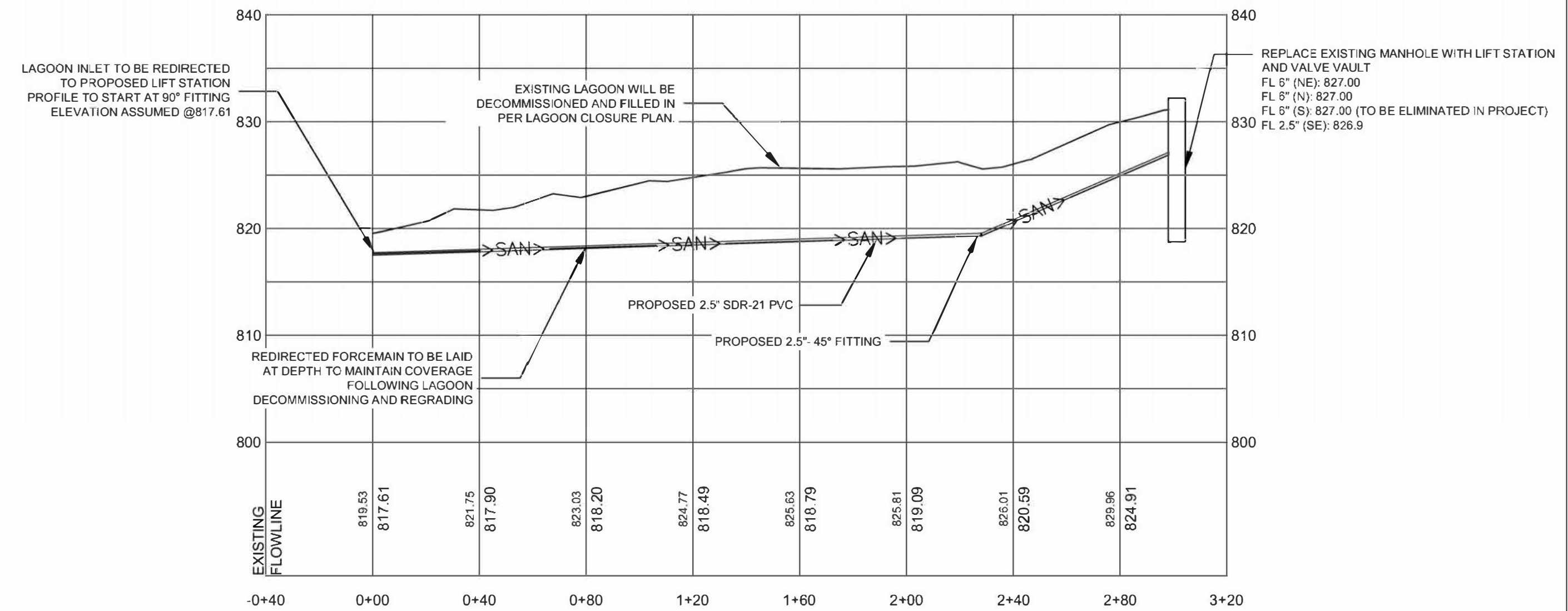
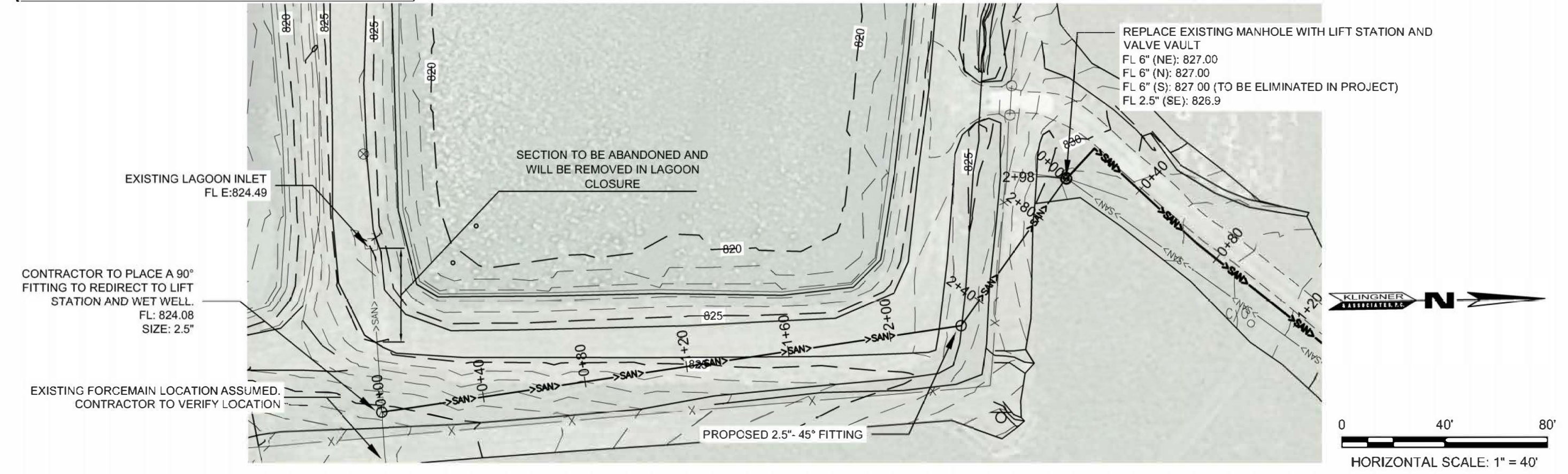
- PUMPS**
- TDH: 144.29 FT
 - GPM: 55 GPM
- FORCEMAIN:**
- LENGTH: 4,237 LF
 - SIZE: 2.5 INCH
 - MATERIAL: C900 PVC SDR-21
 - PROPOSED VELOCITY: 3.45 FT/S



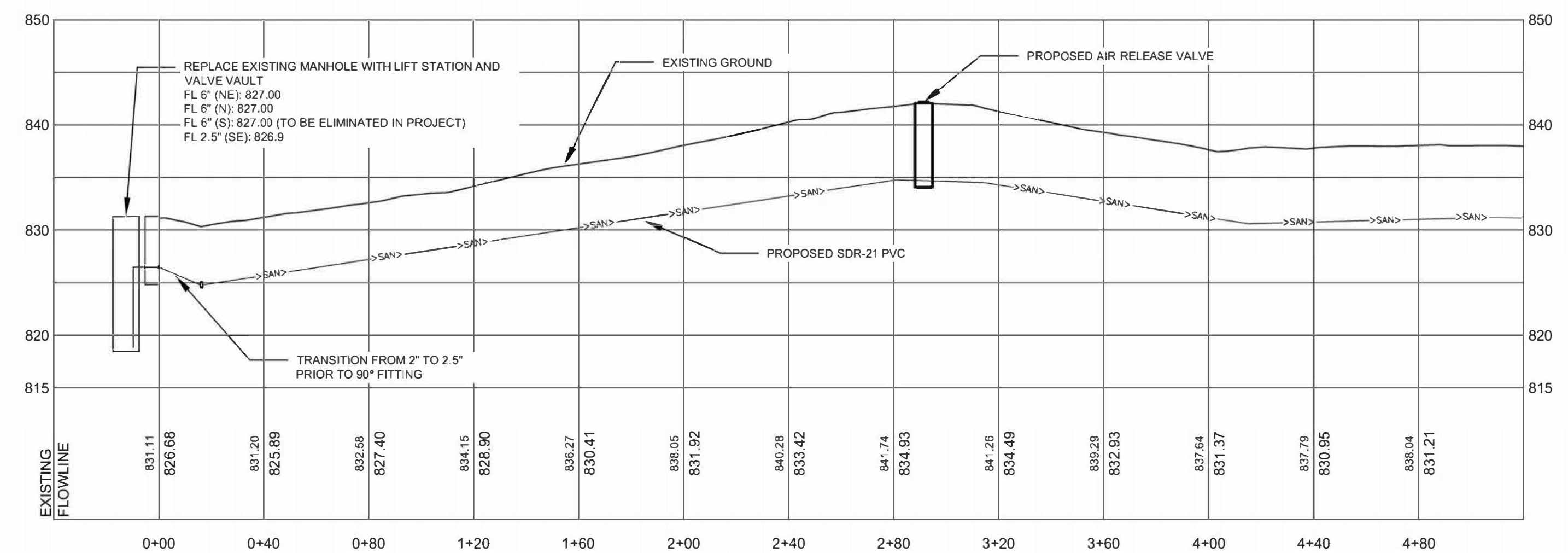
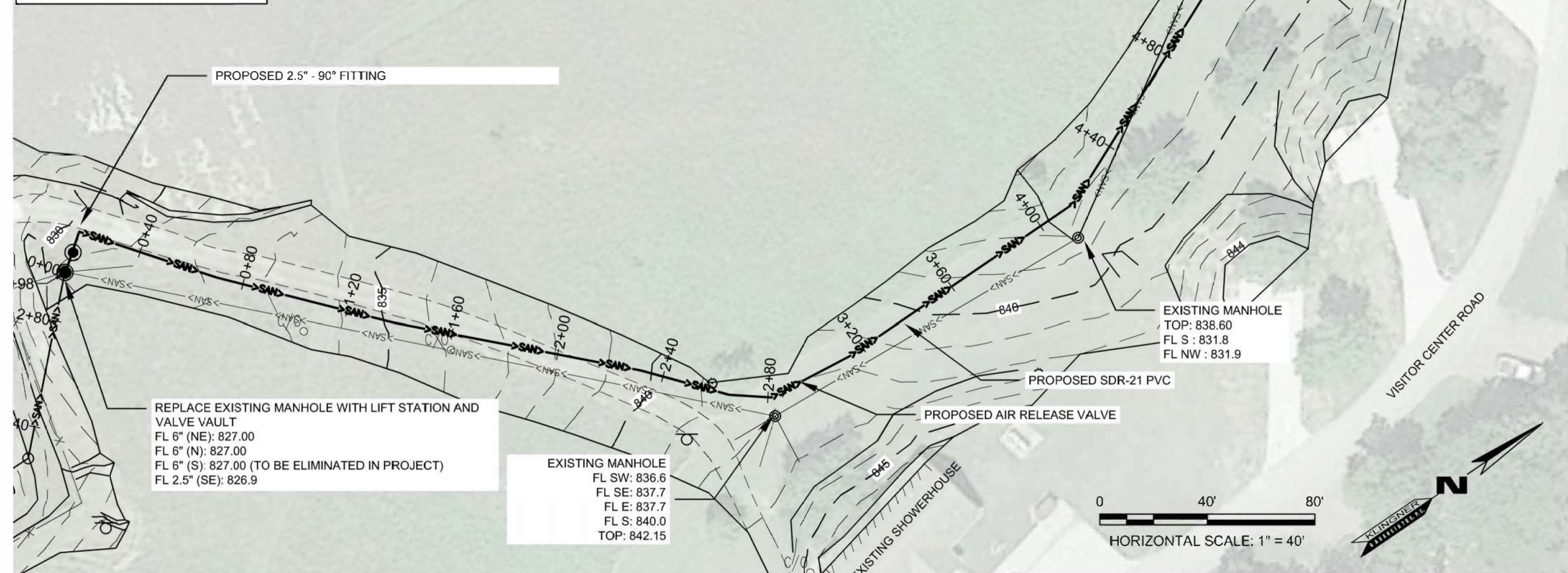
ITEM	DESCRIPTION	MATERIAL AND SIZE
1	PUMP	CAST IRON
2	BASE	CAST CONCRETE
3	WET WELL VENT	304 SS 2"
4	CONTROL PANEL	304 SS (SEE MEP SHEETS)
5	2" SWING CHECK VALVE	316 SS 2"
6	2" GATE VALVE	CAST IRON
7	2" PRESSURE TRANSMITTER	316 SS 2"
8	2" 90° BEND (FLG.)	316 SS 2"
9	2" TEE (FLG.)	316 SS 2"
10	2" GATE VALVE	CAST IRON
11	2" D.I.P. SPOOL 7' LONG (FLG.)	316 SS 2"
12	2" THREADED FLANGE	316 SS 2"
13	2" CAM LOCK FITTING	316 SS 2"

NOTE: ALL METAL FASTENERS, APPURTENANCES, AND MINOR EQUIPMENT WITHIN THE WET-WELL SHALL BE STAINLESS STEEL.

EAST LAGOON INLET REROUTE



FORCEMAIN RUN: 1



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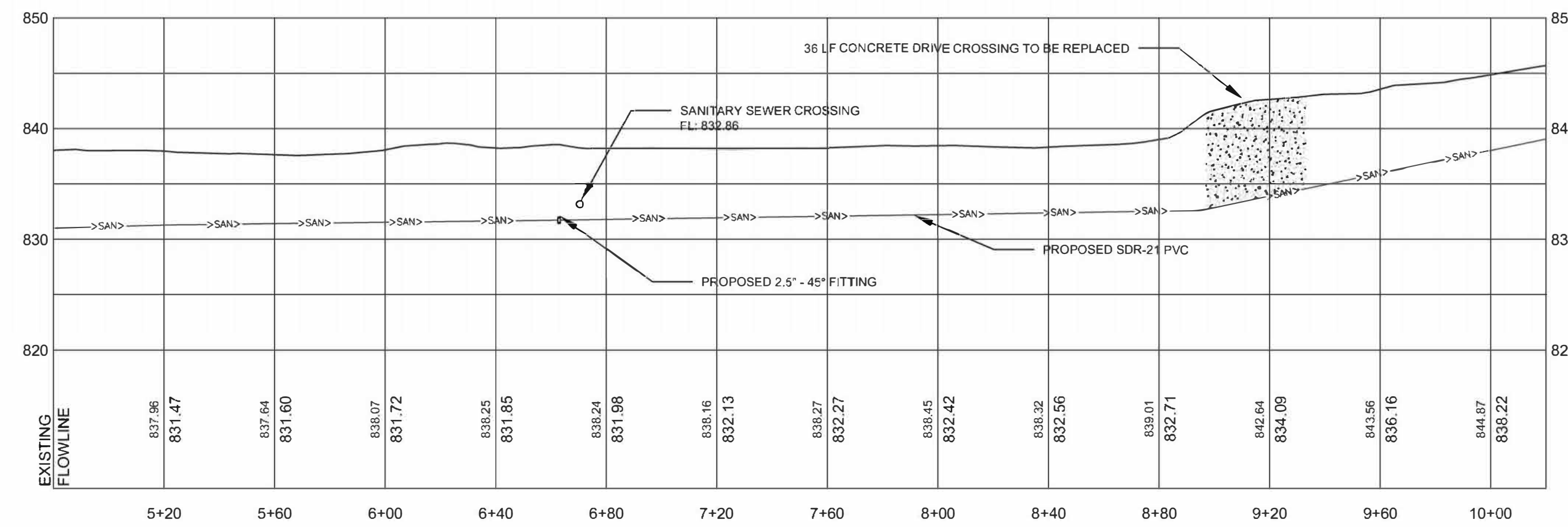
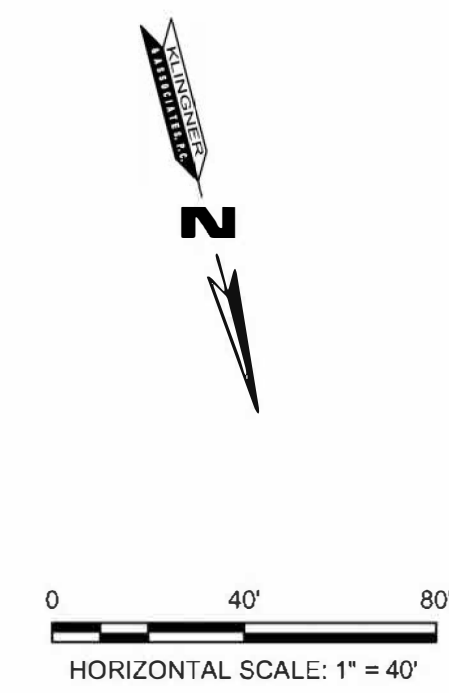
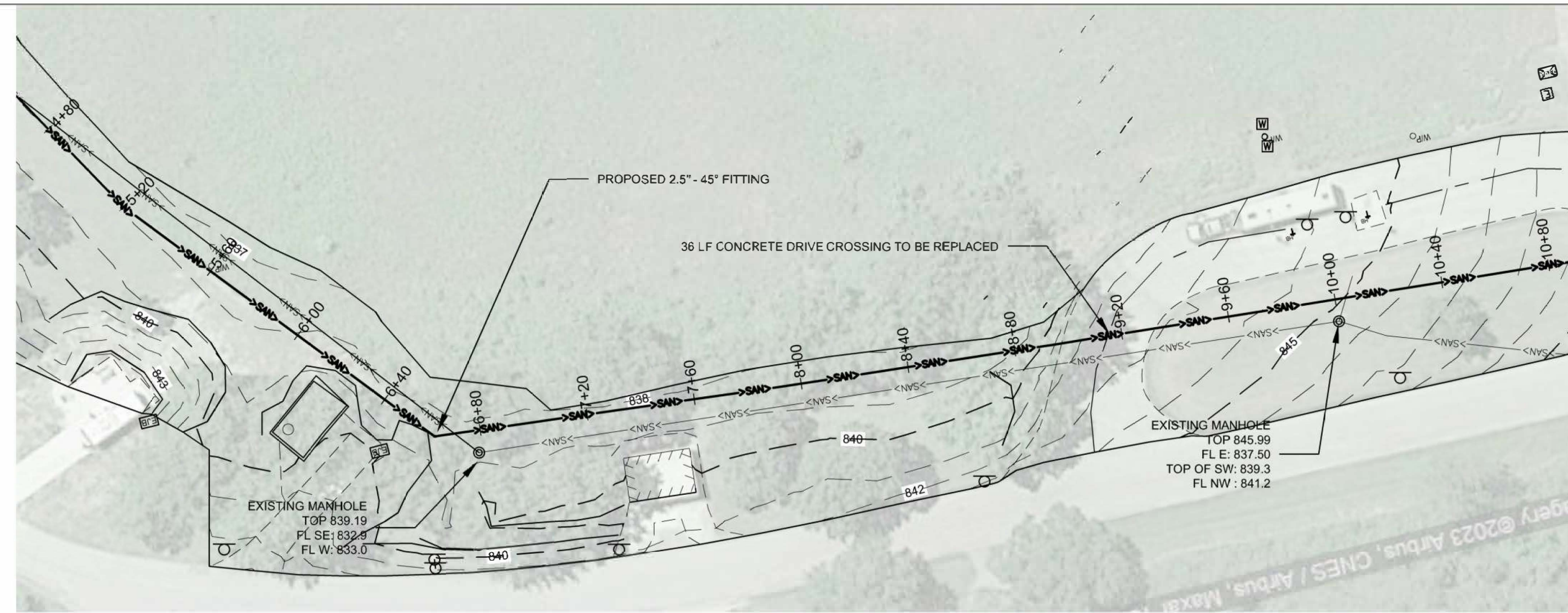
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ISSUE DATE: 02-12-2024

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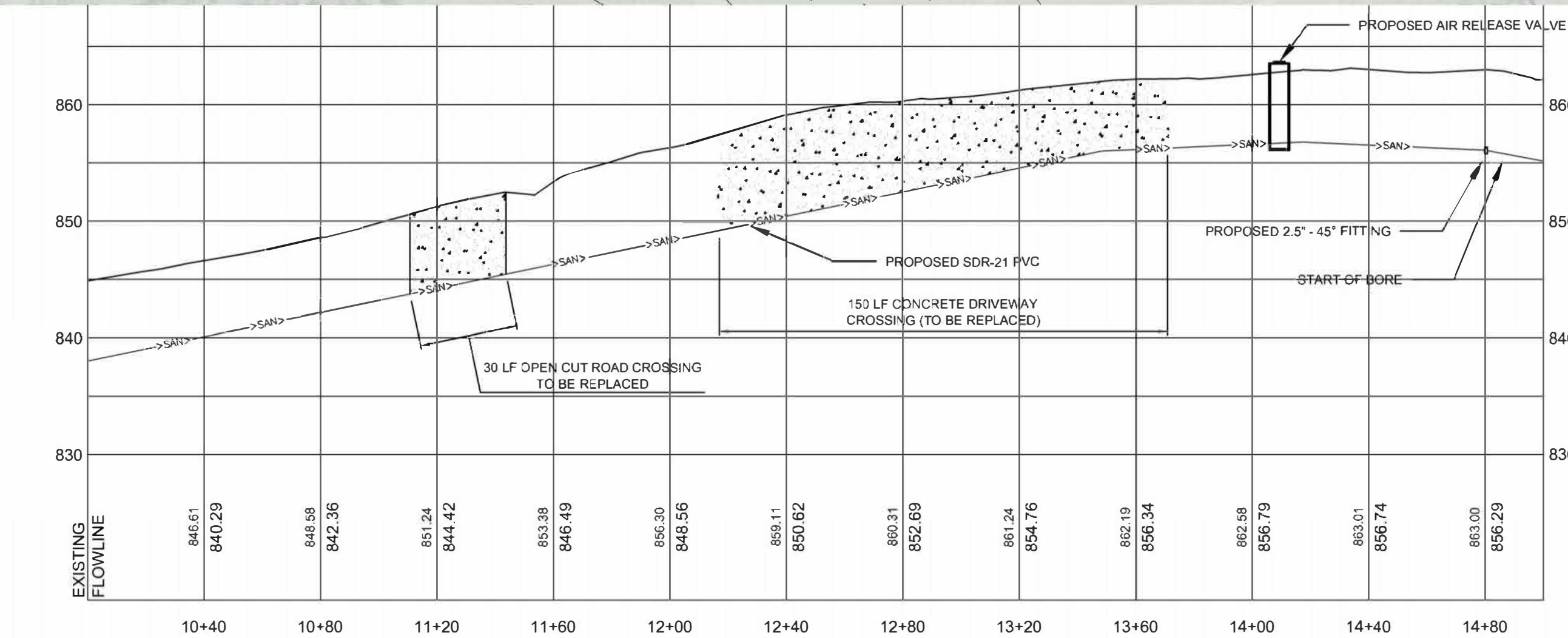
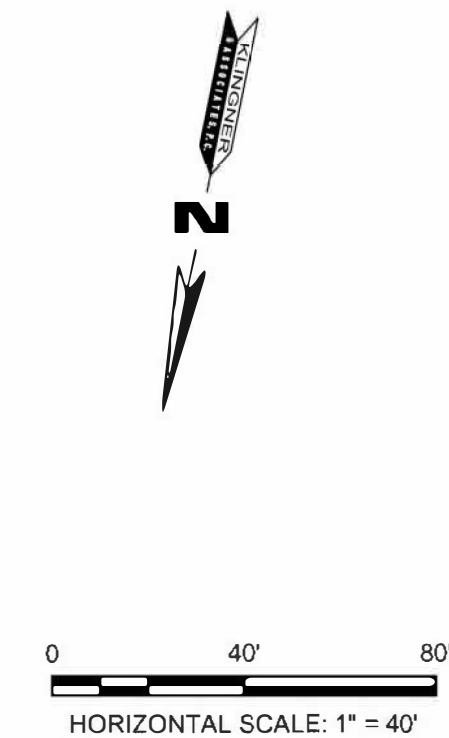
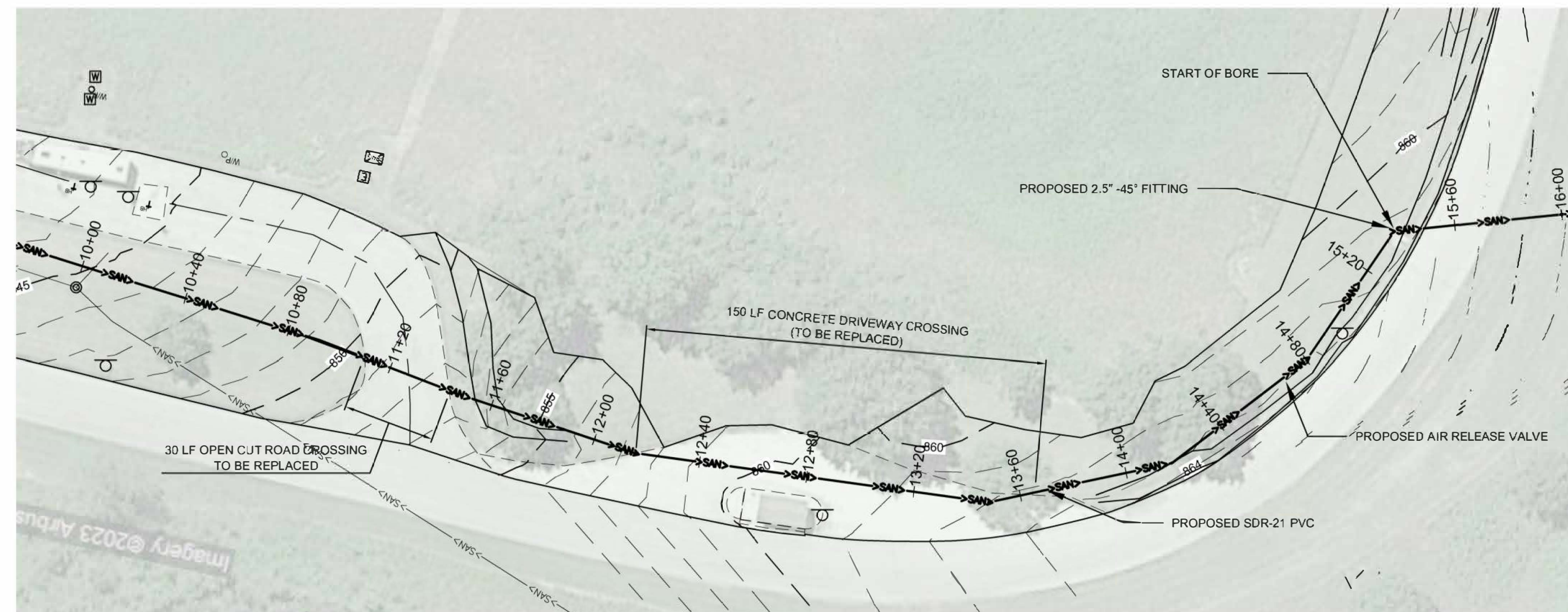
**LIFT STATION DETAILS
AND FORCEMAIN RUN 1**

SHEET NUMBER:

FORCEMAIN RUN: 2



FORCEMAIN RUN: 3



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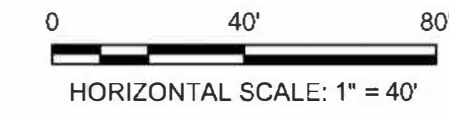
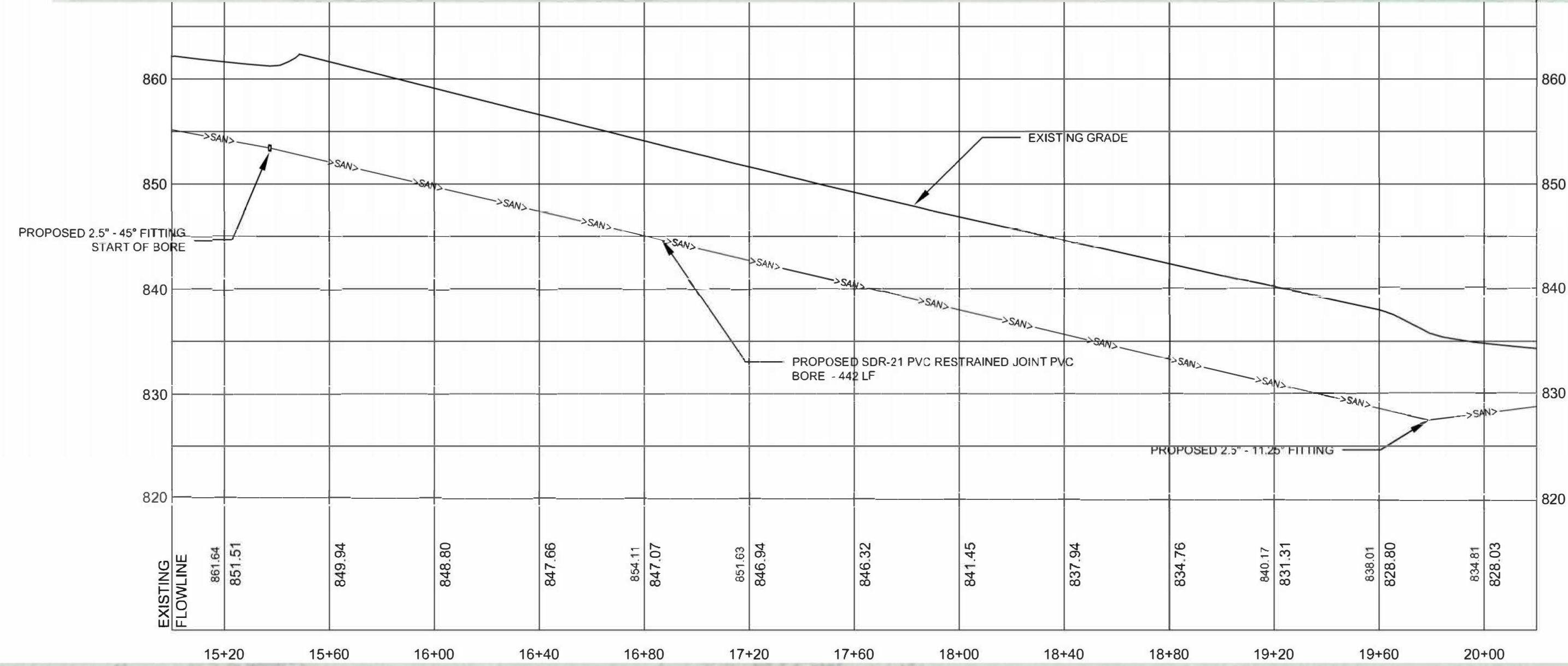
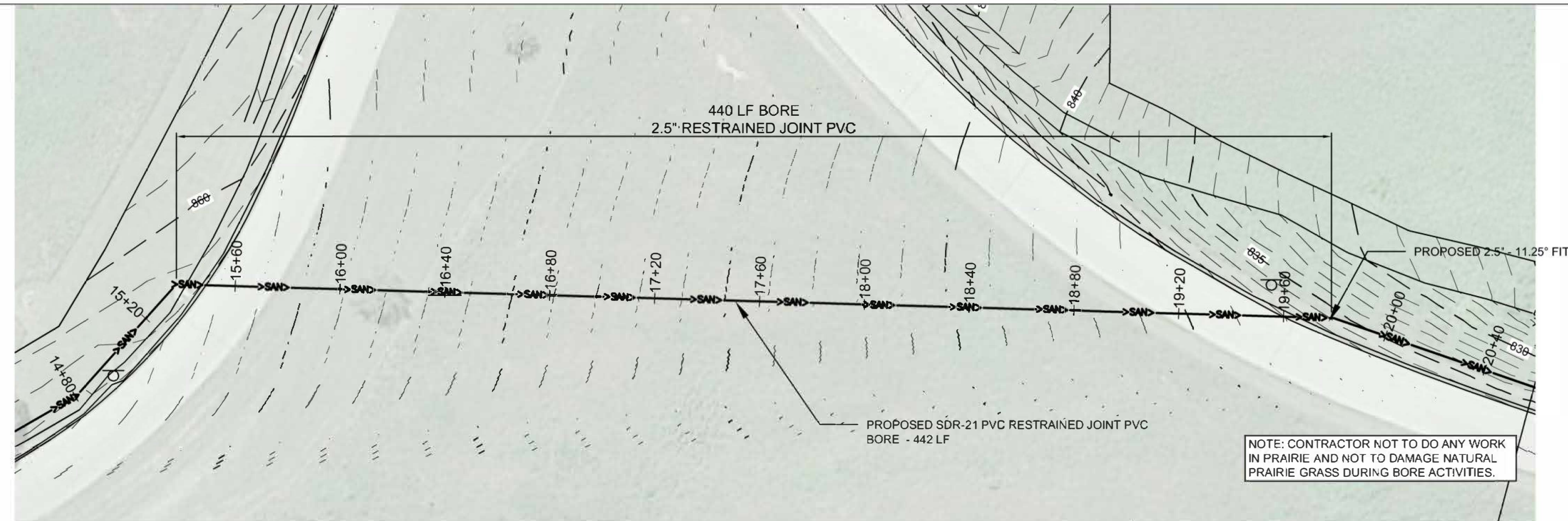
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**FORCEMAIN
RUNS 2 & 3**

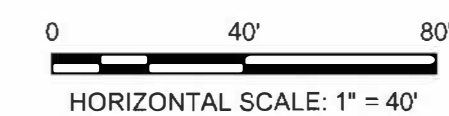
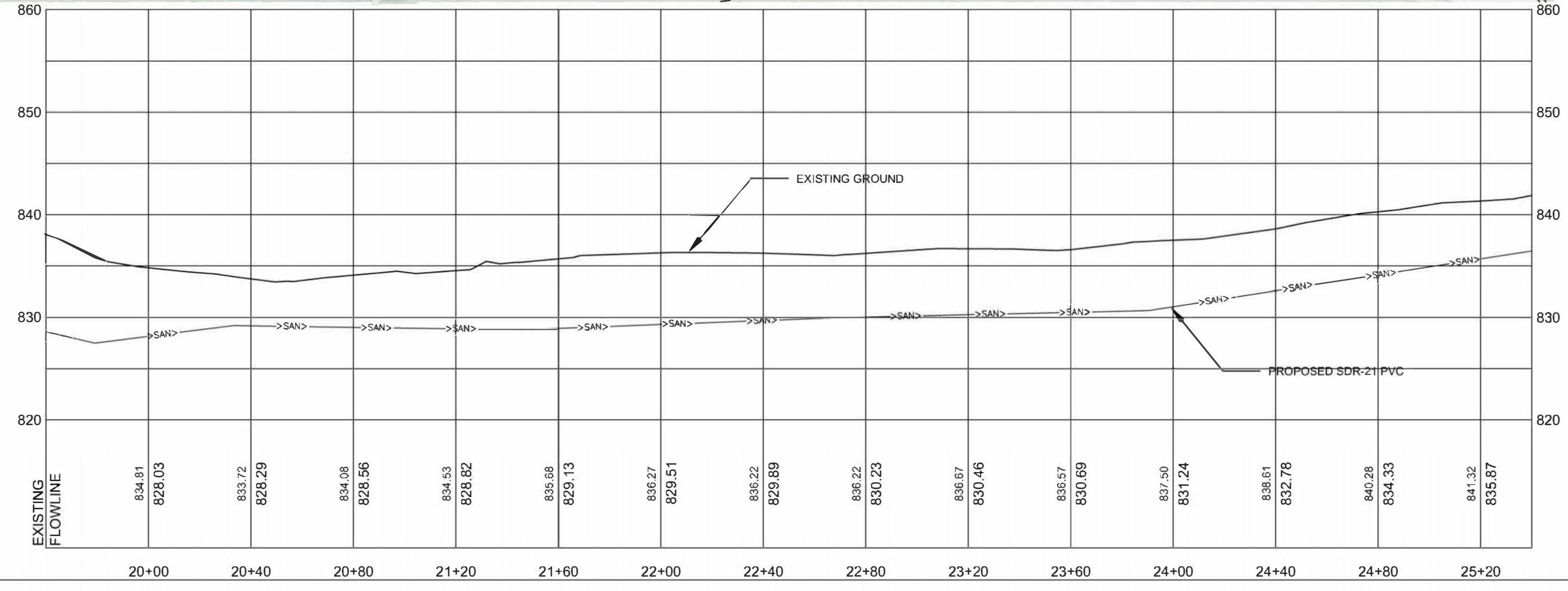
SHEET NUMBER:

C102

FORCEMAIN RUN: 4



FORCEMAIN RUN: 5



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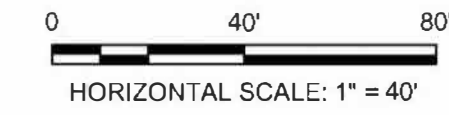
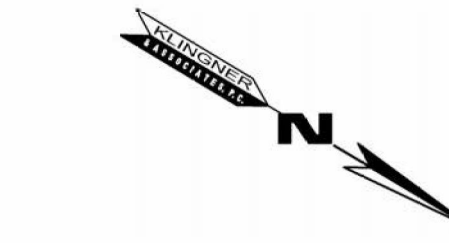
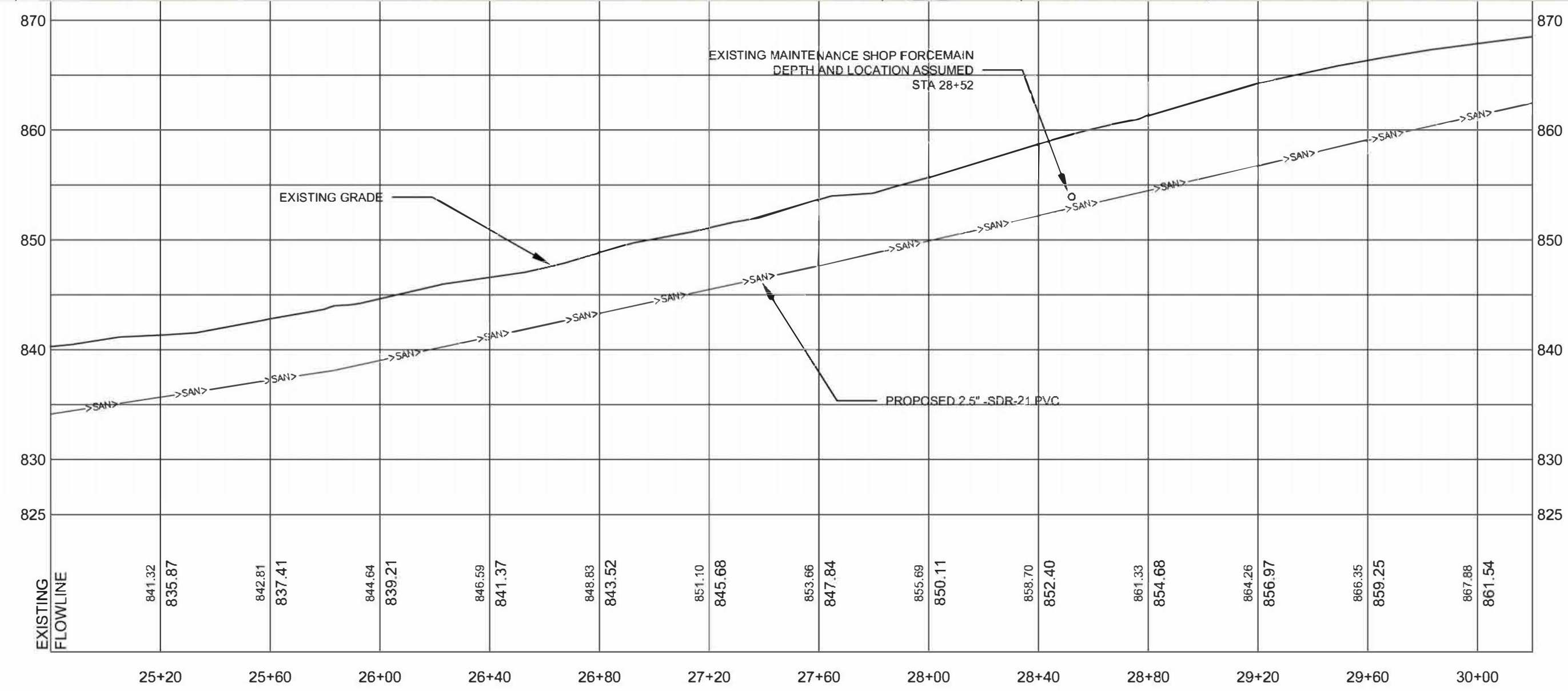
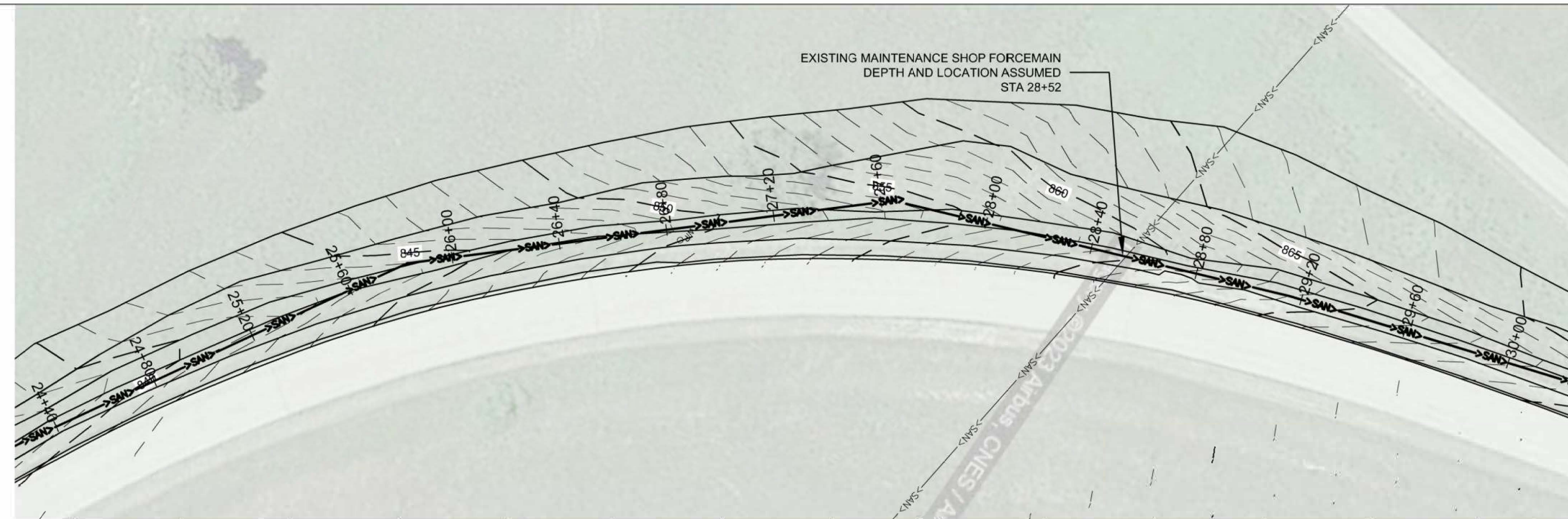
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FORCEMAIN RUNS 4
& 5

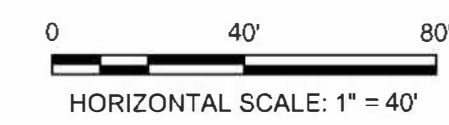
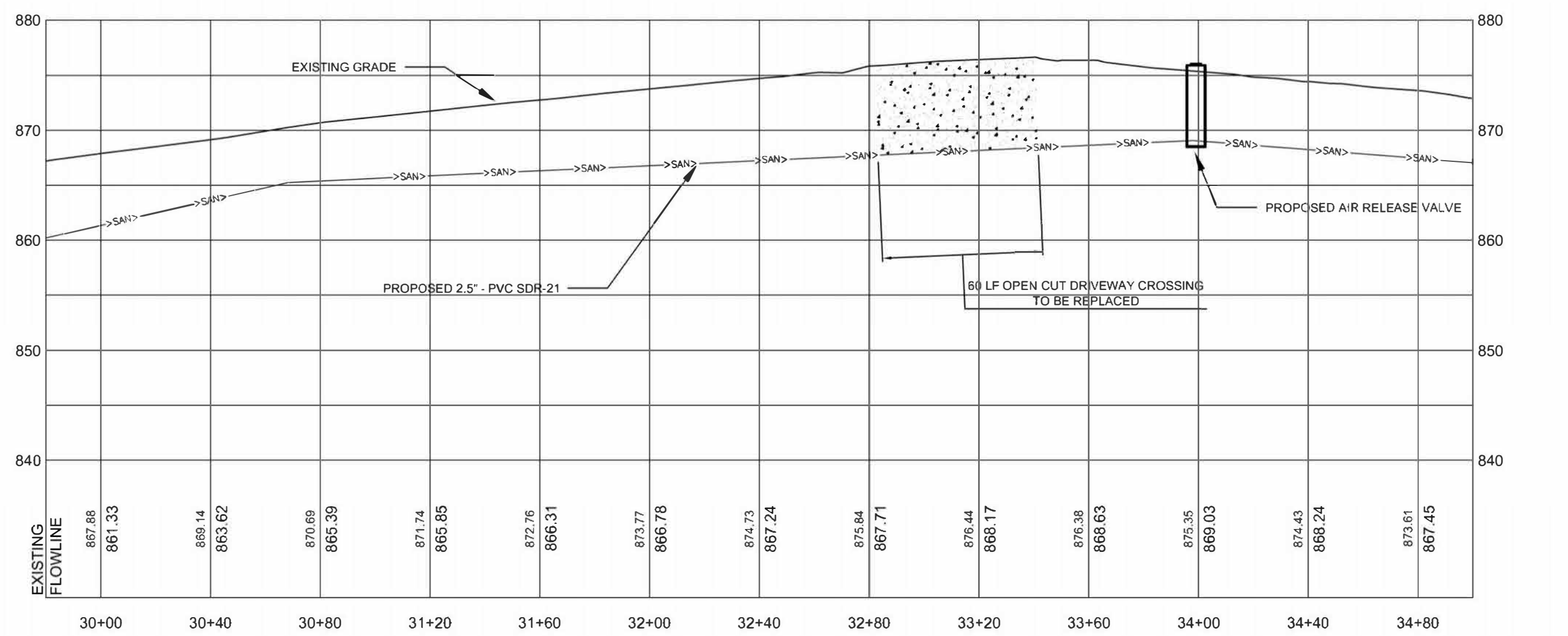
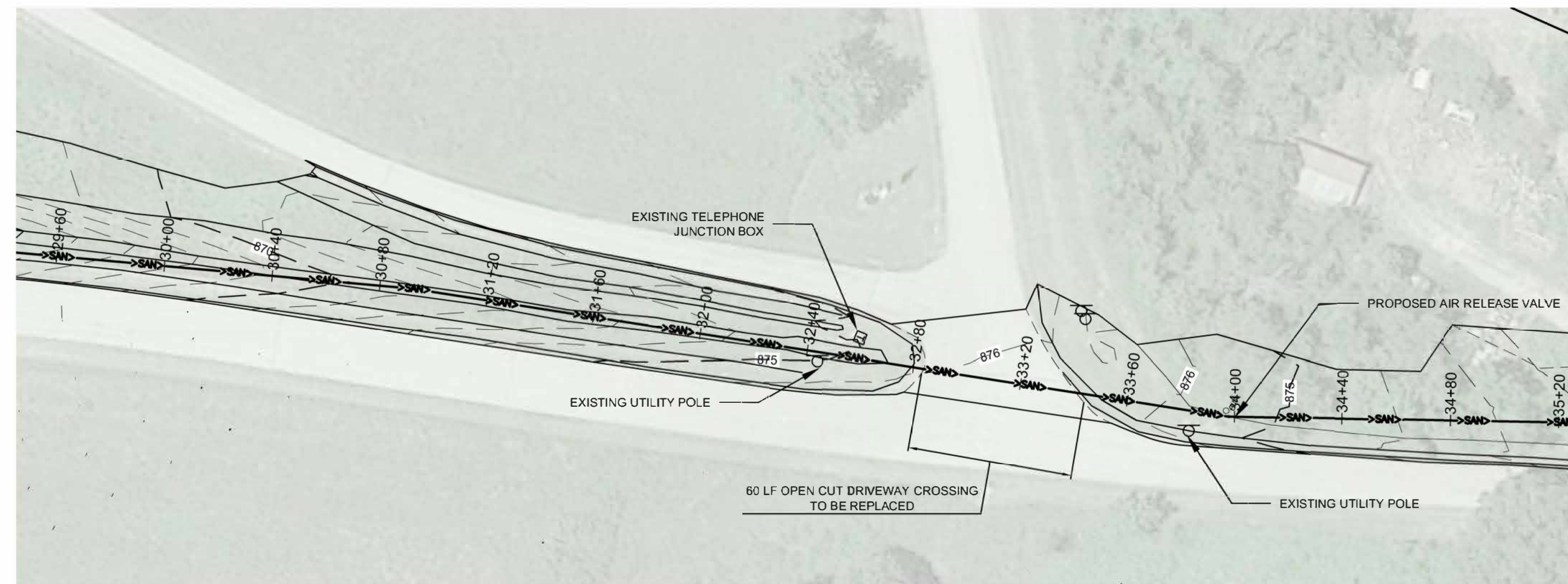
SHEET NUMBER:

C103

FORCEMAIN RUN: 6



FORCEMAIN RUN: 7



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OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF NATURAL
RESOURCES DIVISION OF
STATE PARKS

REPLACE LAGOON

LONG BRANCH STATE
PARK 28615 VISITOR
CENTER RD MACON, MO
63552

PROJECT # X2302-02
SITE # 5601
ASSET # 7815601020

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 02-12-2024

CAD DWG FILE: _____
DRAWING BY: JDH
CHECKED BY: JDH
DESIGNED BY: JDH

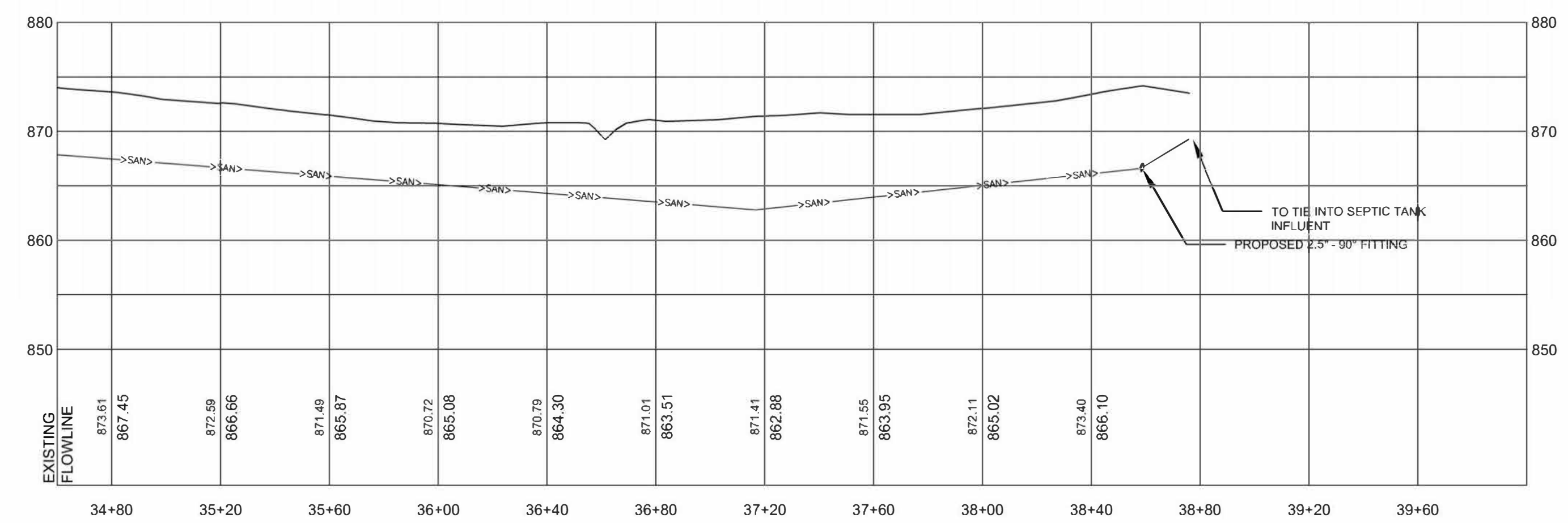
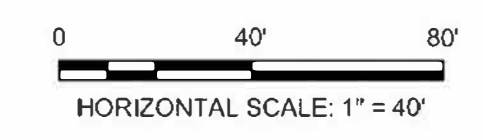
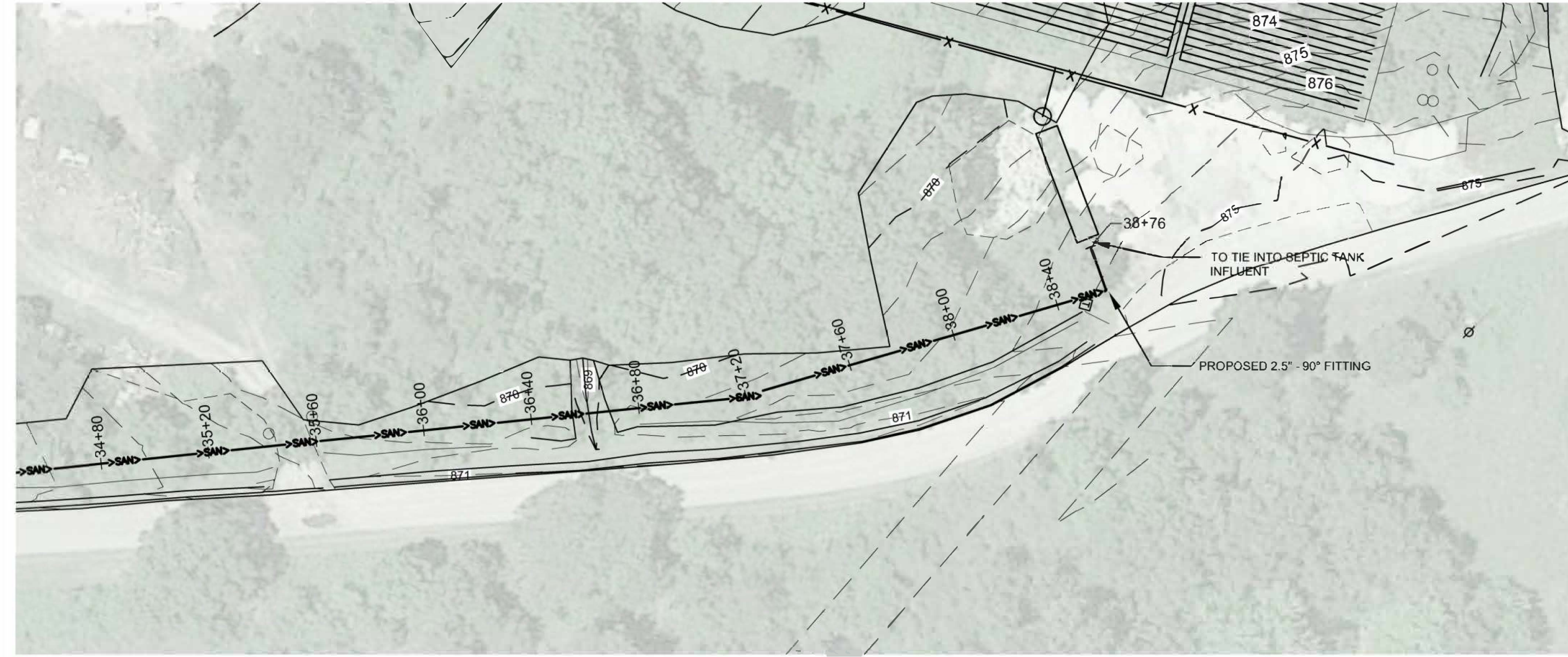
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FORCEMAIN RUNS 6
& 7

SHEET NUMBER:

C104

FORCEMAIN RUN: 8



STATE OF MISSOURI
MICHAEL L. PARSON,
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DRAWING BY: JDH
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DESIGNED BY: JDH

SHEET TITLE:
FORCEMAIN RUN 8

SHEET NUMBER:

C105



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CAD DWG FILE: _____
DRAWING BY: JDH
CHECKED BY: JDH
DESIGNED BY: JDH

SHEET TITLE:

LPP DETAILS - 1

SHEET NUMBER:

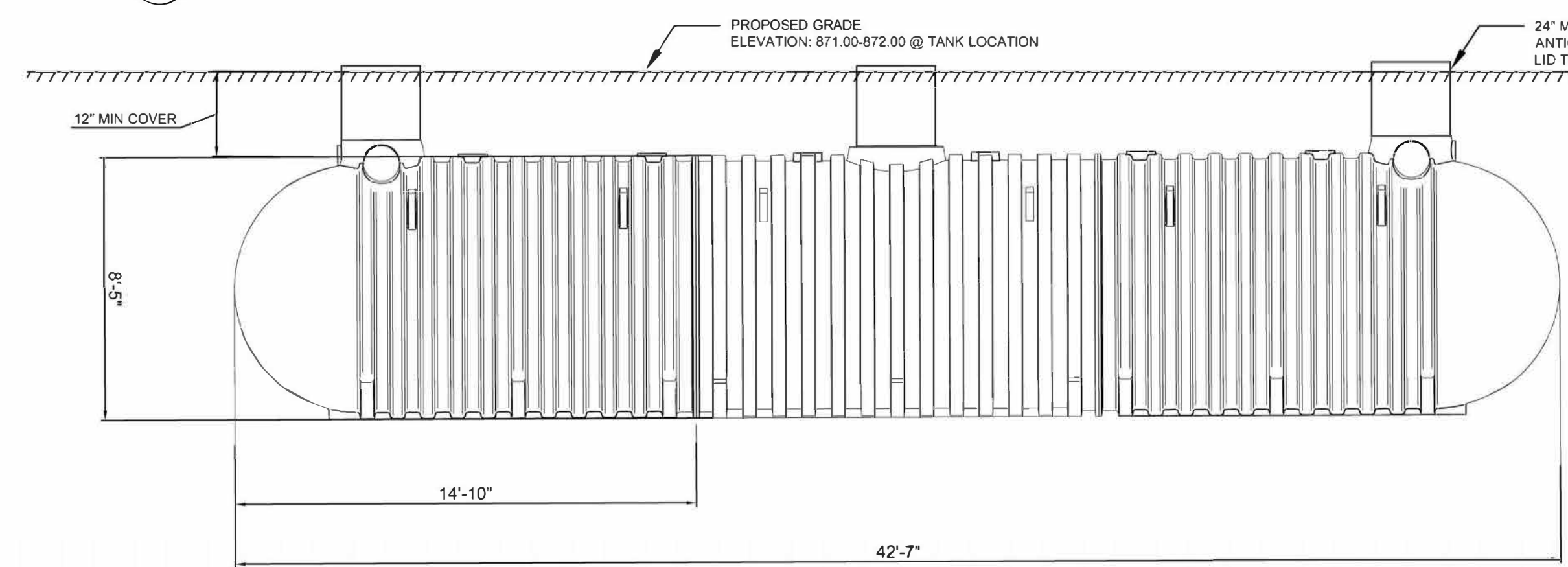
C200

9 OF 15 SHEETS
FEBRUARY 12, 2024

NOTE:
PROPOSED SUBSURFACE IRRIGATION SEQUENCE TO BE APPLIED TO
WHOLE FIELD DURING IRRIGATION TIMES.

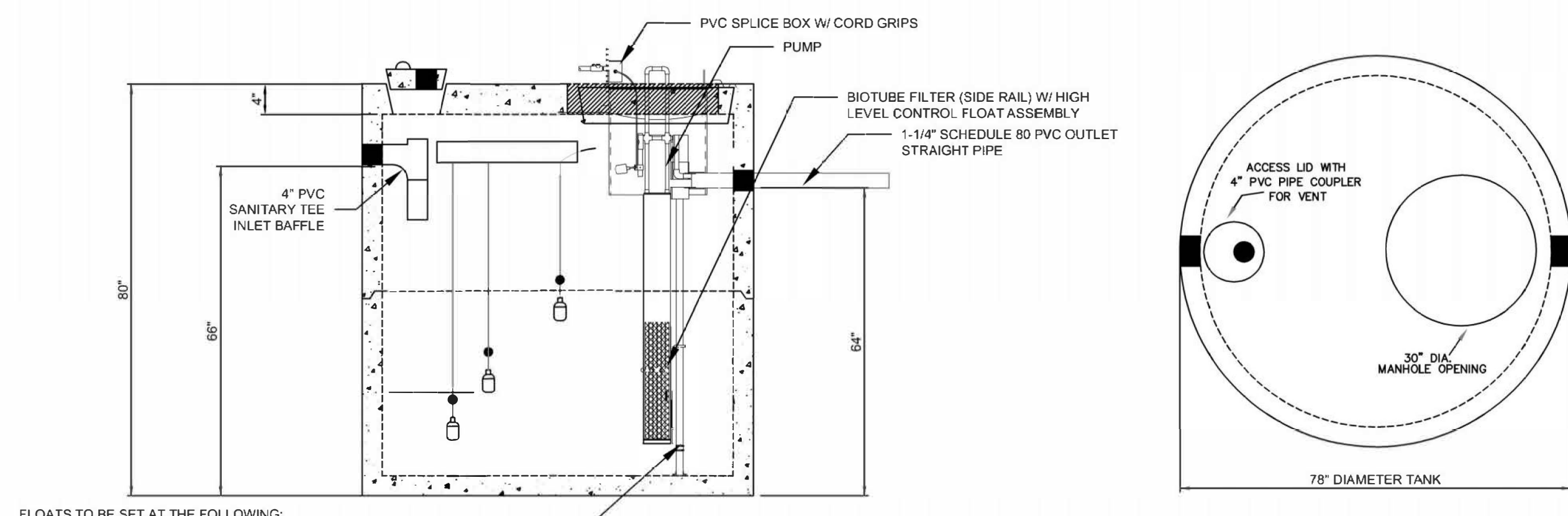
LONG BRANCH STATE PARK LPP DESIGN PARAMETERS:
• DESIGN LOAD RATE: 0.20 GALLONS PER DAY PER SQUARE FOOT
• EFFECTIVE ABSORPTION AREA REQUIRED: 48,864.00 FT²
• TRENCH SPACING: 3 LF
• TOTAL TRENCH LENGTH: 16,288 LF
• LATERAL LENGTH: 68 LF
• NUMBER OF ZONES: 24
• NUMBER OF TRENCHES PER ZONE: 10 TRENCH WIDTH: 24 INCHES
• ORIFICE SPACING: 3.28 FT
• LATERAL DISCHARGE RATE: 13.39 GPM
• ZONE DISCHARGE RATE: 5.57 GPM/ZONE
• LATERAL DIAMETER: 1.25"
• LATERAL MATERIAL: SCH 40 PVC

1 LPP SITE LAYOUT



2 15,000 GALLON HDPE SEPTIC TANK LAYOUT

LONG BRANCH STATE PARK 15,000 GALLON SEPTIC TANK:
• TANK PARAMETERS
• VOLUME: 15,000 GALLON MIN
• MATERIAL: HDPE (DOUBLE WALLED), CONCRETE, OR ENGINEER APPROVED EQUAL
• LENGTH: 51'
• WIDTH: 10'
• HEIGHT: 10'
• MANWAY ACCESS: 24" MIN
• BURIAL DEPTH: 12" (FOLLOW MANUFACTURER RECOMMENDATIONS)
• TANK TO CONTAIN INTERNAL BAFFLING IN ACCORDANCE WITH MISSOURI DNR 10 CSR 20-8-180(2)(B)
• EFFLUENT PIPING TO CONTAIN AN INTERNAL SANITARY TEE (4")
• ANTI-FLOATATION: (CONTRACTOR TO FOLLOW MANUFACTURER'S RECOMMENDATIONS, THE FOLLOWING ARE ESTIMATES AND CONTRACTOR TO VERIFY OWN QUANTITIES FOR QUANTITY TAKEOFFS)
• TOTAL ANCHORS: 8
• DIMENSIONS: 12" X 12" X 16"
• WEIGHT PER ANCHOR: 2,400 LBS/ANCHOR
• STRAPS PER ANCHOR: 6



3 1,000 GALLON DOSING TANK

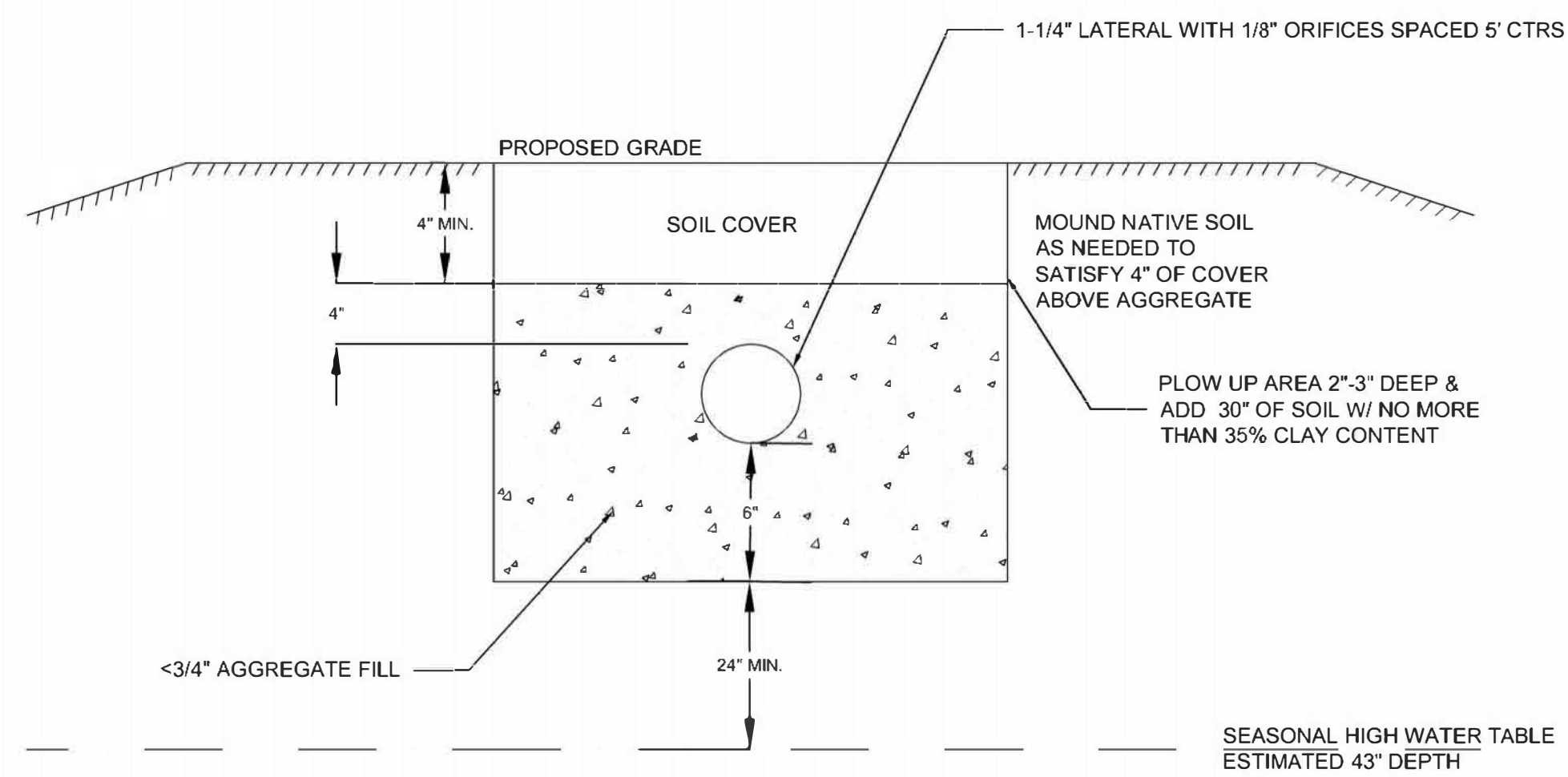
LONG BRANCH STATE PARK 1,000 GALLON DOSING TANK:
• TANK PARAMETERS:
• VOLUME: 1,000 GALLONS MIN
• MATERIAL: CONCRETE OR HDPE (ENGINEER APPROVED EQUAL)
• DIAMETER: 78"
• HEIGHT: 80"
• INLET HEIGHT: 66"
• OUTLET HEIGHT: 64"
• MAX BURIAL COVERAGE: 6"
• MINIMUM CONCRETE STRENGTH: 4,000 PSI
• REINFORCEMENT: #4 REBAR IN TOP AND BOTTOM
• WWF 6X6 W/ 1.4 IN WALLS CONSTRUCTION JOINT
• SEALED WITH BUTYL RESIN SEALANT

FLOATS TO BE SET AT THE FOLLOWING:
1. HIGH LEVEL ALARM: 2" BELOW INLET
2. PUMP ON: 4" BELOW INLET
3. PUMP OFF: 6.5 INCHES BELOW INLET AND MIN 5" ABOVE TOP OF BIOTUBE FILTER CARTRIDGE

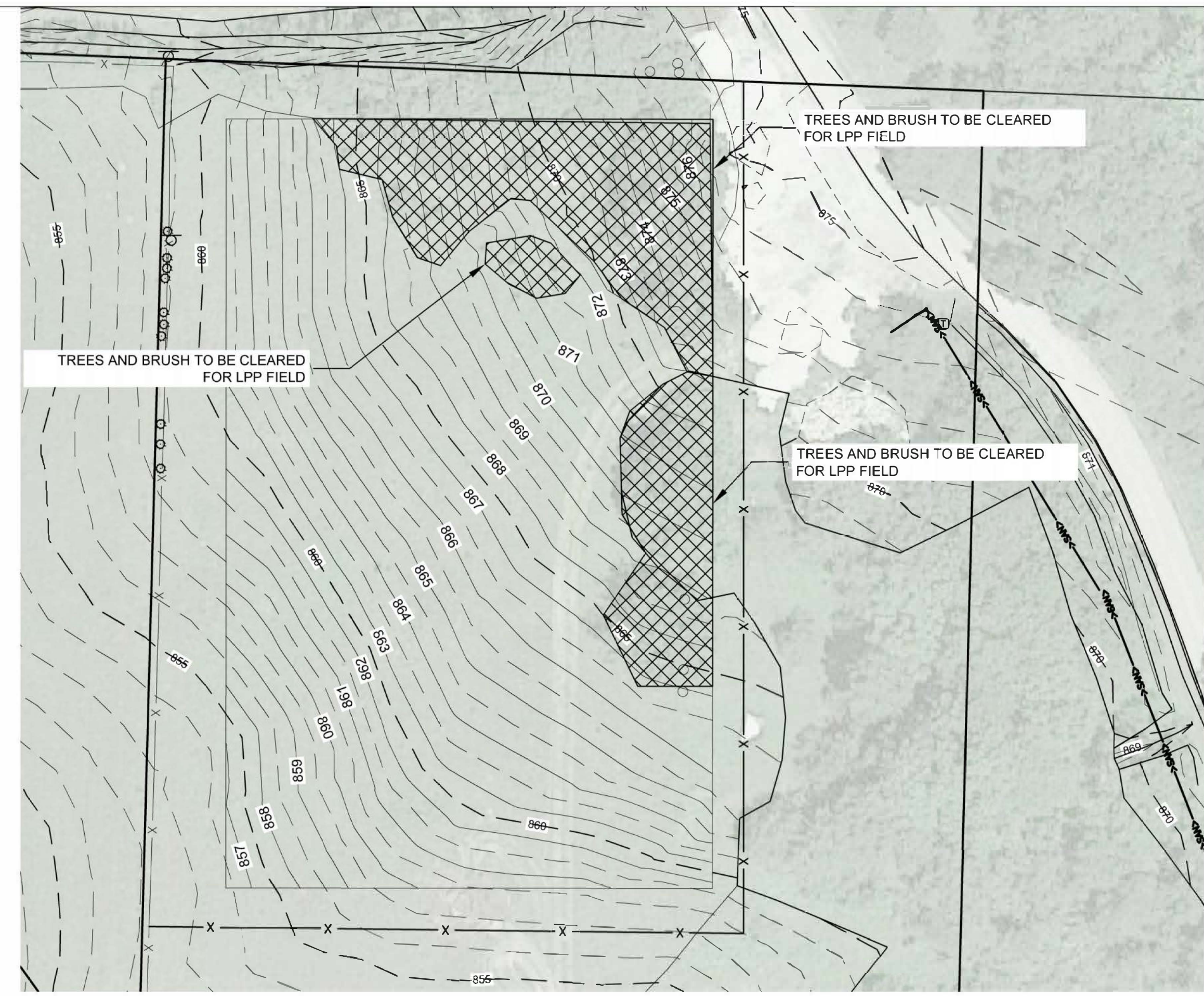
Table 1—Minimum Set-Back Distances

Minimum Distance From	Sewage Tank ¹	Disposal Area ²	Lagoons
Private water supply well ³	(feet) 50	(feet) 100	(feet) 100
Public water supply well	300	300	300
Cistern	25	25	25
Spring	50	100	100
Classified stream, lake or impoundment*	50	50	50
Stream or open ditch ⁴	25	25	25
Property lines	10	10**	75
Building foundation	5	15	15
Basement	15	25	25
Swimming pool	15	15	15
Water line under pressure	10	10	10
Suction water line	50	100	100
Upslope interceptor drains	-	10	10
Downslope interceptor drains	-	25	25
Top of slope of embankments or cuts of two feet (2') or more vertical height	-	20	20
Edge of surficial sink holes	50	100	500
Other soil absorption system except repair area	-	20	20

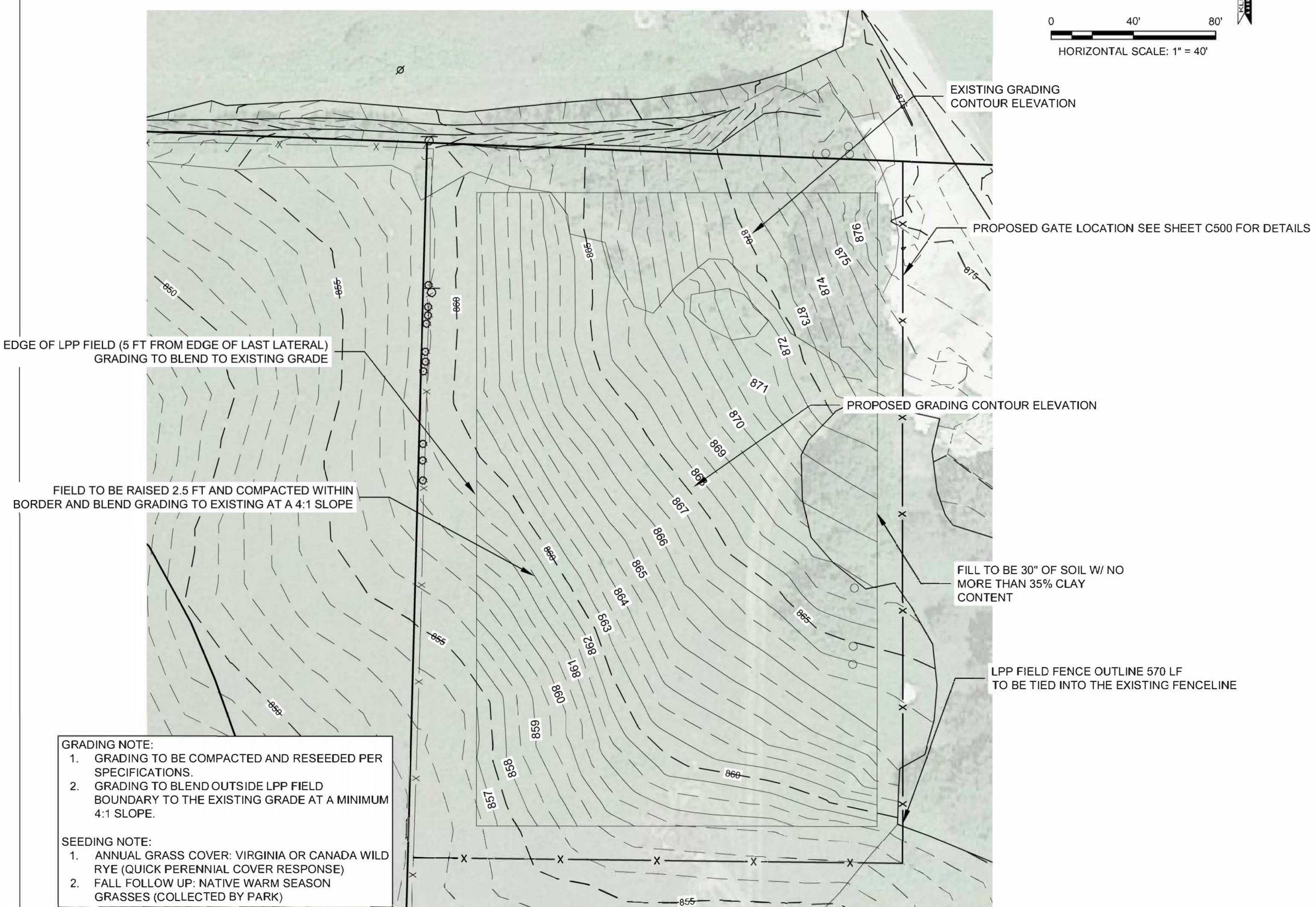
*A classified stream is any stream that maintains permanent flow or permanent pools during drought periods and supports aquatic life.
**Recommend twenty-five feet (25') of downslope property line initially, but repair may be allowed to ten feet (10') of downslope property line.
¹ Includes sewage tanks, intermittent sand filters and dosing chambers.
² Includes all systems (sand filter, wetland and the like) except wastewater stabilization ponds.
³ Unplugged abandoned wells or wells with less than eighty feet (< 80') of casing depth shall have one-hundred-fifty feet (150') minimum distance from all above.
⁴ Sewage tanks and soil absorption systems should never be located in the drainage area of a sinkhole.



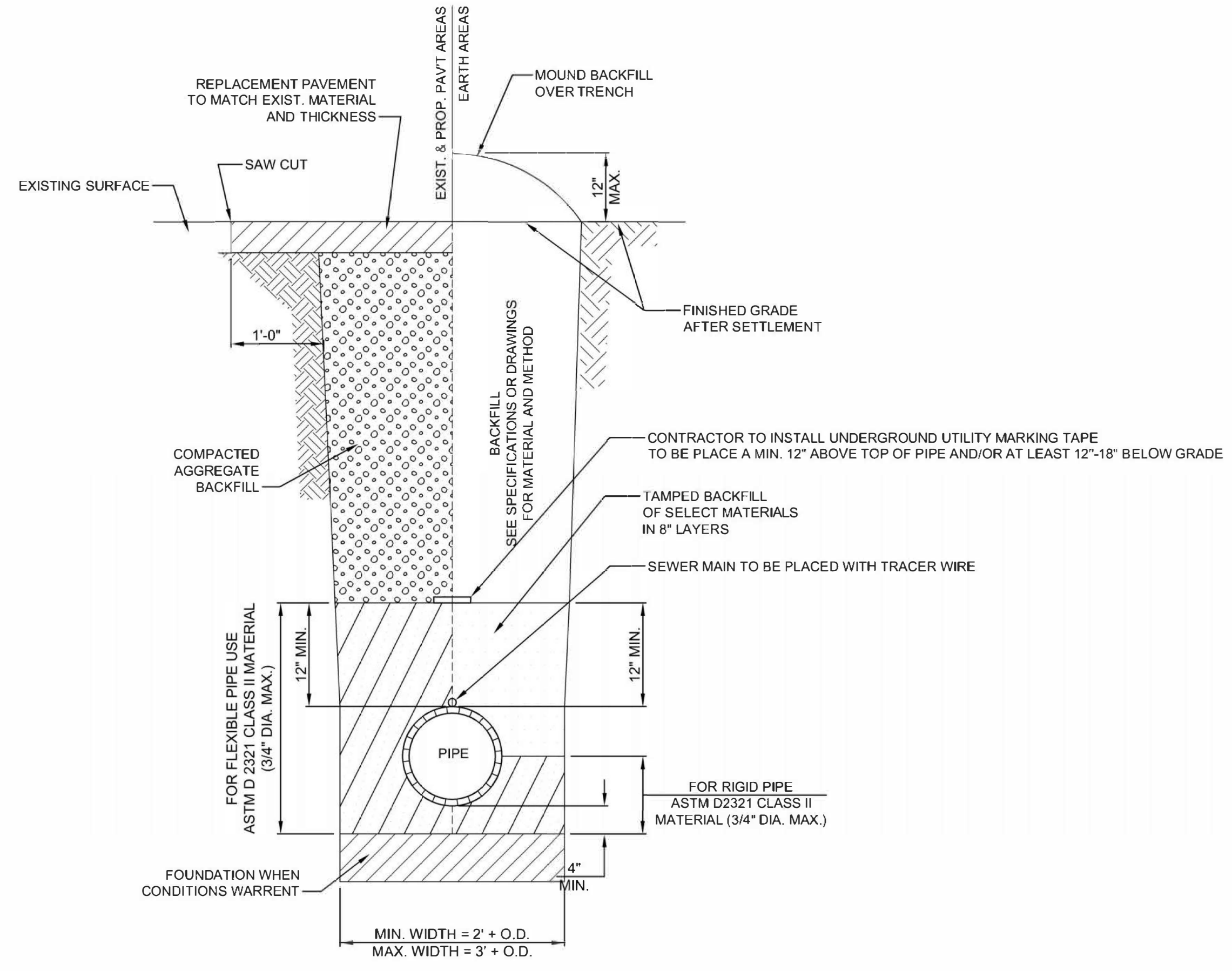
1 TYPICAL TRENCH
C201 SCALE: N.T.S.



2 SITE CLEARING PLAN FOR LPP FIELD
C201 SCALE: 1"=40'

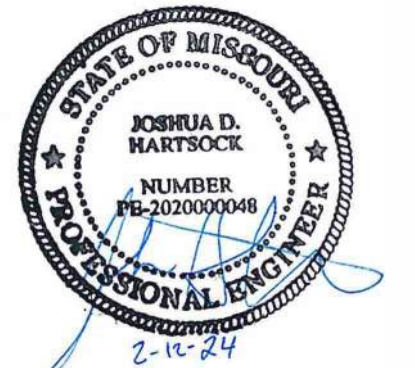


3 LPP FIELD GRADING PLAN
C201 SCALE: 1"=40'



4 SANITARY SEWER TRENCH DETAIL
N.T.S.

- GRADING NOTE:**
1. GRADING TO BE COMPACTED AND RESEEDED PER SPECIFICATIONS.
 2. GRADING TO BLEND OUTSIDE LPP FIELD BOUNDARY TO THE EXISTING GRADE AT A MINIMUM 4:1 SLOPE.
- SEEDING NOTE:**
1. ANNUAL GRASS COVER: VIRGINIA OR CANADA WILD RYE (QUICK PERENNIAL COVER RESPONSE)
 2. FALL FOLLOW UP: NATIVE WARM SEASON GRASSES (COLLECTED BY PARK)



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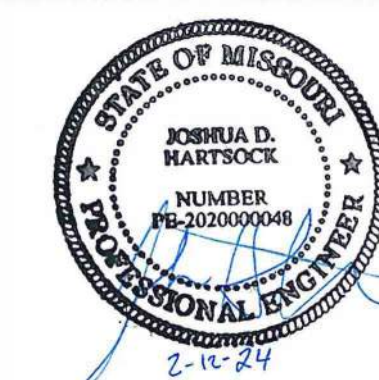
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DRAWN BY: JH
DESIGNED BY: JH

SHEET TITLE:

LPP DETAILS - 2

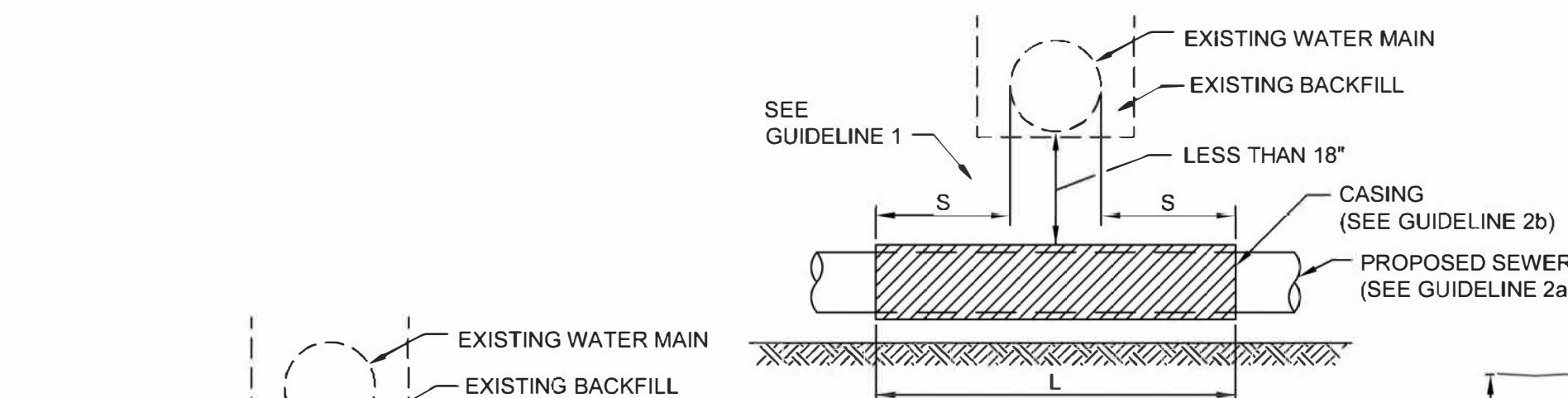
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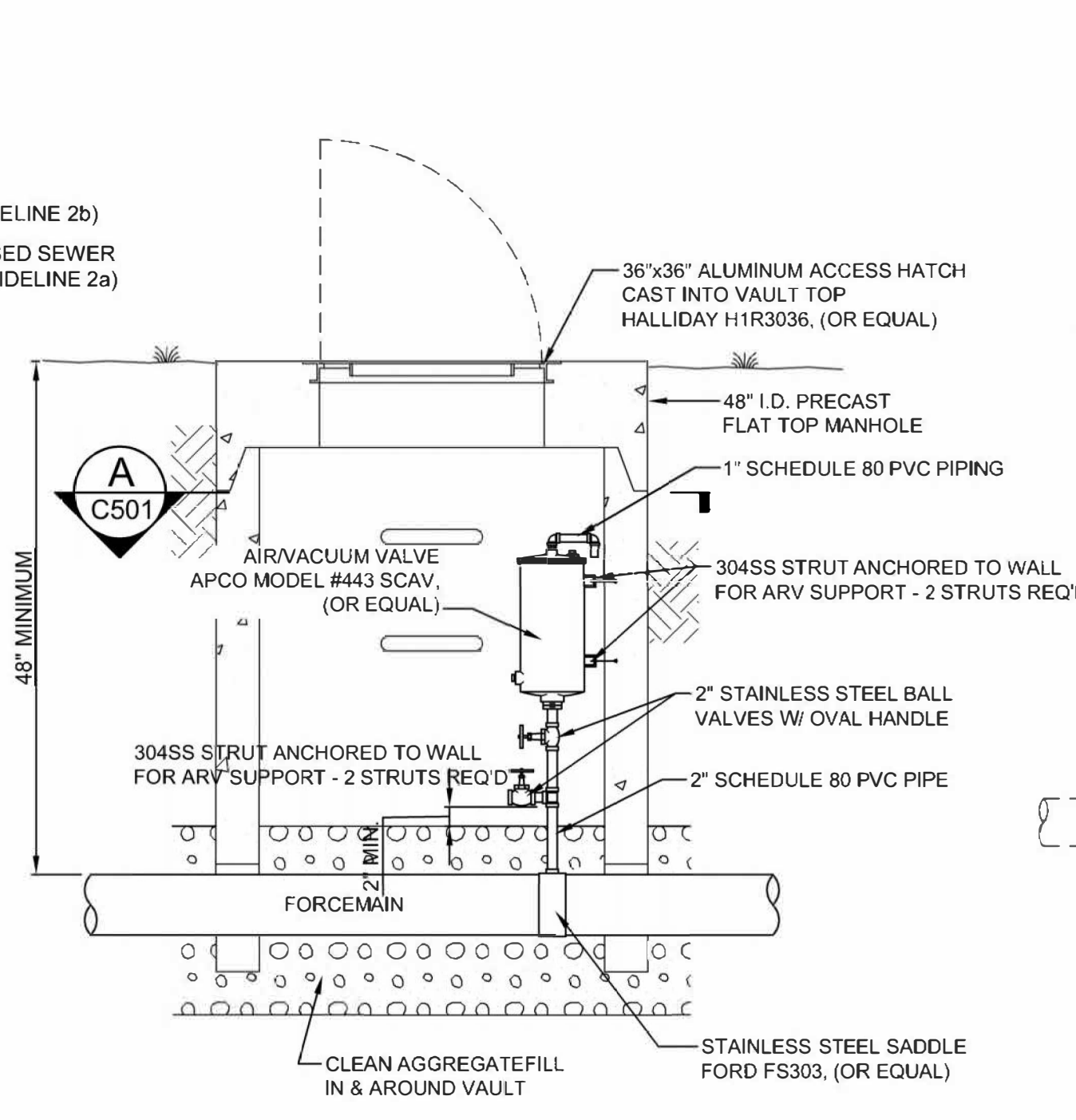
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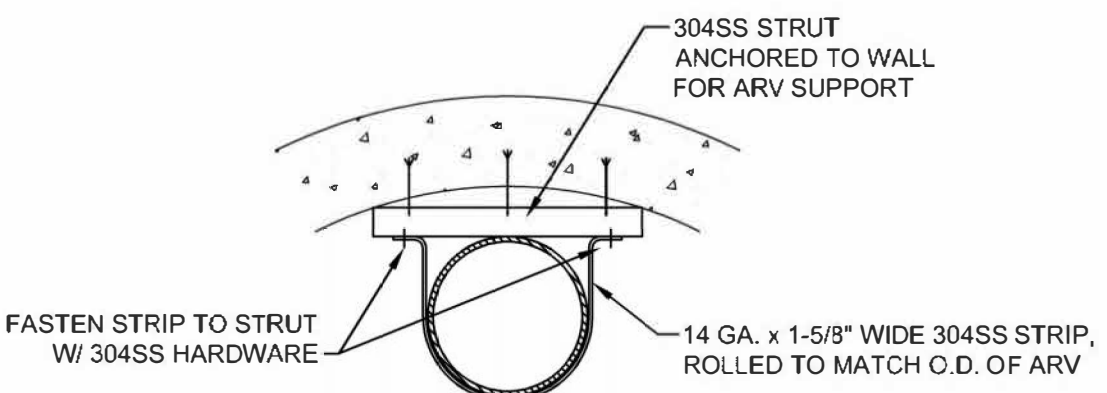
GUIDELINES
1. PROVIDE ADEQUATE SUPPORT FOR EXISTING WATER MAIN TO PREVENT DAMAGE DUE TO SETTLEMENT OF SEWER TRENCH.
(VERTICAL SEPARATION)
C - WATER AND SEWER SEPARATION REQUIREMENTS

GUIDELINES
1. OMIT SELECT GRANULAR EMBEDMENT & GRANULAR WITHIN BACKFILL TO (1) FOOT OVER TOP OF SEWER & USE SELECT EXCAVATED MATL (CLASS IV) & COMPACT FOR "S" FT. ON EA. SIDE OF WATER MAIN
2. a. CONSTRUCT "L" FEET OF PROPOSED SEWER OF WATER MAIN MATL & PRESSURE TEST, (OR);
b. USE "L" FEET OF WATER MAIN MATL FOR CASING OF PROPOSED SEWER & SEAL ENDS OF CASING
3. PROVIDE ADEQUATE SUPPORT FOR EXISTING WATER MAIN TO PREVENT DAMAGE DUE TO SETTLEMENT OF SEWER TRENCH
NOTE: "S" IS THE LENGTH NECESSARY TO PROVIDE 10 FEET OF SEPARATION AS MEASURED PERPEND. TO THE EXISTING WATER MAIN
(VERTICAL SEPARATION)
D - WATER AND SEWER SEPARATION REQUIREMENTS

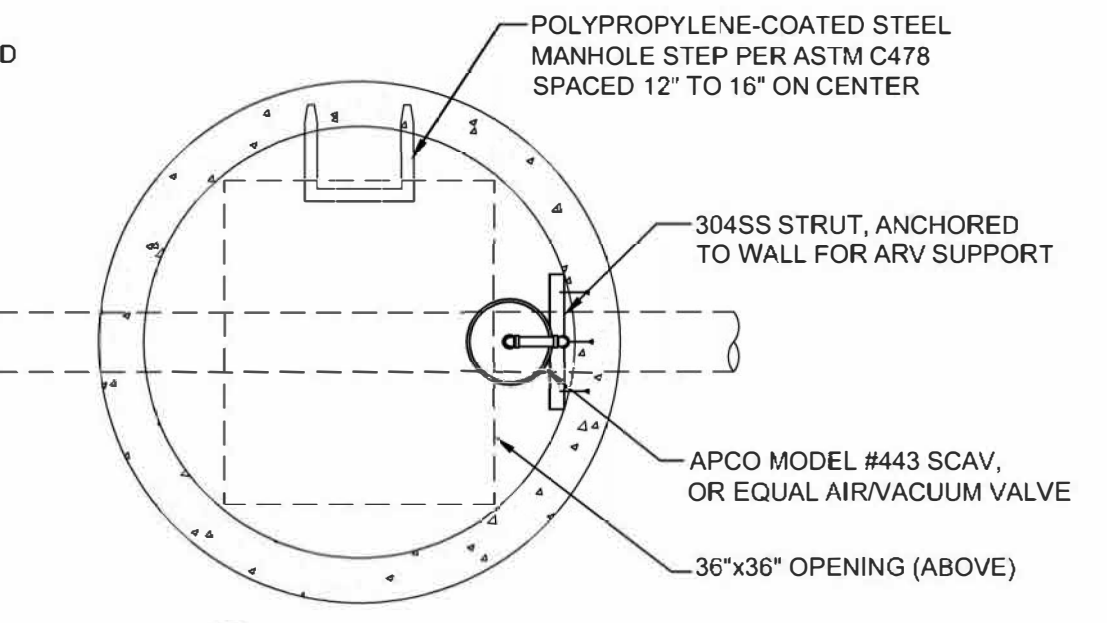
1 WATER & SEWER SEPARATION REQUIREMENTS
N.T.S.



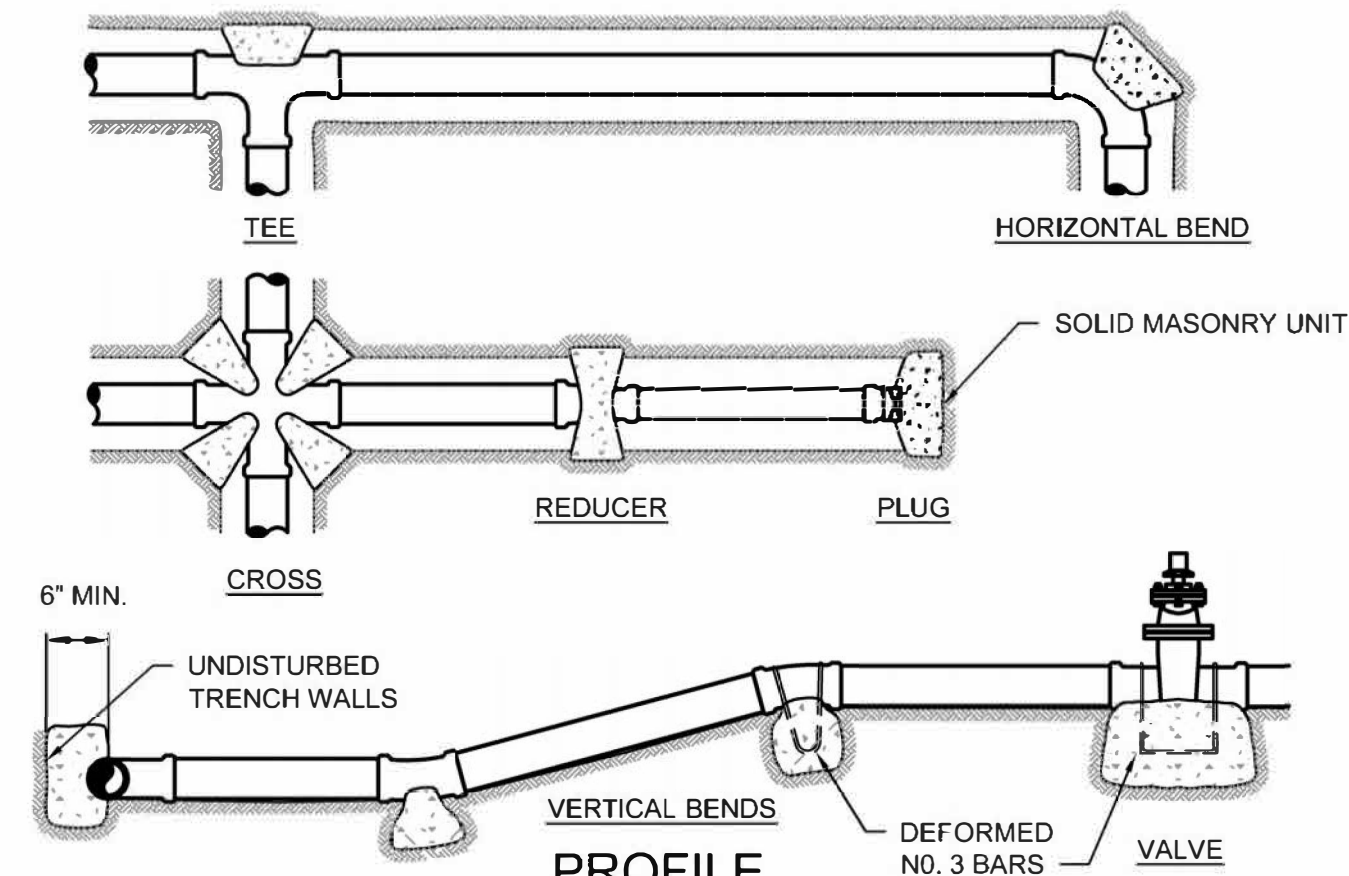
2 FORCEMAIN AIR RELEASE VAULT
N.T.S.



ARV SUPPORT DETAIL
NO SCALE



A SECTION
C500 SCALE: NTS

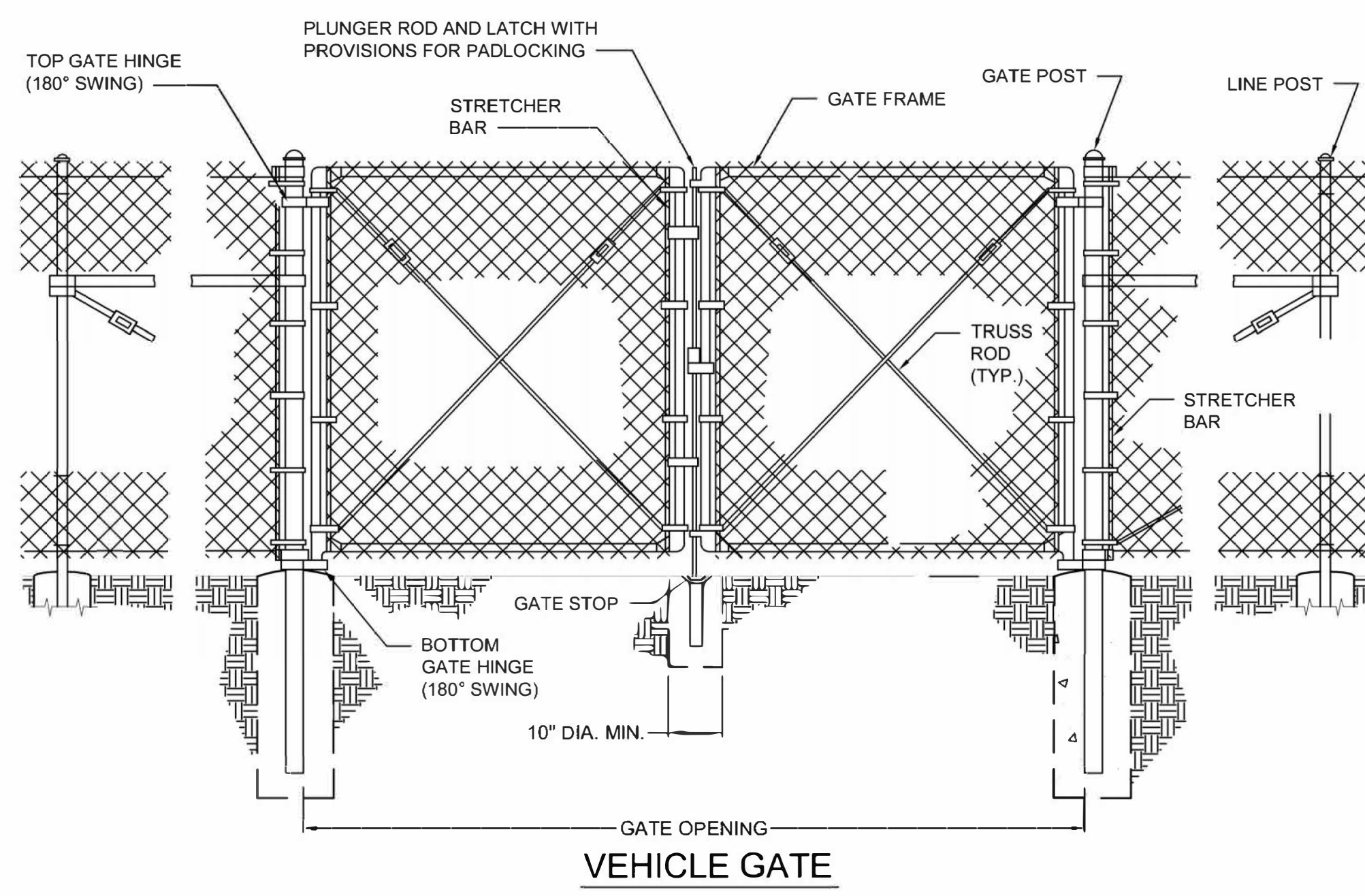


MINIMUM SIZE THRUST BLOCK REQUIRED (SQ. FT.)

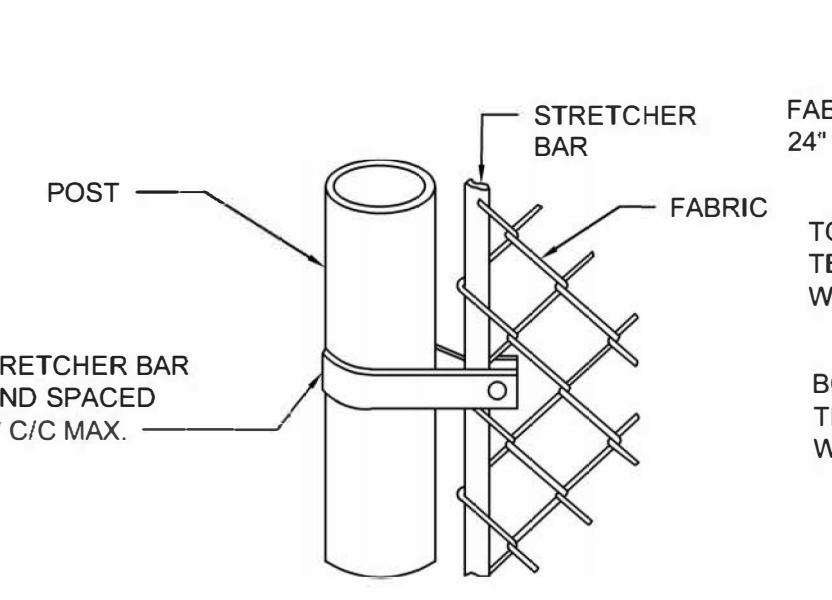
PIPE DIA.	BENDS				REDUCER	CROSS, TEE, PLUG AND VALVE
	11 1/4" & 22 1/2"	45"	90"	180"		
2"	0.25	0.5	1	-	0.25	
2.5"	0.3125	0.625	1.25	0.47	0.3125	
4"	0.5	1	2	0.75	1	
6"	1	2	4	1.75	2.25	
8"	2	4	7	2.75	4	
10"	3	6	11.5	3.75	6.25	
12"	4.5	9	16	4.75	9	

1. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE = 3000 PSI.
2. DESIGN TEST PRESSURE = 100 PSI + 50% FOR IMPACT.
3. DESIGN SOIL BEARING CAPACITY = 2000 PSF.
4. CONCRETE FOR THRUST BLOCKS BASED ON SOIL HAVING A SAFE LOAD BEARING OF 2000 PSF. FOR SOFT SOIL, INCREASE BEARING AREA AND VOLUME OF THRUST BLOCK.

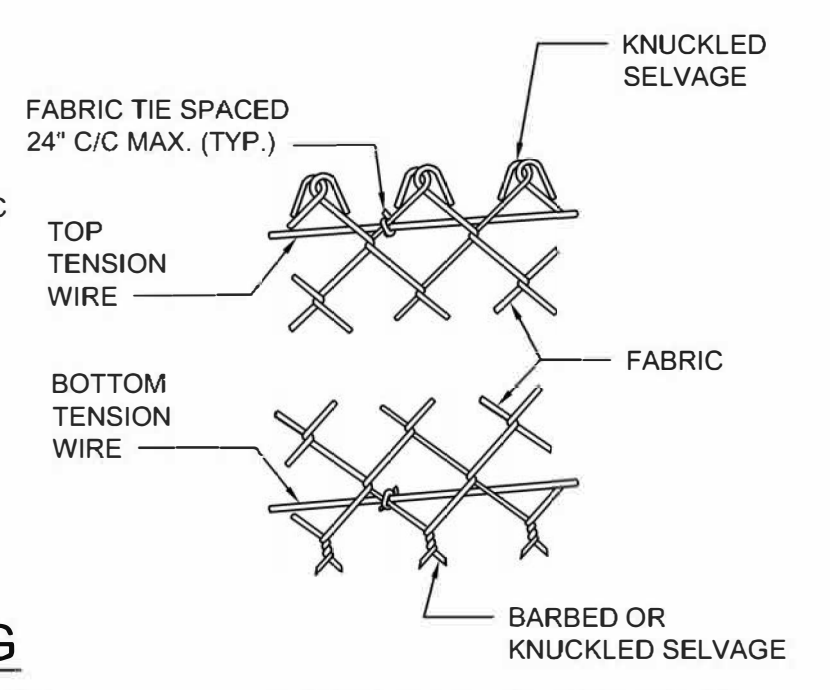
3 THRUST BLOCK
N.T.S.



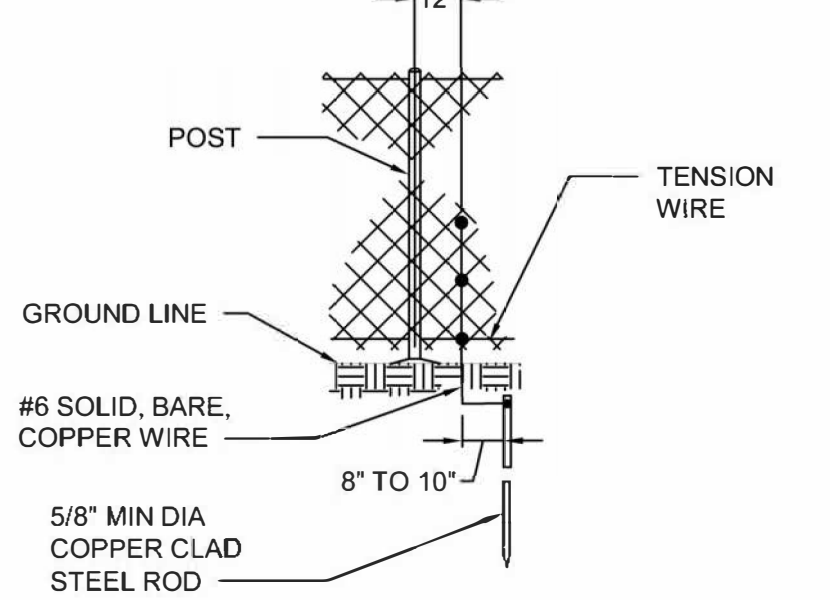
VEHICLE GATE



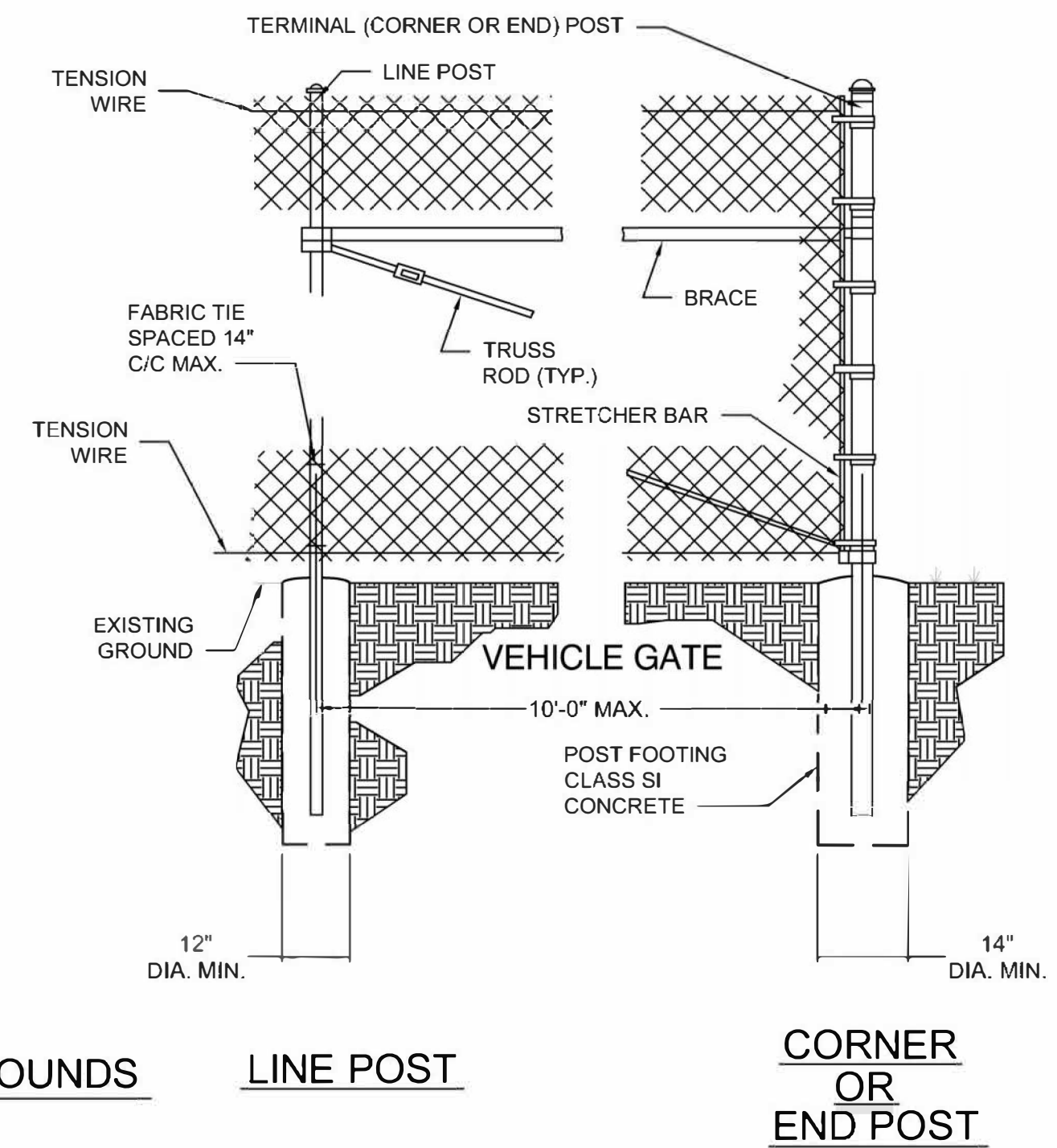
METHOD OF FASTENING STRETCHER BAR TO POST



METHOD OF TYING FABRIC TO TENSION WIRES



STANDARD GROUND PROTECTIVE ELECTRICAL GROUNDS



LINE POST

CORNER OR END POST

4 6' HIGH CHAIN LINK FENCE DETAIL
N.T.S.

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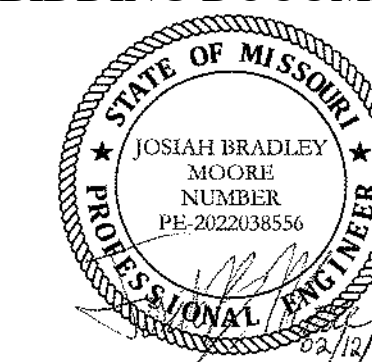
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DRAWING BY: JDH
CHECKED BY: JDH
DESIGNED BY: JDH

SHEET TITLE:

MISCELLANEOUS
DETAILS

SHEET NUMBER:

C500



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MO # PE-2022038556

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CAD DWG FILE: E501
DRAWING BY: JBM
CHECKED BY: JJN
DESIGNED BY: JBM

SHEET TITLE:
**ELECTRICAL
DETAILS**

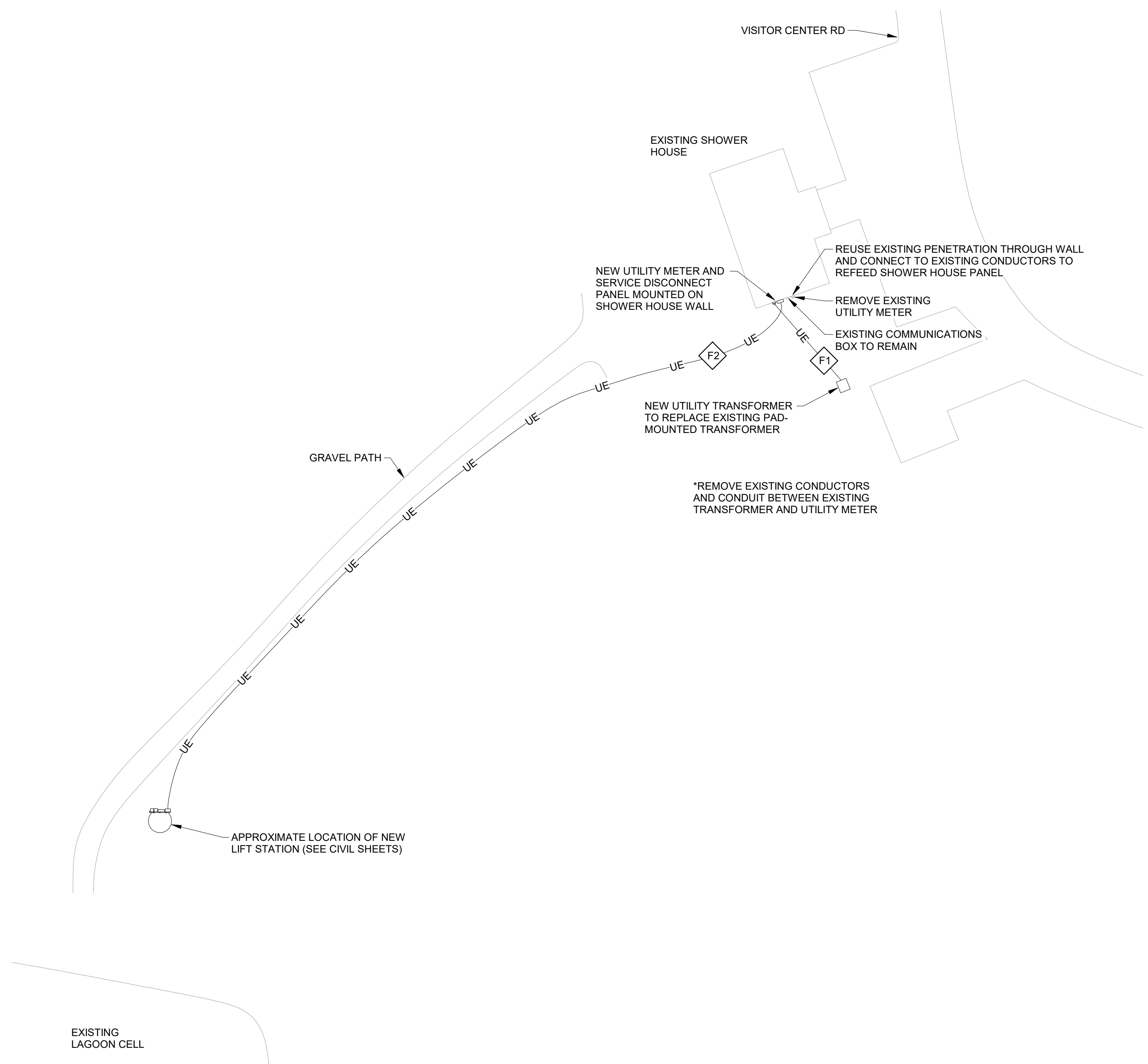
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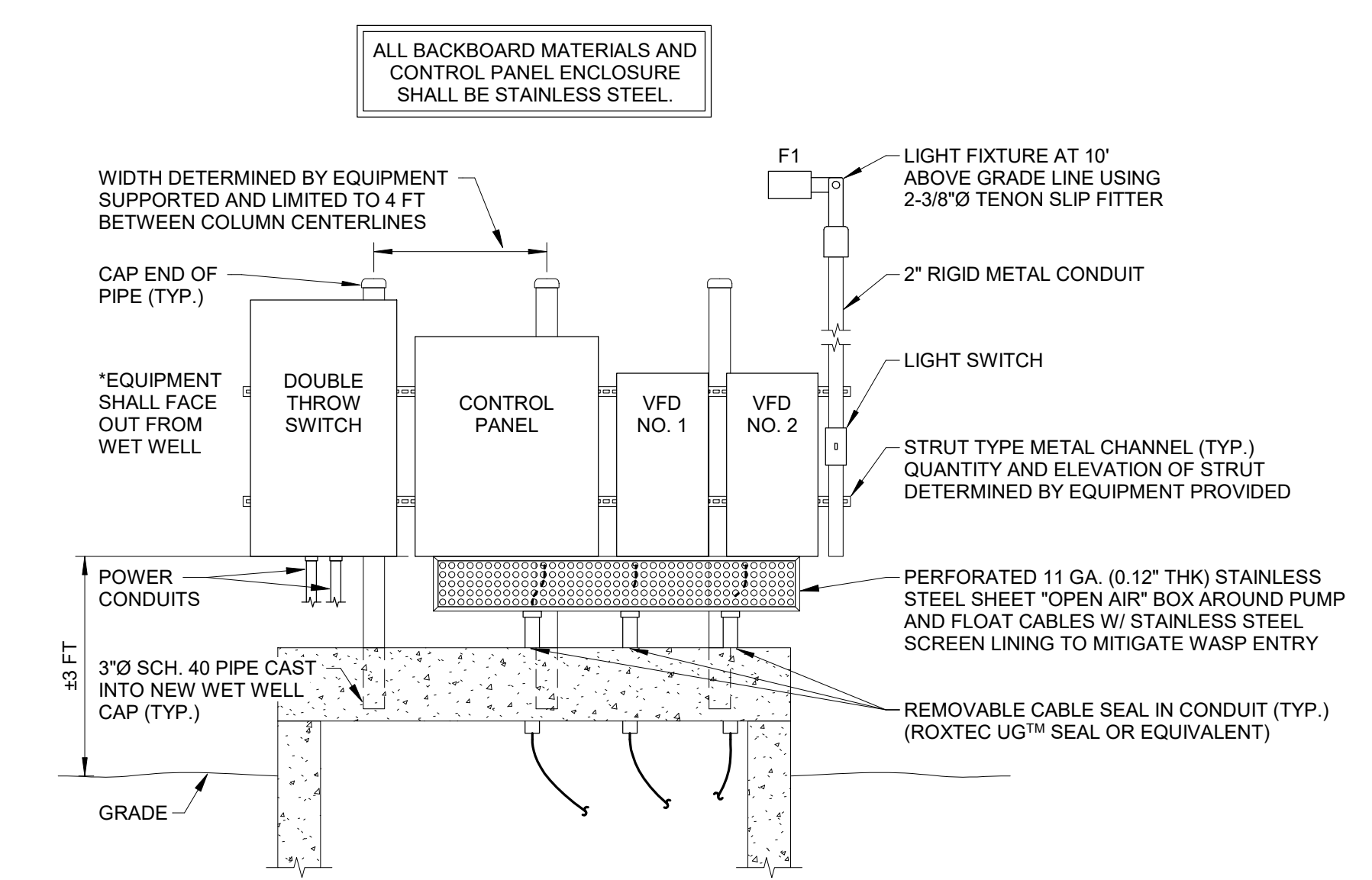
12 OF 15 SHEETS
February 12, 2024

GENERAL ELECTRICAL NOTES:

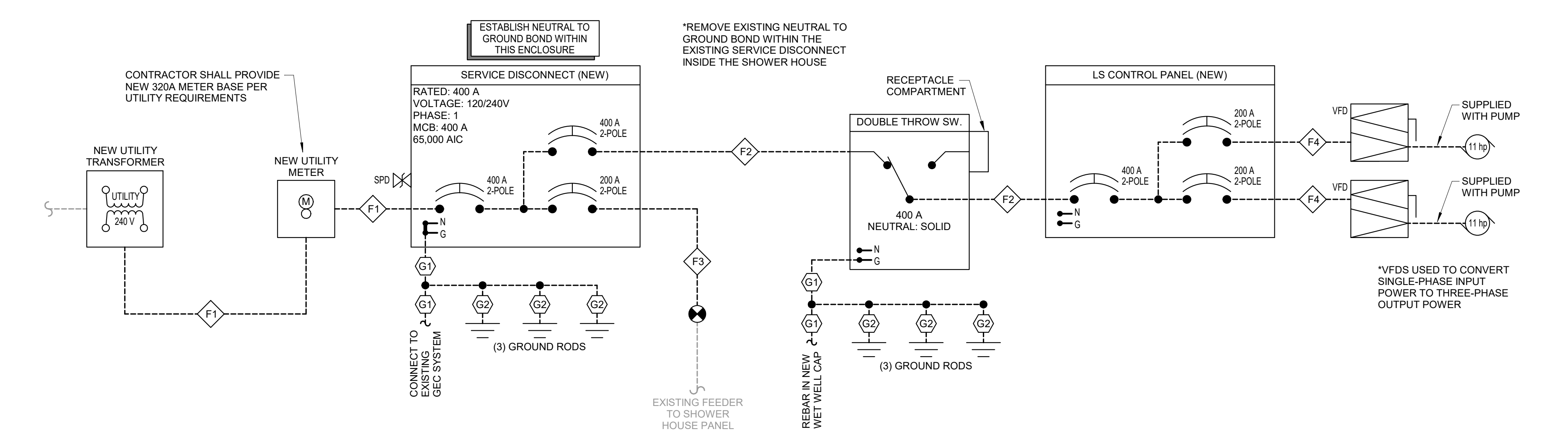
1. APPLICABLE STANDARDS: NFPA-70 AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) OF 1971 AND ALL AMENDMENTS THERETO; EQUIPMENT, DEVICES, APPARATUS, SYSTEMS, AND INSTALLATIONS SHALL BE ENTIRELY SUITABLE AND SAFE FOR EACH INTENDED APPLICATION AND BE IN FULL COMPLIANCE WITH APPLICABLE STANDARDS, REQUIREMENTS, RULES, REGULATIONS, CODES, STATUTES, ORDINANCES, ETC., OF MUNICIPAL, COUNTY, AND STATE GOVERNMENTS, OWNER'S INSURANCE COMPANY, LOCAL UTILITIES, AND LABOR REGULATIONS. NOTHING CONTAINED IN THESE PLANS AND SPECIFICATIONS SHALL BE CONSTRUED TO CONFLICT WITH THESE LAWS, CODES, AND ORDINANCES.
2. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF SYSTEMS. INSTALL SYSTEMS AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON COORDINATION DRAWINGS.
3. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ARRANGE FOR ALL INSPECTIONS REQUIRED BY LOCAL AUTHORITIES.
4. CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS, ACCESSORIES, TOOLS, EQUIPMENT, TRANSPORTATION, LABOR, SERVICES, AND OPERATIONS NECESSARY FOR A COMPLETE ELECTRICAL SYSTEM.
5. CONTRACTOR SHALL PERFORM EXCAVATION REQUIRED TO INSTALL HIS WORK.
6. COORDINATE INSTALLATION OF ELECTRICAL EQUIPMENT ON TOP OF WET WELL AND DOSING TANK CONCRETE CAPS WITH LOCATION OF ACCESS HATCHES. DO NOT INSTALL ELECTRICAL EQUIPMENT DIRECTLY ABOVE ACCESS HATCHES.
7. ELECTRICAL UTILITY PROVIDER: MACON ELECTRIC.



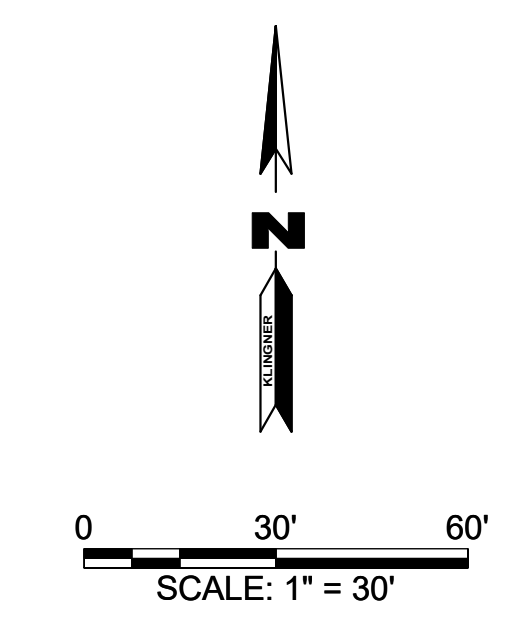
1 ELECTRICAL SITE PLAN - LIFT STATION
1" = 30'-0"

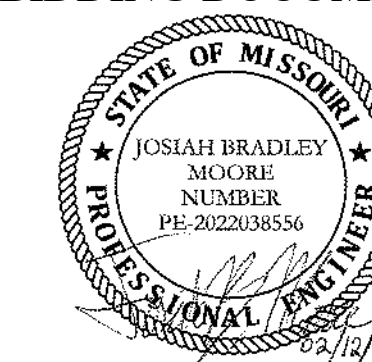


2 PUMP CONTROL PANEL ELEVATION - LIFT STATION
NTS



3 POWER ONE-LINE DIAGRAM - LIFT STATION
NTS





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ISSUE DATE: 02/12/2024

CAD DWG FILE: E502
DRAWING BY: JBM
CHECKED BY: JJN
DESIGNED BY: JBM

SHEET TITLE:
**ELECTRICAL
DETAILS &
SCHEDULES**

SHEET NUMBER:

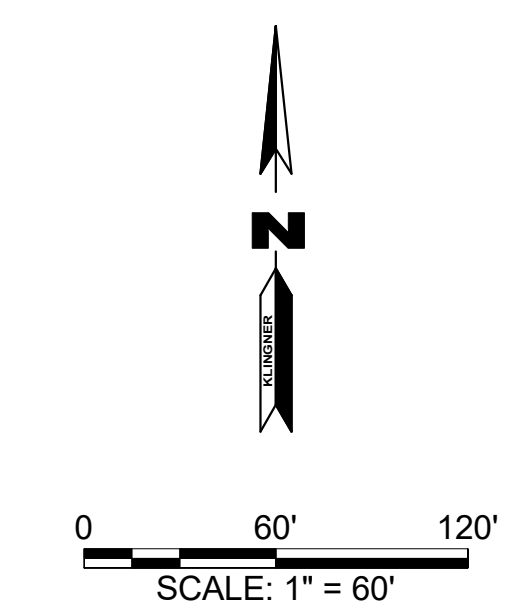
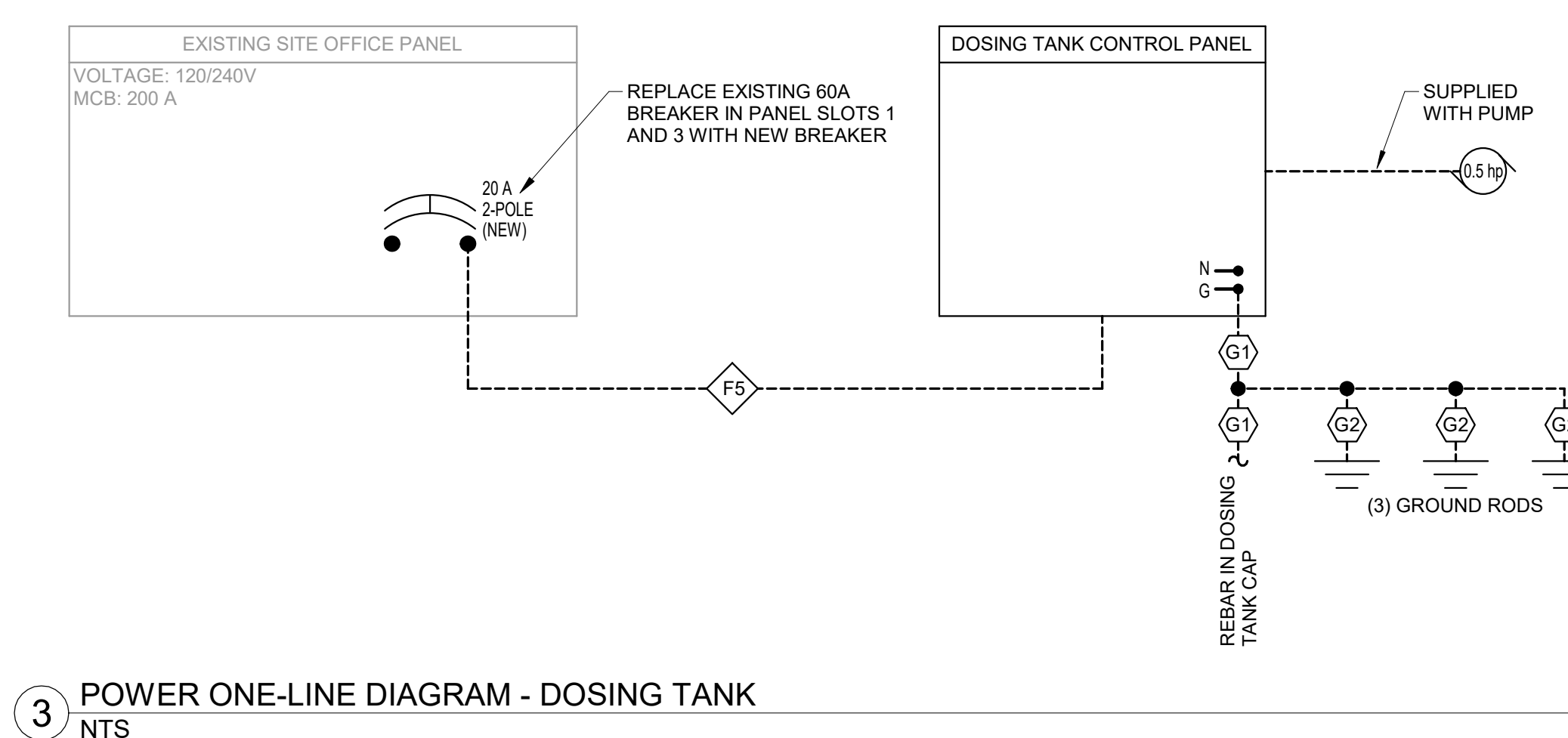
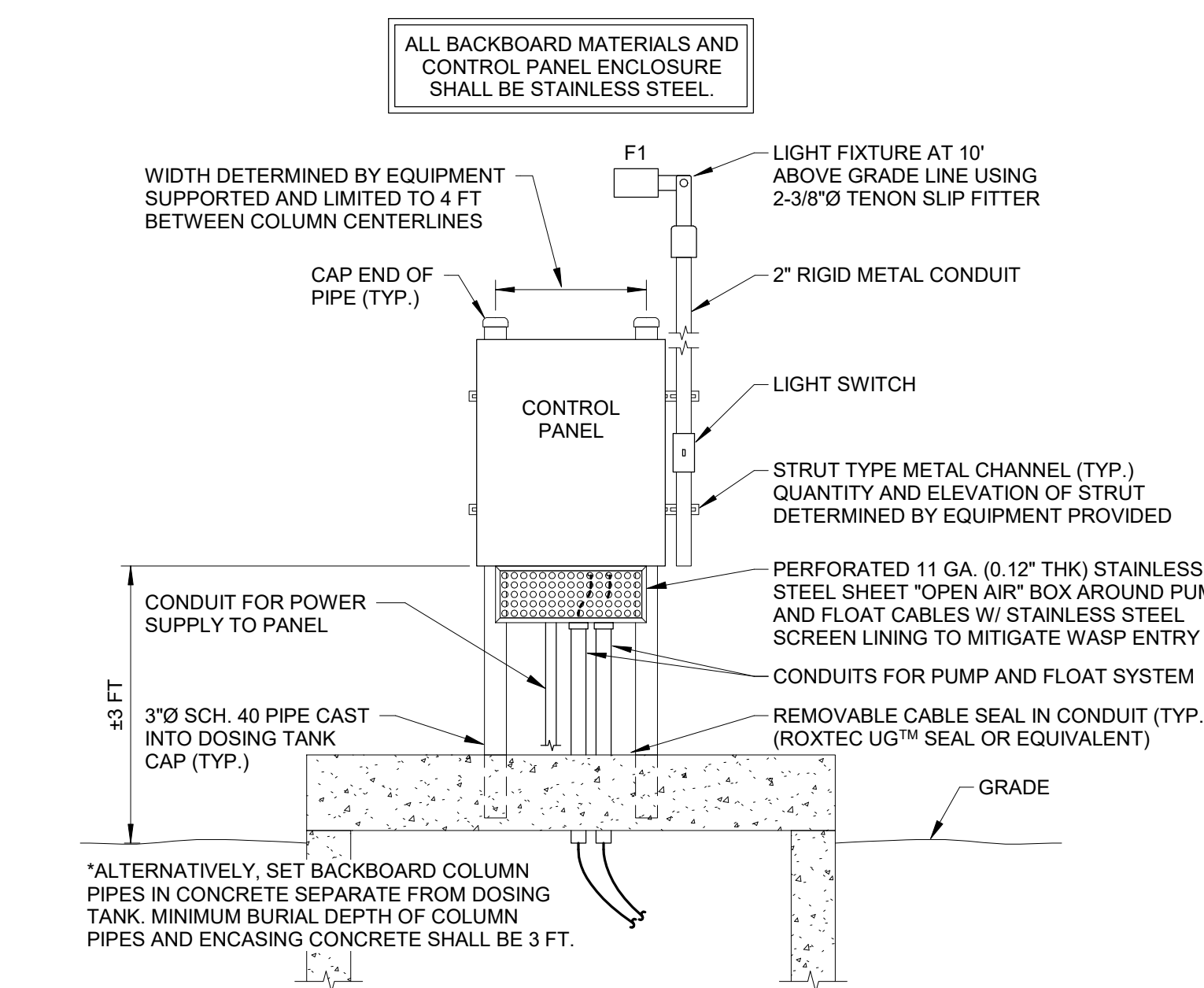
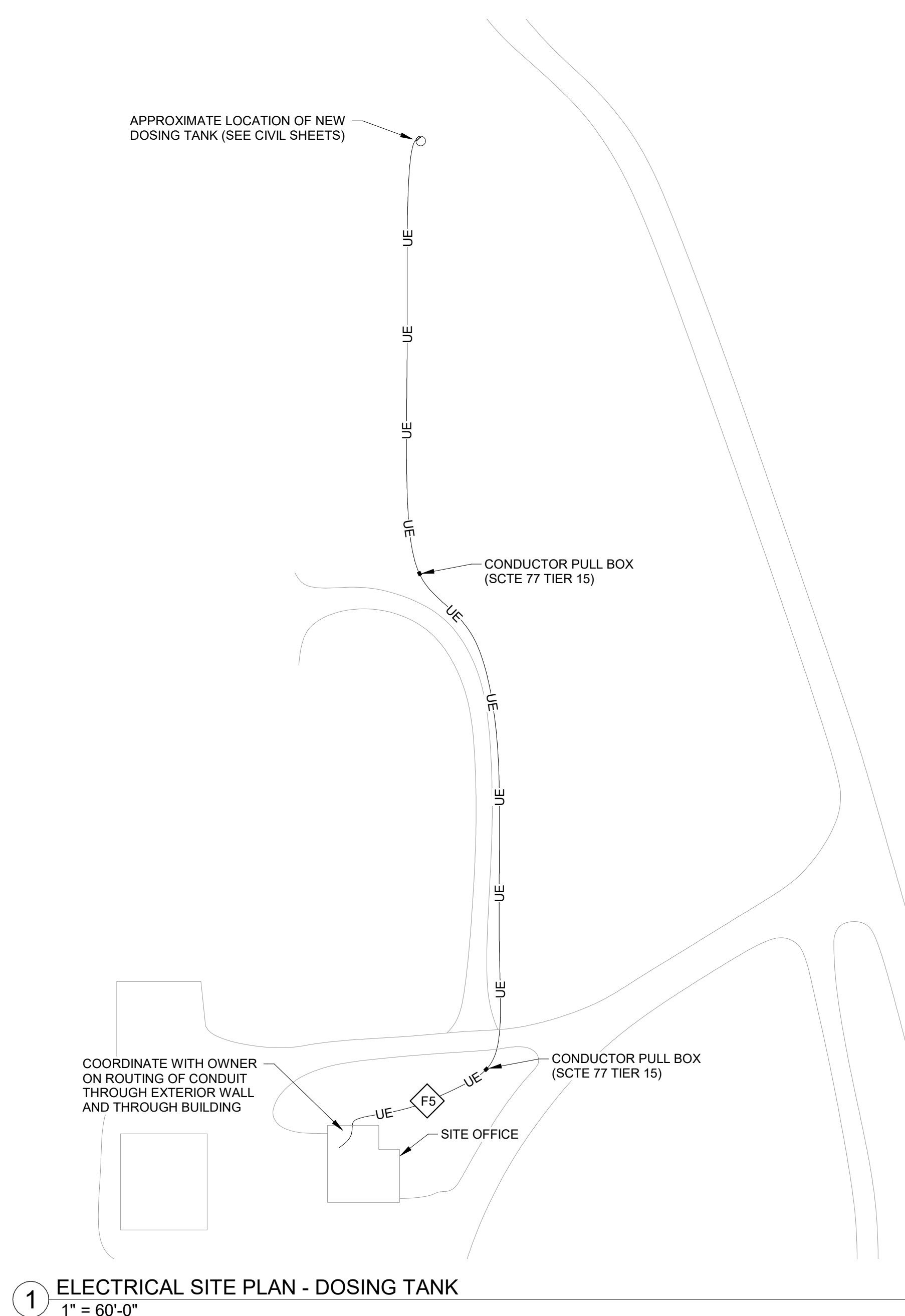
E502

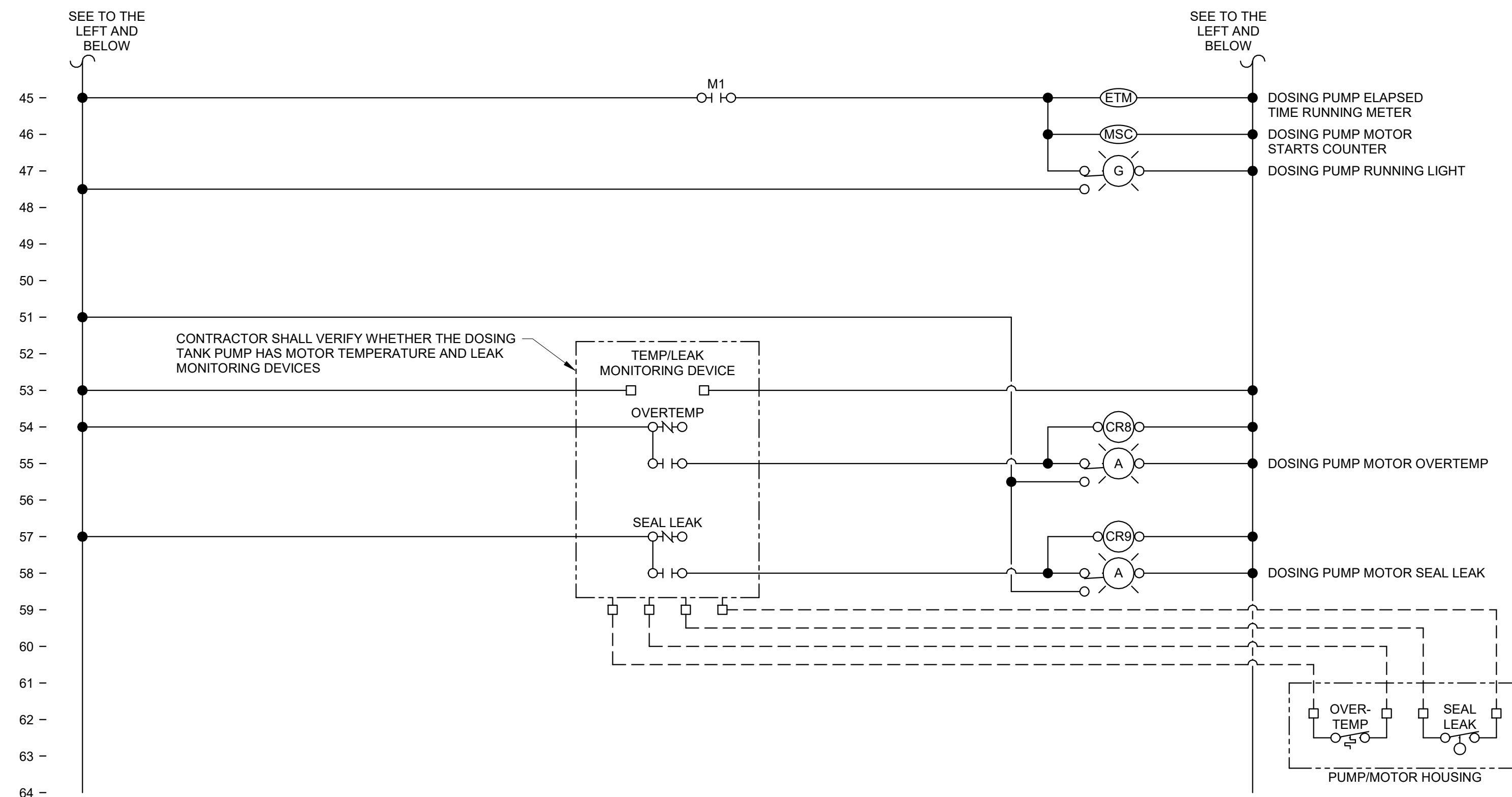
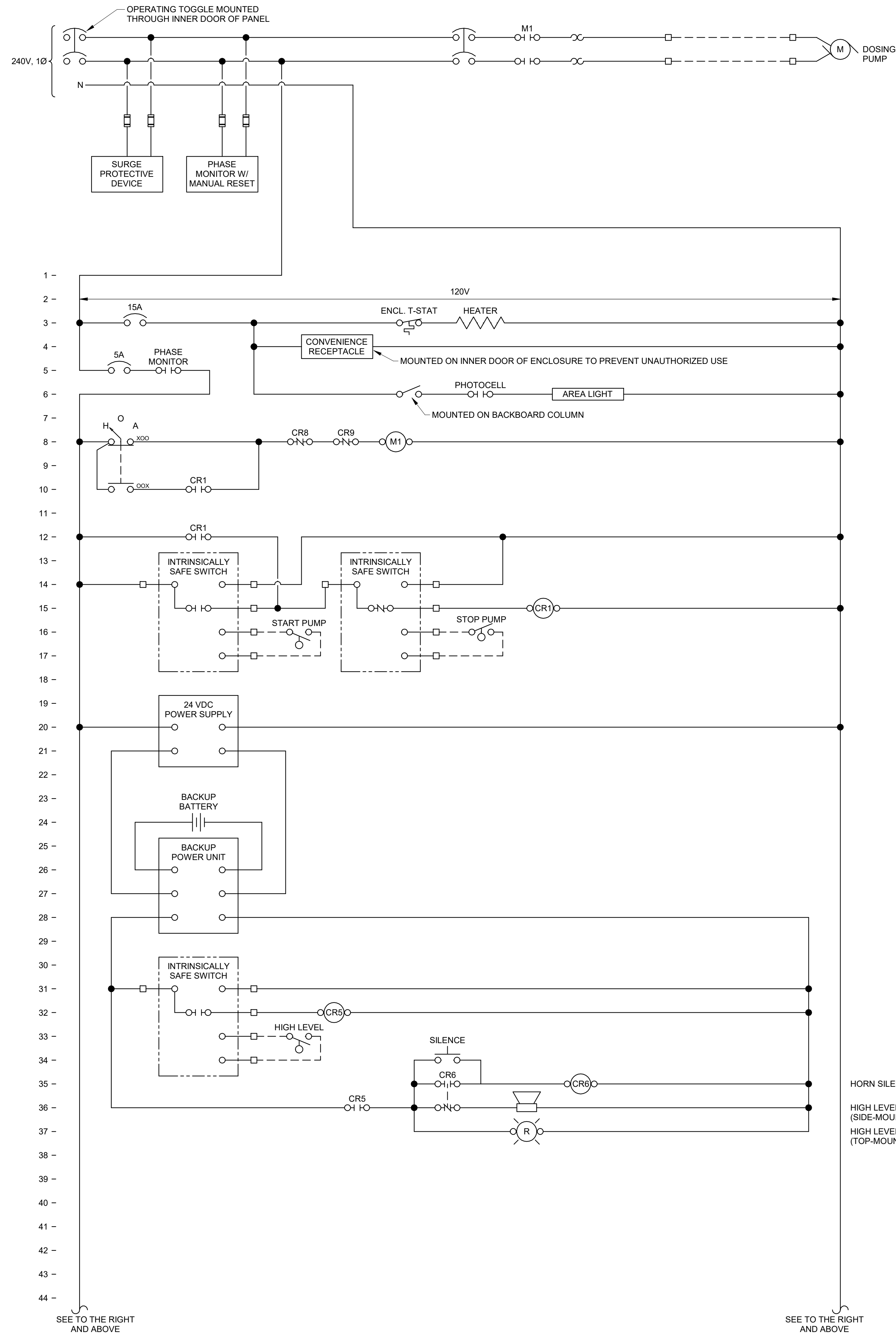
13 OF 15 SHEETS
February 12, 2024

LIGHTING FIXTURE SCHEDULE													
TAG	DESCRIPTION	MOUNT	LENS	LAMP		OUTPUT	DRIVER CONTROL	VOLT	LOAD (W)	BASIS OF DESIGN			REMARKS
				TYPE	COLOR TEMP.					MAKE	MODEL	ACCESSORIES	
F1	EXTERIOR FLOOD LIGHT	TENON SLIP-FITTER	GLASS, IP66	LED	3,000 K	12,054 10,122	INTEGRAL PHOTOCELL	120	93 85	LITHONIA LUMARK	DSXF2-LED-P3-30K-70CRI-WFL-MVOLT-IS-PE-DOBXD NFFLD-C25-E-UNV-66-S-CB-PER	SLIPFITTER FOR 2-3/8" O.D. TENON	SEE DRAWINGS FOR INSTALLATION DETAILS.
										ENGINEER-APPROVED EQUAL			

FEEDER SCHEDULE (LONG BRANCH)						
FEEDER TAG	PARALLEL SETS	PHASE CONDUCTORS QUANTITY	PHASE CONDUCTORS SIZE	NEUTRAL SIZE	EGC SIZE	CONDUIT SIZE
F1	2	2	3/0 AWG Cu	3/0 AWG Cu	N/A	2"
F2	2	2	3/0 AWG Cu	3/0 AWG Cu	#3 AWG Cu	2"
F3	1	2	3/0 AWG Cu	3/0 AWG Cu	#6 AWG Cu	2"
F4	1	2	3/0 AWG Cu	N/A	#6 AWG Cu	2"
F5	1	2	#4 AWG Cu	#4 AWG Cu	#4 AWG Cu	1.25"

GEC SCHEDULE	
GEC TAG	GEC SIZE
G1	#4 AWG Cu
G2	#6 AWG Cu





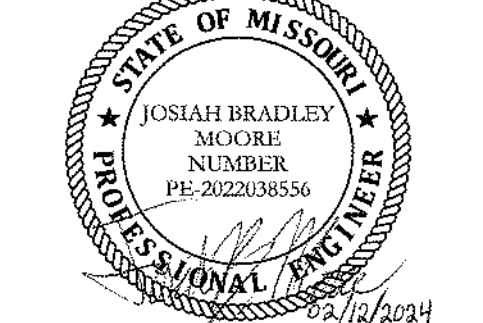
CONTROL SEQUENCE:

- PUMP OPERATION SHALL BE PREVENTED WHENEVER THE PHASE MONITOR IS IN A FAULT CONDITION.
- THE PUMP SHALL HAVE A DEDICATED HAND-OFF-AUTO (HOA) SWITCH.
- WHEN OFF IS SELECTED ON THE HOA SWITCH, THE PUMP SHALL BE OFF.
- WHEN MANUAL (HAND) IS SELECTED ON THE HOA SWITCH, THE PUMP SHALL RUN.
- WHEN AUTO IS SELECTED ON THE HOA SWITCH, THE PUMP SHALL OPERATE AUTOMATICALLY ACCORDING TO THE WET WELL FLOAT ELEVATIONS:
 - THE WET WELL SHALL HAVE (3) FLOATS: STOP PUMP, START PUMP, AND HIGH LEVEL. FLOAT ELEVATIONS SHALL BE FINALIZED DURING CONSTRUCTION WITH OWNER INPUT.
 - WHEN THE LIQUID LEVEL IN THE WET WELL SURPASSES THE STOP PUMP AND START PUMP LEVELS, THE PUMP SHALL TURN ON AND CONTINUE OPERATING UNTIL THE LIQUID LEVEL FALLS BELOW THE STOP PUMP LEVEL.

1 PUMP CONTROL DIAGRAM - DOSING TANK
NTS

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

BIDDING DOCUMENTS



JOSIAH B. MOORE - ENGINEER
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OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

REPLACE LAGOON

LONG BRANCH STATE PARK,
28615 VISITOR CENTER RD
MACON, MO 63552

PROJECT # X2302-02
SITE # 5601
ASSET # 7815601020

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 02/12/2024

CAD DWG FILE: E802
DRAWING BY: JBM
CHECKED BY: JJJ
DESIGNED BY: JBM

SHEET TITLE:
**CTRL DIAGRAM –
DOSING TANK**

SHEET NUMBER:

E802

15 OF 15 SHEETS
February 12, 2024