

# **HARTSBURG WWTF TREATMENT UPGRADES BOONE COUNTY, MO**

<u>UTILITY OWNERS</u>	<u>UTILITY</u>	<u>CONTACT PERSON</u>
BCRSD	WASTEWATER	JESSE STEPHENS 573-443-2774
AMEREN MISSOURI	ELECTRIC	CHRIS BROWN 573-681-7512
MDNR MISSOURI STATE PARKS	KATY TRAIL	JESSE STEPHENS (BCRSD) 573-443-2774

OWNER  
BOONE COUNTY REGIONAL SEWER DISTRICT  
1314 N. 7TH STREET  
COLUMBIA, MO 65201

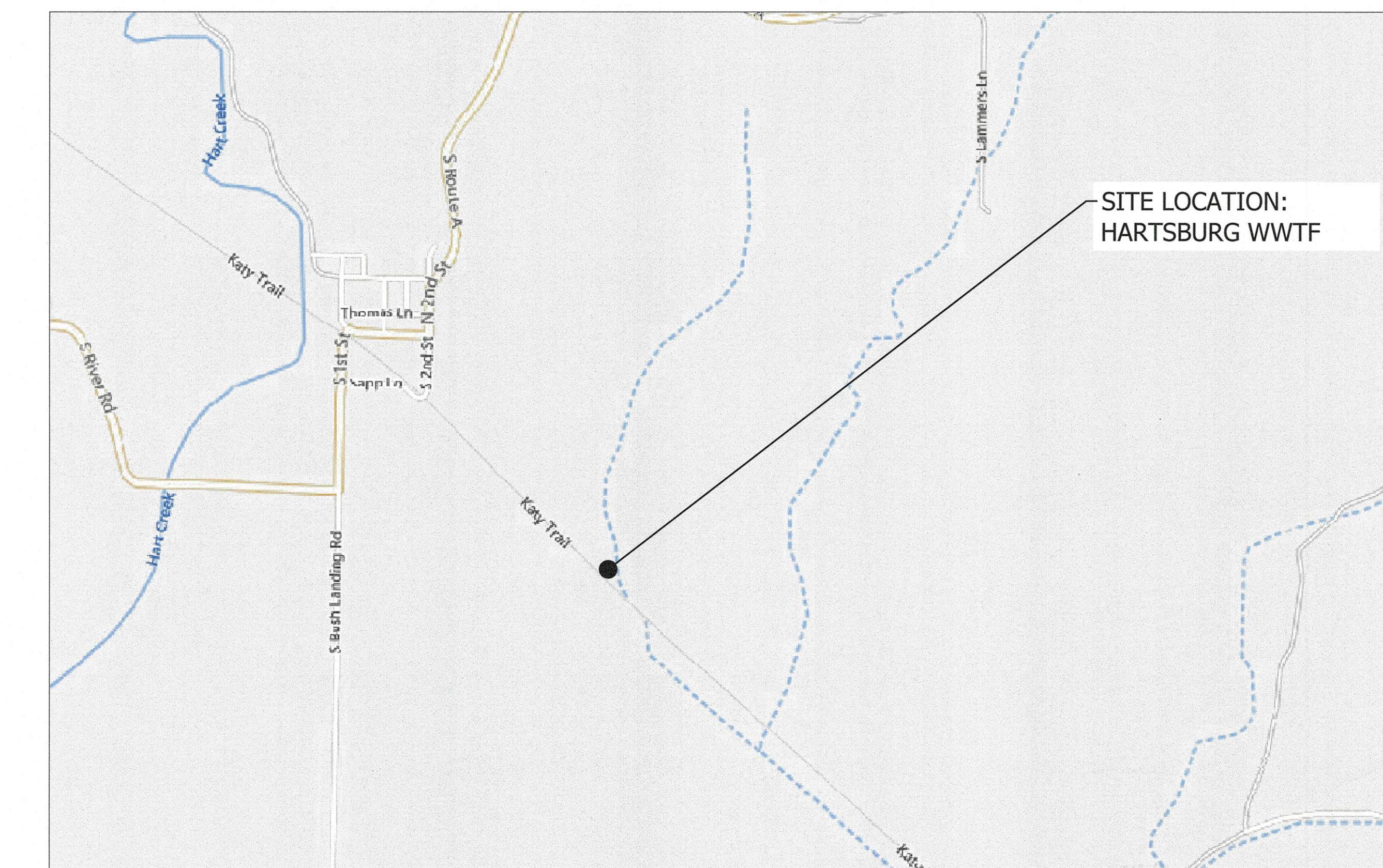
FACILITY ADDRESS  
HARTSBURG WASTEWATER TREATMENT FACILITY  
0.5 MILES SE OF 2ND STREET & KATY TRAIL INTERSECTION  
HARTSBURG, MO 65039



Know what's below.  
**Call** before you dig

BCRSD PROJECT NO. 08-2025

**LOCHMUELLER PROJECT NO. 524-1025-01W-PHASE 2**



NOT TO SCALE

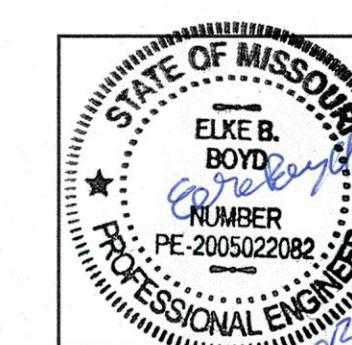
SE $\frac{1}{4}$  OF THE SW $\frac{1}{4}$  OF SECTION 08, TOWNSHIP 45 NORTH, RANGE 12 WEST, 5TH PRINCIPAL MERIDIAN

**APPROVED:**

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Elke Boyd

10/29/2025  
Date:



A map of Missouri showing county boundaries. One county, Boone County, located in the northeastern part of the state, is highlighted with a diagonal hatching pattern. A black dot is placed within the hatched area, and a line with an arrow points from the text "BOONE COUNTY" at the top to this dot. The state's border with Illinois is also visible on the right side of the map.

PROJECT LOCATION SHOWN BY 

## LEGEND

Sheet Index	
Sheet Number	Sheet Title
1	Cover Sheet
2	General Notes & Legend
3	Existing Site Conditions
4	Proposed System Layout (Alternates 1, 2, & 3)
5	Filter & Outfall Details (Alternates 1 & 3)
6	Aeration Details (Alternate 1)
7	Structural & Blower Details (Alternate 1)
8	Alternates 1, 2, & 3 Details
9	Electrical Schedules and Diagrams

### BENCH MARK

BM - MISSOURI DEPARTMENT OF TRANSPORTATION VRS NETWORK.

TBM - CHISELED SQUARE ON SOUTHERLY CORNER OF SANITARY FLUME CONCRETE WALL LOCATED 27 FEET NORTHEAST OF THE SOUTHERLY CORNER POST OF THE WOVEN WIRE FENCE AND 77 FEET WEST OF THE SOUTHWESTERLY CORNER OF CONCRETE WALL OF SANITARY ULTRAVIOLET BOX.

ELEVATION = 567.12

### SURVEY GENERAL NOTES

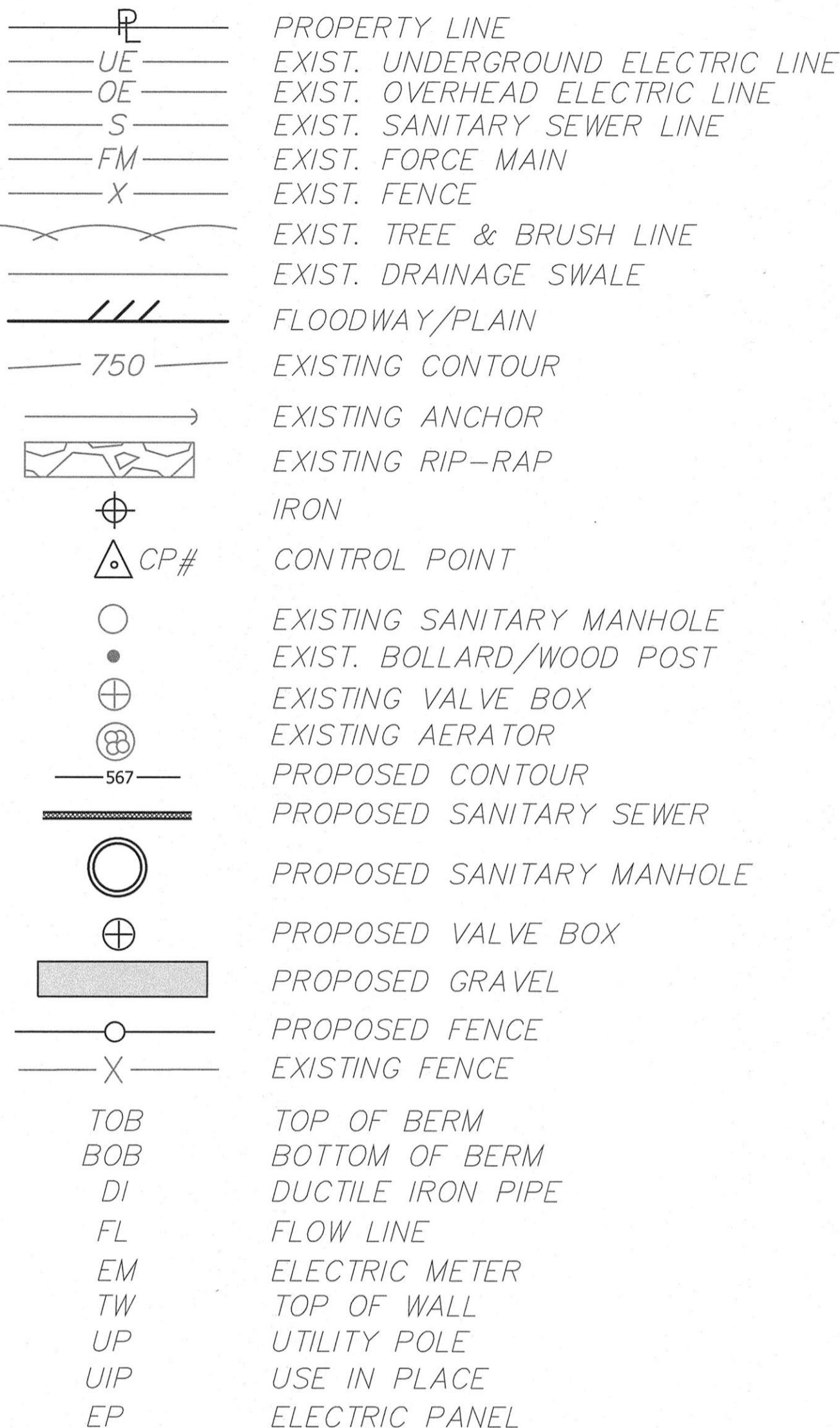
- ACCURATE ELEVATIONS HAVE BEEN SURVEYED AS SHOWN. CONTOURS SHOWN ARE INTERPOLATED BASED ON THESE ELEVATIONS.
- THIS DOES NOT CONSTITUTE A BOUNDARY SURVEY SUITABLE FOR RECORDING AS DEFINED BY THE CURRENT MISSOURI STANDARDS FOR BOUNDARY SURVEYS.
- NO TITLE WORK WAS PERFORMED, EASEMENTS AND OTHER SPECIAL CONDITIONS AFFECTING THE PROPERTY MAY NOT BE SHOWN.
- THE MANHOLE D PIPE (FL IN) HAS A 90 DEGREE BEND TURNED UP VERTICAL. FLOW LINE OF PIPE INTO THE STRUCTURE IS 564.96. TOP OF PIPE (OVERFLOW) IS 567.68

### UTILITY NOTES

THE LOCATIONS, SIZES AND MATERIAL TYPES OF UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS, NOT VISIBLE OR APPARENT FROM THE SURFACE, ARE SHOWN IN THEIR APPROXIMATE LOCATIONS FROM A MISSOURI 811 SYSTEM LOCATE, OR UTILITY COMPANY RECORDS AND WERE NOT VERIFIED IN THE FIELD. UNDERGROUND UTILITY SERVICES TO BUILDINGS WERE NOT LOCATED.

### FLOODPLAIN NOTE

THIS PROPERTY IS LOCATED IN ZONE "AE" AREAS WITH BASE FLOOD ELEVATION OR DEPTH, ZONE "A" AREAS WITHOUT BASE FLOOD ELEVATION, AND ZONE "X" AREAS DETERMINED TO BE WITHIN THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN BY FLOOD INSURANCE RATE MAP NUMBER 29019C0435E, DATED APRIL 19, 2017.



## GENERAL NOTES

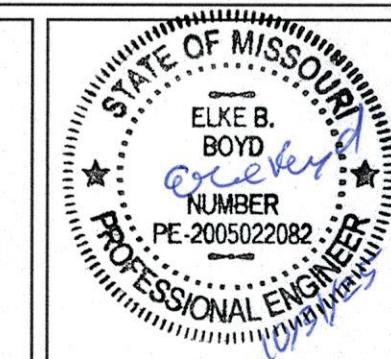
- All trenching shall be carried out in accordance with all Federal rules and regulations regarding safe practices.
- Approximate property lines are shown based on the "Topographic Survey" performed by ES&S and dated August 7, 2025.
- The Contractor shall provide all barricades & construction signs as required by Local, Federal and State rules and regulations.
- It shall be the Contractor's sole responsibility to maintain the integrity of all existing utilities, structures, and abutting properties. The cost of any repair or replacement of damaged items shall be borne solely by the Contractor.
- The Contractor shall coordinate all utility installations and inspections with the appropriate utility company. Advance notice is required before work commencement.
- The Contractor shall be responsible for establishing and maintaining all temporary sediment and erosion controls.
- Contractor is responsible for establishing, maintaining and modifying as necessary, sediment and erosion control measures before construction may begin. At a minimum, sediment and erosion control measures shall include perimeter silt fence along downhill side of facility. Contractor shall be responsible for removing any material tracked out onto public road.
- Any damage to utilities caused by the Contractor's operations shall be the responsibility of the Contractor and the cost of repairs shall be borne by the Contractor at no additional cost to the owner.
- Support existing utilities which are to remain in place during construction.
- Coordinate removal of abandoned utilities with the appropriate utility company.
- All piping shall be ductile iron unless noted otherwise.
- All exposed concrete edges on walls and equipment pads shall be chamfered 3/4".
- The engineering information shown on these plans is from studies made in the field and represents the best information available to Lochmueller Group.
- All grassed area disturbed by the contractor shall be fertilized, seeded, and mulched unless otherwise noted on the plans.
- All utilities and their connections shall be moved or adjusted by the contractor to fit the new construction unless otherwise noted on the plans.
- Contractor shall contact utility companies at least three working days, but no more than ten working days, prior to digging by calling Missouri 811.

## SURVEY CONTROL POINTS

MODIFIED STATE PLANE COORDINATES  
NAD 83, MISSOURI CENTRAL ZONE, NAVD 88, U.S. SURVEY FEET

POINT #	NORTH	EAST	ELEVATION	DESCRIPTION
CP3	1039951.15	1696551.11	568.94	DRILL HOLE
CP4	1039834.54	1696676.19	569.13	DRILL HOLE
CP6	1039710.18	1696726.44	561.54	IRON
CP7	1039909.25	1696479.95	561.22	IRON

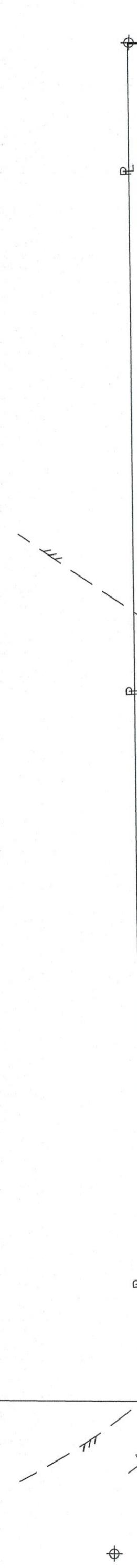
REVISIONS		
DATE	REVISION	BY



RECOMMENDED FOR APPROVAL		10/29/2025
DESIGNED:	DRAWN:	DATE
Elke Boyd	PMH	
CHECKED: EWS	CHECKED: EWS	

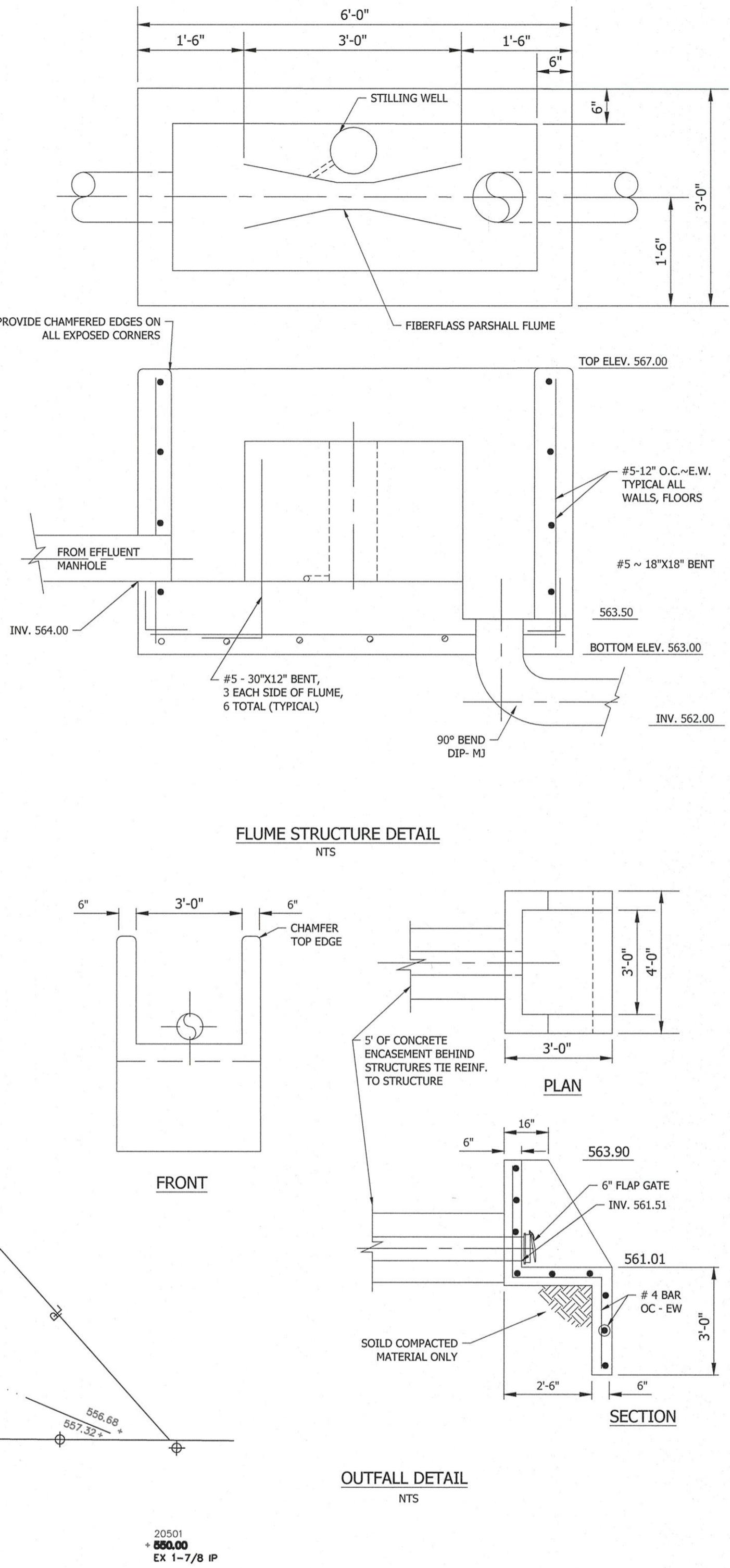
HARTSBURG WWTF TREATMENT UPGRADES	
GENERAL NOTES AND LEGEND	

SCALE
NTS
CONSULTANT PROJECT NUMBER
524-1025-01W-PHASE 2
SHEET
2

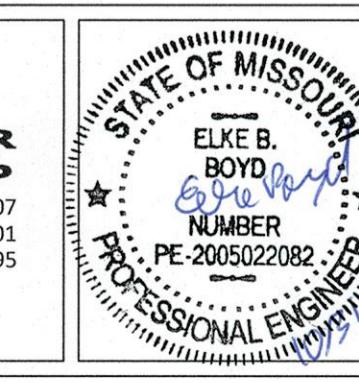


NOTE:  
BLOWER BUILDING CONTAINS TWO BLOWERS AND  
ASSOCIATED PIPING AND CONTROLS.

0 10 20 FEET



REVISIONS		
DATE	REVISION	BY



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EBB	PMH	
ELKE BOYD		

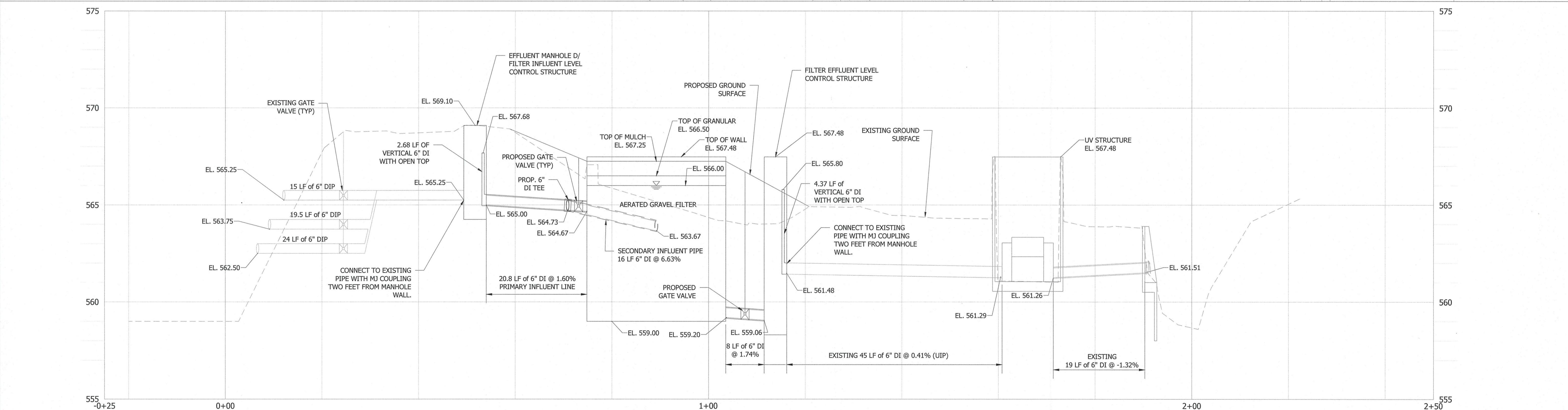
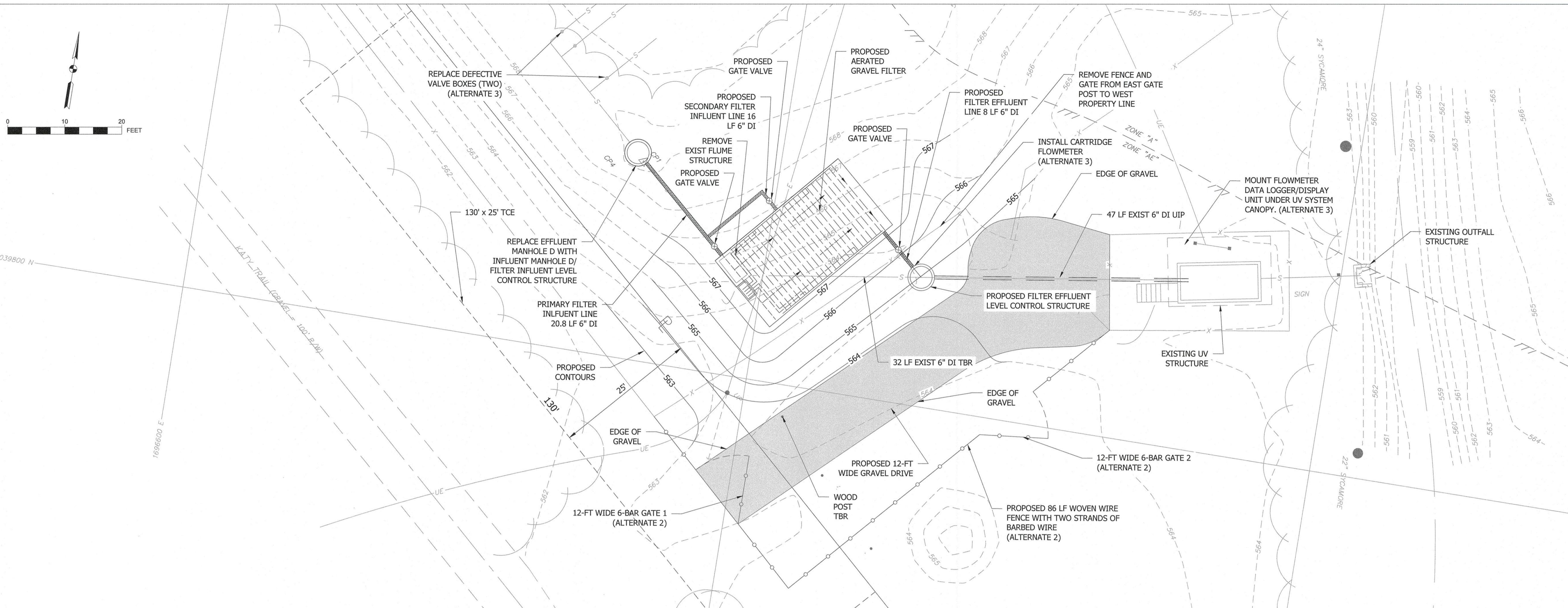
HARTSBURG WWTF  
TREATMENT UPGRADES  
EXISTING  
SITE CONDITIONS

SCALE
1" = 20'
CONSULTANT PROJECT NUMBER
524-1025-01W-PHASE 2
SHEET
3

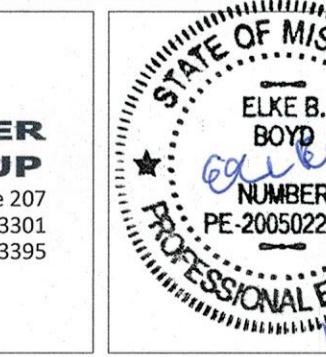
NORTHING/EASTING TABLE		
ALTERNATIVE 1	NORTH	EAST
CENTER OF FILTER INFLUENT LEVEL CONTROL STRUCTURE	1039835.94'	1696674.95'
CENTER OF FILTER EFFLUENT LEVEL CONTROL STRUCTURE	1039822.41'	1696727.43'
SOUTH CORNER OF FILTER	1039809.60'	1696702.60'
ALTERNATE 2	NORTH	EAST
SOUTH CORNER OF GATE 1	1039774.74'	1696702.67'
SOUTH CORNER OF GATE 2	1039796.95'	1696741.94'
SOUTH CORNER OF FENCE	1039765.07'	1696713.17'

NOTES:

1. COORDINATE REMOVAL AND STORAGE OF SALVAGEABLE EQUIPMENT WITH THE BCRSD.
2. REMOVE AND DISPOSE OF OBSOLETE YARD PIPING AND EQUIPMENT NOT WANTED BY BCRSD.
3. ALTERNATE 1 - SEE DETAILS ON SHEETS 5 THROUGH 9.
4. ALTERNATE 2 - SEE DETAIL ON SHEET 8.
5. ALTERNATE 3 - SEE DETAILS ON SHEET 5. REFER TO SPECIFICATIONS FOR FLOWMETER REQUIREMENTS.
6. ALTERNATE 3 - RUN FLOWMETER POWER AND DATA CABLES ABOVE SEWER LINE. MOUNT DATA LOGGER/DISPLAY UNIT ADJACENT TO UV SYSTEM POWER FEED. INSTALL FLOWMETER PER SPECIFICATIONS.
7. CONTRACTOR IS TO VERIFY ALL MEASUREMENTS AND DIMENSION PRIOR TO COMMENCING WORK OR ORDERING MATERIALS OR EQUIPMENT.
8. ALL PIPING SHALL BE FREE OF LEAKS AND INSTALLED TRUE AND TO REQUIRED GRADELINES. BOLTED JOINTS SHALL BE PROPERLY TORQUED.
9. VALVE NUTS SHALL BE CENTERED IN VALVES BOXES, OPERATIVE BY A STANDARD VALVE WRENCH AND OPERATE FREELY.
10. CONNECTIONS AND STRUCTURES SHALL BE WATERTIGHT AND INTERIOR SURFACES SLOPED TO AVOID SOLIDS ACCUMULATIONS.
11. DUCTILE IRON PIPES SHALL BE MORTAR LINED. COAT ALL EXPOSED PIPING WITH FIELD COATING OF COAL TAR EPOXY.
12. FILTER EFFLUENT LEVEL CONTROL STRUCTURE SHALL ACCOMMODATE INSTALLATION OF THE FLOWMETER SPECIFIED UNDER ALTERNATE 3, WHETHER ALTERNATE 3 IS AWARDED OR NOT.
13. ESTIMATED CUT: 121 CY. ESTIMATED FILL: 64 CY.



Know what's below.  
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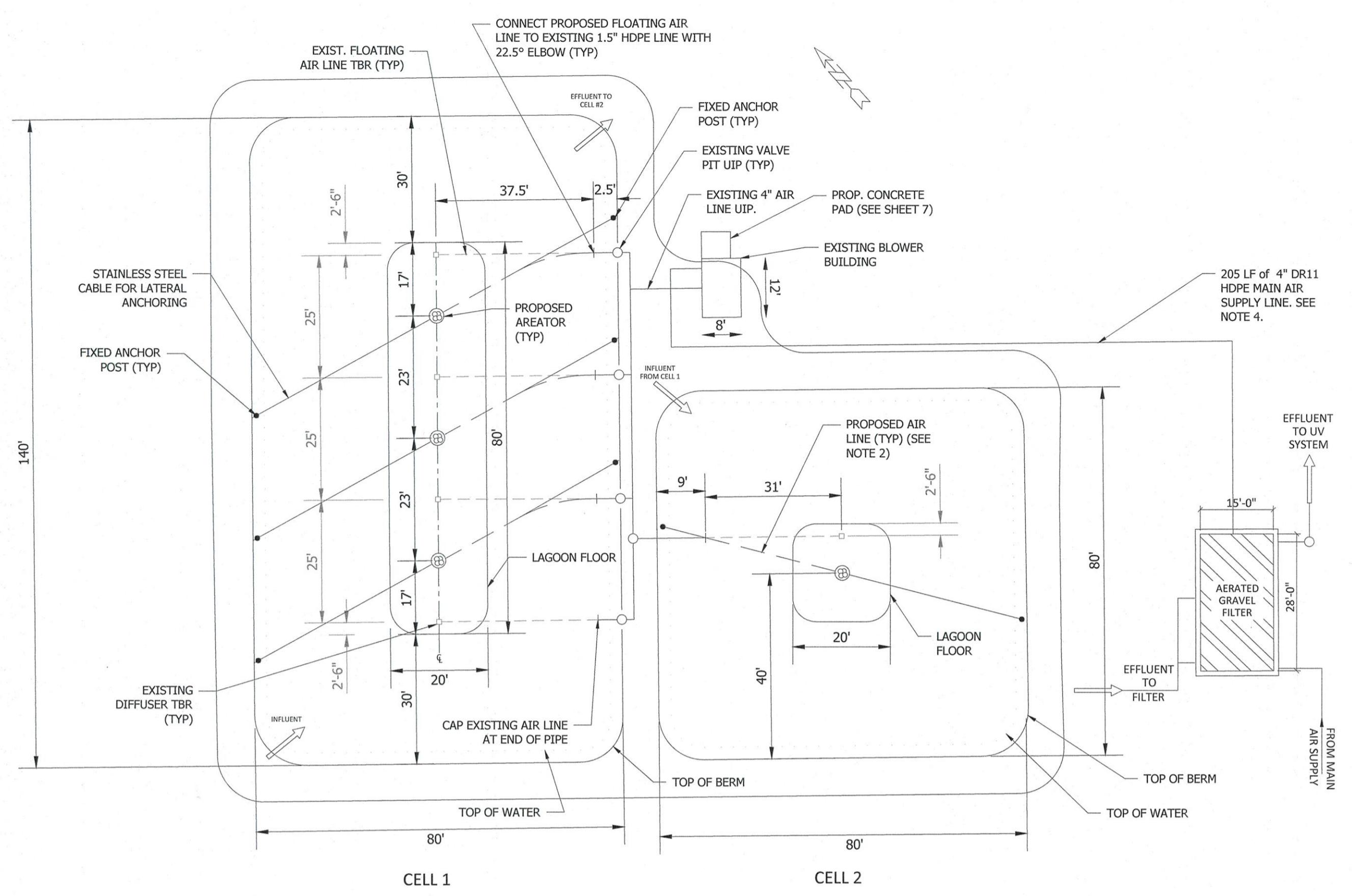
 RECOMMENDED FOR APPROVAL	10/29/2023	
	Elke Boyd	DATE
DESIGNED: EBB	DRAWN: PMH	
CHECKED: EWS	CHECKED: EWS	

# HARTSBURG WWTF TREATMENT UPGRADES

## PROPOSED SYSTEM LAYOUT (ALTERNATES 1, 2 AND 3)

SCALE  
H: 1" = 20' - V: 1" = 10'  
CONSULTANT PROJECT NUMBER  
524-1025-01W-PHASE 2  
SHEET  
4

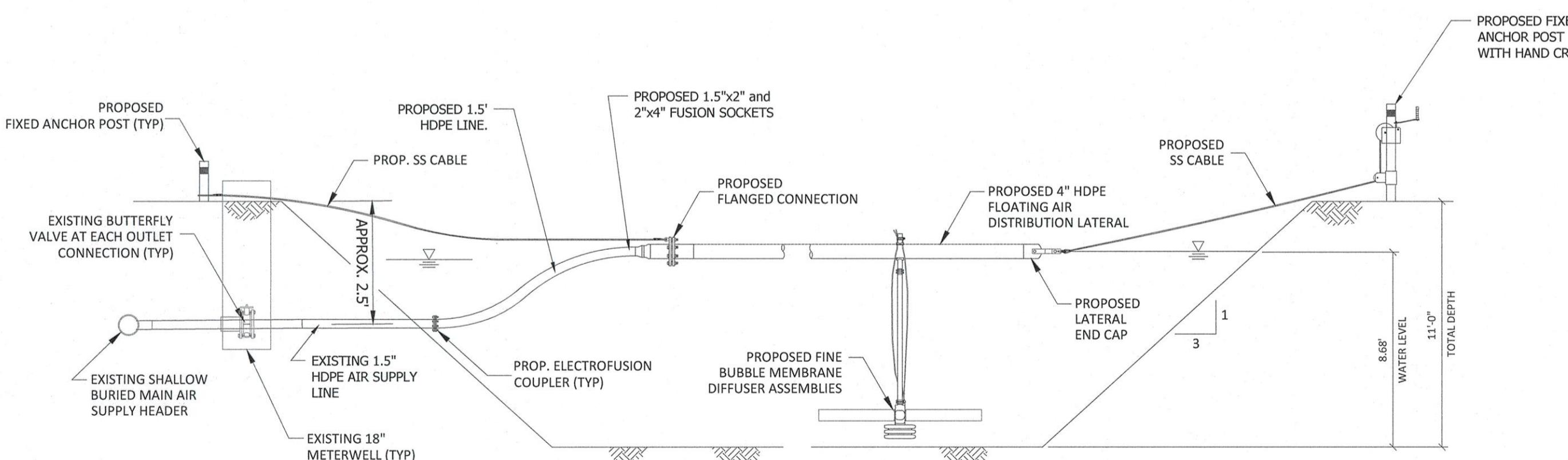




**AERATION LAYOUT**  
N.T.S.

NOTES:

1. REMOVE AND DISPOSE OF EXISTING FLOATING AIR LINES, DIFFUSERS AND VALVE PITS.
2. CONNECT PROPOSED FLOATING AIR LINES INTO EXISTING PIPING DOWNSTREAM OF EXISTING VALVE PITS.
3. PLACE FIXED ANCHOR POSTS SO THAT SS TENSION CABLES FORM STRAIGHT LINE ACROSS THEIR DIFFUSER. PLACE POSTS TWO FEET INTO LAGOON FROM INSIDE TOP OF BERM.
4. INSTALL AIR MAINS IN 18 INCHES DEEP TRENCH.
5. REFER TO SPECIFICATIONS FOR MANUFACTURER'S SCOPE OF SUPPLY AND EXCLUSIONS.



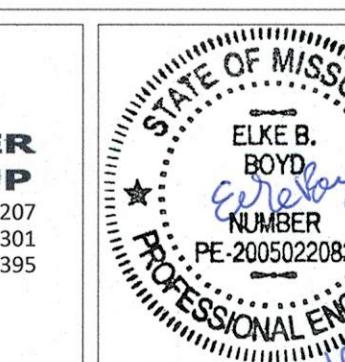
**AERATED LAGOON SECTION**  
SCALE: N.T.S.

1. ALL PROPOSED ITEMS IN SECTION VIEW SUPPLIED BY SYSTEM MANUFACTURER.

REVISIONS		
DATE	REVISION	BY



Know what's below.  
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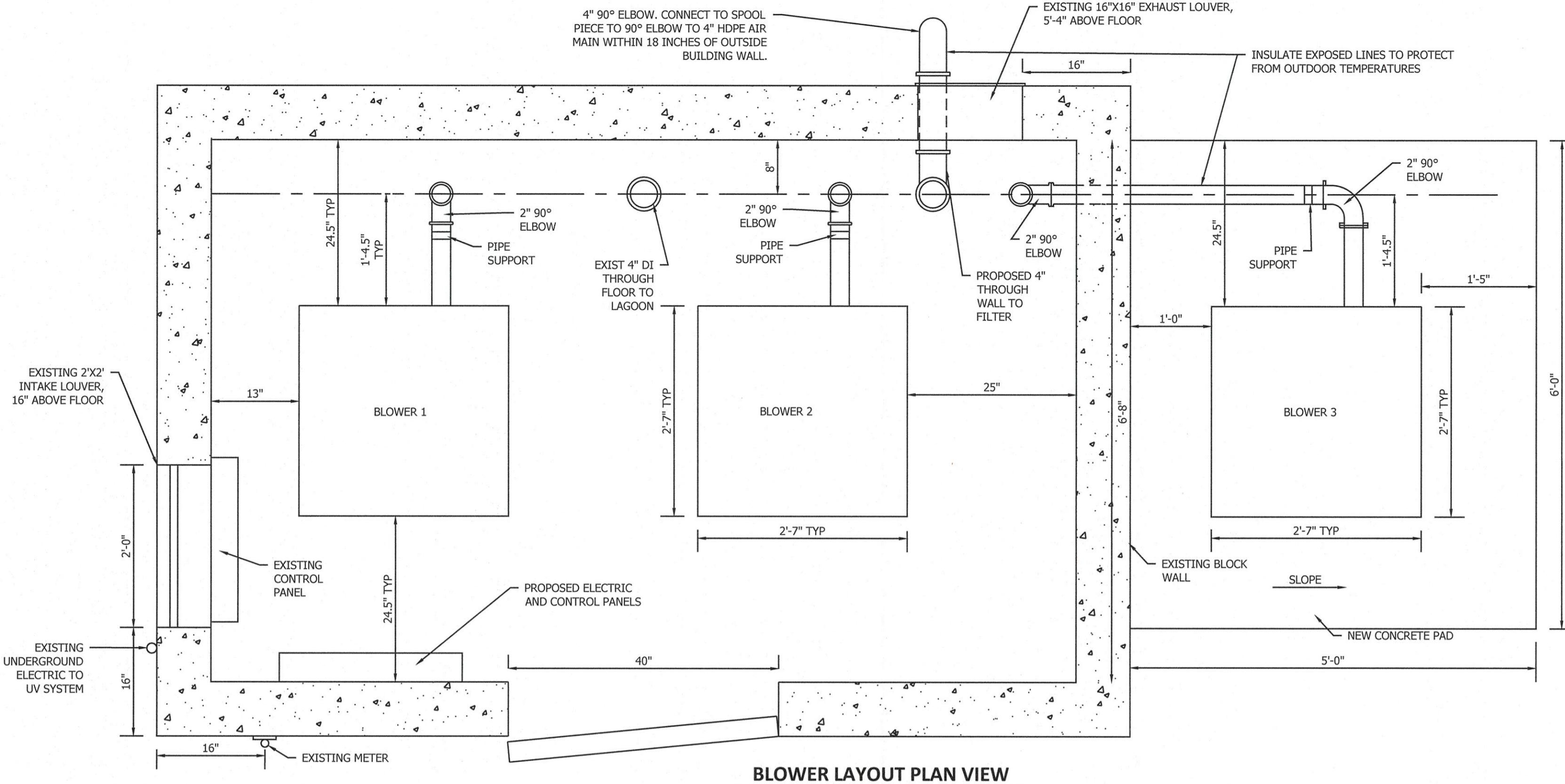
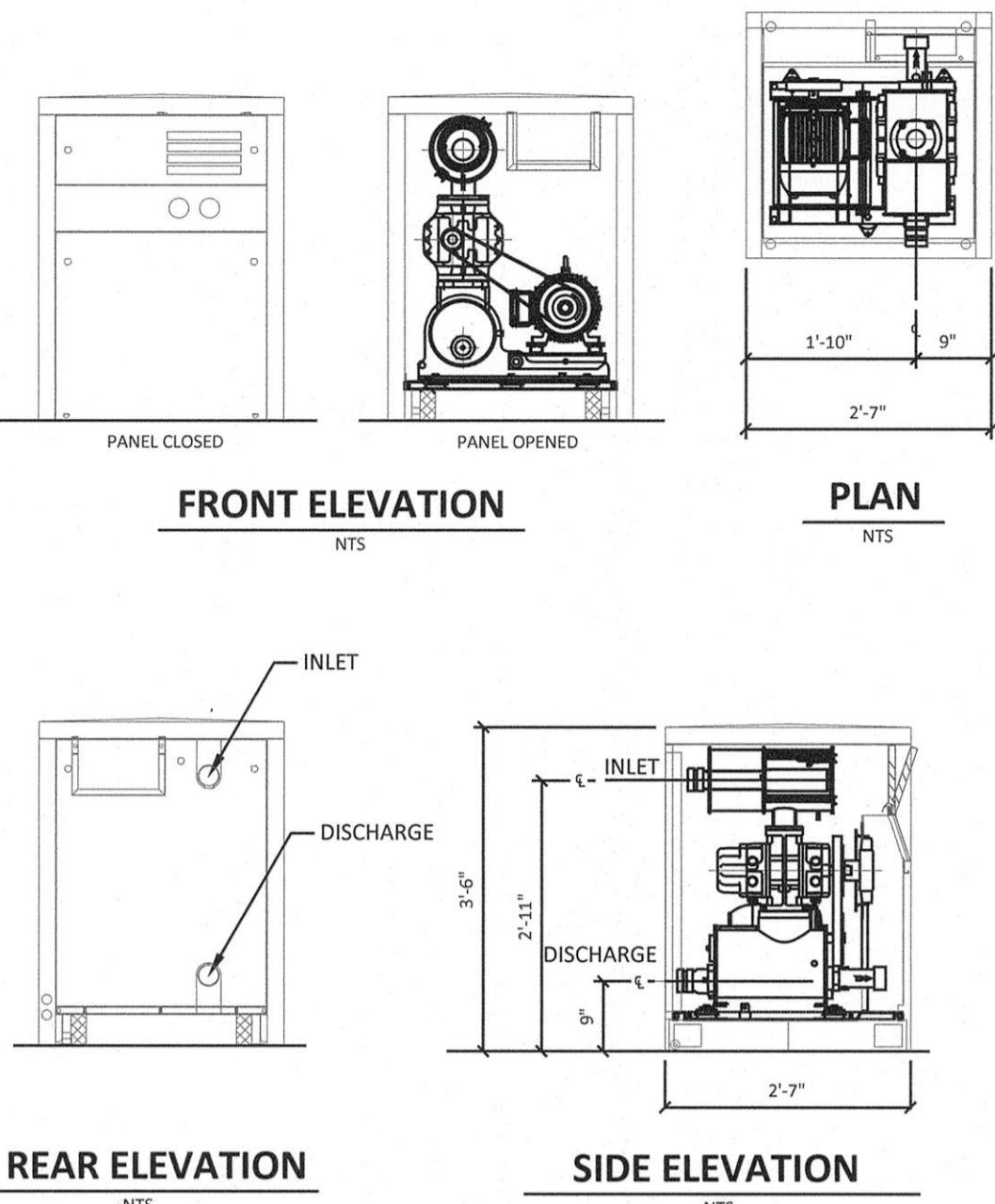


RECOMMENDED FOR APPROVAL		10/29/2025
DESIGNED:	DRAWN:	DATE
EBB	PMH	Elke Boyd
EWS	EWS	CHECKED: EWS

**HARTSBURG WWTF  
TREATMENT UPGRADES**  
**AERATION DETAILS  
(ALTERNATE 1)**

SCALE
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524-1025-01W-PHASE 2
SHEET
6

Performance Data, each blower		
Motor Nameplate Horsepower	5	HP
Estimated Power Consumption	3	BHP
Design Maximum Airflow	48	SCFM
Maximum Operating Pressure	9.2	PSI
Normal Operating Pressure	5.6	PSI
Inlet Temperature	104	oF
Discharge Temperature	180	oF
Blower Speed	3,460	RPM
VFD Frequency	60	Hz
Sound Level	65	dB(A)

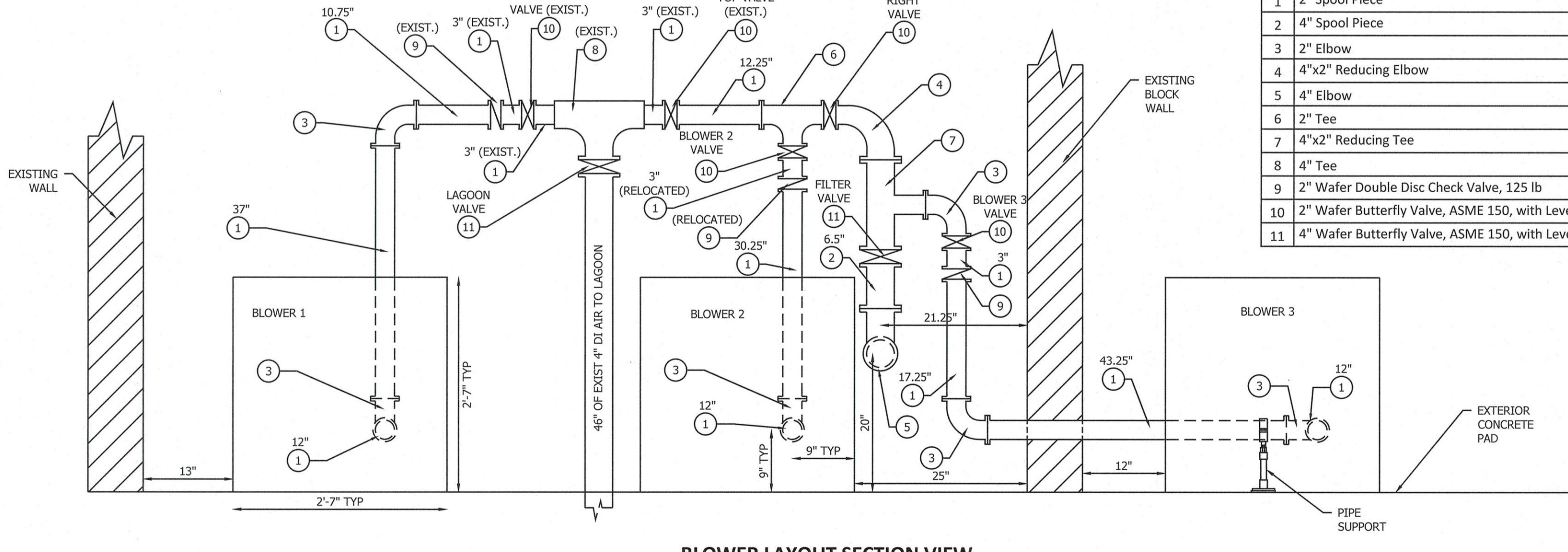


NOTE 1:

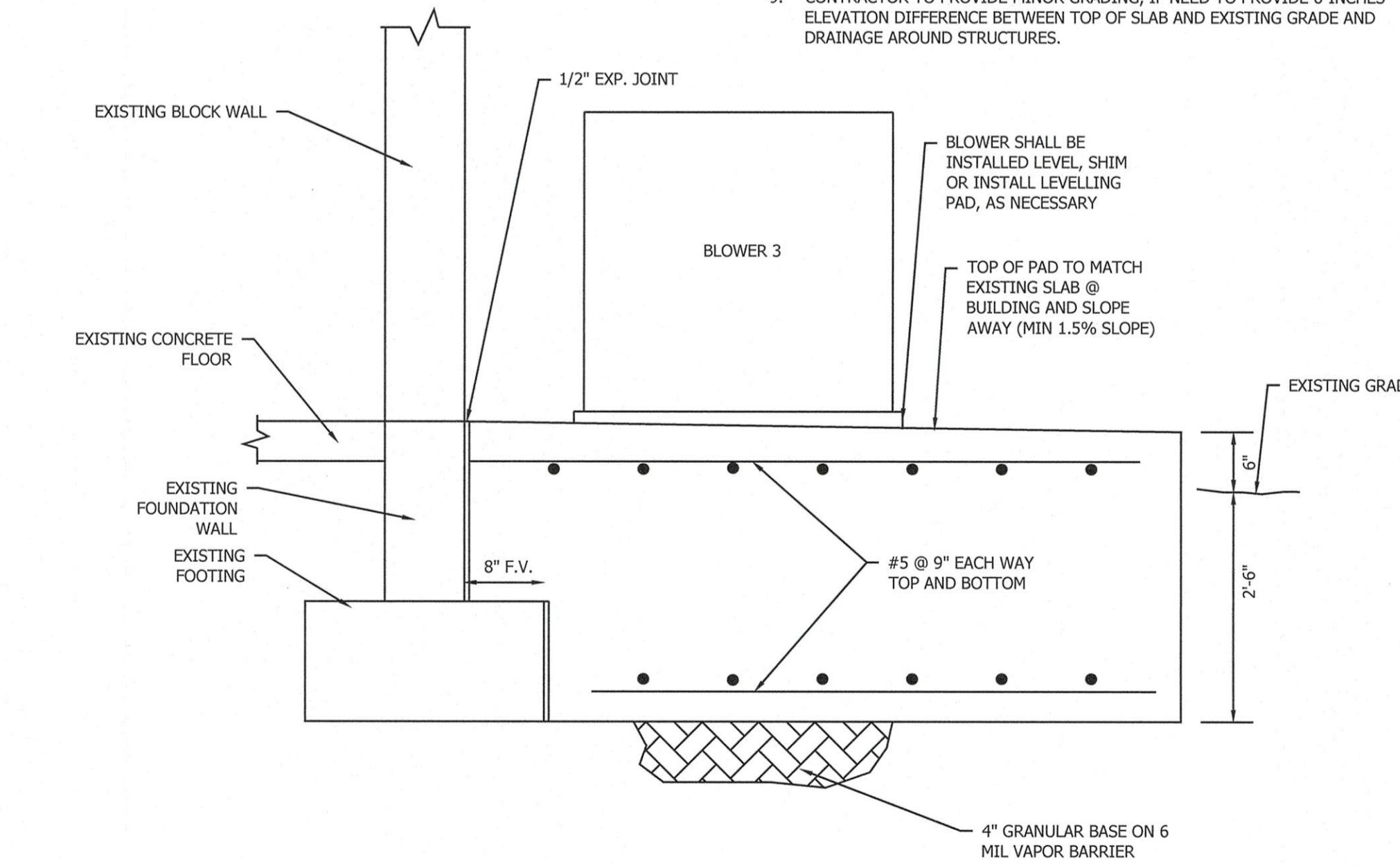
1. EXISTING BLOWER BUILDING TO BE REUSED.
2. CONTRACTOR REMOVE EXISTING BLOWERS, CONTROL PANEL AND RELATED EQUIPMENT AND STORE ON SITE FOR OWNER.
3. REPLACE THE EXISTING ELECTRICAL PANEL AND UTILTIY METER CABINET. SEE ELECTRICAL SHEET FOR DETAILS.
4. SEE TECHNICAL SPECIFICATIONS REGARDING SEQUENCING TO MAINTAIN TREATMENT.
5. REFER TO SPECIFICATIONS FOR MANUFACTURER'S SCOPE OF SUPPLY AND EXCLUSIONS.
6. FILL ALL VOIDS AROUND PIPE WALL PENETRATIONS WITH NON-SHRINK GROUT TO FULL DEPTH OF BLOCKS, FORMING A SMOOTH OUTER SURFACE ON EACH SIDE OF WALL AND PREVENTING THE INTRUSION OF MOISTURE FROM PRECIPITATION.
7. AIR PIPING TO BE BLACK STEEL, SCHEDULE 40.

GENERAL CONCRETE PAD NOTES:

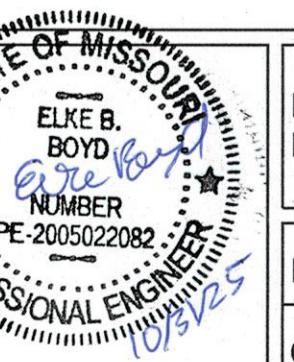
1. CONCRETE SHALL HAVE MINIMUM 28-DAY DESIGN STRENGTH,  $f'_c = 4000$  psi.
2. CONCRETE SHALL BE AIR ENTRAINED 6% +/- 1%.
3. REINFORCING BARS SHALL BE ASTM A615, GRADE 60,
4. CONCRETE COVER SHALL BE 3" AT BOTTOM OF PAD AND 2" OTHERWISE.
5. COORDINATE ANY NECESSARY PIPING THROUGH CONCRETE PAD.
6. CHAMFER EXPOSED EDGES OF CONCRETE 3/4", UNLESS OTHERWISE NOTED.
7. ALL EXPOSED SURFACES OF CONCRETE SHALL HAVE A RUBBED FINISH.
8. CONTRACTOR TO VERIFY MINIMUM SOIL BEARING CAPACITY = 1500 PSF.
9. CONTRACTOR TO PROVIDE MINOR GRADING, IF NEED TO PROVIDE 6-INCHES ELEVATION DIFFERENCE BETWEEN TOP OF SLAB AND EXISTING GRADE AND DRAINAGE AROUND STRUCTURES.



Parts Schedule	
1	2" Spool Piece
2	4" Spool Piece
3	2" Elbow
4	4"x2" Reducing Elbow
5	4" Elbow
6	2" Tee
7	4"x2" Reducing Tee
8	4" Tee
9	2" Wafer Double Disc Check Valve, 125 lb
10	2" Wafer Butterfly Valve, ASME 150, with Lever Operator
11	4" Wafer Butterfly Valve, ASME 150, with Lever Operator



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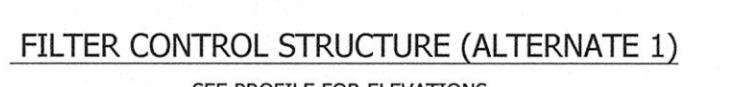
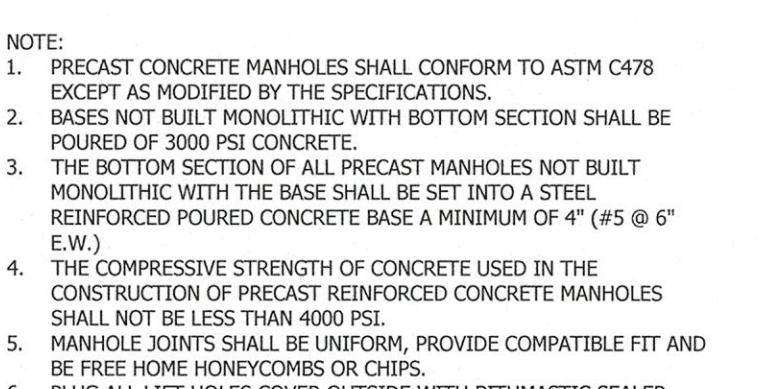
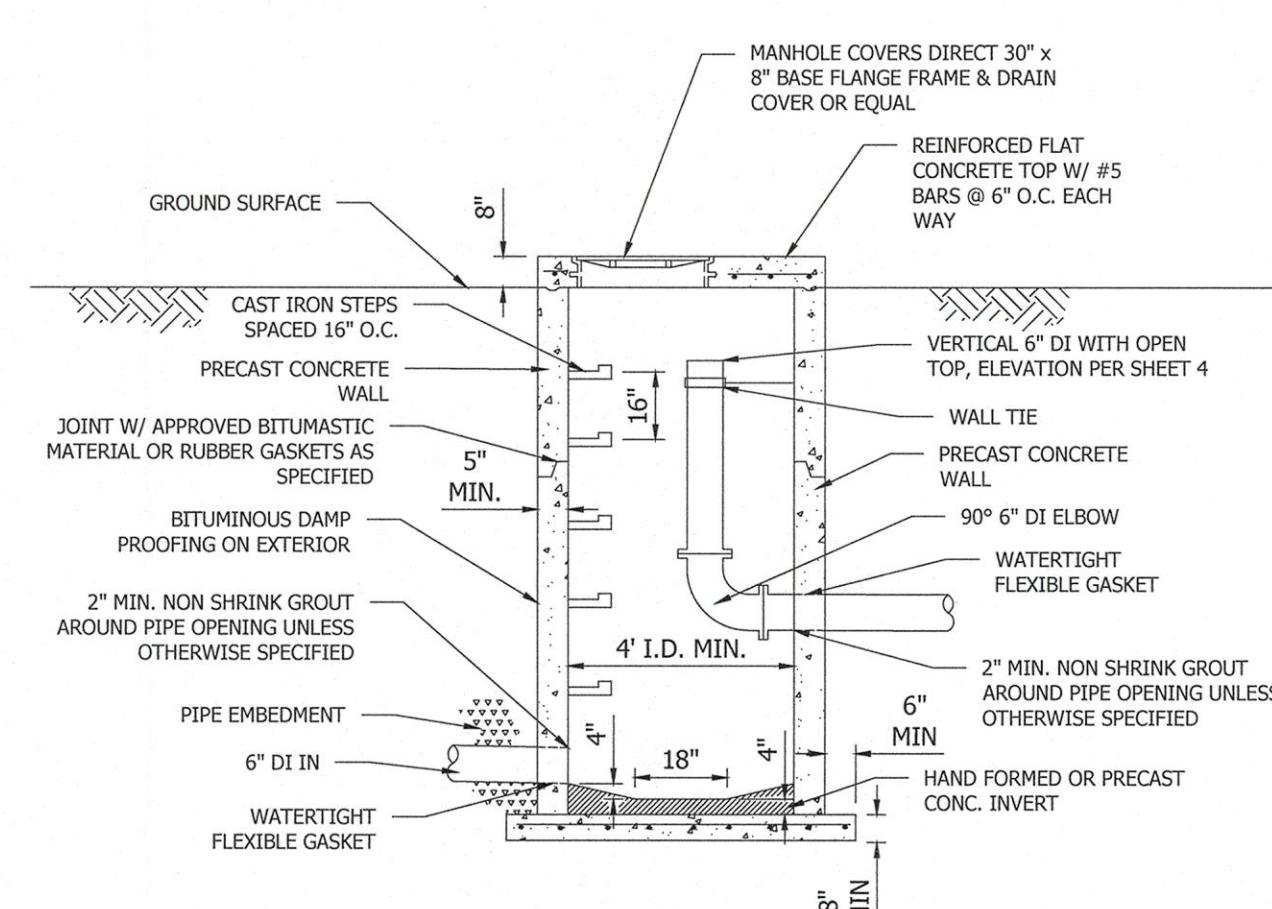
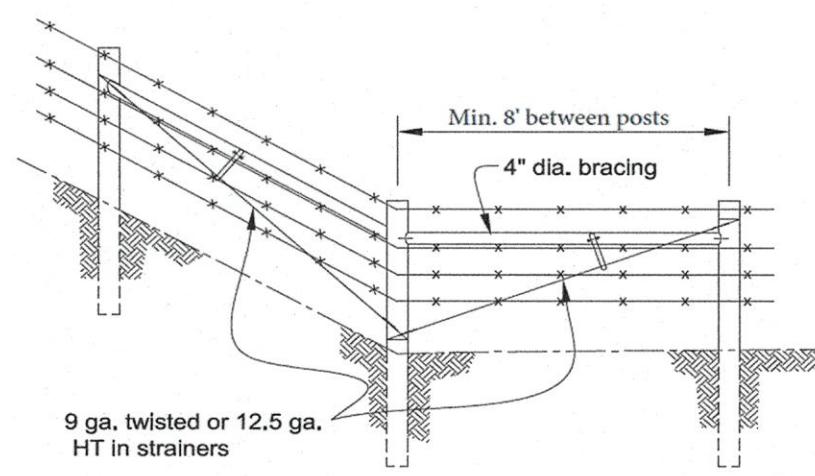
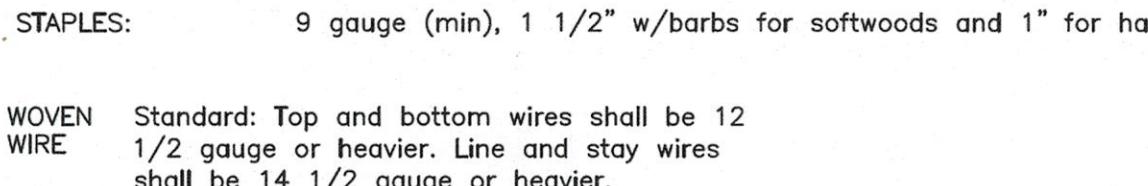
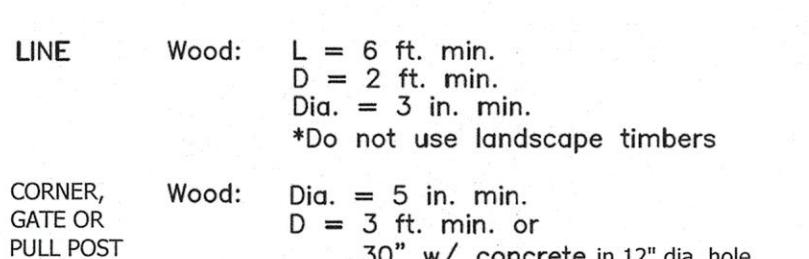
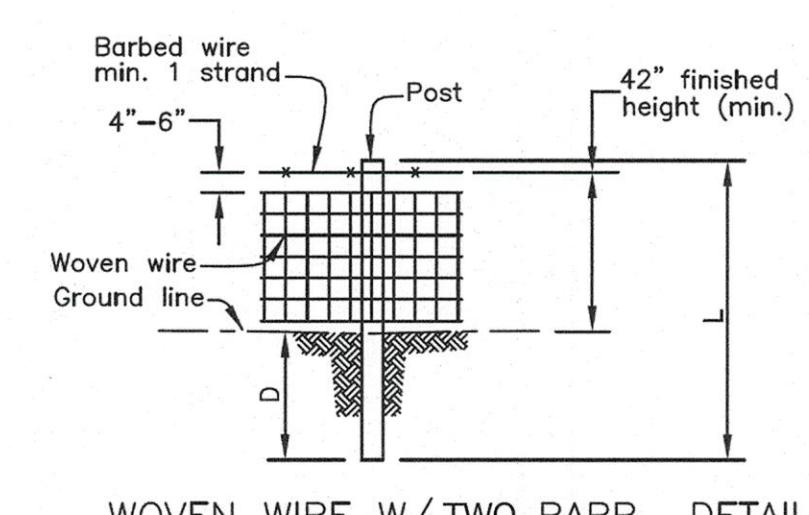
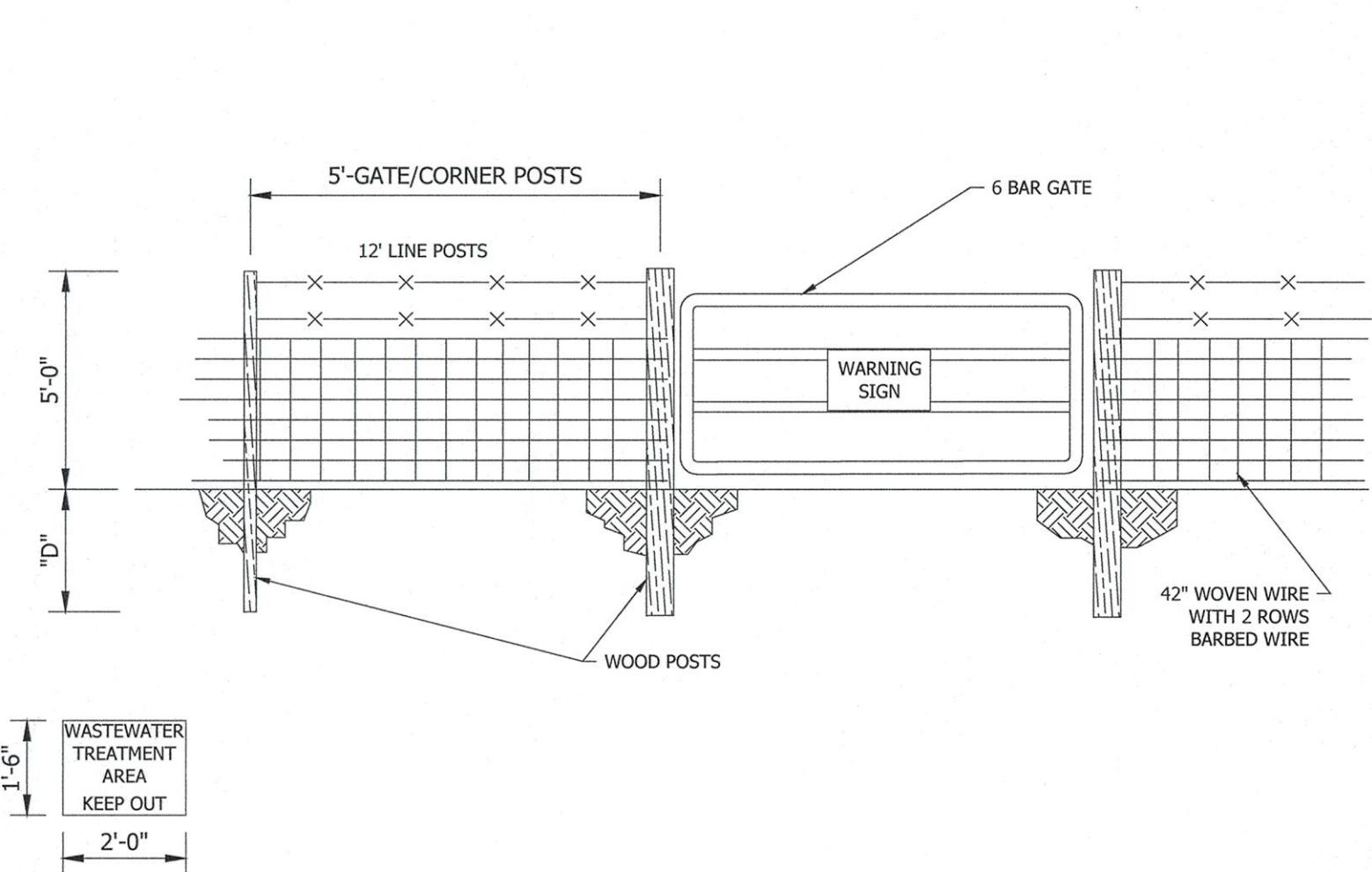
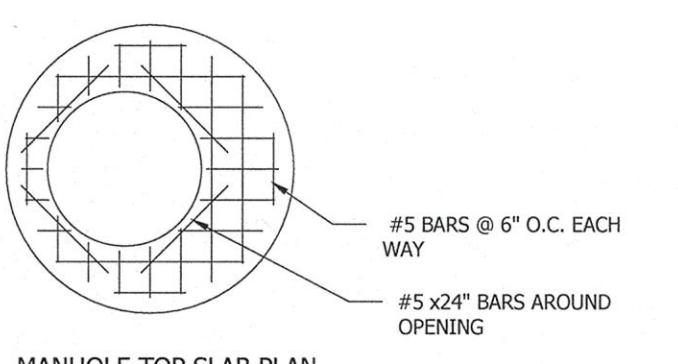
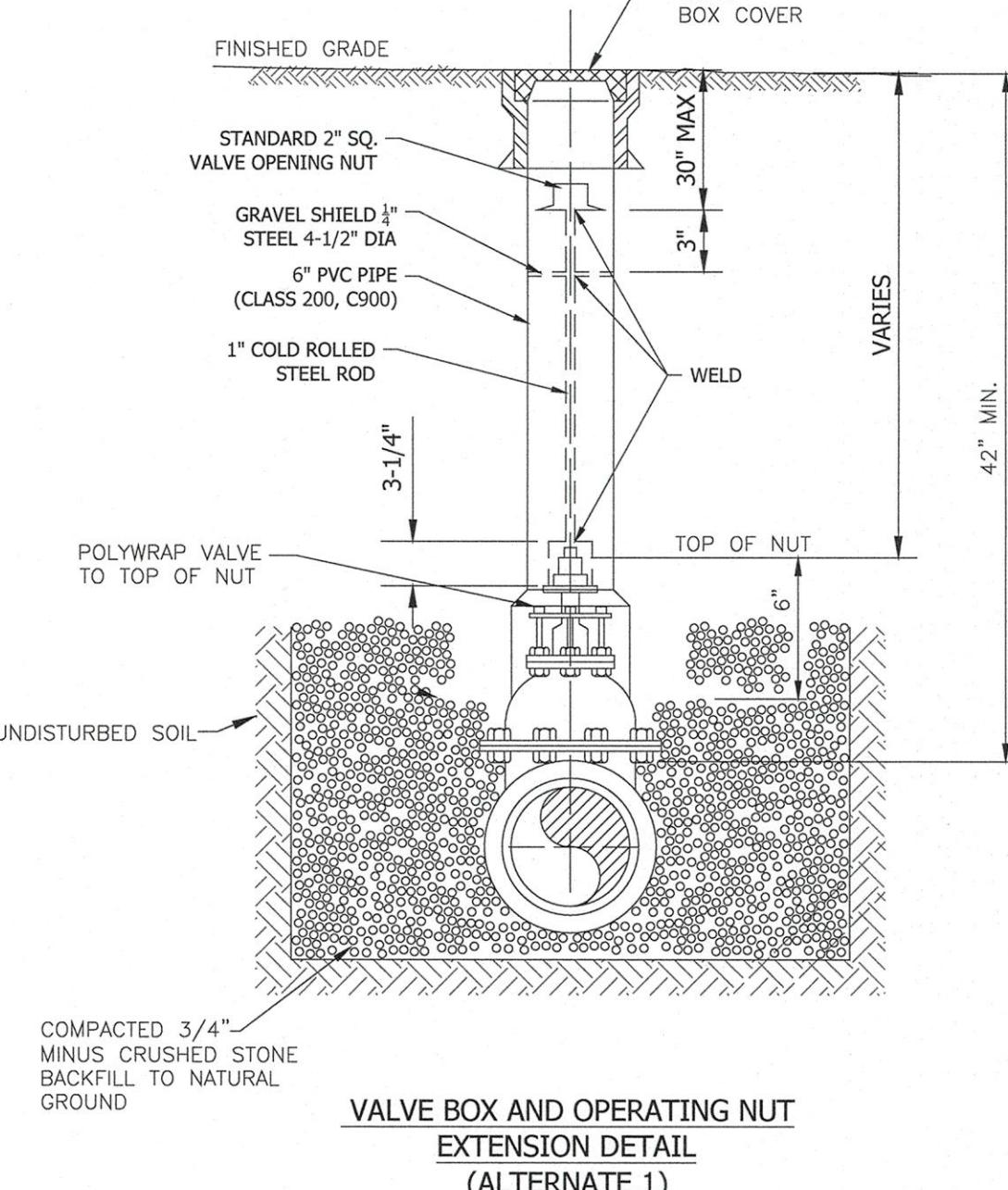
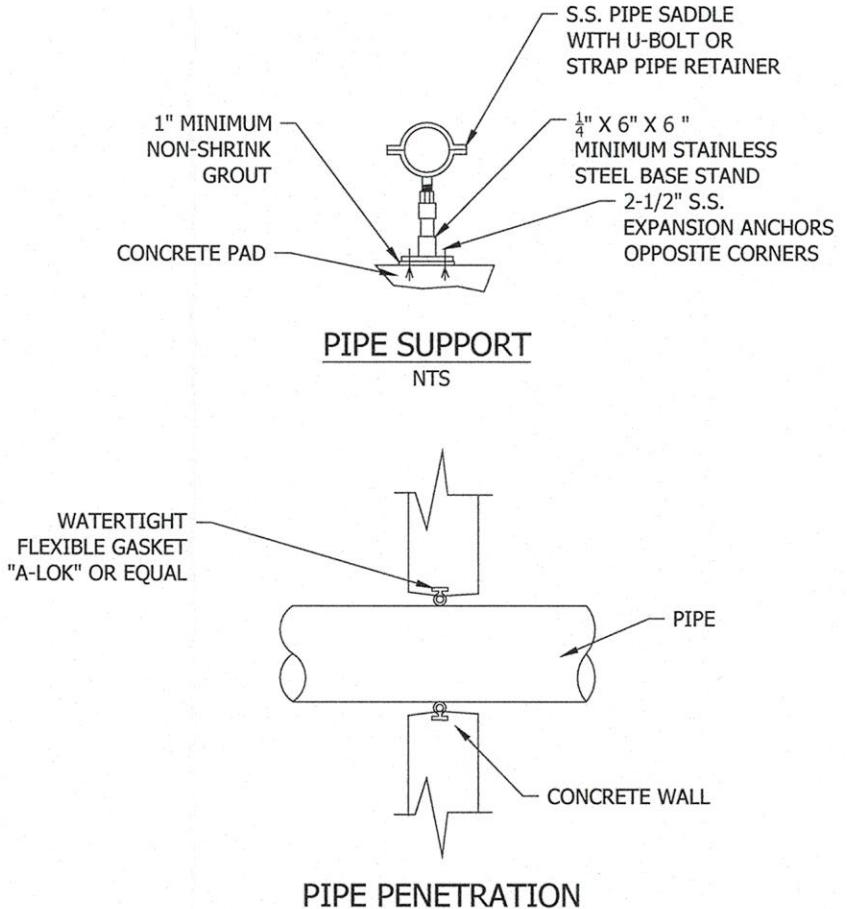
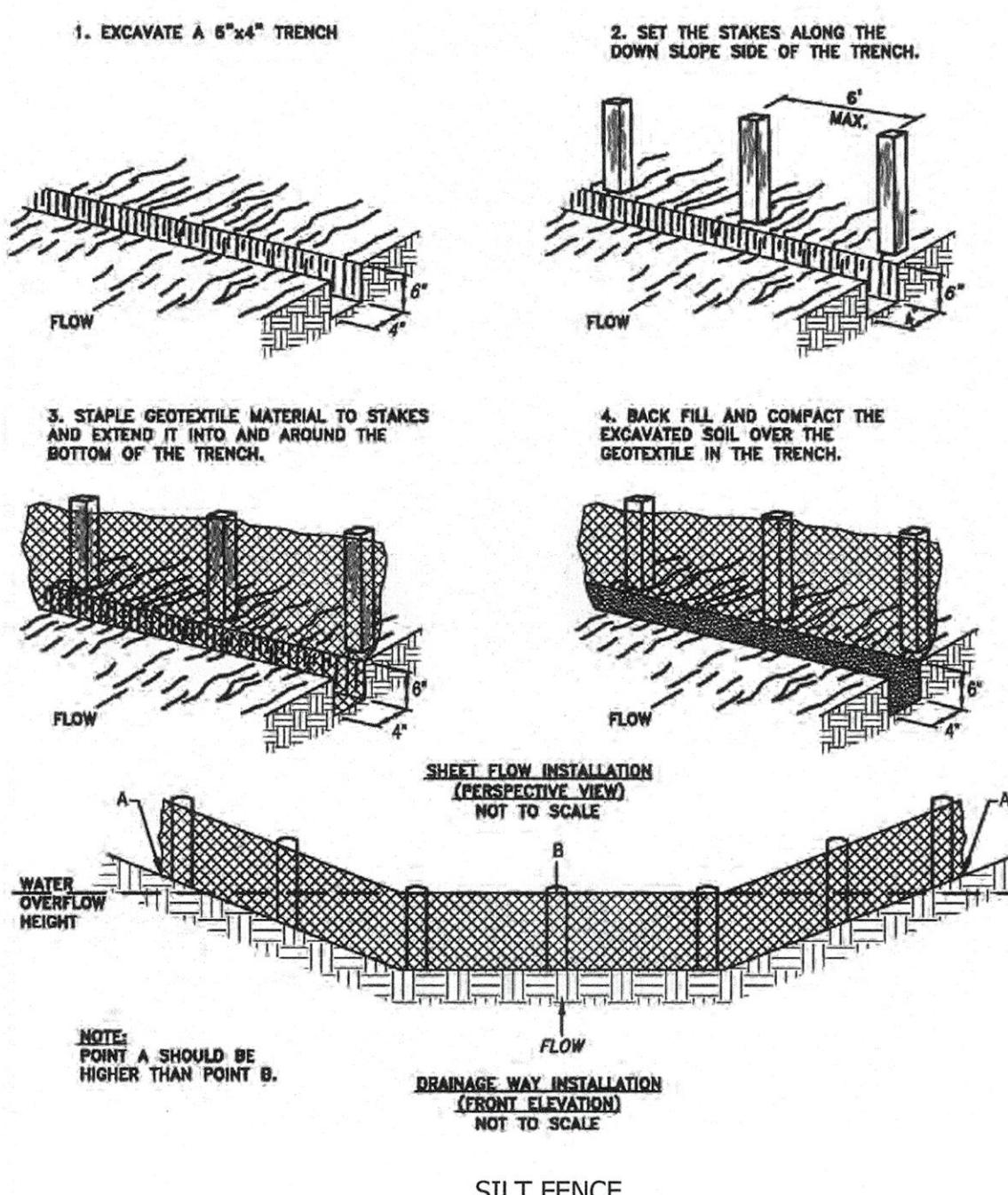
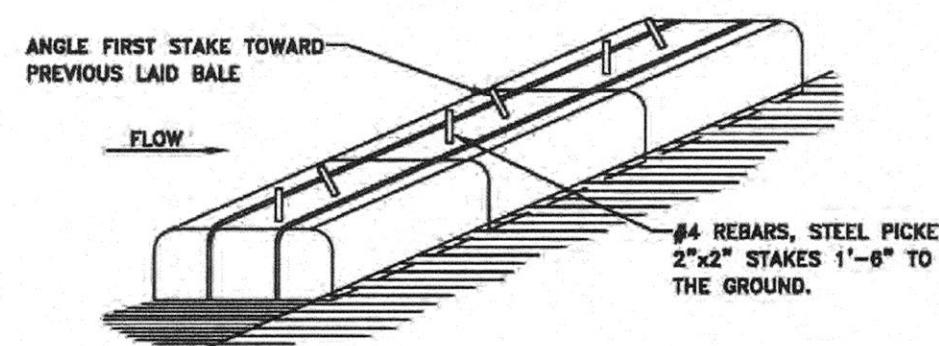
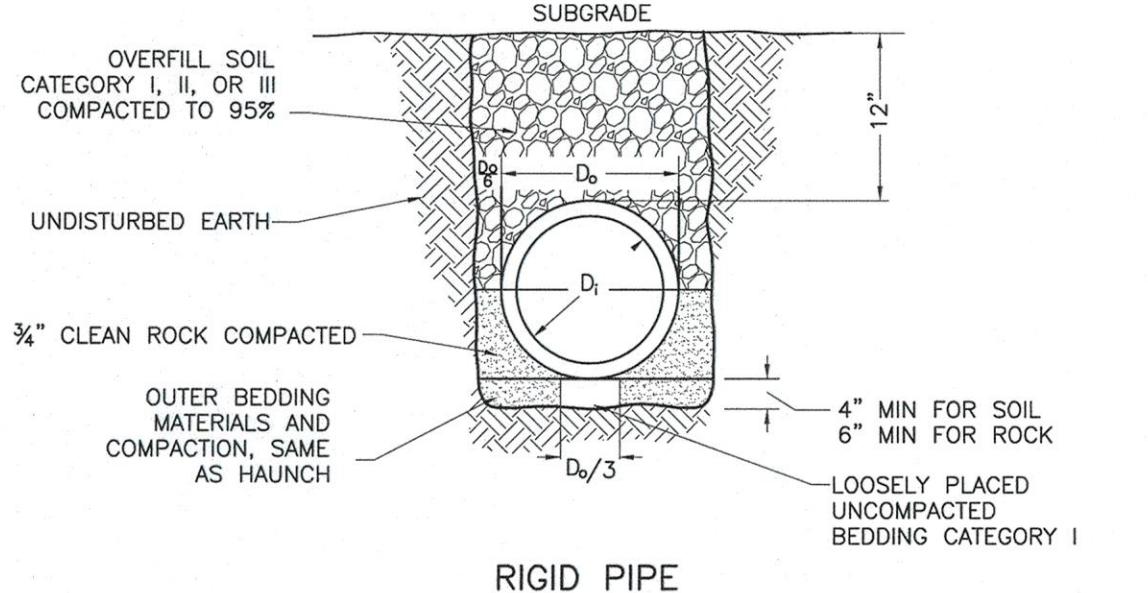
RECOMMENDED FOR APPROVAL	10/29/2025	
Elke Boyd		DATE
DESIGNED: EBB	DRAWN: PMH	
CHECKED: EWS	CHECKED: EWS	

## **BLOWER 3 STRUCTURAL SECTION**

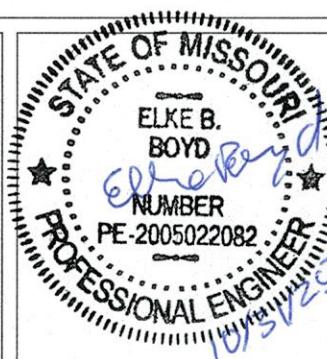
# HARTSBURG WWTF TREATMENT UPGRADES

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SCALE  
NTS  
CONSULTANT PROJECT NUMBER  
524-1025-01W-PHASE 2  
SHEET  
7



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CHECKED: EWS	CHECKED: EWS



## ALTERNATES 1, 2, & 3

### DETAILS

SCALE  
NTS  
CONSULTANT PROJECT NUMBER  
524-1025-01W-PHASE 2  
SHEET  
8

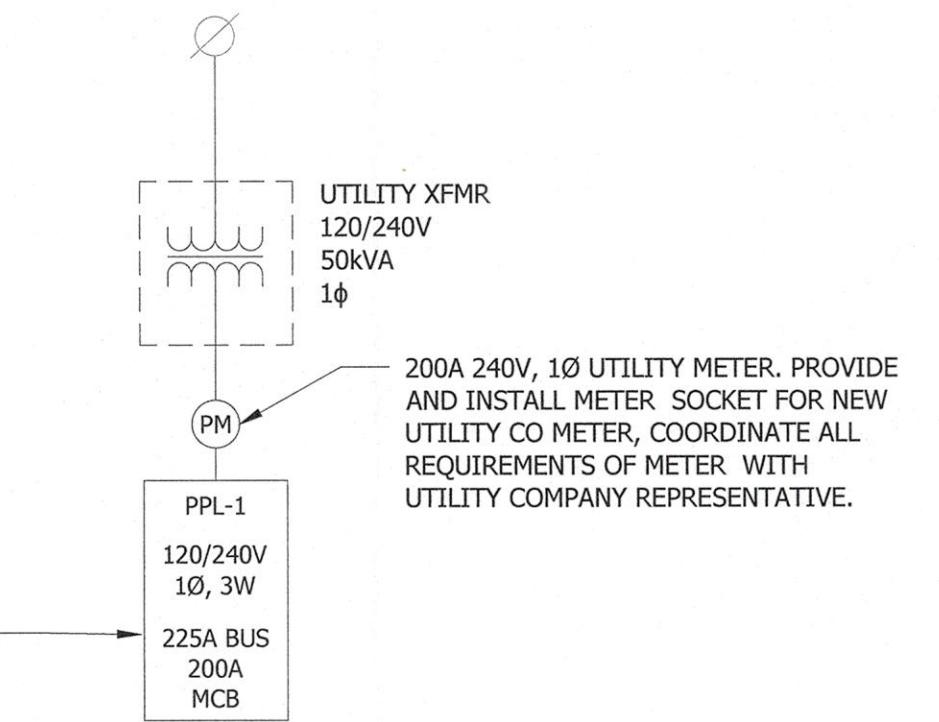
## **GENERAL NOTES:**

- A. ALL UNDERGROUND CONDUIT SHALL BE SCHEDULE 80 PVC BURIED A MINIMUM OF 24" BELOW FINISHED GRADE UNLESS OTHERWISE NOTED.
- B. ALL CONDUITS INSTALLED ABOVE GRADE SHALL BE RIGID GALVANIZED UNLESS OTHERWISE NOTED.
- C. TRANSITION FROM SCHEDULE 80 PVC TO RIGID GALVANIZED PRIOR TO EMERGING FROM GRADE USING RG ELBOWS.
- D. CONTRACTOR TO INSTALL AND COORDINATE NEW UTILITY FEED, NEW METER SOCKET CABINET, AND NEW 200A PANEL. AFTER THE NEW BLOWERS ARE OPERATIONAL AND THE EXISTING CIRCUITS TO REMAIN ARE TRANSFERRED OVER TO THE NEW PANEL, DEMO THE EXISTING UTILITY SERVICE AND THE EXISTING 100A PANEL. TURN OVER PANEL TO OWNER.

## **CODED NOTES:**

1. CONTRACTOR TO PROVIDE NEW 200A, 18 CIRCUIT, 120/240V, 1PH, SQUARE D NO. 1 PANELBOARD. PROVIDE AND INSTALL 2" CONDUIT WITH (2) #2/0AWG AND # 4 GND FROM THE UTILITY TRANSFORMER TO THE NEW PANEL. COORDINATE UPGRADED SERVICE REQUEST AND ALL UTILITY REQUIREMENTS WITH THE ELECTRIC UTILITY.
2. CONTRACTOR TO PROVIDE NEW CONDUIT AND WIRE POWER FEED TO THE BLOWER VFDS, 3/4" CONDUIT W/ (2) #8 AWG & #10 GND. INSTALL ALL NECESSARY POWER AND CONTROLS FOR THE BLOWER SYSTEMS.
3. CONTACTOR TO RECONNECT ALL EXISTING EQUIPMENT TO THE NEW PANELBOARD AS NEEDED FOR CONTINUOUS OPERATION. EXTEND CONDUIT AND WIRE AS NECESSARY.

## **ELECTRICAL ONE-LINE**



## **EXISTING PANEL SCHEDULE**

EXISTING PANEL SCHEDULE																		
WIRING (SEE SCHEDULE)	DESIGNATION: PPL-1				MAINS TYPE: Circuit Breaker								WIRING (SEE SCHEDULE)					
	LOCATION: BLOWER BUILDING				OCPD RATING: 100A													
	FED FROM: UTILITY				BUS RATING: 125A													
	VOLTAGE: 240/120V				PANEL MOUNTING: SURFACE (NEMA 1)													
	PHASE: 1 PHASE, 3 WIRE				MIN. BUS BRACING													
					22,000 AIC (RMS SYMETRICAL)													
WIRING (SEE SCHEDULE)	CKT NO.	LOAD DESCRIPTION	**	KVA	CKT. BKR.		PHASE		CKT. BKR.		KVA	**	LOAD DESCRIPTION	CKT NO.	WIRING (SEE SCHEDULE)			
					AMPS	POLE	A	B	AMPS	POLE								
	1	BLOWER #1		2.04	30	2	4.08		30	2	2.04		BLOWER #2	2				
	3			2.04				4.08			2.04			4				
	5	RECEPTACLE, HEATER		0.84	20	1	3.24		60	2	2.40		UV SYSTEM	6				
	7	LIGHTING			20	1		2.40			2.40			8				
							7.32	6.48	TOTAL 13.80									

\*\* NOTES: (G = GFCI, A = AFCI, L = LOCKABLE, S = SHUNT TRIP, GF = GROUND FAULT PROTECTION FOR EQUIPMENT  
1 PROVIDE A 30A, 2P CIRCUIT BREAKER AND INSTALL IN EXISTING SPACES. BREAKERS SHALL BE MINIMUM 10kAIC.

LOAD CLASSIFICATION	CONN. LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
RECEPTACLE (R)	0.84	NEC 220.44	0.84		
LIGHTING (L)	1.20	100%	1.20		
HVAC HEATING (HH)	0.00	NEC 220.60	0.00	CONNECTED LOAD (A):	
HVAC COOLING (HC)	0.00			DEMANDED LOAD (A):	
MOTOR (M)	4.08	100%	4.08	SPARE CAPACITY (0%):	
LARGEST MOTOR (LM)	4.08	125%	5.10		
CONTINUOUS (C)	4.80	125%	6.00	PANEL CURRENT (A):	71.75
NON-CONTINUOUS (N)	0.00	100%	0.00		

## NEW PANEL SCHEDULE

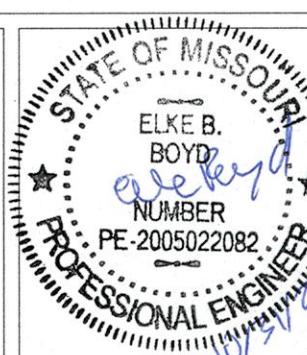
\*\* NOTES: (G = GFCI, A = AFCI, L = LOCKABLE, S = SHUNT TRIP, GF = GROUND FAULT PROTECTION FOR EQUIPMENT  
1 PROVIDE A 30A, 2P CIRCUIT BREAKER AND INSTALL IN EXISTING SPACES. BREAKERS SHALL BE MINIMUM 10kAIC.

LOAD CLASSIFICATION	CONN. LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
RECEPTACLE (R)	1.20	NEC 220.44	1.20		
LIGHTING (L)	1.20	100%	1.20		
HVAC HEATING (HH)	0.24	NEC 220.60	0.24	CONNECTED LOAD (A):	115
HVAC COOLING (HC)	0.00			DEMANDED LOAD (A):	127
MOTOR (M)	13.44	100%	13.44	SPARE CAPACITY (0%):	0
LARGEST MOTOR (LM)	6.72	125%	8.40		
CONTINUOUS (C)	4.80	125%	6.00	PANEL CURRENT (A):	127
NON-CONTINUOUS (N)	0.00	100%	0.00		

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FOR AP  
DESIGN  
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RECOMMENDED  
FOR APPROVAL \_\_\_\_\_ 10/29/2025  
Christopher Campbell, P.E. DATE

DESIGNED: CRC	DRAWN: KCK
CHECKED: CRC	CHECKED: PFB

# HARTSBURG WWTF TREATMENT UPGRADES

# ELECTRICAL SCHEDULES AND DIAGRAMS (ALTERNATE 1)

SCALE  
NONE  
CONSULTANT PROJECT NUMBER  
524-1025-01W-PHASE 2  
SHEET  
9