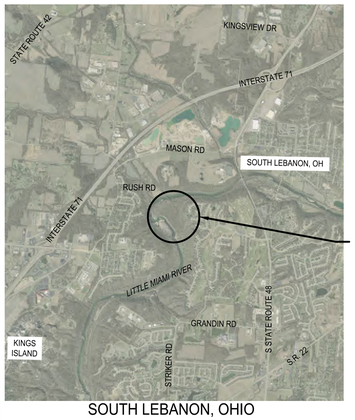
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

FOR THE

BOARD OF COUNTY COMMISSIONERS

WARREN COUNTY, OH



SOUTH LEBANON, OHIO

VICINITY MAP

SCALE: NONE

STATE LOCATION MAP

SCALE: NONE

WESSLER ENGINEERING

More than a Project™

OHIO
80 State Route 103, Suite C
Bluffton, Ohio 45817
Phone: (419) 358-0521
www.wesslerengineering.com

PROJECT NO. 705524-04-001

PROPERTY ADDRESS
1699 MASON-MORROW-MILLGROVE ROAD
LEBANON, OHIO

DRAWINGS PREPARED FOR:

WARREN COUNTY, OHIO

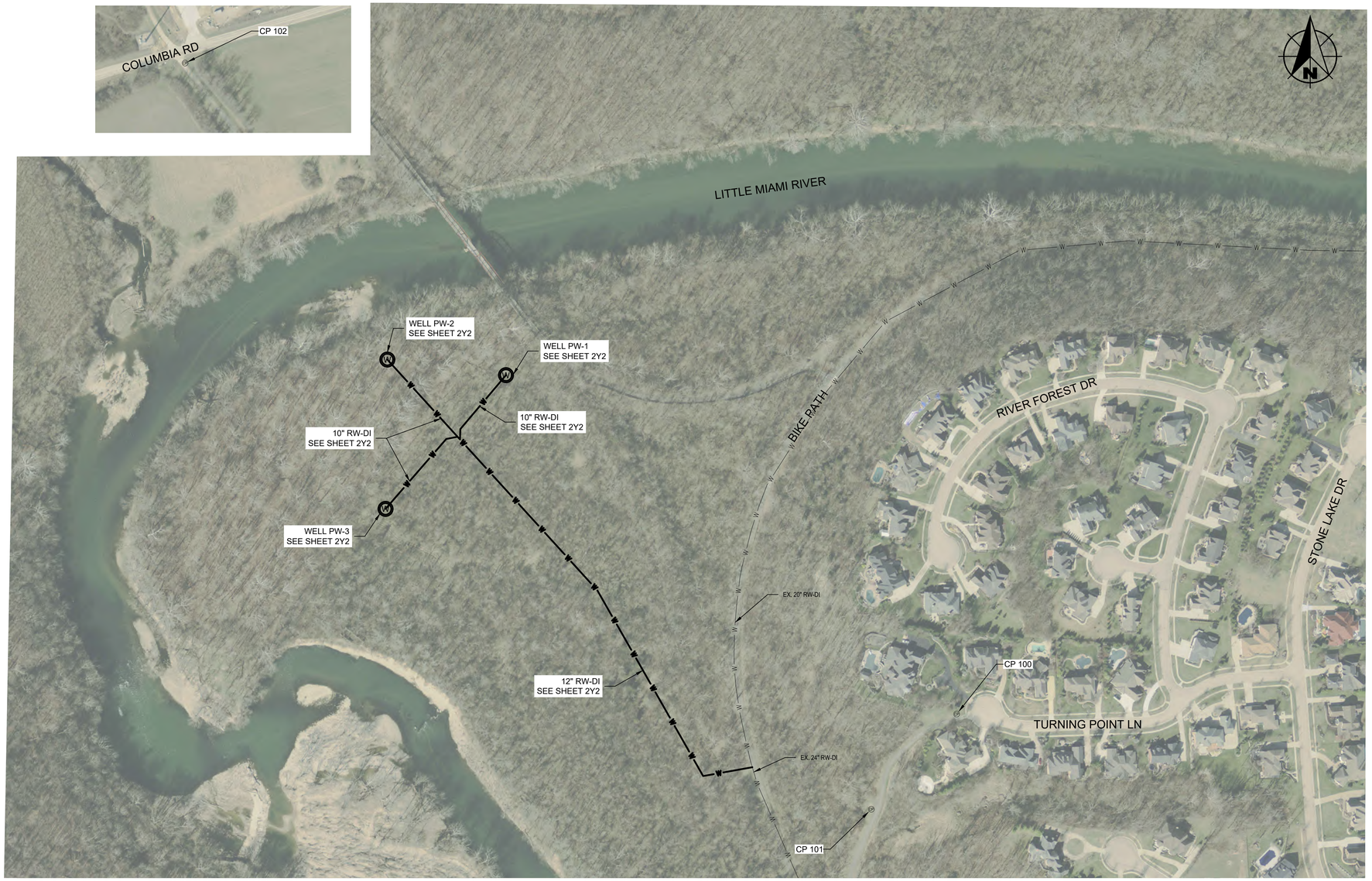
TOM GROSSMAN, COMMISSIONER

SHANNON JONES, COMMISSIONER

DAVID G. YOUNG, COMMISSIONER

MAY 2025

STATE OF OHIO · RYAN KENT BRAUEN · E-79180 · REGISTERED · PROFESSIONAL ENGINEER 05/16/2025	RYAN KENT BRAUEN REGISTERED ENGINEER STATE OF OHIO NO. PE-79180
STATE OF OHIO · JAKOB C. BRUHL · E-89802 · REGISTERED · PROFESSIONAL ENGINEER 05/16/2025	JAKOB C. BRUHL REGISTERED ENGINEER STATE OF OHIO NO. E-89802 COVERING STRUCTURAL DESIGN
STATE OF OHIO · WAYNE C. MOORE · E-70068 · REGISTERED · PROFESSIONAL ENGINEER 05/19/2025	WAYNE C. MOORE REGISTERED ENGINEER STATE OF OHIO NO. PE-70068 COVERING ELECTRICAL AND CONTROLS DESIGN



2012 IMAGERY FROM OHIO STATE MAP.

LOCATION AND SCOPE OF WORK PLAN

0 75 150 300 FT

1" = 150'

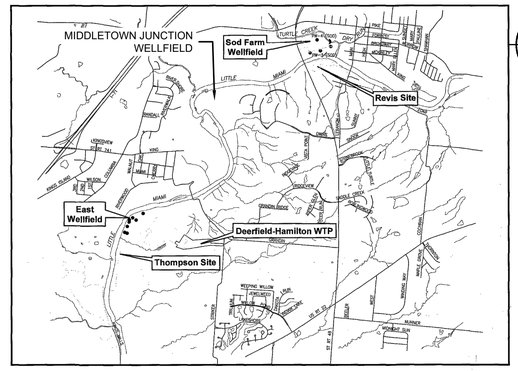
CONTROL POINTS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP 100	500899.46	1477960.92	698.86	CP
CP 101	500656.18	1477742.65	653.98	CP CUT
CP 102	504274.55	1475052.52	647.51	MAGNAIL

HORIZONTAL AND VERTICAL CONTROL INFORMATION

NOTES:
1. A FIELD SURVEY WAS PERFORMED IN MARCH 2024.
2. COORDINATES OHIO STATE PLANE, SOUTH ZONE, NAD 83 AND ELEVATIONS (NAVD 88) ARE BASED ON OHCORS.
3. UNITS ARE U.S. SURVEY FEET.
4. CONTROL POINTS WERE SET USING GPS.
5. ALL PROPERTY LINES AND RIGHT OF WAY LINES SHOWN ARE PER WARREN COUNTY, OHIO GIS DATA.

MIDDLETOWN JUNCTION WELLFIELD - DRAWING INDEX

PAGE NUMBER	SHEET DESIGNATION	SHEET TYPE DEFINITIONS: G - GENERAL; Y - SITE; C - CIVIL / PROCESS; S - STRUCTURAL; E - ELECTRICAL; N - NETWORK
Area 1 - GENERAL		
1	1G1	TITLE SHEET
2	1G2	LOCATION, SCOPE OF WORK PLAN , SURVEY CONTROL AND DRAWING INDEX
3	1G3	GENERAL NOTES AND ABBREVIATIONS
4	1S1	STRUCTURAL GENERAL NOTES
Area 2 - SITE		
5	2Y1	EXISTING SITE PLAN
6	2Y2	SITE IMPROVEMENT PLAN
7	2Y3	WELL SITES - ENLARGED SITE PLANS
8	2Y4	SITE ACCESS PLAN
9	2Y5	PLAN AND PROFILE - LITTLE MIAMI RIVER
10	2WM1	PLAN AND PROFILE - LINE A
11	2WM2	PLAN AND PROFILE - LINE A
12	2WM3	PLAN AND PROFILE - LINES B AND C
13	2E1	ELECTRICAL SITE PLAN
Area 3 - WELLS		
14	3C1	WELL PLAN, VALVE VAULT PLAN, AND SECTION VIEW
15	3S1	WELLS NO. 1 AND 3 PLATFORMS - FOUNDATION PLANS AND FRAMING PLANS
16	3S2	WELLS NO. 1 AND 3 PLATFORMS - ELEVATIONS
17	3S3	WELLS NO. 1 AND 3 PLATFORMS - PLATFORM DETAILS
18	3S4	WELL NO. 1 AND 3 PLATFORMS - DETAILS
19	3S5	WELL NO. 2 PLATFORM - FOUNDATION PLAN AND DETAILS
20	3S6	WELL NO. 2 PLATFORM - STRUCTURAL PLANS
21	3S7	WELL NO. 2 PLATFORM - STRUCTURAL SECTIONS
22	3S8	WELL NO. 2 PLATFORM - SECTIONS AND DETAILS
23	3S9	WELL NO. 2 PLATFORM - SECTIONS AND DETAILS
24	3S10	WELL NO. 2 PLATFORM - STRUCTURAL SECTIONS AND DETAILS
25	3E1	WELL NO. 1 AND 3 - ELECTRICAL PLANS
26	3E2	WELL NO. 2 - ELECTRICAL PLAN
Area 4 - MISCELLANEOUS DETAILS		
27	4Y1	MISCELLANEOUS SITE AND CIVIL DETAILS
28	4Y2	MISCELLANEOUS SITE AND CIVIL DETAILS
29	4Y3	MISCELLANEOUS SITE AND CIVIL DETAILS
30	4EC1	EROSION CONTROL DETAILS
31	4EC2	EROSION CONTROL DETAILS
Area 5 - ELECTRICAL		
32	5E1	ELECTRICAL LEGEND
33	5E2	POWER ONE LINE DIAGRAM
34	5E3	CONTROL ONE LINE DIAGRAM
35	5E4	ELECTRICAL DETAILS
36	5E5	ELECTRICAL GROUNDING DETAILS
37	5E6	REVIS WELLFIELD PLAN AND EXISTING POWER DISTRIBUTION STRUCTURE LAYOUT
Area 6 - NETWORKING		
38	6N1	PROCESS AND INSTRUMENTATION LEGEND
39	6N2	PROCESS AND INSTRUMENTATION DIAGRAM
40	6N3	NETWORK DIAGRAM



WELLFIELD MAP

SCALE VERIFICATION	DRAWN BY	DMG
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS
	APPROVED BY	RKB
	ISSUE DATE	MAY 2025
	PROJECT NUMBER	705524-04-001

NO.	DATE	INITIALS	REVISION DESCRIPTIONS

STATE OF OHIO
RYAN KENT BRAUEN
E-79180
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

WESSLER ENGINEERING
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MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

LOCATION, SCOPE OF WORK PLAN, SURVEY CONTROL AND DRAWING INDEX

SHEET NO.
1G2

PAGE NO.
2

EXISTING FEATURES LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
BM	BENCH MARK	DB	CISTERN		EASEMENT - CONSTRUCTION/PERMANENT
TBM	TEMPORARY BENCH MARK	EM	ELECTRIC METER		LOT BOUNDARY
SB-01	SOIL BORING LOCATION	AC	AIR CONDITIONING UNIT		PROPERTY BOUNDARY
	SECTION CORNER	XXX	UTILITY RISER (DEFINED BY UTILITY)		RIGHT-OF-WAY - TEMPORARY/PERMANENT
	DRILL HOLE IN CONCRETE/HARRISON MONUMENT	XXX	UTILITY PEDESTAL (DEFINED BY UTILITY)		SECTION BOUNDARY
CP	CONTROL POINT (SET/FOUND)	X	UTILITY MARKER (DEFINED BY UTILITY)		WETLANDS
MG	MAGNETIC NAIL (SET/FOUND)	J	JOINT POWER/TELEPHONE POLE	849	CONTOUR - INTERMEDIATE ELEVATION
BS	BOAT SPIKE (SET/FOUND)	L	LIGHT POLE	850	CONTOUR - INDEX ELEVATION
PK	PK NAIL (SET/FOUND)	LP	LIGHT ON POWER POLE	OHE OHE	OVERHEAD ELECTRIC
RS	RAILROAD SPIKE (SET/FOUND)	LJ	LIGHT ON JOINT POLE	OHC OHC	OVERHEAD CABLE TV
R/W	R/W MARKER - CONCRETE/GRANITE/STONE	P	POWER POLE	OHT OHT	OVERHEAD TELEPHONE
	IRON PIPE/IRON PIN/REBAR (WITH DIAMETER)	T	TELEPHONE POLE	UGC UGC	UNDERGROUND CABLE TV
BP	BRASS PLUG		LAMP POST	UGE UGE	UNDERGROUND ELECTRIC
C	CABLE TV MANHOLE		GUY ANCHOR	UGF UGF	UNDERGROUND FIBER OPTIC
E	ELECTRIC MANHOLE		GUY POLE OR STUB	G G G	GAS MAIN
G	GAS MANHOLE		CONTROLLER CABINET	DG DG	DIGESTER GAS
O	OTHER MANHOLE	FP	FLAG POLE	P P P	PETROLEUM MAIN
T	TELEPHONE MANHOLE		POST	UGT UGT	UNDERGROUND TELEPHONE
TEL	TELEPHONE VAULT		GROUND LIGHT	W W W	WATER MAIN
I	TRAFFIC MANHOLE	M	MAILBOX	W W W	WATER SERVICE
H	TRAFFIC HANDHOLE	M M	DOUBLE/MULTIPLE MAILBOX	FM FM	FORCEMAIN
W	WATER MANHOLE		MAST ARM POLE		GRAVITY SEWER PIPE
A	AIR RELEASE VALVE		TRAFFIC SIGNAL STRAIN POLE		PLANT CHLORINE PIPE
S	SANITARY SEWER MANHOLE		SIGNAL LOOP DETECTOR BOX		TOP OF BANK/TOE OF SLOPE
D	DRAINAGE/STORM SEWER MANHOLE		SIGNAL LOOP DETECTOR LOOP		CENTERLINE OF DITCH/SWALE/STREAM
CO	SANITARY SEWER CLEANOUT		SIGN - SINGLE POST	x x x x x x x x x	FENCE - FIELD
ST	SEPTIC TANK		SIGN - DOUBLE POST	o o o o o o o o o	FENCE - METAL
VV	VALVE VAULT		SIGN - RAILROAD SIGNAL		FENCE - WOOD
	BEEHIVE INLET		SIGN - RAILROAD CROSSING		GUARDRAIL
	CURB INLET		BUSH		STREAM
	DROP INLET		STUMP		TREE/BRUSH LINE
	CATCH BASIN		TREE - CONIFEROUS		
DS	DOWNSPOUT		TREE - DECIDUOUS		
GM	GAS METER		ROCK OUTCROP		
GV	GAS VALVE		SATELLITE		
GSV	GAS SERVICE VALVE	SPH	SPRINKLER CONTROL VALVE		
PV	PETROLEUM VALVE		WATER METER		
PSV	PETROLEUM SHUTOFF VALVE	WV	WATER VALVE		
MW	GAS STATION MONITORING WELL		WATER SERVICE VALVE		
GFC	GAS STATION FILL CAP	W	WATER WELL		
GW	NATURAL GAS WELL/STORAGE WELL	WW	WET WELL		
SP	SPRINKLER HEAD		FIRE HYDRANT		
	YARD HYDRANT		PROCESS VALVE		

*NOTE: THIS TABLE IS A LISTING OF TYPICAL EXISTING SYMBOLS AND MAY NOT INCLUDE ALL EXISTING SYMBOLS FOUND WITHIN THIS PLAN SET. ALL PROPOSED ITEMS WILL BE CALLED OUT ON THEIR PLAN SHEETS. IF A QUESTION ARISES ON THE MEANING OF ANY SYMBOL NOT LISTED IN THIS TABLE, PLEASE CONTACT THE ENGINEER FOR CLARIFICATION. THE SYMBOLS ARE NOT TO SCALE.

Ohio Utilities Protection Service
Call 811
before you dig

TABLE OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
AFF	ABOVE FINISHED FLOOR	IPS	IRON PIPE SIZE
ALUM	ALUMINUM	OSPC	OHIO STATE PLANE COORDINATE
APP	APPARENT	LB	POUND(S)
APPROX	APPROXIMATE(LY)	LF	LINEAR FEET
ASPH	ASPHALT	LN	LANE
ASSOC	ASSOCIATES	LS	LIFT STATION
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS	MA EX	MATCH EXISTING
AVE	AVENUE	MJ	MECHANICAL JOINT
AVG	AVERAGE	MATL	MATERIAL
BLDG	BUILDING	MAX	MAXIMUM
BLVD	BOULEVARD	MH	MANHOLE
BM	BENCHMARK	MIN	MINIMUM
CO	CLEANOUT	MISC	MISCELLANEOUS
CI	CAST IRON	MNFR	MANUFACTURER
CL	CENTER LINE	N	NORTHING, NORTH
CMA	COLD MIX ASPHALT	NGS	NATIONAL GEODETIC SURVEY
CMP	CORRUGATED METAL PIPE	NO.	NUMBER
CMU	CONCRETE MASONRY UNIT	OC	ON CENTER
CONC	CONCRETE	OD	OUTSIDE DIAMETER
CONT	CONTINUOUS	PC	POINT OF CURVE (BEGIN CURVE)
CNR	CORNER	POLY	POLYETHYLENE
CP	CONTROL POINT	PI	POINT OF INTERSECTION
CPP	CORRUGATED PLASTIC PIPE	POT	POINT ON TANGENT
CR STN	CRUSHED STONE	PT	POINT OF TANGENT (END CURVE)
CYD	CUBIC YARD	PSI	POUNDS PER SQUARE INCH
D	DEPTH	PT	POINT
DI	DUCTILE IRON	PVC	POLYVINYL CHLORIDE
DI MJ	DUCTILE IRON MECHANICAL JOINT	R	RADIUS
DBL	DOUBLE	ROW	RIGHT-OF-WAY
DIA	DIAMETER	RCP	REINFORCED CONCRETE PIPE
DIP	DUCTILE IRON PIPE	RD	ROAD
DIPS	DUCTILE IRON PIPE SIZE	S	SOUTH
DR	DRIVE	SR	STATE ROUTE
E	EASTING, EAST	SST	STAINLESS STEEL
EF	EACH FACE	SVA	SERVICE VALVE ASSEMBLY
EW	EACH WAY	SB	SOIL BORING
EA	EACH	SCHED	SCHEDULE
EJ	EAST JORDAN IRON WORKS	SDR	STANDARD DIMENSION RATIO
EL	ELEVATION	SECT	SECTION
EX	EXISTING	SF	SQUARE FEET
EXP	EXPANSION	SHT	SHEET
FFE	FINISH FLOOR ELEVATION	SPECS	SPECIFICATION(S)
FM	FORCE MAIN	SQ	SQUARE
FND	FOUND	SRF	STATE REVOLVING FUND
FT	FEET	ST	STREET
FTG	FOOTING	STA	STATION
GALV	GALVANIZED	SYD	SQUARE YARD
GPS	GLOBAL POSITIONING SYSTEM	TBM	TEMPORARY BENCHMARK
HMA	HOT MIX ASPHALT	TC	TOP OF CASTING
HDPE	HIGH DENSITY POLYETHYLENE	TYP	TYPICAL
HORIZ	HORIZONTAL	UNO	UNLESS NOTED OTHERWISE
ID	INSIDE DIAMETER	USGS	US GEOLOGICAL SURVEY
IE	INVERT ELEVATION	VERT	VERTICAL
INC	INCORPORATED	VLV	VALVE
ODOT	OHIO DEPARTMENT OF TRANSPORTATION	W	WIDTH, WEST
INSTR	INSTRUMENT	WSE	WATER SURFACE ELEVATION
INV	INVERT	YR	YEAR

*NOTE: THIS TABLE IS A LISTING OF TYPICAL ABBREVIATIONS AND MAY NOT INCLUDE ALL ABBREVIATIONS FOUND WITHIN THIS PLAN SET. IF A QUESTION ARISES ON THE MEANING OF AN ABBREVIATION NOT LISTED IN THIS TABLE, PLEASE CONTACT THE ENGINEER FOR CLARIFICATION.

GENERAL NOTES:

1. NOTIFY THE ENGINEER IF ANY CONFLICTING INFORMATION BECOMES APPARENT IN THE CONTRACT DOCUMENTS AS SOON AS POSSIBLE AND PRIOR TO THE COMMENCEMENT OF ANY WORK IN THE VICINITY OF OR RELATIVE TO THE APPARENT CONFLICT SO THAT CLARIFICATION MAY OCCUR PRIOR TO CONSTRUCTION.
2. ANY ALTERATIONS TO THESE DRAWINGS NOT AUTHORIZED BY WESSLER ENGINEERING AND NOT IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS AND RECORDS ON FILE AT WESSLER ENGINEERING SHALL RELIEVE WESSLER ENGINEERING OF ANY RESPONSIBILITY FOR THE ACCURACY OF THE DRAWINGS.
3. USE CAUTION DURING THE EXECUTION OF WORK TO PREVENT DAMAGE TO STATE, COUNTY, MUNICIPAL, AND PRIVATE PROPERTY. REPAIR ALL DAMAGES AS A RESULT OF OPERATIONS, INCLUDING DAMAGE TO DRAINAGE STRUCTURES, FIELD TILES, PUBLIC/PRIVATE ROADS, AND LANDSCAPING (INCLUDING FENCING). REPAIR AND REPLACE DAMAGED ITEMS AT NO ADDITIONAL COST TO THE OWNER. PERFORM ALL REPAIR AND REPLACEMENT WORK TO THE SATISFACTION OF THE PERMITTING AGENCY, THE OWNER AND THE ENGINEER.
4. TAKE CARE TO AVOID DAMAGE TO PAVED AREAS WHICH ARE NOT SPECIFICALLY CALLED OUT FOR REPAIR OR REPLACEMENT. REPAIR, OR REPLACE ALL SUCH PAVEMENTS WHICH ARE DAMAGED BY CONSTRUCTION ACTIVITIES AND CONSTRUCTION TRAFFIC AT NO ADDITIONAL COST TO THE OWNER.
5. OBTAIN ALL TEMPORARY EASEMENTS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT AT NO ADDITIONAL COST TO THE OWNER.
6. COMPLY WITH ALL APPLICABLE PERMITS AND REGULATIONS. APPLICABLE PERMITS ISSUED TO THE OWNER WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT ALL APPLICABLE PERMITTING AGENCIES WITHIN THE TIME PERIOD SPECIFIED BY THAT AGENCY PRIOR TO BEGINNING CONSTRUCTION.
7. ALL EXISTING AND NEW UTILITY INFORMATION, INCLUDING BUT NOT LIMITED TO LOCATION, SIZE AND INVERT ELEVATION, IS SHOWN BASED UPON AVAILABLE INFORMATION. THE ENGINEER DOES NOT GUARANTEE OR ASSUME SUCH INFORMATION TO BE TRUE, ACCURATE, ALL INCLUSIVE OR EVEN APPROXIMATE. CONTACT THE OHIO UTILITY PROTECTION SERVICES (OUPS) AT LEAST FORTY-EIGHT (48) HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY. CONTACT NON-MEMBER UTILITIES DIRECTLY.
8. DETERMINE WHICH UTILITIES MAY CONFLICT WITH WORK AND VERIFY THEIR LOCATION, SIZE AND ELEVATION PRIOR TO CONSTRUCTION AND DETERMINE IF THERE ARE ANY DISCREPANCIES OR CONFLICTS. IF ANY DISCREPANCIES OR CONFLICTS ARE DISCOVERED, NOTIFY THE ENGINEER AS SOON AS POSSIBLE.
9. COORDINATE ALL WORK WITH THE RESPECTIVE UTILITIES. SCHEDULE WORK ACCORDINGLY, AND NOTIFY ALL UTILITIES A MINIMUM OF TWO (2) WEEKS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
10. COORDINATE PLANNED UTILITY SERVICE INTERRUPTIONS WITH THE RESPECTIVE UTILITIES AND THE UTILITIES' AFFECTED CUSTOMERS. SERVICE INTERRUPTIONS SHOULD NOT LAST MORE THAN FOUR (4) HOURS. GIVE WRITTEN NOTICE TO ALL AFFECTED UTILITY CUSTOMERS AND PROPERTY OWNERS AT LEAST TWENTY-FOUR (24) HOURS BUT NOT MORE THAN SEVENTY-TWO (72) HOURS PRIOR TO ANY PLANNED INTERRUPTION OF UTILITY SERVICE.
11. USE CAUTION DURING THE EXECUTION OF WORK TO PREVENT DAMAGE TO EXISTING UTILITIES. REPAIR OR REPLACE ALL PUBLIC AND PRIVATE FACILITIES DAMAGED AS A RESULT OF CONSTRUCTION OPERATIONS.
12. COORDINATE STAGING AREA LOCATIONS WITH THE OWNER.
13. BIKE TRAIL TO BE REPAIRED TO EXISTING CONDITIONS AND MAINTAINED DURING CONSTRUCTION.

UTILITY CONTACTS

WATER
WARREN COUNTY WATER AND SEWER DEPT
406 JUSTICE DRIVE
LEBANON, OHIO 45036
513-695-1377
ATTN: CHRIS BRAUSCH, DIRECTOR ENGINEER

ELECTRIC
DUKE ENERGY OHIO
11738 SOLZMAN ROAD
CINCINNATI, OHIO 45249
513-256-4065
ATTN: ZAC WYSINSKI, ENGINEERING SPECIALIST

OHIO DEPARTMENT OF NATURAL RESOURCES
LITTLE MIAMI SCENIC PATHWAY
ODNR
(937) 382-1096
ATTN: TIFFANY DeCHANT-HART

SCALE VERIFICATION	DRAWN BY	DMG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS				
	APPROVED BY	RKB				
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	PROJECT NUMBER	705524-04-001				

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BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

GENERAL NOTES AND ABBREVIATIONS

SHEET NO. **1G3**
PAGE NO. 3

STRUCTURAL GENERAL NOTES

A. GENERAL INFORMATION

1. SHOP DRAWINGS OF ALL FABRICATED ITEMS SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION.

2. VERIFY DIMENSIONS AND DETAILS BEFORE BEGINNING WORK. CONTRACTOR SHALL CHECK AND COORDINATE SIZES AND LOCATIONS OF ALL CONDUITS, PIPE, EMBEDDED ITEMS, ETC. WITH ELECTRICAL.

3. EXISTING CONDITIONS ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR. VERIFICATION IS THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR IS TO IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS BETWEEN EXISTING CONDITIONS AND DESIGN AND DETAILS INDICATED BY THESE DRAWINGS.

4. DETAILS NOT SPECIFICALLY INDICATED SHALL BE SIMILAR TO DETAILS SHOWN FOR SIMILAR CONDITIONS.

B. DESIGN

1. CODES AND SPECIFICATIONS

a. 2024 OHIO BUILDING CODE.
b. ACI 318: BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
c. ACI 301: SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS.
d. ACI 315: DETAILS AND DETAILING OF CONCRETE REINFORCING.
e. SPECIFICATIONS FOR STRUCTURAL STEEL FOR BUILDINGS (AISC 360-16).
f. AMERICAN WELDING SOCIETY STANDARDS AND SPECIFICATIONS (AWS).
g. ASCE 7-16: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
h. ASCE 24-14: FLOOD RESISTANT DESIGN AND CONSTRUCTION.

2. DESIGN LIVE LOADS

SNOW :

GROUND SNOW LOAD (Pg)	20 PSF
IMPORTANCE FACTOR (Is)	1.1
EXPOSURE FACTOR (Ce)	1.0

WIND :

BASIC WIND SPEED	114 MPH
EXPOSURE CATEGORY	C

SEISMIC :

RISK CATEGORY	III
SEISMIC IMPORTANCE FACTOR	1.25
MAPPED SPECTRAL RESPONSE (Ss)	0.139 g
MAPPED SPECTRAL RESPONSE (S1)	0.073 g
SITE CLASS	D
DESIGN SPECTRAL RESPONSE (SDS)	0.148 g
DESIGN SPECTRAL RESPONSE (SD1)	0.116 g
SEISMIC DESIGN CATEGORY	B
BASIC SEISMIC RESISTING SYSTEM	H. STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
DESIGN BASE SHEAR	
WELL PLATFORM NO. 1 & 3	0.50 KIPS
WELL PLATFORM NO. 2	3.10 KIPS
RESPONSE COEFFICIENTS (Cs)	0.062
RESPONSE MODIFIER (R)	3
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE

GENERAL FLOOR LOADING:

WELL PLATFORM NO. 1 & 3	150 PSF
WELL PLATFORM NO. 2	100 PSF

FLOOD LOADS (ASCE 7 & ASCE 24)
WELL PLATFORMS ARE SEPARATED FROM THE RIVER BY A DENSELY WOODED AREA. THE NEAREST WELL (PLATFORM NO. 2) IS APPROX. 300 FEET FROM CENTERLINE OF RIVER. FLOOD WATER VELOCITY AT WELL PLATFORM LOCATIONS WAS CONFIRMED TO BE VERY LOW FROM FLOODWAY DATA.
THE STRUCTURES HAVE BEEN DESIGNED TO RESIST BUOYANT, SLIDING, AND HYDRODYNAMIC FORCES DUE TO FLOOD CONDITIONS.

C. FOUNDATIONS

1. FOUNDATIONS ARE DESIGNED FOR AN ASSUMED ALLOWABLE BEARING PRESSURE OF 1500 PSF.

2. CONSTRUCT FOOTINGS ON ADEQUATE SUBGRADE SOIL OR ENGINEERED FILL. IN ADDITION, PLACE 8 INCHES OF # 67 STONE BELOW ALL STRUCTURES.

3. ALL FOUNDATION EXCAVATIONS SHALL BE INSPECTED BY A QUALIFIED GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE TO VERIFY THAT THE STRUCTURE SUBGRADE MATERIALS ARE SUITABLE FOR THE ASSUMED ALLOWABLE BEARING PRESSURE.

D. CONCRETE

1. REINFORCING SHALL BE DETAILED ACCORDING TO THE ACI DETAILING MANUAL.

2. STANDEES ARE REQUIRED FOR REINF STEEL SUPPORT BETWEEN MATS IN SLABS.

3. CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM ULTIMATE STRENGTH AT 28 DAYS OF 4500 PSI UNLESS OTHERWISE NOTED.

4. THE FOLLOWING CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT UNLESS OTHERWISE INDICATED:

a. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, 3 INCHES.
b. CONCRETE EXPOSED TO EARTH / WEATHER BUT CAST AGAINST FORMS, 2 INCHES.

5. ALL DOWELS SHALL BE THE SAME SIZE AND SPACING AS THE BARS THAT ARE BEING DOWELED.

6. "L" REPRESENTS A TENSION SPLICE, AS NOTED IN THE FOLLOWING TABLE FOR EACH SPECIFIC REINFORCING BAR SIZE. AN UNDIMENSIONED BEND REPRESENTS A STANDARD HOOK. TENSION SPLICES ARE IN ACCORDANCE WITH ACI 318, BASED ON GRADE 60 STEEL REINFORCING AND 4500 PSI 28 DAY CONCRETE STRENGTH BUT ARE NOT TO BE LESS THAN THAT NOTED BELOW.

BAR SIZE	CONDITION OTHER	TOP	
3	18"	21"	TOP BARS ARE HORIZONTAL BARS
4	20"	24"	WITH MORE THAN 12 INCHES OF
5	24"	30"	CONCRETE CAST BELOW THE BAR
6	30"	36"	

7. REINFORCING DETAILS SHOWN REPRESENT MINIMUM REQUIREMENTS. ALTERNATE BUT EQUAL METHODS ARE ACCEPTABLE, BUT THEY SHALL NOT BE USED WITHOUT PRIOR APPROVAL BY THE ENGINEER. SEE SPECIFICATION SECTION 03200 "CONCRETE REINFORCEMENT" FOR SHOP DRAWING REQUIREMENTS.

8. REINFORCING BARS: BILLET STEEL, DEFORMED BARS TO COMPLY WITH ASTM A615, GRADE 60.

9. WELDED WIRE FABRIC: ASTM A1064.

10. ALL EXPOSED CORNERS SHALL HAVE 3/4 INCH CHAMFER.

11. NO CALCIUM CHLORIDE SHALL BE USED IN CONCRETE.

12. IF CONTRACTOR DESIRES TO INCREASE SLUMP ABOVE ALLOWABLE LIMITS INDICATED IN THE SPECIFICATION TO FACILITATE PLACEMENT OR PUMPING, THIS SHALL BE DONE UTILIZING AN APPROPRIATE APPROVED ADMIXTURE. NO WATER SHALL BE ADDED AT THE PROJECT SITE WITHOUT THE ENGINEER'S APPROVAL. ALL ADMIXTURES ARE TO BE SUBMITTED WITH THE CONCRETE MIX DESIGN AND ARE TO BE APPROVED PRIOR TO USE. CONCRETE WITH HIGH-RANGE WATER REDUCING ADMIXTURE SHALL HAVE A MAXIMUM SLUMP OF 3 INCHES PRIOR TO ADDING ADMIXTURE. THE CONTRACTOR, IN COLLABORATION WITH THE CONCRETE SUPPLIER, SHALL TAKE APPROPRIATE STEPS TO COMPENSATE FOR THE LOSS OF AIR-ENTRAINMENT DURING PUMPING.

13. WHERE NEW CONCRETE IS DEPOSITED AGAINST CONCRETE THAT IS GREATER THAN 28 DAYS OLD, THOROUGHLY CLEAN EXISTING SURFACE OF LAITANCE AND FOREIGN MATERIAL, AND APPLY BONDING AGENT FOLLOWING RECOMMENDATIONS OF MANUFACTURER.

14. ALL CONCRETE IS REINFORCED UNLESS SPECIFICALLY NOTED AS UNREINFORCED.

15. MECHANICAL SPLICES, EMBEDDED DOWELS WITH MECHANICAL SPLICES AND DOWEL BAR SUBSTITUTES, SHALL DEVELOP 125% OF THE SPECIFIED YIELD STRENGTH OF THE REINFORCING BAR PER ACI REQUIREMENTS. SPECIFIC USE SHALL BE APPROVED BY ENGINEER.

E. STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL MEET ASTM A992, GRADE 50, EXCEPT ANGLES AND PLATES SHALL MEET ASTM A572 GRADE 50.
HSS SECTIONS SHALL MEET ASTM A500, GRADE C, Fy = 50 KSI.
STAINLESS STEEL : TO ASTM A276, TYPE 304, CLASS A
ANCHOR RODS : SHALL CONFORM TO ASTM F1554, GRADE 36.
BOLTS, NUTS, AND WASHERS: TO ASTM A325, A563 AND A436 RESPECTIVELY.

2. WELDING: AWS STANDARDS AND SPECIFICATIONS.

3. GROUT UNDER COLUMN BASE PLATES WITH 1 1/2 INCH MINIMUM NON-SHRINK GROUT, UNLESS OTHERWISE NOTED.

4. ALL METALS ARE TO BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123.

F. GALVANIZED STEEL GRATING

1. GRATING IS TO BE 1 1/4 INCH MINIMUM, GALVANIZED STEEL GRATING.

2. BEARING BARS: 1 1/4 INCH HIGH X 3/16 INCH WIDE BEARING BARS MINIMUM AND SPACED AT 1 3/16 INCH C/C MINIMUM.

3. MAXIMUM GRATING DEFLECTION IS NOT TO EXCEED 1/4 INCH.

4. ALL GRATING IS TO BE ANCHORED TO SUPPORTING ELEMENTS.

SPECIAL INSPECTIONS AND TESTS

THE FOLLOWING ITEMS SHALL BE SUBJECT TO SPECIAL INSPECTIONS AS OUTLINED IN CHAPTER 17 OF THE 2024 OHIO BUILDING CODE (OBC):

1. STEEL CONSTRUCTION PER OBC 1705.2 AND REQUIREMENTS OF AISC 360 (QA)
a. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS.

2. CONCRETE CONSTRUCTION PER OBC 1705.3
a. INSPECT REINFORCEMENT AND VERIFY PLACEMENT. (PERIODIC)
b. INSPECT ANCHORS CAST IN CONCRETE. (PERIODIC)
c. VERIFY USE OF REQUIRED DESIGN MIX. (CONTINUOUS)
d. PERFORM STRENGTH TESTS, SLUMP AND AIR CONTENT TESTS, AND DETERMINE TEMPERATURE OF CONCRETE. (CONTINUOUS)
e. INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES. (CONTINUOUS)
f. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES. (PERIODIC)
g. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED. (PERIODIC)

3. SOILS PER OBC 1705.6
a. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY. (PERIODIC)
b. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL. (PERIODIC)

4. CONTRACTOR TO PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND INCIDENTALS AS REQUIRED TO COOPERATE WITH INDIVIDUAL SPECIAL INSPECTORS AND TESTING AGENCIES EMPLOYED BY THE OWNER TO FACILITATE SPECIAL INSPECTIONS.

5. CONTRACTOR TO NOTIFY SPECIAL INSPECTION LABORATORY AT LEAST 48 HOURS PRIOR TO START OF WORK.

6. STRUCTURAL OBSERVATIONS PER OBC 1704.6.1
a. WELL PLATFORMS ARE CLASSIFIED RISK CATEGORY III, REQUIRING STRUCTURAL OBSERVATIONS BY A REGISTERED DESIGN PROFESSIONAL.
b. THE STRUCTURAL OBSERVER SHALL VISUALLY OBSERVE REPRESENTATIVE LOCATIONS OF STRUCTURAL SYSTEMS, DETAILS AND LOAD PATHS FOR GENERAL CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS.

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BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JCB				
	APPROVED BY	JRB				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

STRUCTURAL GENERAL NOTES

SHEET NO. **1S1**
PAGE NO. 4

EXISTING SITE PLAN

SCALE: 1" = 80'

0 40 80 160 FT

1"=80'

GENERAL NOTES:

1. CONTRACTOR TO PROTECT EXISTING MONITORING WELLS FROM DAMAGE.
2. ACCESS TO THE SITE SHALL BE FROM THE ODNR'S LITTLE MIAMI SCENIC PATHWAY WITH ENTRY FROM 342 RAILROAD STREET, SOUTH LEBANON.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MOVEMENT ALL EQUIPMENT, MATERIALS, AND SUPPLIES ON AND OFF THE SITE, AS REQUIRED, AND SHALL TAKE ALL NECESSARY MEASURES TO MINIMIZE DAMAGE TO THE PROPERTY. CONTRACTOR SHALL TAKE PRECAUTIONS TO NOT DAMAGE THE APPROXIMATELY 6,500 FEET OF PAVED TRAIL THAT LEADS TO THE WELLFIELD AND SHALL COORDINATE ALL EQUIPMENT AND MATERIAL TRANSPORT WITH THE ODNR PARK MANAGER, TIFFANY DECHANT-HART(937-382-1096). CONTRACTOR SHALL COORDINATE ALL WORK WITH ODNR A MINIMUM TWO WEEKS PRIOR TO MOBILIZING EQUIPMENT. TRAIL CLOSURES WILL NOT BE PERMITTED. ANY AND ALL DAMAGE CAUSED TO THE TRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.
4. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS REQUIRED TO REDUCE THE POTENTIAL FOR PROPERTY DAMAGE AND INJURIES. IF NECESSARY, THE CONTRACTOR SHALL PROVIDE FLAGGERS, SIGNAGE, EXTRA PERSONNEL, TEMPORARY FENCING, ETC AS REQUIRED TO SAFELY MOBILIZE AND DEMOBILIZE EQUIPMENT AND MATERIALS TO THE SITE.
5. ALL EQUIPMENT, MATERIALS, JOB TRAILERS, VEHICLES (INCLUDING EMPLOYEE AND VENDORS) AND PROJECT ITEMS SHALL BE LOCATED OUTSIDE OF VIEW FROM THE LITTLE MIAMI SCENIC PATHWAY.

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E-79180
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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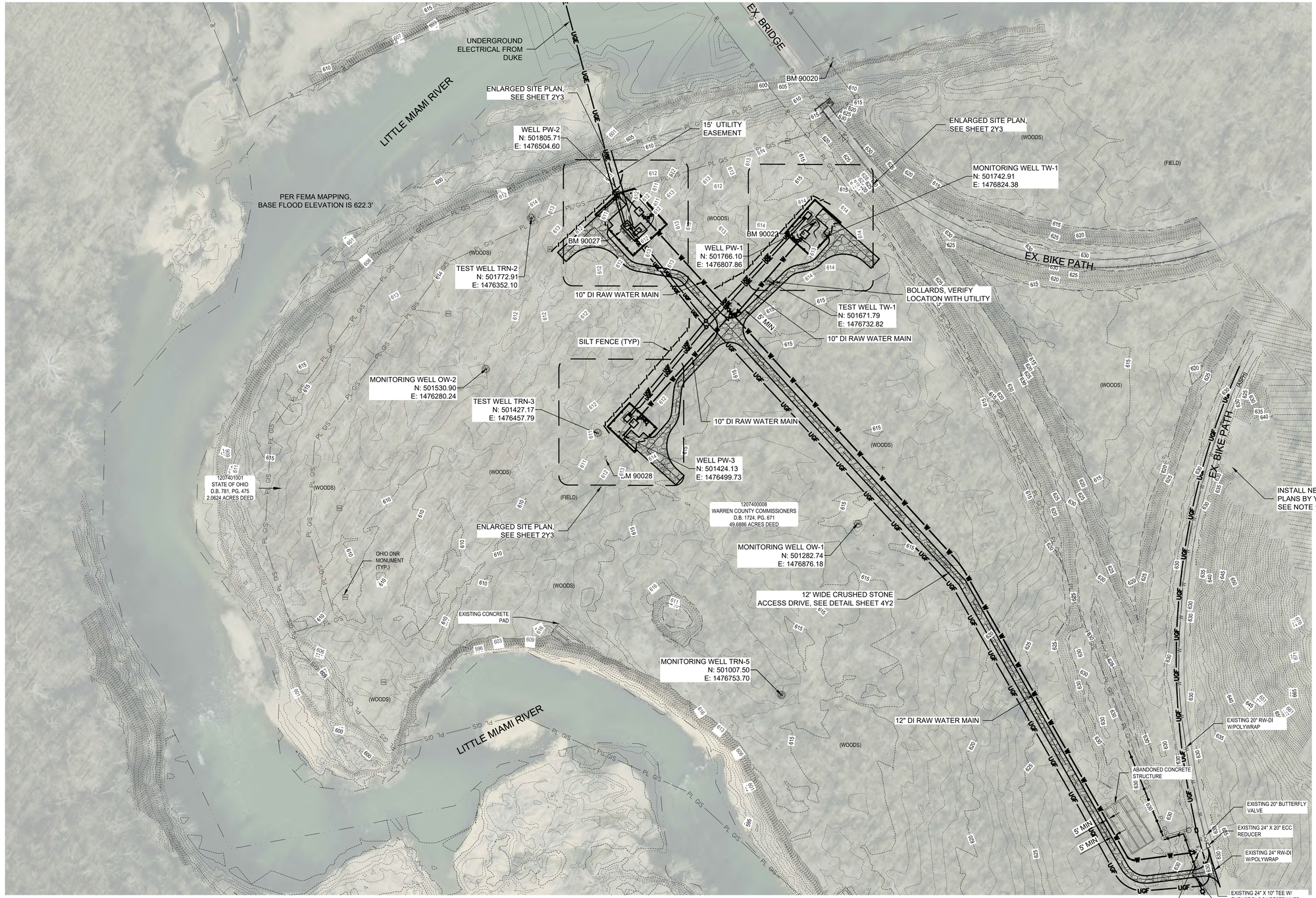
EXISTING SITE PLAN

SHEET NO. 2Y1

PAGE NO. 5



SITE IMPROVEMENTS PLAN

SCALE: 1" = 80'

GENERAL NOTES:

1. FIBER LINE ROUTE IS APPROXIMATE. DESIGN AND ACTUAL LOCATION OF THE FIBER ROUTE IS SHOWN ON YATES CONSTRUCTION PLANS.

LEGEND

SILT FENCE

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E-79180
REGISTERED PROFESSIONAL ENGINEER
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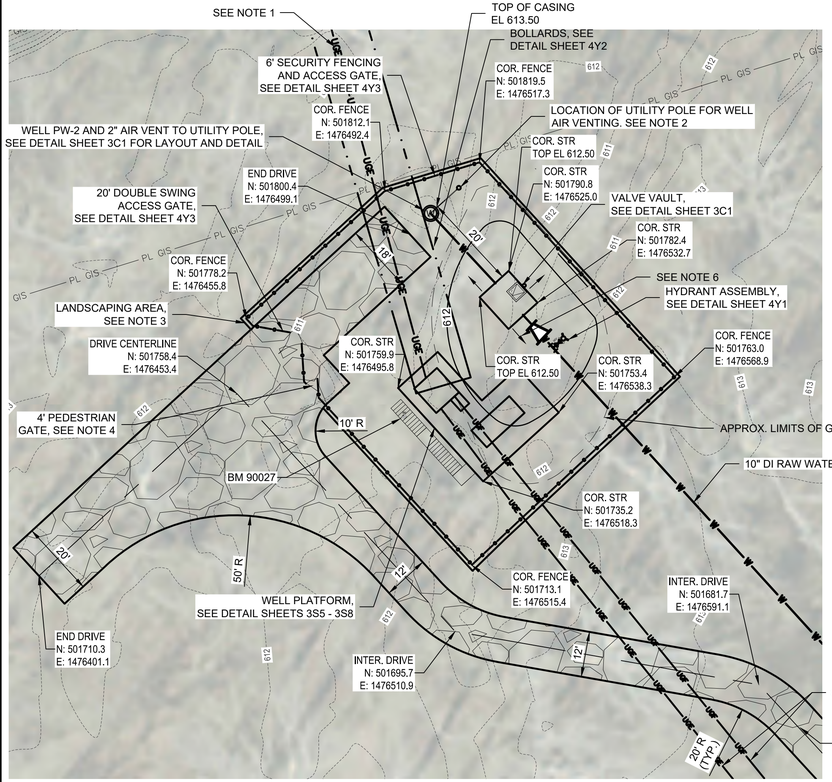
SITE IMPROVEMENT PLAN

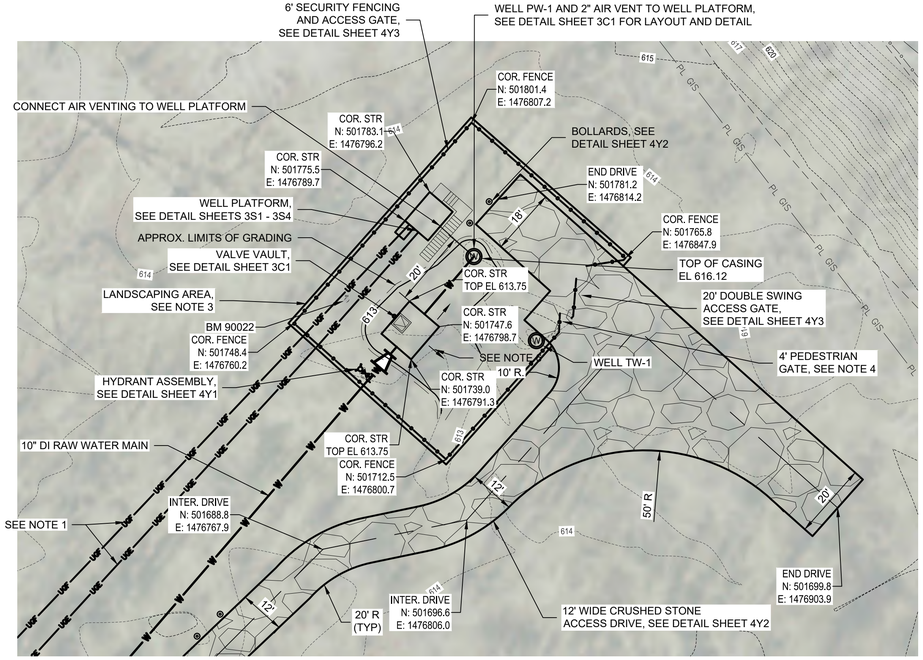
SHEET NO.
2Y2

PAGE NO.
6



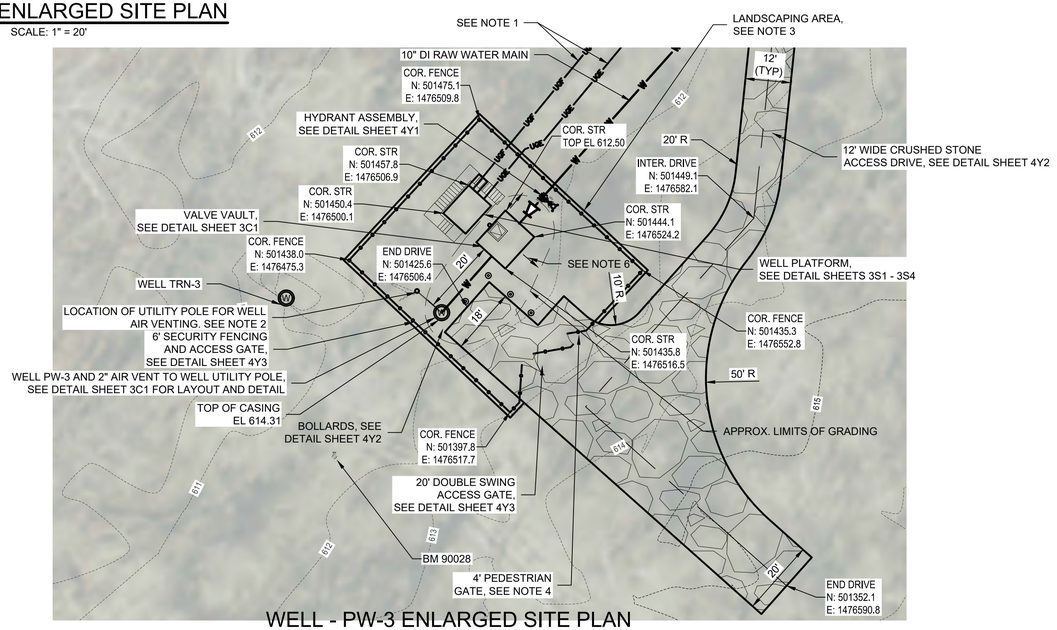
WELL PW-2 ENLARGED SITE PLAN

SCALE: 1" = 20'



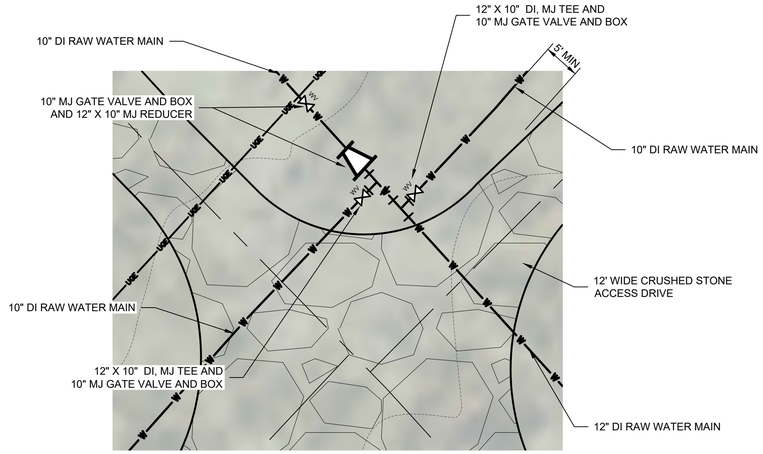
WELL - PW-1 ENLARGED SITE PLAN

SCALE: 1" = 20'



WELL - PW-3 ENLARGED SITE PLAN

SCALE: 1" = 20'



WATER MAIN INTERSECTION PLAN

SCALE: 1" = 10'

0 40 80 160 FT

1"=80'

GENERAL NOTES:

1. SEE ELECTRICAL SHEETS FOR LOCATION OF NEW UTILITY LINES AND EQUIPMENT.
2. CONNECT WELL AIR VENTING TO UTILITY POLE PER OWNER RECOMMENDATIONS. AIR VENTING SHALL EXTEND A MINIMUM OF 3' ABOVE 100 YEAR FLOOD ELEVATION. TOP OF AIR VENT AT APPROX. EL 622.3.
3. LANDSCAPING AREA. EXTEND 18" PAST SECURITY FENCING, SEE SPECIFICATIONS.
4. VERIFY LOCATION OF PEDESTRIAN GATE WITH OWNER PRIOR TO INSTALLATION.
5. GRADING AROUND THE NEW WELL PLATFORMS ARE TO PROVIDE POSITIVE SLOPE AWAY FROM PLATFORM AREA. REFER TO PROFILE SHEETS.
6. SLOPE WITH POSITIVE DRAINAGE TO MEET EXISTING GROUND. APPROX. 5% SLOPE.
7. A CONCRETE SLAB MUST BE PROVIDED AT FINAL GRADE AROUND ALL MAIN VALVE BOXES. THE SLABS MUST BE EIGHTEEN INCHES (18") SQUARE/CIRCLE AND 9 INCHES (9") THICK. PRE-FABRICATED CONCRETE RINGS ARE ACCEPTABLE.
8. MOUNT ALUMINUM SIGN TO PERIMETER FENCE AT EACH WELL STATING "NO TRESPASSING BY ORDER OF THE WARREN COUNTY COMMISSIONERS, VIOLATORS WILL BE PROSECUTED" AND "WARNING THIS AREA IS UNDER VIDEO SURVEILLANCE VIOLATORS WILL BE PROSECUTED".

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RYAN KENT BRAUEN
E-79180
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

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WELL SITES - ENLARGED SITE PLANS

SHEET NO.
2Y3

PAGE NO.
7

GEOMETRY PLAN

SCALE: 1" = 80'

0 40 80 160 FT

1"=80'

GENERAL NOTES:

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN OR AS DETERMINED NECESSARY BY CONTRACTOR TO PROVIDE ADEQUATE CONTROL FOR THE CONSTRUCTION AREA.
2. SITE GRADING AT WELL PLATFORMS IS ON SHEET 2Y3.

LEGEND

- CRUSHED STONE DRIVE
- CW — CONCRETE WASHOUT
- SILT FENCE

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E-79180
REGISTERED PROFESSIONAL ENGINEER
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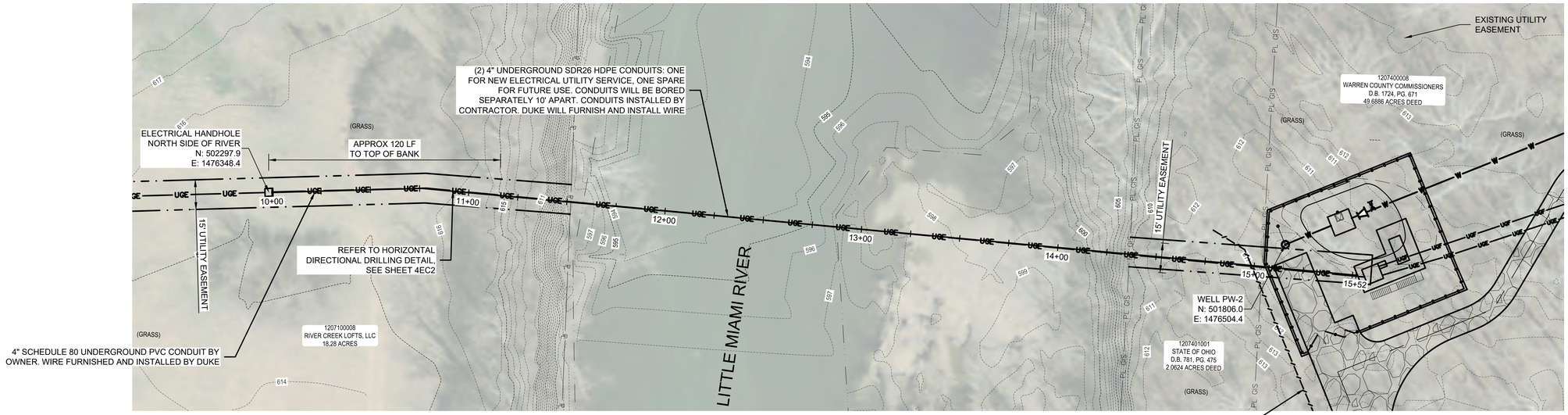
SITE ACCESS PLAN

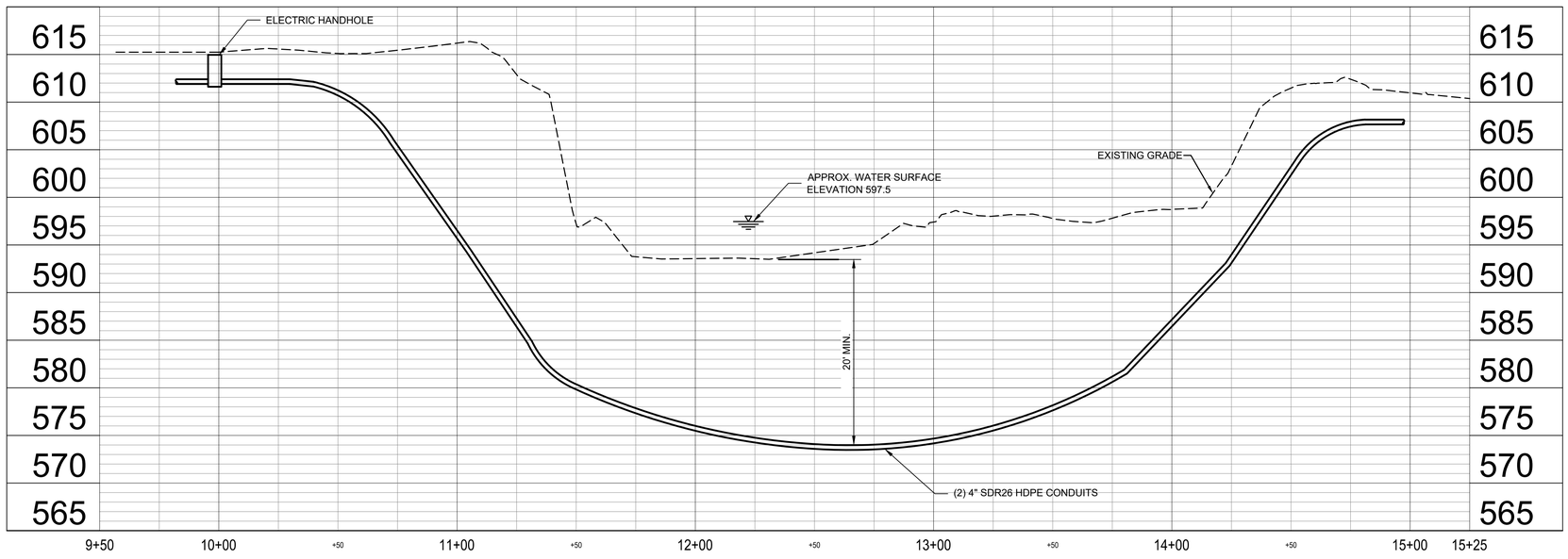
SHEET NO. 2Y4

PAGE NO. 8



PLAN - LITTLE MIAMI RIVER

SCALE: 1" = 30'



PROFILE - LITTLE MIAMI RIVER

HORIZ SCALE: 1" = 30'
VERT SCALE: 1" = 5'

GENERAL NOTES:

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN OR AS DETERMINED NECESSARY BY CONTRACTOR TO PROVIDE ADEQUATE CONTROL FOR THE CONSTRUCTION AREA.

0 15 30 60 FT
1" = 30'

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E-79180
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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LITTLE MIAMI RIVER CROSSING

SHEET NO.
2Y5
PAGE NO.
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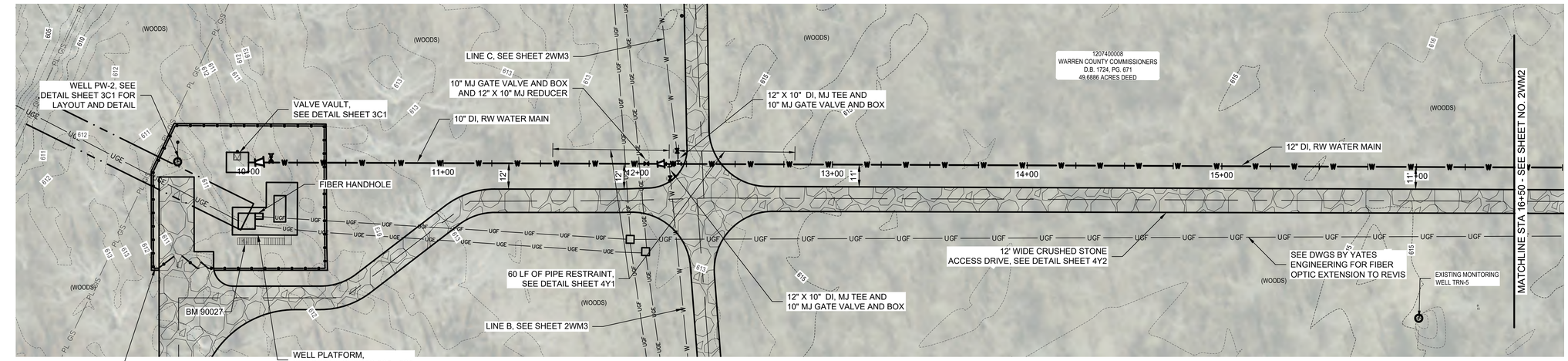
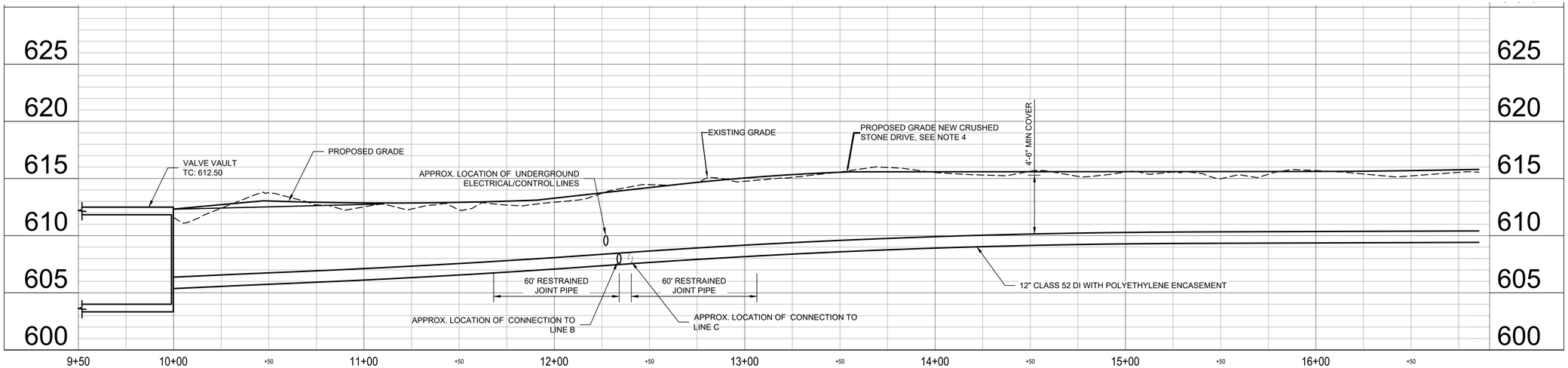


PLAN - LINE A

SCALE: 1" = 30'



PROFILE - LINE A

HORIZ SCALE: 1" = 30'
VERT SCALE: 1" = 5'

GENERAL NOTES:

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN OR AS DETERMINED NECESSARY BY CONTRACTOR TO PROVIDE ADEQUATE CONTROL FOR THE CONSTRUCTION AREA.
2. NEW CRUSHED STONE DRIVE TO HAVE POSITIVE DRAINAGE.

0 15 30 60 FT
1" = 30'

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E-79180
REGISTERED PROFESSIONAL ENGINEER
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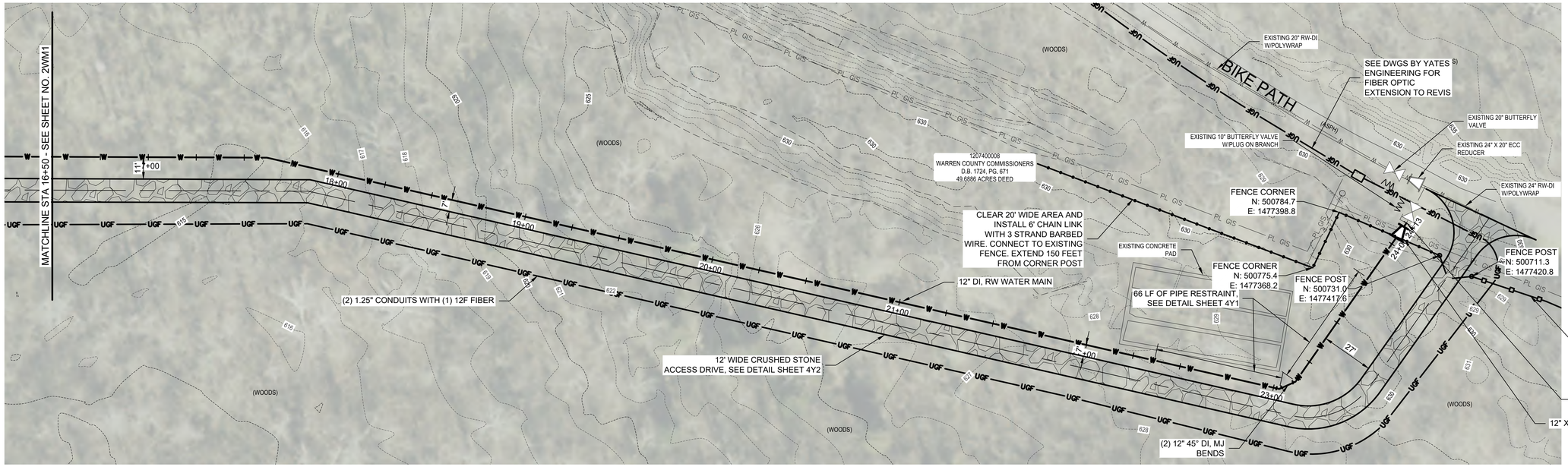
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

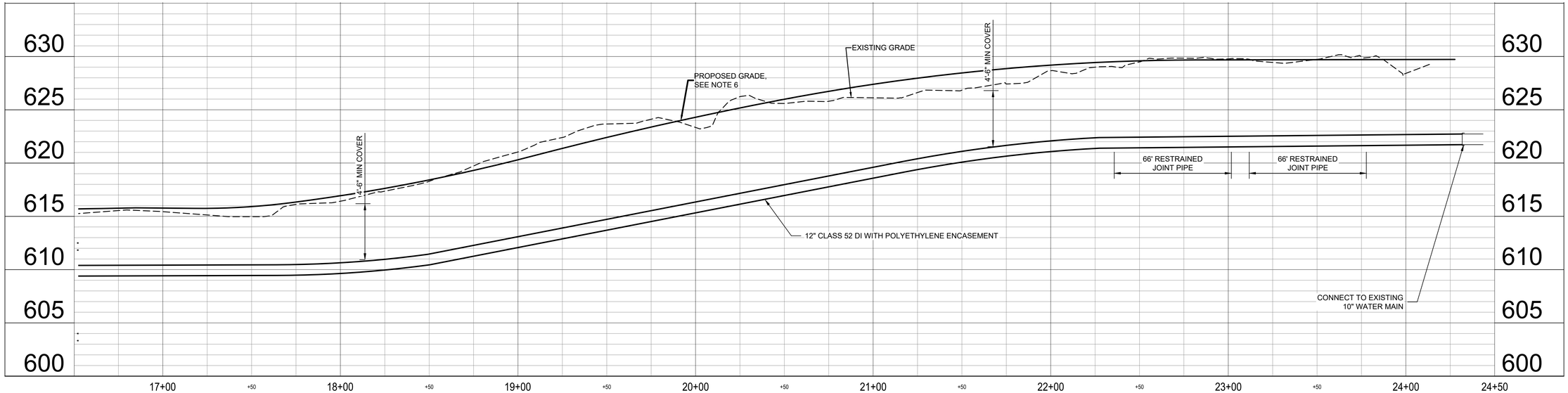
PLAN AND PROFILE - LINE A

SHEET NO.
2WM1
PAGE NO.
10



PLAN - LINE A

SCALE: 1" = 30'



PROFILE - LINE A

HORIZ SCALE: 1" = 30'

VERT SCALE: 1" = 5'

GENERAL NOTES:

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN OR AS DETERMINED NECESSARY BY CONTRACTOR TO PROVIDE ADEQUATE CONTROL FOR THE CONSTRUCTION AREA.
2. CONTRACTOR TO REPAIR AND REINSTATE ANY DAMAGED FIELD TILE WITHIN 24 HOURS OF OCCURRENCE.
3. REMOVE EXISTING CAP AND CONNECT TO EXISTING 10" WATER MAIN. COORDINATE WITH OWNER TO OPEN AND CLOSE EXISTING VALVE AS NEEDED TO MAKE CONNECTION.
4. VERIFY LOCATION OF NEW WATER MAINS AND APPURTENANCES WITH OWNER PRIOR TO CONSTRUCTION.
5. NEW CRUSHED STONE DRIVE TO HAVE POSITIVE DRAINAGE.
6. CONTRACTOR TO VERIFY FENCE LOCATION WITH OWNER.

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NO.	DATE	INITIALS	REVISION DESCRIPTIONS

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E-79180
REGISTERED PROFESSIONAL ENGINEER
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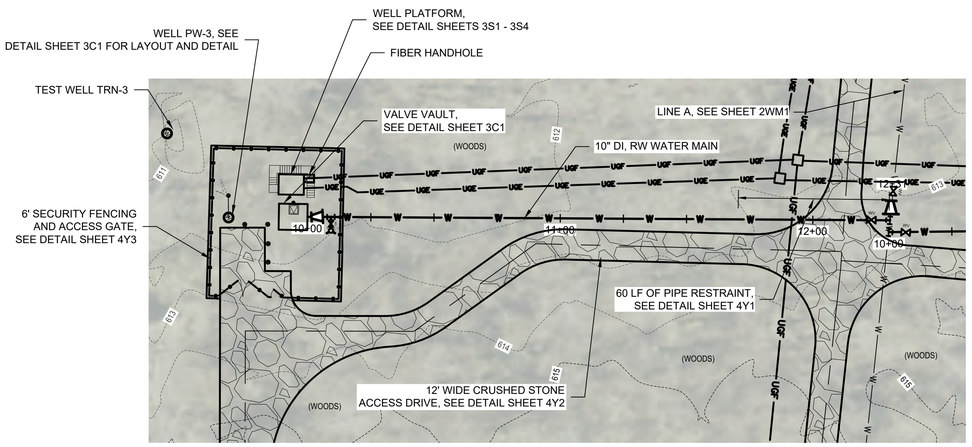
WARREN COUNTY, OH

PLAN AND PROFILE - LINE A

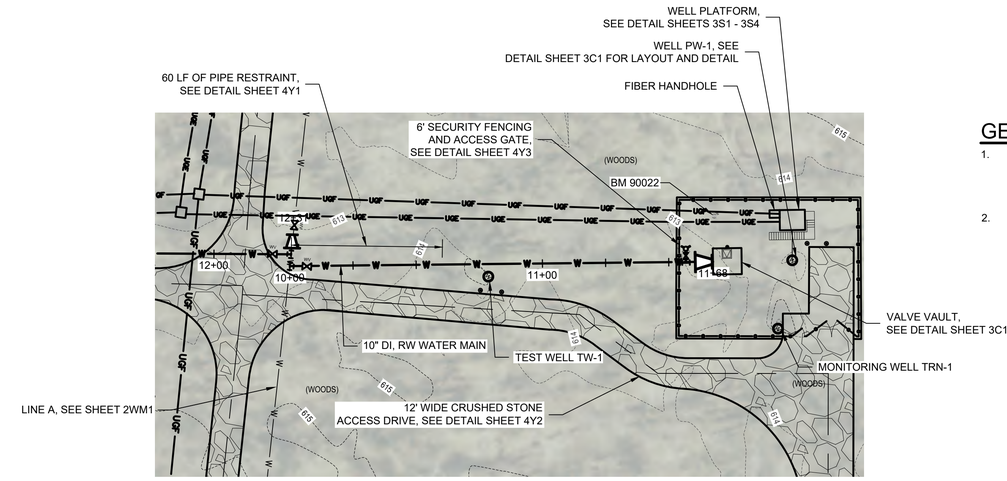
SHEET NO. **2WM2**

PAGE NO. 11



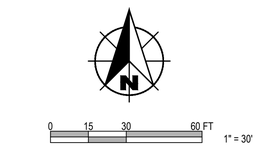
PLAN - LINE B

SCALE: 1" = 30'



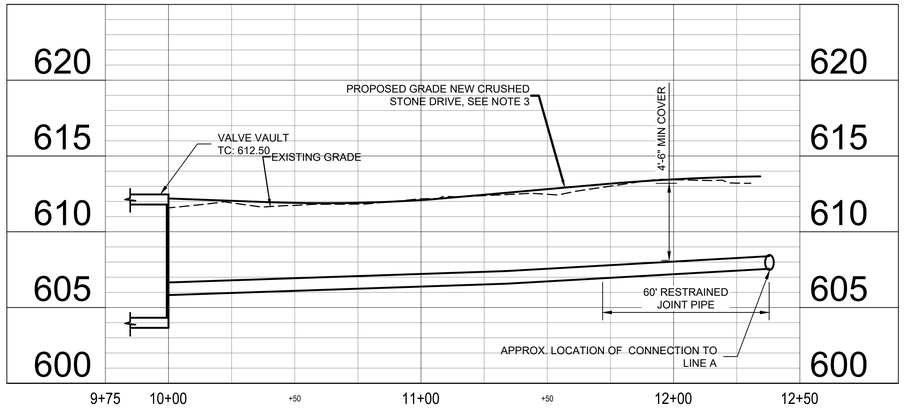
PLAN - LINE C

SCALE: 1" = 30'



GENERAL NOTES:

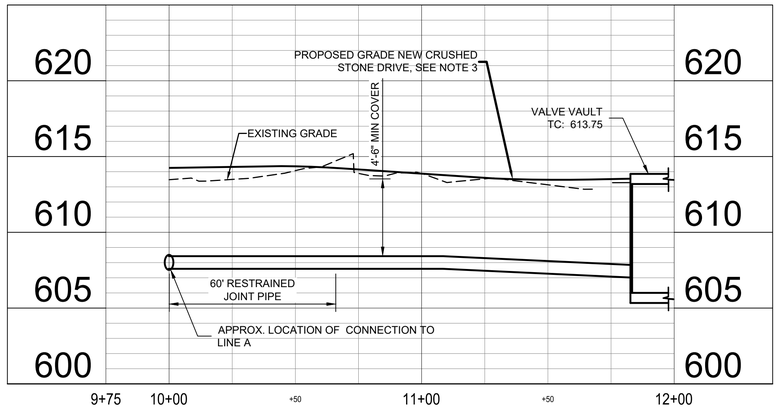
1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN OR AS DETERMINED NECESSARY BY CONTRACTOR TO PROVIDE ADEQUATE CONTROL FOR THE CONSTRUCTION AREA.
2. NEW CRUSHED STONE DRIVE TO HAVE POSITIVE DRAINAGE



PROFILE - LINE B

HORIZ SCALE: 1" = 30'

VERT SCALE: 1" = 5'



PROFILE - LINE C

HORIZ SCALE: 1" = 30'

VERT SCALE: 1" = 5'

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	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
RYAN KENT BRAUEN
E-79180
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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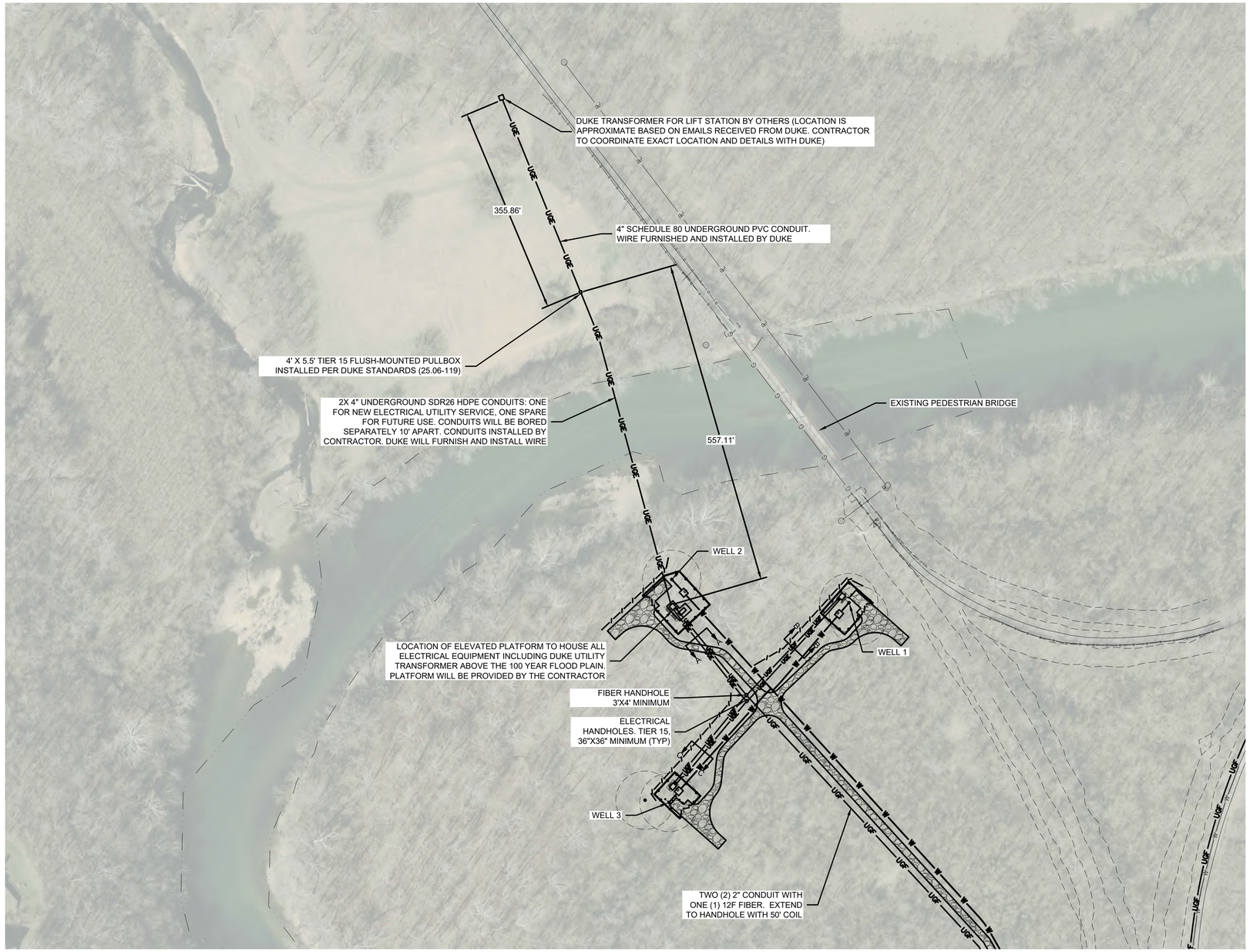
PLAN AND PROFILE - LINES B AND C

SHEET NO.
2WM3

PAGE NO.
12



WELL SITE
SCALE: 1" = 100'

N

50 100 200 FT
1"=100'

LEGEND

UGE — UNDERGROUND ELECTRICAL

UGF — UNDERGROUND FIBER

GENERAL NOTES:

1. A COPY OF THE DEPARTMENT OF THE ARMY, NATIONWIDE PERMIT LRH-2024-00908-LMR SHALL BE AT THE SITE DURING CONSTRUCTION ACROSS LITTLE MIAMI RIVER.
2. HORIZONTAL DIRECTIONAL DRILLING SHALL BE PERFORMED DURING LOW FLOW CONDITIONS TO THE GREATEST EXTENT PRACTICABLE.
3. REGRADING, SEEDING, AND RESTORATION SHALL OCCUR WITHIN 14 DAYS OF BORE COMPLETION.
4. REMOVAL OF TREES GREATER THAN 3 INCHES FOR THE RIVER CROSSING WORK SHALL BE CUT BETWEEN OCTOBER 1 AND MARCH 31.
5. IMMEDIATELY STOP ALL WORK AND PERFORM REMEDIATION OF INADVERTENT RETURNS OF DRILLING FLUIDS TO WATERS OF THE UNITED STATES THROUGH SUB-SOIL FISSURES OR FRACTURES THAT MIGHT OCCUR DURING HORIZONTAL DIRECTIONAL DRILLING ACTIVITIES. THESE REMEDIATION ACTIVITIES MUST BE DONE AS SOON AS PRACTICABLE TO RESTORE THE AFFECTED WATERBODY.
6. PRIOR TO THE START OF ANY WORK, PREPARE AND SUBMIT FOR APPROVAL A REMEDIATION PLAN FOR ADDRESSING INADVERTENT RETURNS OF DRILLING FLUIDS TO WATERS OF THE UNITED STATES DURING HORIZONTAL DIRECTIONAL DRILLING ACTIVITIES.

DUCT	FROM	TO	POWER	FIBER	SPARE
A	WELL 2	HANDHOLE	2 - 3"C (VFDs) AND 2 - 1.5"C (MPZs)	3 - 2"C	1 - 3"C
B	HANDHOLE	WELL 3	1 - 3"C (VFD) AND 1 - 1.5"C (MPZ)	1 - 2"C	1 - 3"C
C	HANDHOLE	WELL 1	1 - 3"C (VFD) AND 1 - 1.5"C (MPZ)	1 - 2"C	1 - 3"C

DUCT BANK SCHEDULE
SCALE: NO SCALE

SCALE VERIFICATION	DRAWN BY	JLK	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JLK				
	APPROVED BY	WCM				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO — WAYNE C. MOORE E-70068 — REGISTERED PROFESSIONAL ENGINEER — 05/19/2025

WESSLER ENGINEERING
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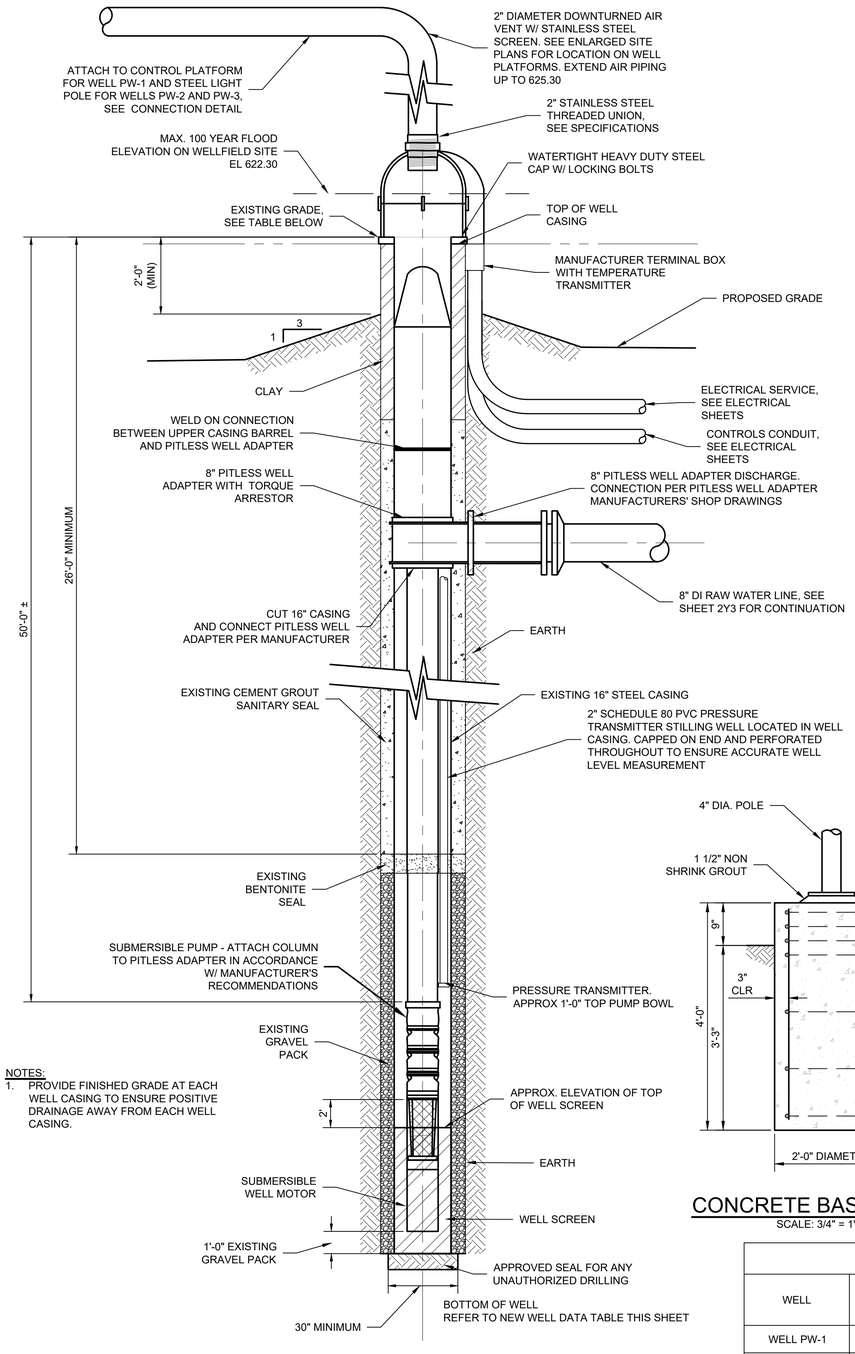
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

ELECTRICAL SITE PLAN

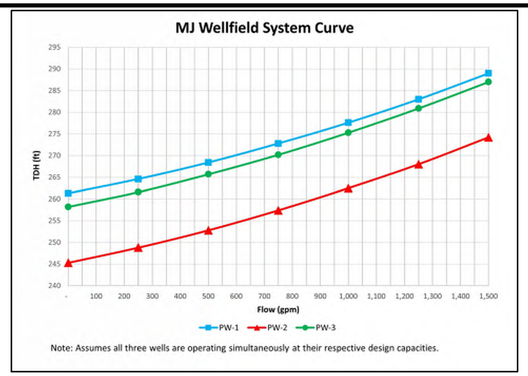
SHEET NO.
2E1

PAGE NO.
13

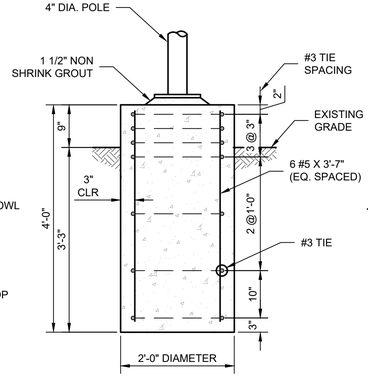


NOTES:
1. PROVIDE FINISHED GRADE AT EACH WELL CASING TO ENSURE POSITIVE DRAINAGE AWAY FROM EACH WELL CASING.

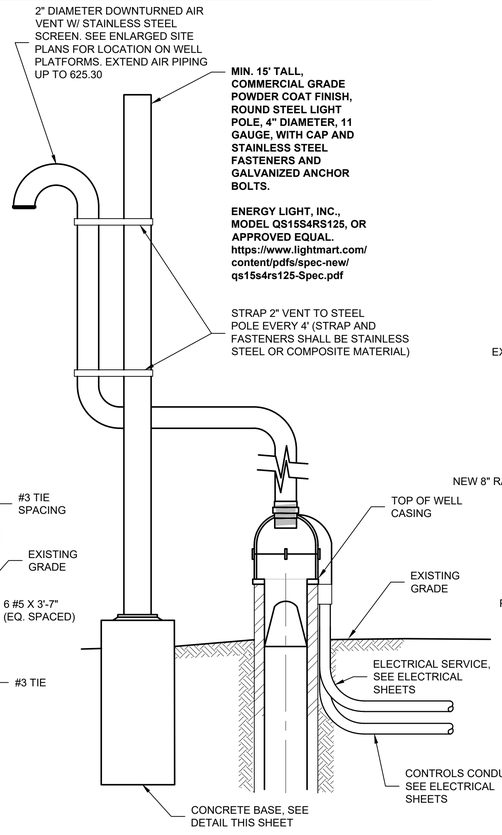
TYPICAL WELL DETAIL
SCALE: NONE



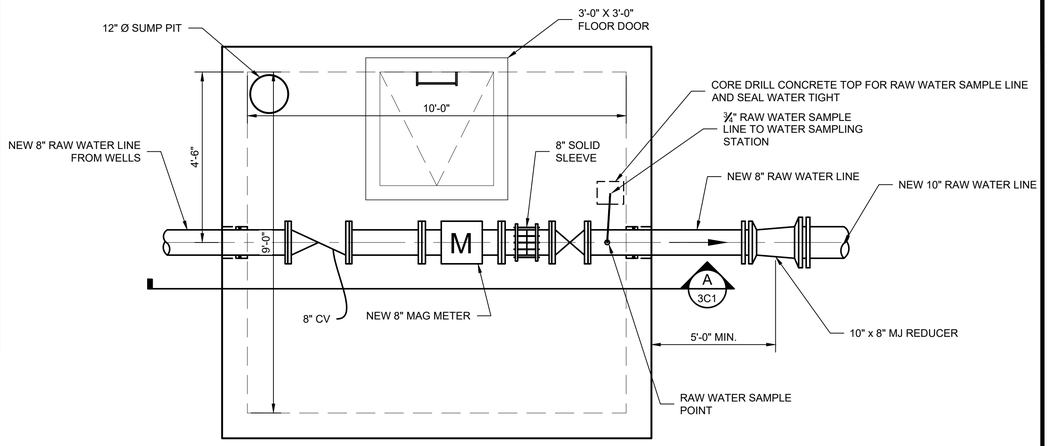
Note: Assumes all three wells are operating simultaneously at their respective design capacities.



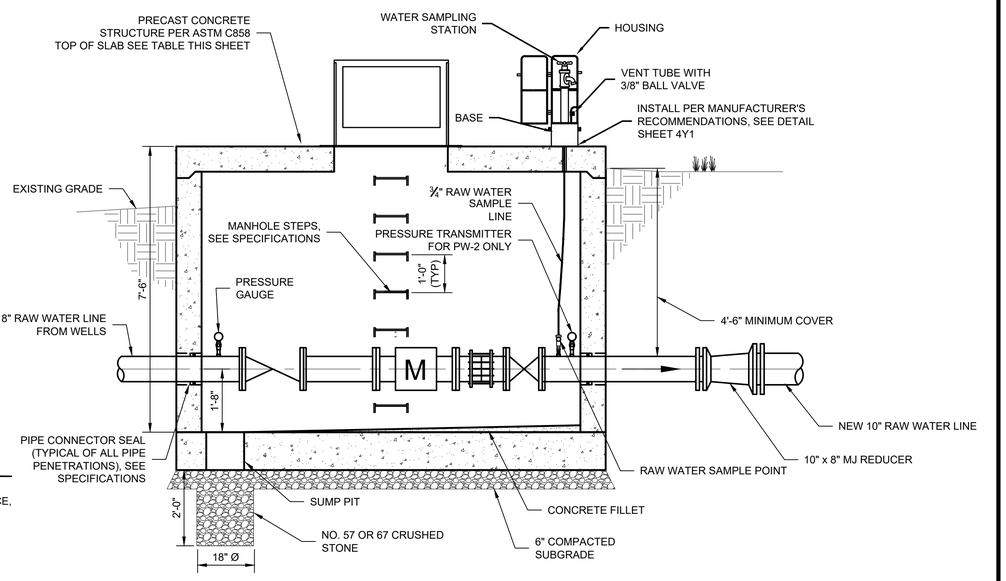
CONCRETE BASE DETAIL
SCALE: 3/4" = 1'-0"



CONNECTION DETAIL
SCALE: NONE



WATER METER VAULT PLAN
0 1 2 4 FT
1/2"=1'-0"



SECTION A 3C1
SCALE:
0 1 2 4 FT
1/2"=1'-0"

TYPICAL WATER METER VAULT LAYOUT

NEW WELL DATA TABLE								
WELL	GROUT DEPTH BELOW FINISHED GRADE	GRAVEL PACK DEPTH BELOW FINISHED GRADE	SCREEN LENGTH	EXISTING GRADE AT WELL	TOP OF CASING	PUMP SETTING DEPTH BELOW FINISHED GRADE	DEPTH OF NEW WELL BELOW FINISHED GRADE	CASING DIAMETER
WELL PW-1	0' - 58'	60' - 90'	20'	613.1'	616.12'	68.1'	90'	16"
WELL PW-2	5' - 30'	45' - 71'	20'	610.5'	613.50'	50'	71'	16"
WELL PW-3	0' - 54.5'	55' - 85'	20'	611.3'	614.31'	63'	85'	16"

METER VAULT TABLE		
WELL NO.	PROPOSED GRADE AT WELL	TOP OF SLAB
WELL PW-1	613.1'	613.75'
WELL PW-2	610.5'	612.50'
WELL PW-3	611.3'	612.50'

SCALE VERIFICATION	DRAWN BY	DMG
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS
	APPROVED BY	RKB
	ISSUE DATE	MAY 2025
	PROJECT NUMBER	705524-04-001

NO.	DATE	INITIALS	REVISION DESCRIPTIONS

STATE OF OHIO
RYAN KENT BRAUEN
E-79180
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

WESSLER ENGINEERING
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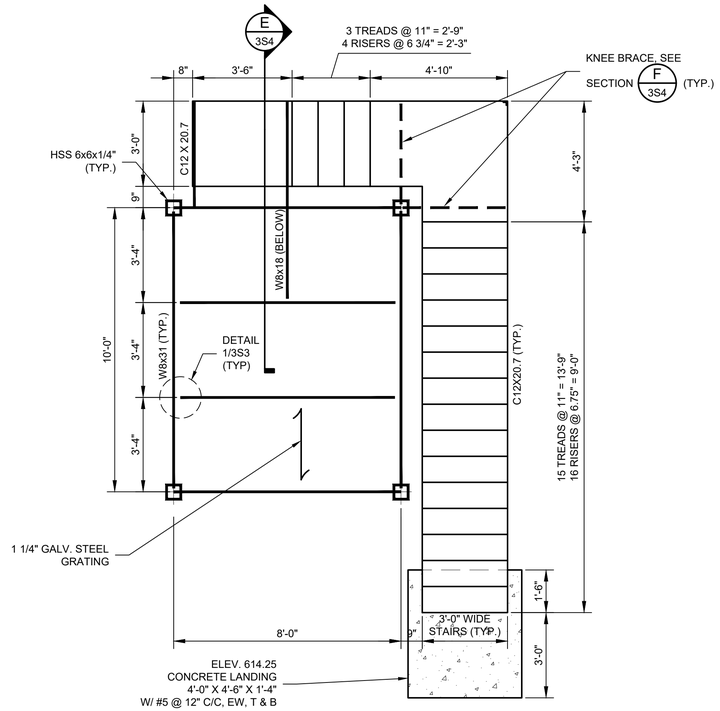
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

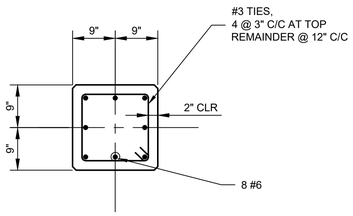
WELL PLAN, VALVE VAULT PLAN, AND SECTION VIEW

SHEET NO.
3C1
PAGE NO.
14



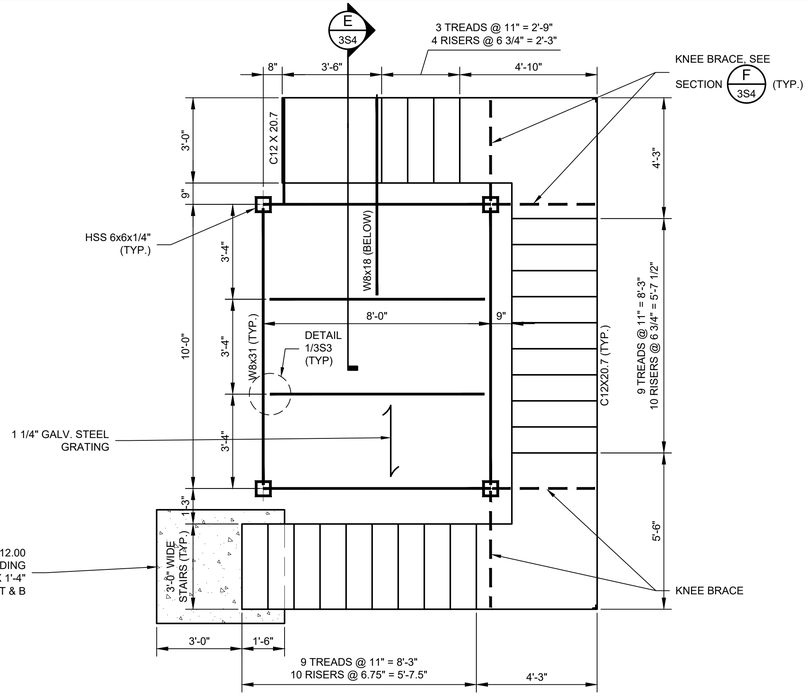
WELL NO. 1 - FRAMING PLAN

SCALE: 3/8" = 1' - 0"



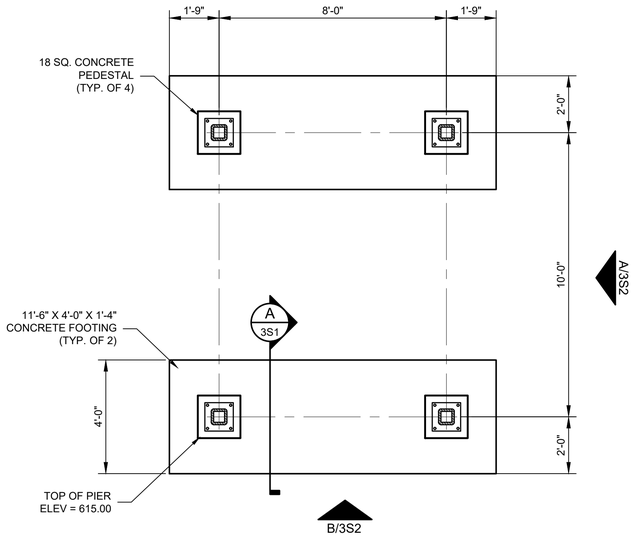
TYPICAL PEDESTAL

SCALE: 3/4" = 1' - 0"



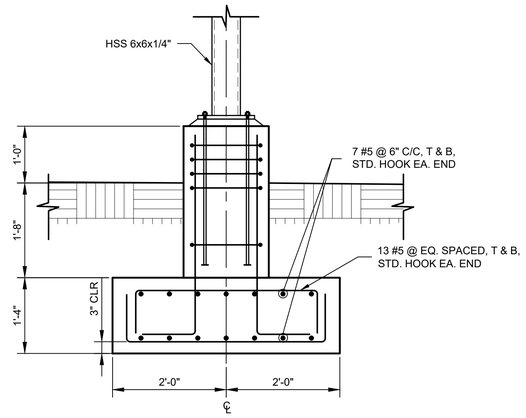
WELL NO. 3 - FRAMING PLAN

SCALE: 3/8" = 1' - 0"



WELL NO. 1 - FOUNDATION PLAN

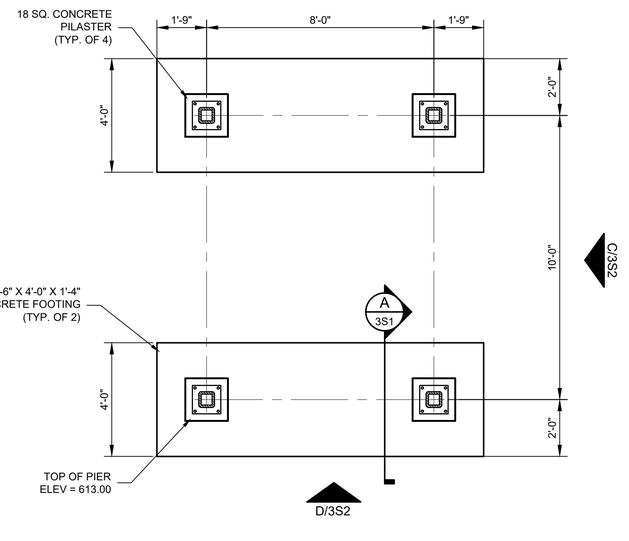
SCALE: 3/8" = 1' - 0"



SECTION

SCALE: 3/4" = 1'-0"

A 3S1



WELL NO. 3 - FOUNDATION PLAN

SCALE: 3/8" = 1' - 0"

SCALE VERIFICATION	DRAWN BY	CLG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB				
	APPROVED BY	JCB				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

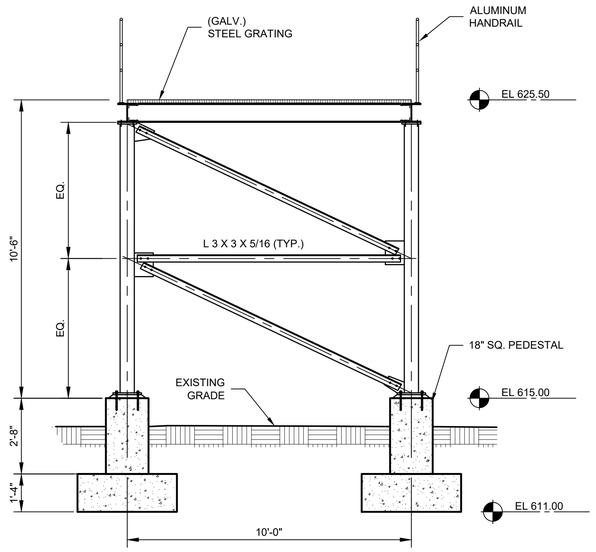
WELLS NO. 1 AND 3 PLATFORMS
FOUNDATION PLANS AND FRAMING PLANS

SHEET NO.
3S1

PAGE NO.
15

PROVIDE 1/2" DIA. DRAIN HOLES AT BASE OF COLUMNS

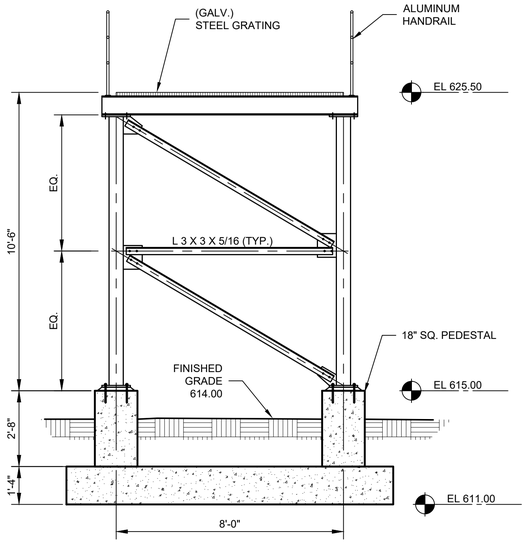
ALL METALS ARE TO BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123



ELEVATION A

SCALE: 3/8" = 1'-0"

(TYP. OF TWO)



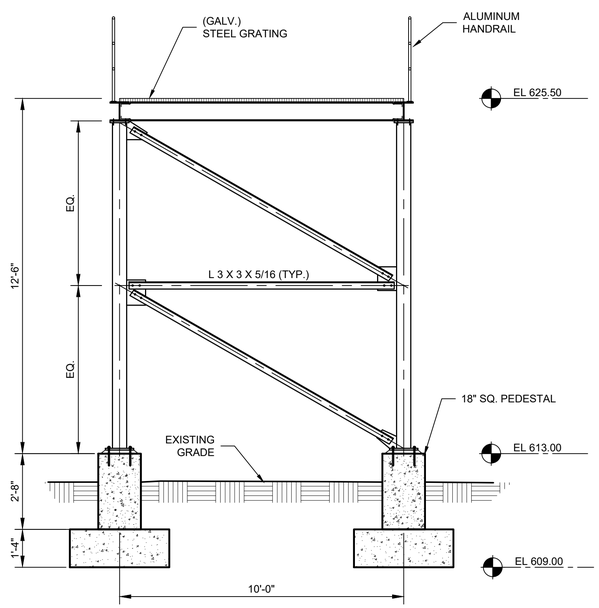
ELEVATION B

SCALE: 3/8" = 1'-0"

(TYP. OF TWO)

WELL PLATFORM NO. 1

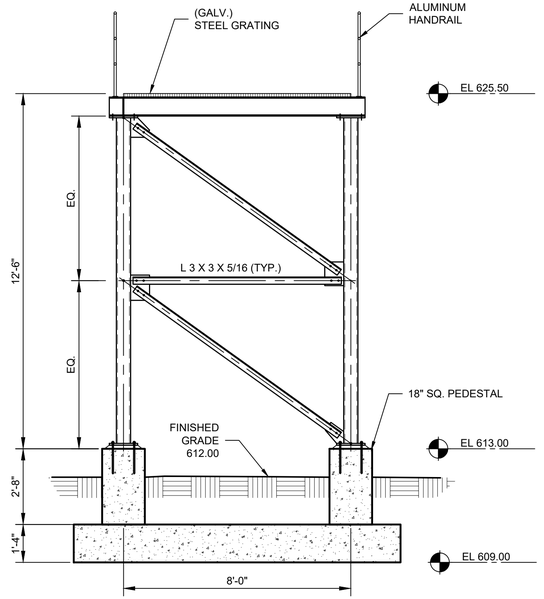
SCALE: 3/8" = 1' - 0"



ELEVATION C

SCALE: 3/8" = 1'-0"

(TYP. OF TWO)



ELEVATION D

SCALE: 3/8" = 1'-0"

(TYP. OF TWO)

WELL PLATFORM NO. 3

SCALE: 3/8" = 1' - 0"

SCALE VERIFICATION	DRAWN BY	CLG
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB
	APPROVED BY	JCB
	ISSUE DATE	MAY 2025
	PROJECT NUMBER	705524-04-001

NO.	DATE	INITIALS	REVISION DESCRIPTIONS

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

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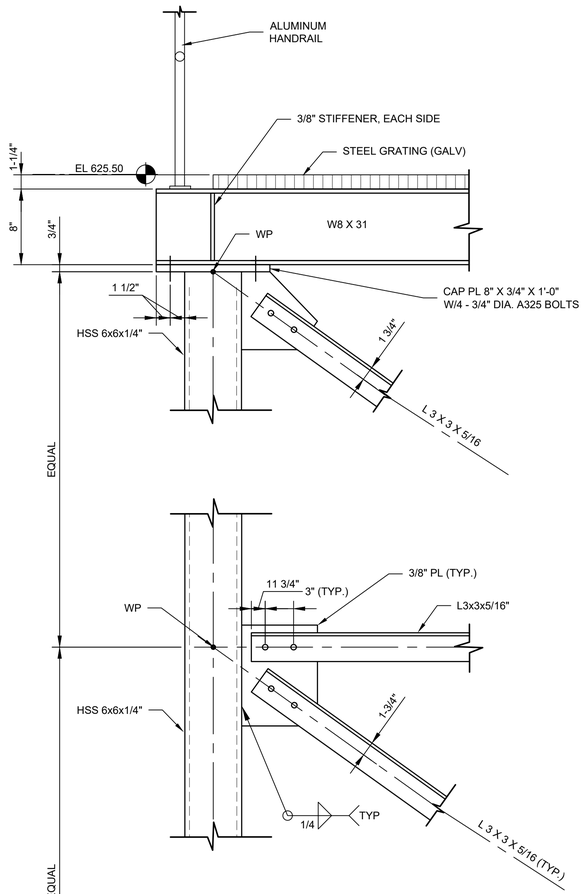
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

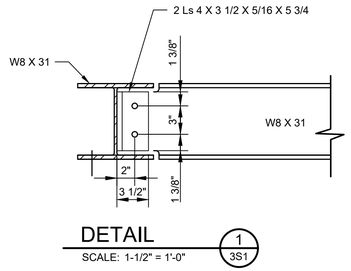
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELLS NO. 1 AND 3 PLATFORMS ELEVATIONS

SHEET NO.
3S2

PAGE NO.
16



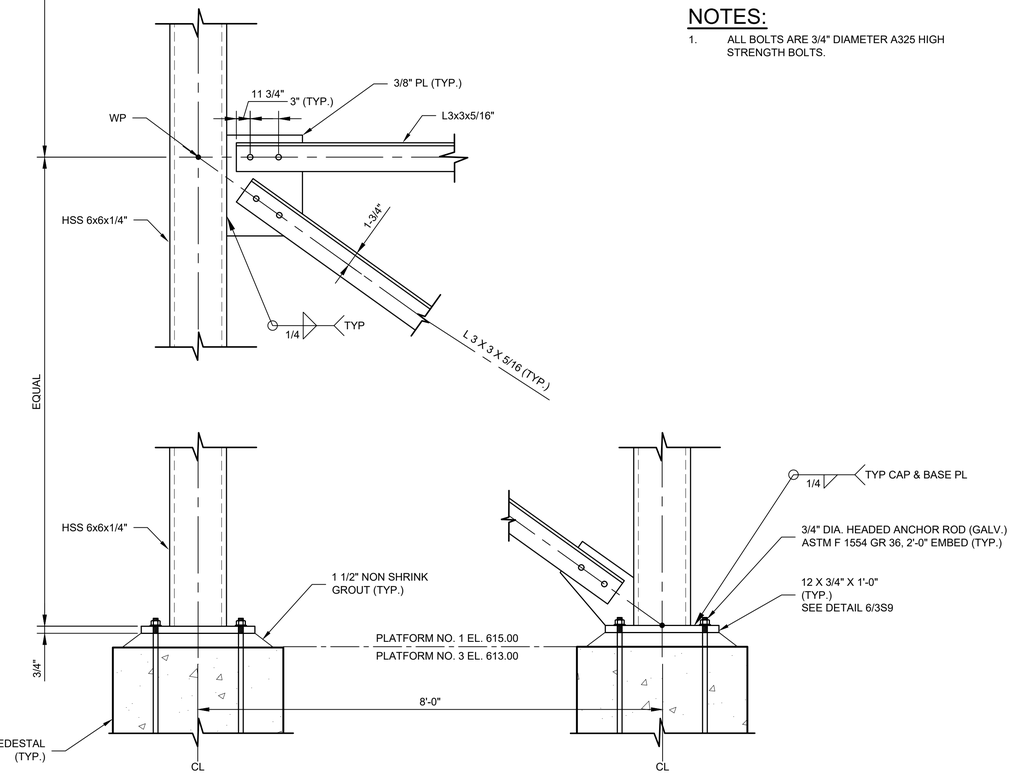


DETAIL 1 / 3S1

SCALE: 1-1/2" = 1'-0"

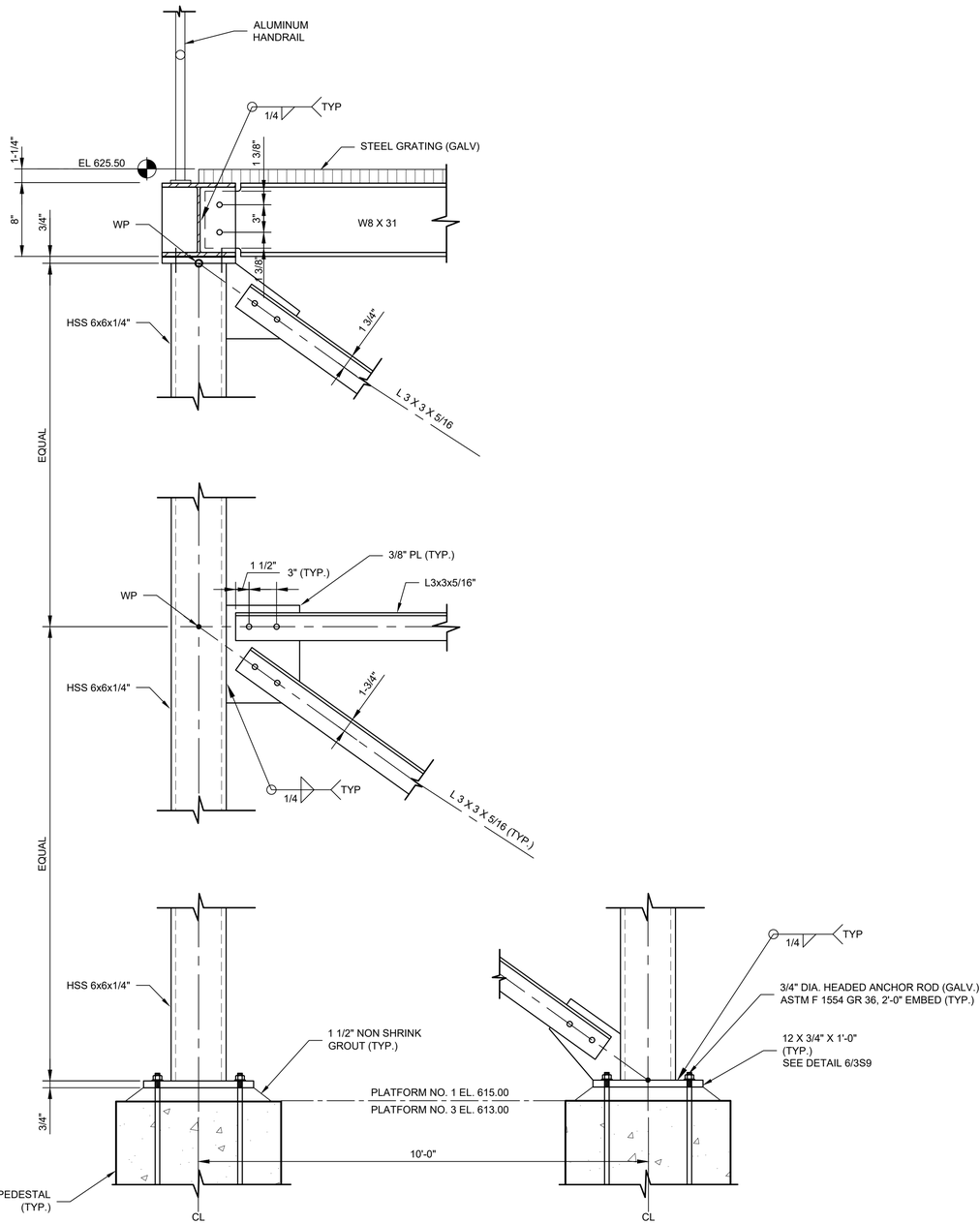
NOTES:

1. ALL BOLTS ARE 3/4" DIAMETER A325 HIGH STRENGTH BOLTS.



TYPICAL SECTION WELL PLATFORM NO. 1 & 3 (8'-0" SIDE)

SCALE: 1-1/2" = 1'-0"



TYPICAL SECTION WELL PLATFORM NO. 1 & 3 (10'-0" SIDE)

SCALE: 1-1/2" = 1'-0"

SCALE VERIFICATION	DRAWN BY	CLG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB				
	APPROVED BY	JCB				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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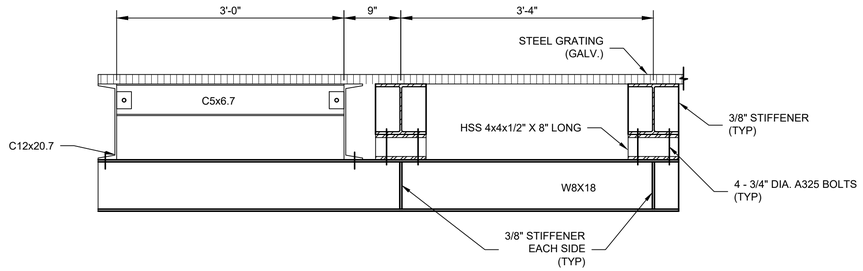
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

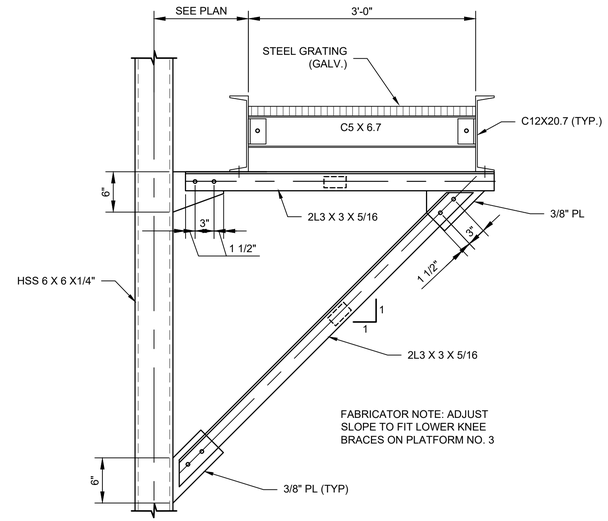
WELLS NO. 1 AND 3 PLATFORMS
PLATFORM DETAILS

SHEET NO. **3S3**

PAGE NO. 17



SECTION E
SCALE: 1" = 1'-0"
3S1



SECTION F
SCALE: 1" = 1'-0"
3S1

	SCALE VERIFICATION	DRAWN BY	CLG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
	BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB				
		APPROVED BY	JCB				
		ISSUE DATE	MAY 2025				
		PROJECT NUMBER	705524-04-001				

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

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MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELLS NO. 1 AND 3 PLATFORMS DETAILS

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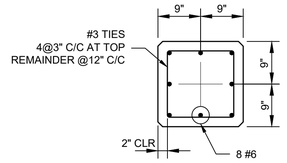
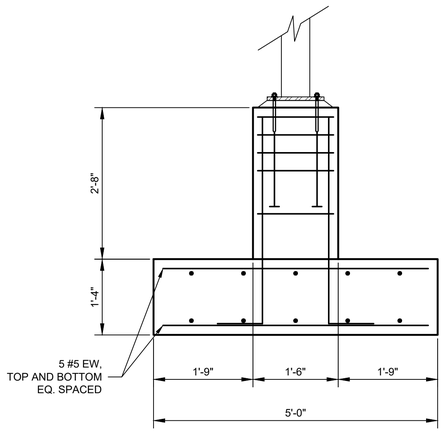
3S4
PAGE NO.
18



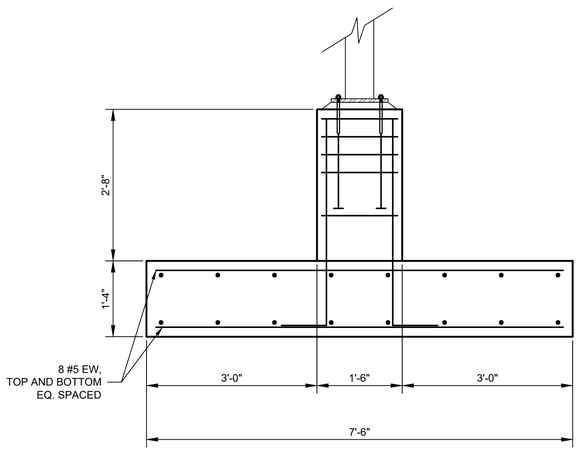
TYPICAL PEDESTAL

SCALE: 3/4" = 1'-0"



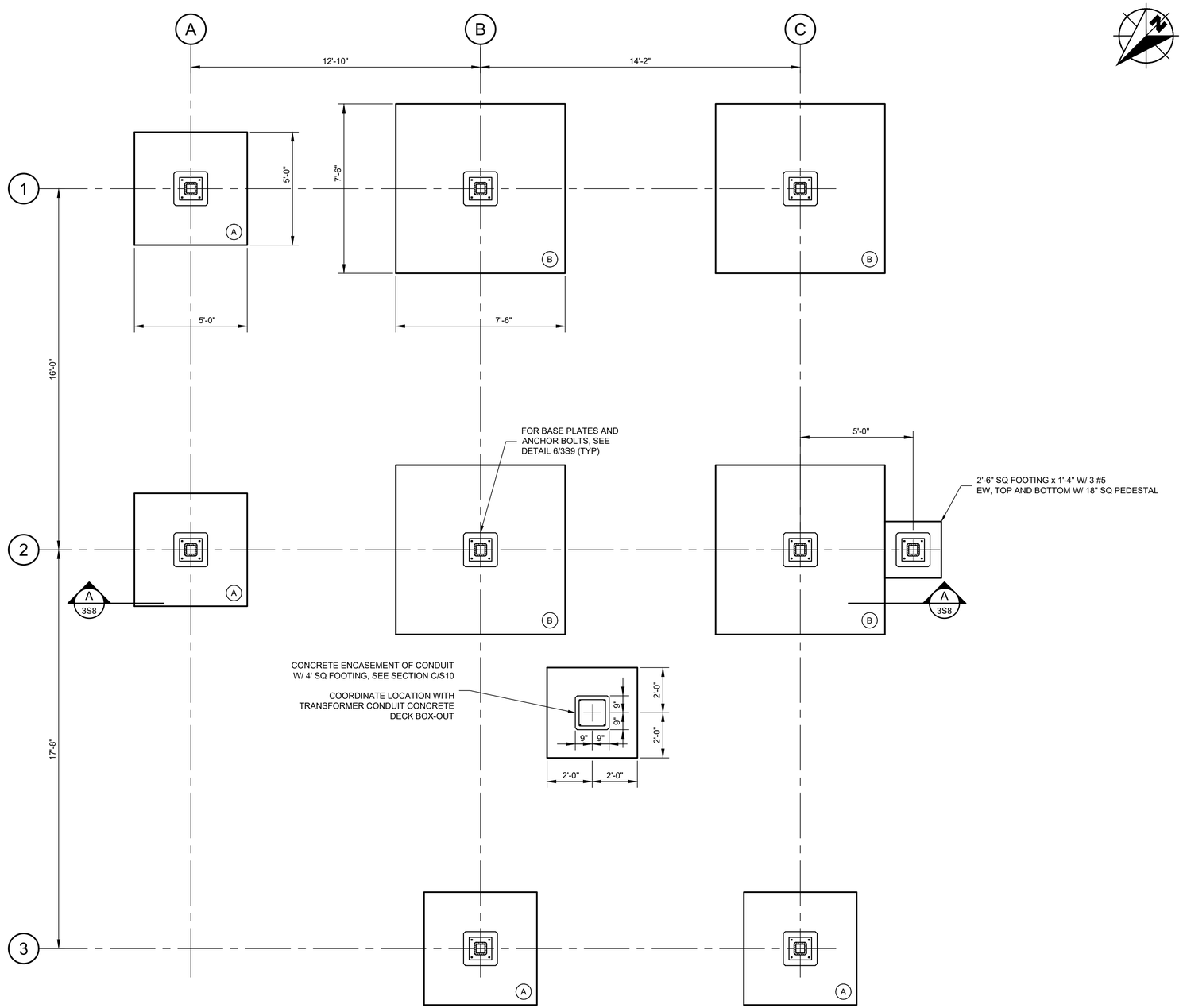
TYPICAL FOUNDATION "A"

SCALE: 3/4" = 1'-0"



TYPICAL FOUNDATION "B"

SCALE: 3/4" = 1'-0"



FOUNDATION PLAN

SCALE: 3/8" = 1' - 0"

SCALE VERIFICATION	DRAWN BY	MLN	NO.	DATE	INITIALS	REVISION DESCRIPTIONS	
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB					
	APPROVED BY	JCB					
	ISSUE DATE	MAY 2025					
	PROJECT NUMBER	705524-04-001					

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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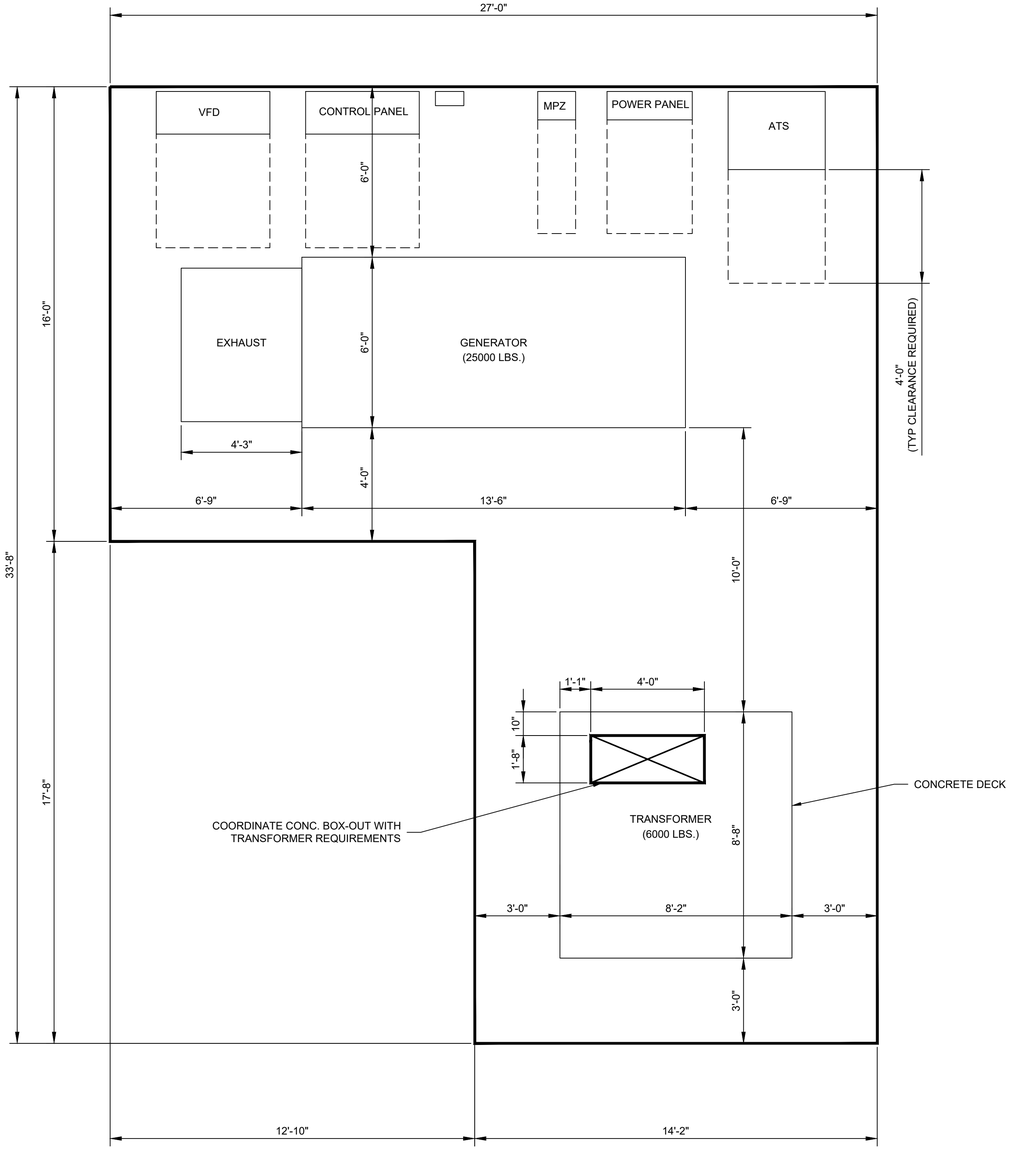
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELL NO. 2 - PLATFORM FOUNDATION PLAN AND DETAILS

SHEET NO. **3S5**

PAGE NO. 19

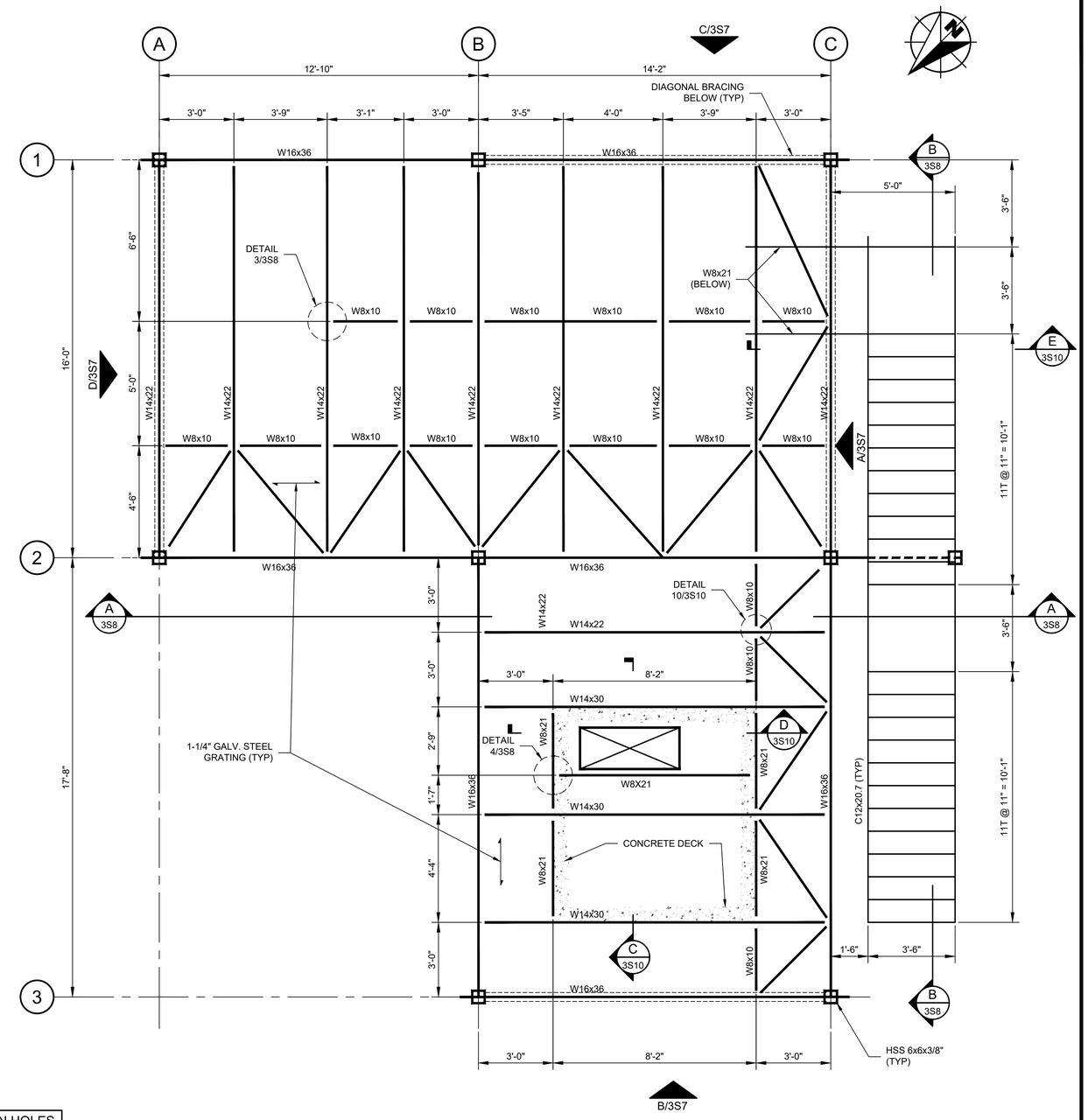


EQUIPMENT LOCATION PLAN

SCALE: 3/8" = 1' - 0"

PROVIDE 1/2" DIA. DRAIN HOLES AT BASE OF COLUMNS

ALL METALS ARE TO BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123



STRUCTURAL FRAMING PLAN

SCALE: 3/8" = 1' - 0"

SCALE VERIFICATION	DRAWN BY	MLN	NO.	DATE	INITIALS	REVISION DESCRIPTIONS	
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB					
	APPROVED BY	JCB					
	ISSUE DATE	MAY 2025					
	PROJECT NUMBER	705524-04-001					

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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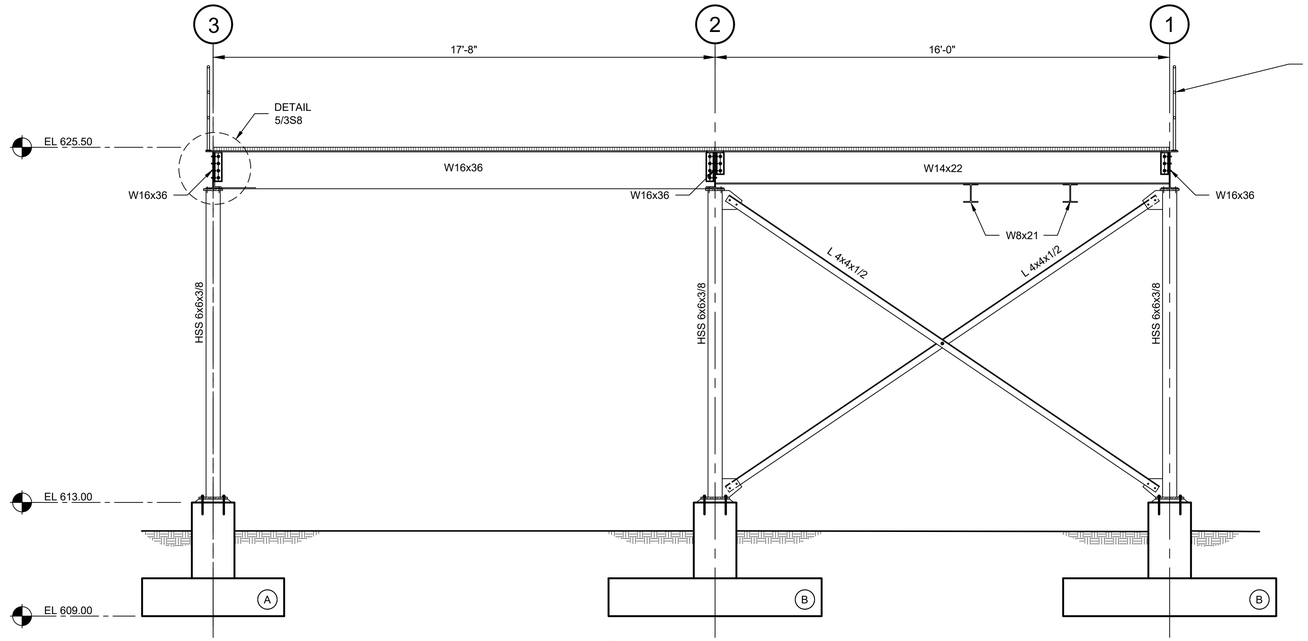
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

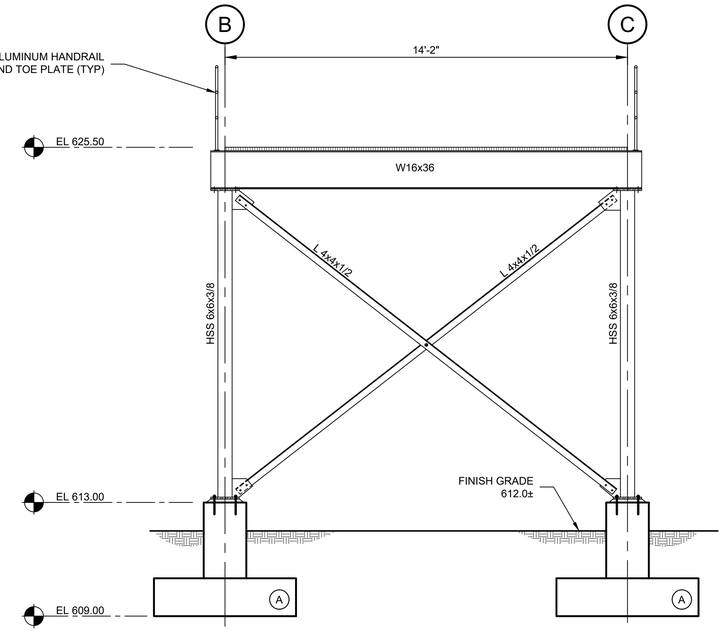
WELL NO. 2 PLATFORM - STRUCTURAL PLANS

SHEET NO.
3S6

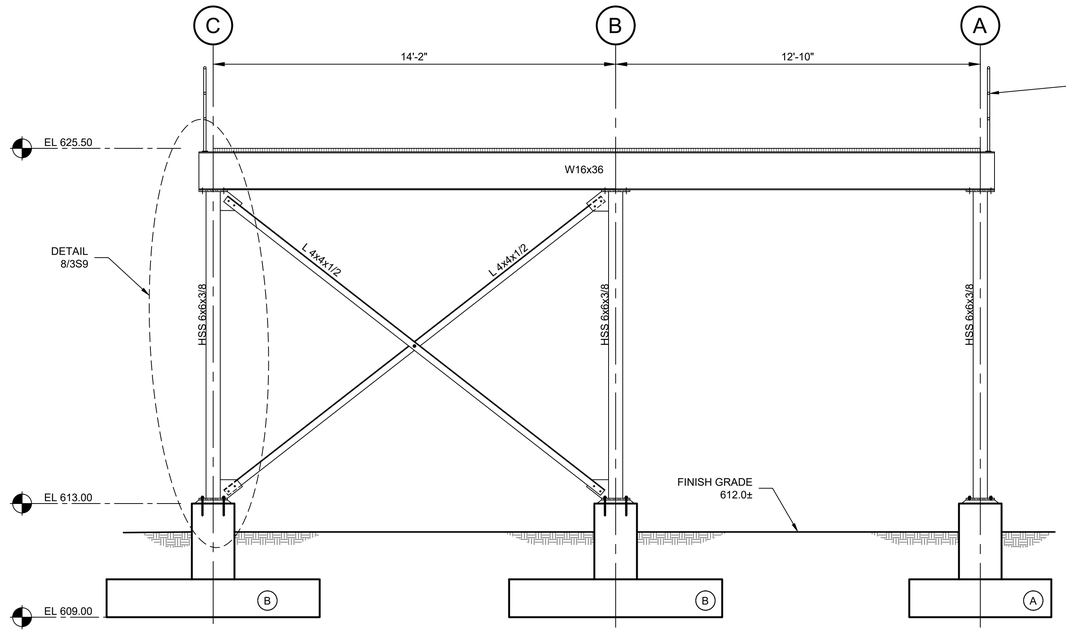
PAGE NO.
20



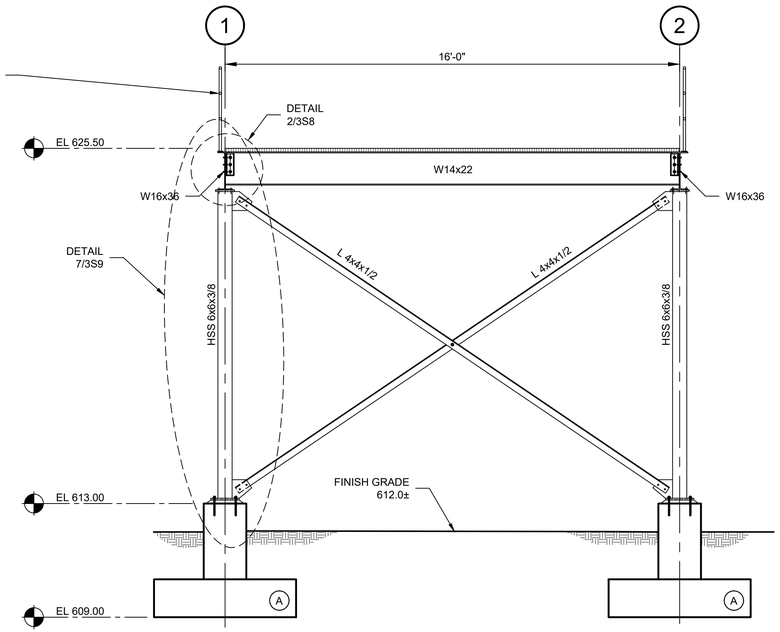
ELEVATION A
SCALE: 3/8" = 1'-0"



ELEVATION B
SCALE: 3/8" = 1'-0"



ELEVATION C
SCALE: 3/8" = 1'-0"



ELEVATION D
SCALE: 3/8" = 1'-0"

SCALE VERIFICATION	DRAWN BY	MLN	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB				
	APPROVED BY	JCB				
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	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

WESSLER ENGINEERING
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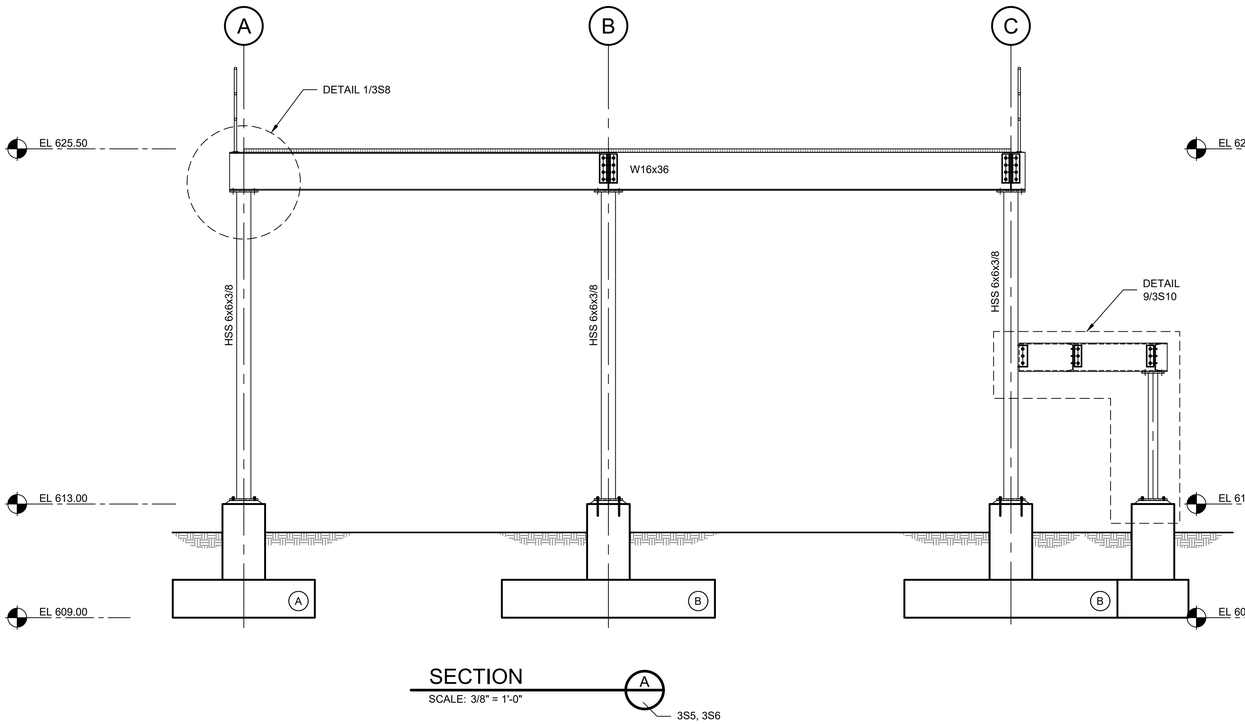
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

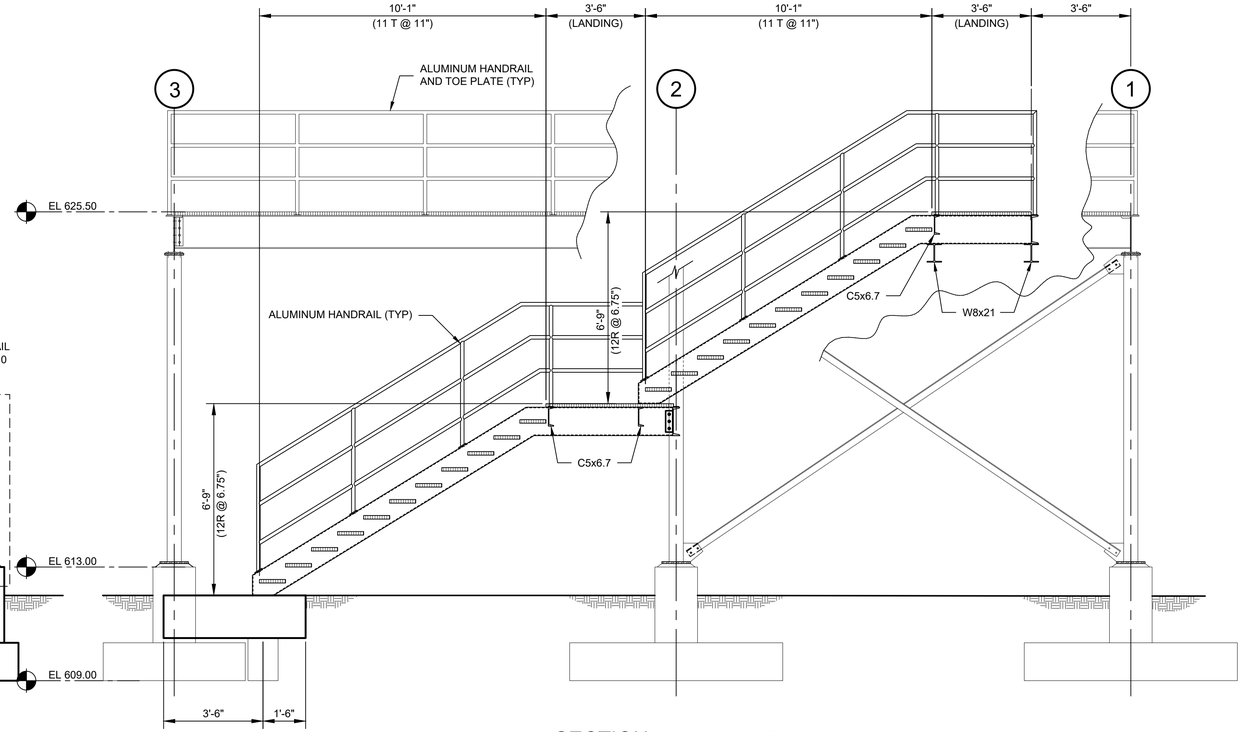
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELL NO. 2 PLATFORM - STRUCTURAL SECTIONS

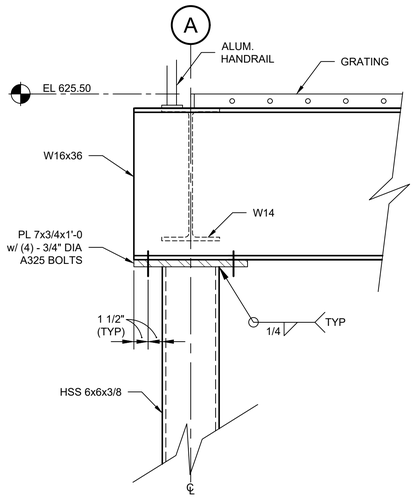
SHEET NO.
3S7
PAGE NO.
21



SECTION
SCALE: 3/8" = 1'-0"
A
3S5, 3S6

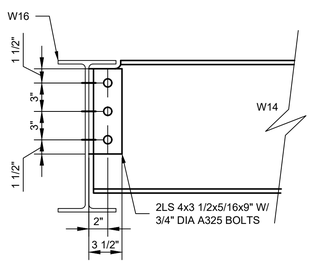


SECTION
SCALE: 3/8" = 1'-0"
B
3S6



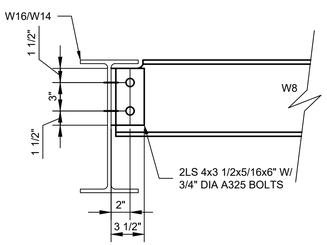
W16 TO HSS (TYP)

DETAIL
SCALE: 1-1/2" = 1'-0"
1
3S8



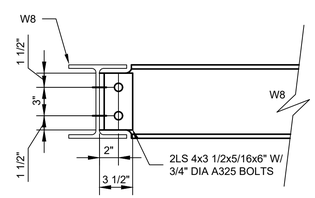
W14 TO W16 (TYP)

DETAIL
SCALE: 1-1/2" = 1'-0"
2
3S7



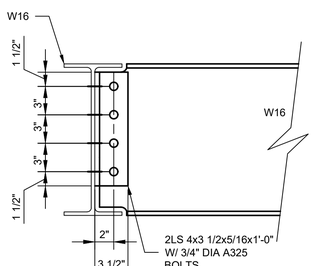
W8 TO W14/W16 (TYP)

DETAIL
SCALE: 1-1/2" = 1'-0"
3
3S6



W8 TO W8 (TYP)

DETAIL
SCALE: 1-1/2" = 1'-0"
4
3S6



W16 TO W16 (TYP)

DETAIL
SCALE: 1-1/2" = 1'-0"
5
3S7

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BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB				
	APPROVED BY	JCB				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

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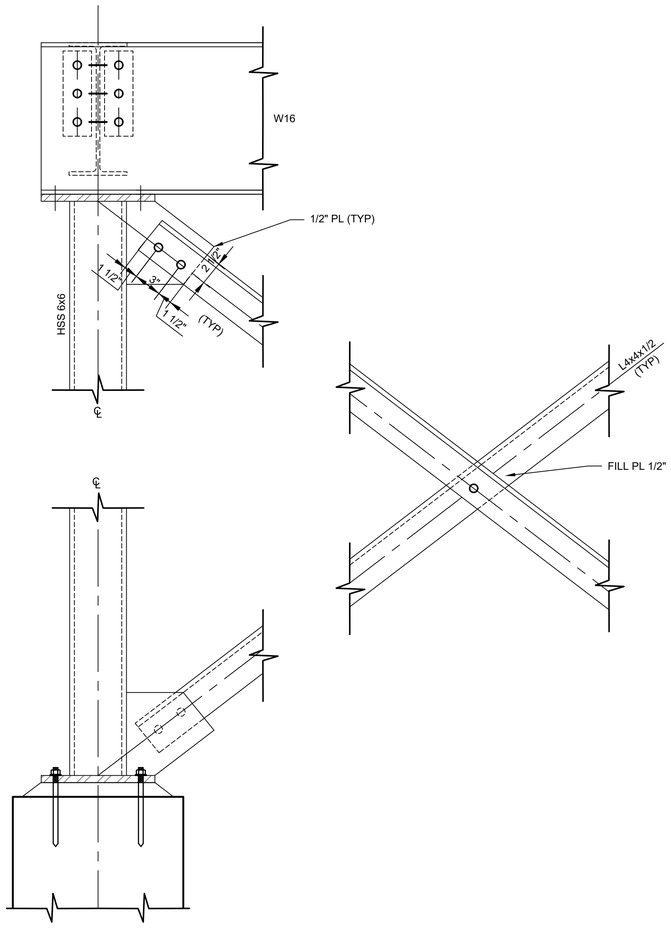
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

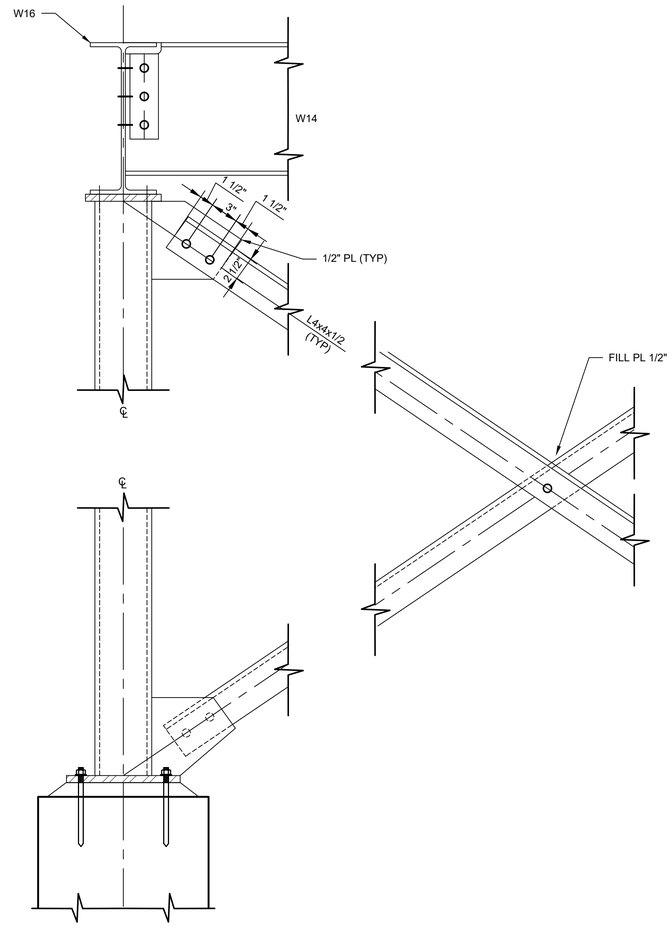
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELL NO. 2 PLATFORM SECTIONS AND DETAILS

SHEET NO.
3S8
PAGE NO.
22



DETAIL 8 / 3S7
SCALE: 1-1/2" = 1'-0"



DETAIL 7 / 3S7
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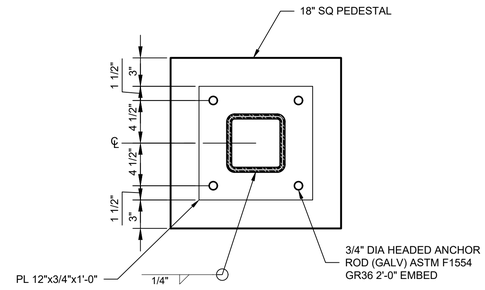

DETAIL 6 / 3S5
SCALE: 1-1/2" = 1'-0"

SCALE VERIFICATION	DRAWN BY	MTF	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
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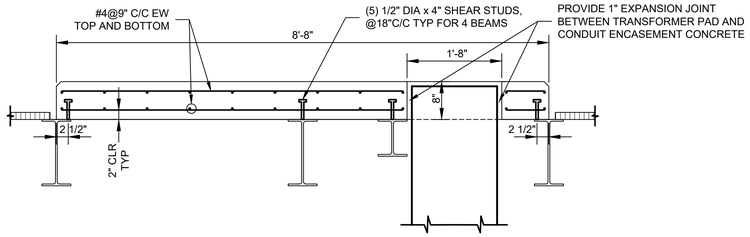
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

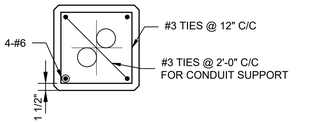
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

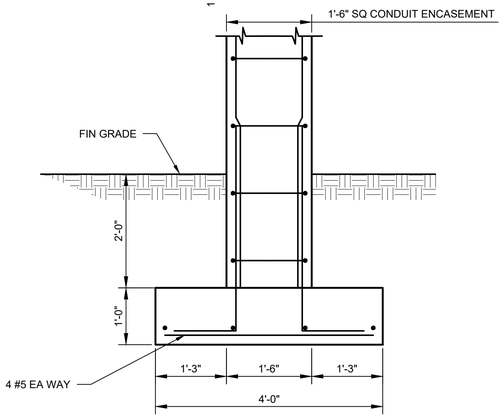
WELL NO. 2 PLATFORM - SECTIONS AND DETAILS

SHEET NO. **3S9**

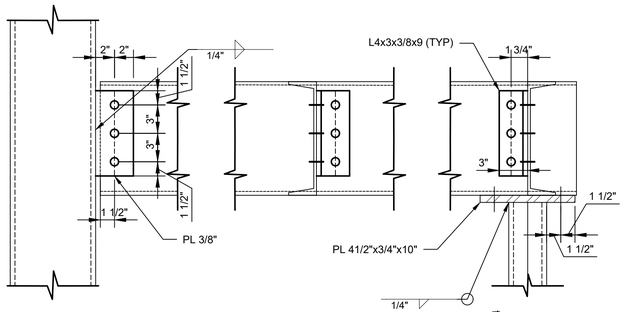
PAGE NO. 23

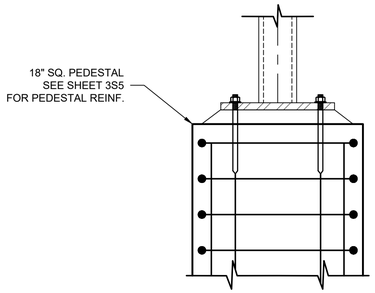




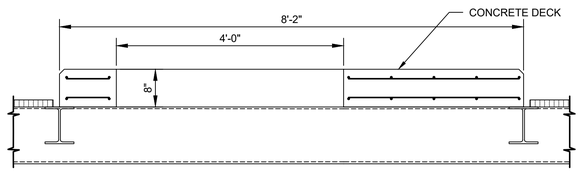


SECTION
SCALE: 3/4" = 1'-0"
C
3S6

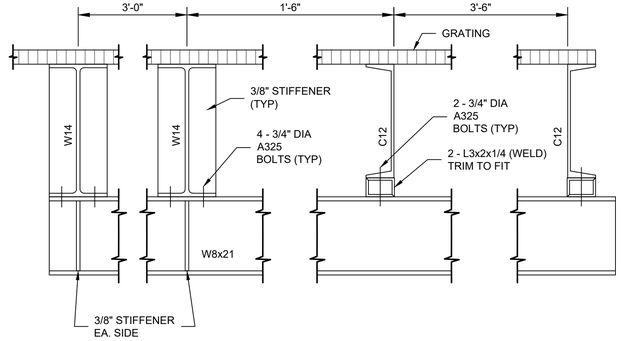




DETAIL
SCALE: 1-1/2" = 1'-0"
9
3S8



SECTION
SCALE: 3/4" = 1'-0"
D
3S6



SECTION
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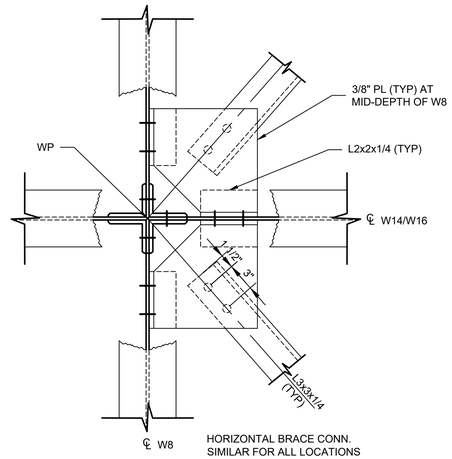
E
3S6



DETAIL
SCALE: 1-1/2" = 1'-0"
10
3S6

SCALE VERIFICATION	DRAWN BY	MTF	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JRB				
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	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
JAKOB C. BRUHL
E-89802
REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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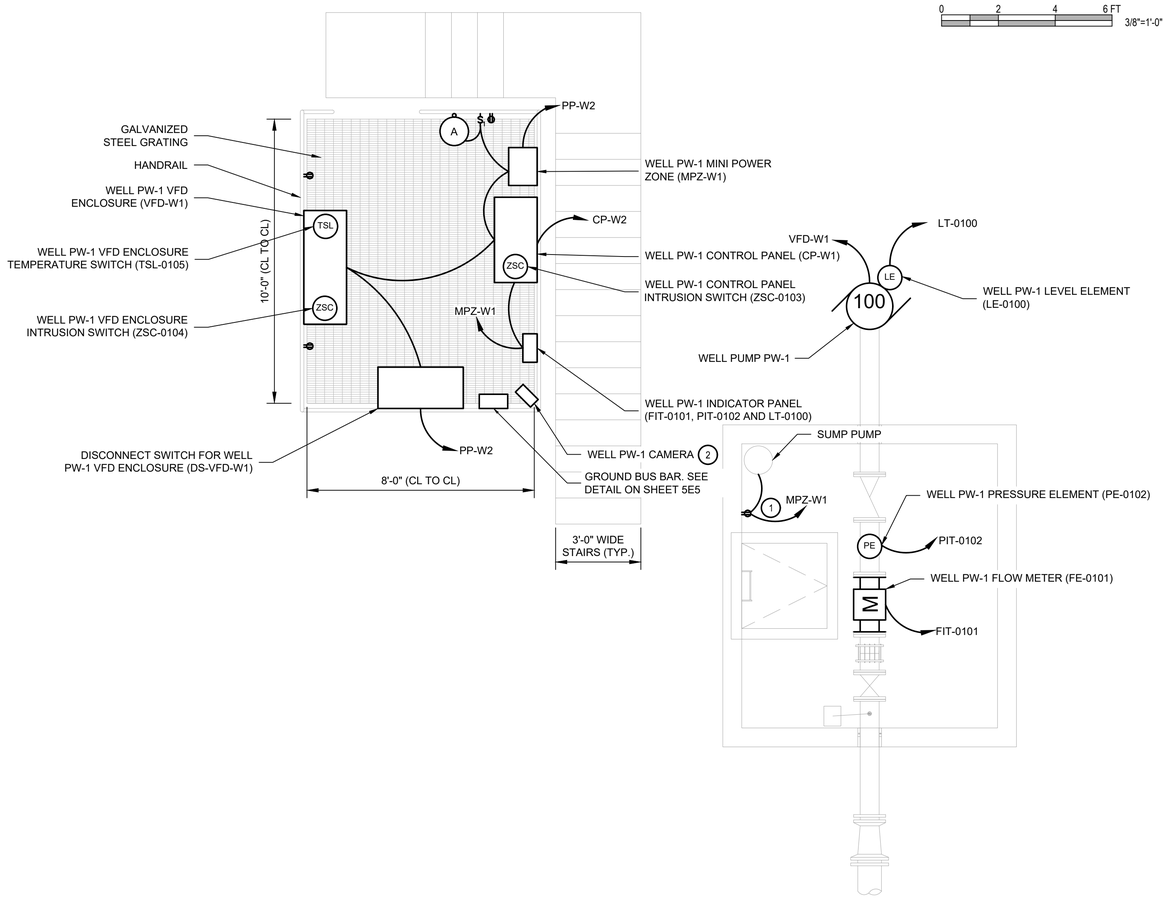
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELL NO. 2 PLATFORM - STRUCTURAL SECTIONS AND DETAILS

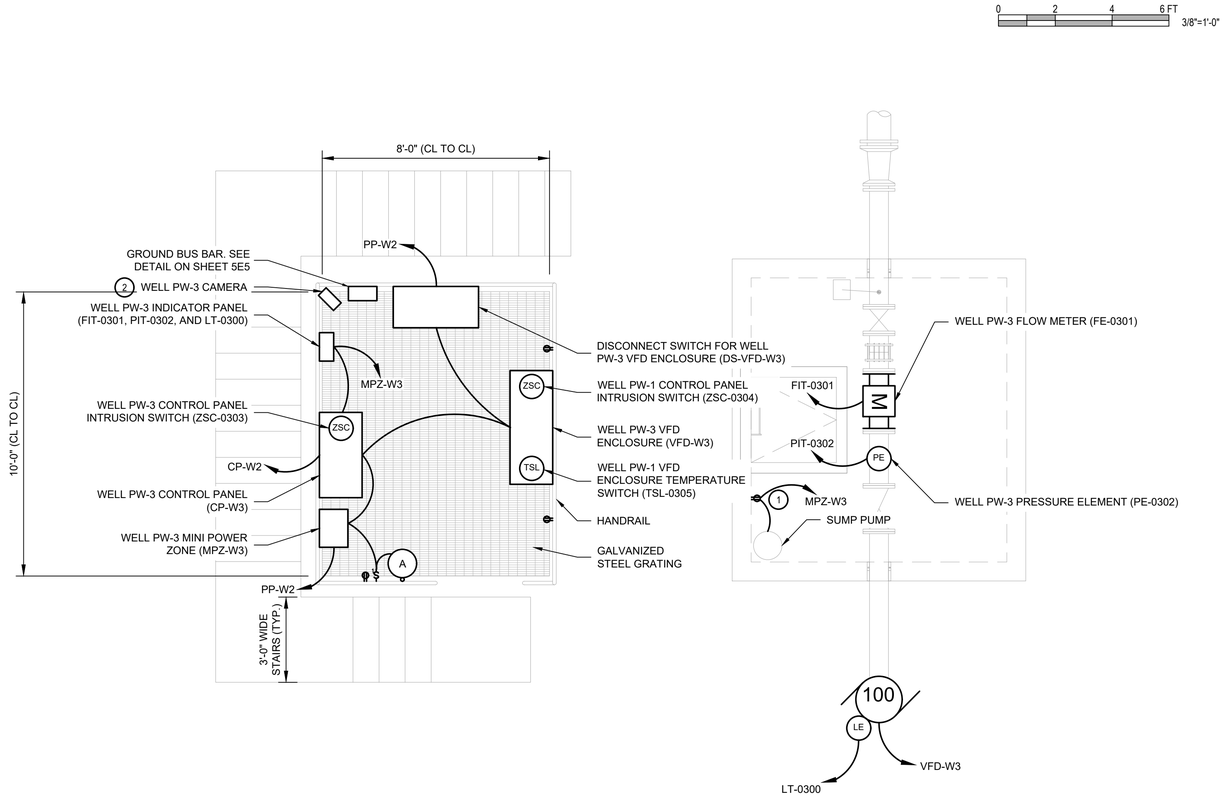
SHEET NO.
3S10

PAGE NO.
24



WELL PLATFORM PW-1 - ELECTRICAL PLAN VIEW

SCALE: 3/8" = 1' - 0"



WELL PLATFORM PW-3 - ELECTRICAL PLAN VIEW

SCALE: 3/8" = 1' - 0"

KEYED NOTES:

1. SUMP PUMP RECEPTACLE TO BE GFCI PROTECTED AT THE BREAKER. SUMP PUMP RECEPTACLE TO BE 120V, 20A, WEATHERPROOF AND PROVIDED WITH AN IN-USE COVER. SUMP PUMP RECEPTACLE TO BE MOUNTED WITHIN 18" OF TOP OF VAULT.
2. CONFIRM FINAL LOCATION AND ORIENTATION OF CAMERAS WITH OWNER.

GENERAL NOTES:

1. ALL RECEPTACLES TO BE GFCI PROTECTED, WEATHERPROOF, AND PROVIDED WITH IN-USE COVERS. (SUMP PUMP GFCI PROTECTION PROVIDED AT THE BREAKER)
2. SEE SHEET 5E4 FOR DETAILS ON MOUNTING ELECTRICAL EQUIPMENT.
3. METER VAULT AND ITS LOCATION NOT TO SCALE.
4. MOUNT ALUMINUM SIGN ON EACH VALVE VAULT STATING "DANGER - CONFINED SPACE. PERMIT REQUIRED, DO NOT ENTER."
5. MOUNT ALUMINUM SIGN ON EACH VFD ENCLOSURE STATING "DANGER HIGH VOLTAGE UNAUTHORIZED PERSONNEL KEEP OUT"

SCALE VERIFICATION	DRAWN BY	JLK	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
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	APPROVED BY	WCM				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO — WAYNE C. MOORE E-70068 — REGISTERED PROFESSIONAL ENGINEER — 05/19/2025

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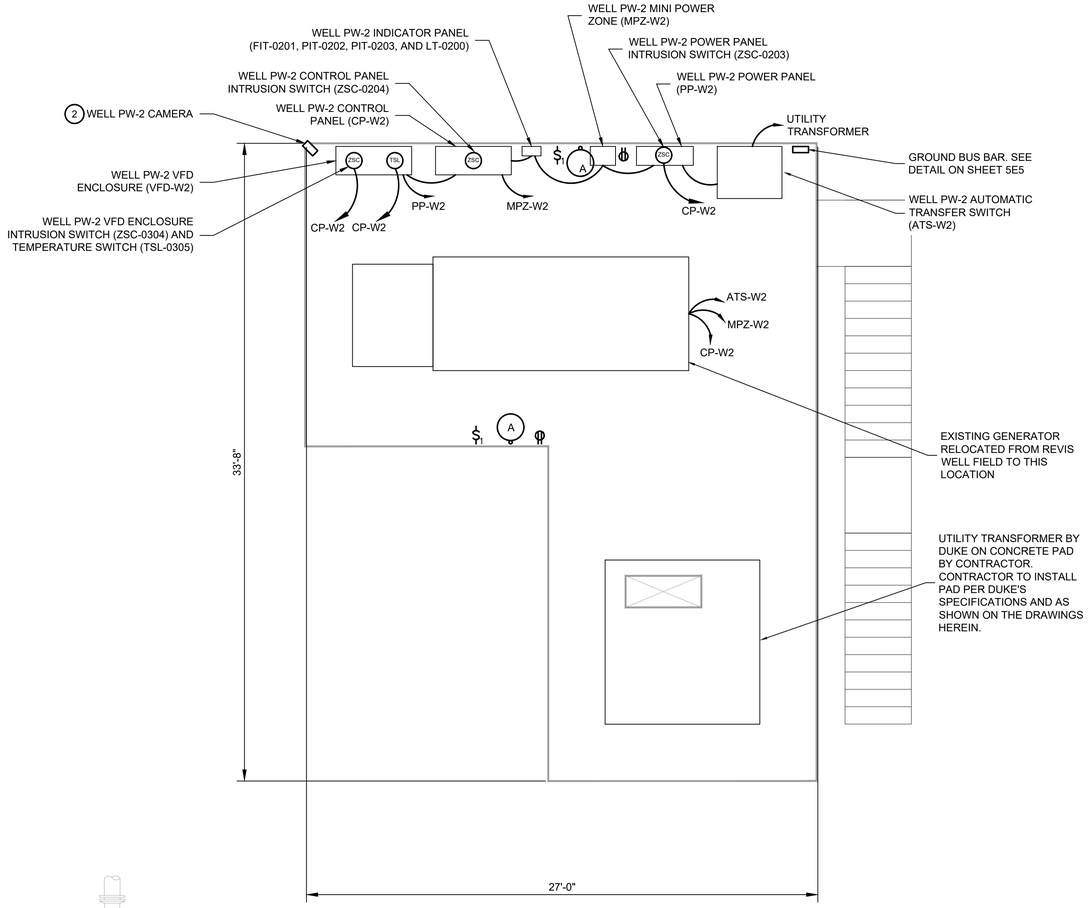
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

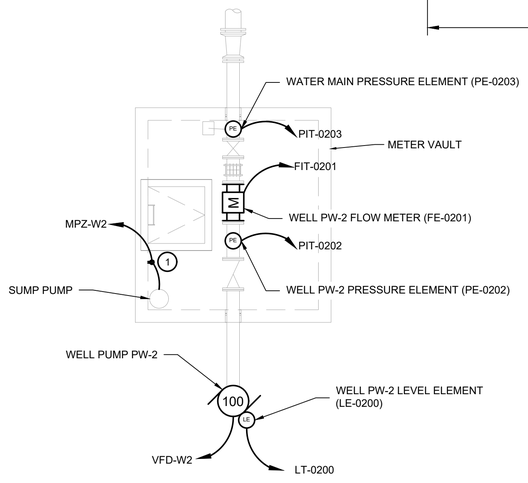
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELL PLATFORM NO. 1 AND 3 ELECTRICAL PLANS

SHEET NO. **3E1**

PAGE NO. 25





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2. CONFIRM FINAL LOCATION AND ORIENTATION OF CAMERAS WITH OWNER.

GENERAL NOTES:

1. ALL RECEPTACLES TO BE GFCI PROTECTED, WEATHERPROOF, AND PROVIDED WITH IN-USE COVERS. (SUMP PUMP GFCI PROTECTION PROVIDED AT THE BREAKER)
2. SEE SHEET 5E4 FOR DETAILS ON MOUNTING ELECTRICAL EQUIPMENT.
3. METER VAULT AND ITS LOCATION NOT TO SCALE
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5. MOUNT ALUMINUM SIGN ON EACH VFD ENCLOSURE STATING "DANGER HIGH VOLTAGE UNAUTHORIZED PERSONNEL KEEP OUT"

0 2 4 8 FT
1/4"=1'-0"

WELL PLATFORM PW-2 - ELECTRICAL PLAN VIEW

SCALE: 1/4" = 1' - 0"

SCALE VERIFICATION	DRAWN BY	JLK	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
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	APPROVED BY	WCM				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
WAYNE C. MOORE
E-70068
REGISTERED PROFESSIONAL ENGINEER
05/19/2025

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MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

WELL PLATFORM NO. 2 ELECTRICAL PLAN

SHEET NO.
3E2

PAGE NO.
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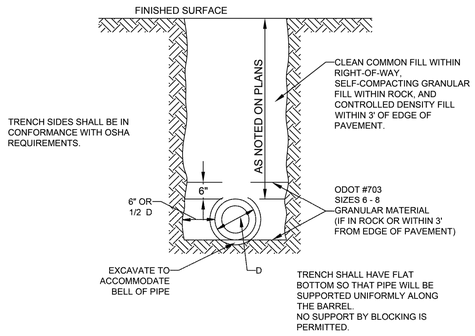
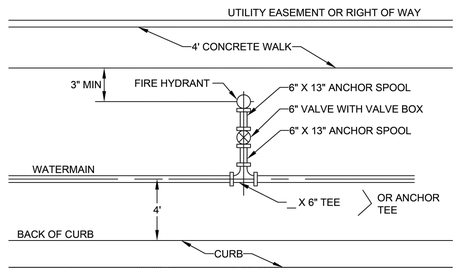
WATERMAIN SHALL BE INSTALLED IN A SEPARATE TRENCH FROM THE SANITARY SEWER AND SHALL BE A MINIMUM DISTANCE OF 10' MEASURED HORIZONTALLY FROM THE SANITARY SEWER.

BACKFILL AND RESTORATION OF PAVEMENT MUST CONFORM TO THE APPLICABLE WARREN COUNTY ENGINEER OR ODOT SPECIFICATION(S).



WATERMAIN TRENCH DETAIL

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
JUNE, 2012		W-2

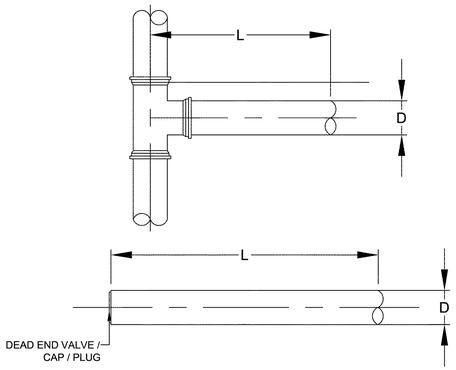


STREET

NOTES:
1. HYDRANT, VALVE, BEND & TEE TO BE CLOSE COUPLED (USE RESTRAINED JOINTS).
2. HYDRANT AND VALVE MUST BE A MINIMUM OF 3' FROM ANY PAVED SURFACE.
3. ALL VALVES MUST BE RESILIENT SEATED.
4. APPROVED VALVE TYPES: CLOW, DRESSER & AMERICAN DARLING. MUST CONFORM TO AWWA C509.
5. RODDING SHALL NOT BE REQ'D IF ANCHOR FLANGES (SPOOLS) ARE USED.
6. HYDRANTS TO BE EQUIPPED WITH PRE-ATTACHED 4.5" NST PUMPER CONNECTION WITH A 5" STORTZ FITTING AND CAP.

FIRE HYDRANT ARRANGEMENT

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
APRIL, 2025		W-11



MINIMUM 60' OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL HORIZONTAL AND VERTICAL BENDS. REFER TO TABLE BELOW.

RESTRAINT OPTIONS:
MECHANICAL JOINT W/MEGALUGS ~ ALL SIZES OF PIPE
US TR FLEX OR AMERICAN FLEX RING ~ ALL SIZES OF PIPE
MJ FIELD LOCKS ~ < 24" PIPE

TABLE
REQUIRED LENGTH OF RESTRAINED JOINTS
D - DIAMETER OF PIPE
L - LENGTH OF PIPE

D	4"	6"	8"	10"	12"	16"	20"	24"
L	60'	60'	60'	60'	66'	98'	125'	145'

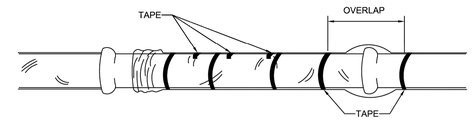
NOTES:
1. ALL DEAD END VALVES, PLUGS, CAPS AND TEES SHALL BE LABELED WITH STATIONING.
2. LABEL LIMITS OF REQUIRED RESTRAINED JOINTS WITH STATIONING.

REQUIRED RESTRAINED JOINTS - DEAD END VALVES PLUGS, CAPS & TEES

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
APRIL, 2025		W-21

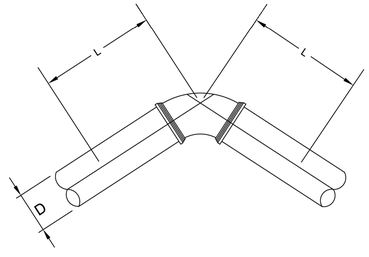
PROCEDURE FOR APPLYING POLYETHYLENE ENCASEMENT

1. REMOVE ALL LUMPS OF CLAY, MUD, CINDERS, OR OTHER MATERIAL THAT MIGHT HAVE ACCUMULATED ON THE PIPE SURFACE.
2. CUT POLYETHYLENE TUBE TO A LENGTH APPROXIMATELY TWO FEET LONGER THAN THE LENGTH OF THE PIPE SECTION. SLIP THE TUBE AROUND THE PIPE, STARTING AT THE SPIGOT END. BUNCH THE TUBE ACCORDION FASHION ON THE END OF THE PIPE. PULL BACK THE OVERHANGING END OF THE TUBE AND CIRCUMFERENTIALLY TAPE IT TO THE BARREL OF THE PIPE JUST BEHIND THE INSERTION LINE. AFTER ASSEMBLY OF THE JOINT, THE TAPE SHOULD BE AS CLOSE TO THE FACE OF THE BELL AS POSSIBLE BUT NOT SO CLOSE TO THE SPIGOT END THAT IT INTERFERES WITH THE GASKET.
3. TAKE UP THE SLACK IN THE TUB ALONG THE BARREL OF THE PIPE TO MAKE A SNUG, BUT NOT TIGHT, FIT. FOLD THE EXCESS POLYETHYLENE BACK OVER THE TOP OF THE PIPE AND USE PIECES OF TAP ACROSS THE FOLD TO SECURELY HOLD IT.
4. DIG A SHALLOW BELL HOLE IN THE TRENCH BOTTOM AT THE JOINT LOCATION TO FACILITATE INSTALLATION OF THE POLYETHYLENE TUBE. LOWER THE PIPE INTO THE TRENCH AND MAKE THE PIPE JOINT WITH THE PRECEDING SECTION OF PIPE.
5. SLIDE THE TUBE OVER THE REMAINING BARREL OF THE PIPE. SNUGLY FOLD OVER THE EXCESS WRAP USING TAPE TO HOLD IT IN PLACE. MAKE SURE NO DIRT OR OTHER BEDDING BECOMES TRAPPED BETWEEN THE WRAP AND PIPE. SECURE THE POLYETHYLENE WITH A CIRCUMFERENTIAL WRAP OF TAPE EVER FIVE (5') FEET.
6. SECURE THE POLYETHYLENE IN PLACE BEHIND THE PROCEEDING BELL USING A CIRCUMFERENTIAL WRAP OF TAP. MAKE THE OVERLAP OF THE POLYETHYLENE TUBE BY PULING BACK THE BUNCHED POLYETHYLENE FROM THE PRECEDING LENGTH OF PIPE AND ENSURE THERE IS AT LEAST A 12-INCH OVERLAP. PLACE ANOTHER CIRCUMFERENTIAL WRAP OF TAPE ON THE OVERLAPPING POLYETHYLENE, SECURING IT TO THE SPIGOT SIDE OF THE JOINT.



INSTALLATION OF POLYETHYLENE ENCASEMENT

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
APRIL, 2025		W-28



MINIMUM 60' OF RESTRAINED JOINT PIPE (RJP) IS REQUIRED BEFORE AND AFTER ALL HORIZONTAL AND VERTICAL BENDS. REFER TO TABLE BELOW.

RESTRAINT OPTIONS:
MECHANICAL JOINT W/MEGALUGS ~ ALL SIZES OF PIPE
US TR FLEX OR AMERICAN FLEX RING ~ ALL SIZES OF PIPE
MJ FIELD LOCKS ~ < 24" PIPE

TABLE
REQUIRED LENGTH OF RESTRAINED JOINTS
D - DIAMETER OF PIPE
L - LENGTH OF PIPE

D	4"	6"	8"	10"	12"	16"	20"	24"
L	60'	60'	60'	60'	66'	98'	125'	145'

NOTES:
1. ALL HORIZONTAL AND VERTICAL BENDS SHALL BE LABELED WITH STATIONING.
2. LABEL LIMITS OF REQUIRED RESTRAINED JOINTS WITH STATIONING.

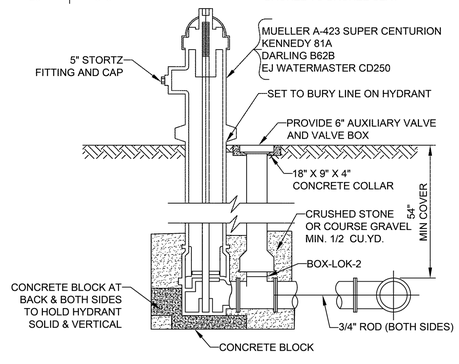
REQUIRED RESTRAINED JOINTS FOR BENDS

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
MAY, 2023		W-18

W.M.	F.H. BURIAL DEPTH
6"	5'-0"
8"	5'-0"
10"	5'-0"
12"	5'-0"
16"	5'-6"
18"	5'-6"
20"	5'-6"

ALL FIRE HYDRANTS AND HYDRANT VALVES MUST OPEN LEFT.

ALL HYDRANTS TO BE 5 1/4" BRONZE TO BRONZE SEAT



1. ALL VALVES MUST BE RESILIENT SEATED.
2. APPROVED VALVE TYPES: CLOW, DRESSER & AMERICAN DARLING. MUST CONFORM TO AWWA C509.
3. RODDING SHALL NOT BE REQUIRED IF ANCHOR FLANGES (SPOOLS) ARE USED.
4. HYDRANTS TO BE EQUIPPED WITH PRE-ATTACHED 4.5" NST PUMPER CONNECTION WITH A 5" STORTZ FITTING AND CAP.
5. PAINT HYDRANT FOREST GREEN.

HYDRANT SETTING

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
MAY, 2023		W-8

MATERIALS:

POLYETHYLENE FILM: TUBULAR OR SHEET FORM WITHOUT TEARS, BREAKS, OR DEFECTS, CONFORMING TO THE FOLLOWING REQUIREMENTS.

1. LINEAR LOW-DENSITY POLYETHYLENE: CO-EXTRUDED LINEAR LOW-DENSITY POLYETHYLENE FILM MANUFACTURED FROM VIRGIN POLYETHYLENE MATERIAL, CONTAINING BIOCIDE FOR CONTROLLING MICROBIOLOGICALLY INFLUENCED CORROSION (MIC) AND A VOLATILE CORROSION INHIBITOR (VCI) FOR CONTROLLING GENERAL CORROSION, AND CONFORMING TO THE FOLLOWING:
   A. EXTRUSION: THE POLYETHYLENE FILM IS TO CONSIST OF THREE LAYERS OF CO-EXTRUDED, POLYETHYLENE. THE INNERMOST LAYER IS TO BE A NOMINAL 1.5 MILS (0.0015 INCHES) IN THICKNESS, CONTAINING A BIOCIDE AND VCI. THE OUTER LAYER IS TO BE A NOMINAL 1.5 MILS THICK LINEAR LOW DENSITY POLYETHYLENE. THE CORE (CENTER) LAYER WILL CONSIST OF A NOMINAL 5 MILS OF LINEAR LOW DENSITY POLYETHYLENE FOR A TOTAL MINIMUM FILM THICKNESS OF 8 MILS.
   B. PHYSICAL PROPERTIES: PHYSICAL PROPERTIES OF FINISHED FILM TO BE AS FOLLOWS:
      a. TENSILE STRENGTH: 3,600 PSI. MINIMUM IN MACHINE AND TRANSVERSE DIRECTION (ASTM D 882)
      b. ELONGATION: 700 PERCENT MINIMUM IN MACHINE AND TRANSVERSE DIRECTION (ASTM D 882) AS
      c. MEASURED USING RUBBER LINED GRIPS.
      d. DIELECTRIC STRENGTH: 800 VOLTS/MIL THICKNESS MINIMUM (ASTM D 149)
      e. IMPACT RESISTANCE: 600 GRAMS MINIMUM (ASTM D 1709 METHOD B)
      f. PROPAGATION TEAR RESISTANCE: 2,550 GRAMS FORCE MINIMUM IN MACHINE AND TRANSVERSE
      g. DIRECTION (ASTM D1922)
   C. THICKNESS: LINEAR LOW-DENSITY POLYETHYLENE FILM SHALL HAVE A MINIMUM THICKNESS OF 8 MILS.
   D. COLOR: POLYETHYLENE FILM SHALL HAVE A WHITE EXTERIOR AND SHALL CONTAIN A NOMINAL 2 PERCENT OF A HINDERED-AMINE ULTRAVIOLET INHIBITOR.
   E. MINIMUM TUBE SIZE SHALL BE AS FOLLOWS:

TUBE SIZE REQUIRED							
PIPE DIAMETER	4"	6"	8"	10"	12"	16"	20"
MIN. FLAT TUBE WIDTH	14"	16"	20"	24"	27"	34"	41"

2. MARKING: THE POLYETHYLENE FILM SHALL BE CLEARLY MARKED EVERY TWO FEET WITH, AT A MINIMUM, THE FOLLOWING INFORMATION.
   A. MANUFACTURER'S NAME OR TRADEMARK
   B. YEAR OF MANUFACTURER
   C. ANSI/AWWA C105/A21.5
   D. MINIMUM FILM THICKNESS AND MATERIAL TYPE (LLDPE)
   E. APPLICABLE RANGE OF NOMINAL PIPE DIAMETER SIZE(S).
   F. WARNING - CORROSION PROTECTION - REPAIR ANY DAMAGE
3. POLYETHYLENE ENCASEMENT SHALL BE V-BIO ENHANCED POLYETHYLENE ENCASEMENT, OR EQUAL.

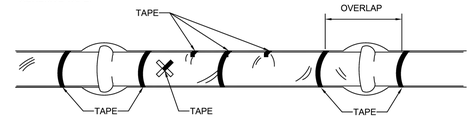
TAPE: POLYETHYLENE TAPE 1-1/2" WIDE AS RECOMMENDED BY THE FILM MANUFACTURER.

POLYETHYLENE ENCASEMENT - DUCTILE IRON PIPE

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
APRIL, 2025		W-27

REPAIR DAMAGED SECTION OF POLYETHYLENE ENCASEMENT:

1. REPAIR ALL SMALL RIPS, TEARS OR OTHER TUBE DAMAGE WITH TWO PIECES OF ADHESIVE TAPE. PLACE THE TAPE OVER THE DAMAGED SECTION IN THE SHAPE OF AN X.IF THE POLYETHYLENE IS BADLY DAMAGED, REPAIR THE DAMAGED AREA WITH A SHEET OF POLYETHYLENE AND SEAL THE EDGES OF THE REPAIR WITH ADHESIVE TAPE.



PIPE SHAPED APPURTENANCES:
BENDS, REDUCERS, OFFSETS AND OTHER PIPE-SHAPED APPURTENANCES SHALL BE COVERED WITH POLYETHYLENE IN THE SAME MANNER AS THE PIPE.

JUNCTIONS BETWEEN WRAPPED AND UNWRAPPED PIPE:
WHERE POLYETHYLENE WRAPPED PIPE JOINTS A PIPE WHICH IS NOT WRAPPED, EXTEND THE POLYETHYLENE TUBE TO COVER THE UNWRAPPED PIPE A DISTANCE OF AT LEAST TWO FEET. SECURE THE END WITH CIRCUMFERENTIAL TURNS OF TAPE.

ODD SHAPED APPURTENANCES
VALVES, TEES, CROSSES AND OTHER ODD-SHAPED PIECES WHICH CANNOT BE WRAPPED PRACTICALLY IN A TUBE SHALL BE WRAPPED WITH A FLAT SHEET OR SPLIT LENGTH OF POLYETHYLENE TUBE. THE SHEET SHALL BE PASSED UNDER THE APPURTENANCE AND BROUGHT UP AROUND THE BODY. SEAMS SHALL BE MADE BY BRINGIN THE EDGES TOGETHER, FOLDING OVER TWICE AND TAPPING DOWN. SLACK WIDTH AND OVERLAPS AT JOINTS SHALL BE HANDLED AS DESCRIBED ABOVE. TAPE POLYETHYLENE SECURELY IN PLACE AT VALVE STEM AND OTHER PENETRATIONS.

BACKFILL FOR POLYETHYLENE WRAPPED PIPE
BACKFILL MATERIAL SHALL BE AS SHOWN IN STANDARD DETAIL W-2. SPECIAL CARE SHOULD BE TAKEN TO PREVENT DAMAGE TO THE POLYETHYLENE WRAPPING WHEN PLACING BACKFILL. BACKFILL MATERIAL SHOULD BE FREE FROM CINDERS, REFUSE, BOULDERS, ROCKS, STONES OR OTHER MATERIAL THAT COULD DAMAGE THE POLYETHYLENE.

REPAIR OF POLYETHYLENE ENCASEMENT

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
APRIL, 2025		W-29

SCALE VERIFICATION	DRAWN BY	DMG
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS
	APPROVED BY	RKB
	ISSUE DATE	MAY 2025
	PROJECT NUMBER	705524-04-001

NO.	DATE	INITIALS	REVISION DESCRIPTIONS

STATE OF OHIO
RYAN KENT BRAUEN
E-79180
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

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MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

MISCELLANEOUS SITE AND CIVIL DETAILS

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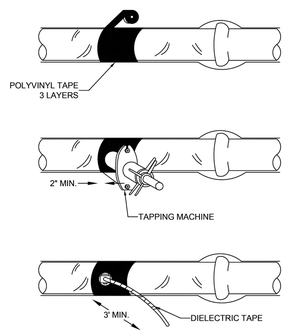
27

PROCEDURE FOR MAKING OPENINGS FOR BRANCHES, SERVICE TAPS, BLOW-OFFS, AIR VALVES, AND SIMILAR APPURTENANCES

1. WRAPPING THREE (3) LAYERS OF POLYVINYL - COMPATIBLE ADHESIVE TAP COMPLETELY AROUND THE PIPE TO COVER THE AREA WHERE THE TAPPING MACHINE AND CHAIN WILL BE MOUNTED, EXTENDING A MINIMUM OF 2" BEYOND THE MOUNTING SURFACE.
2. MOUNT THE TAPPING MACHINE ON THE PIPE AREA COVERED BY THE TAPE AND MAKE THE TAP AND INSTALL THE FERRULE DIRECTLY THROUGH THE TAPE AND POLYETHYLENE.
3. INSPECT THE ENTIRE CIRCUMFERENTIAL AREA FOR DAMAGE AND MAKE ANY NECESSARY REPAIRS WITH TAPE.
4. ON HOUSE SERVICES TO MINIMIZE THE POSSIBILITY OF DISSIMILAR METAL CORROSION AT SERVICE CONNECTIONS, WRAP THE FERRULE AND A MINIMUM CLEAR DISTANCE OF THREE (3) FEET OF THE COPPER SERVICE WITH POLYETHYLENE OR A SUITABLE DIELECTRIC TAPE.



TAPPING POLYETHYLENE ENCASED PIPE

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
APRIL, 2025		W-30

GENERAL NOTES - WATER

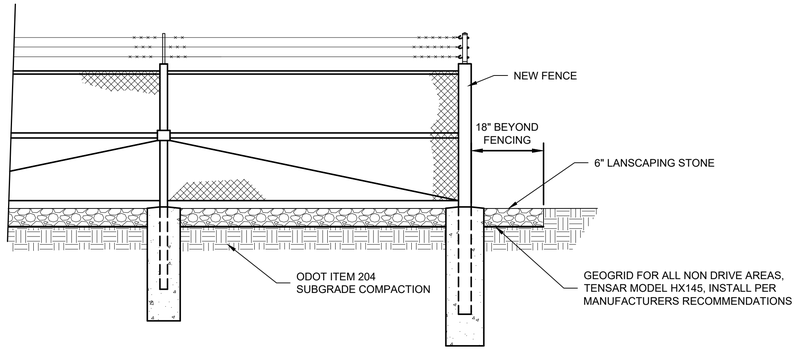
1. ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF 4'-6".
   A. ALL WATER SERVICE LATERALS SHALL HAVE A MINIMUM COVER OF 42".
2. ALL WATER MAINS SHALL BE DUCTILE IRON CONFORMING WITH AWWA SPEC. C-151 CLASS 52 IN SIZES 4"-16" AND PSI CLASS 350 FOR 20" AND ABOVE.
   A. DUCTILE IRON PIPE SHALL BE MANUFACTURED DOMESTICALLY IN THE UNITED STATES OF AMERICA.
   B. RAW MATERIAL FOR DUCTILE IRON PIPE SHALL HAVE A MINIMUM RECYCLED CONTENT CONSISTING OF 90% SCRAP IRON AND STEEL.
3. ALL WATER MAINS SHALL BE INSTALLED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH STANDARD DETAILS W-27, W-28, W-29, AND W-30.
4. COMPACT FITTINGS ARE PERMITTED.
5. ALL WATER VALVES MUST OPEN LEFT. ALL VALVE BOX LIDS MUST BE CAST/ STAMPED "WCWD" IN 1 1/2" LETTERS AND BE NEENAH NF-19130002 OR EQUAL. ALL VALVE EXTENSIONS TO HAVE SET SCREWS. ALL VALVES TO BE EQUIPPED WITH BOX-LOX-2.
6. A CONCRETE SLAB MUST BE PROVIDED AT FINAL GRADE AROUND ALL MAIN VALVE BOXES. THE SLABS MUST BE EIGHTEEN INCHES (18") SQUARE/CIRCLE AND NINE INCHES (9") THICK. PRE-FABRICATED CONCRETE RINGS ARE ACCEPTABLE.
7. WATER AND SEWER LINES SHALL HAVE A MINIMUM OF TEN FEET (10') HORIZONTAL SEPARATION AND/OR TWO FEET (2') VERTICAL SEPARATION.
8. NO GATE VALVE, METER PIT, BLOW OFF OR CORPORATION STOP SHALL BE LOCATED UNDER OR WITHIN THREE FEET (3') OF DRIVEWAYS, ROADWAYS OR SIDEWALKS.
9. NO DRIVEWAY SHALL BE INSTALLED WITHIN FIVE FEET (5') OF A FIRE HYDRANT.
10. A MINIMUM OF THREE FEET (3') IS REQUIRED BETWEEN CORPORATION STOPS. NO TAP SHALL BE MADE WITHIN THREE (3') OF A BELL.
11. THE LOCATION OF WATER SERVICE LATERALS MUST BE STAMPED IN THE CURB AT THE TIME THE CURB IS PLACED TO PERMANENTLY INDICATE THE LOCATION OF SAID LATERALS.
12. THE LOCATION OF ALL WATER SERVICE LATERALS, BENDS, TEES, ETC. MUST BE PROVIDED ON THE AS-BUILT PLANS. ALL OF THESE APPURTENANCES SHOULD BE SURVEYED IN STATE PLANE COORDINATES AND ELECTRONICALLY DELIVERED WITH AS-BUILTS.
13. CONTRACTOR SHALL SUBMIT AS-BUILT PLANS OF SANITARY AND WATER LATERALS TO THE OWNER.

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
APRIL, 2025		WG-1A

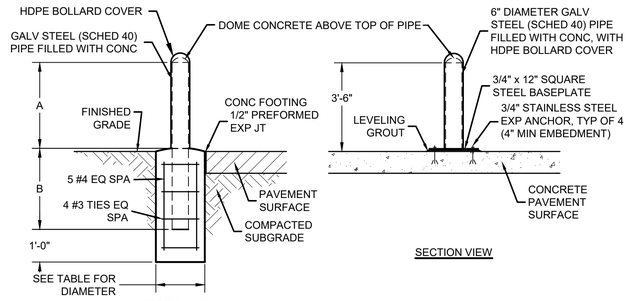
GENERAL NOTES - WATER (CONTINUED)

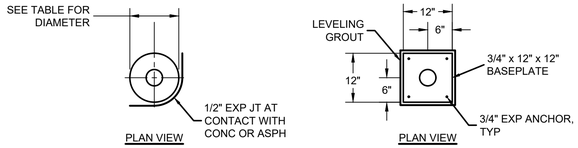
14. ALL WATER MAINS CROSSING UNDER STORM DRAINS SHALL BE BACK-FILLED WITH GRANULAR MATERIAL, O.D.O.T. ITEM 310.02, BETWEEN MAINS AND DRAINS.
15. ALL NEW WATER MAINS SHALL BE PRESSURE TESTED FOR 2 HOURS AT 200 PSI. ALLOWABLE LEAKAGE SHALL BE PER TABLE 6A OF AWWA C-600.
16. WHERE PVC IS USED IN RURAL WATER SERVICE AREAS, DETECTABLE WATER TAPE, PRESCO #PSD3105B52, SHOULD BE PLACED 1' ABOVE WATER MAIN.
17. EACH SERVICE LATERAL MUST BE A CONTINUOUS PIECE OF PIPE FROM THE CORP STOP TO THE METER. COUPLINGS SHALL NOT BE ALLOWED. TYPE K COPPER SHALL BE USED FOR 3/4" AND 1" SERVICES. POLYETHYLENE 200 PSI (COPPER TUBE SIZE) MAY BE USED FOR 1 1/2" AND 2" SERVICES. TRACER WIRE MUST BE USED WITH POLY AND SDR 21.
18. SERVICE LINES 1" AND LARGER MUST BE EITHER TYPE K COPPER, POLY 200 PSI (ASTM D-2737) OR SDR 21 (SLIP JOINT) (ASTM-2241). TRACER WIRE MUST BE TAPED EVENLY EVERY 3' ON POLY AND SDR 21 FROM THE METER PIT INTO THE STRUCTURE BEING SERVED (A 3' LEAD IS REQUIRED INSIDE THE PIT).
19. 1 1/2" AND 2" SERVICE LINES FROM THE CORP STOP TO THE METER PIT MUST BE TYPE K COPPER OR POLYETHYLENE 200 PSI. POLY MUST HAVE A TRACER WIRE. SEE W-10B.
20. FIRE HYDRANTS MUST BE PROVIDED AT THE ENTRANCE TO ALL SUBDIVISIONS AND AT ALL STREET INTERSECTIONS.
21. AN APPROVED BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED ON ALL WATER SERVICE LATERALS BY THE PROPERTY OWNER PRIOR TO ANY POINT OF CONNECTION OR USAGE. THE FOLLOWING DEVICES AND LOCATIONS ARE REQUIRED.
   A) RESIDENTIAL DWELLING UNITS (3 FAMILY OR LESS): LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE. DUEL CHECK VALVE A.S.S.E. 1024.
   B) LANDSCAPE IRRIGATION SYSTEMS: REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY A.S.S.E. 1013. LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE.
   C) FIRE PROTECTION SYSTEMS: DOUBLE CHECK DETECTOR CHECK ASSEMBLY A.S.S.E. 1048 OR REDUCED PRESSURE PRINCIPLE DETECTOR CHECK A.S.S.E. 1047 IF SYSTEM CONTAINS ADDITIVES; A.S.S.E. 1048 LOCATED IN VAULT AND A.S.S.E. 1047 LOCATED IN BUILDING.
   D) NON-RESIDENTIAL SERVICES: REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY A.S.S.E. 1013, LOCATED IMMEDIATELY UPON ENTRY OF STRUCTURE.
21. BACKFLOW PREVENTION DEVICE THAT COMPLIES WITH A.S.S.E. 1013 IS TO BE INSTALLED AHEAD OF ANY SPRINKLER BUT NOT IN THE METER PIT.
22. NEW BACKFLOW PREVENTION DEVICES BEING INSTALLED ON EXISTING SERVICES SHALL BE INSTALLED EITHER IMMEDIATELY UPON ENTRY TO THE BUILDING, BEFORE ANY CONNECTIONS, OR IN A PIT OR ABOVE GROUND HEATED INCLOSURE (IN ACCORDANCE WITH DEVICE INSTALLATION REQUIREMENTS) A MINIMUM OF 4 FEET AWAY FROM THE EXISTING METER PIT OR VAULT.

APPROVED/REVISED	WARREN COUNTY STANDARD DETAILS DEPARTMENT OF WATER & SEWER	STANDARD NUMBER
NOVEMBER, 2024		WG-1B



LANDSCAPING DETAIL
SCALE: NONE





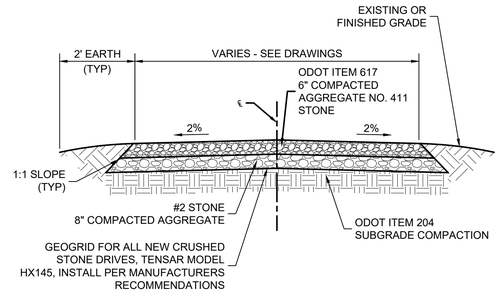
TYPES 1 AND 2 BOLLARDS

TYPE 3 BOLLARD

NOTES:
1. TYPE OF BOLLARD INSTALLED SHALL BE AS IDENTIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
2. REFER TO SPEC 05520 FOR BOLLARD COVERS.

BOLLARDS		
	TYPE 1	TYPE 2
PIPE DIA	6"	8"
PIPE LENGTH	6'	7'
DIMENSION A	3'-6"	4'-0"
DIMENSION B	2'-6"	3'-0"
CONC FOOTING DIA	18"	24"

BOLLARD DETAIL
SCALE: NONE



CRUSHED STONE DRIVE
SCALE: NONE

SCALE VERIFICATION	DRAWN BY	DMG
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS
	APPROVED BY	RKB
	ISSUE DATE	MAY 2025
	PROJECT NUMBER	705524-04-001

NO.	DATE	INITIALS	REVISION DESCRIPTIONS

STATE OF OHIO — RYAN KENT BRAUEN E-79180 REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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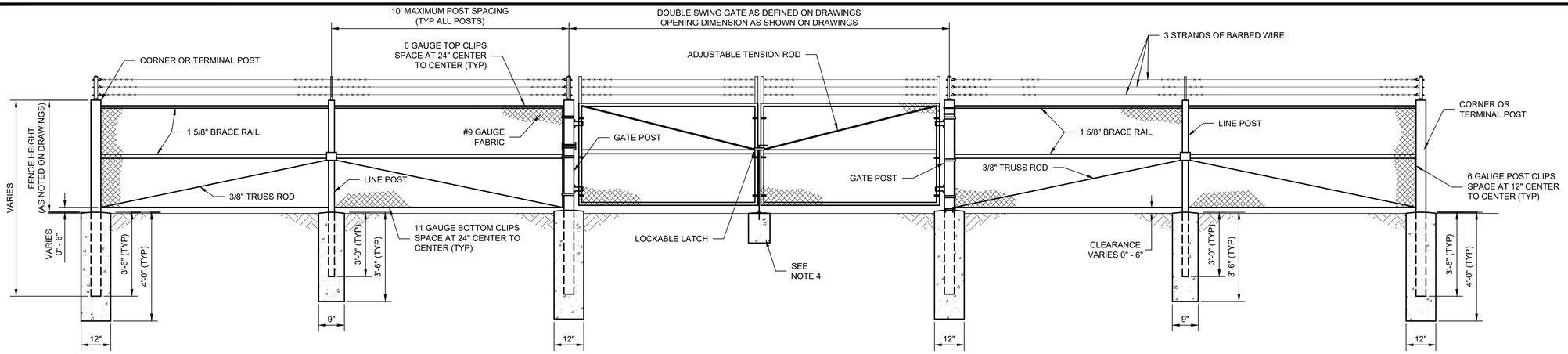
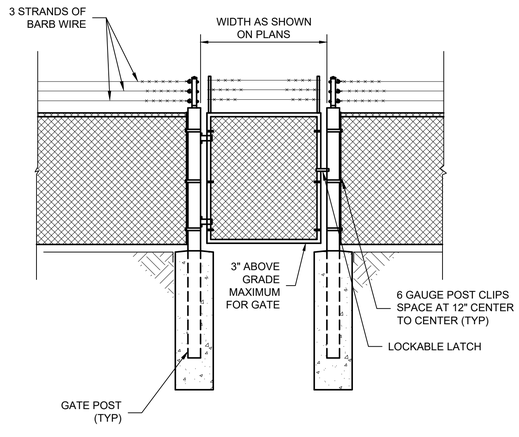
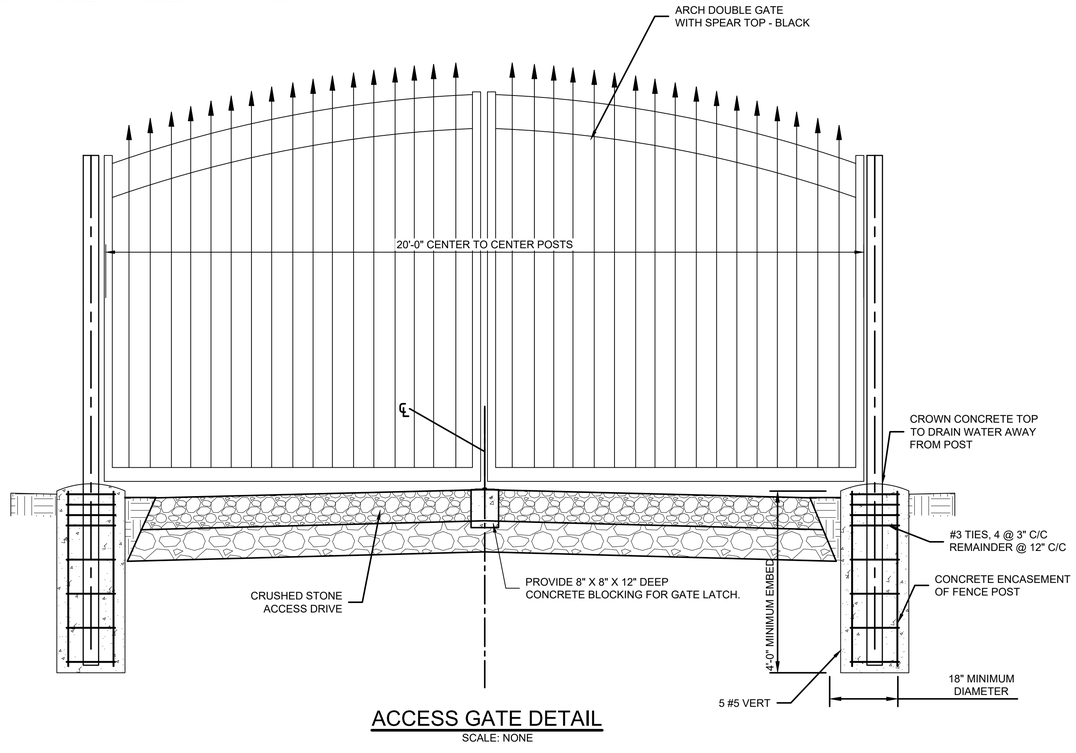


DOUBLE GATE

NOTES:
1. TERMINAL POSTS SHALL BE USED AT EACH FENCE CORNER OR END. GATE POSTS SHALL BE USED AT EACH GATE OPENING. LINE POSTS SHALL BE USED AT MAXIMUM 10' SPACING WHERE TERMINAL, GATE OR PULL POSTS ARE NOT REQUIRED.
2. PULL POSTS SHALL BE SPACED AT A MAXIMUM OF 500' ON LONG STRAIGHT RUNS ALONG CONSISTENT GRADES, AT EVERY HORIZONTAL BEND GREATER THAN 10° WHERE TERMINAL POSTS ARE NOT REQUIRED, AND AT EVERY MAJOR CHANGE OF GRADE. PULL POSTS SHALL NOT BE USED AS GATE OR TERMINAL POSTS.
3. ALL CONCRETE IN POST ANCHORS SHALL CONFORM TO THE SPECIFICATIONS.
4. PROVIDE 8" X 8" X 12" DEEP CONCRETE BLOCKING FOR GATE LATCH.



PEDESTRIAN SWING GATE
SCALE: NONE



ACCESS GATE DETAIL
SCALE: NONE

SCALE VERIFICATION	DRAWN BY	DMG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS				
	APPROVED BY	RKB				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO
RYAN KENT BRAUEN
E-79180
REGISTERED
PROFESSIONAL ENGINEER
05/16/2025

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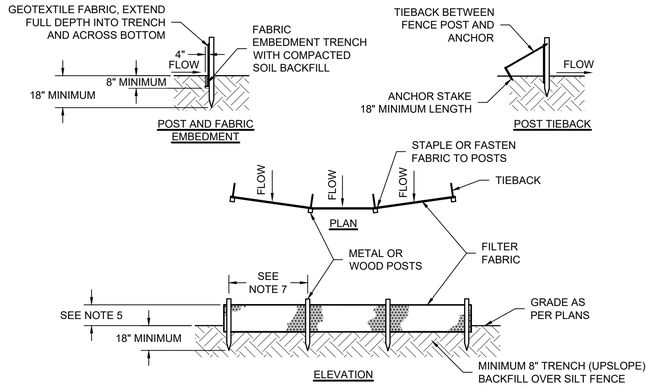
EROSION CONTROL SCHEDULE

CONSTRUCTION ACTIVITY	SCHEDULE CONSIDERATION
PRECONSTRUCTION ACTIVITIES: POST THE FOLLOWING INFORMATION NEAR THE MAIN ENTRANCE OF THE PROJECT SITE OR AT A PUBLICLY ACCESSIBLE LOCATION: NOTICE OF INTENT (NOI) DOCUMENT, COPY OF THE PUBLIC NOTICE, NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NUMBER, NAME, ADDRESS, AND PHONE NUMBER OF THE LOCAL CONTACT PERSON, AND LOCATION OF A COPY OF THE CONSTRUCTION DRAWINGS AND STORMWATER POLLUTION PREVENTION PLAN (SWP3). MAINTAIN DOCUMENTATION ON-SITE PER SPECIFICATION 02101 FOR THE PROJECT MANAGEMENT LOG. THE SWPPP SHOULD BE ONSITE AND SELF-MONITORING INSPECTION REPORTS MUST BE AVAILABLE WITHIN 48 HOURS OF REQUEST. INFORM OR TRAIN PERSONNEL ASSOCIATED WITH THE PROJECT OF THE TERMS AND CONDITIONS OF THE CGP AND THE SWPPP REQUIREMENTS.	AUTHORIZATION UNDER THE CGP IS EFFECTIVE 48-HOURS AFTER SUBMITTAL OF THE NOTICE OF INTENT TO OEPA AND LOCAL AUTHORITY BY THE OWNER.
REVIEW THE EROSION CONTROL SCHEDULE ON THE DRAWINGS AND REVISE AS NEEDED TO PHASE CONSTRUCTION ACTIVITIES TO MINIMIZE THE FOOTPRINT OF DISTURBED UNSTABLE AREAS. SUBMIT A REVISED EROSION CONTROL SCHEDULE AS NEEDED FOR TEMPORARY AND PERMANENT EROSION CONTROL WORK AS APPLICABLE.	COMPLETE BEFORE CONSTRUCTION BEGINS.
CONSTRUCTION ACCESS - ENTRANCE TO SITE, CONSTRUCTION ROUTES, AREAS DESIGNATED FOR EQUIPMENT PARKING OR MATERIAL STAGING AND WASTE HANDLING.	THIS IS THE FIRST LAND-DISTURBING ACTIVITY. AS SOON AS CONSTRUCTION BEGINS, STABILIZE ANY BARE AREAS WITH AGGREGATE AND TEMPORARY VEGETATION.
SEDIMENT TRAPS AND BARRIERS - BASIN TRAPS, SILT FENCE AND PERIMETER PROTECTION.	AFTER CONSTRUCTION IS ACCESSED, BASINS SHALL BE INSTALLED, WITH THE ADDITION OF MORE TRAPS AND BARRIERS AS NEEDED DURING GRADING. SET UP PROTECTION FOR NATURAL FEATURES, TREES AND BUFFERS.
RUNOFF CONTROL - DIVERSIONS, PERIMETER PROTECTION, CHECK DAMS, OUTLET PROTECTION.	RUNOFF CONTROL PRACTICES SHALL BE INSTALLED AFTER THE INSTALLATION OF SEDIMENT TRAPS AND BEFORE LAND GRADING. ADDITIONAL RUNOFF CONTROL MEASURES MAY BE INSTALLED DURING GRADING.
RUNOFF CONVEYANCE SYSTEM - STABILIZE STREAM BANKS, STORM DRAINS, CHANNELS, INLET AND OUTLET PROTECTION, SLOPE DRAINS.	AS NECESSARY, STABILIZE STREAM BANKS AND SIDE SLOPES OF RUNOFF SYSTEMS AS SOON AS POSSIBLE. USE EROSION CONTROL BLANKETS OR SLOPE DRAINS TO PREVENT EROSION. INSTALL INLET PROTECTION TO PREVENT SEDIMENTS FROM ENTERING STORM DRAINAGE SYSTEMS. PROTECT STORM OUTLETS TO PREVENT EROSION.
LAND CLEARING AND GRADING - SITE PREPARATION (CUTTING, FILLING, AND GRADING, SEDIMENT TRAPS, BARRIERS, DIVERSIONS, DRAINS, SURFACE ROUGHENING).	IMPLEMENT CLEARING AND GRADING AFTER INSTALLATION OF SEDIMENT TRAPS AND RUNOFF CONTROL MEASURES, AND INSTALL ADDITIONAL CONTROL MEASURES AS GRADING CONTINUES. CLEAR BORROW AND DISPOSAL AREAS AS NEEDED.
SURFACE STABILIZATION - TEMPORARY AND PERMANENT SEEDING, MULCHING, SODDING, RIPRAP, EROSION CONTROL BLANKET.	APPLY TEMPORARY OR PERMANENT STABILIZING MEASURES IMMEDIATELY TO ANY DISTURBED AREAS WHERE WORK HAS BEEN EITHER COMPLETED OR DELAYED.
CONSTRUCTION - STRUCTURES, UTILITIES, PAVING, CONCRETE WASHOUT, AND CONSTRUCTION ENTRANCES.	DURING CONSTRUCTION, INSTALL ANY EROSION AND SEDIMENTATION CONTROL MEASURES THAT ARE NEEDED.
LANDSCAPING AND FINAL STABILIZATION - TOPSOILING, TREES AND SHRUBS, PERMANENT SEEDING, MULCHING, SODDING, RIPRAP.	THIS IS THE LAST CONSTRUCTION PHASE. STABILIZE ALL DISTURBED AREAS, INCLUDING BORROW AND SPOIL AREAS, AND REMOVE ALL TEMPORARY CONTROL MEASURES. FINAL STABILIZATION IS WHEN A UNIFORM DENSITY OF 70% VEGETATION COVER IS MET. PROVIDE NOTIFICATION TO THE OWNER WHEN THE ENTIRE SITE HAS BEEN STABILIZED AND ALL CONSTRUCTION MATERIALS, WASTES, AND EQUIPMENT HAVE BEEN REMOVED.

EROSION CONTROL SCHEDULE
SCALE: NONE

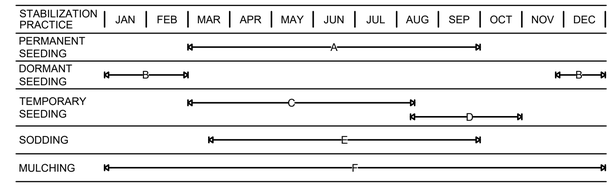


NOTES:
1. SYNTHETIC FILTER FABRIC SHALL BE A PERVIOUS SHEET OF WOVEN OR NON-WOVEN GEOTEXTILE FABRIC AND SHALL BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE FOLLOWING REQUIREMENTS:
   a. TEXTILE STRENGTH AT 20% (MAXIMUM) ELONGATION, PER ASTM D4632.
   b. WOVEN EXTRA STRENGTH - 50 LB/LINEAR INCH (MINIMUM), NON-WOVEN EXTRA STRENGTH - 70 LB/INCH (MINIMUM).
   c. WOVEN STANDARD STRENGTH - 30 LB/LINEAR INCH (MINIMUM), NON-WOVEN STANDARD STRENGTH - 50 LB/INCH (MINIMUM).
   d. APPARENT OPENING SIZE (AOS) (U.S. SIEVE) - NO. 30 PARTICLE SIZE OF 0.6 mm (MAXIMUM), ASTM D4751.
   e. PERMITTIVITY - 0.05 S^{-1} (MAXIMUM), ASTM D4491.
2. POSTS FOR SILT FENCES SHALL BE EITHER 2"X2" SQUARE WOOD OR EQUIVALENT METAL POSTS WITH A MINIMUM LENGTH OF 5'. METAL POSTS SHALL HAVE PROJECTIONS FOR FASTENING WIRE TO THEM.
3. ANCHOR STAKES FOR SILT FENCES SHALL BE 1"x2" WOOD (PREFERRED) OR EQUIVALENT METAL WITH A MINIMUM LENGTH OF 18".
4. WIRE FENCE REINFORCEMENT FOR SILT FENCES USING STANDARD STRENGTH FILTER CLOTH SHALL BE A MINIMUM OF 42" IN HEIGHT, A MINIMUM OF 14 GAUGE, AND SHALL HAVE A MAXIMUM MESH SPACING OF 6".
5. THE HEIGHT OF THE BARRIER SHALL BE A MINIMUM OF 18" AND A MAXIMUM OF 30".
6. 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 NECESSARY, FILTER FABRIC SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6" OVERLAP, AND SECURELY SEALED.
7. POSTS SHALL BE SPACED A MAXIMUM OF 6' APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 18"). WHEN STANDARD STRENGTH FABRIC IS USED WITH THE WIRE SUPPORT FENCE, POST SPACING SHALL NOT EXCEED 8'.
8. THE SPACING OF TIEBACKS SHALL EQUAL THE SPACING OF THE POSTS. ADDITIONAL POST DEPTH OR TIEBACKS MAY BE REQUIRED IN UNSTABLE SOILS.
9. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4" WIDE AND A MINIMUM OF 8" DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
10. WHEN STANDARD STRENGTH FILTER FABRIC IS USED WITH A WIRE MESH SUPPORT FENCE IT SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY 1" WIRE STAPLES, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2" AND SHALL NOT EXTEND MORE THAN 36" ABOVE THE ORIGINAL GROUND SURFACE.
11. THE STANDARD STRENGTH FILTER FABRIC, WITHOUT A WIRE MESH SUPPORT FENCE, SHALL BE STAPLED OR WIRED TO THE FENCE, AND A MINIMUM 8" OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36" ABOVE THE ORIGINAL GROUND SURFACE. DO NOT STAPLE FILTER FABRIC TO EXISTING TREES.
12. WHEN EXTRA STRENGTH FILTER FABRIC OR BURLAP AND POST SPACING IS LESS THAN THE MAXIMUM SPECIFIED SPACING OF 6', THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED.
13. BACKFILL THE TRENCH AND COMPACT THE SOIL OVER THE FILTER FABRIC.
14. REMOVE SILT FENCES WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
15. SILT FENCE SHALL NOT BE USED AS A DIVERSION AND SHALL NOT BE INSTALLED ACROSS A STREAM, CHANNEL, DITCH, SWALE, ETC.

MAINTENANCE:
1. INSPECT AFTER EACH RAINFALL AND DAILY DURING PROLONGED RAINFALL. INSPECT AT LEAST ONCE EVERY 7 CALENDAR DAYS.
2. REPLACE OR REPAIR FABRIC IMMEDIATELY IF IT DECOMPOSES OR IS INEFFECTIVE.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY HALF THE HEIGHT OF THE BARRIER.
4. SPREAD ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED AND DRESS TO CONFORM WITH THE FINISHED GRADING.

SILT FENCE
SCALE: NONE

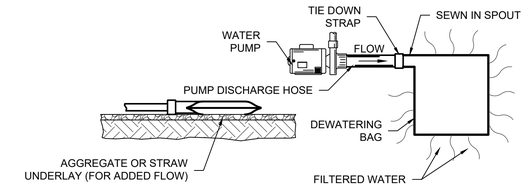
SEASONAL SOIL PROTECTION CHART



A. = KENTUCKY BLUEGRASS AND PERENNIAL RYEGRASS 100 LB/ACRE
B. = KENTUCKY BLUEGRASS AND PERENNIAL RYEGRASS 150 LB/ACRE. PREPARE SEEDBED PRIOR TO NOV 20
C. = MIX 1 (128 LB/ACRE OATS, 40 LB/ACRE TALL FESCUE, 40 LB/ACRE ANNUAL RYEGRASS), MIX 2 (40 LB/ACRE PERENNIAL RYEGRASS, 40 LB/ACRE TALL FESCUE, 40 LB/ACRE ANNUAL RYEGRASS), MIX 3 (55 LB/ACRE ANNUAL RYEGRASS, 142 LB/ACRE PERENNIAL RYEGRASS, 17 LB/ACRE CREEPING RED FESCUE, 17 LB/ACRE KENTUCKY BLUEGRASS), OR MIX 4 (128 LB/ACRE OATS, 40 LB/ACRE TALL FESCUE, 40 LB/ACRE ANNUAL RYEGRASS)
D. =MIX 5 (112 LB/ACRE RYE, 40 LB/ACRE TALL FESCUE, 40 LB/ACRE ANNUAL RYEGRASS), MIX 6 (120 LB/ACRE WHEAT, 40 LB/ACRE TALL FESCUE, 40 LB/ACRE ANNUAL RYEGRASS), MIX 7 (40 LB/ACRE PERENNIAL RYE, 40 LB/ACRE TALL FESCUE, 40 LB/ACRE ANNUAL RYEGRASS), OR MIX 8 (40 LB/ACRE ANNUAL RYEGRASS, 40 LB/ACRE PERENNIAL RYEGRASS, 40 LB/ACRE CREEPING RED FESCUE, 40 LB/ACRE KENTUCKY BLUEGRASS)
E. = SOD
F. = ANCHORED STRAW/HAY (2 TONS/ACRE) OR WOOD CELLULOSE FIBER (750 LB/ACRE) OR WOOD MULCH/CHIPS (10 TONS/ACRE)

NOTES:
1. IRRIGATION NEEDED DURING MAY THROUGH SEPTEMBER.
2. IRRIGATION NEEDED FOR 2 TO 4 WEEKS AFTER APPLYING SOD.
3. ANCHORED MULCH IS REQUIRED FOR PERMANENT, DORMANT AND TEMPORARY SEEDING.
4. OPTIMUM SEEDING DATES PROVIDED. DATES MAY BE EXTENDED OR SHORTENED BASED ON PROJECT LOCATION.
5. SEED MIXTURES PROVIDED FOR LAWNS AND HIGH MAINTENANCE AREAS.
6. ADDITIONAL REQUIREMENTS AND INFORMATION ARE LOCATED IN THE OHIO DEPT. OF NATURAL RESOURCES RAINWATER AND LAND DEVELOPMENT MANUAL.

MAINTENANCE:
1. INSPECT WITHIN 24 HOURS OF EACH 0.5-INCH RAIN EVENT AND AT LEAST ONCE EVERY 7 CALENDAR DAYS.
2. CHECK FOR EROSION AND MOVEMENT OF MULCH AND REPAIR IMMEDIATELY.
3. MONITOR FOR EROSION DAMAGE AND ADEQUATE COVER (70% DENSITY).
4. RESEED, FERTILIZE OR APPLY MULCH WHERE NECESSARY.



MECHANICAL PROPERTIES	TEST METHOD	UNITS	INDUSTRY STANDARD
GRAB TENSILE STRENGTH	ASTM D4632	kN (LB)	0.9 (205) X 0.9 (205)
GRAB TENSILE ELONGATION	ASTM D4632	%	50 X 50
PUNCTURE STRENGTH	ASTM D4833	kN (LB)	0.58 (130)
MULLEN BURST STRENGTH	ASTM D3786	kPa (PSI)	2618 (380)
TRAPEZOID TEAR STRENGTH	ASTM D4533	kN (LB)	0.36 (80) X 0.36 (80)
UV RESISTANCE	ASTM D4355	%	70
APPARENT OPENING SIZE	ASTM D4751	Mm (US STD SIEVE)	0.180 (80)
FLOW RATE	ASTM D4491	1/MIN/M² (GAL/MIN/FT²)	3866 (95)
PERMITTIVITY	ASTM D4491	S^{-1}	1.2

MAINTENANCE:
1. DURING THE ACTIVE DEWATERING PROCESS, INSPECTION OF THE PUMPING BAG SHOULD BE REVIEWED FREQUENTLY. SPECIAL ATTENTION SHOULD BE PAID TO THE BUFFER AREA FOR ANY SIGN OF EROSION AND CONCENTRATION OF FLOW. OBSERVE WHERE POSSIBLE THE VISUAL QUALITY OF THE EFFLUENT AND DETERMINE IF ADDITIONAL TREATMENT CAN BE PROVIDED.
2. DISPOSE OF ACCUMULATED SEDIMENT REMOVED DURING PUMPING OPERATIONS IN CONFORMANCE WITH THE SPECIFICATIONS.
3. REPLACE THE BAG OR DISPOSE OF SILT WHEN HALF FULL OF SEDIMENT OR WHEN SEDIMENT HAS REDUCED THE FLOW RATE TO AN IMPRACTICAL RATE.

SOURCE:
KRISTAR
DANDY DEWATERING BAG
SEDCATCH

PUMPING BAG
SCALE: NONE

SCALE VERIFICATION	DRAWN BY	DMG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS	
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS					
	APPROVED BY	RKB					
	ISSUE DATE	MAY 2025					
	PROJECT NUMBER	705524-04-001					

STATE OF OHIO · RYAN KENT BRAUEN · E-79180 · REGISTERED PROFESSIONAL ENGINEER
05/16/2025

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MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

EROSION CONTROL DETAILS

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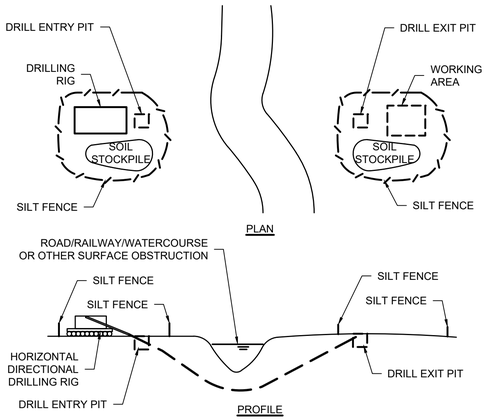
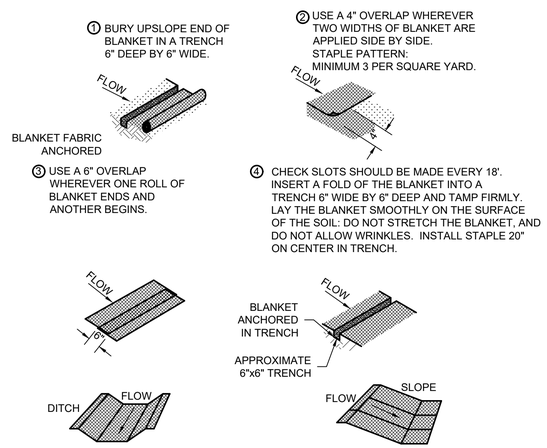


NOTES:
1. INSTALL SILT FENCE PRIOR TO ANY EXCAVATION.
2. FILTER WATER FROM BORE PIT DEWATERING, AND DO NOT DIRECTLY DISCHARGE TO ANY DITCH, STREAM, WETLAND OR STORM WATER CONVEYANCE. REFER TO PUMPING BAG DETAIL.
3. PLACE SOIL STOCKPILES WITHIN THE SILT FENCE BOUNDARY.
4. SOIL FROM STOCKPILES SHALL BE USED FOR BACKFILL OR DISPOSED OF PROPERLY.
5. RESEED AND MULCH ALL DISTURBED SOIL SURFACES.
6. ENVIRONMENTAL PROTECTION TO BE PROVIDED AS NECESSARY TO CONTAIN ANY DRILLING FLUID SPILLS.

MAINTENANCE:
1. INSPECT SILT FENCE BARRIERS AFTER EACH RAINFALL, AND REPAIR OR REPLACE IMMEDIATELY.
2. REMOVE SEDIMENT DEPOSITS FROM THE SILT FENCE AFTER STORM EVENTS.

HORIZONTAL DIRECTIONAL DRILLING
SCALE: NONE

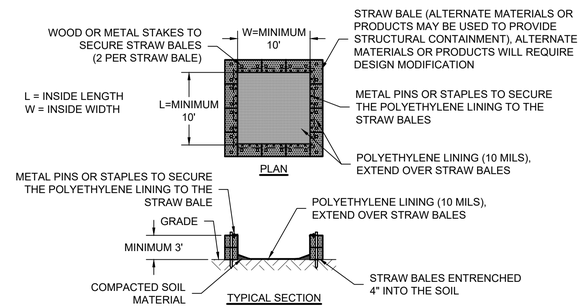


PRODUCT:
1. NORTH AMERICAN GREEN SC150, OR EQUAL.

NOTES:
1. PROTECT THE SLOPES WITH AN EROSION CONTROL BLANKET WHERE CONSTRUCTION DISTURBS SLOPES EQUAL OR STEEPER THAN 3:1.

MAINTENANCE:
1. INSPECT FOR EROSION AFTER EACH STORM EVENT DURING VEGETATION ESTABLISHMENT, AND AT LEAST ONCE EVERY 7 CALENDAR DAYS.
2. IF ANY AREAS SHOW EROSION, PULL BACK THAT PORTION OF THE BLANKET, ADD SOIL, RESEED, RELAY AND STAPLE THE BLANKET.
3. CHECK AREAS PERIODICALLY AFTER VEGETATION ESTABLISHMENT.

EROSION CONTROL BLANKET
SCALE: NONE

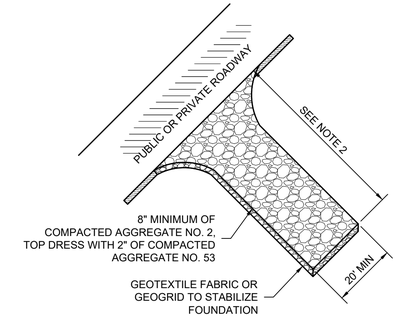


NOTES:
1. LOCATE WASHOUTS AT LEAST 50' FROM ANY CREEKS, WETLANDS, DITCHES, KARST FEATURES, OR STORM DRAIN/CONVEYANCES.

WASHOUT PROCEDURES:
1. DO NOT LEAVE EXCESS MUD IN THE CHUTES OR HOPPER AFTER POURING CONCRETE. MAKE EVERY EFFORT TO EMPTY THE CHUTE AND HOPPER AT THE POUR. THE LESS MATERIAL LEFT IN THE CHUTES AND HOPPER, THE QUICKER AND EASIER THE CLEANOUT. SMALL AMOUNTS OF EXCESS CONCRETE (NOT WASHOUT WATER) MAY BE DISPOSED OF IN AREAS THAT WILL NOT FLOW TO AN AREA THAT IS TO BE PROTECTED.
2. SCRAPE AS MUCH MATERIAL FROM THE CHUTES AS POSSIBLE BEFORE WASHING THEM. USE NON-WATER CLEANING METHODS TO MINIMIZE THE CHANCE FOR WASTE TO FLOW OFF SITE.
3. STOP WASHING OUT IN AN AREA IF YOU OBSERVE WATER RUNNING OFF THE DESIGNATED AREA OR IF THE WATER IS NOT BEING CONTAINED WITHIN THE WASHOUT AREA.
4. DO NOT BACK FLUSH EQUIPMENT AT THE PROJECT SITE.
5. DO NOT USE ADDITIVES WITH WASH WATER.
6. DO NOT WASH OUT OR DRAIN WASTE WATERS TO STORM DRAINS, WETLANDS, STREAMS, RIVERS, CREEKS, DITCHES OR STREETS.

MAINTENANCE:
1. MAINTENANCE REQUIREMENTS PROVIDED IN SPECIFICATIONS.

CONCRETE WASHOUT
SCALE: NONE



NOTES:
1. PLACE CONSTRUCTION ENTRANCE AS SHOWN ON THE PLANS AND AT ALL TEMPORARY CONSTRUCTION DRIVES THAT ARE INSTALLED.
2. FOR LARGE SITES (2 ACRES OR LARGER) THE MINIMUM LENGTH IS 150'. FOR SMALLER SITES (LESS THAN 2 ACRES) THE MINIMUM LENGTH IS 50'.
3. PROVIDE CULVERT OR OTHER METHODS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.

MAINTENANCE:
1. INSPECT DAILY AND REPLACE DISPLACED STONE.
2. IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED ONTO ADJACENT ROADWAY.
3. RESHAPE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.
4. AT COMPLETION OF PROJECT COMPLETELY REMOVE AND RESTORE SITE TO ORIGINAL CONDITIONS, OR AS APPLICABLE USE FOR BASE OF NEW PERMANENT DRIVE, MAINTAINING DESIGN ELEVATIONS AND SECTION.

CONSTRUCTION ENTRANCE
SCALE: NONE

SCALE VERIFICATION	DRAWN BY	DMG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	VVS				
	APPROVED BY	RKB				
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STATE OF OHIO · RYAN KENT BRAUEN · E-79180 · REGISTERED PROFESSIONAL ENGINEER
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BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

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LIGHTING

- SURFACE/PENDANT MOUNTED LIGHT FIXTURE LETTER DENOTES TYPE, # DENOTED CIRCUIT, SHADING DENOTES EMERGENCY AND/OR NIGHT LIGHT
- SURFACE/PENDANT MOUNTED LIGHT FIXTURE LETTER DENOTES TYPE, # DENOTES CIRCUIT, SHADING DENOTES EMERGENCY AND/OR NIGHT LIGHT
- RECESS MOUNTED LIGHT FIXTURE LETTER DENOTES TYPE, # DENOTED CIRCUIT, SHADING DENOTES EMERGENCY AND/OR NIGHT LIGHT
- RECESS MOUNTED LIGHT FIXTURE LETTER DENOTES TYPE, # DENOTES CIRCUIT, SHADING DENOTES EMERGENCY AND/OR NIGHT LIGHT
- H.I.D. OR INCANDESCENT FIXTURE CEILING MOUNTED LETTER DENOTES TYPE, # DENOTES CIRCUIT
- WALL MOUNTED FIXTURE LETTER DENOTES TYPE, # DENOTES CIRCUIT
- WALL MOUNTED PHOTOCELL
- CEILING MOUNTED EXIT SIGN
- WALL MOUNTED EXIT SIGN
- EMERGENCY LIGHT FIXTURE # DENOTES CIRCUIT
- POLE MOUNTED FIXTURE

RECEPTACLE

- DUPLEX RECEPTACLE SUBSCRIPT DENOTES TYPE: UPS DENOTES UNINTERRUPTIBLE POWER SUPPLY # DENOTES CIRCUIT
- SINGLE OUTLET RECEPTACLE
- SPECIAL PURPOSE OUTLET
- MULTI-OUTLET RECEPTACLE SINGLE
- MULTI-OUTLET RECEPTACLE DUPLEX
- 240 VOLT RECEPTACLE

PANELS AND BOXES

- JUNCTION BOX
- PULL BOX
- PANEL

HVAC AND FIRE ALARM

- FIRE ALARM PULL STATION
- FIRE ALARM CONTROL PANEL
- ANNUNCIATOR
- HORN/LIGHT DEVICE
- DUCT DETECTOR
- SMOKE DETECTOR SUBSCRIPT DENOTES TYPE:
  - Z DENOTES IONIZATION
  - P DENOTES PHOTOELECTRIC
  - T DENOTES THERMAL
- THERMOSTAT
- AMBIENT TEMPERATURE TRANSMITTER
- UNIT HEATER
- WALL MOUNTED GAS DETECTION FIXTURE

SWITCHES

- WALL SWITCH
  SUBSCRIPT DENOTES TYPE:
  NO SUBSCRIPT DENOTES SINGLE POLE
  3 DENOTES 3 WAY
  4 DENOTES 4 WAY
  M DENOTES MANUAL MOTOR STARTER
- MOTOR STARTER
- COMBINATION MOTOR STARTER
- DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH
- DOOR LIMIT SWITCH
- LOCAL CONTROL STATION
- SPEED SWITCH

WIRING

- CONDUIT HOME RUN
- CONDUIT EXPOSED
- CONDUIT CONCEALED
- FLEXIBLE CONDUIT

SCHEMATICS

- 3-POSITION SELECTOR SWITCH HAND - OFF - AUTO
- PUSHBUTTON SWITCH N.O. TEXT DENOTES LEGEND PLATE
- PUSHBUTTON SWITCH N.C. TEXT DENOTES LEGEND PLATE
- MUSHROOM HEAD EMERGENCY STOP PUSHBUTTON SWITCH N.C. MAINTAINED TEXT DENOTES LEGEND PLATE
- PUSHBUTTON SWITCH N.C. WITH LOCK-OUT TEXT DENOTES LEGEND PLATE
- DISCONNECT SWITCH N.O.
- DISCONNECT SWITCH N.C.
- TEMPERATURE SWITCH OR THERMOSTAT N.O. TEXT DENOTES TAG NUMBER
- TEMPERATURE SWITCH OR THERMOSTAT N.C. TEXT DENOTES TAG NUMBER
- PRESSURE SWITCH N.O. TEXT DENOTES TAG NUMBER
- PRESSURE SWITCH N.C. TEXT DENOTES TAG NUMBER
- LEVEL SWITCH N.O. TEXT DENOTES TAG NUMBER
- LEVEL SWITCH N.C. TEXT DENOTES TAG NUMBER
- ON DELAY TIMED SWITCH N.O.T.C. TEXT DENOTES TAG NUMBER
- ON DELAY TIMED SWITCH N.C.T.O. TEXT DENOTES TAG NUMBER
- OFF DELAY TIMED SWITCH N.O.T.O. TEXT DENOTES TAG NUMBER
- OFF DELAY TIMED SWITCH N.C.T.C. TEXT DENOTES TAG NUMBER
- TORQUE SWITCH TEXT DENOTES TAG NUMBER
- LIMIT SWITCH TEXT DENOTES TAG NUMBER
- CONTACT (NORMALLY OPEN) # DENOTES COIL NUMBER
- CONTACT (NORMALLY CLOSED) # DENOTES COIL NUMBER
- INDICATOR LIGHT - LETTER DENOTES COLOR
- PUSH-TO-TEST INDICATOR LIGHT LETTER DENOTES COLOR
- ELAPSED TIME METER
- SOLENOID VALVE
- MECHANICAL INTERLOCK CONNECTION
- COIL
  - M DENOTES MOTOR STARTER
  - CR DENOTES CONTROL RELAY
  - TR DENOTES TIME DELAY RELAY
  - LC DENOTES LIGHTING CONTACTOR
  - PR DENOTES INTERPOSING PILOT RELAY
  - XXX DENOTES REFERENCE LINE NUMBER

SINGLE LINE

- EXISTING TO REMAIN
- EXISTING TO BE DEMOLISHED
- NEW
- FUTURE
- TX-STRUCTURE DESIGNATION XXX kVA 480-120/208V
- TRANSFORMER
- 3P/4W TYPE OF TRANSFORMER
- PROTECTIVE RELAY, NUMBER DENOTES IEEE DEVICE FUNCTION
- 1200A 52 MEDIUM VOLTAGE DRAWOUT CIRCUIT BREAKER
- 100 A FUSE
- XXA DRAWOUT POWER CIRCUIT BREAKER
- MCP MOLDED CASE CIRCUIT BREAKER
- THERMAL OVERLOAD RELAY
- GROUND
- 600:5A (3) CURRENT TRANSFORMER NUMBER DENOTES QUANTITY
- 480-120V (3) POTENTIAL TRANSFORMER NUMBER DENOTES QUANTITY
- DRAW-OUT ELEMENT
- 800A 3Ø 3W ATS AUTOMATIC OR MANUAL TRANSFER SWITCH
- 25 MOTOR NUMBER DENOTES HORSEPOWER
- XXkW 480V,3Ø,4W GENERATOR XX NUMBER DENOTES REQUIRED kW RATING AND VOLTAGE

EQUIPMENT/DEVICE LOCATION SYMBOLS

- LOCATED AT MCC, COMBINATION STARTER, OR BYPASS STARTER
- LOCATED IN FIELD
- LOCATED AT DCU 1A REMOTE I/O RACK
- LOCATED AT VFD

MISC PLAN VIEW SYMBOLS

- EQUIPMENT CONNECTION
- GROUND ROD
- INSTRUMENT TRANSMITTER

COMMUNICATIONS

- TELEPHONE OR NETWORK DROP
- ETHERNET JACK

SINGLE LINE, CONT'D.

- X% LINE REACTOR X% NUMBER DENOTES PERCENT IMPEDANCE
- CAPACITOR
- VOLTMETER AND SWITCH
- SHUNT TRIP
- TVSS TRANSIENT VOLTAGE SURGE SUPPRESSOR
- LIGHTNING ARRESTOR
- KIRK-KEY INTERLOCK
- COMBINATION POWER UNIT
  LP-#
- VFD VARIABLE FREQUENCY DRIVE

SITE DUCTBANKS

- UGC UNDERGROUND CONTROL
- UGE UNDERGROUND ELECTRICAL
- UGF UNDERGROUND FIBER

ABBREVIATIONS

A	AMPERE(S)	MAN	MANUFACTURER SUPPLIED (EX. MAN-CP)
ACU	AIR CONDITIONING UNIT	MAU	MAKEUP AIR UNIT
AE	ANALYTICAL SENSOR	MCC	MOTOR CONTROL CENTER
AF	AMP FRAME	MH	MANHOLE
AFF	ABOVE FINISHED FLOOR	MOL	MOTOR OPERATED LOUVER
AHU	AIR HANDLING UNIT	MPU	MINI POWER UNIT
AIT	ANALYTICAL INDICATOR TRANSMITTER	MV	MEDIUM VOLTAGE
AM	AMMETER	N	NEUTRAL
AMP	AMPERE(S)	N/A	NOT APPLICABLE
AT	AMP TRIP	N.C.	NORMALLY CLOSED
ATL	ACROSS THE LINE (STARTER)	NEC	NATIONAL ELECTRICAL CODE
ATS	AUTOMATIC TRANSFER SWITCH	NET	NETWORK (PANEL)
AUX	AUXILIARY	NF	NON-FUSED
AWG	AMERICAN WIRE GAUGE	NFSS	NON-FUSED SAFETY SWITCH
BKR	BREAKER	N.O.	NORMALLY OPEN
BLDG	BUILDING	NTS	NOT TO SCALE
C	CONDUIT	OL	OVERLOAD
CB	CIRCUIT BREAKER	PB	PUSHBUTTON
CKT	CIRCUIT	PLC	PROGRAMMABLE LOGIC CONTROLLER
CP	CONTROL PANEL	PM	POWER METER/MONITOR
CR	CORROSION RESISTANT	PNL	PANEL
CU	COPPER	PP	POWER PANEL
DF	DUCT FAN	RCPT	RECEPTACLE
DH	DUCT HEATER	RGS	RIGID GALVANIZED STEEL
DISC	DISCONNECT	RIO	REMOTE INPUT/OUTPUT
EF	EXHAUST FAN	R/S	RING SWITCH
ELEV	ELEVATION	RVSS	REDUCED VOLTAGE SOFT STARTER
EMH	ELECTRICAL MANHOLE	RVAT	REDUCED VOLTAGE AUTOTRANSFORMER
EMT	ELECTRICAL METALLIC TUBING	SF	SUPPLY FAN
EQUIP	EQUIPMENT	SHLD	SHIELDED
EWC	ELECTRICAL WATER COOLER	SOL	SOLENOID
EXP	EXPLOSION PROOF	SP	SINGLE POLE
F	FUSED OR FUSE	SPD	SURGE PROTECTIVE DEVICE
FE	FLOW SENSOR	SST	STAINLESS STEEL
FIT	FLOW INDICATOR TRANSMITTER	STR	STARTER
FLA	FULL LOAD AMPS	SW	SWITCH
FOPP	FIBER OPTIC PATCH PANEL	SWBD	SWITCHBOARD
FV(N)R	FULL VOLTAGE (NON) REVERSING	SWGR	SWITCHGEAR
G	GROUND	TB	TERMINAL BOX
GEN	GENERATOR	TPS	TWISTED PAIR SHIELDED
GF	GROUND FAULT	TYP	TYPICAL
GF(C)I	GROUND FAULT (CIRCUIT) INTERRUPTER	UGE	UNDERGROUND ELECTRICAL
HH	HANDHOLE	UGT	UNDERGROUND TELEPHONE
HOA	HAND-OFF-AUTOMATIC	UGCC	UNDERGROUND CONTROLS CABLE
HOR	HAND-OFF-REMOTE	UGF	UNDERGROUND FIBER
HP	HORSEPOWER	UH	UNIT HEATER
HPS	HIGH PRESSURE SODIUM	UL	UNDERWRITERS LABORATORIES
JB	JUNCTION BOX	UNO	UNLESS NOTED OTHERWISE
KV	KILOVOLTS	V	VOLTS
KVA	KILOVOLTS AMPS	VFD	VARIABLE FREQUENCY DRIVE
KVAR	KILOVAR	VM	VOLTMETER
KW	KILOWATTS	VS	VOLTMETER SWITCH
LCP	LOCAL CONTROL PANEL	W	WIRE/WATT
LCS	LOCAL CONTROL STATION	WH	WATER HEATER
LE	LEVEL SENSOR	WP	WEATHERPROOF
LIT	LEVEL INDICATING TRANSMITTER	XFMR	TRANSFORMER
LOR	LOCAL-OFF-REMOTE		
LP	LIGHTING PANEL		
LTG	LIGHTING		
LV	LOW VOLTAGE		

GENERAL NOTES:

1. PROVIDE SPARES AND SPARE EQUIPMENT AS OUTLINED IN SPECIFICATIONS.
2. CONTRACTOR RESPONSIBLE FOR WIRING SUCH THAT THE FUNCTIONALITY SHOWN IN THE PROJECTS DOCUMENTS IS INTEGRATED AS WELL AS ANY ADDITIONAL CONDUIT, WIRE, EQUIPMENT AND SUPPORTING EQUIPMENT NECESSARY TO MAKE THE DEVICE OPERATE AS DEPICTED AND IN ACCORDANCE WITH THE NEC.
3. ALL CONTROL PANELS AND LOCAL STATIONS NOT EXPLICITLY INDICATED TO HAVE A DISCONNECT SWITCH MOUNTED ADJACENT TO THE PANEL SHALL HAVE A MAIN CIRCUIT BREAKER WITH THRU PANEL OPERATOR WHICH SHALL BE LOCKABLE AND INTERLOCKED WITH THE PANEL DOOR AS NEEDED TO MEET THE REQUIREMENTS OF THE NEC.
4. CONTRACTOR RESPONSIBLE FOR ALL CONDUIT AND WIRE BETWEEN MECHANICAL EQUIPMENT (INCLUDING BUT NOT LIMITED TO UNIT HEATERS, EXHAUST FANS AND AIR CONDITIONING UNITS) AND CONTROLLERS (INCLUDING BUT NOT LIMITED TO MOTOR STARTERS, THERMOSTATS AND MOTOR OPERATED LOUVERS). FOR BID PURPOSES THIS IS TO BE 1"C, 4#14, #14G BETWEEN EACH PIECE OF EQUIPMENT AND CONTROLLER.
5. MANUFACTURER EQUIPMENT SHOWN FOR BIDDING PURPOSES ONLY. FINAL WIRING LIST TO BE PROVIDED BY EQUIPMENT SUPPLIER IN SHOP DRAWING SUBMITTAL. CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL WIRING AND CONDUIT BETWEEN THE MANUFACTURER'S CONTROL PANELS AND THE EQUIPMENT PROVIDED BY THE MANUFACTURER.

SCALE VERIFICATION

BAR IS ONE INCH LONG ON ORIGINAL DRAWING

DRAWN BY	JLK
CHECKED BY	JLK
APPROVED BY	WCM
ISSUE DATE	MAY 2025
PROJECT NUMBER	705524-04-001

NO.	DATE	INITIALS	REVISION DESCRIPTIONS

STATE OF OHIO WAYNE C. MOORE E-70068 REGISTERED PROFESSIONAL ENGINEER 05/19/2025

WESSLER ENGINEERING
More than a Project™

MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

ELECTRICAL LEGEND

SHEET NO. 5E1

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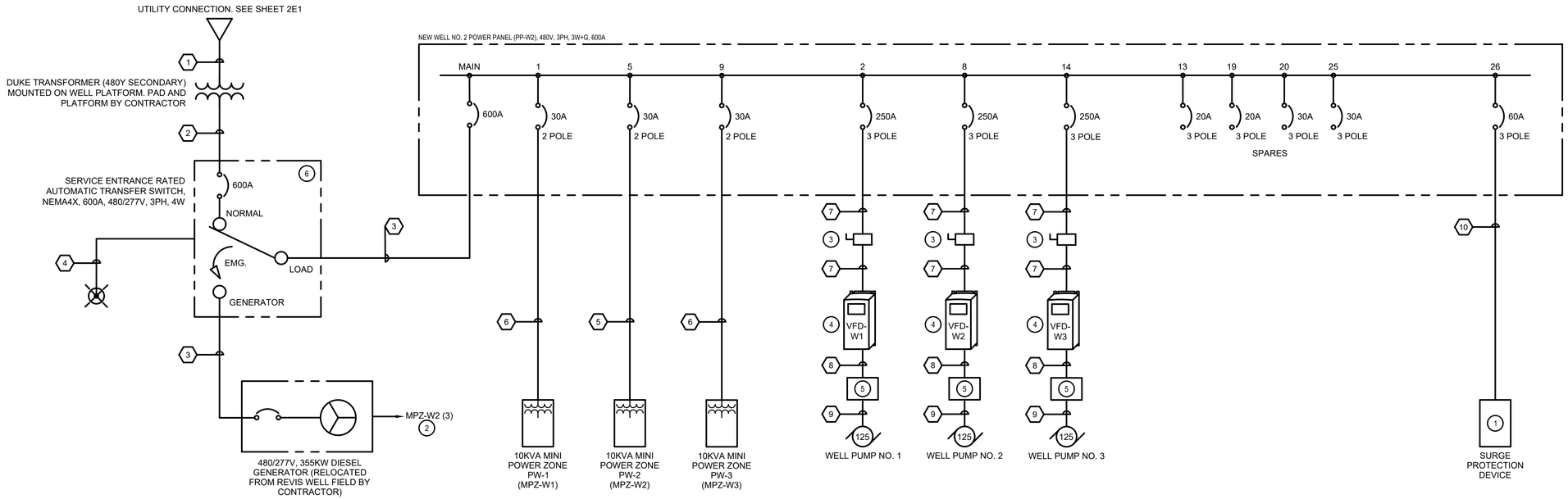

WELL 2 POWER PANEL (PP-W2)

NO SCALE

CONDUIT & WIRE SCHEDULE:

1	SEE SHEET 2E1
2	3X (3"C, 3#4/0, #4/0N)
3	3X (3"C, 3#4/0, #4/0G)
4	1"C, 1/0G
5	3/4"C, 2#10, #10G
6	1.5"C, 2#6, #8G
7	3"C, 3#250MCM, #4G
8	3"C, 3#250MCM VFD CABLE WITH SYMMETRICAL GROUND. GROUND WIRE BETWEEN MOTOR AND VFD SHOULD BE CONTINUOUS WITH NO SPLICES.
9	SUBMERSIBLE PUMP CABLE BY PUMP MANUFACTURER
10	1"C, 3#6, #10G
11	3/4"C, #12, #12N, #12G
12	3/4"C, 2#12, #12G
13	3/4"C, 2#10, #10G

KEYED NOTES:

1. SEE PANELBOARD SPECIFICATION FOR SPD INFORMATION
2. THREE (3) CIRCUITS ARE SHOWN BETWEEN MPZ-W2 AND EXISTING GENERATOR. MISCELLANEOUS GENERATOR LOADS VARY BY MODEL/MANUFACTURER. CONTRACTOR TO PROVIDE THESE CIRCUITS AND ANY OTHERS REQUIRED TO PROVIDE POWER FOR MISCELLANEOUS GENERATOR LOADS. BATTERY CHARGER, BLOCK HEATER ETC.
3. 480V, 400A, 3PH, NEMA 4X S.S. DISCONNECT SWITCH, NON-FUSIBLE UNLESS FUSES REQUIRED BY VFD MANUFACTURER
4. ALLEN BRADLEY POWERFLEX TL XT 755 DRIVE WITH ACTIVE FRONT END. VFD TO BE HOUSED IN A NEMA 4X STAINLESS STEEL, AIR CONDITIONED AND HEATED ENCLOSURE
5. MANUFACTURER'S TERMINAL BOX. ALL JUNCTIONS MADE HERE SHALL BE WATERPROOF.
6. CONTRACTOR SHALL PROVIDE ATS WITH REMOTE START AND STOP CAPABILITY FOR THE GENERATOR. FOR ASCO SWITCH, INCLUDE FEATURE 17 TO ENABLE GENERATOR START VIA A CONTRACTOR PROVIDED NORMALLY OPEN DRY CONTACT WITHIN THE CONTROL PANEL. PROVIDE A SEPARATE DRY CONTACT RELAY WIRED TO THE GENERATOR'S EMERGENCY STOP (ESTOP) CIRCUIT TO ENABLE SCADA-BASED STOP CONTROL.
7. SUMP PUMP RECEPTACLE TO BE GFCI PROTECTED AT THE BREAKER. SUMP PUMP RECEPTACLE TO BE 120V, 20A, WEATHERPROOF AND PROVIDED WITH AN IN-USE COVER.

PANEL SCHEDULE

DESIGNATION: MPZ-W1 AND MPZ-W3 | MAINS: 30 AMP PRIMARY 60 AMP SECONDARY
LOCATION: WELL (NO. 1, OR NO. 3) | BUS SIZE: 60 AMP
VOLTAGE: 120/240 V AC | ENCLOSURE: NEMA 3R STAINLESS STEEL
PHASE: 1 PHASE, 3 WIRE | ALL BREAKERS: 10000 A.I.C. (MINIMUM)

CKT. NO.	LOAD DESCRIPTION	#	KVA	CKT. BKR. AMPS	CKT. BKR. POLE	KVA A	KVA B	CKT. BKR. AMPS	CKT. BKR. POLE	KVA	#	LOAD DESCRIPTION	CKT. NO.
1	SCADA PANEL	11	2.00	20	1	3.50		20	1	1.50	11	LIGHTING	2
3	RECEPTACLES	11	1.50	20	1		1.50	20	1		11	INSTRUMENT INDICATING PANEL	4
5	SUMP PUMP RECEPTACLE (7)	11	1.00	20	1	1.00		20	1			SPARE	6
7	SPARE			20	1		0.00	20	1			SPARE	8
9	SPARE			20	1	0.00		20	1			SPARE	10
11	SPARE			20	1		0.00	20	1			SPARE	12
13	SPARE			20	1	0.00		30	2		13	(1) SPD	14
15	SPARE			20	1		0.00						16
	TOTAL CONNECTED LOAD:					4.50	1.50	TOTAL =		6.00	KVA		

\# ONE (1) OR TWO (2) DIGIT NUMBERS REFER TO CONDUIT & WIRE SCHEDULE ON THIS SHEET.
14 1-pole 20A breakers, 1 2-pole 30A breaker

WELL NO.1 AND NO.3 MINI POWER ZONE PANEL SCHEDULE

NO SCALE

PANEL SCHEDULE

DESIGNATION: MPZ-W2 | MAINS: 30 AMP PRIMARY 60 AMP SECONDARY
LOCATION: WELL NO.2 | BUS SIZE: 60 AMP
VOLTAGE: 120/240 V AC | ENCLOSURE: NEMA 3R STAINLESS STEEL
PHASE: 1 PHASE, 3 WIRE | ALL BREAKERS: 10000 A.I.C. (MINIMUM)

CKT. NO.	LOAD DESCRIPTION	#	KVA	CKT. BKR. AMPS	CKT. BKR. POLE	KVA A	KVA B	CKT. BKR. AMPS	CKT. BKR. POLE	KVA	#	LOAD DESCRIPTION	CKT. NO.
1	SCADA PANEL	11	2.00	20	1	3.50		20	1	1.50	11	LIGHTING	2
3	RECEPTACLES	11	1.50	20	1		1.50	20	1		11	INSTRUMENT INDICATING PANEL	4
5	MISC GENERATOR LOAD 1	11		20	1	1.00		20	1	1.00	11	(7) SUMP PUMP RECEPTACLE	6
7	MISC GENERATOR LOAD 2	11		20	1		0.00	20	1			SPARE	8
9	MISC GENERATOR LOAD 3	12		20	2	0.00		20	1			SPARE	10
11							0.00	20	1			SPARE	12
13	SPARE			20	1	0.00		30	2		13	(1) SPD	14
15	SPARE			20	1		0.00						16
	TOTAL CONNECTED LOAD:					4.50	1.50	TOTAL =		6.00	KVA		

\# ONE (1) OR TWO (2) DIGIT NUMBERS REFER TO CONDUIT & WIRE SCHEDULE ON THIS SHEET.
12 1-pole 20A breakers, 1 2-pole 20A breaker, 1 2-pole 30A breaker

WELL NO.2 MINI POWER ZONE PANEL SCHEDULE

NO SCALE

SCALE VERIFICATION	DRAWN BY	JLK	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JLK				
	APPROVED BY	WCM				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

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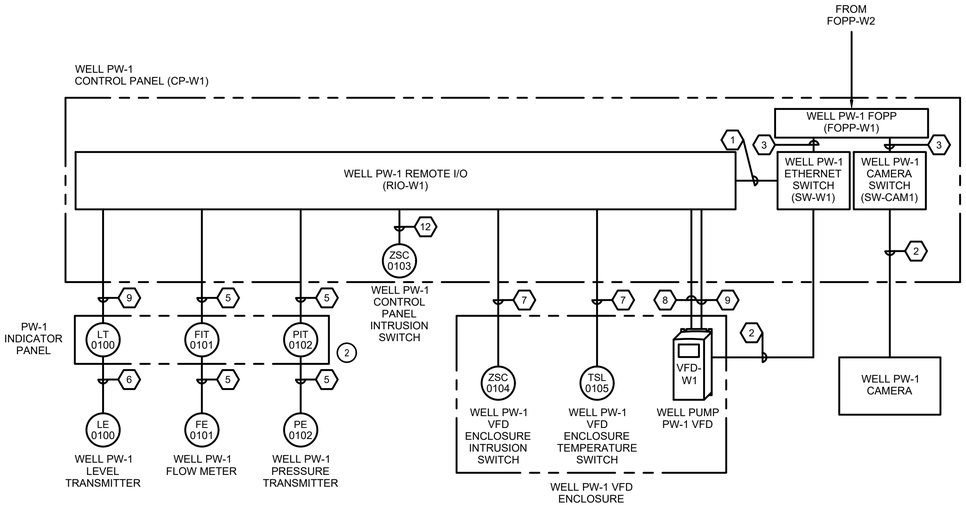
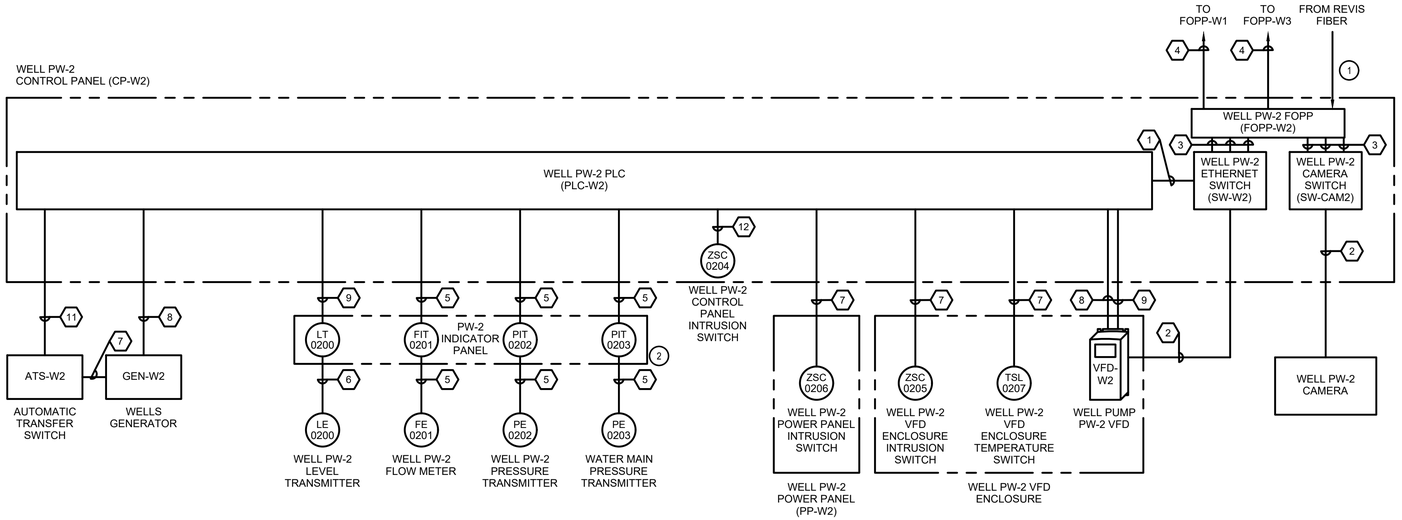
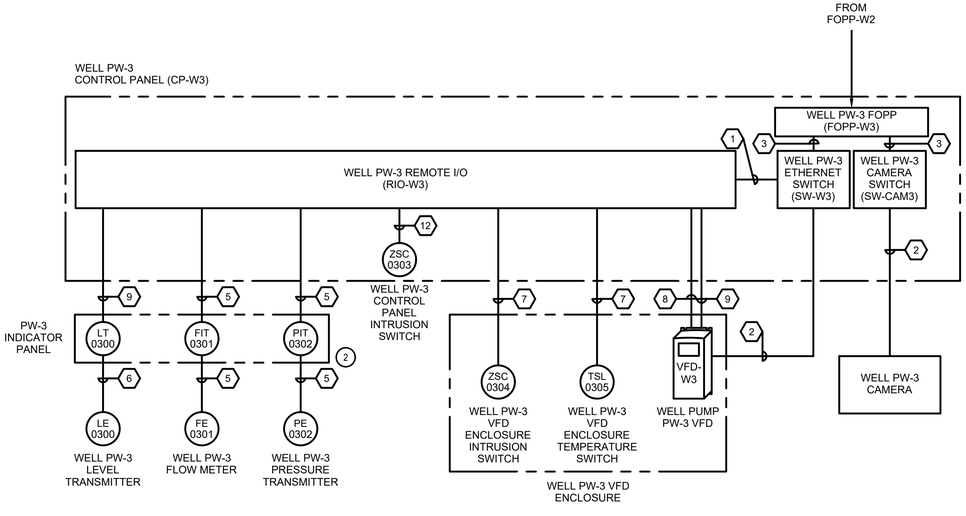
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT
BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

POWER ONE LINE DIAGRAM

SHEET NO. **5E2**
PAGE NO. 33







KEYED NOTES:

1. ONE 2"C FROM HANDHOLE TO FOPP-W2 WITH FIBER OPTIC FROM REVIS WELLFIELD.
2. REFER TO SECTION 13431 IN PROJECT MANUAL FOR ADDITIONAL ENCLOSURE DETAILS.

CONDUIT & WIRE SCHEDULE:

1	CAT 6 ETHERNET
2	1"C, CAT6 ETHERNET
3	FIBER PATCH CORD
4	2"C, FIBER OPTIC CABLE VIA HANDHOLE
5	3/4"C, 2/C#16TPS
6	3/4"C, MANUFACTURER'S CABLE
7	3/4"C, 3#14
8	3/4"C, 8#14
9	3/4"C, 2 - 2/C#16TPS
10	3/4"C, 10#14, #14G
11	3/4"C, 10#14
12	2#14

SCALE VERIFICATION

BAR IS ONE INCH LONG ON ORIGINAL DRAWING

DRAWN BY	BNH
CHECKED BY	BDP
APPROVED BY	WCM
ISSUE DATE	MAY 2025
PROJECT NUMBER	705524-04-001

NO.	DATE	INITIALS	REVISION DESCRIPTIONS

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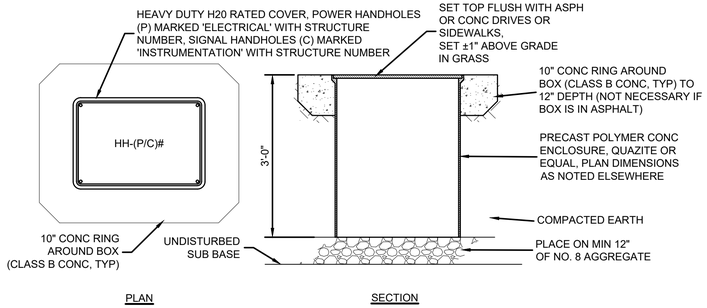
MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

CONTROL ONE LINE DIAGRAM

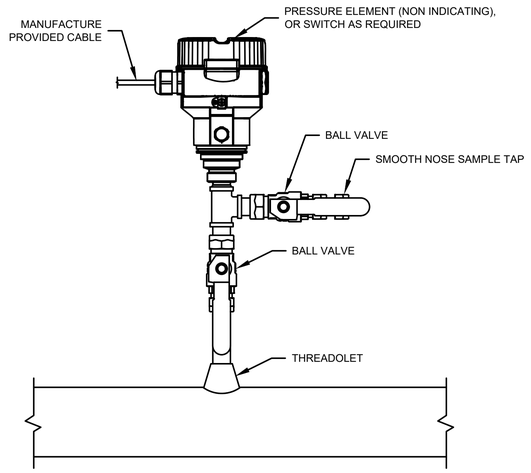
SHEET NO. **5E3**

PAGE NO. 34



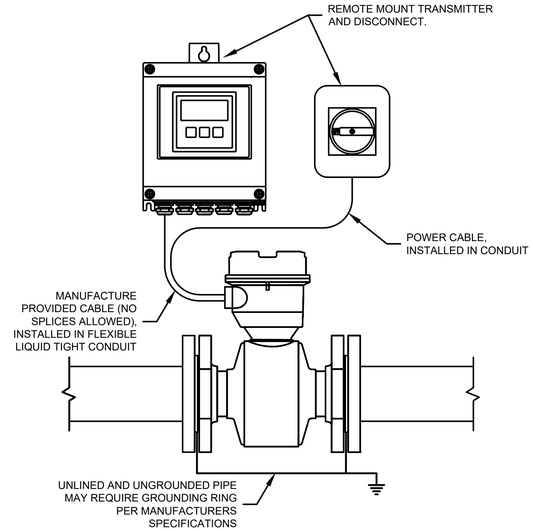
PULL BOX AND HANDHOLE (HH) INSTALLATION

SCALE: NONE



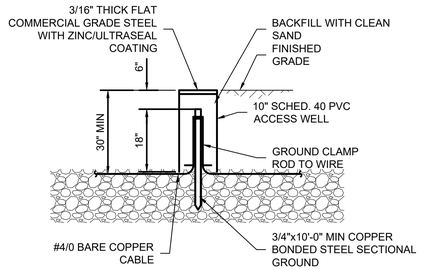
PRESSURE TRANSMITTER MOUNTING

SCALE: NONE



FLOW METER MOUNTING

SCALE: NONE

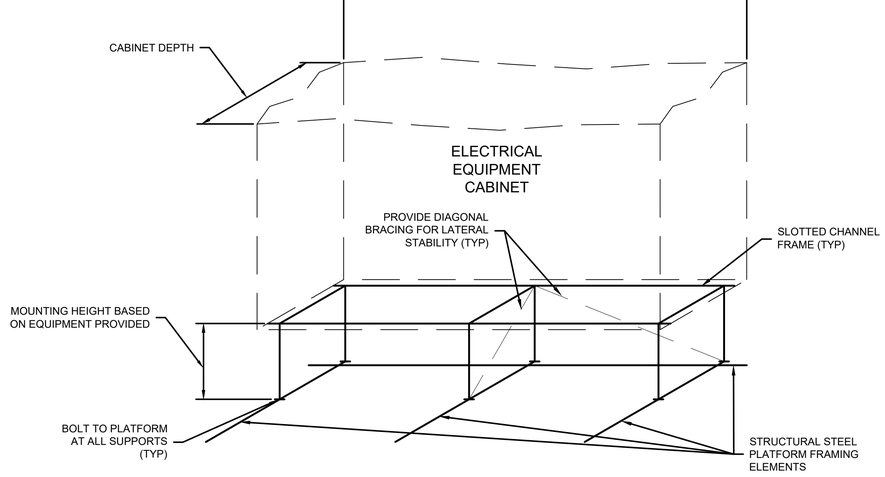


NOTES:

1. REFER TO JOB SPECIFICATION FOR MINIMUM SYSTEM RESISTANCE TO GROUND. IF THE RESISTANCE CANNOT BE MET WITH SINGLE 10'-0" RODS, ADD ADDITIONAL SECTIONS TO RODS OR ADD NEW RODS AS REQUIRED, SPACED 6'-0" TO 10'-0" FROM EXISTING RODS.

ELECTRICAL INSTALLATION AND GROUND ROD ASSEMBLY

SCALE: NONE

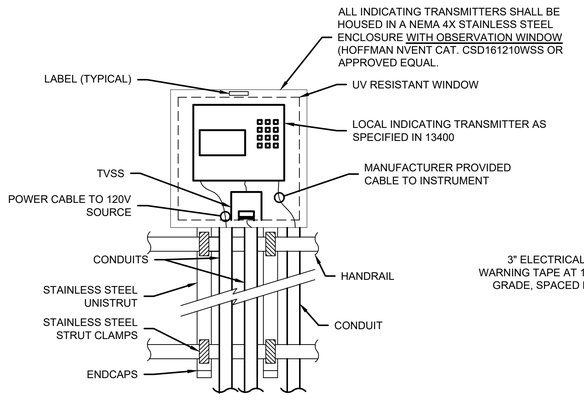


NOTES:

1. THIS DETAIL IS INTENDED FOR ELECTRICAL EQUIPMENT >100LB. FOR SMALLER ELECTRICAL EQUIPMENT SEE OTHER DETAIL ON THIS SHEET.

SLOTTED CHANNEL - EQUIPMENT SUPPORT DETAIL

SCALE: NONE

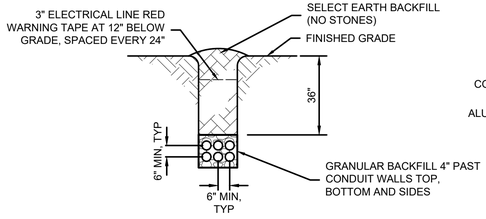


NOTES:

1. MOUNTING INFORMATION IN THIS DETAIL IS INTENDED FOR ALL INSTRUMENTATION AND ELECTRICAL EQUIPMENT <100LB. FOR LARGER ELECTRICAL EQUIPMENT SEE OTHER DETAIL ON THIS SHEET.

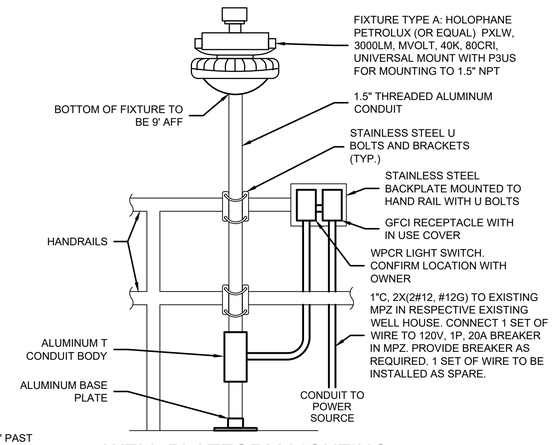
ELECTRICAL/INSTRUMENT HANDRAIL MOUNTING

SCALE: NONE



CONDUIT TRENCH

SCALE: NONE



WELL PLATFORM LIGHTING

SCALE: NONE

SCALE VERIFICATION	DRAWN BY	JLK	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
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	APPROVED BY	WCM				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

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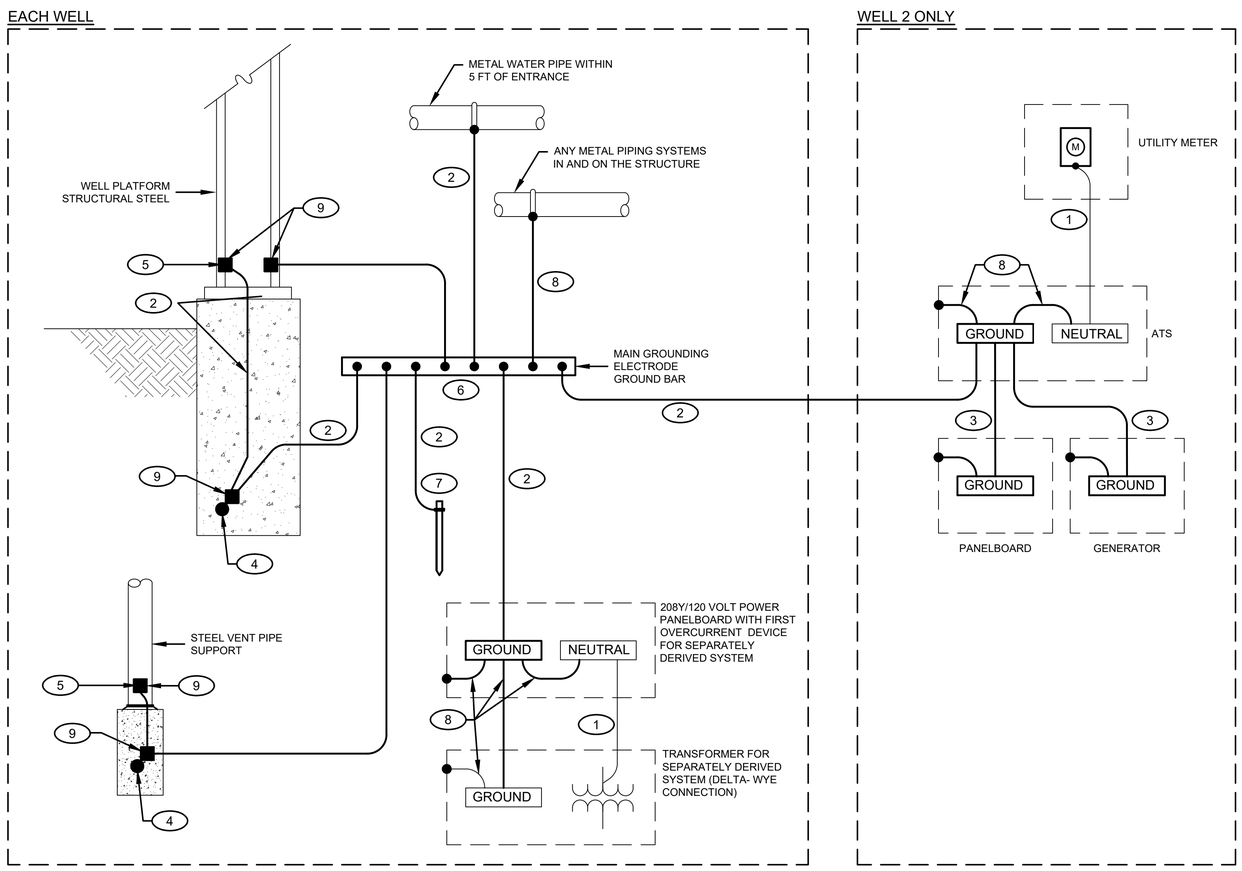
WARREN COUNTY, OH

ELECTRICAL DETAILS

SHEET NO. **5E4**

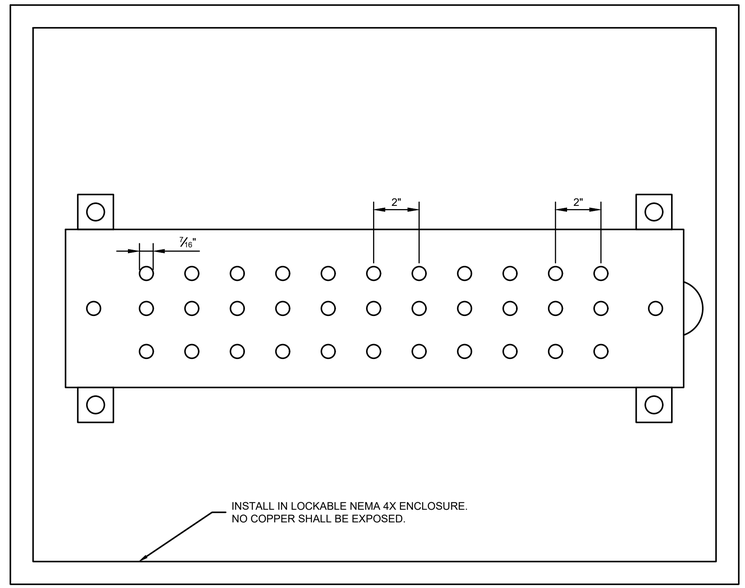
PAGE NO. 35



WELLFIELD GROUND SYSTEM DIAGRAM
SCALE: NONE

KEYED NOTES

1. INSTALL GROUNDED (NEUTRAL) CONDUCTOR SAME SIZE AS THE LARGEST PHASE CONDUCTOR.
2. INSTALL GROUNDING ELECTRODE CONDUCTOR, SIZED BASED ON NEC TABLE 250.66 USING THE SERVICE PHASE CONDUCTOR SIZE, BUT NOT SMALLER THAN 4 AWG.
3. INSTALL EQUIPMENT GROUNDING CONDUCTOR SIZED BASED ON NEC TABLE 250.122 USING THE FEEDER OVERCURRENT DEVICE SIZE.
4. INSTALL A CONCRETE-ENCASED GROUNDING ELECTRODE IN THE STRUCTURE FOUNDATION. LOCATE ELECTRODE WITH AT LEAST 3 INCHES OF CONCRETE COVER. USE EITHER OF THE FOLLOWING MATERIALS FOR THE ELECTRODE:
   - BARE COPPER CABLE NOT SMALLER THAN THE GROUNDING ELECTRODE CONDUCTOR REQUIRED BY THE NEC AND NOT SMALLER THAN 4 AWG.
   - BARE OR GALVANIZED REBARS THAT ARE MADE ELECTRICALLY CONTINUOUS USING COPPER JUMPERS NOT SMALLER THAN 1/2IN DIAMETER AND 20 FEET IN TOTAL LENGTH.
5. BOND EACH PERIMETER STRUCTURAL STEEL COLUMN TO THE CONCRETE-ENCASED MAIN GROUNDING ELECTRODE. USE COMPRESSION CONNECTORS THAT MEET IEEE 837 REQUIREMENTS OR USE EXOTHERMIC WELDS.
6. INSTALL A "MAIN GROUND ELECTRODE GROUND BAR" FOR SINGLE POINT GROUNDING. LOCATE AT AN ACCESSIBLE AND VISIBLE POINT NEAR THE SERVICE ENTRANCE EQUIPMENT. MAKE CONNECTIONS TO THE GROUND BAR USING TWO-HOLE COMPRESSION SPADE LUGS THAT MEET IEEE 837 REQUIREMENTS. LABEL EACH CONNECTION TO THE GROUND BAR. DETAIL ON THIS SHEET.
7. GROUND ROD/GRID. BOND THE GROUND ROD TO THE MAIN GROUNDING ELECTRODE GROUND BAR. AT THE UNDERGROUND CONNECTION USE A COMPRESSION CONNECTOR THAT MEETS IEEE 837 REQUIREMENTS OR USE AN EXOTHERMIC WELD.
8. INSTALL BONDING CONDUCTOR THAT IS SIZED BASED ON NEC TABLE 250.102(C)(1).
9. INSTALL IRREVERSIBLE COMPRESSION CONNECTOR WITH TAMPER-PROOF HARDWARE OR INSTALL EXOTHERMIC WELD.



NOTES:
1. PROVIDE 1/4"DEEP X 4" HIGH X 2'-0" LONG COPPER GROUND BUS BAR WITH INSULATED WALL BRACKET ASSEMBLY. ERICO EGB-A-14-4-24-CC OR APPROVED EQUAL AS SPECIFIED. PRE DRILLED NEMA BOLT CONFIGURATION AS INDICATED. PROVIDE BRASS METAL NAME TAGS ON EACH GROUNDING CABLE INDICATING IDENTIFYING TAG OF EQUIPMENT BEING GROUNDED. TERMINATE GROUNDING CABLE WITH NEMA TWO-HOLE BOLTED LUG.
2. REFER TO EQUIPMENT PLANS FOR GROUNDING CABLE SIZES, QUANTITIES AND EQUIPMENT DESCRIPTIONS.
3. ONE (1) GROUND BUS BAR FOR EACH WELL.
4. ALL WIRE TO GROUND BUS BAR SHALL BE INSTALLED IN CONDUIT. NO COPPER SHALL BE EXPOSED.

GROUND BUS BAR DETAIL
SCALE: NONE

SCALE VERIFICATION	DRAWN BY	JLK	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JLK				
	APPROVED BY	WCM				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

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BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

ELECTRICAL GROUNDING DETAILS

SHEET NO. **5E5**
PAGE NO. 36

WELLFIELD AREA PLAN

SCALE: 1" = 500'

0 250 500 1,000 FT

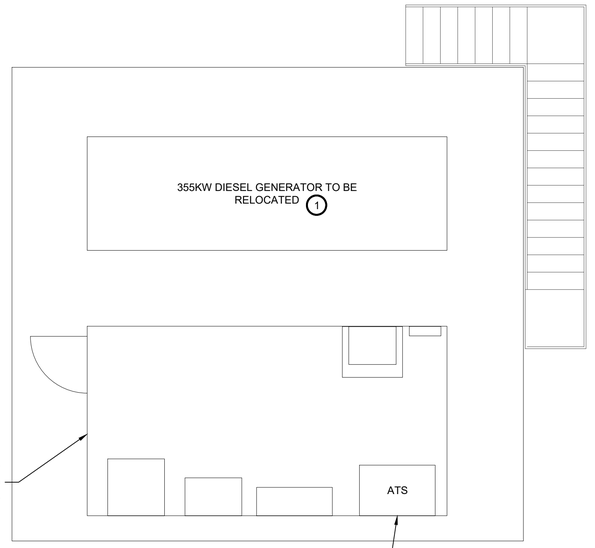
1"=500'

GENERAL NOTES:

1. EXISTING 355KW DIESEL GENERATOR TO BE RELOCATED FROM THE EXISTING REVIS WELL FIELD TO THE NEW MIDDLETOWN JUNCTION WELL FIELD.

KEYED NOTES ○

1. REMOVE ALL WIRING TO THE GENERATOR AND DISCONNECT CONDUITS BEFORE MOVING THE GENERATOR. CONDUITS TO THE GENERATOR CAN BE CAPPED AND LEFT IN PLACE BELOW THE PLATFORM. INSTALL 1/4" THICK GALVANIZED STEEL CHECKER PLATE TO COVER VOID IN GRATING LEFT BY REMOVED CONDUITS. PLATE SHALL EXTEND A MINIMUM OF 5" BEYOND EDGE OF OPENING ON ALL SIDES. FIELD WELD PLATE TO EXISTING PLATFORM. CLEAN WELDS AND APPLY COLD GALVANIZING SPRAY TO ALL BARE STEEL SURFACES EXPOSED FROM WELDING.



EXISTING POWER DISTRIBUTION STRUCTURE LAYOUT

SCALE: NO SCALE

SCALE VERIFICATION	DRAWN BY	DMG	NO.	DATE	INITIALS	REVISION DESCRIPTIONS	
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	JLK					
	APPROVED BY	WCM					
	ISSUE DATE	MAY 2025					
	PROJECT NUMBER	705524-04-001					

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REVIS WELLFIELD PLAN AND EXISTING POWER DISTRIBUTION STRUCTURE LAYOUT

SHEET NO. **5E6**

PAGE NO. 37

VALVE SYMBOLS

- ECCENTRIC PLUG
- THREE - WAY
- BUTTERFLY
- BALL
- GLOBE
- PRESSURE RELIEF
- AIR RELEASE AND VACUUM RELIEF
- GATE
- KNIFE GATE
- CONSTANT VOLUME FLOW REGULATOR
- MUD
- BALL CHECK
- SWING CHECK
- SPLIT DISC CHECK
- REGULATED SIDE PRESSURE CONTROL
- PINCH
- DIAPHRAGM
- NEEDLE
- CALIBRATED BALANCE
- SOLENOID

GATE SYMBOLS

- SLUICE GATE
- SLIDE GATE
- FLAP GATE
- WEIR GATE
- STOP GATE
- WEIR AND STOP GATE

VALVE AND GATE POWER ACTUATOR SYMBOLS

- ELECTRIC MOTOR
- HYDRAULIC WITH SOLENOID
- ELECTRIC MOTOR WITH POSITIONER
- PNEUMATIC WITH POSITIONER
- HYDRAULIC WITH POSITIONER
- PNEUMATIC WITH SOLENOID

XX: FC = FAIL CLOSED
FIP = FAIL INTERMEDIATE POSITION
FIP = FAIL TO LAST POSITION
FO = FAIL OPEN

NOTE: XX = FAIL POSITION ON LOSS OF PRIMARY POWER (PNEUMATIC OR ELECTRICAL)

FLOW ELEMENTS SYMBOLS

- WEIR PLATE
- PARSHALL FLUME
- ROTAMETER
- PROPELLER OR TURBINE METER
- ORIFICE METER
- CLAMP ON ULTRASONIC FLOWMETER
- MAGNETIC FLOWMETER
- VENTURI OR FLOW TUBE
- AREA VELOCITY FLOWMETER

MISCELLANEOUS SYMBOLS

- HARDWIRED INTERLOCK SEE SPECIFICATION
- MICROPROCESSOR BASED INTERLOCK SEE SPECIFICATION
- BLIND FLANGE OR CLEAN OUT
- AIR GAP
- STRAINER
- FLUSHING WATER CONNECTION
- SEAL WATER CONNECTION
- EJECTOR
- AUTOMATIC SAMPLER
- DIFFUSER
- BUBBLER LEVEL ELEMENT
- VENT
- RUPTURE DISK
- ORTHO PHOSPHATE ELEMENT
- PROBE
- ELECTRIC MOTOR
- MANUAL SAMPLE PORT
- AUTOMATIC DRAIN
- MANUAL DRIP TRAP
- DIAPHRAGM SEAL
- ANNULAR SEAL
- FLOW STRAIGHTENING VANE
- CALIBRATION CHAMBER
- DENSITY METER X: N - NUCLEAR O - OPTICAL U - ULTRASONIC
- SELF CONTAINED AIR SUPPLY
- PURGE SET X: W = WATER A = AIR
- SUBMERSIBLE MIXER
- AIR COMPRESSOR
- FLOATING MIXER
- FLAME TRAP AND THERMAL SHUTOFF ASSEMBLY
- FLOATING DECANTER
- TEMPERATURE GAUGE
- PRESSURE GAUGE
- PRESSURE TRANSMITTER
- LEVEL SWITCH

LEVEL ELEMENTS SYMBOLS

- SUBMERSIBLE PRESSURE
- ULTRASONIC
- FLOAT
- NON-CONTACT RADAR
- CAPACITANCE FLOAT STICK

PUMP AND COMPRESSOR SYMBOLS

- SUBMERSIBLE PUMP
- CENTRIFUGAL BLOWER
- CENTRIFUGAL PUMP (DRY PIT)
- VERTICAL TURBINE PUMP
- PROGRESSING CAVITY PUMP
- LOBE PUMP, BLOWER OR COMPRESSOR (POSITIVE DISPLACEMENT)
- COMPRESSOR (PISTON)
- CHEMICAL FEED PUMP
- PLUNGER PUMP
- DIAPHRAGM PUMP
- PERISTALTIC PUMP

FLOW STREAM IDENTIFIERS

SEE PROCESS - MECHANICAL LEGEND

INPUTS AND OUTPUTS TO PLC OR DISTRIBUTED CONTROL

- ANALOG INPUT
- ANALOG OUTPUT
- PULSE INPUT
- PULSE OUTPUT
- DIGITAL INPUT
- DIGITAL OUTPUT

NOTE:
X = TOTAL NUMBER OF SIGNALS WHERE MORE THAN ONE SIGNAL IS REQUIRED. IF QUANTITY IS NOT SHOWN THEN ONE SIGNAL IS REQUIRED.

GENERAL NOTE:

1. THIS IS A STANDARD LEGEND. NOT ALL THE INFORMATION SHOWN ON THIS LEGEND IS USED IN THESE CONTRACT DRAWINGS.

SCALE VERIFICATION	DRAWN BY	BNH	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
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	APPROVED BY	WCM				
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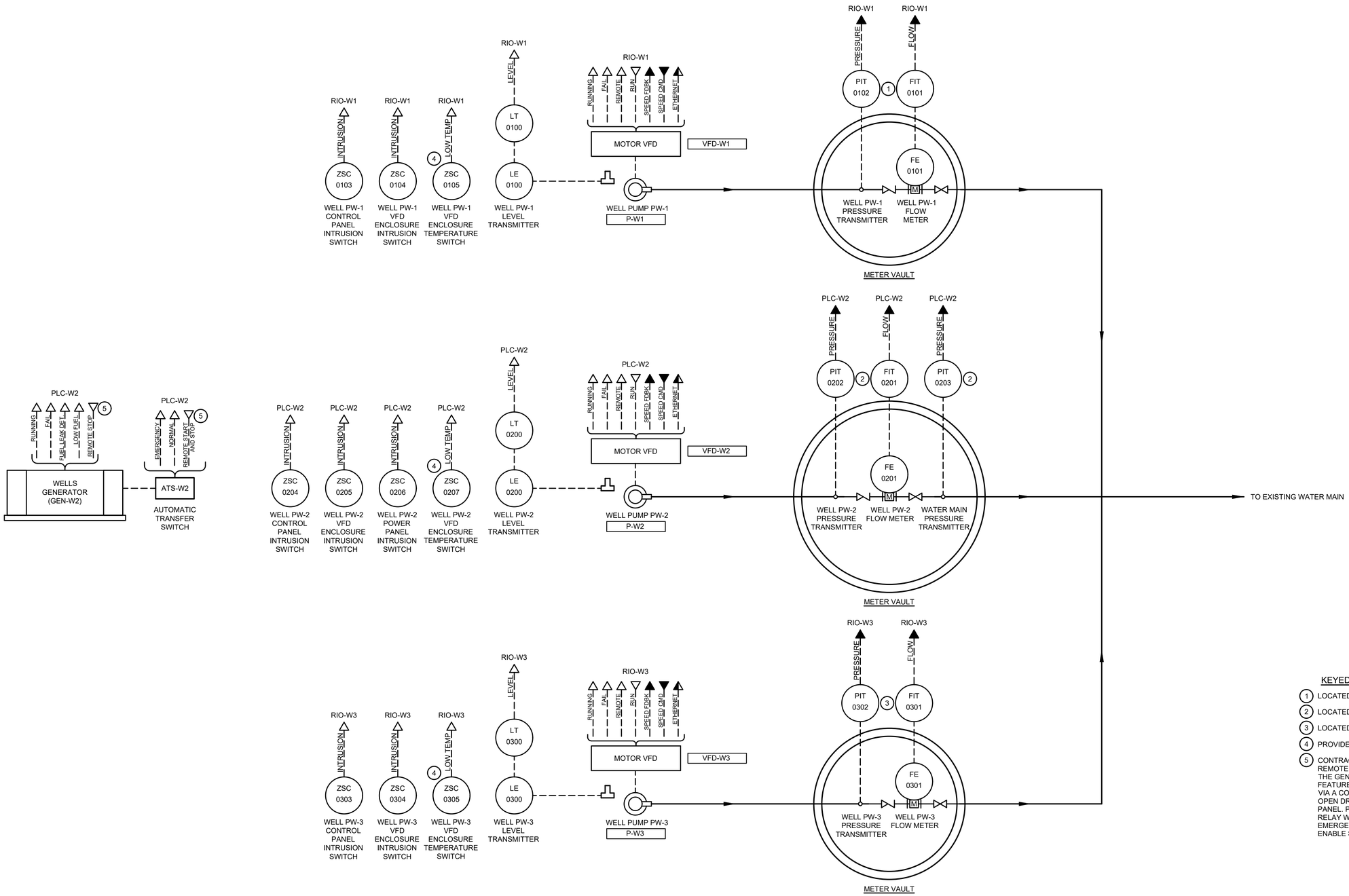
PROCESS AND INSTRUMENTATION LEGEND

SHEET NO. 6N1

PAGE NO. 38



KEYED NOTES:

1. LOCATED IN PW-1 INDICATOR PANEL
2. LOCATED IN PW-2 INDICATOR PANEL
3. LOCATED IN PW-3 INDICATOR PANEL
4. PROVIDED BY MANUFACTURER
5. CONTRACTOR SHALL PROVIDE ATS WITH REMOTE START AND STOP CAPABILITY FOR THE GENERATOR. FOR ASCO SWITCH, INCLUDE FEATURE 17 TO ENABLE GENERATOR START VIA A CONTRACTOR PROVIDED NORMALLY OPEN DRY CONTACT WITHIN THE CONTROL PANEL. PROVIDE A SEPARATE DRY CONTACT RELAY WIRED TO THE GENERATOR'S EMERGENCY STOP (ESTOP) CIRCUIT TO ENABLE SCADA-BASED STOP CONTROL.

SCALE VERIFICATION	DRAWN BY	BNH	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
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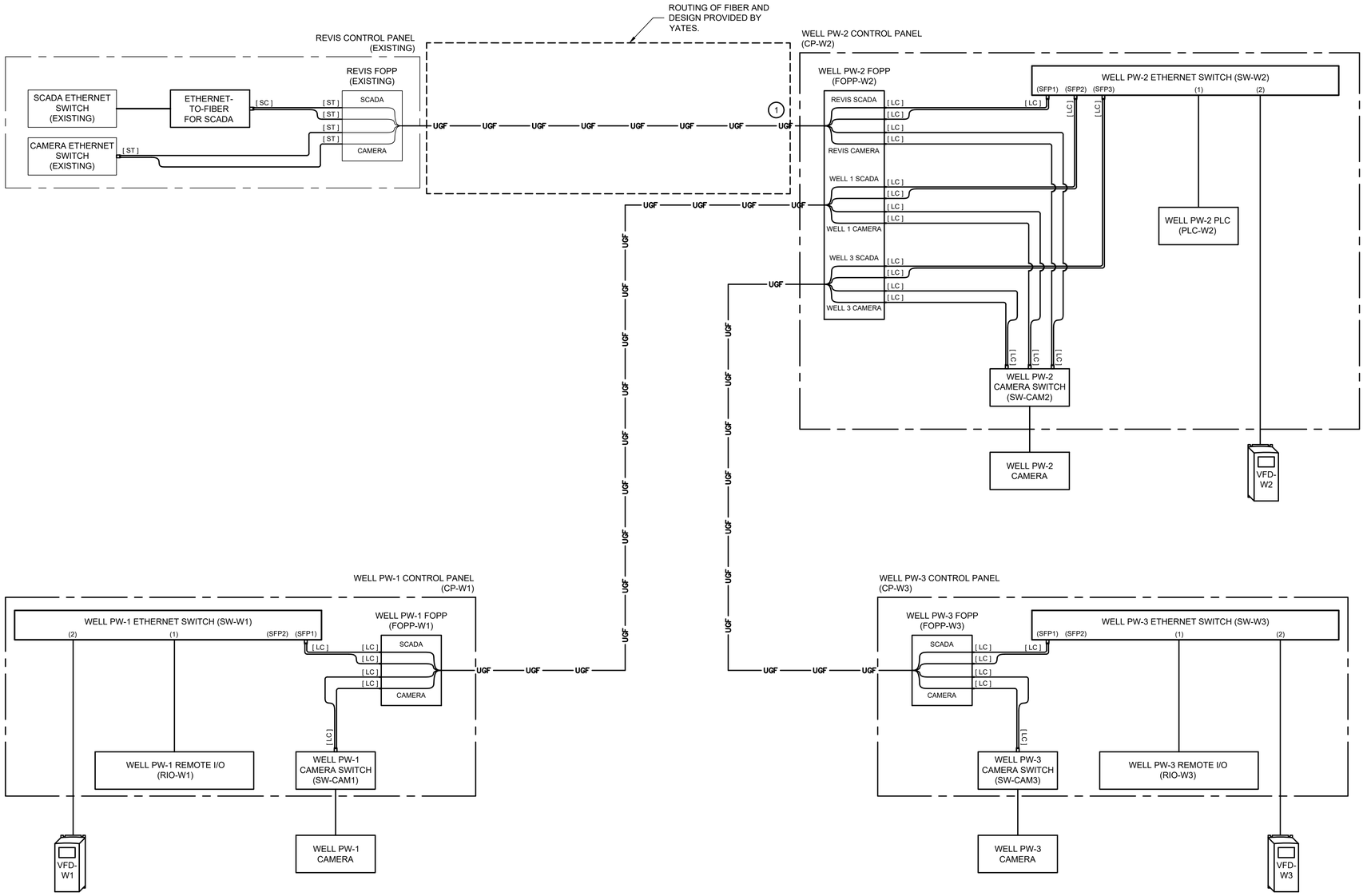
WARREN COUNTY, OH

PROCESS AND INSTRUMENTATION DIAGRAM

SHEET NO. **6N2**

PAGE NO. 39



KEYED NOTES:

1. DESIGN OF THE FIBER FROM REVIS TO MIDDLETOWN FOPP IS PROVIDED IN THE YATES ENGINEERING DRAWINGS.

LINE TYPE DETAILS:

- UGF — UNDERGROUND FIBER
- ETHERNET
- FIBER OPTIC PATCH CABLE

SCALE VERIFICATION	DRAWN BY	BNH	NO.	DATE	INITIALS	REVISION DESCRIPTIONS
BAR IS ONE INCH LONG ON ORIGINAL DRAWING	CHECKED BY	BDP				
	APPROVED BY	WCM				
	ISSUE DATE	MAY 2025				
	PROJECT NUMBER	705524-04-001				

STATE OF OHIO — WAYNE C. MOORE E-70068 — REGISTERED PROFESSIONAL ENGINEER — 05/19/2025

WESSLER ENGINEERING — More than a Project™

MIDDLETOWN JUNCTION WELLFIELD DEVELOPMENT

BOARD OF COUNTY COMMISSIONERS
WARREN COUNTY, OH

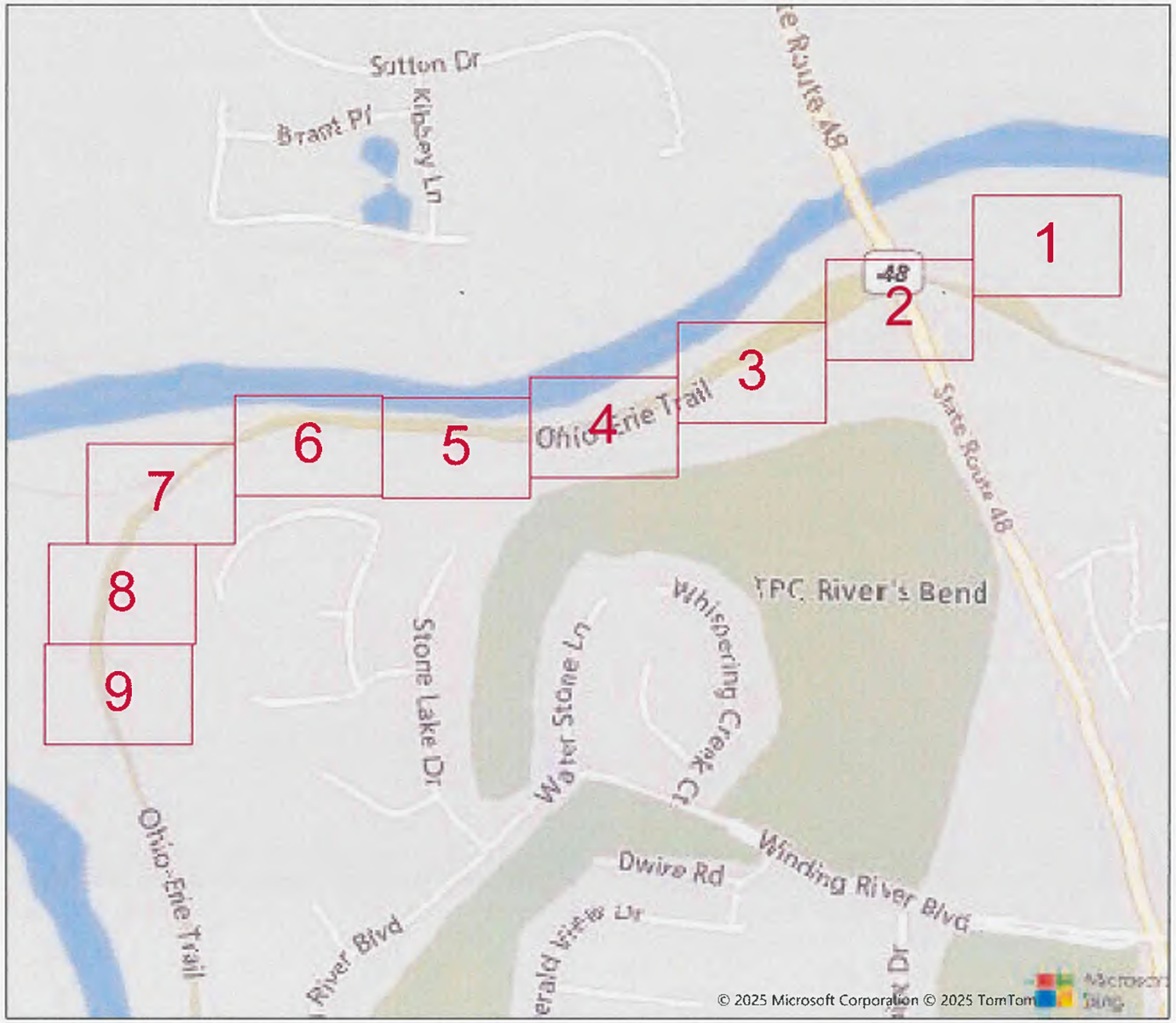
NETWORK DIAGRAM

SHEET NO. 6N3

PAGE NO. 40

WARREN COUNTY
REVIS STATION TO BIKE TRAIL
FOR BIDDING AND CONSTRUCTION

PREPARED BY:
YATES ENGINEERING SERVICES LLC
2536 W. INDUSTRIAL PARK DR. SUITE #1
BLOOMINGTON, IN 47404
812-333-7335



CALL BEFORE YOU DIG!!!
INDIANA UNDERGROUND
PLANT PROTECTION , INC.
811 OR 800-382-5544

CONTRACTOR NOTE

KNOWN UTILITIES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES SHOWN OR NOT SHOWN ON DRAWINGS FOR ACTUAL LOCATION AND PROTECTING ALL UTILITIES DURING CONSTRUCTION.

PROJECT DESCRIPTION

- INSTALLATION OF NEW UNDERGROUND STRUCTURES.
- INSTALLATION OF NEW FIBER OPTIC CABLE THROUGH NEW UNDERGROUND CONDUITS

SHEET INDEX

LEGEND

- PROPOSED HH
- EXISTING HH
- MANHOLE
- HYDRANT
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- ELECTRIC MARKER
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- GAS MARKER
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- PROPOSED BORE
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- STREET CENTERLINE
- RIGHT OF WAY
- FENCE

OVERVIEW

YATES
Yates Engineering Services, LLC
2536 W Industrial Park Dr
Suite 1
Bloomington, IN 47404
(812)333-7335

PROJECT: REVIS WELL FIELD **DATE:** 5/7/2025
DRAWN BY: CS **STAKED BY:** YES
COUNTY: OH **CITY:** WARREN

N

CONSTRUCTION NOTES

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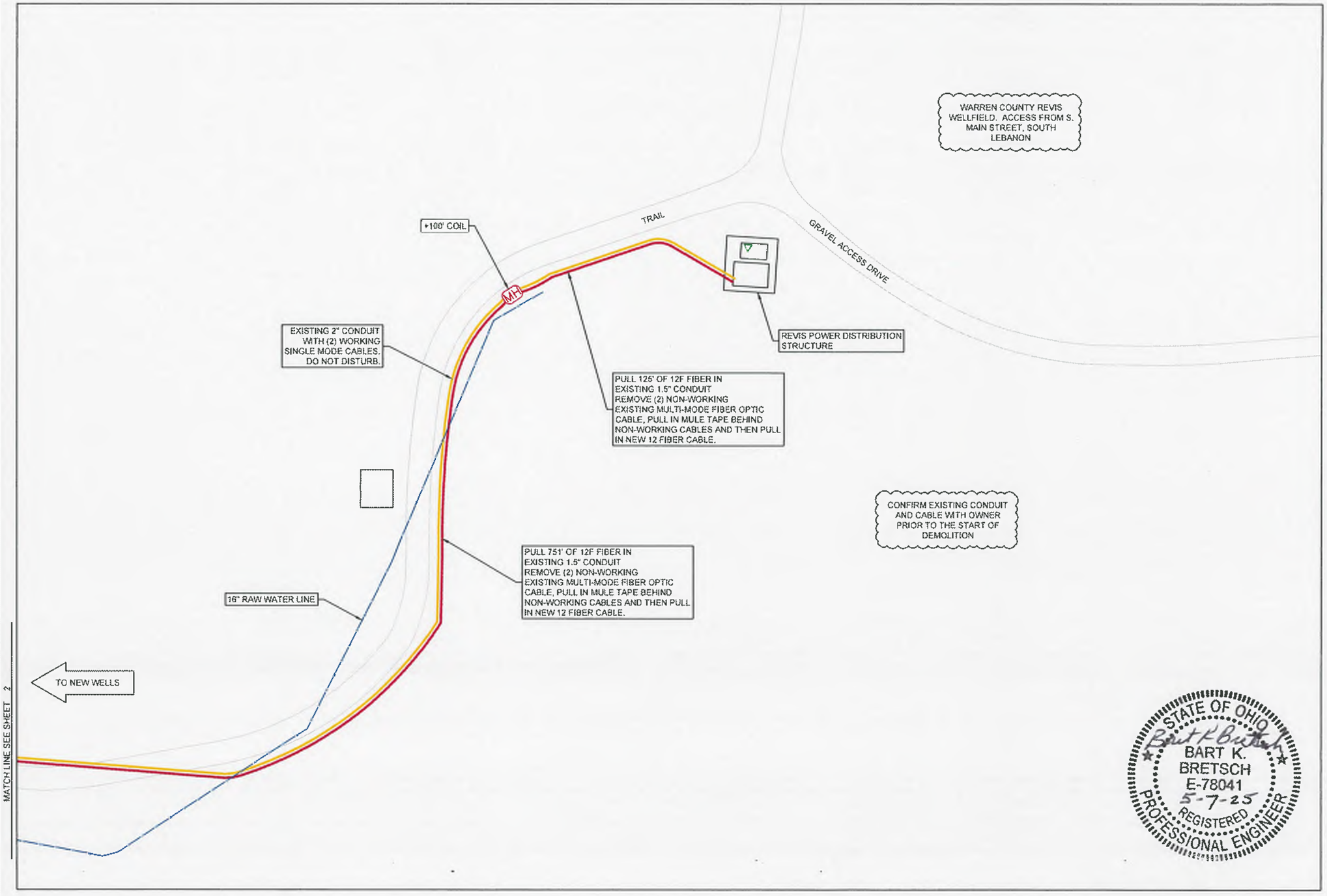

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STATE OF OHIO
BART K. BRETSCH
E-78041
5-7-25
REGISTERED PROFESSIONAL ENGINEER

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Bloomington, IN 47404
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DRAFTER: CS **SCALE:** 1:50

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BORE FROM HANDHOLE TO MANHOLE. 48" MINIMUM DEPTH BELOW SWALE. 60" DEPTH FROM NORTH SIDE OF SWALE TO MANHOLE. 96" DEPTH ACROSS SWALE.

EXISTING MH
+300' COIL
0+00

0+00

PULL 12F FIBER IN EXISTING 1.5" CONDUIT REMOVE (2) NON-WORKING EXISTING MULTI-MODE FIBER OPTIC CABLE. PULL IN MULE TAPE BEHIND NON-WORKING CABLES AND THEN PULL IN NEW 12 FIBER CABLE.

EXISTING 2" CONDUIT WITH (2) WORKING SINGLE MODE CABLES. DO NOT DISTURB.

TRAIL

16" RAW WATER LINE

DIRECTIONAL BORE=356'
PLACE (2) 1.25" CONDUITS WITH (1) 12F FIBER

1+00

SWALE AREA

MAINTAIN 10' CLEARANCE

POWER EASEMENT

STATE ROUTE 48

2+00

EX 10' FORCE MAIN

TO NEW WELLS

3+00

BIKE TRAIL

FUTURE 12" FORCE MAIN (SOUTH LEBANON)

4+00

PLACE 2X3 HH
+100' COIL
3+56

36" PIPE. ON OUTLET SIDE TOP OF PIPE IS APPROXIMATELY 8' BELOW PATHWAY

PLACE (2) 1.25" CONDUITS WITH (1) 12F FIBER

TYPICAL FIBER DEPTH AT 24"

BURY HANDHOLE AT LEAST 6" BELOW GRADE

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MATCH LINE SEE SHEET 1

MATCH LINE SEE SHEET 3

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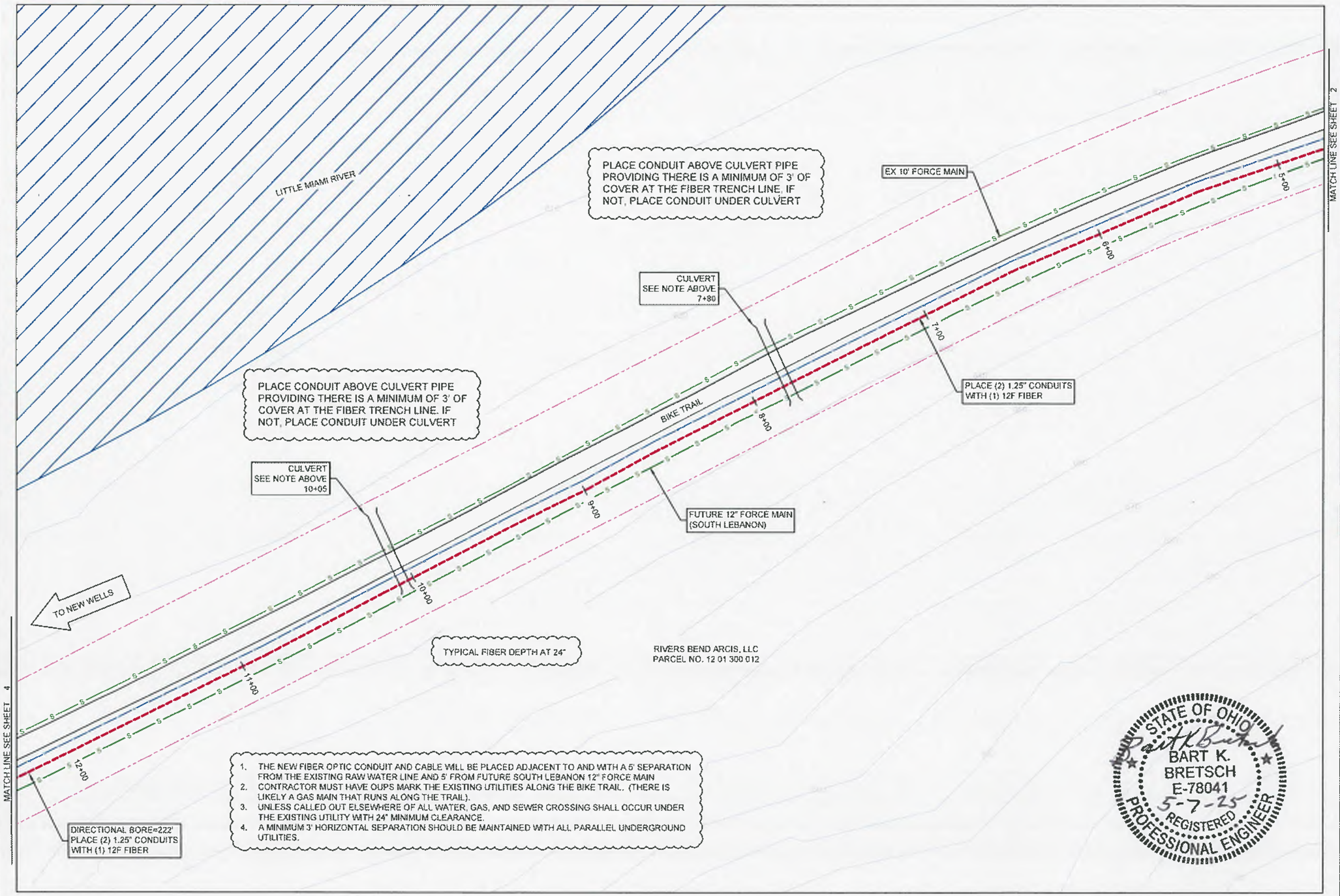

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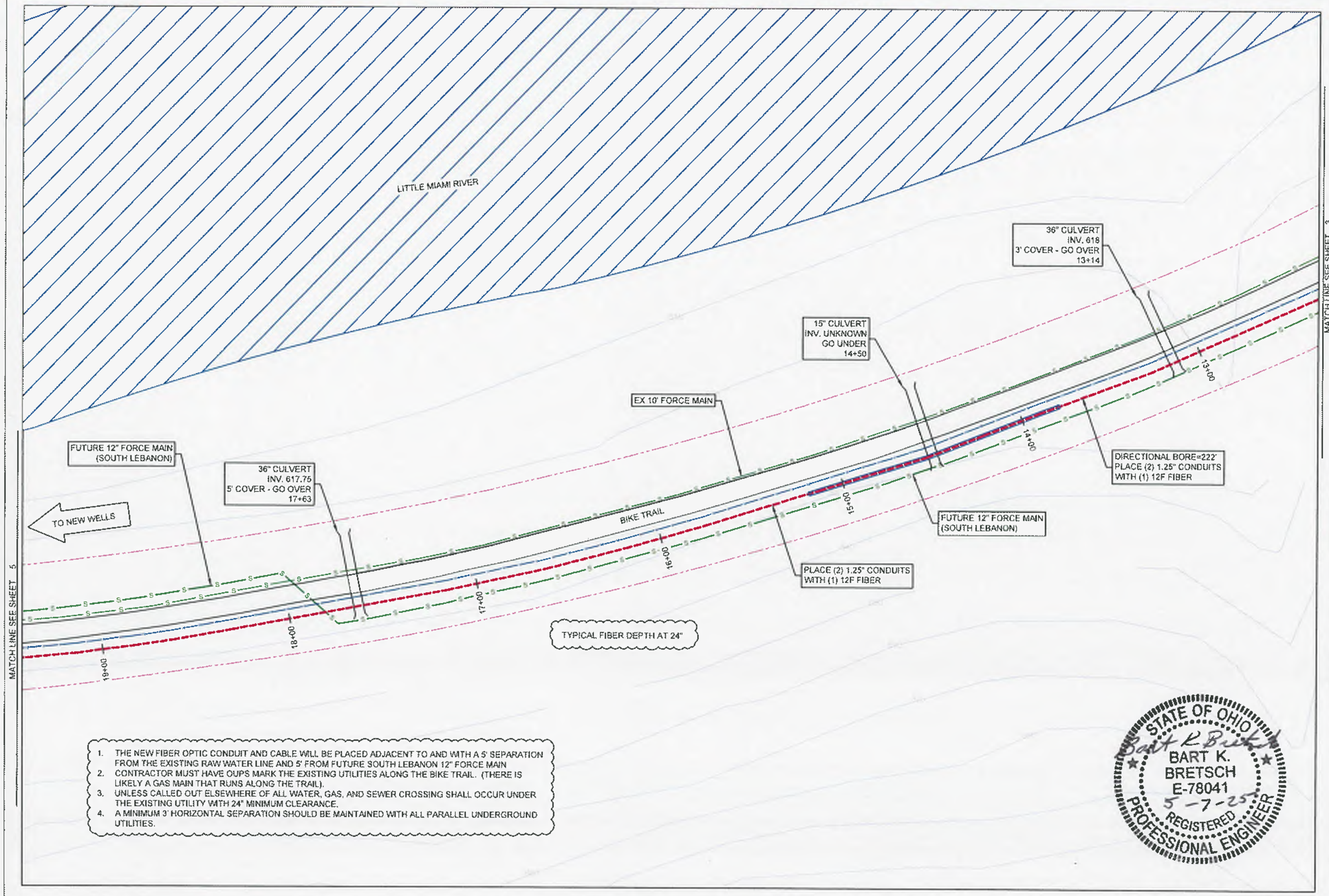

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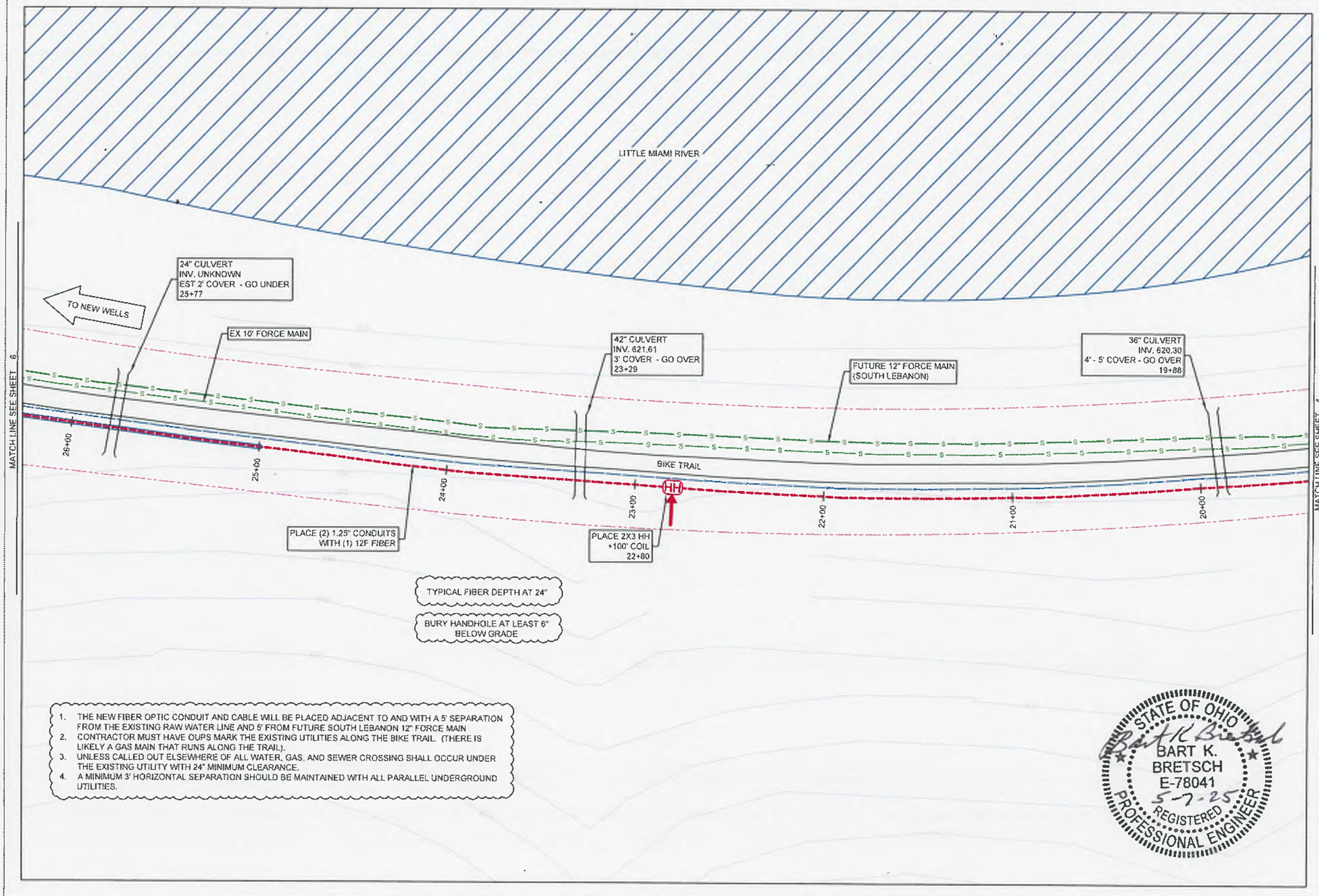

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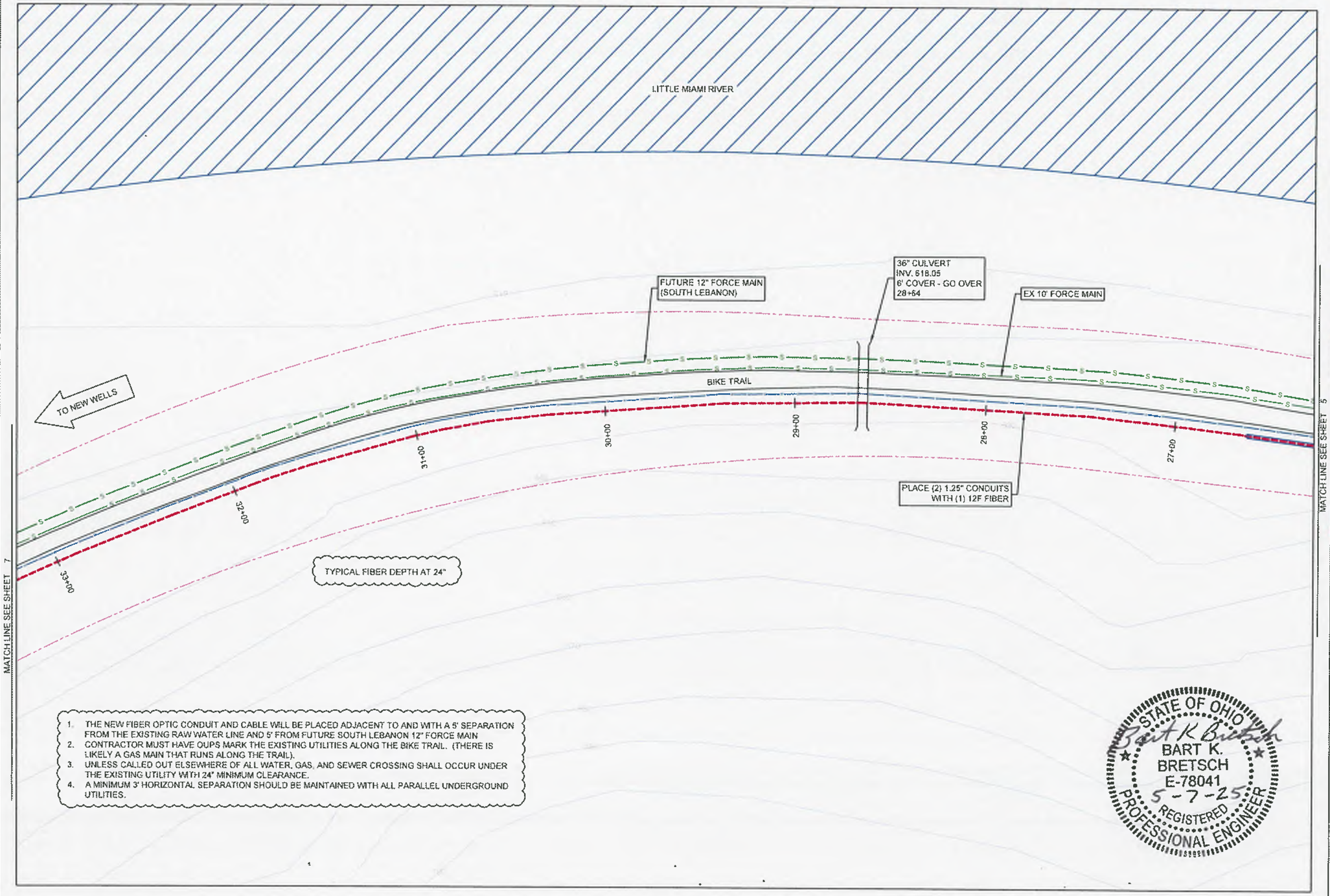

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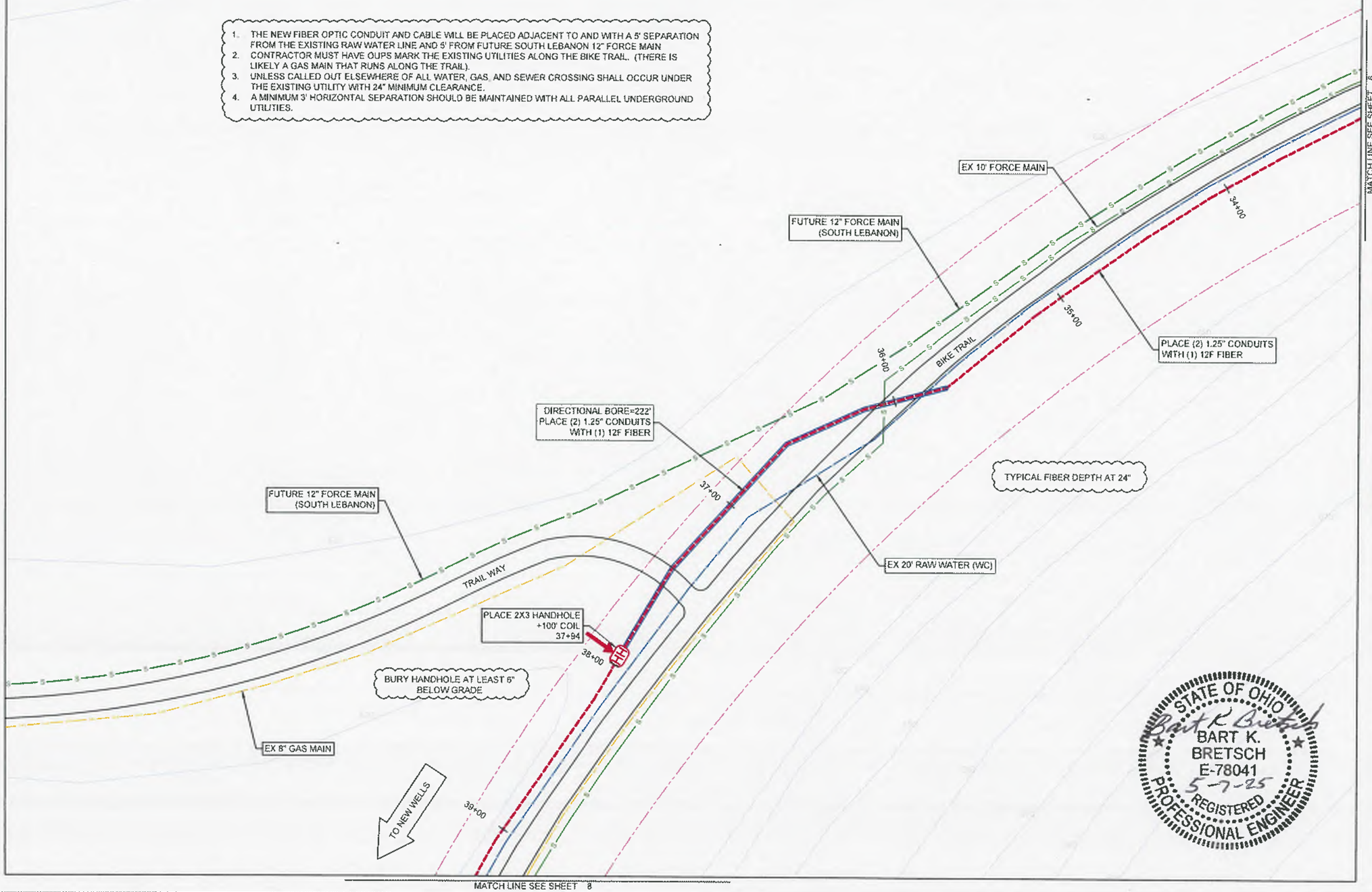

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MATCH LINE SEE SHEET 7

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40+00

EX 20' RAW WATER (WC)

PLACE CONDUIT OVER THE TOP OF CULVER PIPE

41+00

CULVERT 40+79

EX 10' FORCE MAIN

PLACE CONDUIT OVER THE TOP OF CULVER PIPE

42+00

CULVERT 41+74

TYPICAL FIBER DEPTH AT 24"

BIKE TRAIL

43+00

TO NEW WELLS

44+00

MATCH LINE SEE SHEET 9

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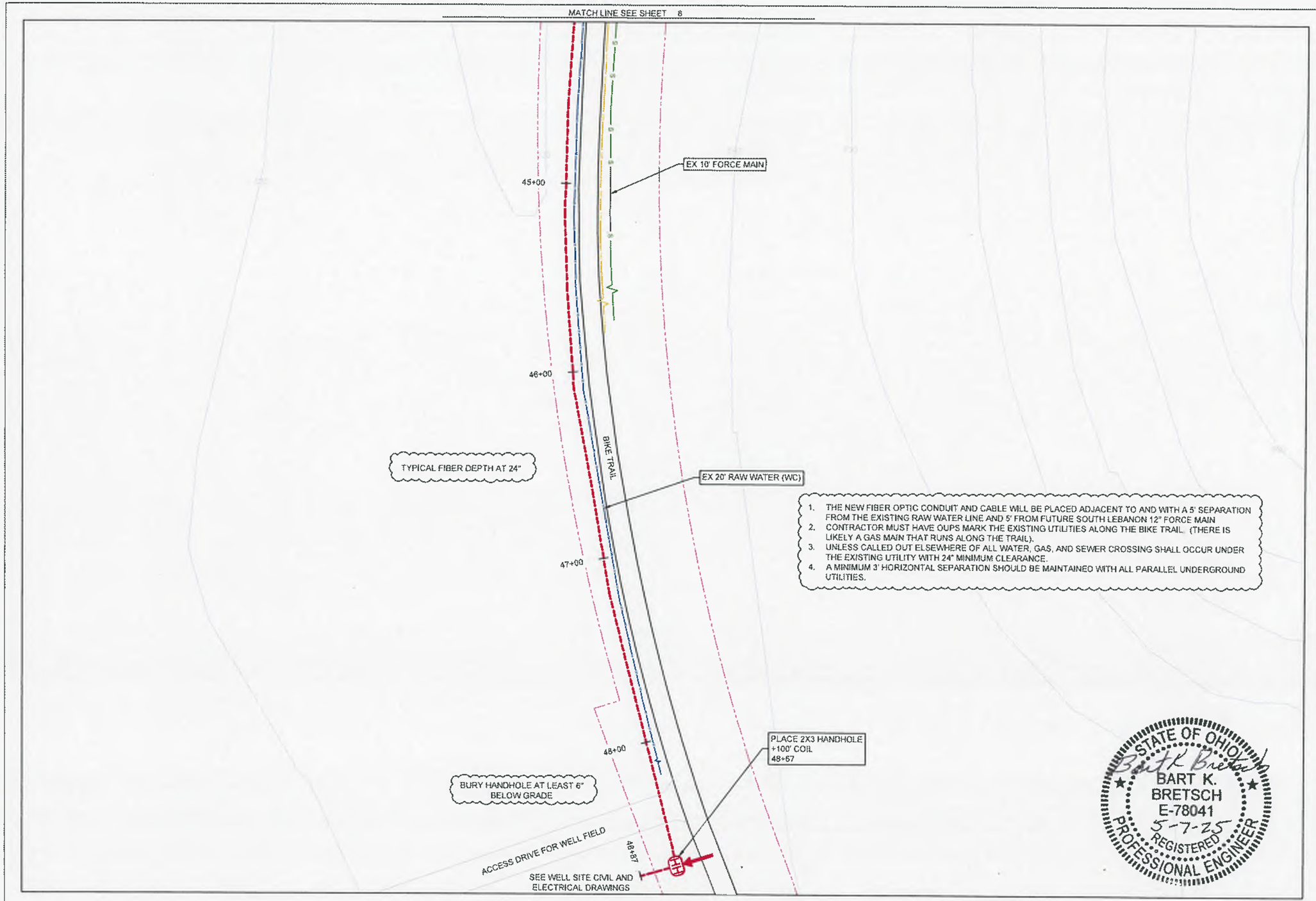

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CONSTRUCTION NOTES

1. The exact location of facility placement will be determined after all underground utilities have been located. The preferred route is as close to the Right-of-Way line as possible. Right-of-Way data shown should be considered approximate and not guaranteed.
2. If dielectric fiber is placed, a locate wire must be placed along with the fiber.
3. Known utilities shown are for reference only. Actual utility locations must be determined by 811 prior to construction.
4. The construction area will be restored to the original condition or better.
5. All new handholes are required to be installed on a 6" base of pea gravel.
6. Any changes or deviations in proposed work must be approved by the designated Resident Engineer.

811 Know what's below. Call