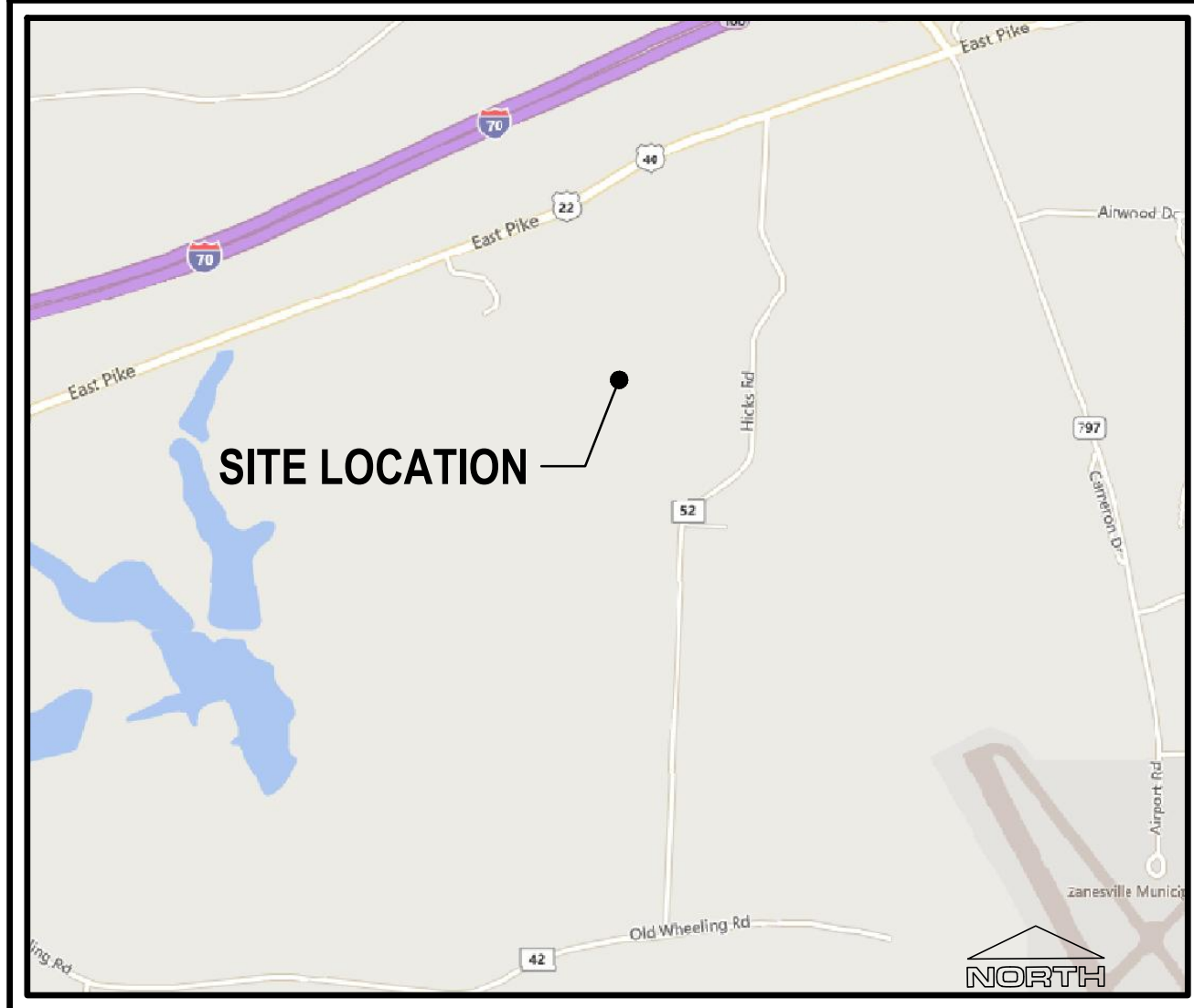


SITE CONSTRUCTION DOCUMENTS FOR: INDUSTRIAL DRIVE MUSKINGUM COUNTY, OHIO



LOCATION MAP



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PROPERTY OWNER LEGEND

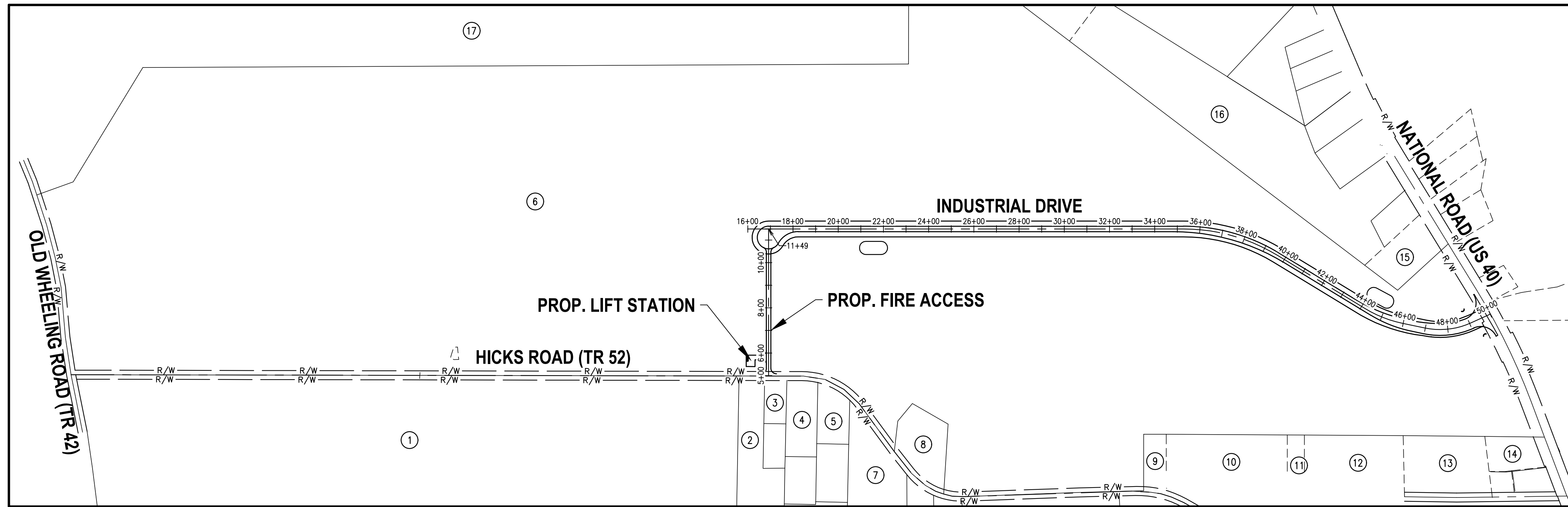
- | | | | |
|--|---|---|--|
| 1 BGT RENTALS LLC
51-70-03-10-000
69.8 Ac. | 6 ZANESVILLE MUSKINGUM COUNTY PORT AUTHORITY
51-70-03-13-000
203.41 Ac. | 11 ADAMS, JUSTIN M
51-62-01-54-000
.87 Ac. | 16 DUTRO, JOSEPH R & CHERYL A
51-60-03-05-000
10.5 Ac. |
| 2 PRINDLE, JENNIFER BETH
51-62-01-47-000
4.32 Ac. | 7 BRACKEN, CHASE
51-62-01-46-001
7.59 AC | 12 ZUMBRO SCOTT D & KELLY A
51-62-01-56-000
2.7 AC | 17 MERRY, SCOTT A & CYNTHIA K
51-70-03-14-000
98.12 AC |
| 3 KUSSMAUL, ROBERT G
51-62-01-48-000
0.46 Ac. | 8 MURPHY JR, HOWARD M
51-62-01-49-001
1.47 AC | 13 ZUMBRO SCOTT D & KELLY A
51-62-01-59-001
2.34 AC | |
| 4 BUCHANAN, RONALD E & JANET A
51-62-01-46-000
1.13 Ac. | 9 BGT RENTALS LLC
51-62-01-52-000
0.58 AC | 14 CLARK, ULYSSES WAYNE
51-62-01-61-000
0.8 AC | |
| 5 SCHAFER, SR DAVID L & DARLENE J
51-62-01-46-002
1.04 Ac. | 10 BENLINE, TARA L. & NATHAN P.
010-017094-02.000
1.32 Ac | 15 KOHLER, ADAM & TAYLOR POITTS
010-017094-02.000
1.32 Ac | |

PLANS PREPARED BY:



JAMES ROBERTS, PE 52927

DATE



INDEX MAP

SCALE: 1"=300'

THE STANDARD DRAWINGS LISTED ON THESE PLANS SHALL BE CONSIDERED A PART THEREOF

OHIO DEPARTMENT OF TRANSPORTATION STANDARD CONSTRUCTION DRAWINGS						SUPPLEMENTAL SPECIFICATIONS	
BP-3.1	7-18-2014	WQ-1.1	1-18-2013	RM-4.2	4-17-2020	800	10-20-2017
CB-1.2	1-15-2016	WQ-1.2	1-15-2016	TC-41.20	10-18-2013		
MH-1.2	1-15-2016	HW-1.1	7-20-2018	TC-41.30	10-18-2013		
DM-1.1	7-21-2017	HW-2.1	7-20-2018	TC-41.50	10-18-2013		
DM-1.2	1-18-2013	MGS-1.1	1-19-2018	TC-42.20	10-18-2013		
DM-4.2	7-20-2012	MGS-2.1	1-19-2018	TC-65.10	1-17-2014		
DM-4.3	1-15-2016	MGS-4.2	7-19-2013	TC-65.11	7-21-2017		
DM-4.4	1-15-2016	MGS-5.2	7-15-2016	TC-71.10	1-19-2018		

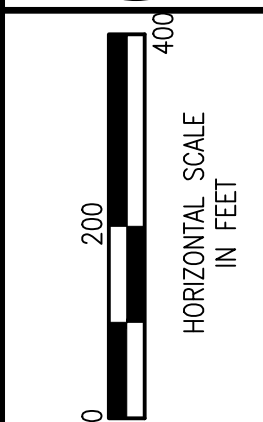
APPROVALS

THE SIGNATURES BELOW SIGNIFY ONLY CONCURRENCE WITH THE GENERAL PURPOSE AND GENERAL LOCATION OF PROJECT. ALL TECHNICAL DETAILS REMAIN THE RESPONSIBILITY OF THE DESIGN ENGINEER PREPARING THE PLANS.

MUSKINGUM COUNTY WATER _____ DATE _____

MUSKINGUM COUNTY ENGINEER _____

MUSKINGUM COUNTY SANITARY _____ DATE _____



HORIZONTAL SCALE
IN FEET

DATE

NO.

PLAN ISSUE/REVISION

DATE

CHECKED

ELB

DATE

5/22/2020

HULL & ASSOCIATES, Inc.
59 Grant Street
Zanesville, OH 43885
Phone: (740) 344-5851
Fax: (740) 344-8899
www.hullinc.com



CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
TITLE SHEET

JOB NUMBER:
ZAN012

1

WATER NOTES

OPERATION OF IN SERVICE VALVES SHALL BE BY MUSKINGUM COUNTY WATER DEPARTMENT PERSONNEL ONLY. A 24 HOUR NOTICE SHALL BE REQUIRED FOR SHUT DOWNS.

ALL WATER LINES SHALL BE INSTALLED WITH AT LEAST 10 FEET HORIZONTAL SEPARATION FROM SANITARY SEWER AND STORM SEWER LINES. WHENEVER A WATER LINE AND SEWER MUST CROSS, THE SEWER MAIN (STORM OR SANITARY) SHALL BE LAID SUCH THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER LINE MEASURED BETWEEN THE OUTSIDE PIPE WALLS. IN CASES WHERE THE REQUIRED SEPARATION CANNOT BE MAINTAINED, CLOSER INSTALLATION MAY BE PERMITTED ON A CASE-BY-CASE BASIS ONLY AFTER RECEIPT OF WRITTEN CONCURRENCE FROM THE OHIO EPA DIVISION OF DRINKING WATER. 2003 RECOMMENDED STANDARDS FOR WATER WORKS, SECTIONS 8.8.2 AND 8.8.3 SHALL GOVERN AS TO THE SEPARATION OF WATER LINE FROM CONTAMINATION SOURCES.

ALL WATER MAIN MATERIALS MUST MEET AWWA SPECIFICATIONS AND A STATEMENT OF VERIFICATION MUST BE FURNISHED TO MUSKINGUM COUNTY.

ALL BENDS, JOINTS, DEFLECTIONS AND FITTINGS SHALL BE APPROPRIATELY BLOCKED WITH CONCRETE, AS PER MUSKINGUM COUNTY AND ODOT SPECIFICATION 638.06.

ALL VALVES SHALL BE APPROPRIATELY BLOCKED WITH CONCRETE, AS PER ODOT SPECIFICATIONS 638.06. THE TOP OF ALL VALVE BOXES SHALL BE ENCASED IN 6" OF CONCRETE.

WATER LINE PIPE MATERIAL

ALL MAIN LINE PIPE SHALL CARRY THE NATIONAL SANITATION FOUNDATION (NSF) SEAL OF APPROVAL FOR POTABLE WATER APPLICATIONS. PVC SDR SERIES PIPE (NORMALLY LIMITED TO 2'-3') SHALL CONFORM TO ASTM 2241 WITH JOINTS CONFORMING TO ASTM D3139 RATED CLASS 200 OR HIGHER. PVC MUNICIPAL MAINS (4'-12') SHALL CONFORM TO AWWA C-900 WITH BELL AND SPIGOT JOINTS CONFORMING TO ASTM F-477 RATED DR-14. PVC TRANSMISSION PIPE (14'-30') SHALL CONFORM TO AWWA C-905 WITH BELL AND SPIGOT JOINTS CONFORMING TO ASTM F-477 RATED DR 18. ALL HIGH-DENSITY POLYETHYLENE PIPE (HDPE) SHALL CONFORM TO AWWA C906 AND SHALL BE BUTT FUSED JOINTS. UNDER SPECIAL CONDITIONS, WATERLINE PIPE MATERIAL MAY BE DUCTILE IRON PIPE WITH PUSH-ON TYPE JOINTS, CEMENT LINED (AWWA C-104) AND SHALL MEET THE REQUIREMENTS OF AWWA C-150 AND AWWA C-151 WHERE APPROVED BY MUSKINGUM COUNTY.

TRACER WIRE AND WARNING TAPE

INSULATED, SOLID, COPPER CONDUCTOR, 12 GAGE TRACER WIRE SHALL BE BURIED WITH ALL PVC AND HDPE WATER MAINS AND SERVICES LOCATED DIRECTLY ON TOP OF ABOVE THE PIPE. TRACER WIRE WILL BE TERMINATED OUTSIDE AND EXTENDED OVER THE TOP OF THE VALVE BOXES. ANY CONNECTIONS OF THE TRACER WIRE WILL BE MADE USING DRY-CON CONNECTORS. WARNING TAPE THAT IS THREE INCHES (3") WIDE, CONTINUOUS ALUMINUM FOIL CORE (0.00055 INCHES THICK), DETECTABLE BY INDUCTIVE AND CONDUCTIVE METHOD, AND PIGMENTED ON ONE PRINTED SIDE WITH 1½ INCH LETTERS WILL BE INSTALLED OVER PIPE APPROXIMATELY TWELVE INCHES (12') BELOW FINISH GRADE. FOR WATER MAINS TAPE WILL BE AWWA APPROVED, BLUE IN COLOR, AND IMPRINTED 'CAUTION: WATER LINE BURIED BELOW.'

FITTINGS

FOR THREE INCH (3") THROUGH TWENTY-FOUR INCH (24") PIPE ALL FITTINGS SHALL BE CLASS 350 DUCTILE IRON CONFORMING TO THE REQUIREMENTS OF ANSI A21.53/AWWA C153. END CONNECTIONS WILL BE MECHANICAL JOINT TYPE WITH RUBBER GASKETS IN ACCORDANCE WITH ANSI A21.11/AWWA C111. FITTINGS WILL BE COATED INSIDE AND OUTSIDE WITH FUSION-BONDED EPOXY, 6 TO 8 MILS THICKNESS PER AWWA C550 AND AWWA C116. USE OF PVC PRESSURE PIPE FITTINGS IS LIMITED TO PIPE LESS THAN 3 INCH DIAMETER. PVC FITTINGS SHALL BE PUSH-ON TYPE, GASKETED BELL JOINTS, CLASS 200 MANUFACTURED IN ONE PIECE CONFORMING TO ASTM 1784 AND REQUIREMENTS OF SDR 21. HDPE FITTINGS SHALL BE SAME MATERIAL, SIZE, DIMENSION RATIO, AND PRESSURE CLASS AS PIPE MATERIAL. ALL FITTINGS SHALL BE INSTALLED WITH CONCRETE THRUST BLOCKS TO PREVENT MOVEMENT. A RESTRAINER GLAND SYSTEM SHALL BE USED ALONG WITH CONCRETE THRUST BLOCK AT TERMINATION OF THE WATERLINE.

WATER LINE VALVES

WATER LINE VALVES TWO INCH THROUGH TWELVE INCH (2'-12') SHALL BE RESILIENT WEDGE GATE VALVE (RWGV) AND MEET THE REQUIREMENTS OF AWWA C509 OR C515, LATEST EDITION AS MANUFACTURED BY CLOW OR AMERICAN FLOW CONTROL, SERIES 2500. THE RWGV SHALL HAVE A 250 PSIG WORKING PRESSURE; DUCTILE IRON BODY, BONNET, AND WEDGE; ALL EXPOSED INTERNAL AND EXTERNAL IRON SURFACES TO BE FUSION BONDED EPOXY COATED IN COMPLIANCE WITH AWWA C550. RWGV SHALL HAVE STAINLESS STEEL BONNET BOLTS AND NUTS, NON-RISING BRONZE STEM, AND CONNECTIONS TO SUIT TYPE OF PIPE. THE RWGV SHALL OPEN 'LEFT' OR 'COUNTER-CLOCKWISE' AND SHALL BE SUPPLIED WITH A TWO INCH (2) SQUARE-BLACK WRENCH NUT. WATER LINE VALVES ON FOURTEEN INCH (14') AND LARGER DIAMETER PIPE WILL BE SPECIFIED BY THE WATER DEPARTMENT.

VALVE MANHOLES WHEN REQUIRED BY WATER DEPARTMENT SHALL BE FOUR FEET (4) DIAMETER PRE-CAST CONCRETE AND DESIGNED FOR AN H-20 LOADING.

VALVE BOXES SHALL BE 5-1/4 INCH I.D., CAST IRON, ADJUSTABLE, SLIP-TYPE BOX FITTED WITH A CAST IRON LID, MODEL 6855, AS MANUFACTURED BY TYLER PIPE, OR APPROVED EQUAL. BOX LID SHALL BE MARKED 'W' OR 'WATER.' VALVE BOXES WILL BE SET TO FINISH GRADE.

FIRE HYDRANTS

HYDRANTS SHALL BE CLOW MEDALLION 5-1/4' OR AMERICAN DARLING, MODEL B-62-B. FIRE HYDRANTS SHALL COMPLY WITH AWWA C502 LATEST EDITION, AND BE DRY BARREL TYPE, MOISTUREPROOF, 'O' RING TYPE, SEALED AUTOMATIC LUBRICANT CHAMBER ENCLOSED OPERATING THREADS, COMPRESSION TYPE, AND OPENING AGAINST LINE PRESSURE. HYDRANTS SHALL HAVE ONE 5 INCH STORZ NOZZLE PUMPER OUTLET; FORGED OR EXTRUDED 6061-T6 ALUMINUM ASSEMBLY WITH BRASS FACE METAL SEAL AND HARD ANODIZED ALUMINUM STORZ RAMPS AND LUGS; HARRINGTON INTEGRAL HYDRANT STORZ - METAL FACE STORZ AS MANUFACTURED BY HARRINGTON, INC. OR EQUAL. THE CAP SHALL BE BLIND TYPE; FORGED OR EXTRUDED 6061-T6 HARD ANODIZED ALUMINUM STORZ RAMPS AND LUGS. CENTER CAP EQUIPPED WITH A SUCTION SEAL; REQUIRING STORZ SPANNER WRENCH FOR REMOVAL; CONNECTED TO NOZZLE ASSEMBLY OR HYDRANT WITH STAINLESS STEEL CHAIN OR 0.125" VINYL-COATED STAINLESS-STEEL CABLE. HYDRANTS SHALL ALSO HAVE TWO 2-1/2 INCH I.D. HOSE NOZZLES WITH STANDARD NATIONAL THREAD. THE CAPS SHALL BE DUCTILE CAST IRON BODY WITH 1-INCH SQUARE NUT, THREADS COMPATIBLE WITH HOSE NOZZLE THREADS; EACH CAP TP BE CONNECTED TO HYDRANT BY SEPARATE CHAIN. THE HYDRANT SHOE SHALL BE SIX-INCH (6") M.J. CONNECTION WITH 5 1/4 INCH INTERNAL VALVE. HYDRANTS SHALL BE "OPEN RING" TYPE. THE VALVE SEAT RING SHALL BE BRONZE WITH BRONZE THREAD ENGAGEMENT. ALL HYDRANTS SHALL BE DRAINABLE INTO PIPE BEDDING MATERIAL CONSISTING OF NO. 8 LIMESTONE GRAVEL POCKET, UNLESS SPECIFIED DIFFERENTLY BY MUSKINGUM COUNTY. ALL HYDRANTS SHALL HAVE TYPE 316 STAINLESS STEEL BOLTS AND NUTS BELOW THE BURY LINE. UNLESS OTHERWISE SPECIFIED, HYDRANTS SHALL BE BURIED A MINIMUM OF FOUR FEET (4) DEEP.

ALL HYDRANTS SHALL BE PAINTED USING ZINC CHROMATE (RUST-OLEUM #1573) PRIMER AND A FINISH COAT OF RUST-OLEUM #1548 SAFETY YELLOW. ANY DAMAGE TO PAINT WILL BE CLEANED WITH A WIRE BRUSH, PRIMED, AND A COMPLETE FINISH COAT APPLIED.

ALL HYDRANT LEADS SHALL CONSIST OF AN ANCHOR COUPLING WITH APPROPRIATE THRUST BLOCKS. AS A MINIMUM THE ANCHOR COUPLING SHALL INCLUDE A TWO FOOT (2) OR LONGER SECTION OF PIPE BETWEEN THE VALVE AND THE HYDRANT. ANY SPACER PIPE REQUIRED BETWEEN THE TEE AND THE VALVE SHALL CONSIST OF ANCHORING PIPE OR RESTRAINED JOINT PIPE. HYDRANT PIPING SHALL INCLUDE SWIVEL FITTINGS.

WATCH VALVES WITH BOX SHALL MEET WATER LINE VALVE REQUIREMENTS.

DISINFECTION

FLUSHING AND DISINFECTION OF THE WATER MAIN SHALL BE THE RESPONSIBILITY OF THE PARTY CONSTRUCTING SAME AND SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARD PROCEDURES AND REQUIREMENTS OF THE MUSKINGUM COUNTY WATER DEPARTMENT AT NO COST TO THE COUNTY. DISINFECTION SHALL BE IN ACCORDANCE WITH AWWA C651. THE WATER DEPARTMENT WILL PROVIDE WATER FOR THE INITIAL FLUSHING AND DISINFECTION AT NO COST. ADDITIONAL WATER FOR FLUSHING AND TESTING WILL BE BILLED TO THE CONTRACTOR. THE MAIN LINE VALVE SHALL BE CLOSED AFTER DISINFECTION AND FLUSHING OF ALL LINES.

TESTING

SAMPLING AND TESTING OF WATER MAINS SHALL BE PERFORMED BY MUSKINGUM COUNTY WATER DEPARTMENT PERSONNEL UTILIZING COUNTY EQUIPMENT AND FACILITIES. THE WATER DEPARTMENT COST OF OBTAINING ALL SAMPLES AND TIME TO PERFORM TESTING WILL BE BORNE BY THE CONTRACTOR. ALL TESTING WILL FOLLOW E.P.A. RULES AND REGULATIONS WHICH CURRENTLY CONSISTS OF TWO CONSECUTIVE SAMPLES, TWENTY-FOUR HOURS APART FOR EVERY 1500 FEET AND/OR TWO SAMPLES PER STREET RUN. NO WATER MAIN SHALL BE ALLOWED INTO SERVICE UNTIL ALL SERVICE CHARGES FOR SAMPLING AND TESTING DUE AND OWED TO THE WATER DEPARTMENT HAVE BEEN PAID AND SATISFACTORY TEST RESULTS ARE BACK TO THE RESPONSIBLE PARTY.

THRUST BLOCKS

THRUST BLOCKS SHALL BE PROVIDED AT FITTINGS, VALVES OR CHANGES IN DIRECTION OF PIPE OR AS DETERMINED BY THE MUSKINGUM COUNTY WATER DEPARTMENT. THRUST BLOCKING WILL BE AN APPROVED MECHANICAL SYSTEM OF RESTRAINED JOINTS OR CONCRETE THRUST BLOCKING. JOINT RESTRAINT SYSTEMS NORMALLY USED ARE MEGALUG®, FIELD-LOK 350®, SUPER-LOCK®, OR FAST-GRIP®. WHERE MAKING A TIE-IN TO THE EXISTING SYSTEM A COMBINATION OF RESTRAINTS MAY BE REQUIRED. CONCRETE THRUST BLOCKING SHALL CONSIST OF CONCRETE WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI AND SHALL BE INSTALLED USING THE DIMENSIONS SHOWN IN THE STANDARD DRAWINGS. THE CONTRACTOR SHALL USE FORMS AND PLASTIC TO ENSURE ALL PIPE FITTING JOINTS AND BOLTS ARE FREE OF CONCRETE.

CONNECTION TO EXISTING MAINS

CONNECTION OF NEW MAINS TO EXISTING MUSKINGUM COUNTY WATER MAINS SHALL GENERALLY BE MADE WITH TAPPING VALVES AND SLEEVES, UNLESS APPROVAL IS OBTAINED FROM MUSKINGUM COUNTY TO SHUT-OFF THE EXISTING MAIN. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION AND PROVIDE AND INSTALL ALL MATERIALS. TAPPING SLEEVES WILL BE STAINLESS STEEL. TAPPING VALVES WILL MEET ALL REQUIREMENTS OF WATER LINE VALVES.

BACKFILL

ALL BACKFILL FOR WATER LINES AND WATER SERVICES ON THIS PLAN SHALL BE NATIVE MATERIAL, FREE OF ORGANIC MATERIAL AND DEBRIS FOR THE ENTIRE TRENCH DEPTH, UNLESS OTHERWISE NOTED.

DRAWN		DATE	
ELB	CHECKED	INV	DATE
			5/22/2020
PLAN ISSUE/REVISION			
NO.			

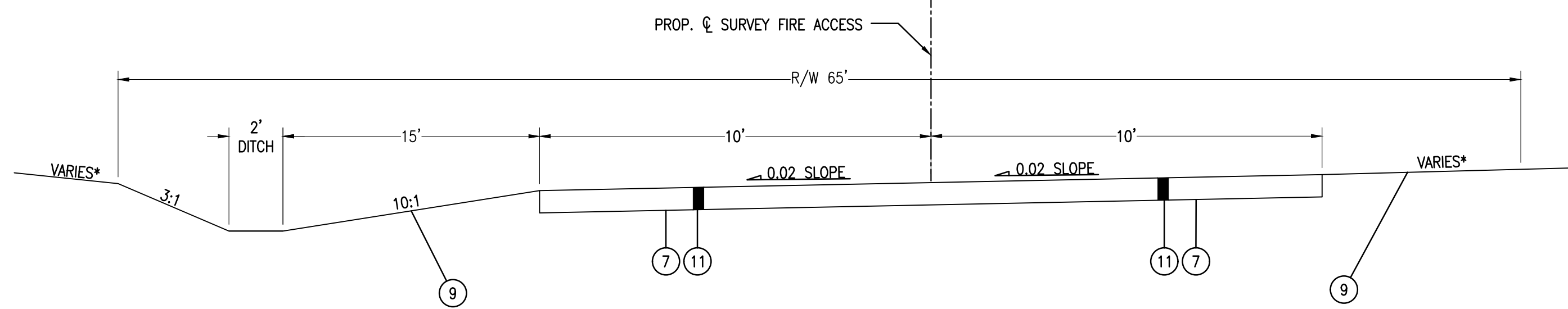
HULL & ASSOCIATES, Inc.
59 Grant Street
Zanesville, OH 43885
Phone: (740) 344-5451
Fax: (740) 344-8899
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
GENERAL NOTES

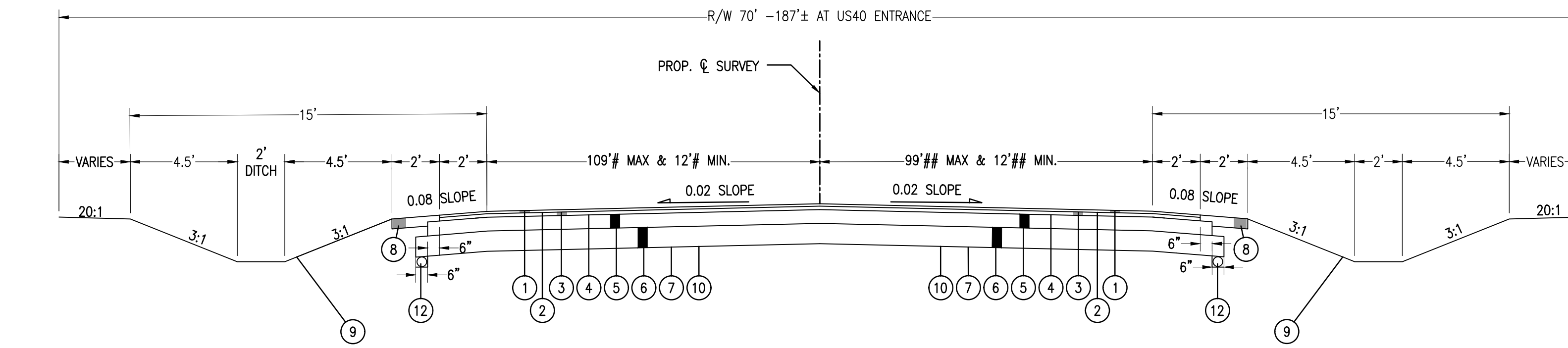
JOB NUMBER:
ZAN012

3



PROPOSED FIRE ACCESS — TYPICAL SECTION

STA. 5+08.40-10+61.10 = 552.07 FT
TOTAL 552.70 FT



PROPOSED INDUSTRIAL ROAD — TYPICAL SECTION

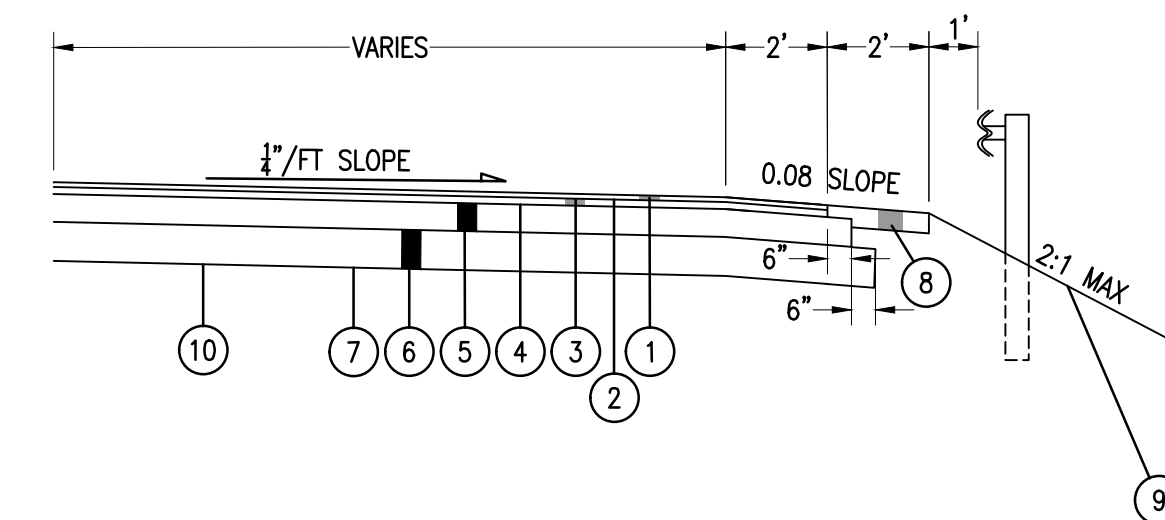
STA. 16+59.93-49+88.61 = 3,328.68 FT
TOTAL 3,328.68 FT

#NOTE:
TAPERS FROM 0.00' @ STA. 16+59.93 TO 12.0'± @ STA. 16+92.43
TAPERS FROM 12.0'± @ STA. 16+92.43 TO 12.0'± @ STA. 43+56.70
TAPERS FROM 12.0'± @ STA. 43+56.70 TO 26.0'± @ STA. 47+57.00
TAPERS FROM 26.0'± @ STA. 47+57.00 TO 26.0'± @ STA. 48+88.21
TAPERS FROM 26.0'± @ STA. 48+88.21 TO 109.0'± @ STA. 49+80.33

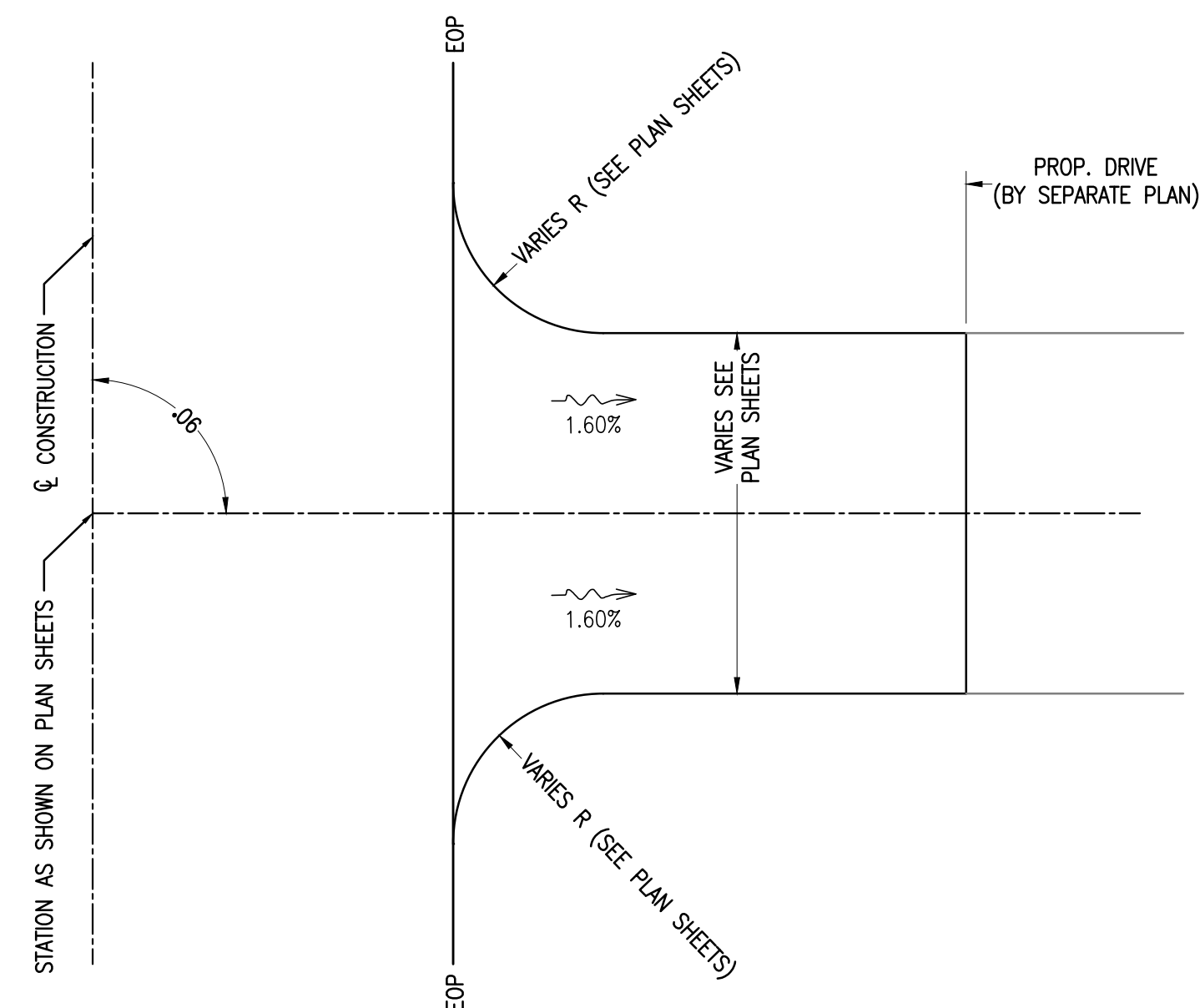
##NOTE:
TAPERS FROM 0.00' @ STA. 16+59.93 TO 88.0'± @ STA. 16+92.43
TAPERS FROM 88.0'± @ STA. 16+92.43 TO 12.0'± @ STA. 18+22.91
TAPERS FROM 12.0'± @ STA. 18+22.91 TO 12.0'± @ STA. 34+81.40
TAPERS FROM 12.0'± @ STA. 34+81.40 TO 18.2'± @ STA. 37+45.16
TAPERS FROM 18.2'± @ STA. 37+45.16 TO 12.0'± @ STA. 40+08.92
TAPERS FROM 12.0'± @ STA. 40+08.92 TO 12.0'± @ STA. 44+16.85
TAPERS FROM 12.0'± @ STA. 44+16.85 TO 26.0'± @ STA. 46+39.18
TAPERS FROM 26.0'± @ STA. 46+39.18 TO 26.0'± @ STA. 49+07.91
TAPERS FROM 26.0'± @ STA. 49+07.91 TO 99.0'± @ STA. 49+88.61

- LEGEND
- ① ITEM 441 — 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG70-22M
 - ② ITEM 407 — TACK COAT @ 0.05 GAL/SY
 - ③ ITEM 441 — 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448), PG70-22M
 - ④ ITEM 407 — TACK COAT @ 0.075 GAL/SY
 - ⑤ ITEM 301 — 5" ASPHALT CONCRETE BASE, PG64-22
 - ⑥ ITEM 304 — 9" AGGREGATE BASE
 - ⑦ ITEM 204 — SUBGRADE COMPACTION
 - ⑧ ITEM 617 — 5" COMPACTED AGGREGATE
 - ⑨ ITEM 659 — SEEDING & MULCHING, TYPE 2
 - ⑩ ITEM 204 — PROOF ROLLING
 - ⑪ ITEM 304 — 12" AGGREGATE BASE
 - ⑫ ITEM 605 — 6" BASE PIPE UNDERDRAIN (ALTERNATE 1)

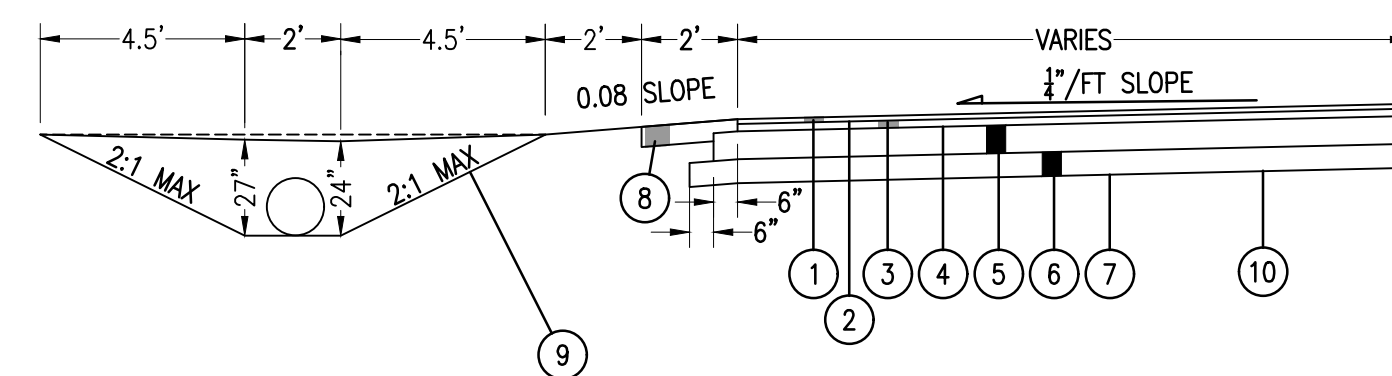
PROPOSED GUARDRAIL TYPICAL



TYPICAL ENTRANCES



PROPOSED VEHICLE ENTRANCE



NO.	DATE	PLAN ISSUE/REVISION	DRAWN ELB	CHECKED INW	DATE 5/22/2020

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Zanesville, Ohio 43885
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Environment / Energy / Infrastructure

CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
TYPICAL SECTION

JOB NUMBER:
ZAN012

4

Line No.	Item	Description	Qty	Unit
EARTHWORK				
1	201	CLEARING AND GRUBBING	LUMP	SUM
2	202	GUARDRAIL REMOVAL	276	LIN FT
3	202	ASPHALT PAVEMNT REMOVAL	80	SY
4	203	EXCAVATION, AS PER PLAN	LUMP	SUM
5	203	EMBANKMENT, AS PER PLAN	LUMP	SUM
6	203	EXCAVATION, AS DIRECTED BY ENGINEER	50	CY
7	203	EMBANKMENT, AS DIRECTED BY ENGINEER	50	CY
8	204	SUBGRADE COMPACTION	13,939	SQ YD
9	204	PROOF ROLLING	17	HOOR
10	255	FULL DEPTH PAVEMENT SAWING	280	LIN FT
EROSION CONTROL				
11	601	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER	110	CU YD
12	601	CRUSHED AGGREGATE SLOPE PROTECTION	900	SQ YD
13	659	SEEDING AND MULCHING, CLASS 2	37,240	SQ YD
14	659	REPAIR SEEDING AND MULCHING	1,862	SQ YD
15	659	WATER	202	M GAL
16	659	COMMERCIAL FERTILIZER	6	TON
17	659	LIME	7.7	ACRE
18	670	SLOPE EROSION PROTECTION	750.0	SQ YD
19	832	EROSION CONTROL, AS PER PLAN	LUMP	SUM
DRAINAGE				
20	602	CONCRETE MASONRY, AS PER PLAN (FULL HEIGHT HEADWALLS)	25	CU YD
21	602	CONCRETE MASONRY, AS PER PLAN (HALF HEIGHT HEADWALLS)	2	CU YD
22	611	12" CONDUIT, TYPE B	129	LIN FT
23	611	18" CONDUIT, TYPE B	176	LIN FT
24	611	36" CONDUIT, TYPE B	174	LIN FT
25	611	60" CONDUIT, TYPE B	140	LIN FT
26	611	CATCH BASIN, NO. 2-3	4	EACH
27	611	CATCH BASIN, NO. 2-4	1	EACH
28	611	CATCH BASIN, NO. 2-4, AS PER PLAN (OUTLET STRUCTURE)	2	EACH
PAVEMENT				
29	301	ASPHALT CONCRETE BASE, PG64-22	1,883	CU YD
30	304	AGGREGATE BASE	3,908	CU YD
31	407	NON-TRACKING TACK COAT	1,647	GAL
32	441	ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG 70-22M	589	CU YD
33	441	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448), PG70-22M	922	CU YD
34	617	COMPACTED AGGREGATE, 5"	209	CU YD
35	606	GUARDRAIL, TYPE MGS	150	LIN FT
36	606	GUARDRAIL, TYPE MGS HALF POST SPACING	625	LIN FT
37	606	ANCHOR ASSEMBLY, MGS TYPE T	2	EACH

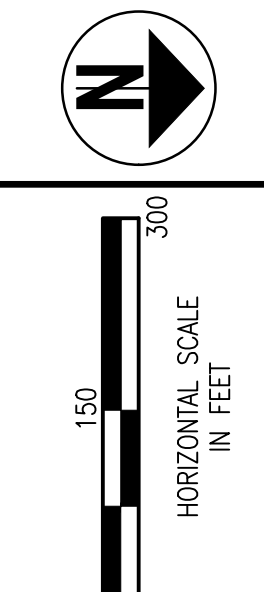
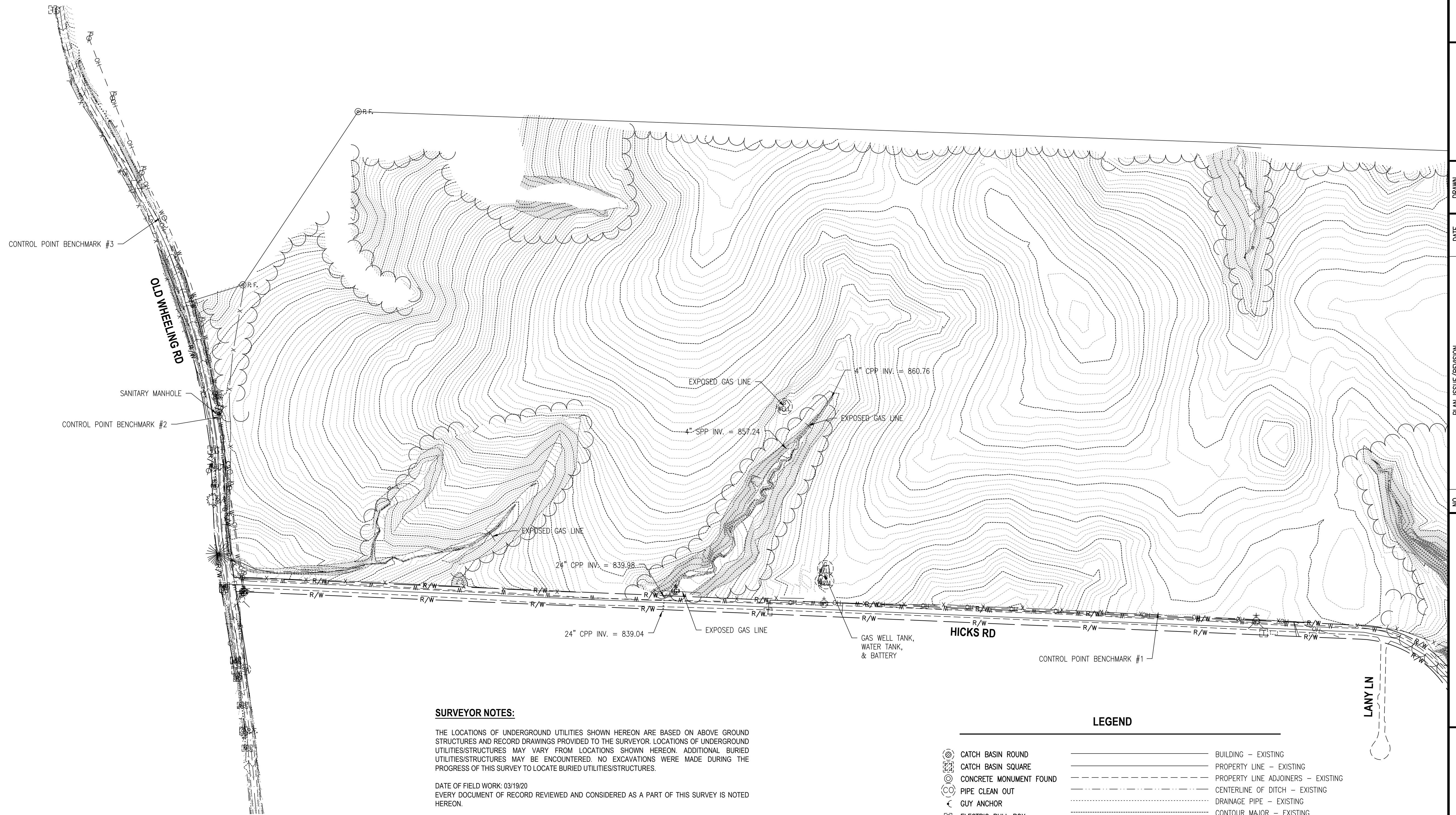
Line No.	Item	Description	Qty	Unit
MAINTENANCE OF TRAFFIC				
38	614	MAINTAINING TRAFFIC	LUMP	SUM
SIGNAGE & STRIPING				
39	621	RPM	90	EACH
40	621	RPM REFLECTOR	90	EACH
41	630	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	1	EACH
42	630	GROUND MOUNTED SUPPORTED, NO. 3 POST	280	LIN FT
43	630	SIGN, FLAT SHEET	97	SQ FT
44	644	STOP LINE	36	LIN FT
45	644	EDGE LINE, 4"	1.30	MILE
46	644	CENTER LINE	0.63	MILE
47	644	CHANNELIZING LINE, 8"	223	LIN FT
48	644	TRANSVERSE/DIAGONAL LINE	326	LIN FT
49	644	LANE ARROW	4	EACH
50	SPEC	FIRE LANE POST, AS PER PLAN	4	EACH
WATER MAIN WORK				
51	638	12" WATERMAIN PVC PIPE & FITTINGS, AWWA C900, DR 18	2,918	LIN FT
52	638	8" WATERMAIN PVC PIPE & FITTINGS, AWWA C900, DR 18	299	LIN FT
53	638	8" GATE VALVE WITH ACCESSORIES	5	EACH
54	638	12" GATE VALVE WITH ACCESSORIES	9	EACH
55	638	FIRE HYDRANT, TYPE A	9	EACH
56	638	18"x12" TAPPING SLEEVE & VALVE	1	EACH
57	638	PLUG & THRUST BLOCK	6	EACH
SANITARY SEWER WORK				
58	611	12" CONDUIT, TYPE B, AS PER PLAN	2638	LIN FT
59	611	8" CONDUIT, TYPE B, AS PER PLAN	192	LIN FT
60	611	MANHOLE, NO. 3	10	EACH
61	638	8" SANITARY FORCEMAIN PVC PIPE & FITTINGS, AWWA C900 DR 18	2,774	LIN FT
62	638	VIA DIRECTIONAL BORE 8" SANITARY FORCEMAIN PVC PIPE & FITTINGS, AWWA C900 RJ DR 18	254	LIN FT
63	SPEC	8" PLUG VALVE, COMPLETE FURNISH AND INSTALL PER PLAN	2	EACH
64	SPEC	8" SWING CHECK VALVE, COMPLETE FURNISH AND INSTALL PER PLAN	2	EACH
65	SPEC	AUTO AIR VALVE, COMPLETE FURNISH AND INSTALL PER PLAN	3	EACH
66	SPEC	LIFT STATION AND SITE, COMPLETE	LUMP	SUM
INCIDENTALS				
67	SPEC	PERFORMANCE BOND	LUMP	SUM
68	624	MOBILIZATION	LUMP	SUM
69	623	CONSTRUCTION LAYOUT STAKES AND SURVEYING	LUMP	SUM

Line No.	Item	Description	Qty	Unit
ALTERNATE #1 - UNDERDRAINS				
1	605	6" BASE PIPE UNDERDRAINS	6,840	LIN FT
2	611	PRECAST REINFORCED CONCRETE OUTLET	10	EACH

Line No.	Item	Description	Qty	Unit
ALTERNATE #2 - OFF ROADWAY GRADING				
1	203	EXCAVATION, AS PER PLAN	LUMP	SUM
2	203	EMBANKMENT, AS PER PLAN	LUMP	SUM
ALTERNATE #2 - EROSION CONTROL				
3	659	SEEDING AND MULCHING, CLASS 2	65,700	SQ YD
4	659	REPAIR SEEDING AND MULCHING	3,285	SQ YD
5	659	WATER	355	M GAL
6	659	COMMERCIAL FERTILIZER	9	TON
7	659	LIME	13.6	ACRE
8	832	EROSION CONTROL, AS PER PLAN	LUMP	SUM

DRAWN ELB	CHECKED NW	DATE 5/22/2020	
DATE	NO.	PLAN ISSUE/REVISION	
HULL Environment / Energy / Infrastructure			
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO QUANTITIES			
JOB NUMBER: ZAN012			
5			

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				5/22/2020

NO.	PLAN	ISSUE/REVISION	DATE

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SURVEYOR NOTES:

THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON ABOVE GROUND STRUCTURES AND RECORD DRAWINGS PROVIDED TO THE SURVEYOR. LOCATIONS OF UNDERGROUND UTILITIES/STRUCTURES MAY VARY FROM LOCATIONS SHOWN HEREON. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED. NO EXCAVATIONS WERE MADE DURING THE PROGRESS OF THIS SURVEY TO LOCATE BURIED UTILITIES/STRUCTURES.

DATE OF FIELD WORK: 03/19/20
 EVERY DOCUMENT OF RECORD REVIEWED AND CONSIDERED AS A PART OF THIS SURVEY IS NOTED HEREON.

SUBSURFACE AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED AS A PART OF THIS SURVEY. NO STATEMENT IS MADE CONCERNING THE EXISTENCE OF UNDERGROUND OR OVERHEAD CONTAINERS OR FACILITIES THAT MAY AFFECT THE USE OR DEVELOPMENT OF THIS TRACT.

BASIS OF BEARINGS:

THE BEARINGS SHOWN HEREIN ARE BASED ON OHIO STATE PLANE COORDINATE SYSTEM, SOUTH SYSTEM, NAD83, GEOID12A.

CONTROL POINT / BENCHMARKS:

AS PER THE TOPOGRAPHIC SURVEY PREPARED BY HULL & ASSOCIATES THE CONTRACTOR AND/OR HIS SURVEYOR SHALL BE RESPONSIBLE TO CROSS CHECK ALL CONTROL FOR DISTURBANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

BASIS OF BEARING: TRUE NORTH, BASED ON OBSERVATIONS, GPS DATA COLLECTED WITH TRIMBLE R8 UNIT VRS CORRECTION ON OHIO STATE PLANE SOUTH ZONE COORDINATE SYSTEM, NAD 1983, NAVD 1988, GEOID 12A.

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	712051.919	2135064.523	879.24	5/8" IRON PIN 30" LONG WITH ID CAP "TRAV" SEE DRAWING FOR LOCATION
2	709375.746	2134507.905	822.81	5/8" IRON PIN 30" LONG WITH ID CAP "TRAV" SEE DRAWING FOR LOCATION
3	709209.644	2133941.783	779.63	5/8" IRON PIN 30" LONG WITH ID CAP "TRAV" SEE DRAWING FOR LOCATION
4	715955.395	2135582.423	827.46	5/8" IRON PIN 30" LONG WITH ID CAP "TRAV" SEE DRAWING FOR LOCATION
5	715663.477	2134848.147	841.40	5/8" IRON PIN 30" LONG WITH ID CAP "TRAV" SEE DRAWING FOR LOCATION

LEGEND

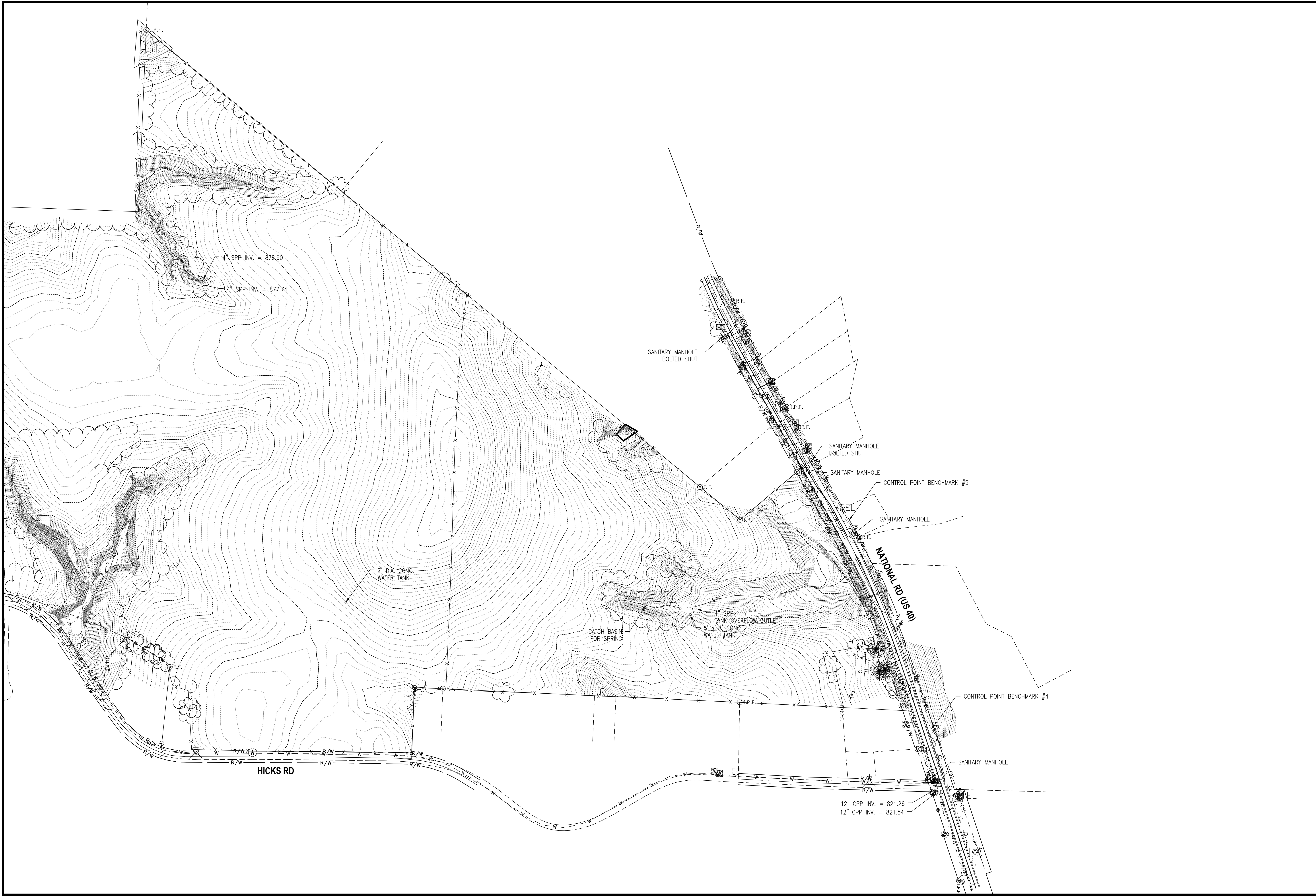
- CATCH BASIN ROUND
- CATCH BASIN SQUARE
- CONCRETE MONUMENT FOUND
- PIPE CLEAN OUT
- GUY ANCHOR
- ELECTRIC PULL BOX
- FIRE HYDRANT
- PAD MOUNT TRANSFORMER
- GAS METER
- GAS SERVICE VALVE
- GAS VALVE
- I.P.F. IRON PIN & CAP FOUND
- I.P.F. IRON PIN FOUND
- MAIL BOX
- POST
- POWER POLE
- SIGN PUBLIC
- SANITARY MANHOLE
- STORM MANHOLE
- DECIDUOUS TREE
- TELEPHONE RISE/PEDESTAL/BOX
- EVERGREEN TREE
- TELEPHONE AND POWER POLE
- WATER METER
- WATER SERVICE VALVE
- WATER GATE VALVE
- BUILDING - EXISTING
- PROPERTY LINE - EXISTING
- PROPERTY LINE ADJOINERS - EXISTING
- CENTERLINE OF DITCH - EXISTING
- DRAINAGE PIPE - EXISTING
- CONTOUR MAJOR - EXISTING
- CONTOUR MINOR - EXISTING
- WATER EDGE - EXISTING
- DRIVEWAY - EXISTING
- EDGE OF PAVEMENT - EXISTING
- STEPS - EXISTING
- PAVEMENT MARKING - EXISTING
- CENTERLINE OF RIGHT-OF-WAY - EXISTING
- RIGHT-OF-WAY LINE - EXISTING
- CONCRETE PAD - EXISTING
- FENCE - EXISTING
- GUARDRAIL - EXISTING
- UNDERGROUND ELECTRIC LINE - EXISTING
- OVERHEAD UTILITIES - EXISTING
- GAS LINE - EXISTING
- SANITARY LINE - EXISTING
- WATER LINE - EXISTING
- TREE LINE - EXISTING


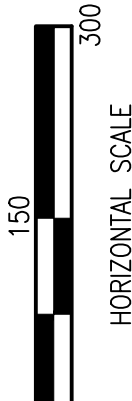
CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
 ZANESVILLE, MUSKINGUM COUNTY, OHIO
EXISTING CONDITIONS

JOB NUMBER:
ZAN012

6

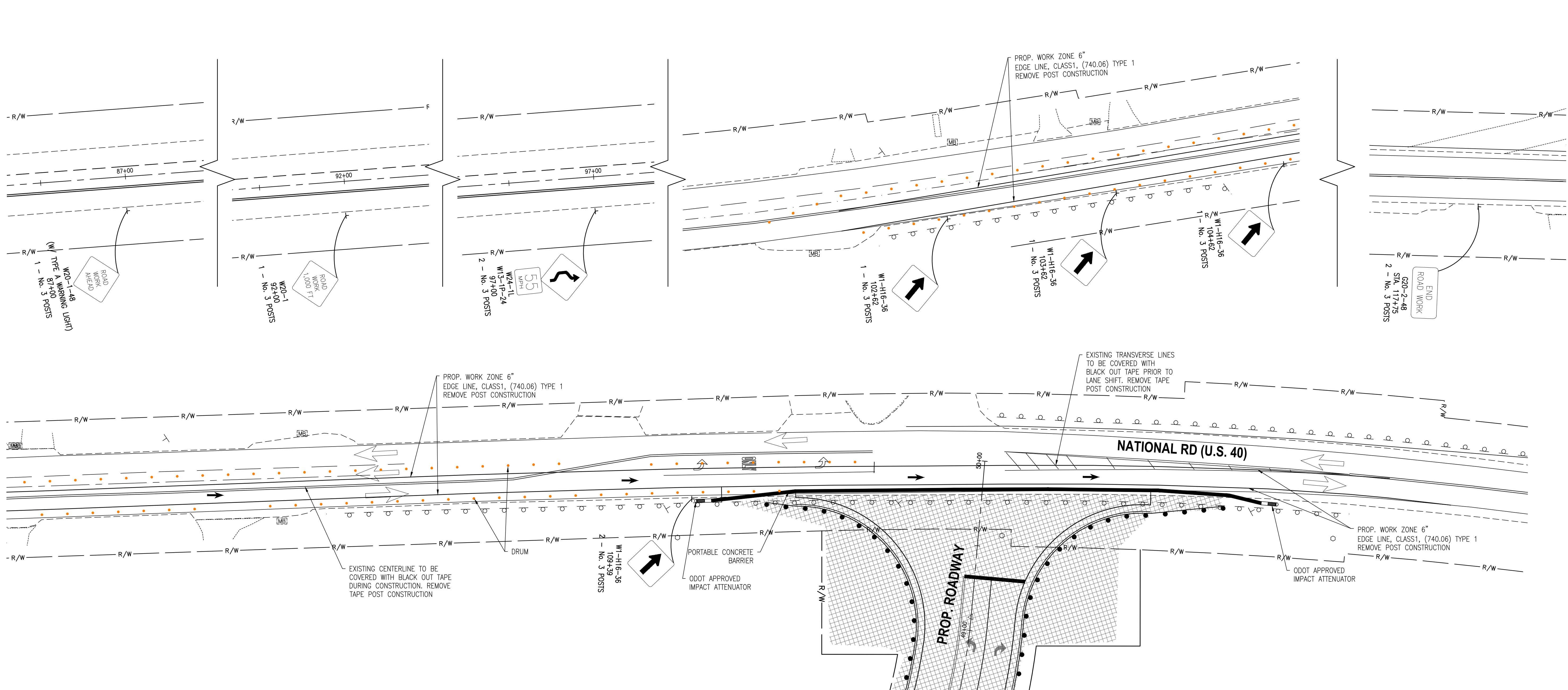
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<p>INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO EXISTING CONDITIONS</p>																			
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ITEM 614, MAINTAINING TRAFFIC:
 TRAFFIC SHALL BE MAINTAINED AS PER THE DETAIL SHEET, ODOT CMS SPECIFICATIONS, AND AS OUTLINED IN THE CONSTRUCTION AND MAINTENANCE OF TRAFFIC SECTION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS LATEST REVISION. IN ADDITION THE FOLLOWING REQUIREMENTS APPLY.

THE CONTRACTOR SHALL SUBMIT, IN WRITING, A SCHEDULE OF OPERATIONS TO BRIAN BOSCH AND RECEIVE APPROVAL WORK IS STARTED ON THE PROJECT.

PRIOR TO APPROVAL AND WORK BEGINNING, THE CONTRACTOR SHALL SUBMIT TO ENGINEER THE NAMES AND TELEPHONE NUMBERS OF A PERSON OR PERSONS WHO CAN BE CONTACTED 24 HOURS A DAY BY THE OHIO DEPARTMENT OF TRANSPORTATION AND ALL INTERESTED POLICE AGENCIES. THIS PERSON OR PERSONS SHALL BE RESPONSIBLE FOR REPLACING NECESSARY TRAFFIC CONTROL DEVICES IMMEDIATELY, AS PER 614.03.

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR THE PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL REQUIRED TRAFFIC CONTROL DEVICES SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

DRUMS SHALL BE PROPERLY REFLECTORIZED (HIGH INTENSITY, FLORESCENT SHEETING) PLASTIC DRUMS AND WEIGHTED.

THE CONTRACTOR SHALL ARRANGE HIS OPERATIONS SO AS TO PREVENT ANY INTERFERENCE TO THE CONTINUOUS FLOW OF TRAFFIC. ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE RESTRICTED AT ALL TIME TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER.

THE PLANS INDICATE THE MINIMUM SIGNAGE WHICH MUST BE INSTALLED AND/OR MAINTAINED DURING ALL PHASES OF CONSTRUCTION. EXISTING SIGNS OR CONTRACTOR SUPPLIED SIGNS SHALL BE USED TO MAINTAIN TRAFFIC DURING CONSTRUCTION.

ANY CONFLICTING SIGNS AND PAVEMENT MARKINGS WHETHER INSIDE OR OUTSIDE THE WORK LIMITS SHALL BE REMOVED OR COVERED AND TEMPORARY SIGNS AND MARKINGS ERECTED AND PLACED WHEN APPLICABLE BY THE CONTRACTOR.

THE CONTRACTOR SHALL RECORD INSTALLATION AND REMOVAL OF PROPOSED SIGNS, COVERED OR REMOVED AND UNCOVERED OR REERECTED SIGNS IN THE PROJECT DIARY.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH ITEM 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS AS DESCRIBED ABOVE SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

THE FOLLOWING QUANTITIES HAS BEEN INCLUDED:
 ITEM 614, MAINTAINING TRAFFIC LUMP
 ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 5 HOURS

ITEM 614, MAINTAINING TRAFFIC CONTINUED:

DUST CONTROL
 THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:
 ITEM 616, WATER 6 M. GAL

ITEM 614, REPLACEMENT SIGN
 FLATSHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT SIGNS SHALL BE NEW. OTHER MATERIALS MAY BE IN USED, BUT GOOD, CONDITION SUBJECT TO APPROVAL BY THE ENGINEER.

PAYMENT FOR THE NEW SIGNS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM 614, REPLACEMENT SIGN, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF DAMAGED SIGNS, HARDWARE AND SUPPORTS, AND PROVIDING THE NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ETC.

AN ESTIMATED QUANTITY OF 2 EACH HAS BEEN PROVIDED.

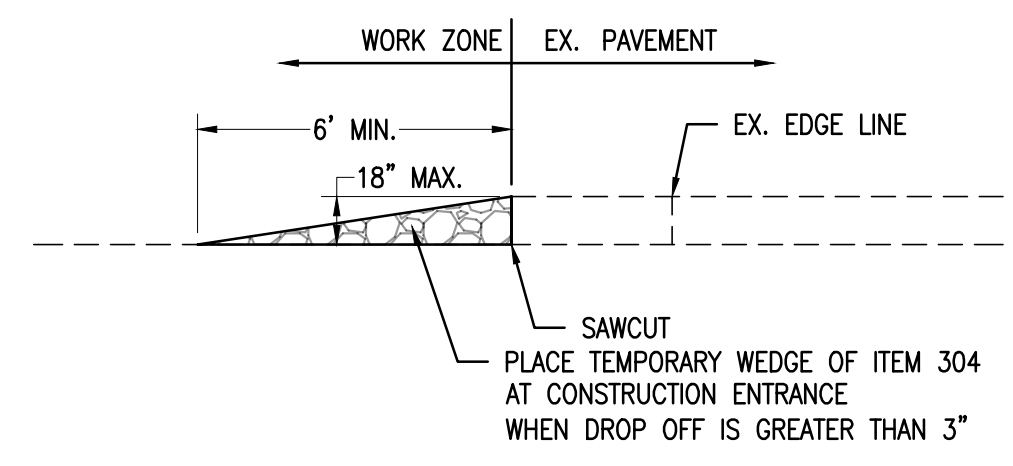
ITEM 614, REPLACEMENT DRUM
 DRUMS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT DRUMS SHALL BE NEW.

PAYMENT FOR THE NEW DRUMS SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM 614, REPLACEMENT DRUM, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED DRUM, AND PROVIDING AND MAINTAINING THE REPLACEMENT DRUM IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS FOR THE ORIGINAL DRUM.

AN ESTIMATED QUANTITY OF 5 EACH HAS BEEN PROVIDED.

SEQUENCE OF CONSTRUCTION:
 THE CONTRACTOR SHALL INSTALL NECESSARY TRAFFIC CONTROL DEVICES AS PER STANDARD CONSTRUCTION DRAWINGS AND PLAN SHEET 8-9. THE CONTRACTOR SHALL INSTALL PROJECT CONSTRUCTION ENTRANCE AND ALL EROSION AND SEDIMENT CONTROL ITEMS AS PER PLAN SHEETS 10-19 CONTRACTOR SHALL CONSTRUCT STORM SEWER, CATCH BASINS, PROPOSED PAVEMENT, DRIVES, AND GRADING.

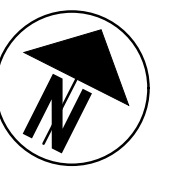
NOTE A: CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVES DURING CONSTRUCTION. THE COST FOR THIS SHALL BE INCLUDED IN THE BID FOR ITEM 614 MAINTAINING TRAFFIC



CONSTRUCTION ENTRANCE DETAIL

LEGEND

- WORK AREA
- DRUM (40" TYP. SPACING)
- SINGLE DRUM
- DIRECTION OF TRAVEL
- PORTABLE BARRIER (PB)
- IMPACT ATTENUATOR



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HORIZONTAL SCALE IN FEET

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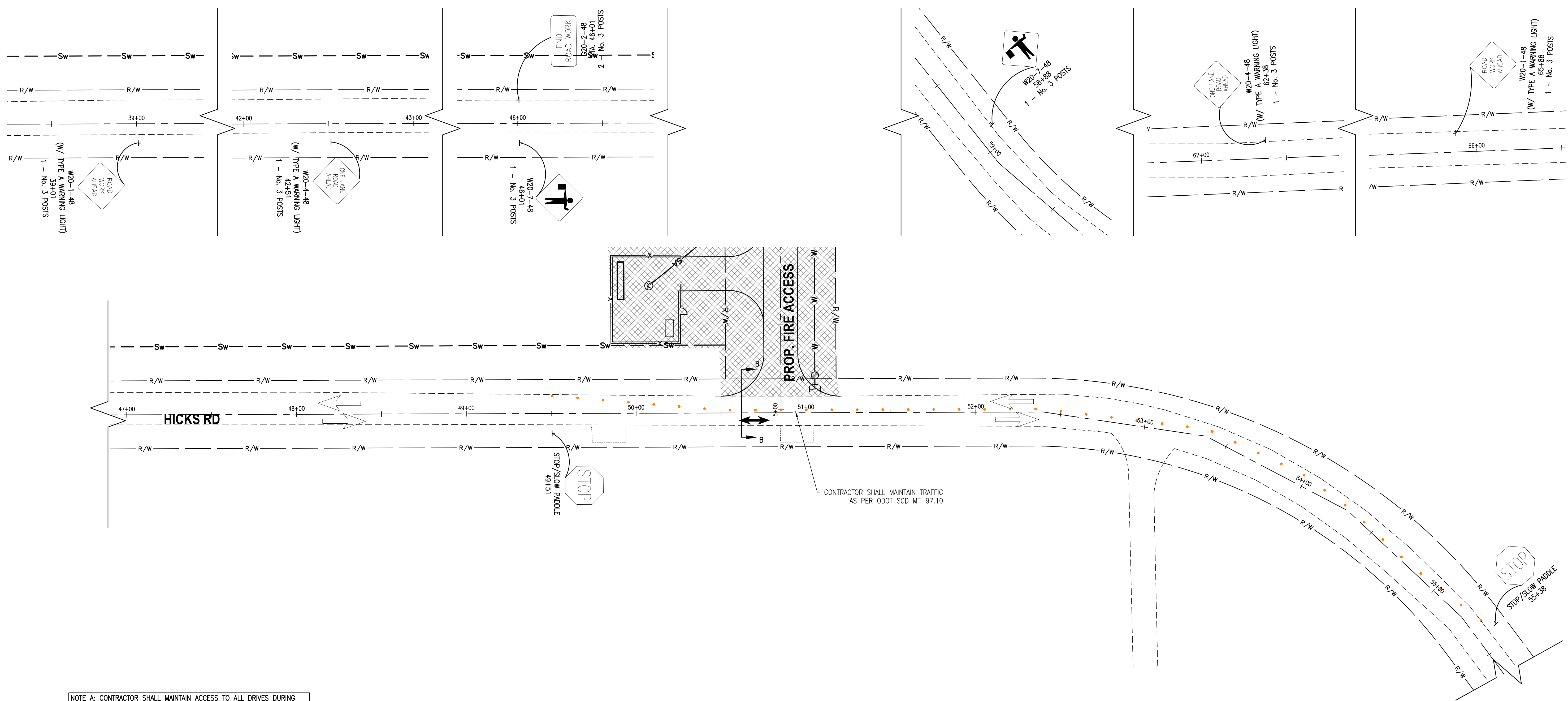
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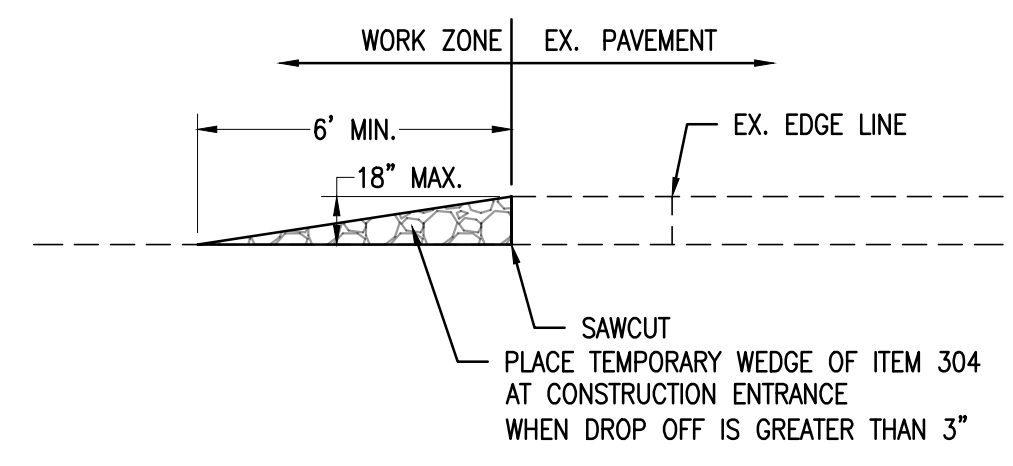
CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
 ZANESVILLE, MUSKINGUM COUNTY, OHIO
MOT PLAN - US 40

JOB NUMBER:
ZAN012

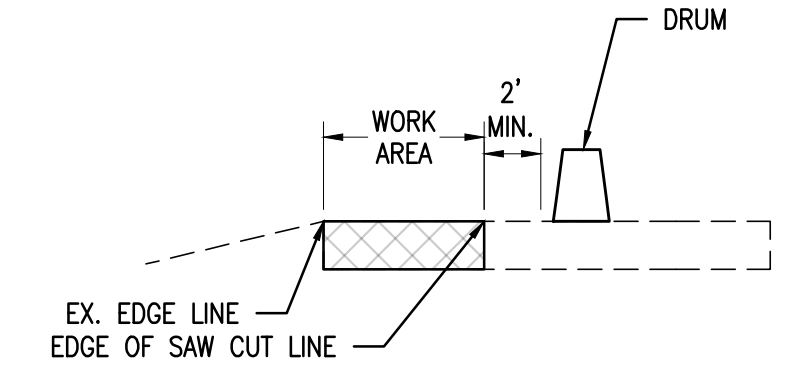
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NOTE A: CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVES DURING CONSTRUCTION. THE COST FOR THIS SHALL BE INCLUDED IN THE BID FOR ITEM 614 MAINTAINING TRAFFIC



CONSTRUCTION ENTRANCE DETAIL

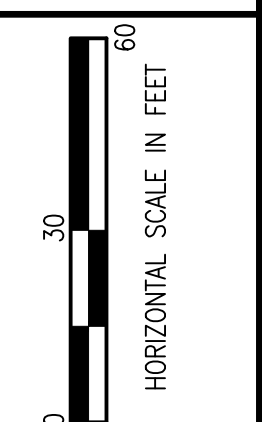
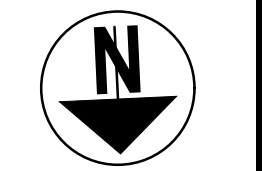
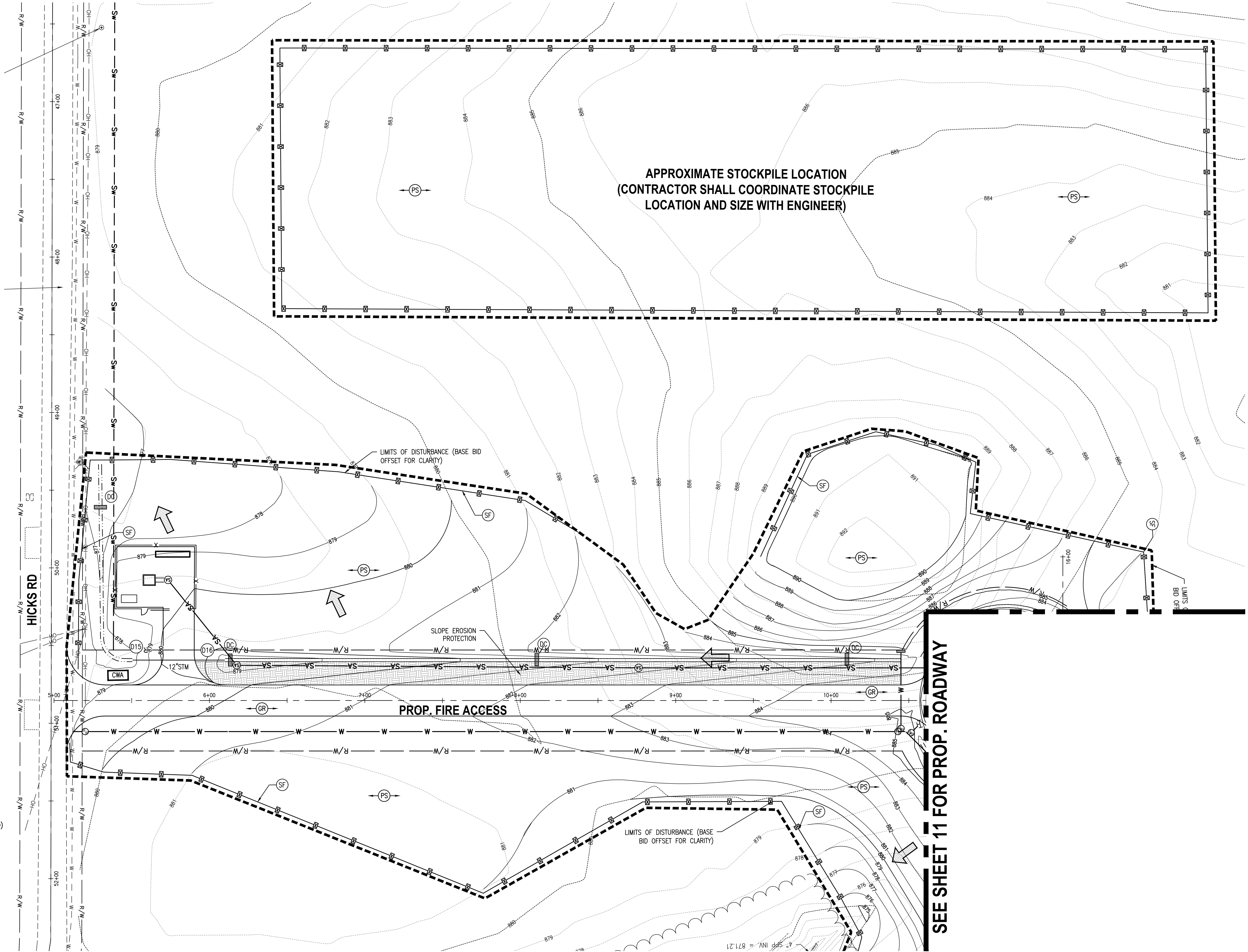


SECTION B-B

- LEGEND**
- WORK AREA
 - DRUM (40' TYP. SPACING)
 - SINGLE DRUM
 - DIRECTION OF TRAVEL
 - PORTABLE BARRIER (PB)
 - IMPACT ATTENUATOR

 HORIZONTAL SCALE IN FEET												
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<p style="font-size: small;">HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43885 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com</p> <h1 style="margin: 0;">HULL</h1> <p style="font-size: small; margin: 0;">Environment / Energy / Infrastructure</p>												
<p>CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO MOT PLAN - HICKS ROAD</p>												
JOB NUMBER: ZAN012												
9												

- SWPPP LEGEND**
- PERIMETER FILTER FABRIC FENCE (BASE BID)
 - PERIMETER FILTER FABRIC FENCE (ALT. #2)
 - INLET PROTECTION (IP)
(specific method dependent upon type and location)
 - PERMANENT SEEDING
 - ASPHALT CONCRETE
 - GRAVEL PAVEMENT
 - ROCK CHANNEL PROTECTION
TYPE C, 18" THICK
 - DITCH CHECK (DC)
 - EARTH DISTURBED AREA (BASE BID)
 - EARTH DISTURBED AREA (ALT. #2)
 - CONCRETE WASHOUT AREA
 - PROPOSED FLOOD ROUTING
 - SLOPE EROSION PROTECTION
 - ALT. #2 GRADING AREA
 - EXISTING TREES TO BE REMOVED



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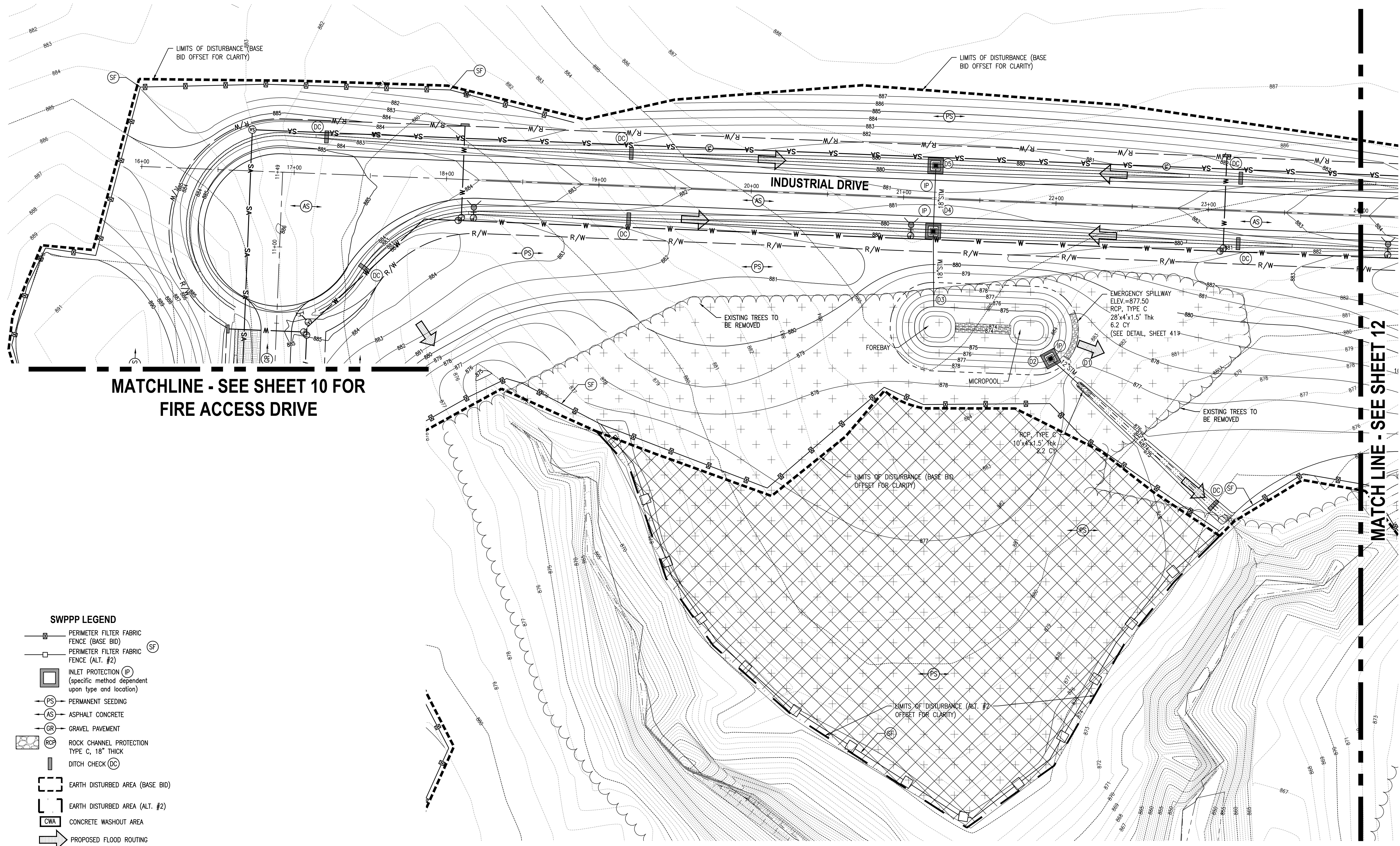


CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
EROSION, SEDIMENT CONTROL & GRADING PLAN

JOB NUMBER:
ZAN012

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**MATCHLINE - SEE SHEET 10 FOR
FIRE ACCESS DRIVE**

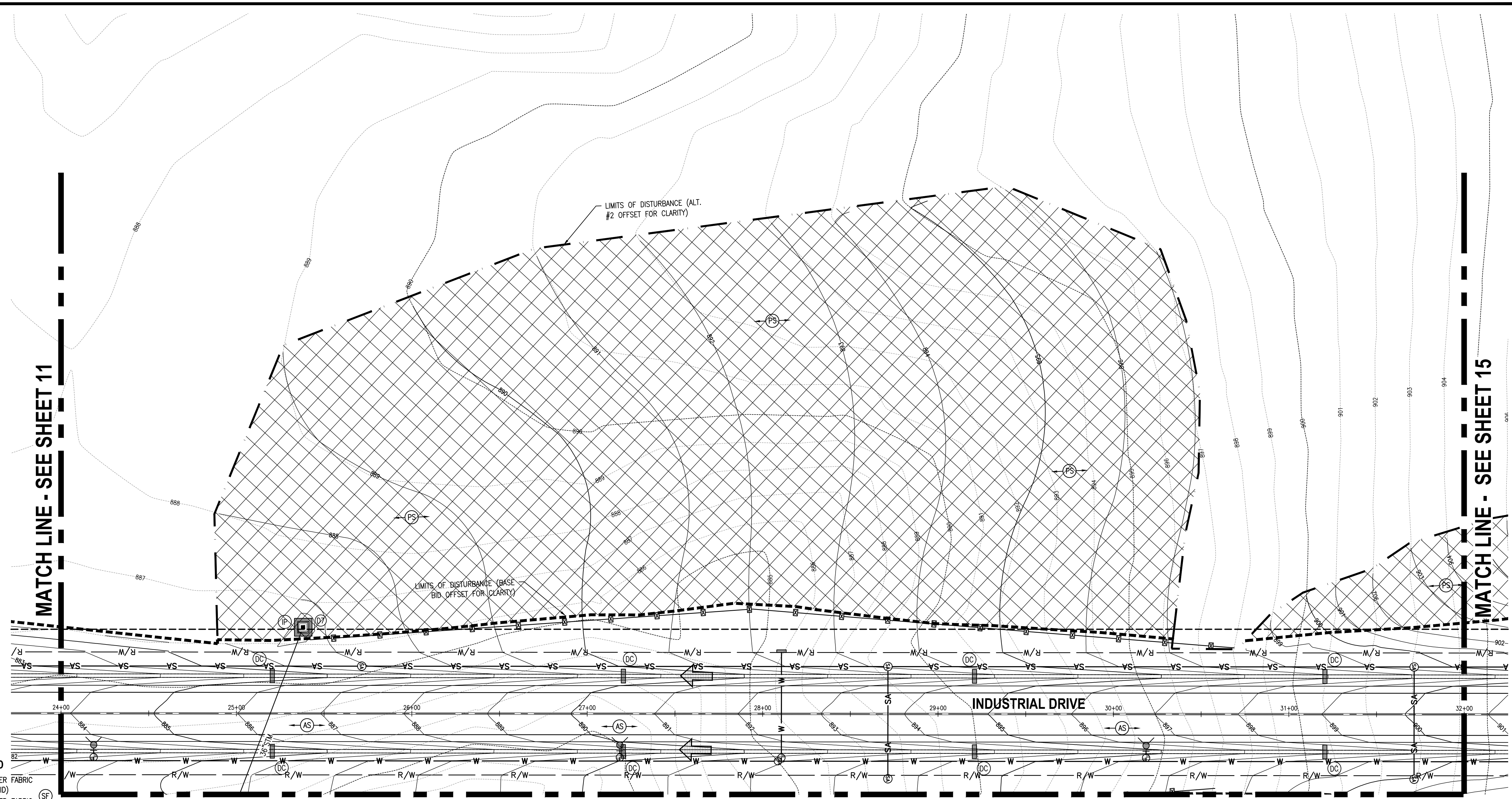
MATCHLINE - SEE SHEET 12

SWPPP LEGEND

- PERIMETER FILTER FABRIC FENCE (BASE BID)
- PERIMETER FILTER FABRIC FENCE (ALT. #2)
- INLET PROTECTION (IP)
(specific method dependent upon type and location)
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TYPE C, 18" THICK
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- SLOPE EROSION PROTECTION
- ALT. #2 GRADING AREA
- EXISTING TREES TO BE REMOVED

 HORIZONTAL SCALE IN FEET
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JOB NUMBER: ZAN012
11

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MATCH LINE - SEE SHEET 11

MATCH LINE - SEE SHEET 15

MATCH LINE - EAST SIDE OF ROAD
SEE SHEET 13

- SWPPP LEGEND**
- PERIMETER FILTER FABRIC FENCE (BASE BID)
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(specific method dependent upon type and location)
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HORIZONTAL SCALE IN FEET

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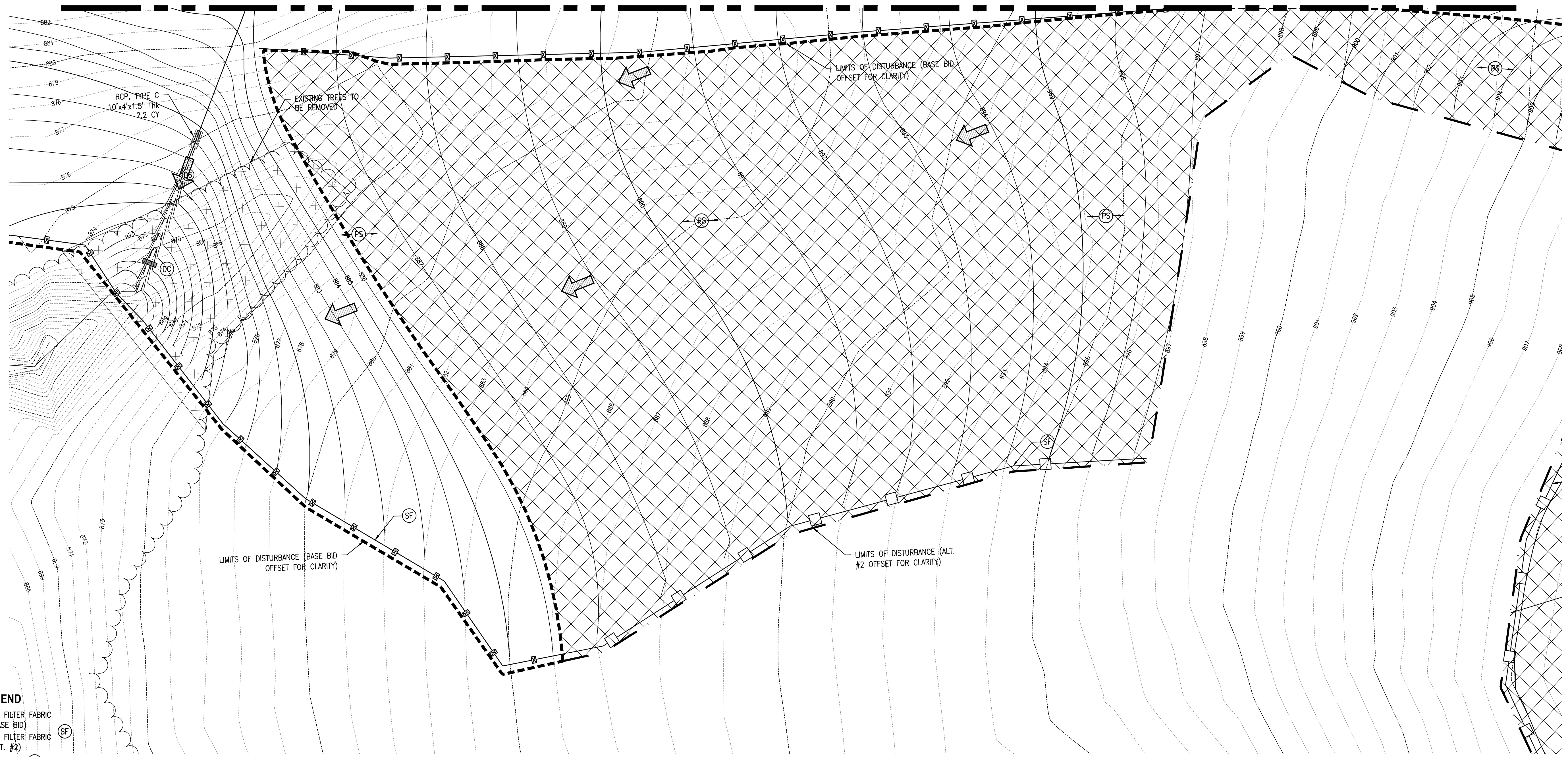
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
EROSION, SEDIMENT CONTROL & GRADING PLAN

JOB NUMBER:
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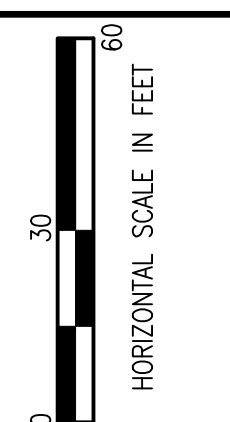
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MATCH LINE - WEST SIDE OF ROAD
SEE SHEET 12



- SWPPP LEGEND**
- PERIMETER FILTER FABRIC FENCE (BASE BID)
 - PERIMETER FILTER FABRIC FENCE (ALT. #2)
 - INLET PROTECTION (IP) (specific method dependent upon type and location)
 - PERMANENT SEEDING (PS)
 - ASPHALT CONCRETE (AS)
 - GRAVEL PAVEMENT (GR)
 - ROCK CHANNEL PROTECTION TYPE C, 18" THICK (RCP)
 - DITCH CHECK (DC)
 - EARTH DISTURBED AREA (BASE BID)
 - EARTH DISTURBED AREA (ALT. #2)
 - CONCRETE WASHOUT AREA (CWA)
 - PROPOSED FLOOD ROUTING
 - SLOPE EROSION PROTECTION
 - ALT. #2 GRADING AREA
 - EXISTING TREES TO BE REMOVED (+)

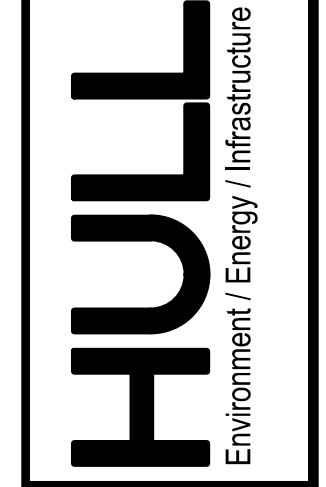
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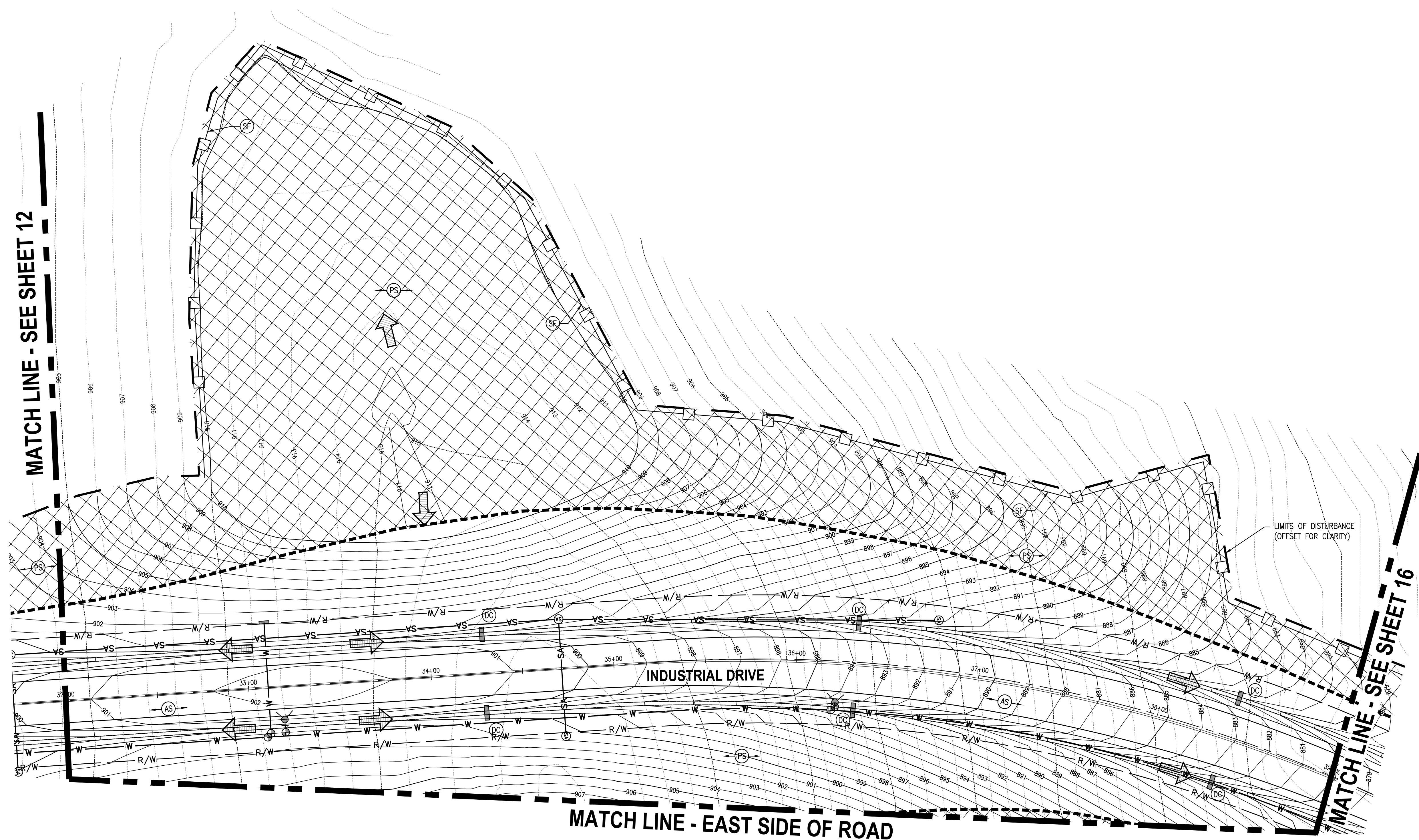
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59 Grant Street
Zanesville, OH 43885
Phone: (740) 344-5451
Fax: (740) 344-8899
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
EROSION, SEDIMENT CONTROL & GRADING PLAN

JOB NUMBER:
ZAN012

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- SWPPP LEGEND**
- PERIMETER FILTER FABRIC FENCE (BASE BID)
 - PERIMETER FILTER FABRIC FENCE (ALT. #2)
 - INLET PROTECTION (IP) (specific method dependent upon type and location)
 - PERMANENT SEEDING
 - ASPHALT CONCRETE
 - GRAVEL PAVEMENT
 - ROCK CHANNEL PROTECTION TYPE C, 18" THICK
 - DITCH CHECK (DC)
 - EARTH DISTURBED AREA (BASE BID)
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 - CONCRETE WASHOUT AREA
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 - ALT. #2 GRADING AREA
 - EXISTING TREES TO BE REMOVED

0 30 60
HORIZONTAL SCALE IN FEET

NO.	PLAN ISSUE/REVISION	DATE	DRAWN ELB	CHECKED NW	DATE 5/22/2020
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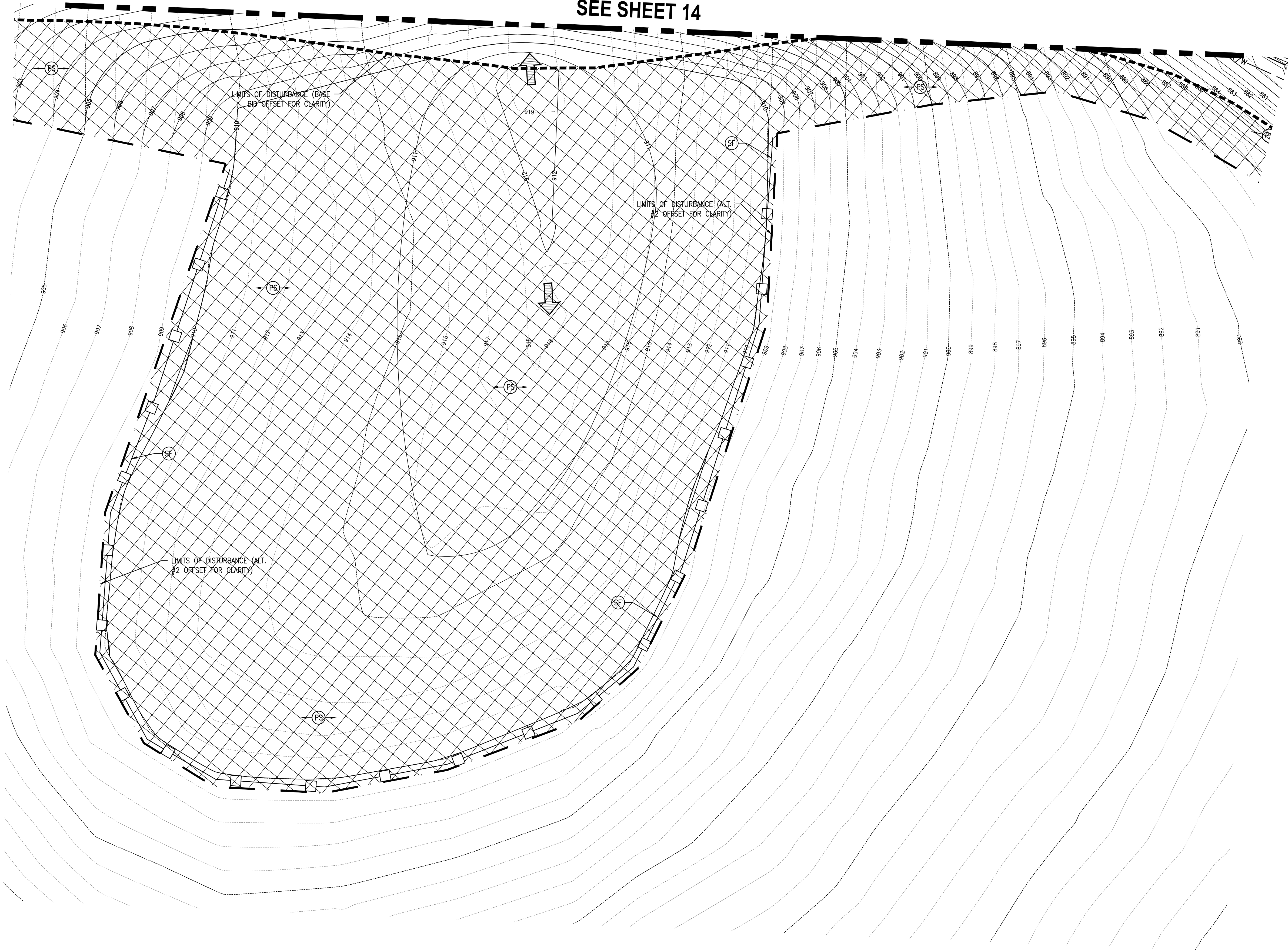
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CONSTRUCTION PLANS:
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ZANESVILLE, MUSKINGUM COUNTY, OHIO
EROSION, SEDIMENT CONTROL & GRADING PLAN

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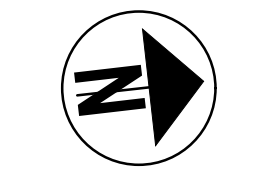
14

**MATCH LINE - WEST SIDE OF ROAD
SEE SHEET 14**



SWPPP LEGEND

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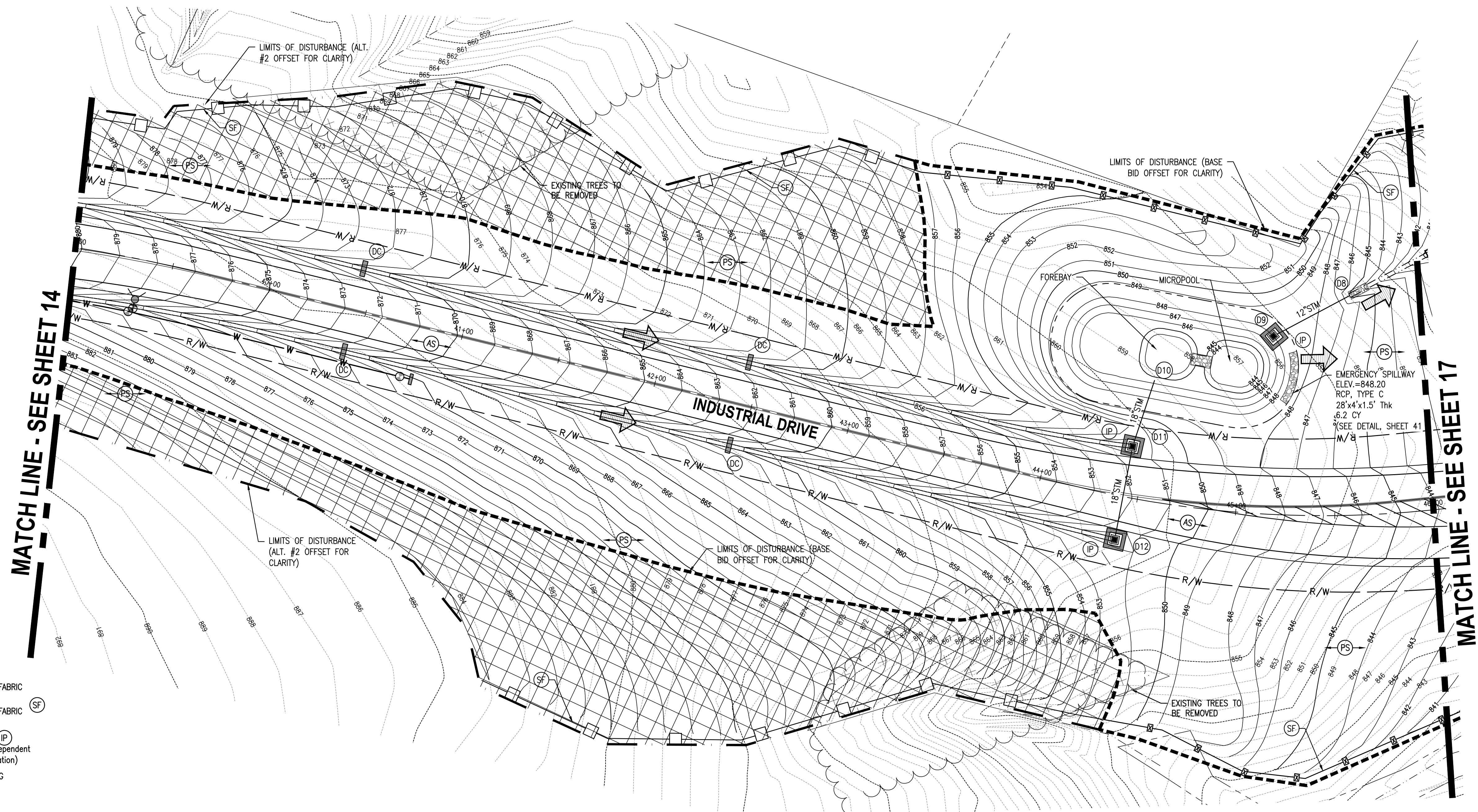
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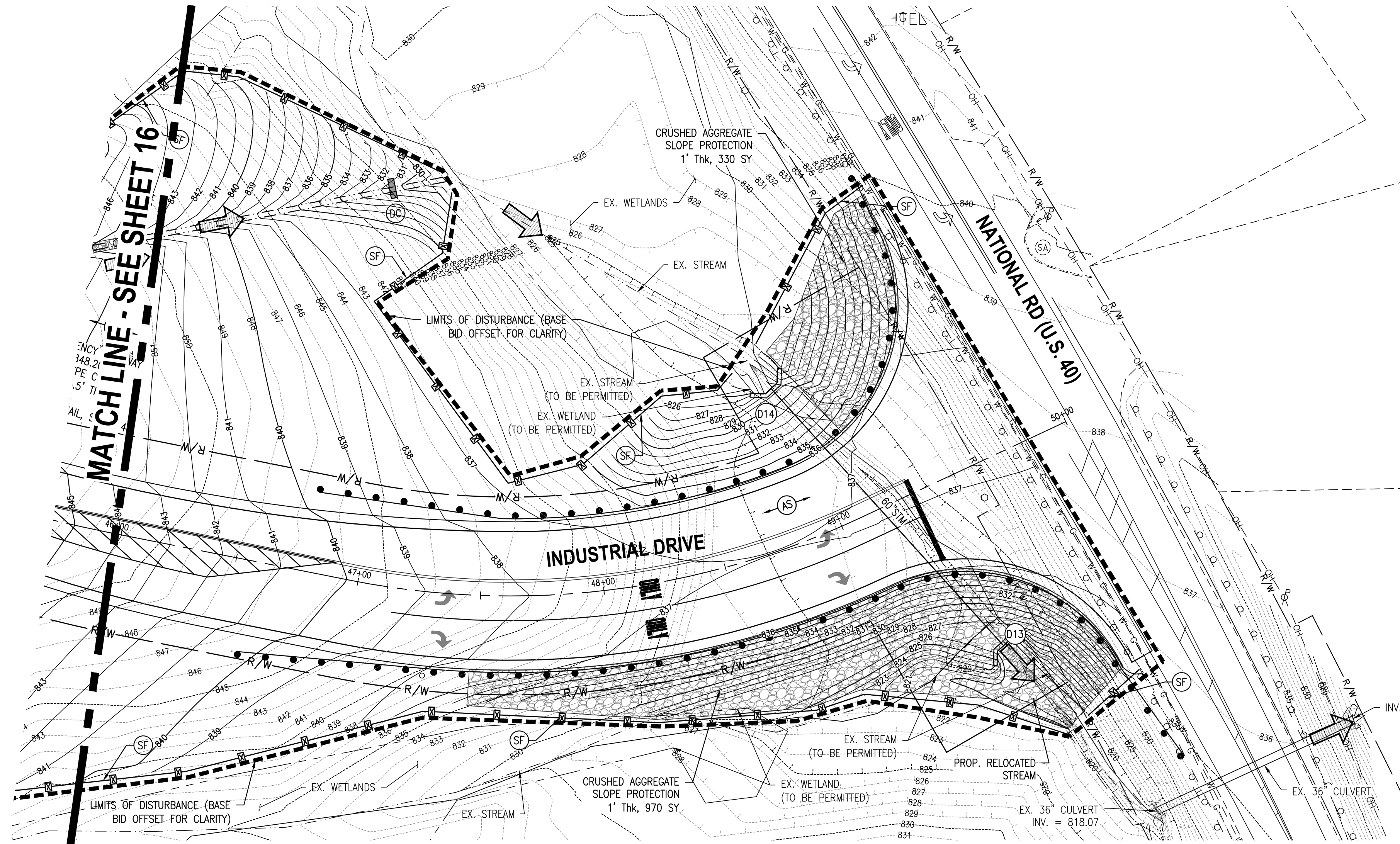
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SWPPP LEGEND

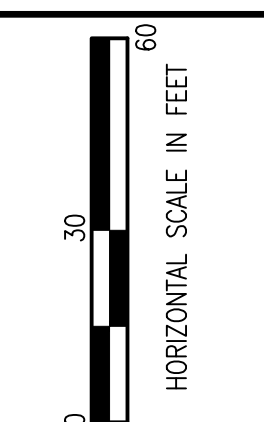
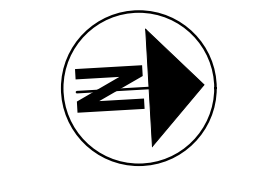
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HULL & ASSOCIATES, Inc. 59 Grant Street Columbus, OH 43215 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com
HULL Environment / Energy / Infrastructure
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JOB NUMBER: ZAN012
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SWPPP LEGEND

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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
 ZANESVILLE, MUSKINGUM COUNTY, OHIO
EROSION, SEDIMENT CONTROL & GRADING PLAN

JOB NUMBER:
ZAN012

17

SITE NARRATIVE

PLAN DESIGNER: HULL & ASSOCIATES, INC.
59 GRANT STREET, NEWARK, OH 43055
P.740.344.5451 F.740.344.8659

DEVELOPER: ZANESVILLE MUSKINGUM COUNTY PORT AUTHORITY
205 NORTH FIFTH STREET
ZANESVILLE, OH 43701
P- 740-455-0742
CONTACT: MATT ABBOTT

PROJECT DESCRIPTION:
THE PROPOSED PROJECT IS APPROXIMATELY 30 ACRES AND IS LOCATED BETWEEN NATIONAL RD, HICKS RD, AND OLD WHEELING RD. IN ZANESVILLE, OHIO. THE PROJECT WILL INCLUDE THE CONSTRUCTION OF INDUSTRIAL DRIVE, DETENTION BASINS, STORM SEWER, GRAVITY AND FORCEMAIN SANITARY SEWER, WATER MAIN AND MASS GRADING.

RECEIVING STREAM:
THE PROJECT DISCHARGES TO MULTIPLE UNNAMED STREAMS AND DITCHES ONSITE, WHICH ARE ULTIMATELY TRIBUTARY TO BOGGS CREEK AND SALT CREEK.

ADJACENT AREAS:
THE PROPERTY IS BORDERED TO THE NORTH BY NATIONAL ROAD, TO THE EAST BY HICKS ROAD, TO THE SOUTH BY OLD WHEELING ROAD, AND TO THE WEST BY WOODLANDS.

PROJECT DATA:

TOTAL AREA	10.05 AC.
PRE-CONSTRUCTION IMPERVIOUS AREA	0.00 AC.
PRE-CONSTRUCTION IMPERVIOUS AREA (%)	0.00%
POST CONSTRUCTION IMPERVIOUS AREA	2.29 AC.
POST CONSTRUCTION IMPERVIOUS AREA (%)	22.79 %
PRE-CONSTRUCTION RUNOFF COEFFICIENT	83.00
POST CONSTRUCTION RUNOFF COEFFICIENT	78.95
PROJECT EARTH DISTURBED AREA	30.0 AC.
ESTIMATED CONTRACTOR EARTH DISTURBED AREA	30.0 AC.
NOTICE OF INTENT EARTH DISTURBED AREA	30.0 AC.

SOILS: THE FOLLOWING SOILS ARE PRESENT ONSITE:
AaB - AARON SILT LOAM, 2 TO 8 PERCENT SLOPES
AaC2 - AARON SILT LOAM, 8 TO 15 PERCENT SLOPES, ERODED
A1C2 - ALFORD SILT LOAM, 8 TO 15 PERCENT SLOPES, ERODED
CsC2 - COSHOCTON SILT LOAM, 8 TO 15 PERCENT SLOPES, ERODED
C1E - COSHOCTON-WESTMORELAND SILT LOAMS, 25 TO 40 PERCENT SLOPES
RgD - RIGLEY CHANNERY LOAM, 15 TO 25 PERCENT SLOPES
WhC2 - WELLSTON SILT LOAM, 8 TO 15 PERCENT SLOPES
W1C2 - WESTMORELAND SILT LOAM, 8 TO 15 PERCENT SLOPES
W1D2 - WESTMORELAND SILT LOAM, 15 TO 25 PERCENT SLOPES
ZnB - ZANESVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES
ZnC2 - ZANESVILLE SILT LOAM, 8 TO 15 PERCENT SLOPES

GRADING REQUIREMENTS:
THE SITE WILL BE STRIPPED OF TOPSOIL AND WILL REQUIRE CUT AND FILL OVER PORTIONS OF THE PROJECT CONSTRUCT TO SUBGRADE.

EROSION AND SEDIMENT CONTROL MEASURES:
EROSION AND SEDIMENT WILL BE CONTROLLED THROUGH THE USE OF INLET PROTECTION AT THE PROPOSED INLETS, TEMPORARY SEDIMENT CONTROL STRUCTURES, DITCH CHECKS, AND PERIMETER FILTER FABRIC FENCE.

POST CONSTRUCTION WATER QUALITY:
WATER QUALITY WILL BE MAINTAINED THROUGH DETENTION BASINS AND WATER QUALITY ORIFICES IN THE BASIN OUTLET STRUCTURES.

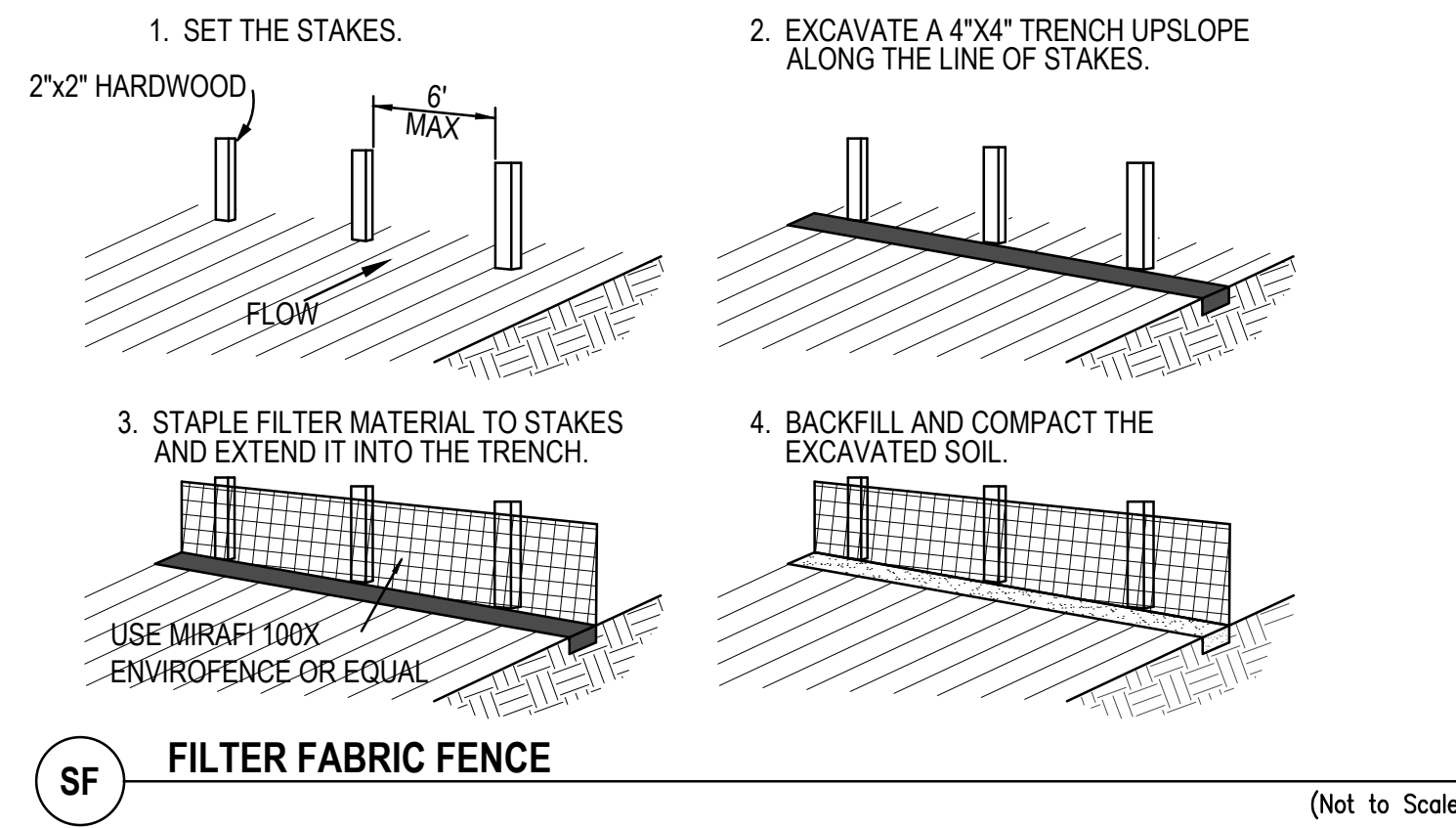
PERMANENT STABILIZATION:
THE SITE WILL BE STABILIZED BY THE USE OF SEEDING OR SODDING.

MAINTENANCE:
ALL EROSION CONTROL DEVICES ARE TO BE INSPECTED BY THE CONSTRUCTION SUPERINTENDENT DAILY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 1/8" OF RAIN PER 24 HOUR PERIOD. ANY DAMAGED FACILITIES ARE TO BE REPLACED / REPAIRED IMMEDIATELY AS MAY BE NECESSARY.

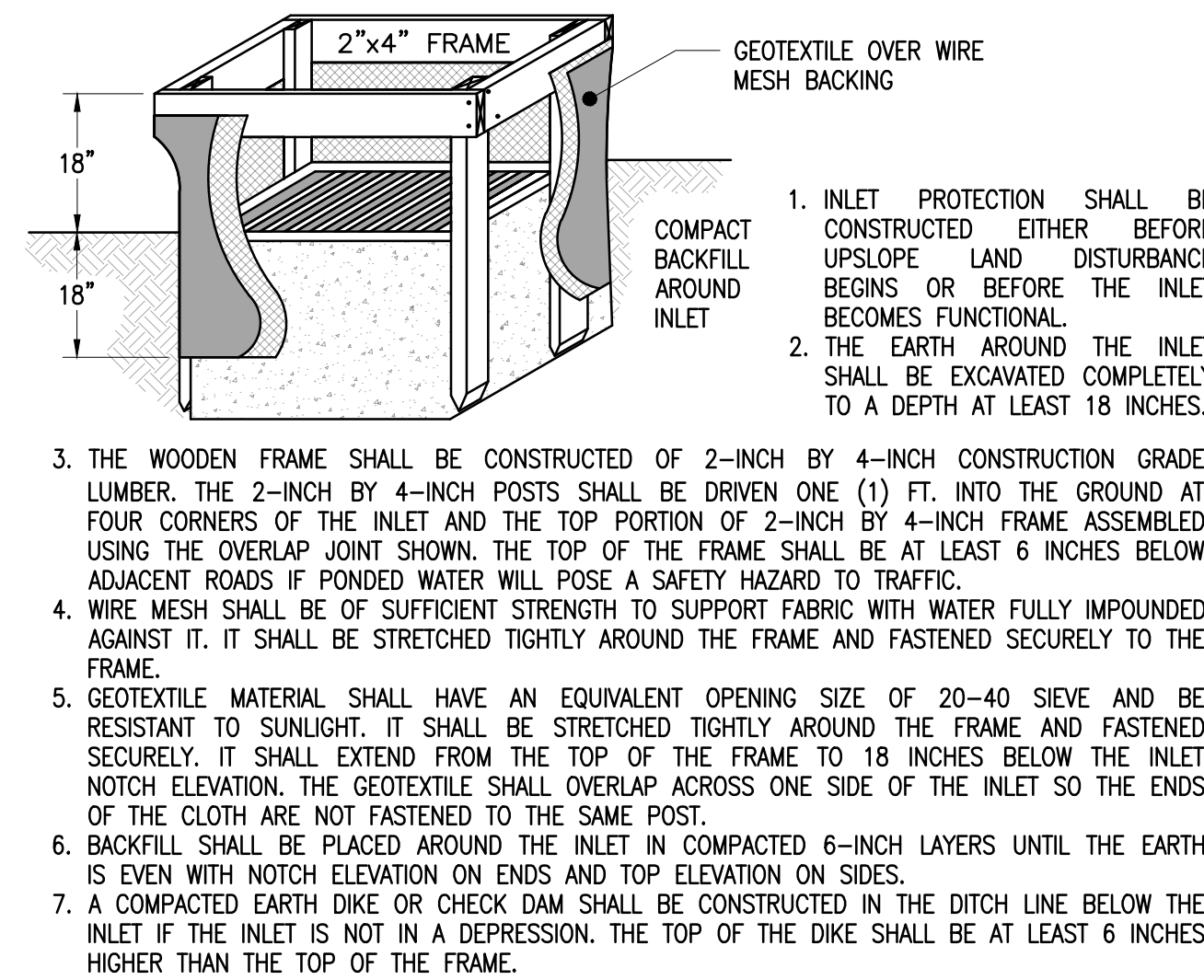
CONSTRUCTION SEQUENCE:

- UTILIZE A DESIGNATED CONSTRUCTION ENTRANCE WHICH IS THE FIRE ACCESS OFF OF HICKS RD.
- INSTALL PERIMETER FILTER FABRIC FENCE.
- CONSTRUCT THE TEMPORARY/PERMANENT DETENTION POND(S) AND OUTLET STRUCTURE(S).
- BEGIN EXCAVATION OF TEMPORARY DIVERSION SWALES TO ROUTE STORM WATER RUNOFF TO THE BASINS DURING CLEARING AND GRADING.
- REMOVE THE EXISTING VEGETATION FROM THE REMAINDER OF THE SITE AS NECESSARY.
- GRADE THE SITE AS NECESSARY TO FORM THE ROADWAY PER TYPICAL SECTION, AS WELL AS GRADING OUTSIDE OF RIGHT OF WAY. FINE-GRADE AREAS AS NEEDED.
- STABILIZE ANY REMAINING DISTURBED AREAS.
- WHEN PERMANENT VEGETATION AND OTHER PERMANENT BMP'S ARE ESTABLISHED, REMOVE SEDIMENT AND ALL TEMPORARY BMP'S.

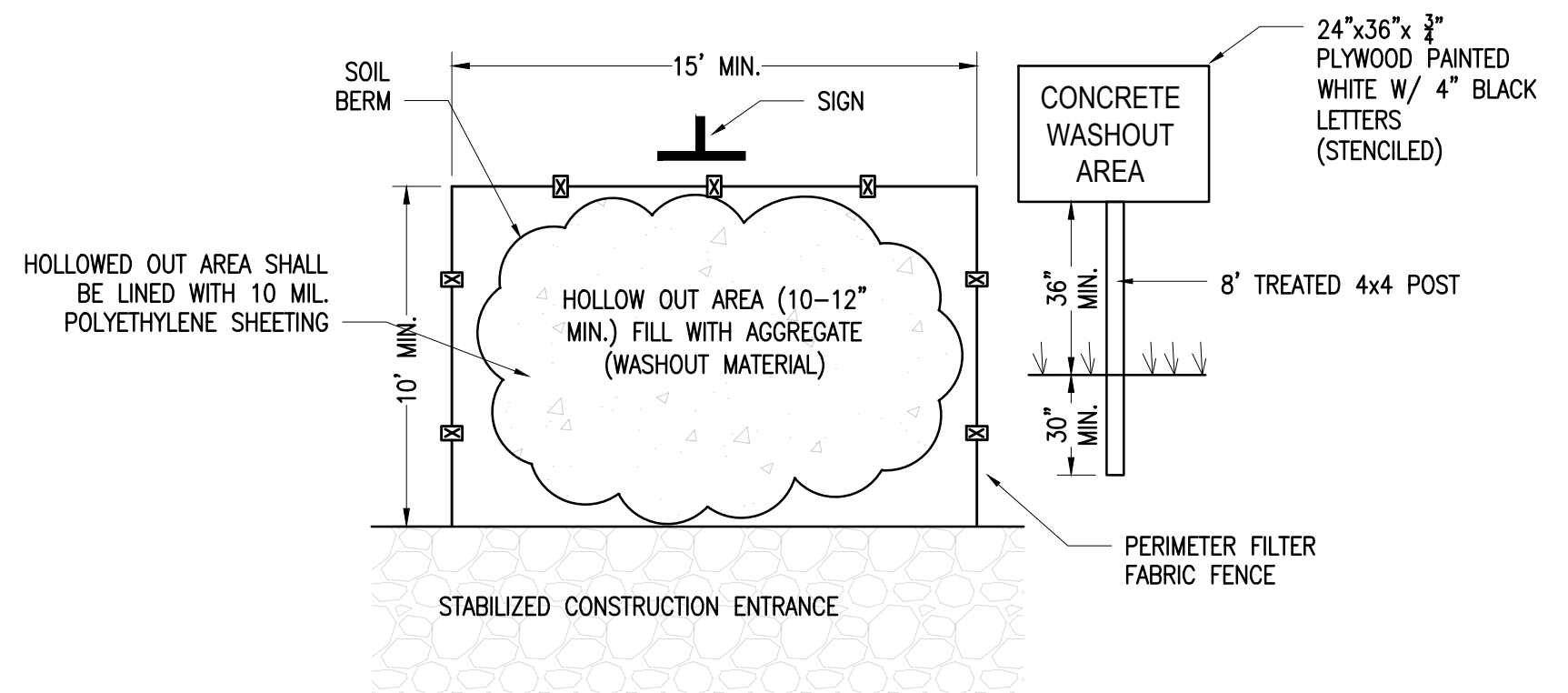
SCHEDULE:
THE CONTRACTOR SHALL PROVIDE A SCHEDULE OF OPERATIONS TO THE OWNER. SEDIMENTATION AND EROSION CONTROL FEATURES SHALL BE PLACED IN ACCORDANCE WITH THIS SCHEDULE.



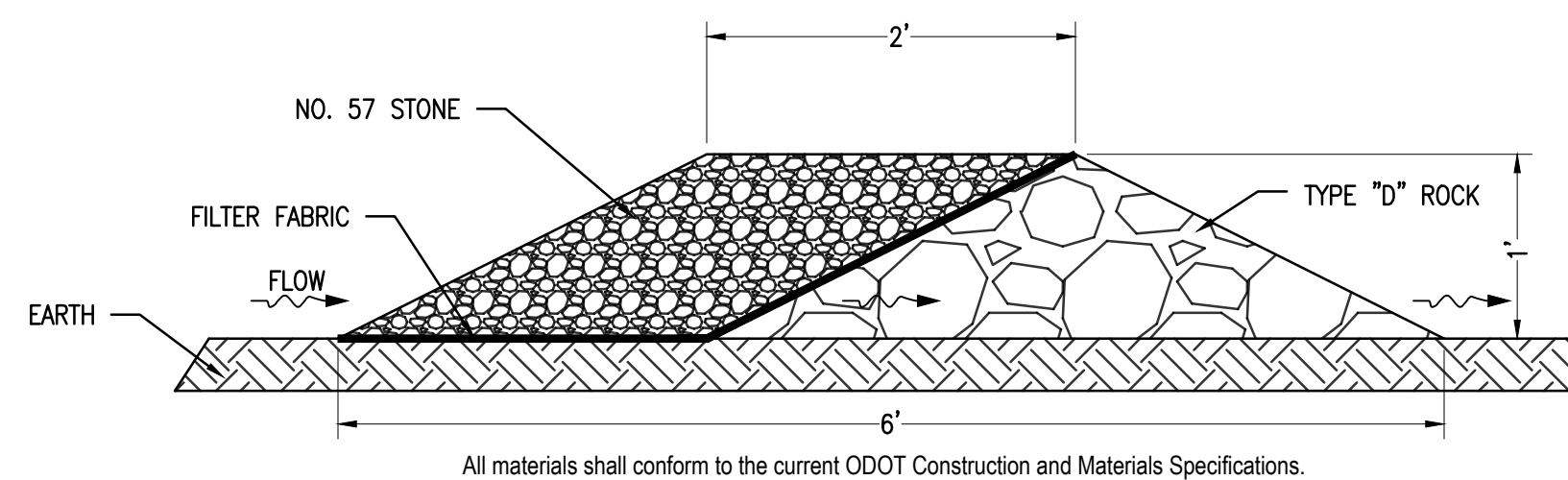
SF FILTER FABRIC FENCE (Not to Scale)



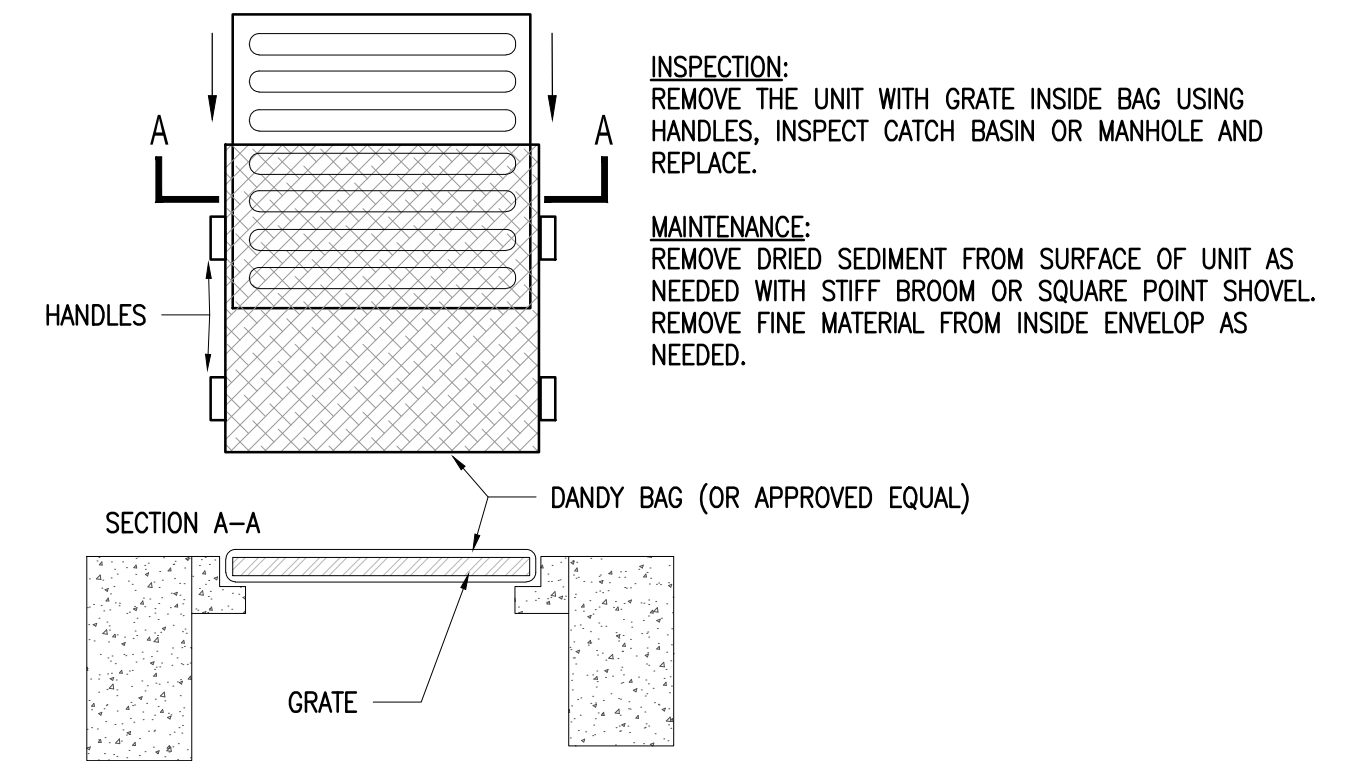
IP GEOTEXTILE INLET PROTECTION (Rainwater and Land Development rev.6-24-09)



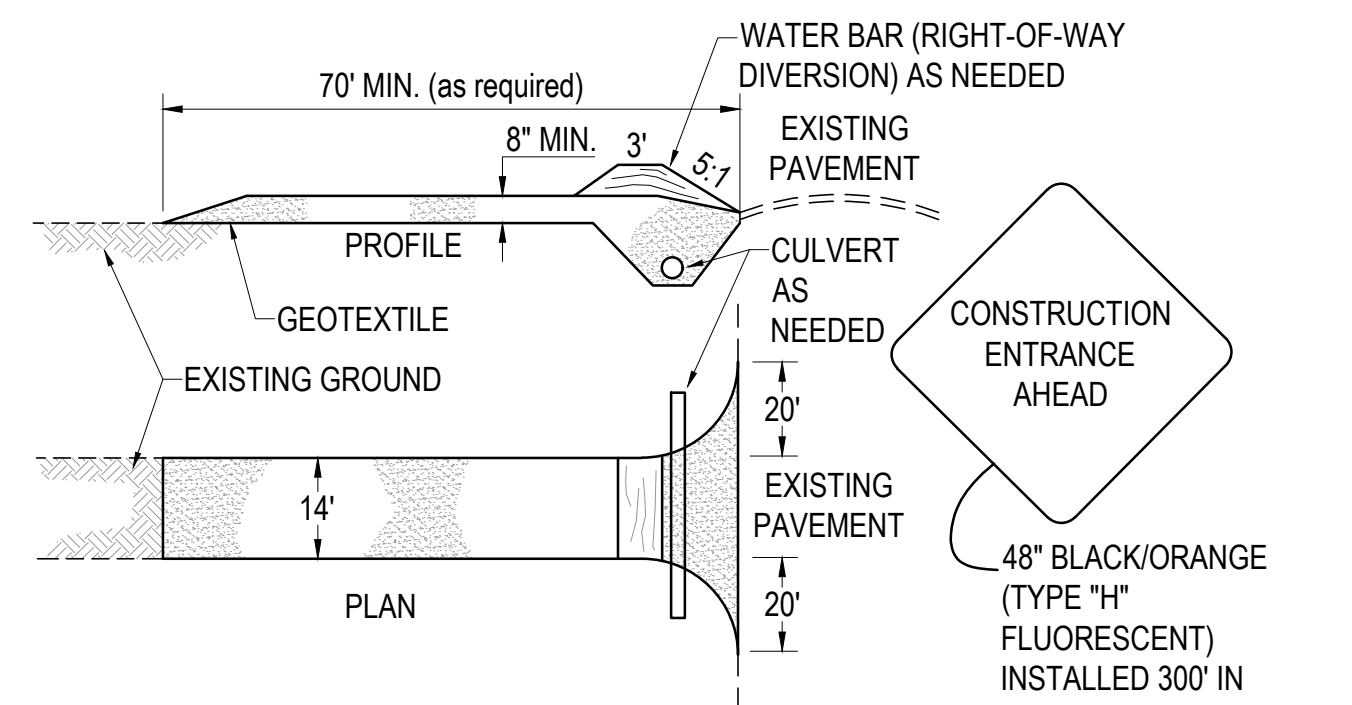
CWA CONCRETE WASHOUT AREA (Not to Scale)



DC TEMPORARY DITCH CHECK NOT TO SCALE



DB DANDY BAG (Not to Scale)



- Stone Size - odot #2 (1.5-2.5 inch) stone shall be used, or reclaimed or recycled concrete equivalent.
- Length - as long as required to stabilize high traffic areas but not less than 70 ft.
- Thickness - not less than eight (8) inches for light duty or at least ten (10) inches for heavy duty.
- Width - fourteen (14) feet minimum, but not less than the full width at points where ingress or egress occurs.
- Geotextile - laid over the entire area prior to placing stone. it shall be composed of strong rot-proof polymeric fibers and meet the following specifications:

min. tensile strength = 200 lbs.	min. puncture strength = 80 psi
min. tear strength = 50 lbs.	min. burst strength = 320 psi
min. elongation = 20%	equivalent opening size = eos < 0.6mm
permeability = 1x10 ⁻³ cm/sec.	
- Timing - the construction entrance shall be installed as soon as is practicable before major grading activities.
- Culvert - a pipe or culvert shall be constructed under the entrance if needed to prevent surface water from flowing across the entrance or to prevent runoff from being directed out onto paved surfaces.
- Water bar - a water bar shall be constructed as part of the construction entrance if needed to prevent surface runoff from flowing the length of the construction entrance and out onto paved surfaces.
- Maintenance - top dressing of additional stone shall be applied as conditions demand. mud spilled, dropped, washed or tracked onto public roads, or any surface where runoff is not checked by sediment controls, shall be removed immediately. removal shall be accomplished by scraping or sweeping.
- Construction entrances shall not be relied upon to remove mud from vehicles and prevent off-site tracking. vehicles that enter and leave the construction-site shall be restricted from muddy areas.
- Removal - the entrance shall remain in place until the disturbed area is stabilized or replaced with a permanent roadway or entrance.

CE STABILIZED CONSTRUCTION ENTRANCE (Not to Scale)

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HULL Environment / Energy / Infrastructure						
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO EROSION, SEDIMENT CONTROL & GRADING DETAILS						
JOB NUMBER: ZAN012						
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SWPPP GENERAL NOTES

THE CONTRACTOR SHALL BE DESIGNATED A CO-PERMITTEE TO THE GENERAL CONSTRUCTION STORM WATER NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS UNDER THE MOST RECENT VERSION OF THE OHIO ENVIRONMENTAL PROTECTION AGENCY (OHIO EPA) GENERAL PERMIT (GENERAL PERMIT).

THE CONTRACTOR SHALL FILE A CO-PERMITTEE FORM. INFORMATION ABOUT THE CO-PERMITTEE FORM CAN BE FOUND AT www.epa.state.oh.us/dsw/stormform.html. THE CONTRACTOR SHALL FURNISH A COPY OF THE FORM SUBMITTED TO THE OHIO EPA TO THE PROJECT OWNER, OR OWNER'S REPRESENTATIVE, AND ZONING DEPARTMENT AT OR BEFORE THE PRE-CONSTRUCTION MEETING.

ALL CONTRACTOR'S AND SUB-CONTRACTORS SHALL PROVIDE SIGNATURES TO THE OWNER ACKNOWLEDGING THAT THEY REVIEWED AND UNDERSTAND THE CONDITIONS AND RESPONSIBILITIES OF THE GENERAL PERMIT AND THE SWP3. THESE SIGNATURES SHALL BE PROVIDED PRIOR TO COMMENCEMENT OF WORK ON THE CONSTRUCTION SITE.

EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO INITIAL DISTURBANCE ACTIVITIES OR AS SOON AS PRACTICAL. THE CONTRACTOR SHALL COMPLY WITH THE TERMS AND CONDITIONS OF THE OHIO EPA GENERAL PERMIT AND THE STORM WATER POLLUTION PREVENTION PLAN (SWP3) DEVELOPED FOR THE PROJECT.

DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE PROPER SOIL EROSION MEASURES FOR PROTECTION OF ALL ADJOINING ROADS, LANDS, AND STREAMS. THE CONTRACTOR SHALL BE DESIGNATED A CO-PERMITTEE TO THE GENERAL CONSTRUCTION STORM WATER NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEMS (NPDES) REQUIREMENTS UNDER THE MOST RECENT VERSION OF THE OHIO ENVIRONMENTAL PROTECTIVE AGENCY (OHIO EPA) GENERAL PERMIT (GENERAL PERMIT). REFER TO THE MOST RECENT VERSION OF THE O.D.N.R. MANUAL "RAINWATER AND LAND DEVELOPMENT THIRD EDITION 2006" AND ODOT "HANDBOOK FOR SEDIMENT AND EROSION CONTROL" FOR REQUIREMENTS.

ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP IN GRADING. THE CONTRACTOR SHALL PROVIDE SEDIMENT CONTROL AT ALL POINTS WHERE STORM WATER LEAVES THE LIMITS OF THE PROJECT, ALL POINTS WHERE STORM WATER ENTERS A STREAM THAT TRAVERSES THE PROJECT, AND ALL POINTS WHERE STORM WATER ENTERS PORTIONS OF COMPLETED UNDERGROUND PIPING.

SWPPP UPDATES

THE SWP3 PLAN IS A DYNAMIC PLAN BASED UPON SITE CONDITIONS AND THE CONSTRUCTION SCHEDULE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND UPDATING THE SWP3 PLAN AS THE PROJECT PROCEEDS.

THE CONSTRUCTION BMP'S WITHIN THESE PLANS REPRESENT THE MINIMUM REQUIRED ONSITE. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ONSITE BMP'S AS THE PROJECT PROGRESSES AT NO ADDITIONAL COST OVER THE ITEMS BID.

INSPECTION

THE CONTRACTOR SHALL PROVIDE A QUALIFIED INSPECTION PERSONNEL TO CONDUCT INSPECTIONS PER PART III.G.2 OF THE GENERAL PERMIT. RECORDS OF THESE INSPECTIONS SHALL BE KEPT AND MADE AVAILABLE TO THE OWNER, THE OWNER'S REPRESENTATIVE, OR THE JURISDICTIONAL AGENCIES IF REQUESTED.

AS PER THE GENERAL PERMIT, AT A MINIMUM, ALL CONTROLS ON THE SITE SHALL BE INSPECTED AT LEAST ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN ONE-HALF INCH OF RAIN PER 24 HOUR PERIOD. INSPECTION PERIODS MAY BE REDUCED PER PART III.G.2 OF THE GENERAL PERMIT.

MAINTENANCE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF ALL TEMPORARY AND PERMANENT CONTROL PRACTICES TO ENSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. SHOULD A STRUCTURE OR FEATURE BECOME DAMAGED, THE CONTRACTOR SHALL REPAIR OR REPLACE AT NO ADDITIONAL COST TO THE OWNER.

TREE PRESERVATION

ANY AREA SHOWN IN THE CONSTRUCTION DRAWINGS OR ON THE STORM WATER POLLUTION PREVENTION PLAN AS A "TREE PRESERVATION" OR "TREE PROTECTION" AREA, THE CONTRACTOR SHALL ENCLOSE THE AREA WITH T-POSTS AND CONSTRUCTION FENCING.

TS

TEMPORARY SEEDING

Table with columns: SEEDING DATES, SPECIES, Lb./1000 ft2, Lb/Acre. Rows include various grasses like Oats, Tall Fescue, Annual Ryegrass, Perennial Ryegrass, etc., with seeding rates.

(Rainwater and Land Development rev.6-24-09)

- 1. STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS AND SEDIMENT TRAPS SHALL BE INSTALLED AND STABILIZED WITH TEMPORARY SEEDING PRIOR TO GRADING THE REST OF THE CONSTRUCTION SITE.
2. THE SEEDBED SHOULD BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION.
3. SOIL AMENDMENTS-TEMPORARY VEGETATION SEEDING RATES SHALL ESTABLISH ADEQUATE STANDS OF VEGETATION...
4. SEEDING METHOD-SEED SHALL BE APPLIED UNIFORMLY WITH A CYCLONE SPREADER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER.

NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED.

MULCHING TEMPORARY SEEDING

- 1. APPLICATIONS OF TEMPORARY SEEDING SHALL INCLUDE MULCH, WHICH SHALL BE APPLIED DURING OR IMMEDIATELY AFTER SEEDING. SEEDINGS MADE DURING OPTIMUM SEEDING DATES ON FAVORABLE, VERY FLAT SOIL CONDITIONS MAY NOT NEED MULCH TO ACHIEVE ADEQUATE STABILIZATION.
2. MATERIALS:
- STRAW-IF STRAW IS USED, IT SHALL BE UNROTTED SMALL-GRAIN STRAW APPLIED AT A RATE OF 2 TONS PER ACRE OR 90 LBS./ 1,000 SQ. FT. (2-3 BALES)
- HYDROSEEDERS-IF WOOD CELLULOSE FIBER IS USED, IT SHALL BE USED AT 2000 LBS./ AC. OR 46 LB./ 1,000-SQ.-FT.
3. STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER. ANCHORING METHODS:
- MECHANICAL-A DISK, CRIMPER, OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL.
- SYNTHETIC BINDERS-SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TRACK OR EQUIVALENT MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER.

PS

PERMANENT SEEDING

Table with columns: Seed Mix, Seeding Rate (Lbs. Ac, Lbs. 1,000 Sq.Ft.), Notes. Rows include Creeping Red Fescue, Perennial Ryegrass, Kentucky Bluegrass, etc., with seeding rates and notes like 'For close mowing & waterways w/ <2 ft/sec'.

(Rainwater and Land Development rev.6-24-09)

- SITE PREPARATION
1. SUBSOILER, PLOW, OR OTHER IMPLEMENT SHALL BE USED TO REDUCE SOIL COMPACTION AND ALLOW MAXIMUM INFILTRATION.
2. THE SITE SHALL BE GRADED AS NEEDED TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION AND SEEDING.
3. TOPSOIL SHALL BE APPLIED WHERE NEEDED TO ESTABLISH VEGETATION.

- SEEDBED PREPARATION
1. LIME-AGRICULTURAL GROUND LIMESTONE SHALL BE APPLIED TO ACID SOIL AS RECOMMENDED BY A SOIL TEST.
2. FERTILIZER-FERTILIZER SHALL BE APPLIED AS RECOMMENDED BY A SOIL TEST.
3. THE LIME AND FERTILIZER SHALL BE WORKED INTO THE SOIL WITH A DISK HARROW, SPRING-TOOTH HARROW, OR OTHER SUITABLE FIELD IMPLEMENT TO A DEPTH OF 3 INCHES.

SEEDING DATES AND SOIL CONDITIONS

- 1. SEEDING SHOULD BE DONE MARCH 1 TO MAY 31 OR AUGUST 1 TO SEPTEMBER 30. IF SEEDING OCCURS OUTSIDE OF THE ABOVE SPECIFIED DATES, ADDITIONAL MULCH AND IRRIGATION MAY BE REQUIRED TO ENSURE A MINIMUM OF 80% GERMINATION.
2. FROM OCTOBER 1 THROUGH NOVEMBER 20, PREPARE THE SEEDBED, ADD THE REQUIRED AMOUNTS OF LIME AND FERTILIZER, THEN MULCH AND ANCHOR.

DORMANT SEEDINGS

- 1. SEEDINGS SHOULD NOT BE MADE FROM OCTOBER 1 THROUGH NOVEMBER 20. DURING THIS PERIOD, THE SEEDS ARE LIKELY TO GERMINATE BUT PROBABLY WILL NOT BE ABLE TO SURVIVE THE WINTER.
2. THE FOLLOWING METHODS MAY BE USED FOR 'DORMANT SEEDING':
- FROM OCTOBER 1 THROUGH NOVEMBER 20, PREPARE THE SEEDBED, ADD THE REQUIRED AMOUNTS OF LIME AND FERTILIZER, THEN MULCH AND ANCHOR.
- FROM NOVEMBER 20 THROUGH MARCH 15, WHEN SOIL CONDITIONS PERMIT, PREPARE THE SEEDBED, LIME AND FERTILIZE, APPLY THE SELECTED SEED MIXTURE, MULCH AND ANCHOR.

MULCHING

- 1. MULCH MATERIAL SHALL BE APPLIED IMMEDIATELY AFTER SEEDING. DORMANT SEEDING SHALL BE MULCHED. 100% OF THE GROUND SURFACE SHALL BE COVERED WITH AN APPROVED MATERIAL.
2. MATERIALS:
- STRAW-IF STRAW IS USED IT SHALL BE UNROTTED SMALL-GRAIN STRAW APPLIED AT THE RATE OF 2 TONS PER ACRE OR 90 POUNDS (TWO TO THREE BALES) PER 1,000-SQ. FT.
3. STRAW AND MULCH ANCHORING METHODS
- STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER.
- MECHANICAL-A DISK, CRIMPER, OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL.

IRRIGATION

PERMANENT SEEDING SHALL INCLUDE IRRIGATION TO ESTABLISH VEGETATION DURING DRY WEATHER OR ON ADVERSE SITE CONDITIONS, WHICH REQUIRE ADEQUATE MOISTURE FOR SEED GERMINATION AND PLANT GROWTH.

IRRIGATION RATES SHALL BE MONITORED TO PREVENT EROSION AND DAMAGE TO SEEDED AREAS FROM EXCESSIVE RUNOFF.

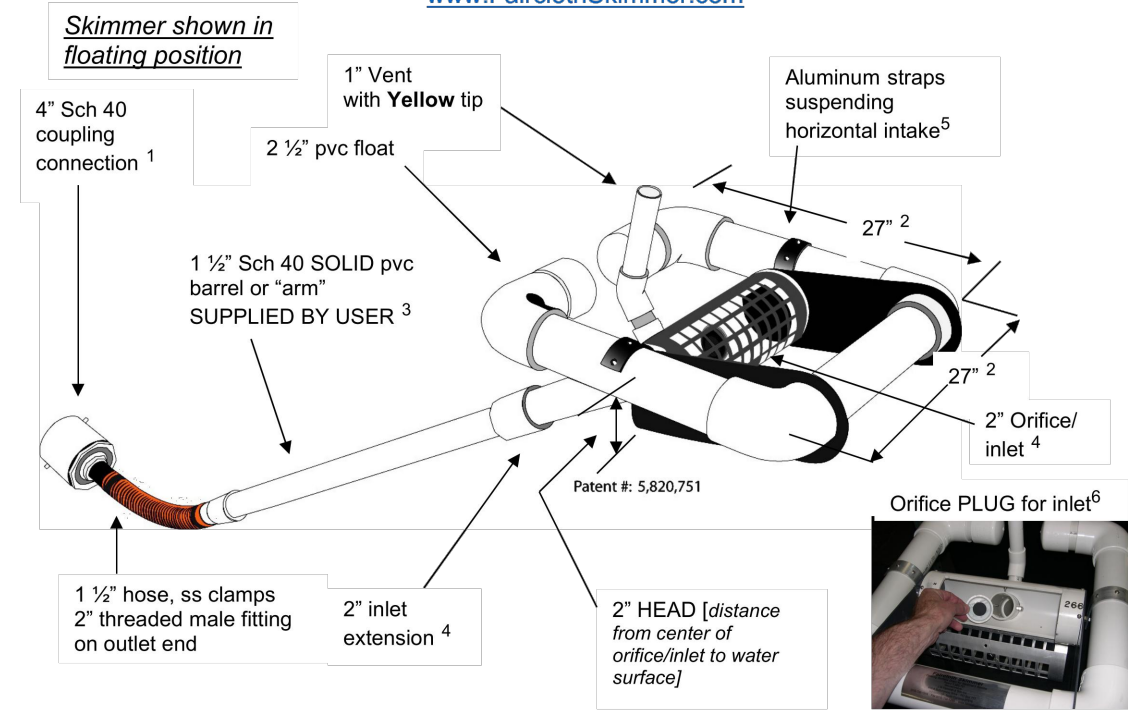
Table with columns: AREA REQUIRING PERMANENT STABILIZATION, TIME FRAME TO APPLY EROSION CONTROLS. Rows include areas requiring permanent stabilization and areas requiring temporary stabilization.

Table with columns: AREA REQUIRING TEMPORARY STABILIZATION, TIME FRAME TO APPLY EROSION CONTROLS. Rows include areas requiring temporary stabilization and disturbed areas that will be idle over winter.

WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INSTABILITY OR ARE OTHERWISE UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED. PERMANENT AND TEMPORARY STABILIZATION IS DEFINED IN PART VII OF THE OHIO ENVIRONMENTAL PROTECTION AGENCY GENERAL PERMIT AUTHORIZATION FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM.

2" Faircloth Skimmer® Cut Sheet

J. W. Faircloth & Son, Inc. www.FairclothSkimmer.com



- 1. Skimmer can be attached to a straight 4" sch 40 pipe through the dam but the pipe may need to be anchored to the bottom at the connection so it is secure.
2. Dimensions are approximate, not intended as plans for construction.
3. Barrel (solid, not foam core pipe) should be 1.4 times the depth of water with a minimum length of 6' so the inlet can be pulled to the side for maintenance.
4. Orifice/inlet tapers down from 2" maximum inlet to a 1 1/2" barrel and hose.

2inchCut 5-1-19 © J. W. Faircloth & Son, Inc. 2019

Table for Calculate Skimmer Size for Faircloth Skimmer®. Shows Basin Volume in Cubic Feet (5,276 Cu.Ft), Days to Drain (2 Days), and Skimmer Size (2.0 Inch).

SOUTH DETENTION BASIN SKIMMER CALCULATIONS

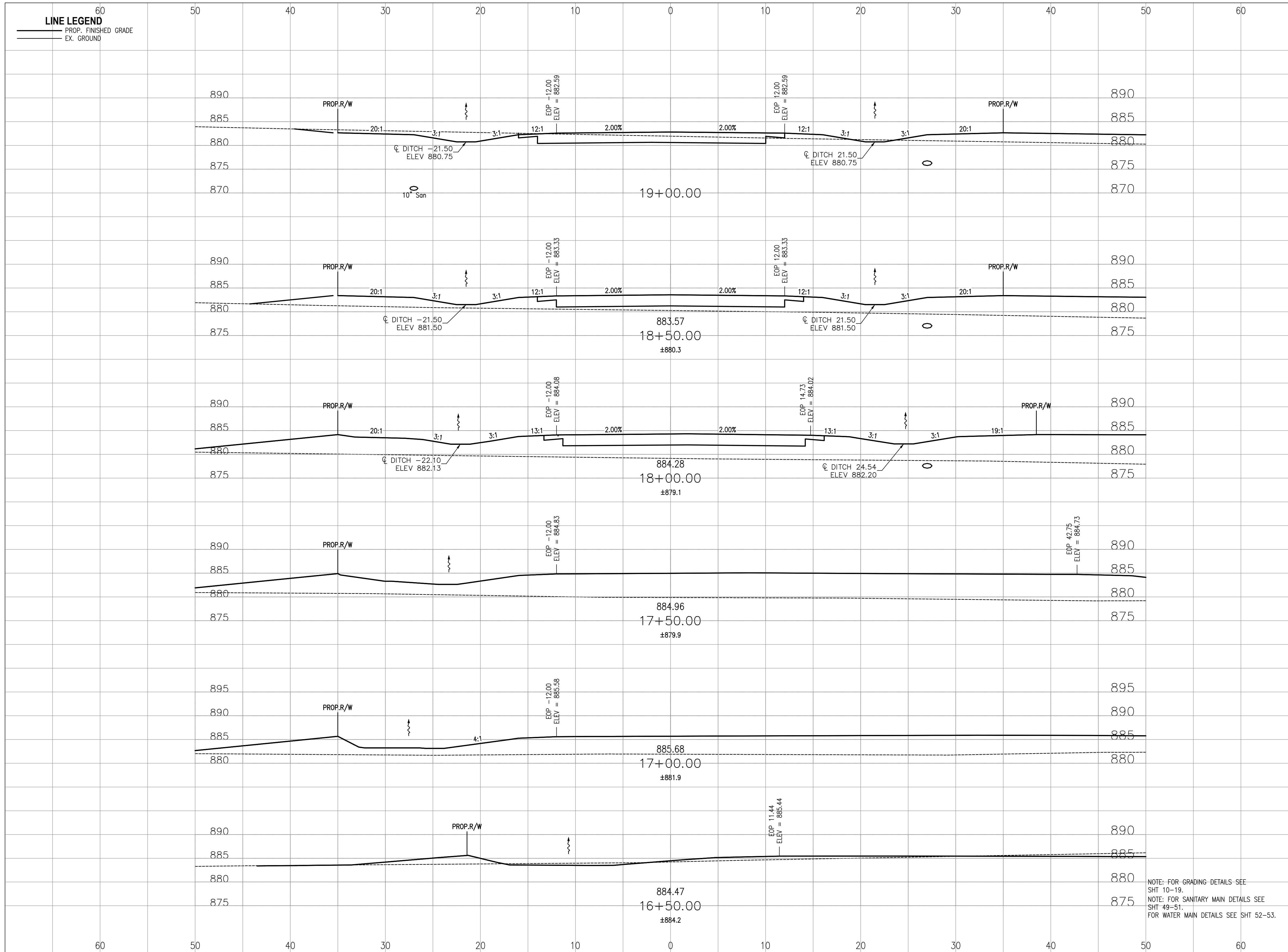
Table for Calculate Skimmer Size for Faircloth Skimmer®. Shows Basin Volume in Cubic Feet (5,628 Cu.Ft), Days to Drain (2 Days), and Skimmer Size (2.0 Inch).

NORTH DETENTION BASIN SKIMMER CALCULATIONS

Vertical sidebar containing drawing information: DRAWN, ELB, CHECKED, DATE (5/22/2020), PLAN ISSUE/REVISION, NO., HULL logo (HULL Environment / Energy / Infrastructure), CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO, EROSION, SEDIMENT CONTROL & GRADING NOTES, JOB NUMBER: ZAN012, and page number 19.

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INDUSTRIAL DRIVE
 ZANESVILLE, MUSKINGUM COUNTY, OHIO
CROSS SECTIONS

JOB NUMBER:
ZAN012

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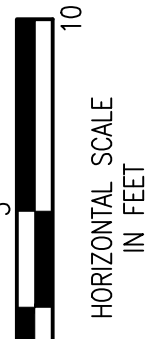
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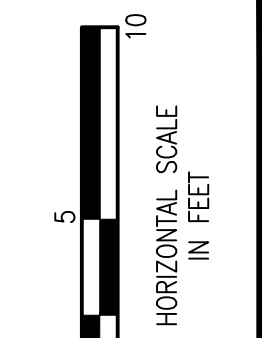
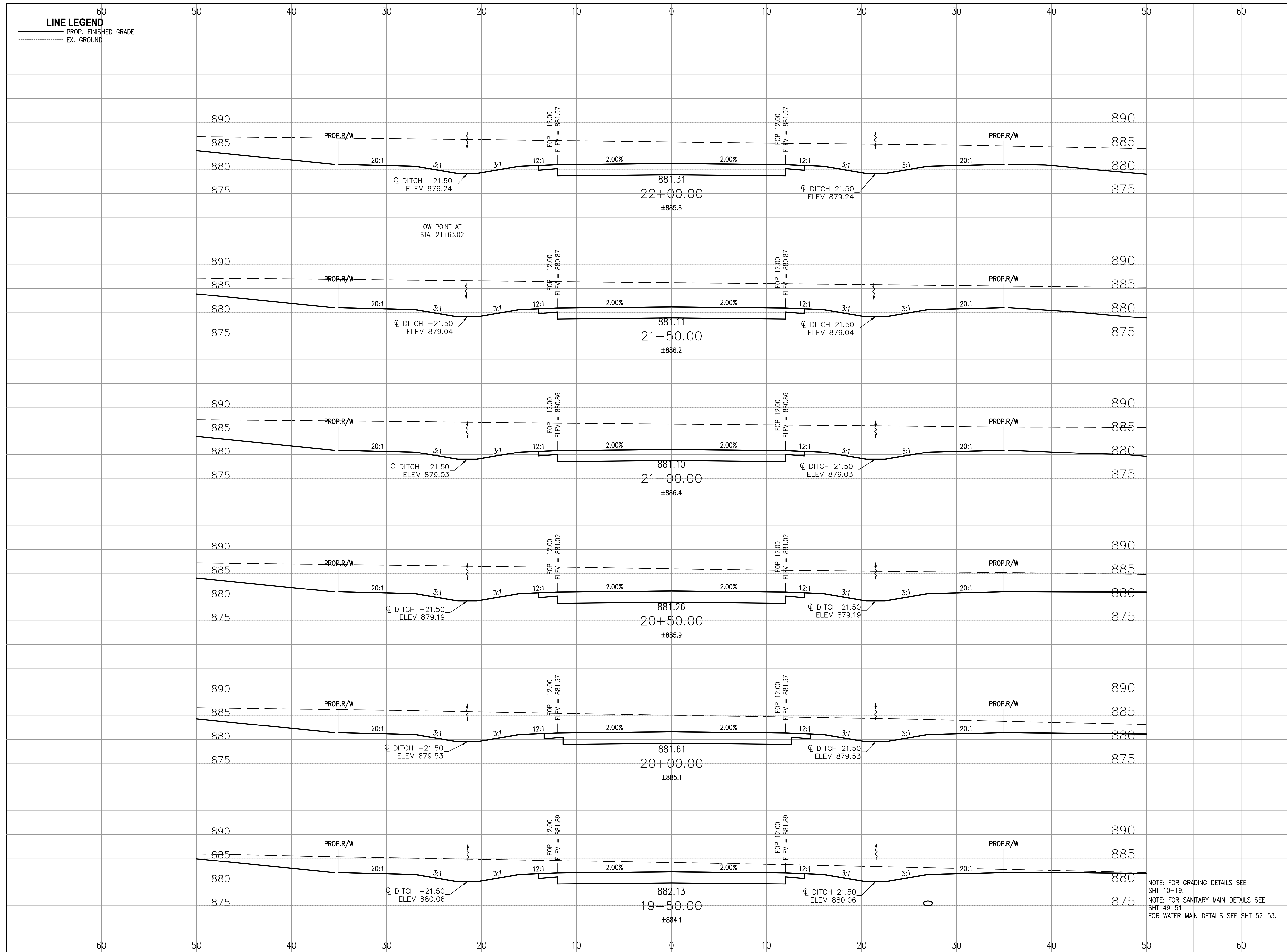
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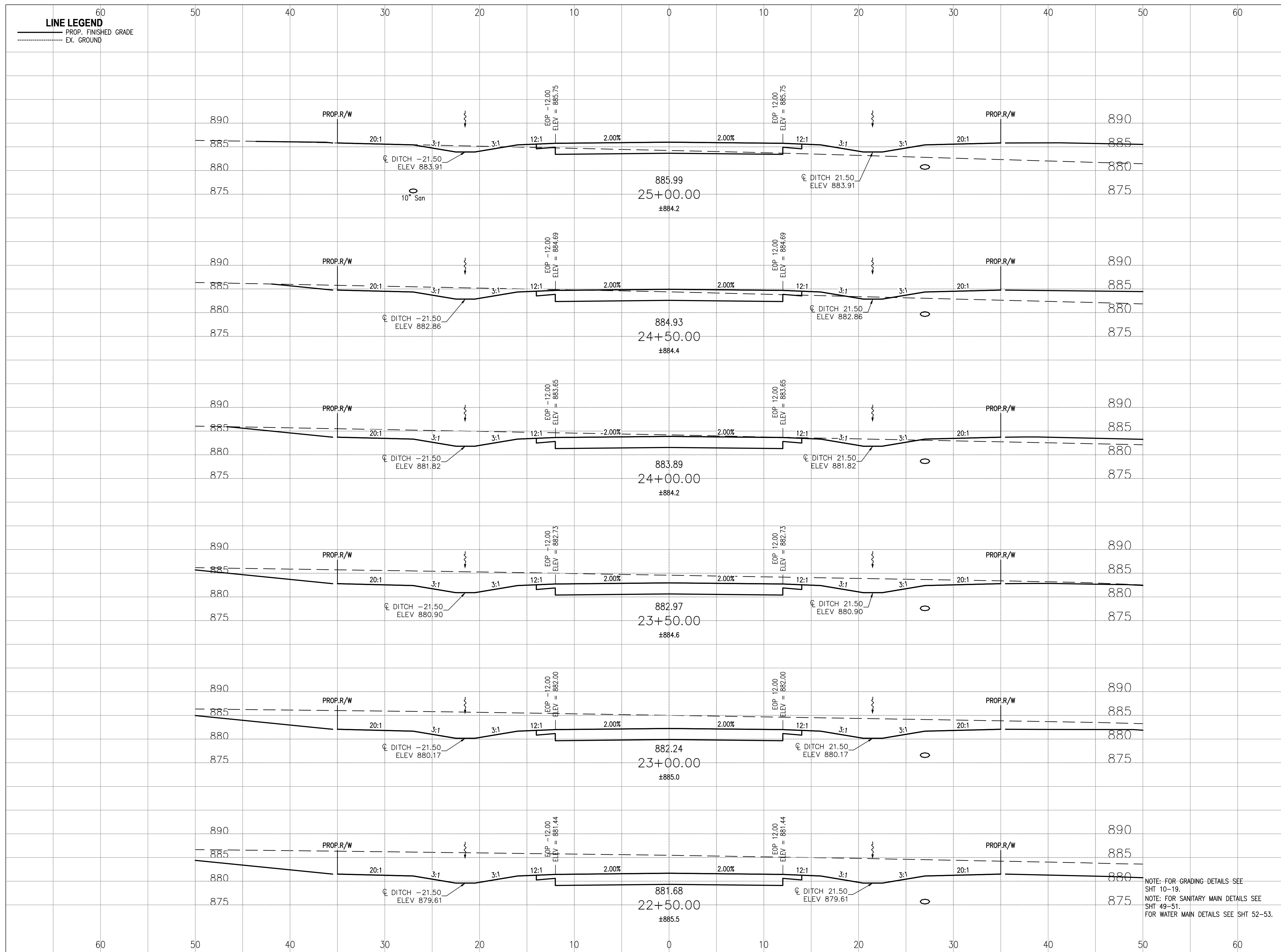


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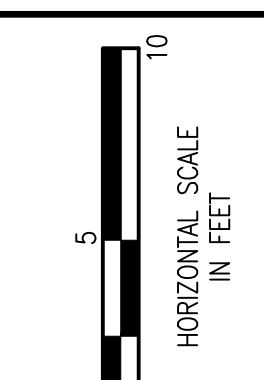
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NOTE: FOR GRADING DETAILS SEE SHT 10-19.
 NOTE: FOR SANITARY MAIN DETAILS SEE SHT 49-51.
 FOR WATER MAIN DETAILS SEE SHT 52-53.



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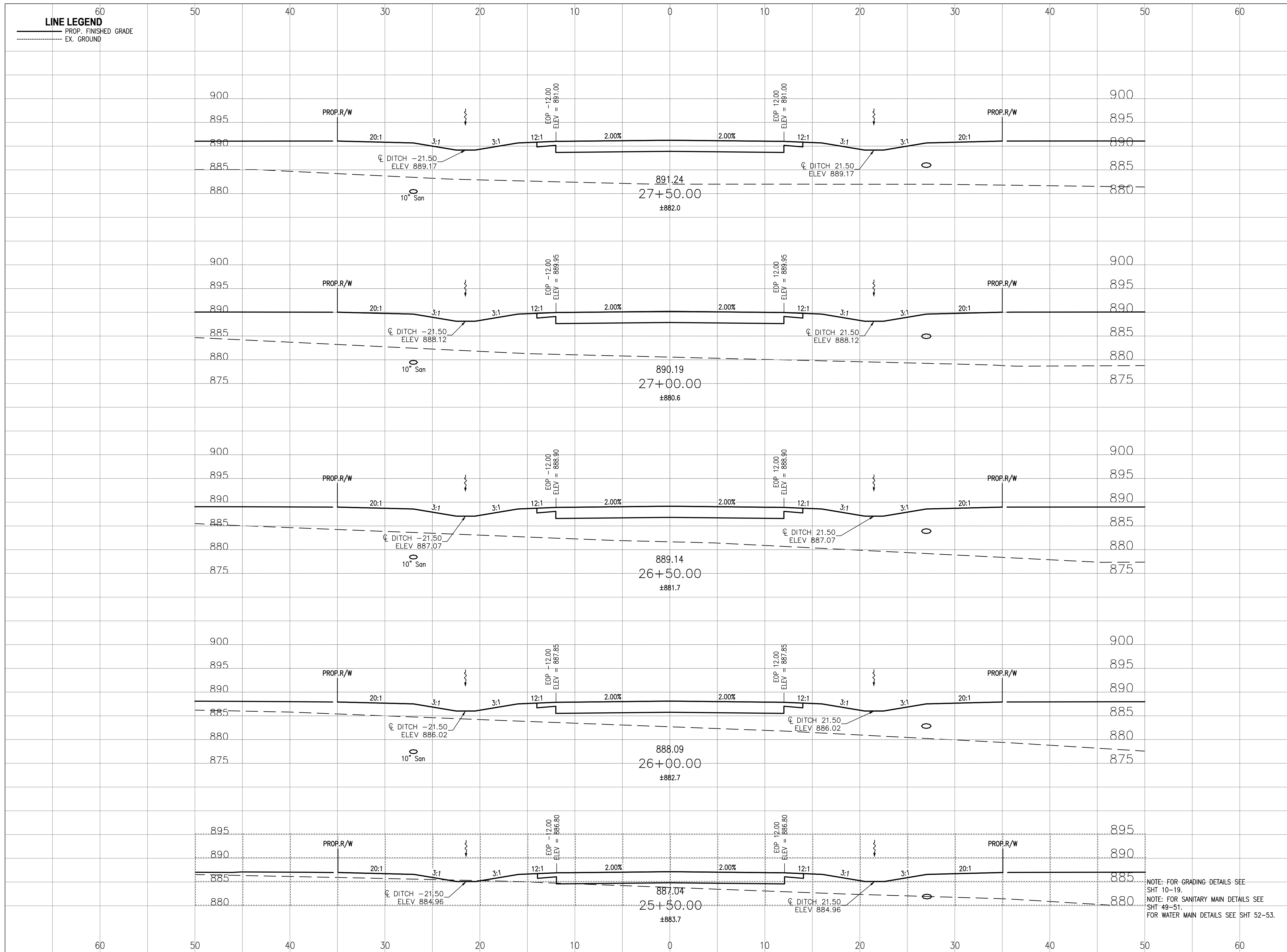
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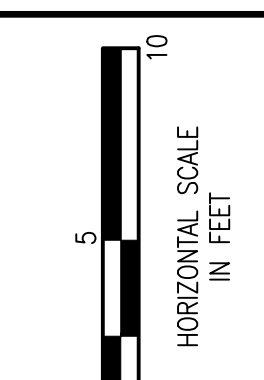
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LINE LEGEND
 ——— PROP. FINISHED GRADE
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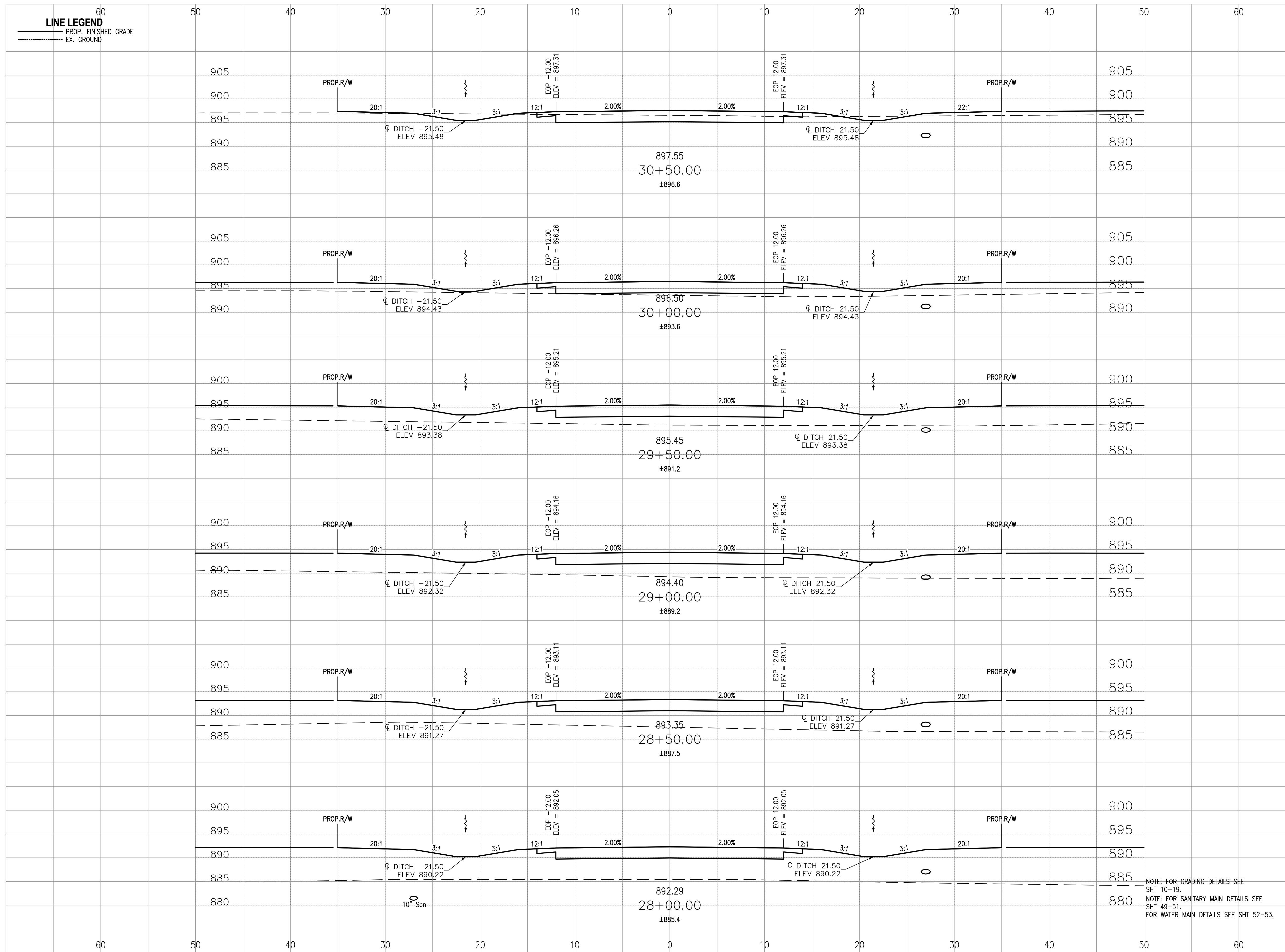
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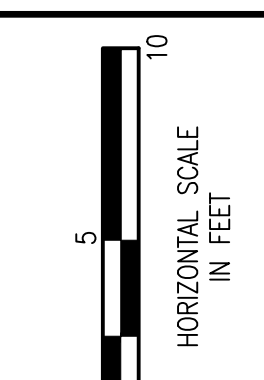
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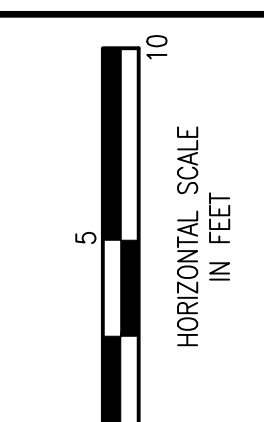
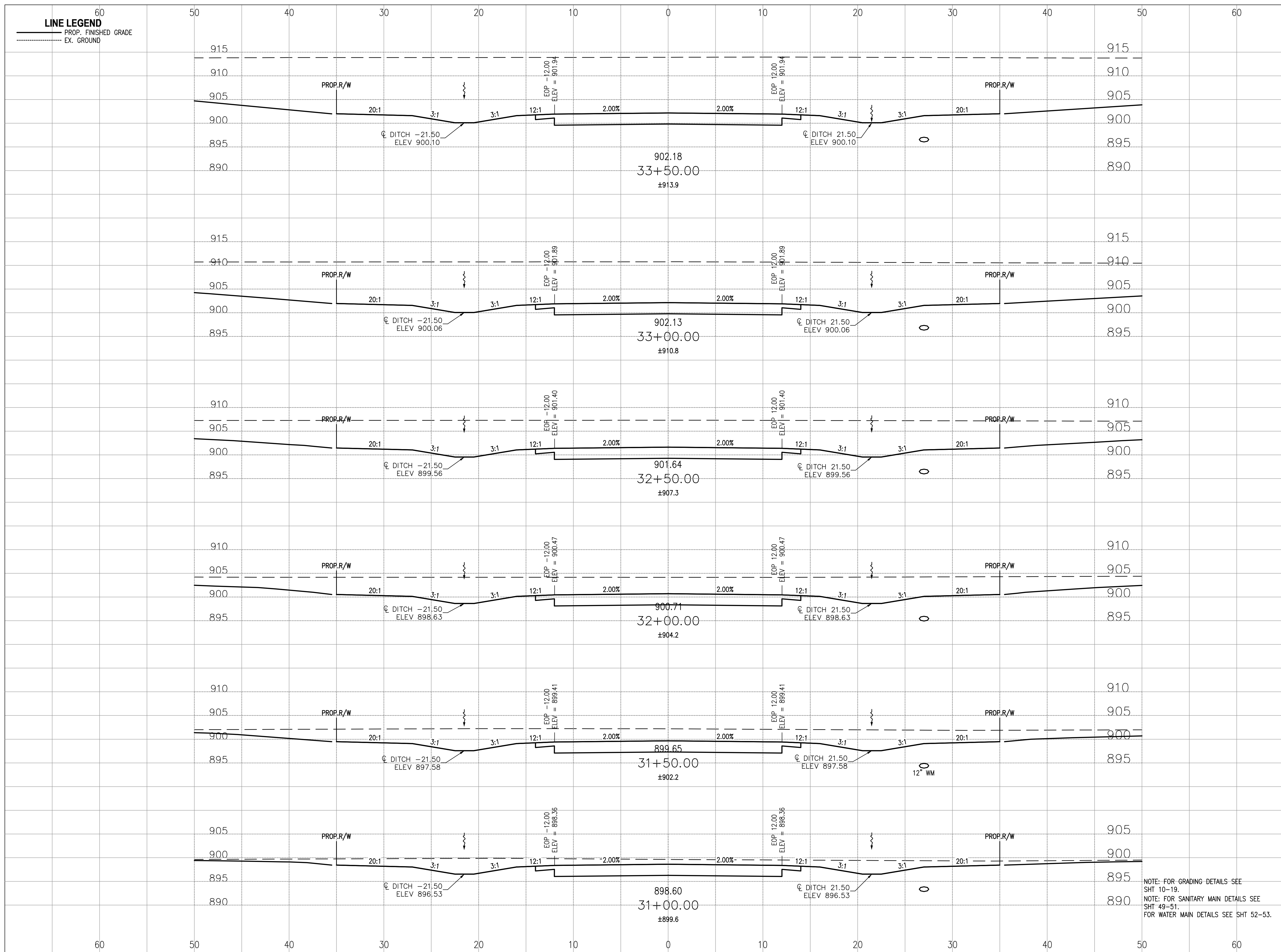
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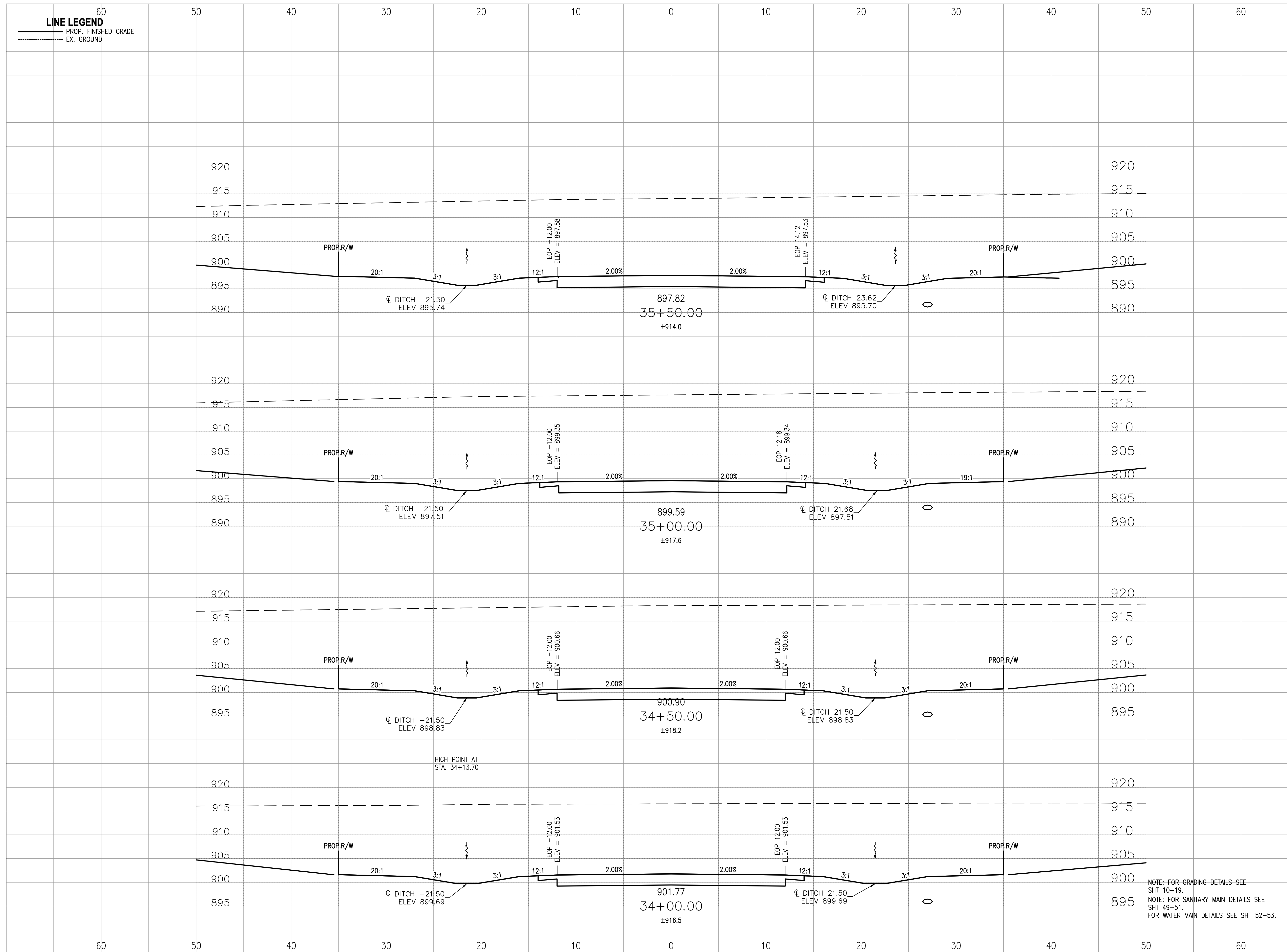


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 FOR WATER MAIN DETAILS SEE SHT 52-53.

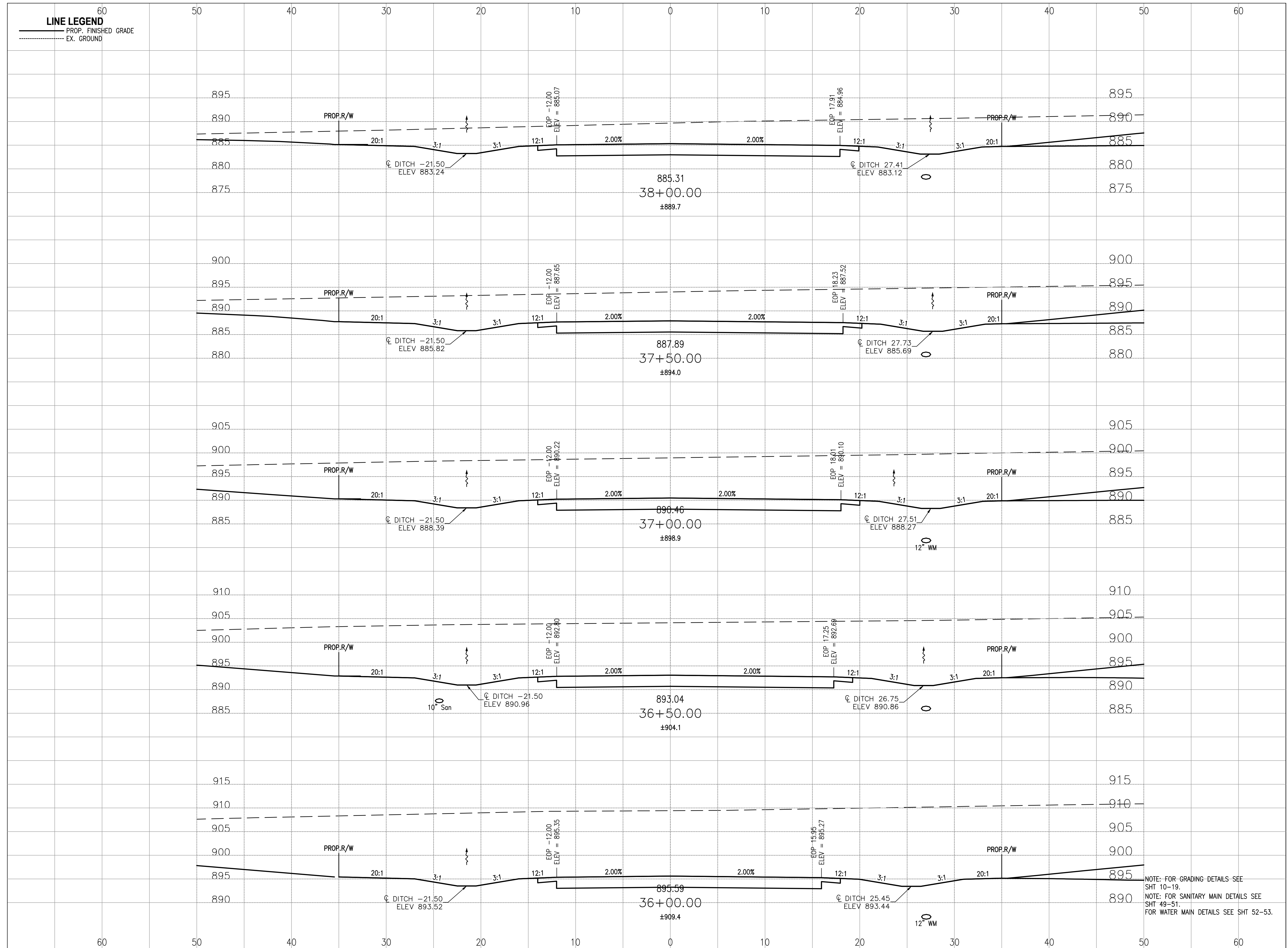
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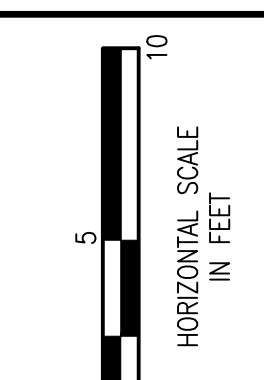
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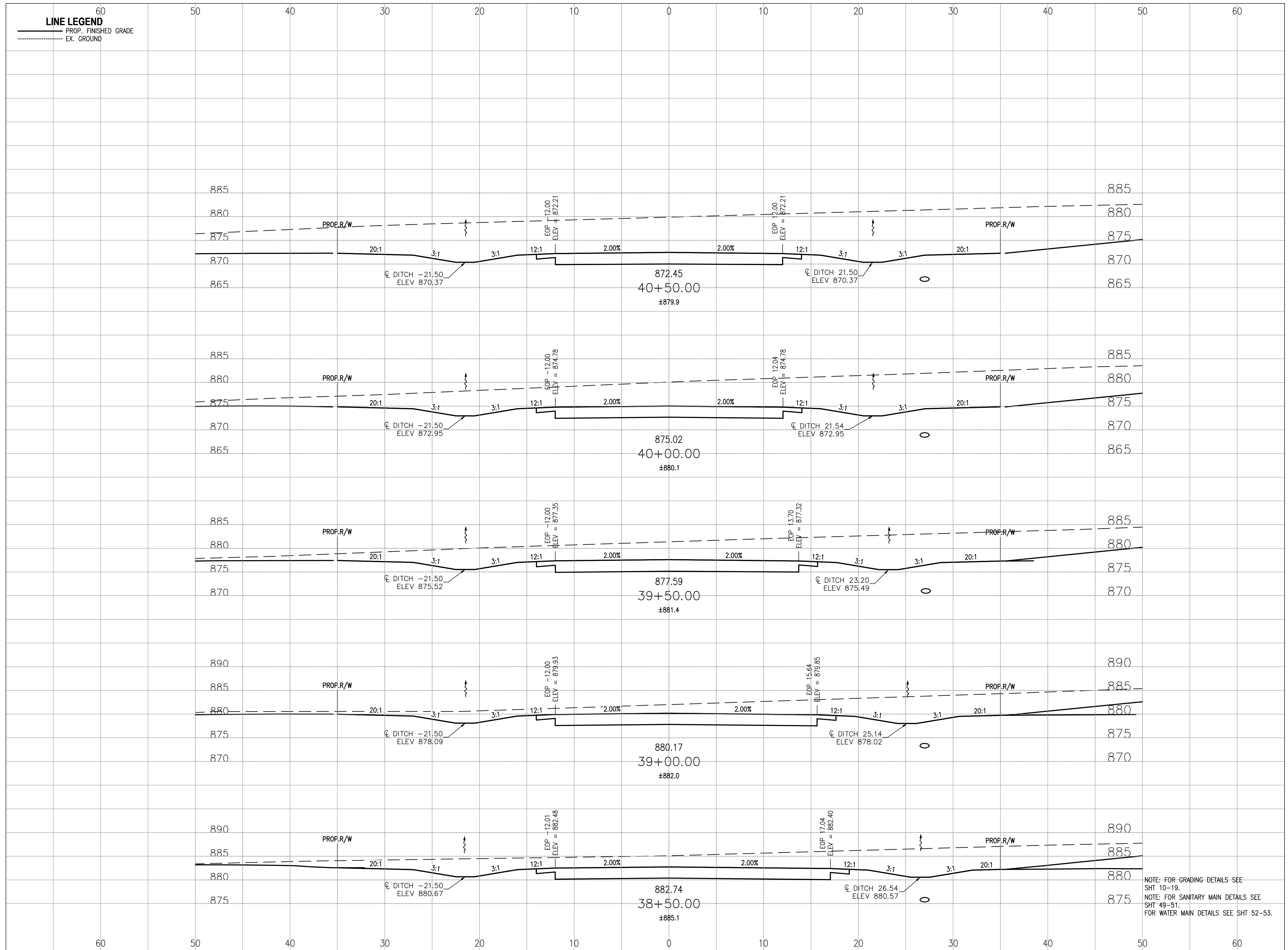
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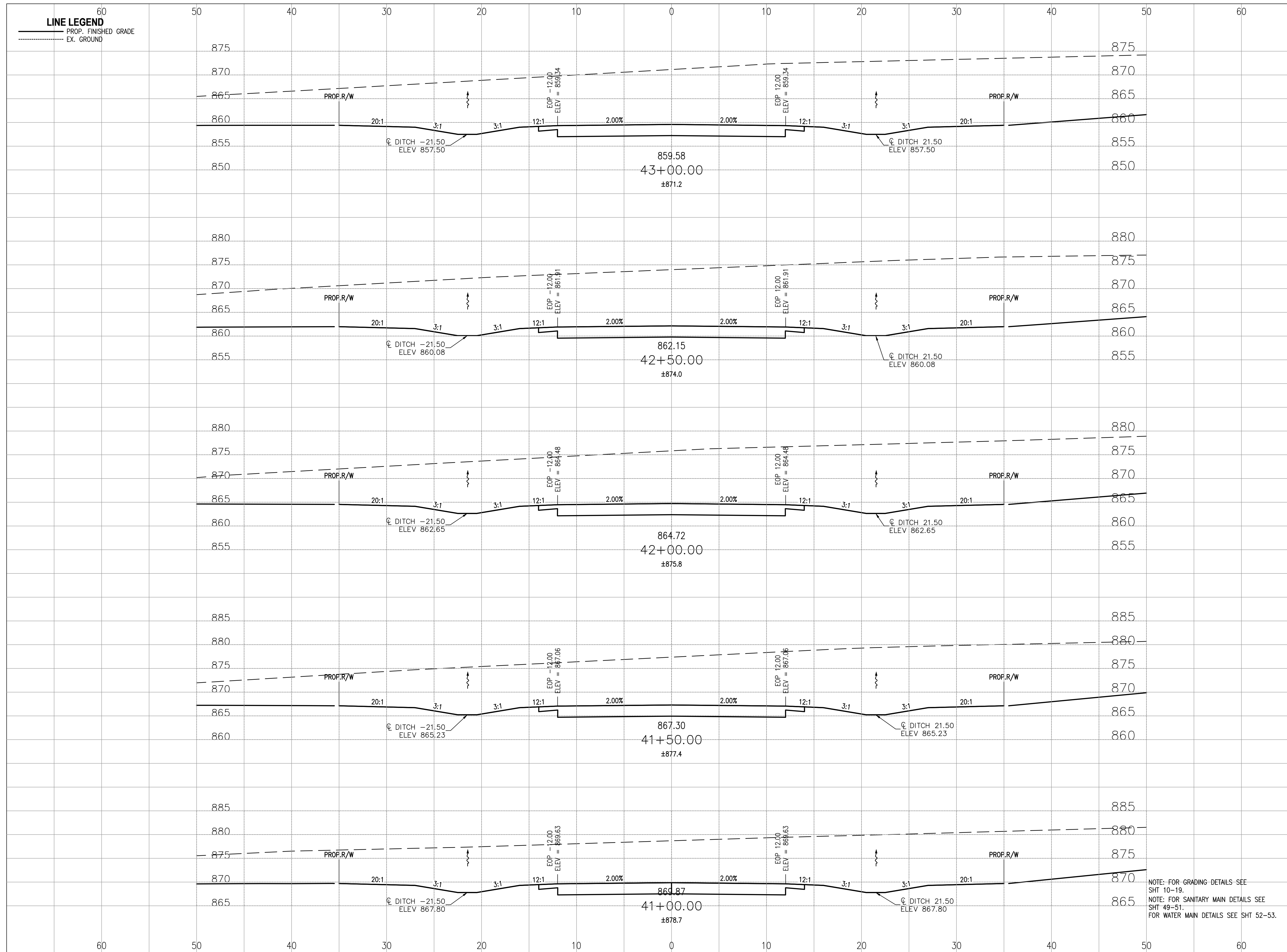
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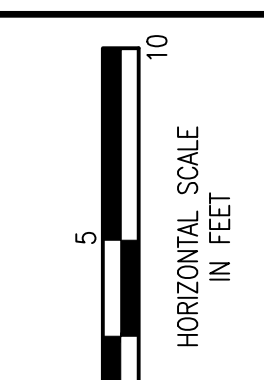
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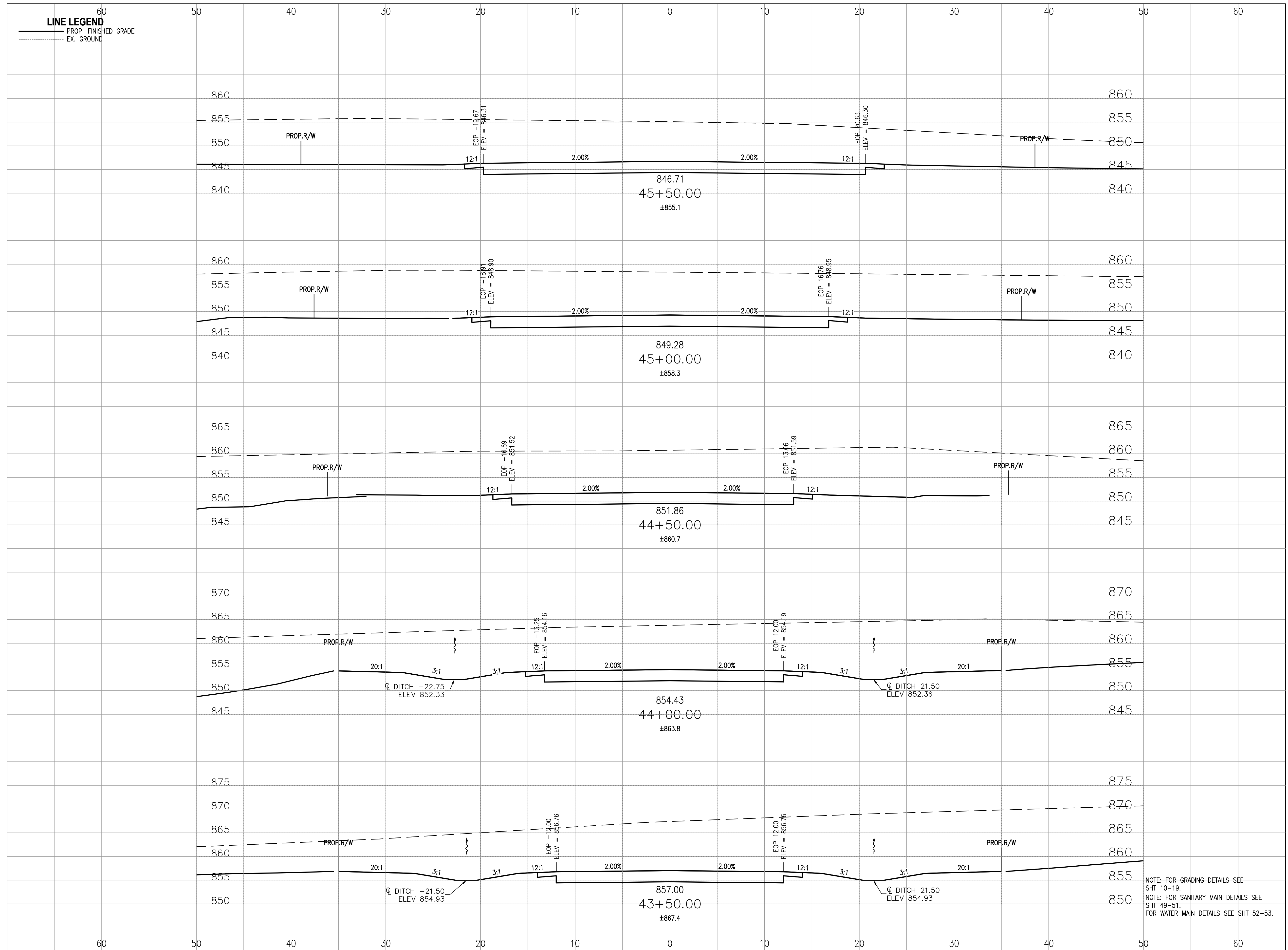
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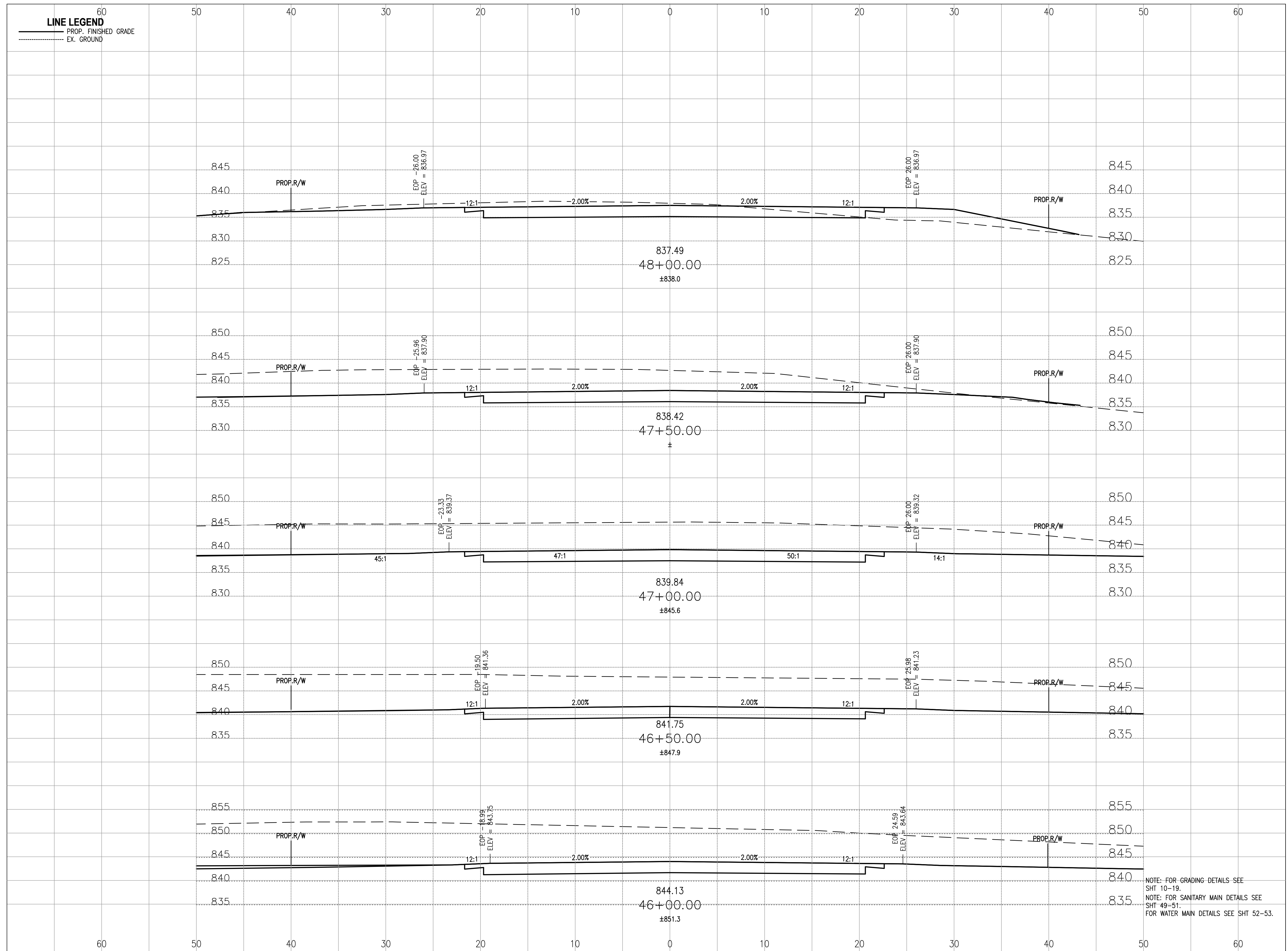
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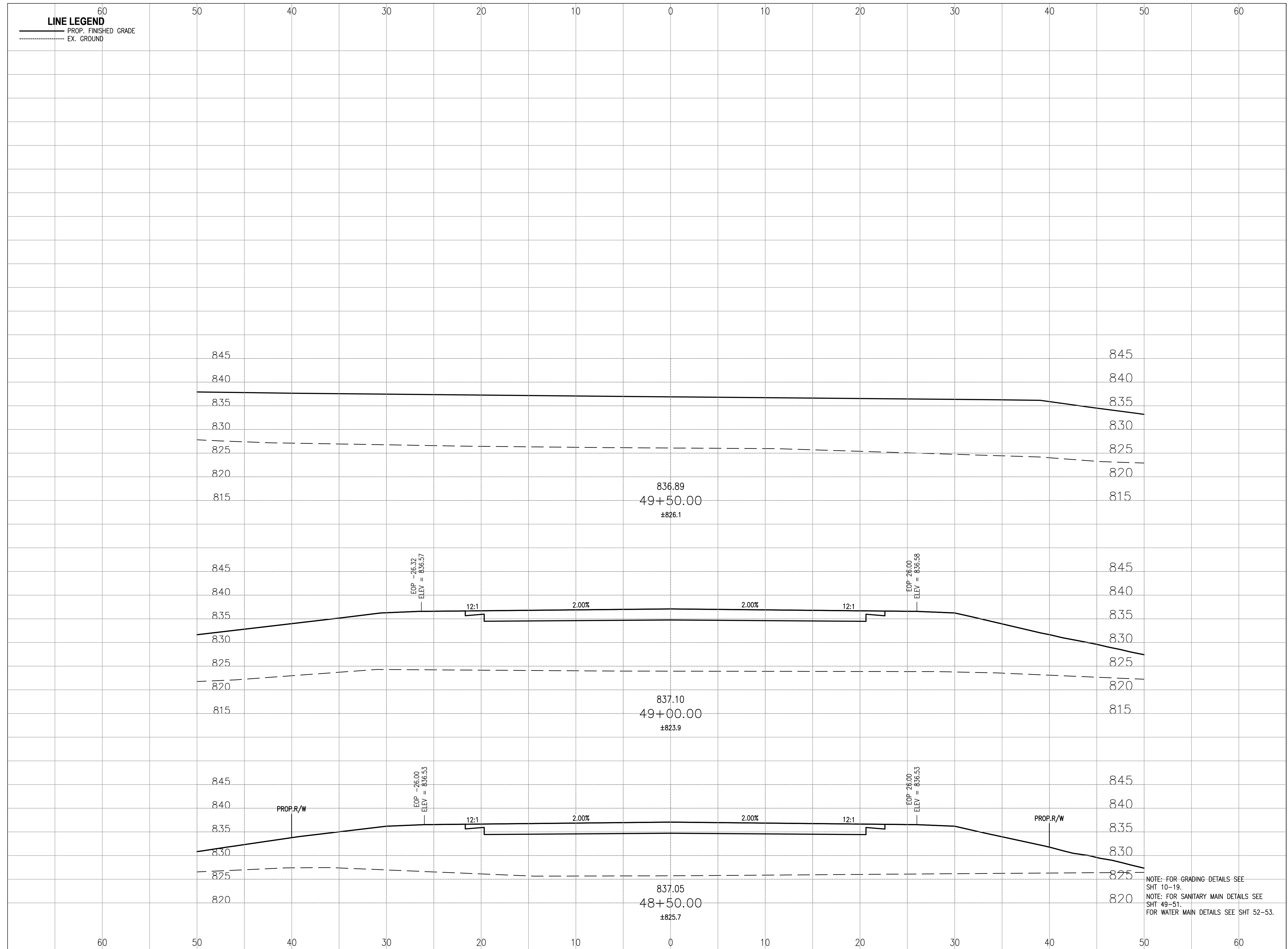
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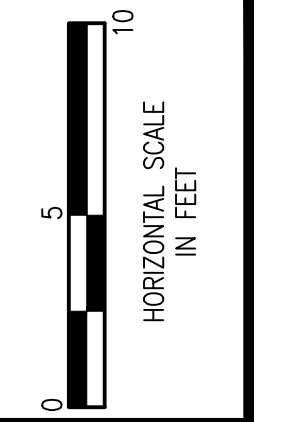
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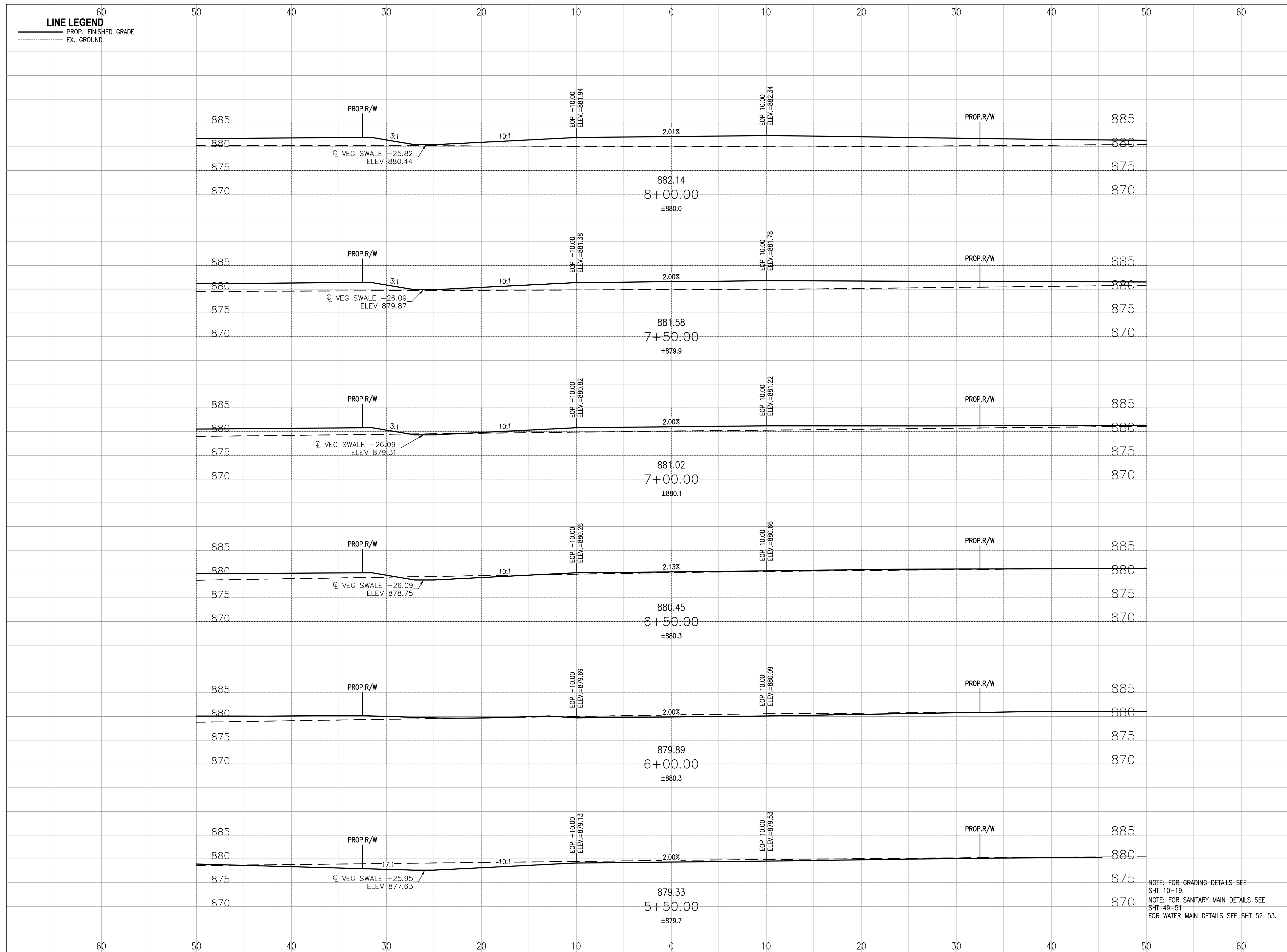
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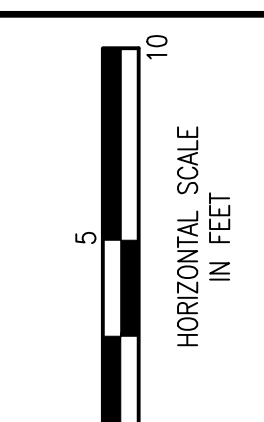
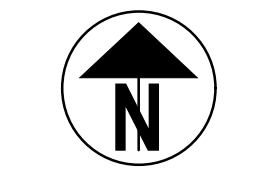
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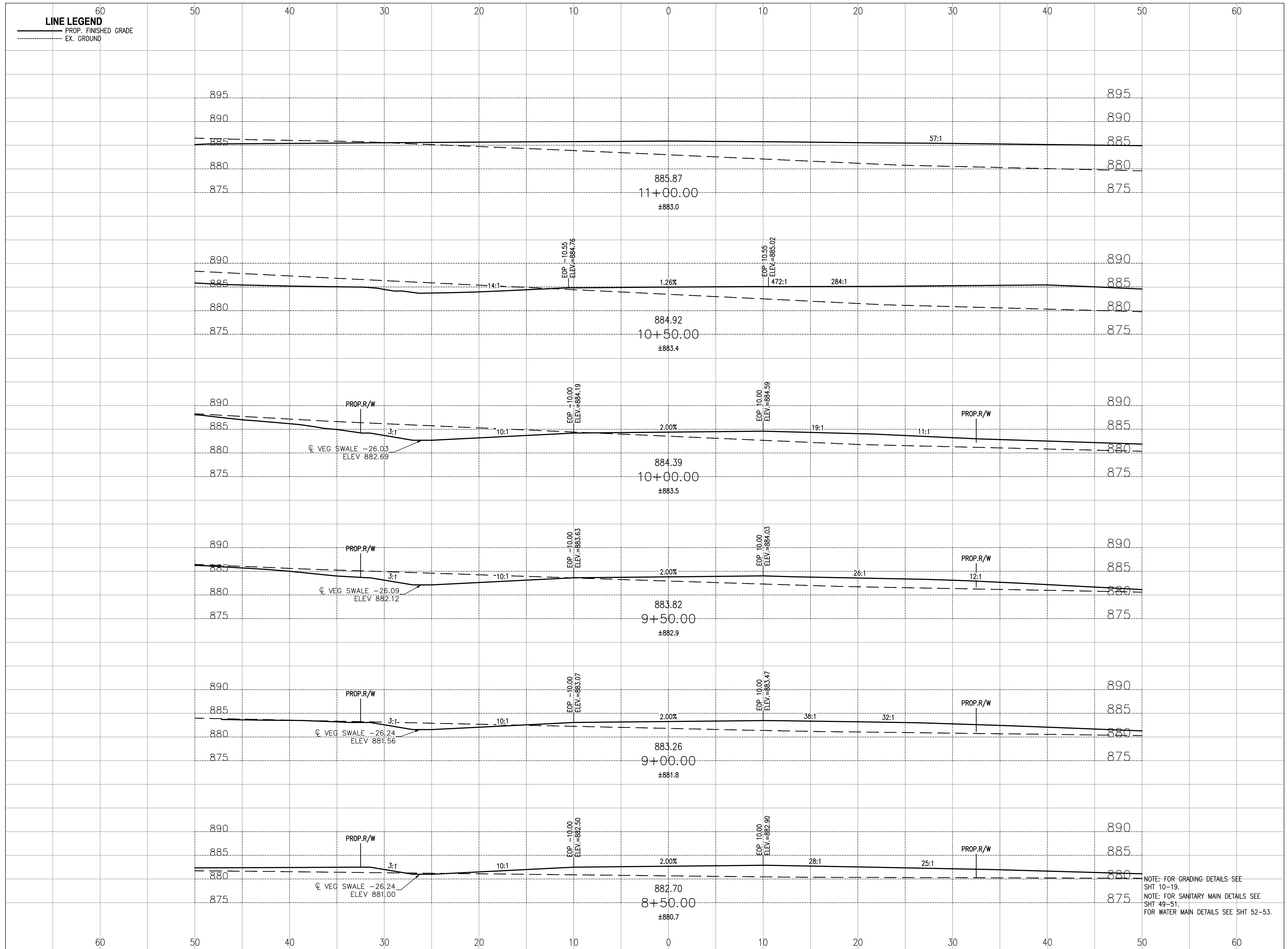
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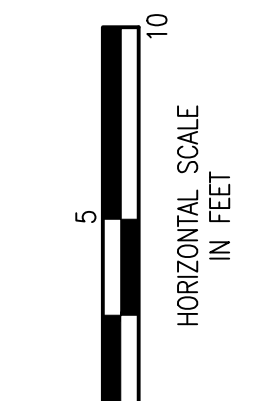
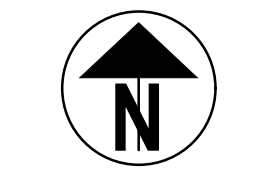
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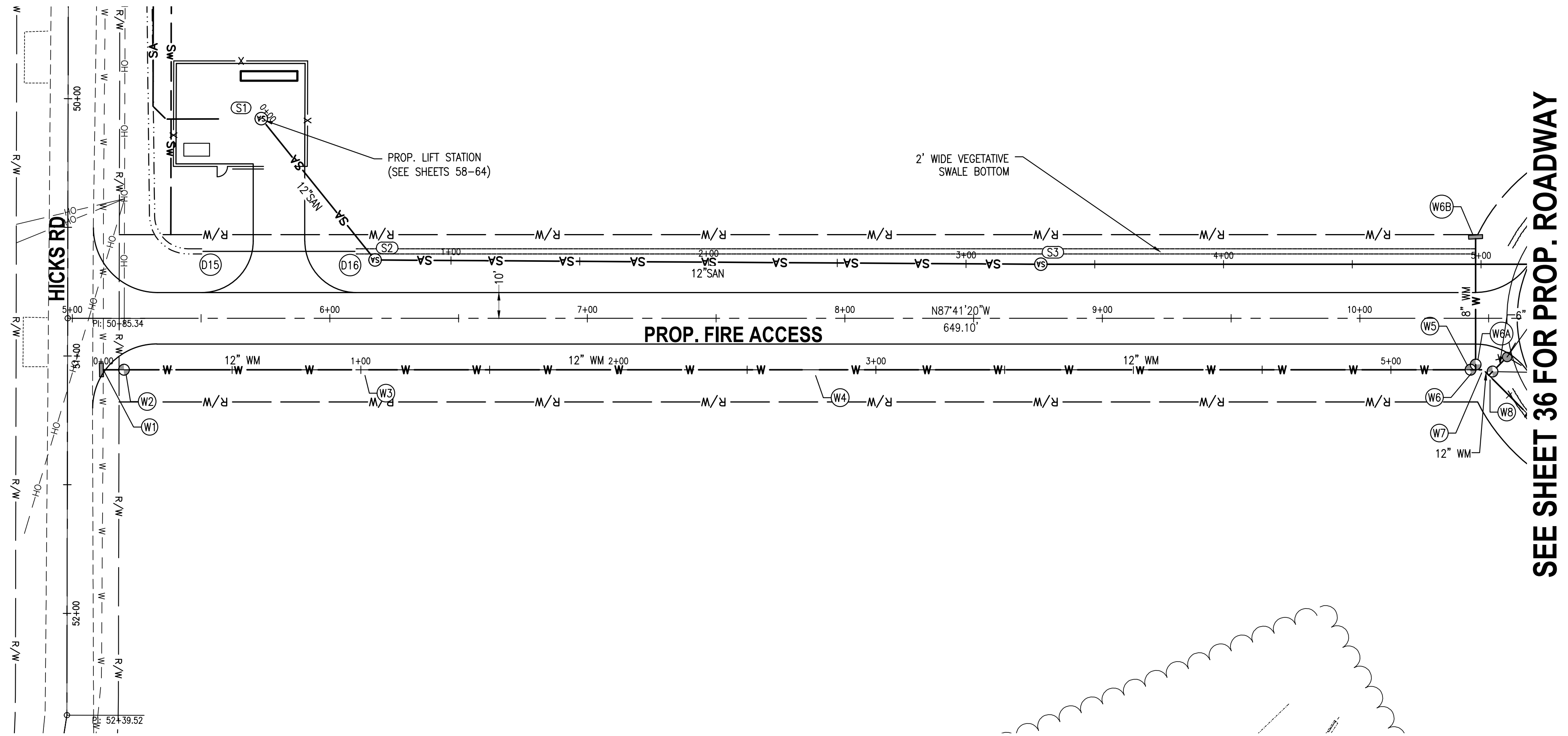
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D15	CULVERT	STA. 5+50.27, -26.0L FIRE ACCESS
D16	CULVERT	STA. 6+10.27, -26.0L FIRE ACCESS
S1	WET WELL	STA. 5+73.36, 77.6L FIRE ACCESS RD
S2	SAN. MH.	STA. 6+17.57, 22.7L FIRE ACCESS RD
S3	SAN. MH.	STA. 8+76.10, 21.0L FIRE ACCESS RD

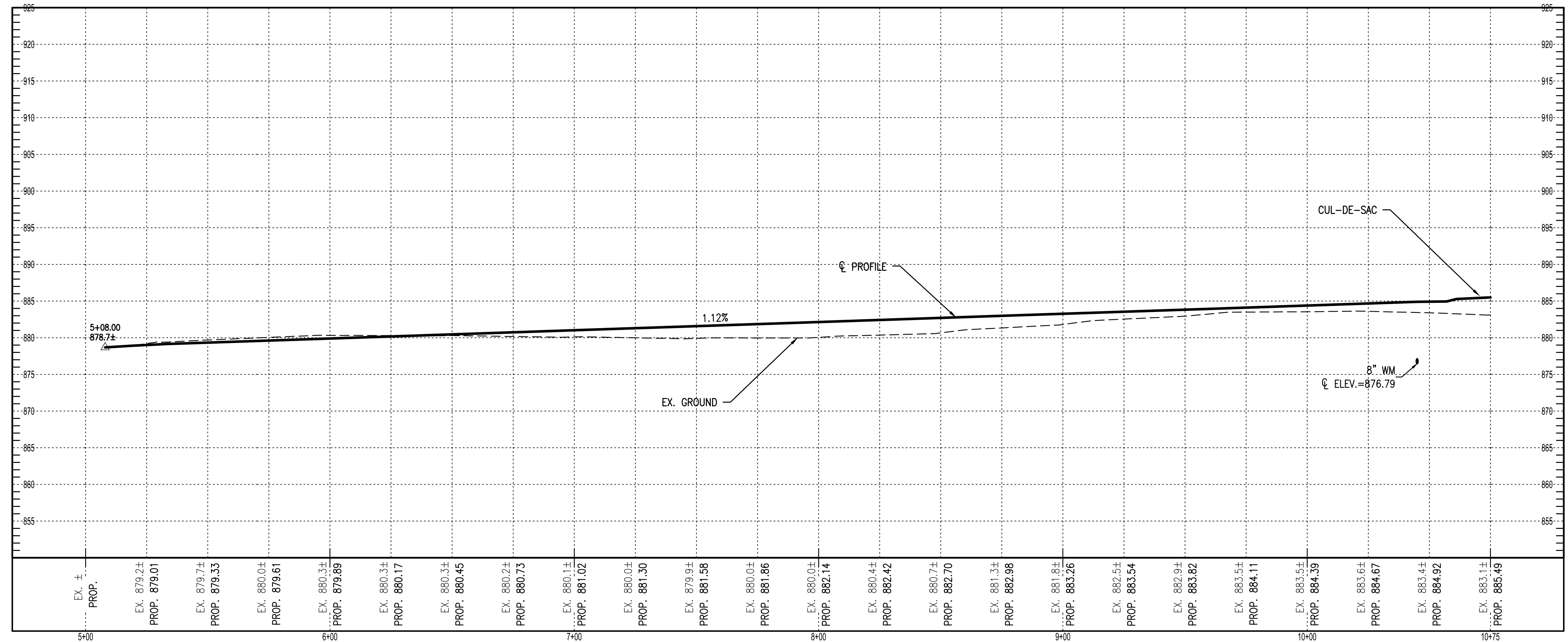
W1	18"x12" TAPPING SLEEVE & VALVE	STA. 5+12.06, 20.0R FIRE ACCESS RD
W2	12" GATE VALVE VERT DEFLECTION	STA. 5+20.06, 20.0R FIRE ACCESS RD
W3	VERTICAL DEFLECTION	STA. 6+12.12, 20.0R FIRE ACCESS RD
W4	VERTICAL DEFLECTION	STA. 7+87.12, 20.0R FIRE ACCESS RD
W5	12" GATE VALVE	STA. 10+42.96, 20.0R FIRE ACCESS RD
W6	12"x8" TEE	STA. 10+44.96, 20.0R FIRE ACCESS RD
W6A	12" GATE VALVE	STA. 10+44.96, 18.0R FIRE ACCESS RD
W6B	STUB	STA. 10+44.96, 30.9L FIRE ACCESS RD
W7	45° HORIZ BEND	STA. 10+47.96, 20.0R FIRE ACCESS RD
W8	12"x6" TEE VERT DEFLECTION	STA. 10+50.08, 22.1R FIRE ACCESS RD

LEGEND

	EXTENTS OF DITCH/STREAM
	EDGE OF PAVEMENT - PROPOSED
	SHOULDER - PROPOSED
	RIGHT-OF-WAY LINE - PROPOSED
	GUARDRAIL - PROPOSED
	SANITARY LINE - PROPOSED
	WATER LINE - PROPOSED

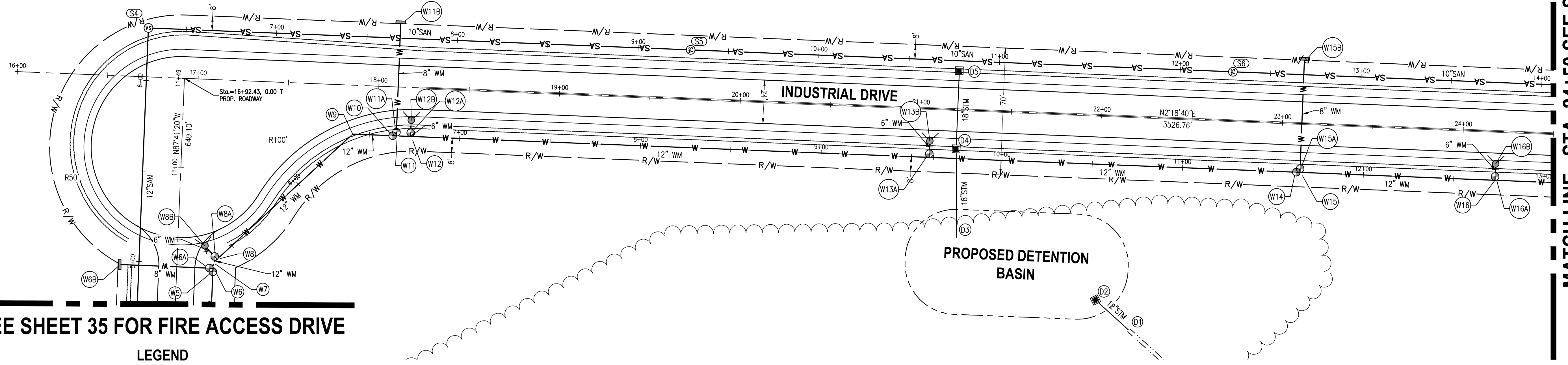


SEE SHEET 36 FOR PROP. ROADWAY



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DRAWN	ELB	CHECKED	DATE					
			5/22/2020					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">NO.</td> <td style="width: 25%;">PLAN</td> <td style="width: 25%;">ISSUE/REVISION</td> <td style="width: 25%;">DATE</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	PLAN	ISSUE/REVISION	DATE				
NO.	PLAN	ISSUE/REVISION	DATE					
<p style="font-size: small;">HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43885 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com</p>								
<p style="font-size: small;">Environment / Energy / Infrastructure</p>								
<p>CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO</p>								
<p>PLAN & PROFILE</p>								
<p>JOB NUMBER: ZAN012</p>								
<p style="font-size: 1.5em; font-weight: bold;">35</p>								

W5	12" GATE VALVE	STA. 10+42.96, 20.0R FIRE ACCESS RD	W9	45° HORIZ BEND	STA. 17+86.57, 27.0R INDUSTRIAL DR	W13	12"x6" TEE VERT DEFLECTION	STA. 9+59.77, 0.0 INDUSTRIAL DR	W16A	6" GATE VALVE	STA. 24+18.63, 25.0R INDUSTRIAL DR	S4	SAN. MH.	STA. 16+71.43, 27.0L INDUSTRIAL DR
W6	12"x8" TEE	STA. 10+44.96, 20.0R FIRE ACCESS RD	W10	12" GATE VALVE VERT DEFLECTION	STA. 18+08.72, 27.0R INDUSTRIAL DR	W13A	6" GATE VALVE	STA. 21+05.59, 25.0R INDUSTRIAL DR	W16B	FIRE HYDRANT	STA. 24+18.63, 18.0R INDUSTRIAL DR	S5	SAN. MH.	STA. 19+71.43, 27.0L INDUSTRIAL DR
W6A	12" GATE VALVE	STA. 10+44.96, 18.0R FIRE ACCESS RD	W11	12"x8" TEE	STA. 18+10.72, 27.0R INDUSTRIAL DR	W13B	FIRE HYDRANT	STA. 21+05.59, 18.0R INDUSTRIAL DR				S6	SAN. MH.	STA. 22+71.43, 27.0L INDUSTRIAL DR
W6B	STUB	STA. 10+44.96, 30.9L FIRE ACCESS RD	W11A	8" GATE VALVE	STA. 18+10.72, 25.0R INDUSTRIAL DR	W14	12" GATE VALVE	STA. 23+08.72, 27.0R INDUSTRIAL DR				D1	HW-2.1	STA. 22+19.83, 118.0R INDUSTRIAL DR.
W7	45° HORIZ BEND	STA. 10+47.96, 20.0R FIRE ACCESS RD	W11B	STUB	STA. 18+10.72, 35.0L INDUSTRIAL DR	W15	12"x8" TEE VERT DEFLECTION	STA. 23+10.72, 27.0R INDUSTRIAL DR				D2	CB2-3	STA. 22+00.63, 101.9R INDUSTRIAL DR.
W8	12"x6" TEE VERT DEFLECTION	STA. 10+50.08, 22.1R FIRE ACCESS RD	W12	12"x6" TEE VERT DEFLECTION	STA. 18+18.63, 27.0R INDUSTRIAL DR	W15A	8" GATE VALVE	STA. 23+10.72, 25.0R INDUSTRIAL DR				D3	HW-2.1	STA. 21+22.60, 71.0R INDUSTRIAL DR.
W8A	6" GATE VALVE	STA. 10+51.50, 20.7R FIRE ACCESS RD	W12A	6" GATE VALVE	STA. 18+18.63, 25.0R INDUSTRIAL DR	W15B	STUB	STA. 23+10.72, 35.0L INDUSTRIAL DR				D4	CB2-3	STA. 21+20.33, 21.7R INDUSTRIAL DR.
W8B	FIRE HYDRANT	STA. 10+57.16, 15.0R FIRE ACCESS RD	W12B	FIRE HYDRANT	STA. 18+18.63, 18.1R INDUSTRIAL DR	W16	FIRE HYDRANT TEE	STA. 24+18.63, 27.0R INDUSTRIAL DR				D5	CB2-3	STA. 21+20.33, -21.5L INDUSTRIAL DR.

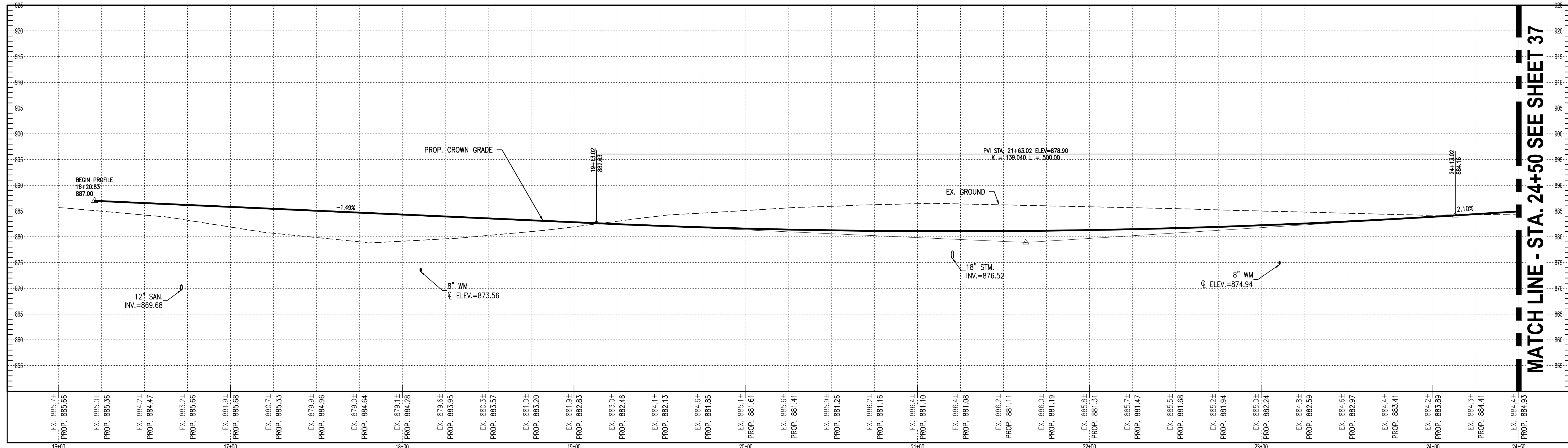


SEE SHEET 35 FOR FIRE ACCESS DRIVE

MATCH LINE - STA. 24+50 SEE SHEET 37

LEGEND

	EXTENTS OF DITCH/STREAM
	EDGE OF PAVEMENT - PROPOSED
	SHOULDER - PROPOSED
	R/W
	RIGHT-OF-WAY LINE - PROPOSED
	GUARDRAIL - PROPOSED
	SA
	SANITARY LINE - PROPOSED
	W
	WATER LINE - PROPOSED

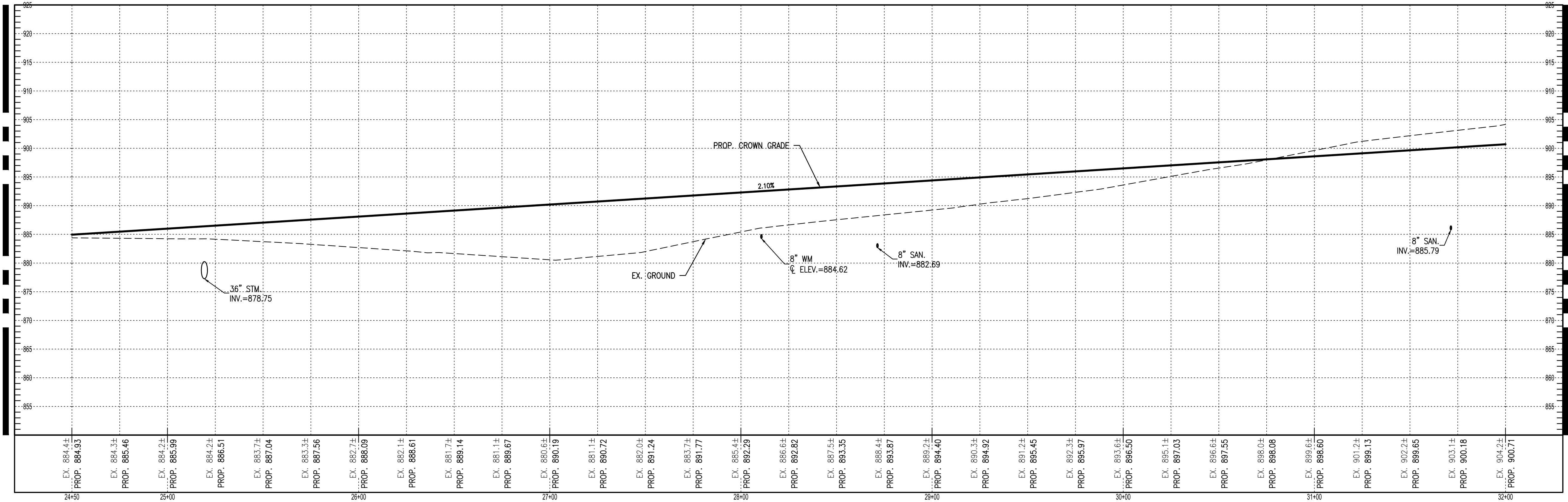


MATCH LINE - STA. 24+50 SEE SHEET 37

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DRAWN: ELB CHECKED: INV DATE: 5/22/2020	PLAN ISSUE/REVISION NO.
HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43895 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com	
HULL Environment / Energy / Infrastructure	
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO PLAN & PROFILE	
JOB NUMBER: ZAN012	
36	

MATCH LINE - STA. 24+50 SEE SHEET 36



MATCH LINE - STA. 32+00 SEE SHEET 38

MATCH LINE - STA. 24+50 SEE SHEET 36

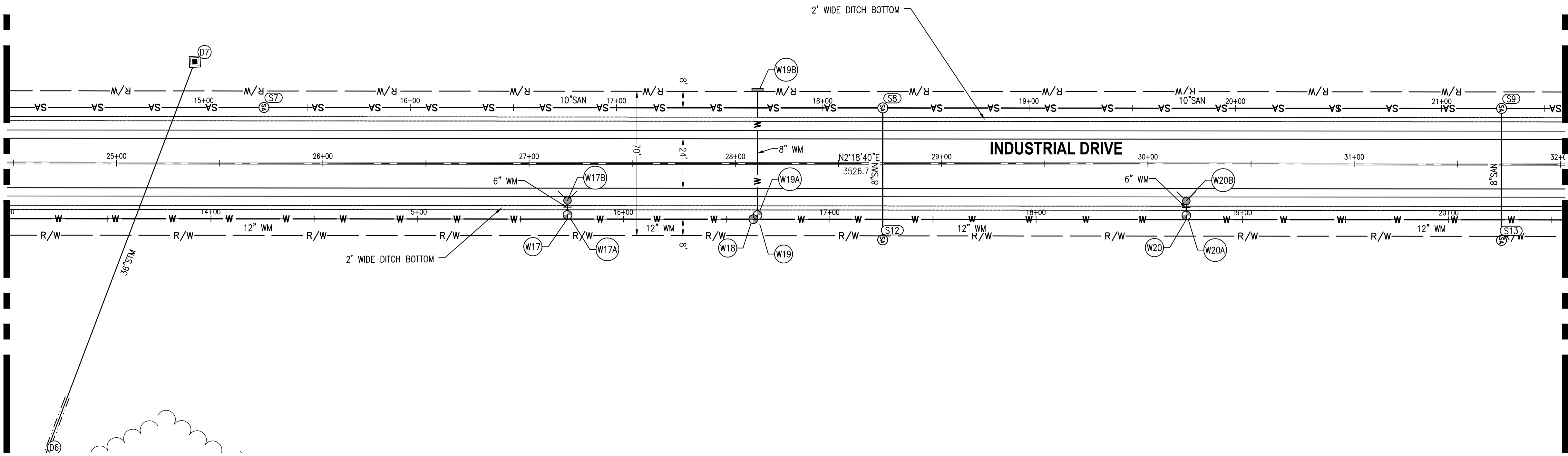
W17	12"x6" TEE	STA. 27+18.63, 27.0R INDUSTRIAL DR	W21	VERT DEFLECTION	STA. 32+56.29, 27.0R INDUSTRIAL DR
W17A	6" GATE VALVE	STA. 27+18.63, 25.0R INDUSTRIAL DR	W22	12" GATE VALVE	STA. 33+08.72, 27.0R INDUSTRIAL DR
W17B	FIRE HYDRANT	STA. 27+18.63, 18.0R INDUSTRIAL DR	W23	12"x8" TEE	STA. 33+10.72, 27.0R INDUSTRIAL DR
W18	12" GATE VALVE	STA. 28+08.72, 27.0R INDUSTRIAL DR	W23A	8" GATE VALVE	STA. 33+10.72, 25.0R INDUSTRIAL DR
W19	12"x8" TEE	STA. 28+10.72, 27.0R INDUSTRIAL DR			
W19A	8" GATE VALVE	STA. 28+10.72, 25.0R INDUSTRIAL DR			
W19B	STUB	STA. 28+10.72, 35.0L INDUSTRIAL DR			
W20	12"x6" TEE	STA. 30+18.63, 27.0R INDUSTRIAL DR			
W20A	6" GATE VALVE	STA. 30+18.63, 25.0R INDUSTRIAL DR			
W20B	FIRE HYDRANT	STA. 30+18.63, 18.0R INDUSTRIAL DR			

S7	SAN. MH.	STA. 25+71.43, 27.0L INDUSTRIAL DR
S8	SAN. MH.	STA. 28+71.43, 27.0L INDUSTRIAL DR
S9	SAN. MH.	STA. 31+71.43, 27.0L INDUSTRIAL DR
S12	SAN. MH.	STA. ???, ????? INDUSTRIAL DR
S13	SAN. MH.	STA. ???, ????? INDUSTRIAL DR

D6	HW-2.1	STA. 24+76.18, 113.7R INDUSTRIAL DR.
D7	CB2-3	STA. 25+37.93, -49.1L INDUSTRIAL DR.

LEGEND

- EXTENTS OF DITCH/STREAM
- EDGE OF PAVEMENT - PROPOSED
- SHOULDER - PROPOSED
- RIGHT-OF-WAY LINE - PROPOSED
- GUARDRAIL - PROPOSED
- SANITARY LINE - PROPOSED
- WATER LINE - PROPOSED



MATCH LINE - STA. 32+00 SEE SHEET 38

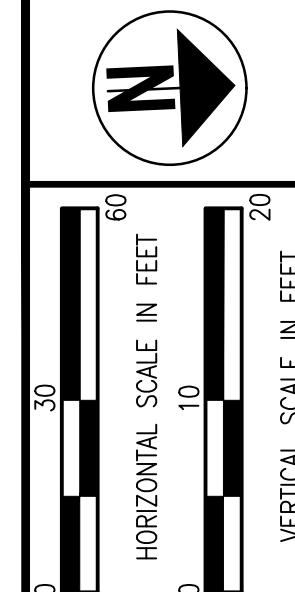
JOB NUMBER:
ZAN012

CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO

PLAN & PROFILE

HULL & ASSOCIATES, Inc.
59 Grant Street
Zanesville, OH 43895
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NO.	PLAN ISSUE/REVISION	DATE	DRAWN	CHECKED	DATE
			ELB	INV	5/22/2020



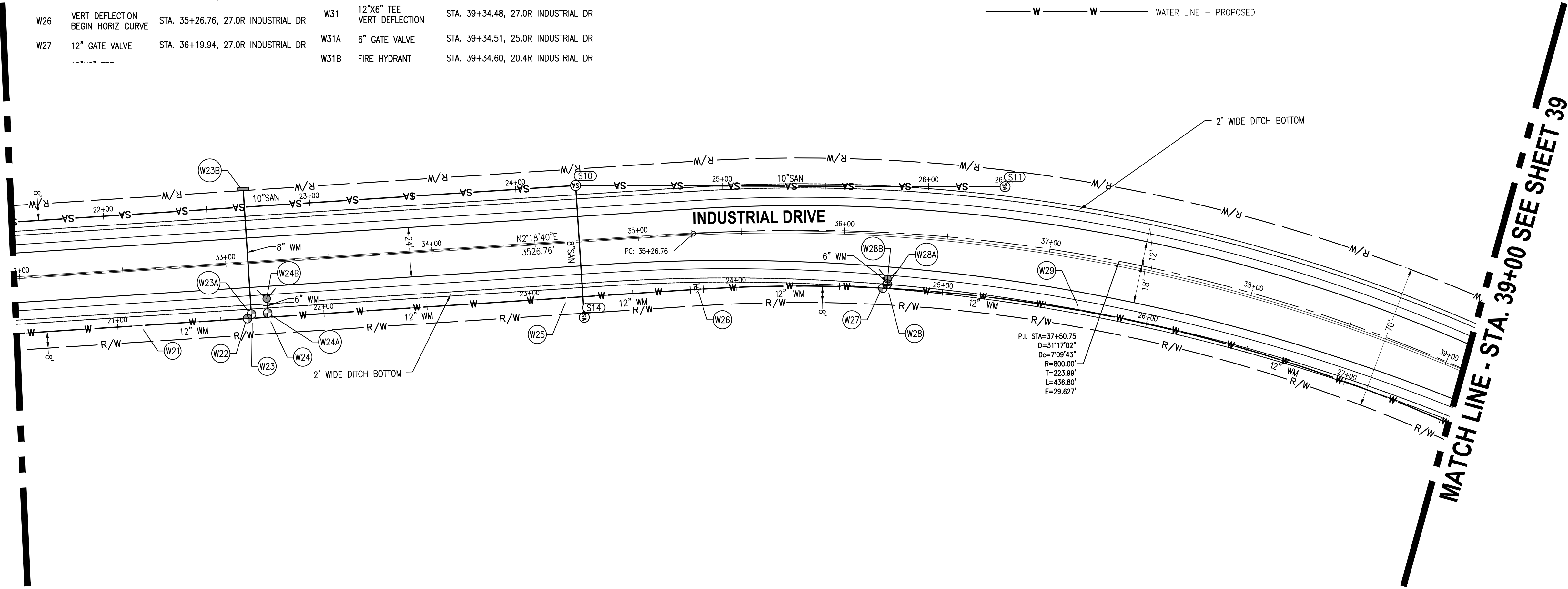
W23B	STUB	STA. 33+10.72, 35.0L INDUSTRIAL DR	W28	12" AD TEE VERT DEFLECTION	STA. 36+22.01, 27.0R INDUSTRIAL DR
W24	12"x6" TEE VERT DEFLECTION	STA. 33+18.63, 27.0R INDUSTRIAL DR	W28A	6" GATE VALVE	STA. 36+22.07, 25.0R INDUSTRIAL DR
W24A	6" GATE VALVE	STA. 33+18.63, 25.0R INDUSTRIAL DR	W28B	FIRE HYDRANT	STA. 36+22.14, 22.6R INDUSTRIAL DR
W24B	FIRE HYDRANT	STA. 33+18.63, 18.0R INDUSTRIAL DR	W29	VERT DEFLECTION	STA. 37+20.14, 27.0R INDUSTRIAL DR
W25	VERT DEFLECTION	STA. 34+64.44, 27.0R INDUSTRIAL DR	W30	12" GATE VALVE	STA. 39+32.41, 27.0R INDUSTRIAL DR
W26	VERT DEFLECTION BEGIN HORIZ CURVE	STA. 35+26.76, 27.0R INDUSTRIAL DR	W31	12"x6" TEE VERT DEFLECTION	STA. 39+34.48, 27.0R INDUSTRIAL DR
W27	12" GATE VALVE	STA. 36+19.94, 27.0R INDUSTRIAL DR	W31A	6" GATE VALVE	STA. 39+34.51, 25.0R INDUSTRIAL DR
			W31B	FIRE HYDRANT	STA. 39+34.60, 20.4R INDUSTRIAL DR

S10	SAN. MH.	STA. 34+71.43, 27.0L INDUSTRIAL DR
S11	SAN. MH.	STA. 36+74.74, 27.0L INDUSTRIAL DR
S14	SAN. MH.	STA. ???, ????? INDUSTRIAL DR

LEGEND

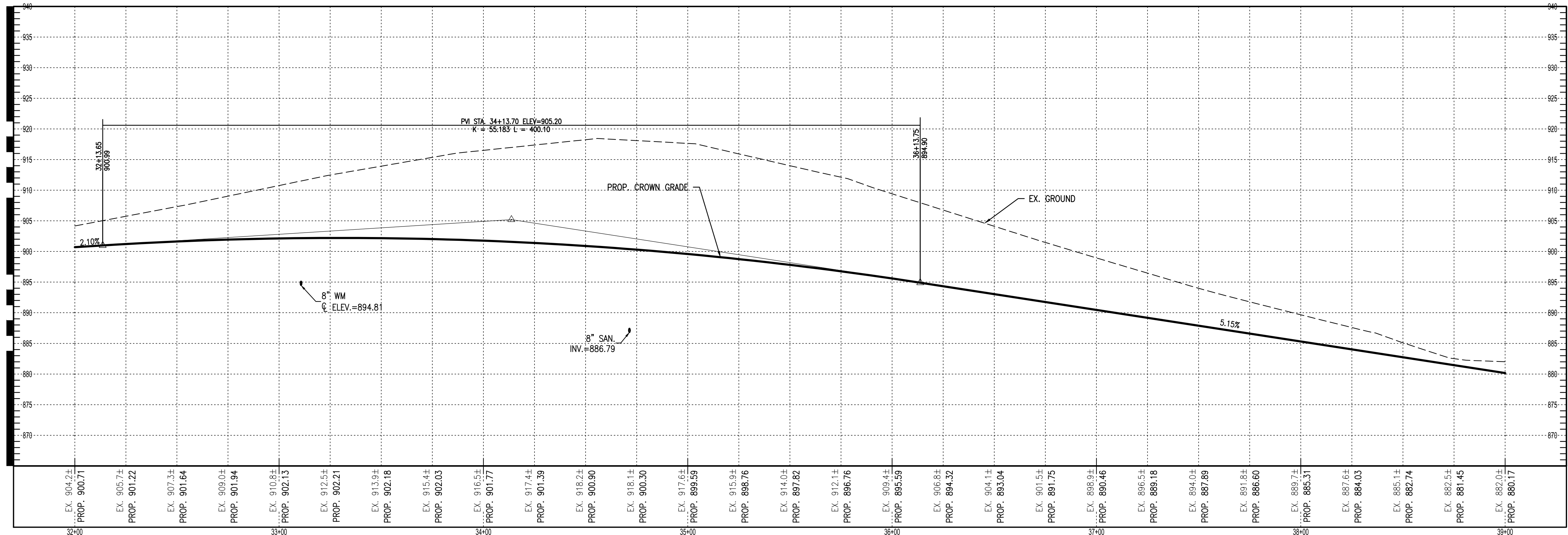
- EXTENTS OF DITCH/STREAM
- EDGE OF PAVEMENT - PROPOSED
- SHOULDER - PROPOSED
- R/W --- RIGHT-OF-WAY LINE - PROPOSED
- GUARDRAIL - PROPOSED
- SA --- SANITARY LINE - PROPOSED
- W --- WATER LINE - PROPOSED

MATCH LINE - STA. 32+00 SEE SHEET 37



MATCH LINE - STA. 39+00 SEE SHEET 39

MATCH LINE - STA. 32+00 SEE SHEET 37



MATCH LINE - STA. 39+00 SEE SHEET 39



NO.	PLAN	ISSUE/REVISION	DATE	DRAWN	ELB	CHECKED	DATE
							5/22/2020

NO.	PLAN	ISSUE/REVISION	DATE	DRAWN	ELB	CHECKED	DATE

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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
PLAN & PROFILE

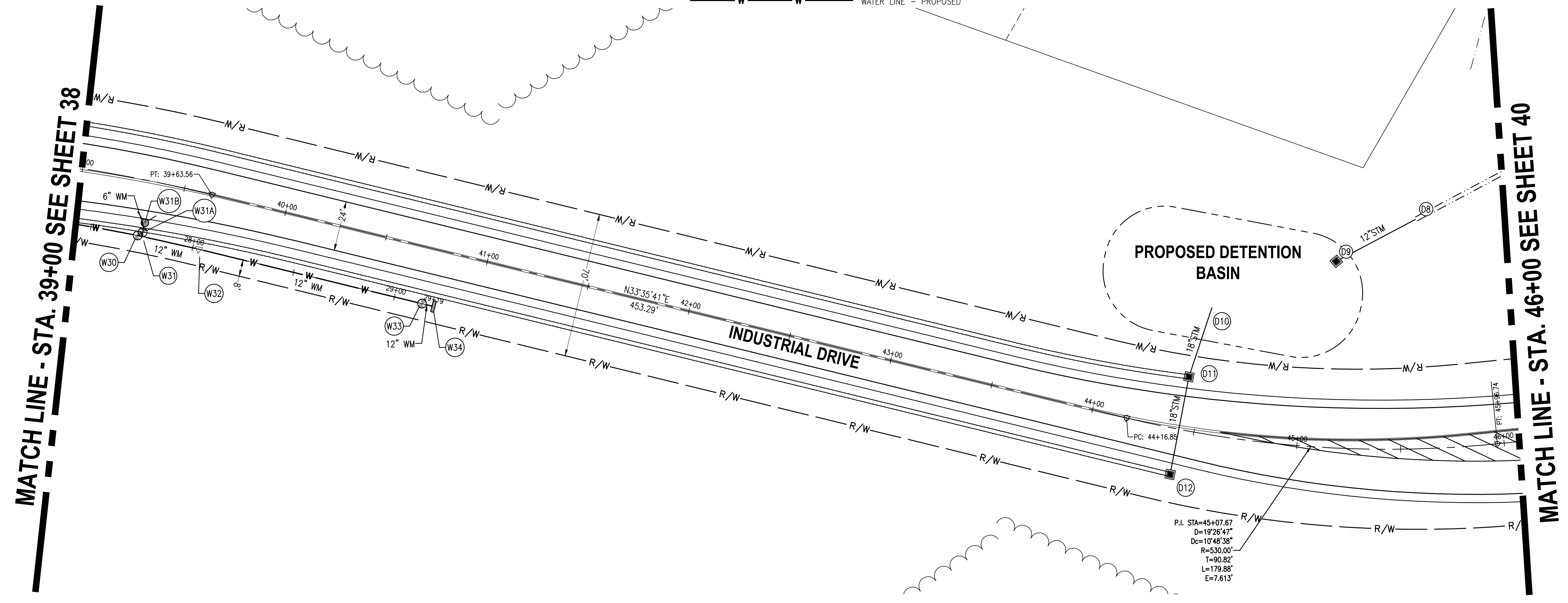
JOB NUMBER:
ZAN012

38

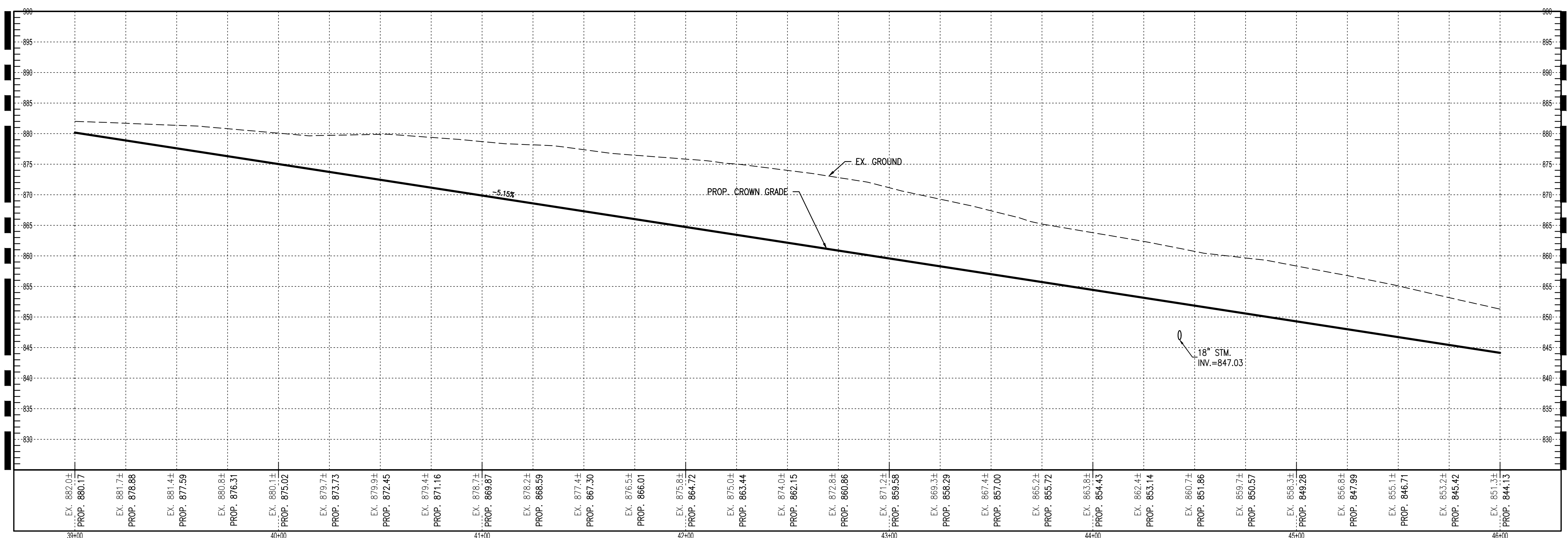
W31B	FIRE HYDRANT	STA. 39+34.60, 20.4K INDUSTRIAL DR	D8	HW-2.1	STA. 45+61.24, -110.7L INDUSTRIAL C
W32	FND HORI7 CURVF	STA. 39+63.56, 27.0R INDUSTRIAL DR	D9	CB2-3	STA. 45+13.99, -89.8L INDUSTRIAL DR
W33	12" GATE VALVE	STA. 40+74.19, 27.0R INDUSTRIAL DR	D10	HW-2.1	STA. 44+47.82, -61.0L INDUSTRIAL DR
W34	PLUG & THRUST BLOCK	STA. 40+79.19, 27.0R INDUSTRIAL DR	D11	CB2-3	STA. 44+42.61, -25.7L INDUSTRIAL DR
			D12	CB2-3	STA. 44+42.61, 22.1R INDUSTRIAL DR.

LEGEND

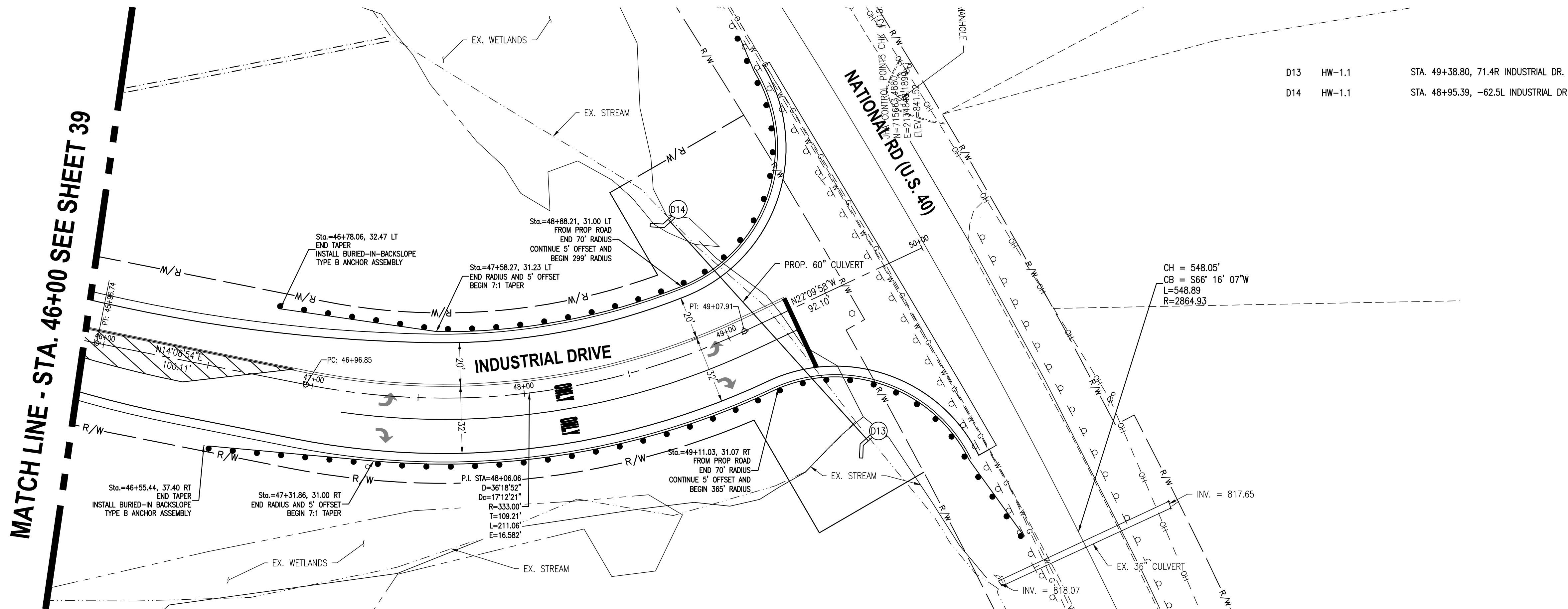
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- EDGE OF PAVEMENT - PROPOSED
- SHOULDER - PROPOSED
- RIGHT-OF-WAY LINE - PROPOSED
- GUARDRAIL - PROPOSED
- SANITARY LINE - PROPOSED
- WATER LINE - PROPOSED



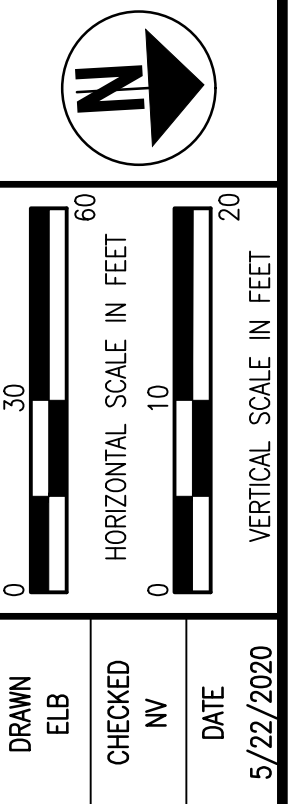
MATCH LINE - STA. 46+00 SEE SHEET 38



DRAWN: ELB CHECKED: INV DATE: 5/22/2020	PLAN ISSUE/REVISION NO.
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PLAN & PROFILE	
JOB NUMBER: ZAN012	
39	



D13 HW-1.1 STA. 49+38.80, 71.4R INDUSTRIAL DR.
D14 HW-1.1 STA. 48+95.39, -62.5L INDUSTRIAL DR.

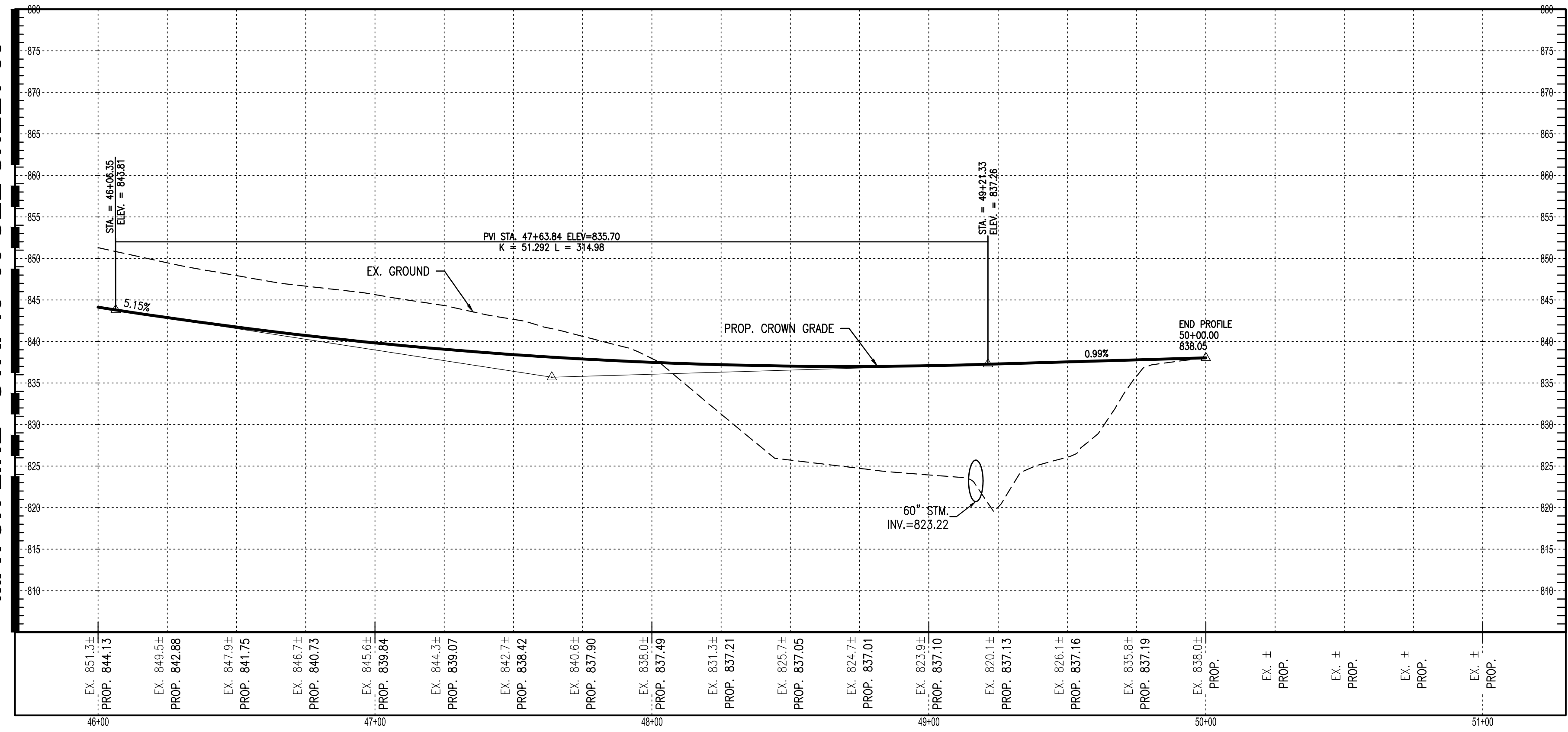


NO.	PLAN ISSUE/REVISION	DATE	DRAWN	CHECKED	DATE
			ELB	INV	5/22/2020

LEGEND

- EXTENTS OF DITCH/STREAM
- EDGE OF PAVEMENT - PROPOSED
- SHOULDER - PROPOSED
- R/W --- RIGHT-OF-WAY LINE - PROPOSED
- GUARDRAIL - PROPOSED
- SA --- SANITARY LINE - PROPOSED
- W --- WATER LINE - PROPOSED

MATCH LINE - STA. 46+00 SEE SHEET 39

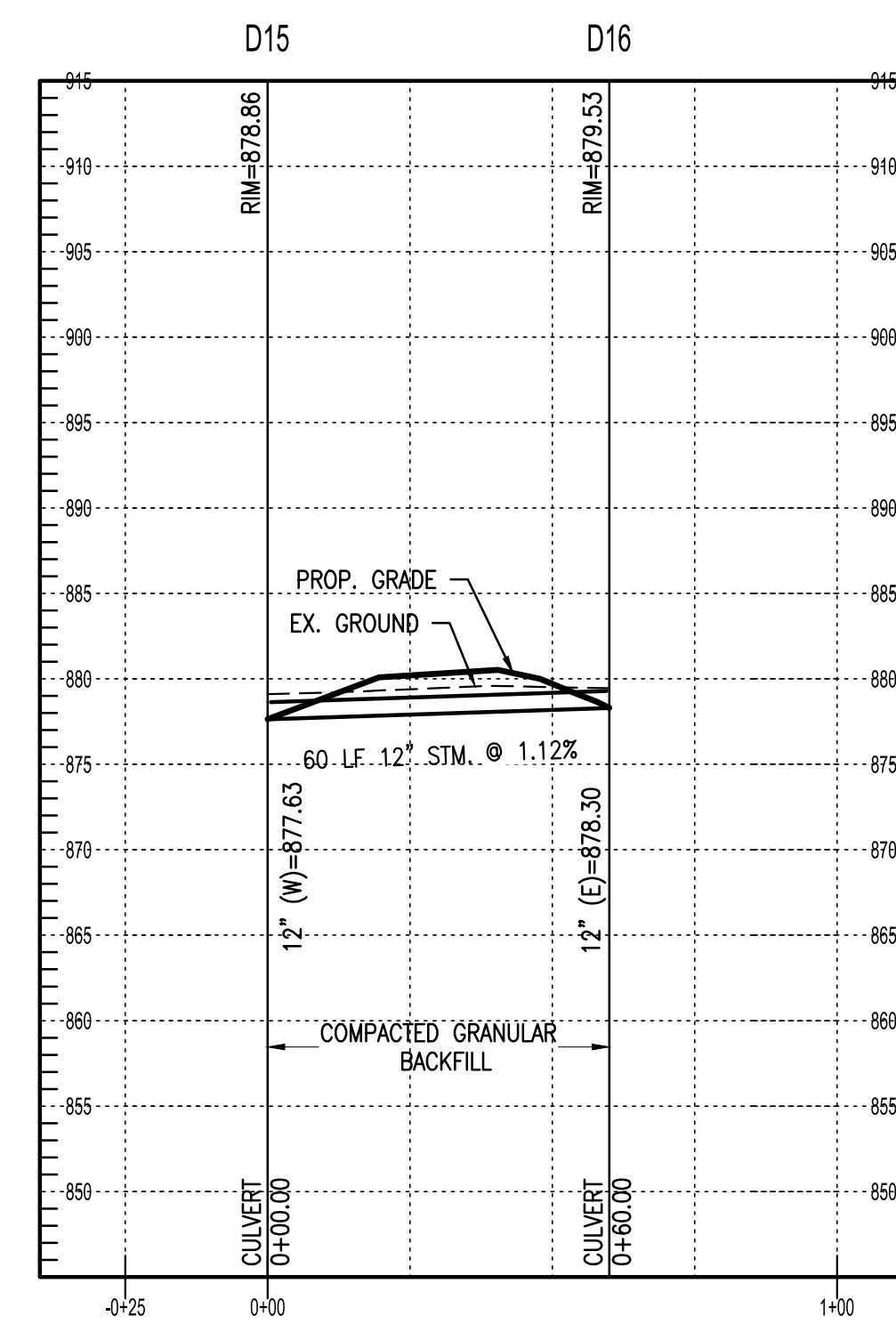
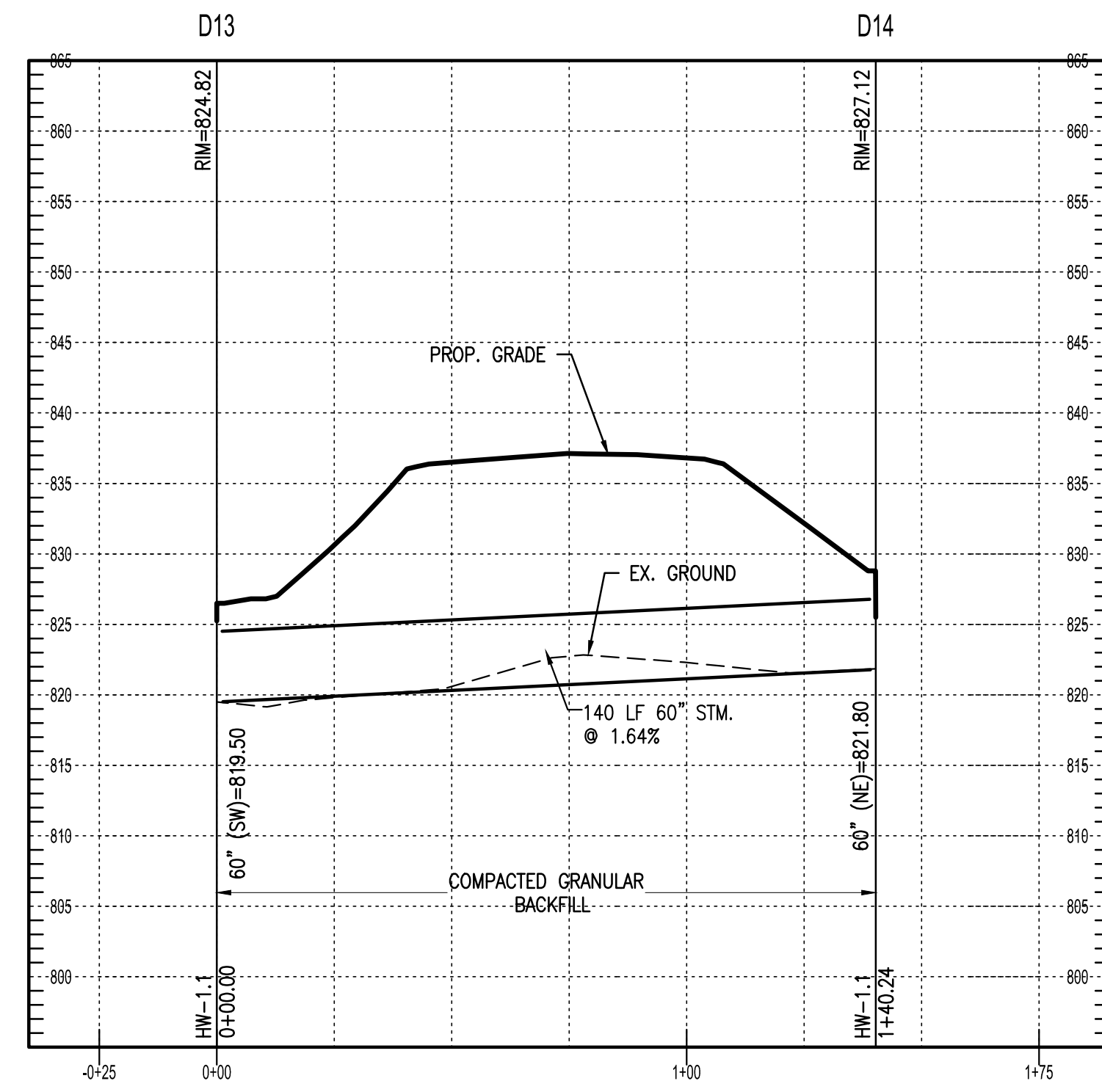
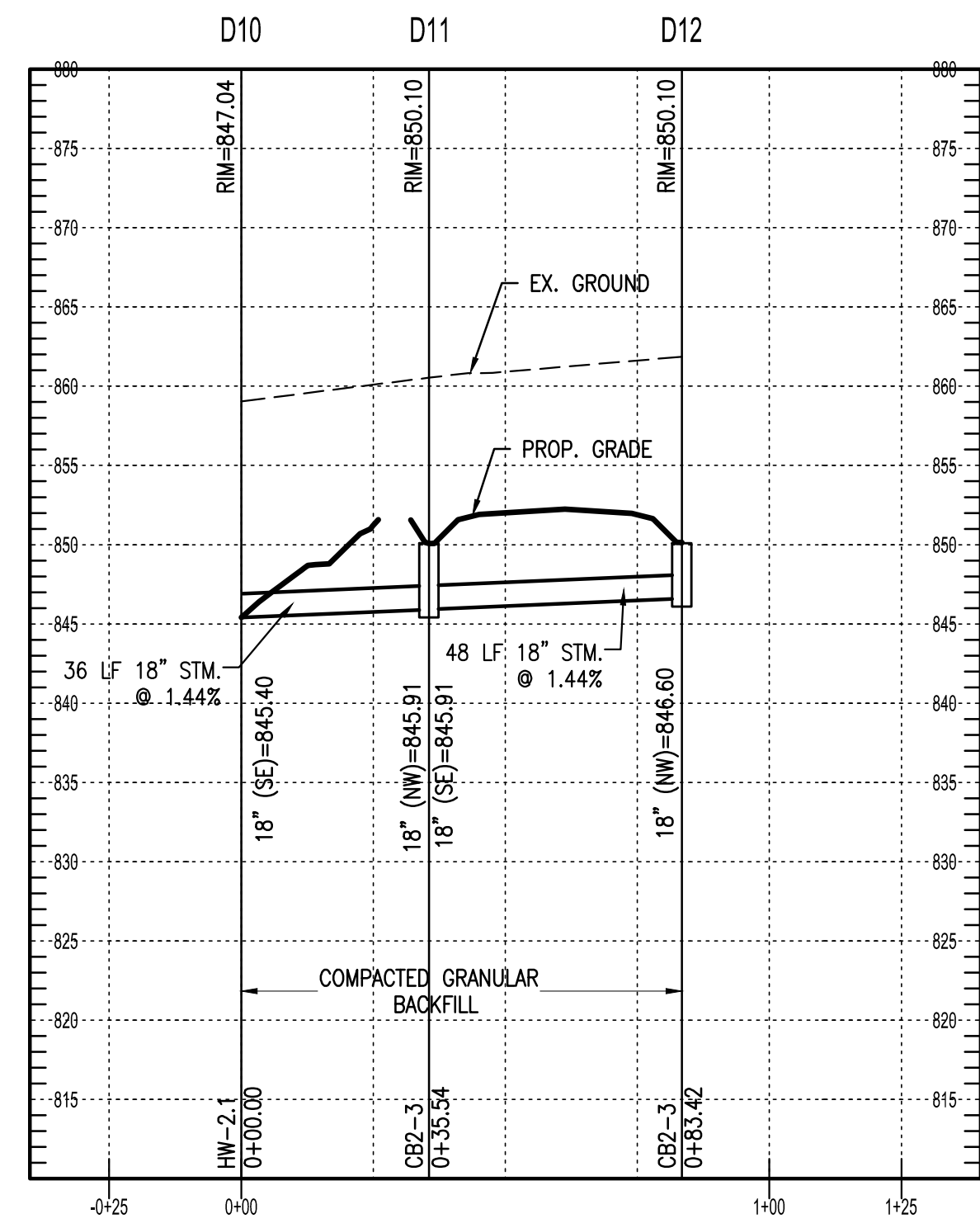
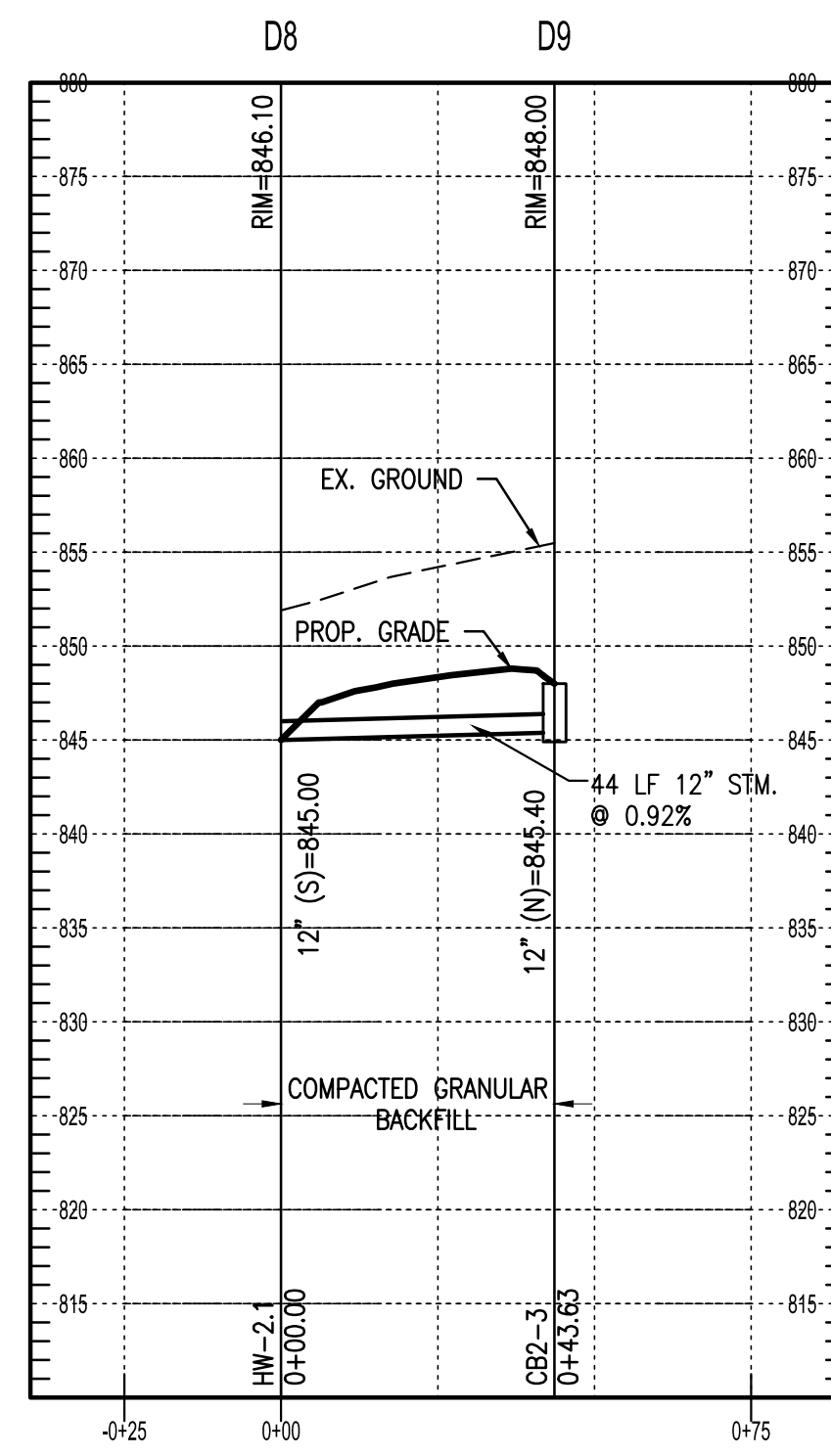
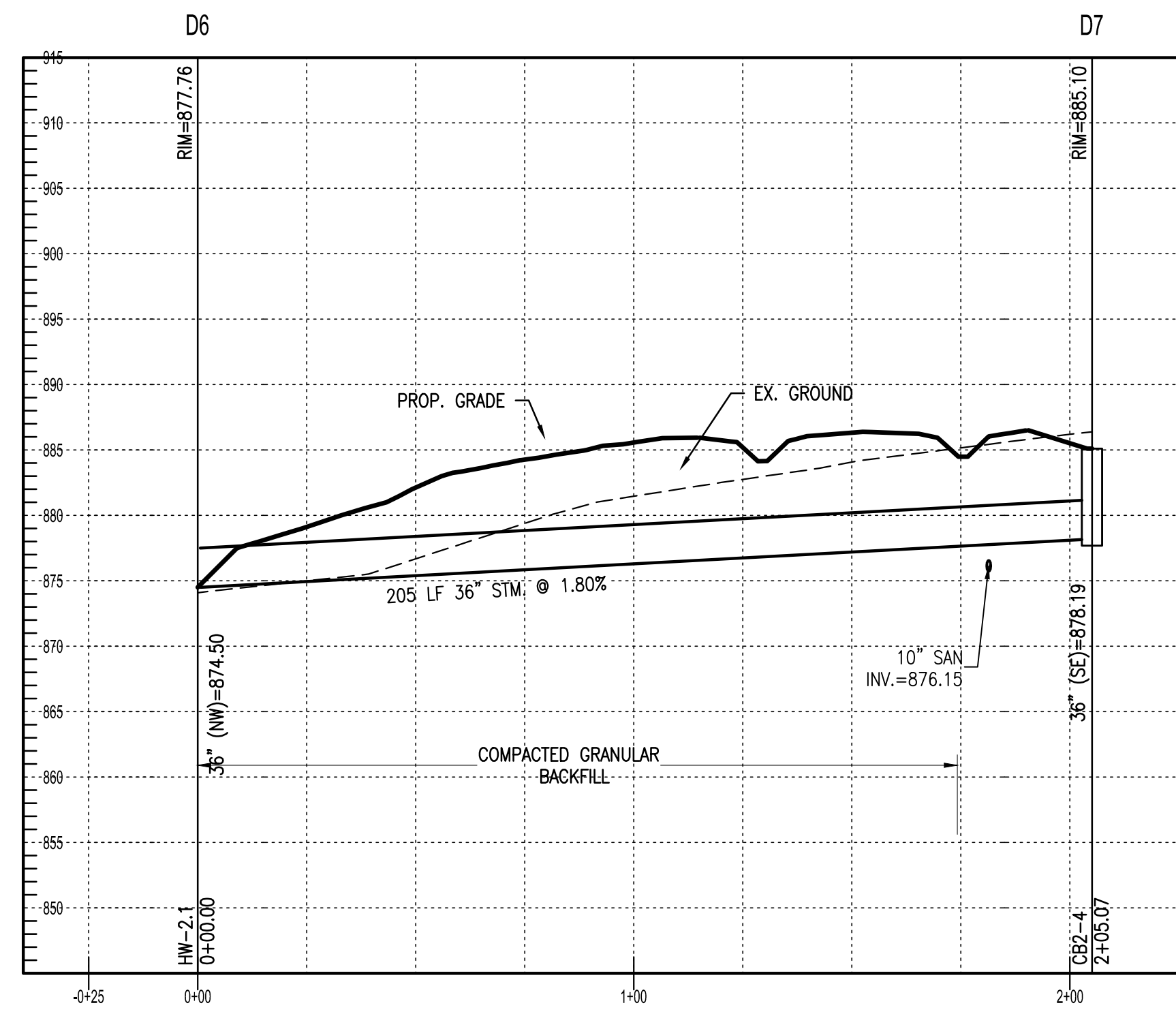
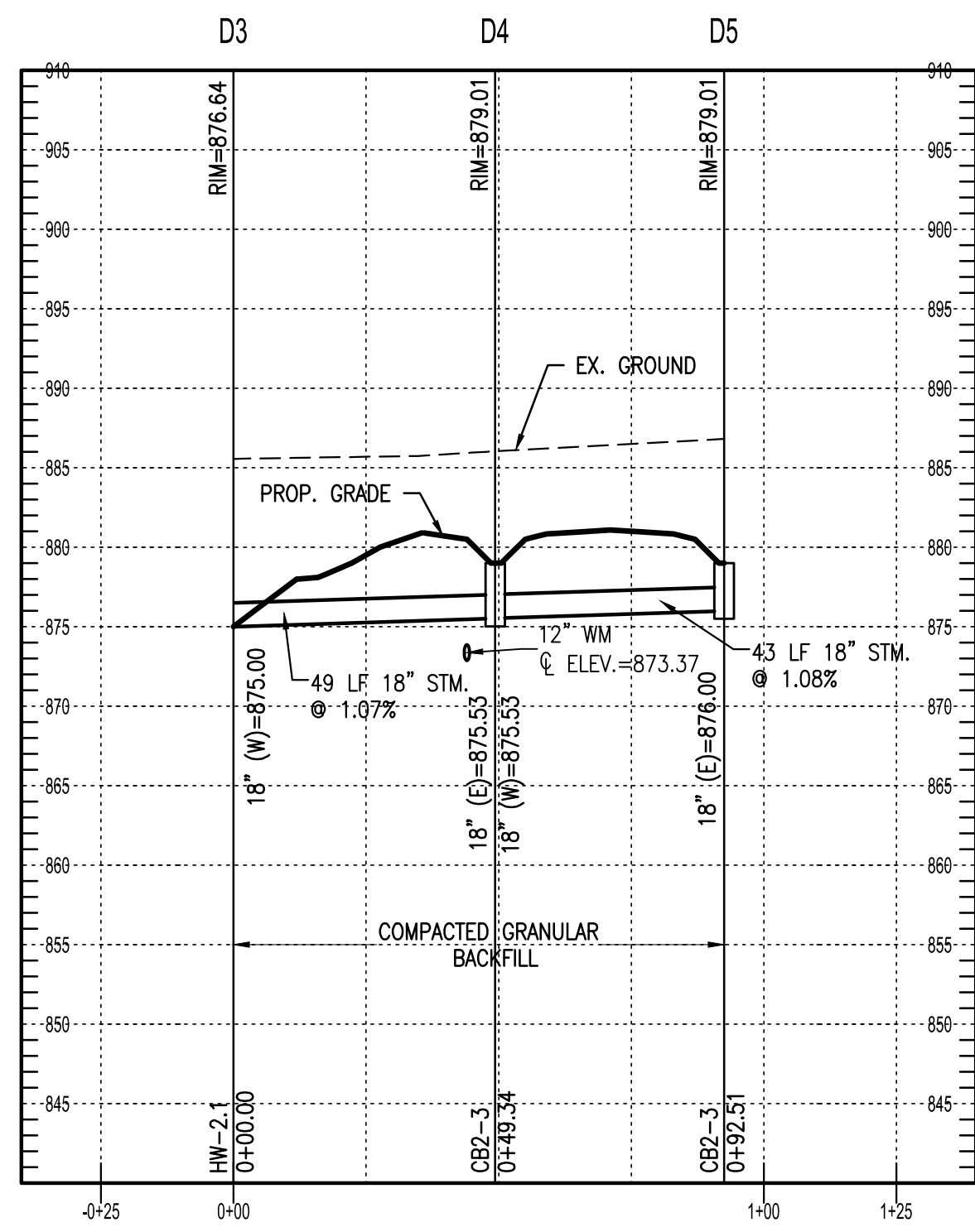
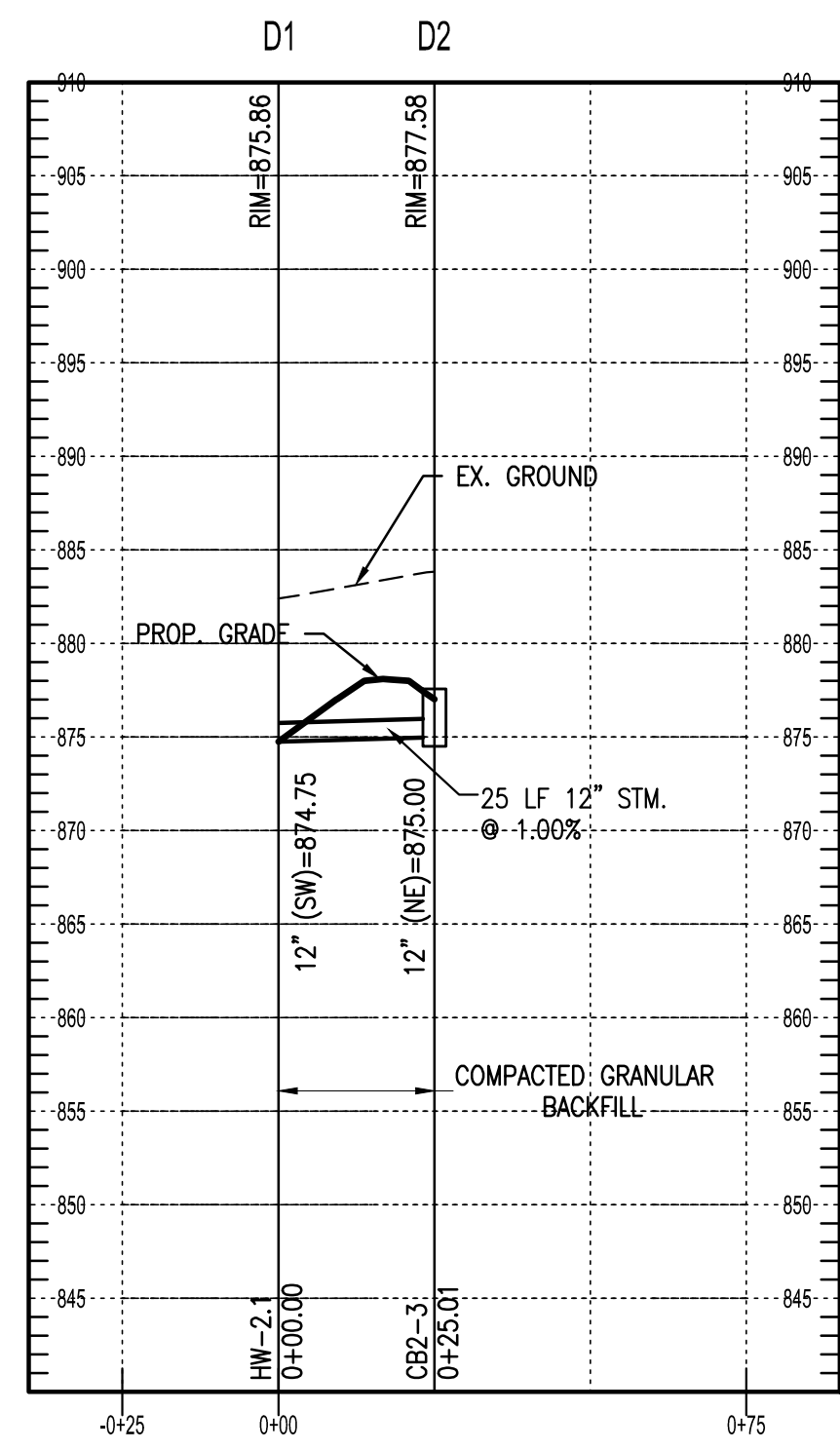


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ZANESVILLE, MUSKINGUM COUNTY, OHIO
PLAN & PROFILE

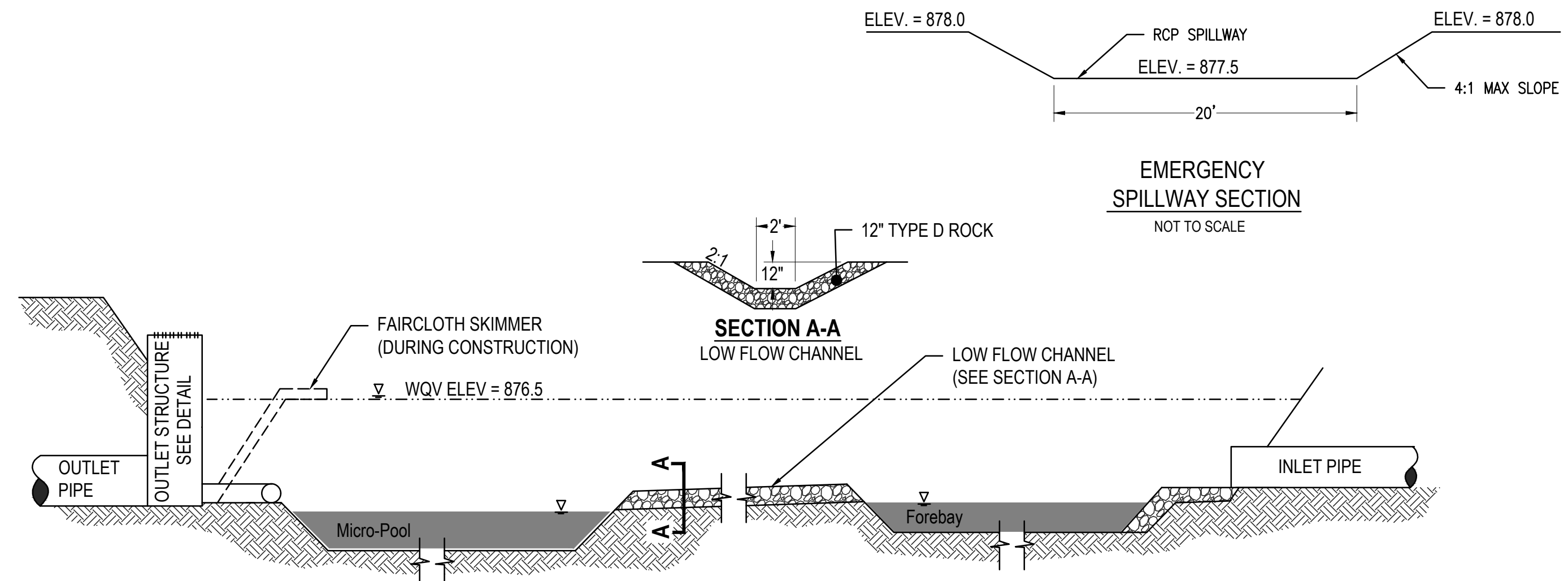
JOB NUMBER:
ZAN012



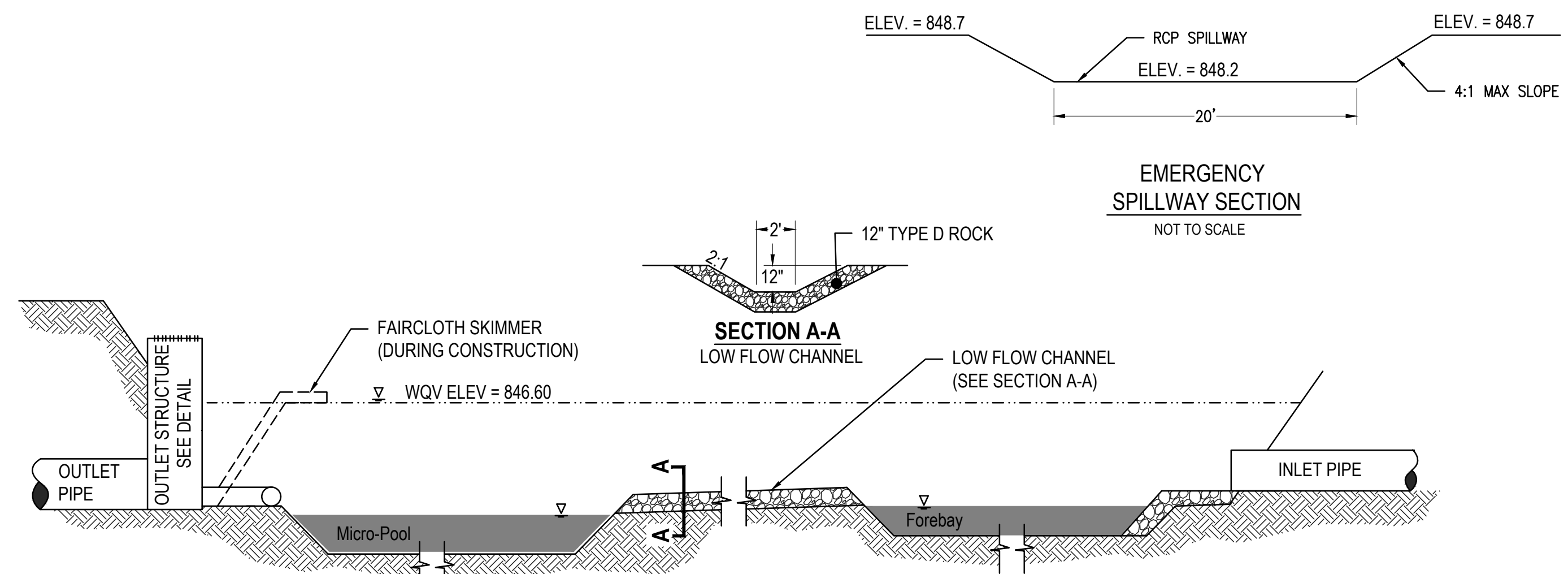
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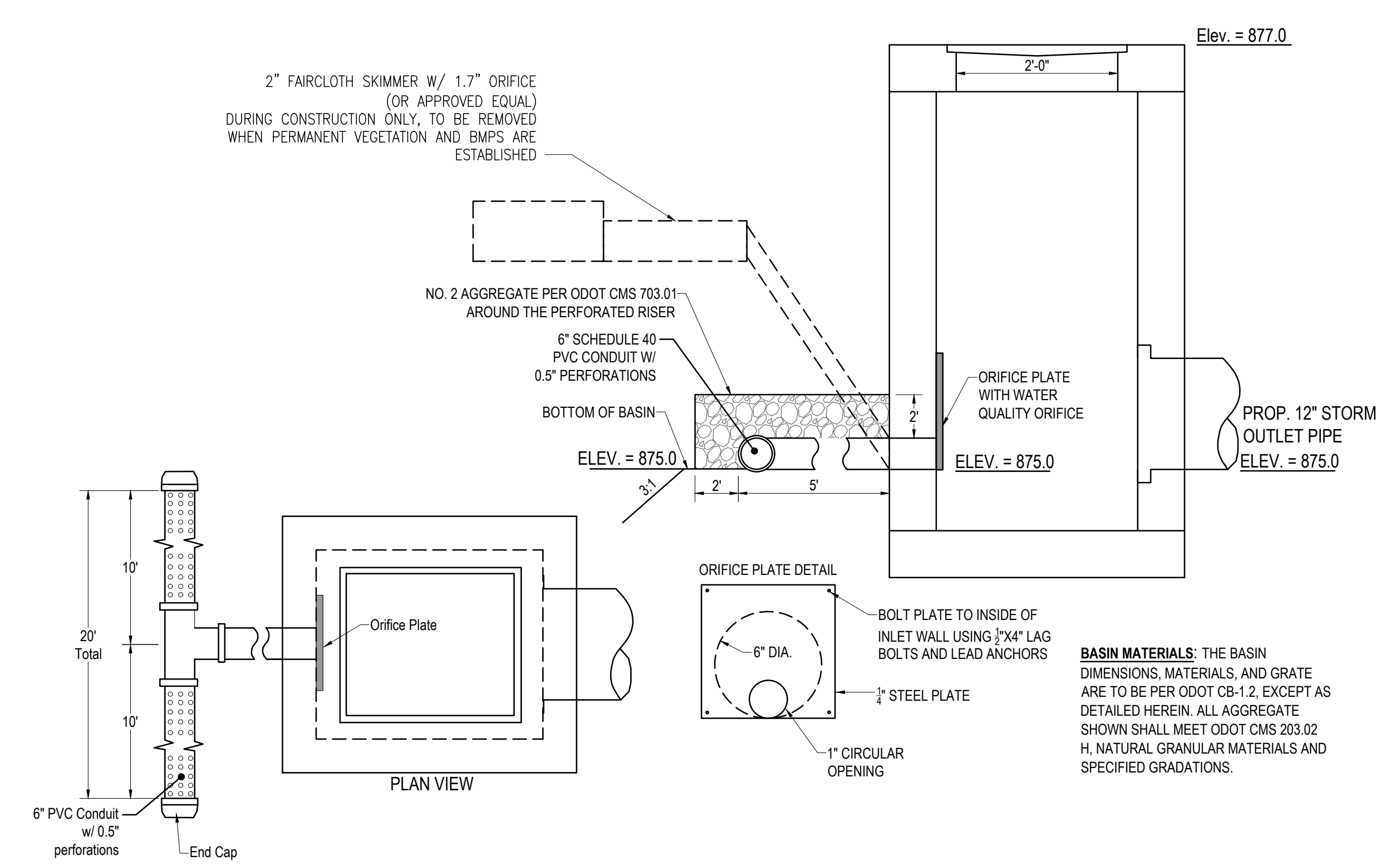
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DRAWN	ELB	CHECKED	INW	DATE	5/22/2020
PLAN	ISSUE/REVISION	DATE			
NO.					
<small>HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43885 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com</small>					
<h1 style="margin: 0;">HULL</h1> <p style="margin: 0;">Environment / Energy / Infrastructure</p>					
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO DRAINAGE PROFILES & DETAILS					
JOB NUMBER:					
ZAN012					
41					



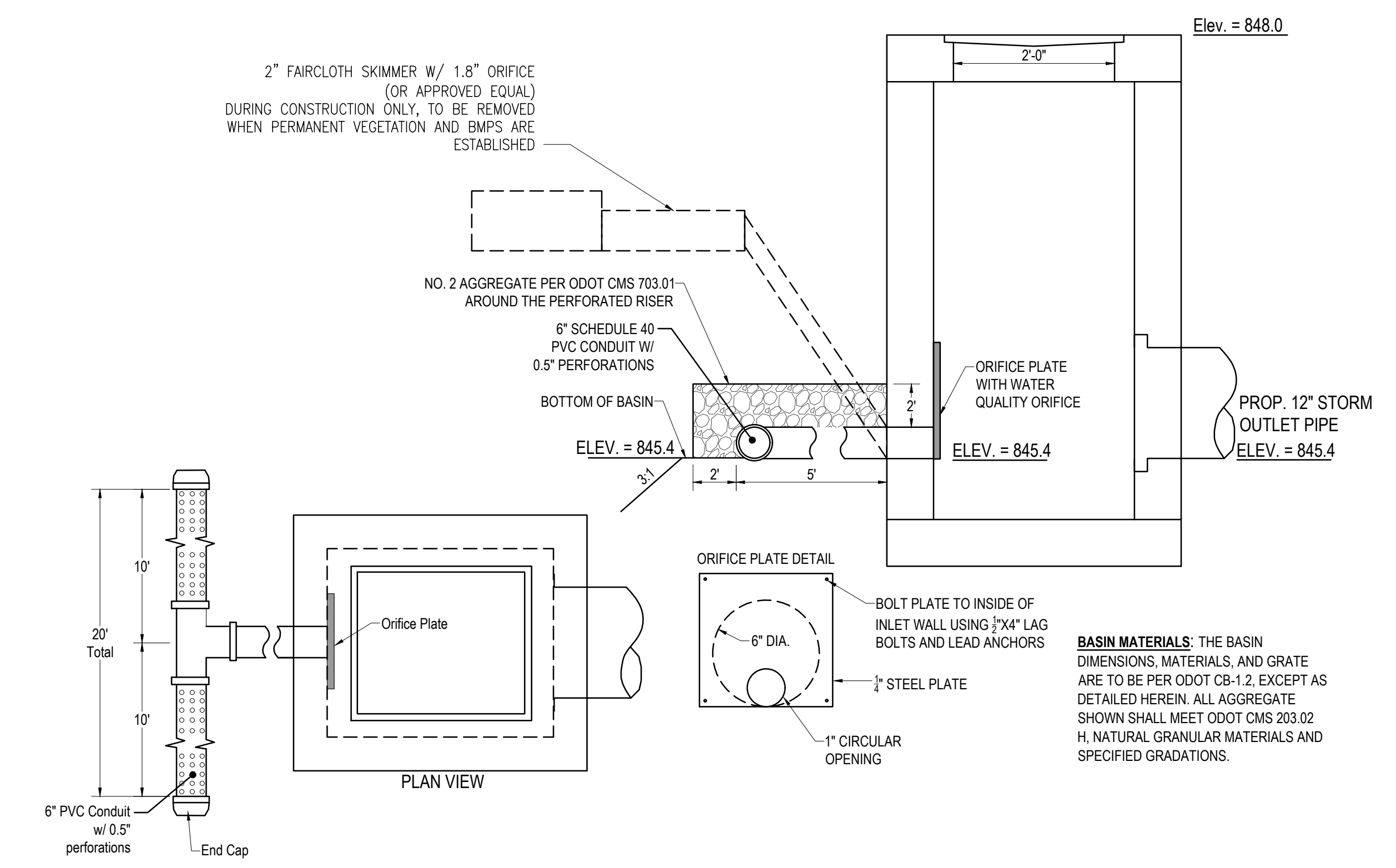
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DR2 NORTH DETENTION BASIN DETAIL NOT TO SCALE



D1 SOUTH DETENTION BASIN OUTLET STRUCTURE Not to Scale



D2 NORTH DETENTION BASIN OUTLET STRUCTURE Not to Scale

DRAWN	ELB	CHECKED	DATE
			5/22/2020

DATE	ISSUE/REVISION

NO.	DATE	ISSUE/REVISION

NO.	DATE	ISSUE/REVISION

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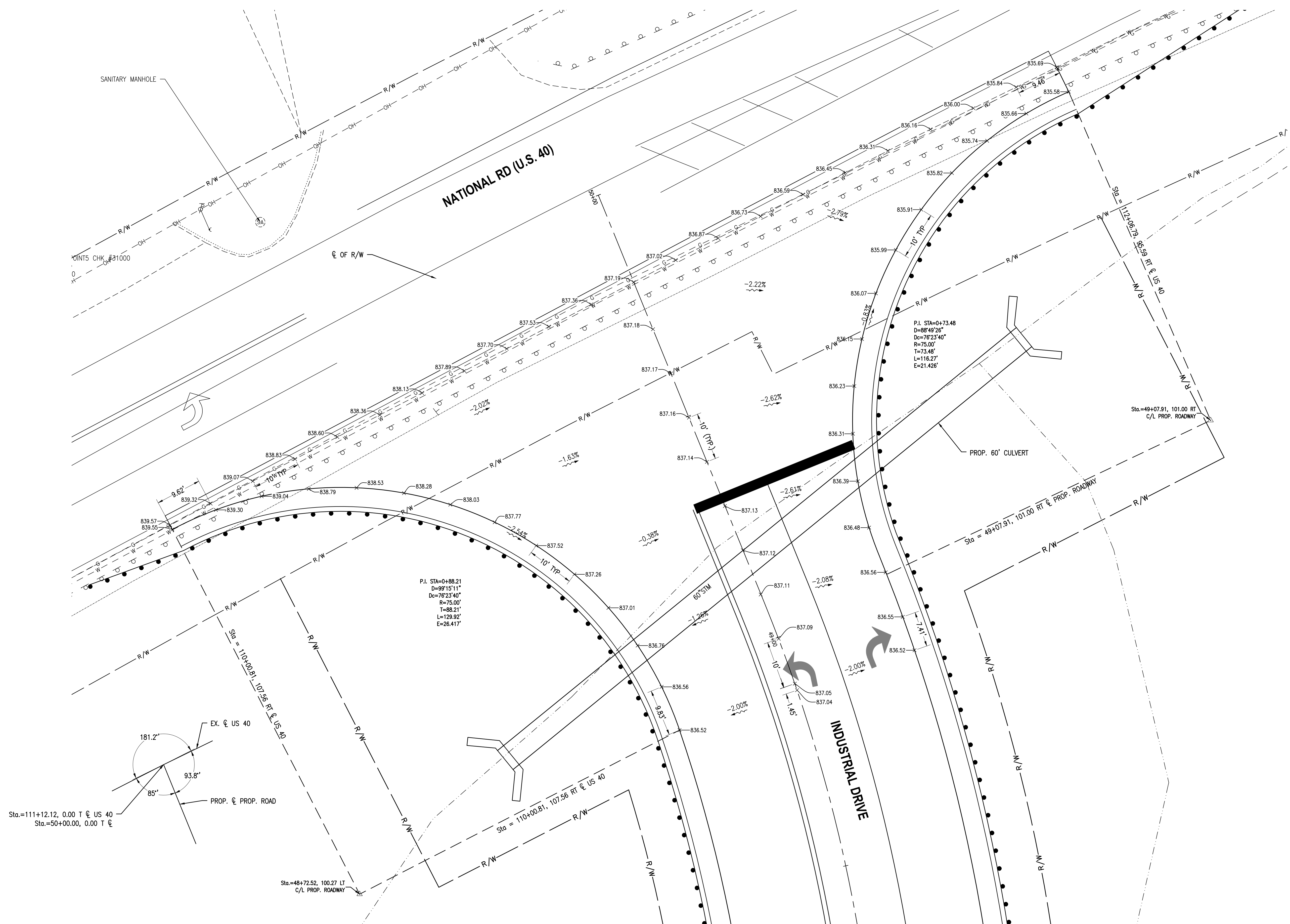
JOB NUMBER:	ZAN012
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
DRAINAGE DETAILS

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DRAWN	ELB	CHECKED	INW	DATE	5/22/2020
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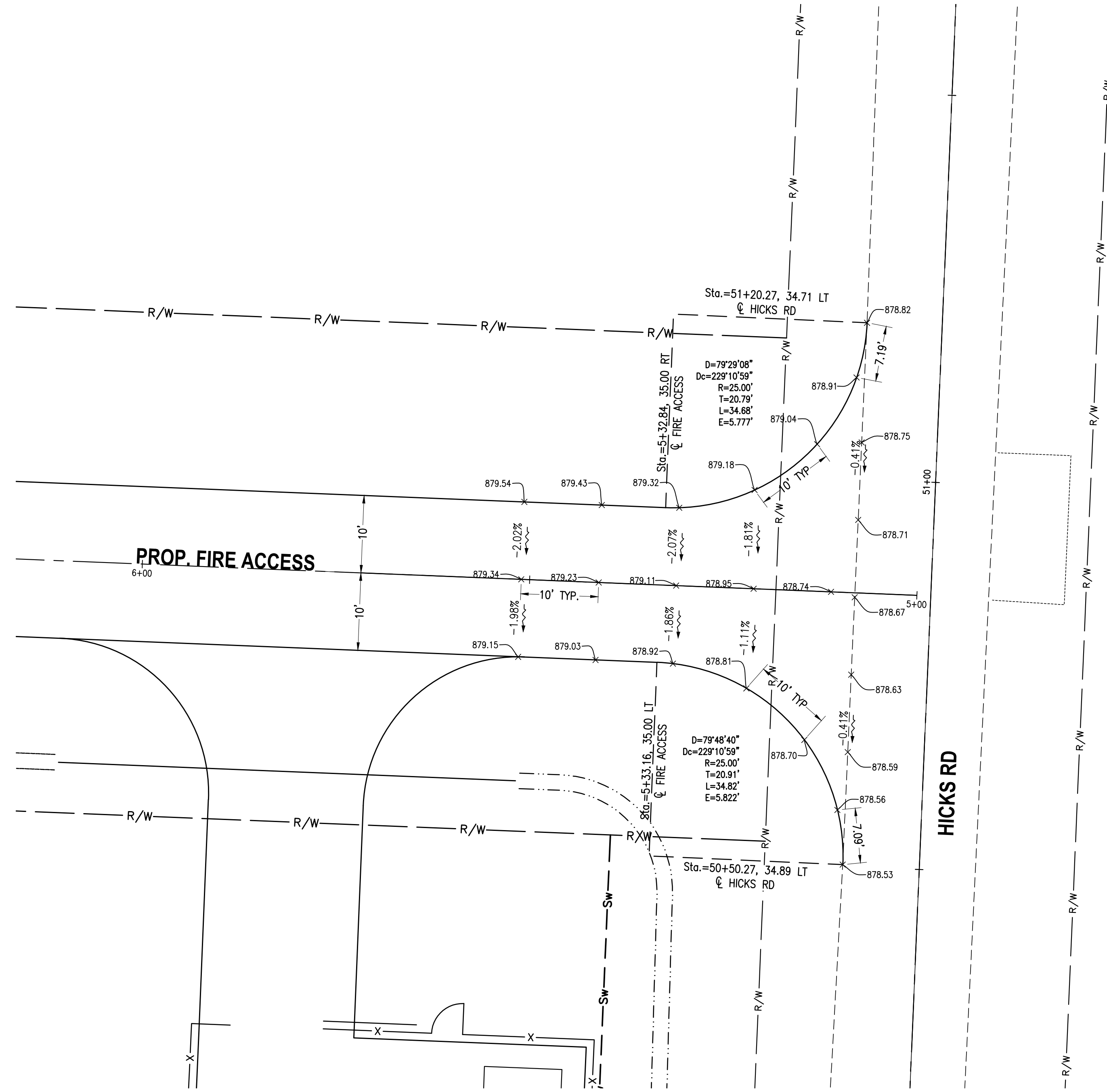
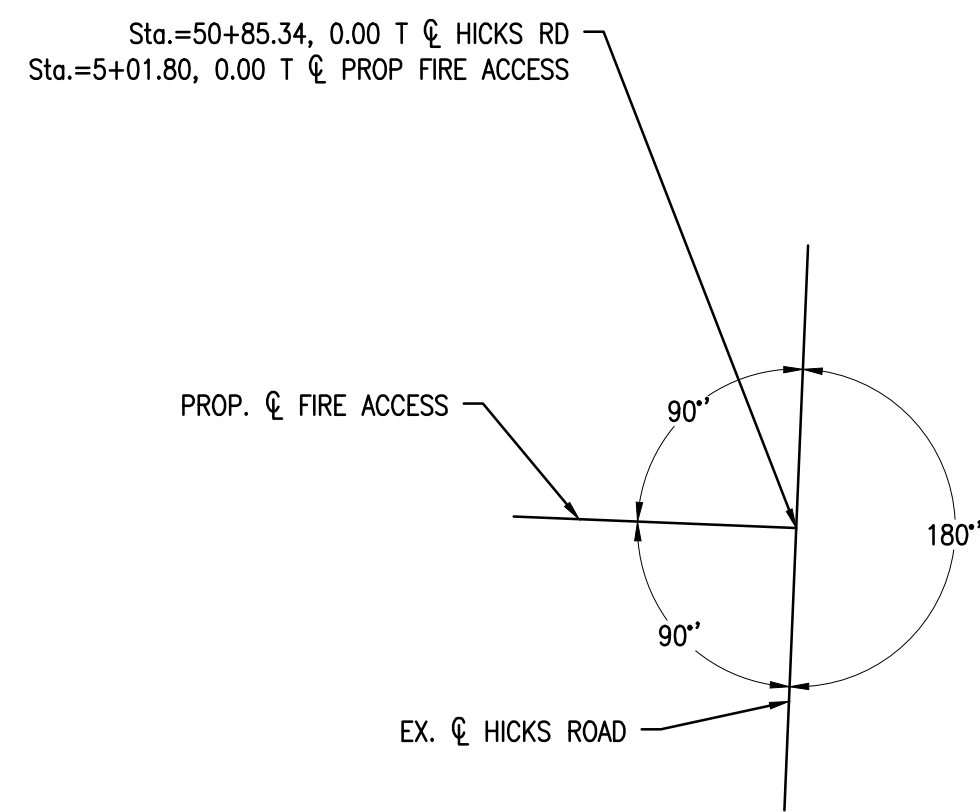
NO.	DATE	PLAN ISSUE/REVISION

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59 Grant Street
Mansfield, Ohio 44880-4551
Tel: (740) 344-8888
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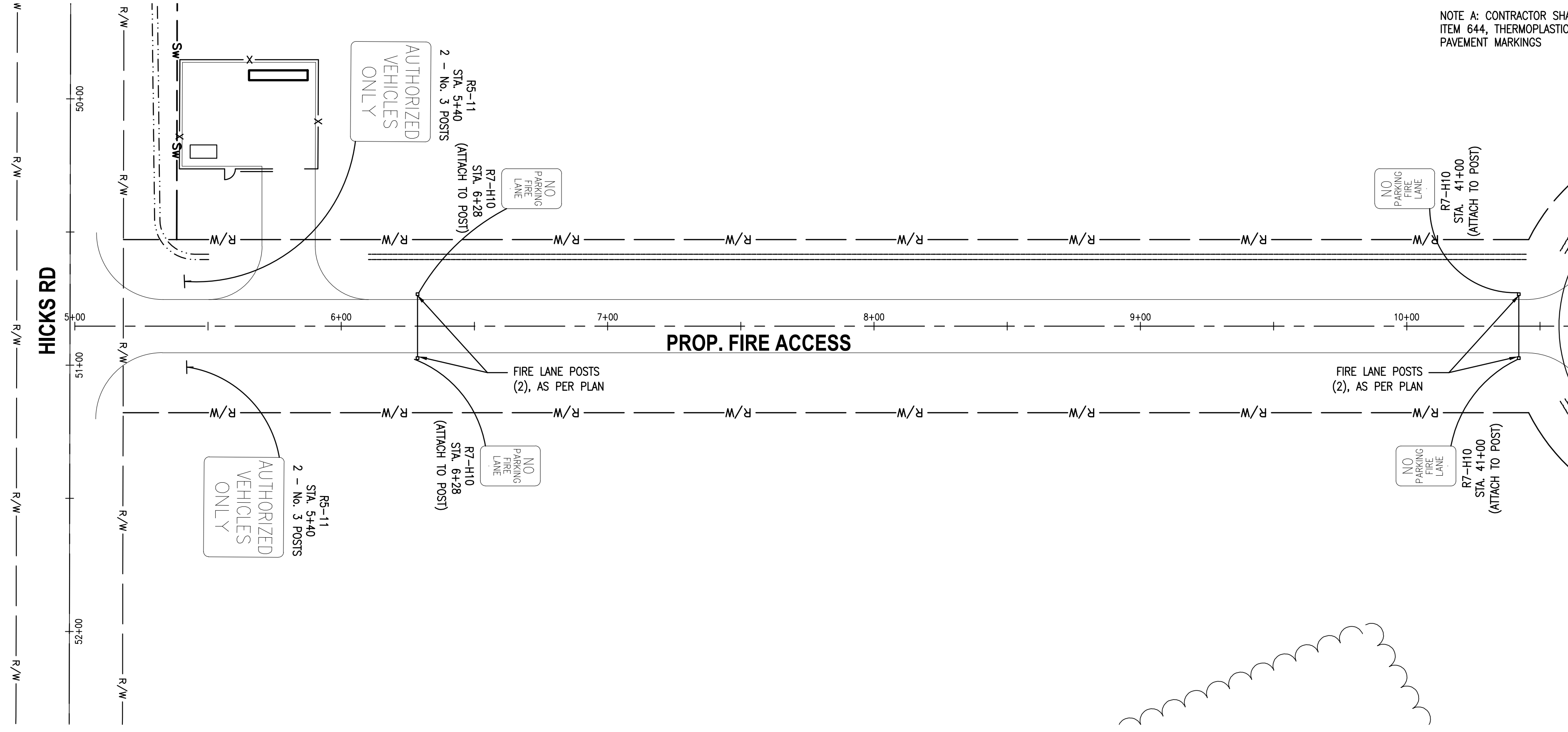


CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
US40 INTERSECTION DETAIL

JOB NUMBER:
ZAN012



<p>HORIZONTAL SCALE IN FEET</p>	
DRAWN ELB	CHECKED IN
DATE	DATE 5/22/2020
PLAN ISSUE/REVISION	
NO.	NO.
HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, Ohio 43895 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com	
<h1 style="text-align: center;">HULL</h1> Environment / Energy / Infrastructure	
CONSTRUCTION PLANS: <h2 style="text-align: center;">INDUSTRIAL DRIVE</h2> ZANESVILLE, MUSKINGUM COUNTY, OHIO <h3 style="text-align: center;">FIRE ACCESS INTERSECTION DETAIL</h3>	
JOB NUMBER: <h2 style="text-align: center;">ZAN012</h2>	
<h1 style="text-align: center;">44</h1>	



JOB NUMBER:
ZAN012

45

CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
PAVEMENT MARKINGS & SIGNAGE PLAN

HULL
Environment / Energy / Infrastructure

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59 Grant Street
Zanesville, OH 43885
Phone: (740) 344-5451
Fax: (740) 344-8899
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PLAN ISSUE/REVISION

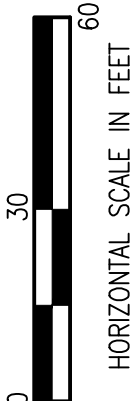
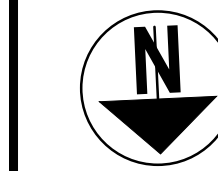
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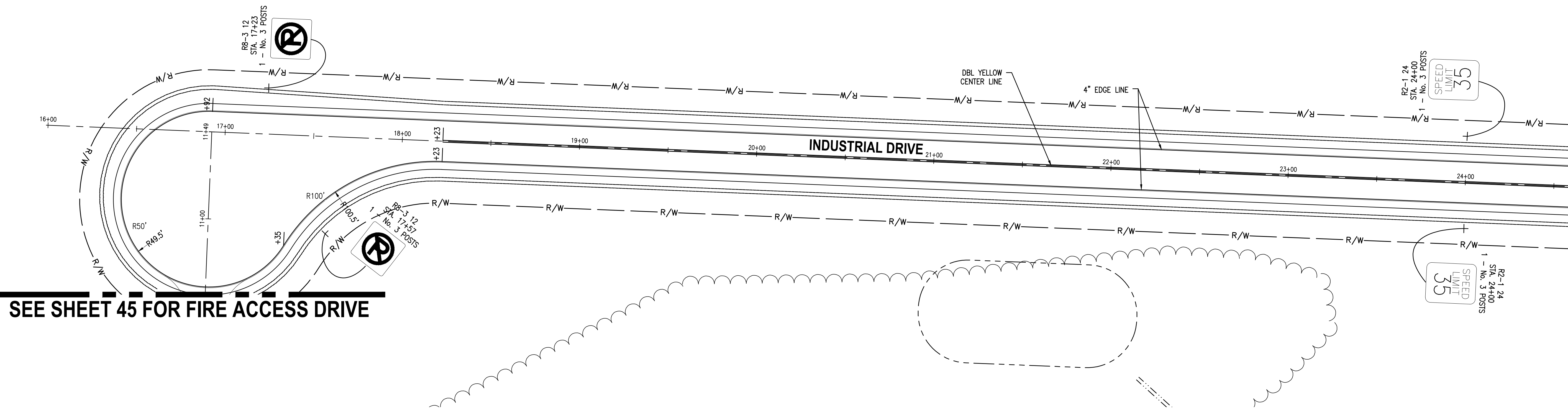
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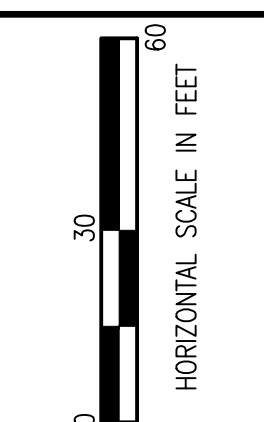
DATE

5/22/2020





NOTE A: CONTRACTOR SHALL UTILIZE ITEM 644, THERMOPLASTIC FOR ALL PAVEMENT MARKINGS



NO.	DATE	DESCRIPTION

NO.	DATE	DESCRIPTION

HULL & ASSOCIATES, Inc.
59 Grant Street
Zanesville, Ohio 43885
Phone: (740) 344-6651
Fax: (740) 344-8899
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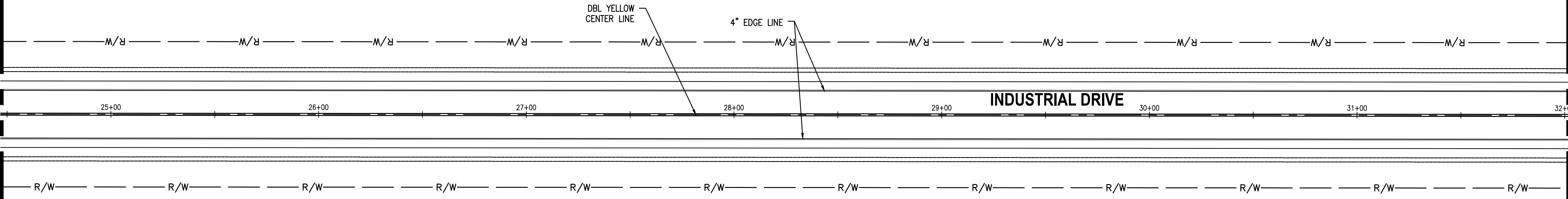


CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
PAVEMENT MARKINGS & SIGNAGE PLAN

JOB NUMBER:
ZAN012

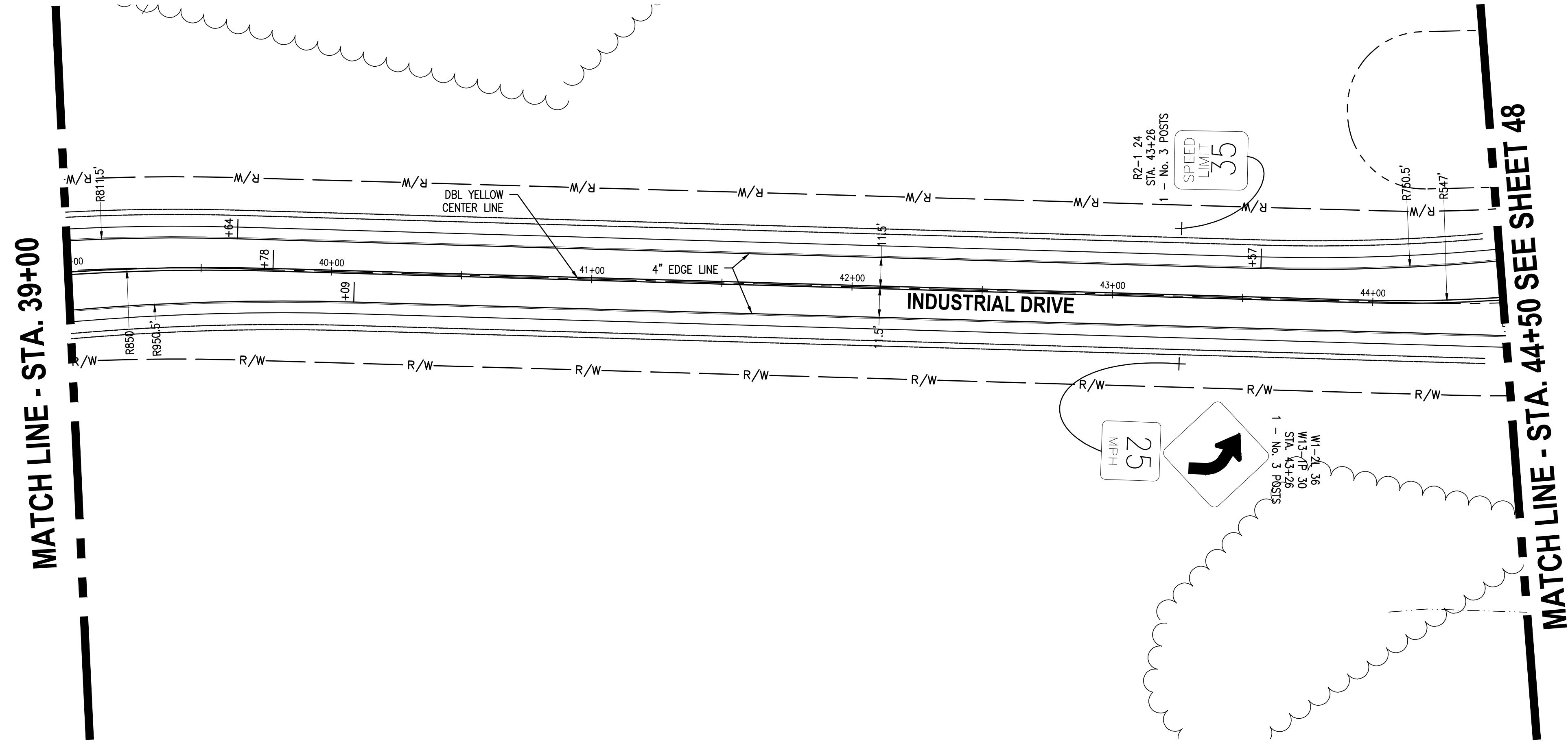
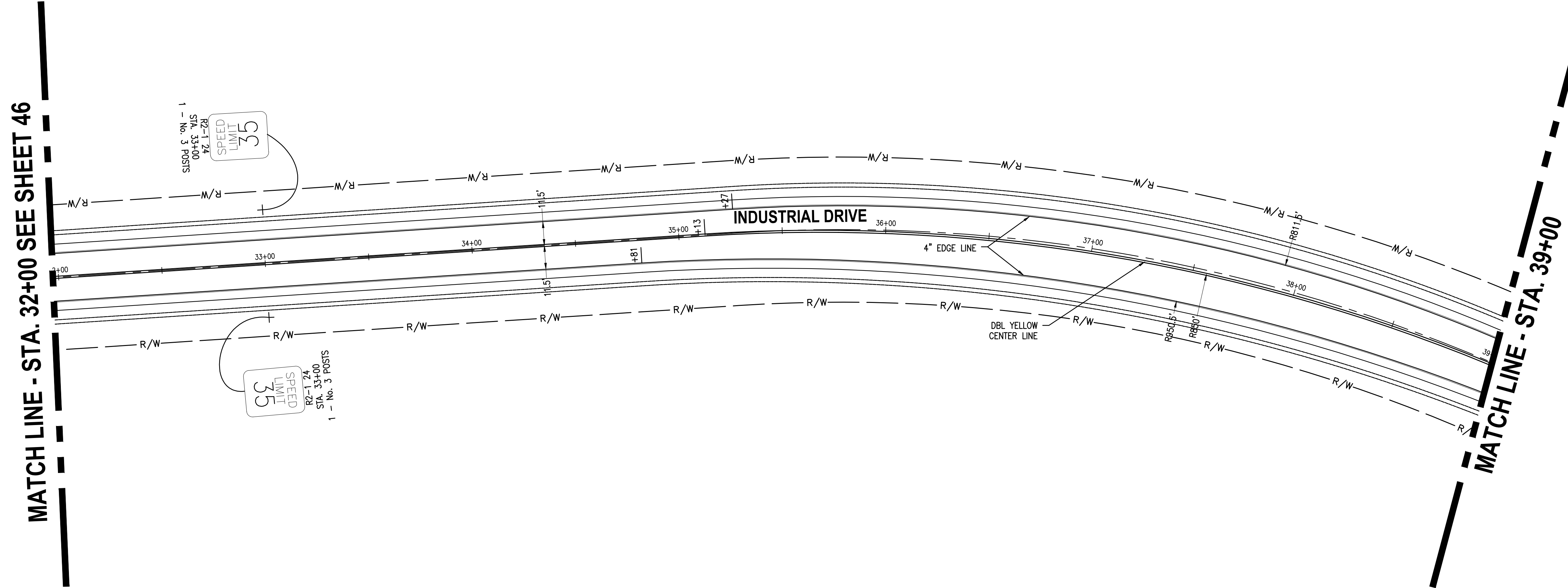
46



MATCH LINE - STA. 24+50



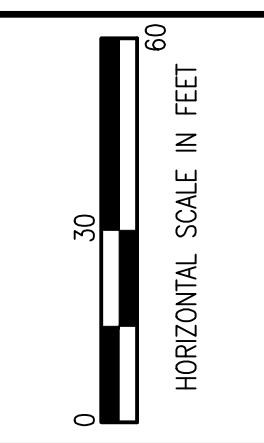
MATCH LINE - STA. 32+00 SEE SHEET 47

NOTE A: CONTRACTOR SHALL UTILIZE ITEM 644, THERMOPLASTIC FOR ALL PAVEMENT MARKINGS



	
	
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DATE 5/22/2020	PLAN ISSUE/REVISION
NO.	DATE
HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43895 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com	
HULL Environment / Energy / Infrastructure	
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO	
PAVEMENT MARKINGS & SIGNAGE PLAN	
JOB NUMBER: ZAN012	
47	

NOTE A: CONTRACTOR SHALL UTILIZE ITEM 644, THERMOPLASTIC FOR ALL PAVEMENT MARKINGS



NO.	DATE	PLAN ISSUE/REVISION

DATE	
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DATE	
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DATE	
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DATE	
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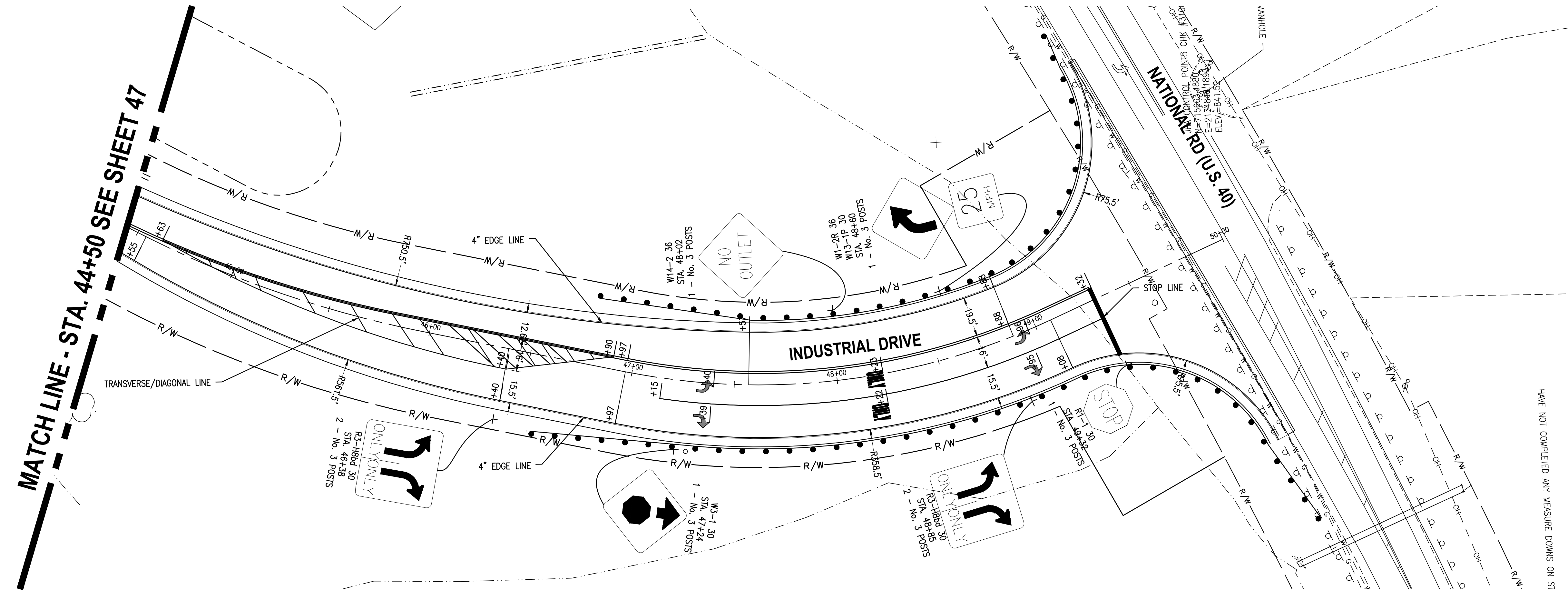
HULL & ASSOCIATES, Inc.
59 Grant Street
Zanesville, OH 43906
Phone: (740) 344-5451
Fax: (740) 344-8899
www.hullinc.com



CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
PAVEMENT MARKINGS & SIGNAGE PLAN

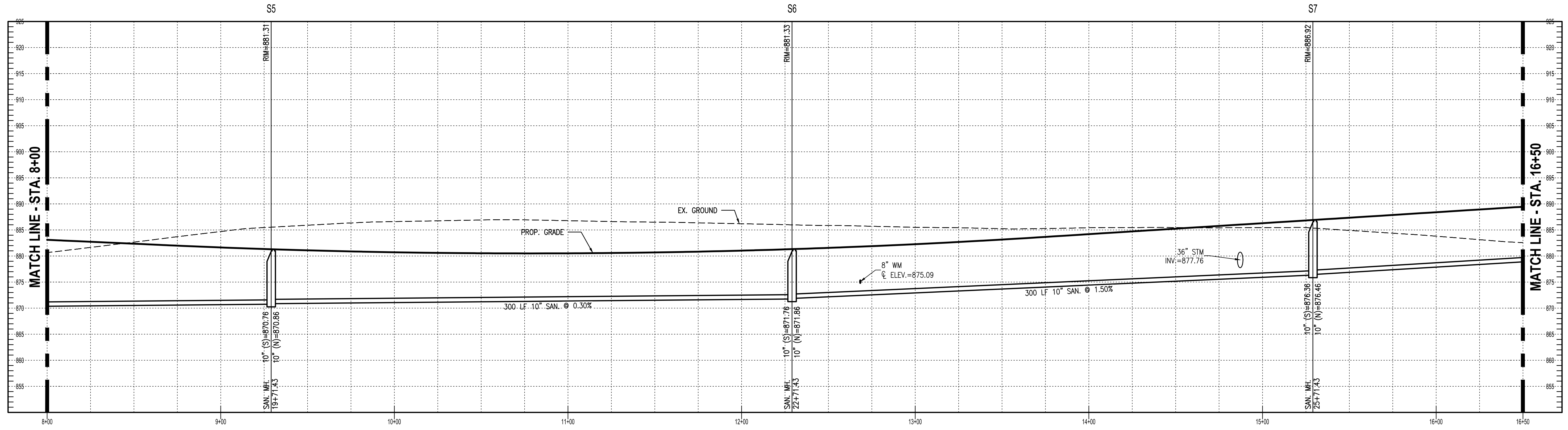
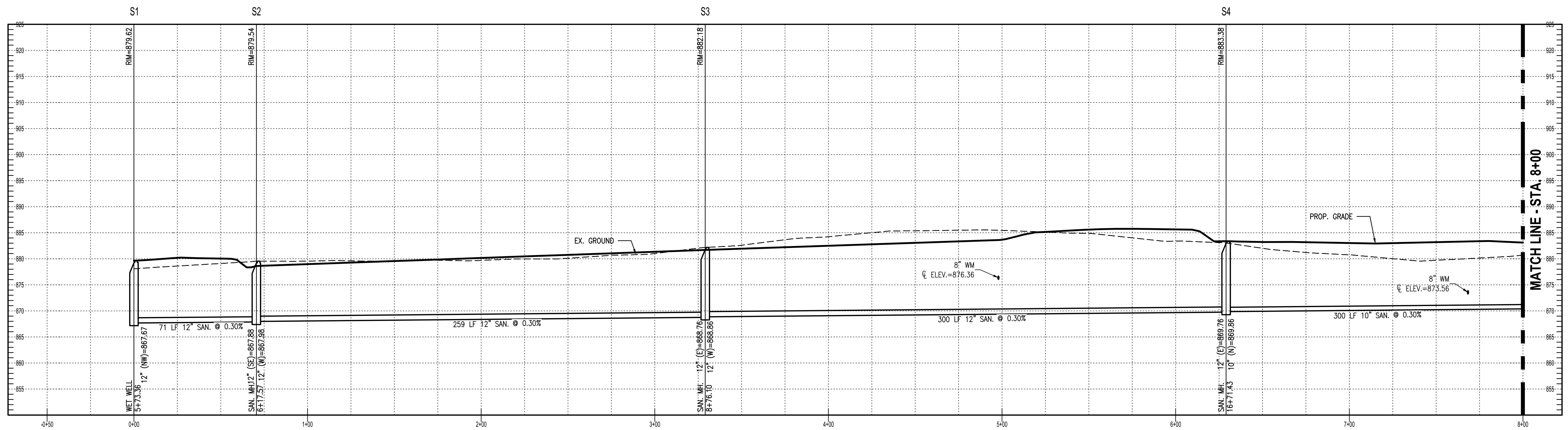
JOB NUMBER:
ZAN012

48



HAVE NOT COMPLETED ANY MEASURE DOWNS ON SITE

MATCH LINE - STA. 44+50 SEE SHEET 47



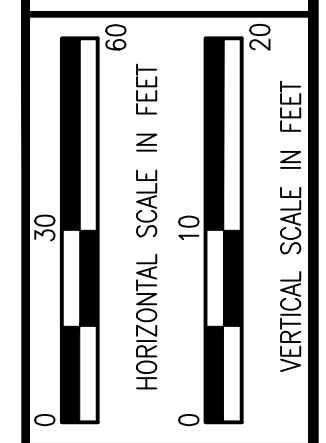
JOB NUMBER:
ZAN012

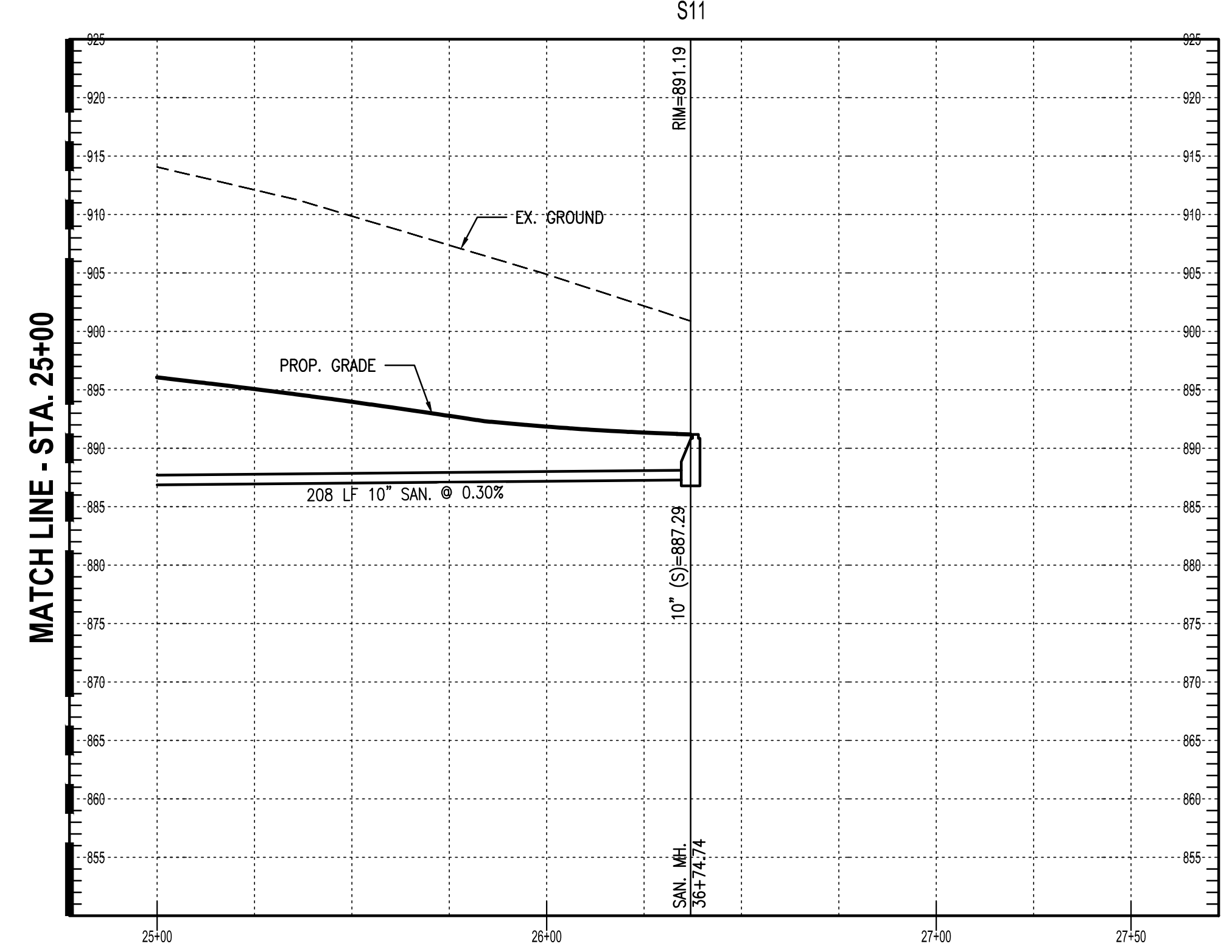
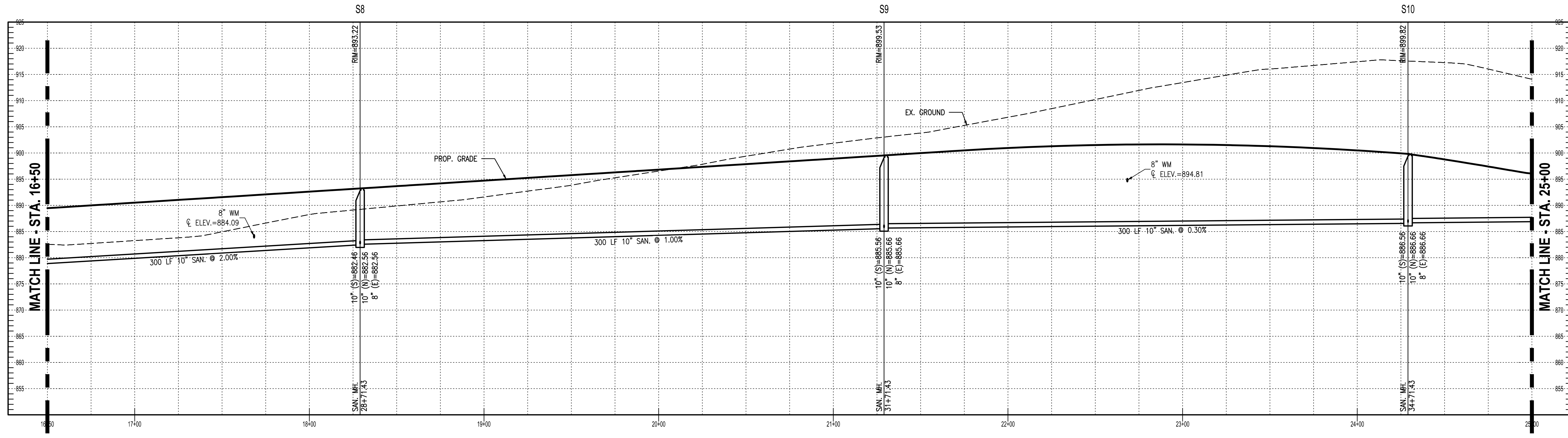
CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
PUBLIC SANITARY PROFILES

HULL
Environment / Energy / Infrastructure

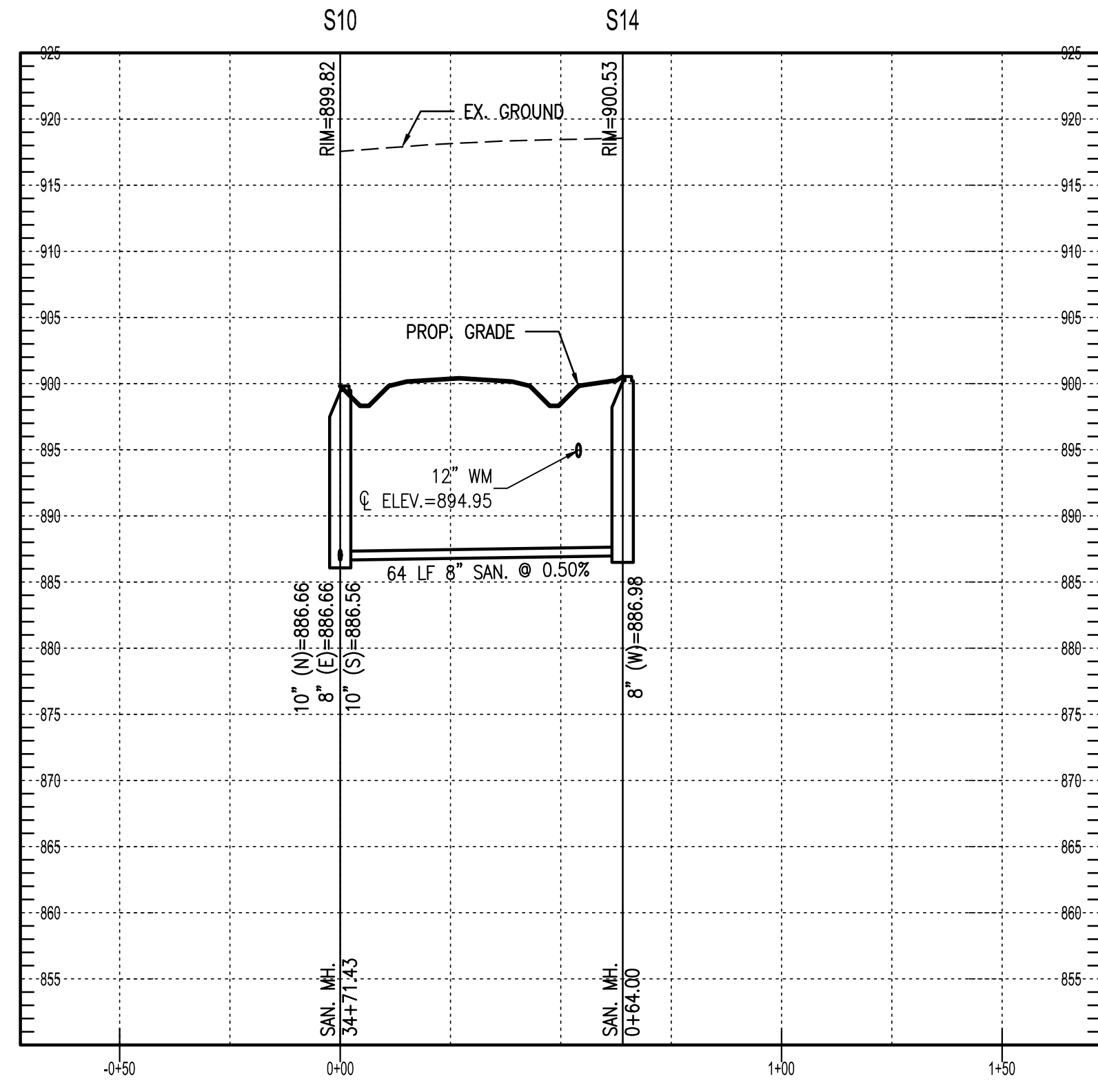
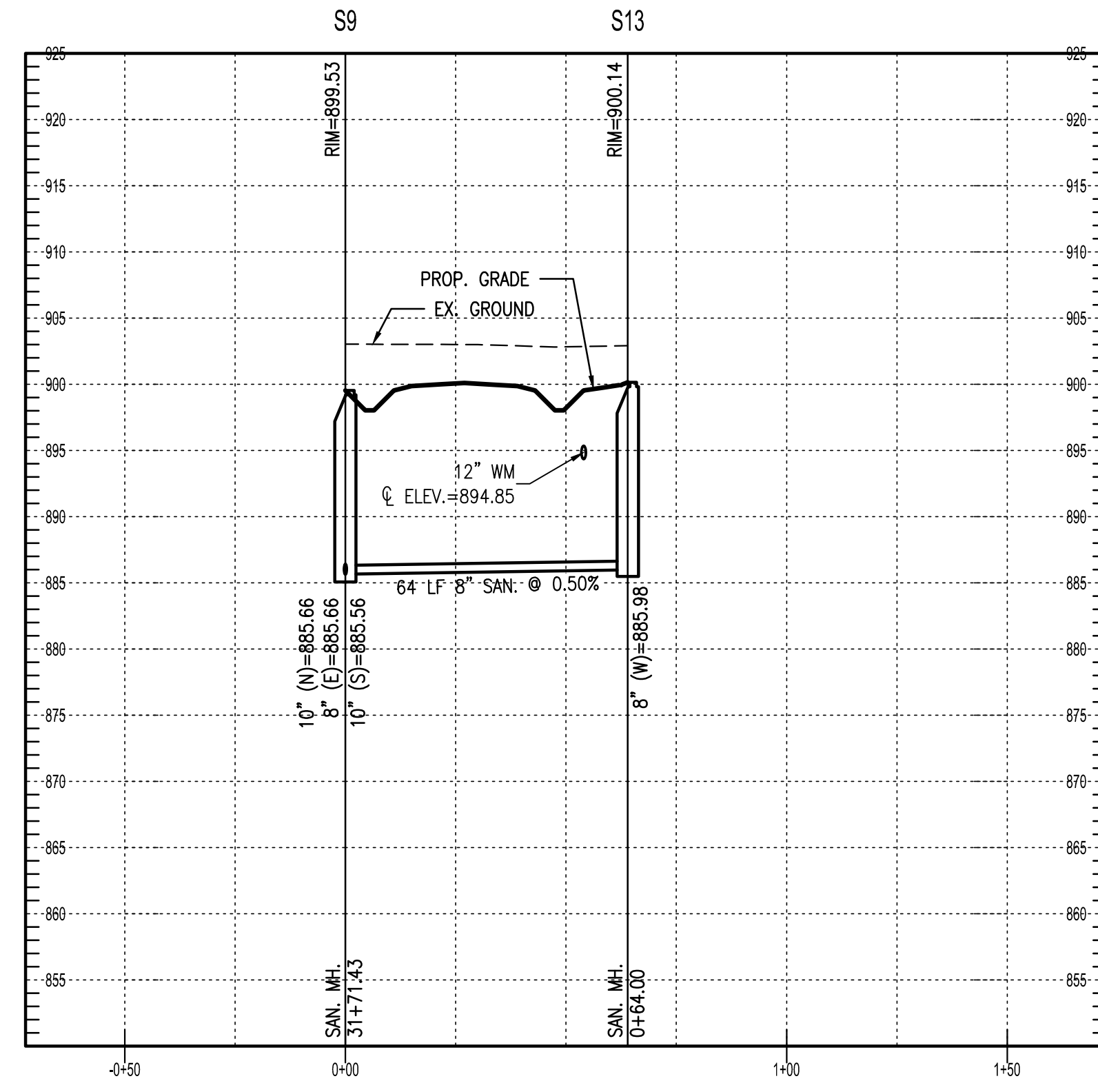
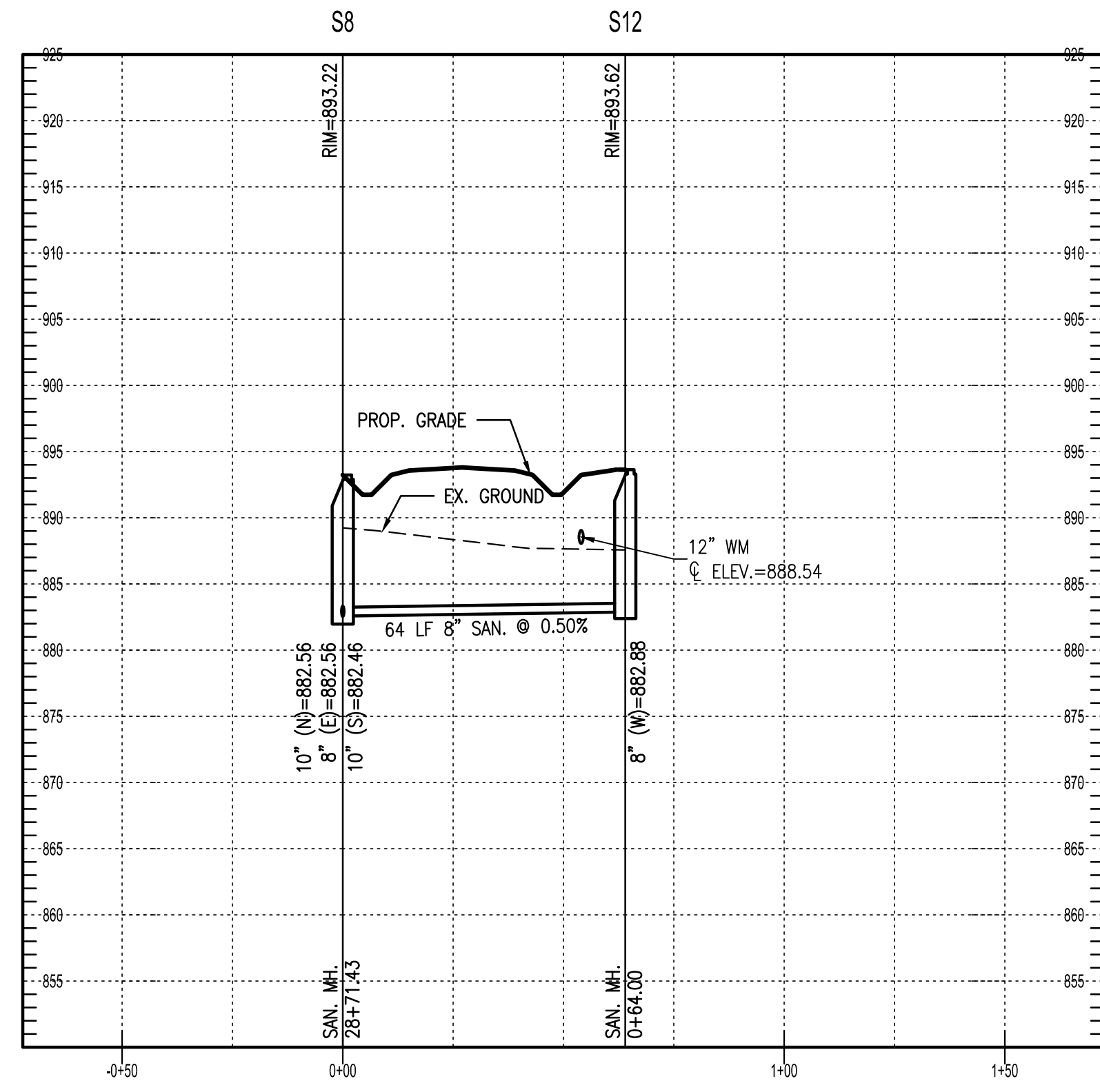
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			ELB	IN	5/22/2020



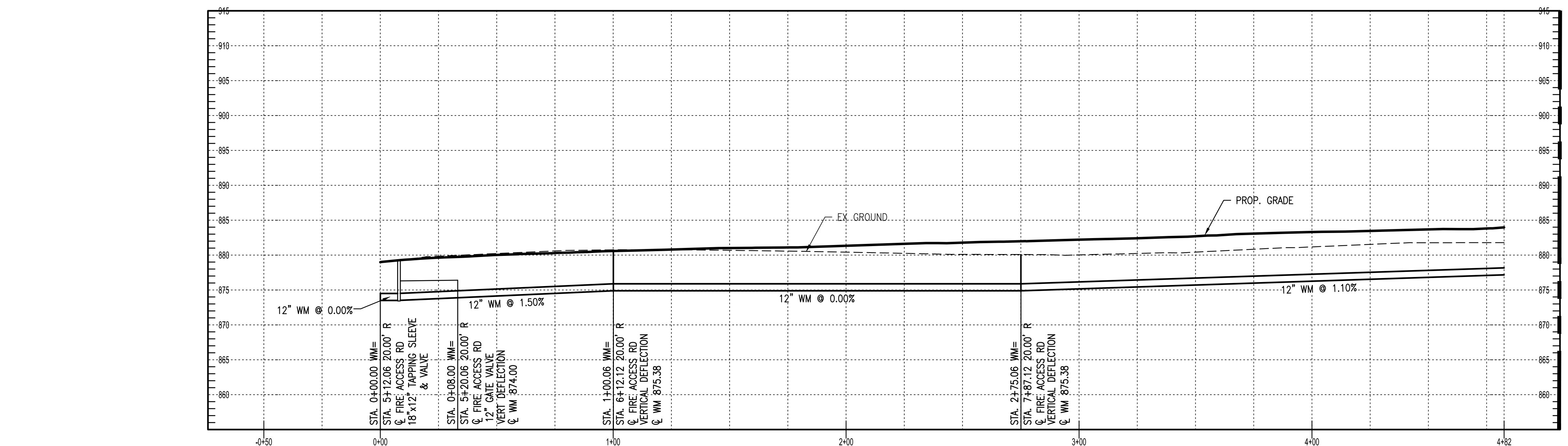
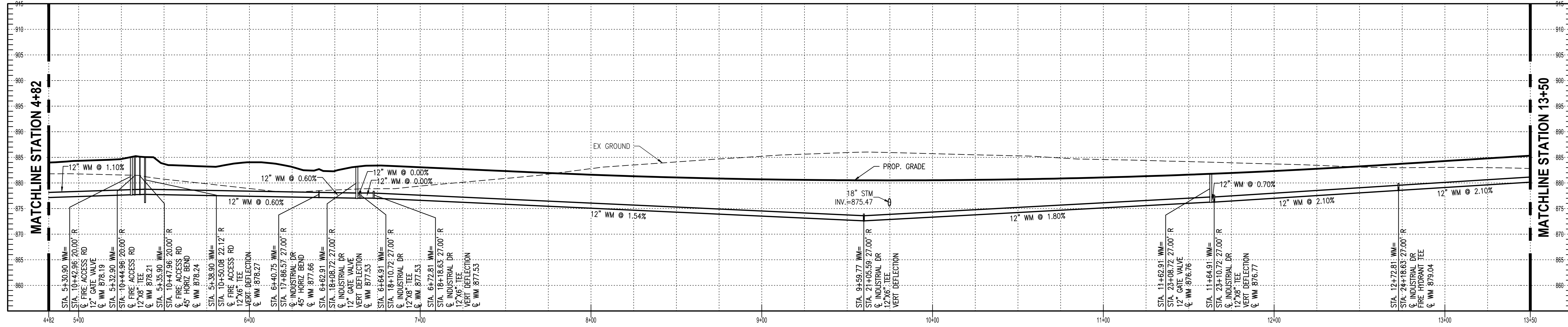


NO.	PLAN ISSUE/REVISION	DATE	DRAWN ELB	CHECKED IN	DATE 5/22/2020
				HORIZONTAL SCALE IN FEET VERTICAL SCALE IN FEET	
<small>HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43906 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com</small>					
<h1 style="margin: 0;">HULL</h1> <p style="margin: 0; font-size: small;">Environment / Energy / Infrastructure</p>					
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO PUBLIC SANITARY PROFILES					
JOB NUMBER: ZAN012					
50					



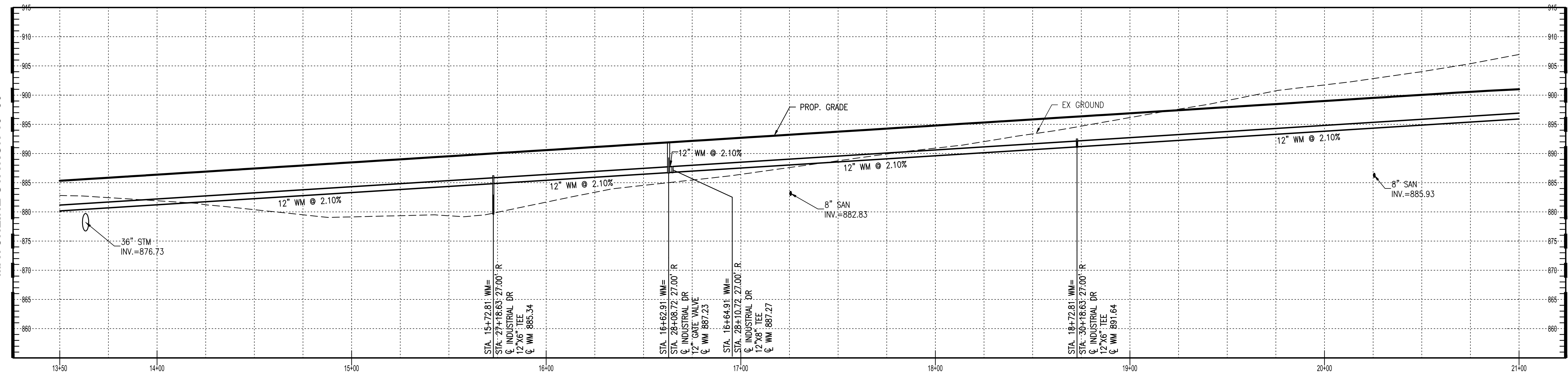
NO.	PLAN ISSUE/REVISION	DATE	DRAWN	CHECKED	DATE
			ELB	INY	5/22/2020





MATCHLINE STATION 4+82

MATCHLINE STATION 13+50



MATCHLINE STATION 21+00

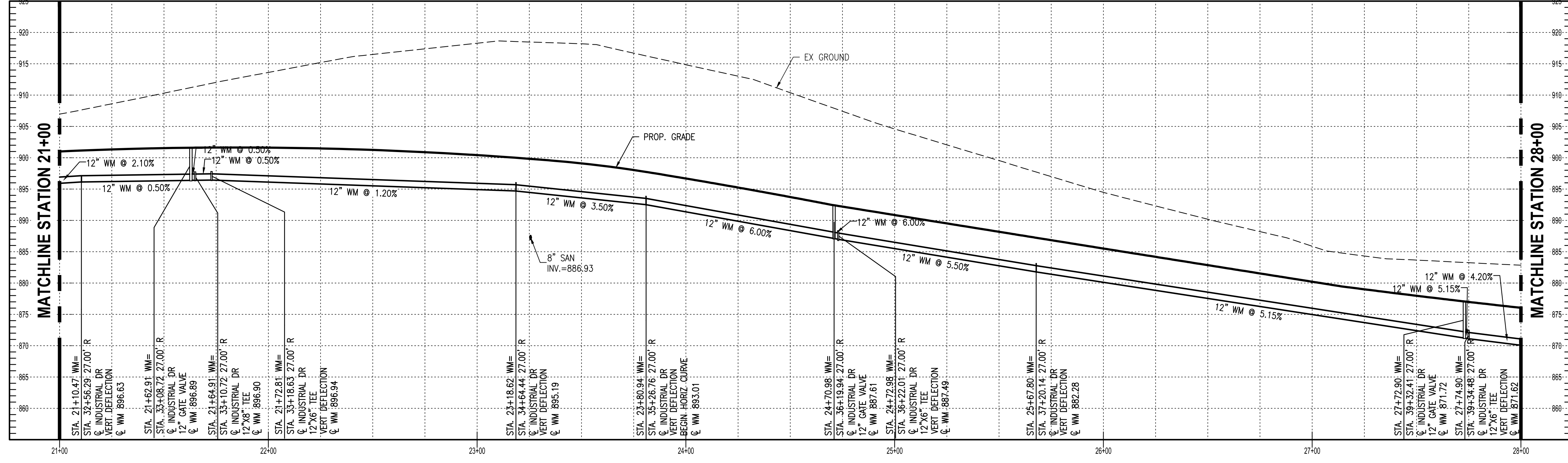
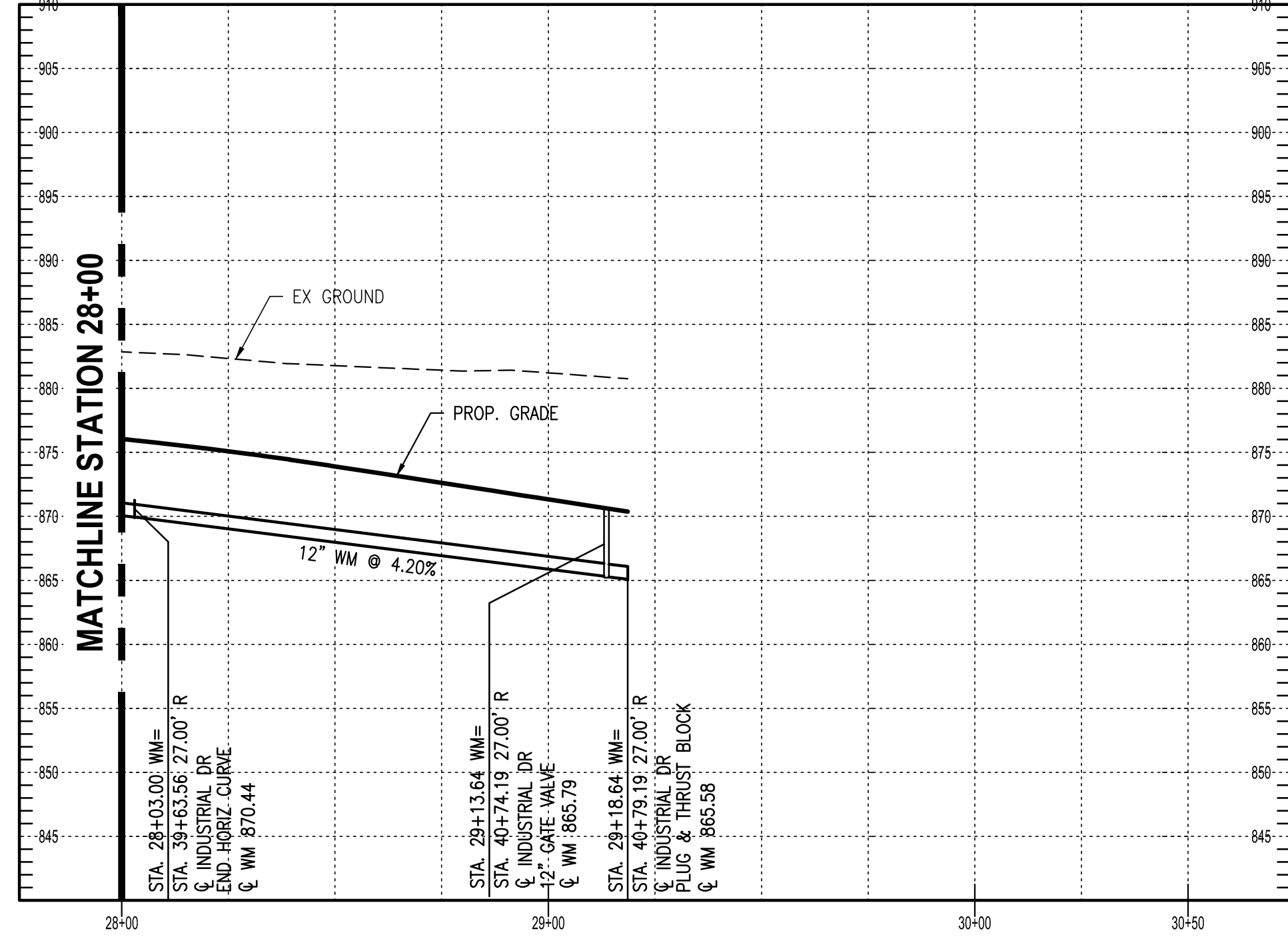
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<p>ELB</p>	<p>CHECKED</p>	<p>DATE</p>
<p>DATE</p>	<p>DATE</p>	<p>5/22/2020</p>

<p>HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, Ohio 43905 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com</p>	<p>HULL Environment / Energy / Infrastructure</p>
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
 ZANESVILLE, MUSKINGUM COUNTY, OHIO
PUBLIC WATER PROFILES

JOB NUMBER:
ZAN012

52



NO.	PLAN ISSUE/REVISION	DATE	DRAWN	CHECKED	DATE
			ELB	IN	5/22/2020



FM1	VALVE VAULT	STA. 0+00.00
FM2	45° HORIZ BEND W/ VERT DEFL	STA. 0+20.92
FM3	45° HORIZ BEND	STA. 0+27.97
FM4	VERTICAL DEFLECTION	STA. 1+00.00
FM5	VERTICAL DEFLECTION	STA. 2+57.00
FM6	AIR RELEASE VALVE W/ VERT DEFL	STA. 3+75.06
FM7	VERTICAL DEFLECTION	STA. 4+30.06
FM8	VERTICAL DEFLECTION	STA. 5+72.06
FM9	VERTICAL DEFLECTION	STA. 6+69.06
FM10	VERTICAL DEFLECTION	STA. 7+75.06

NOTES:

CONTRACTOR TO PROVIDE ANY VERTICAL AND HORIZONTAL BENDS TO MAINTAIN A MINIMUM OF 5' OF COVER UNDER STREAMS AND PAVEMENT SURFACES AND A MINIMUM 4' OF COVER UNDER EXISTING GRADE. PROPOSED FORCE MAIN SHALL HAVE A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN UTILITIES AND A MINIMUM OF 10' HORIZONTAL SEPARATION BETWEEN WATER MAINS.

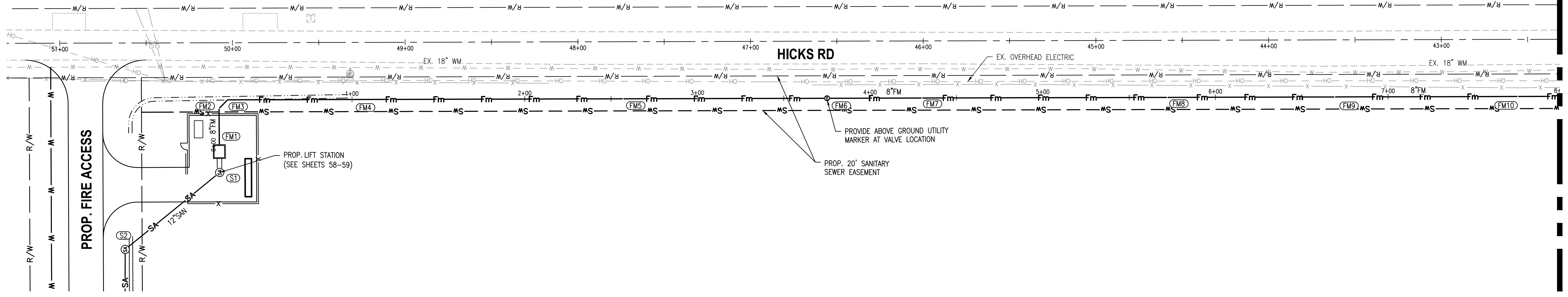
CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY CLEARING AND GRUBBING TO PROPERLY INSTALL FORCE MAIN. ALL DEBRIS SHALL BE HAULED OFF SITE TO AN APPROVED LOCATION. CLEARING AND GRUBBING LIMITS ARE 10' EACH SIDE OF CENTERLINE OF THE PROPOSED FORCE MAIN.

PROPOSED FORCE MAIN MATERIAL SHALL BE PVC C900 (DR18), GREEN IN COLOR, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

FORCE MAIN BACKFILL MATERIAL SHALL BE #57 LIMESTONE, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

BENDS AND VERTICAL DEFLECTIONS SHOWN CAN BE NON-PERFORMED AS NECESSARY IF PIPE CAN BE INSTALLED PER MANUFACTURES SPECIFICATIONS.

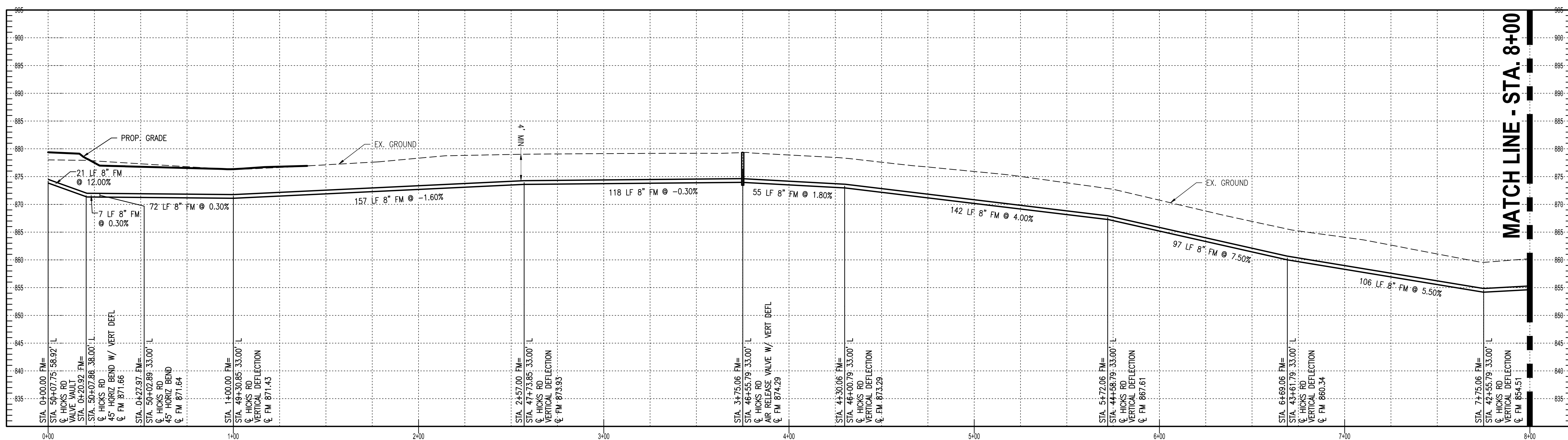
CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC FOR FORCE MAIN WORK ALONG HICKS RD AND OLD WHEELING RD. CONTRACTOR SHALL COORDINATE WITH MUSKINGUM COUNTY ENGINEER MARK EICHER (P:740-454-0155), FOR MAINTENANCE OF TRAFFIC.



MATCH LINE - STA. 8+00 SEE SHEET 55

NO.	PLAN ISSUE/REVISION	DATE	DRAWN ELB	CHECKED NW	DATE 5/22/2020

HORIZONTAL SCALE IN FEET: 1" = 60'
 VERTICAL SCALE IN FEET: 1" = 20'



MATCH LINE - STA. 8+00

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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
FORCE MAIN PLAN & PROFILE

JOB NUMBER:
ZAN012

MATCH LINE - STA. 8+00 SEE SHEET 54

FM11	VERTICAL DEFLECTION	STA. 10+09.94
FM12	VERTICAL DEFLECTION	STA. 12+14.06
FM13	AIR RELEASE VALVE W/ VERT DEFL	STA. 12+93.00
FM14	VERTICAL DEFLECTION	STA. 15+30.06
FM15	45° HORIZ BEND	STA. 16+25.00

NOTES:

CONTRACTOR TO PROVIDE ANY VERTICAL AND HORIZONTAL BENDS TO MAINTAIN A MINIMUM OF 5' OF COVER UNDER STREAMS AND PAVEMENT SURFACES AND A MINIMUM 4' OF COVER UNDER EXISTING GRADE. PROPOSED FORCE MAIN SHALL HAVE A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN UTILITIES AND A MINIMUM OF 10' HORIZONTAL SEPARATION BETWEEN WATER MAINS.

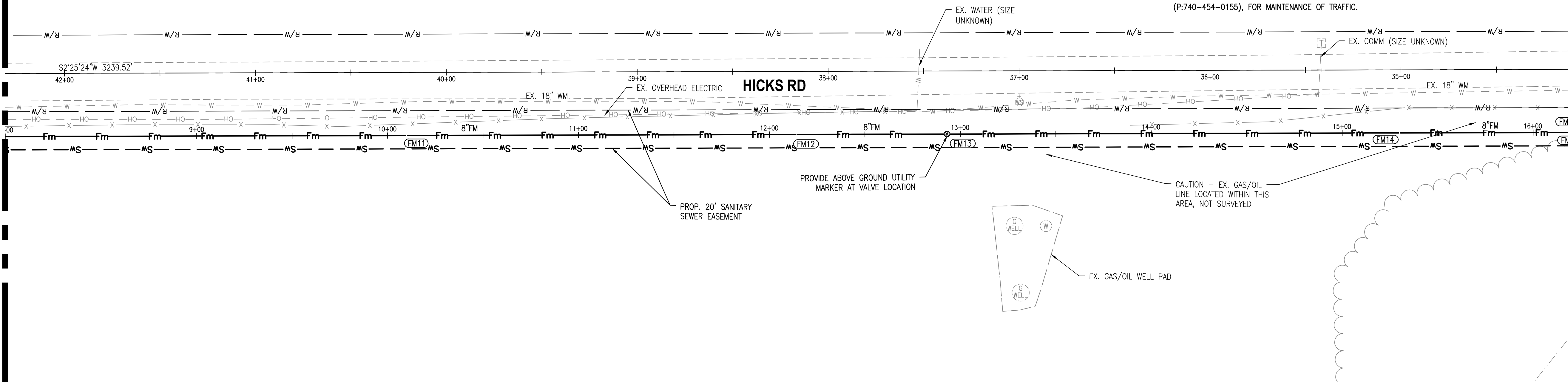
CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY CLEARING AND GRUBBING TO PROPERLY INSTALL FORCE MAIN. ALL DEBRIS SHALL BE HAULED OFF SITE TO AN APPROVED LOCATION. CLEARING AND GRUBBING LIMITS ARE 10' EACH SIDE OF CENTERLINE OF THE PROPOSED FORCE MAIN.

PROPOSED FORCE MAIN MATERIAL SHALL BE PVC C900 (DR18), GREEN IN COLOR, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

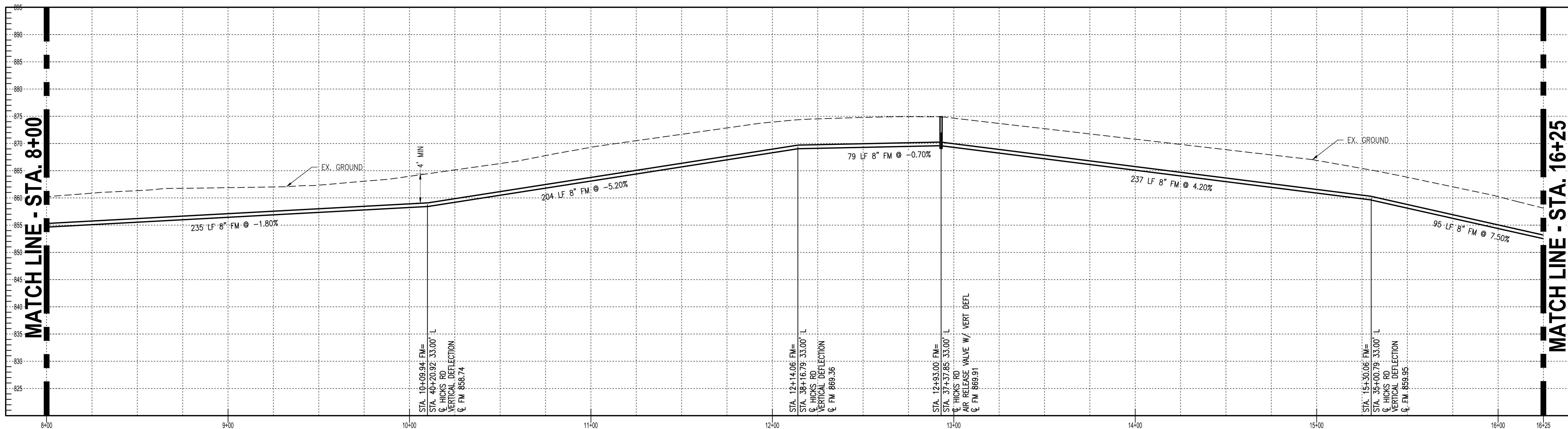
FORCE MAIN BACKFILL MATERIAL SHALL BE #57 LIMESTONE, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

BENDS AND VERTICAL DEFLECTIONS SHOWN CAN BE NON-PERFORMED AS NECESSARY IF PIPE CAN BE INSTALLED PER MANUFACTURES SPECIFICATIONS.

CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC FOR FORCE MAIN WORK ALONG HICKS RD AND OLD WHEELING RD. CONTRACTOR SHALL COORDINATE WITH MUSKINGUM COUNTY ENGINEER MARK EICHER (P:740-454-0155), FOR MAINTENANCE OF TRAFFIC.



MATCH LINE - STA. 16+25 SEE SHEET 56



 HORIZONTAL SCALE IN FEET 0 30 60 VERTICAL SCALE IN FEET 0 10 20	DRAWN ELB CHECKED INY DATE 5/22/2020	PLAN ISSUE/REVISION NO.	DATE	HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43895 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com
<h1 style="margin: 0;">HULL</h1> Environment / Energy / Infrastructure		CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO FORCE MAIN PLAN & PROFILE		JOB NUMBER: ZAN012
<h2 style="margin: 0;">55</h2>				

MATCH LINE - STA. 16+25 SEE SHEET 55

FM16	45° HORIZ BEND, BEGIN BORE	STA. 16+29.24
FM17	VERTICAL DEFLECTION	STA. 17+00.00
FM18	VERTICAL DEFLECTION	STA. 17+70.00
FM19	45° HORIZ BEND, END BORE	STA. 18+80.76
FM20	45° HORIZ BEND	STA. 18+85.00
FM21	AIR RELEASE VALVE W/ VERT DEFL	STA. 19+57.06
FM22	VERTICAL DEFLECTION	STA. 20+24.94
FM23	VERTICAL DEFLECTION	STA. 21+60.06
FM24	45° HORIZ BEND, BEGIN BORE	STA. 23+07.74
FM25	45° HORIZ BEND, END BORE	STA. 23+75.64

NOTES:

CONTRACTOR TO PROVIDE ANY VERTICAL AND HORIZONTAL BENDS TO MAINTAIN A MINIMUM OF 5' OF COVER UNDER STREAMS AND PAVEMENT SURFACES AND A MINIMUM 4' OF COVER UNDER EXISTING GRADE. PROPOSED FORCE MAIN SHALL HAVE A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN UTILITIES AND A MINIMUM OF 10' HORIZONTAL SEPARATION BETWEEN WATER MAINS.

CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY CLEARING AND GRUBBING TO PROPERLY INSTALL FORCE MAIN. ALL DEBRIS SHALL BE HAULED OFF SITE TO AN APPROVED LOCATION. CLEARING AND GRUBBING LIMITS ARE 10' EACH SIDE OF CENTERLINE OF THE PROPOSED FORCE MAIN.

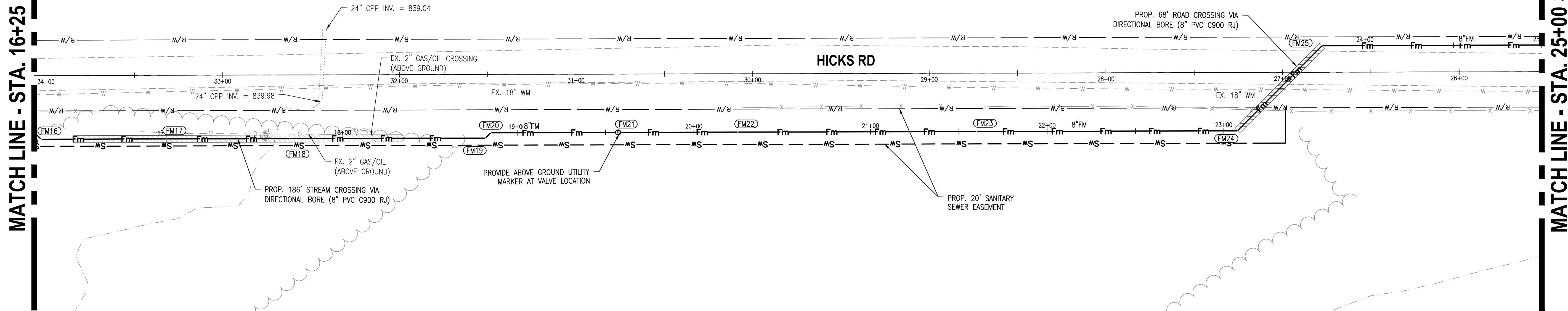
PROPOSED FORCE MAIN MATERIAL SHALL BE PVC C900 (DR18), GREEN IN COLOR, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

FORCE MAIN BACKFILL MATERIAL SHALL BE #57 LIMESTONE, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

PROPOSED DIRECTIONAL BORED FORCE MAIN SHALL BE PVC C900 (DR18) RJ. RJ PIPE SHALL HAVE AN INTERNAL JOINT RESTRAINT SYSTEM AND NOT REQUIRE EXTERNAL, BOLT ON, RESTRAINT DEVICES.

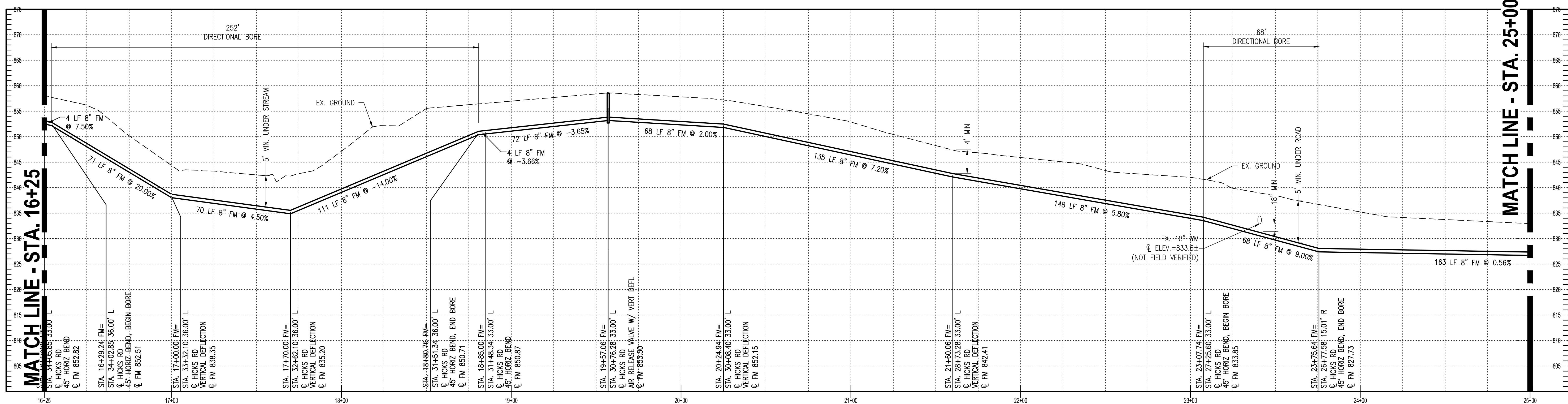
BENDS AND VERTICAL DEFLECTIONS SHOWN CAN BE NON-PERFORMED AS NECESSARY IF PIPE CAN BE INSTALLED PER MANUFACTURES SPECIFICATIONS.

CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC FOR FORCE MAIN WORK ALONG HICKS RD AND OLD WHEELING RD. CONTRACTOR SHALL COORDINATE WITH MUSKINGUM COUNTY ENGINEER MARK EICHER (P:740-454-0155), FOR MAINTENANCE OF TRAFFIC.



MATCH LINE - STA. 25+00 SEE SHEET 57

MATCH LINE - STA. 16+25



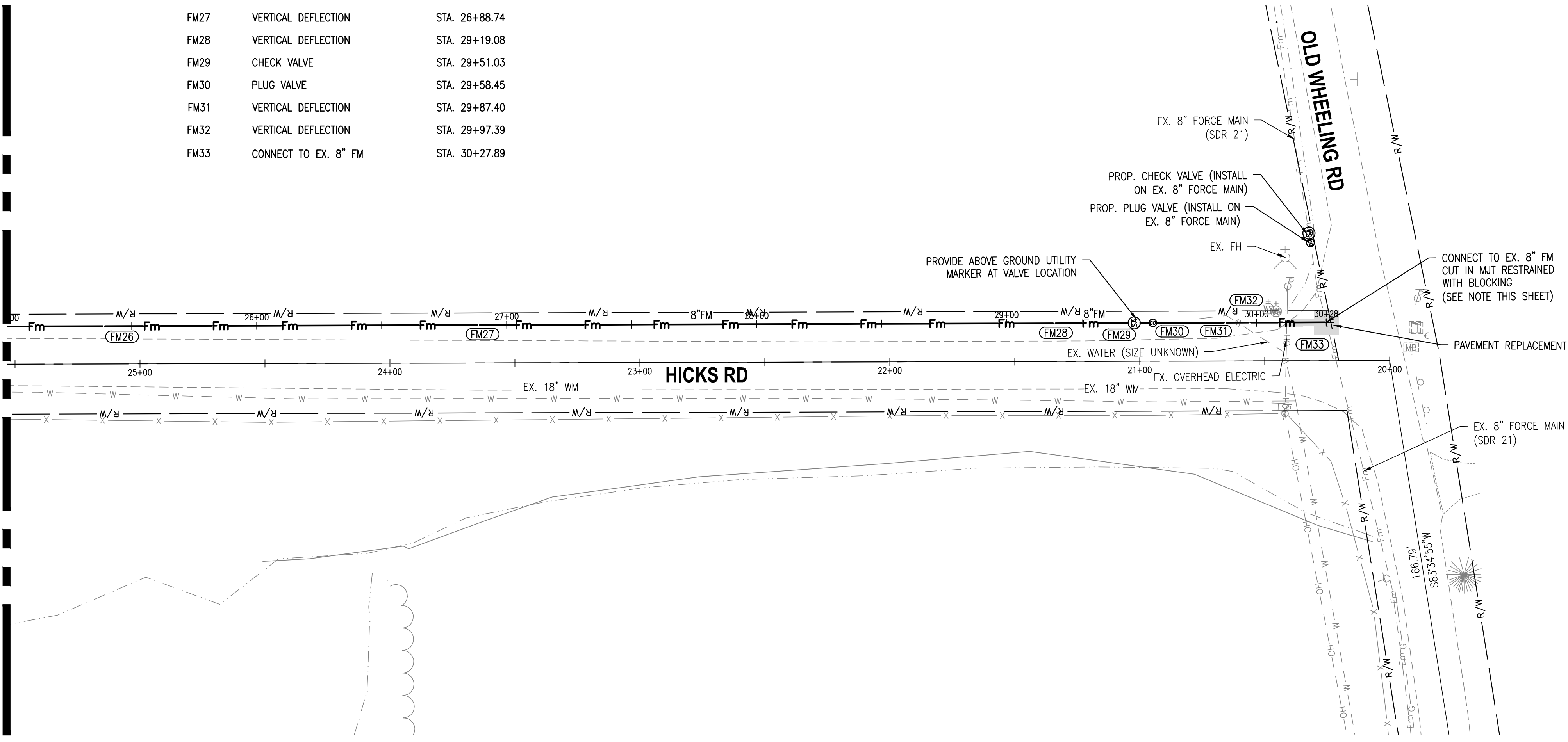
MATCH LINE - STA. 25+00

DRAWN: ELB CHECKED: NW DATE: 5/22/2020	PLAN ISSUE/REVISION NO.
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO FORCE MAIN PLAN & PROFILE	
JOB NUMBER: ZAN012	
56	

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 Environment / Energy / Infrastructure
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 Zanesville, OH 43885
 Phone: (740) 344-5451
 Fax: (740) 344-8899
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MATCH LINE - STA. 25+00 SEE SHEET 56

FM26	VERTICAL DEFLECTION	STA. 25+38.81
FM27	VERTICAL DEFLECTION	STA. 26+88.74
FM28	VERTICAL DEFLECTION	STA. 29+19.08
FM29	CHECK VALVE	STA. 29+51.03
FM30	PLUG VALVE	STA. 29+58.45
FM31	VERTICAL DEFLECTION	STA. 29+87.40
FM32	VERTICAL DEFLECTION	STA. 29+97.39
FM33	CONNECT TO EX. 8" FM	STA. 30+27.89



NOTES:

CONTRACTOR TO PROVIDE ANY VERTICAL AND HORIZONTAL BENDS TO MAINTAIN A MINIMUM OF 5' OF COVER UNDER STREAMS AND PAVEMENT SURFACES AND A MINIMUM 4' OF COVER UNDER EXISTING GRADE. PROPOSED FORCE MAIN SHALL HAVE A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN UTILITIES AND A MINIMUM OF 10' HORIZONTAL SEPARATION BETWEEN WATER MAINS.

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PROPOSED FORCE MAIN MATERIAL SHALL BE PVC C900 (DR18), GREEN IN COLOR, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

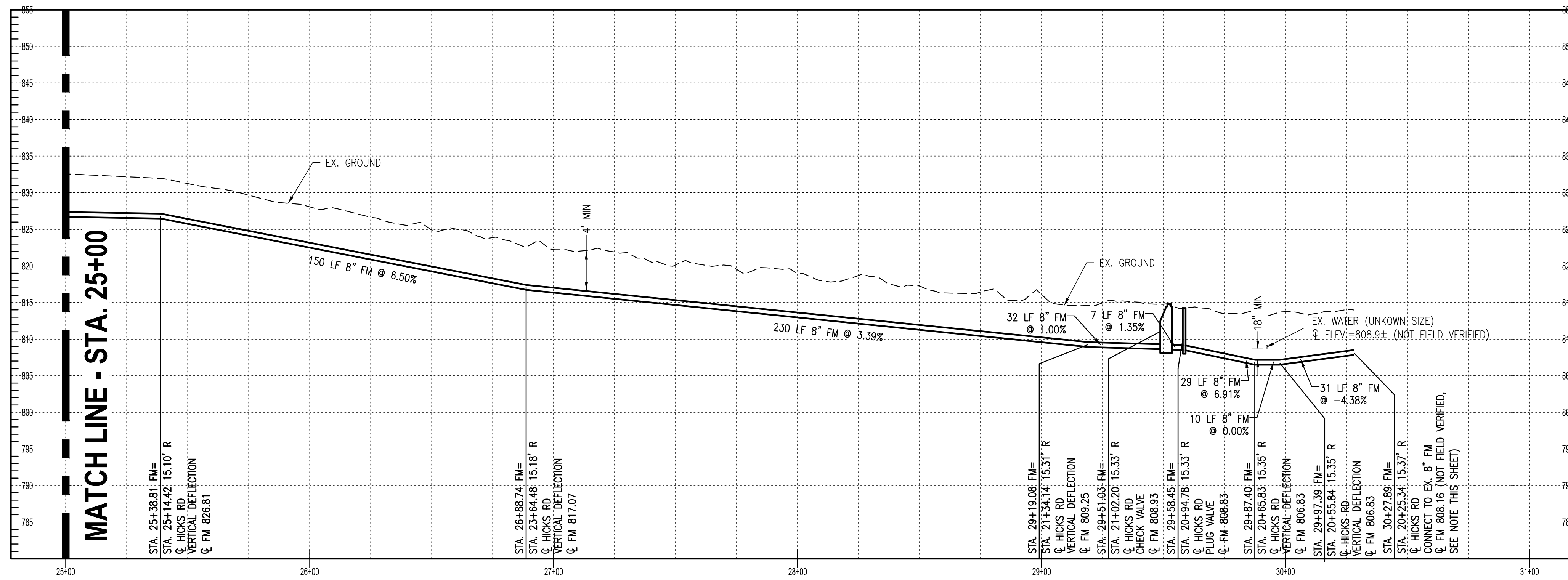
FORCE MAIN BACKFILL MATERIAL SHALL BE #57 LIMESTONE, UNLESS OTHERWISE NOTED ON PLAN OR DETAILS.

BENDS AND VERTICAL DEFLECTIONS SHOWN CAN BE NON-PERFORMED AS NECESSARY IF PIPE CAN BE INSTALLED PER MANUFACTURERS SPECIFICATIONS.

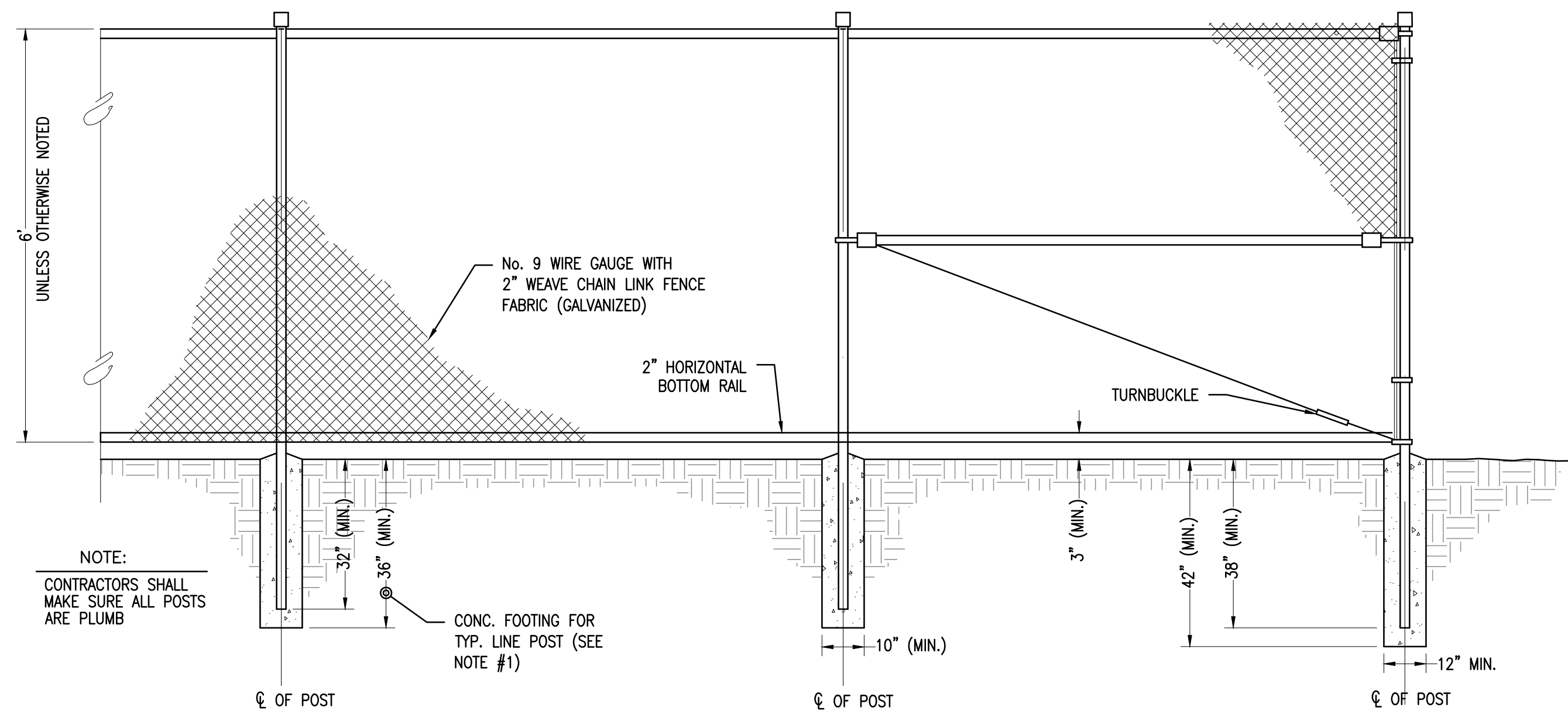
PRIOR TO CONSTRUCTION, CONTRACTOR SHALL FIELD VERIFY EXISTING SANITARY FORCE MAIN HORIZONTAL LOCATION AND VERTICAL ELEVATION AT PROPOSED FORCE MAIN CONNECTION LOCATION AND SHALL NOTIFY ENGINEER OF FIELD VERIFIED ELEVATION AND COORDINATES. CONTRACTOR SHALL COORDINATE WITH MUSKINGUM COUNTY SEWER DEPARTMENT MANAGER STAN LUCAS (P:740-452-4940), FOR ALL WORK ASSOCIATED WITH EXISTING FORCE MAIN.

PRIOR TO ANY PROPOSED WORK ON EXISTING FORCE MAIN, INCLUDING CONNECTION AND VALVES, CONTRACTOR SHALL NOTIFY MUSKINGUM COUNTY SEWER DEPARTMENT MANAGER STAN LUCAS (P:740-452-4940) AT LEAST 24 HOURS BEFORE BEGINNING WORK. CONTRACTOR SHALL COORDINATE WITH MUSKINGUM COUNTY SEWER DEPARTMENT ON EXISTING LIFT STATION SHUTDOWN WINDOW AND TIMELINE. EXISTING LIFT STATION AND FORCE MAIN SHUT DOWN WILL BE A MAX OF 4 HOURS AT ONE TIME. CONTRACTOR WILL NOT BE RESPONSIBLE FOR HAULING WASTE FROM EXISTING LIFT STATION DURING SHUTDOWN. CONTRACTOR WILL BE RESPONSIBLE FOR HAULING AND PROPERLY DISPOSING OF ANY WASTE IN EXISTING FORCE MAIN AT PROPOSED FORCE MAIN TIE IN LOCATION.

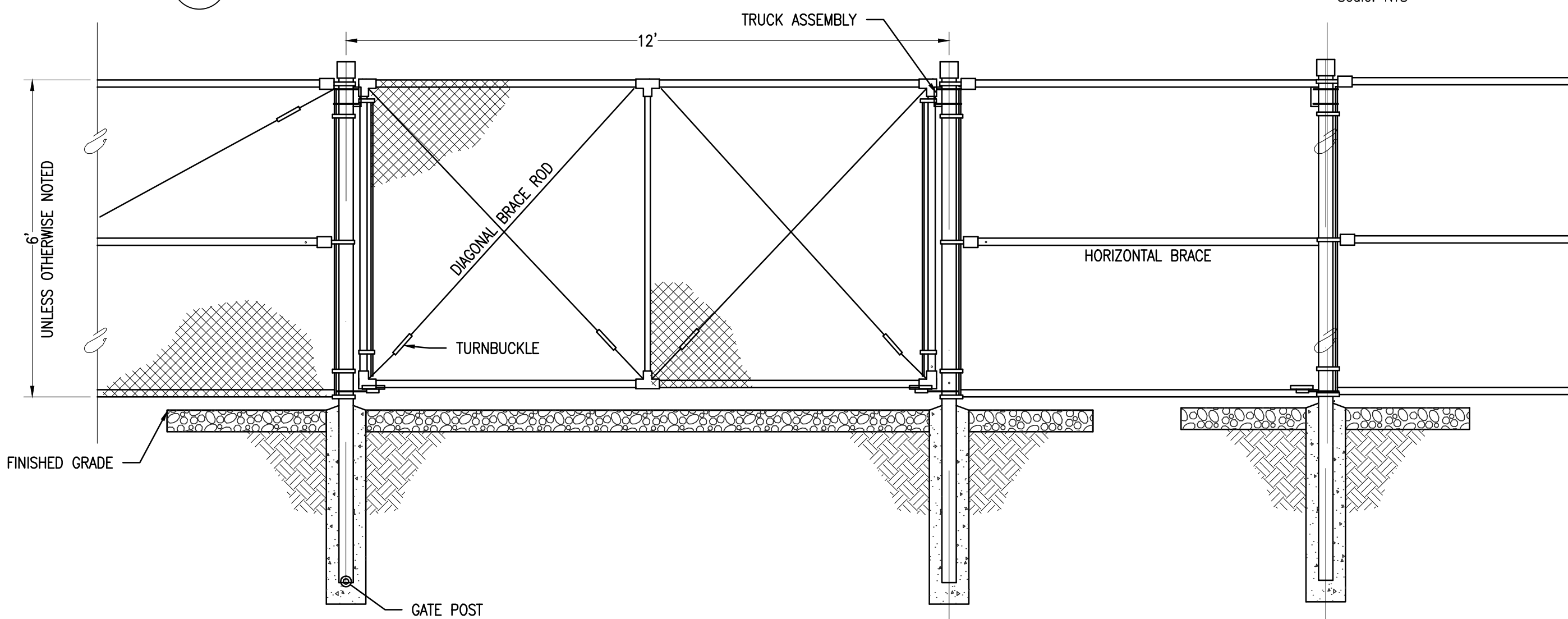
CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC FOR FORCE MAIN WORK ALONG HICKS RD AND OLD WHEELING RD. CONTRACTOR SHALL COORDINATE WITH MUSKINGUM COUNTY ENGINEER MARK EICHER (P:740-454-0155), FOR MAINTENANCE OF TRAFFIC.



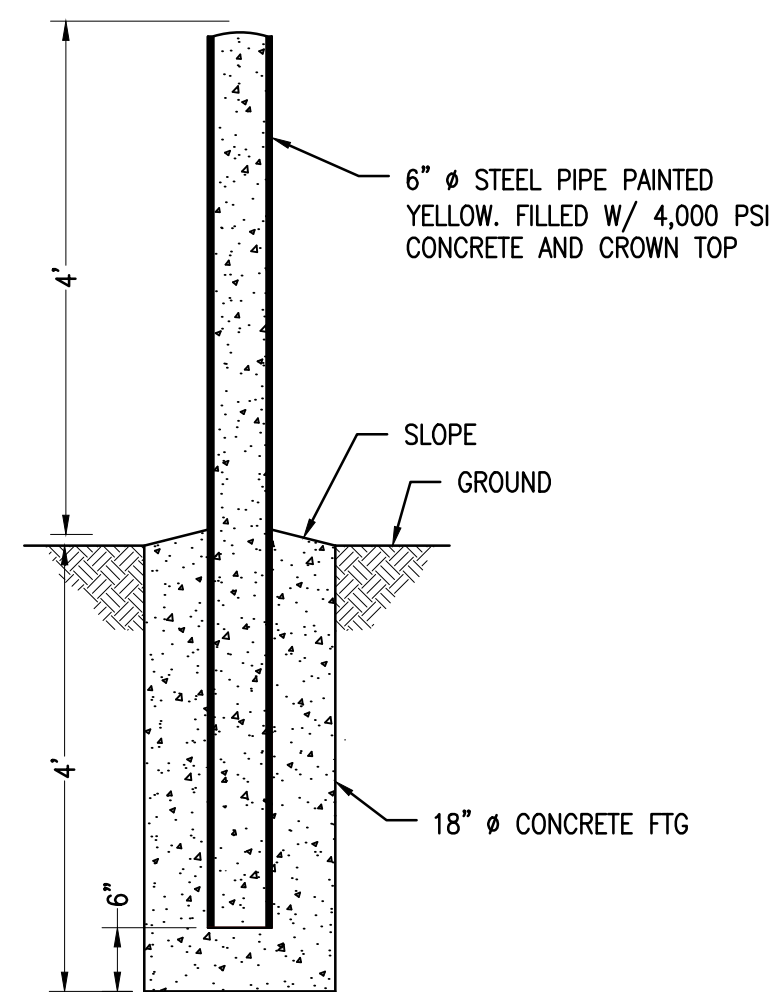
DRAWN: ELB CHECKED: INY DATE: 5/22/2020	PLAN ISSUE/REVISION NO.
HULL & ASSOCIATES, Inc. 59 Grant Street Zanesville, OH 43885 Phone: (740) 344-5451 Fax: (740) 344-8899 www.hullinc.com	
<h1 style="margin: 0;">HULL</h1> Environment / Energy / Infrastructure	
CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO FORCE MAIN PLAN & PROFILE	
JOB NUMBER: ZAN012	
57	



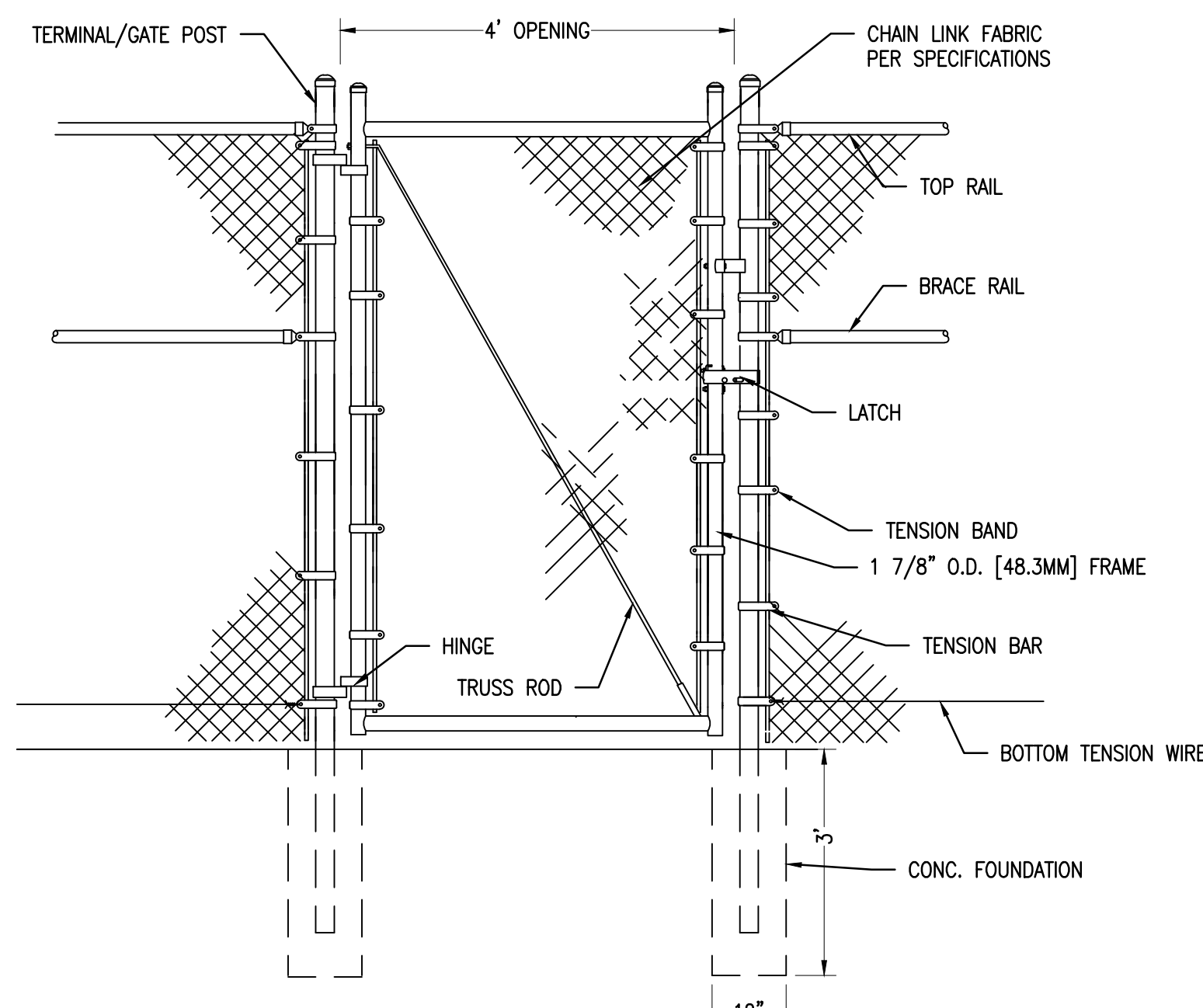
1 CHAIN LINK FENCE DETAIL



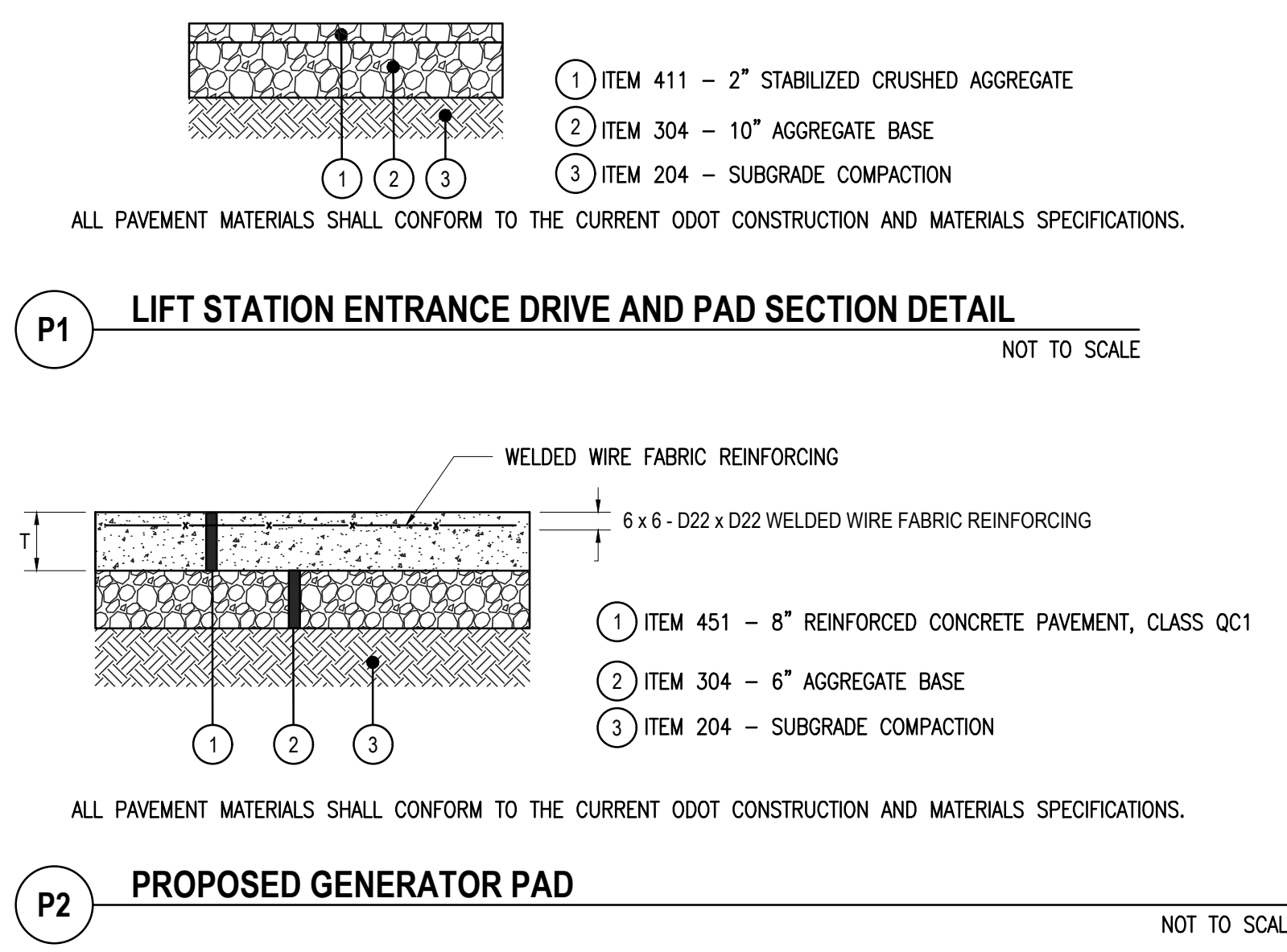
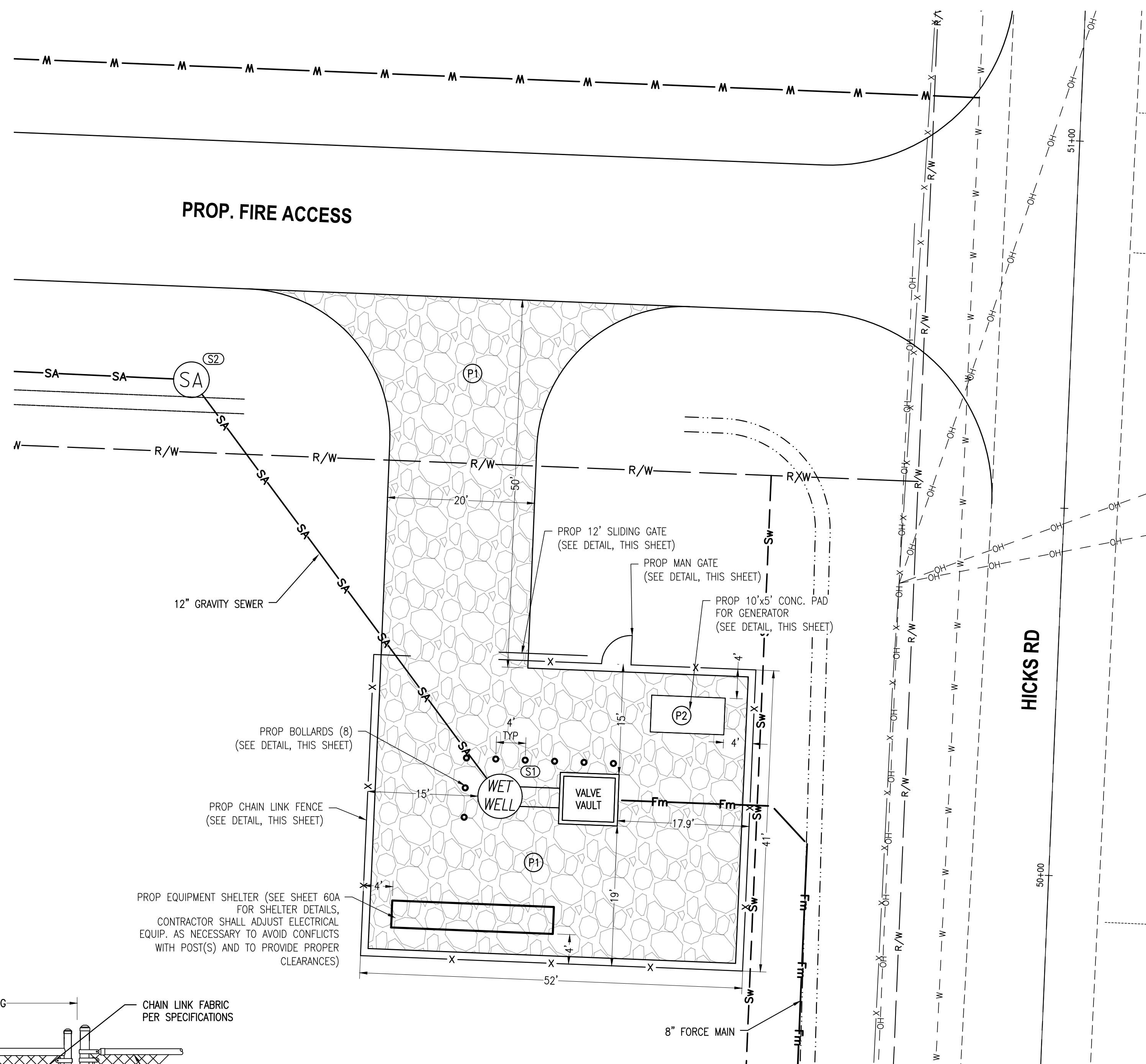
2 SLIDING GATE DETAIL



3 BOLLARD DETAIL

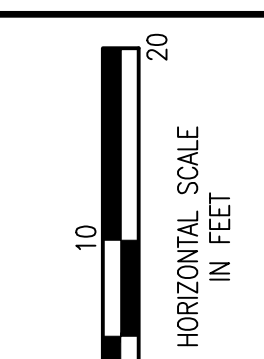
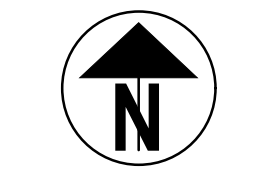


4 4' WIDE CHAIN LINK GATE



P1 LIFT STATION ENTRANCE DRIVE AND PAD SECTION DETAIL

P2 PROPOSED GENERATOR PAD



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		TW	5/22/2020

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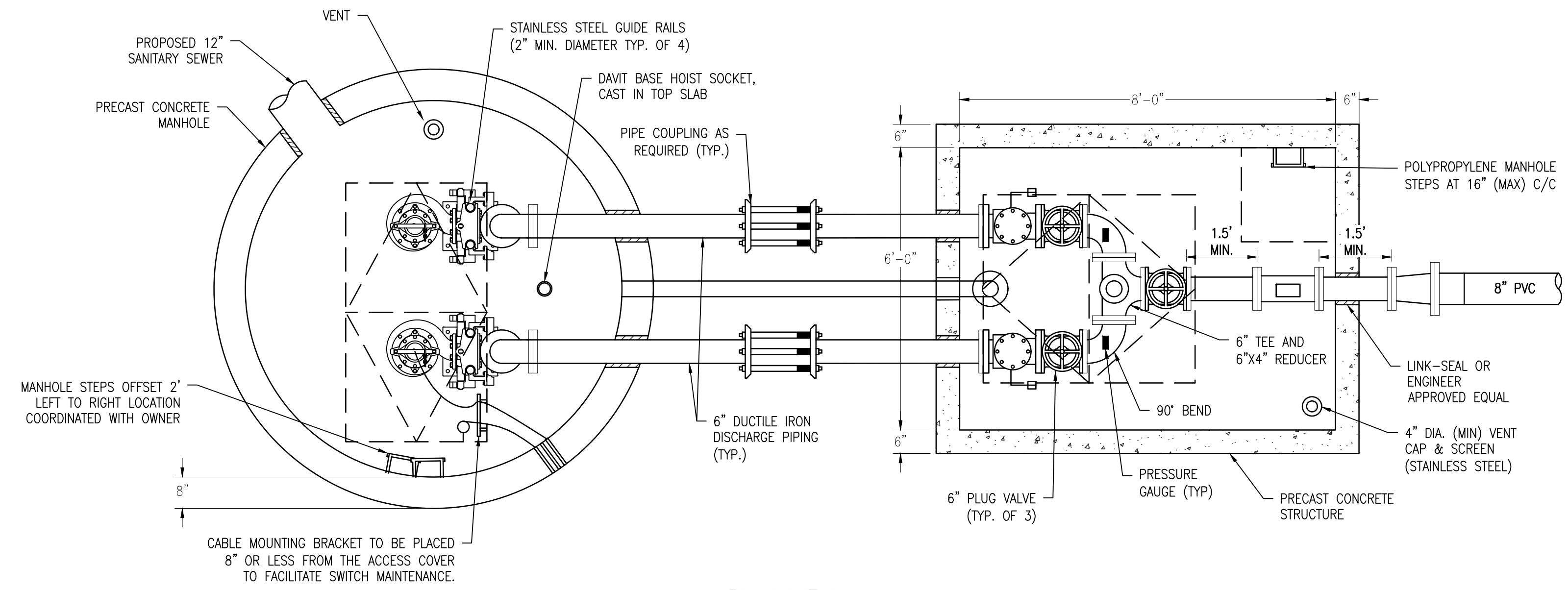
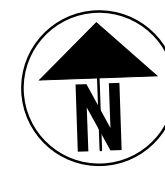
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
 ZANESVILLE, MUSKINGUM COUNTY, OHIO
LIFT STATION SITE PLAN

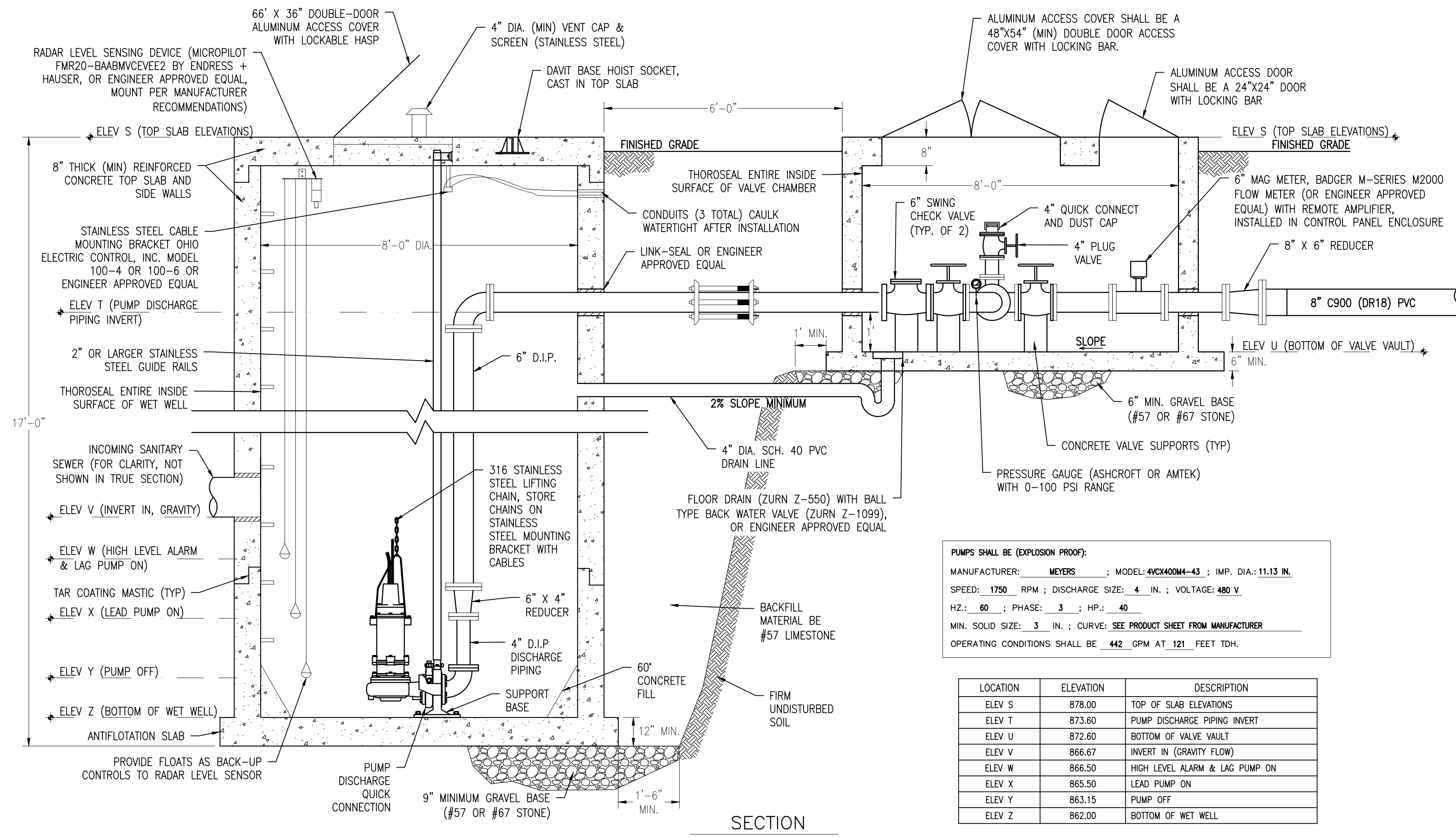
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PLAN VIEW
1" = 2'



SECTION
1" = 2'
*INVERT ELEVATIONS AND PUMP CONTROL ELEVATIONS NOT SHOWN TO SCALE

PUMPS SHALL BE (EXPLOSION PROOF):
 MANUFACTURER: MEYERS ; MODEL: 4VCX400M4-43 ; IMP. DIA.: 11.13 IN.
 SPEED: 1750 RPM ; DISCHARGE SIZE: 4 IN. ; VOLTAGE: 480 V
 HZ.: 60 ; PHASE: 3 ; HP: 40
 MIN. SOLID SIZE: 3 IN. ; CURVE: SEE PRODUCT SHEET FROM MANUFACTURER
 OPERATING CONDITIONS SHALL BE 442 GPM AT 121 FEET TDH.

LOCATION	ELEVATION	DESCRIPTION
ELEV S	878.00	TOP OF SLAB ELEVATIONS
ELEV T	873.60	PUMP DISCHARGE PIPING INVERT
ELEV U	872.60	BOTTOM OF VALVE VAULT
ELEV V	866.67	INVERT IN (GRAVITY FLOW)
ELEV W	866.50	HIGH LEVEL ALARM & LAG PUMP ON
ELEV X	865.50	LEAD PUMP ON
ELEV Y	863.15	PUMP OFF
ELEV Z	862.00	BOTTOM OF WET WELL

PUMP STATION NOTES:

- SUBMITTALS**
- THE PUMP STATION MANUFACTURER SHALL FURNISH SHOP DRAWINGS FOR ENGINEER'S APPROVAL PRIOR TO ANY PURCHASE OF EQUIPMENT OR PRODUCTION OF CONCRETE PRODUCTS.
 - SUBMIT SHOP DRAWINGS SHOWING DIMENSIONS, DETAILS OF CONSTRUCTION, AND INSTALLATION FOR PUMPS, MOTORS, SUPPORTS, CONTROLS, WET WELL, AND OTHER EQUIPMENT AND MATERIALS TO PROVIDE COMPLETE AND PROPER PERFORMANCE OF THE WORK OF THE LIFT STATION OPERATION AND CONTROLS.
- GUARANTEES**
- PROVIDE A ONE YEAR WRITTEN WARRANTY FOR ALL WORK PROVIDED AND INSTALLED FOR THE PUMP STATION INCLUDING ALL LABOR REQUIRED AND ALL MATERIAL REPLACEMENTS NECESSARY FOR THE PROPER PERFORMANCE OF THE WORK, AND INCLUDING THE DESIGN, MATERIALS, AND WORKMANSHIP FOR THE PERIOD TO COMMENCE UPON PUMP STATION START-UP.
- PUMP SPECIFICATIONS**
- PUMPS SHALL BE A MYERS SOLIDS HANDLING SUBMERSIBLE PUMP, MODEL 4VCX400M4-43, AS MANUFACTURED BY MYERS, OR ENGINEER-APPROVED EQUAL. PUMP SHALL BE FURNISHED WITH A 40 HP MOTOR TO MEET TARGET OPERATING CONDITION OF 442 GPM @ 121 FT TDH. MOTOR SHALL BE SUITABLE FOR 40 HP DUTY, 60 HZ, 1750 RPM. PUMP SHALL COME FURNISHED WITH 4-INCH BREAKAWAY FITTINGS AND DISCHARGE ELBOW AND RAIL BRACKETS FOR MOUNTING PUMP ON CONTRACTOR-FURNISHED PIPE RAILS.
 - SCADA INTEGRATOR SHALL PROVIDE PLC-RTU PUMP CONTROL PANEL, WITH SHORT CIRCUIT AND OVERLOAD PROTECTION FOR THE PUMP. PANEL SHALL BE NEMA 4X STAINLESS STEEL ENCLOSURE WITH LOCKABLE DEAD FRONT SWING-OUT COVER, COMPLETE WITH STAINLESS STEEL STAND. THE CONTROL PANEL SHALL BE EQUIPPED WITH HAND-OFF-AUTO SELECTOR SWITCHES, INDICATOR LIGHTS, AND PLC-FLOAT CONTROL SWITCH. THE CONTROL SHALL INCLUDE HIGH AND LOWER WATER ALARM FUNCTIONS THAT ACTIVATE A FLASHING RED COMMON ALARM LIGHT, SHUTS DOWN THE PUMP AND REQUIRES A MANUAL RESET. SCADA INTEGRATOR SHALL ALSO PROVIDE AN INTRINSICALLY SAFE WET WELL INTERFACE PANEL WITH ELECTRICAL (SAFE) BARRIERS AND TERMINALS INTERFACING TO THE RADAR SENSOR AND BACK-UP FLOATS. BOTH CONTROL PANELS SHALL BE WIRED IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. LEVEL CONTROLS, INCLUDING PRIMARY RADAR LEVEL MEASUREMENT AND BACK-UP LEVEL FLOAT SWITCHES, ARE TO BE FURNISHED BY THE PUMP MANUFACTURER AND NECESSARY TERMINAL BLOCK FOR CONNECTION OF LEVEL CONTROLS AND OTHER WIRING FOR PROPER INSTALLATION. NOTE: THE SCADA INTEGRATOR CURRENTLY UTILIZED BY THE COUNTY IS MICRO-COMM, INC.
 - RAIL PUMP OUT SYSTEM, TOP GUIDE RAIL SUPPORTS, HATCHES, ETC. SHALL BE GALVANIZED.
 - THE PUMP DISCHARGE SEAL SHALL INCLUDE ADJUSTABLE GUIDE RAIL SUPPORTS AND PUMP DISCHARGE ELBOW TO ALIGN WITH HYDRAULIC SEALING FLANGE ON PUMP DISCHARGE PIPING.
- GENERAL**
- INTERCONNECTING WIRING BETWEEN THE PUMP AND CONTROL PANEL SHALL BE FURNISHED AND INSTALLED BY THE PUMP MANUFACTURER WHO WILL ALSO PROVIDE TESTING AND CHECKOUT OF THE PUMP CONTROL SYSTEM.
 - ALL DUCTILE IRON PIPING IN THE LIFT STATION AND IN THE VALVE VAULT SHALL BE PAINTED. COORDINATE PAINT COLOR WITH THE OWNER.
 - INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SHOP DRAWINGS AS APPROVED BY THE ENGINEER.
 - AS SOON AS PRACTICAL AFTER INSTALLATION, HAVE THE MANUFACTURER'S ENGINEER CHECK OUT THE PUMP STATION OPERATION AND CONTROLS. PROMPTLY MAKE ALL CHANGES AND ADDITIONS AS REQUIRED FOR THE APPROVAL OF THE MANUFACTURER'S ENGINEER.
 - WHEN ALL REQUIRED APPROVALS OF THIS PORTION OF THE WORK HAVE BEEN OBTAINED, AND AT A TIME DESIGNATED BY THE OWNER, THE MANUFACTURER'S FIELD TECHNICIAN SHALL THOROUGHLY DEMONSTRATE TO THE LOCAL OPERATING PERSONNEL THE OPERATION AND MAINTENANCE OF ALL ITEMS INSTALLED.

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 DATE: 5/22/2020

DATE

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PLAN ISSUE/REVISION

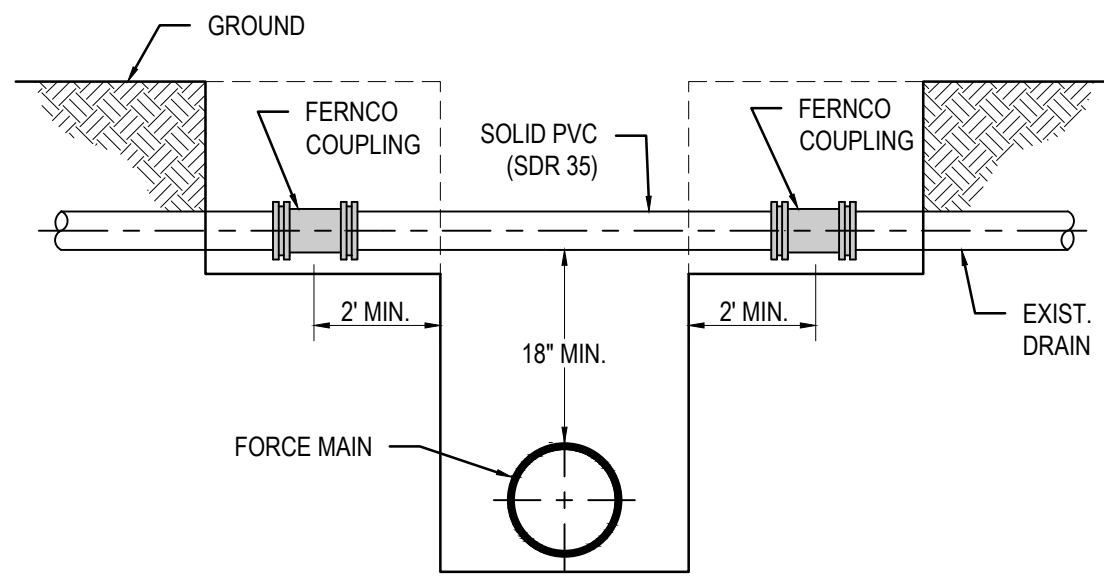
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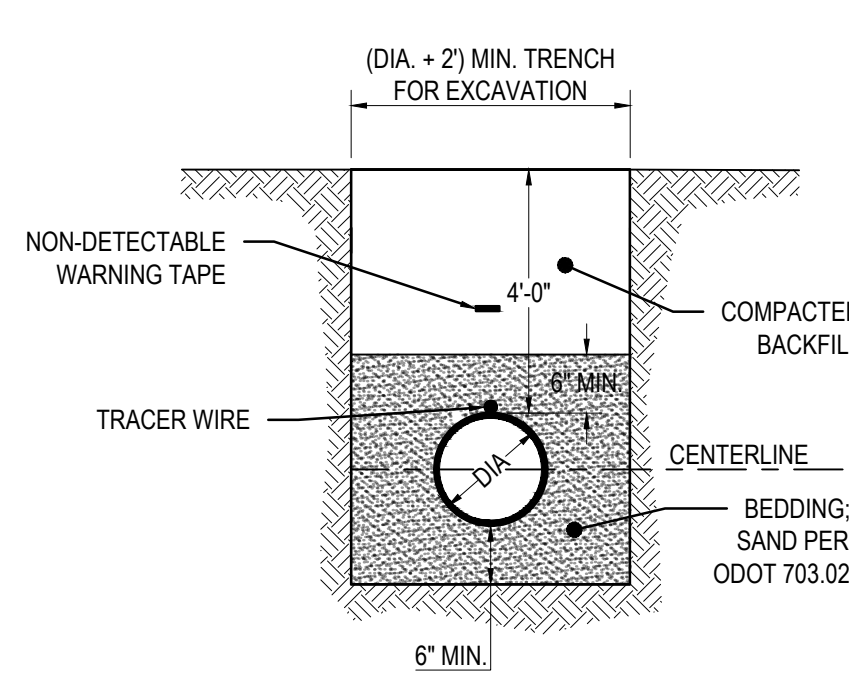
CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
 ZANESVILLE, MUSKINGUM COUNTY, OHIO
LIFT STATION DETAILS

JOB NUMBER:
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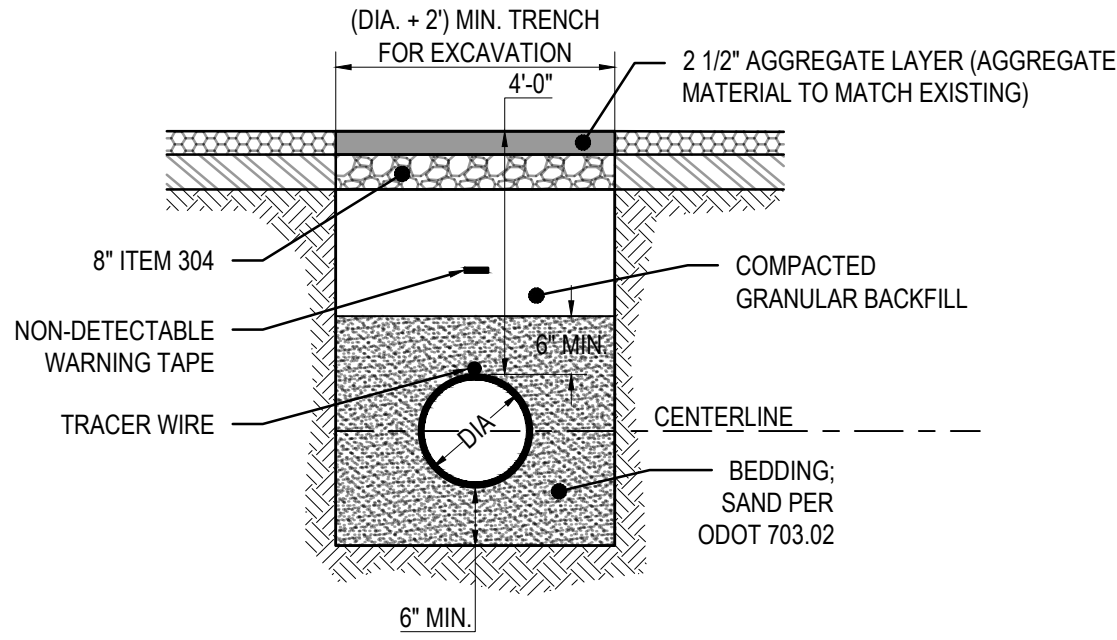


DRAIN PIPE REPAIR
NOT TO SCALE



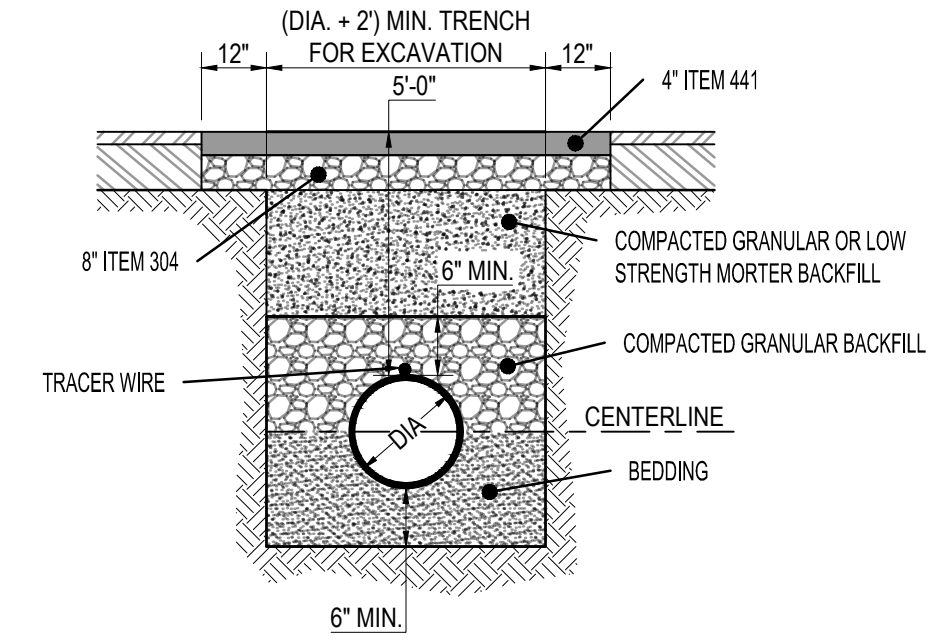
TRENCH DETAIL IN GRASSY AREA
NOT TO SCALE

NOTE:
1. BEDDING SHALL BE REQUIRED ON ALL PIPE INSTALLATION. ADDITIONAL BEDDING OF 4" (10" TOTAL) IN AREAS CONTAINING ROCK EXCAVATION.



TRENCH DETAIL IN STONE DRIVE
NOT TO SCALE

NOTE:
1. BEDDING SHALL BE REQUIRED IN ALL AREAS CONTAINING ROCK EXCAVATION.



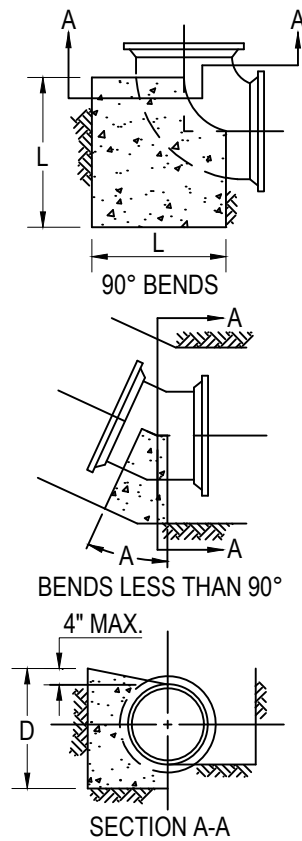
TRENCH DETAIL UNDER OR WITHIN 3' OF PAVEMENT
NOT TO SCALE

NOTE:
1. BEDDING SHALL BE REQUIRED IN ALL AREAS CONTAINING ROCK EXCAVATION.
2. LOW STRENGTH MORTAR SHALL BE INSTALLED AS REQUIRED BY ODOT WITHIN 3' OF PAVEMENT.

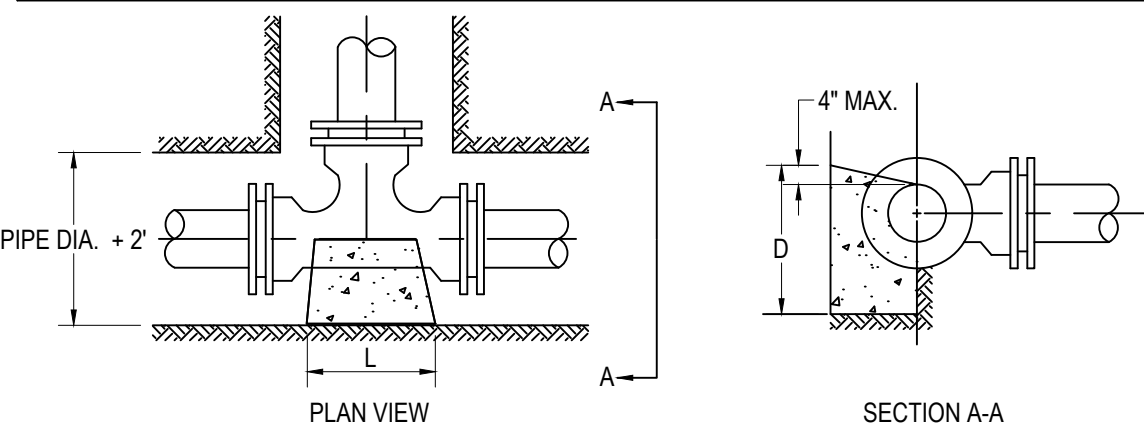
SIZE OF PIPE	DEGREE OF BEND											
	11 1/4°			22 1/2°			45°			90°		
	L"	D"	Vc.f.	L"	D"	Vc.f.	L"	D"	Vc.f.	L"	D"	Vc.f.
3"	4	3	0.1	6	4	0.2	10	4	0.3	10	4	0.3
4"	5	4	0.2	9	5	0.4	14	5	0.6	14	5	0.6
6"	8	6	0.5	12	7	0.7	20	8	1.4	18	9	1.7
8"	9	8	0.7	16	9	1.4	24	12	2.7	25	11	4.0
12"	14	12	1.8	24	14	3.6	36	18	6.8	32	18	10.7
16"	18	16	3.4	32	18	6.7	36	32	13.4	41	26	25.4
20"	25	20	6.4	30	30	11.5	49	36	20.5	50	32	46.5
24"	27	24	9.0	39	34	18.4	60	42	35.0	58	40	77.7

BACKING FOR VERTICAL SAGS AND HORIZONTAL BENDS
NOT TO SCALE

NOTES:
1. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH WITH A MINIMUM SOIL BEARING CAPACITY OF 3000 PSF.
2. CONTRACTOR SHALL PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.

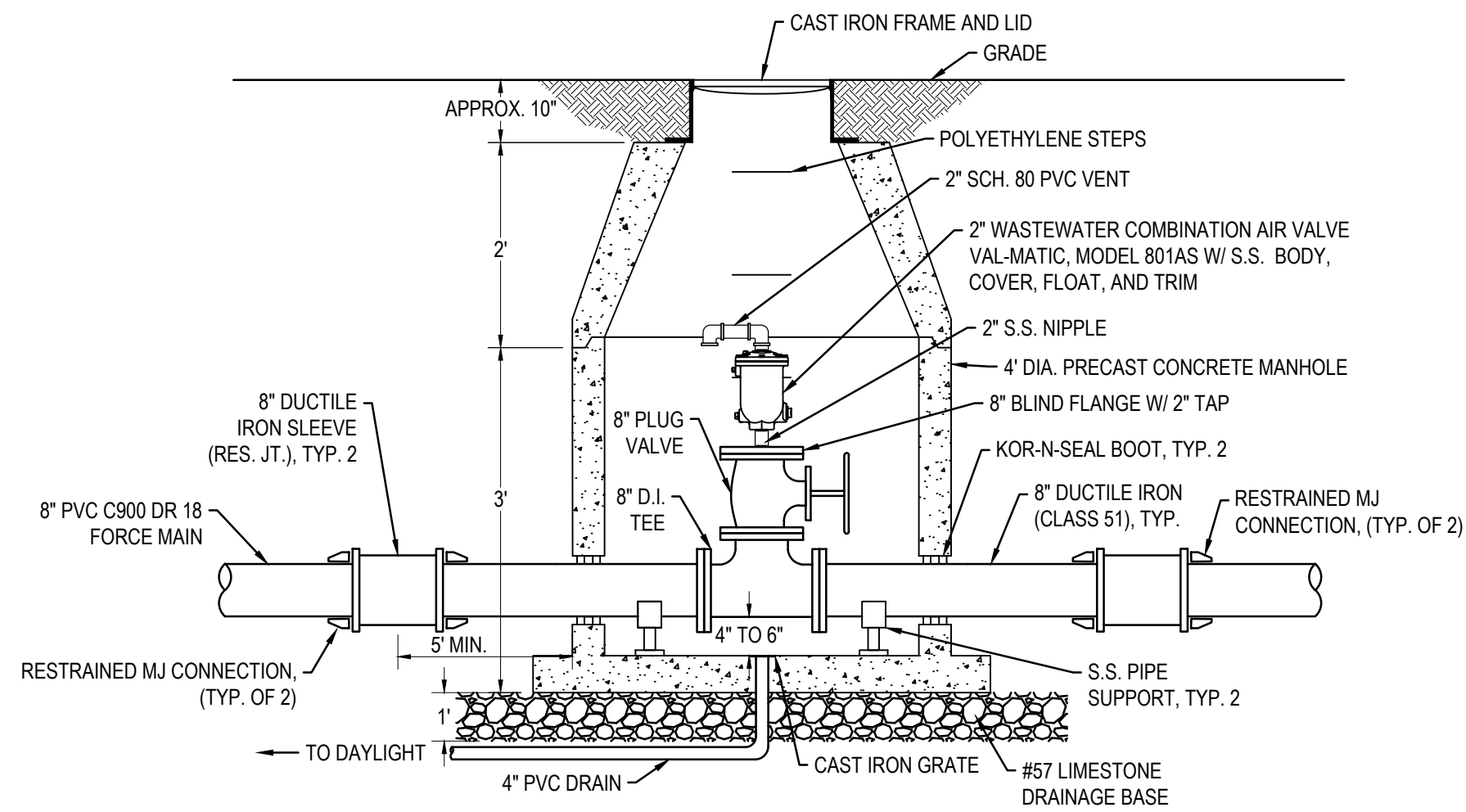


R U N	BRANCH															
	3"		4"		6"		8"		12"		16"		20"		24"	
	L"	D"	Vc.f.	L"	D"	Vc.f.	L"	D"	Vc.f.	L"	D"	Vc.f.	L"	D"	Vc.f.	
3"	12	5	0.5													
4"	10	6	0.5	11	8	0.8										
6"	9	7	0.5	11	8	0.8	18	12	1.9							
8"	8	8	0.5	10	9	0.7	18	12	1.9	23	16	3.5				
12"	6	12	0.6	8	12	0.8	18	12	1.9	23	16	3.5	38	22	8.7	
16"	6	16	0.8	6	16	0.8	14	16	2.0	20	18	3.3	36	23	8.7	
20"	6	20	1.0	6	20	1.0	11	20	1.9	18	20	3.3	35	24	8.7	
24"	6	24	1.2	6	24	1.2	9	24	1.9	15	24	3.3	30	28	8.7	



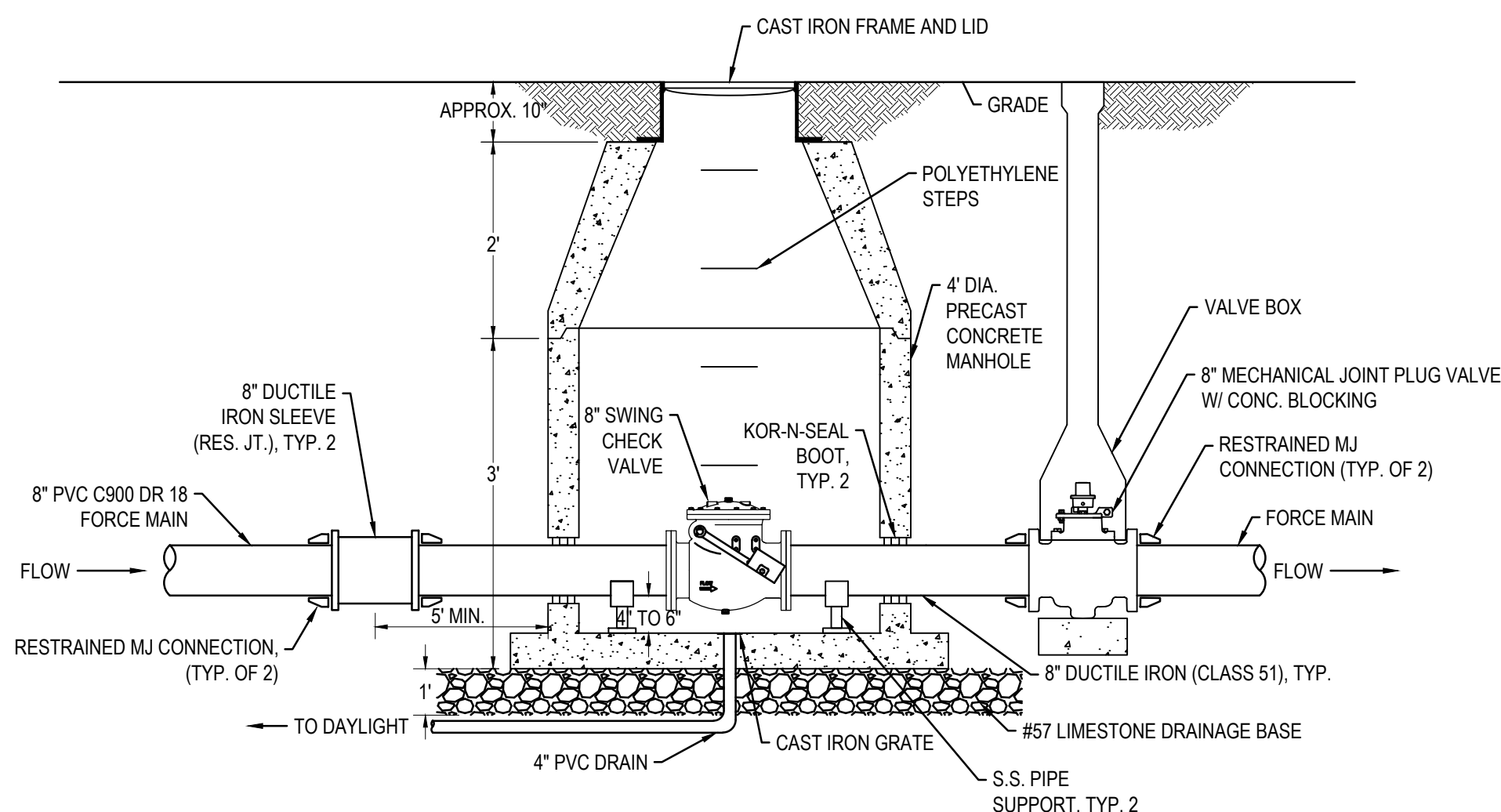
BACKING FOR TEES
NOT TO SCALE

NOTES:
1. CONCRETE SHALL BE PLACED AGAINST UNDISTURBED EARTH WITH A MINIMUM SOIL BEARING CAPACITY OF 3000 PSF.
2. CONTRACTOR SHALL PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.



AUTOMATIC AIR VALVE DETAIL
NOT TO SCALE

NOTES:
1. CONTRACTOR SHALL UTILIZE GRADE RINGS TO MAINTAIN PROPER BURIAL DEPTH ON THE PIPE.
2. CONTRACTOR SHALL VISUAL INSPECT PROPER OPERATION OF EACH AUTOMATIC AIR VALVE.
3. CONTRACTOR SHALL PROVIDE ANY NECESSARY SUPPORT FOR AIR VALVE.



SWING CHECK VALVE PIT DETAIL
NOT TO SCALE

NOTES:
1. CONTRACTOR SHALL UTILIZE GRADE RINGS TO MAINTAIN PROPER BURIAL DEPTH ON THE PIPE.
2. CONTRACTOR SHALL VISUAL INSPECT PROPER OPERATION OF EACH SWING CHECK VALVE.
3. CONTRACTOR SHALL PROVIDE ANY NECESSARY SUPPORT FOR CHECK VALVE.

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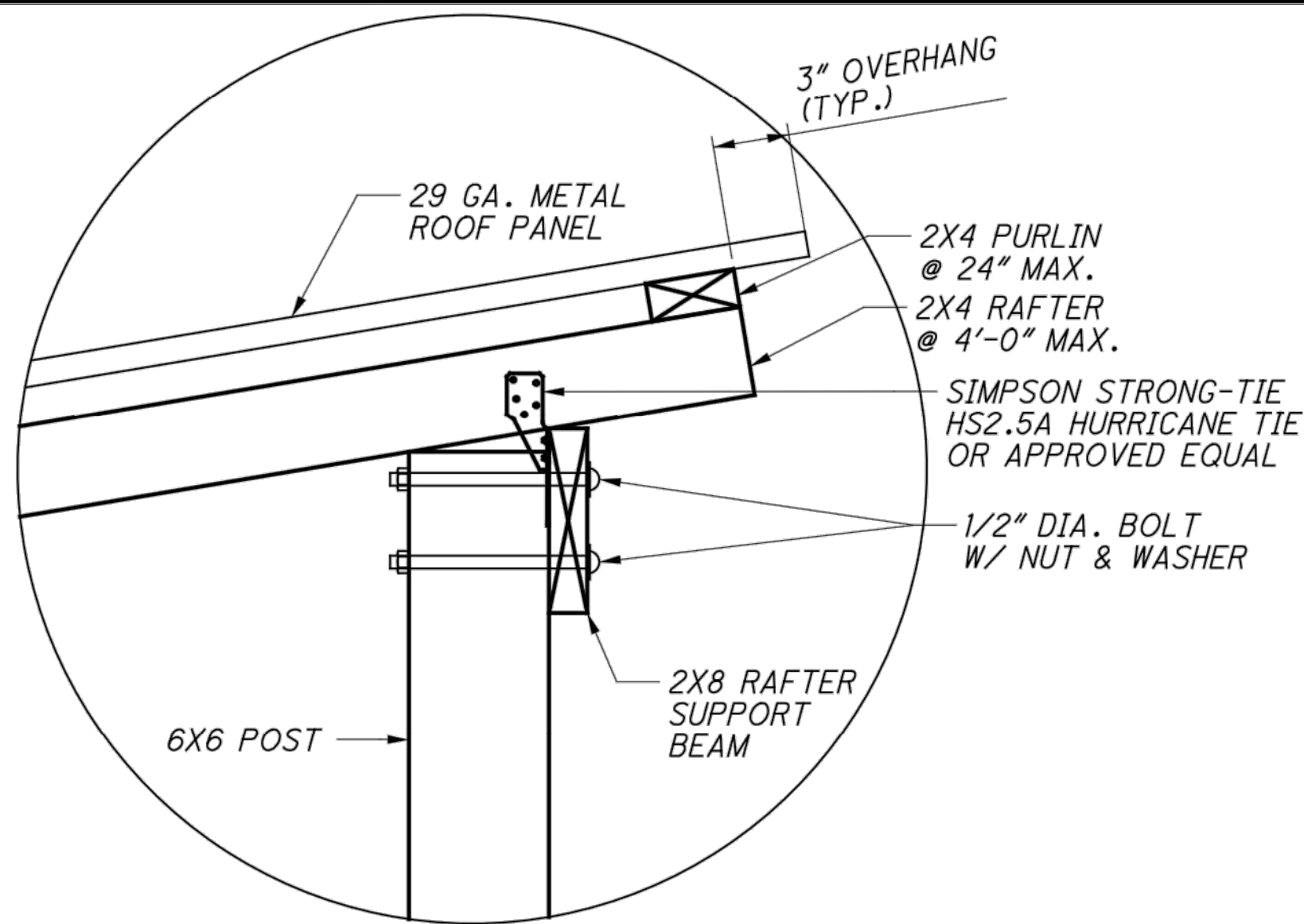
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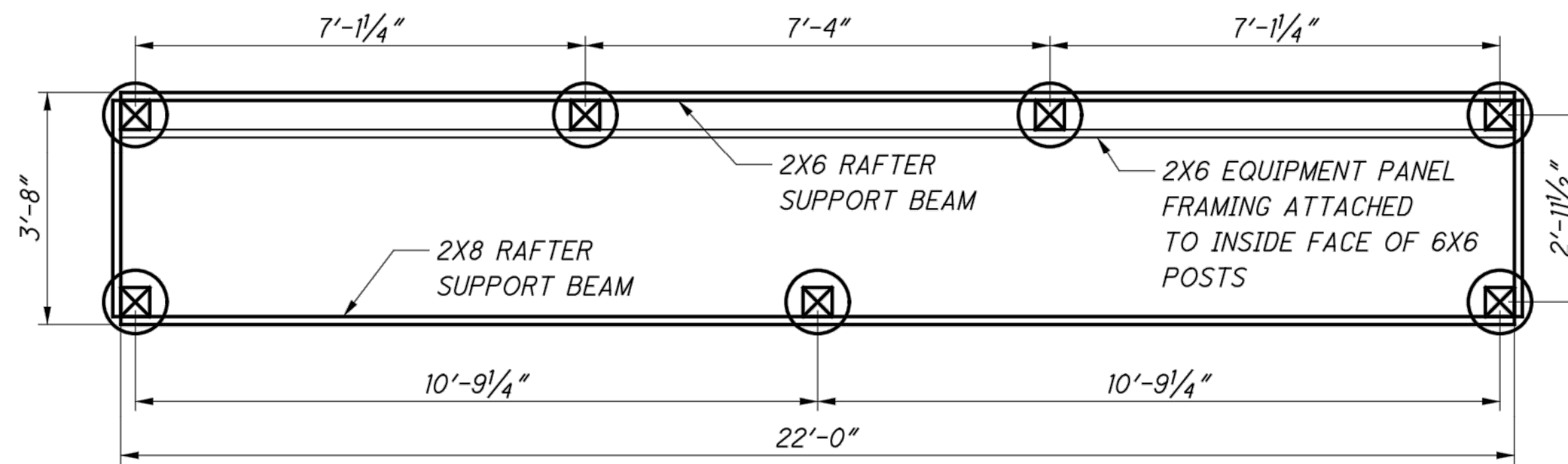
CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
FORCE MAIN DETAILS

JOB NUMBER:
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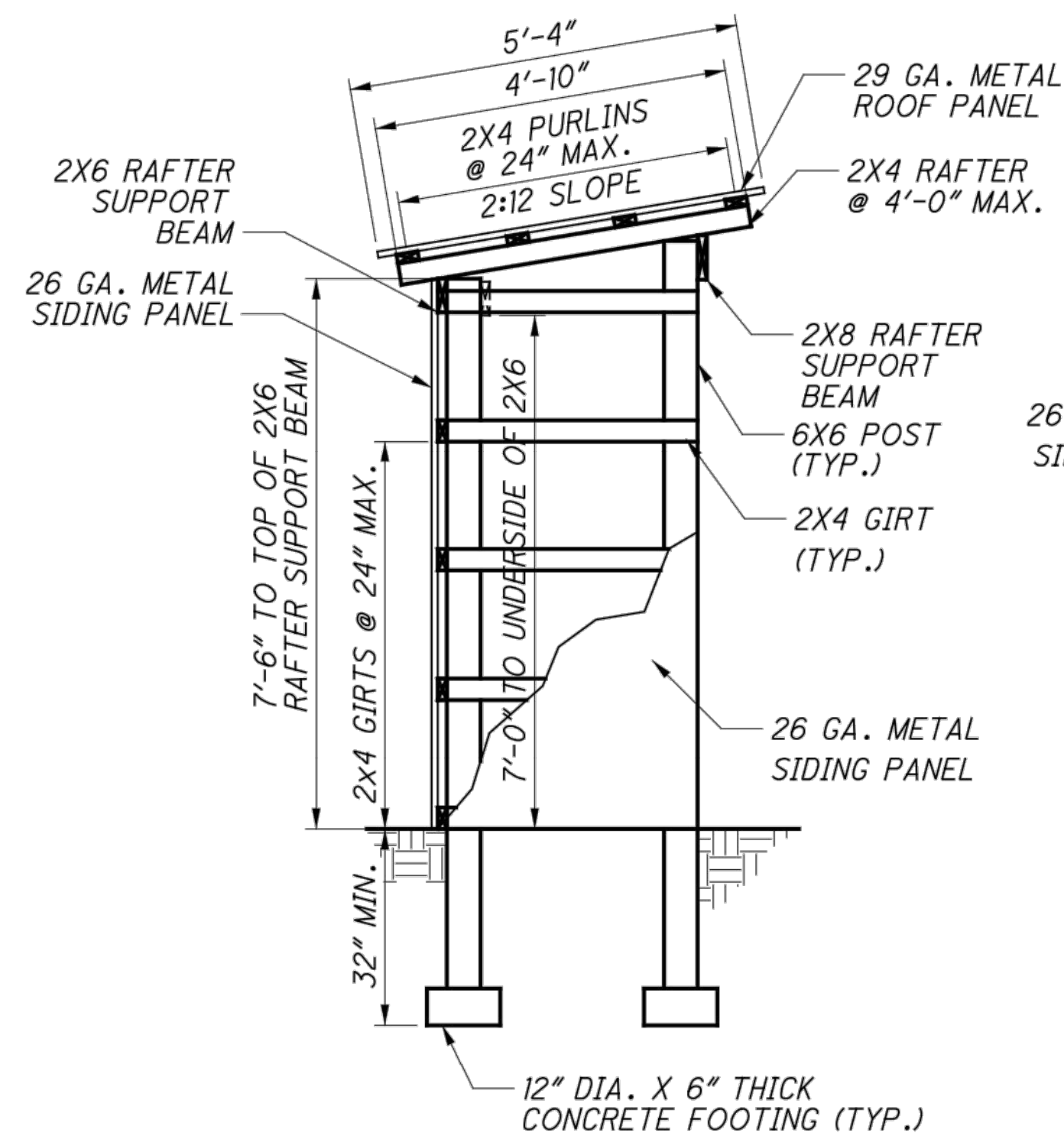
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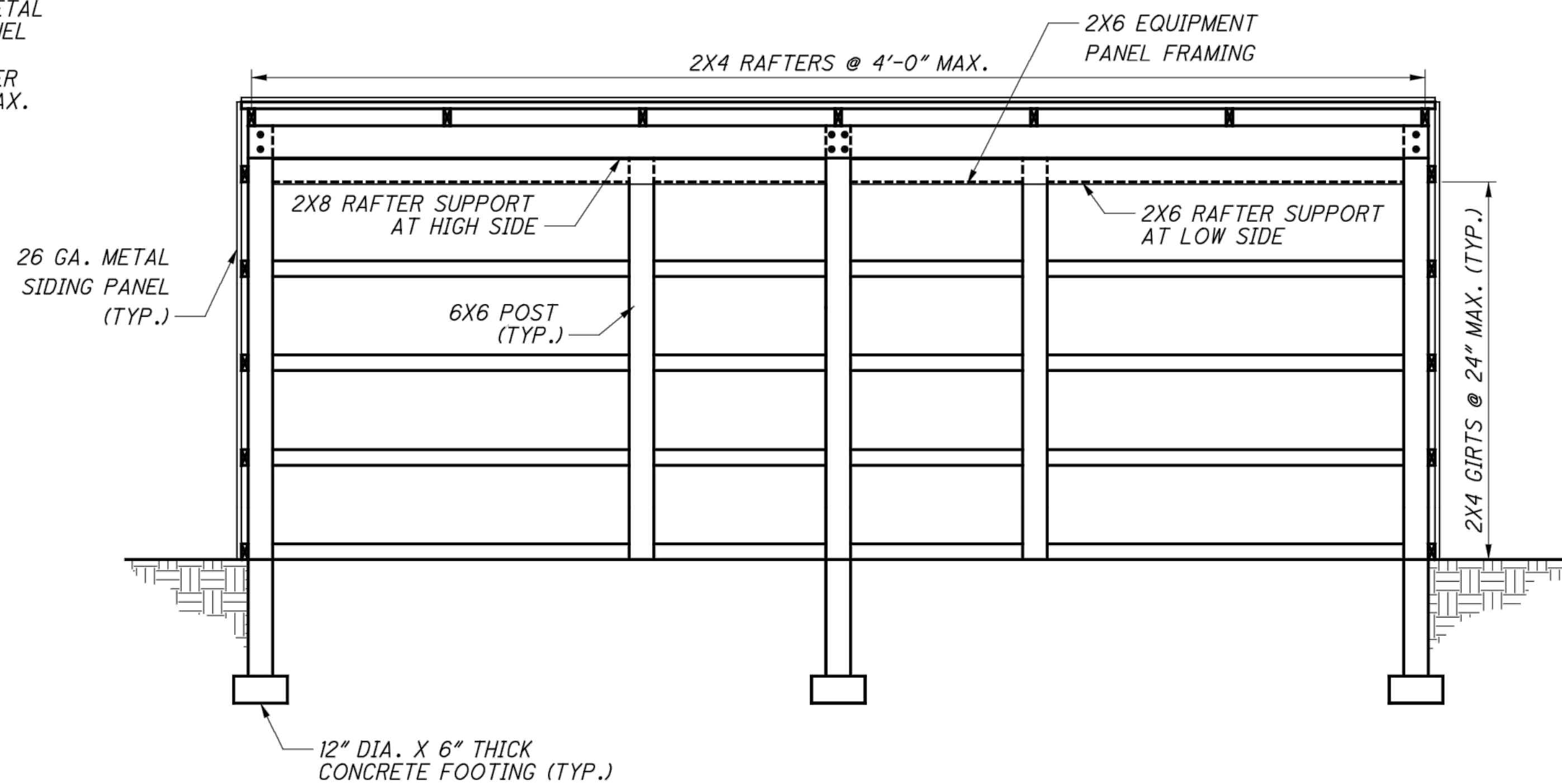
TYPICAL CONNECTION DETAIL



PLAN VIEW



SECTION VIEW



HIGH SIDE ELEVATION VIEW

GENERAL STRUCTURAL NOTES

GOVERNING CODES

OHIO BUILDING CODE - 2017 (REFERENCES ASCE-7 2010)

DESIGN LOADS

1. ROOF LOAD
 - A. GROUND SNOW LOAD (Pg) = 25 PSF
 - B. SNOW EXPOSURE FACTOR (Ce) = 0.9
 - C. IMPORTANCE FACTOR (I) = 0.8
 - D. THERMAL FACTOR (Ct) = 1.2
2. WIND LOAD
 - A. DESIGN WIND SPEED = 115 MPH
 - B. IMPORTANCE FACTOR = 1.15
 - C. EXPOSURE CATEGORY = C
 - D. INTERNAL PRESSURE COEFFICIENT (G CPI) = 0.55

FOUNDATIONS

FOUNDATION DESIGN IS BASED ON THE ASSUMPTION OF FAVORABLE SOIL CONDITIONS. SOIL BEARING CAPACITY OF THE PROJECT SITE HAS BEEN ESTIMATED AT 1500 PSF. CONTRACTOR SHALL PERFORM COMPACTION TESTS TO VERIFY A MINIMUM BEARING CAPACITY OF 1500 PSF.

CONCRETE

CONCRETE UTILIZED FOR THE POST FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.

WOOD

1. DIMENSIONAL LUMBER SHALL BE #2 SPRUCE PINE FIR OR BETTER, UNLESS NOTED OTHERWISE.
2. PRESSURE TREAT LUMBER WITH ACQ (ALKALINE COPPER QUAT), CBA-A, OR CA-B (COPPER AZOLE), OR NON-DOT BORATE PRESSURE TREATED LUMBER. PRESSURE TREAT TO 0.60 FOR POLES AND 0.25 ELSEWHERE.
3. ALL NAILS AND FASTENERS SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL.
4. UNLESS NOTED OTHERWISE, CONNECTIONS SHALL BE MADE PER TABLE 2304.10.1 "FASTENING SCHEDULE", IN REFERENCED BUILDING CODE.
5. SIMPSON STRONG-TIE CONNECTORS SPECIFIED IN THE PLANS SHALL BE ZMAX (G185) OR HOT DIPPED GALVANIZED AND SHALL BE MANUFACTURED BY THE SIMPSON STRONG-TIE COMPANY AND SHALL BE FASTENED AS SPECIFIED IN THE SIMPSON STRONG-TIE PRODUCT AND INSTRUCTION MANUAL.

METAL PANEL

1. METAL ROOF PANEL SHALL BE 29 GAGE MINIMUM.
2. METAL SIDING PANEL SHALL BE 26 GAGE MINIMUM.
3. ALL METAL SIDING AND ROOF PANEL SHALL BE PRE-PAINTED. COLOR TO BE SELECTED BY OWNER. CONTRACTOR SHALL SUPPLY OWNER WITH COLOR SELECTION CHART.
4. METAL PANELS SHALL BE FASTENED WITH ZINC-COATED SCREWS WITH SEALING WASHER (COLOR TO MATCH METAL), AS RECOMMENDED BY MANUFACTURER. SCREWS SHALL BE EVENLY SPACED.
5. METAL PANEL COMPONENTS SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS. ALL RECOMMENDED TRIM SHALL BE INSTALLED TO COVER JOINT AT ENDS. NOT ALL TRIM IS SHOWN IN DETAIL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUBMIT ALL TRIM BEING USED AS A SUBMITTAL.

CONSTRUCTION AND SAFETY

CONTRACTOR SHALL BRACE ENTIRE STRUCTURE AS REQUIRED TO MAINTAIN STABILITY UNTIL COMPLETE AND FUNCTIONING AS THE DESIGNED UNIT.

NOTE:

CONTRACTOR SHALL ADJUST ELECTRICAL EQUIP. AS NECESSARY TO AVOID CONFLICTS WITH POST(S) AND TO PROVIDE PROPER CLEARANCES.

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			5/22/2020

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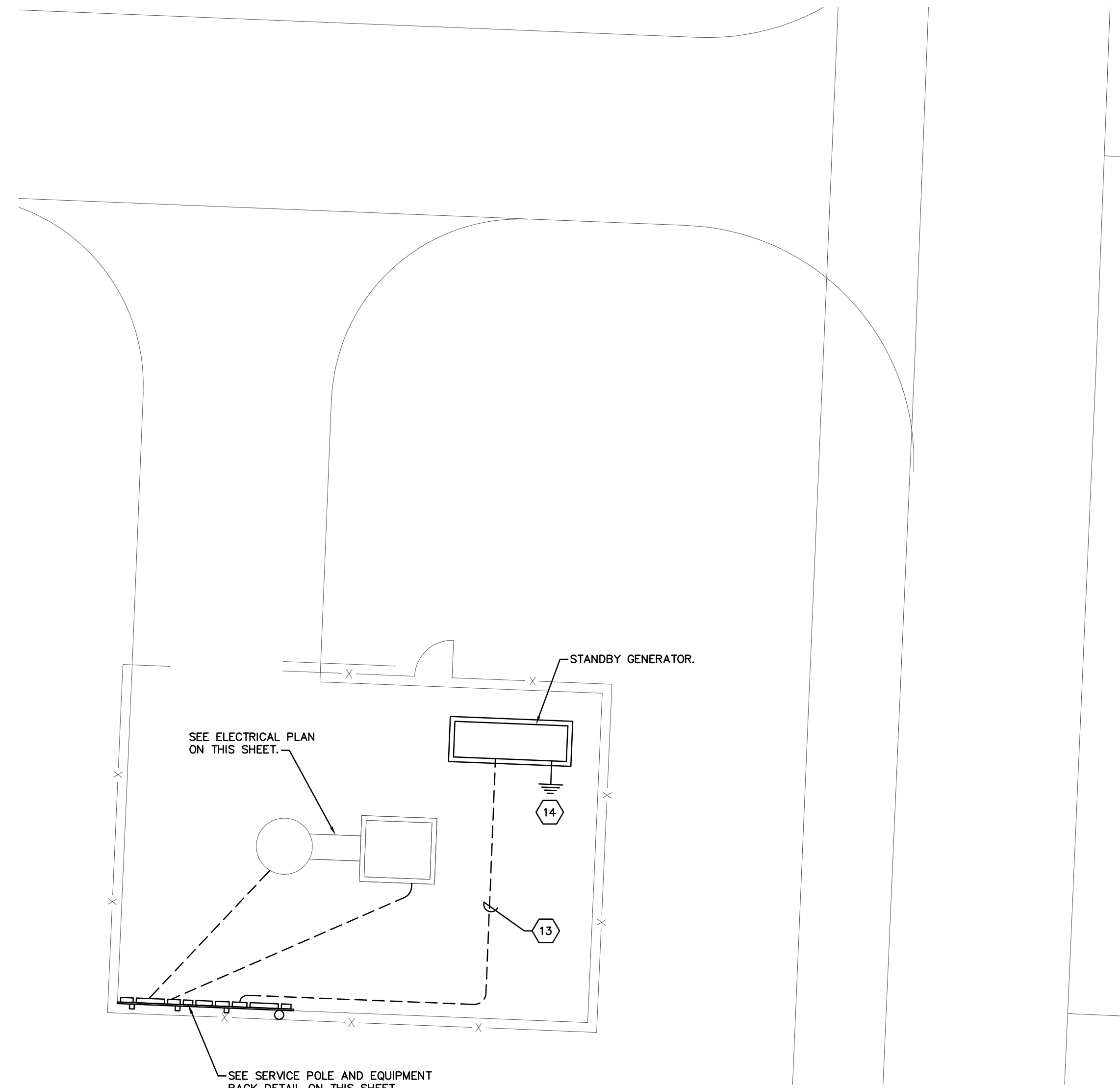
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
ELECTRIC EQUIPMENT SHELTER DETAIL

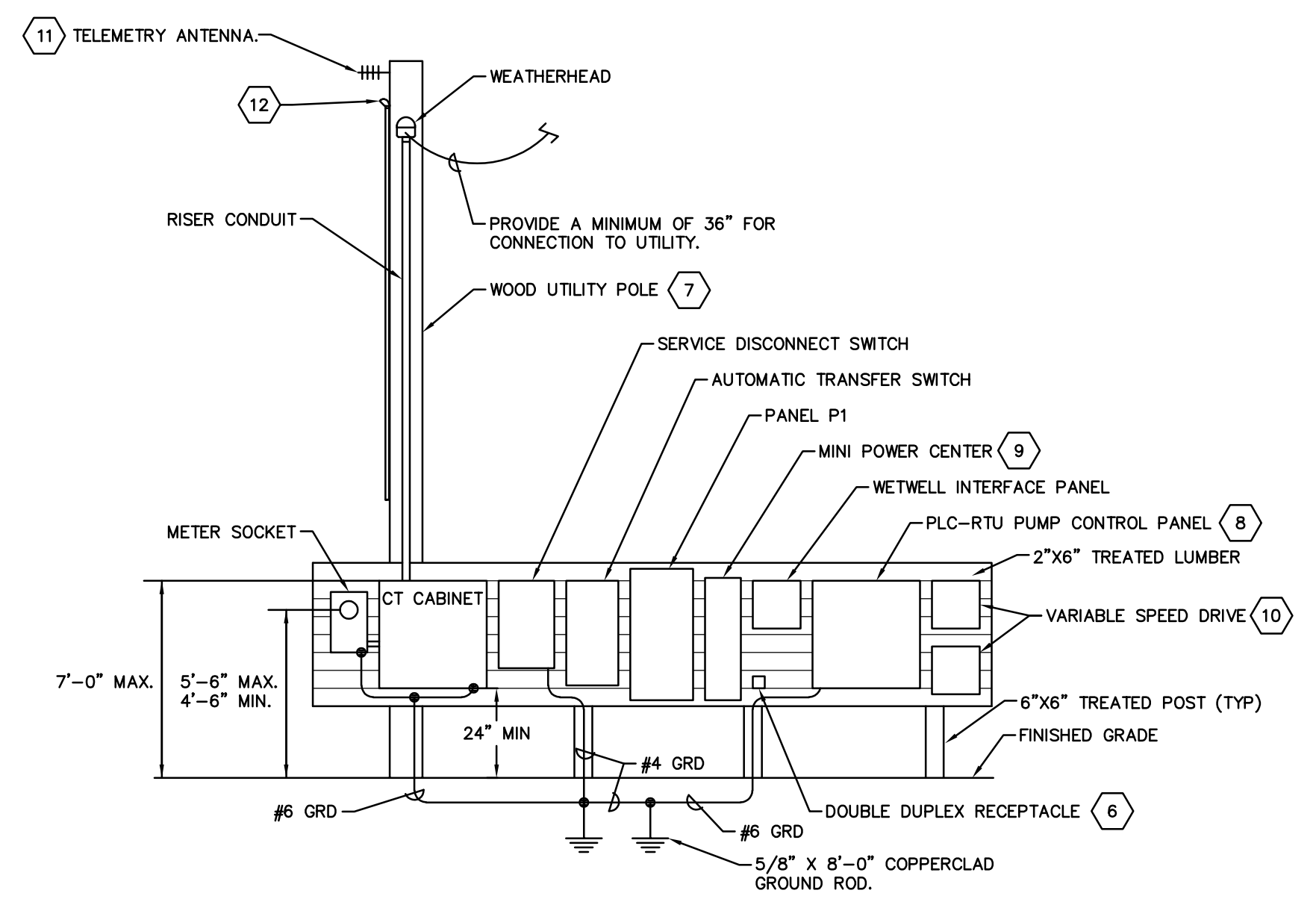
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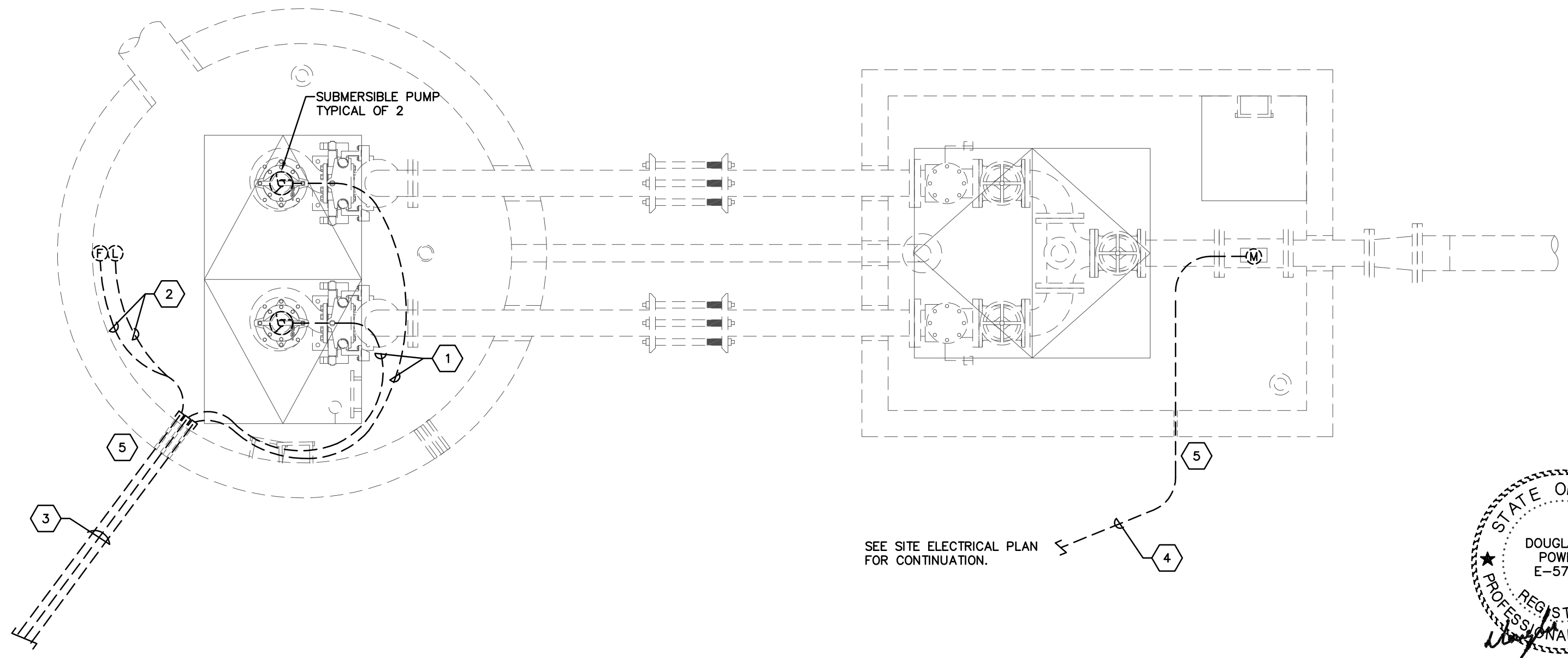


ELECTRICAL SITE PLAN
SCALE: 1" = 10'



NOTES: 1. CONFIRM SERVICE INSTALLATION REQUIREMENTS WITH THE ELECTRIC UTILITY COMPANY PRIOR TO ANY WORK.

SERVICE POLE AND EQUIPMENT RACK DETAIL
SCALE: NONE



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

CODED NOTES			
1.	POWER CABLE FURNISHED WITH PUMP.		
2.	CONTROL/SIGNAL CABLE FURNISHED WITH LEVEL SENSOR/FLOAT.		
3.	1 1/2" CONDUIT FOR CONTROL AND TWO CONDUITS FOR POWER TO PUMP CONTROL PANEL.		
4.	1" CONDUIT WITH SIGNAL CABLE FOR FLOW METER TO PUMP CONTROL PANEL. CABLE FURNISHED WITH FLOW METER.		
5.	CONDUIT PENETRATIONS SHALL BE MADE WATERTIGHT WITH GROUT, CAULK OR MECHANICAL SEAL.		
6.	RECEPTACLE SHALL BE WEATHERPROOF WITH GROUND FAULT CIRCUIT INTERRUPTER. CONNECT TO PC-1-2.		
7.	PROVIDE POLE HEIGHT AS REQUIRED TO MAINTAIN A MINIMUM OF 18' CLEARANCE OVER ROADWAY, STREETS AND DRIVEWAYS.		
8.	CONNECT TO PC-1-4.		
9.	MINI POWER CENTER SHALL BE SQUARE D MPZB5540F OR EQUAL.		
10.	CONFIRM MOUNTING REQUIREMENTS. VFD MAY BE MOUNTED IN PUMPS CONTROL PANEL DEPENDING ON CONTROL PANEL MANUFACTURER.		
11.	MOUNT ANTENNA A MINIMUM OF 20' ABOVE FINISHED GRADE. COORDINATE ORIENTATION ON POLE WITH SYSTEM INTEGRATOR.		
12.	PROVIDE A WEATHERHEAD AND A 3/4" CONDUIT TO PLC-RTU PUMP CONTROL PANEL.		
13.	1" CONDUIT WITH BRANCH CIRCUITS FOR GENERATOR BATTERY CHARGER AND WATER HEATER TO PANEL PC-1; AND GENERATOR FEEDER CONDUIT TO AUTOMATIC TRANSFER SWITCH, SEE ONE LINE DIAGRAM.		
14.	PROVIDE A 5/8" X 10' GROUND ROD AND CONNECT TO GENERATOR GROUND LUG OR FRAME WITH A BARE #6 COPPER CONDUCTOR.		

NO.	DATE	PLAN ISSUE/REVISION	DATE

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Zanesville, OH 43885
Phone: (740) 344-5451
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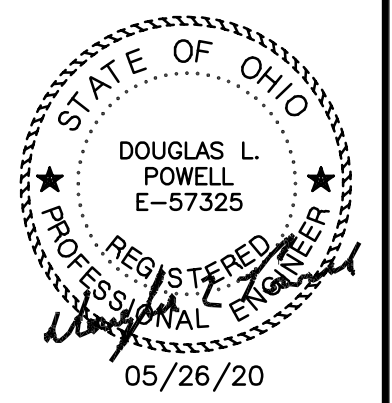
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CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO

ELECTRICAL PLANS

JOB NUMBER:
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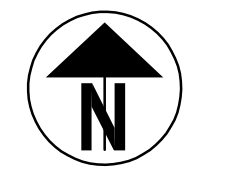
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PRATER
Engineering Associates, Inc.

6130 Wilcox Road
Dublin, Ohio 43016

(614) 766 4896
FAX: (614) 766 2354

DESIGNED BY D.POWELL	DRAWN BY DLP	CHECKED BY PEA	JOB NUM. 20110
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CODED NOTES

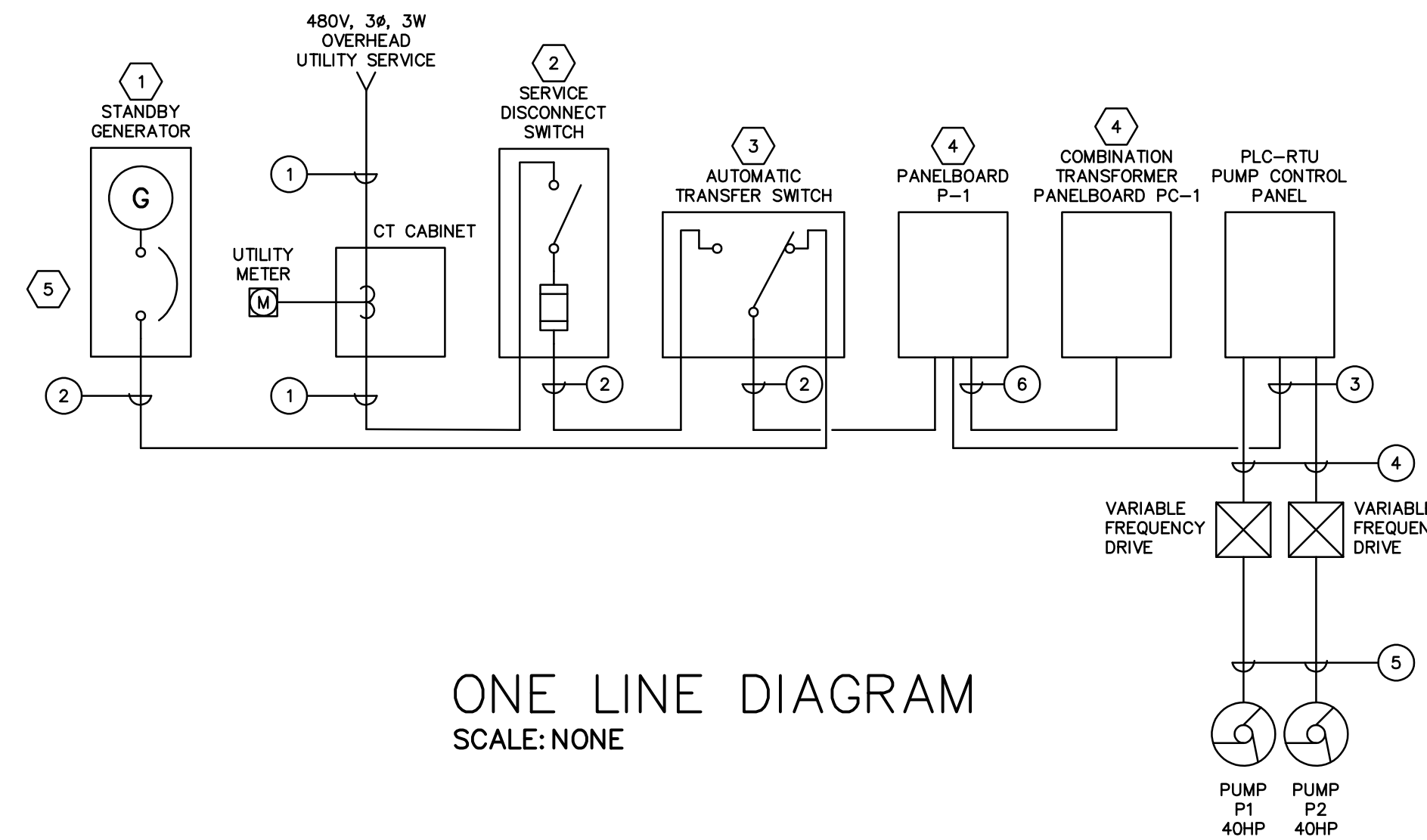
- 125KW, 480V, 3 PHASE, 3 WIRE STANDBY GENERATOR WITH 200A CIRCUIT BREAKER. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 480V, 3 POLE, 200A FUSIBLE DISCONNECT SWITCH, SUITABLE FOR USE AS A SERVICE DISCONNECT. PROVIDE WITH 200A FUSES.
- 480V, 3 PHASE, 200A TRANSFER SWITCH.
- SEE PANELBOARD SCHEDULE ON THIS SHEET.
- IF PROVIDED, REMOVE THE NEUTRAL TO GROUND BONDING JUMPER IN THE GENERATOR.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE W/ GROUND FAULT INTERRUPTER (WEATHER RESISTANT)
	LEVEL FLOATS
	RADAR LEVEL SENSOR
	MAGNETIC FLOW METER
	THREE PHASE MOTOR
	ELECTRICAL PANEL

FEEDER SCHEDULE	
DESIG.	FEEDER SIZE
1	3 - 3/0 - 2"
2	3 - 3/0 + 6 - 2"
3	3 - 1/0 + 6 - 1 1/2"
4	3 - 2 + 8 - 1 1/4"
5	POWER CORD SUPPLIED WITH PUMP IN 1" C
6	2 - 12 + 12 - 3/4"

WIRING LEGEND	
4 - 350 + 350 - 3"	NO. OF CONDUCTORS
3"	SIZE OF CONDUIT
350 - 3"	SIZE OF CONDUCTORS
3"	SIZE OF GROUND CONDUCTOR



ONE LINE DIAGRAM
SCALE: NONE

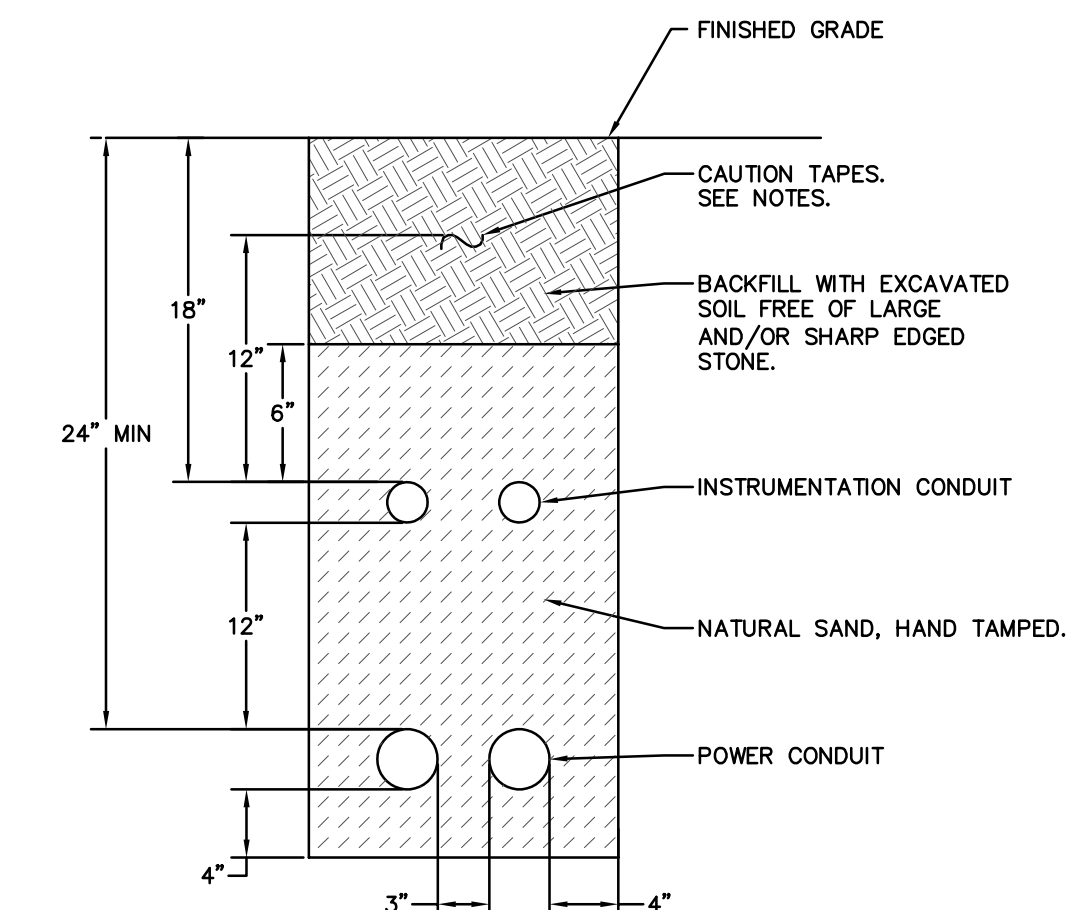
Panel ID: P-1		Voltage: 480 Volts		Panel Type: POWER								
Location: PUMP STATION		Phase: 3		Enclosure: NEMA 3R								
Mounting: SURFACE		Wire: 3										
Main Type: MCB		Main Size: 200 Amps										
GND SIZE	WIRE SIZE	BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CONN. LOAD (KVA)	CTK NO.	PHASE	CTK NO.	CONN. LOAD (KVA)	CKT BKR SIZE	BRANCH CIRCUIT DESCRIPTION	WIRE SIZE	GND SIZE
**	**	PUMP CONTROL PANEL	150/3	33.810	1	A	2	2.500	20/2	PANEL PC-1	12	12
-	**	SPACE	---	33.810	3	A	4	0.000	---	SPACE	---	---
-	-	SPACE	---	0.000	5	A	6	0.000	---	SPACE	---	---
-	-	SPACE	---	0.000	7	B	8	0.000	---	SPACE	---	---
-	-	SPACE	---	0.000	9	A	10	0.000	---	SPACE	---	---
-	-	SPACE	---	0.000	9	A	10	0.000	---	SPACE	---	---

Connected Load Panel Summary			
Phase A:	36.3 KVA	131.1 AMPS	
Phase B:	36.6 KVA	131.1 AMPS	
Phase C:	33.8 KVA	122.1 AMPS	
Total:	106.4 KVA		

** SEE ONE LINE DIAGRAM

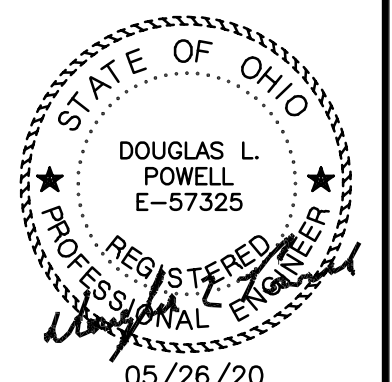
Panel ID: PC-1		Voltage: 120/240 Volts		Panel Type: INTEGRAL TRANSFORMER/POWER								
Location: PUMP STATION		Phase: 1		Enclosure: NEMA 3R								
Mounting: SURFACE		Wire: 3										
Primary Main Type: MCB		Primary Main Size: 20 Amps		Transformer Size: 5 kVA								
Secondary Main Type: MCB		Secondary Main Size: 30 Amps		Primary Voltage: 480 V								
GND SIZE	WIRE SIZE	BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CONN. LOAD (KVA)	CTK NO.	PHASE	CTK NO.	CONN. LOAD (KVA)	CKT BKR SIZE	BRANCH CIRCUIT DESCRIPTION	WIRE SIZE	GND SIZE
10	10	GENERATOR HEATER	20/1	1.500	1	A	2	0.360	20/1	RECEPTACLE	12	12
12	12	BATTERY CHARGER	20/1	0.240	3	B	4	1.200	20/1	REMOTE TERMINAL UNIT	12	12
-	-	SPARE	20/1	0.000	5	A	6	0.000	20/1	SPARE	---	---
-	-	SPARE	20/1	0.000	7	B	8	0.000	20/1	SPARE	---	---
-	-	SPARE	20/1	0.000	9	A	10	0.000	20/1	SPARE	---	---

Connected Load Panel Summary			
Phase A:	1.9 KVA	15.5 AMPS	
Phase B:	1.4 KVA	11.8 AMPS	
Total:	3.3 KVA		



- NOTES
- INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF NEC ARTICLE 310 & LOCAL CODES / REGULATIONS.
 - CONDUIT SHALL BE DIRECT BURY SCHEDULE 80 PVC SEE SITE PLAN FOR CONDUIT SIZE AND QUANTITIES.
 - PROVIDE A RED ELECTRIC CAUTION TAPE WHERE SHOWN.
 - MAINTAIN 12" OF SEPARATION BETWEEN POWER AND INSTRUMENTATION CONDUITS. WHEN INSTRUMENTATION CONDUITS ARE NOT PRESENT IN THE SAME TRENCH, TOP OF POWER CONDUITS TO BE 24" BELOW FINISHED GRADE, AND ELECTRIC CAUTION TAPE SHALL BE 12" ABOVE POWER CONDUITS.

TYPICAL DIRECT BURIED
DUCTBANK DETAIL
SCALE: NONE



E2-20110.DWG

PRATER
Engineering Associates, Inc.

6130 Wilcox Road
Dublin, Ohio 43016

(614) 766 4896
FAX: (614) 766 2354

DESIGNED BY: D.POWELL
DRAWN BY: DLP
CHECKED BY: PEA
JOB NUM.: 20110

NO.	DATE	DESCRIPTION

HULL
Environment / Energy / Infrastructure

HULL & ASSOCIATES, Inc.
500 Grant Street
Cincinnati, OH 45202
Phone: (760) 344-5451
Fax: (760) 344-8899
www.hullinc.com

CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
ELECTRICAL DETAILS & SCHEDULES

JOB NUMBER:
ZAN012

62

PART 5 STANDBY GENERATOR

5.1 GENERATOR SET CHARACTERISTICS

- A. BASIS OF DESIGN IS KOHLER #125RE0ZJG WITH A 4R12X ALTERNATOR. EQUAL EQUIPMENT AS MANUFACTURED BY CUMMINS MAY BE SUPPLIED AT THE CONTRACTOR'S OPTION.
B. MINIMUM RATING BASED ON A MAXIMUM ALTITUDE OF 1000 FEET, AND AN AMBIENT TEMPERATURE OF 104 DEGREES F OR LESS AND A RELATIVE HUMIDITY OF 95%, @ 1800 RPM:
STANDBY KW WITH FAN - 125 KW
STANDBY KVA WITH FAN - 156.25 KVA
POWER FACTOR - 0.8
VOLTAGE - 480/277V, 3 PHASE, 4 WIRE
FREQUENCY - 60 HERTZ
MINIMUM STARTING KVA - 440 @ 35% VOLTAGE DIP
C. THE STANDBY RATING SHALL BE AVAILABLE FOR THE DURATION OF THE OUTAGE. THE GENERATOR MUST ACCEPT RATED LOAD IN ONE STEP.
D. THE GENERATOR SET SHALL BE LISTED TO UL2200. THE ENGINE SHALL BE EPA CERTIFIED FROM THE FACTORY.

5.2 GENERAL

- A. THE STANDBY SYSTEM SHALL BE WARRANTED BY THE MANUFACTURER AGAINST DEFECTIVE MATERIALS AND FACTORY WORKMANSHIP FOR A PERIOD OF FIVE (5) YEARS. SUCH DEFECTIVE PARTS SHALL BE REPAIRED OR REPLACED AT THE MANUFACTURER'S OPTION, FREE OF CHARGE FOR PARTS, LABOR AND TRAVEL. THE WARRANTY PERIOD SHALL COMMENCE WHEN THE STANDBY POWER SYSTEM IS FIRST PLACED INTO SERVICE.
B. AFTER COMPLETION OF THE INSTALLATION AT THE SITE, A TWO (2) HOUR ON-SITE TEST SHALL BE PERFORMED WHICH INCLUDES THE OPERATION OF ALL SAFETIES, CONTROLS AND AUTOMATIC TRANSFER SWITCH. THE GENERATOR SHALL BE TESTED UNDER FULL RATED LOAD BY LOAD BANK AT UNITY POWER FACTOR. RESISTIVE LOAD BANKS FOR TESTING SHALL BE PROVIDED BY THE CONTRACTOR. ALL NECESSARY CABLES REQUIRED TO CONNECT THE LOAD BANK TO THE GENERATOR SHALL BE PROVIDED BY THE CONTRACTOR. THE ON-SITE TWO (2) HOUR TEST SHALL BE WITNESSED BY THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL PROVIDE ALL FUEL REQUIRED FOR TESTING AND SHALL FILL THE FUEL TANK AFTER TESTING.
C. MOUNTING - THE UNIT SHALL BE MOUNTED ON A STRUCTURAL STEEL SUBBASE AND SHALL BE PROVIDED WITH SUITABLE VIBRATION ISOLATORS.

5.3 ENGINE

- A. THE GENERATOR SET SHALL BE LISTED TO UL2200. THE ENGINE SHALL BE EPA CERTIFIED FROM THE FACTORY.
B. THE ENGINE SHALL BE FUELED BY DIESEL AND SHALL BE EQUIPPED WITH AN ELECTRONIC ISOCHRONOUS GOVERNOR CAPABLE OF 0.25% STEADY STATE FREQUENCY REGULATION; A POSITIVE ENGAGEMENT SOLENOID SHIFT STARTING MOTOR; AN AUTOMATIC BATTERY CHARGING ALTERNATOR WITH A SOLID STATE VOLTAGE REGULATOR; A POSITIVE DISPLACEMENT FULL PRESSURE LUBRICATION OIL PUMP; DRY TYPE REPLACEABLE AIR CLEANER ELEMENTS; AND A FUEL TRANSFER PUMP WITH FUEL FILTER AND SHUT OFF VALVE. THE ENGINE SHALL BE LIQUID COOLED.
C. THE ENGINE SHALL BE LIQUID-COOLED BY A CLOSED LOOP, UNIT MOUNTED RADIATOR RATED TO OPERATE THE GENERATOR SET AT FULL LOAD AT AN AMBIENT TEMPERATURE OF 122 DEGRESS F.

5.4 ALTERNATOR

- A. THE ALTERNATOR SHALL BE SALIENT-POLE, BRUSHLESS, 2/3-PITCH, WITH DRIP-PROOF CONSTRUCTION AND AMORTISSEUR ROTOR WINDINGS, AND SKEWED FOR SMOOTH VOLTAGE WAVEFORM. THE RATINGS SHALL MEET THE NEMA STANDARD (MG1-32.40) TEMPERATURE RISE LIMITS. THE INSULATION SHALL BE CLASS H PER UL1446 AND THE VARNISH SHALL BE A VACUUM PRESSURE IMPREGNATED, FUNGUS RESISTANT EPOXY. TEMPERATURE RISE OF THE ROTOR AND STATOR SHALL BE LIMITED TO 130°C STANDBY. THE PMG BASED EXCITATION SYSTEM SHALL BE OF BRUSHLESS CONSTRUCTION CONTROLLED BY A DIGITAL, THREE PHASE SENSING, SOLID STATE, VOLTAGE REGULATOR. THE AVR SHALL BE CAPABLE OF PROPER OPERATION UNDER SEVERE NONLINEAR LOADS AND PROVIDE INDIVIDUAL ADJUSTMENTS FOR VOLTAGE RANGE, STABILITY AND VOLTS-PER-HERTZ OPERATIONS. THE AVR SHALL BE PROTECTED FROM THE ENVIRONMENT BY CONFORMAL COATING. THE WAVEFORM HARMONIC DISTORTION SHALL NOT EXCEED 5% TOTAL RMS MEASURED LINE-TO-LINE AT FULL RATED LOAD. THE TIF FACTOR SHALL NOT EXCEED 50.
B. THE GENERATOR SHALL BE INHERENTLY CAPABLE OF SUSTAINING AT LEAST 300% OF RATED CURRENT FOR AT LEAST 10 SECONDS UNDER A 3-PHASE SYMMETRICAL SHORT CIRCUIT WITHOUT THE ADDITION OF SEPARATE CURRENT-SUPPORT DEVICES.
C. THE ALTERNATOR SHALL BE DIRECTLY CONNECTED TO THE FLYWHEEL HOUSING WITH A SEMI-FLEXIBLE COUPLING BETWEEN THE ROTOR AND THE FLYWHEEL.

5.5 GENERATOR OVERCURRENT AND FAULT PROTECTION

- A. THE GENERATOR SHALL BE PROVIDED WITH A FACTORY INSTALLED, 80% RATED, THERMO-MAGNETIC LINE CIRCUIT BREAKER RATED AT 150 AMPERES THAT IS UL489 LISTED.
C. THE ALTERNATOR SHALL BE DIRECTLY CONNECTED TO THE FLYWHEEL HOUSING WITH A SEMI-FLEXIBLE COUPLING BETWEEN THE ROTOR AND THE FLYWHEEL.

5.6 BATTERY

- A. MAINTENANCE FREE BCI GROUP 24 BATTERY SHALL COMPLY WITH THE NFPA REQUIREMENTS FOR ENGINE CRANKING CYCLES. THIS BATTERY SHALL BE RATED ACCORDING TO SAE STANDARDS J-537 WITH A MINIMUM COLD CRANKING AMP OF 650 AMPS AND A MINIMUM RESERVE CAPACITY OF 120 MINUTES AT 80F. THE BATTERY PLATES SHALL BE CONSTRUCTED OF A CALCIUM-LEAD ALLOY.
B. BATTERY RACK AND BATTERY CABLES CAPABLE OF HOLDING THE MANUFACTURER'S RECOMMENDED BATTERIES SHALL BE SUPPLIED.

5.7 BATTERY CHARGER

- A. 10-AMPERE AUTOMATIC FLOAT/EQUALIZE BATTERY CHARGER CAPABLE OF CHARGING BOTH LEAD-ACID AND NI-CAD TYPE BATTERIES, WITH AUTOMATIC 3-STAGE FLOAT TO EQUALIZATION CHARGE; VOLTAGE REGULATION OF 1% FROM NO TO FULL LOAD OVER 10% AC INPUT LINE VOLTAGE VARIATIONS; BATTERY CHARGING CURRENT AMMETER AND BATTERY VOLTAGE VOLTMETER WITH 5% FULL-SCALE ACCURACY; LED LAMP FOR POWER ON INDICATION; CURRENT LIMITING DURING ENGINE CRANKING, SHORT CIRCUIT, AND REVERSE POLARITY CONDITIONS; TEMPERATURE COMPENSATION FOR AMBIENT TEMPERATURES FOR -40°C TO 60°C; ALARM CIRCUIT BOARD FEATURING ALARM CONTACTS FOR LOW BATTERY VOLTAGE, HIGH BATTERY VOLTAGE, AND BATTERY CHARGER MALFUNCTION. CHARGER SHALL BE UL 1012 LISTED.

5.8 BLOCK HEATER

- A. THERMOSTATICALLY CONTROLLED, 1,500 WATT, 110-120 VAC - SINGLE PHASE, TO MAINTAIN MANUFACTURERS RECOMMENDED ENGINE COOLANT TEMPERATURE TO MEET THE START-UP REQUIREMENTS OF NFPA 110, LEVEL 1.

5.9 WEATHERPROOF ENCLOSURE

- A. PROVIDE A SOUND ATTENUATED, WEATHERPROOF ENCLOSURE FOR THE GENERATOR SYSTEM. THE ENCLOSURE SHALL BE DESIGNED TO ATTACH TO THE GENERATOR SET BASE. THE ENCLOSURE SHALL BE COATED WITH ELECTROSTATIC APPLIED POWDER PAINT, BAKED AND FINISHED TO MANUFACTURER'S SPECIFICATIONS. THE COLOR WILL BE MANUFACTURER'S STANDARD.
B. THE ENCLOSURE SHALL OFFER PROTECTION AS SPECIFIED BY OSHA FROM ALL MOVING PARTS OF THE ENGINE, GENERATOR AND GENERATOR COUPLING. IT SHALL BE CONSTRUCTED WITH HINGED, REMOVABLE DOORS TO ALLOW FULL ACCESS TO THE ENGINE, ALTERNATOR, AND CONTROL PANEL FOR MAINTENANCE. RADIATOR AND RADIATOR FAN ASSEMBLY SHALL BE TOTALLY ENCLOSED.
C. LOUVERS SHALL ALLOW SUFFICIENT AIR FLOW TO ALLOW FULL LOAD OPERATION OF THE GENERATOR SET. THE LOUVERS SHALL INCLUDE GRAVITY DAMPERS TO KEEP MOISTURE FROM ENTERING THE ENCLOSURE.
D. ALL NECESSARY FITTINGS AND VALVES SHALL BE PROVIDED BY THE MANUFACTURER TO FACILITATE DRAINING THE LUBE OIL AND COOLING WATER TO THE OUTSIDE OF THE ENCLOSURE. IN ADDITION, THE ENGINE CRANKCASE BREATHER SHALL BE EXTENDED TO THE OUTSIDE OF THE ENCLOSURE AND DISCHARGE DIRECTLY UNDER THE RADIATOR AIR DISCHARGE.
E. THE CRITICAL SILENCER SHALL BE MOUNTED ON THE DISCHARGE HOOD OF THE ENCLOSURE OR MOUNTED INSIDE THE MAIN GENERATOR COMPARTMENT. A GALVANIZED STEEL SKIRT SHALL BE PROVIDED AROUND THE ENCLOSURE OPENING TO PREVENT SNOW AND RAIN ENTRY INTO THE ENCLOSURE. THE SILENCER SHALL BE FITTED WITH A RAIN CAP.

5.10 FUEL OIL STORAGE

- A. THE GENERATOR SET SHALL BE SUPPLIED WITH A DOUBLE WALL SECONDARY CONTAINMENT SUB-BASE FUEL TANK OF SUFFICIENT CAPACITY TO HOLD DIESEL FUEL REQUIRED FOR 48 HOURS OF OPERATION AT FULL LOAD. THE SUB-BASE FUEL SYSTEM SHALL BE LISTED UNDER UL 142 AND WILL BEAR THEIR MARK OF UL APPROVAL.
B. NORMAL VENTING SHALL BE SIZED IN ACCORDANCE WITH THE AMERICAN PETROLEUM INSTITUTE STANDARD NO 2000. THE EMERGENCY VENT OPENING SHALL BE SIZED TO ACCOMMODATE THE TOTAL CAPACITY OF BOTH NORMAL AND EMERGENCY VENTING AND SHALL BE NOT LESS THAN THAT DERIVED FROM NFPA 30, TABLE 2-8, AND BASED ON THE WETTED SURFACE AREA OF THE TANK. THE VENT IS TO BE SPRING-PRESSURE OPERATED.
C. PROVIDE 2" NPT OPENING WITHIN THE PRIMARY TANK AND LOCKABLE MANUAL FILL CAP.
D. A DIRECT READING, UL LISTED, MAGNETIC FUEL LEVEL GAUGE WITH A HERMETICALLY SEALED, VACUUM TESTED DIAL, TO ELIMINATE FOGGING, SHALL BE PROVIDED.
E. A FLOAT SWITCH FOR REMOTE OR LOCAL ANNUNCIATION OF A (50% STANDARD) LOW FUEL LEVEL CONDITION SHALL BE SUPPLIED.

5.11 CONTROLS AND STARTING SYSTEM

- A. ALL ENGINE ALTERNATOR CONTROLS AND INSTRUMENTATION SHALL BE DESIGNED, BUILT, WIRED, TESTED AND SHOCK MOUNTED IN A NEMA 1 ENCLOSURE TO THE ENGINE-GENERATOR SET BY THE MANUFACTURER. IT SHALL CONTAIN PANEL LIGHTING AND A FUSED DC CIRCUIT TO PROTECT THE CONTROLS.
B. SAFETY SHUTDOWN MONITORING SYSTEM SHALL INCLUDE ENGINE MONITOR WITH INDIVIDUAL LIGHTS AND ONE COMMON EXTERNAL ALARM CONTACT INDICATING THE FOLLOWING CONDITIONS:

- OVERCRANK
OVERSPEED
HIGH COOLANT TEMPERATURE
LOW OIL PRESSURE

- C. ENGINE INSTRUMENTATION LOCATED ON THE CONTROL PANEL SHALL CONSIST OF:

- OIL PRESSURE GAUGE
COOLANT TEMPERATURE GAUGE
DC AMMETER
ENGINE RUN HOURMETER

- D. ALTERNATOR INSTRUMENTATION MUST INCLUDE DIGITAL METERS TO INDICATE OUTPUT VOLTAGE, AMPERAGE AND FREQUENCY.

5.12 AUTOMATIC TRANSFER SWITCH

- A. TRANSFER SWITCHES SHALL BE 3 POLE, SOLID NEUTRAL, DOUBLE THROW, ACTUATED BY TWO ELECTRICAL OPERATORS MOMENTARILY ENERGIZED AND CONNECTED TO THE TRANSFER MECHANISM BY AN

OVERCENTER LINKAGE.

- B. THE TIME DELAY BETWEEN THE OPENING OF THE CLOSED CONTACTS AND THE CLOSING OF THE OPEN CONTACTS WILL ALLOW THE LOADS TO BE DEMAGNETIZED BEFORE TRANSFER. THE TRANSFER SWITCH SHALL ALLOW THE MOTOR AND TRANSFORMER LOADS TO BE REENERGIZED AFTER TRANSFER WITH NORMAL INRUSH CURRENT.
C. THIS TRANSFER SWITCH SHALL BE CAPABLE OF TRANSFERRING SUCCESSFULLY IN EITHER DIRECTION WITH 70% OF RATED VOLTAGE APPLIED TO THE SWITCH TERMINALS.
D. THE NORMAL AND EMERGENCY CONTACTS SHALL BE POSITIVELY INTERLOCKED TO PREVENT SIMULTANEOUS CLOSING.
E. SWITCHING MECHANISM SHALL PROVIDE "QUICK-MAKE"; "QUICK-BREAK" OPERATION OF CONTACTS.
F. FUNCTIONAL OPERATION - THE NORMAL AND EMERGENCY POWER SOURCE WILL BE CONTINUOUSLY MONITORED IN ALL 3 PHASE LEGS AND THE CONDITION SHALL BE CONSIDERED ABNORMAL IF THE VOLTAGE OF ANY PHASE DROPS BELOW 80% (ADJUSTABLE). AN ABNORMAL CONDITION WILL, AFTER A TIME DELAY OF 3 SECONDS, INITIATE TRANSFER SEQUENCE TO ALTERNATE SOURCE OF POWER. AT THIS TIME AN AUXILIARY CONTACT WILL CLOSE TO INITIATE ENGINE START. THE ALTERNATE SOURCE WILL BE MONITORED AND LOAD TRANSFER INHIBITED UNTIL 90% OF VOLTAGE AND FREQUENCY IS ATTAINED. THE LOAD WILL THEN BE TRANSFERRED TO THE ALTERNATE SOURCE AFTER AN ADJUSTABLE TIME DELAY SET FOR ONE SECOND UNLESS OTHERWISE INSTRUCTED. AFTER RESTORATION OF NORMAL POWER TO THE PRESET VOLTAGE DIFFERENTIAL (90%), THE TRANSFER SWITCH SHALL RETRANSFER THE LOAD TO THE NORMAL POWER SOURCE AUTOMATICALLY AFTER AN ADJUSTABLE TIME DELAY OF 0-30 MINUTES. IF THE EMERGENCY SOURCE SHOULD FAIL BEFORE THE TRANSFER SWITCH HAS BEEN RETRANSFERRED TO NORMAL, THE SWITCH SHOULD AUTOMATICALLY RETURN TO THE NORMAL SOURCE IF IT IS AVAILABLE. AFTER RETRANSFER OF THE LOAD BACK TO THE NORMAL SOURCE, THE SYSTEM SHALL CONTINUOUSLY MONITOR FOR FUTURE ABNORMAL CONDITIONS. THE ENGINE SHALL CONTINUE TO RUN FOR AN ADJUSTABLE PERIOD OF TIME, (0-5 MINUTES) UNLOADED FOR COOL DOWN. DUAL OPERATOR SWITCHES SHALL BE UTILIZED AS SHOWN ON THE DRAWINGS TO PROVIDE A DWELL PERIOD ADJUSTABLE FROM 0-2 MINUTES DURING TRANSFER IN EITHER DIRECTION TO ALLOW MOTOR AND TRANSFORMER LOADS TO DEMAGNETIZE. TIME SETTING SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE.
G. THE FOLLOWING ADDITIONAL ACCESSORIES FOR CONTROL OR INDICATION SHALL BE PROVIDED:

A DOOR MOUNTED, TWO-POSITION, MAINTAINED CONTACT, TEST SWITCH TO SIMULATE A NORMAL POWER FAILURE.

DOOR MOUNTED, PRESS TO TEST TYPE PILOT LIGHT (OR L.E.D.) FOR INDICATING THE TRANSFER SWITCH IS IN THE NORMAL POSITION.

DOOR MOUNTED, PRESS TO TEST TYPE PILOT LIGHT (OR L.E.D.) FOR INDICATING THE TRANSFER SWITCH IS IN THE EMERGENCY POSITION.

DOOR MOUNTED, PRESS TO TEST TYPE PILOT LIGHT (OR L.E.D.) FOR INDICATING THE GENERATOR IS NOT OPERABLE.

AUXILIARY CONTACT ON MAIN SHAFT CLOSED ON NORMAL; QUANTITY OF TWO (2).

AUXILIARY CONTACT ON MAIN SHAFT CLOSED ON EMERGENCY; QUANTITY OF TWO (2).

A CONTACT FOR A "PRE-TRANSFER" SIGNAL TO THE ELEVATOR CONTROLLER PRIOR TO INITIATING TRANSFER FROM NORMAL TO EMERGENCY AND PRIOR TO RETRANSFER FROM EMERGENCY TO NORMAL. THE TRANSFER SHALL BE DELAYED BY AN ADJUSTABLE TIME DELAY OF UP TO 1 MINUTE.

- H. THE TRANSFER SWITCHES, COMPLETE WITH ALL TIMERS, RELAYS, AND ACCESSORIES, SHALL BE LISTED BY UNDERWRITERS' LABORATORIES, INC. UNDER STANDARD UL-1008 (AUTOMATIC TRANSFER SWITCHES) AND APPROVED FOR USE ON EMERGENCY SYSTEMS PER NFPA 76A REQUIREMENTS.

- I. SWITCHES SHALL BE LISTED BY UNDERWRITERS' LABORATORIES, INC., STANDARD UL-1008 WITH WITHSTAND AND CLOSE-IN OF 22,000A.

5.13 START-UP, ACCEPTANCE TESTS AND INSTRUCTION

- A. ON COMPLETION OF THE INSTALLATION, START-UP SHALL BE PERFORMED BY A FACTORY-TRAINED DEALER SERVICE REPRESENTATIVE. ACCEPTANCE TESTS SHALL BE AS DIRECTED ELSEWHERE IN THIS SPECIFICATION. APPROVED OPERATING AND MAINTENANCE INSTRUCTION BOOKS SHALL BE TURNED OVER AT THIS TIME AND PROCEDURES EXPLAINED TO OPERATING PERSONNEL.



Table with 4 columns: DRAWN PEA, CHECKED PEA, DATE, 05/22/2020

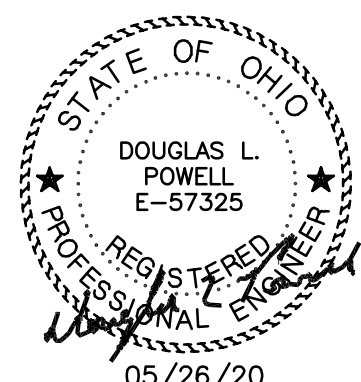
Table with 2 columns: DATE, PLAN ISSUE/REVISION

Table with 2 columns: PLAN ISSUE/REVISION, NO.

HULL & ASSOCIATES, Inc.
59 Grant Street
Zanesville, OH 43895
Phone: (740) 344-5451
Fax: (740) 344-8899
www.hullinc.com

HULL
Environment / Energy / Infrastructure

CONSTRUCTION PLANS:
INDUSTRIAL DRIVE
ZANESVILLE, MUSKINGUM COUNTY, OHIO
ELECTRICAL SPECIFICATIONS



E4-20110.DWG 05/26/20

PRATER Engineering Associates, Inc.
6130 Wilcox Road, Dublin, Ohio 43016
(614) 766 4896, (614) 766 2354
DESIGNED BY D.POWELL, DRAWN BY DLP, CHECKED BY PEA, JOB NUM. 20110

JOB NUMBER: ZAN012
64

PART 6 INSTRUMENTATION

6.1 GENERAL

- A. THE WORK TO BE ACCOMPLISHED UNDER THIS SECTION SHALL CONSIST OF FURNISHING THE EQUIPMENT NECESSARY FOR A COMPLETE AUTOMATIC CONTROL AND MONITORING SYSTEM TO FUNCTION AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS. IT IS THE SYSTEM INTEGRATOR'S RESPONSIBILITY TO SUPPLY A SYSTEM THAT IS COMPATIBLE WITH EXISTING MICRO-COMM, INC. SCADA EQUIPMENT. THE COMPLETE SYSTEM SHALL BE DESIGNED, FABRICATED, PROGRAMMED, TESTED, STARTED UP, AND WARRANTED BY A SINGLE SUPPLIER TO INSURE A SINGLE SOURCE OF RESPONSIBILITY.
B. THE EXISTING MICRO-COMM SCADA SYSTEM MODIFICATIONS TO INCLUDE:
1. PROPOSED INDUSTRIAL DRIVE SEWAGE LIFT STATION REMOTE UNIT (PLC-RTU).
2. MODIFICATION TO THE EXISTING MICRO-COMM CENTRAL UNIT, INCORPORATING THE PROPOSED RTU DATA INTO THE EXISTING CENTRAL UNIT, LOCATED AT THE WASTEWATER OFFICE.

6.2 MANUFACTURER SUPPORT

- A. THE FOLLOWING SHALL BE PERFORMED AND/OR SUPPLIED BY A MANUFACTURER AUTHORIZED SYSTEM INTEGRATOR.
1. ENGINEERING SUBMITTAL AND SHOP DRAWINGS...
2. ALL THE PAPERWORK AND FEES NECESSARY TO OBTAIN AN FCC RADIO LICENSE IN THE NAME OF THE OWNER.
3. ALL USER LICENSES AND FEES FOR SOFTWARE SUPPLIED IN THIS SYSTEM WITH LICENSES IN THE NAME OF THE OWNER.
4. SPARE PARTS AND MAINTENANCE TOOLS.
5. OPERATION AND MAINTENANCE MANUALS.
6. PROGRAMMING.
7. TESTING.
8. START-UP LABOR AND SERVICES.
9. OWNER TRAINING.

6.3 SUBMITTALS

- A. PROVIDE A COMPLETE SUBMITTAL PRIOR TO EQUIPMENT FABRICATION. SUBMITTAL SHALL INCLUDE PRODUCT DATA, SHOP DRAWINGS, PANEL LAYOUT DRAWINGS, INSTALLATION DRAWINGS, AND A DESCRIPTION OF THE OPERATOR'S INTERFACE SOFTWARE INCLUDING SAMPLE TEXT SCREENS AND MENUS, SAMPLE GRAPHICS, AND SAMPLE REPORT LOGS AND GRAPHS.

6.4 WARRANTY.

- A. THE CONTROL SYSTEM MANUFACTURER SHALL SUPPLY A FIVE (5) YEAR PARTS AND LABOR WARRANTY AND COMPREHENSIVE SUPPORT PROGRAM FOR ALL ITEMS AND SOFTWARE SUPPLIED UNDER THIS SECTION (INCLUDING PLC/RTU FRONT PANEL DISPLAYS, EXCEPT AS NOTED BELOW). POWER SURGES AND LIGHTNING DAMAGE SHALL BE INCLUDED AS PART OF THE WARRANTY.

6.5 PROGRAMMABLE LOGIC CONTROLLERS & LOCAL I/O EQUIPMENT

- A. INDUSTRIAL PROGRAMMABLE LOGIC CONTROLLERS (PLCS) SHALL BE USED AT ALL LOCATIONS. THE PLCS SHALL HAVE AN OPERATIONAL RANGE OF 0-60DEGC AND 5-95% RELATIVE HUMIDITY. THE PLCS SHALL ALL BE FROM THE SAME FAMILY OF CONTROLLERS, SCALABLE FROM VERY SMALL TO VERY LARGE APPLICATIONS, AND PROGRAMMED FROM IDENTICAL PROGRAMMING SOFTWARE USED FOR ALL PROCESSORS. THE PLCS SHALL BE MICRO-COMM M1600 SERIES CONTROLLERS.

6.6 1.1 RADIO TRANSCEIVERS & ACCESSORIES

- A. GENERAL
1. THE CONTROL SYSTEM SHALL BE SPECIFICALLY DESIGNED FOR RADIO CHANNEL DATA COMMUNICATIONS. THE CORE OF THE SYSTEM SHALL BE OVER FCC LICENSED RADIO FREQUENCY SPECTRUM INTENDED FOR SCADA AND REMOTE CONTROL PURPOSES. THE SYSTEMS INTEGRATOR SHALL BE RESPONSIBLE OF OBTAINING THE NECESSARY FCC LICENSES FOR ONE OR MORE FREQUENCIES AS NEEDED TO ESTABLISH BOTH SUPERVISORY AND DISTRIBUTED CONTROL.
2. ALL OF THE EQUIPMENT REQUIRED FOR OPERATION OF THE SYSTEM SHALL BE DIRECTLY OWNED BY THE OWNER AND INCLUDED AS PART OF THIS CONTRACT. SYSTEMS USING THIRD PARTY REPEATERS, TRUNKING MASTERS, OR LEASED EQUIPMENT WILL NOT BE ALLOWED.
3. THE OVERALL SYSTEM DESIGN AND OPERATION SHALL PROVIDE A 20DB PAD OVER THE MINIMUM REQUIRED FOR OPERATION ON ALL PRIMARY DATA PATHS (PRIMARY PATHS MAY INCLUDE DATA RELAYS) TO INSURE A 98% RELIABILITY OF COMMUNICATIONS. REMOTE SITE COMMUNICATIONS FOR DISTRIBUTED PEER-TO-PEER COMMUNICATIONS SHALL PROVIDE 30DB OF PAD TO ENSURE OPERATION UNDER ALL WEATHER CONDITIONS AND PROVIDE A 99.9% COMMUNICATIONS RELIABILITY. THE 20DB AND 30DB PAD REQUIREMENTS AND FCC RULE COMPLIANCE SHALL BE DEMONSTRATED (AT NO ADDITIONAL COST) TO THE ENGINEER AT HIS REQUEST. THE TESTING SHALL BE ACCOMPLISHED USING AN IFR AM/FM 1000S COMMUNICATIONS ANALYZER OR EQUAL EQUIPMENT.
B. COMMUNICATIONS
1. THE CTU-RTU SUPERVISORY COMMUNICATIONS AND RTU-RTU DISTRIBUTED CONTROL COMMUNICATIONS SYSTEM SHALL OPERATE IN A HALF-DUPLEX MODE OVER A SINGLE "LICENSED" RADIO FREQUENCY USING "POINT-TO-POINT" COMMUNICATION TECHNIQUES. THE RTUS SHALL MONITOR FOR THE CHANNEL TO AVOID DATA COLLISIONS WITH OTHER RTUS DURING PEER-TO-PEER COMMUNICATIONS. THE SYSTEM SHALL BE CAPABLE OF SHARING THE RADIO CHANNEL WITH OTHER RADIO TELEMETRY SYSTEM.
2. ALL DATA TRANSMITTED SHALL BE IN DIGITAL WORD FORM USING FSK (FREQUENCY SHIFT KEYING) TRANSMISSION. ALL TRANSMISSIONS SHALL INCLUDE THE ADDRESS OF THE SENDER AND THE RECEIVER, AND BE SUBJECT TO CHECK SUM, PARITY, AND FRAMING ERROR CHECKS, TO INSURE A MINIMUM DATA RELIABILITY OF 1 ERROR IN 1,000,000 BITS. ANY TRANSMISSIONS THAT FAIL THE DATA CHECKING WILL BE RETRIED UNTIL CORRECT. NO DATA CORRECTION METHODS WILL BE ALLOWED. A PLUG-IN RS232C DATA PORT SHALL BE PROVIDED AT ALL LOCATIONS IN THE SYSTEM TO ALLOW THE USE OF A STANDARD DATA TERMINAL TO VIEW DATA

- EXCHANGES BETWEEN THE SITES AND TO PROVIDE A MEANS OF EXTENSIVE DE-BUGGING.
3. THE SYSTEM SHALL PROVIDE A COMPLETE DATA UPDATE AT LEAST ONCE EVERY (2) MINUTES WITH SOME FUNCTIONS UPDATING FASTER AS REQUIRED BY LOCAL SYSTEM CONDITIONS. THE RADIO TRANSCEIVERS SHALL BE AN ICOM DATA RADIO.

6.7 INSTRUMENTATION & ACCESSORIES

- A. GENERAL
1. ALL ITEMS IN THE CONTROL SYSTEM (ELECTRONIC CARDS, POWER SUPPLIES, RADIOS, TIME DELAYS, RELAYS, ETC.) SHALL BE OF PLUG-IN CONSTRUCTION, MAKE USE OF A PLUG-IN WIRING HARNESS, USE PLUG-IN TERMINAL BLOCKS, AND BE INTERCHANGEABLE WITHOUT RECALIBRATION. TO ENSURE FIELD REPAIR-ABILITY BY NON-TECHNICAL PERSONNEL, EQUIPMENT THAT MUST BE UN-WIRED FOR REPLACEMENT WILL NOT BE ACCEPTED.
2. THE FOLLOWING INSTRUMENTATION DEVICES AND TECHNIQUES SHALL BE USED AS SPECIFICALLY CALLED FOR IN THE RTU AND CTU INPUT/OUTPUT SECTIONS OF THIS SPECIFICATION.
B. POWER SUPPLIES
1. THE DC POWER SUPPLIES SHALL PROVIDE ±0.1% LINE AND LOAD REGULATION WITH ±10% INPUT VARIATIONS. THEY SHALL HAVE A TEMPERATURE COEFFICIENT OF ±0.02% PER DEGREE C. THE INPUT/OUTPUT ISOLATION SHALL BE 100 MOHMS DC (900VOLTS AC) WITH OUTPUT TRANSIENT RESPONSE OF 50 MICROSECONDS MAXIMUM. THE POWER SUPPLIES SHALL BE SIZED TO OPERATE THE REMOTE UNIT EQUIPMENT WITH OR WITHOUT THE BACK-UP BATTERY IN PLACE. POWER SUPPLIES SHALL BE A POWER ONE SERIES MAP130, SOLA SLS, OR APPROVED EQUAL.
C. BATTERY BACK-UP OPERATION
1. THE REMOTE UNITS INDICATED SHALL BE SUPPLIED WITH BATTERY BACK-UP OPERATION. THE RECHARGEABLE BATTERIES SHALL BE THE SEALED SOLID GELLED ELECTROLYTE TYPES, DESIGNED FOR FLOAT OR STANDBY SERVICE. UNLESS NOTED OTHERWISE IN THE RTU DESCRIPTIONS, BATTERIES SHALL BE SIZED TO MAINTAIN 24-HOUR SERVICE AT WATER TOWER REMOTES AND 8-HOUR SERVICE AT PUMP STATIONS AND OTHER REMOTES. THE REMOTE SHALL INCLUDE A CHARGING MODULE TO RECHARGE THE BATTERY WHEN POWER IS RESUMED, MAINTAIN THE CHARGE BETWEEN OUTAGES, AND PROVIDE A LOW VOLTAGE CUT-OFF TO PROTECT THE BATTERY FROM EXCESSIVE DISCHARGE DURING PROLONGED OUTAGES. ALL DISCRETE, ANALOG, AND PULSE INPUTS (I.E. SWITCH CLOSURES, PRESSURE, LEVEL, FLOWS, ETC.) SHALL CONTINUE TO FUNCTION ON BATTERY BACK UP. BATTERIES SHALL BE GLOBE GEL/CELL OR APPROVED EQUAL.
D. SINGLE PHASE 120VAC SURGE PROTECTIVE DEVICE
1. A 120VAC SURGE PROTECTIVE DEVICE (SPD) SHALL BE INSTALLED ON THE 120V INCOMING POWER IN THE RTU PANEL POWER SUPPLY. THE SPD UNIT SHALL BE UL 1449 THIRD EDITION LISTED, PRE-WIRED WITH CONDUCTOR LEADS A MINIMUM OF 24-INCHES IN LENGTH AND CONTAIN LED INDICATOR LIGHTS TO INDICATE POWER IS APPLIED TO THE SPD AND ALL IS OK (GREEN). SURGE CURRENT CAPACITY SHALL BE 50KA MINIMUM, L-N AND N-G PROTECTION, AND THE VOLTAGE PROTECTION RATING (VPR) SHALL BE 600V FOR 120VAC.
E. KEYPAD & DISPLAY UNIT
1. AS DETAILED IN THE APPENDIX, THE OPTIONAL KEYPAD & DISPLAY UNIT SHALL HAVE A 4X20 BACK-LIGHTED LCD DISPLAY TO DISPLAY THE STATUS OF ALL LOCAL INPUTS AND THE TANK LEVEL OF THE ASSOCIATED CONTROL WATER TOWER LEVEL. THE 5X5 KEYPAD SHALL PROVIDE FOR OPERATOR INPUT OF SET POINTS AND TIMER SETTINGS. THE OPERATOR INTERFACE SHALL BE MENU DRIVEN AND PROVIDE FOR DEDICATED KEYS FOR CURSOR POSITION AND INPUT FUNCTIONS. THE OPERATOR INTERFACE SHALL PROVIDE FOR UP TO 50 SCREENS OF DATA DISPLAY. THE KEYPAD & DISPLAY UNIT SHALL BE SUPPLIED AND MOUNTED ON THE FRONT OF THE PLC ENCLOSURE IF DETAILED IN THE SPECIFIC PLC I/O REQUIREMENT LIST. THE KEYPAD & DISPLAY UNIT SHALL MAINTAIN THE NEMA 4 RATING OF THE PLC ENCLOSURE.
F. RADAR LEVEL SENSORS
1. THE FREE SPACE RADAR SENSOR IS USED FOR CONTINUOUS, NON-CONTACT LEVEL MEASUREMENT OF LIQUIDS, PASTES AND SLURRIES. THE MEASUREMENT IS NOT AFFECTED BY CHANGING MEDIA, TEMPERATURE CHANGES, GAS BLANKETS OR VAPORS. SETUP, PROGRAMMING AND COMMISSIONING OF THIS DEVICE IS POSSIBLE VIA 4-20MA OR WIRELESS VIA APP USING BLUETOOTH.
2. THE PULSED TIME OF FLIGHT RADAR TRANSMITTER SHALL OPERATE AT 26 GHZ USING 2-WIRE TECHNOLOGY FOR LEVEL MEASUREMENT AND/OR OPEN CHANNEL FLOW MEASUREMENT. ACCURACY SHALL BE +/- 0.08". PROCESS TEMPERATURE RANGE IS -40 TO 176 DEGREES F AND PRESSURE RANGE IS FROM -14.5 TO 43 PSI. THE PROCESS CONNECTION SHALL BE 1"NPT, 1.5"NPT, 2"NTP OR 3"-6" ANSI FLANGE CONNECTION BY APPLICATION. THE RADAR DEVICE SHALL HAVE BLUETOOTH WIRELESS TECHNOLOGY INTERFACE AND CAN BE OPERATED AND CONFIGURED VIA THIS INTERFACE USING THE SMARTBLUE APP. THE RADAR UNIT SHALL BE RATED FOR IP66/68, NEMA4X/6P. THE RADAR SENSOR BODY MATERIAL SHALL BE MADE OF PVDF. THE RADAR SENSOR MUST HAVE HERMETICALLY SEALED WIRING AND FULLY POTTED ELECTRONICS ELIMINATING WATER INGRESS.
3. RADAR TRANSMITTERS SHALL BE ENDRESS HAUSER - MICROPILOT FMR20.
G. HIGH/LOW WETWELL FLOATS
1. THE HIGH/LOW WETWELL ALARM FLOATS SHALL BE DIRECT ACTING FLOAT SWITCHES. THE FLOATS SHALL HAVE A POLYPROPYLENE CASE CONTAINING A HERMETICALLY SEALED MERCURY SWITCH AND BE SUPPLIED WITH 40' OF PVC TYPE STO CABLE. THE FLOAT SWITCHES SHALL BE ANCHOR SCIENTIFIC ROTO-FLOAT SERIES, CYNERGY3 FFT SERIES, OR APPROVED EQUAL.
H. ENTRY ALARM
1. UNAUTHORIZED ENTRY ALARMS AT REMOTE SITES SHALL BE ACCOMPLISHED THROUGH A PERIMETER ALARM SYSTEM

POWERED FROM THE COMMON 12VDC-POWER SUPPLY. THE SYSTEM SHALL INCLUDE THE NECESSARY STRUCTURE ENTRANCE MAGNETIC DOOR SWITCHES. SHOULD AN INTRUDER ENTER THE STRUCTURE WITHOUT ACKNOWLEDGING HIS PRESENCE, AN ENTRY ALARM WILL BE SENT TO THE CENTRAL UNIT. THE ENTRY ALARM SHALL HAVE AN ADJUSTABLE TIME DELAY (0-60 SECONDS) TO ALLOW AUTHORIZED PERSONNEL TIME TO ACKNOWLEDGE THEIR PRESENCE WHEN ENTERING THE STRUCTURE AND PROVIDE A RE-ARMING DELAY WHEN LEAVING THE STRUCTURE. THE RTU DOOR MOUNTED KEY SWITCH SHALL BE CONSTRUCTED SO THAT THE KEY CAN ONLY BE REMOVED IN THE "ARMED" POSITION. THE ALARM SYSTEM CAN BE IMPLEMENTED AS PART OF THE RTU LOGIC SYSTEM OR BE A DIGITAL CONTROL SYSTEMS (DCS) OR APPROVED EQUAL.

6.8 EXECUTION

- A. FCC LICENSING
1. THE SYSTEM MANUFACTURER/SUPPLIER SHALL BE RESPONSIBLE FOR COLLECTING ALL INFORMATION, GENERATING ALL PAPERWORK, AND PAYING ALL FEES REQUIRED FOR MODIFYING THE LICENSE ON BEHALF OF THE OWNER.
B. SYSTEM START-UP
1. THE MANUFACTURER SHALL SUPPLY "FACTORY" PERSONNEL FOR START-UP SERVICE AS NEEDED TO INSURE SATISFACTORY OPERATION. SUBSEQUENT TRIPS TO THE JOB SITE TO CORRECT DEFECTS SHALL BE MADE AT NO CHARGE TO THE OWNER DURING THE WARRANTY PERIOD.

6.9 APPENDIX

- A. SEWAGE LIFT STATION REMOTE UNIT (RTU-PLC) REQUIREMENTS:
1. INDUSTRIAL DRIVE INSTALLATION REQUIREMENTS:
A) THE SYSTEM INTEGRATOR SHALL SUPPLY THE PUMP STATION SCADA EQUIPMENT, HOUSED IN A NEMA 4/12 WALL MOUNT ENCLOSURE. THE PUMP STATION ENCLOSURE SHALL INCLUDE AN INTERNAL POWER SWITCH, BULKHEAD COAXIAL CABLE LIGHTNING ARRESTOR, PLC, RADIO AND A POWER LINE LIGHTNING ARRESTOR AS SPECIFIED EARLIER.
B) THE CONTRACTOR WILL BE RESPONSIBLE FOR THE INSTALLATION OF THE SCADA PANEL, INCLUDING INSTRUMENTATION, WIRING, CONDUIT AND ANTENNA. THE CONTRACTOR INSTALLATION REQUIREMENTS SHALL BE DETAILED BY THE SYSTEM INTEGRATOR.
C) THE ANTENNA SHALL BE MOUNTED ON A 20' POWER POLE WITH 3/4" RIGID CONDUIT AND A WEATHER-HEAD RUN TO THE RTU ENCLOSURE, AS PREVIOUSLY SPECIFIED.
2. FRONT PANEL DISPLAY REQUIREMENTS: KEYPAD LCD DISPLAY
3. DISCRETE OUTPUTS:
A) PUMP #1 CALL
B) PUMP #2 CALL
C) PLC LEVEL CONTROL "NORMAL" ("FAILURE" WILL ACTIVATE BACK-UP FLOAT PUMP CONTROL)
D) SPARE
4. DISCRETE INPUTS:
A) POWER FAILURE
B) PUMP #1 RUNNING
C) PUMP #2 RUNNING
D) PUMP #1 FAIL
E) PUMP #2 FAIL
F) ENTRY/INTRUSION ALARM
G) BACKUP FLOAT CONTROL "ACTIVE"
H) HIGH WETWELL LEVEL (FROM FLOAT SWITCH)
I) ATS GENERATOR ACTIVE
J) GENERATOR RUNNING
K) GENERATOR ALARM
L) SPARE
5. ANALOG INPUTS:
A) WETWELL LEVEL INDICATION (NEW RADAR LEVEL SENSOR AS SPECIFIED EARLIER)
B) FLOW RATE/TOTAL (SIGNAL FROM FLOW METER, SUPPLIED BY OTHERS)
C) PUMP #1 VFD SPEED
D) PUMP #2 VFD SPEED
E) SPARE
6. ANALOG OUTPUTS:
A) PUMP #1 VFD SPEED CONTROL
B) PUMP #2 VFD SPEED CONTROL
B. SEWAGE LIFT STATION BACKUP FLOAT CONTROL PANEL REQUIREMENTS:
1. INDUSTRIAL DRIVE INSTALLATION REQUIREMENTS:
A) THE SYSTEM INTEGRATOR SHALL SUPPLY A "BACKUP FLOAT CONTROL PANEL" IN A NEMA 4/12 ENCLOSURE, WITH A UL-698A BARRIER SECTION. THE CONTROL PANEL SHALL OPERATOR THE PUMPS, BASED OFF OF FLOAT ACTIVATION, IN THE EVENT OF A PRIMARY CONTROL FAILURE (PLC OR LEVEL SENSOR FAILURE). THE CONTROL PANEL WILL BE COMPOSED OF RELAY LOGIC, TIMERS, SWITCHES AND LIGHTS. ELECTRONIC CONTROLLERS, PLCS OR PROCESSORS WILL NOT BE ALLOWED FOR BACK-UP PUMP CONTROL OPERATION.
2. FRONT PANEL "OPERATIONAL" REQUIREMENTS:
A) TELEMETRY/FLOAT CONTROL SWITCH
B) FLOAT CONTROL "ACTIVE" LIGHT
C) PUMP #1 LEAD/LAG SWITCH
D) PUMP #1 FLOAT CALL LIGHT
E) PUMP #1 RUNNING LIGHT
F) PUMP #2 LEAD/LAG SWITCH
G) PUMP #2 FLOAT CALL LIGHT
H) PUMP #2 RUNNING LIGHT
3. UL-698 EXPLOSION PROOF SECTION:
A) TERMINAL BLOCKS TO INTERFACE TO ALL WETWELL DEVICES
B) INTRINSICALLY SAFE ISOLATION MODULE FOR THE RADAR INSTRUMENT
C) INTRINSICALLY SAFE BARRIER FOR THE FLOAT SWITCHES
4. FLOAT CONTROL OPERATION:
A) FLOAT: HIGH LEVEL ALARM
B) FLOAT: LAG PUMP "CALL"
C) FLOAT: LEAD PUMP "CALL"
D) FLOAT: LOW LEVEL "PUMP(S) OFF"



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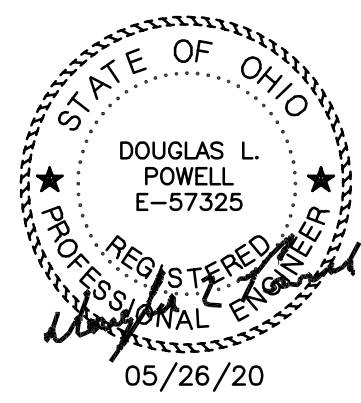
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HULL & ASSOCIATES, Inc. 59 Grant Street, Columbus, OH 43215 Phone: (614) 344-5451 Fax: (614) 344-8899 www.hullinc.com

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CONSTRUCTION PLANS: INDUSTRIAL DRIVE ZANESVILLE, MUSKINGUM COUNTY, OHIO ELECTRICAL SPECIFICATIONS



PRATER Engineering Associates, Inc. 6130 Wilcox Road, Dublin, Ohio 43016. (614) 766 4896, (614) 766 2354. DESIGNED BY D.POWELL, DRAWN BY DLP, CHECKED BY PEA, JOB NUM. 20110.

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