

May 20, 2022

Ms. Tanowa Troupe, Secretary
Docketing Division, Ohio Power Siting Board
The Public Utilities Commission of Ohio
180 East Broad Street
Columbus, OH 43215-3793

Re: *In re American Transmission Systems, Incorporated's Application for a Certificate of Environmental Compatibility and Public Need to Construct the Beaver-Wellington 138 kV Transmission Line Project in Lorain County, Ohio* (OPSB Case No. 20-0004-EL-BTX)
Notice of Compliance With Certificate Condition (9)

Dear Ms. Troupe:

In conformance with Condition (9) of the order granting a Certificate of Environmental Compatibility and Public Need for the above-captioned project, American Transmission Systems, Incorporated ("ATSI"), a FirstEnergy company ("Applicant") submits the following documents relative to the Wellington Substation expansion:

- Final geotechnical engineering report;
- Below Grade and Above Grade sets of drawings

Sincerely,



Nataliya Bryksenkova
Engineer
Transmission Siting
FirstEnergy Service Company



GEOTECHNICAL ENGINEERING REPORT


FIRSTENERGY WELLINGTON SUBSTATION EXPANSION HAWLEY ROAD, WELLINGTON, OHIO

Prepared For:
FirstEnergy Service Company

ATTENTION:
Paul Barkoukis

GPD Project No. 2019821.63
September 17, 2019




Delbert J. Channels, P.E.
Director of Geotechnical Services

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SECTION 1

1.0 Introduction

GPD Group is pleased to submit this Geotechnical Report for the aforementioned project. The purposes of our investigation were to advance six (6) borings at specified locations, conduct laboratory tests on various collected samples, and to provide recommendations relative to foundation design and other pertinent geotechnical aspects of this project.

1.1 Project Description

We understand the project will consist of expanding the existing Wellington substation located at 23860 Hawley Road near Wellington, Ohio. The expansion will include A-frames, transformers, breakers, and other miscellaneous equipment stands. Anticipated foundation types include slab on grade and drilled shafts. New structures are planned within and adjacent to the existing substation yard and minimal grade changes are anticipated.

SECTION 2

2.0 Subsurface Exploration Program

The subsurface exploration, performed between August 15 and 19, 2019, consisted of drilling and sampling six (6) borings at the site to a depth of 40.0 feet below existing grade. The boring locations were laid out by GPD personnel using a drawing provided in the RFQ. The final test locations can be seen on the attached Boring Location Plan.

The borings were drilled with a truck-mounted CME-55 rotary drill rig using hollow-stem augers and an automatic SPT hammer to advance the boreholes. Representative soil samples were obtained by split-barrel sampling procedure in general accordance with the appropriate ASTM standards. In the split-barrel sampling procedure, the number of blows required to advance a standard 2-inch O.D. split-barrel sampler the last 12 inches of the typical total 18-inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (N-Value). This value is used to estimate the in-situ relative density of cohesionless soils and the consistency of cohesive soils. The sampling depths and penetration distance, plus the standard penetration resistance values, are shown on the boring log. The samples were sealed and returned to the laboratory for testing and classification.

An automatic SPT hammer was used to advance the split-barrel sampler in the borings performed for this site. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the standard penetration resistance blow count (N) values. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report and is illustrated as the N_{60} value located on the boring log.

2.0.1 Resistivity Survey

Soil resistivity measurements were performed by injecting current into the earth between two outer electrodes and measuring the resulting voltage between two potential probes placed in a straight line between the current injection electrodes. When the electrodes are closer together, the measured soil resistivity is indicative of local surface soil characteristics. When the electrodes are far apart, the measured soil resistivity is indicative of average deep soil characteristics throughout a much larger area. The four-point wenner method was utilized obtain the apparent resistivities.

The four-point wenner method was utilized at two locations with a center locations labeled R-1 and R-2 with traverse orientations in the north-south and east-west directions. The north-south traverse could not be performed at the requested location due to agricultural crops. The test locations can be seen on the attached location plan with results following the test boring logs.

2.1 Laboratory Testing

The samples were classified in the laboratory based on visual observation, texture and plasticity. The descriptions of the soils indicated on the boring logs are in accordance with the enclosed General Notes and the Unified Soil Classification System. A brief description of this classification system is attached to this report.

The laboratory testing program consisted of performing the following tests:

- ❖ Thirty (30) Natural water content tests (ASTM D-2216)
- ❖ Seven (7) Atterberg Limits (ASTM D-4318)
- ❖ Three (3) Unconfined Compression Soil (ASTM D-2166)
- ❖ Three (3) Unit Weight (ASTM D-7263)
- ❖ One (1) Chemical Testing Suite (Various)

Information from these tests was used in conjunction with field penetration test data to evaluate soil strength in-situ, volume change potential, and soil classification. Results of these tests are attached and provided on the boring logs.

2.2 Subsurface Conditions

Test boring data collected at the site indicate the presence of silt, sand and clay soils. These can generally be described for engineering purposes as presented below. For specific profiles and descriptions at each test location, refer to the Test Boring Logs.

Underlying 3 to 4 inches of gravel or 12 inches of topsoil and continuing to termination depths of 40 feet was varying combinations and sequences of brown over gray silt, sand, and clay soils. Where sampled, the soils were damp to moist, and medium stiff to hard where cohesive and medium dense where granular.

2.2.1 Groundwater Conditions

Each boring was monitored while drilling and immediately after completion for the presence and level of groundwater. No groundwater was observed during our investigation.

It should be recognized that fluctuations of the groundwater table may occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

2.3 Conclusions and Recommendations

Based on our evaluation of the subsurface conditions encountered at the location indicated, and the assumption that conditions across the construction site are similar to those known, we offer the following for your consideration.

2.3.1 Excavations

Excavations of the site soils can be made with a large excavator. Additional effort will be required in excavating rock. Temporary excavation sidewalls should be sloped per O.S.H.A. guidelines for type "C" soil, thus requiring a 1.5:1 (horizontal:vertical) slope. The soil type should be confirmed by a competent person at the time of construction, who would determine if steeper slopes associated with type B or A soils could be considered. Groundwater seeps will not likely be encountered during shallow excavations across the site.

2.3.2 Earthwork

Prior to construction, all existing topsoil and vegetation should be completely removed from within the proposed new substation area, and areas to be cut or receive fill. All surfaces cut to subgrade elevation or subgrades to receive fill should be proof-rolled under the direction of an on-site geotechnical engineer or their representative. Proof-rolling should be performed with a minimum 10-ton vibratory roller with rear tires except for the main entrance drive, which should be proof-rolled with a 20 ton dump truck. Two (2) passes, (1 forward and 1 backward) should be made at normal walking speed. Any soft, loose, yielding, or obviously contaminated zones should be undercut as directed by the engineer. It should be noted that the upper soils at test locations B-1, B-4, and B-6 were in a relatively weak and moist condition. These soils will likely need stabilized prior to fill placement. All backfill placed adjacent to foundations should be select material, as

approved by a qualified geotechnical engineer. For all filling operations, the following should be observed:

- 1) Prior to use, the approved fill material should be tested as outlined in ASTM D-698 to determine the maximum dry density and optimum moisture content for silty or cohesive soils, or ASTM D-4253 and D-4254 for clean granular soils. For each change in borrow material, additional tests will be required.
- 2) For all fill or backfill used, the fill material should be placed on the approved subgrade in controlled lifts, with each lift compacted to a stable condition, and to a minimum of 98% maximum dry density per ASTM D-698 at a moisture content within 1.5% of optimum for cohesive or silty borrow. Controlled lifts of granular material should be compacted to 80% relative density per ASTM D-4254.
- 3) All filling operations should be observed by a qualified soils technician with field density tests made, to assure compaction to specification.

Backfill may consist of mixes of natural soil or crushed aggregate meeting one of the following USCS Classifications: GW, GP, GM, GC, SW, SP, SM, SC, CL, ML, any dual symbol combinations of the preceding. Backfill material should contain a maximum organic content of 1 percent, and a maximum particle size of 3-inches. Excavated site soils are considered acceptable.

Proper moisture control of fine grained silty soils is critical in attaining the required compaction. It should be noted that both in-situ soils and new fill composed of fine grained soils are susceptible to disturbance by construction equipment traffic when wet. Thus, construction operations should be planned to prevent such disturbance and the resulting weakening of the subgrade soils. Such precautions would include, but not be limited to grading the site to prevent ponding of water, sealing the subgrade soils at the end of operations each day, and allowing wet subgrades to dry before operating heavy equipment on the soil.

2.3.3 Aggregate Overlay/Pavement

The aggregate surface and/or pavement may be placed over subgrades prepared as outlined above. The aggregate overlay may be designed based on a CBR value of 5, a modulus of subgrade reaction of 75 pci, a resilient modulus of 6,000 psi, and a friction angle "phi" of 30.

The subgrades should be proofrolled after they are graded, immediately prior to stone placement. Any yielding areas should be stabilized prior to installing the stone.

2.3.4 Drilled Concrete Piers

Straight shaft drilled piers may be used to support the planned structures. The pier may bear at any practical depth below frost depth which provides the required resistance, and can be sized to support compression and resist uplift using the following estimated properties:

B-1 Soil Parameters										
Depth (ft)	Soil Type	Total Unit Weight (pcf)	C _u psf	Friction Angle, ϕ	Ult. Bearing Capacity (psf)	Ult. Side Shear Compression (psf)	Ult. Side Shear Uplift (psf)	Pressure Meter Modulus (ksi)	k**	Strain Factor E50
0-3	CL/ML	110	500	---	---	---	---	---	---	---
3-6	CL/ML	125	3,000	---	15,000	1,500	1,000	1.80	245	0.005
6-8	CL/ML	135	5,000	---	25,000	2,500	1,665	4.00	400	0.004
8-17	CL/ML	130	2,000	---	10,000	1,000	665	1.40	160	0.007
17-22	CL/ML	125	1,000	---	9,000	500	330	0.70	80	0.01
22-27	CL/ML	130	2,000	---	18,000	1,000	665	1.40	160	0.007
27-32	CL/ML	135	2,500	---	22,500	1,250	830	1.60	200	0.005
32-37	CL/ML	130	2,000	---	18,000	1,000	665	1.40	160	0.007
37-40	CL/ML	135	3,000	---	27,000	1,500	1,000	1.80	245	0.005

B-2 Soil Parameters										
Depth (ft)	Soil Type	Total Unit Weight (pcf)	C _u psf	Friction Angle, ϕ	Ult. Bearing Capacity (psf)	Ult. Side Shear Compression (psf)	Ult. Side Shear Uplift (psf)	Pressure Meter Modulus (ksi)	k**	Strain Factor E50
0-3	CL/ML	110	1,000	---	---	---	---	---	---	---
3-8	CL/ML	125	3,500	---	17,500	1,750	1,165	2.20	285	0.005
8-12	MLS	125	---	31	13,500	465	310	0.70	150	---
12-17	CL/ML	130	2,500	---	12,500	1,250	830	1.60	200	0.005
17-22	CL/ML	125	1,500	---	13,500	750	500	0.80	120	0.007
22-27	CL/ML	135	3,000	---	27,000	1,500	1,000	1.80	245	0.005
27-32	CL/ML	140	5,000	---	30,000	2,500	1,665	4.00	400	0.004
32-37	CL/ML	130	1,500	---	13,500	750	500	0.80	120	0.007
37-40	CL/ML	135	3,000	---	27,000	1,500	1,000	1.80	245	0.005

B-3 Soil Parameters										
Depth (ft)	Soil Type	Total Unit Weight (pcf)	C _u psf	Friction Angle, ϕ	Ult. Bearing Capacity (psf)	Ult. Side Shear Compression (psf)	Ult. Side Shear Uplift (psf)	Pressure Meter Modulus (ksi)	k**	Strain Factor E50
0-3	CL/ML	115	1,500	---	---	---	---	---	---	---
3-8	CL/ML	125	3,000	---	15,000	1,500	1,000	1.80	245	0.005
8-17	CL/ML	125	2,500	---	12,500	1,250	830	1.60	200	0.005
17-22	CL/ML	130	2,000	---	18,000	1,000	665	1.40	160	0.007
22-27	CL/ML	130	1,000	---	9,000	500	330	0.70	80	0.01
27-32	ML	140	---	36	30,000	1,500	1,000	1.80	400	---
32-37	CL/ML	130	1,500	---	13,500	750	500	0.80	120	0.007
37-40	CL/ML	135	2,500	---	22,500	1,250	830	1.60	200	0.005

B-4 Soil Parameters										
Depth (ft)	Soil Type	Total Unit Weight (pcf)	C_u psf	Friction Angle, φ	Ult. Bearing Capacity (psf)	Ult. Side Shear Compression (psf)	Ult. Side Shear Uplift (psf)	Pressure Meter Modulus (ksi)	k**	Strain Factor E50
0-3	CL/ML	105	500	---	---	---	---	---	---	---
3-6	CL/ML	120	1,500	---	7,500	750	500	0.80	120	0.007
6-8	CL/ML	125	3,000	---	15,000	1,500	1,000	1.80	245	0.005
8-12	CL/ML	137	4,425	---	22,500	2,250	1,500	3.50	365	0.004
12-17	CL/ML	125	1,500	---	7,500	750	500	0.80	120	0.007
17-22	CL/ML	125	1,000	---	9,000	500	330	0.70	80	0.01
22-27	CL/ML	135	4,000	---	30,000	2,000	1,330	2.50	325	0.005
27-32	CL/ML	135	3,500	---	30,000	1,750	1,165	2.20	285	0.005
32-37	CL/ML	135	2,500	---	22,500	1,250	830	1.60	200	0.005
37-40	CL/ML	135	2,000	---	18,000	1,000	665	1.40	160	0.007

B-6 Soil Parameters										
Depth (ft)	Soil Type	Total Unit Weight (pcf)	C_u psf	Friction Angle, φ	Ult. Bearing Capacity (psf)	Ult. Side Shear Compression (psf)	Ult. Side Shear Uplift (psf)	Pressure Meter Modulus (ksi)	k**	Strain Factor E50
0-3	CL/ML	125	500	---	---	---	---	---	---	---
3-6	CL/ML	125	1,000	---	5,000	500	330	0.70	80	0.01
6-8	CL/ML	125	1,500	---	7,500	750	500	0.80	120	0.007
8-12	CL/ML	125	3,000	---	15,000	1,500	1,000	1.80	245	0.005
12-27	CL/ML	135	2,500	---	22,500	1,250	830	1.60	200	0.005
27-32	CL/ML	135	2,000	---	18,000	1,000	665	1.40	160	0.007
32-37	CL/ML	135	3,500	---	30,000	1,750	1,165	2.20	285	0.005
37-40	CL/ML	130	1,500	---	13,500	750	500	0.80	120	0.007

B-7 Soil Parameters										
Depth (ft)	Soil Type	Total Unit Weight (pcf)	C_u psf	Friction Angle, φ	Ult. Bearing Capacity (psf)	Ult. Side Shear Compression (psf)	Ult. Side Shear Uplift (psf)	Pressure Meter Modulus (ksi)	k**	Strain Factor E50
0-3	CL/ML	110	1,000	---	---	---	---	---	---	---
3-12	CL/ML	125	3,000	---	15,000	1,500	1,000	1.80	245	0.005
12-27	CL/ML	130	2,500	---	22,500	1,250	830	1.60	200	0.005
27-32	CL/ML	140	4,000	---	30,000	2,000	1,330	2.50	325	0.005
32-37	CL/ML	130	1,500	---	13,500	750	500	0.80	120	0.007
37-40	CL/ML	135	3,000	---	27,000	1,500	1,000	1.80	245	0.005

**Modulus of subgrade reaction values are for use in "LPile" computer analyses, and for lateral resistance determinations only.

***Effective strength parameters are provided. The maximum RMR_{76} value used is 40.

We recommend that a factor of safety of 3 be applied to the ultimate bearing capacity, and a factor of safety of 2 be applied to the ultimate side shear values. The pressure meter modulus and certain other parameters were based on correlations with standard penetration test N-count, laboratory test results, and soil/rock type as shown in the User Guide of MFAD version 5.0. A strength factor of 0.63 is recommended for use with MFAD 5.0. Where lower capacity zones exist below and within 1 pier diameter of higher capacity zones, the lower bearing pressure should be used.

During construction, the pier bottom should be clean and inspected by a qualified geotechnical engineer prior to placing concrete. Concrete should be placed as soon after drilling as possible, with the exposed bearing surface kept as dry as practical. If any delay occurs, the bottom of the pier excavation should be re-augered to remove any softened soil. Any water accumulating in the shaft should be removed before placing concrete. Alternately, the concrete may be placed by a tremie method to preclude segregation of the mix. Casing and drilling mud should be used as necessary for water control and/or sidewall stability.

If temporary casing is used, while withdrawing casing, care should be exercised to maintain concrete inside the casing at a sufficient level to resist earth and hydrostatic pressures acting on the casing exterior. Arching of the concrete, loss of seal and other problem can occur during casing removal and result in contamination of the drilled shaft. These conditions should be considered during the design and construction phases. Placement of soil backfill should not be permitted around the casing prior to removal.

If permanent casing is used, the casing must be advanced ahead of the excavation via driving, vibro-hammer, or twisting. The casing must be installed in such a way to provide good load transfer through side resistance, under no circumstances should the hole be over drilled and casing placed into the excavation. The provided side shear values should be reduced by a factor of 0.60 for cohesionless soils and 0.50 for cohesive soil.

A reduction factor is recommended where the center to center spacing of piers is between 2.5 and 4 times the pier diameter. A reduction factor of 0.65 would apply when the center to center spacing is reduced to 2.5, the minimum pier spacing. A linear correlation would apply for spacings between 2.5 and 4. Alternatively, an industry standard for pier spacing may be used as designed by others.

2.3.5 Shallow Foundations

Shallow mat, slab, spread, or strip foundations may be used to support the equipment, and be loaded to the ultimate bearing capacities listed above. A safety factor of 3 should be applied. The bearing capacity can be increased by a factor of 1.5 for short sustained seismic or wind loads.

The following provisions for shallow foundation design and construction would apply:

- 1) All foundation subgrades consist of undisturbed medium dense granular soil, medium stiff cohesive soil, undisturbed bedrock, or better; and be free of soft, loose, or organic soils and miscellaneous inclusions or voids.
- 2) The subgrades should be approved by a geotechnical engineer prior to concrete placement.
- 3) If present, any deleterious conditions should be remedied by undercutting as directed by an on-site geotechnical engineer, and replacement with lean concrete.
- 4) Foundation subgrades be concreted in a dry and frost-free condition, and as soon after exposure as possible.
- 5) The ground surface surrounding the structures be graded so as to effect surface drainage of water away from all exterior foundation walls and members.
- 6) The mat or slab edges should be turned down, extending to frost depth of 42 inches.
- 7) The foundations shall have a minimum width of 24 inches.

A modulus of subgrade reaction of 125 pci may be used for the design of slab or mat foundations bearing on site soils.

Settlement of shallow foundations would not exceed 1 inch total, and/or 0.5 inch differential, provided the subgrades are prepared and foundations designed as recommended.

Resistance to sliding may be calculated using a coefficient of friction of 0.45 for foundations bearing on site soils or fill compacted to the above earthwork specifications. Passive earth pressure against mat foundations may be calculated using $K_p=3.0$, assuming the backfill soil is compacted to "Earthwork" specifications. Both parameters are ultimate values; a factor of safety of 2 should be applied.

2.3.6 Lateral Earth Pressure

Both rigid and flexible below grade vertical walls may be utilized. Rigid and flexible walls should be designed to support an equivalent fluid pressure of 65 and 43.3 psf per foot depth, respectively. The equivalent fluid pressure for passive resistance would be 390 psf per foot depth. The at-rest, active, and passive coefficients used to determine these fluid pressures is 0.5, 0.333, and 3.0, respectively; with a soil unit weight of 130 pcf. We are assuming that such walls are backfilled with free-draining granular material.

2.3.7 Corrosion Potential of Soil

Chemical testing was performed on combined samples from Boring B-2 from 3.5 to 10.0 feet below the ground surface. In evaluating potential corrosion to ferrous metal, we utilize Table A.1 of AWWA C105-10. Soils are considered corrosive if they have a composite point total of 10 or

above. The point total was 10, thus the site is considered corrosive to ductile iron pipe. The lack of sulfides indicates the ground is not corrosive to buried copper. The sulfate content of 280 ppm indicates that moderate sulfate resistant concrete will be required. Type 2 Portland cement is recommended.

2.4 Seismic Considerations

Based on the subsurface profile found in the test boring, a Seismic Site Classification "D" should be used for design of the structure according to the "International Building Code and Related Codes, Section 1613.5.2 Site Class Definitions."

2.5 Special Conditions

We would not expect the presence of limestone or karst conditions in the investigated areas. The clay soils have low swell potential, and collapsing conditions would not be expected. No mines were identified on the Ohio Department of Natural Resources mine map.

2.6 General Comments

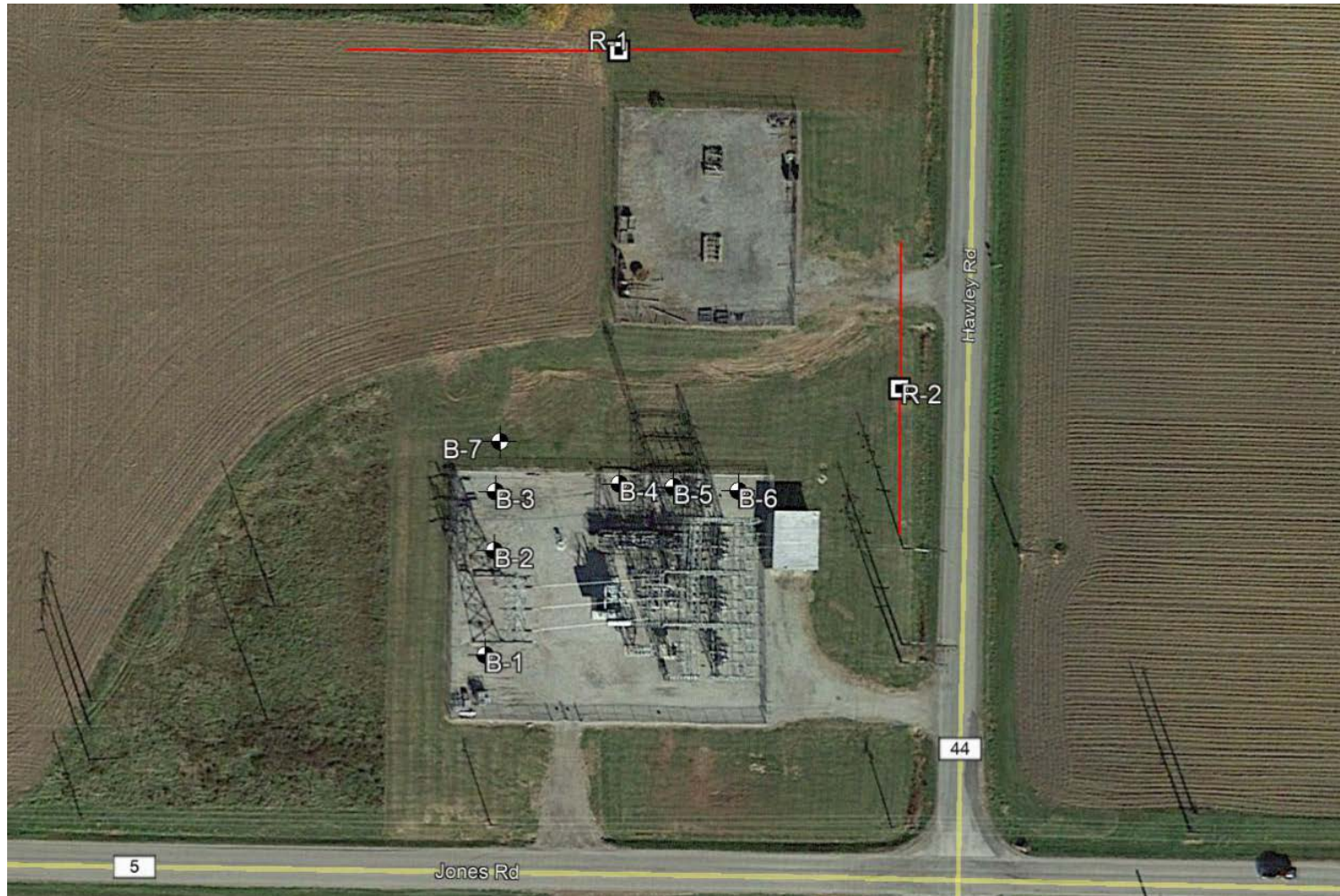
GPD Group should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. GPD or another qualified engineer should also be retained to provide testing and observation during site preparation and fill placement operations as well as during the foundation construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the boring performed at the indicated location and from other information discussed in this report. This report does not reflect variations that may occur across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, GPD should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

This report has been prepared for the exclusive use of **FirstEnergy Corporation** for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless GPD Group reviews the changes and either verifies or modifies the conclusions of this report in writing.

LOCATION PLAN



Legend

Soil Boring: 
Resistivity: 

PROJECT: FE Wellington Substation

PROJECT NUMBER: 2019821.63

DATE: 9-16-19

LOCATION: Jones Rd and Hawley Rd, Wellington, OH



**GPD GEOTECHNICAL
SERVICES, INC.®**

520 S Main St, Suite 2531 Akron, Ohio 44311 (330)733-6748

Boring Number: B-1

CLIENT <u>FirstEnergy Service Company</u>	PROJECT NAME <u>Wellington Substation</u>
PROJECT NUMBER <u>2019821.63</u>	PROJECT LOCATION <u>Hawley Road, Wellington, Ohio</u>
DATE STARTED <u>August 15, 2019</u> COMPLETED <u>August 15, 2019</u>	GROUND ELEVATION _____ HOLE SIZE _____
DRILLING CONTRACTOR <u>GPD Geotechnical Services, Inc.</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Hollow Stem Auger with Automatic Hammer</u>	AT TIME OF DRILLING <u>---</u>
LOGGED BY <u>Dave Campana</u> CHECKED BY <u>Jason Arney</u>	AT END OF DRILLING <u>---</u>
NOTES <u>CME-55, Truck</u>	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		3" Gravel									
		Moist, medium stiff, brown & gray, silty CLAY, minor sand.	SS 1	100	2-1-3 N ₆₀ =5	1.25	22				
		Damp, very stiff to hard, brown, clayey SILT, minor sand.	SS 2	100	6-8-11 N ₆₀ =26	4.5+	17				
5			ST 3	100	q _u =11,770 psf	4.5+	17	33	17	16	
		Moist, stiff, gray, silty CLAY; fine sand lenses.	SS 4	100	5-5-7 N ₆₀ =16	3.0					
10											
		Moist to damp, medium stiff to very stiff, gray, clayey SILT, minor sand, trace to minor gravel.	SS 5	100	3-5-7 N ₆₀ =16	4.5+					
15											
			SS 6	94	2-2-4 N ₆₀ =8	1.0	19				
20											
			SS 7	100	3-4-7 N ₆₀ =15	4.5+					
25											
			SS 8	100	5-7-8 N ₆₀ =20	4.5+					
30											
			SS 9	100	4-5-7 N ₆₀ =16	4.5+	13				
35											

(Continued Next Page)

Boring Number: B-1

CLIENT FirstEnergy Service Company

PROJECT NAME Wellington Substation

PROJECT NUMBER 2019821.63

PROJECT LOCATION Hawley Road, Wellington, Ohio

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
35											
		Moist to damp, medium stiff to very stiff, gray, clayey SILT, minor sand, trace to minor gravel. <i>(continued)</i>									
40			X SS 10	100	6-8-12 N ₆₀ =27	4.5+					

Boring terminated at 40.0 feet



520 South Main Street, Suite 2531
Akron, Ohio 44311

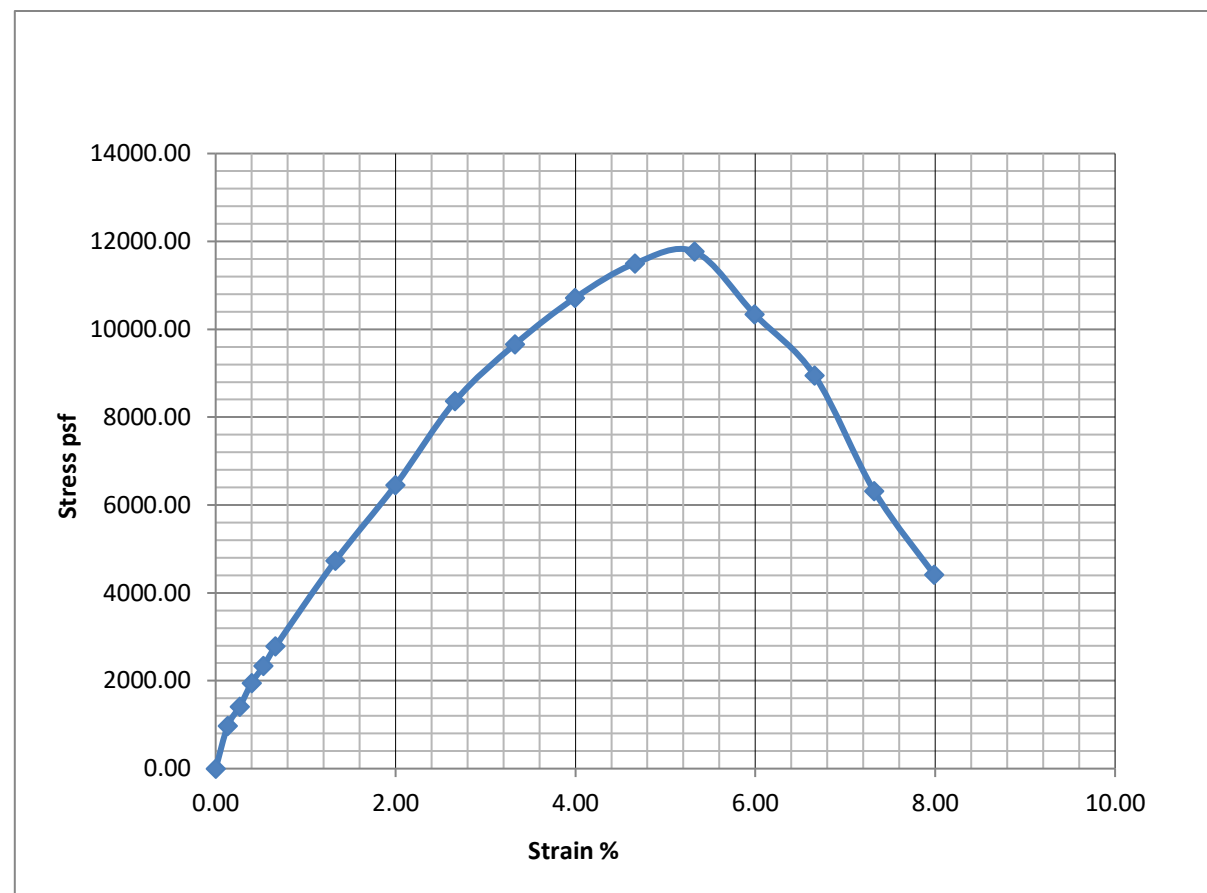
Phone 330.572.2100
www.gpdgroup.com

Unconfined Compression Test (ASTM D-2166)

Job Name: FirstEnergy Wellington Substation
Date: 9/4/19
Sample: B-1:S-3
Depth: 6.0'-8.0'
Strain Rate: 1% per minute

Project Number: 2019821.63
Lab Number: 19188
Moisture Content (%): 16.9
Dry Unit Weight (pcf): 115.5
Compressive Strength (psf): 11770
Strain at Failure (%): 5.3
Shear Strength (psf): 5885
Average Length (in): 3.755
Average Diameter (in): 1.893
Length to Dia. Ratio: 1.98

Strain (%)	Stress (psf)
0.00	0.00
0.13	965.73
0.27	1408.38
0.40	1946.68
0.53	2335.95
0.67	2780.08
1.33	4730.30
2.00	6448.36
2.66	8366.76
3.33	9659.83
3.99	10713.25
4.66	11497.49
5.33	11765.96
5.99	10341.26
6.66	8949.90
7.32	6311.28
7.99	4415.82



Boring Number: B-2

CLIENT <u>FirstEnergy Service Company</u>	PROJECT NAME <u>Wellington Substation</u>
PROJECT NUMBER <u>2019821.63</u>	PROJECT LOCATION <u>Hawley Road, Wellington, Ohio</u>
DATE STARTED <u>August 15, 2019</u> COMPLETED <u>August 15, 2019</u>	GROUND ELEVATION _____ HOLE SIZE _____
DRILLING CONTRACTOR <u>GPD Geotechnical Services, Inc.</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Hollow Stem Auger with Automatic Hammer</u>	AT TIME OF DRILLING <u>---</u>
LOGGED BY <u>Dave Campana</u> CHECKED BY <u>Jason Arney</u>	AT END OF DRILLING <u>---</u>
NOTES <u>CME-55, Truck</u>	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		4" Gravel									
		Moist, medium stiff, brown & gray, silty CLAY, minor sand.	SS 1	100	2-3-3 N ₆₀ =8	1.25					
		Damp, very stiff, brown, clayey SILT, minor sand, trace of gravel.	SS 2	100	6-8-11 N ₆₀ =26	4.5+					
5			SS 3	100	3-8-15 N ₆₀ =31						
		Damp to moist, medium dense, gray SILT, some fine sand, trace of clay.	SS 4	100	2-4-6 N ₆₀ =13						
10											
		Damp, stiff to very stiff, gray, clayey SILT, minor sand & gravel.	SS 5	100	4-7-9 N ₆₀ =21		11				
15											
			SS 6	94	4-4-5 N ₆₀ =12	2.5	15	27	14	13	
20											
			SS 7	100	6-9-10 N ₆₀ =26	3.5					
25											
			SS 8	100	10-13-16 N ₆₀ =39	4.5+					
30											
			SS 9	100	3-4-6 N ₆₀ =13	4.5+	12				
35											


(Continued Next Page)

Boring Number: B-2

CLIENT <u>FirstEnergy Service Company</u>	PROJECT NAME <u>Wellington Substation</u>
PROJECT NUMBER <u>2019821.63</u>	PROJECT LOCATION <u>Hawley Road, Wellington, Ohio</u>

PROJECT NAME Wellington Substation

PROJECT LOCATION Hawley Road, Wellington, Ohio

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
35											
40		Damp, stiff to very stiff, gray, clayey SILT, minor sand & gravel. (continued)	SS 10	100	4-7-11 N ₆₀ =24	4.5+					

Boring Number: B-3

CLIENT FirstEnergy Service Company
PROJECT NUMBER 2019821.63
DATE STARTED August 16, 2019 **COMPLETED** August 19, 2019
DRILLING CONTRACTOR GPD Geotechnical Services, Inc.
DRILLING METHOD Hollow Stem Auger with Automatic Hammer
LOGGED BY Dave Campana **CHECKED BY** Jason Arney
NOTES CME-55, Truck

PROJECT NAME Wellington Substation
PROJECT LOCATION Hawley Road, Wellington, Ohio
GROUND ELEVATION _____ **HOLE SIZE** _____
GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING ---

CENTER TERMINATION NOTE - GINT STD US LAB.GDT - 9/6/19 15:45 - F:\GPD GILCHRIST\JOBS\2019\2019821\63 - FIRSTENERGY - WELLINGTON SUBSTATION\B-1 BLANK.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		4" Gravel									
		Damp, stiff, brown & gray, silty CLAY, trace of sand.	SS 1	100	3-3-7 N ₆₀ =13	4.0	18				
		Damp, very stiff, brown, clayey SILT, minor sand.	SS 2	100	6-8-12 N ₆₀ =27	4.5+					
5			SS 3	100	4-7-12 N ₆₀ =26		16	32	16	16	
		Damp to moist, gray, clayey SILT, minor sand.	SS 4	100	4-6-8 N ₆₀ =19						
10			SS 5	89	5-7-8 N ₆₀ =20	4.5+	15				
15			SS 6	100	3-4-8 N ₆₀ =16	4.5+					
20		Moist, stiff, gray silty CLAY, trace of sand & gravel.	SS 7	100	3-2-5 N ₆₀ =9	2.5	16				
25			SS 8	100	8-10-14 N ₆₀ =32						
30		Damp, medium dense, gray SILT, minor clay & sand.	SS 9	100	3-5-5 N ₆₀ =13		14				
35		Damp, stiff to very stiff, gray, clayey SILT, minor sand, trace of gravel.									

(Continued Next Page)



Boring Number: B-3

CLIENT FirstEnergy Service Company

PROJECT NAME Wellington Substation

PROJECT NUMBER 2019821.63

PROJECT LOCATION Hawley Road, Wellington, Ohio

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
35											
40		Damp, stiff to very stiff, gray, clayey SILT, minor sand, trace of gravel. (continued)	 SS 10	100	4-7-9 N ₆₀ =21						

Boring terminated at 40.0 feet

Boring Number: B-4

CLIENT <u>FirstEnergy Service Company</u>	PROJECT NAME <u>Wellington Substation</u>
PROJECT NUMBER <u>2019821.63</u>	PROJECT LOCATION <u>Hawley Road, Wellington, Ohio</u>
DATE STARTED <u>August 16, 2019</u> COMPLETED <u>August 16, 2019</u>	GROUND ELEVATION _____ HOLE SIZE _____
DRILLING CONTRACTOR <u>GPD Geotechnical Services, Inc.</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Hollow Stem Auger with Automatic Hammer</u>	AT TIME OF DRILLING ---
LOGGED BY <u>Dave Campana</u> CHECKED BY <u>Jason Arney</u>	AT END OF DRILLING ---
NOTES <u>CME-55, Truck</u>	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		4" Gravel									
		Moist, soft, gray, silty CLAY, trace of organics.	X SS 1	100	2-1-2 N ₆₀ =4	0.75	30	44	21	23	
5		Damp, stiff to very stiff, brown & gray, clayey SILT, minor sand.	X SS 2	100	2-4-5 N ₆₀ =12	1.5	22				
			X SS 3	100	4-7-10 N ₆₀ =23		17				
10			ST 4	100	q _u =8,850 psf	4.5+	17	31	16	15	
15		Moist to damp, medium stiff to very stiff, gray, clayey SILT, minor sand, trace of gravel.	X SS 5	89	4-4-6 N ₆₀ =13	3.0					
20			X SS 6	100	2-3-3 N ₆₀ =8	1.25	15				
25			X SS 7	100	6-9-14 N ₆₀ =31	4.5+					
30			X SS 8	100	6-8-13 N ₆₀ =28	4.5+	17				
35			X SS 9	100	7-9-8 N ₆₀ =21	4.5+					

(Continued Next Page)

Boring Number: B-4

CLIENT FirstEnergy Service Company **PROJECT NAME** Wellington Substation

PROJECT NUMBER 2019821.63 **PROJECT LOCATION** Hawley Road, Wellington, Ohio

PROJECT NAME Wellington Substation

PROJECT LOCATION Hawley Road, Wellington, Ohio

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
35											
		Moist to damp, medium stiff to very stiff, gray, clayey SILT, minor sand, trace of gravel. <i>(continued)</i>									
40			SS 10	100	3-5-8 N ₆₀ =17		13				



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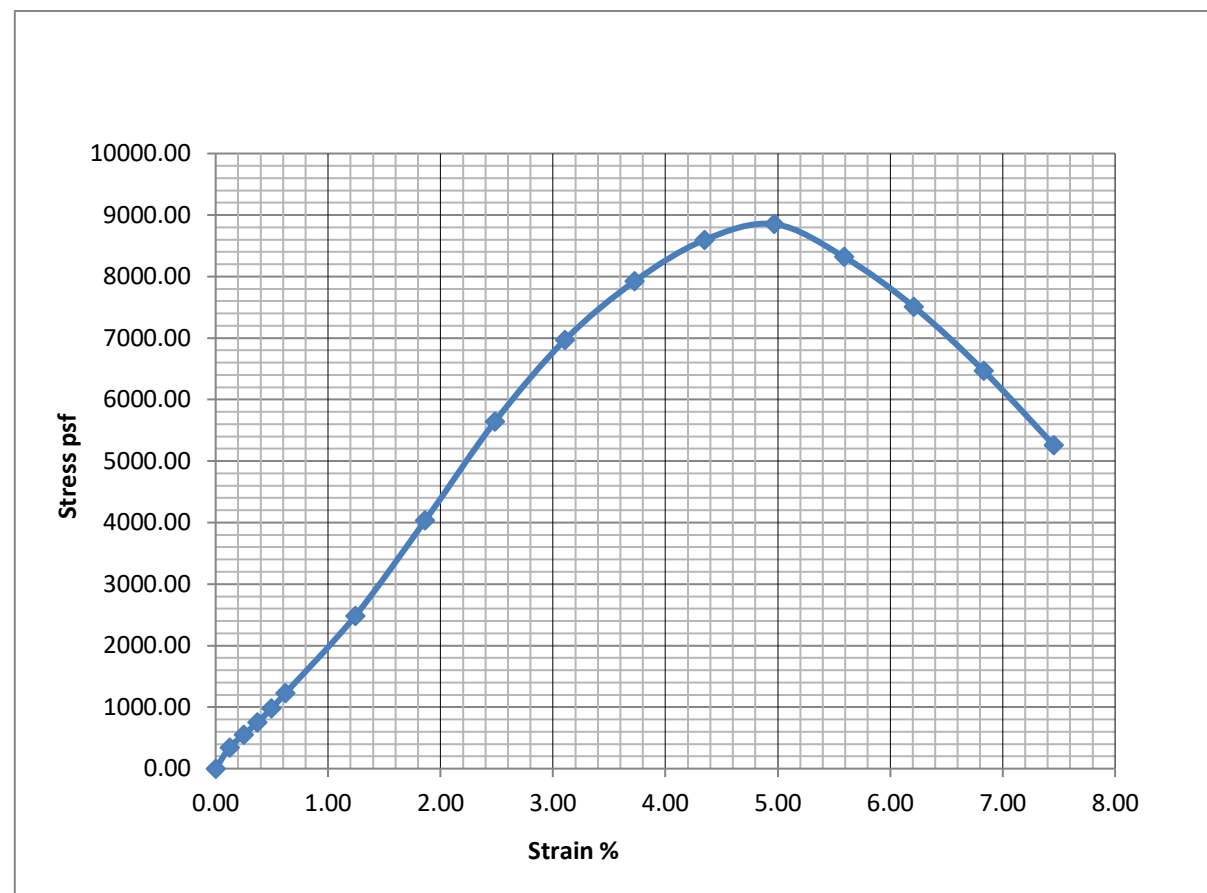
Phone 330.572.2100
www.gpdgroup.com

Unconfined Compression Test (ASTM D-2166)

Job Name: FirstEnergy Wellington Substation
Date: 9/4/19
Sample: B-4:S-4
Depth: 8.0'-10.0'
Strain Rate: 1% per minute

Project Number: 2019821.63
Lab Number: 19188
Moisture Content (%): 16.6
Dry Unit Weight (pcf): 116.9
Compressive Strength (psf): 8850
Strain at Failure (%): 5.0
Shear Strength (psf): 4425
Average Length (in): 4.025
Average Diameter (in): 1.888
Length to Dia. Ratio: 2.13

Strain (%)	Stress (psf)
0.00	0.00
0.12	344.19
0.25	549.00
0.37	753.29
0.50	977.55
0.62	1226.80
1.24	2483.98
1.86	4033.16
2.48	5642.79
3.11	6967.44
3.73	7923.07
4.35	8595.19
4.97	8852.21
5.59	8318.46
6.21	7506.34
6.83	6464.65
7.45	5260.06



Boring Number: B-6

CLIENT <u>FirstEnergy Service Company</u>	PROJECT NAME <u>Wellington Substation</u>
PROJECT NUMBER <u>2019821.63</u>	PROJECT LOCATION <u>Hawley Road, Wellington, Ohio</u>
DATE STARTED <u>August 16, 2019</u> COMPLETED <u>August 16, 2019</u>	GROUND ELEVATION _____ HOLE SIZE _____
DRILLING CONTRACTOR <u>GPD Geotechnical Services, Inc.</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Hollow Stem Auger with Automatic Hammer</u>	AT TIME OF DRILLING <u>---</u>
LOGGED BY <u>Dave Campana</u> CHECKED BY <u>Jason Arney</u>	AT END OF DRILLING <u>---</u>
NOTES <u>CME-55, Truck</u>	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		4" Gravel									
		Moist, soft, brown & gray, silty CLAY, trace of sand	ST 1	100	q _u =1,080 psf	1.0	28	38	20	18	
5		Damp, medium stiff to very stiff, brown, clayey SILT, minor sand, trace of gravel.	SS 2	33	2-3-3 N ₆₀ =8	1.5					
			SS 3	100	2-4-6 N ₆₀ =13	4.5+	17				
10			SS 4	100	4-7-11 N ₆₀ =24	4.5+					
15		Damp to moist, very stiff, gray, clayey SILT, minor sand, trace of gravel.	SS 5	89	4-6-8 N ₆₀ =19	4.5+	13				
20			SS 6	100	2-6-8 N ₆₀ =19	2.5					
25			SS 7	100	4-6-9 N ₆₀ =20	4.0	16				
30			SS 8	100	2-4-9 N ₆₀ =17						
35			SS 9	100	6-10-11 N ₆₀ =28		13				

(Continued Next Page)

Boring Number: B-6

CLIENT FirstEnergy Service Company

PROJECT NAME Wellington Substation

PROJECT NUMBER 2019821.63

PROJECT LOCATION Hawley Road, Wellington, Ohio

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
35											
		Damp to moist, very stiff, gray, clayey SILT, minor sand, trace of gravel. <i>(continued)</i>									
40			X SS 10	100	3-4-6 N ₆₀ =13						

Boring terminated at 40.0 feet



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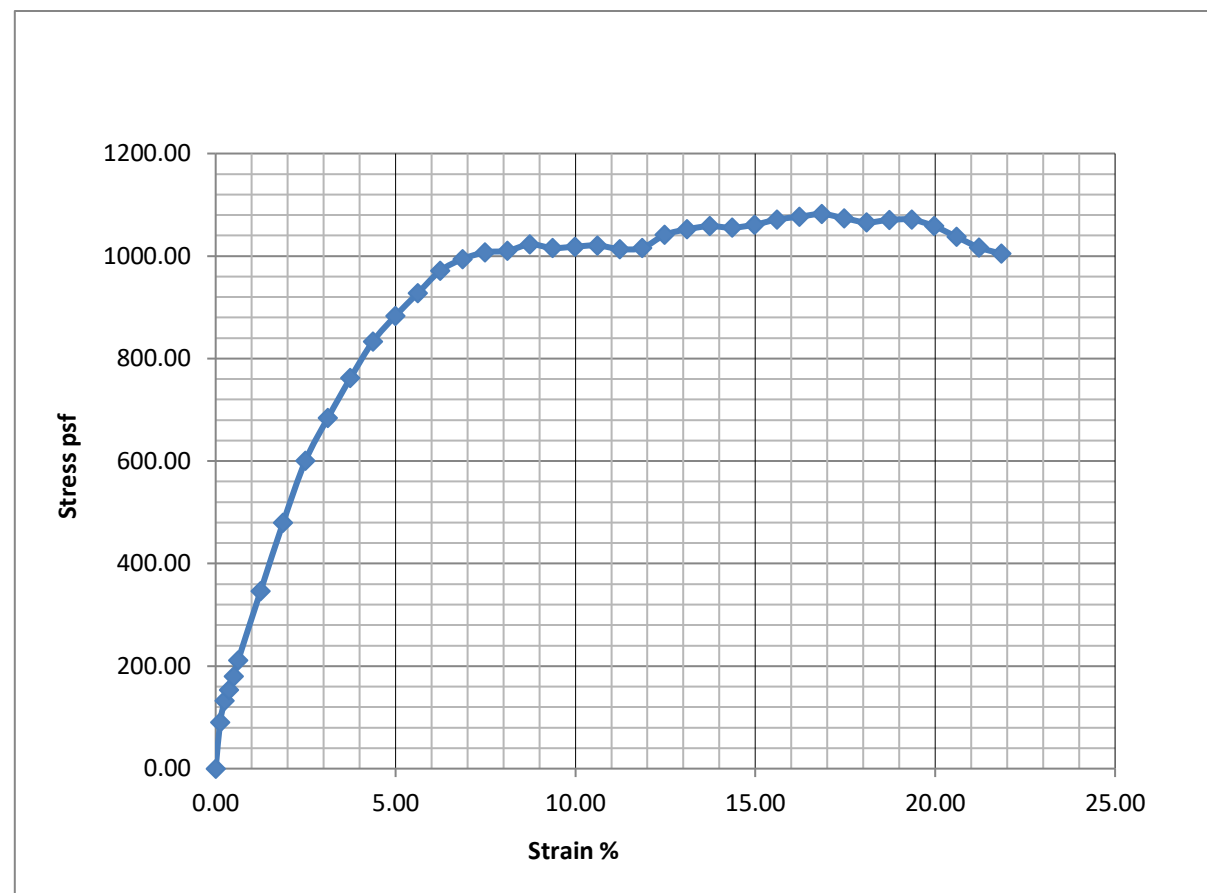
Phone 330.572.2100
www.gpdgroup.com

Unconfined Compression Test (ASTM D-2166)

Job Name: FirstEnergy Wellington Substation
Date: 9/4/19
Sample: B-6:S-1
Depth: 1.0'-3.0'
Strain Rate: 1% per minute

Project Number: 2019821.63
Lab Number: 19188
Moisture Content (%): 27.8
Dry Unit Weight (pcf): 97.8
Compressive Strength (psf): 1080
Strain at Failure (%): 16.9
Shear Strength (psf): 540
Average Length (in): 4.006
Average Diameter (in): 1.858
Length to Dia. Ratio: 2.16

Strain (%)	Stress (psf)
0.00	0.00
0.12	90.18
0.25	132.44
0.37	153.44
0.50	179.67
0.62	211.12
1.25	346.15
1.87	479.47
2.50	600.70
3.12	684.33
3.74	761.72
4.37	832.96
4.99	883.03
5.62	927.36
6.24	971.02
6.86	994.24
7.49	1007.23
8.11	1010.20
8.74	1022.72
9.36	1015.73
9.99	1018.30
10.61	1020.73
11.23	1013.61
11.86	1015.84
12.48	1041.19
13.11	1052.22
13.73	1058.41
14.35	1055.30
14.98	1061.16
15.60	1071.30
16.23	1076.73
16.85	1081.96
17.47	1073.84
18.10	1065.72
18.72	1070.55
19.35	1070.89
19.97	1058.36
20.59	1037.45
21.22	1016.75
21.84	1004.54



Boring Number: B-7

CLIENT <u>FirstEnergy Service Company</u>	PROJECT NAME <u>Wellington Substation</u>
PROJECT NUMBER <u>2019821.63</u>	PROJECT LOCATION <u>Hawley Road, Wellington, Ohio</u>
DATE STARTED <u>August 19, 2019</u> COMPLETED <u>August 19, 2019</u>	GROUND ELEVATION _____ HOLE SIZE _____
DRILLING CONTRACTOR <u>GPD Geotechnical Services, Inc.</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Hollow Stem Auger with Automatic Hammer</u>	AT TIME OF DRILLING ---
LOGGED BY <u>Dave Campana</u> CHECKED BY <u>Jason Arney</u>	AT END OF DRILLING ---
NOTES <u>CME-55, Truck</u>	

CENTER TERMINATION NOTE - GINT STD US LAB.GDT - 9/6/19 15:46 - F:\GPD GILCHRIST\JOBS\2019\2019821\63 - FIRSTENERGY - WELLINGTON SUBSTATION\B-1 BLANK.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		12" Topsoil									
		Moist, medium stiff, brown, silty CLAY, minor sand.	X SS 1	100	2-3-3 N ₆₀ =8	3.0					
5		Damp, very stiff, brown, silty CLAY, minor sand.	X SS 2	100	5-9-12 N ₆₀ =28	4.5+	16	34	17	17	
			X SS 3	100	3-6-11 N ₆₀ =23	4.5+					
10			X SS 4	100	5-8-12 N ₆₀ =27	4.5+	14				
		Damp, stiff to very stiff gray, clayey SILT, minor sand, trace of gravel.									
15			X SS 5	89	5-7-9 N ₆₀ =21	4.5+					
20			X SS 6	100	4-7-8 N ₆₀ =20	4.5+	15				
25			X SS 7	100	4-6-9 N ₆₀ =20						
30			X SS 8	100	7-10-14 N ₆₀ =32		12				
35			X SS 9	100	4-4-6 N ₆₀ =13	4.5+					

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

Boring Number: B-7

CLIENT FirstEnergy Service Company **PROJECT NAME** Wellington Substation

PROJECT NUMBER 2019821.63 **PROJECT LOCATION** Hawley Road, Wellington, Ohio

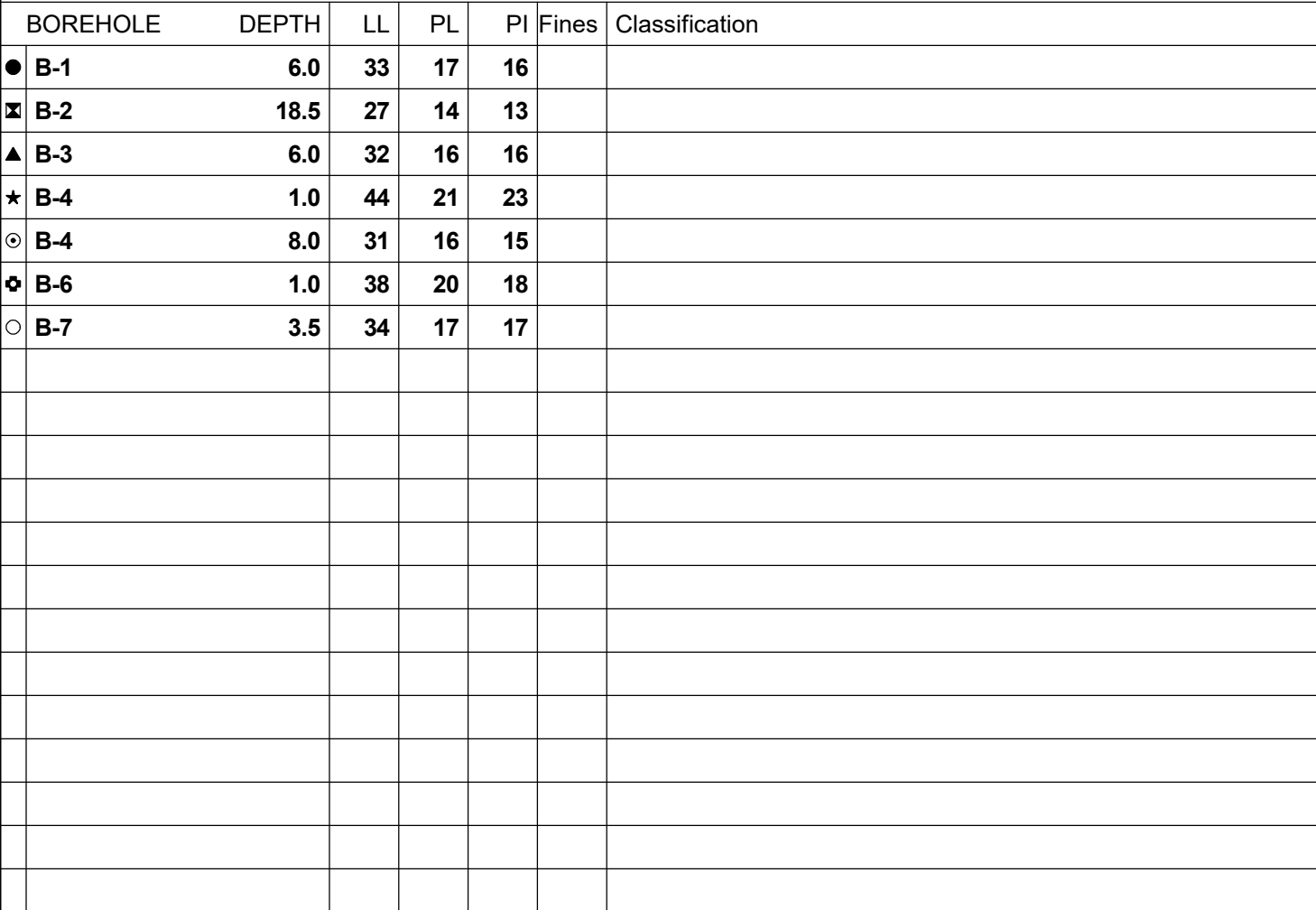
PROJECT NAME Wellington Substation

PROJECT LOCATION Hawley Road, Wellington, Ohio

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
35											
		Damp, stiff to very stiff gray, clayey SILT, minor sand, trace of gravel. (continued)									
40			 SS 10	100	5-7-10 N ₆₀ =23		12				

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PROJECT LOCATION Hawley Road, Wellington, Ohio





Summary of Chemical Test Results

Test	B-2 (3.5'-10.0')
pH	8.5
Chloride	ND
Sulfate	280 mg/Kg
Sulfide	ND
Resistivity	1,300 ohm-cm
Redox Potential	180 mV

ND:No detection

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.	SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted.	ST: Shelby Tube - 3" O.D., except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry	BS: Bulk Sample
R.C.: Diamond Bit Core Sampler	PM: Pressuremeter
H.A.: Hand Auger	CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings
P.A.: Power Auger - Handheld motorized auger	

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N ₆₀ : A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q _u : Unconfined compressive strength, TSF
Q _p : Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL), %
DD: Dry unit weight, pcf
▼, ▼, ▼: Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Relative Density</u>	<u>N - Blows/foot</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

<u>Description</u>	<u>Criteria</u>
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

<u>Component</u>	<u>Size Range</u>
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (3/4 in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to 3/4 in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

<u>Description</u>	<u>Criteria</u>
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

<u>Q_u - TSF</u>	<u>N - Blows/foot</u>	<u>Consistency</u>
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

<u>Description</u>	<u>Criteria</u>
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

<u>Description</u>	<u>Criteria</u>	<u>Description</u>	<u>Criteria</u>
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick	Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick	Lensed:	Inclusion of small pockets of different soils
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing	Layer:	Inclusion greater than 3 inches thick (75 mm)
Slickensided:	Fracture planes appear polished or glossy, sometimes striated	Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
		Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

<u>Q_u - TSF</u>	<u>Consistency</u>
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

<u>Description</u>	<u>Criteria</u>
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

<u>Voids</u>	<u>Void Diameter</u>
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

<u>(Typically Sedimentary Rock)</u>	
<u>Component</u>	<u>Size Range</u>
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

<u>Rock Mass Description</u>	<u>RQD Value</u>
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

Unified Soil Classification System

Major Divisions			Letter	Symbol	Description
Coarse-grained Soils More than ½ retained on the No. 200 Sieve	Gravels More than ½ coarse fraction retained on the No. 4 sieve	Clean Gravels	GW		Well-graded gravels and gravel-sand mixtures, little or no fines.
			GP		Poorly-graded gravels and gravel-sand mixtures, little or no fines.
		Gravels With Fines	GM		Silty gravels, gravel-sand-silt mixtures.
			GC		Clayey gravels, gravel-sand-clay mixtures.
	Sands More than ½ passing through the No. 200 sieve	Clean Sands	SW		Well-graded sands and gravelly sands, little or no fines.
			SP		Poorly-graded sands and gravelly sands, little or no fines.
		Sands With Fines	SM		Silty sands, sand-silt mixtures
			SC		Clayey sands, sandy-clay mixtures.
Fine-grained Soils More than ½ passing through the No. 200 Sieve	Silts and Clays Liquid Limit less than 50%		ML		Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL		Organic clays of medium to high plasticity.
	Silts and Clays Liquid Limit greater than 50%		MH		Inorganic silts, micaceous or diatomaceous fines sands or silts, elastic silts.
			CH		Inorganic clays of high plasticity, fat clays.
			OH		Organic clays of medium to high plasticity.
Highly Organic Soils		PT		Peat, muck, and other highly organic soils.	
Consistency Classification					
Granular Soils			Cohesive Soils		
Description - Blows Per Foot (Corrected)			Description - Blows Per Foot (Corrected)		
	<u>MCS</u>	<u>SPT</u>		<u>MCS</u>	<u>SPT</u>
Very loose	<5	<4	Very soft	<3	<2
Loose	5 - 15	4 - 10	Soft	3 - 5	2 - 4
Medium dense	16 - 40	11 - 30	Firm	6 - 10	5 - 8
Dense	41 - 65	31 - 50	Stiff	11 - 20	9 - 15
Very dense	>65	>50	Very Stiff	21 - 40	16 - 30
			Hard	>40	>30
MCS = Modified California Sampler			SPT = Standard Penetration Test Sampler		



PROJECT NUMBER: 2019821.63

DATE: 8/1/2019

CREW: A.I. & M.C.

ELECTRICAL RESISTIVITY TEST REPORT

SITE NAME: FirstEnergy Wellington Substation

SITE ADDRESS: 23860 Hawley Rd, Wellington, Ohio

DESCRIPTION OF SITE SOILS: Damp to dry, clayey SILT, minor sand

SOIL CONDITION: ☐ Wet ☐ Moist ☒ Damp ☐ Dry

SOIL TYPE THAT BEST DESCRIBES THE EARTH CONDITIONS:

☒ Good clay earth

☒ Sandy soil

☐ Solid Rock

WEATHER AT TIME OF TEST: Sunny, 81° F

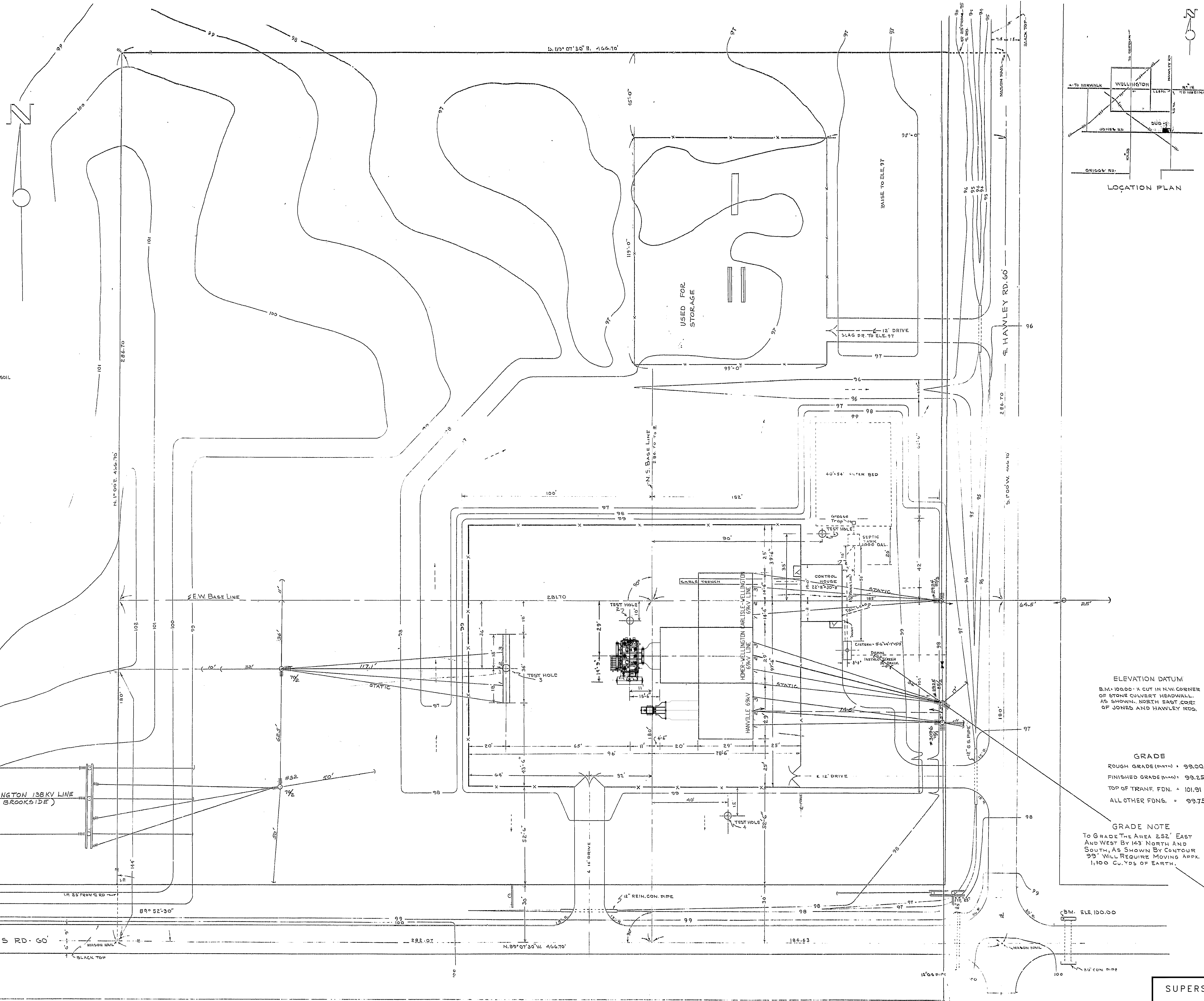
WEATHER FOR 7 DAYS PRECEDING THE TEST: Highs of 81° to 90°, 0.09" of precipitation

WEATHER FOR 3 DAYS PRECEDING THE TEST: Highs of 81° to 90°, 0.09" of precipitation

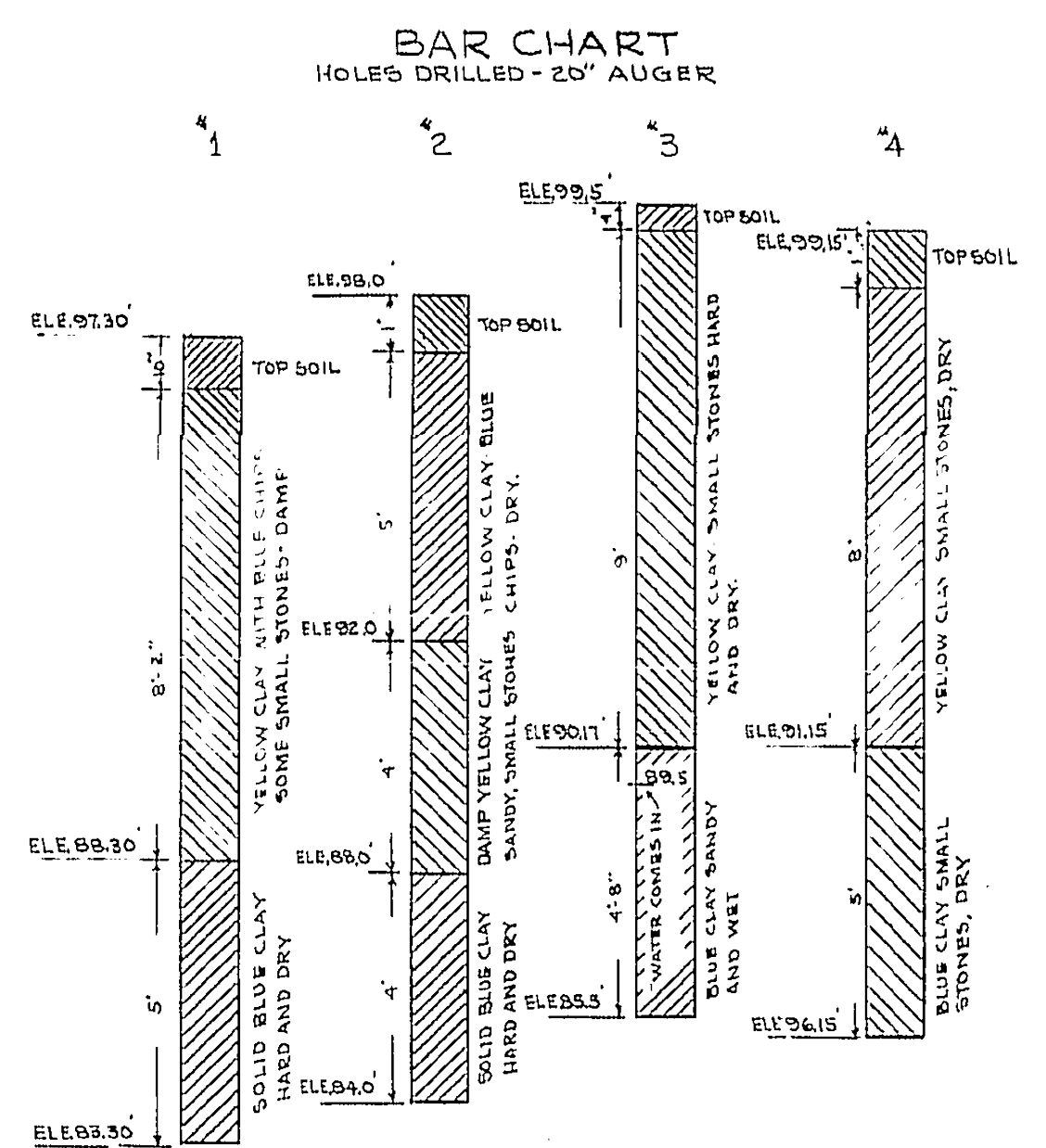
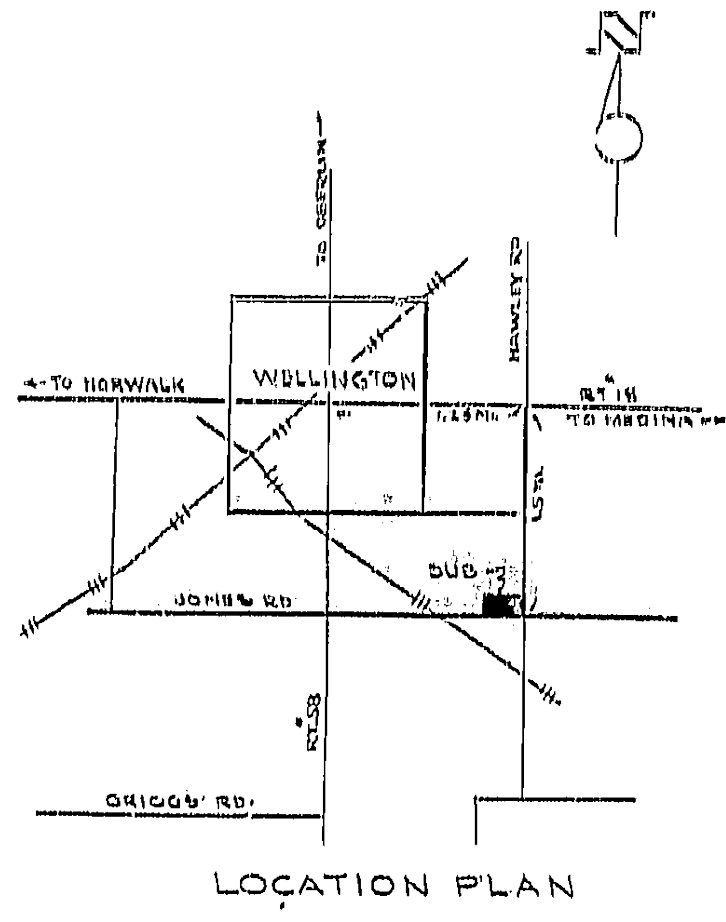
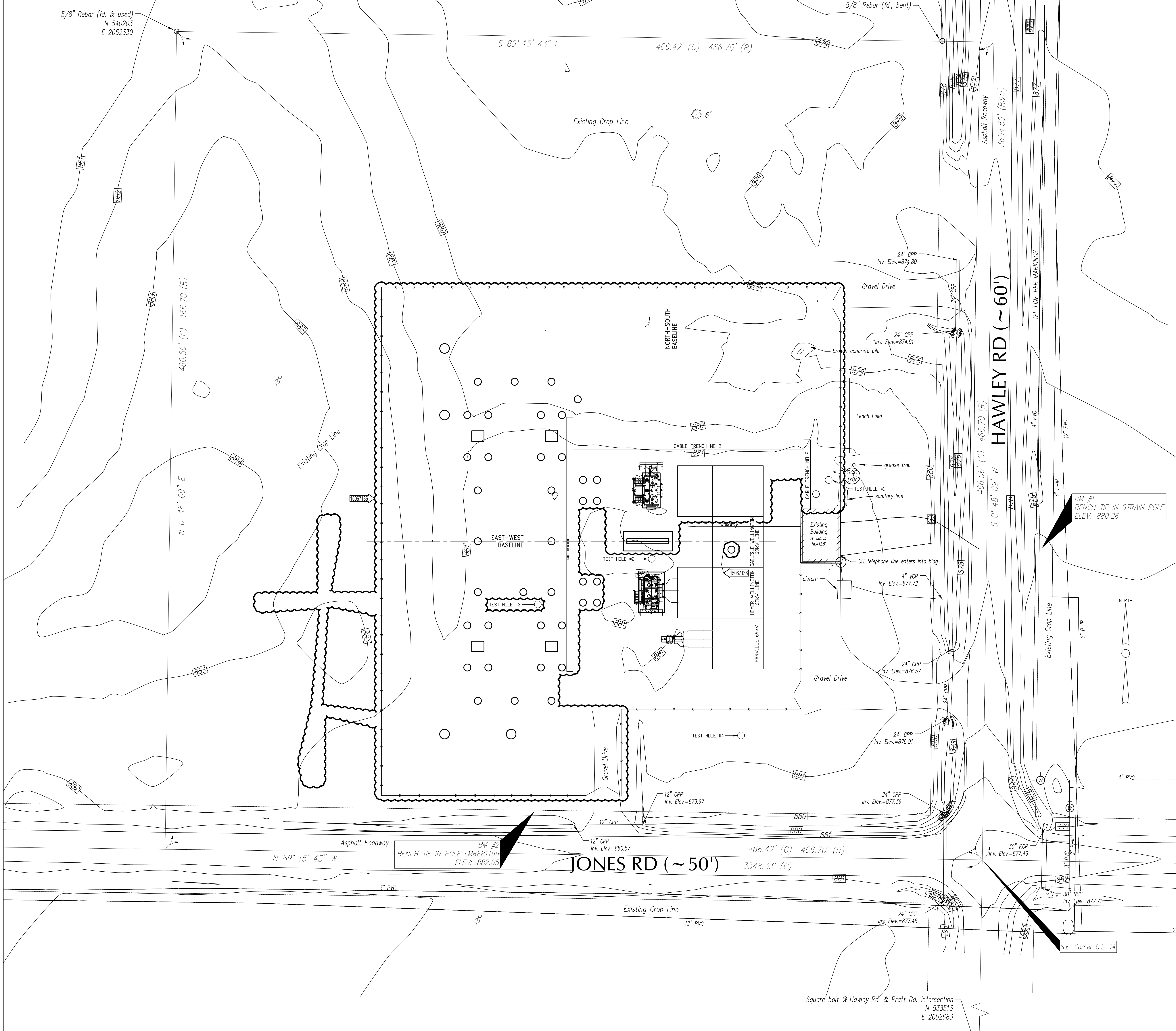
EQUIPMENT: MC Miller 400A, Serial Number: 2389,

16 ga. test lead cable, 0.5" diameter x 24" long steel electrodes

R-1 East-West			R-2 North-South		
Spacing (Feet)	Probe Depth (Inches)	Apparent Resistivity (Ω-cm)	Spacing (Feet)	Probe Depth (Inches)	Apparent Resistivity (Ω-cm)
2	1	2719.3	2	1	2604.4
3	2	2298.0	3	3	2585.3
4	3	1991.6	4	3	2374.6
5	4	2010.8	5	4	2393.8
10	4	1915.0	10	4	3064.0
15	4	2010.8	15	4	3734.3
20	5	1915.0	20	4	3064.0
30	5	5170.5			
40	5	5591.8			
60	5	6549.3			
80	6	12562.4			
100	6	22980.0			



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524
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ELEVATION DATUM

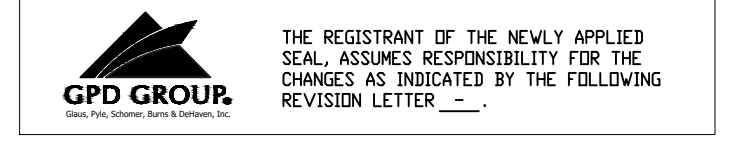
B.M. 10000 - X CUT IN N.W. CORNER OF STONE CULVERT HEADWALL, AS SHOWN, NORTH EAST COR. OF JONES AND HAWLEY RDS.

GRADE

ROUGH GRADE (R&H) = 99.00
FINISHED GRADE (R&H) = 99.25
TOP OF TRANS. FDN. = 101.91
ALL OTHER FDS. = 99.75

15067136 INFORMATION ABOVE WAS RELOCATED FROM DRAWING D-471-04-01, REVISION E, DATED 10/14/15.

RR spike @ Jones Rd. & Smith Rd. intersection
N 539671
E 2056124

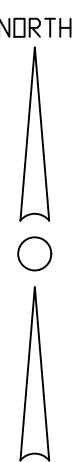


THIS DRAWING SUPERCEDES DRAWING D-471-04-01, REVISION E, DATED 10/14/15.

DATE: 05/26/2022	BY: JSC	PROJECT: 15067136	CLIENT: FirstEnergy	DESIGNER: JSC	DATE: 05/26/2022
15067136- EXPANDED FENCE LINE AND 69KV BOX STRUCTURE FOR 138/69KV NO 4 TR AND 138KV (4) BREAKER RING BUS ADDITION. REMOVED T-LINE INFORMATION. (GPD)			WELLINGTON		
PROPERTY PLAN 2020 SURVEY			REV. 1		


Square bolt @ Hawley Rd. & Pratt Rd. intersection
N 533513
E 2052683

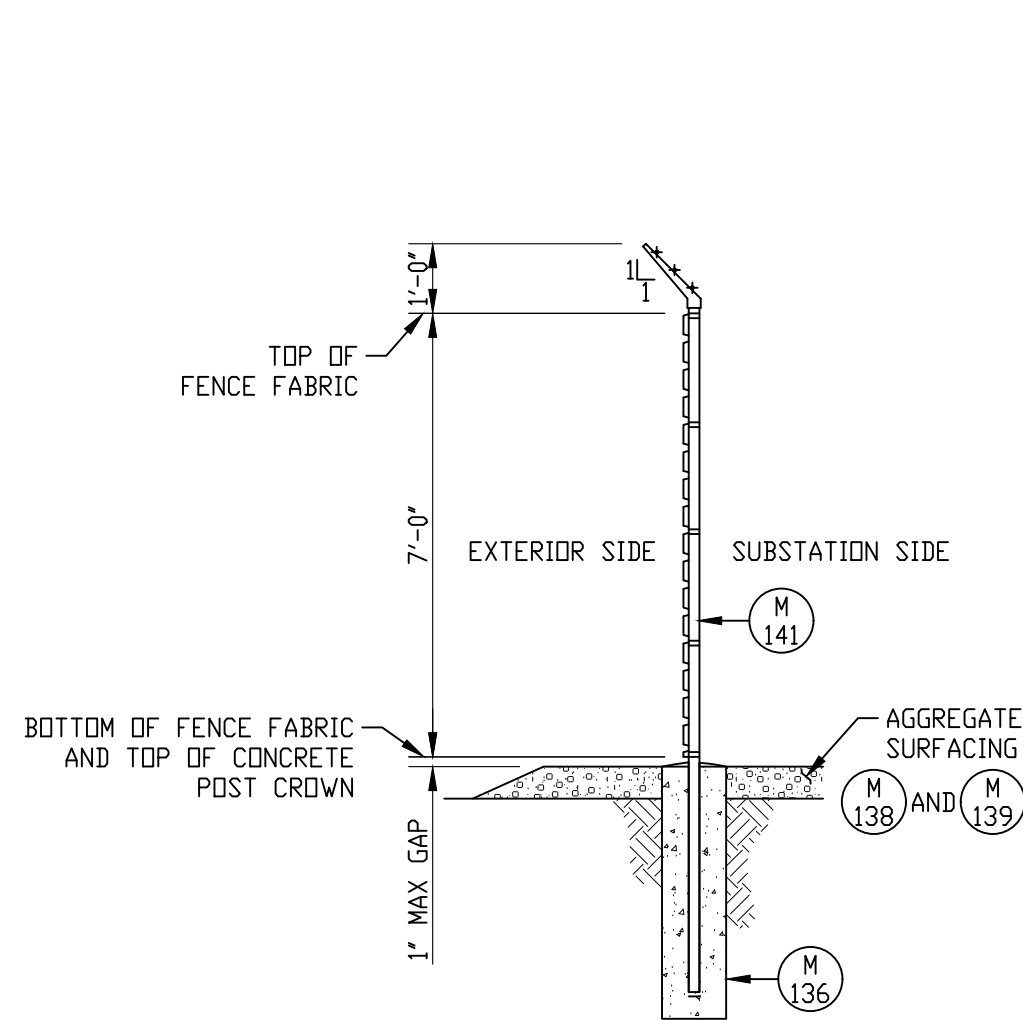
S.E. Corner O.L. 14



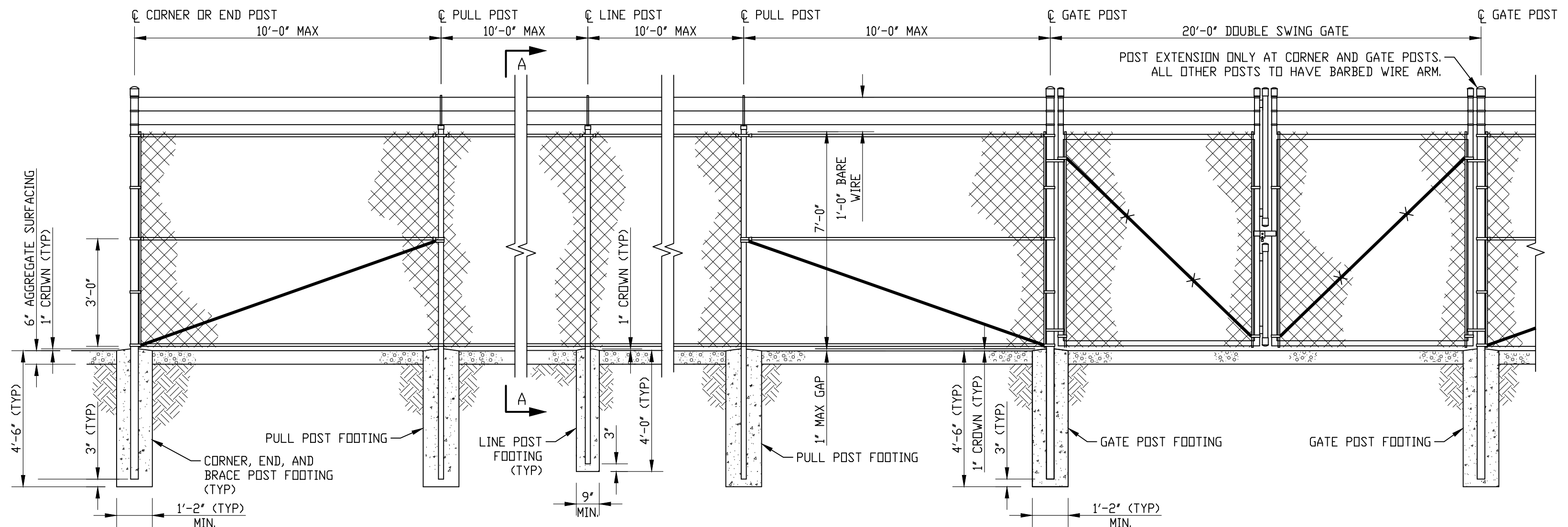
NOTES:

1. NINE (9) "DANGER-NO TRESPASSING-KEEP OUT" SIGNS ARE REQUIRED, MOUNTED ON FENCE & GATES IN APPROXIMATE LOCATIONS AS SHOWN. THERE SHALL BE APPROXIMATELY 100' BETWEEN TWO SIGNS ON ANY SIDE. SIGNAGE SUPPLIED BY SUBSTATION DESIGN ENGINEERING.
2. TWO (2) "PRIVATE PROPERTY" SIGNS ARE REQUIRED, MOUNTED ON FENCE GATES IN APPROXIMATE LOCATIONS AS SHOWN. SIGNAGE SUPPLIED BY SUBSTATION DESIGN ENGINEERING.
3. TWO (2) "ADDRESS" SIGNS ARE REQUIRED, MOUNTED ON GATES IN APPROXIMATE LOCATIONS AS SHOWN. SIGNAGE SUPPLIED BY SUBSTATION DESIGN ENGINEERING.

 <p>THE REGISTRANT OF THE NEWLY APPLIED SEAL ASSUMES RESPONSIBILITY FOR THE CHANGES AS INDICATED BY THE FOLLOWING REVISION LETTER <u>—</u></p>		DATE: 05/01/2009 TIME: 11:40 AM BY: 45630		PROJECT: DMLD EDISON (DE) AREA: DM-CE LAKE ERIE	
WBS SPS 05/01/2009 05/01/2009 CONSTRUCTION (GPD)		FirstEnergy Energy Delivery Technical Services		PROJECT: WELLINGTON FENCE PLAN	
		DATE: 05/01/2009 TIME: 11:40 AM BY: 45630		DATE: 05/01/2009 TIME: 11:40 AM BY: 45630	



SECTION A-A
TYPICAL FENCE ELEVATION
NOT TO SCALE



DETAIL 1
TYPICAL FENCE ELEVATION
NOT TO SCALE

**SPECIFICATIONS FOR FOUNDATIONS OF
STANDARD 84 INCH HIGH CHAIN LINK FENCE**

SCOPE:

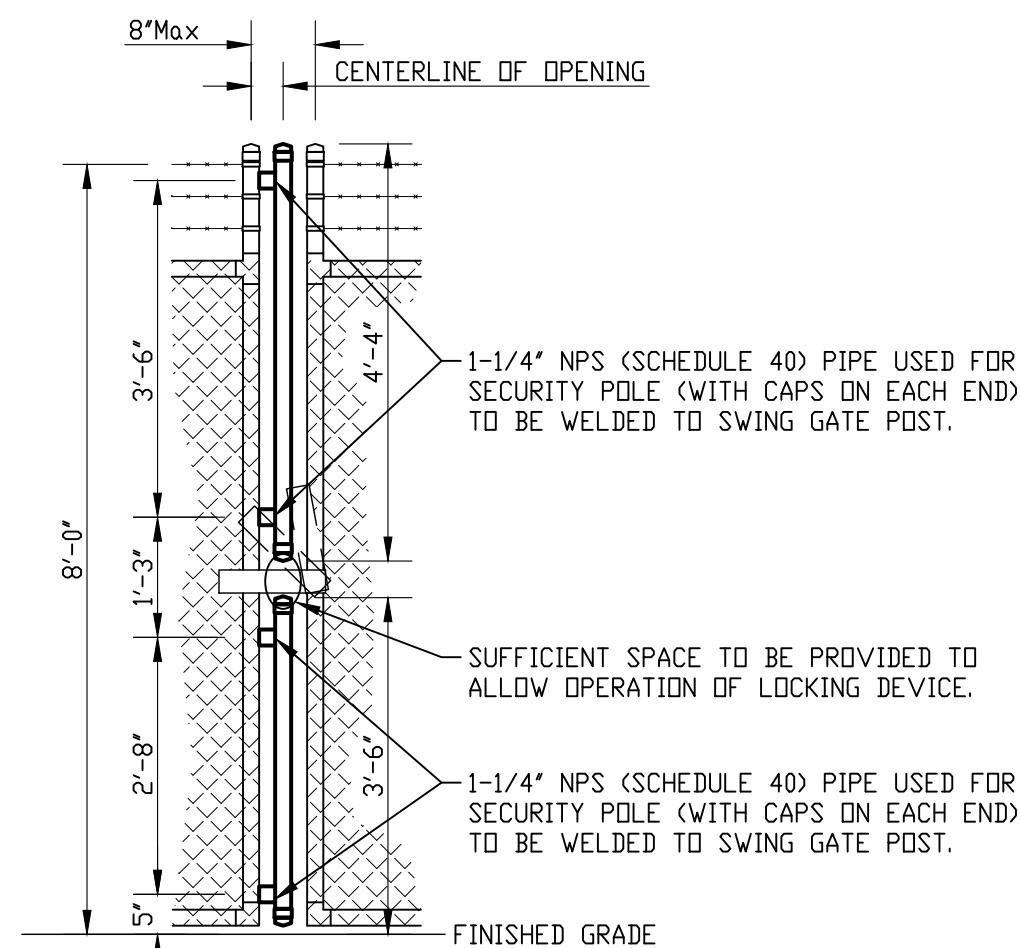
THIS SPECIFICATION COVERS FOUNDATIONS FOR LINE POSTS, CORNER POSTS, GATE POSTS, AND GATE STOPS FOR STANDARD 84 INCH HIGH CHAIN LINK FENCE WITH 10 FOOT MAXIMUM POST SPACING.

GENERAL:

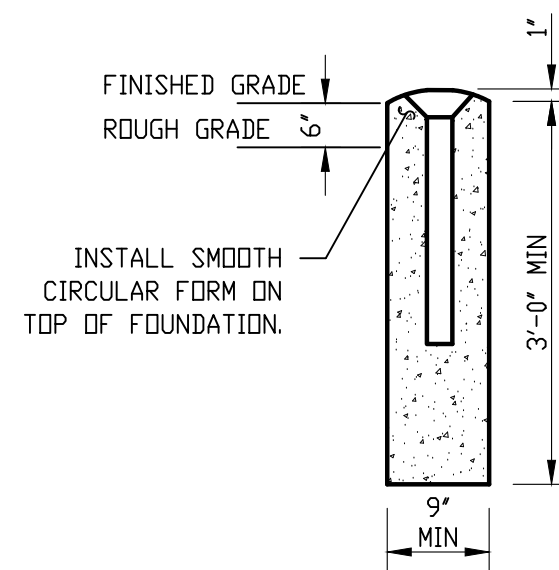
1. CARE SHOULD BE TAKEN DURING EXCAVATION FOR THE FOUNDATIONS TO ASSURE THAT THE TOP DIAMETER DOES NOT EXCEED THE BOTTOM DIAMETER BY AN EXCESSIVE AMOUNT. SMOOTH, CIRCULAR FORMS SHALL BE INSTALLED ON THE TOP 12 INCHES OF EACH FOUNDATION. THIS FORM SHALL BE EXTENDED TO A DEPTH OF 24 INCHES WHEN THE TOP EXCAVATION DIAMETER EXCEEDS THE BOTTOM DIAMETER BY 4 INCHES OR MORE. THE FORM SHALL BE LEFT IN PLACE. POSTS SHALL BE PLUMB AND CENTERED WITHIN THIS FORM. AFTER THE CONCRETE HAS BEEN PLACED AND ALLOWED TO CURE FOR 24 HOURS THE AREA AROUND THE TOP OF THE FOUNDATION SHALL BE BACKFILLED TO ROUGH GRADE AND TAMPED WITH SOIL. EACH FOUNDATION SHALL BE ALLOWED TO CURE FOR 72 HOURS BEFORE FURTHER WORK IS DONE ON THE POST.
2. ALL LINE, CORNER, AND GATE POSTS SHALL HAVE A MINIMUM EMBEDMENT IN CONCRETE OF 2'-8".
3. THE TOP OF ALL FOUNDATIONS SHALL BE CROWNED APPROXIMATELY 1 INCH. THE END OF THE CROWN SHALL BE AT FINISHED GRADE.
4. FOR INSTALLATIONS WHERE THE FOUNDATION ELEVATIONS VARY, SEE THE PROPERTY PLAN FOR GRADE ELEVATIONS.
5. FOUNDATIONS SHALL BE FORMED AS DETAILED ON THIS DWG.

SPECIFIC:

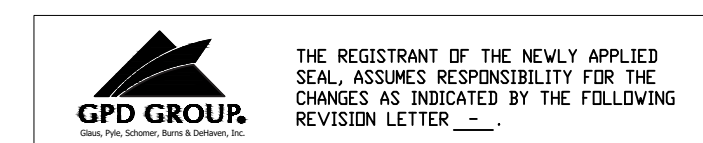
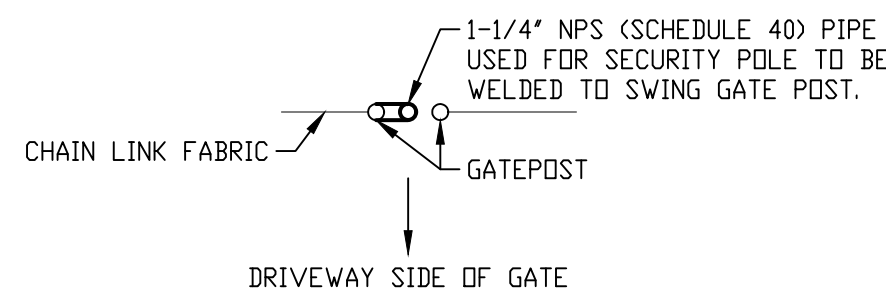
1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS AND AN AVERAGE AIR CONTENT OF 6 PERCENT, PLUS OR MINUS 1 PERCENT.
2. CONCRETE SHALL CONSIST OF CEMENT CONFORMING TO FE-MNC-1, FINE AND COARSE AGGREGATE CONFORMING TO ASTM C-33 AND WATER WHICH IS FREE OF DELETERIOUS SUBSTANCES. CONCRETE SHALL BE MIXED FOR A MINIMUM OF 2 MINUTES IN A BATCH MIXER. CONCRETE SHALL BE MIXED IN THE VOLUMETRIC PROPORTIONS OF ONE PART CEMENT, TWO PARTS FINE AGGREGATE AND THREE PARTS COARSE AGGREGATE. NO MORE WATER SHALL BE ADDED THAN IS REQUIRED FOR A WORKABLE MIXTURE.



GATE ELEVATION
NOT TO SCALE

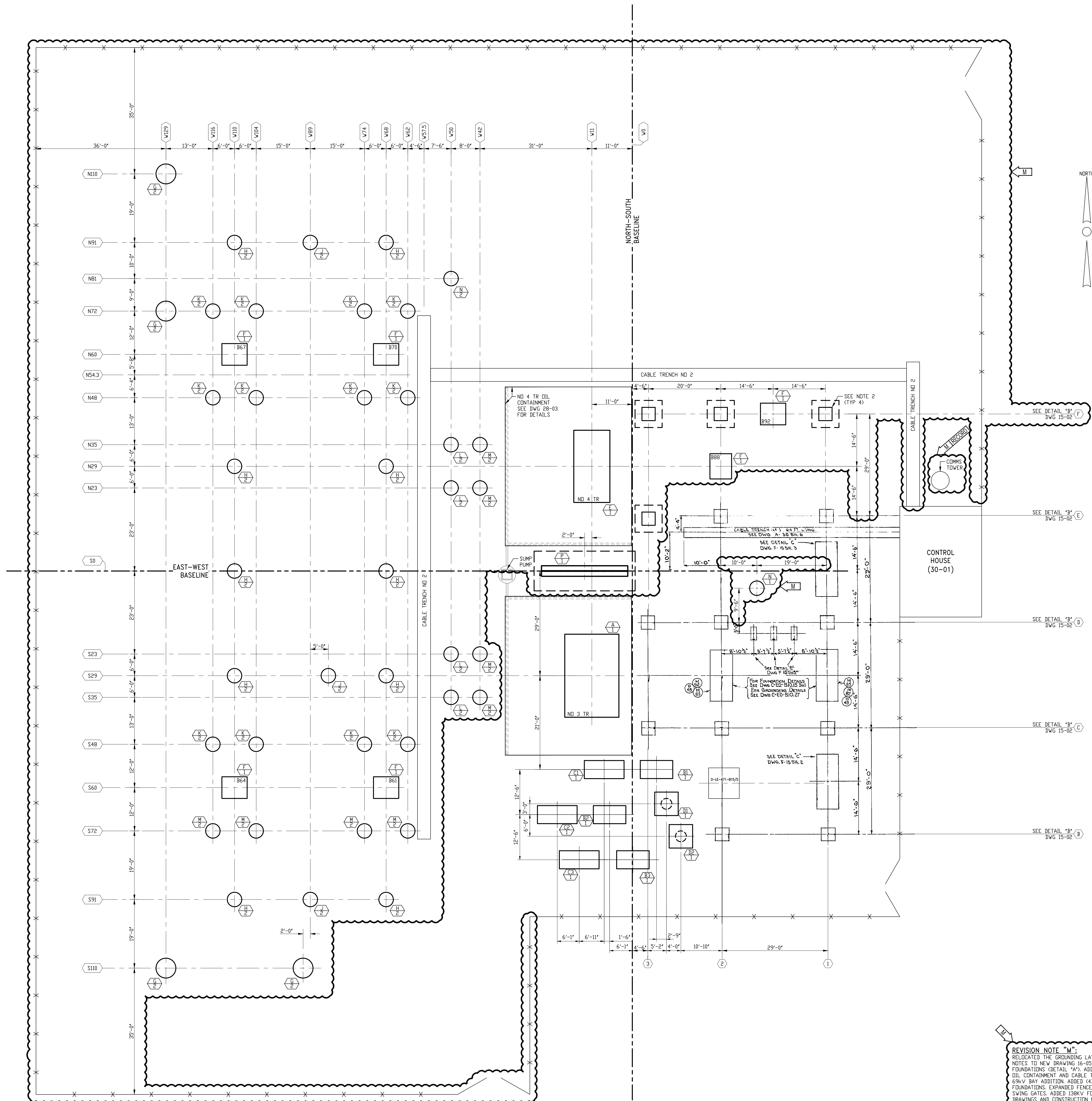


GATE STOP FOUNDATION
NOT TO SCALE



THE REGISTRANT OF THE NEWLY APPLIED
SEAL, ASSUMES RESPONSIBILITY FOR THE
CHANGES AS INDICATED BY THE FOLLOWING
REVISION LETTER

BY: WDB APP: SPS DATE: 05/26/2022 ISSUE: CONSTRUCTION (GPD)	FirstEnergy Energy Delivery Technical Services	DIST. CODE: C SCALE: NONE SIZE: 24x18	OPERATING COMPANY: OHIO EDISON (OE) REGION: OH-CE AREA: LAKE ERIE
FACILITY: WELLINGTON TITLE: FENCE DETAILS			SAP NO: 15067136 DOC. ID: 0-471-04-10 REV. -



138/69KV FOUNDATION TABLES			
FDN REF	DETAIL DWG NO.	DESCRIPTION	FDN REF ELEVATION
A	D-471-15-09	138/69KV NO 3 TRANSFORMER FOUNDATION	SEE NOTE 1
B	D-471-15-10	69KV CAPACITOR STACK FOUNDATION	882.00'
C	D-471-15-10	69KV REACTOR STACK FOUNDATION	
D	D-471-15-11	69KV 1Ø BUS SUPPORT FOUNDATION	
E	D-471-15-12	138/69KV NO 4 TRANSFORMER FOUNDATION	
F	D-471-15-13	138/69KV BREAKER FOUNDATION	
G	D-471-15-13	138KV H-FRAME STRUCTURE FOUNDATION	
H	D-471-15-14	138KV 3Ø DIAGONAL BUS SUPPORT STAND FOUNDATION	
I	D-471-15-14	138KV 3Ø HIGH/LOW BUS SUPPORT STAND FOUNDATION	
J	D-471-15-14	138KV 3Ø LOW V-SWITCH STAND FOUNDATION	
K	D-471-15-14	138KV 3Ø CVT STAND FOUNDATION	
L	D-471-15-14	138KV 3Ø HIGH V-SWITCH STAND FOUNDATION	
M	D-471-15-14	138/69KV 1Ø SSVT STAND FOUNDATION	
N	D-471-15-15	138/69KV TRANSFORMER FIREWALL	

NOTES:
1. TOP OF CONCRETE SHALL BE 6" ABOVE FINISHED GRADE.
2. CONTRACTOR SHALL MATCH NEW 69KV STRUCTURE FOUNDATION ELEVATIONS WITH EXISTING FOUNDATION ELEVATIONS (APPROXIMATELY 6" ABOVE FINISHED GRADE).

REFERENCE DRAWINGS:
D-471-04-02 THROUGH 04-08 PROPERTY PLANS AND DETAILS
D-471-04-09 & 04-10 FENCE PLAN & DETAILS
D-471-16-01 CONDUIT LAYOUT
D-471-16-05 GROUNDING LAYOUT
D-471-28-01 DRAINAGE LAYOUT & DETAILS
D-471-28-02 OIL CONTAINMENT PLAN AND DETAILS NO 3 TR
D-471-28-03 OIL CONTAINMENT PLAN AND DETAILS NO 4 TR

REVISION NOTE "M":
RELOCATED THE GROUNDING LAYOUT, DETAILS, LEGENDS, AND NOTES TO NEW DRAWING 16-05. REMOVED DEAD END STRUCTURE FOUNDATIONS (DETAIL "A"). ADDED FOUNDATIONS "E"-"P", NO 4 TR OIL CONTAINMENT AND CABLE TRENCH FOR 138KV RING BUS AND 69KV BAY ADDITION. ADDED (A) 69KV BOX STRUCTURE COLUMN FOUNDATIONS. EXPANDED FENCE LINE AND ADDED (2) TWENTY FOOT SWING GATES. ADDED 138KV FOUNDATION COORDINATES. REFERENCE DRAWINGS AND CONSTRUCTION NOTES. REVISED DRAWING TITLE. ADDED COMMUNICATIONS TOWER FOR RECORD. (GPD)

THE REGISTRATION OF THE NEWLY APPLIED SEAL ASSURES RESPONSIBILITY FOR THE CHANGES AS INDICATED BY THE FOLLOWING REVISION LETTER "M".

DATE: 05/26/2022
BY: [Signature]
FOR: CONSTRUCTION

FirstEnergy
Energy Delivery Technical Services

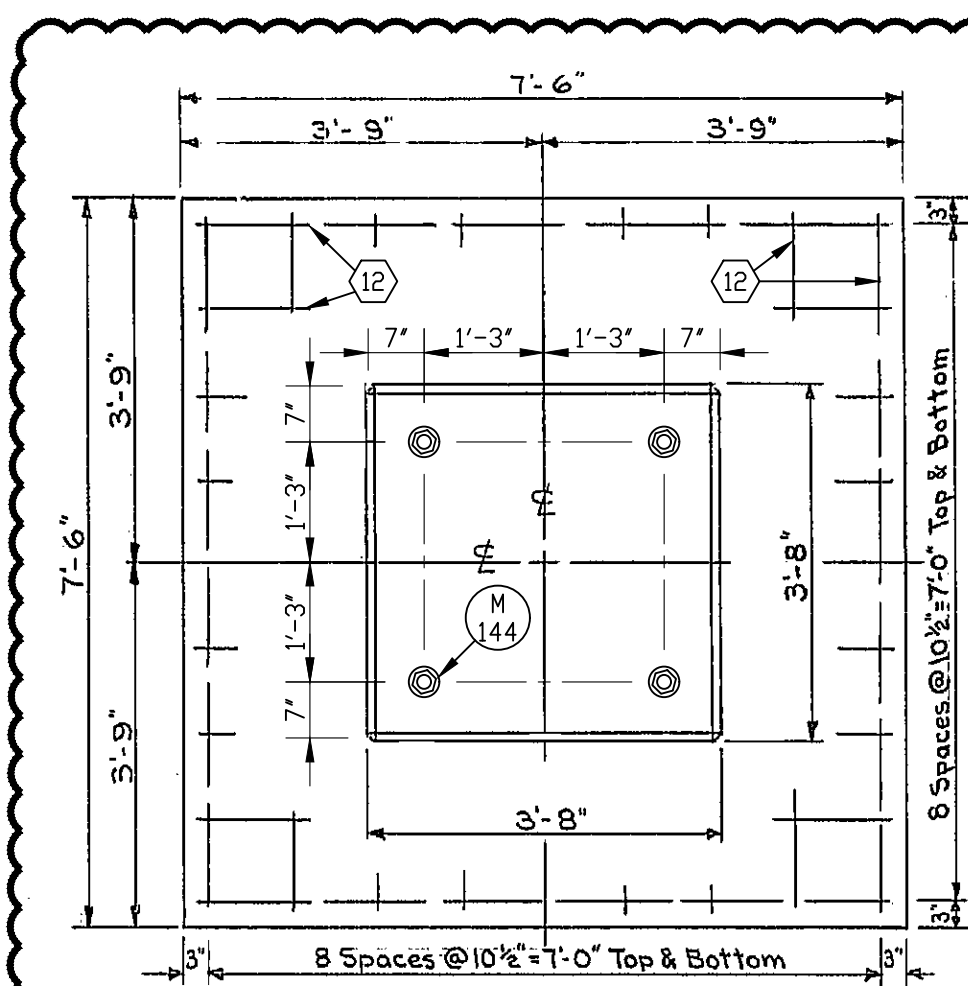
PROJECT: 15067136
SHEET: 04-CE
SUBSHEET: 04-CE
SCALE: 3/32"=1'-0"
100 462/30

DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: 05/26/2022

WELLINGTON
FOUNDATION LAYOUT

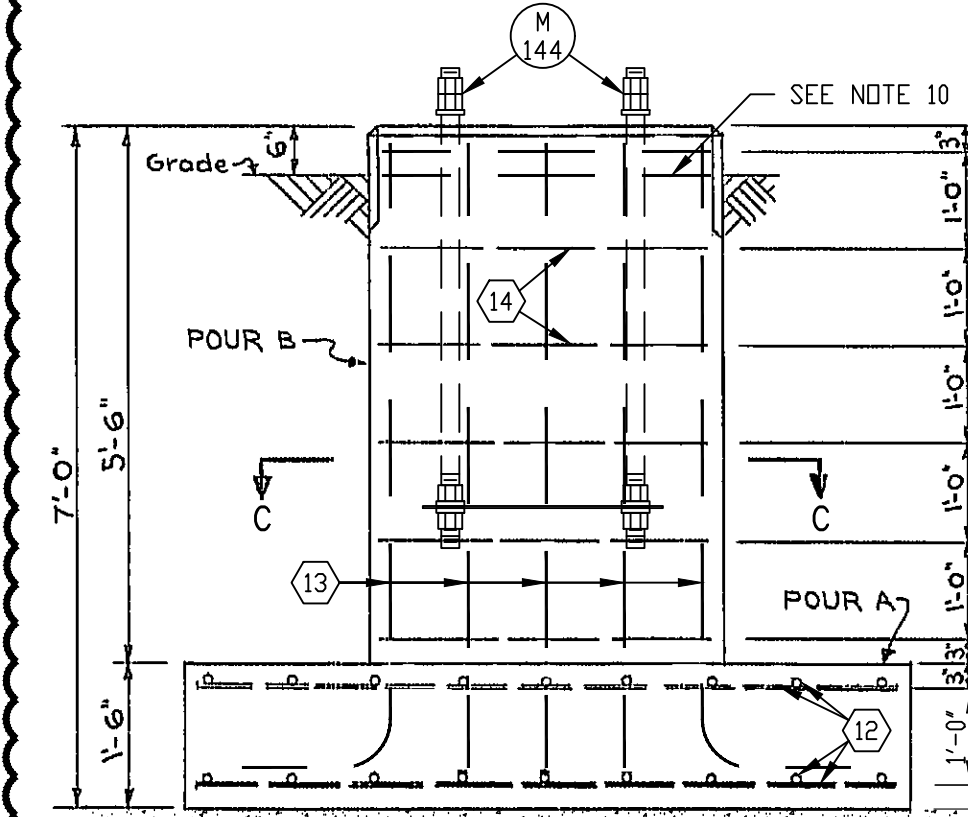
REV. 15067136
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REV. 15067136

D-471-15-01
M



PLAN

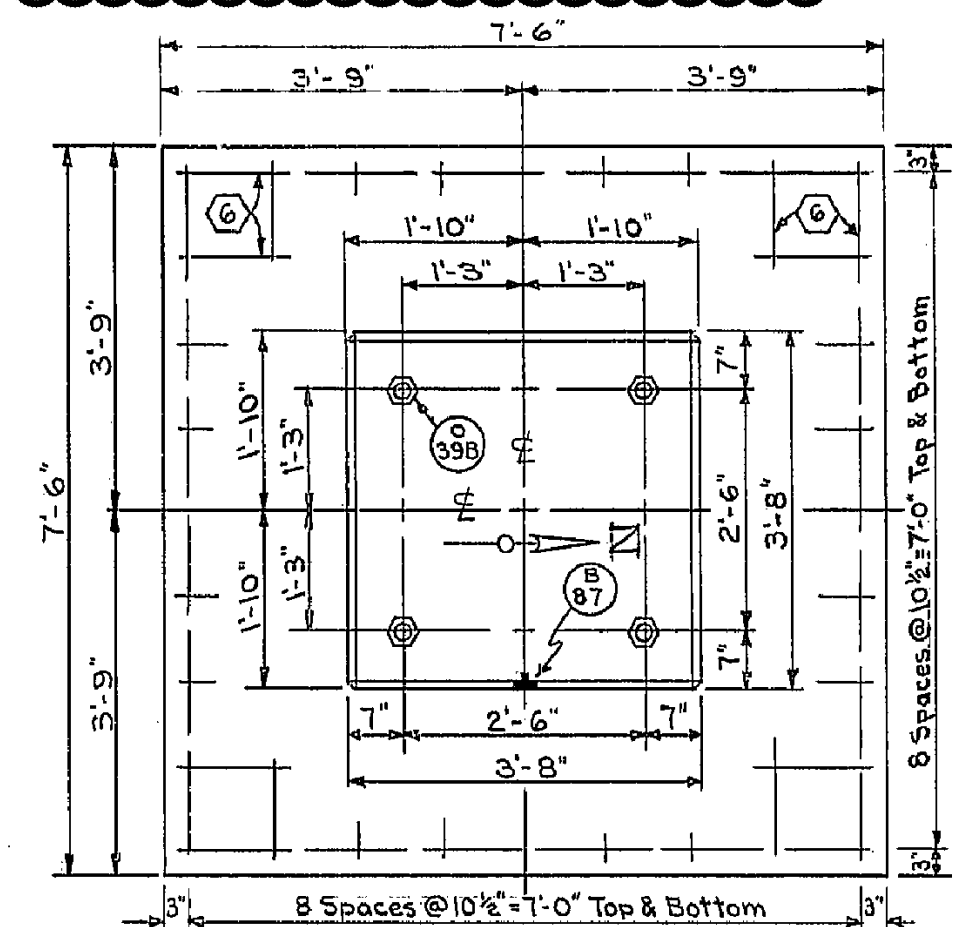
SEE NOTE 9



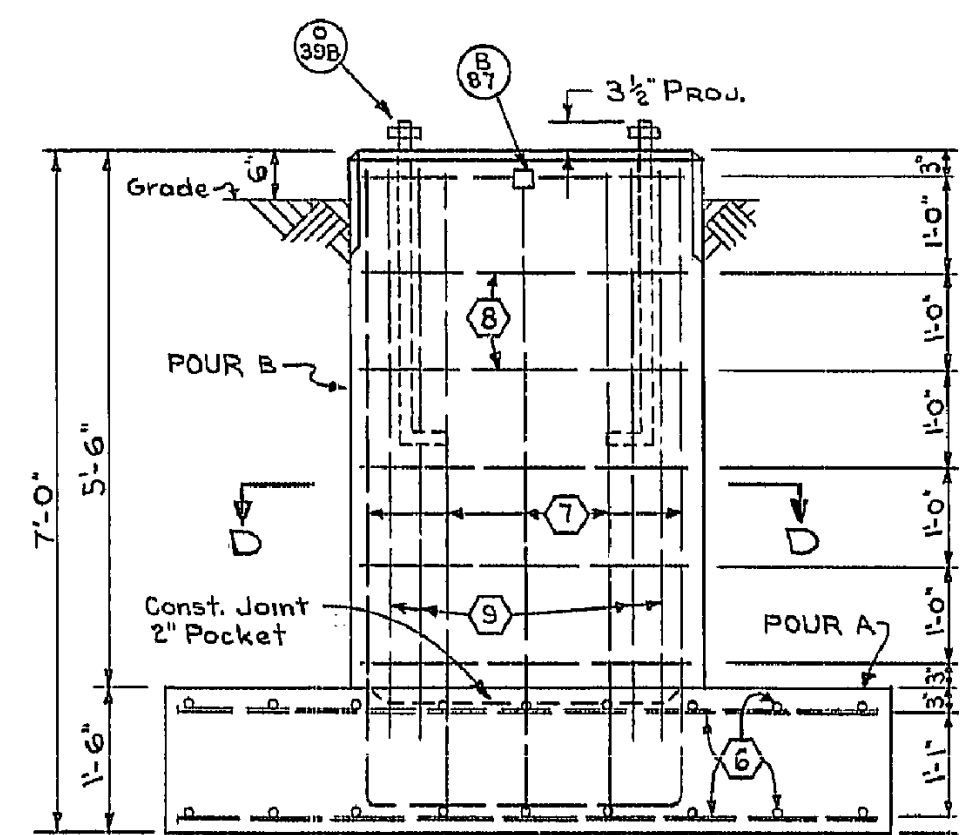
ELEVATION

DETAIL "B" (2022 CONSTRUCTION)
(COL. FOOTER FOR 69KV. SUBST.)
SCALE: 1/2"=1'-0"

6" GRANULAR BASE
EXTENDED 1'-0" BEYOND
PAD IN ALL DIRECTIONS
SEE NOTE 8

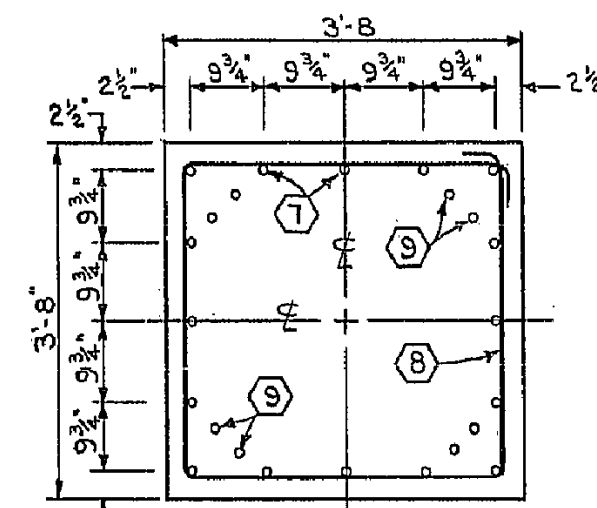


PLAN

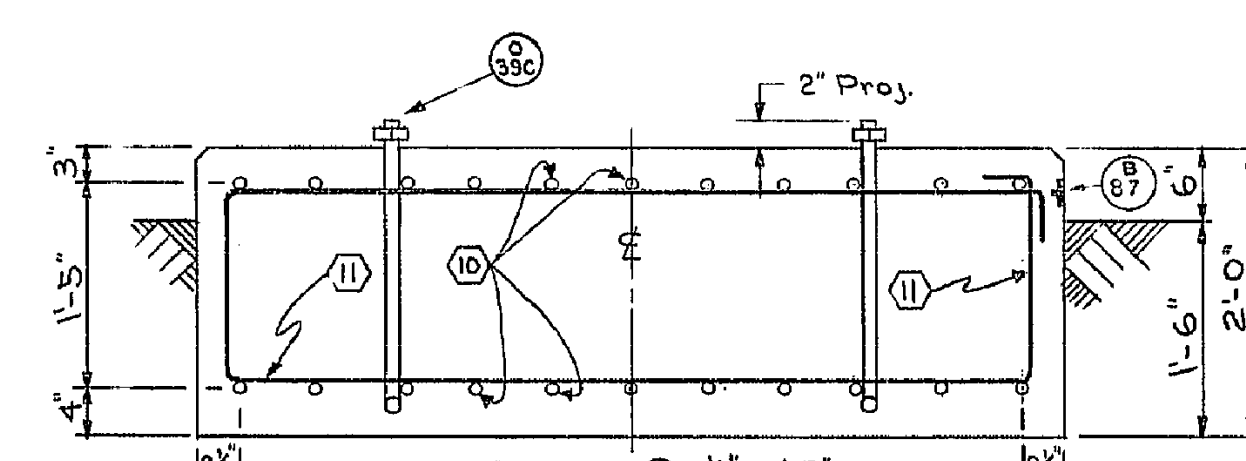


ELEVATION

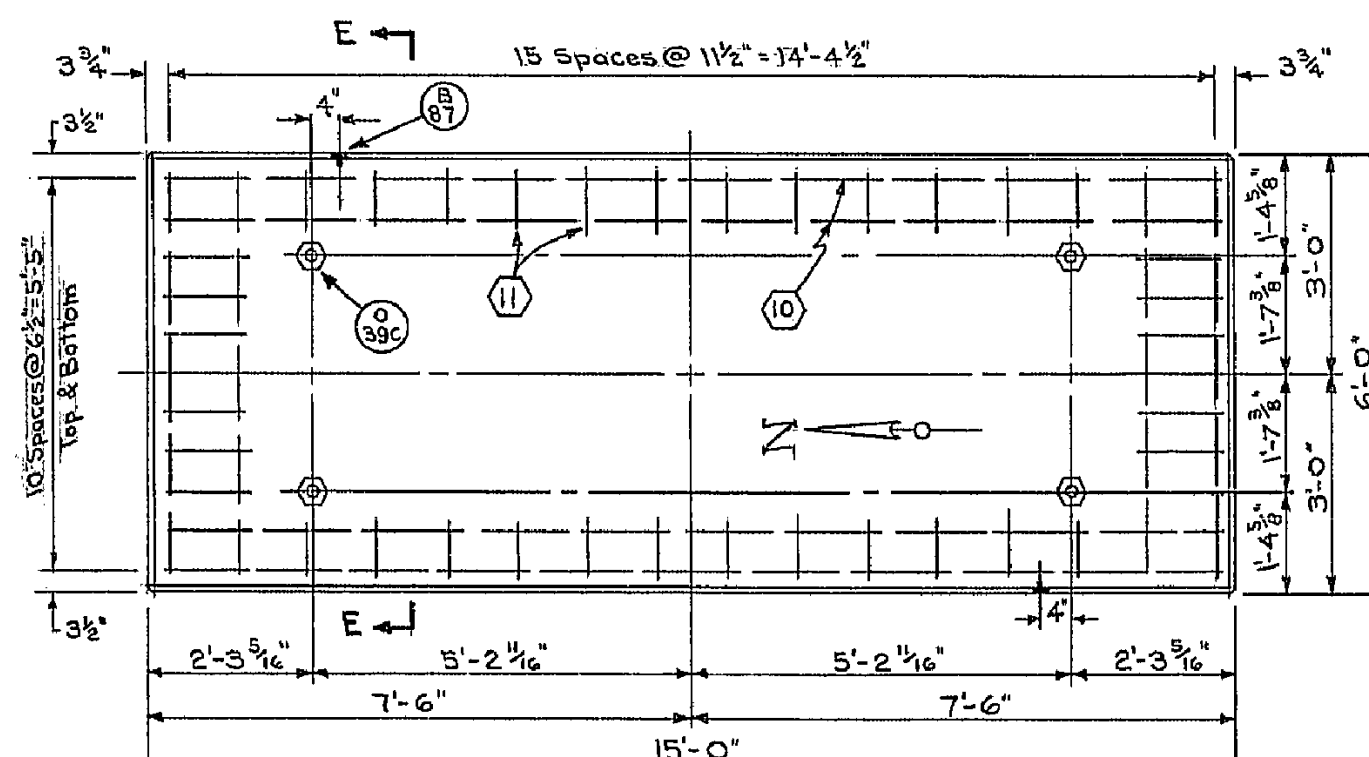
DETAIL "B" (PRE-2022 CONSTRUCTION)
(COL. FOOTER FOR 69KV. SUBST.)
SCALE: 1/2"=1'-0"



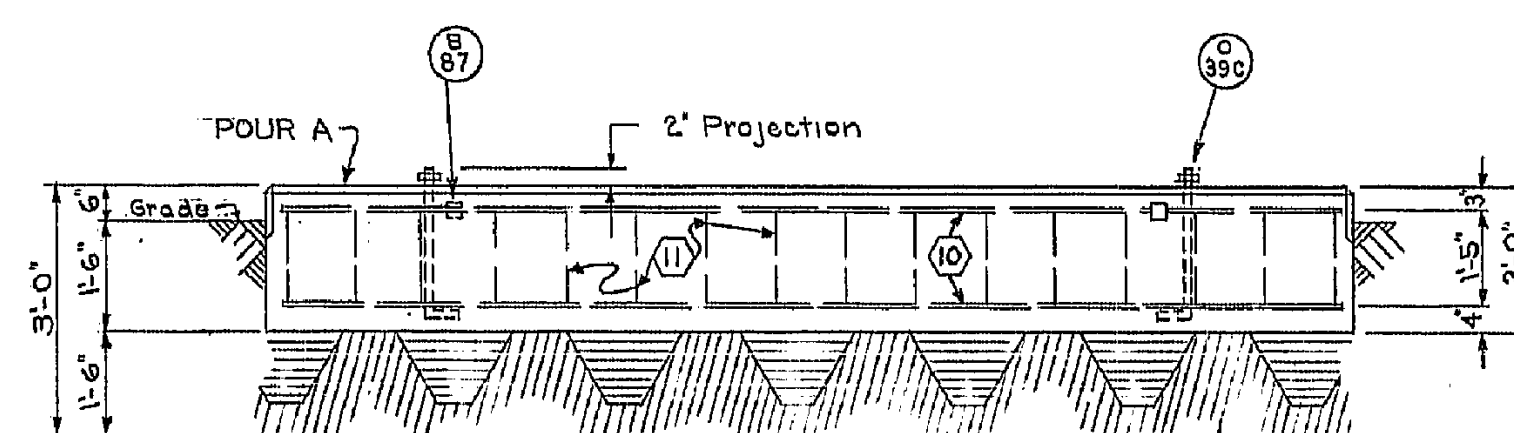
SECTION D-D
Scale: 3/4"=1'-0"



SECTION E-E
Scale: 3/4"=1'-0"



PLAN



ELEVATION

DETAIL "C"
(FON. FOR 69KV O.C.B. TYPE 630-G-2500)
Scale: 3/8"=1'-0"

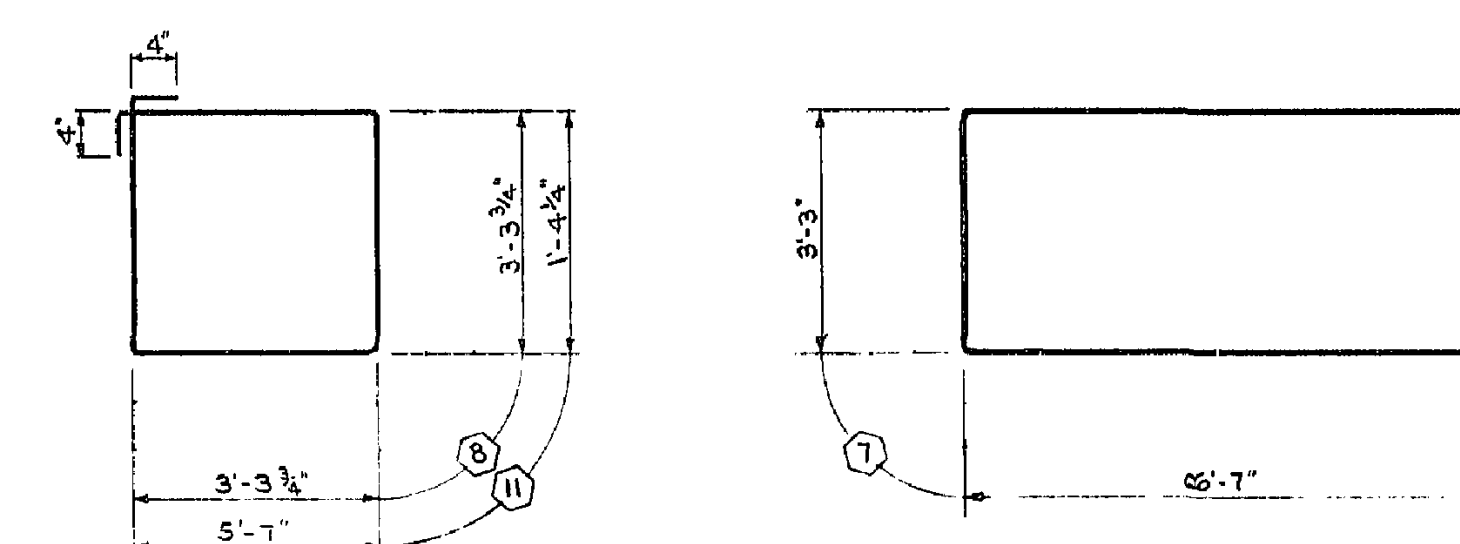
NOTES:

- ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FIRSTENERGY MATERIAL AND CONSTRUCTION SPECIFICATIONS FOR TRANSMISSION LINE & SUBSTATION STRUCTURE FOUNDATIONS FE-TLS-004, LATEST REVISION, AND ACI 301-10, "STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE", ACI 302, 305 AND 306 UNLESS NOTED OTHERWISE.
- ALL DETAILING, FABRICATION AND PLACING OF CONCRETE SHALL CONFORM TO ACI 318-14, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND THE LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAIL REINFORCED CONCRETE STRUCTURES" UNLESS NOTED OTHERWISE.
- CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS AND SHALL BE IN ACCORDANCE WITH THE FIRSTENERGY GENERAL SPECIFICATION FOR CONCRETE FE-MNC-1 AND THE FIRSTENERGY MATERIAL AND CONSTRUCTION SPECIFICATIONS FOR TRANSMISSION LINE & SUBSTATION STRUCTURE FOUNDATIONS FE-TLS-004, LATEST REVISION.
- SEE DRAWING 0-471-15-01 FOR FOUNDATION LAYOUT AND TOP OF CONCRETE ELEVATIONS.
- SEE 14 SERIES DRAWINGS FOR EQUIPMENT POSITIONS AND 16 SERIES DRAWINGS FOR CONDUIT LOCATIONS. ANCHOR BOLT LOCATIONS SHALL BE VERIFIED WITH EQUIPMENT SUPPLIER'S CERTIFIED DRAWINGS.
- SOIL INFORMATION IS BASED ON A GEOTECHNICAL REPORT BY GPD GROUP (PROJECT #201982163, DATED NOVEMBER 17, 2019). CONTRACTOR SHALL OBTAIN AND IMPLEMENT ALL RECOMMENDATIONS CONTAINED IN THE REFERENCED GEOTECHNICAL REPORT. IF SOIL CONDITIONS ENCOUNTERED ARE DIFFERENT FROM REFERENCED GEOTECHNICAL REPORT, NOTIFY ENGINEER IMMEDIATELY.
 - A. ALLOWABLE/ULTIMATE BEARING = 7,500 PSF
 - B. UNIT WEIGHT OF SOIL = 125 PSF
 - C. GROUNDWATER = NOT ENCOUNTERED
- SOIL BEARING CONDITIONS SHALL BE VERIFIED BY AN INDEPENDENT SOILS TESTING LABORATORY PRIOR TO INSTALLATION OF THE FOUNDATION.
- GRANULAR BASE FILL MATERIALS SHALL CONFORM WITH ASTM C33 SIZE NO. 57 AND ARE TO BE PLACED IN LIFTS NOT EXCEEDING EIGHT (8) INCHES IN LOOSE MEASURED THICKNESS. EACH LIFT IS TO BE COMPACTED A MINIMUM OF 98% MAXIMUM DENSITY BY ASTM D698.
- ANCHOR BOLTS AND TEMPLATES TO BE FURNISHED BY THE STEEL STRUCTURE MANUFACTURER. ANCHOR BOLT PROJECT SHALL MATCH MANUFACTURER DRAWINGS.
- THE TOTAL TIES FOR EACH PIER INCLUDE ONE ADDITIONAL TIE SPACED AT 3' IN THE UPPER 5' OF PIER.

RECORD B

REINFORCING ROD LIST									
NO.	BAR SIZE	LENGTH	SHAPE	WT/PC	NO/FON	TOTAL REQ'D	TOTAL WT.	SAP NO 15067136	
								TOTAL REQ'D	TOTAL WT.
1									
2									
3									
4									
5									
6	#5	7'-2"	Straight	7.5	36	360	2700.0		
7	#5	16'-4"	Bent	17.0	8	80	1360.0		
8	#5	13'-10"	Bent	5.2	6	60	312.0		
9	#5	6'-0"	Straight	6.3	8	80	504.0		
10	#6	14'-6 1/2"	Straight	21.8	22	44	959.2		
11	#5	14'-6 1/2"	Bent	15.1	16	32	483.2		
12	#5	7'-0"	STRAIGHT	7.5	36			144	1,080
13	#8	7'-3"	BENT	19.4	16			64	1,241.6
14	#3	13'-10"	BENT	5.2	7			28	145.6
15									
16									
TOTAL WEIGHT							6,519.2 LBS	2,467.20	

BENDING DIAGRAM



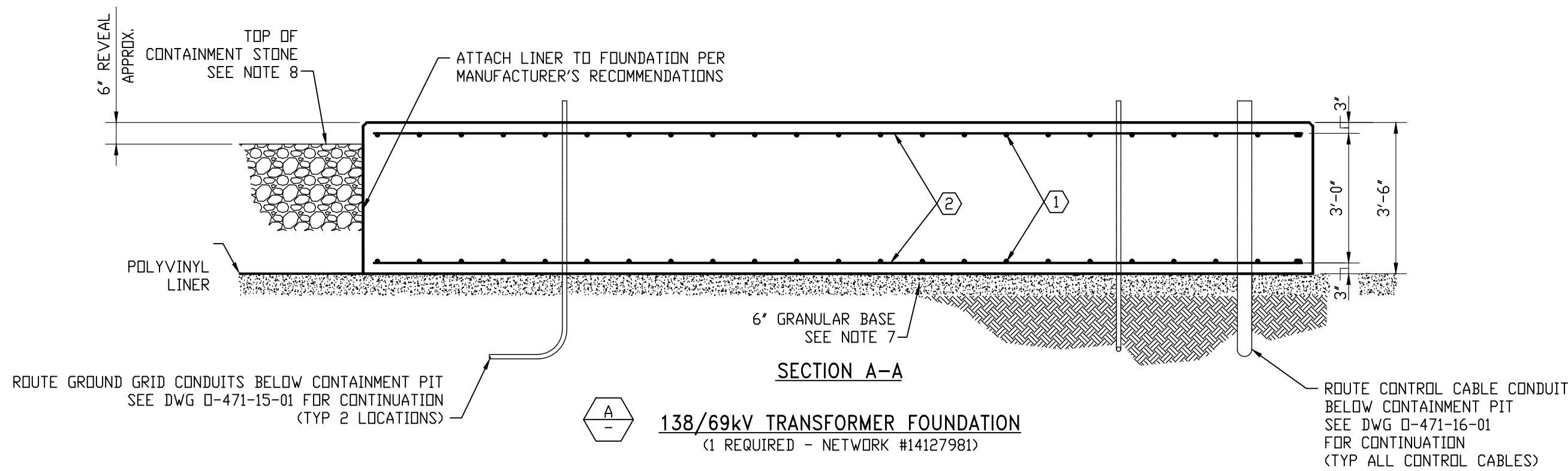
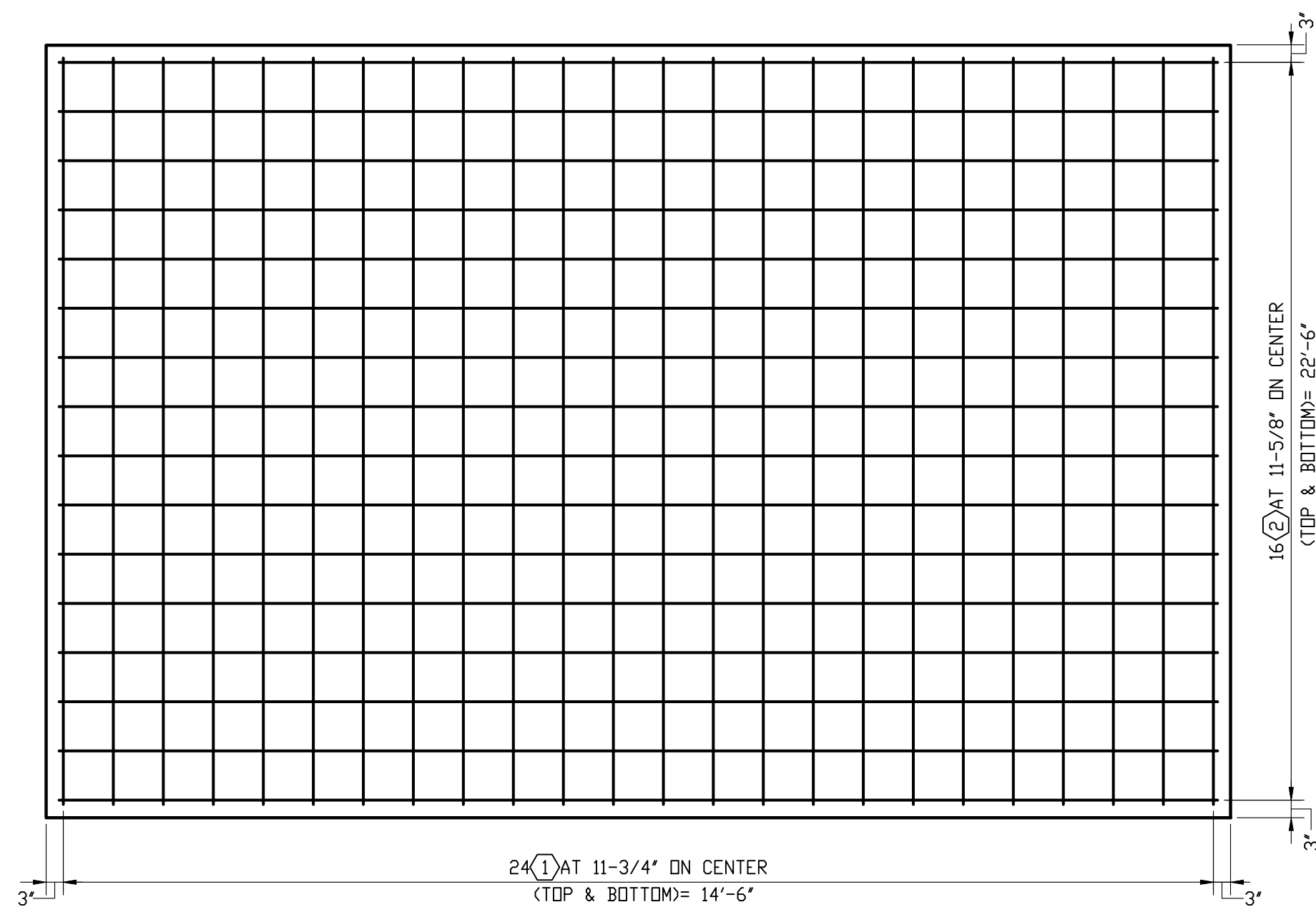
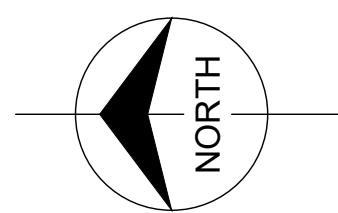
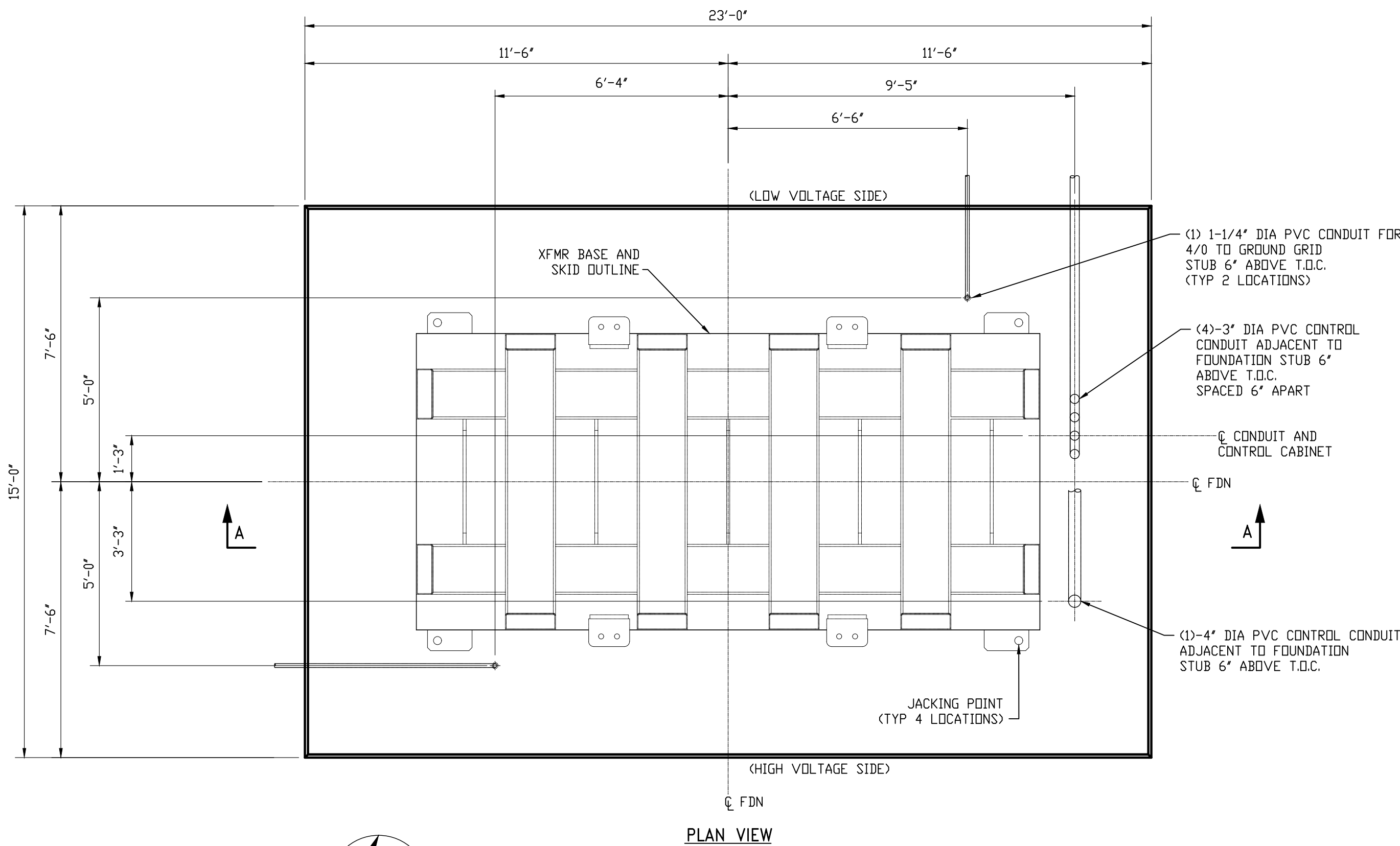
ALL BENDING DIMENSIONS ARE OUT TO OUT OF BARS

CONCRETE QUANTITY LIST									
FON. DETAIL	CONCRETE REQ'D PER FON. POUR	CU. YDS. PER FON. POUR	W.O. NO. X647 S/M ITEM: 1440	NO FON. REQ'D	TOTAL CU. YDS.	SAP NO 15067136		BOM M-136	
						NO FON. REQ'D	TOTAL CU. YDS.	NO FON. REQ'D	TOTAL CU. YDS.
B	3.1 CU. YDS.	2.7 CU. YDS.	5.8	10	58.0	4	23.2		
C	6.8 CU. YDS.		6.8	2	13.6				
TOTAL CU. YDS. CONCRETE						71.6	23.2		



THE REGISTRANT OF THE NEWLY APPLIED SEAL, ASSUMES RESPONSIBILITY FOR THE CHANGES AS INDICATED BY THE FOLLOWING REVISION LETTER "B".

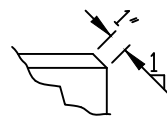
BY	DATE	REVISION	AREA
WDB	05/26/2022	CONSTRUCTION	SPS
FirstEnergy Energy Delivery Technical Services			
OPERATING COMPANY: OHIO EDISON (OE)			
REGION: OH-CE			
TERRITORY: WELLINGTON			
TITLE: FOUNDATION DETAILS			
B: REMOVED FOUNDATION DETAIL "A", REMOVED FOUNDATION DETAIL "D" FOR RECORD, ADDED BOMS AND SECOND DETAIL "B" FOR THE REQUIRED (4) FOUNDATIONS FOR THE 69KV BOX STRUCTURE EXPANSION. ADDED NOTES, REVISED DRAWING TITLE. (GPD)			
SAP NO: 15067136			
0-471-15-02			



NETWORK #14127981				REINFORCING BAR LIST				
BM ITEM NO.	TOTAL WT.	NO. REQ'D	PIECE	NO. PER FDN.	SIZE	LENGTH	TOTAL WT PER PC	DETAIL
M-112	1423#	48	1	48	7	14'-6"	29.6#	STRAIGHT
	1472#	32	2	32	7	22'-6"	46.0#	STRAIGHT
M-113	CONCRETE QUANTITY							
	44.7 CU. YDS. PER FDN.							
	DESIGN CRITERIA							
	VERTICAL LOAD (WT. OF EQUIP) = 245,290#							
	MAXIMUM SOIL BEARING = 1,500 PSF							
	CONCRETE = 4000 PSI AT 28 DAYS MINIMUM							
	REBAR = GRADE 60 DEFORMED STEEL							

NOTES:

1. CHAMFER ALL EXPOSED EDGES 1".
2. FOUNDATION DESIGNED FOR A NET ALLOWABLE SOIL BEARING PRESSURE OF 1,500 PSF.
3. REINFORCING STEEL SHALL BE NEW INTERMEDIATE GRADE BILLET STEEL DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60, LATEST REV. FURNISHED BY BELOW GRADE CONTRACTOR.
4. REINFORCING STEEL MAY BE REARRANGED TO MAINTAIN CORRECT CONDUIT PENETRATION LOCATIONS. MAXIMUM SPACING OF REINFORCING STEEL SHALL BE 16".
5. WHEN THE AIR TEMPERATURE IS BELOW 50°F HIGH-EARLY STRENGTH CEMENT SHALL BE USED AND CONCRETE STRUCTURE SHALL BE KEPT AT 50°F FOR FOUR DAYS AFTER POURING.
6. SEE DWG D-471-15-01 FOR FOUNDATION LAYOUT.
7. THE MATERIAL USED FOR GRANULAR BASE SHALL CONFORM WITH ASTM C33 SIZE NO. 57 AND SHALL BE COMPACTED TO 98% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698 OR 80% OF RELATIVE DENSITY AS DETERMINED BY D4253 AND D4254.
8. SEE DWG D-471-28-02 FOR OIL CONTAINMENT PLAN AND DETAILS.
9. CONTACT ENGINEER IF SOILS ENCOUNTERED ARE NOT INDICATIVE OF THOSE ANTICIPATED OR IF BEARING CAPACITY OF THE SOIL IS LESS THAN THE MINIMUM REQUIRED (1,500 PSF).

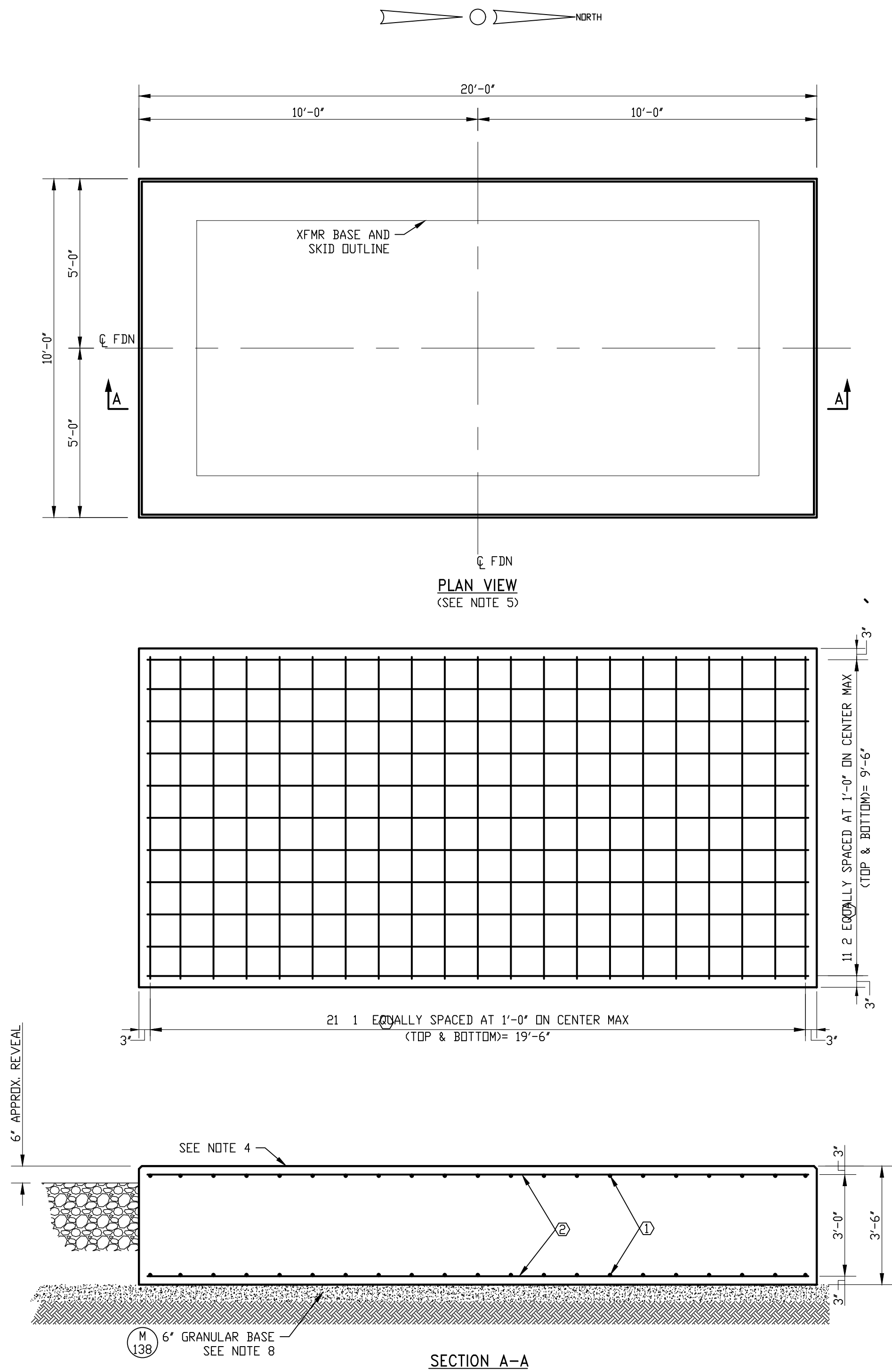


(1) REQUIRED FOR NETWORK #14127981



THE REGISTRANT OF THE NEWLY APPLIED SEAL ASSUMES RESPONSIBILITY FOR THE CHANGES AS INDICATED BY THE FOLLOWING REVISION LETTER "B..."

BY: WDB	FirstEnergy	OPERATING COMPANY	OHIO EDISON (OE)	REGION	LAKE ERIE
APP: SPS	Energy Delivery Technical Services	DATE: 05/26/2022	SCALE: 3/8"=1'-0"	REV: 36x24	
DATE: 05/26/2022	CONSTRUCTION	PROJECT: WELLINGTON	REVISION: 138/69 KV NO 3 TRANSFORMER (471 TR 26)	FOUNDATION DETAIL "A"	
B: REVISED DRAWING TITLE. (GPD)			SHEET NO. 15067136	DOC ID: 0-471-15-09	REV: B

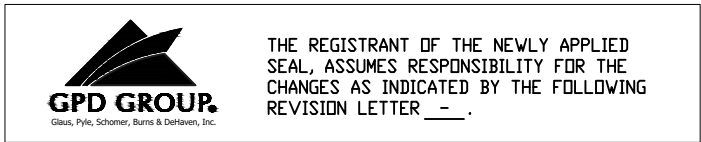


NETWORK #15067136			REINFORCING BAR LIST					
BM ITEM NO.	TOTAL WT.	NO. REQ'D	PIECE	NO. PER FDN.	SIZE	LENGTH	TOTAL WT PER PC	DETAIL
M-137	815#	42	<div>1</div>	42	7	9'-6"	19.4#	STRAIGHT
	878#	22	<div>2</div>	22	7	19'-6"	39.9#	STRAIGHT
M-136	CONCRETE - 4000psi @ 28 DAYS MINIMUM TOTAL REQ'D 25.9 CU YDS		CONCRETE QUANTITY					
			25.9 CU. YDS. PER FDN.					
			DESIGN CRITERIA					
			VERTICAL LOAD (WT. OF EQUIP) = 253,637#					
			MAXIMUM SOIL BEARING = 5,000 PSF					
			CONCRETE = 4000 PSI AT 28 DAYS MINIMUM					
			REBAR = GRADE 60 DEFORMED STEEL					

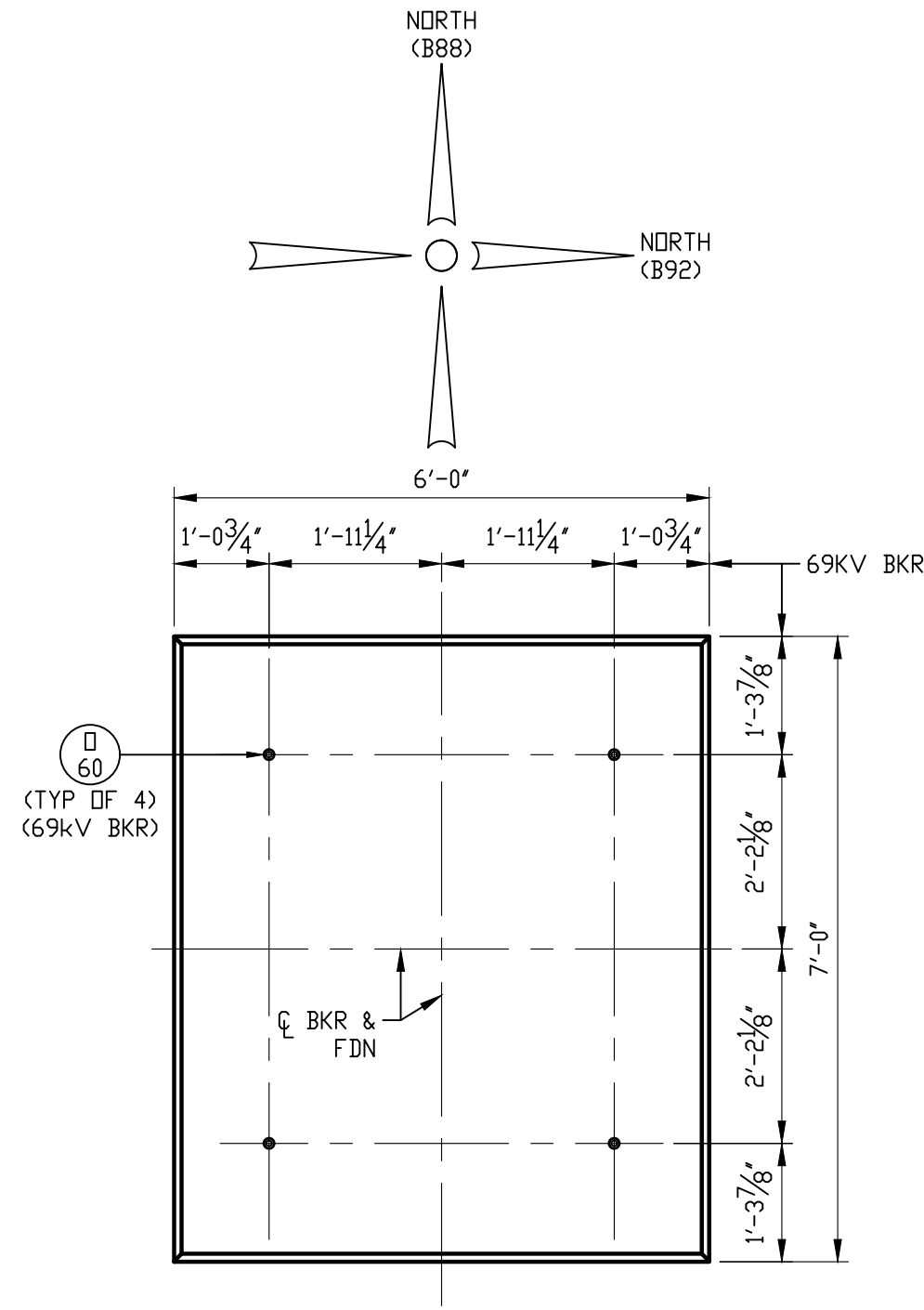
- NOTES:
- ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FIRSTENERGY MATERIAL AND CONSTRUCTION SPECIFICATIONS FOR TRANSMISSION LINE & SUBSTATION STRUCTURE FOUNDATIONS FE-TLS-004, LATEST REVISION, AND ACI 301-10, "STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE", ACI 302, 305 AND 306 UNLESS NOTED OTHERWISE.
 - ALL DETAILING, FABRICATION AND PLACING OF CONCRETE SHALL CONFORM TO ACI 318-14, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND THE LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAIL REINFORCED CONCRETE STRUCTURES" UNLESS NOTED OTHERWISE.
 - CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS AND SHALL BE IN ACCORDANCE WITH THE FIRSTENERGY GENERAL SPECIFICATION FOR CONCRETE FE-MNC-1 AND THE FIRSTENERGY MATERIAL AND CONSTRUCTION SPECIFICATIONS FOR TRANSMISSION LINE & SUBSTATION STRUCTURE FOUNDATIONS FE-TLS-004, LATEST REVISION.
 - SEE DRAWING D-471-15-01 FOR FOUNDATION LAYOUT AND TOP OF CONCRETE ELEVATIONS.
 - SEE 14 SERIES DRAWINGS FOR EQUIPMENT POSITIONS AND 16 SERIES DRAWINGS FOR CONDUIT AND GROUNDING PIGTAIL LOCATIONS. SEE 28 SERIES DRAWINGS FOR EQUIPMENT OIL CONTAINMENT PLAN AND DETAILS.
 - SOIL INFORMATION IS BASED ON A GEOTECHNICAL REPORT BY GPD GROUP (PROJECT #201982163, DATED NOVEMBER 17, 2019). CONTRACTOR SHALL OBTAIN AND IMPLEMENT ALL RECOMMENDATIONS CONTAINED IN THE REFERENCED GEOTECHNICAL REPORT. IF SOIL CONDITIONS ENCOUNTERED ARE DIFFERENT FROM REFERENCED GEOTECHNICAL REPORT, NOTIFY ENGINEER IMMEDIATELY.

A. ALLOWABLE/ULTIMATE BEARING = 5,000 PSF
B. UNIT WEIGHT OF SOIL = 125 PSF
C. GROUNDWATER = NOT ENCOUNTERED
 - SOIL BEARING CONDITIONS SHALL BE VERIFIED BY AN INDEPENDENT SOILS TESTING LABORATORY PRIOR TO INSTALLATION OF THE FOUNDATION.
 - GRANULAR BASE FILL MATERIALS SHALL CONFORM WITH ASTM C33 SIZE NO. 57 AND ARE TO BE PLACED IN LIFTS NOT EXCEEDING EIGHT (8) INCHES IN LOOSE MEASURED THICKNESS. EACH LIFT IS TO BE COMPACTED A MINIMUM OF 98% MAXIMUM DENSITY BY ASTM D698.

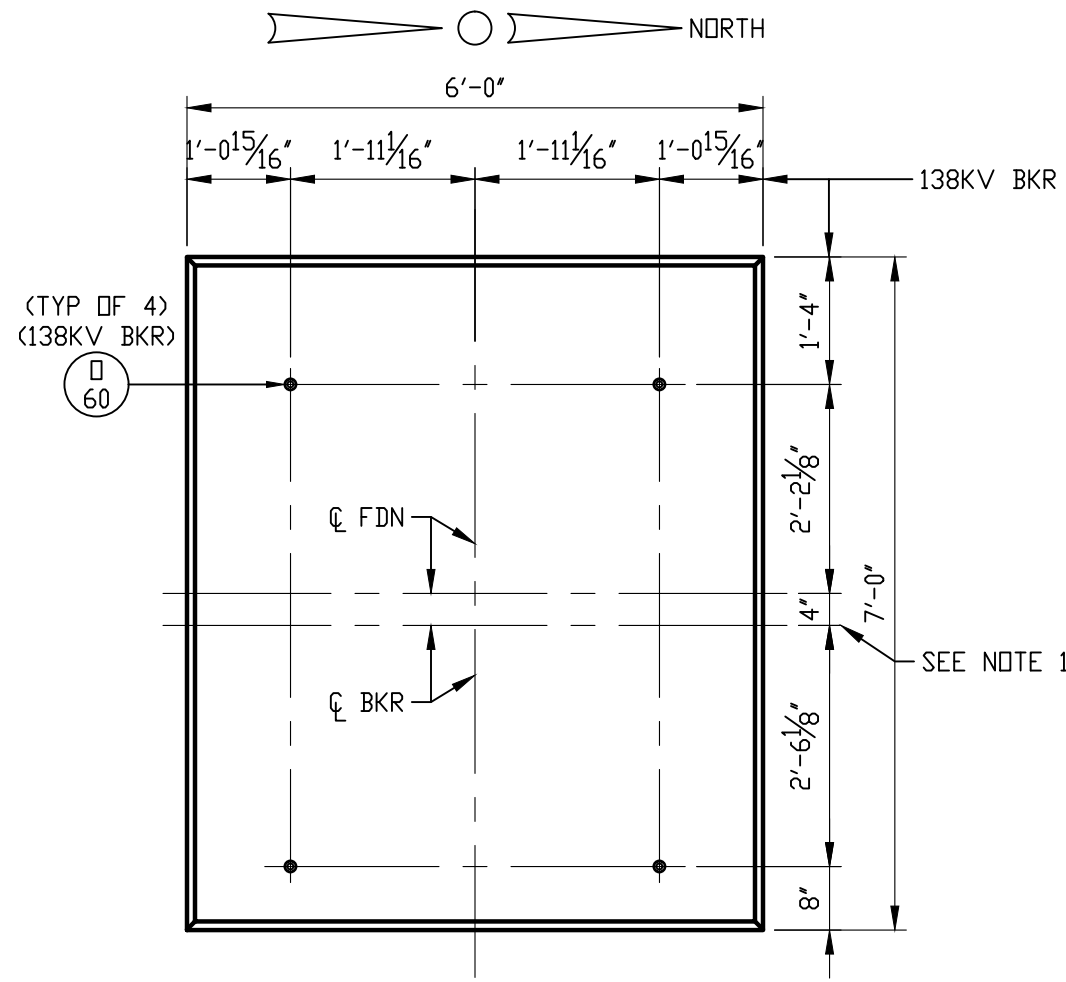
REFERENCE DRAWINGS:
D-471-28-03 OIL CONTAINMENT PLAN AND DETAILS NO 4 TR



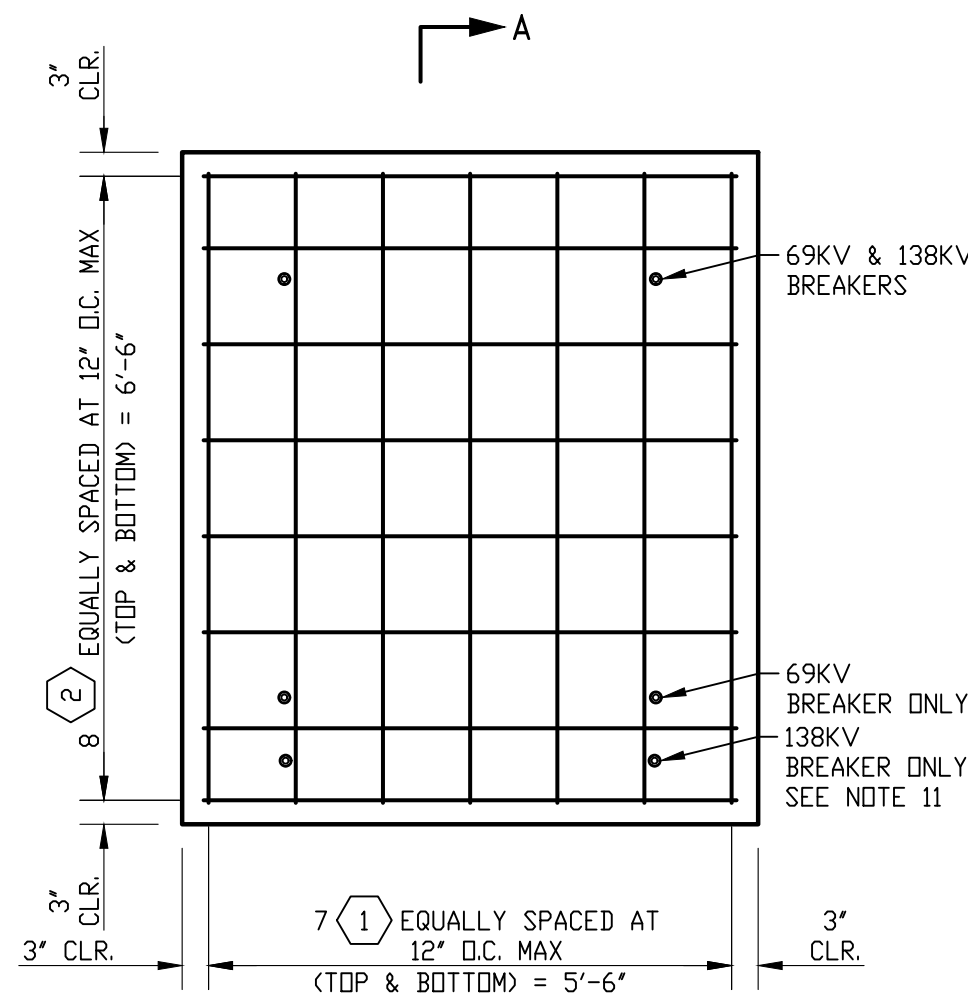
BY: WDB APP: SPS DATE: 05/26/2022 ISSUE: CONSTRUCTION (GPD)	FirstEnergy Energy Delivery Technical Services	DIST. CODE: SCALE: 3/8"=1'-0" SIZE: 24x18	OPERATING COMPANY OHIO EDISON	REGION OH-CE	AREA LAKE ERIE
			FACILITY WELLINGTON		
			TITLE FOUNDATION DETAIL "E" 138/69KV NO 4 TRANSFORMER (471 TR 55)		
SAP NO. 15067136		DOC. ID D-471-15-12		REV. -	



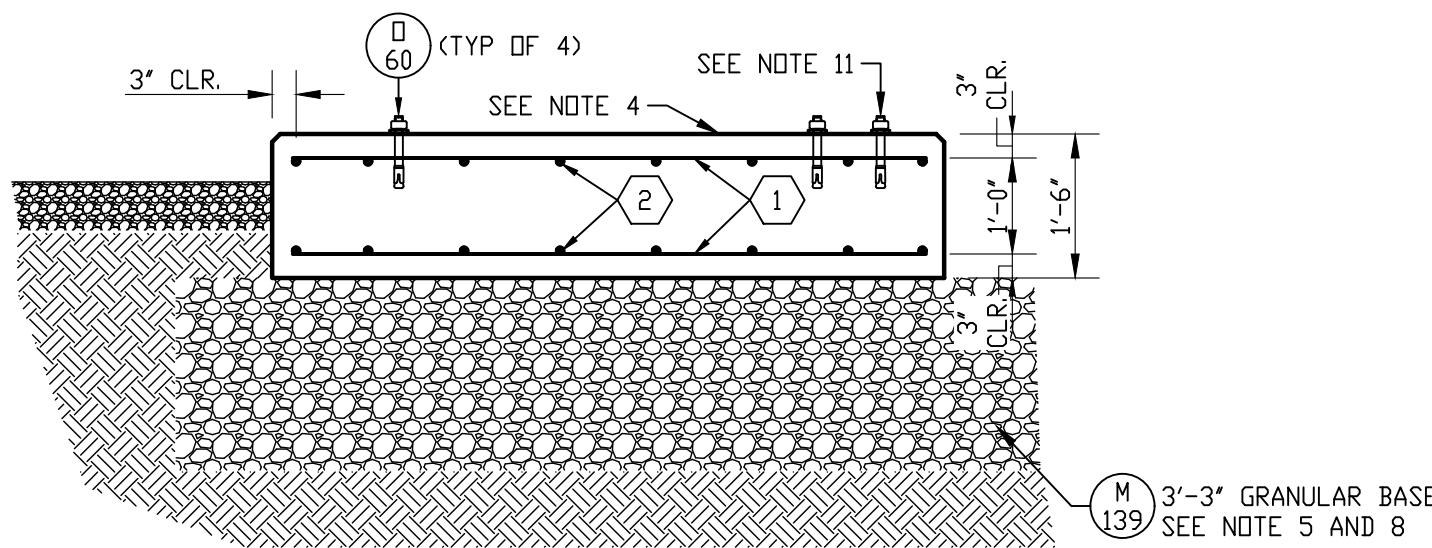
ANCHOR BOLT PLAN (69KV BREAKER)
SCALE: 1/2"=1'-0"



ANCHOR BOLT PLAN (138KV BREAKER)
SCALE: 1/2"=1'-0"



SECTION A-A



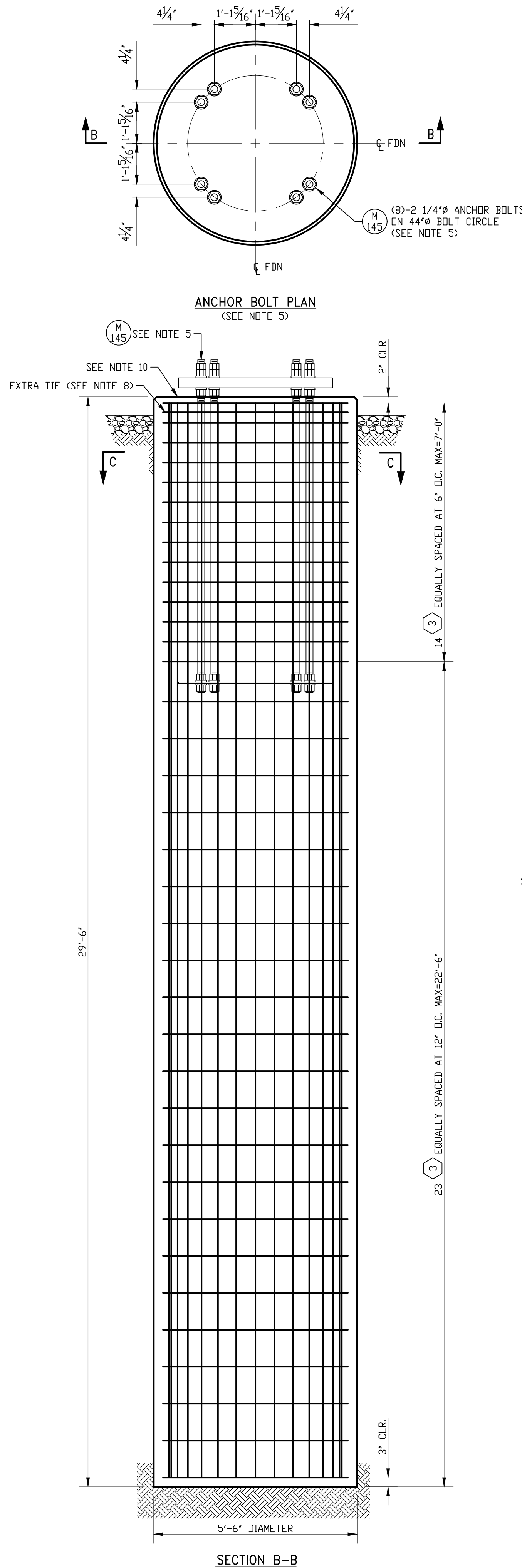
138/69KV BREAKER FOUNDATION
(6 REQUIRED - SAP NETWORK NO 15067136)

SAP NETWORK NO 15067136				REINFORCING BAR LIST				
BM ITEM NO.	TOTAL WT.	NO. REQ'D	PIECE	NO. PER FDN.	SIZE	LENGTH	TOTAL WT PER PC	DETAIL
M-137	823#	84	1	14	#6	6'-6"	9.8#	STRAIGHT
	797#	96	2	16	#6	5'-6"	8.3#	STRAIGHT
CONCRETE - 4000psi @ 28 DAYS MINIMUM				CONCRETE QUANTITY				
TOTAL REQ'D: 14.4 CU. YDS.				2.4 CU. YDS. PER FDN.				
				DESIGN CRITERIA				
				VERTICAL LOAD (WT. OF EQUIP) = 6,500 LBS				
				MAXIMUM SOIL BEARING = 5,000 PSF				
				CONCRETE = 4000 PSI AT 28 DAYS MINIMUM				
				REBAR = GRADE 60 DEFORMED STEEL				

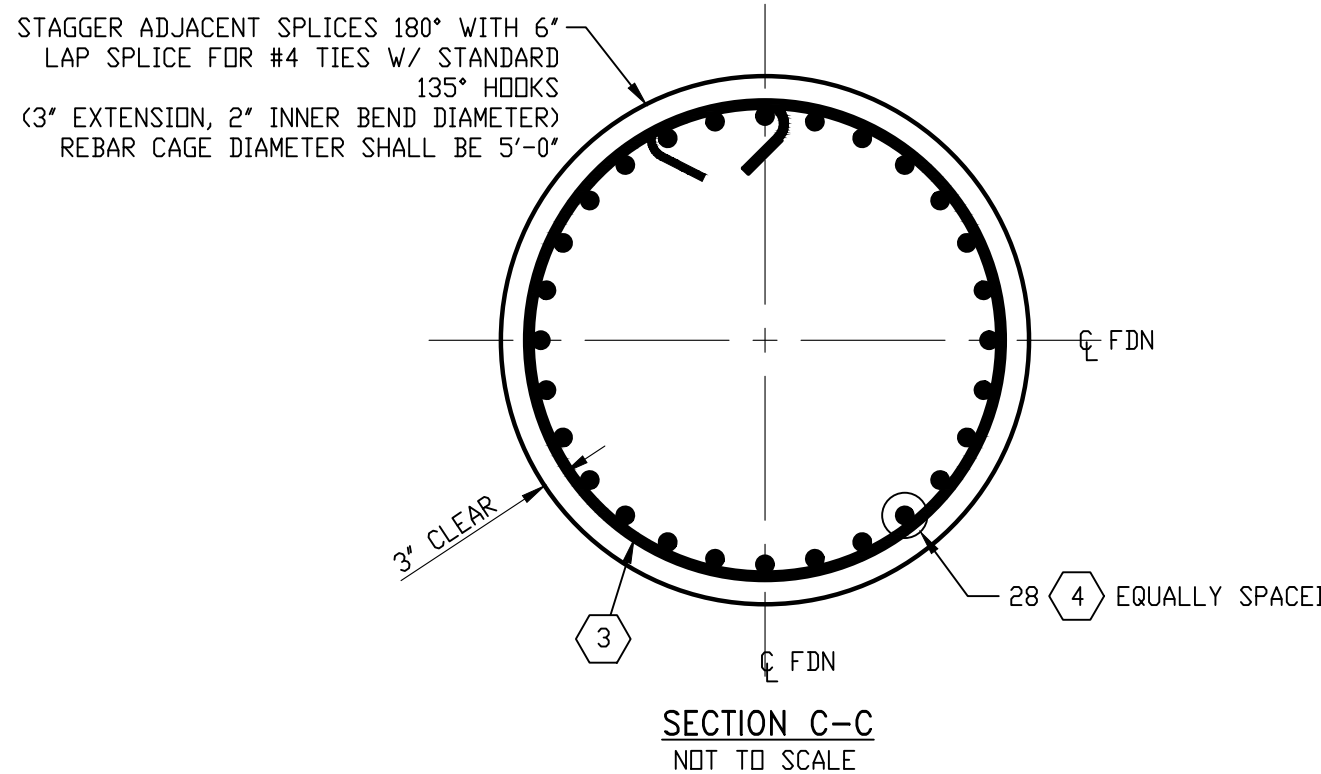
- NOTES:
- CHAMFER ALL EXPOSED EDGES 1".
 - REINFORCING STEEL SHALL BE NEW INTERMEDIATE GRADE BILLET STEEL DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60, LATEST REV. FURNISHED BY BELOW GRADE CONTRACTOR.
 - REBAR CLEAR COVER TO BE 3" MINIMUM UNLESS OTHERWISE NOTED.
 - WHEN THE AIR TEMPERATURE IS BELOW 50°F HIGH-EARLY STRENGTH CEMENT SHALL BE USED AND CONCRETE STRUCTURE SHALL BE KEPT AT 50°F FOR FOUR DAYS AFTER PLACING.
 - SEE DRAWING D-471-15-01 FOR FOUNDATION LAYOUT AND TOP OF CONCRETE ELEVATIONS.
 - THE MATERIAL USED FOR GRANULAR BASE SHALL CONFORM WITH ASTM C33 SIZE NO. 57 AND SHALL BE COMPACTED TO 98% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698 OR 80% OF RELATED DENSITY AS DETERMINED BY ASTM D4253 AND D4254.
 - SEE DRAWING D-471-16-01 FOR BREAKER CONDUIT LOCATIONS.
 - SOIL BEARING CONDITIONS SHALL BE VERIFIED BY AN INDEPENDENT SOILS TESTING LABORATORY PRIOR TO INSTALLATION OF THE BREAKER FOUNDATIONS.
 - FOUNDATIONS DESIGNED PER THE RECOMMENDED SOIL PARAMETERS PER THE GEOTECHNICAL REPORT PROVIDED BY GPD TIMMERMAN. (PROJECT #2019821.63, DATED 09/17/19)
 - REBAR SHALL BE SPACED IN SUCH A WAY THAT AVOIDS DISTURBANCE BY POST INSTALLED ANCHOR BOLTS.
 - THE CONCRETE MIX SHALL CONTAIN AN AIR-ENTRAINING ADMIXTURE TO ACHIEVE AN ENTRAINED AIR CONTENT OF 6%, ±1%.
 - THE 138KV BREAKER ANCHOR BOLT PLAN IS OFFSET 4" FROM THE BREAKER FOUNDATION CENTERLINE TO AVOID INTERFERENCE WITH THE FOUNDATION REBAR LAYOUT.

ANCHOR BOLTS	
NO. PER FDN.	DESCRIPTION
4	1"Ø x 9" LONG HILTI KWIK BOLT III SS 304 POST-INSTALLED EXPANSION ANCHOR BOLTS WITH NOMINAL EMBEDMENT OF 6-3/8".

CONSTRUCTION NOTES (SAP NETWORK NO 15067136):
C1. ABOVE GRADE CONTRACTOR TO CONFIRM ANCHOR BOLT LOCATIONS WITH MANUFACTURER SHOP DRAWINGS PRIOR TO INSTALLATION.



SECTION B-B



138KV H-FRAME STRUCTURE FOUNDATION
(4 REQUIRED - SAP NETWORK NO 15067136)

SAP NETWORK NO 15067136				REINFORCING BAR LIST				
BM ITEM NO.	TOTAL WT.	NO. REQ'D	PIECE	NO. PER FDN.	SIZE	LENGTH	TOTAL VT. PER PC.	DETAIL
M-137	1760#	152	3	38	#4	17'-4"	11.6#	BENT (SEE SECTION C-C)
	8697#	112	4	28	#8	29'-1"	77.7#	STRAIGHT
CONCRETE - 4000psi @ 28 DAYS MINIMUM				CONCRETE QUANTITY				
TOTAL REQ'D: 104 CU. YDS.				26 CU. YDS. PER FDN.				
				DESIGN CRITERIA				
				VERTICAL LOAD (WT. OF EQUIP) = 49,000 LBS				
				MAXIMUM SOIL BEARING = 22,500 PSF				
				CONCRETE = 4000 PSI AT 28 DAYS MINIMUM				
				REBAR = GRADE 60 DEFORMED STEEL				

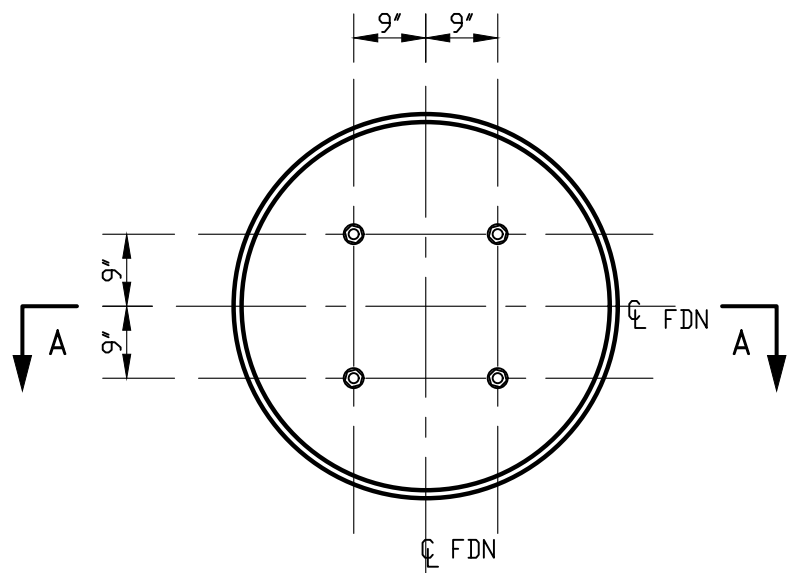
- NOTES:
- CHAMFER ALL EXPOSED EDGES 1".
 - MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT AGE OF 28 DAYS SHALL BE 4000 PSI.
 - WHEN THE AIR TEMPERATURE IS BELOW 50°F HIGH-EARLY STRENGTH CEMENT SHALL BE USED AND CONCRETE STRUCTURE SHALL BE KEPT AT 50°F FOR FOUR DAYS AFTER PLACING.
 - THE CONCRETE MIX SHALL CONTAIN AN AIR-ENTRAINING ADMIXTURE TO ACHIEVE AN ENTRAINED AIR CONTENT OF 6%, ±1%.
 - ANCHOR BOLTS AND TEMPLATES TO BE FURNISHED BY STEEL STRUCTURE MANUFACTURER. ANCHOR BOLT PROJECTION SHALL MATCH MANUFACTURER DRAWINGS.
 - ALL REBAR TO HAVE CLEAR COVER OF 3" MINIMUM UNLESS OTHERWISE NOTED.
 - REINFORCING STEEL SHALL BE NEW INTERMEDIATE GRADE BILLET STEEL DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60, LATEST REV. SUPPLIED BY BELOW GRADE CONTRACTOR.
 - THE TOTAL TIES FOR EACH PIER INCLUDES ONE (1) ADDITIONAL TIE SPACED AT 3" IN THE FIRST 5' OF CONCRETE.
 - ALL ABOVE GRADE STEEL TO BE HOT DIP GALVANIZED AFTER FABRICATION PER ANSI/ASTM SPEC. A123.
 - SEE DRAWING D-471-15-01 FOR FOUNDATION LAYOUT AND TOP OF CONCRETE ELEVATIONS.
 - ALL FOUNDATION DESIGNS ASSUME THAT NO ROCK WILL BE ENCOUNTERED DURING DRILLED SHAFT EXCAVATION. CONTACT ENGINEER IF ROCK IS ENCOUNTERED.
 - FOUNDATIONS DESIGNED PER THE RECOMMENDED SOIL PARAMETERS PER THE GEOTECHNICAL REPORT PROVIDED BY GPD TIMMERMAN. (PROJECT #2019821.63, DATED 09/17/19)

BY: WDB APP: SPS DATE: 05/26/2022 TITLE: CONSTRUCTION (GPD)		FirstEnergy Energy Delivery Technical Services		OPERATING COMPANY OHIO EDISON (OE)		REGION OH-CE		AREA LAKE ERIE	
								WELLINGTON	
								FOUNDATION DETAILS 'F' & 'G'	
SAP NO. 15067136								DEC 10 0-471-15-13	

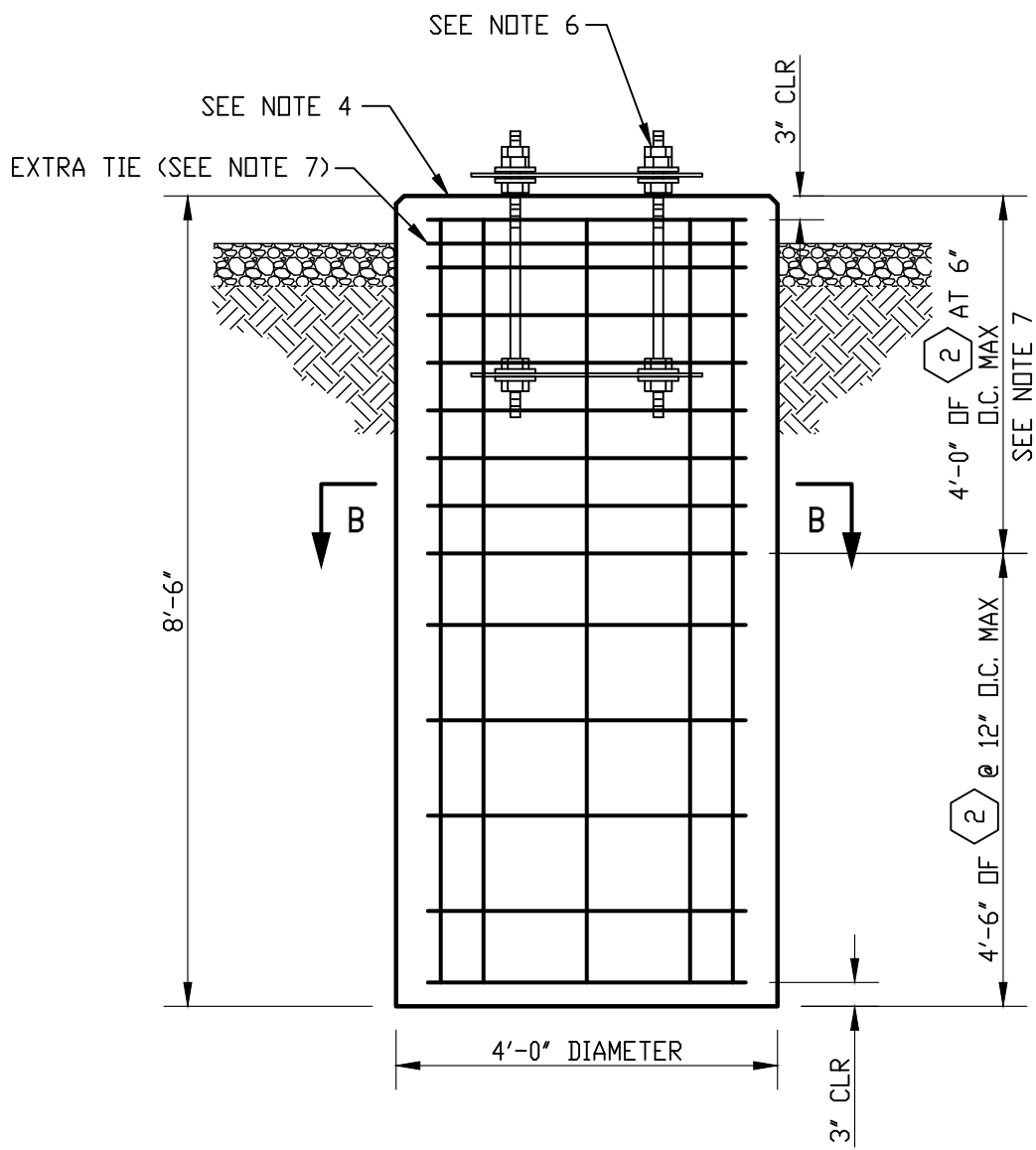
NETWORK # 15067136			REINFORCING BAR LIST					
BM ITEM NO.	TOTAL WT.	NO. REQ'D	PIECE	NO. PER FDN.	SIZE	LENGTH	TOTAL WT PER PC	DETAIL
M-137	2226#	104	1	8	#8	8'-0"	21.4#	STRAIGHT
	1584#	182	2	14	#4	13'-0"	8.7#	BENT (SEE SECTION B-B)
M-136	CONCRETE - 4000 PSI @ 28 DAYS MINIMUM		CONCRETE QUANTITY					
	TOTAL REQUIRED 52 CU. YDS.		4 CU. YDS. PER FDN.					
			DESIGN CRITERIA					
			VERTICAL LOAD (WT. OF EQUIP AND STAND) = 6010 LBS					
			MAXIMUM SOIL BEARING = 12000 PSF					
			CONCRETE = 4000 PSI AT 28 DAYS MINIMUM					
			REBAR = GRADE 60 DEFORMED STEEL					

NOTES:

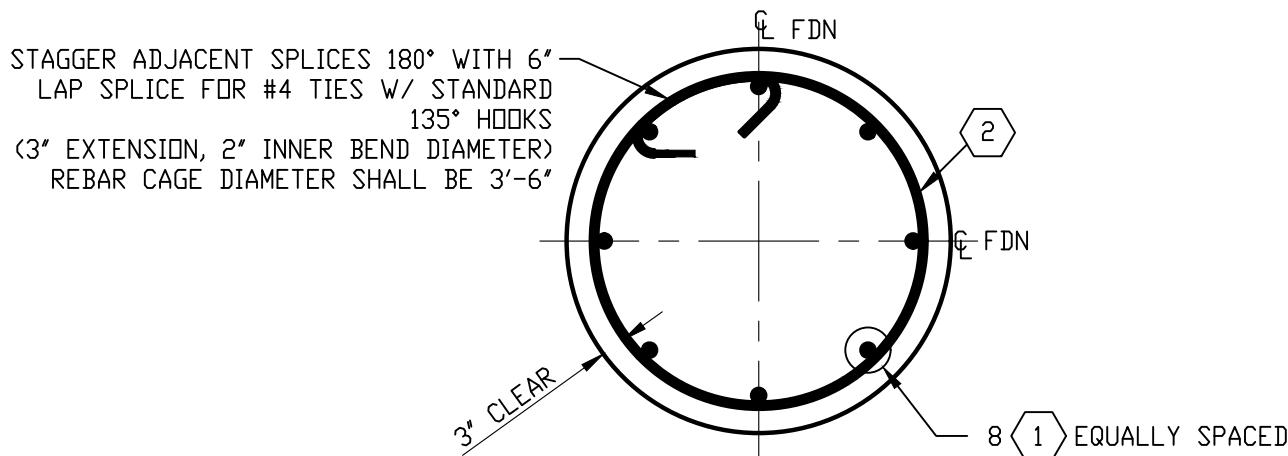
- CHAMFER ALL EXPOSED EDGES 1".
- REINFORCING STEEL SHALL BE NEW INTERMEDIATE GRADE BILLET STEEL DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60, LATEST REV. FURNISHED BY BELOW GRADE CONTRACTOR.
- WHEN THE AIR TEMPERATURE IS BELOW 50°F HIGH-EARLY STRENGTH CEMENT SHALL BE USED AND CONCRETE STRUCTURE SHALL BE KEPT AT 50°F FOR FOUR DAYS AFTER POURING.
- SEE DRAWING D-471-15-01 FOR FOUNDATION LAYOUT AND TOP OF CONCRETE ELEVATIONS.
- THE CONCRETE MIX SHALL CONTAIN AN AIR-ENTRAINING ADMIXTURE TO ACHIEVE AN ENTRAINED AIR CONTENT OF 6%, ±1%.
- ANCHOR BOLTS AND TEMPLATES TO BE FURNISHED BY STEEL STRUCTURE MANUFACTURER. ANCHOR BOLT PROJECTION TO MATCH STD STEEL DRAWINGS 18-16, 18-18 & 18-22.
- THE TOTAL TIES FOR EACH PIER INCLUDES ONE (1) ADDITIONAL TIE SPACED AT 3' IN THE FIRST 6' OF CONCRETE.
- FOUNDATIONS DESIGNED PER THE RECOMMENDED SOIL PARAMETERS PER THE GEOTECHNICAL REPORT PROVIDED BY GPD TIMMERMAN. (PROJECT #2019821.63, DATED 09/17/19)



ANCHOR BOLT PLAN
(SEE NOTE 6)

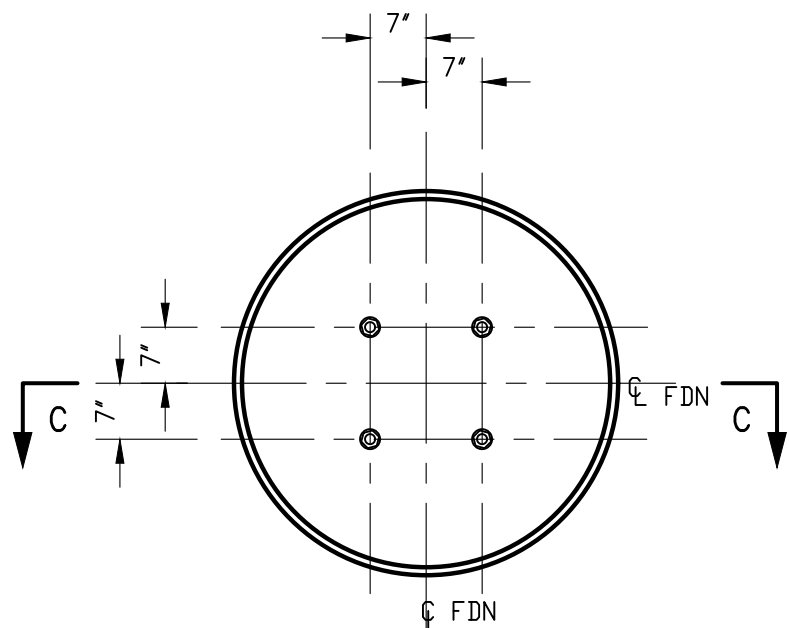


SECTION A-A

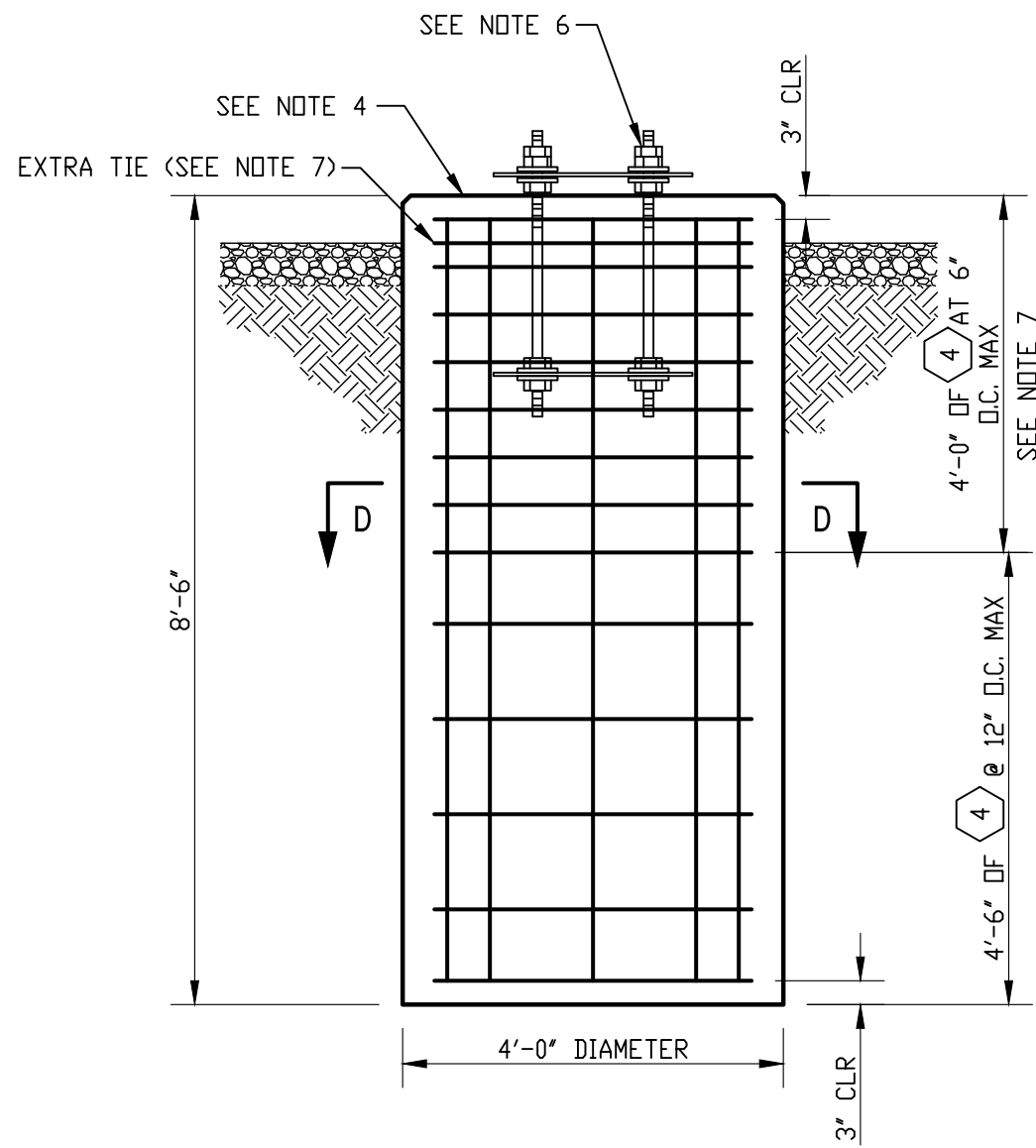


SECTION B-B

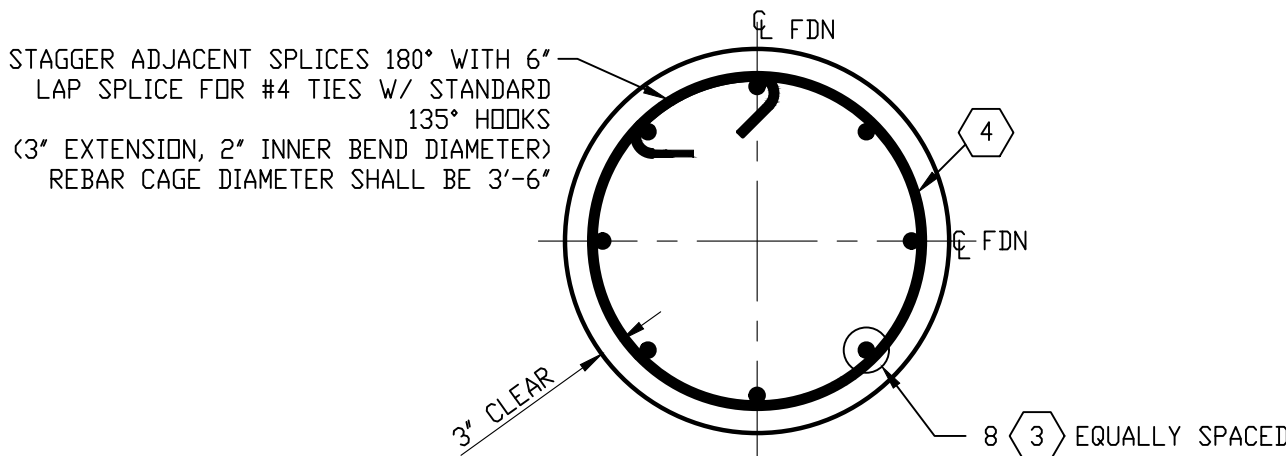
- 138kV 3Ø DIAGONAL BUS SUPPORT STAND FOUNDATION
(10 REQUIRED - SAP NETWORK NO 15067136)
- 138kV 3Ø HIGH/LOW BUS SUPPORT STAND FOUNDATION
(3 REQUIRED - SAP NETWORK NO 15067136)



ANCHOR BOLT PLAN
(SEE NOTE 6)



SECTION C-C



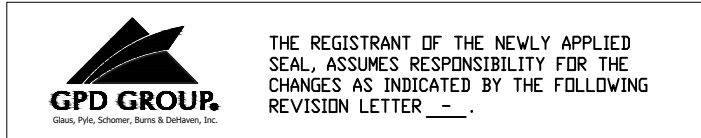
SECTION D-D

- 138kV 3Ø LOW V-SWITCH STAND FOUNDATION
(12 REQUIRED - SAP NETWORK NO 15067136)
- 138kV 3Ø CVT STAND FOUNDATION
(4 REQUIRED - SAP NETWORK NO 15067136)
- 138kV 3Ø HIGH V-SWITCH STAND FOUNDATION
(8 REQUIRED - SAP NETWORK NO 15067136)
- 138/69kV 1Ø SSVT STAND FOUNDATION
(2 REQUIRED - SAP NETWORK NO 15067136)

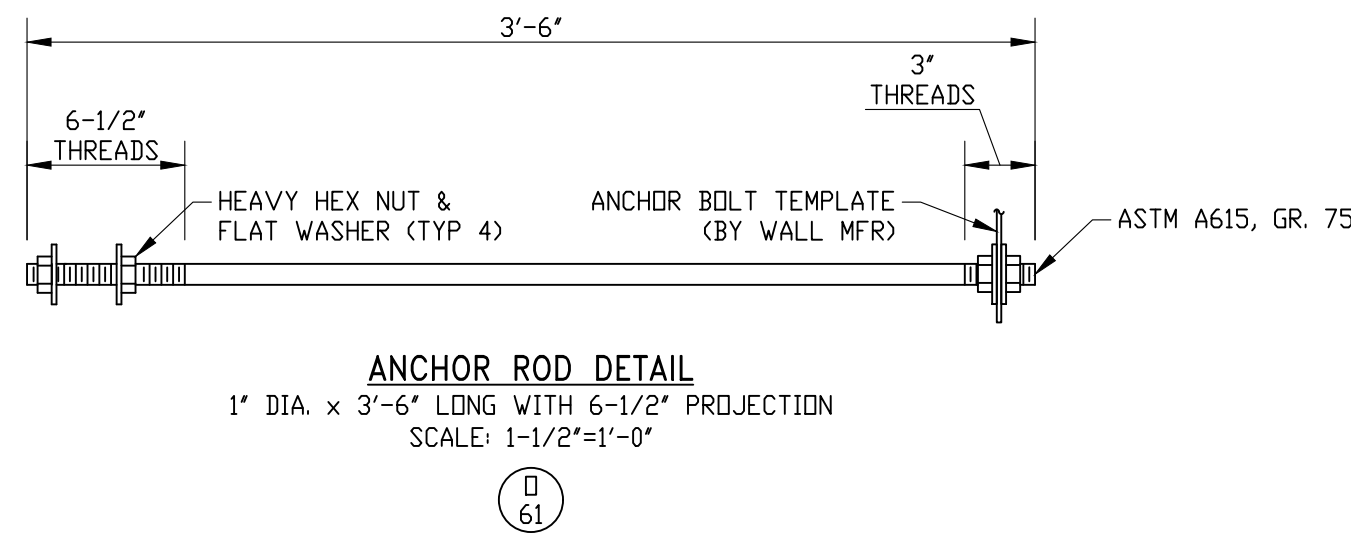
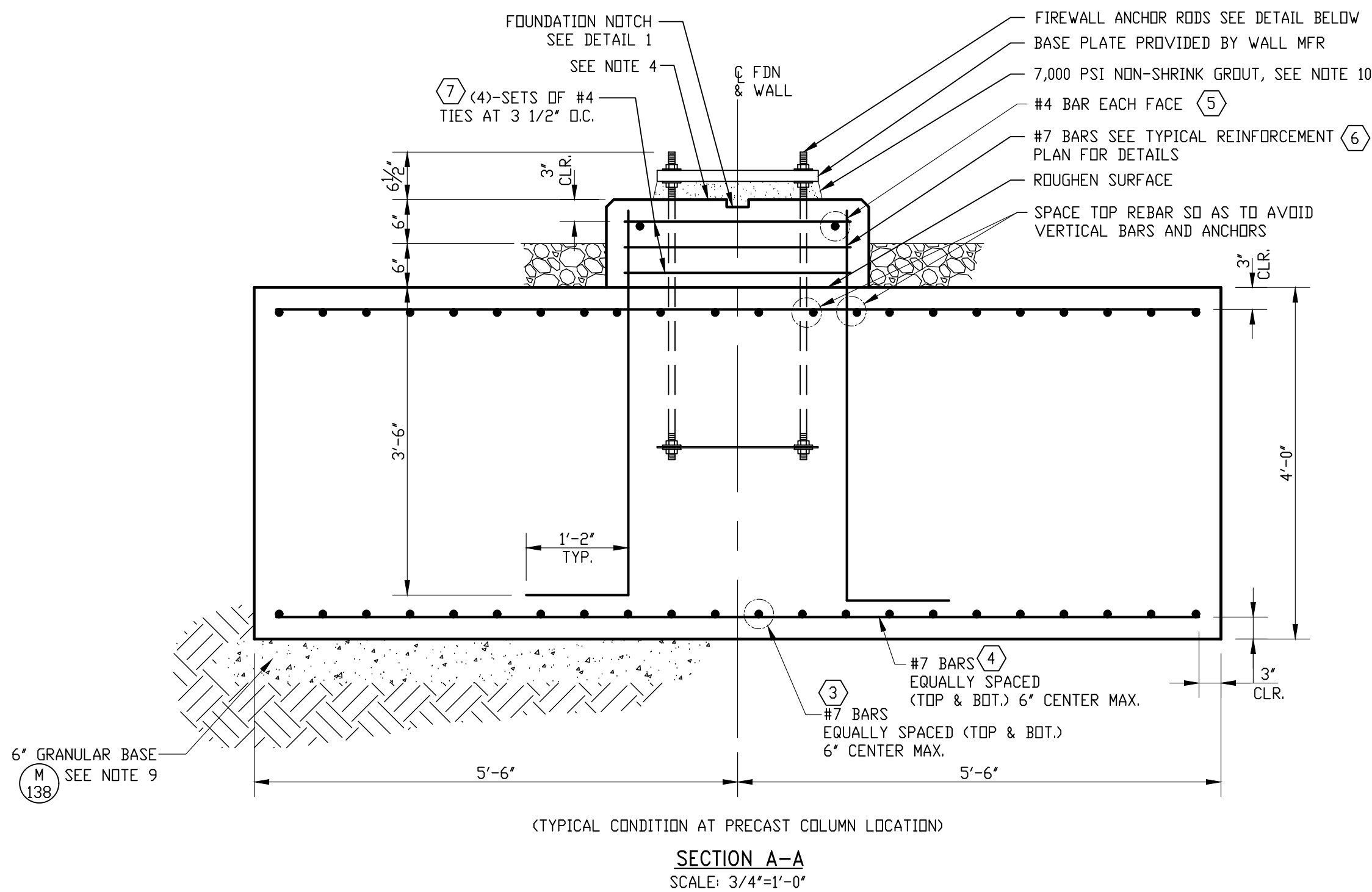
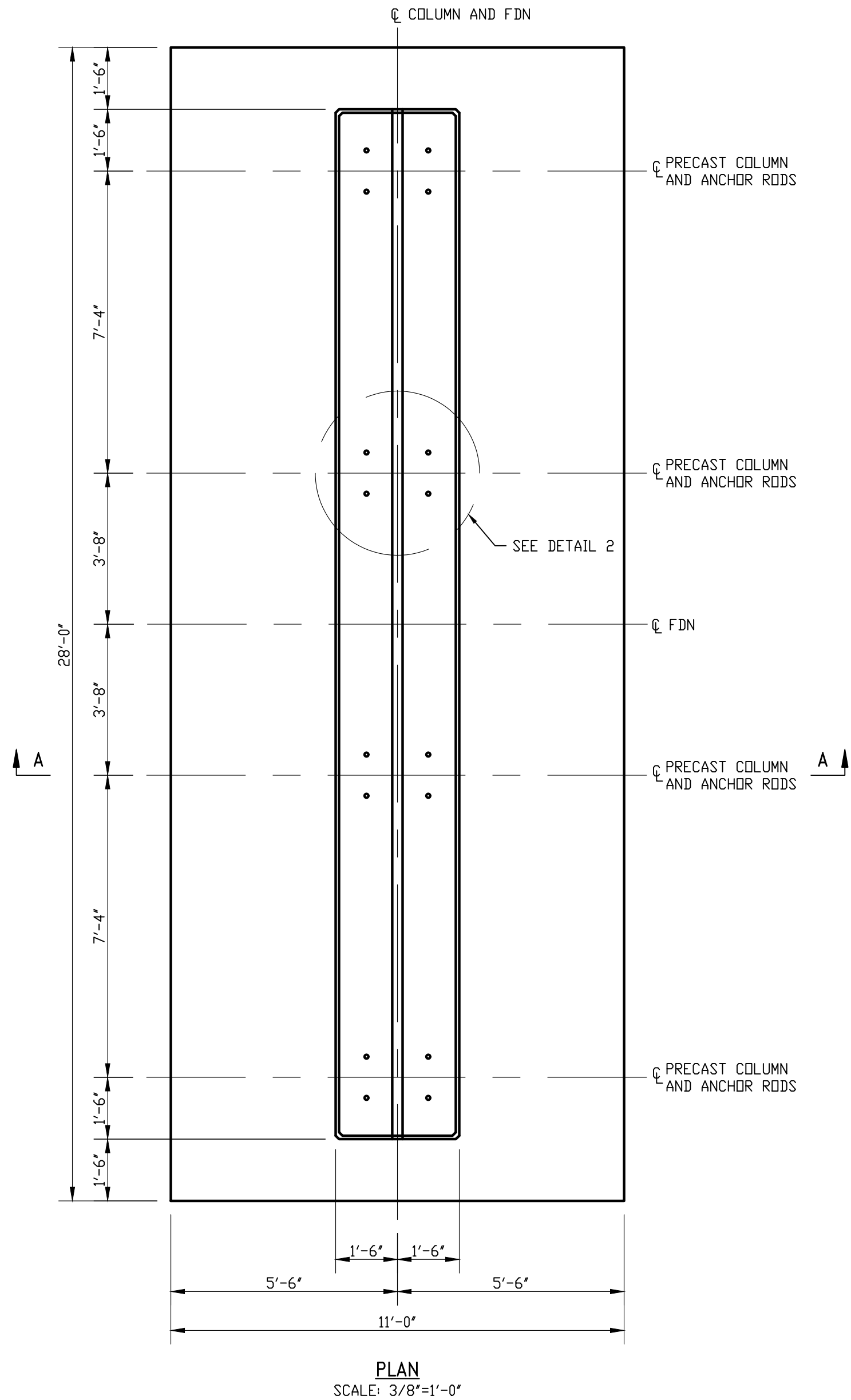
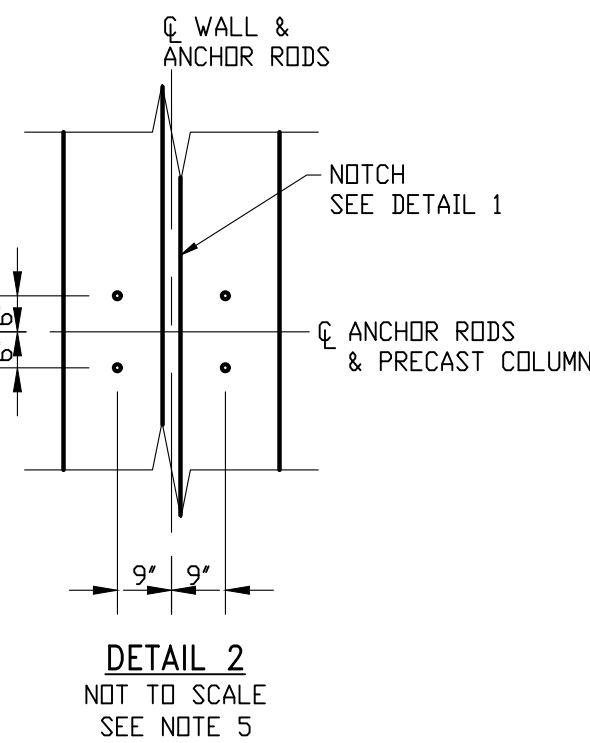
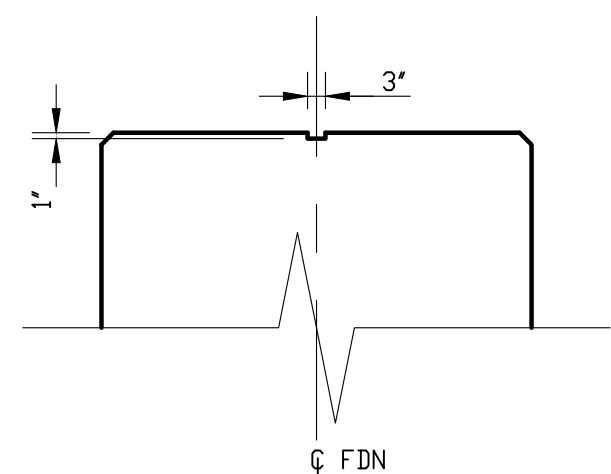
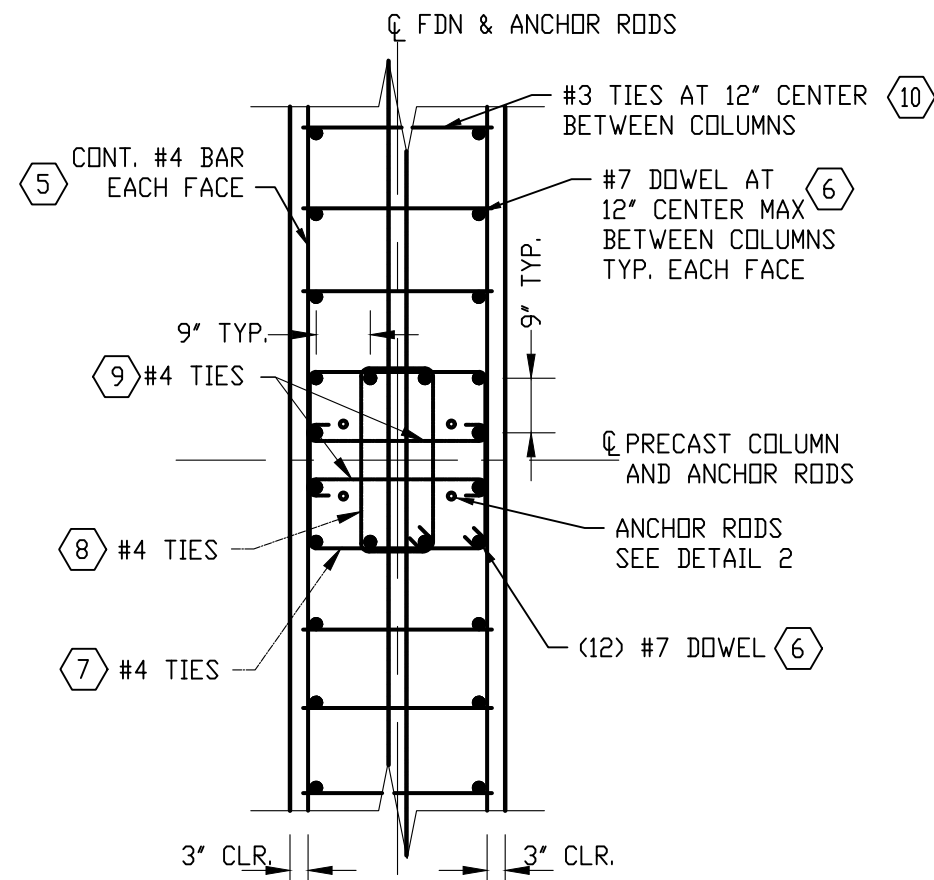
NETWORK # 15067136			REINFORCING BAR LIST					
BM ITEM NO.	TOTAL WT.	NO. REQ'D	PIECE	NO. PER FDN.	SIZE	LENGTH	TOTAL WT PER PC	DETAIL
M-137	4451#	208	<div>3</div>	8	#8	8'-0"	21.4#	STRAIGHT
	3167#	364	<div>4</div>	14	#4	13'-0"	8.7#	BENT (SEE SECTION D-D)
M-136	CONCRETE - 4000 PSI @ 28 DAYS MINIMUM		CONCRETE QUANTITY					
	TOTAL REQUIRED 104 CU. YDS.		4 CU. YDS. PER FDN.					
DESIGN CRITERIA								
VERTICAL LOAD (WT. OF EQUIP AND STAND) = 6010 LBS								
MAXIMUM SOIL BEARING = 7500 PSF								
CONCRETE = 4000 PSI AT 28 DAYS MINIMUM								
REBAR = GRADE 60 DEFORMED STEEL								

NOTES:

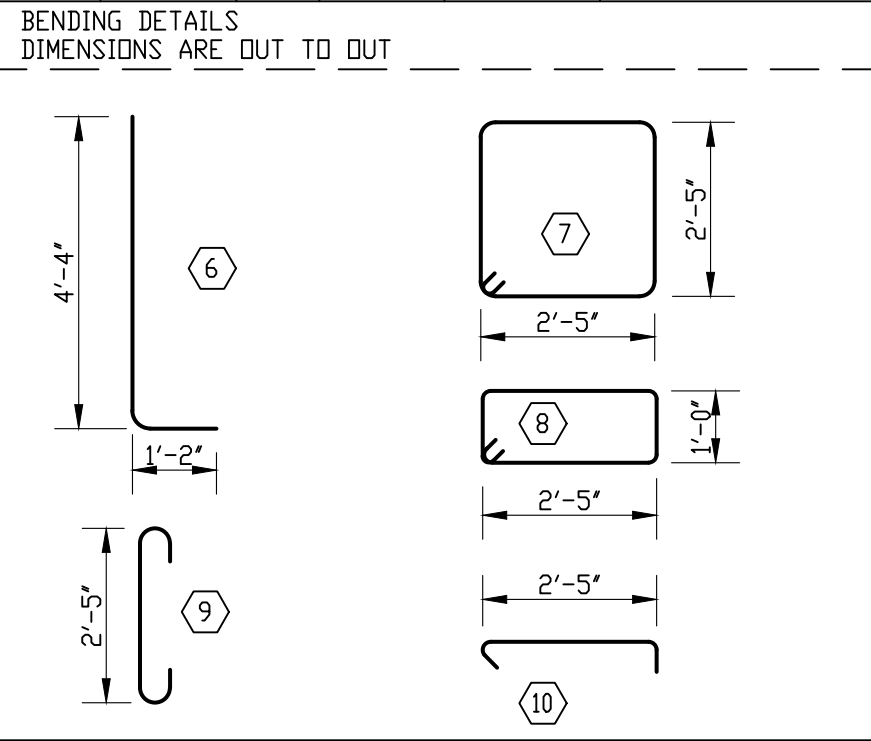
- CHAMFER ALL EXPOSED EDGES 1".
- REINFORCING STEEL SHALL BE NEW INTERMEDIATE GRADE BILLET STEEL DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60, LATEST REV. FURNISHED BY BELOW GRADE CONTRACTOR.
- WHEN THE AIR TEMPERATURE IS BELOW 50°F HIGH-EARLY STRENGTH CEMENT SHALL BE USED AND CONCRETE STRUCTURE SHALL BE KEPT AT 50°F FOR FOUR DAYS AFTER POURING.
- SEE DRAWING D-471-15-01 FOR FOUNDATION LAYOUT AND TOP OF CONCRETE ELEVATIONS.
- THE CONCRETE MIX SHALL CONTAIN AN AIR-ENTRAINING ADMIXTURE TO ACHIEVE AN ENTRAINED AIR CONTENT OF 6%, ±1%.
- ANCHOR BOLTS AND TEMPLATES TO BE FURNISHED BY STEEL STRUCTURE MANUFACTURER. ANCHOR BOLT PROJECTION TO MATCH STD STEEL DRAWINGS 18-17, 18-19, 18-20 & 18-21.
- THE TOTAL TIES FOR EACH PIER INCLUDES ONE (1) ADDITIONAL TIE SPACED AT 3' IN THE FIRST 6' OF CONCRETE.
- FOUNDATIONS DESIGNED PER THE RECOMMENDED SOIL PARAMETERS PER THE GEOTECHNICAL REPORT PROVIDED BY GPD TIMMERMAN. (PROJECT #2019821.63, DATED 09/17/19)



BY: WDB	FirstEnergy	DATE: 05/26/2022	SCALE: 1/2"=1'-0"	REV: 36x24
APP: SPS	Energy Delivery Technical Services	PROJECT: WELLINGTON	REVISION: DH-CE	AREA: LAKE ERIE
DATE: 05/26/2022	CONSTRUCTION	PROJECT: WELLINGTON	REVISION: DH-CE	AREA: LAKE ERIE
(GPD)		PROJECT: WELLINGTON	REVISION: DH-CE	AREA: LAKE ERIE
SAP NO: 15067136		DOC ID: D-471-15-14	REV: -	



SAP NETWORK NO 15067136				REINFORCING BAR LIST			
BM ITEM NO.	TOTAL WT.	NO. REQ'D	PIECE	NO. PER FDN.	SIZE	LENGTH	DETAIL
M-137	2474#	44	3	44	#7	27'-6"	STRAIGHT
	2408#	112	4	112	#7	10'-6"	STRAIGHT
	314#	2	5	2	#4	24'-6"	STRAIGHT
	809.5#	72	6	72	#7	5'-6"	BENT
	85.2#	12	7	12	#4	10'-5"	BENT
	61.2#	12	8	12	#4	7'-7"	BENT
	56.1#	24	9	24	#4	3'-5"	BENT
	15.8#	12	10	12	#3	3'-5"	BENT



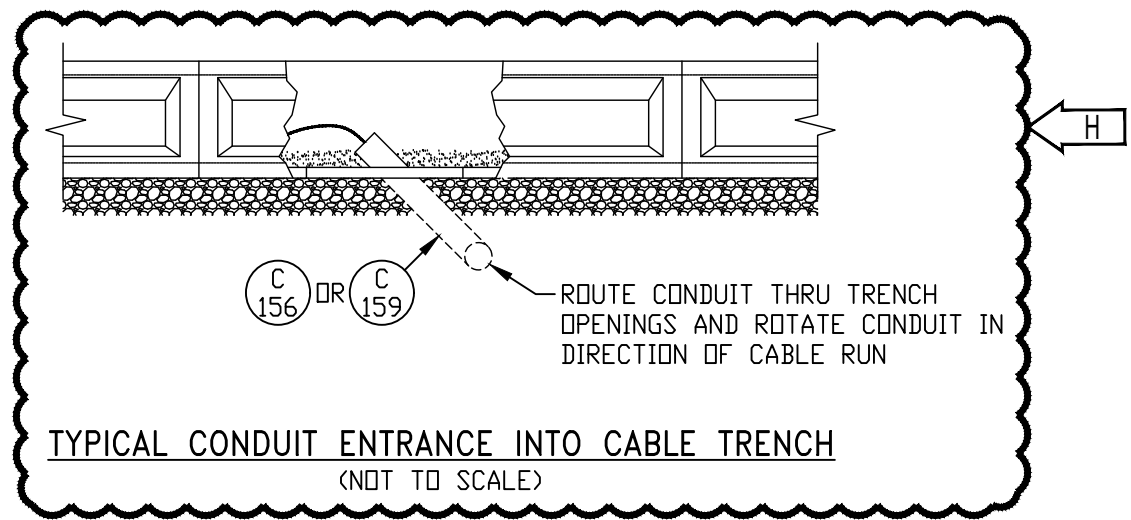
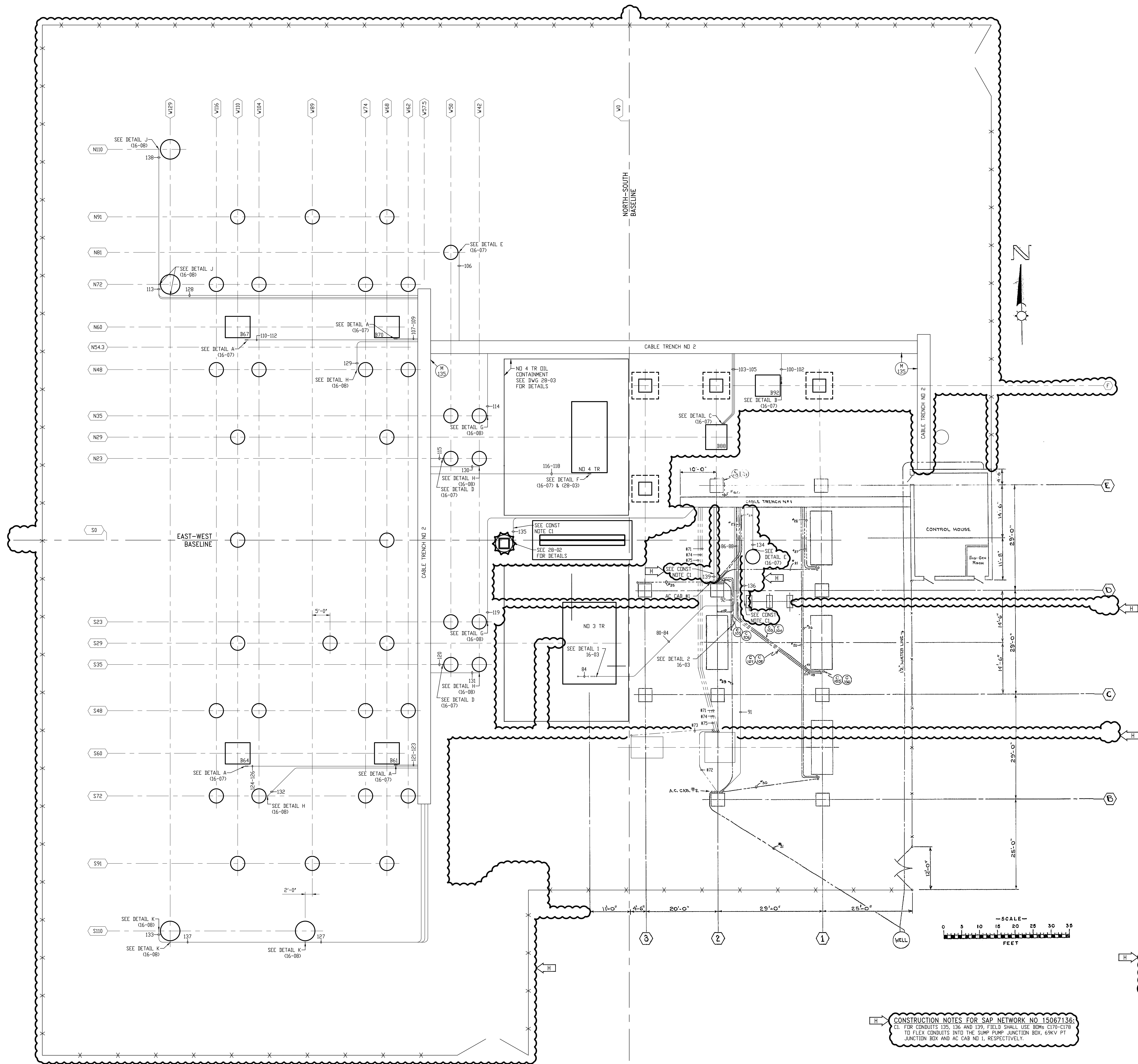
M-136	CONCRETE - 4000psi @ 28 DAYS MINIMUM	CONCRETE QUANTITY
	Total Required 48.4 Cu Yds	48.4 CU. YDS. PER FDN.
		DESIGN CRITERIA
		VERTICAL LOAD (WT. OF EQUIP) = 3960 LBS MAXIMUM SOIL BEARING = 5,000 PSF CONCRETE = 4000 PSI (AIR-ENTRAINED) AT 7 DAYS MINIMUM REBAR = GRADE 60 DEFORMED STEEL
		FOUNDATION REACTIONS USED: (PER PRECAST COLUMN) M=48.45 FT-KIP (UNFACTORED) V=4.40 KIP (UNFACTORED) Pmax=3.93 KIP (FACTORED) Pmin=2.69 KIP (FACTORED)

- NOTES:
- ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FIRSTENERGY MATERIAL AND CONSTRUCTION SPECIFICATIONS FOR TRANSMISSION LINE & SUBSTATION STRUCTURE FOUNDATIONS FE-TLS-004, LATEST REVISION, AND ACI 301-10, "STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE", ACI 302, 305 AND 306 UNLESS NOTED OTHERWISE.
 - ALL DETAILING, FABRICATION AND PLACING OF CONCRETE SHALL CONFORM TO ACI 318-14, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND THE LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAIL REINFORCED CONCRETE STRUCTURES" UNLESS NOTED OTHERWISE.
 - CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS AND SHALL BE IN ACCORDANCE WITH THE FIRSTENERGY GENERAL SPECIFICATION FOR CONCRETE FE-MNC-1 AND THE FIRSTENERGY MATERIAL AND CONSTRUCTION SPECIFICATIONS FOR TRANSMISSION LINE & SUBSTATION STRUCTURE FOUNDATIONS FE-TLS-004, LATEST REVISION.
 - SEE DRAWING D-471-15-01 FOR FOUNDATION LAYOUT, ORIENTATION, AND TOP OF CONCRETE ELEVATIONS.
 - SEE 14 SERIES DRAWINGS FOR EQUIPMENT POSITIONS AND 16 SERIES DRAWINGS FOR CONDUIT LOCATIONS. ANCHOR BOLT LOCATIONS SHALL BE VERIFIED WITH EQUIPMENT SUPPLIER'S CERTIFIED DRAWINGS.
 - ALL ABOVE GRADE STEEL TO BE HOT DIP GALVANIZED AFTER FABRICATION PER ANSI/ASTM SPEC. A153
 - SOIL INFORMATION IS BASED ON A GEOTECHNICAL REPORT BY GPD GROUP (PROJECT #: 201982163, DATED NOVEMBER 17, 2019). CONTRACTOR SHALL OBTAIN AND IMPLEMENT ALL RECOMMENDATIONS CONTAINED IN THE REFERENCED GEOTECHNICAL REPORT. IF SOIL CONDITIONS ENCOUNTERED ARE DIFFERENT FROM REFERENCED GEOTECHNICAL REPORT, NOTIFY ENGINEER IMMEDIATELY.
A. ALLOWABLE/ULTIMATE BEARING =5,000 PSF
B. UNIT WEIGHT OF SOIL = 125 PSF
C. GROUNDWATER = NOT ENCOUNTERED
 - SOIL BEARING CONDITIONS SHALL BE VERIFIED BY AN INDEPENDENT SOILS TESTING LABORATORY PRIOR TO INSTALLATION OF THE FOUNDATION.
 - GRANULAR BASE FILL MATERIALS SHALL CONFORM WITH ASTM C33 SIZE NO. 57 AND ARE TO BE PLACED IN LIFTS NOT EXCEEDING EIGHT (8) INCHES IN LOOSE MEASURED THICKNESS. EACH LIFT IS TO BE COMPACTED A MINIMUM OF 98% MAXIMUM DENSITY BY ASTM D698.
 - INSTALL A NON-SHRINK, CEMENTITIOUS GROUT UNDER BASE PLATE AND WALL AFTER PANEL INSTALLTION (PER MANUFACTURER'S INSTRUCTIONS). GROUT TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 7,000 PSI AND SHALL BE IN ACCORDANCE WITH ASTM C1107.
 - CHAMFER ALL EXPOSED EDGES 1".

CONSTRUCTION NOTES SAP NETWORK NO 15067136:
C1. CONTRACTOR SHALL BE AWARE OF EXISTING ELECTRICAL CONDUITS, GROUND GRID AND OIL CONTAINMENT LINER WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTOR SHALL WORK AROUND EXISTING CONDUITS AND OIL CONTAINMENT AND RELOCATE GROUND GRID AS REQUIRED.

138/69KV TRANSFORMER FIREWALL FOUNDATION
(1 REQUIRED - SAP NETWORK NO 15067136)

BY: WDB APP: SPS DATE: 05/26/2022 TITLE: CONSTRUCTION	FirstEnergy Energy Delivery Technical Services	PROJECT CODE: SCALE: AS NOTED DATE: 06/04/24	OPERATING COMPANY: OHIO EDISON (OE)	REGION: OH-CE	AREA: LAKE ERIE
(GPD)			WELLINGTON FOUNDATION DETAIL "P"		
SAP NO: 15067136			DEC 15 0-471-15-15		



- NOTES:**
1. ALL CONDUIT TO BE STUBBED A MINIMUM OF 6" ABOVE TOP OF CONCRETE.
 2. ALL STUBBED CONDUIT TO HAVE OPENINGS CAPPED TO PREVENT DEBRIS FROM COLLECTING IN CONDUIT.
 3. CONTRACTOR TO INSTALL PULL STRING IN ALL CONDUITS BEFORE CAPPING AND MARK CONDUIT NUMBERS AT EACH END.
 4. ALL CONDUIT SHALL BE BURIED 2'-0" BELOW ROUGH GRADE.
 5. SCHEDULE 80 CONDUIT TO BE USED IN DRIVE AREA.
 6. CONTRACTOR SHALL USE MINIMUM 48" RADIUS ELBOWS FOR STATION SERVICE CONDUITS.
 7. CONTRACTOR SHALL USE MINIMUM 48" RADIUS ELBOWS FOR FUTURE ANTENNA FEED LINE.
 8. CONTRACTOR SHALL USE MINIMUM 4" CONDUIT AND MINIMUM 48" RADIUS ELBOWS FOR FIBER CONDUITS.
 9. GROUND WIRE CONDUIT SHALL EXTEND A MINIMUM OF 24" PAST EDGE OF OIL CONTAINMENT LINER BEFORE CONNECTING GROUND WIRE TO GROUND GRID.
 10. CONTRACTOR TO REPAIR OR REPLACE ANY CONDUIT DAMAGED DURING CONSTRUCTION.

- REFERENCE DRAWINGS:**
- D-471-04-02 THROUGH 04-10 PROPERTY PLANS AND DETAILS
 - D-471-15-01 FOUNDATION LAYOUT
 - D-471-16-05 GROUNDING LAYOUT
 - D-471-28-01 DRAINAGE LAYOUT & DETAILS
 - D-471-28-02 OIL CONTAINMENT PLAN AND DETAILS TR NO. 3
 - D-471-28-03 OIL CONTAINMENT PLAN AND DETAILS TR NO. 4

CONSTRUCTION NOTES FOR SAP NETWORK NO. 15067136:
C1. FOR CONDUITS 135, 136 AND 139, FIELD SHALL USE BIMS C170-C178 TO FLEX CONDUITS INTO THE SUMP PUMP JUNCTION BOX, 69KV PT JUNCTION BOX AND AC CAB NO. 1, RESPECTIVELY.

		THE REGISTRATION OF THE NEWLY APPLIED SEAL ASSUMES RESPONSIBILITY FOR THE CHANGES AS INDICATED BY THE FOLLOWING REVISION LETTER "J".	
DATE: 05/26/2022	BY: [Signature]	SCALE: 3/32"=1'-0"	PROJECT: WELLINGTON
REVISIONS: 1. REMOVED CONDUITS 36-39, 128KV DEADEND STRUCTURE FINS AND COORDINATES "4", "BC" & "CD". 2. ADDED 138KV (4) BREAKER RING BUS, NO. 4 TR. 3. XFRM BLAST WALL, (2) 69KV BKRS, ASSOCIATED FOUNDATIONS, AND CABLE TRENCH EXPANDED FENCE LINE. 4. ADDED CONDUITS 100-129, REPLACED CONDUIT 85 WITH CONDUIT 135, (GPD).		SHEET: 01 OF 01	
PROJECT: WELLINGTON		SHEET: 01 OF 01	
CONDUIT LAYOUT		CONDUIT LAYOUT	
15067136		D-471-16-01	

ITEM		DESCRIPTION	ID No.	BOM	BOM
①	WIRE, JACKETED 19 ND9 COPPER CLAD STEEL, 100' (SEE DETAIL "B")	10008062 69993272	B-227	B-287	
②	COPPERWELD CABLE, COPPER CLAD STEEL, GROUNDING WIRE	10008630	B-228	B-298	
③	CONNECTOR, COMPRESSION, 19 ND9 COPPER CLAD STEEL, CABLE TO FLAT, 2 HOLE TINNED	33232272	B-236	B-301	
④	CONNECTOR, COMPRESSION, PARALLEL CABLES, 19 ND9 TO 19 ND9 (BUNDY CAT. YHC29C29)	61933933	B-299		
⑤	GROUND MAT, 6'-0" x 4'-0" x 3/4" (ENGINEERED PRODUCTS)	10008630	B-231	B-288	
⑥	CONNECTOR, COMPRESSION, SPLIT ELBOW, 4/0 COPPER RUN TO 19 ND9 TAP	10008630	B-231	B-288	
⑦	CONNECTOR CLAMP, GROUNDING, TWO BOLT (ROYAL PRB CAT. 16080, D0SSER) CAT. GF-25-2N-LV)	22501583	B-235	B-302	

TIN COATED COPPER
BRAIDED GND DEVICE (BY
SWITCH TYPE)

SEE DETAIL "B"

TYPICAL SWING TYPE
HANDLE

① 19 ND9 CABLE TO GND MAT TO
BE ISOLATED FROM COLUMN &
GND CABLE RUNNING TO THE
GRID

② GROUND MAT (SEE DET. "A")

③ FINISHED GRADE
ROUGH GRADE

④ 4/0 SS CU GND GRID

⑤

⑥

VISIBLE CONN. TO SW. OPER
SHAFT GND DEVICE

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**TYPICAL SWING TYPE SWITCH
HANDLE GROUNDING**

NOTES:

1. BRAID TO BE LOCATED BETWEEN STRUCTURAL STEEL AND GROUND WIRE TWO HOLE CONNECTOR.
2. 19 ND9 COLUMN GROUND WIRE TO BE CONTINUOUS UP FROM GROUND GRID, THROUGH CONNECTION (ITEM 6)
3. IF MULTIPLE GROUND CONNECTORS ARE REQUIRED, THE CONNECTORS MUST BE POSITIONED TOGETHER, NOT WITH STEEL SANDWICHED BETWEEN.
4. GROUND MAT PARALLEL CONNECTION (ITEM 3) MUST BE AS CLOSE TO SWITCH BRAID CONNECTION AS POSSIBLE.

LOCATE MAT AFTER SWITCH IS
ADJUSTED TO COORDINATE
LOCATION OF MAT WITH SWING
OF HANDLE

① SWITCH SHAFT

② SWITCH SHAFT/COLUM
GROUND LOCATION

③ 19 ND9 CABLE

④ GROUND MAT

⑤ GND CLAMP

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① 19 ND9 CABLE TO GND MAT TO
BE ISOLATED FROM COLUMN &
GND CABLE RUNNING TO THE
GRID

② GROUND MAT (SEE DET. "A")

③ FINISHED GRADE
ROUGH GRADE

④ 4/0 SS CU GND GRID

⑤

⑥

LOCATE MAT AFTER SWITCH IS
ADJUSTED TO COORDINATE
LOCATION OF MAT WITH SWING
OF HANDLE

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**TYPICAL SWING TYPE SWITCH
HANDLE GROUNDING**

NOTES:

1. BRAID TO BE LOCATED BETWEEN STRUCTURAL STEEL AND GROUND WIRE TWO HOLE CONNECTOR.
2. 19 ND9 COLUMN GROUND WIRE TO BE CONTINUOUS UP FROM GROUND GRID, THROUGH CONNECTION (ITEM 6)
3. IF MULTIPLE GROUND CONNECTORS ARE REQUIRED, THE CONNECTORS MUST BE POSITIONED TOGETHER, NOT WITH STEEL SANDWICHED BETWEEN.
4. GROUND MAT PARALLEL CONNECTION (ITEM 3) MUST BE AS CLOSE TO SWITCH BRAID CONNECTION AS POSSIBLE.

LOCATE MAT AFTER SWITCH IS
ADJUSTED TO COORDINATE
LOCATION OF MAT WITH SWING
OF HANDLE

① SWITCH SHAFT

② SWITCH SHAFT/COLUM
GROUND LOCATION

③ 19 ND9 CABLE

④ GROUND MAT

⑤ GND CLAMP

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① 19 ND9 CABLE TO GND MAT TO
BE ISOLATED FROM COLUMN &
GND CABLE RUNNING TO THE
GRID

② GROUND MAT (SEE DET. "A")

③ FINISHED GRADE
ROUGH GRADE

④ 4/0 SS CU GND GRID

⑤

⑥

LOCATE MAT AFTER SWITCH IS
ADJUSTED TO COORDINATE
LOCATION OF MAT WITH SWING
OF HANDLE

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DESCRIPTION	FE ID No.	BOM No.	BOM No.	BOM No.
CU-CLAD STEEL 5/8" DIA x 8'-0" THRD	29933923	B-232	B-261	B-285
COMPRESSION, SPLIT ELBOW, 4/0 COPPER RUN TO 5/8" GND ROD R CAT. GC739B004-562	100086304	B-230	B-260	B-286

B

SAP NETWORK
NO 15067136

FINISHED GRADE

REBAR GRADE

1'-0"

GROUND GRID

②

①

SINGLE 8'-0"
GROUND ROD

FirstEnergy <small>Energy Delivery Technical Services</small>	EST. CODE	OPERATING COMPANY	REGION	AREA
	SCALE: NO SCALE GRID: 8x11	FACILITY STANDARD GROUNDING DETAIL TITLE		
	GROUNDING ROD SINGLE 8 FT. ROD WITH DMC FITTINGS			
SAP NETWORK NO.		REV. 13	REV.	

S-16-002-14

ITEM	DESCRIPTION	FE ID No.	BOM No.	BOM
①	WIRE, JACKETED 19 NO.9 COPPER CLAD STEEL OR COPPER/CLAD CABLE, COPPER CLAD STEEL GROUNDING WIRE	100081025 100995717	B-227	B-207
②	CONNECTOR, COMPRESSION, 19 NO.9 COPPER CLAD STEEL, CABLE TO FLAT, 2 HOLE TINNED DMC POWER CAT. GC920B025T	100086308	B-228	B-298
③	CONNECTOR, COMPRESSION, SPLIT ELBOW, 4/0 COPPER RUN TO 19 NO.9 TAP DMC POWER CAT. GC739B004-925	100086303	B-231	B-288

CONDUCTOR TO NEUT. BUSHING SUPPLIED BY VENDOR

ALTERNATE CONNECTION TO NEUT. IF ONLY TWO HOLE GROUND PAD IS PROVIDED BELOW.

TO TRANSFORMER ARRESTERS

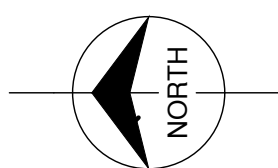
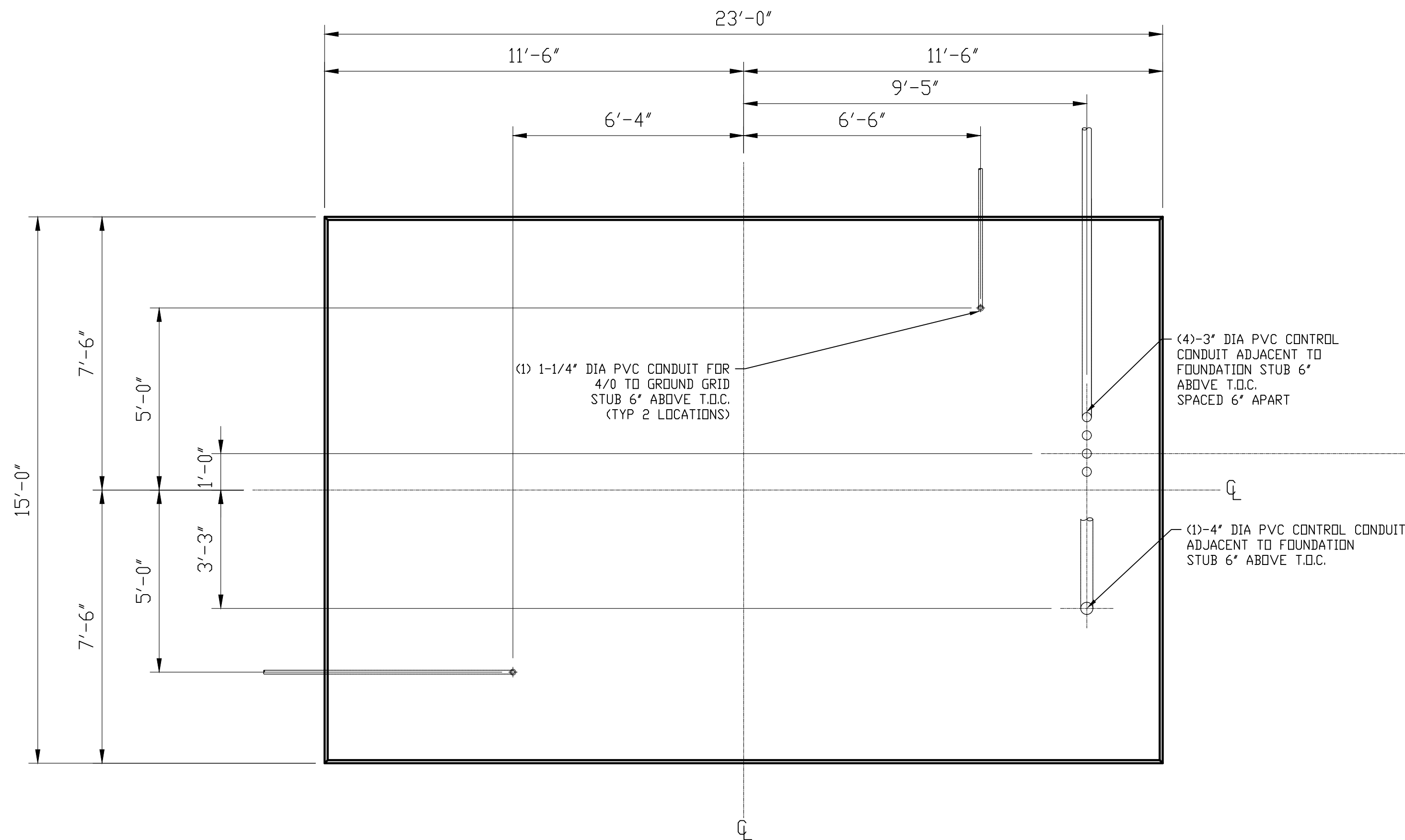
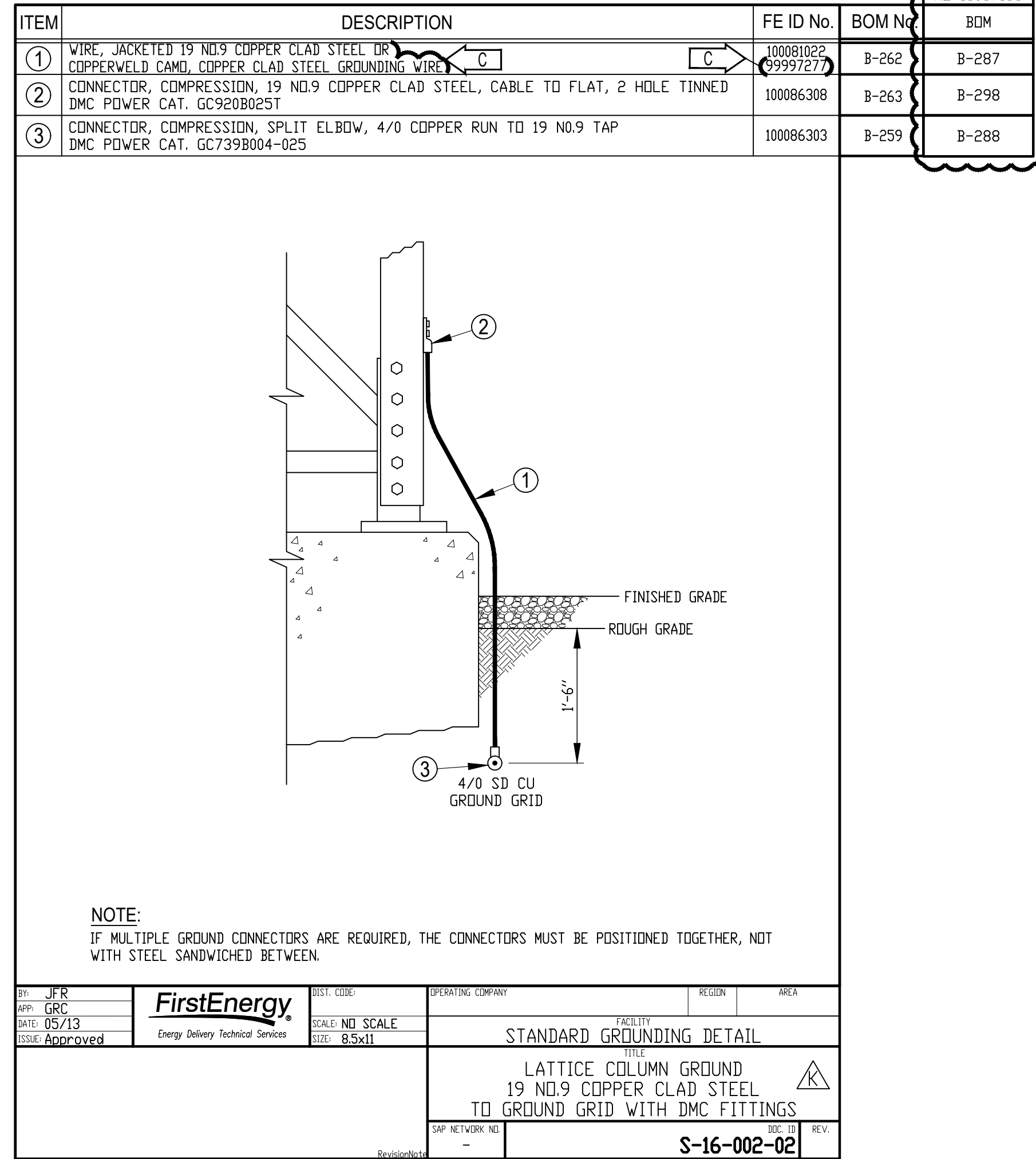
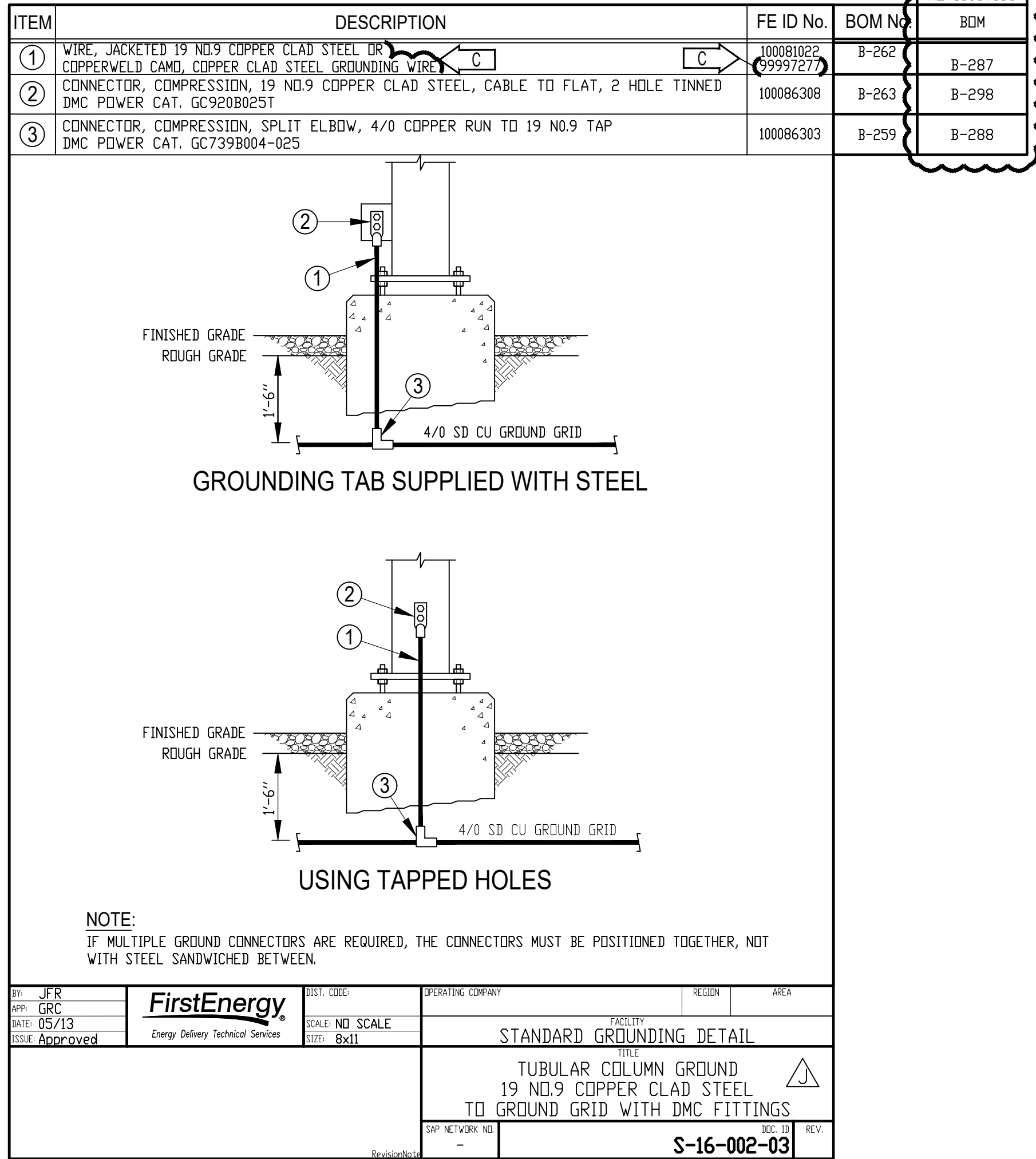
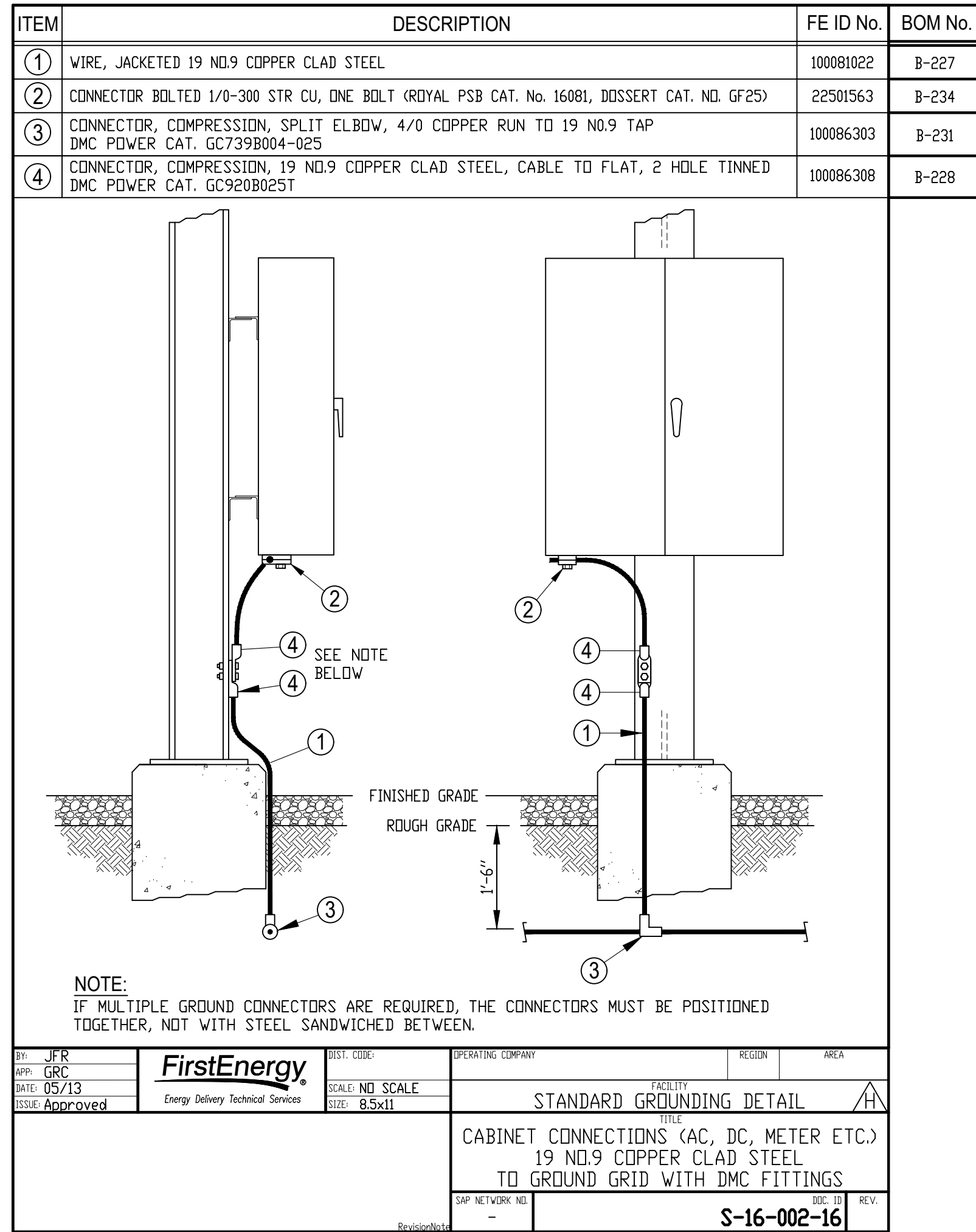
4/0 SD CU GROUND GRID

BY: JFR APP: GSC DATE: 05/13 DES: Approved	FirstEnergy Energy Delivery Technical Services	EST: CECO SCALE: NO SCALE STD: 8x11	OPERATING COMPANY FACILITY TITLE STANDARD GROUNDING DETAIL TRANSFORMER TANK & NEUTRAL 19 NO.9 COPPER CLAD STEEL TO GROUND GRID WITH DMC FITTINGS	REGION AREA REV
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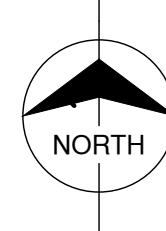
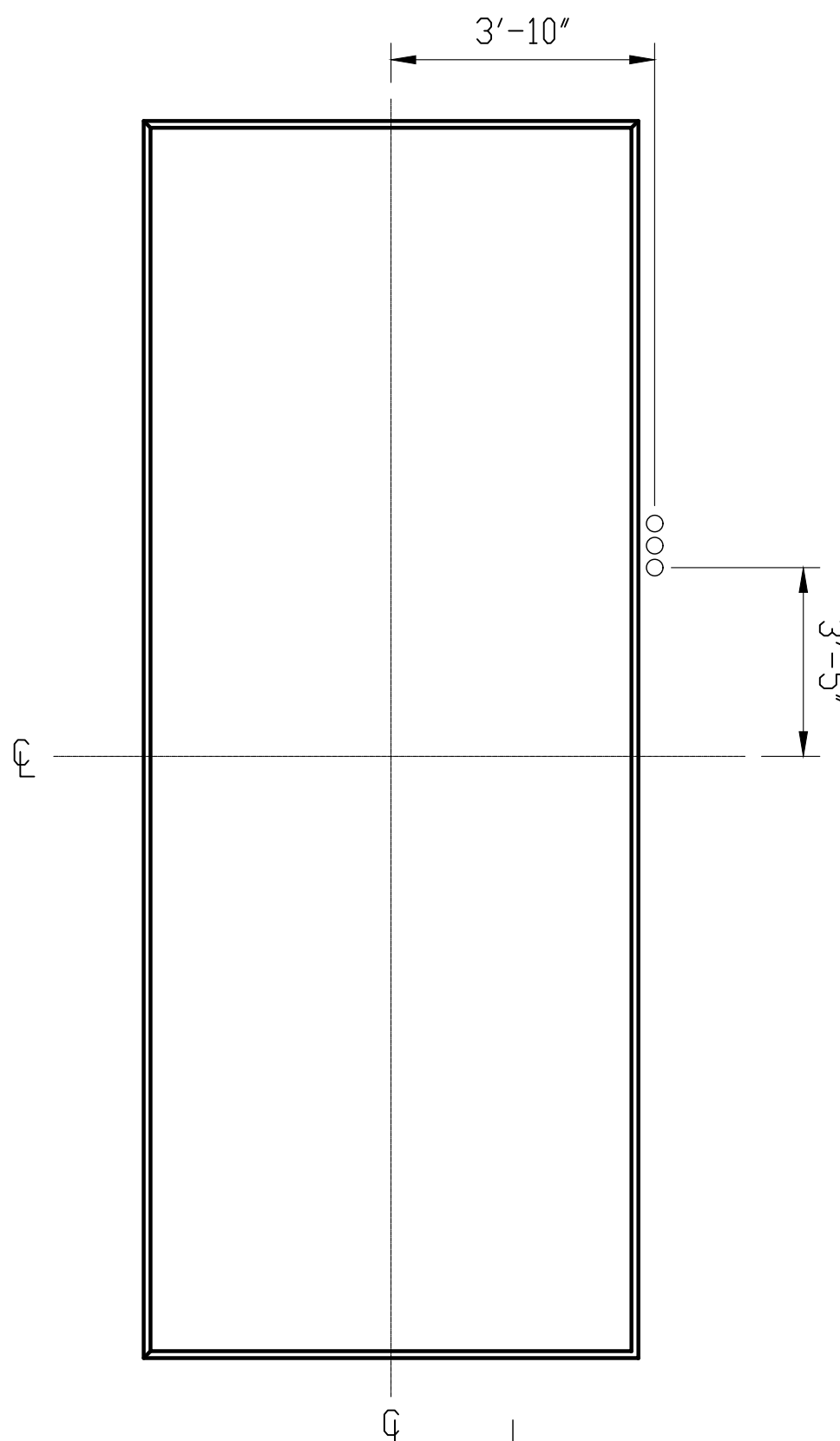
ITEM	DESCRIPTION	FE'ID No.	BOM No.	BOM No.	BOM
(1)	WIRE, JACKETED 19 N/9 COPPER CLAD STEEL OR COPPERWELDED CAND. COPPER CLAD STEEL, GRINDING WIRE	100818025 9999727	B-227	B-262	B-287
(2)	WIRE, BARE CU, #6 SD	20502263	B-241	B-267	B-294
(3)	CONNECTOR, COMPRESSION, 3/0 TO 250 kcmil RUN, #6 TO 2/0 CU TAP, BURNDY CAT. NO. YGHC29C26	33230372	B-242	B-266	B-295
(4)	CONNECTOR, COMPRESSION, SPLIT ELBOW, 4/0 COPPER RUN TO 19 N/9 TAP	100086303	B-231	B-259	B-288
(5)	DMC POWER CAT. GC739B004-025	22501583	B-235	B-265	B-302
(6)	CONNECTOR CLAMP, GROUNDING, TWO BOLT	99997233	B-243	B-268	B-296
(7)	TERMINAL CONNECTOR, TWO 14 STR - 1/0 STR, BURNDY CAT. K2A25U	99997234	-	B-269	B-297
(8)	BULKHEAD GROUND CONNECTOR, BURNDY CAT. KCKF23	99997233			

NOTE:
1. SHEATHING ON 19 N/9 WIRE TO BE REMOVED AT ANY GROUNDING CONNECTION POINT.

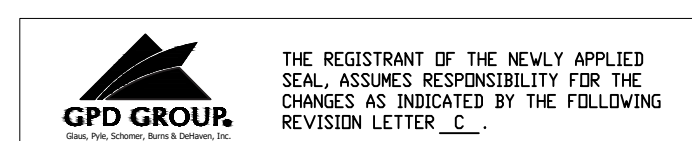
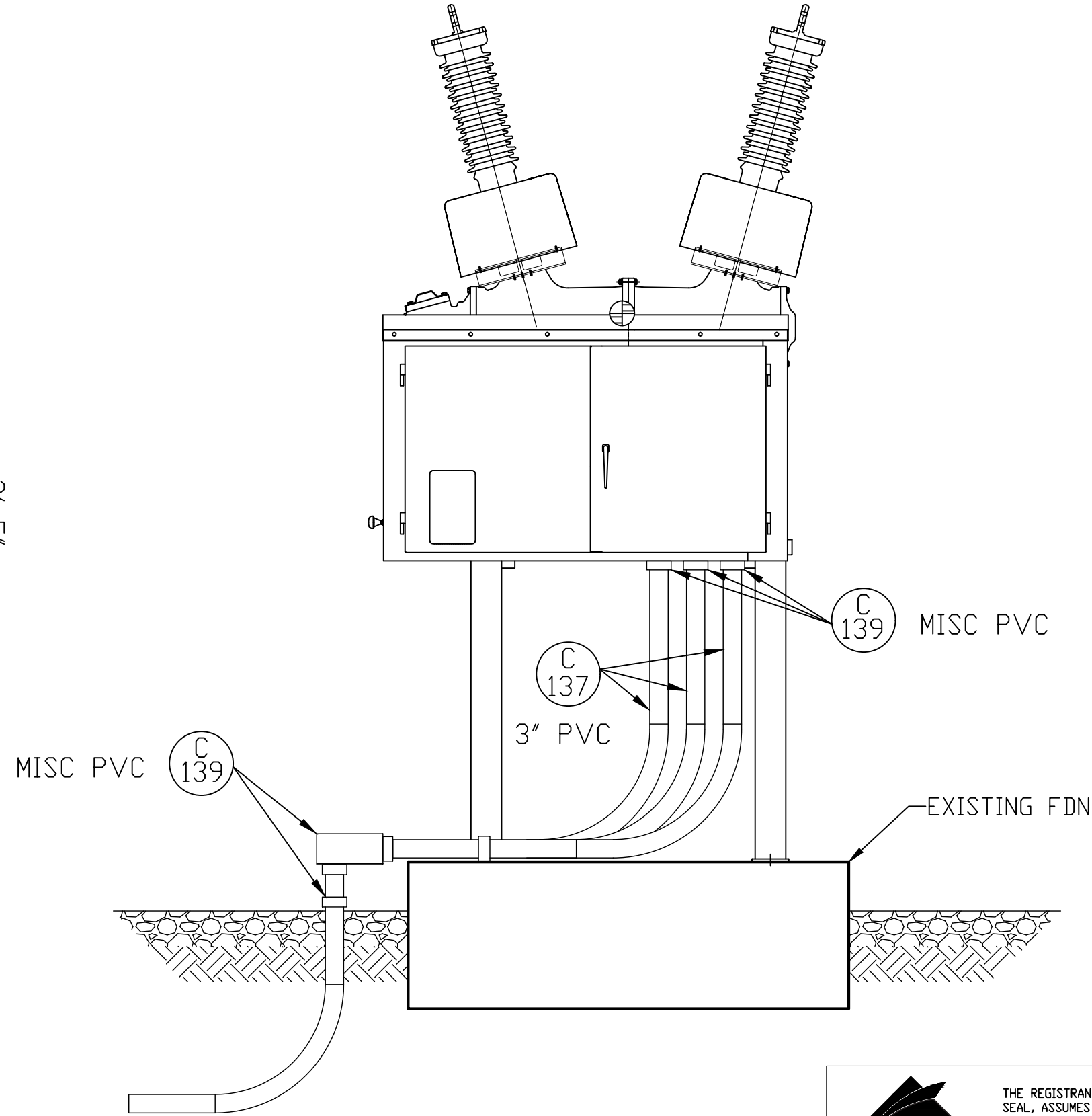
DES: PKA APP: JHE DATE: 10-03-16 DESG:	FirstEnergy <small>Energy Delivery Solutions Group</small> SCALE: NONE (8.5x11)	EST: CDD SCALE: NONE (8.5x11)	DRAWING COMPANY:	REGION:	AREA:
GROUNDING DETAIL					
FIBERGLASS JUNCTION BOX GROUNDING TO GRID WITH DMC FITTINGS					
REV 1 REPLACED TWO BURNDY GROUND LUGS WITH ONE BURNDY BULKHEAD FITTING FOR INTERNAL PANEL GROUNDING. REVISION BY BURNS & McDONNELL.			SAP NETWORK NO. _____ DEC. TO: 1		



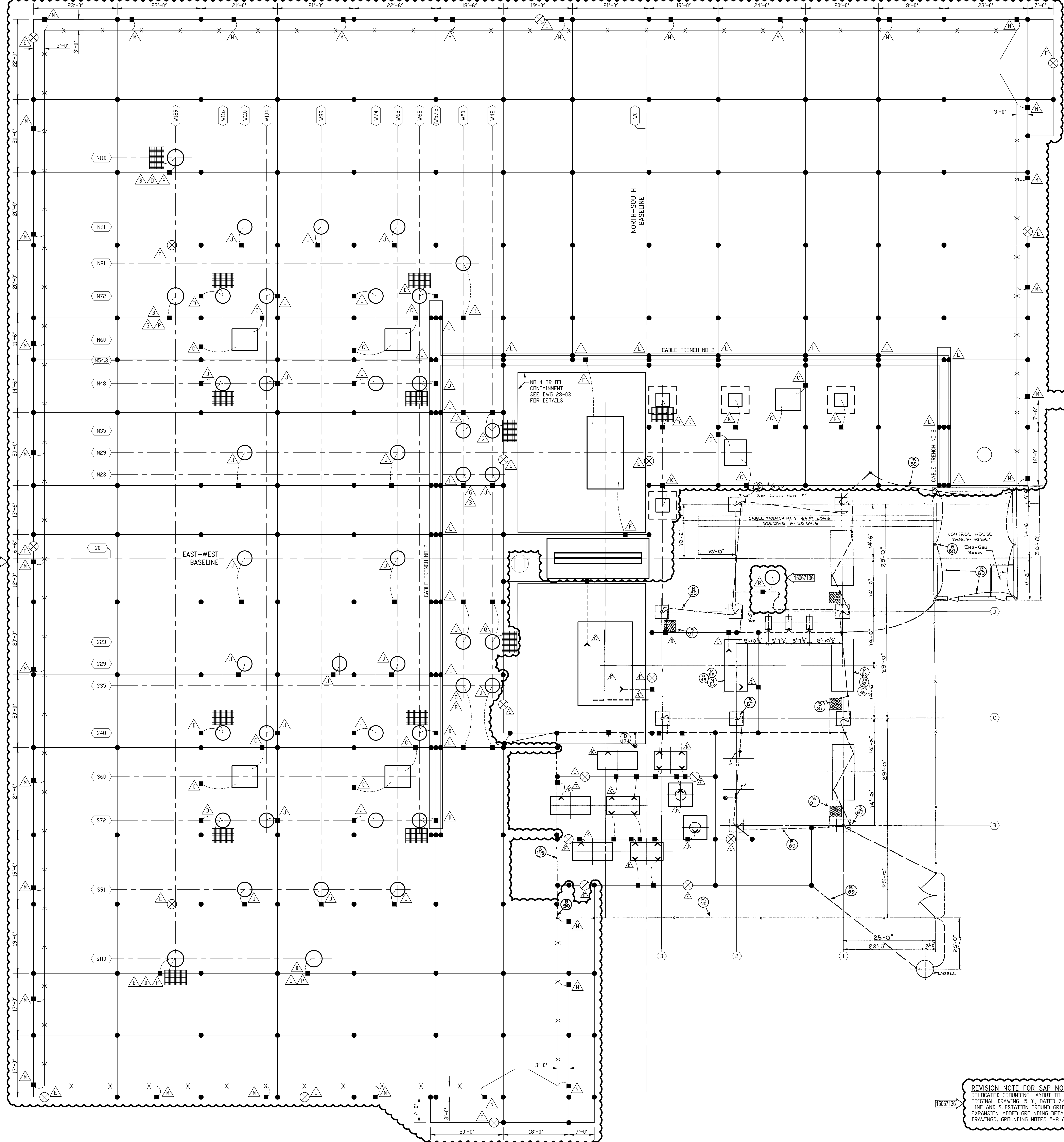
DETAIL 1
138/69kV TRANSFORMER CONDUIT LOCATION
NOT TO SCALE



DETAIL 2
69kV CIRCUIT BREAKER CONDUIT LOCATION
NOT TO SCALE



BY: WDB APP: SPS DATE: 05/26/2022 TICK: CONSTRUCTION	FirstEnergy Energy Delivery Technical Services	FEID CODE: SCALE: NONE TICK: 36x24	OPERATING COMPANY OHIO EDISON (OE)	REGION OH-CE	AREA LAKE ERIE
C: ADDED GROUNDING BILL OF MATERIAL COLUMNS FOR THE ADDITION OF A 138kV (4) BREAKER RING BUS, 138/69kV TRANSFORMER, (2) 69kV BREAKERS, AND 69kV STRUCTURE EXPANSION. REVISED DRAWING TITLE: (GPD)			WELLINGTON		
SAP NO. 15067136			DOC ID 0-471-16-03		



SND REF	DETAIL DWG NO.	DESCRIPTION	COIL LENGTH
A	16-02	STAND MOUNTED EQUIPMENT	20 Ft
B	16-02	STRUCTURE MOUNTED EQUIPMENT	10 Ft
C	16-02	MAJOR EQUIPMENT	10 Ft
D	16-02	GROUP OPERATED SWITCH SWING TYPE AND GROUND MAT	10 Ft
E	16-02	GROUND ROD	-
F	16-02	TRANSFORMER TANK NEUTRAL GROUND	10 Ft
G	16-02	FIBERGLASS JUNCTION BOX GROUNDING	10 Ft
H	16-03	CABINET CONNECTIONS	10 Ft
I	16-03	COLUMN GROUND TUBULAR STEEL	10 Ft
J	16-03	LATTICE COLUMN GROUND	10 Ft
K	16-06	CABLE TRENCH	5 Ft
L	16-06	FENCE LINE & CORNER POST	5 Ft
M	16-06	FENCE GATE	5 Ft
N	16-06	STATIC WIRE & NEUTRAL CONNECTIONS	10 Ft
O	16-06	MOTOR OPERATED SWITCH	10 Ft
P	16-06	STATION SERVICE VOLTAGE TRANSFORMER	10 Ft

SYMBOL	DESCRIPTION	B/M NO.	B/M NO.	SAP NETWORK NO 15067136 B/M NO.
⊗	GROUND ROD	B-232	B-261	B-285 B-286
●	DMC 4/0 TO 4/0	B-233	B-256	B-284
■	DMC 4/0 TO 19 NO. 9	B-231	B-259	B-288
▲	GROUND TAB LOCATION	-	-	-
—	4/0 CU.	B-226	B-255	B-283
---	19/9 COPPER WELD	B-227	B-262	B-287
■	6"x4" GROUND MAT	-	-	B-299

- GROUNDING NOTES:**
- 4/0 CU. SHALL BE BURIED 1'-6" BELOW ROUGH GRADE, WITH DMC COMPRESSION CONNECTIONS AT EACH INTERSECTION OF THE 4/0 CU. GRID.
 - GROUND CONDUCTOR TO BE CONTINUOUS FROM GROUND GRID TO EQUIPMENT GROUND PAD. SEE TABLE ABOVE FOR TYPICAL COIL LENGTHS FOR EQUIPMENT. LENGTH IS DETERMINED FROM POINT WHERE CABLE REACHES FINISHED GRADE AT FOUNDATION. STINGERS SHALL ALSO BE BURIED 1'-6" BELOW ROUGH GRADE FROM CONNECTION TO 4/0 TO FOUNDATION.
 - AT NO. 3 TR, GROUND WIRE TO BE ROUTED THRU CONDUIT EMBEDDED IN CONCRETE FOUNDATION. CONDUIT TO BE ROUTED UNDER OIL CONTAINMENT LINER AND A MINIMUM OF 24" BEYOND LINER. SEE OIL CONTAINMENT DRAWINGS 0-471-28-02 FOR DETAILS.
 - CONTRACTOR TO REPAIR OR REPLACE ANY GROUND WIRE DAMAGED DURING CONSTRUCTION.
 - WHEN MULTIPLE GROUND RISERS ARE SHOWN AT ONE LOCATION, CONTRACTOR SHALL COIL LENGTH OF LONGEST RISER ONLY AS INDICATED IN THE GROUND REFERENCE CHART.
 - PROVIDE GROUND PIGTAILS FOR ALL EQUIPMENT AND STRUCTURES AS INDICATED ON GROUNDING DETAILS.
 - CONTRACTOR TO PROVIDE 10'-0" GROUND PIGTAILS AT CABLE TRENCH END CLOSEST TO CONTROL ENCLOSURE TO TIE CABLE TRENCH AND CABLE TRAY GROUNDING TOGETHER.
 - FENCE SHALL BE GROUNDED AT INTERVALS NOT EXCEEDING 30 FEET TO THE GROUND GRID. ALL FENCE CORNER POSTS AND GATE POSTS SHALL BE GROUNDED TO THE GROUND GRID.

CALCULATED GRID RESISTANCE:	0.4267 OHMS
TOTAL GROUND FAULT CURRENT:	8.8 KA
FAULT CURRENT RETURNING TO REMOTE EARTH:	8.8 KA
UPPER LAYER SOIL RESISTIVITY:	232 OHM-METERS
DEPTH OF UPPER LAYER:	14.2 FEET
LOWER LAYER SOIL RESISTIVITY:	114.6 OHM METERS
CALCULATED GRID POTENTIAL RISE:	410.3 VOLTS
CLEARING TIME:	0.5 SECONDS
DATE:	02/08/2022

- REFERENCE DRAWINGS:**
- 0-471-04-02 THROUGH 04-10 PROPERTY PLANS AND DETAILS
 - 0-471-16-01 CONDUIT LAYOUT
 - 0-471-16-05 GROUNDING LAYOUT
 - 0-471-28-01 DRAINAGE LAYOUT & DETAILS
 - 0-471-28-02 OIL CONTAINMENT PLAN AND DETAILS TR NO. 2
 - 0-471-28-03 OIL CONTAINMENT PLAN AND DETAILS TR NO. 3

REVISION NOTE FOR SAP NO 15067136:
RELOCATED GROUNDING LAYOUT TO THIS DRAWING FROM ORIGINAL DRAWING 15-01, DATED 7/28/17. EXPANDED FENCE LINE AND SUBSTATION GROUND GRID FOR 138KV RING BUS EXPANSION. ADDED GROUNDING DETAILS L-R. REFERENCE DRAWINGS, GROUNDING NOTES 5-8 AND BDM COLUMN. (GPD)

THE REGISTRANT OF THE NEWLY APPLIED SEAL ASSUMES RESPONSIBILITY FOR THE CHANGES AS INDICATED BY THE FOLLOWING REVISION LETTER.

THIS DRAWING WAS CREATED FROM DRAWING (15-01), DATED 7/28/17, REVISION L.

DATE: 05/26/2022
BY: JSP
CHECKED: JSP
DESIGNED: JSP
DRAWN: JSP
PROJECT: 15067136
SHEET: 15067136

FirstEnergy

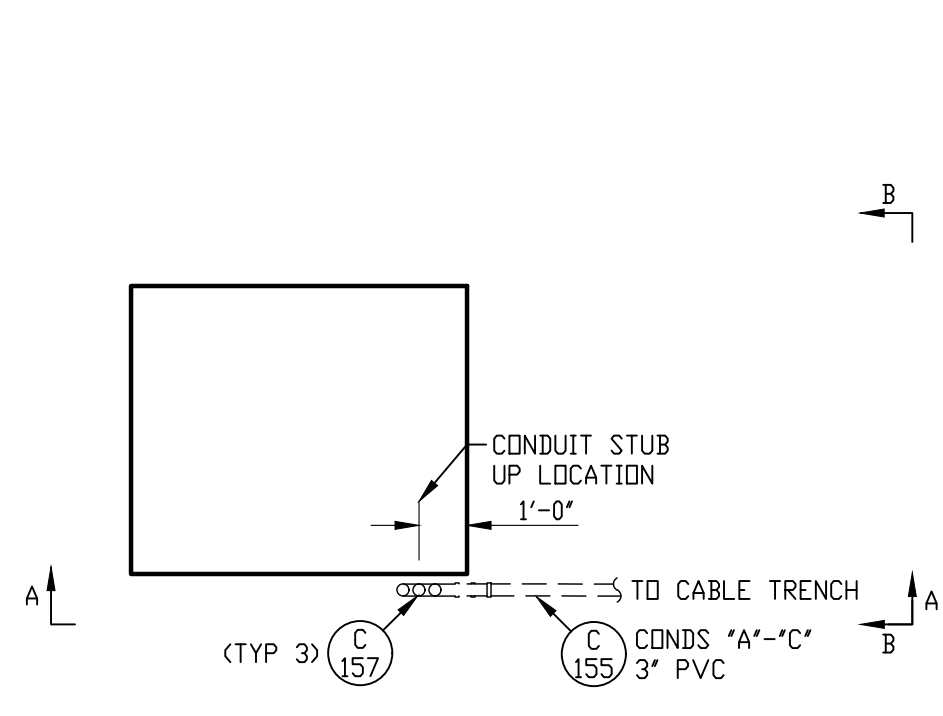
Energy Delivery Technical Services

CONSTRUCTION

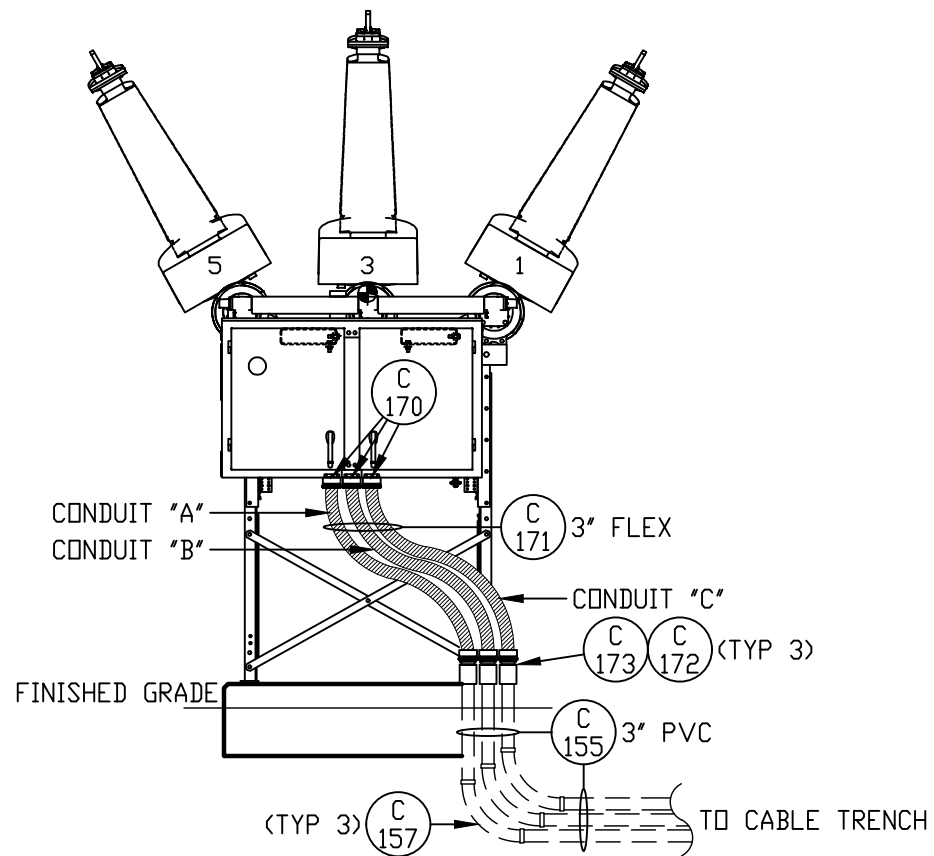
DATE: 02/08/2022
BY: JSP
CHECKED: JSP
DESIGNED: JSP
DRAWN: JSP
PROJECT: 15067136
SHEET: 15067136

PROJECT: 15067136
SHEET: 15067136
TITLE: GROUNDING LAYOUT

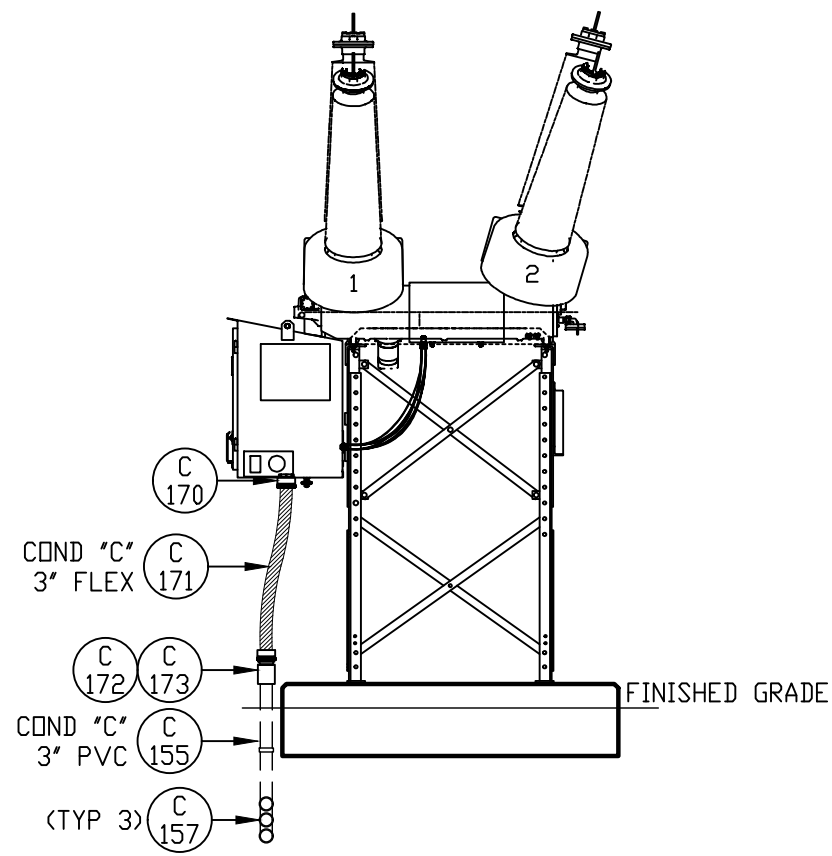
DATE: 02/08/2022
BY: JSP
CHECKED: JSP
DESIGNED: JSP
DRAWN: JSP
PROJECT: 15067136
SHEET: 15067136



PLAN VIEW



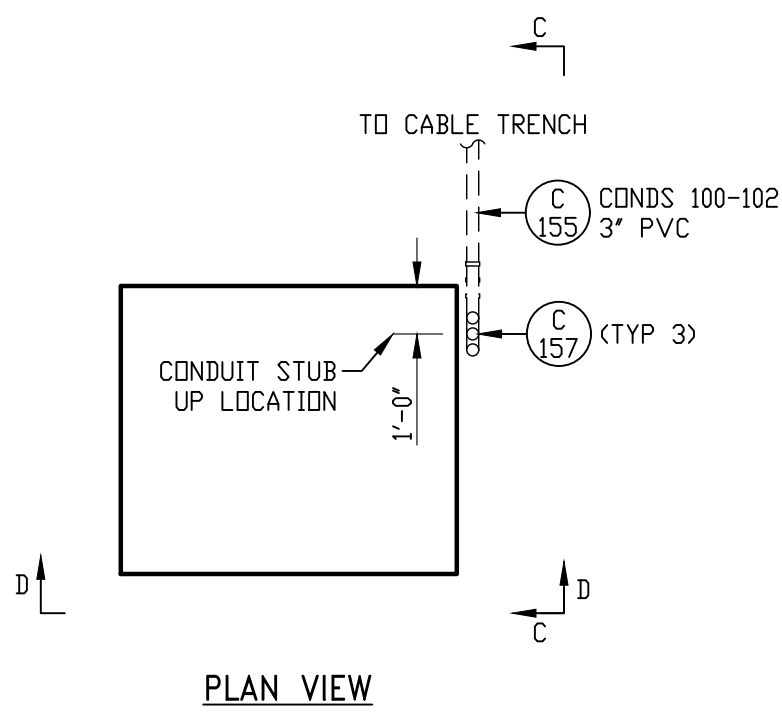
ELEVATION A-A



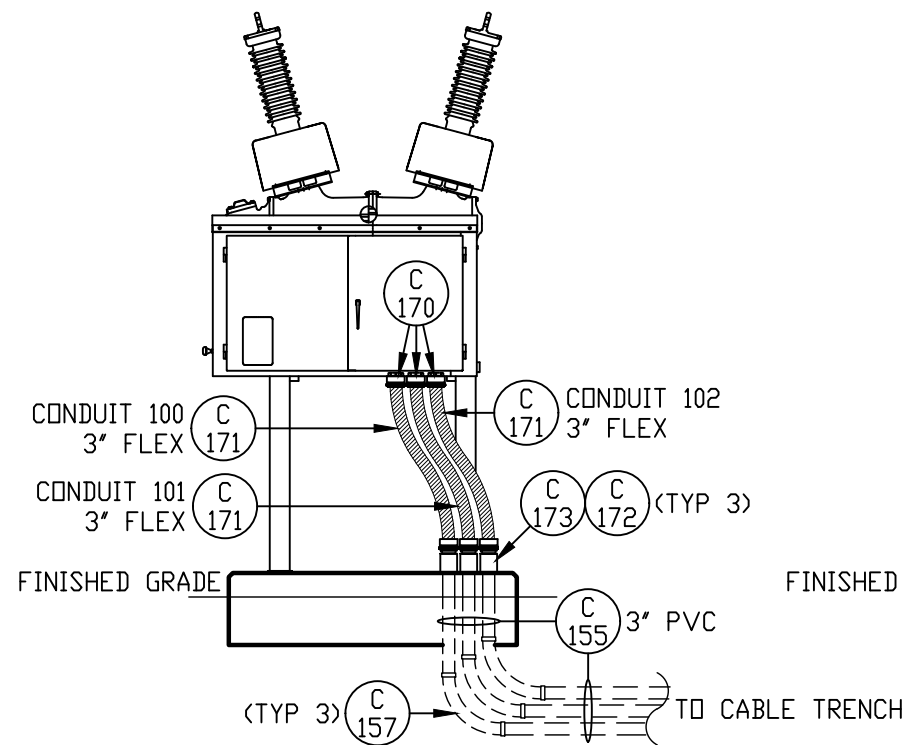
ELEVATION B-B

TABLE 1			
LOCATION	CONDUIT 'A'	CONDUIT 'B'	CONDUIT 'C'
138KV SF6 CIRCUIT BREAKER B61	121	122	123
138KV SF6 CIRCUIT BREAKER B64	124	125	126
138KV SF6 CIRCUIT BREAKER B67	110	111	112
138KV SF6 CIRCUIT BREAKER B70	107	108	109

DETAIL A
138KV BREAKERS B61, B64, B67 & B70

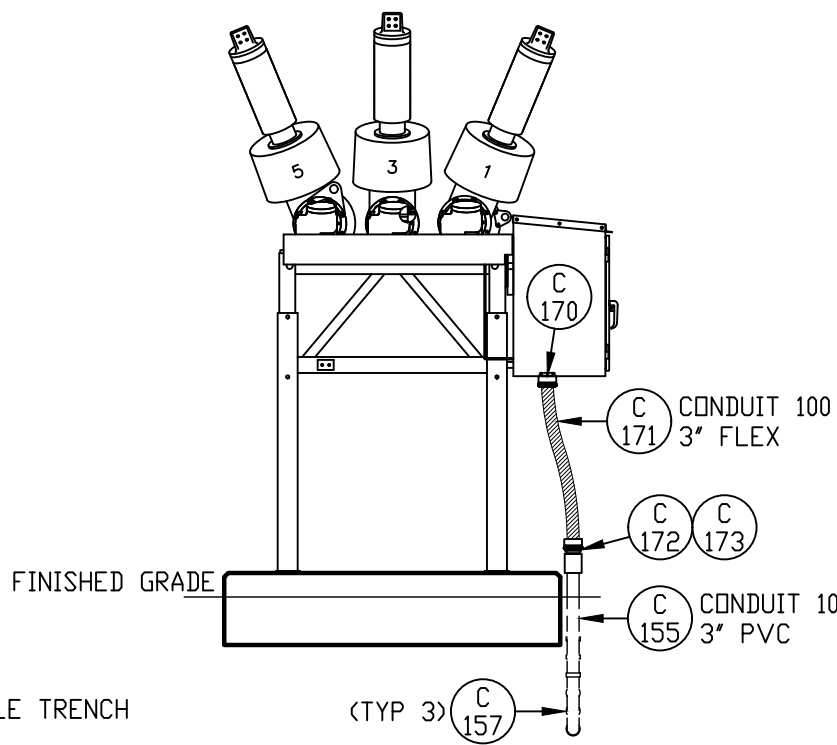


PLAN VIEW

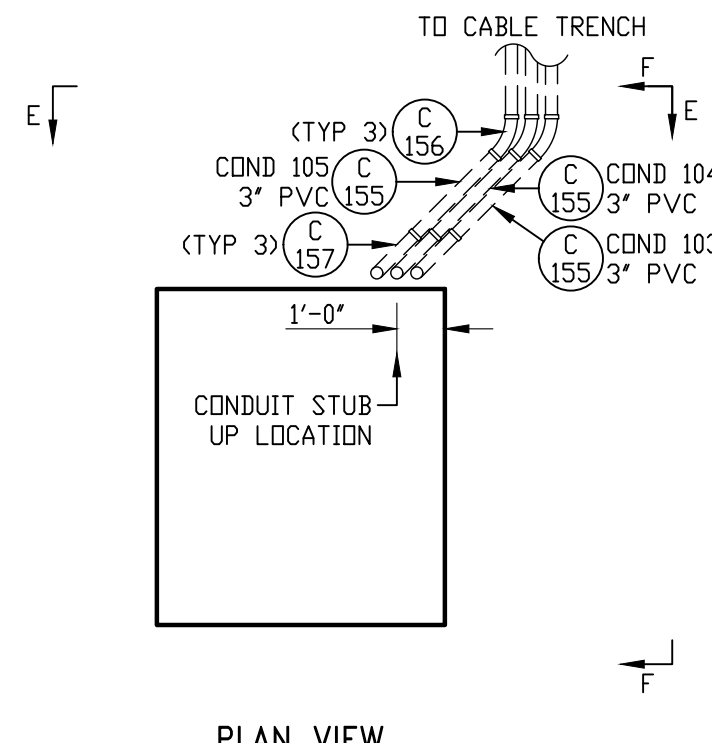


ELEVATION C-C

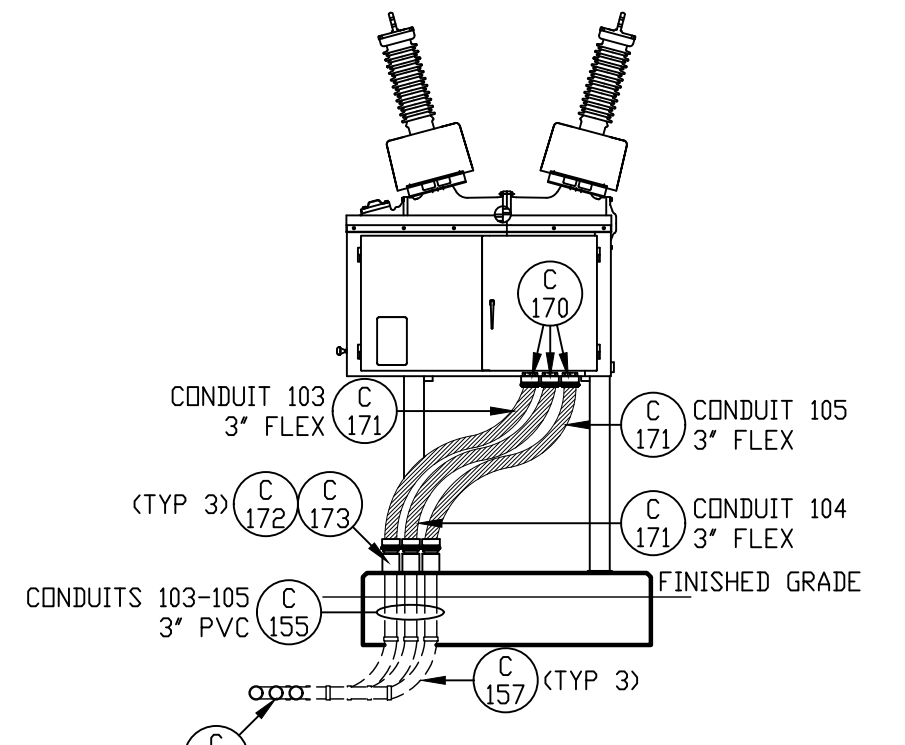
DETAIL B
69KV BREAKER B92



ELEVATION D-D

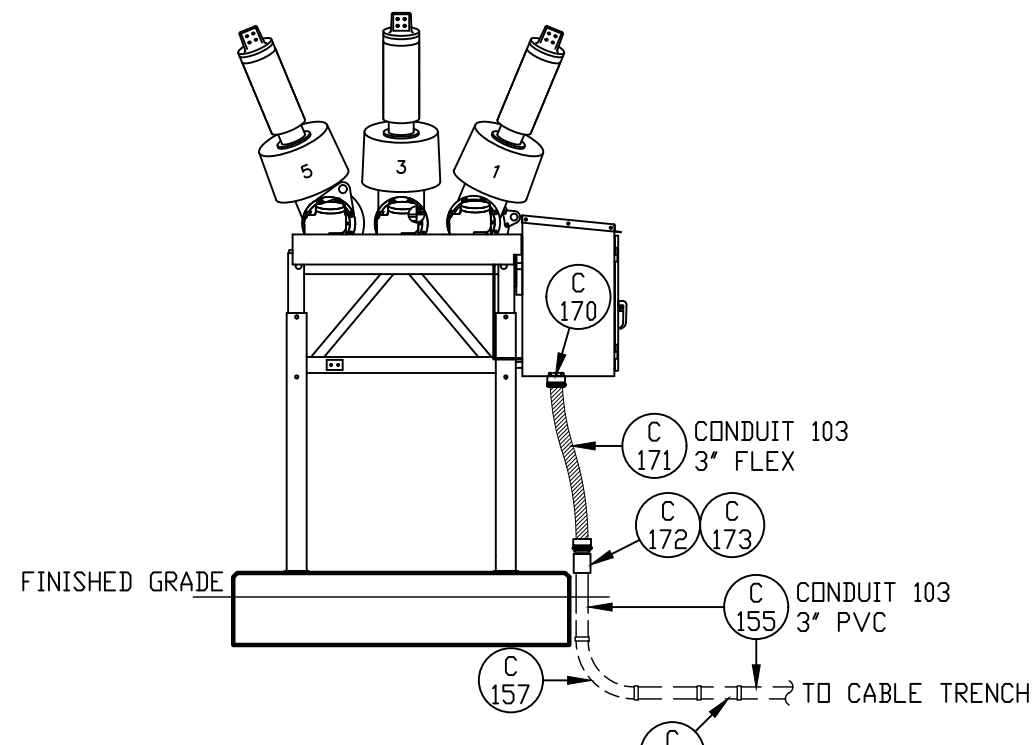


PLAN VIEW

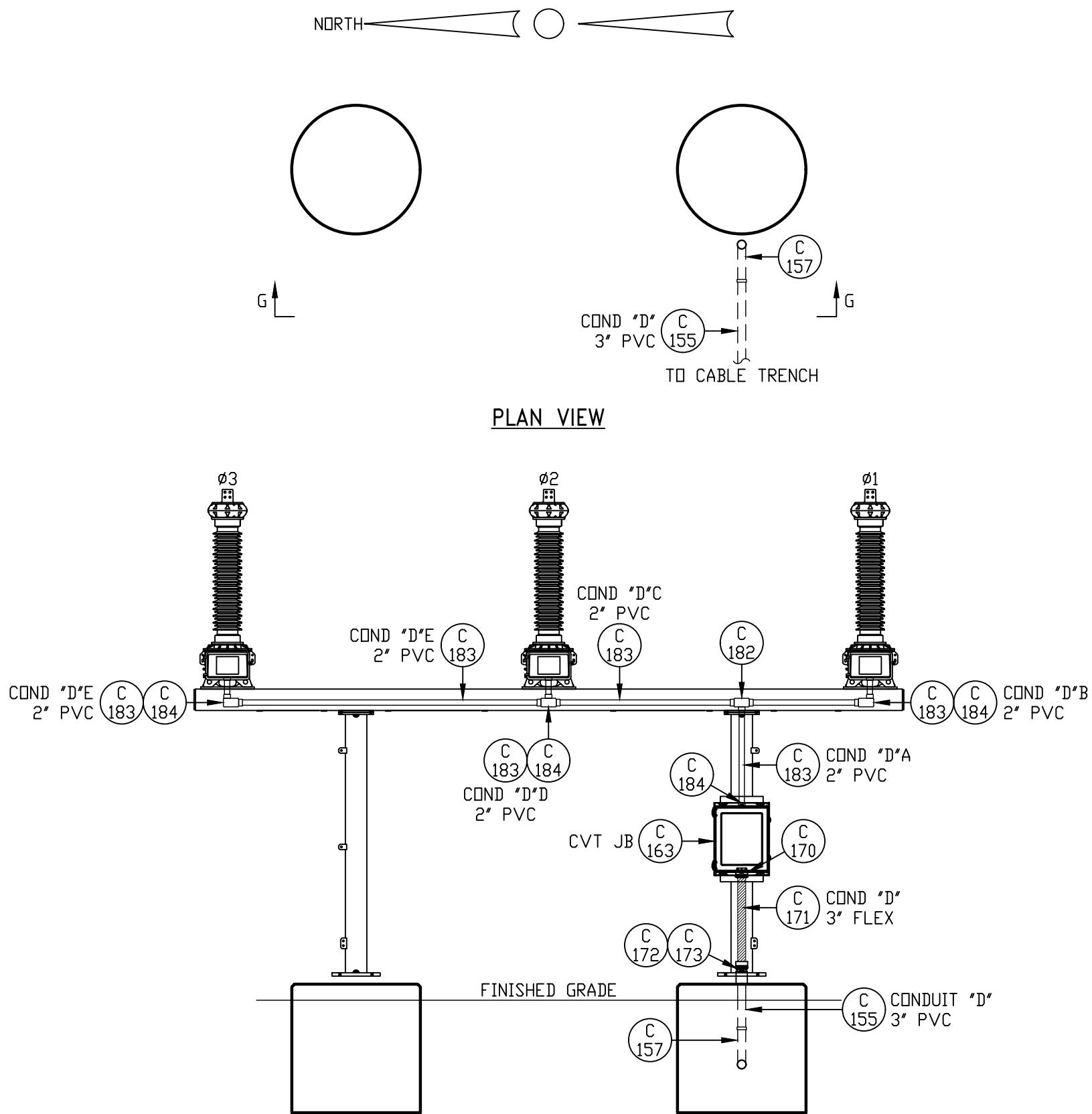


ELEVATION E-E

DETAIL C
69KV BREAKER B88



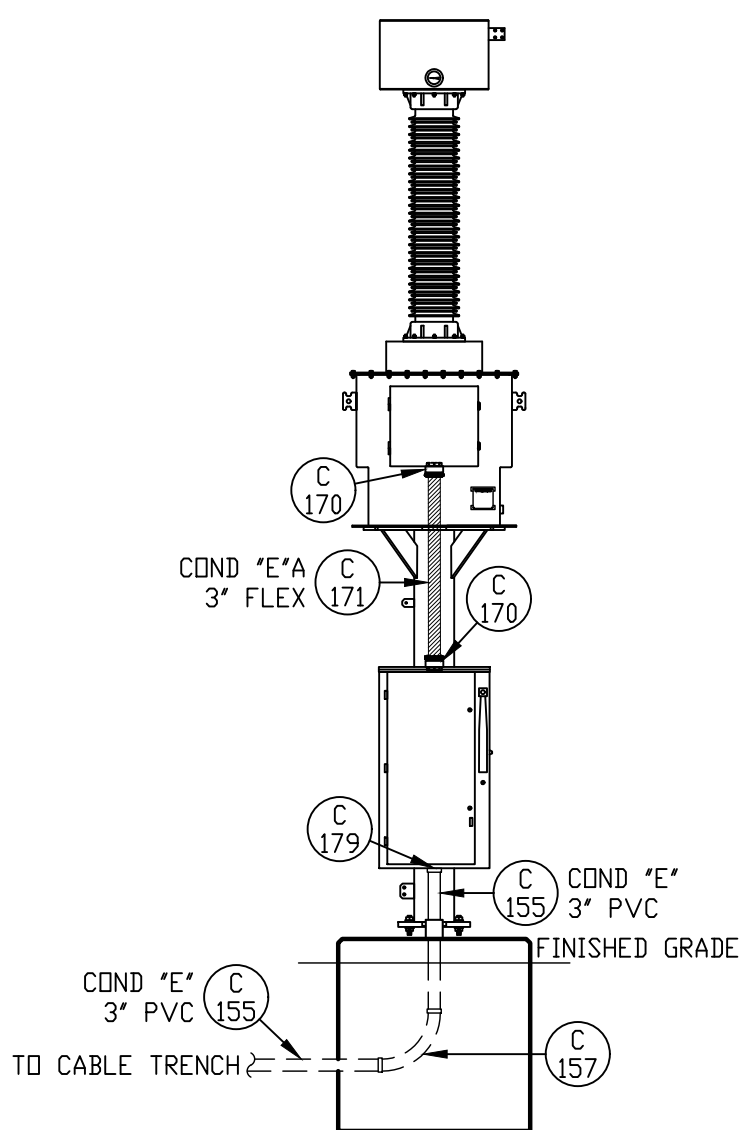
ELEVATION F-F



ELEVATION G-G

TABLE 2	
LOCATION	CONDUIT 'D'
138KV ND 3 TR CVTs CC72	120
138KV ND 4 TR CVTs CC57	115

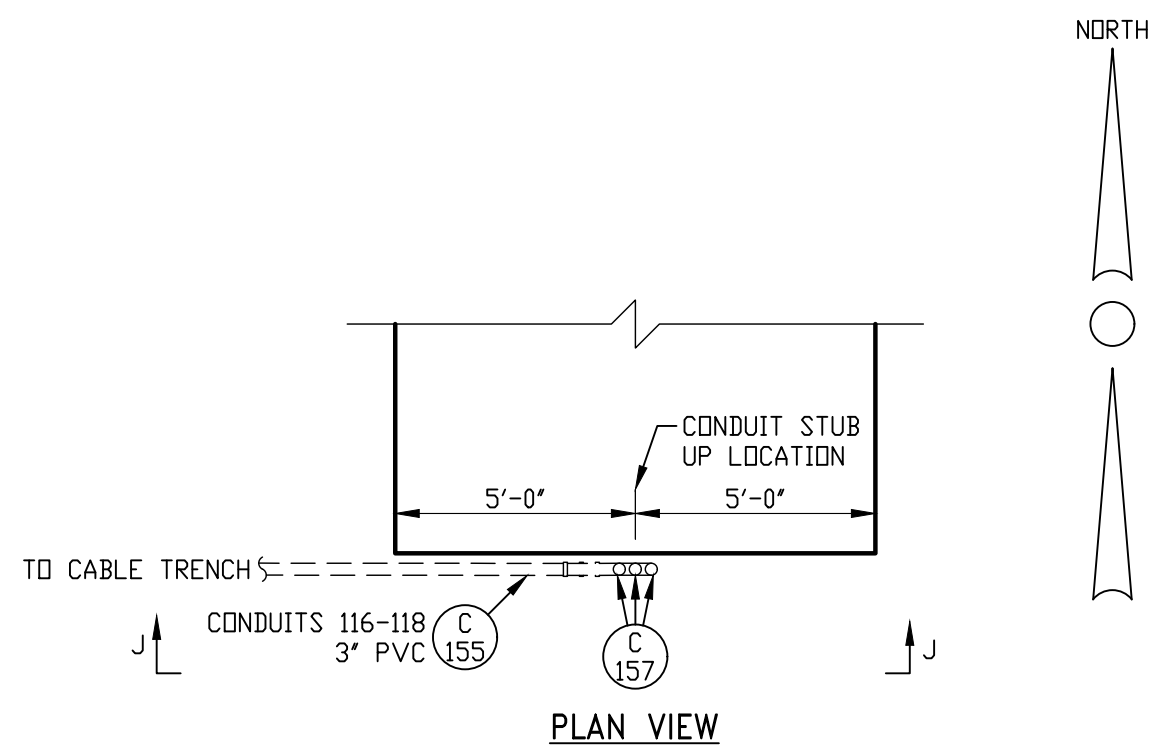
DETAIL D
138KV CVTs CC57 & CC72



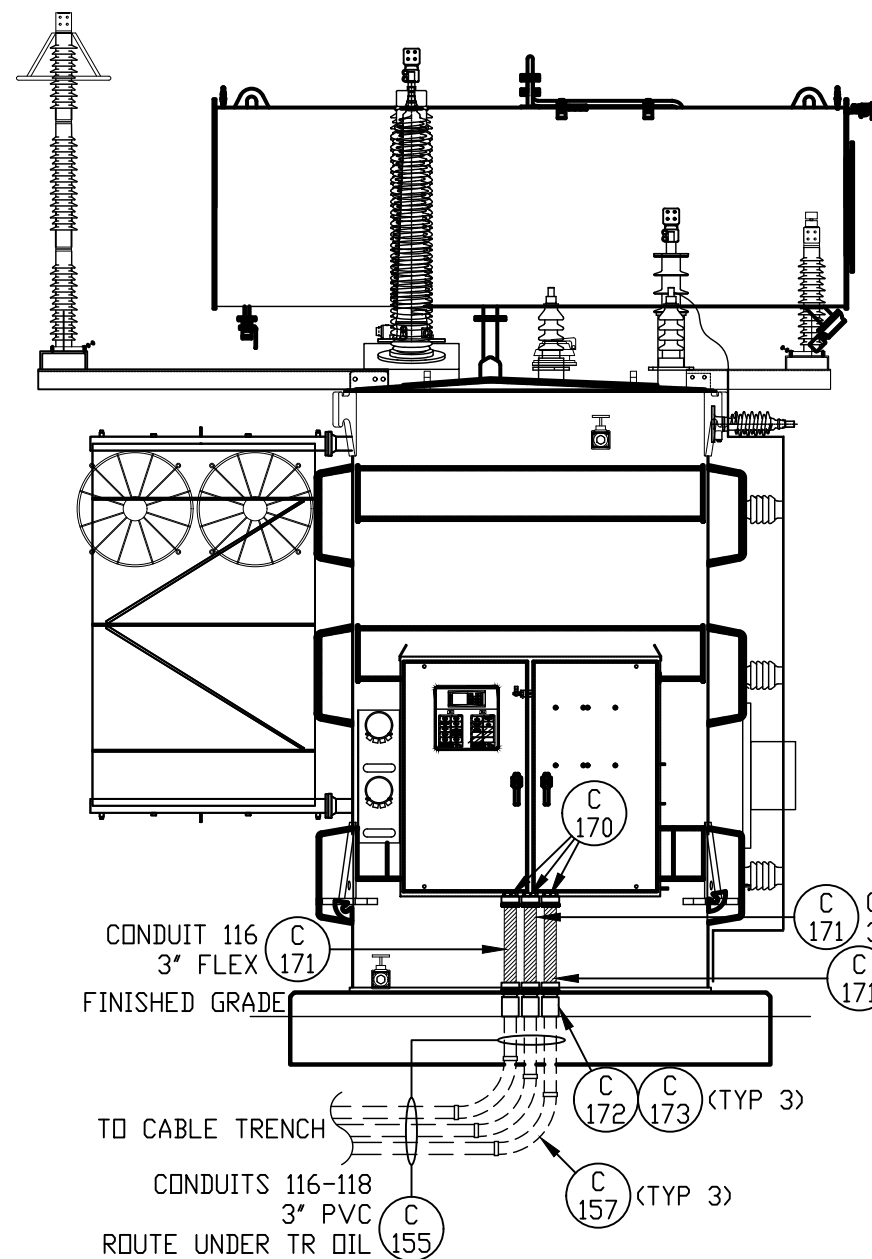
ELEVATION VIEW

TABLE 3	
LOCATION	CONDUIT 'E'
138KV ND 1 STA PWR SSVT TR 83	106
69KV ND 2 STA PWR SSVT TR 94	134

DETAIL E
TYPICAL STATION SERVICE VOLTAGE TRANSFORMER

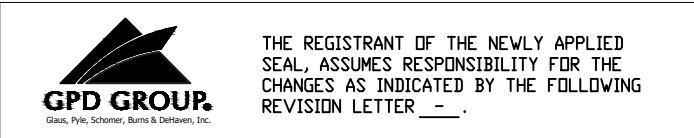


PLAN VIEW

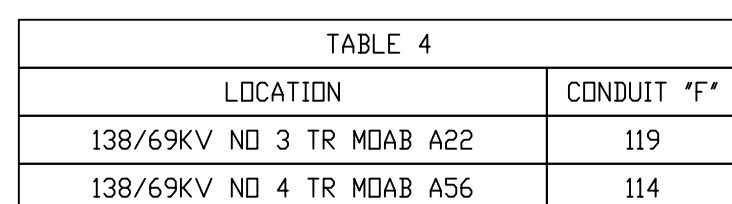


ELEVATION J-J

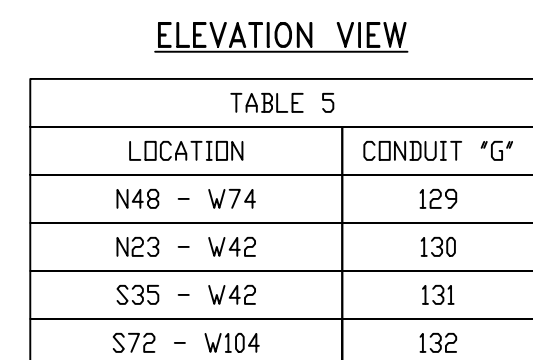
DETAIL F
138/69KV ND 4 TR



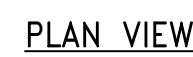
BY: WDB APP: SPS DATE: 05/26/2022 SCALE: 1/4"=1'-0" FILE: 36x24	FirstEnergy Energy Delivery Technical Services	OPERATING COMPANY OHIO EDISON (OE)	REGION OH-CE	AREA LAKE ERIE
WELLINGTON				
CONDUIT DETAILS A THROUGH F				
SAP NO. 15067136	0-471-16-07			



DETAIL G
TYPICAL MOTOR OPERATOR



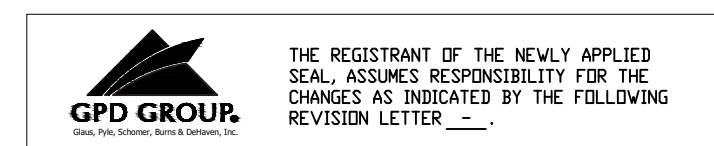
DETAIL H
TYPICAL STRUCTURE UP-DOWN LIGHTING




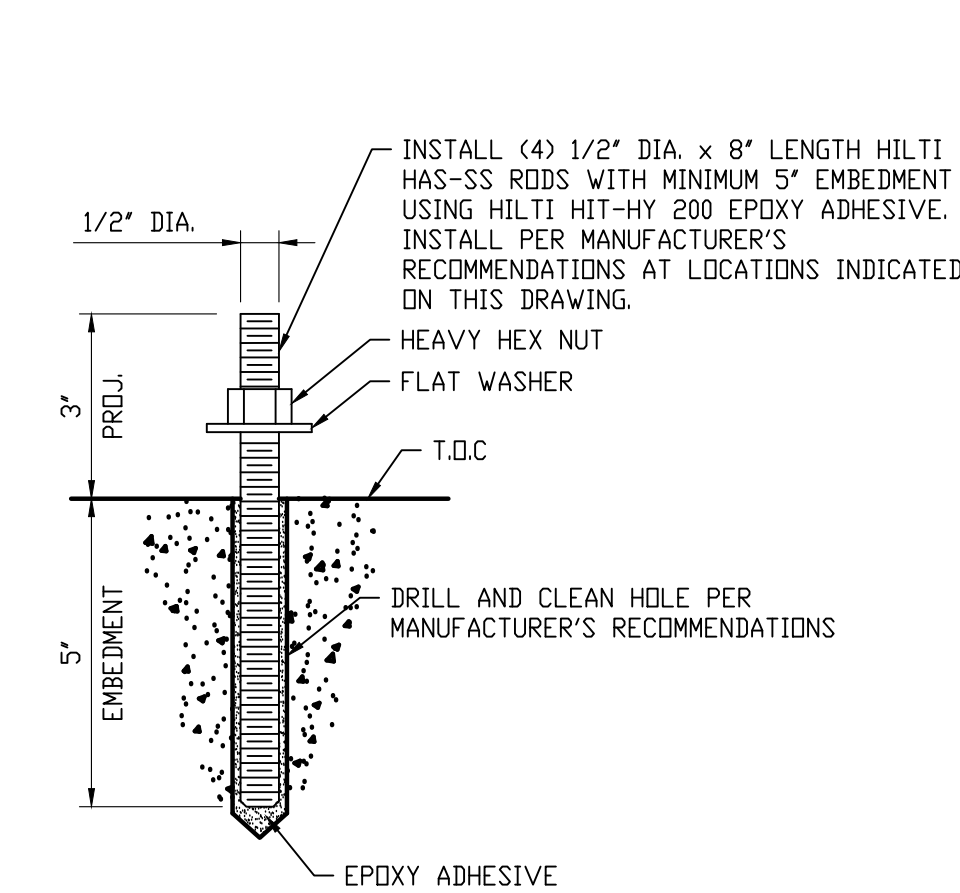
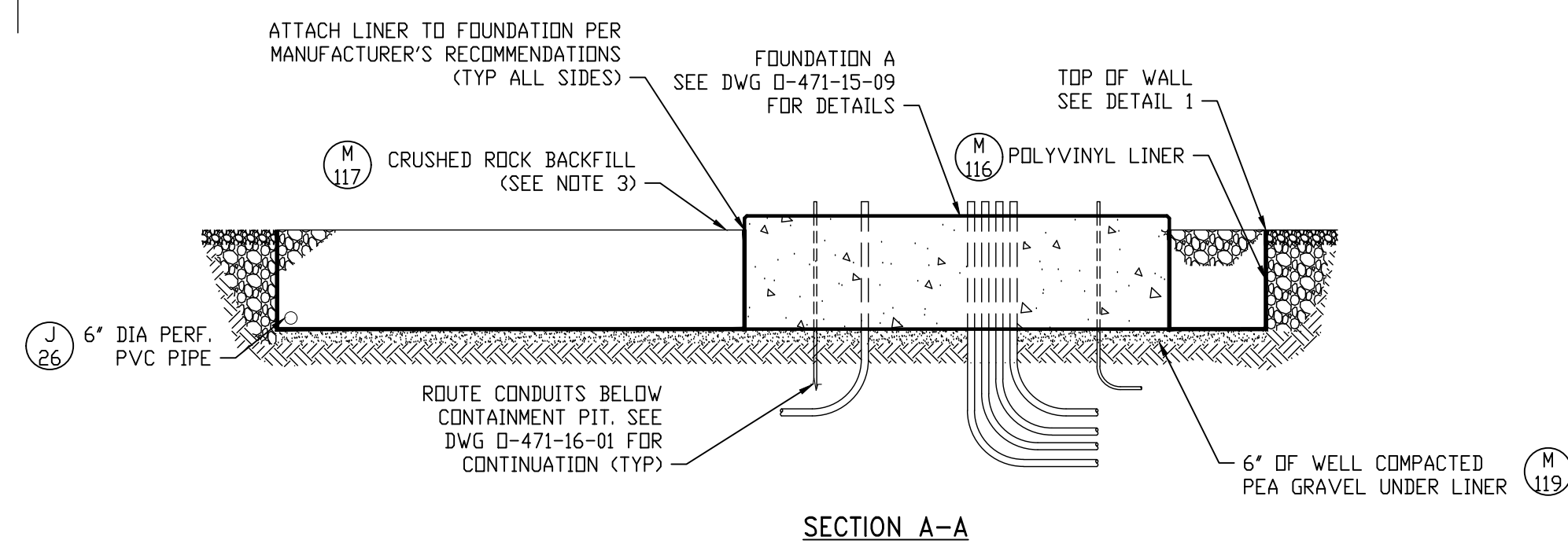
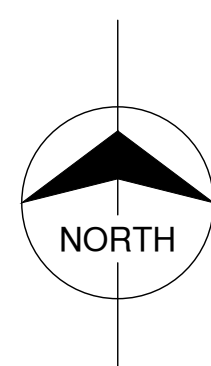
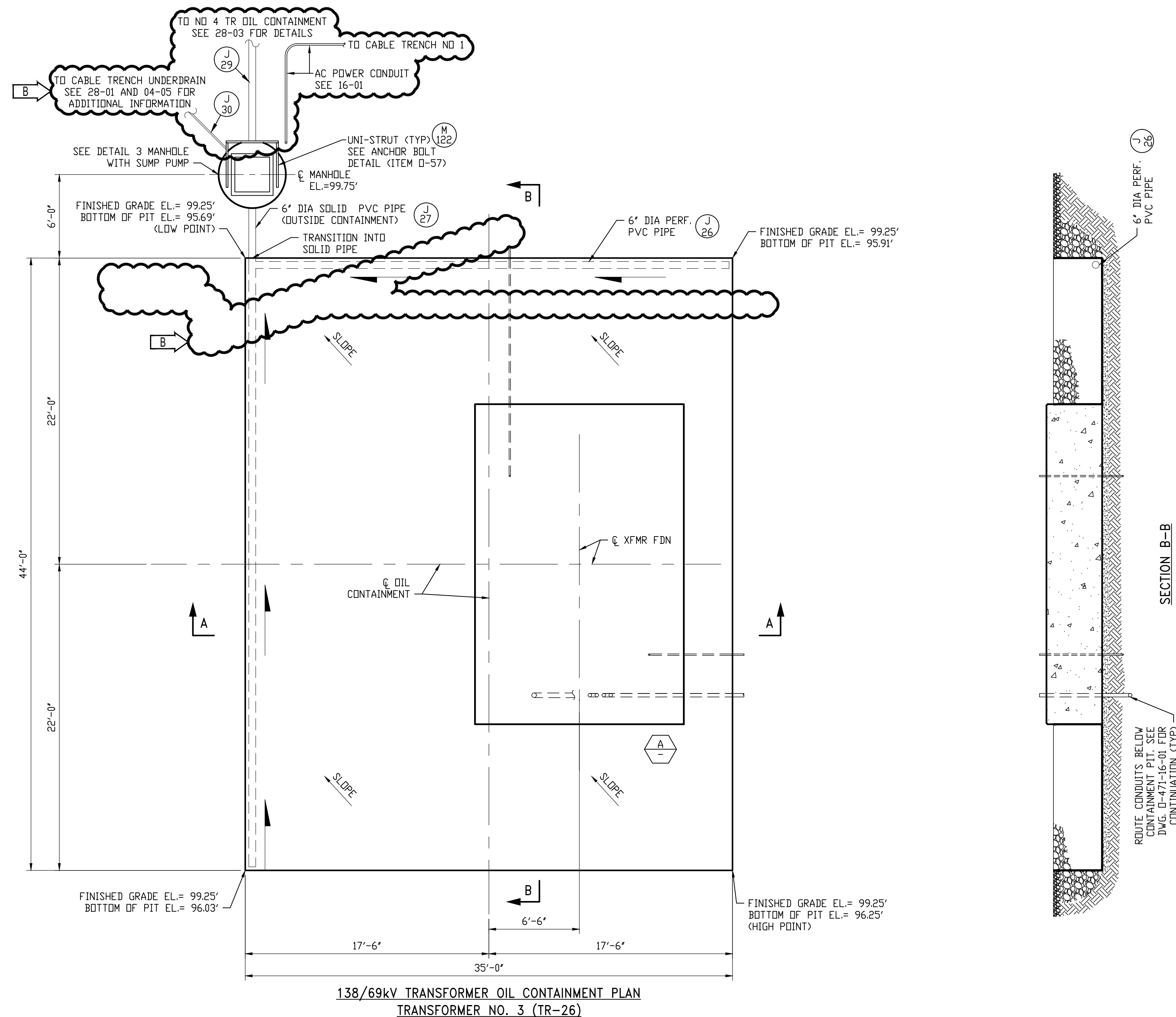
DETAIL J
138KV BEAVER LINE CVT_s CC79 AND
DISCONNECT SWITCH D82 AUX SWITCH



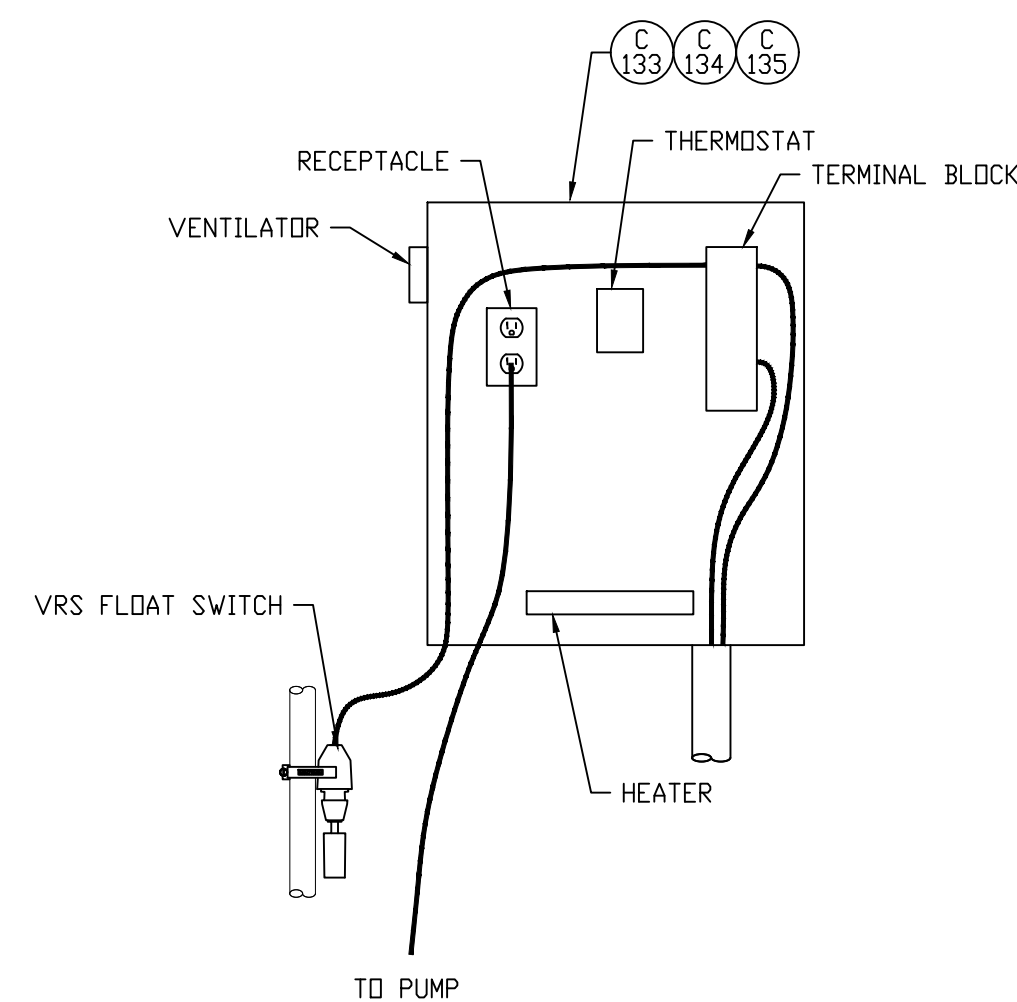
DETAIL K
138KV BROOKSIDE LINE CVT_s CC75 AND
DISCONNECT SWITCH D78 AUX SWITCH



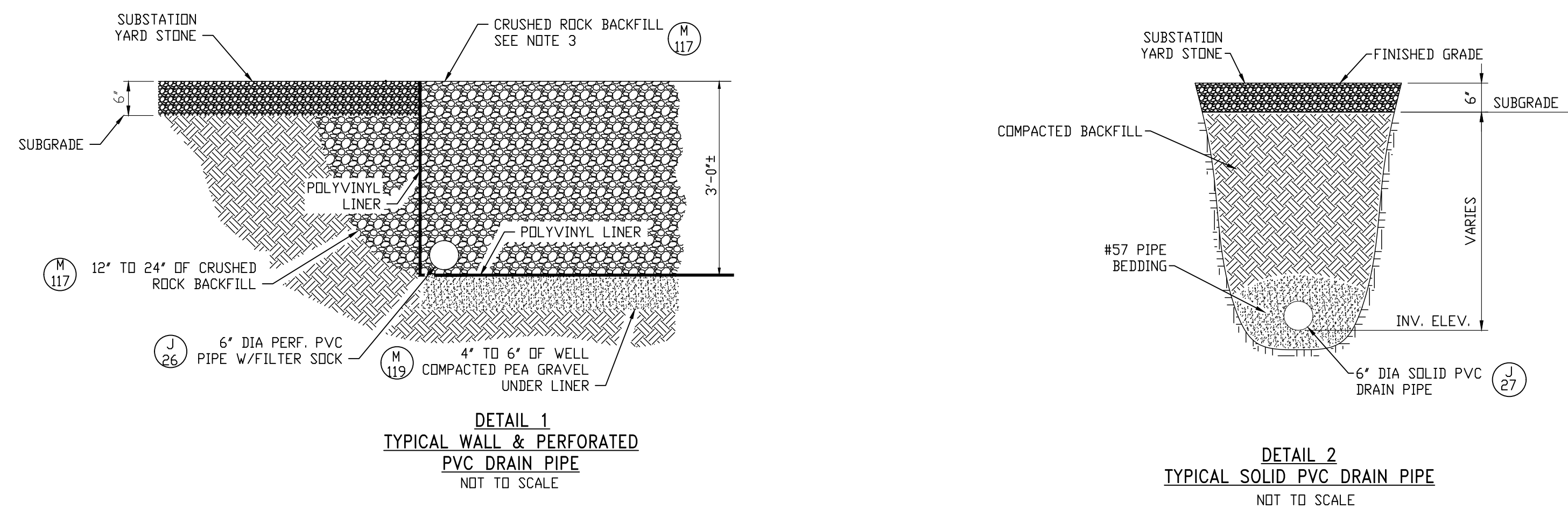
BY: WJB		DEST. CODE:	OPERATING COMPANY:	REV. CHG.	ASSA
APP: SPS			OHIO EDISON (OE)	DN-CE	AREA ERIE
DATE: 05/26/2002		Energy Delivery Technical Services	SCALE: 1/4"=1'-0"	TITLE WELLINGTON	
SUBJ: CONSTRUCTION	(GPD)	DWG: 36x24	TITLE CONDUIT DETAILS G THROUGH K		
		CAP. NO. 15067136	DEC. TO	REV. 0-471-16-08 -	



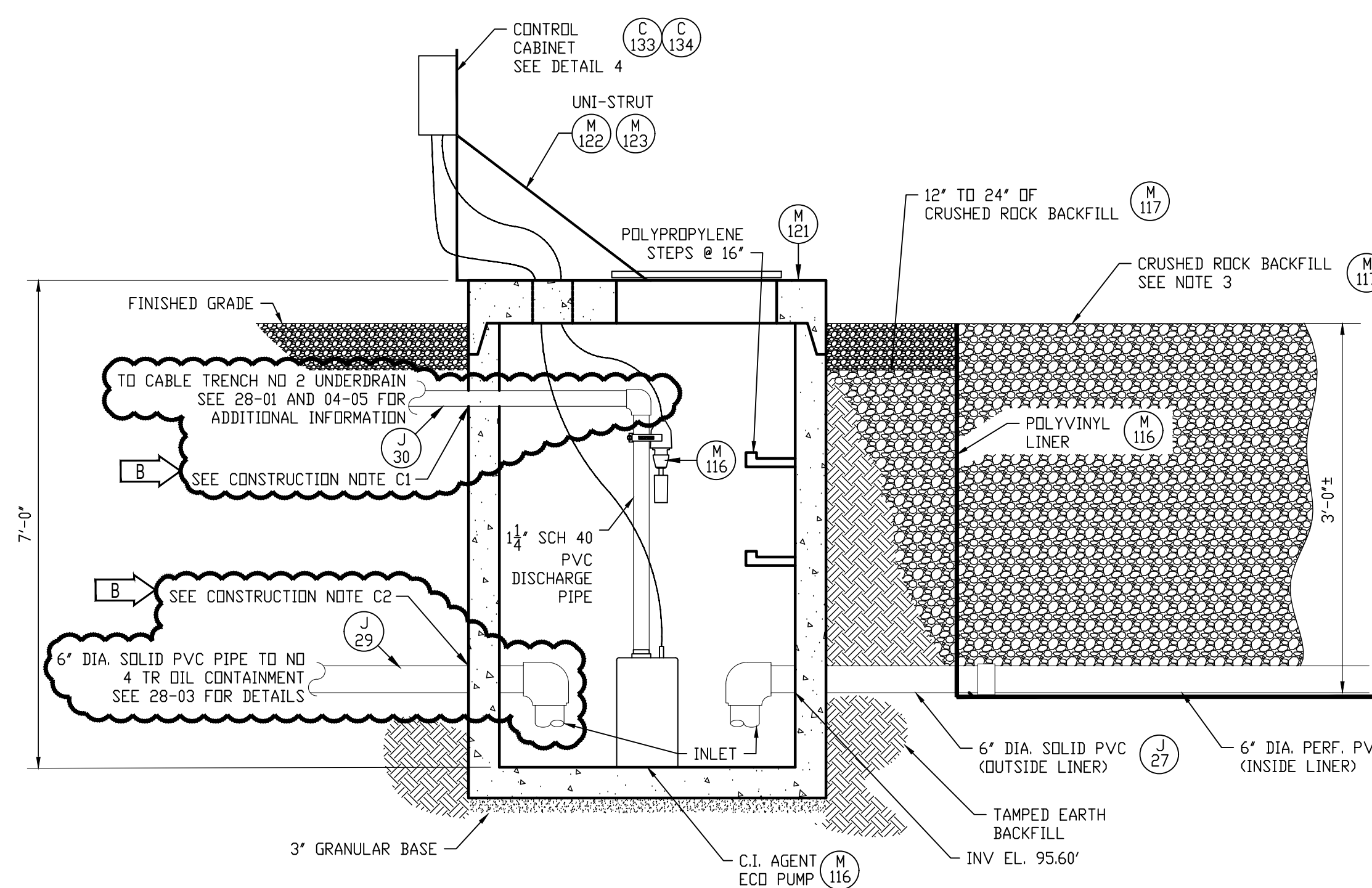
ANCHOR BOLT DETAIL
(ITEM Q-57)
1/2" DIA. x 8"
(4 REQUIRED - PER MANHOLE)
(4 REQUIRED - NETWORK #14127981)
NOT TO SCALE



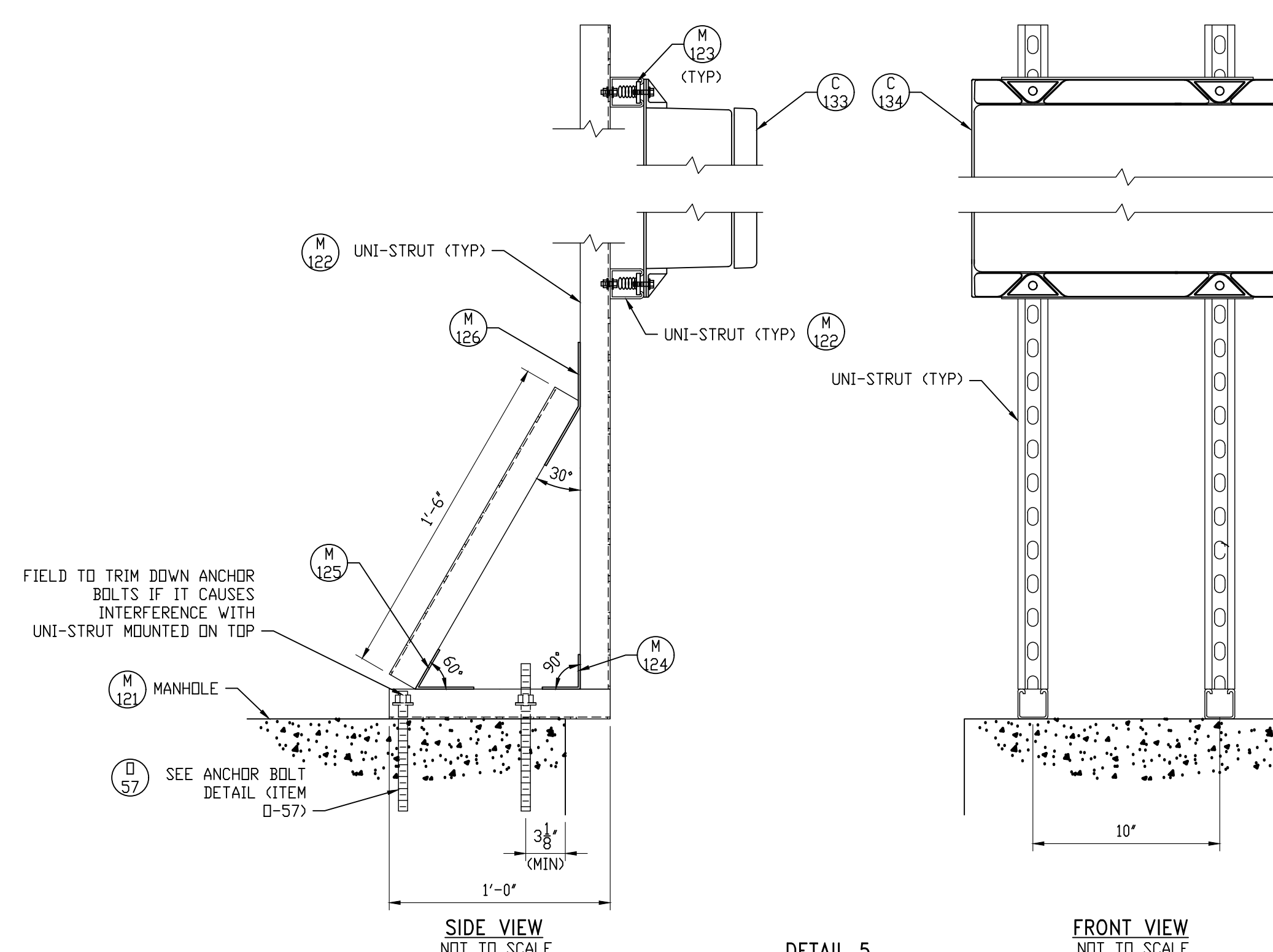
DETAIL 4
SUMP PUMP CONTROLLER
NOT TO SCALE
SEE DWG Q-471-03-02 FOR BOM AND WIRING



DETAIL 2
TYPICAL SOLID PVC DRAIN PIPE
NOT TO SCALE



DETAIL 3
MANHOLE WITH SUMP PUMP
NOT TO SCALE
(LOOKING EAST)



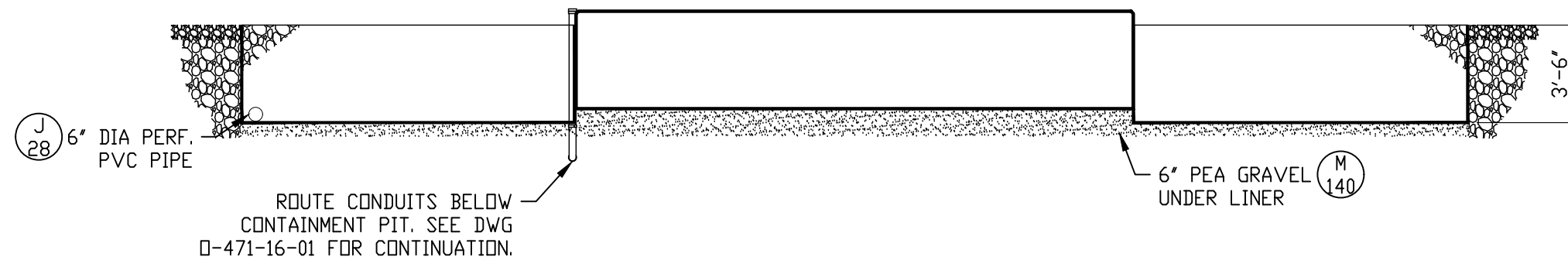
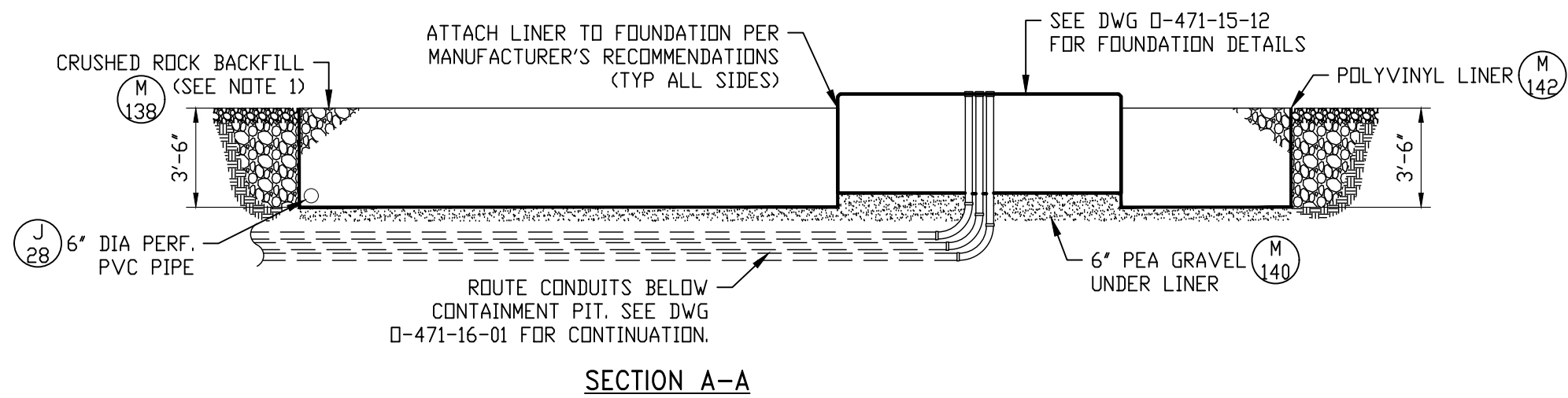
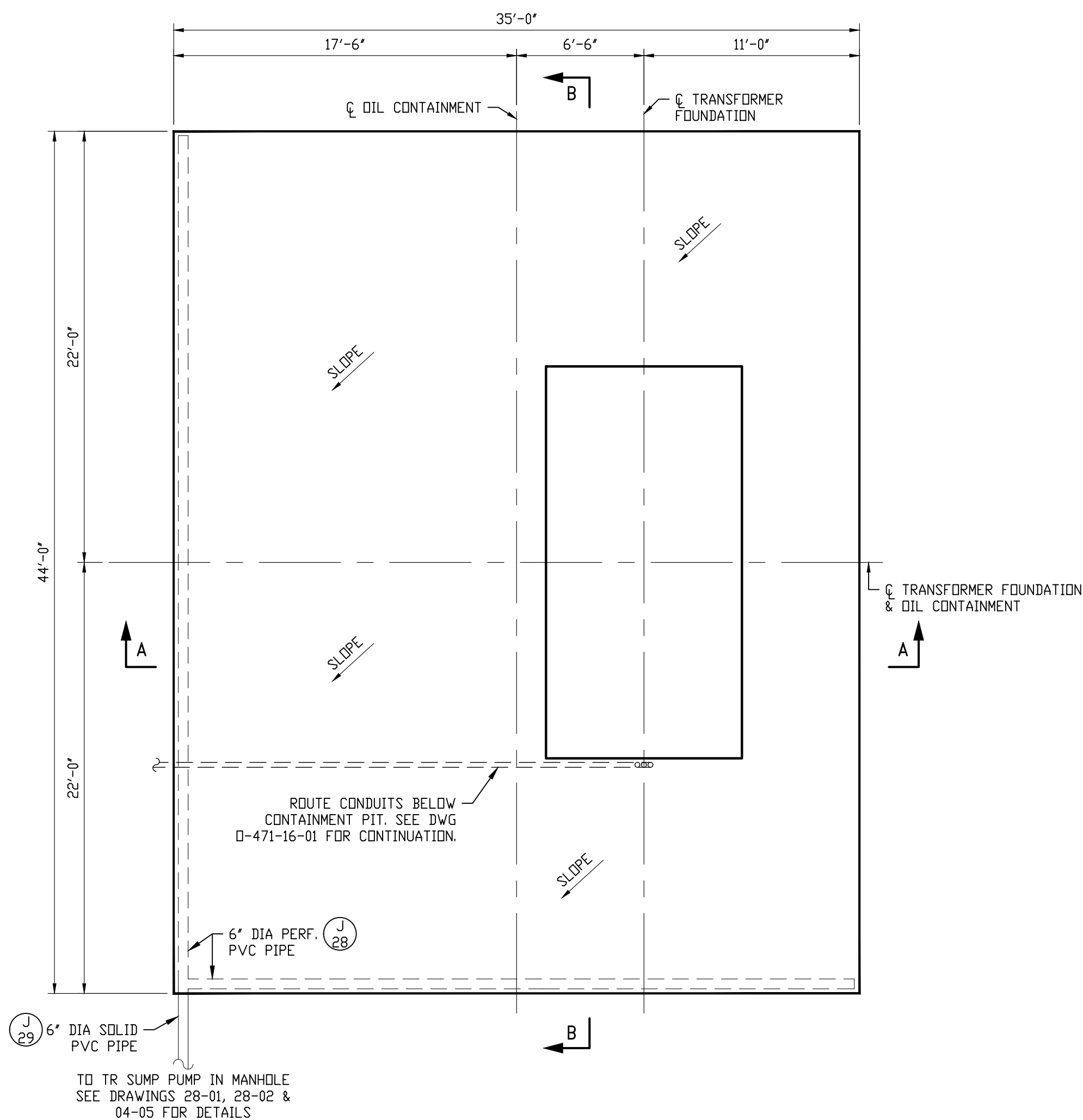
DETAIL 5
UNI-STRUT
NOT TO SCALE

CONSTRUCTION NOTES FOR SAP NETWORK NO 15067136:
C1. FIELD SHALL REQUIRE DISCHARGE PIPE OUTLET FROM ABOVE GRADE SPLASH BLOCK TO CABLE TRENCH NO 2 BELOW GRADE UNDERDRAIN. FIELD SHALL CORE DRILL MANHOLE SIDEWALL AND PROPERLY SEAL CONDUIT ENTRANCE AFTER INSTALLATION.
C2. FIELD SHALL ROUTE NO 4 TR OIL CONTAINMENT WATER DISCHARGE PIPE TO MANHOLE. FIELD SHALL CORE DRILL MANHOLE SIDEWALL AND PROPERLY SEAL CONDUIT ENTRANCE AFTER INSTALLATION.

NOTES:

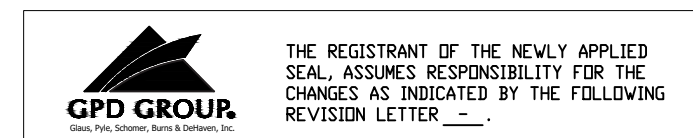
- OIL CONTAINMENT DIMENSIONS SHALL BE APPROXIMATELY 44'-0" x 35'-0" x 3'-0". DEPTH VARIES.
- POLYVINYL SUMP LINER AND ECO PUMP SHALL BE PROVIDED AND INSTALLED BY C.I. AGENT SOLUTIONS. BELOW GRADE CONTRACTOR TO COORDINATE THIS WORK WITH EXCAVATING, STONE, AND FOUNDATION.
- CRUSHED ROCK BACKFILL WITHIN LIMITS OF OIL CONTAINMENT PIT SHALL BE CLEAN WASHED UNIFORMLY GRADED AASHTO SIZE NO. 4 CRUSHED LESTONE PER FE STANDARD.
- SLOPE FLOOR OF OIL CONTAINMENT PIT TO DRAIN AS SHOWN.
- WRAP 6" DIA PVC PIPE OUTSIDE CONTAINMENT WITH GEOTEXTILE FABRIC.
- CONTRACTOR SHALL SUPPLY ALL PVC PIPES AND JOINTS FOR PIPING PLAN AS SHOWN ON THIS DRAWING. BACKFILL AND COMPACT WITH FILL MATERIAL AS SPECIFIED OVER SOLID PIPE SECTION.
- C.I. AGENT SHALL SEAL CONDUIT PENETRATIONS PER MANUFACTURER'S RECOMMENDATIONS.
- SEE DWG Q-471-15-01 FOR FOUNDATION LAYOUT AND T.O.C. ELEVATIONS.
- SEE DWG Q-471-28-01 FOR EXISTING PIPE DETAILS.
- CONDUIT FOR CONTROL CABLE AND GROUND WIRE SHALL BE ROUTED UNDER CONTAINMENT LINER BRING ALL CONDUITS UP TO A MINIMUM OF 2'-0" BELOW SUBGRADE OUTSIDE OF LIMITS OF OIL CONTAINMENT USING 45 DEGREE ELBOWS. STAKE LOCATION OF CONDUIT STUB AFTER BACKFILLING.
- MANHOLE STEPS SHOWN FOR CLARITY. MANHOLE STEPS SHALL NOT BE PLACED ON THE SAME SIDE OF THE MANHOLE AS THE SUMP PUMP OR THE INLET PIPE.
- FIELD SHALL SUPPLY PIPE REDUCERS TO CONNECT C.I. AGENT ECOPUMP OUTLET PIPE WITH EXISTING PIPE AS SHOWN ON DWG Q-471-28-01. REDUCER SHALL FORM WATER TIGHT SEALS WITH ECOPUMP AND EXISTING PIPE.
- REQUIRED OIL CAPACITY 9,944 GALLONS.

		THE REGISTRANT OF THE NEWLY APPLIED SEAL ASSUMES RESPONSIBILITY FOR THE CHANGES AS INDICATED BY THE FOLLOWING REVISION LETTER 'B'.	
DATE: 05/26/2022 DRAWN: J. W. B.	SCALE: 3/16"=1'-0" TITLE: OIL CONTAINMENT	PROJECT: WELLINGTON SHEET: 13 OF 13	CLIENT: LAKE ERIE
REMOVED CONDUITS 36-39. REVISED SUMP PUMP DETAIL 3 FOR ADDITION OF NO 4 TR OIL CONTAINMENT AND DRAWING TITLE. REMOVED NOTE 13. ADDED CONSTRUCTION NOTES. (GPD)		OIL CONTAINMENT PLAN AND DETAILS NO 3 TR	
15067136		Q-471-28-02	

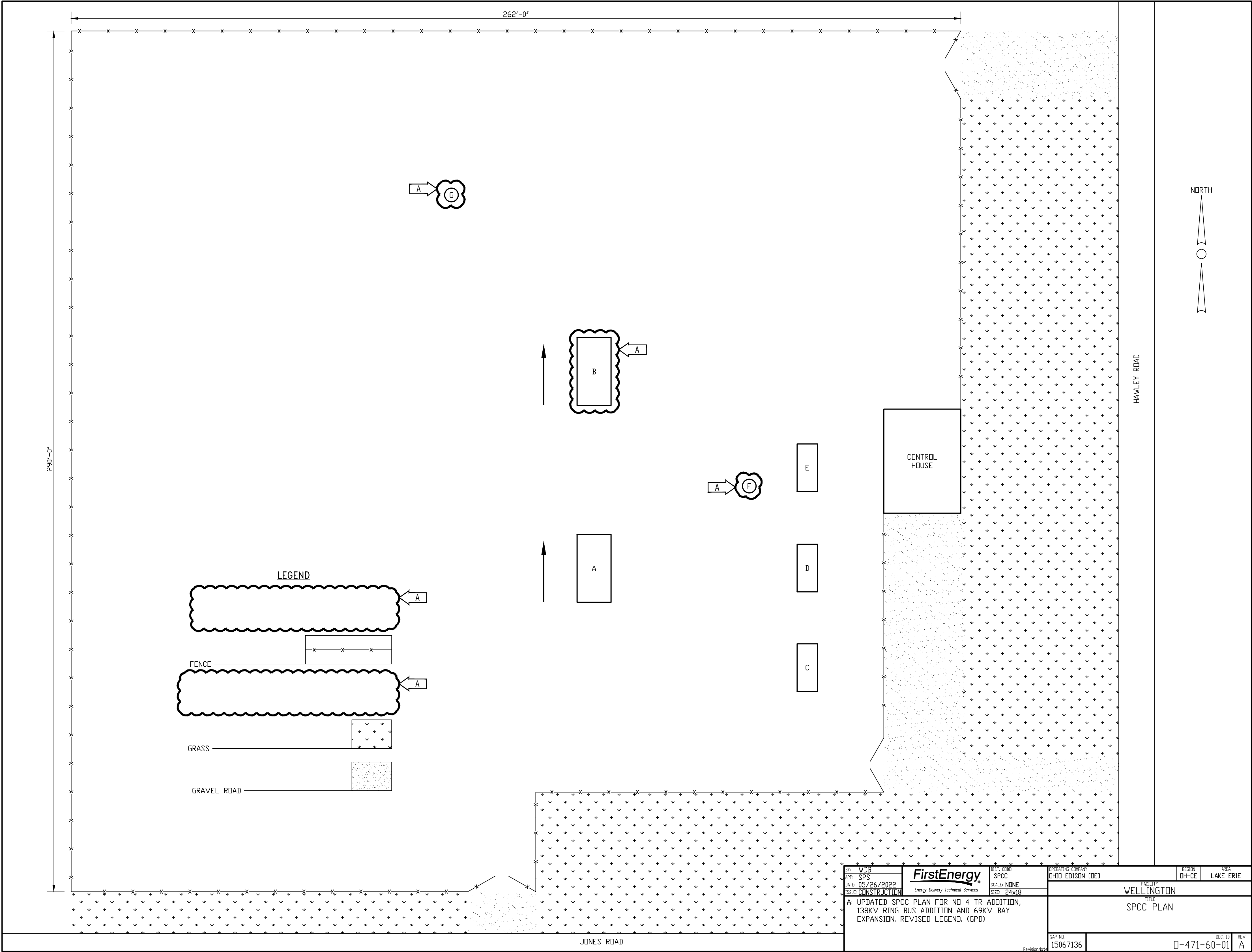


NOTES:

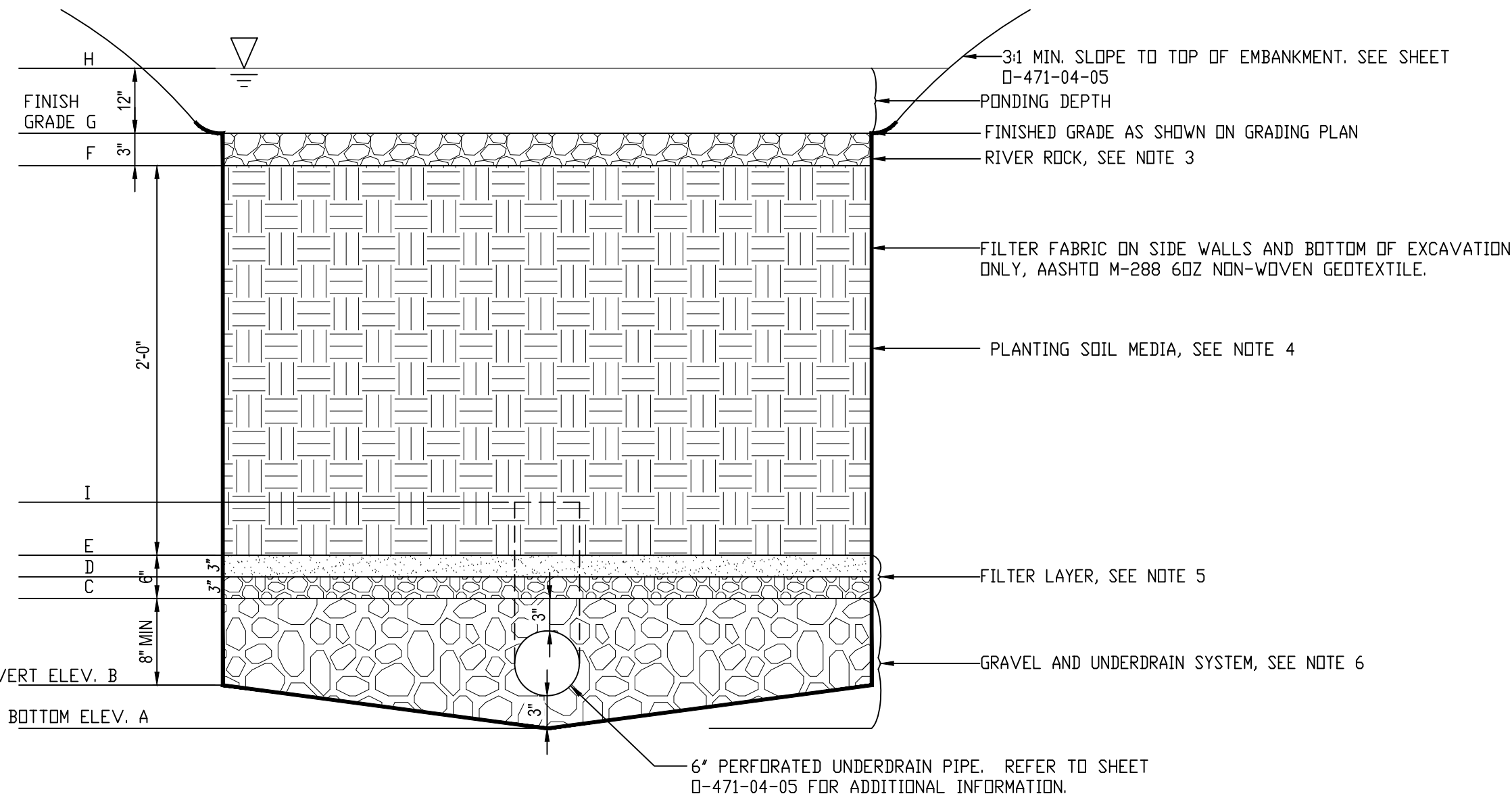
1. CRUSHED ROCK BACKFILL WITHIN LIMITS OF OIL CONTAINMENT PIT SHALL BE CLEAN WASHED UNIFORMLY GRADED AASHTO SIZE #57 CRUSHED LIMESTONE PER FE STANDARD.
2. SLOPE FLOOR OF OIL CONTAINMENT PIT TO DRAIN AS SHOWN.
3. CONTRACTOR SHALL SUPPLY ALL PVC PIPES AND JOINTS FOR PIPING PLAN AS SHOWN ON THIS DRAWING. BACKFILL AND COMPACT WITH FILL MATERIAL AS REQUIRED OVER SOLID PIPE SECTION.
4. SEE DWG D-471-15-01 FOR FOUNDATION LAYOUT AND T.O.C. ELEVATIONS, 16-01 FOR CONDUIT ROUTING AND 16-05 FOR GROUNDING LAYOUT.
5. SEE DWG D-471-28-01 & 28-02 FOR EXISTING PIPE DETAILS.
6. GROUND WIRE AND CONDUIT FOR CONTROL CABLE SHALL BE ROUTED UNDER CONTAINMENT LINER AND SEALED TIGHT AT THE TRANSFORMER FOUNDATION PER LINER MANUFACTURER SPECIFICATIONS. BRING ALL CONDUITS UP TO A MINIMUM OF 2'-0" BELOW SUBGRADE OUTSIDE OF LIMITS OF OIL CONTAINMENT USING 45 DEGREE ELBOWS. STAKE LOCATION OF CONDUIT STUB AFTER BACKFILLING.
7. TOTAL OIL CAPACITY: 10,499 GALLONS



BY: WDB APP: SPS DATE: 05/26/2022 ISSUE: CONSTRUCTION (GPD)	FirstEnergy Energy Delivery Technical Services	DIST. CODE: SCALE: 3/16"=1'-0" SIZE: 24x18	OPERATING COMPANY OHIO EDISON (OE)	REGION OH-CE	AREA LAKE ERIE
			FACILITY WELLINGTON		
			TITLE OIL CONTAINMENT PLAN AND DETAILS NO 4 TR		
			SAP NO. 15067136	DOC. ID D-471-28-03	REV. -



BY: WDB APP: SPS DATE: 05/26/2022 ISSUE: CONSTRUCTION	FirstEnergy Energy Delivery Technical Services	DIST. CODE: SPCC SCALE: NONE SIZE: 24x18	OPERATING COMPANY: OHIO EDISON (OE)	REGION: OH-CE AREA: LAKE ERIE
A: UPDATED SPCC PLAN FOR NO 4 TR ADDITION, 138KV RING BUS ADDITION AND 69KV BAY EXPANSION. REVISED LEGEND. (GPD)			FACILITY: WELLINGTON TITLE: SPCC PLAN	
SAP NO: 15067136		DOC. ID: 0-471-60-01		REV. A



NOTES:

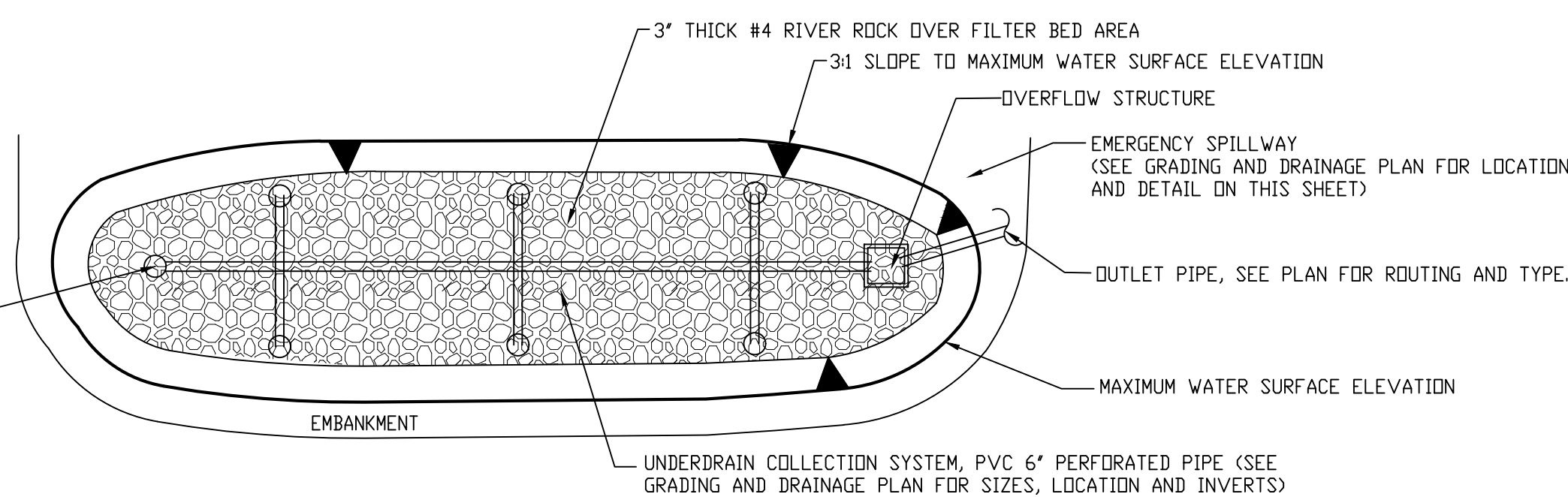
- CONSTRUCTION SHALL BE PER ODMR RAIN WATER MANUAL CHAPTER 2.10. BIORETENTION REQUIREMENTS.
- TIMING OF CONSTRUCTION - CONSTRUCTION OF BIORETENTION PRACTICES SHALL TAKE PLACE AFTER LAND GRADING IS COMPLETE AND THE CONTRIBUTING DRAINAGE AREA HAS BEEN FULLY STABILIZED.
- RIVER ROCK - THE RIVER ROCK LAYER SHOULD CONSIST OF A MINIMUM OF 3 INCHES THICK.
- TEXTURE CLASS: LOAMY SAND, HAVING NO LESS THAN 70% SAND AND NO GREATER THAN 10% CLAY CONSIDERING ONLY THE MINERAL FRACTION OF THE SOIL.
 - PH RANGE: 5.2-8.0
 - SOLUBLE SALTS: 500 PPM MAXIMUM
 - DECOMPOSED ORGANIC MATTER: 3-5% BY WEIGHT (NOTE: THIS TRANSLATES TO 8-20% ORGANIC MATTER BY VOLUME. SEE NOTE ON "CREATING A SUITABLE SOIL MEDIA" BELOW.)
 - PHOSPHORUS: PHOSPHORUS OF THE PLANTING MEDIA SHOULD FALL BETWEEN 15 AND 60 MG/KG (PPM) AS DETERMINED BY THE MEHLICH III TEST. FOR SITES IN WATERSHEDS WITH A PHOSPHORUS TMDL OR SITES WITH HIGH PHOSPHORUS LOADS, THE PHOSPHORUS CONTENT OF THE PLANTING MEDIA SHOULD FALL BETWEEN 10 AND 30 MG/KG AS DETERMINED BY THE MEHLICH III TEST.
 - SAND ADDED SHALL BE CLEAN (ND FOUNDRY SAND) AND MEET AASHTO M-6 OR ASTM C-33 WITH A GRAIN SIZE OF 0.02-0.01 INCHES.

PLAN ELEV.'S	BASIN
I	875.00
H	877.75
G	876.75
F	876.50
E	874.50
D	874.25
C	874.00
B	873.33
A	873.08

CREATING SUITABLE SOIL MEDIA - TO MEET THE ABOVE SOIL MEDIA CRITERIA, THE FOLLOWING MIX (BY VOLUME) IS RECOMMENDED AS A STARTING POINT:
SAND: 7.5 PARTS CLEAN SAND (I.E., ASTM C-33 OR EQUIVALENT, <1% PASSING NO. 200 SIEVE)
NATIVE SOIL: 1.5 PART (LOAM, SILT LOAM OR CLAY LOAM TEXTURE)
DECOMPOSED ORGANIC MATTER: 1 PART (LEAF COMPOST, PINE BARK FINES, MULCH FINES, ETC.)
BASED ON TESTING, EXPERIENCE AND NATIVE SOIL CHARACTERISTICS THE SAND, SOIL OR ORGANIC MATTER CONTENT CAN BE ADJUSTED TO ACHIEVE THE DESIRED MIX. THE SOIL MIX SUPPLIER SHOULD PRE-TEST THE SAND, NATIVE SOIL AND ORGANIC MATTER TO EVALUATE THEIR PHOSPHORUS CONTENT. THE SOIL MIX SUPPLIER MUST PRESENT A SOIL TEST SHOWING THE PLANTING MEDIA MEETS THE CRITERIA ABOVE.

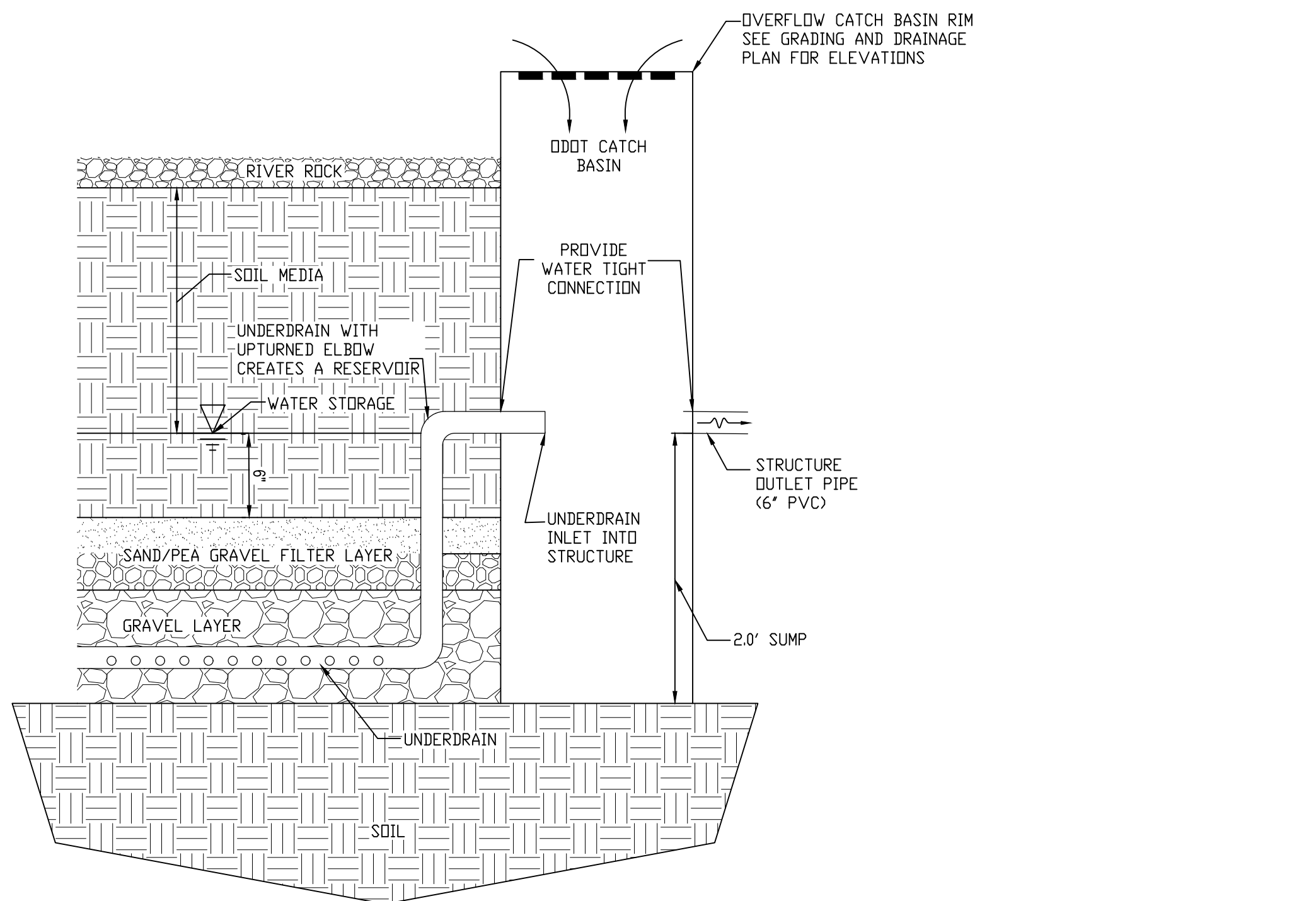
- FILTER LAYER - THREE INCHES OF CLEAN MEDIUM CONCRETE SAND (ASTM C-33) OVER THREE INCHES OF #8 OR #78 STONE (PEA GRAVEL).
- GRAVEL LAYER AND UNDERDRAIN SYSTEM - A GRAVEL BED CONSISTING OF #57 WASHED STONE (EXCLUDING RECYCLED CONCRETE) SHALL BE PROVIDED AS DRAINAGE MEDIA AND BEDDING MATERIAL FOR UNDERDRAIN PIPES. THE GRAVEL LAYER SHALL GENERALLY BE 10-12" THICK WITH A MINIMUM OF 3-IN. OF GRAVEL PROVIDED ABOVE AND BELOW UNDERDRAIN PIPES.
- PLANTING SOIL MEDIA STOCK TO BE USED ON PROJECT SHALL BE TESTED AND CERTIFIED BY A CERTIFIED LABORATORY TO INSURE THEY MEET THE REQUIRED SPECIFICATIONS.
- PLANTING SOIL MEDIA SHALL BE PLACED IN 12 INCH LIFTS AND LIGHTLY SETTLED BY SOAKING WITH WATER. THIS SHALL BE COMPLETED AT A STEADY RATE, DO NOT RUSH.
- CONTRACTOR SHALL PLACE ADDITIONAL PLANTING SOIL MEDIA TO ACCOUNT FOR SETTLEMENT. DO NOT COMPACT DURING OR AFTER INSTALLATION.

TYPICAL SECTION

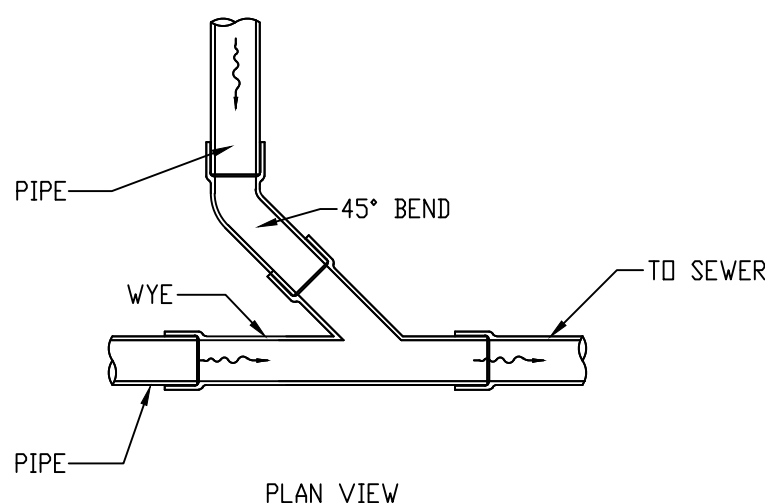


TYPICAL BIORETENTION AREA SCHEMATIC (PLAN)

NOTE: BIORETENTION CELLS SHALL NOT BE INSTALLED UNTIL ALL UPSTREAM AREAS ARE STABILIZED. THIS INCLUDES THE INSTALLATION OF THE UNDERDRAIN AND GRAVEL LAYERS.



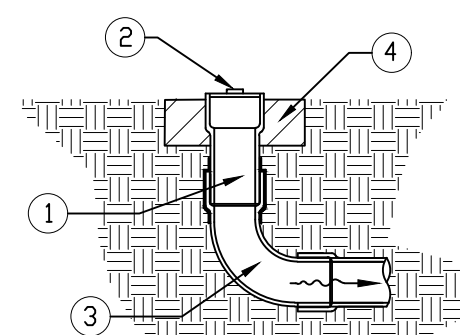
BIORETENTION



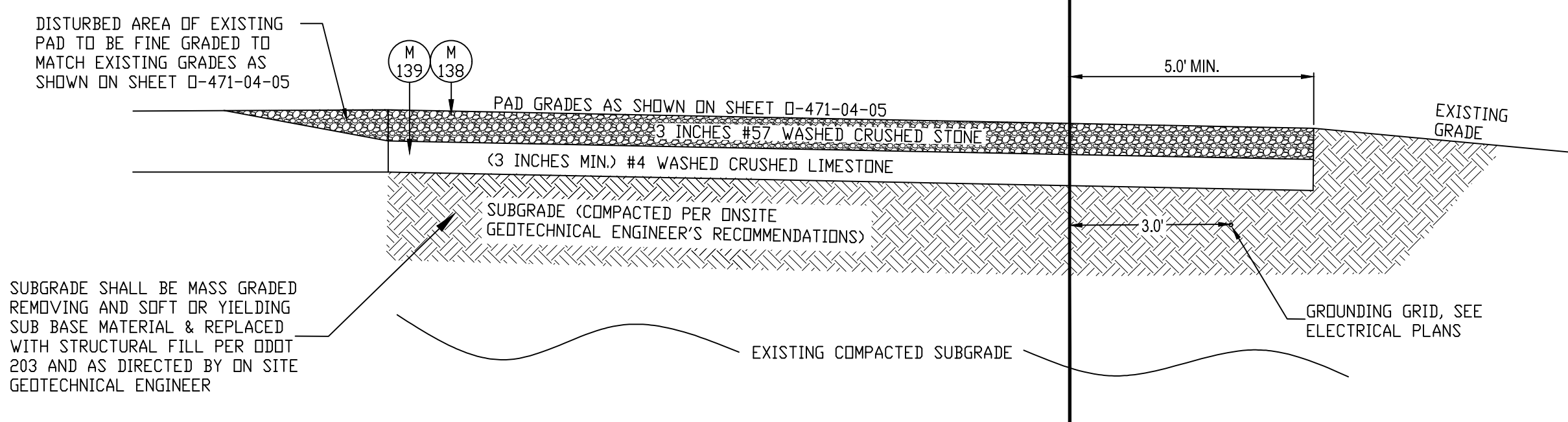
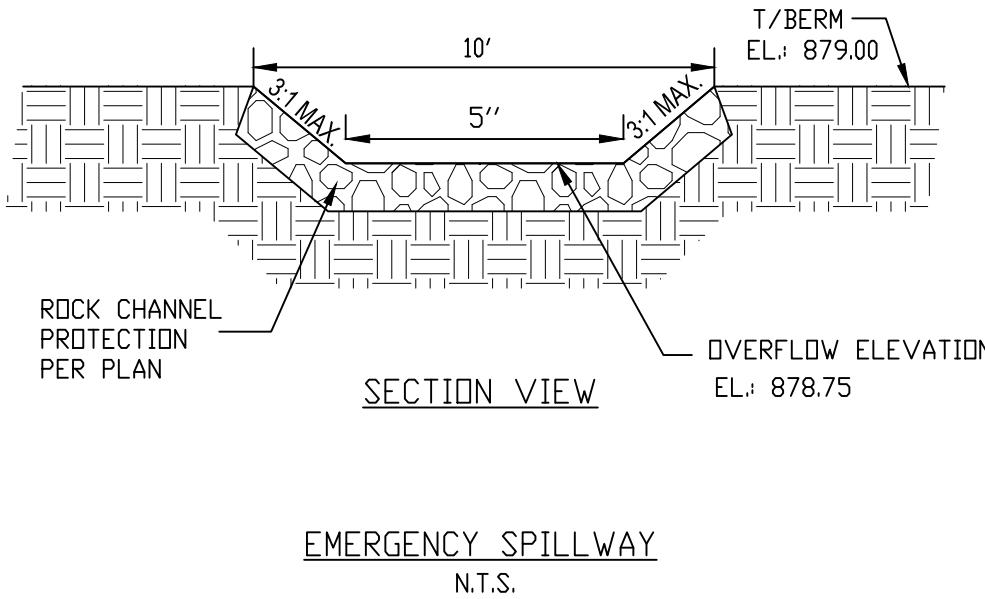
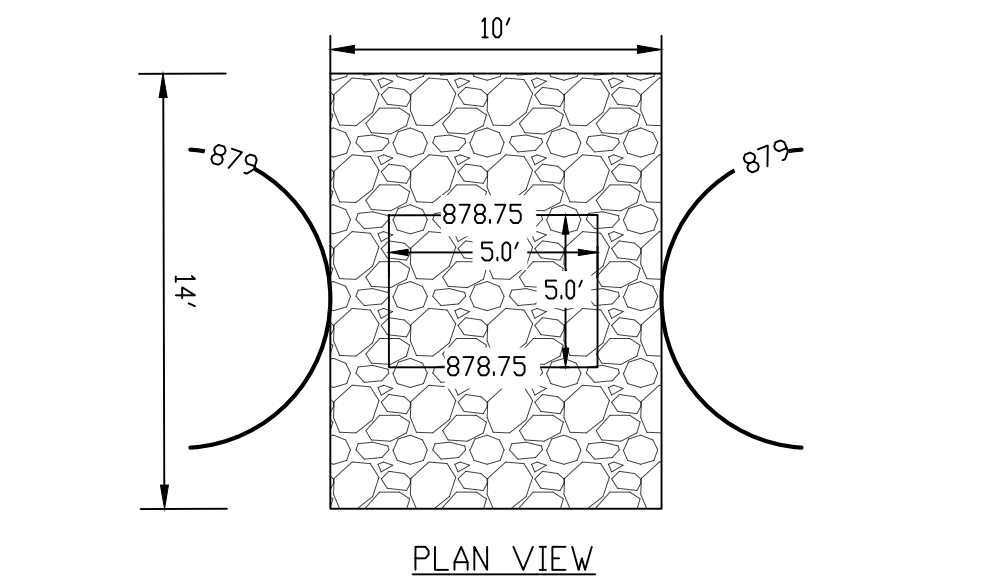
WYE CONNECTION
N.T.S.

KEYED NOTES:

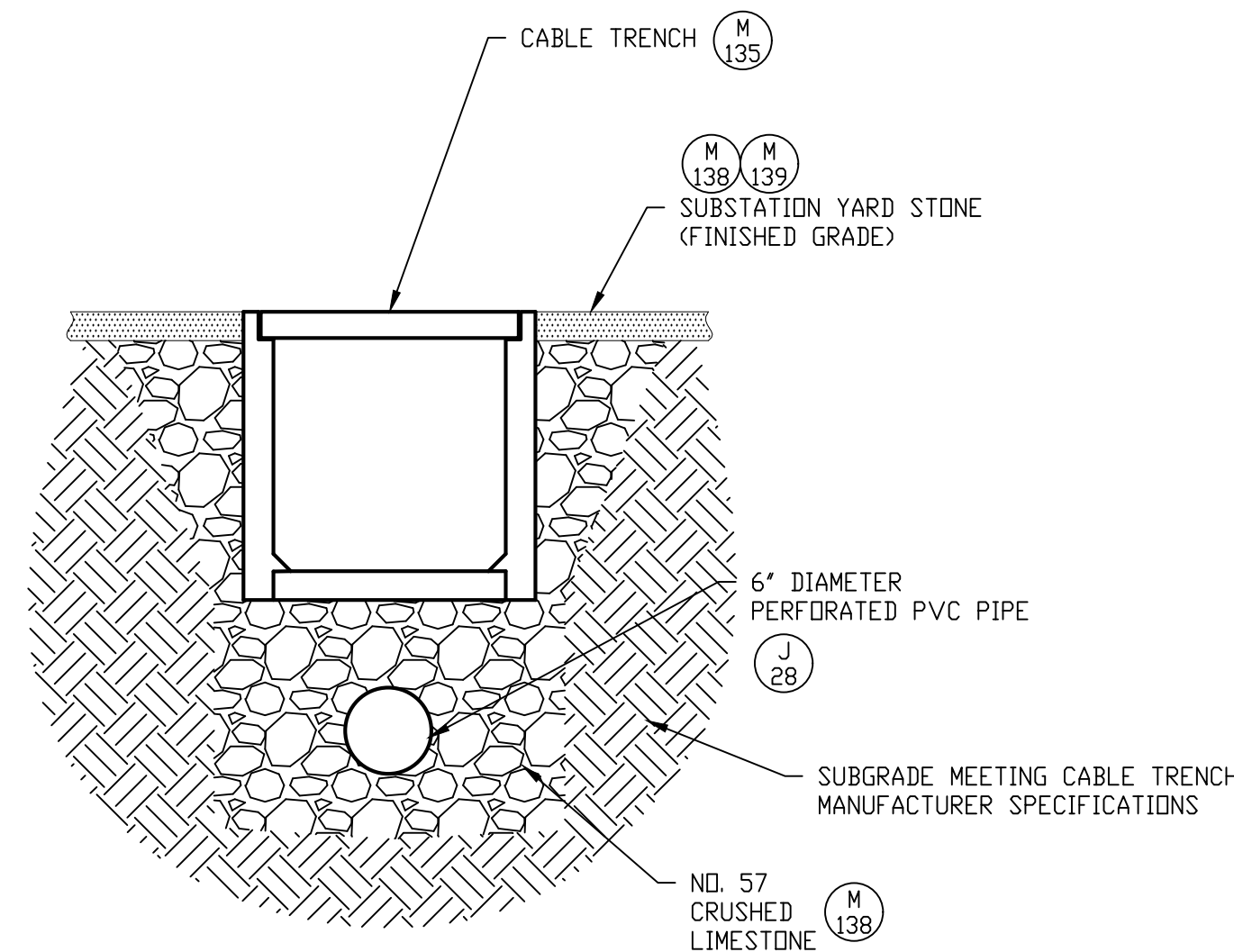
- 6" DIA. CLEAN-OUT PIPE
- THREADED CLEAN-OUT CAP
- 45° BEND
- CONCRETE COLLAR



CLEANOUT (LAWN AREA)
N.T.S.



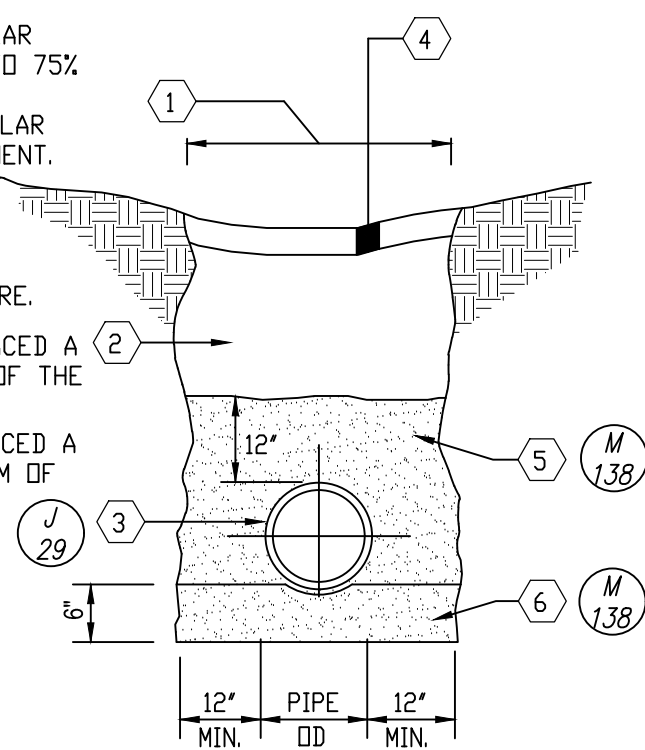
TYPICAL SUBSTATION PAD SECTION
N.T.S.



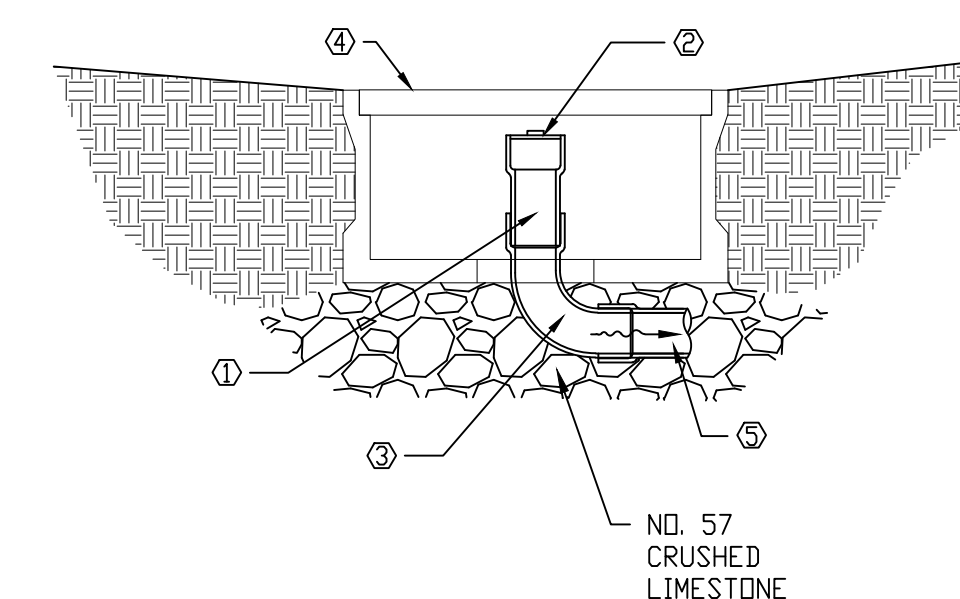
SECTION-CABLE TRENCH WITH UNDERDRAIN
N.T.S.

KEYED NOTES:

- EXCAVATE WIDTH OF TRENCH AS NEEDED
- PLACE SUITABLE SOIL OR GRANULAR BACKFILL IN 6" MAX. LIFTS. SUITABLE SOIL SHALL BE COMPACTED TO 90% MIN. (98% MIN. UNDER PAVEMENT) DRY DENSITY, PER ASTM D698. GRANULAR BACKFILL SHALL BE COMPACTED TO 75% (80% UNDER PAVEMENT) RELATIVE DENSITY, PER ASTM 4353. GRANULAR BACKFILL REQUIRED UNDER PAVEMENT.
- PROPOSED STORM
- TOPSOIL, SEED, AND MULCHING OR PAVEMENT AS DETAILED ELSEWHERE.
- NO. 57 OR NO. 67 AGGREGATE PLACED A MINIMUM OF 12" ABOVE THE TOP OF THE PIPE
- NO. 57 OR NO. 67 AGGREGATE PLACED A MINIMUM OF 6" BELOW THE BOTTOM OF THE PIPE



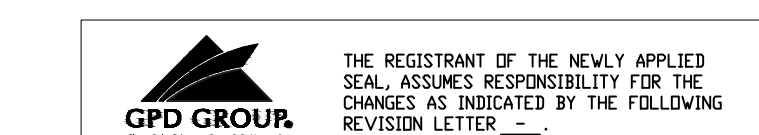
SEWER TRENCH (FOR SOLID WALL PIPE)
N.T.S.



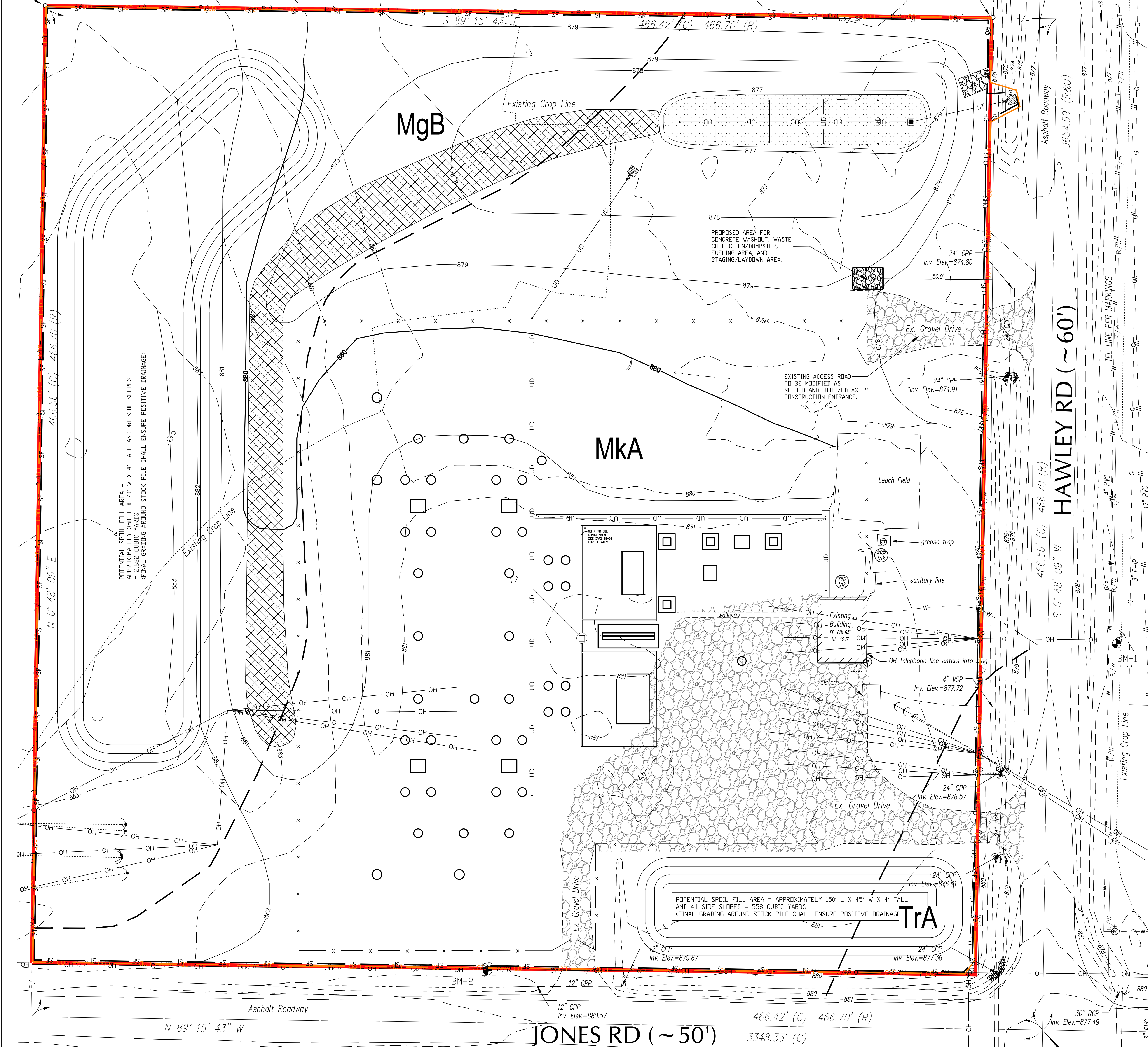
KEYED NOTES:

- 6" DIA. CLEAN-OUT PIPE
- THREADED CLEAN-OUT CAP
- 90° SWEEP
- TRENCH BOX, SEE SHEET D-471-16-01
- SEWER

NOTE: CONTRACTOR SHALL INSTALL STRAPPING OR ANCHORS PER MANUFACTURER RECOMMENDATIONS TO PREVENT STRUCTURE BUDYANCY.

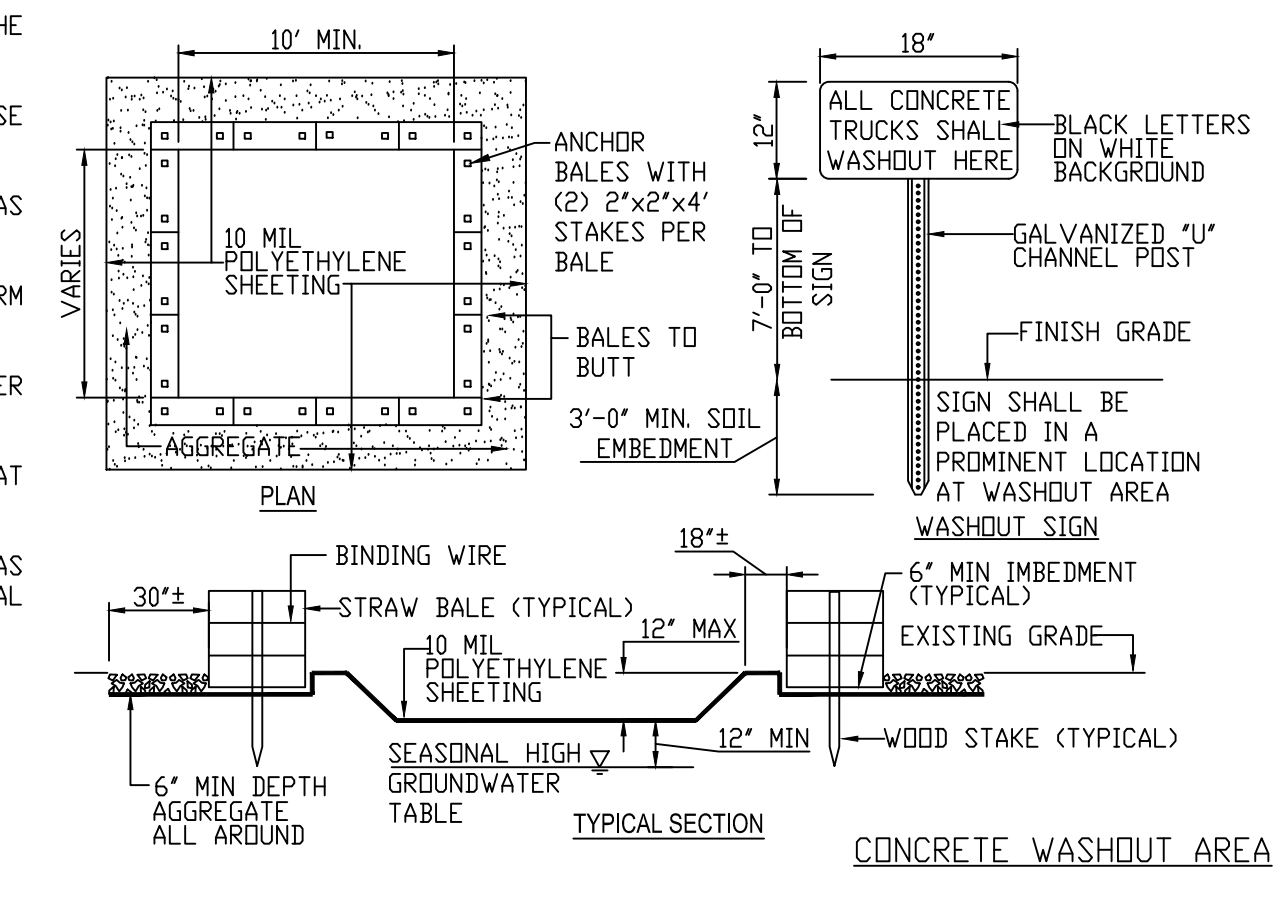


V08/EA SPE-478 DATE: 05/26/2022 FILE: CONSTRUCTION (GPD)	FirstEnergy Energy Delivery Technical Services	SCALE: NONE DATE: 4/22/20	DESIGNED BY: DMH CHECKED BY: DMH DATE: 05/26/2022 FILE: CONSTRUCTION (GPD)	PROJECT: WELLINGTON SITE DETAILS	REV: LANE ERIC REV: 01 REV: 02 REV: 03 REV: 04 REV: 05 REV: 06 REV: 07 REV: 08 REV: 09 REV: 10 REV: 11 REV: 12 REV: 13 REV: 14 REV: 15 REV: 16 REV: 17 REV: 18 REV: 19 REV: 20 REV: 21 REV: 22 REV: 23 REV: 24 REV: 25 REV: 26 REV: 27 REV: 28 REV: 29 REV: 30 REV: 31 REV: 32 REV: 33 REV: 34 REV: 35 REV: 36 REV: 37 REV: 38 REV: 39 REV: 40 REV: 41 REV: 42 REV: 43 REV: 44 REV: 45 REV: 46 REV: 47 REV: 48 REV: 49 REV: 50 REV: 51 REV: 52 REV: 53 REV: 54 REV: 55 REV: 56 REV: 57 REV: 58 REV: 59 REV: 60 REV: 61 REV: 62 REV: 63 REV: 64 REV: 65 REV: 66 REV: 67 REV: 68 REV: 69 REV: 70 REV: 71 REV: 72 REV: 73 REV: 74 REV: 75 REV: 76 REV: 77 REV: 78 REV: 79 REV: 80 REV: 81 REV: 82 REV: 83 REV: 84 REV: 85 REV: 86 REV: 87 REV: 88 REV: 89 REV: 90 REV: 91 REV: 92 REV: 93 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982 REV: 983 REV:
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- CONSTRUCTION SEQUENCE**
DURING PRECONSTRUCTION MEETING ALL EROSION & SEDIMENT CONTROL FACILITIES & PROCEDURES SHALL BE DISCUSSED.
1. INSTALL CONSTRUCTION ENTRANCE AS DETAILED ON PLANS. IF REQUIRED, TEMPORARY CONSTRUCTION FENCING SHALL BE INSTALLED AROUND PERIMETER OF CONSTRUCTION SITE. WHERE THERE IS EXISTING FENCE ALONG THE PERIMETER OF THE SITE, IT CAN BE UTILIZED. FENCING SHALL BE USED TO RESTRICT OUTSIDE TRAFFIC TO SITE.
 2. DELIVER CONSTRUCTION TRAILER TO SITE AND INSTALL TEMPORARY POWER AND TELEPHONE, IF REQUIRED. TEMPORARY UTILITY SERVICES ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
 3. STAKE AND/OR FLAG LIMITS OF CLEARING.
 4. CLEARING & GRUBBING, AS NECESSARY, FOR INSTALLATION OF PERIMETER CONTROLS. INSTALL SILT PERIMETER CONTROLS AS SHOWN ON PLANS. SILT PERIMETER CONTROLS SHALL BE INSTALLED LEVEL, ALONG THE CONTOURS, WITH ENDS TURNED UPSLOPE TO PREVENT CONCENTRATED FLOW AT THE SILT PERIMETER CONTROLS.
 5. INSTALL TEMPORARY SILT INLET PROTECTION ON ALL EXISTING CATCH BASINS AND INLETS, AFTER COMPLETING FIELD INSPECTION FOR STRUCTURES. REMOVAL OF SILT INLET PROTECTION FROM DESIGNATED INLETS CAN ONLY OCCUR WHEN A STRUCTURE IS REMOVED, AND AS REQUIRED BY THE PROGRESSION OF THE DEMOLITION AND CONSTRUCTION.
 6. CLEARING & GRUBBING THE SITE AS NECESSARY. TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON SITE FOR REUSE, OR REMOVED TO AN APPROVED OFFSITE SPOIL AREA.
 7. BEGIN FILLING & GRADING AS REQUIRED TO REACH SUBGRADE.

8. UTILIZE DUST CONTROL MEASURES AS REQUIRED TO MINIMIZE AIR-BORNE POLLUTION BY METHODS APPROVED BY THE AUTHORIZING EPA OFFICE.
9. DUNE PAD GRADES HAVE BEEN ESTABLISHED, AS DESIGNATED ON THE PLANS, THE CONTRACTOR SHALL UTILIZE THESE AREAS FOR STRUCTURE CONSTRUCTION.
10. IN PROPOSED GRASS AREAS, REPLACE TOPSOIL, FINE GRADE AND SEED, AS REQUIRED. STABILIZE ALL DISTURBED AREAS WITH PERMANENT SEED AND MULCHING OR TEMPORARY SEEDING IMMEDIATELY UPON REACHING FINAL GRADE.
11. CONSTRUCT UNDERGROUND UTILITY WORK INCLUDING STORM DRAINAGE FACILITIES. UPON INSTALLATION OF STORM DRAINAGE CATCH BASINS, YARD DRAINS AND INLETS, INSTALL REQUIRED INLET PROTECTION.
12. CONSTRUCT BID-RETENTION PER SPECIFICATIONS. BID-RETENTION CONSTRUCTION WORK SHALL START AFTER ALL OTHER SITE CONSTRUCTION IS COMPLETED AND AREAS ARE STABILIZED.
13. COMPLETE SITEWORK, AND FINAL CLEAN-UP. RESEED ANY AREAS THAT MAY REQUIRE ATTENTION IMMEDIATELY. NOTE THAT LAWN AREAS WILL NOT BE DEEMED STABLE UNTIL A MINIMUM 70% VEGETATIVE DENSITY HAS BEEN ACHIEVED.
14. MAINTAIN EROSION & SEDIMENTATION CONTROL MEASURES UNTIL THE SITE HAS BEEN COMPLETELY STABILIZED. ALL AREAS OF VEGETATIVE SURFACE, WHETHER PERMANENT OR TEMPORARY, SHALL BE CONSIDERED TO BE IN PLACE AND FUNCTIONAL WHEN THE REQUIRED UNIFORM RATE OF COVERAGE (70%) IS OBTAINED.
15. REMOVE SEDIMENT CONTROLS.
16. THE FOLLOWING ITEMS MUST BE COMPLETED IN ORDER BY THE CONTRACTOR, ONCE THE SITE HAS BEEN DEEMED STABLE:
 - a) REMOVE CONSTRUCTION ENTRANCE (IF APPLICABLE) PRIOR TO COMPLETION OF PAVING
 - b) SITE CLEAN UP
 - c) RESEED ANY AREAS THAT REQUIRE ADDITIONAL SEED
 - d) SILT FENCE SHOULD BE CLEANED, REMOVED, BACKFILLED AND SEEDED WITH PERMANENT SEEDING.
 - e) VERIFY POSITIVE DRAINAGE FLOW IN ALL DRAINAGE STRUCTURES, REPAIR AS NECESSARY.



- NOTES:**
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
 2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
 3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
 4. WASHOUT AREAS(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
 5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
 6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

- STORM WATER POLLUTION PREVENTION PLAN NARRATIVE**
- THIS SITE IS AN EXISTING SUBSTATION SERVING THE COMMUNITY OF WELLINGTON TWP. ASHTABULA, OHIO. THE PROJECT SCOPE INCLUDES EXPANDING THE EXISTING SUBSTATION PAD, CABLE TRENCH AND CONTROL HOUSE.
- PROJECT COMPLETION STATISTICS**
- | EXISTING LAND USE FOR THE SITE IS AN EXISTING SUBSTATION. | APPROXIMATELY 4.42 ACRES |
|---|--------------------------|
| ESTIMATED PRE-CONSTRUCTION IMPERVIOUS AREA: | 0.97 ACRES |
| ESTIMATED POST-CONSTRUCTION IMPERVIOUS PERCENT: | 28% |
| POST-CONSTRUCTION RUN-OFF COEFFICIENT: | 0.43 |
- PROPOSED LAND USE WILL BE AN EXPANDED SUBSTATION.**
- | ESTIMATED POST-CONSTRUCTION IMPERVIOUS AREA: | 2.01 ACRES |
|--|------------|
| ESTIMATED POST-CONSTRUCTION IMPERVIOUS PERCENT: <td>59%</td> | 59% |
| POST-CONSTRUCTION RUN-OFF COEFFICIENT: <td>0.57</td> | 0.57 |
- PROJECT LOCATION:**
- EXISTING SITE SOIL TYPES:**
- REFERENCE:** USDA NATIONAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY
- FIRST AND SUBSEQUENT RECEIVING WATERS:**
- INITIAL RECEIVING WATER IS A NATURAL DRAINAGE DITCHES ON THE EAST AND SOUTH SIDE OF THE SITE, AND THE SUBSEQUENT RECEIVING WATER IS A CREEK, THE WELLINGTON CREEK.
- ** YEARLY INSPECTIONS, COMPLETED BY MAY 31ST OF EACH YEAR, MUST BE DOCUMENTED. COPIES SHOULD BE SENT TO THE LOCAL CITY AS WELL AS THE THE LOCAL COUNTY SOIL AND WATER CONSERVATION DISTRICT.**
- CONTRACTOR'S INSPECTOR SHALL BE A QUALIFIED INDIVIDUAL. SITE INSPECTIONS SHALL BE DONE WEEKLY AND WITHIN 24 HOURS OF EACH RAINFALL EVENT EXCEEDING 1/2" OF RAINFALL. ALL NECESSARY REPAIRS SHOULD BE IMPLEMENTED IMMEDIATELY AFTER SUCH INSPECTIONS.
- CONTRACTOR'S INSPECTOR SHALL BE RESPONSIBLE FOR PREPARING AND SIGNING WEEKLY AND ALL INTERMEDIATE EROSION CONTROL INSPECTION REPORTS AFTER EVERY INSPECTION. SUCH REPORTS SHALL BE MADE AVAILABLE TO OWNER, ENGINEER AND CITY / STATE OFFICIALS UPON THEIR REQUEST.
- REPORTS SHALL BE KEPT FOR 3 YEARS AFTER TERMINATION OF THE CONSTRUCTION ACTIVITIES.
- CONTRACTOR MAY SUBMIT A WAIVER REQUEST TO THE STATE EPA FOR A REDUCTION TO MONTHLY INSPECTIONS IF THE SITE WILL BE STABILIZED DORMANT SITE FOR A LONG PERIOD.
- ONLY A QUALIFIED INSPECTION PERSONNEL IS TO PERFORM THE INSPECTIONS.
- FOR BMPs THAT REQUIRE REPAIR OR MAINTENANCE - NON SEDIMENT POND BMPs ARE TO BE REPAIRED WITHIN 10 DAYS OF INSPECTION AND SEDIMENT PONDS ARE TO BE REPAIRED OR CLEANED OUT WITHIN 10 DAYS OF INSPECTION.
- FOR MISSING BMPs REQUIRED, THE MISSING BMPs SHALL BE INSTALLED WITHIN 10 DAYS OF THE INSPECTION.

ADDITIONAL CONSTRUCTION SITE POLLUTION CONTROLS

1. CONSTRUCTION PERSONNEL, INCLUDING SUBCONTRACTORS WHO MAY USE OR HANDLE HAZARDOUS MATERIALS, SHALL BE MADE AWARE OF THE FOLLOWING GENERAL GUIDELINES REGARDING DISPOSAL AND HANDLING OF HAZARDOUS AND CONSTRUCTION WASTES:
 - a) PREVENT SPILLS
 - b) USE PRODUCTS UP
 - c) FOLLOW LABEL DIRECTIONS FOR DISPOSAL
 - d) REMOVE LIDS FROM EMPTY BOTTLES AND CANS WHEN DISPOSING IN TRASH
 - e) RECYCLE WASTES WHENEVER POSSIBLE
 - f) DON'T POUR INTO WATERWAYS, STORM DRAINS OR ONTO THE GROUND
 - g) DON'T POUR DOWN THE SINK, DRAIN DRAIN OR SEPTIC TANKS
 - h) DON'T BURY CHEMICALS OR CONTAINERS
 - i) DON'T BURN CHEMICALS OR CONTAINERS
 - j) DON'T MIX CHEMICALS TOGETHER
2. CONTAINERS SHALL BE PROVIDED FOR THE PROPER COLLECTION OF ALL WASTE MATERIAL INCLUDING CONSTRUCTION DEBRIS, TRASH, PETROLEUM PRODUCTS AND ANY HAZARDOUS MATERIALS USED ON-SITE. CONTAINERS SHALL BE COVERED AND NOT LEAKING. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THAT MATERIAL. CONSTRUCTION DEMOLITION AND DEBRIS (CDD&D) WASTE MUST BE DISPOSED OF AT THE OHIO EPA APPROVED CDD&D LAND FILL.
3. NO CONSTRUCTION RELATED WASTE MATERIALS ARE TO BE BURIED ON-SITE.
4. HANDLING CONSTRUCTION CHEMICALS : MIXING, PUMPING, TRANSFERRING OR OTHER HANDLING OF CONSTRUCTION CHEMICALS SUCH AS FERTILIZER, LIME, ASPHALT, CONCRETE DRYING COMPOUNDS, AND ALL OTHER POTENTIALLY HAZARDOUS MATERIALS SHALL BE PERFORMED IN AN AREA AWAY FROM ANY WATERCOURSE, DITCH OR STORM DRAIN.
5. EQUIPMENT FUELING AND MAINTENANCE, OIL CHANGING, ETC., SHALL BE PERFORMED AWAY FROM WATERCOURSES, DITCHES OR STORM DRAINS, IN AN AREA DESIGNATED FOR THAT PURPOSE. THE DESIGNATED AREA SHALL BE EQUIPPED FOR RECYCLING OIL AND CATCHING SPILLS. SECONDARY CONTAINMENT SHALL BE PROVIDED FOR ALL FUEL OIL STORAGE TANKS. THESE AREAS MAY BE INSPECTED EVERY SEVEN DAYS AND WITHIN 24 HRS. OF A 0.5 INCH OR GREATER RAIN EVENT TO ENSURE THERE ARE NO EXPOSED MATERIALS WHICH WOULD CONTAMINATE STORM WATER. SITE OPERATORS MUST BE AWARE THAT SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) REQUIREMENTS MAY APPLY. AN SPC PLAN IS REQUIRED FOR SITES WITH ONE SINGLE ABOVE GROUND TANK OF 660 GALLONS OR MORE, ACCUMULATIVE ABOVE GROUND STORAGE OF 1330 GALLONS OR MORE, OR 42,000 GALLONS OF UNDERGROUND STORAGE. CONTAMINATED SOILS MUST BE DISPOSED OF IN ACCORDANCE WITH ITEM 8.
6. CONCRETE WASH WATER SHALL NOT BE ALLOWED TO FLOW TO STREAMS, DITCHES, STORM DRAINS OR ANY OTHER WATER CONVEYANCE. A SUMP OR PIT WITH NO POTENTIAL FOR DISCHARGE SHALL BE CONSTRUCTED IF NEEDED TO CONTAIN CONCRETE WASH WATER. FIELD TILE OR OTHER SUBSURFACE DRAINAGE STRUCTURES WITHIN 10 FT. OF THE SUMP SHALL BE CUT AND PLUGGED FOR SMALL PROJECTS. TRUCK CHUTES MAY BE RINSED AWAY FROM ANY WATER CONVEYANCES.
7. SPILL REPORTING REQUIREMENTS : SPILLS ON PAVEMENT SHALL BE ABSORBED WITH SAWDUST OR KITTY LITTER AND DISPOSED OF WITH THE TRASH AT A LICENSED SANITARY LAND FILL. HAZARDOUS OR INDUSTRIAL WASTES SUCH AS MOST SOLVENTS, GASOLINE, OIL-BASED PAINTS, AND CEMENT CURING COMPOUNDS, REQUIRE SPECIAL HANDLING. SPILLS SHALL BE REPORTED TO THE OHIO EPA. SPILLS OF 25 GALLONS OR MORE OF PETROLEUM PRODUCTS SHALL BE REPORTED TO THE OHIO EPA, THE LOCAL FIRE DEPARTMENT, AND THE LOCAL EMERGENCY PLANNING COMMITTEE WITHIN 30 MINUTES OF THE DISCOVERY OF THE RELEASE. ALL SPILLS WHICH CAUSE CATCH WATERS OF THE STATE MUST BE REPORTED TO THE OHIO EPA.
8. CONTAMINATED SOILS : IF SUBSTANCES SUCH AS OIL, DIESEL FUEL, HYDRAULIC FLUID, ANTIFREEZE, ETC. ARE SPILLED, LEAKED, OR RELEASED ONTO THE SOIL, THE SOIL SHOULD BE DUG UP AND DISPOSED OF AT LICENSED SANITARY LAND FILL OR OTHER APPROVED PETROLEUM CONTAMINATED SOIL REMEDIATION FACILITY. NOT CONSTRUCTION/DEMOLITION DEBRIS (LAND FILL). NOTE THOSE STORM WATER RUNOFFS ASSOCIATED WITH CONTAMINATED SOILS ARE NOT BE AUTHORIZED UNDER THE OHIO EPA GENERAL STORM WATER PERMIT ASSOCIATED WITH CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL TAKE PREVENTIVE MEASURES FOR DISCHARGE OF CONTAMINATED SOILS.
9. THE USE OF BERMS, TRENCHES, AND PITS TO COLLECT CONTAMINATED RUNOFF AND PREVENT DISCHARGES.
10. PUMPING RUNOFF INTO A SANITARY SEWER (WITH PRIOR WRITTEN APPROVAL OF THE SANITARY SEWER SERVICE OPERATOR) OR INTO A CONTAINER FOR TRANSPORT TO AN APPROPRIATE TREATMENT/DISPOSAL FACILITY.
11. COVERING AREAS OF CONTAMINATION WITH TARPS OR OTHER METHODS THAT PREVENT STORMWATER FROM COMING INTO CONTACT WITH CONTAMINATED MATERIALS.
12. DUST CONTROL OR DUST SUPPRESSANTS SHALL BE USED TO PREVENT NUISANCE CONDITIONS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND IN A MANNER, WHICH PREVENT A DISCHARGE TO WATERS OF THE STATE. SUFFICIENT DISTANCE MUST BE PROVIDED BETWEEN APPLICATIONS AND NEARBY BRIDGES, CATCH BASINS, AND OTHER WATERWAYS. APPLICATION (EXCLUDING WATER) MAY NOT OCCUR WHEN RAIN IS IMMINENT AS NOTED IN THE SHORT TERM FORECAST. USED OIL MAY NOT BE APPLIED FOR DUST CONTROL.
13. OTHER AIR PERMITTING REQUIREMENTS : CERTAIN ACTIVITIES ASSOCIATED WITH CONSTRUCTION WILL REQUIRE AIR PERMITS INCLUDING BUT NOT LIMITED TO MOBILE CONCRETE BATCH PLANTS, MOBILE ASPHALT PLANTS, CONCRETE CRUSHERS, LARGE GENERATORS, ETC. THESE ACTIVITIES WILL REQUIRE SPECIFIC THE OHIO EPA AIR PERMITS FOR INSTALLATION AND OPERATION. OPERATORS MUST SEEK AUTHORIZATION FROM THE CORRESPONDING DISTRICT OF THE EPA FOR DEMOLITION OF ALL COMMERCIAL SITES, A NOTIFICATION FOR RESTORATION AND DEMOLITION MUST BE SUBMITTED TO THE OHIO EPA TO DETERMINE IF ASBESTOS CORRECTIVE ACTIONS ARE REQUIRED.
14. PROCESS WASTE WATER/LEACHATE MANAGEMENT : EPA'S CONSTRUCTION GENERAL PERMIT ONLY ALLOWS THE DISCHARGE OF STORM WATER AND DOES NOT INCLUDE OTHER WASTE STREAMS/DISCHARGES SUCH AS VEHICLE AND/OR EQUIPMENT WASHING, ON-SITE SEPTIC LEACHATE, CONCRETE WASH OUTS, WHICH ARE CONSIDERED PROCESS WASTEWATERS. ALL PROCESS WASTEWATERS MUST BE COLLECTED AND PROPERLY DISPOSED AT AN APPROVED DISPOSAL FACILITY. IN THE EVENT, LEACHATE OR SEPTAGE IS DISCHARGED, IT MUST BE ISOLATED FOR COLLECTION AND PROPER DISPOSAL AND CORRECTIVE ACTIONS TAKEN TO ELIMINATE THE SOURCE OF WASTE WATER.
15. PLEASE REFER TO THE LOCAL JURISDICTION STORM WATER MANAGEMENT MANUAL, CURRENT EDITION, FOR ADDITIONAL INFORMATION.
16. WASTES GENERATED BY CONSTRUCTION ACTIVITIES (I.E. CONSTRUCTION MATERIALS SUCH AS PAINTS, SOLVENTS, FUELS, CONCRETE, WOOD, ETC) MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL REGULATIONS. HAZARDOUS AND TOXIC SUBSTANCES ARE USED ON VIRTUALLY ALL CONSTRUCTION SITES. GOOD MANAGEMENT OF THESE SUBSTANCES IS ALWAYS NEEDED.

CONTRACTOR'S RATIONALE AND DESCRIPTION

DETENTION:
THE PROPOSED DEVELOPED AREA WILL HAVE GRADUAL PAD AND AS PER SECTION 9.3.4.6.3 OF LORAIN COUNTY STORM WATER REGULATION THIS DOES NOT QUALIFY AS ADDITION OF IMPERVIOUS SURFACE AND HENCE NO POST CONSTRUCTION STORM WATER MANAGEMENT IS REQUIRED.

WATER QUALITY:
ACCORDING TO THE OHIO EPA, SITES DISTURBING OVER AN ACRE OF LAND ARE REQUIRED TO PROVIDE POST-CONSTRUCTION BMP'S TO TREAT STORMWATER RUNOFF PRIOR TO DISCHARGE. THE DISTURBED AREA FOR THIS PROJECT IS 3.42 ACRES. POST-CONSTRUCTION BMP'S WILL BE REQUIRED FOR THIS PROJECT. SEE BID RETENTION POND CALCULATIONS ON SHEET D-471-04-05 FOR REQUIRED WATER QUALITY TREATMENT.

PROJECT OWNER:
AMERICAN TRANSMISSION SYSTEMS, INCORPORATED
(A FIRSTENERGY COMPANY)
76 SOUTH MAIN STREET
AKRON, OH 44308
724.630.5971

PROJECT CONTACT:
MIKE TALLON, FIRSTENERGY
PROJECT MANAGER
76 SOUTH MAIN STREET
AKRON, OH 44308
330.801.5123
MTALLON@FIRSTENERGYCORP.COM

ANTICIPATED TIMING:

CONSTRUCTION BEGIN	JANUARY, 2022
CONSTRUCTION COMPLETE	MARCH, 2022

CONTRACTOR: T.B.D.
CONTACT: _____
PHONE NUMBER: _____

CONTRACTOR SHALL MAINTAIN A CONSTRUCTION LOG DOCUMENTING ALL GRADING AND STABILIZATION ACTIVITIES.

BENCHMARKS:

STATE PLANE GRID NORTH, NAD 83 (2011), GEOID 128, OHIO NORTH ZONE, TIED BY GPS TO THE OJD31T.VRS.

ELEVATIONS ARE NAVD 88.

BENCHMARK #1 - BENCH TIE IN STRAIN POLE ELEVATION=880.026

BENCHMARK #2 - BENCH TIE IN POLE LMBR81199 ELEVATION=882.05

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BENCHMARK #1 - BENCH TIE IN STRAIN POLE ELEVATION=880.026

BENCHMARK #2 - BENCH TIE IN POLE LMBR81199 ELEVATION=882.05

CONTRACTOR SHALL MAINTAIN A CONSTRUCTION LOG DOCUMENTING ALL GRADING AND STABILIZATION ACTIVITIES.

BENCHMARKS:

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Case No(s). 20-0004-EL-BTX

Summary: Correspondence Condition 9 Compliance: Wellington Substation
Expansion electronically filed by Ms. Devan K. Flahive on behalf of American
Transmission Systems Incorporated