HIGHPOINT PARK STATION

SCALE: 1:200
LAT : 39.288510° LONG : -84.354555°

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ISSUED FOR CONSTRUCTION

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB
1	11-30-2020	UPDATED CIVIL AND STRUCTURAL NOTE 1	RDC	JBF	CAB

DESCRIPTION		APPROVALS		
AREA CODE				
ACCOUNT NUMBER	AW2123			REGIONAL ENGINEER
PROJECT NUMBER	1880115			MGR TECH REC & STD
DRAWING BY	MAS			
STATION ID	S0867O1			PRINCIPAL ENGINEER
CHECKER INITIALS	JBF	11/30/2020	CAB	

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
COVER SHEET
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 1 OF 66 | DWG SCALE AS NOTED
DWG DATE 09/05/2018 | SUPERSEDED
DRAWING NUMBER: PNG -G-004-0001040 | REVISION: 1
DISCIPLINE / RESOURCE CENTER / LINE NUMBER

GENERAL NOTES:

1. INSTALLER SHALL FURNISH ALL MATERIALS NOT PROVIDED BY THE COMPANY (UNLESS OTHERWISE NOTED ON DRAWINGS OR SPECIFICATIONS), INCLUDING EQUIPMENT, TRANSPORTATION, SERVICES, AND PERFORM ALL NECESSARY WORK AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREINAFTER.
2. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO VERIFY ALL DIMENSIONS GIVEN ON THE DRAWINGS. ANY ITEM IN QUESTION SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER IN WRITING VIA RFI PROCESS PRIOR TO PROCEEDING WITH THE WORK.
3. INSTALLER SHALL BE RESPONSIBLE FOR PROTECTION OF ALL SURROUNDING AREAS. CONTRACTOR SHALL NOT UNNECESSARILY DISTURB EXISTING CONDITIONS WITHIN CONSTRUCTION LIMITS. DISCRETION SHALL BE PER COMPANY REPRESENTATIVE.
4. PROPOSED ELEVATIONS AND DIMENSIONS INDICATE TOP OF PIPE, UNLESS OTHERWISE NOTED. UNLESS SPECIFICALLY NOTED, DEPTHS OF EXISTING FACILITIES ARE ESTIMATED ONLY. CONTRACTOR IS RESPONSIBLE FOR VERIFYING DEPTH AND LOCATION OF ALL FACILITIES PRIOR TO COMMENCING WORK.
5. ALL BELOW GROUND WELDS SHALL BE COATED WITH DENSO 7200 PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS OR AS APPROVED OTHERWISE. SURFACE PREPARATION AND BLASTING SHALL ADHERE TO PERTINENT DESIGN AND CONSTRUCTION STANDARDS AND COATING MATERIAL SPECIFICATIONS.
6. UPON BACKFILLING IN AREAS OF ROCK, BURIED PIPE SHALL HAVE MINIMUM 6" OF SAND PAD FILL PLACED AROUND THE PIPE'S CIRCUMFERENCE.
7. PRESSURE TESTING SHALL MEET THE REQUIREMENTS OF DUKE'S PRESSURE TESTING STANDARD, PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
8. INSTALLER SHALL DEWATER ALL HYDROSTATICALLY TESTED PIPING, USING CLEANING PIGS AS REQUIRED, AND DRY TO A DEWPOINT OF -40 °F PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
9. ALL DISTANCES SHOWN ARE GRID DISTANCES BASED ON OHIO STATE PLANE COORDINATE SOUTH ZONE (3402) NAD 83.
10. ABOVE GROUND FEATURES AND CONTOURS PROVIDED BY XP-RS, LLC FROM OVERLAND PARK, KS 66225.
11. BELOW GROUND SURVEY PROVIDED BY G.J. BERDING SURVEYING FROM MILFORD, OH 45150. SURVEY SUBS INCLUDE RLA UTILITIES FROM CINCINNATI, OH 45215 AND THE UNDERGROUND DETECTIVE® FROM CINCINNATI, OH 45251.
12. ANY CHANGES TO THE DESIGN SHOWN ON DRAWINGS SHALL BE APPROVED BY COMPANY REPRESENTATIVE IN WRITING VIA RFI PROCESS.

CONSTRUCTION NOTES:

1. EXISTING OVERHEAD AND BELOWGROUND FACILITIES MAY BE IN THE WORK AREA VICINITY. INSTALLER IS RESPONSIBLE FOR HAVING SUCH FACILITIES LOCATED AND IS RESPONSIBLE FOR MAINTENANCE AND PRESERVATION OF THESE FACILITIES.
2. PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS, INSTALLER IS REQUIRED TO CALL 811 FOR UTILITY LOCATES A MINIMUM OF 72 HOURS PRIOR TO COMMENCEMENT OF WORK. NO EXTRA COMPENSATION WILL BE ALLOWED FOR DELAYS FROM ANY WORK PROVIDED BY OTHER UTILITIES.
3. IF EXISTING UTILITIES OF ANY TYPE ARE ENCOUNTERED IN THE FIELD AND DEEMED TO BE IN CONFLICT WITH INSTALLATION OF FACILITIES, INSTALLER SHALL NOTIFY THE PROJECT MANAGER IN WRITING VIA FRI PROCESS IMMEDIATELY SO THE CONFLICT MAY BE RESOLVED.
4. WHEN EXISTING DRAINAGE FACILITIES ARE DISTURBED, INSTALLER SHALL PROVIDE AND MAINTAIN TEMPORARY OUTLETS AND CONNECTIONS FOR PRIVATE DRAINS OR SEWERS. RESTORATION OF THESE FACILITIES IS TO BE PERFORMED ONCE CONSTRUCTION IS COMPLETE AND ARE CONSIDERED INCIDENTAL COSTS OF THE PROJECT.
5. ALL DRAWING MEASUREMENTS ARE TO BE TAKEN FROM EXISTING GRADE. FINAL GRADE SHALL BE MATCHED TO SURROUNDING GRADE AS PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
6. INSTALLER IS TO REMAIN WITHIN CONSTRUCTION WORKING LIMITS. ACCESS TO AREAS OUTSIDE WORKING LIMITS MUST BE COORDINATED WITH THE OWNER OR DUKE ENERGY PROJECT MANAGER.
7. ALL EXCESS EXCAVATION, CONSTRUCTION DEMOLITION DEBRIS AND UNSUITABLE MATERIALS THAT DO NOT CONTAIN ASBESTOS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED.
8. STANDARD SPECIFICATIONS REFERENCED ON THIS SHEET AND CONSTRUCTION PLANS ARE CONSIDERED AS PART OF THE CONTRACT DOCUMENTS. INCIDENTAL ITEMS OR ACCESSORIES NECESSARY TO COMPLETE THIS WORK MAY NOT BE SPECIFICALLY NOTED, BUT ARE CONSIDERED TO BE A PART OF THIS CONTRACT.
9. BEFORE ACCEPTANCE BY THE OWNER AND FINAL PAYMENT, ALL WORK SHALL BE INSPECTED AND APPROVED BY DUKE OR COMPANY REPRESENTATIVE. FINAL PAYMENT SHALL BE MADE AFTER ALL OF THE INSTALLER'S WORK HAS BEEN ACCEPTED AND APPROVED AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
10. DURING CONSTRUCTION, ALL LOOSE MATERIAL THAT ARE DEPOSITED IN THE FLOW LINE OF GUTTERS, DRAINAGE STRUCTURES, DITCHES, ETC. SUCH THAT THE NATURAL FLOW LINE OF WATER IS OBSTRUCTED, SHALL BE REMOVED AT THE END OF EACH WORK DAY.
11. ALL FIELD TILE ENCOUNTERED DURING CONSTRUCTION SHALL BE EXTENDED TO OUTLET INTO AN EXISTING DRAINAGE WAY. A RECORD OF ALL FIELD TILE FOR ONSITE DRAIN PIPE ENCOUNTERED SHALL BE KEPT BY THE INSTALLER AND TURNED OVER TO THE PROJECT MANAGER UPON COMPLETION OF THE PROJECT.
12. INSTALLER IS REQUIRED TO MAINTAIN A SET OF ISSUED FOR CONSTRUCTION DRAWINGS AND ALL PERMITS AT THE JOB SITE. ANY MODIFICATIONS OR ALTERATIONS TO THE PLANS OR SPECIFICATIONS SHALL BE APPROVED BY THE PROJECT MANAGER.
13. INSTALLER IS SOLELY RESPONSIBLE FOR EXECUTION OF HIS/HER WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS. INSTALLER IS RESPONSIBLE FOR THE CONSTRUCTION METHODS AND TECHNIQUES, SEQUENCES, TIME OF PERFORMANCE ALL SAFETY PRECAUTIONS.
14. MINIMUM DEPTH OF BURIAL SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
15. ALL PIPELINES BEING CROSSED ARE TO BE PROTECTED WITH A MINIMUM OF (3) 4 FEET X 18 FEET WOODEN MATS.
16. CONTRACTOR TO PROTECT SIDEWALKS AND BIKE PATHS FROM VEHICLE TRAFFIC UTILIZING STEEL PLATING, TIMBER MATTING OR SIMILAR. EXISTING SIDEWALK, BITUMINOUS SHOULDER, CURB/GUTTER AND/OR ROADWAY PAVEMENT DISTURBED OR DAMAGED DUE TO THE PERMITTED WORK SHALL BE REPLACED IN KIND UP TO THE LIMITS AS DETERMINED AND DIRECTED BY THE CITY REPRESENTATIVE IN WHICH DAMAGE WAS DONE.
17. PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS, FOR OPEN DITCH EXCAVATION, A MINIMUM OF TWO FEET OF SEPARATION SHALL BE MAINTAINED BETWEEN ALL CROSSING STRUCTURES. SEPARATION BETWEEN CROSSING STRUCTURES AND PIPELINES THAT ARE INSTALLED VIA DIRECTIONAL DRILLING METHODS IS AT THE DISCRETION OF ENGINEERING.
18. DURING BACKFILLING, A SIX INCH CROWN SHALL BE PLACED ON ALL DISTURBED AREAS. COMPACTION REQUIREMENTS SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
19. BOLTS FOR FLANGES TO BE TORQUE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
20. ALL BUTT WELDS SHALL BE 100% X-RAYED PER PERTINENT WELDING PROCEDURES. ALL OTHER WELDS SHALL BE NON DESTRUCTIVELY TESTED PER PERTINENT WELDING PROCEDURES.

CIVIL AND STRUCTURAL NOTES:

1. ADDITIONAL EXCAVATIONS BELOW FOOTINGS MAY BE NECESSARY TO REACH UNDISTURBED SOIL. SHOULD THIS OCCUR, REFER TO THE SOILS AND FOUNDATIONS SECTION ON DWG PNG-S-004-0001000 FOR ADDITIONAL DETAILS. (1)
2. CONCRETE SHALL BE MIXED AND POURED PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS. TESTING SHALL CONFORM TO ACI 318. CONTRACTOR TO SUPPLY ALL CONCRETE AND TESTING.
3. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 SPECIFICATION. STEEL REINFORCING BAR SHALL CONFORM TO ASTM A615 GRADE 60 AND WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. TIE WIRE SHALL CONFORM TO ASTM A82.
4. UNSUITABLE OR EXCESS EARTH SPOIL SHALL BE DISPOSED OF AT AN APPROVED WASTE LOCATION. SOIL BEING TRANSPORTED ONTO THE JOB SITE SHALL BE APPROVED BY DUKE ENERGY.
5. A LAYER OF NON ABRASIVE MATERIAL SUCH AS FRP SHALL BE INSTALLED BETWEEN ALL PIPE SUPPORTS AND PIPING.
6. ALL FIELD BENDING OF REBAR SHALL BE DONE COLD.

ENVIRONMENTAL NOTES:

1. CONTRACTOR IS TO CONSTRUCT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AT THE COMMENCEMENT OF THE PROJECT, PROVIDE MAINTENANCE AND ASSURE EFFECTIVENESS THROUGHOUT THE DURATION OF THE PROJECT.
2. CARE SHALL BE TAKEN TO MINIMIZE DOWNSTREAM SILTATION. RAW BANKS MAY BE SEEDED AND MULCHED TO PREVENT EROSION.
3. ALL SPOILS INCLUDING ORGANIC SOILS, VEGETATION AND DEBRIS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF IN SUCH A MANNER AS TO NOT ERODE INTO ANY BODY OF WATER OR WETLAND.
4. SOIL EROSION AND SEDIMENT CONTROLS SHALL BE PLACED WHERE NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE WORK AREA.
5. INLET PROTECTION DEVICES ARE REQUIRED AT ALL SEWER INLETS, GRATES AND MANHOLES FOR SEDIMENT CONTROL.
6. TOPSOIL STOCKPILES SHALL BE LOCATED TO AVOID EROSION OF SAID STOCKPILE ONTO OFFSITE AREAS.
7. ALL ENVIRONMENTAL MEASURES SHALL BE PER PERTINENT DESIGN AND CONSTRUCTION STANDARDS.
8. DUKE ENERGY SHALL CONTACT OPSB STAFF, ODNR, AND USFWS WITHIN 24 HOURS IF STATE OR FEDERAL THREATENED OR ENDANGERED SPECIES ARE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES. CONSTRUCTION ACTIVITIES THAT COULD ADVERSELY IMPACT THE IDENTIFIED PLANTS OR ANIMALS SHALL BE IMMEDIATELY HALTED UNTIL AN APPROPRIATE COURSE OF ACTION HAS BEEN AGREED UPON BY DUKE ENERGY, OPSB STAFF, AND THE APPROPRIATE REGULATORY AGENCIES.
9. THE CONSTRUCTION CONTRACTOR SHALL COMPLY WITH FUGITIVE DUST RULES BY THE USE OF WATER SPRAY OR OTHER APPROPRIATE DUST SUPPRESSANT MEASURES WHENEVER NECESSARY.
10. THE CONSTRUCTION CONTRACTOR SHALL REMOVE ALL TEMPORARY GRAVEL AND OTHER CONSTRUCTION STAGING AREA AND ACCESS ROAD MATERIALS AFTER COMPLETION OF CONSTRUCTION ACTIVITIES, AS WEATHER PERMITS, UNLESS OTHERWISE DIRECTED BY THE LANDOWNER OF DUKE ENERGY. IMPACTED AREAS SHALL BE RESTORED TO RECONSTRUCTION CONDITIONS IN COMPLIANCE WITH OHIO EPA GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS OBTAINED FOR THE PROJECT AND THE APPROVED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) CREATED FOR THE PROJECT.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB
1	11-30-2020	UPDATED CIVIL AND STRUCTURAL NOTE 1	HEC	EAB	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	11/30/2020	CAB	PRINCIPAL ENGINEER

REF. DWG(S)

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
GENERAL NOTES & REQUIREMENTS

HAMILTON COUNTY, OHIO

SHEET(S) 2 OF 66	DWG SCALE NONE
DWG DATE 08/28/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -G-004-0001041	1
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

GENERAL NOTES:

1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED BY BERDING SURVEY IN FEBRUARY, 2020.
2. ALL DIMENSIONS, ELEVATIONS, AND STATIONS ARE IN FEET, UNLESS INDICATED OTHERWISE.
3. CALLOUTS, COORDINATES, AND DIMENSIONS ARE POINTED TO OR MEASURED TO STRUCTURE CENTER, EDGE OF PAVEMENT, BACK OF CURB, OR OUTSIDE FACE OF FOUNDATION WALL, UNLESS INDICATED OTHERWISE.
4. ALL WORK SHALL BE SUBJECT TO INSPECTION BY AUTHORIZED PERSONNEL OF LOCAL AND GOVERNMENT REGULATORY AGENCIES AND THE CLIENT REPRESENTATIVE.
5. SEE OHIO DEPARTMENT OF TRANSPORTATION (ODOT) DESIGN STANDARDS FOR REFERENCES TO ODOT STANDARD DRAWINGS. ALL SUBSEQUENT SPECIFICATIONS AND STANDARDS SHALL APPLY.
6. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND LOCAL AND GOVERNMENT CODES, ORDINANCES, AND REGULATIONS. IN CASE OF CONTRADICTION OR DISCREPANCY BETWEEN REQUIREMENTS, CONTRACTOR SHALL INCORPORATE WHICHEVER IS MOST STRINGENT. WHERE A QUESTION REMAINS ON WHICH REQUIREMENT IS MOST STRINGENT, CONTRACTOR SHALL SUBMIT ISSUE TO THE CLIENT REPRESENTATIVE IN WRITING. THE DECISION OF THE CLIENT REPRESENTATIVE SHALL BE CONSIDERED FINAL.
7. ALL WORK SHALL BE CONDUCTED IN A PROFESSIONAL WORKMANSHIP MANNER USING QUALITY MATERIALS. WORK SHALL CONFORM TO THESE DRAWINGS, UNLESS INDICATED OTHERWISE OR AS DIRECTED BY THE CLIENT REPRESENTATIVE.
8. CONTRACTOR SHALL CONFINE ALL WORK TO BE WITHIN THE PERMANENT AND TEMPORARY EASEMENTS.
9. ALL GRADING, PAVEMENT WORK, AND ANY OTHER MISCELLANEOUS WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT ODOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND SUPPLEMENTAL SPECIFICATIONS.
10. CONTRACTOR SHALL TAKE CARE TO MAINTAIN THE SITE AND ADJACENT AREAS IN AS CLEAN A CONDITION AS POSSIBLE. ANY DEBRIS, DIRT, MUD, ETC. SHALL BE CLEANED DAILY, OR AS THE CLIENT REPRESENTATIVE DIRECTS, FROM ANY ADJOINING STREETS OR PROPERTIES BY THE CONTRACTOR AS A PART OF THE PRIMARY CONSTRUCTION WORK. THIS SHALL BE AT NO ADDITIONAL COMPENSATION TO THE CONTRACTOR.
11. DUKE ENERGY SHALL CONTACT OPSB STAFF, ODNR AND USFWS WITHIN 24 HOURS IF STATE OR FEDERAL THREATENED OR ENDANGERED SPECIES ARE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES. CONSTRUCTION ACTIVITIES THAT COULD ADVERSELY IMPACT THE IDENTIFIED PLANTS OR ANIMALS SHALL BE IMMEDIATELY HALTED UNTIL AN APPROPRIATE COURSE OF ACTION HAS BEEN AGREED UPON BY DUKE ENERGY, OPSB STAFF, AND THE APPROPRIATE REGULATORY AGENCY.
12. THE CONSTRUCTION CONTRACTOR SHALL COMPLY WITH FUGITIVE DUST RULES BY THE USE OF WATER SPRAY OR OTHER APPROPRIATE DUST SUPPRESSANT MEASURES WHENEVER NECESSARY.
13. THE CONSTRUCTION CONTRACTOR SHALL REMOVE ALL TEMPORARY GRAVEL AND OTHER CONSTRUCTION STAGING AREA AND ACCESS ROAD MATERIALS AFTER COMPLETION OF CONSTRUCTION ACTIVITIES, AS WEATHER PERMITS, UNLESS OTHERWISE DIRECTED BY THE LANDOWNER OR DUKE ENERGY. IMPACTED AREAS SHALL BE RESTORED TO PRECONSTRUCTION CONDITIONS IN COMPLIANCE WITH THE OHIO EPA GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS OBTAINED FOR THE PROJECT AND THE APPROVED STORMWATER POLLUTION PREVENTION (SWPPP) CREATED FOR THE PROJECT.

CONSTRUCTION DRAWING NOTES:

1. CONTRACTOR SHALL MAINTAIN UPDATED CONSTRUCTION DRAWINGS AT ALL TIMES THROUGH THE DURATION OF THE PROJECT. CONSTRUCTION RECORD DRAWINGS SHALL BE SUBMITTED TO THE CLIENT REPRESENTATIVE.
2. DURING CONSTRUCTION OF THE PROJECT, CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING TRACK OF ANY CLIENT REPRESENTATIVE-APPROVED FIELD CONSTRUCTION REVISIONS TO THE DESIGN DEPICTED ON APPROVED CONSTRUCTION DRAWINGS.
3. ALL VARIATIONS IN PROJECT CONDITIONS, LOCATIONS, AND CONFIGURATIONS, AND ANY OTHER CHANGES OR DEVIATIONS FROM THE INFORMATION PRESENTED ON THE ORIGINAL, APPROVED CONSTRUCTION DRAWINGS SHALL BE NOTED. THIS INCLUDES BURIED OR CONCEALED CONSTRUCTION AND UTILITY FEATURES THAT WERE REVEALED DURING CONSTRUCTION.
4. THE CLIENT REPRESENTATIVE SHALL REVIEW COMPLETENESS, ACCURACY, AND FORMAT OF SUBMITTED CONSTRUCTION DRAWINGS. IF THE CONSTRUCTION DRAWINGS ARE CONSIDERED UNACCEPTABLE, THEY SHALL BE RETURNED TO THE CONTRACTOR FOR CORRECTION AND RESUBMISSION. THIS SHALL BE AT NO ADDITIONAL COMPENSATION TO THE CONTRACTOR.

COORDINATION AND COMMUNICATION

1. CONTRACTOR SHALL APPOINT A PRIMARY CONSTRUCTION SUPERINTENDENT, SUBJECT TO THE APPROVAL OF THE CLIENT REPRESENTATIVE, WHO SHALL BE PRESENT ON THE CONSTRUCTION SITE AT ALL TIMES DURING WORKING HOURS AND ACCESSIBLE AT ALL TIMES WHILE WORK IS IN PROGRESS. THE PRIMARY CONSTRUCTION SUPERINTENDENT SHALL BE DESIGNATED THE RESPONSIBLE CONTRACTOR'S REPRESENTATIVE WHO SHALL BE AVAILABLE ON A 24-HOUR BASIS. WHEN THE CONTRACTOR'S PRIMARY CONSTRUCTION REPRESENTATIVE IS NOT AVAILABLE ON THE CONSTRUCTION SITE, AN ALTERNATE REPRESENTATIVE SHALL BE PROVIDED. CONTRACTOR SHALL PROVIDE NAMES AND CONTACT INFORMATION OF REPRESENTATIVES TO THE CLIENT REPRESENTATIVE PRIOR TO THE START OF CONSTRUCTION ACTIVITIES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONSTANT COORDINATION BETWEEN ANY SUBCONTRACTORS AND THE CLIENT REPRESENTATIVE. ALL CONSTRUCTION ACTIVITIES PLANNED BY THE CONTRACTOR SHALL BE REVIEWED AND APPROVED BY THE CLIENT REPRESENTATIVE.
3. THE FOLLOWING CONTACT INFORMATION IS PROVIDED FOR CONTRACTOR'S USE IN CASE OF AN EMERGENCY:

   a. EMERGENCY 911
   b. OTHER CONTACTS AS DIRECTED AT PRE-CONSTRUCTION MEETING

EXCAVATION AND TRENCHES

1. CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT EDITION OF OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS AND THE STATE OF OHIO LAWS CONCERNING EXCAVATION.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EXCAVATION, TRENCHING AND SHORING ARE PERFORMED IN A MANNER THAT COMPLIES WITH LOCAL REGULATIONS AND OSHA REGULATIONS FOR CONSTRUCTION.
3. OPEN TRENCHES AND EXCAVATIONS AT THE CONSTRUCTION SITE SHALL BE PROMINENTLY MARKED WITH ORANGE BARRICADES WITH FLASHING RED LIGHTS ACCEPTABLE TO THE CLIENT REPRESENTATIVE.
4. CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF 48 HOURS TO THE CLIENT REPRESENTATIVE AND ASSOCIATED UTILITY COMPANIES AND AGENCIES BEFORE PROCEEDING WITH ANY EXCAVATION.
5. DEWATERING OF UTILITY TRENCHES AND OTHER EXCAVATIONS MAY BE REQUIRED.
6. OPEN ONLY THOSE TRENCHES FOR WHICH MATERIAL IS ON-HAND AND READY FOR PLACING THEREIN. AS SOON AS POSSIBLE AFTER THE MATERIAL HAS BEEN PLACED AND WORK APPROVED, BACKFILL AND COMPACT TRENCHES AS SPECIFIED.
7. NO SPECIAL PROVISIONS WILL BE MADE FOR ROCK EXCAVATION. ANY BOULDERS ENCOUNTERED SHALL BE REMOVED AND DISPOSED OF OFF SITE.
8. ALL TOPSOIL SHALL BE REMOVED FROM AREAS TO BE GRADED. ALL USEABLE TOPSOIL SHALL BE STOCKPILED DURING GRADING AND REAPPLIED IN 3" LAYERS TO ALL SLOPES IMMEDIATELY AFTER GRADING IS COMPLETE.

OTHER SAFETY REQUIREMENTS:

1. CONTRACTOR SHALL MAINTAIN SAFETY PRACTICES THAT CONFORM TO OSHA REGULATIONS.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN AND PAY FOR ALL APPLICABLE PERMITS, FEES AND LICENSES FOR CONSTRUCTION AND EQUIPMENT.
3. THE CONTRACTOR SHALL PERFORM ON-SITE INSPECTIONS THROUGHOUT THE PROJECT AND REMEDY ANY SAFETY CONCERNS IMMEDIATELY.
4. THERE SHALL BE NO PERMANENT WASTE SITES ON SITE PROPERTY. ANY TEMPORARY WASTE AREA SHALL BE APPROVED BY THE CLIENT REPRESENTATIVE AND SHALL BE KEPT IN AN ORDERLY CONDITION. REMOVAL OF WASTE THAT IS NOT PROPERLY MAINTAINED IS SUBJECT TO THE DIRECTION OF THE CLIENT REPRESENTATIVE.
5. EROSION CONTROL DEVICES SHALL BE USED FOR THE ACCESS AND HAUL ROUTES, STAGING AREA, AND ANY MATERIAL STOCKPILES WHEN NECESSARY TO CONTROL EROSION AND STORM WATER RUNOFF. SEE DRAWINGS C-004-0001003 AND C-004-0001007 FOR EROSION AND SEDIMENT CONTROL REQUIREMENTS.
6. STOCKPILED MATERIAL SHALL BE CONSTRAINED IN A MANNER TO PREVENT MOVEMENT RESULTING FROM WIND CONDITIONS.
7. CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO LIMIT DUST CAUSED BY CONSTRUCTION ACTIVITIES TO A LIMIT ACCEPTABLE TO PROJECT SITE OPERATIONS. THE CONTRACTOR SHALL CONTROL BLOWING DUST ON THE PROJECT SITE FROM ANY HAUL ROUTE OR WORK AREA REGARDLESS OF SOURCE.
8. WILDLIFE ATTRACTANTS, SUCH AS TRASH AND FOOD SCRAPS, FROM CONSTRUCTION PERSONNEL AND ACTIVITIES SHALL BE REMOVED FROM THE PROJECT LIMITS.
9. GASOLINE, DIESEL FUEL, OIL, AND HAZARDOUS WASTE RESULTING FROM CONTRACTOR'S OPERATIONS OR ACTIVITIES SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH THE SPECIFICATIONS AND LOCAL REGULATORY REQUIREMENTS AND PROPERLY REMOVED FROM THE PROJECT PROPERTY. IF HAZARDOUS MATERIALS ARE ENCOUNTERED OR UNCOVERED DURING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CLIENT REPRESENTATIVE.
10. FAILURE TO COMPLY WITH THE CLIENT REPRESENTATIVE SAFETY REQUIREMENTS SHALL RESULT IN THE SUSPENSION OF CONSTRUCTION ACTIVITIES UNTIL ALL SAFETY CONCERNS ARE ADDRESSED BY THE CONTRACTOR TO THE SATISFACTION OF THE CLIENT REPRESENTATIVE.
11. ANY WORKERS AND EQUIPMENT NOT IN COMPLIANCE WITH SAFETY PLAN SHALL IMMEDIATELY BE REMOVED FROM THE WORK AREA.
12. THE CONTRACTOR SHALL NOT BURN OR BURY DEBRIS WITHOUT PERMISSION FROM THE SITE INSPECTOR.

SURVEY AND SUBSURFACE INVESTIGATION NOTES:

1. SURVEY CONTROL POINTS WILL BE PROVIDED PRIOR TO CONSTRUCTION. IF THE CONTRACTOR SHOULD NEED TO DISTURB THE CONTROL POINTS DURING CONSTRUCTION, REQUEST SHALL BE GIVEN TO THE SURVEYOR TO HAVE THE CONTROL POINTS RESET.
2. IF BENCHMARKS SHOWN ARE IN AREAS THAT REQUIRE DEMOLITION, OTHER BENCHMARKS SHALL BE ESTABLISHED BEFORE DEMOLITION AND CONSTRUCTION WORK BEGINS. CONTRACTOR SHALL GIVE REQUEST TO THE SURVEYOR.
3. HORIZONTAL CONTROL IS BASED ON NAD 83, OHIO STATE PLAN SOUTH ZONE. VERTICAL CONTROL IS BASED ON NAVD 83.

EXISTING CONDITIONS NOTES:

1. THE LOCATIONS OF STRUCTURES AND UNDERGROUND UTILITIES AS INDICATED HAVE BEEN OBTAINED FROM EXISTING RECORDS AND FIELD SURVEYS. UNDERGROUND STRUCTURES AND UTILITIES MAY BE PRESENT WHICH ARE NOT DOCUMENTED OR LOCATED.
2. THE CONTRACTOR SHALL FIELD-CHECK ALL EXISTING CONDITIONS AND BE THOROUGHLY FAMILIAR WITH THE SITE BEFORE ANY WORK COMMENCES. ANY DISCREPANCIES IN THE DRAWINGS SHALL BE IMMEDIATELY REPORTED TO THE CLIENT REPRESENTATIVE BEFORE ANY FURTHER WORK COMMENCES.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD-VERIFY EXISTING STRUCTURES, UTILITIES, AND SURVEY INFORMATION, AND TO TAKE NECESSARY PRECAUTIONS DURING DEMOLITION AND CONSTRUCTION. CONTRACTOR SHALL VERIFY EXISTENCE AND MARK LOCATIONS OF ALL UTILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES, PRIOR TO BEGINNING WORK. CONTRACTOR SHALL CONTACT THE CLIENT REPRESENTATIVE AND ALL ASSOCATED UTILITY COMPANIES AND AGENCIES TO IDENTIFY THE LOCATION OF UTILITIES. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED DURING CONSTRUCTION.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE CLIENT REPRESENTATIVE OF OPERATIONAL PLANS. IN THE EVENT AN UNEXPECTED UTILITY OR STRUCTURE INTERFERENCE OR CONFLICT IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CLIENT REPRESENTATIVE. ANY UTILITY SERVICES OR STRUCTURES DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED IMMEDIATELY AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ITEMS NOT TO BE DAMAGED DURING DEMOLITION AND CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE DAMAGED OR DISTURBED ITEMS TO THE SATISFACTION OF THE CLIENT REPRESENTATIVE.

GENERAL GRADING NOTES:

1. ALL GRADING, PAVEMENT WORK, AND ANY OTHER MISCELLANEOUS WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT ODOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND SUPPLEMENTAL SPECIFICATIONS.
2. THE GRAVEL SURFACE COURSE SHALL BE CONSTRUCTED IN ACCORDANCE WITH ITEM 411 OF THE ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GRADING, INCLUDING EXCAVATION, EMBANKMENT, AND BACKFILLING AS NECESSARY TO CONSTRUCT ALL AGGREGATE ACCESS ROADS, AS OUTLINED IN THESE TECHNICAL SPECIAL PROVISIONS AND AS DIRECTED BY THE CLIENT REPRESENTATIVE.
4. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE DONE TO STORM MANHOLES OR OTHER UTILITIES DURING GRADING.
5. DISTRIBUTE EXCESS SOIL ON SITE AT THE DIRECTION OF THE CLIENT REPRESENTATIVE. DO NOT ALTER DIRECTION OF SURFACE DRAINAGE PATTERNS.
6. THE TOLERANCE OF THIS WORK SHALL BE TO WITHIN TO 0.1 FT OF THE EXISTING GROUND SURFACE ELEVATIONS.
7. THE ACCESS ROAD SUBGRADE SHALL HAVE SUFFICIENT STABILITY TO ACCOMMODATE CONSTRUCTION TRAFFIC WITHOUT EXCESSIVE SUBRADE RUTTING OR SHOVING. AT THE TIME OF PLACEMENT OF THE PAVEMENT, THE IN SITU SUBGRADE SHALL HAVE A CALIFORNIA BEARING RATIO (CBR) OF AT LEAST 6 PERCENT IN THE TOP 12 INCHES OF SUBGRADE. THE CBR PERCENTAGE WILL BE ASCERTAINED BY THE CONTRACTOR.
8. IF SOFT SPOTS ARE IDENTIFIED IN THE SUBGRADE SOIL, THE SUBGRADE SHALL BE SCARIFIED AND PROOF-ROLLED TO THE DEPTHS REQUIRED BY THE OWNER'S CONSTRUCTION INSPECTOR TO COMPACT AREAS TO THE DENSITY REQUIREMENTS OF THIS DOCUMENT. IF THE SOFT AREAS CANNOT BE ADEQUATELY COMPACTED, THE SOFT SOIL SHALL BE REMOVED AND REPLACED PER THE DESIGN PLANS WITH SUITABLE SOIL MATERIAL AND COMPACTED TO THE DENSITY REQUIREMENTS IN ACCORDANCE WITH THIS DOCUMENT.
9. THE QUALITY OF THE SOIL TO BE USED AS FILL MATERIAL SHALL BE AS SPECIFIED IN THIS DOCUMENT. ALL BACKFILL SHALL BE SPREAD IN LOOSE LIFTS NOT EXCEEDING 8" THICKNESS WHEN SELF-PROPELLED EQUIPMENT IS USED AND NOT EXCEEDING 6" WHEN HAND GUIDED EQUIPMENT IS USED. ALL ROOTS, WOOD, AND VEGETATION SHALL BE REMOVED FROM THE LAYER OF FILL PRIOR TO COMPACTION. ALL FILL AND EXPOSED SOIL IN CUT AREAS SHALL BE COMPACTED AS SPECIFIED IN THIS DOCUMENT. SOIL COMPACTION TESTS WILL BE REQUESTED BY THE OWNER AT APPROPRIATE INTERVALS DURING GRADING OPERATIONS.
10. ALL HAUL-IN MATERIAL SHALL BE FREE OF ROCKS 3" IN DIAMETER AND LARGER. THE OWNER'S CONSTRUCTION INSPECTOR SHALL APPROVE ALL HAUL-IN MATERIAL TO ENSURE THE QUALITY AND THE ABSENCE OF ENVIRONMENTAL HAZARDS.
11. THE FILL AREA SHALL BE CONSTRUCTED TO THE LINES AND GRADES SHOWN ON THE DESIGN DRAWINGS WITH MATERIAL SPECIFIED IN THIS DOCUMENT. THE OWNER'S CONSTRUCTION INSPECTOR WILL PROVIDE ALL NECESSARY BENCHMARKS, SURVEY MONUMENTS, AND BASE LINES REQUIRED FOR THE WORK. THE CONTRACTOR SHALL LAY OUT ALL LINES AND GRADES FOR THE BACKFILL AREAS. ANY PROPOSED CHANGES TO THE SLOPES AND GRADES SHALL REQUIRE THE APPROVAL OF THE OWNER'S CONSTRUCTION INSPECTOR IN ADVANCE. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE, AT HIS OWN EXPENSE, ANY COMPACTED MATERIAL PLACED OUTSIDE OF THE APPROVED LINES OR GRADES.
12. SPOIL MATERIAL SHALL BE TOPSOIL AND OTHER SOIL MATERIALS CONTAINING GREATER THAN 5 PERCENT ORGANIC MATERIAL, SOIL WHICH IS TOO WET, SOIL WHICH DOES NOT MEET THE PLASTICITY AND/OR GRADATION LIMITS FOR SELECT MATERIAL AS SPECIFIED IN THIS DOCUMENT, OR OTHER SOIL MATERIAL DESIGNATED BY THE OWNER'S CONSTRUCTION INSPECTOR TO BE UNSUITABLE FOR SELECT MATERIAL.
13. UNLESS SPECIFIED AS WETLANDS, FILL OVER THE PAD AREA PER THE PLANS. SELECT SOIL MATERIAL SHALL BE THAT MATERIAL CLASSIFIED AS SM, SP, SC, SW AND CL, OR SW AND SC IN ACCORDANCE WITH ASTM D2487, AND SHALL HAVE A MAXIMUM LIQUID LIMIT OF 30, A MAXIMUM PLASTICITY INDEX OF 8, AND A MAXIMUM OF 35 PERCENT PASSING THE #200 SIEVE.
14. THE TOP SURFACE OF EACH LIFT OF BACKFILL SHALL BE PROTECTED FROM PUMPING, PONDING, AND GULLYING.
15. COMPACTION TESTING WILL BE PROVIDED AT THE EXPENSE OF THE CONTRACTOR. COMPACTION REQUIREMENTS OF SOIL BACKFILL SHALL BE AS INDICATED IN THE FOLLOWING TABLE:

LOCATION OF FILL	MINIMUM REQUIRED COMPACTION LEVEL STANDARD PROCTOR
A. GENERAL YARD AREA	98%(ASTM D698)
B. UPPER 18 INCHES OF SOIL TO BE USED AS ROAD SUBGRADE MATERIAL AND EXTENDING A MINIMUM OF 5 FEET BEYOND THE EDGE OF DEFINED ROADWAYS (IMMEDIATELY UNDER BASE MATERIAL)	98%(ASTM D698)

16. CRUSHED STONE IN DRIVE AREAS SHALL BE COMPACTED WITH A STATIC STEEL DRUM ROLLER (APPROXIMATELY 8 TONS). IF A VIBRATORY COMPACTOR IS USED, NO MORE THAN FOUR (4) PASSES SHALL BE ALLOWED.
17. APPROVAL SHALL BE RECEIVED FROM THE CLIENT REPRESENTATIVE FOR EACH FILL TYPE TO BE USED PRIOR TO PROCEEDING WITH BACKFILL OPERATIONS WITH THE MATERIAL IN QUESTION.
18. BACKFILL TO BE IMPORTED SHALL BE TESTED IN ACCORDANCE WITH THIS DOCUMENT AND APPROVED BY THE PROJECT MANAGER PRIOR TO DELIVERY OF MATERIAL TO THE SITE. THE OWNER'S CONSTRUCTION INSPECTOR ACCEPTS NO LIABILITY FOR ANY OUT OF SPECIFICATION MATERIAL ACCEPTED AND STOCKPILED BY THE CONTRACTOR.
19. INSPECTION AND TESTING OF MATERIAL SHALL BE PERFORMED AS REQUIRED BY THIS DOCUMENT AT THE EXPENSE OF THE CONTRACTOR.
20. TESTS AND ANALYSIS OF MATERIAL SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE STANDARDS REFERENCED IN THIS DOCUMENT FOR THE SPECIFIC TEST. FIELD INSPECTION SHALL BE PERFORMED AS REQUIRED BY THIS DOCUMENT.
21. THE BACKFILL AND EXPOSED SOIL IN CUT AREAS SHALL BE COMPACTED AS SPECIFIED ON THIS DOCUMENT. FIELD DENSITY TESTS SHALL BE PERFORMED BY THE CONTRACTOR TO VERIFY COMPACTION REQUIREMENTS HAVE BEEN ACHIEVED. IN-PLACE FIELD DENSITY TESTING OF THE COMPACTED BACKFILL SHALL BE CONDUCTED ACCORDING TO THE PROCEDURES OF THE SAND CONE METHOD (ASTM 1556), NUCLEAR METHOD (ASTM D3017), OR ACCORDING TO THE PROVISIONS OF THIS DOCUMENT. TEST RESULTS REPORTED SHALL INCLUDE BOTH THE MOISTURE CONTENT AND DRY DENSITY, ALONG WITH OTHER PERTINENT DATA SUCH AS LOCATION, ELEVATION, PROCTOR CURVE USED FOR COMPARISON, ETC. THE TESTING FREQUENCY SHALL BE ONE TEST FOR EACH 5,000 SQUARE FEET OF LIFT AREA OR PORTION THEREOF FOR EACH LIFT. IN ISOLATED AREAS OF LESS THAN 5,000 SQUARE FEET, TEST AT LEAST EVERY THIRD LIFT. WHEN BACKFILL OPERATIONS ARE CONCENTRATED IN SMALL AREAS USING LIGHT MANUALLY-GUIDED EQUIPMENT AND RELATIVELY THIN LIFTS, THE FREQUENCY OF DENSITY TESTING MAY BE REVISED AS DIRECTED BY THE OWNER'S CONSTRUCTION INSPECTOR. TEST LOCATION SHALL BE THE WEAKEST APPEARING AREA OF THE TOP LIFT DETERMINED BY TRACKING ACTION OF THE EQUIPMENT.
22. SUITABILITY OF SOIL MATERIAL FOR USE AS BACKFILL SHALL BE DETERMINED FOR EACH FILL TYPE BY THE RESULTS OF THE FOLLOWING TESTS:

   A. LIQUID LIMIT IN ACCORDANCE WITH ASTM D4318.
   B. PARTICLE SIZE ANALYSIS IN ACCORDANCE WITH ASTM D422.
   C. MOISTURE-DENSITY RELATIONS (STANDARD PROCTOR) IN ACCORDANCE WITH ASTM D698.
   D. MOISTURE CONTENT IN ACCORDANCE WITH ASTM D2216.
   E. SAMPLING OF SOIL SHALL BE IN ACCORDANCE WITH ASTM D2216.
   F. SOIL SHALL BE CLASSIFIED IN ACCORDANCE WITH ASTM D2487.

23. FREQUENCY OF TESTS: TESTS OF MATERIALS TO BE USED IN THE OPERATIONS COVERED IN THIS DOCUMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS GIVEN IN THIS DOCUMENT. FREQUENCIES OF IN-PLACE DENSITY TESTS SHALL BE AS STATED IN THIS DOCUMENT.
24. IF QUESTIONABLE COMPACTION RESULTS ARE OBTAINED, THE CLIENT REPRESENTATIVE MAY REQUIRE THE CONTRACTOR TO PERFORM PROCTOR CHECKS (ON DRY SIDE OF OPTIMUM) TO VERIFY THAT THE PROPER PROCTOR CURVE IS BEING REFERENCED. IF NOT, A NEW PROCTOR CURVE DETERMINED BY A FIVE-POINT TEST SHALL BE REQUIRED. IF THE COMPACTION REQUIREMENTS FOR A LIFT HAVE NOT BEEN ACHIEVED, THE LIFT SHALL BE REWORKED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
25. TESTING OF IN-PLACE DENSITY AND MOISTURE CONTENT BY NUCLEAR METHODS IN ACCORDANCE WITH ASTM D2922 AND ASTM D3017, RESPECTIVELY, WILL BE ALLOWED PROVIDED:

   A. ACCEPTABLE CORRELATION WITH SAND CONE DENSITY AND LABORATORY DETERMINED MOISTURE CONTENT TEST RESULTS CAN BE OBTAINED ACCORDING TO THE GUIDELINES OF "CALIBRATION" SECTIONS OF ASTM D2922 AND ASTM D3017.
   B. THE INITIAL CORRELATION RESULTS ARE REVIEWED AND USE OF THE NUCLEAR DEVICE IS APPROVED BY THE OWNER'S CONSTRUCTION INSPECTOR.
   C. THE CONTRACTOR ENSURES THAT THE REPRESENTATIVE FROM THE TESTING AGENCY OPERATING THE NUCLEAR DENSITY TESTING HAS THE NECESSARY STATE AND/OR FEDERAL LICENSES TO OPERATE THE DEVICE AND CARRY A NUCLEAR ENERGY SOURCE.

EMBANKMENT FILL NOTES:

1. EMBANKMENT FILL SHALL CONSIT OF AN INORGANIC, NON-PLASTIC, GRANULAR SOIL CONTAINING LESS THAN 10% MATERIAL PASSING THE NO. 200 MESH SIEVE WITH UNIFIED SOIL CLASSIFICATION OF SP, SP-SC, OR SP-SM. UNLESS SPECIFIED AS WETLANDS, FILL OVER THE PAD AREA PER THE PLANS. EMBANKMENT FILL SHALL BE PLACED IN LIFTS NOT EXCEEDING 8 INCHES WHEN USING A STATIC DRUM ROLLER WITH A MINIMUM OPERATING WEIGHT OF 5 TONS WITH A DRUM DIAMETER OF 3 TO 4 FEET. WHERE LIGHTWEIGHT VIBRATORY COMPACTION METHODS ARE UTILIZED MAXIMUM LOOSE LIFT THICKNESS SHALL BE 6 INCHES. COMPACTION TO MEET A MAXIMUM DRY DENSITY OF 98% STANDARD PROCTOR DRY DENSITY.
2. ANY GRADING TO CORRECT SLOPES SHALL BE COMPACTED PER THIS DOCUMENT.

GENERAL EXCAVATION REQUIRED FOR CONSTRUCTION

1. THIS ITEM SHALL CONSIST OF FURNISHING ALL LABOR, MATERIALS, MACHINERY, TOOLS, AND SUPERVISION FOR EXCAVATION AND GRADING REQUIRED TO PREPARE THE ROADWAY, AND GRADING REQUIRED TO COMPLETE THE FINAL GRADING OF AREAS ADJACENT TO THE ROADWAY AS SHOWN ON THE PLANS IN ACCORDANCE WITH THE PROVISIONS OF ITEM 209 OF THE ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS INSOFAR AS THEY ARE NOT AMENDED BY THE PLANS AND THESE SPECIAL PROVISIONS, AND IN ACCORDANCE WITH THE FOLLOWING SPECIAL PROVISIONS.

SUBGRADE COMPACTION VERIFICATION

1. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT CONSTRUCTION MATERIAL ENGINEERING TESTING FIRM TO MONITOR THE PROOFROLLING OF THE SITE AFTER THE STRIPPINGS HAVE BEEN REMOVED TO INSPECT AND TEST THE COMPACTED FILL AREAS IN THE ACCESS ROAD AREAS AS INDICATED ON THE BID DOCUMENTS AND/OR AS SPECIFIED BY THE OWNER'S DESIGNATED REPRESENTATIVE. COPIES OF THE TEST RESULTS SHALL BE FURNISHED TO THE OWNER'S DESIGNATED REPRESENTATIVE AND OTHERS AS INDICATED BY OWNER'S DESIGNATED REPRESENTATIVE. THE OWNER'S DESIGNATED REPRESENTATIVE MUST APPROVE THE INDEPENDENT CONSTRUCTION MATERIAL ENGINEERING TESTING FIRM. INCLUDED WITH THIS BID PROPOSAL, THE CONTRACTOR SHALL FURNISH THE NAME, ADDRESS AND A PHONE NUMBER OF THE INDEPENDENT CONSTRUCTION MATERIAL ENGINEERING TESTING FIRM FOR APPROVAL.

WETLANDS CONSTRUCTION NOTES

1. CONSTRUCTION OCCURS WITHIN WOODED WETLANDS. CONTRACTOR MUST LIMIT ALL CONSTRUCTION ACTIVITIES AND DISTURBANCE TO WITHIN THE LIMITS OF DISTURBANCE AS SHOWN IN THE PLANS.
2. CONTRACTOR MUST INSTALL ORANGE CONSTRUCTION FENCING IMMEDIATELY OUTSIDE OF THE PERIMETER EROSION CONTROL MEASURES ALONG THE PERIMETERS OF WETLAND AREAS NOT TO BE DISTURBED.
3. SIGNS MUST BE INSTALLED EVERY 75' ON THE ORANGE CONSTRUCTION. SIGNS MUST READ "WETLANDS - DO NOT ENTER OR DISTURB".
4. DO NOT PLACE CONCRETE WASHOUTS WITHIN 125 FEET OF A WETLAND OR STREAM. CONCRETE WASHOUT FOR STATION CONSTRUCTION SHALL BE PLACED ALONG THE PIPELINE ALIGNMENT WORKSPACE OR ACCESS AREA. CONCRETE WASHOUT FOR STATION CONSTRUCTION SHALL NOT BE PLACED WITHIN THE FOOTPRINT OF THE HIGHPOINT PARK STATION. DO NOT PLACE THE CONCRETE WASHOUT WITHOUT APPROVAL BY DUKE ENVIRONMENTAL.
5. OVER EXCAVATION IS REQUIRED IN WETLAND AREAS TO BE CONSTRUCTED UPON. A MINIMUM OF 1 FOOT OF OVER EXCAVATION AND REPLACEMENT WILL BE REQUIRED. SUBGRADE SHALL BE STABILIZED IN AREAS OF OVER EXCAVATION. STABILIZATION METHODS SHALL INCLUDE OVEREXCAVATION AND REPLACEMENT ALONG WITH GEOGRID. SEE DETAILS ON SHEET C-004-0001268. CONTACT THE GEOTECHNICAL ENGINEER OF RECORD FOR RECOMMENDATIONS AND APPROVAL.

DEWATERING NOTES:

1. ALL DEWATERING SHALL BE PERFORMED IN ACCORDANCE WITH THE SWPPP.
2. CONTROL GRADING AROUND EXCAVATIONS TO PREVENT SURFACE WATER FROM FLOWING INTO EXCAVATION AREAS.
3. DRAIN OR PUMP AS REQUIRED TO MAINTAIN, INCLUDING DAYS NOT NORMALLY WORKED, ALL EXCAVATIONS FREE OF WATER OR MUD FROM ANY SOURCE, AND DISCHARGE TO APPROVED DRAINS OR CHANNELS. COMMENCE WHEN WATER FIRST APPEARS AND CONTINUE AS REQUIRED TO KEEP EXCAVATION FREE OF STANDING WATER DURING ENTIRE TIME EXCAVATION IS OPEN.
4. USE PUMPS OF ADEQUATE CAPACITY TO ENSURE RAPID DRAINAGE OF AREA, AND CONSTRUCT AND USE DRAINAGE CHANNELS AND SUBDRAINS WITH SUMPS AS REQUIRED BY QUANTITY OF INFLOW.
5. WHEN WATER IS FOUND IN THE EXCAVATION DUE TO CONTRACTOR NEGLIGENCE, REMOVE UNSUITABLE EXCESSIVELY WET SUBGRADE MATERIALS AND REPLACE WITH APPROVED COMPACTED EMBANKMENT MATERIAL AS DIRECTED BY OWNER AND AT NO ADDITIONAL COST TO OWNER.

ABBREVIATIONS:

ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CBR	CALIFORNIA BEARING RATION
FT	FEET
JAB	JACK AND BORE
GIS	GEOGRAPHIC INFORMATION SYSTEM
MAX	MAXIMUM
MIN	MINIMUM
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NTS	NOT TO SCALE
ODOT	OHIO DEPARTMENT OF TRANSPORTATION
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PL	PROPERTY LINE

LEGEND:

ST	EXISTING STORM SEWER
	EXISTING UTILITY POLE
E	EXISTING OVERHEAD ELECTRIC
	EXISTING FENCE
PL	PROPERTY LINE
COMM	EXISTING OVERHEAD COMM LINE
SS	EXISTING SANITARY SEWER
T	EXISTING UNDERGROUND TELEPHONE LINE
W	EXISTING WATER LINE
G	EXISTING UNDERGROUND GAS LINE
x	PROPOSED FENCE
- - - - - - - -	PRECAST CONCRETE SCREENING WALL

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
CHRISTOPHER D. WILSON
82217
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	S0867O1
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/01/2020	CDW

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
CIVIL GENERAL NOTES & ABBREVIATIONS
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S)	3 OF 66
DWG SCALE	AS NOTED
DWG DATE	07/26/2019
SUPERSEDED	—
DRAWING NUMBER	PNG -C-004-0001257
REVISION	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

ACCESS AND STAGING

1. ACCESS AND HAUL ROUTES FOR ALL CONTRACTOR PERSONNEL, VEHICLES, EQUIPMENT, AND DELIVERIES ARE ILLUSTRATED ON THIS DRAWING AND ARE SUBJECT TO THE APPROVAL OF THE CLIENT REPRESENTATIVE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES WITH THE APPROPRIATE OWNER WHO HAS JURISDICTION OVER THE AFFECTED ROUTE. ACCESS ROUTES AND HAUL ROUTES ARE SUBJECT TO CHANGE AT THE DIRECTION OF THE CLIENT REPRESENTATIVE AND MAY CHANGE BASED ON OPERATIONAL REQUIREMENTS OF THE SITE.
2. CONTRACTOR SHALL COORDINATE ACTIVITIES AND MAINTAIN ALL ACCESS AND HAUL ROUTES IN A MANNER THAT ALLOWS UNOBSTRUCTED EMERGENCY ACCESS TO ALL PROJECT AREAS AND EXISTING ROADWAYS AT ALL TIMES WITHOUT DELAY TO EMERGENCY AND SECURITY VEHICLE RESPONSE TIME.
3. IF ANY EMERGENCY ROUTES REQUIRE CLOSURE DUE TO CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL NOTIFY THE CLIENT REPRESENTATIVE, POLICE, LOCAL FIRE AUTHORITY, AND ALL OTHER EMERGENCY SERVICES OF THE CLOSURE.
4. CONTRACTOR SHALL MAINTAIN ACCESS AND HAUL ROUTES TO BE FREE FROM DEBRIS CAUSED FROM CONSTRUCTION ACTIVITIES ON A DAILY BASIS.
5. CONTRACTOR SHALL RESTRICT ALL OPERATIONS TO AREAS WITHIN THE CONSTRUCTION LIMITS UNLESS COORDINATED OTHERWISE WITH THE CLIENT REPRESENTATIVE.
6. CONTRACTOR SHALL PROVIDE TEMPORARY CONSTRUCTION FENCING AROUND THE ENTIRE SITE DURING CONSTRUCTION.
7. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING A STAGING AND STOCKPILE AREA FOR MATERIALS AND EQUIPMENT. LOCATION OF CONTRACTOR'S STAGING SHALL BE AS ILLUSTRATED ON THIS DRAWING, AND IS SUBJECT TO THE APPROVAL OF THE CLIENT REPRESENTATIVE. CONTRACTOR MAY SUBMIT ALTERNATIVES TO THE STAGING AREA LOCATIONS AS SHOWN. CONTRACTOR'S STAGING AREA IS SUBJECT TO CHANGE AT THE DIRECTION OF THE CLIENT REPRESENTATIVE AND MAY CHANGE BASED ON OPERATIONAL REQUIREMENTS OF THE PROJECT SITE.
8. WHEN NOT ENGAGED IN CONSTRUCTION ACTIVITIES, CONTRACTOR'S EQUIPMENT AND VEHICLES SHALL BE PARKED IN THE STAGING AREA.
9. ACCESS POINTS, HAUL ROUTES, STAGING AREA, AND ANY OTHER AREAS DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE CLIENT REPRESENTATIVE.
10. CONTRACTOR SHALL IMPROVE THE EXISTING ACCESS ROAD AS REQUIRED AND AS DIRECTED BY AND APPROVED BY CLIENT REPRESENTATIVE.

TRAFFIC CONTROL

1. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL CORDON OFF THE CONSTRUCTION WORK AREA AND ASSOCIATED ROADWAYS BY USING BARRICADES APPROVED BY THE CLIENT REPRESENTATIVE.
2. ALL CONSTRUCTION EQUIPMENT AND VEHICLES SHALL BE MARKED WITH COMPANY DESIGNS, INSIGNIAS, OR OTHER MARKINGS, WHICH ARE CLEARLY VISIBLE
3. CONSTRUCTION EQUIPMENT SHALL HAVE AUTOMATIC SIGNALING DEVICES TO SOUND AN ALARM WHEN MOVING IN REVERSE.
4. NO PEDESTRIAN TRAFFIC SHALL BE ALLOWED INSIDE THE CONSTRUCTION LIMITS.
5. ANY DAMAGE TO ROADS AND PAVEMENTS-TO-REMAIN DUE TO CONSTRUCTION EQUIPMENT OR TRAFFIC SHALL BE REPAIRED TO RESTORE THE ROADS AND PAVEMENTS TO THEIR ORIGINAL CONDITION TO THE SATISFACTION OF THE CLIENT REPRESENTATIVE.

N

0 100 200
1IN = 100FT

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
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DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
ACCESS & CONSTRUCTION STAGING

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 4 OF 66	DWG SCALE AS NOTED		
DWG DATE 07/26/2019	SUPERSEDED —		
DRAWING NUMBER		REVISION	
PNG -C-004-0001258		0	
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GENERAL NOTES FOR SEDIMENT POLLUTANT CONTROLS:

1. PERIMETER SEDIMENT CONTROL MEASURES (FILTER SOCK) SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING AND WITHIN SEVEN (7) DAYS FROM THE START OF GRUBBING AND SHALL CONTINUE TO FUNCTION UNTIL UPSLOPE AREAS DRAINING TO THEM ARE PERMANENTLY STABILIZED.

2. EXISTING STORM DRAINAGE SYSTEM SHALL BE FLUSHED OF SEDIMENT PRIOR TO BEGINNING GRADING ACTIVITIES.

3. NO EROSION AND SEDIMENT CONTROL BMPS SHALL BE REMOVED FROM THE SITE PRIOR TO ADEQUATE PERMANENT STABILIZATION OF THE ASSOCIATED UPLAND DRAINAGE AREAS. ALL BMPS WILL BE MAINTAINED IN ACCORDANCE WITH OHIO EPA GENERAL NPDES PERMIT AUTHORIZATION FOR STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY.

4. THERE SHALL BE NO SEDIMENT-LADEN OR TURBID DISCHARGES TO WATER RESOURCES OR WETLANDS RESULTING FROM DEWATERING ACTIVITIES. IF TRENCH OR GROUNDWATER CONTAINS SEDIMENT, IT MUST PASS THROUGH A SEDIMENT TRAP OR OTHER EQUALLY EFFECTIVE SEDIMENT CONTROL DEVICE, PRIOR TO BEING DISCHARGED FROM THE CONSTRUCTION SITE. ALTERNATIVELY, SEDIMENT MAY BE REMOVED BY SETTLING IN PLACE OR BY DEWATERING INTO A SUMP PIT, FILTER BAG OR COMPARABLE PRACTICE. GROUND WATER DEWATERING WHICH DOES NOT CONTAIN SEDIMENT OR OTHER POLLUTANTS IS NOT REQUIRED TO BE TREATED PRIOR TO DISCHARGE, HOWEVER, CARE MUST BE TAKEN WHEN DISCHARGING GROUND WATER TO ENSURE THAT IT DOES NOT BECOME POLLUTANT-LADEN BY TRAVERSING OVER DISTURBED SOILS OR OTHER POLLUTANT SOURCES.

5. STREETS DIRECTLY ADJACENT TO CONSTRUCTION ENTRANCES AND RECEIVING TRAFFIC FROM THE DEVELOPMENT AREA SHALL BE CLEANED DAILY TO REMOVE SEDIMENT TRACKED OFF-SITE. IF APPLICABLE, THE CATCH BASINS ON THESE STREETS NEAREST TO THE CONSTRUCTION ENTRANCES SHALL ALSO BE CLEANED WEEKLY.

6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, OR HIS/HER REPRESENTATIVE, TO INSPECT ALL CONTROLS ON THE SITE AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN TWENTY-FOUR (24) HOURS AFTER ANY STORM EVENT GREATER THAN ONE-HALF INCH OF RAIN PER TWENTY-FOUR (24) HOUR PERIOD. WHEN INSPECTIONS REVEAL THE NEED FOR REPAIR, REPLACEMENT, OR INSTALLATION OF EROSION AND SEDIMENT CONTROL BMPS, THE FOLLOWING PROCEDURES SHALL BE FOLLOWED:

   A. WHEN PRACTICES REQUIRE REPAIR OR MAINTENANCE: IF AN INTERNAL INSPECTION REVEALS THAT A CONTROL PRACTICE IS IN NEED OF REPAIR OR MAINTENANCE, WITH THE EXCEPTION OF A SEDIMENT-SETTLING POND, IT MUST BE REPAIRED OR MAINTAINED WITHIN THREE (3) DAYS OF THE INSPECTION. SEDIMENT-SETTLING PONDS MUST BE REPAIRED OR MAINTAINED WITHIN TEN (10) DAYS OF THE INSPECTION.

   B. WHEN PRACTICES FAIL TO PROVIDE THEIR INTENDED FUNCTION: IF AN INTERNAL INSPECTION REVEALS THAT A CONTROL PRACTICE FAILS TO PERFORM ITS INTENDED FUNCTION AS DETAILED IN THE SWP3 AND THAT ANOTHER, MORE APPROPRIATE CONTROL PRACTICE IS REQUIRED, THE SWP3 MUST BE AMENDED AND THE NEW CONTROL PRACTICE MUST BE INSTALLED WITHIN TEN (10) DAYS OF THE INSPECTION.

   C. WHEN PRACTICES DEPICTED ON THE SWPP³ ARE NOT INSTALLED: IF AN INTERNAL INSPECTION REVEALS THAT A CONTROL PRACTICE HAS NOT BEEN IMPLEMENTED IN ACCORDANCE WITH THE SCHEDULE, THE CONTROL PRACTICE MUST BE IMPLEMENTED WITHIN TEN (10) DAYS FROM THE DATE OF THE INSPECTION. IF THE INTERNAL INSPECTION REVEALS THAT THE PLANNED CONTROL PRACTICE IS NOT NEEDED, THE RECORD MUST CONTAIN A STATEMENT OF EXPLANATION AS TO WHY THE CONTROL PRACTICE IS NOT NEEDED.

7. THE APPLICANT SHALL MAINTAIN FOR THREE (3) YEARS FOLLOWING FINAL STABILIZATION THE RESULTS OF THESE INSPECTIONS, THE NAMES AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTIONS, THE DATES OF INSPECTIONS, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWP3, A CERTIFICATION AS TO WHETHER THE FACILITY IS IN COMPLIANCE WITH THE SWP3, AND INFORMATION ON ANY INCIDENTS OF NON-COMPLIANCE DETERMINED BY THESE INSPECTIONS.

8. ALL EROSION AND SEDIMENT CONTROL PRACTICES SPECIFIED ON THIS PLAN SHALL CONFORM WITH DETAILS AND SPECIFICATIONS OUTLINED IN THE CURRENT VERSION OF THE OHIO DEPARTMENT OF NATURAL RESOURCES BOOKLET, "RAINWATER AND LAND DEVELOPMENT" OR OTHER STANDARDS ACCEPTABLE TO OHIO EPA.

9. EROSION AND SEDIMENT CONTROL PRACTICES NOT ALREADY SPECIFIED ON THIS PLAN MAY BE NECESSARY DUE TO UNFORESEEN ENVIRONMENTAL CONDITIONS AND/OR CHANGES IN DRAINAGE PATTERNS CAUSED BY EARTH-MOVING ACTIVITY.

10. NO STRUCTURAL SEDIMENT CONTROLS (E.G. FILTER SCCK, SEDIMENT TRAPS, ETC.) SHALL BE USED IN A WATER RESOURCE OR WETLAND, UNLESS THEIR USE IS SPECIFICALLY PROVIDED FOR WITHIN THE SITE'S APPROVED PLAN.

11. SOIL STOCKPILES, TOPSOIL OR OTHERWISE, SHALL BE SITUATED AWAY FROM STREETS, SWALES, OR OTHER WATERWAYS AND SHALL BE SEEDED AND/OR MULCHED IN ACCORDANCE WITH THE OHIO EPA TIMEFRAME FOR STABILIZATION.

12. STORM DRAINAGE SHALL BE FLUSHED OF SEDIMENT AFTER COMPLETION OF CONSTRUCTION.

13. ON-SITE PERSONNEL SHALL TAKE ALL NECESSARY MEASURES TO COMPLY WITH APPLICABLE REGULATIONS REGARDING FUGITIVE DUST EMISSIONS. FUGITIVE DUST EMISSIONS SHALL BE CONTROLLED IN ACCORDANCE WITH OAC-3745-17-08.

14. FINAL STABILIZATION REQUIREMENTS SHALL INCLUDE A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF AT LEAST 80% COVER FOR ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES OR EQUIVALENT STABILIZATION MEASURES.

PERMANENT/TEMPORARY SEEDING, FERTILIZING, AND MULCHING:

1. ALL ACTIVITIES, MATERIALS, EQUIPMENT AND PERFORMANCE IN CONNECTION WITH ESTABLISHING TURF SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
2. PERMANENT SEEDING SPECIES AND RATES SHALL BE IN ACCORDANCE WITH THE SEEDING SPECIFICATION.
3. TEMPORARY TOPSOIL STOCKPILE SHALL BE SEEDED AT A RATE OF 150 POUNDS OF PURE LIVE SEED(PLS) PER ACRE IF LEFT UNDISTURBED FOR OVER 7 DAYS. SEEDING RATE SHALL BE 80 LBS/ACRE CEREAL RYE OR WHEAT PLUS 20 LBS/ACRE ANNUAL RYEGRASS.
4. ACTIVITIES ASSOCIATED WITH APPLICATION OF LIME, SEED, MULCH, COMPACTING, WATERING, MAINTENANCE AND PROTECTION SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
5. STABILIZATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLES.

PERMANENT STABILIZATION

AREAS REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS:
ANY AREAS THAT WILL LIE DORMANT FOR ONE (1) YEAR OR MORE	WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE
ANY DISTURBED ARE WITHIN FIFTY (50) FEET OF A STREAM AND AT FINAL GRADE.	WITHIN TWO (2) DAYS OF REACHING FINAL GRADE.
ANY OTHER AREAS AT FINAL GRADE	WITHIN SEVEN (7) DAYS OF REACHING FINAL GRADE WITHIN THAT AREA
NOTE: WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INSTABILITY OR ARE OTHERWISE UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED. THESE TECHNIQUES MAY INCLUDE MULCHING OR EROSION MATTING.	

TEMPORARY STABILIZATION

AREAS REQUIRING TEMPORARY STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS:
ANY DISTURBED AREA WITHIN FIFTY (50) FEET OF A STREAM AND NOT AT FINAL GRADE.	WITHIN TWO (2) DAYS OF THE MOST RECENT DISTURBANCE IF THAT AREA WILL REMAIN IDLE FOR MORE THAN FOURTEEN (14) DAYS.
FOR ALL CONSTRUCTION ACTIVITIES, ANY DISTURBED AREA, INCLUDING SOIL STOCKPILES THAT WILL BE DORMANT FOR MORE THAN FOURTEEN (14) DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN FIFTY (50) FEET OF A STREAM.	WITHIN SEVEN (7) DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA.
DISTURBED AREA THAT WILL BE IDLE OVER WINTER.	PRIOR TO THE ONSET OF WINTER WEATHER/NOVEMBER 1ST.
NOTE: WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INSTABILITY OR ARE OTHERWISE UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED. THESE TECHNIQUES MAY INCLUDE MULCHING OR EROSION MATTING.	

GENERAL NOTES FOR NON-SEDIMENT POLLUTANT CONTROLS:

1. 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.

2. CONSTRUCTION MATERIALS THAT POSE A POTENTIAL CONTAMINATION THREAT TO STORM WATER SHALL BE MANAGED TO MINIMIZE EXPOSURE TO STORM WATER. MATERIALS SHALL BE KEPT IN SECURE CONTAINERS AND PROPERLY LABELED. SOLID AND LIQUID WASTE AND OTHER WASTES SHALL BE DISPOSED OF PROPERLY IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL DISPOSAL REQUIREMENTS. DISPOSAL SHALL BE CONSISTENT WITH APPLICABLE STATE AND/OR LOCAL WASTE DISPOSAL, SANITARY SEWER OR SEPTIC SYSTEM REGULATIONS AND SHALL PROVIDE FOR THE PROPER DISPOSAL OF CONTAMINATED SOILS TO THE EXTENT THESE ARE LOCATED WITHIN THE PERMITTED AREA.

3. 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.

4. EQUIPMENT FUELING AND MAINTENANCE, OIL CHANGING, ETC., SHALL BE PERFORMED IN ACCORDANCE WITH THE SITE SPECIFIC SWP3 AND GENERAL PERMIT.

5. THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ON SITE DURING THE CONSTRUCTION PROJECT:

   A. AN EFFORT WILL BE MADE TO STORE ONLY ENOUGH PRODUCT REQUIRED TO DO THE JOB.

   B. ALL MATERIALS STORED ON SITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.

   C. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE MANUFACTURER'S LABEL. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

   D. WHENEVER POSSIBLE, ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.

   E. THE MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.

   F. PROPER USE AND DISPOSAL OF MATERIALS ON SITE SHALL BE IN ACCORDANCE WITH THE SITE SPECIFIC SWP3.

6. IN ADDITION TO PREVIOUS NOTES, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEAN-UP:

   A. SPILL CLEAN-UP AND PROCEDURES SHALL BE IN CONFORMANCE WITH THE SITE SPECIFIC SWP3.

   B. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT READILY AVAILABLE ON THE SITE IN ACCORDANCE WITH THE SITE SPECIFIC SWP3.

   C. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.

   D. SPILLS OF TOXIC OR HAZARDOUS MATERIALS SHALL BE ADDRESSED AND REPORTED IN CONFORMANCE WITH THE SITE SPECIFIC SWP3.

   E. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM REOCCURRING AND HOW TO CLEAN UP THE SPILL IF THERE IS ANOTHER ONE. A DESCRIPTION OF THE SPILL, WHAT CAUSED IT, AND THE CLEANUP MEASURES WILL ALSO BE INCLUDED.

   F. SPILL CONTROL AND CLEANUP AND SITE PERSONNEL AWARENESS SHALL BE IN CONFORMANCE WITH THE SITE SPECIFIC SWP3.

SOIL CLASSIFICATIONS:

WsS1A1 WESTBORO-SCHAFFER SILT LOAMS 0 TO 2 PERCENT SLOPES GROUP C/D

PER THE USDA NATURAL RESOURCES CONSERVATION SERVICE, THIS SOIL IS DEFINED AS FOLLOWS:

GROUP C: SOILS HAVING A SLOW INFILTRATION RATE WHEN THOROUGHLY WET. THESE CONSIST CHIEFLY OF SOILS HAVING A LAYER THAT IMPEDES THE DOWNWARD MOVEMENT OF WATER OR SOILS OF MODERATELY FINE TEXTURE OR FINE TEXTURE. THESE SOILS HAVE A SLOW RATE OF WATER TRANSMISSION.

GROUP D: SOILS HAVING A VERY SLOW INFILTRATION RATE (HIGH RUNOFF POTENTIAL) WHEN THOROUGHLY WET. THESE CONSIST CHIEFLY OF CLAYS THAT HAVE A HIGH SHRINK-SWELL POTENTIAL, SOILS THAT HAVE A HIGH WATER TABLE, SOILS THAT HAVE A CLAYPAN OR CLAY LAYER AT OR NEAR THE SURFACE, AND SOILS THAT ARE SHALLOW OVER NEARLY IMPERVIOUS MATERIAL. THESE SOILS HAVE A VERY SLOW RATE OF WATER TRANSMISSION.

SEEDING SCHEDULE:

TYPE 1 MIX - CUT AND EMBANKMENT FILL AREAS (NON-WET)/CHANNELS

BOTANICAL NAME	COMMON NAME	RATE OF PURE LIVE SEED (PLS) PER ACRE:
Festuca Arundinacea	TALL FESCUE	40-50 LBS

STOCKPILING AND DISPOSAL OF SOILS:

1. ALL IMPORTED SOILS, EXCAVATED SOILS, GRAVEL, AND OTHER MATERIAL STOCKPILES SHALL BE PROTECTED WITH PERIMETER EROSION CONTROLS AND TEMPORARILY STABILIZED AS APPLICABLE.
2. ANY WASTED TOPSOIL EXCAVATED FROM WETLANDS OR OTHER SOURCES ON SITE SHALL BE DRIED ON SITE, REMOVED, AND DISPOSED OF AT AN APPROVED FACILITY. ONSITE TOP SOILS SHALL NOT BE REUSED ON SITE. NO SOILS SHALL BE REMOVED FROM THE SITE WITHOUT APPROVAL FROM DUKE ENVIRONMENTAL.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	S0867O1
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/01/2020	CDW	PRINCIPAL ENGINEER

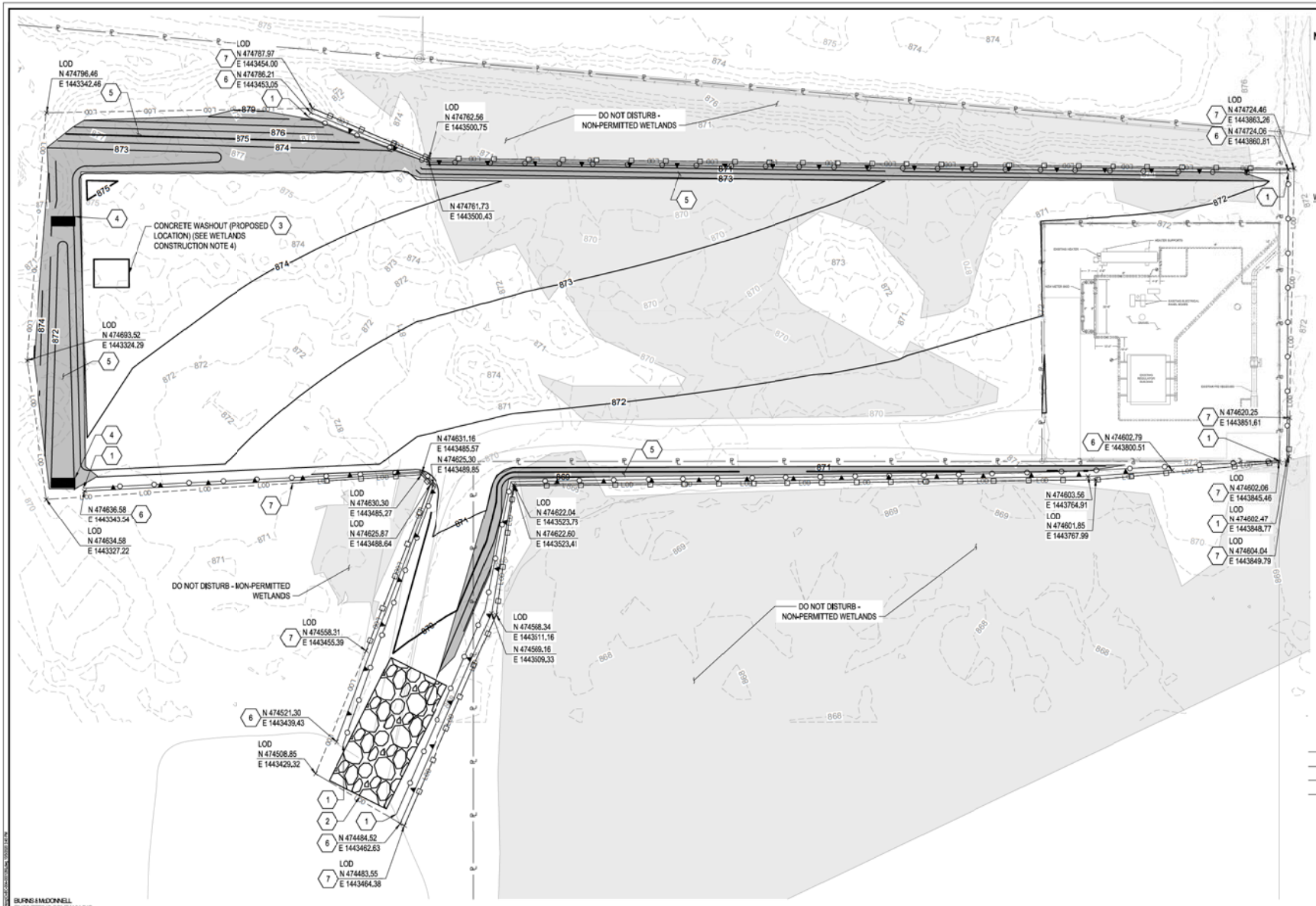
REF. DWG(S)

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
ES&PC NOTES

HAMILTON COUNTY, OHIO

SHEET(S) 5 OF 66 | DWG SCALE AS NOTED
DWG DATE 07/26/2019 | SUPERSEDED —
DRAWING NUMBER: PNG -C-004-0001259 | REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER



NOTES:

1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED BY BERDING SURVEY IN FEBRUARY, 2020. COORDINATES ARE IN OHIO STATE PLANE SOUTH ZONE, 3702, NAD83 HORIZONTAL DATUM AND NAVD88 VERTICAL DATUM.
2. SEE SHEET C-004-0001257 FOR CIVIL GENERAL NOTES AND ABBREVIATIONS.
3. SEE SHEET C-004-0001259 FOR GENERAL EROSION CONTROL NOTES.
4. SEE SHEET C-004-0001259 FOR TEMPORARY AND PERMANENT STABILIZATION REQUIREMENTS AND SEEDING SCHEDULES.
5. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS NOTED OTHERWISE.

WETLANDS CONSTRUCTION NOTES

1. CONSTRUCTION OCCURS WITHIN WOODED WETLANDS. CONTRACTOR MUST LIMIT ALL CONSTRUCTION ACTIVITIES AND DISTURBANCE TO WITHIN THE LIMITS OF DISTURBANCE AS SHOWN IN THE PLANS.
2. CONTRACTOR MUST INSTALL ORANGE CONSTRUCTION FENCING IMMEDIATELY OUTSIDE OF THE PERIMETER EROSION CONTROL MEASURES ALONG THE PERIMETERS OF WETLAND AREAS NOT TO BE DISTURBED.
3. SIGNS MUST BE INSTALLED EVERY 75' ON THE ORANGE CONSTRUCTION. SIGNS MUST READ "WETLANDS - DO NOT ENTER OR DISTURB".
4. DO NOT PLACE CONCRETE WASHOUTS WITHIN 125 FEET OF A WETLAND OR STREAM. CONCRETE WASHOUT FOR STATION CONSTRUCTION SHALL BE PLACED ALONG THE PIPELINE ALIGNMENT WORKSPACE OR ACCESS AREA. CONCRETE WASHOUT FOR STATION CONSTRUCTION SHALL NOT BE PLACED WITHIN THE FOOTPRINT OF THE HIGHPOINT PARK STATION. DO NOT PLACE THE CONCRETE WASHOUT WITHOUT APPROVAL BY DUKE ENVIRONMENTAL. UNDER NO CIRCUMSTANCES SHALL UNHARDENED CONCRETE BE ALLOWED TO LEAVE THE WASHOUT AREA AND/OR DISCHARGE TOWARDS WETLANDS.

KEY NOTES:

1	FIBER ROLL	3 C-004-0001265
2	TEMPORARY CONSTRUCTION ENTRANCE	1 C-004-0001265
3	CONCRETE WASHOUT (SEE WETLANDS CONSTRUCTION NOTE 4)	2 C-004-0001265
4	ROCK CHECK DAM	4 C-004-0001265
5	EROSION CONTROL BLANKET	1 C-004-0001266
6	SILT FENCE	3 C-004-0001266
7	CONSTRUCTION BARRIER FENCING	2 C-004-0001266

LEGEND:

- CONSTRUCTION ENTRANCE/EXIT
- WETLAND AREA
- CONSTRUCTION BARRIER FENCING
- SILT FENCE
- FIBER ROLL
- LOD — LIMITS OF DISTURBANCE
- EROSION CONTROL BLANKET

0 20 40
1IN = 20FT

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STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER
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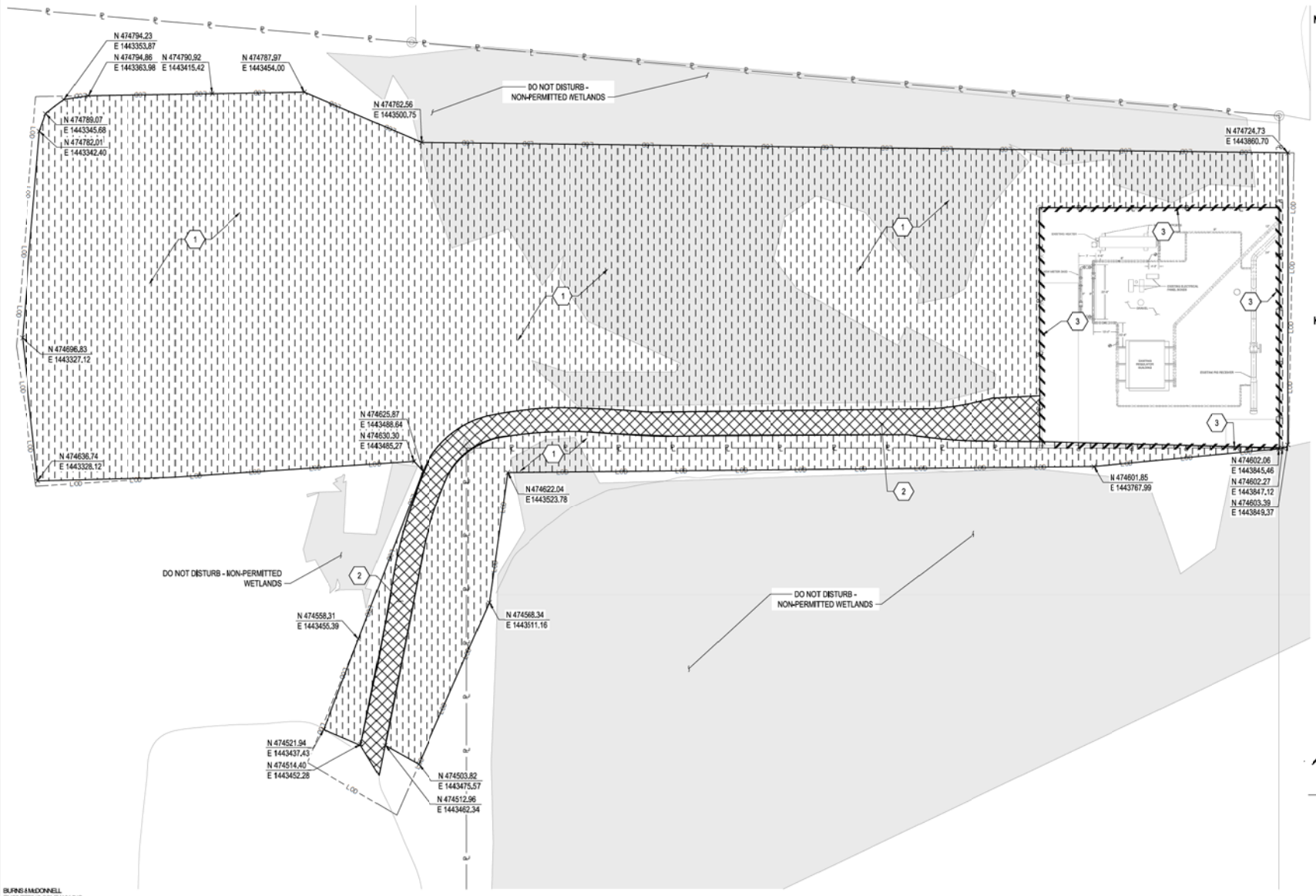
DESCRIPTION		APPROVALS		
AREA CODE		DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	AW2123			
PROJECT NUMBER	1880115			MGR TECH REC & STD
DRAWING BY	JTG			
STATION ID	S0667O1	DATE	INITIALS	PRINCIPAL ENGINEER
CHECKER INITIALS	CNS	10/01/2020	CDW	

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
ES&PC PLAN
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 6 OF 66	DWG SCALE AS NOTED
DWG DATE 07/26/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-004-0001260	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



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2. SEE SHEET C-004-0001257 FOR CIVIL GENERAL NOTES AND ABBREVIATIONS.
3. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS NOTED OTHERWISE.
4. OVEREXCAVATE AND REPLACE WETLANDS SOILS IN AREAS SHOWN ON DRAWING C-004-0001263 AND PER DETAILS ON C-004-0001268.

KEY NOTES:

1. CLEAR AND GRUB VEGETATION (SEE NOTE 4)
2. DEMOLISH AND REMOVE GRAVEL ROAD, ASSUME #57 STONE AT 12" DEPTH
3. DEMOLISH AND REMOVE CHAIN LINK FENCE

LEGEND:

- CLEAR AND GRUB AREA
- DEMOLISH AND REMOVE GRAVEL ROAD, ASSUME #57 STONE AT 12" DEPTH
- DEMOLISH AND REMOVE CHAIN LINK FENCE
- LOD — LIMITS OF DISTURBANCE
- WETLAND AREA

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0 20 40
1IN = 20FT

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STATE OF OHIO
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PRINCIPAL ENGINEER	10/01/2020	CDW

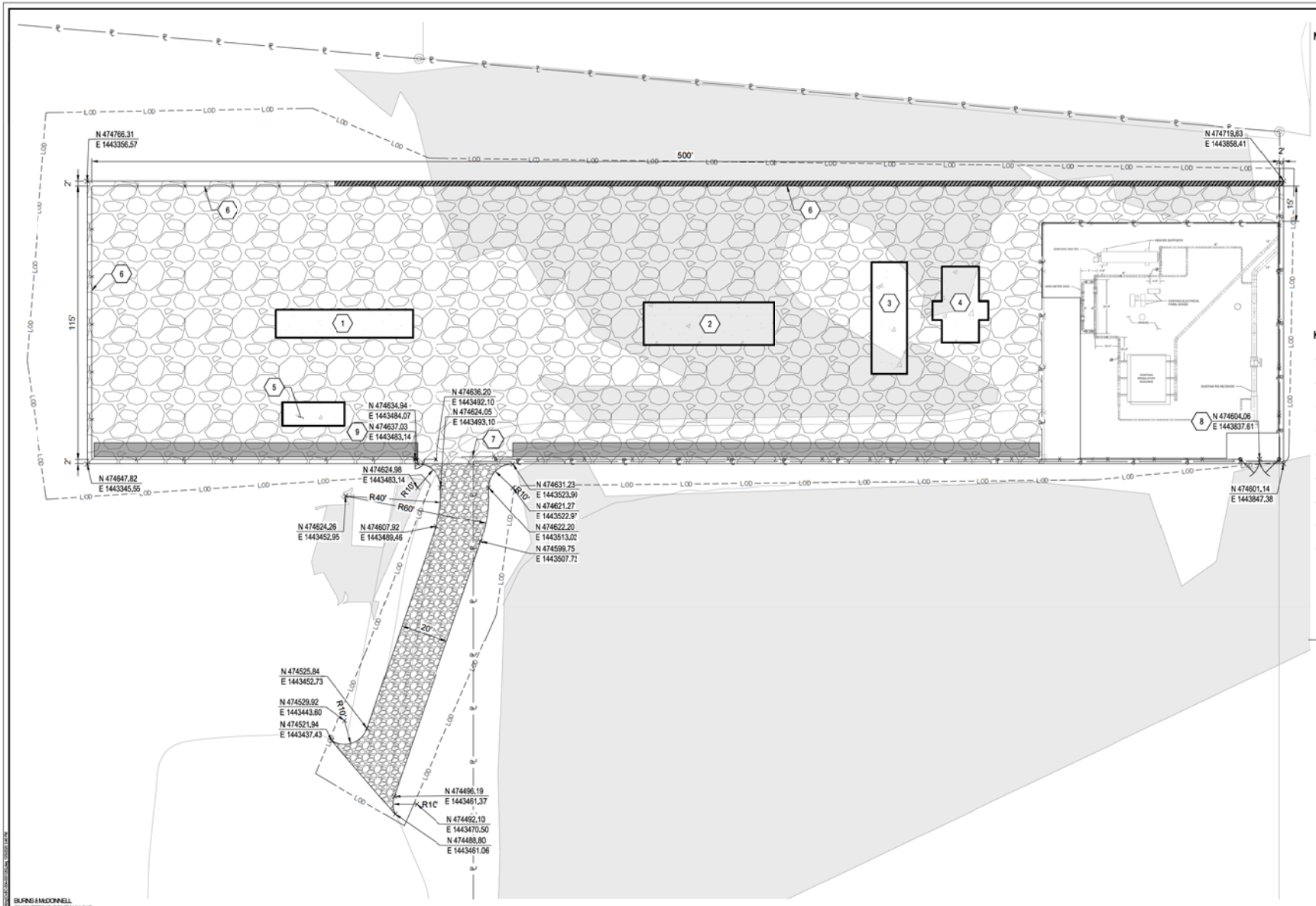
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
DEMOLITION PLAN

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 7 OF 66	DWG SCALE AS NOTED		
DWG DATE 07/26/2019	SUPERSEDED —		
DRAWING NUMBER		REVISION	
PNG -C-004-0001261		0	
DISCIPLINE / RESOURCE CENTER / LINE NUMBER			



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2. SEE SHEET C-004-0001257 FOR CIVIL GENERAL NOTES AND ABBREVIATIONS.
3. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS NOTED OTHERWISE.
4. SEE ODOT DESIGN STANDARDS, LATEST EDITION, AS INDICATED. ALL SUBSEQUENT AND RELEVANT STANDARDS AND SPECIFICATIONS SHALL APPLY.

KEY NOTES:

1. LAUNCHER CONCRETE PAD
2. PRESSURE CONTROL CONCRETE PAD
3. HEATER CONCRETE PAD
4. FLOW METER CONCRETE PAD
5. ODORIZER CONCRETE PAD
6. CHAIN-LINK SECURITY FENCE WITH OPAQUE SCREENING — 1 / C-004-0001267
7. 25' MANUAL SLIDE GATE — 1 / C-004-0001268
8. 16' DOUBLE SWING GATE — 1 / C-004-0001267
9. 4' MAN GATE — 1 / C-004-0001267

LEGEND:

- LOD — LIMITS OF DISTURBANCE
- PERMEABLE PAVEMENT BMP — A / C-004-0001263
- PROPOSED GRAVEL SURFACE COURSE — 2 / C-004-0001268
- PROPOSED ACCESS ROAD SURFACE COURSE — 2 / C-004-0001268
- CUTOFF TRENCH — 5 / C-004-0001266
- CONCRETE PAD
- WETLAND AREA

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0 20 40
1IN = 20FT

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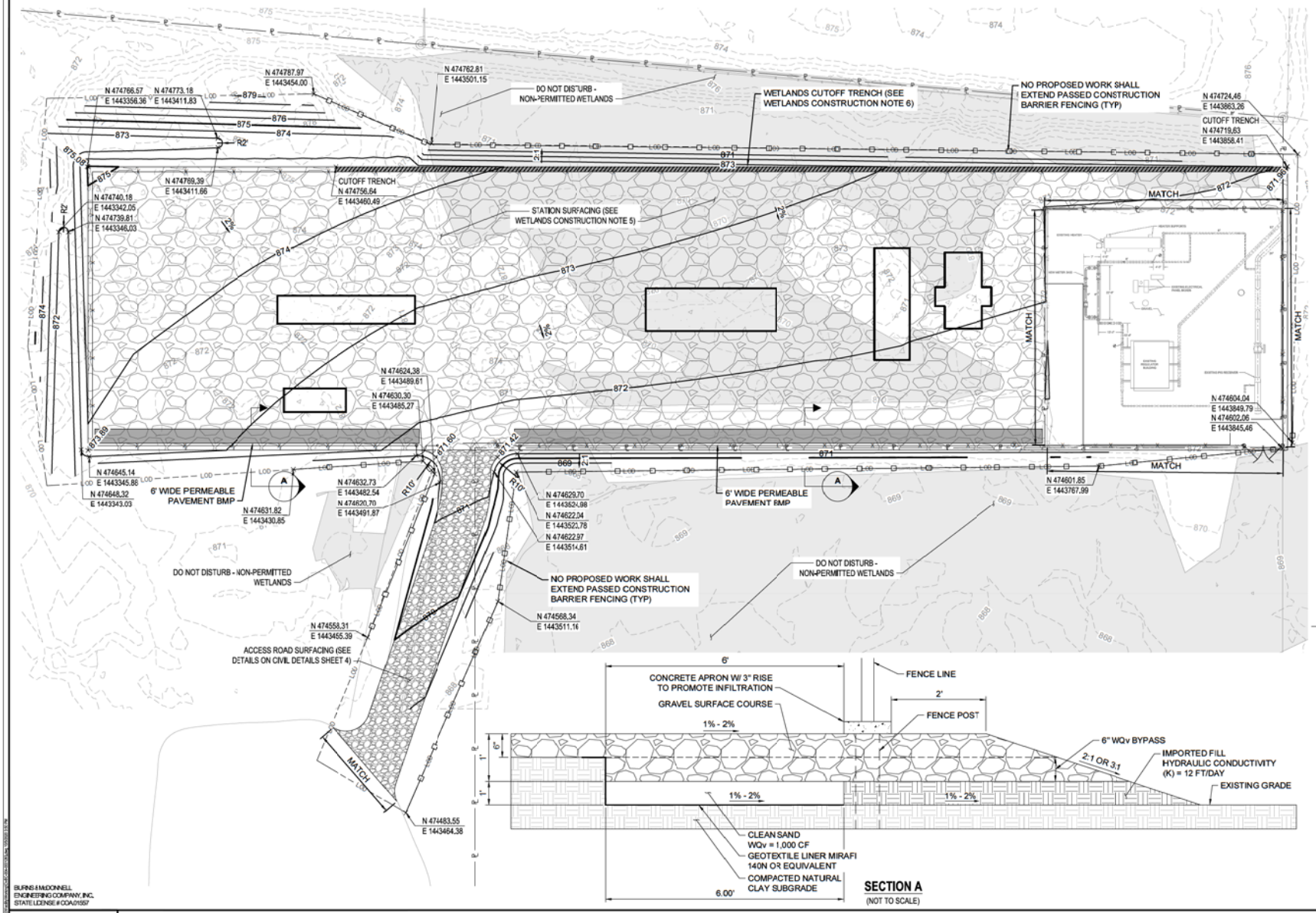
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
SITE PLAN

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 8 OF 66	DWG SCALE AS NOTED
DWG DATE 07/26/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-004-0001262	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



SECTION A
(NOT TO SCALE)

NOTES:

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2. SEE SHEET C-004-0001257 FOR CIVIL GENERAL NOTES AND ABBREVIATIONS.
3. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS NOTED OTHERWISE.

WETLANDS CONSTRUCTION NOTES

1. CONSTRUCTION OCCURS WITHIN WOODED WETLANDS, CONTRACTOR MUST LIMIT ALL CONSTRUCTION ACTIVITIES AND DISTURBANCE TO WITHIN THE LIMITS OF DISTURBANCE AS SHOWN IN THE PLANS.
2. CONTRACTOR MUST INSTALL ORANGE CONSTRUCTION FENCING IMMEDIATELY OUTSIDE OF THE PERIMETER EROSION CONTROL MEASURES ALONG THE PERIMETERS OF WETLAND AREAS NOT TO BE DISTURBED. SEE DETAILS ON CIVIL DETAILS SHEET 2.
3. SIGNS MUST BE INSTALLED EVERY 75' ON THE ORANGE CONSTRUCTION. SIGNS MUST READ "WETLANDS - DO NOT ENTER OR DISTURB".
4. DO NOT PLACE CONCRETE WASHOUTS WITHIN 125 FEET OF A WETLAND OR STREAM. CONCRETE WASHOUT FOR STATION CONSTRUCTION SHALL BE PLACED ALONG THE PIPELINE ALIGNMENT WORKSPACE OR ACCESS AREA. CONCRETE WASHOUT FOR STATION CONSTRUCTION SHALL NOT BE PLACED WITHIN THE FOOTPRINT OF THE HIGHPOINT PARK STATION. DO NOT PLACE THE CONCRETE WASHOUT WITHOUT APPROVAL BY DUKE ENVIRONMENTAL.
5. CONTRACTOR SHALL OVEREXCAVATE AND REPLACE WETLANDS SOILS PER DETAILS ON CIVIL DETAILS SHEET 4.
6. CONTRACTOR SHALL INSTALL WETLANDS CUTOFF TRENCH ON THE NORTHERN EDGE OF THE STATION PER DETAILS ON CIVIL DETAILS SHEET 2.

LEGEND:

- LOD — LIMITS OF DISTURBANCE
- PERMEABLE PAVEMENT BMP
- PROPOSED GRAVEL SURFACE COURSE — 2 / C-004-0001268
- PROPOSED ACCESS ROAD SURFACE COURSE — 2 / C-004-0001268
- CUTOFF TRENCH — 5 / C-004-0001266
- CONCRETE PAD
- WETLAND AREA

0 20 40
1IN = 20FT

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHRISTOPHER D. WILSON
82217
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	S0867O1
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/01/2020	CDW	PRINCIPAL ENGINEER

DUKE ENERGY

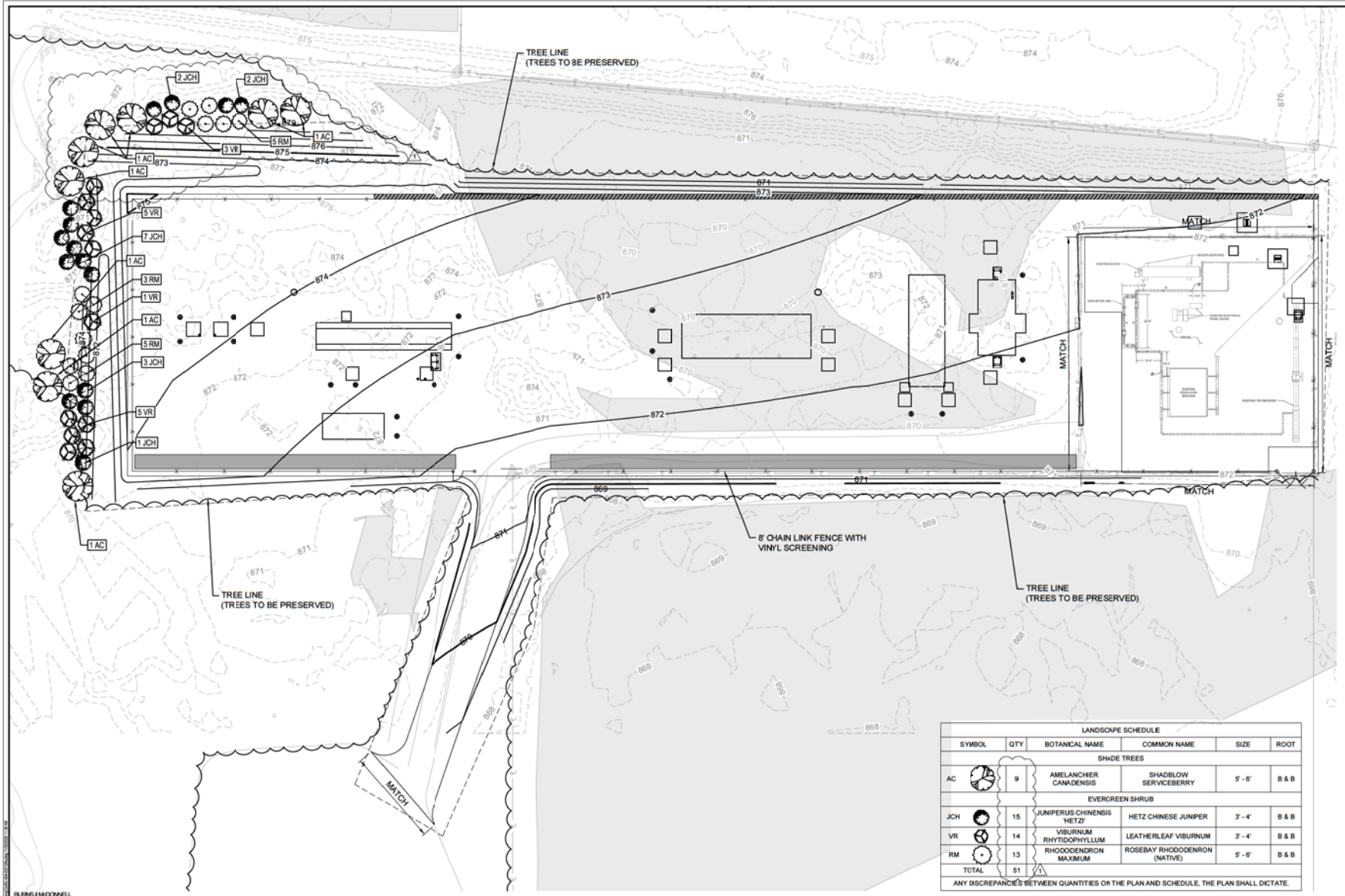
C350 PROJECT
HIGHPOINT PARK STATION
GRADING PLAN

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S)	9 OF 66
DWG SCALE	AS NOTED
DWG DATE	07/26/2019
SUPERSEDED	—
DRAWING NUMBER	PNG -C-004-0001263
REVISION	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



NOTES:

1. THE EXISTING SITE UTILITIES AND FEATURES SHOWN ARE BASED ON ODOT PROVIDED PRELIMINARY PLANS.
2. SEE SHEET C-004-0001257 FOR CIVIL GENERAL NOTES AND ABBREVIATIONS.
3. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS NOTED OTHERWISE.

LEGEND:

PROPOSED GRAVEL SURFACE COURSE

WETLAND AREA

CONCRETE PAD

LANDSCAPE SCHEDULE

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
SHADE TREES					
AC	9	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	5' - 6'	B & B
EVERGREEN SHRUB					
JCH	15	JUNIPERUS CHINENSIS 'HETZI'	HETZ CHINESE JUNIPER	3' - 4'	B & B
VR	14	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3' - 4'	B & B
RM	13	RHODODENDRON MAXIMUM	ROSEBAY RHODODENRON (NATIVE)	5' - 6'	B & B
TOTAL	51				

ANY DISCREPANCIES BETWEEN QUANTITIES ON THE PLAN AND SCHEDULE, THE PLAN SHALL DICTATE.

0 20 40
1IN = 20FT

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHRISTOPHER D. WILSON
82217
REGISTERED PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW
1	11-30-2020	UPDATED LANDSCAPING QUANTITIES	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	-
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	50867O1
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	11/30/2020	CDW

DUKE ENERGY

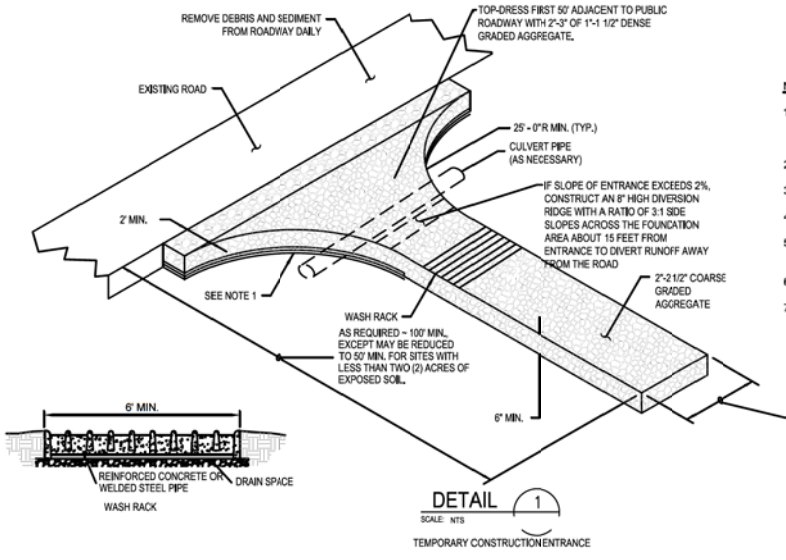
C350 PROJECT
HIGHPOINT PARK STATION
LANDSCAPING PLAN

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 10 OF 66	DWG SCALE AS NOTED
DWG DATE 07/26/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-004-0001264	1

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

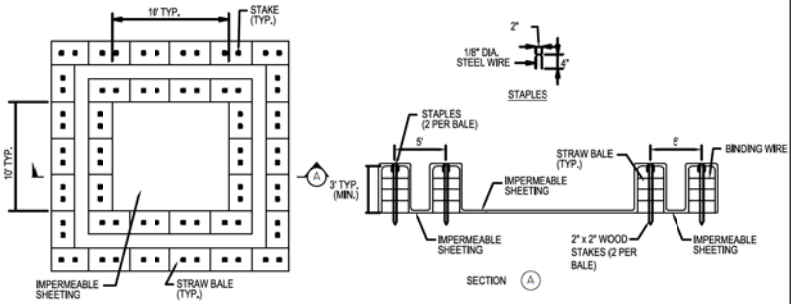


DETAIL 1
SCALE: NTS

TEMPORARY CONSTRUCTION ENTRANCE

NOTES:

1. PLACE 8 OZ/SY NON-WOVEN GEOTEXTILE FABRIC UNDERLINER TO STABILIZE FOUNDATION (ESPECIALLY WHEN WET CONDITIONS ARE EXPECTED) TO EXTEND 2' FROM OUTSIDE EDGE. GEOGRID CAN ALSO BE ADDED FOR INCREASED STABILITY.
2. COUNTY OR STATE HIGHWAY ACCESS PERMITTING MAY BE REQUIRED FOR PLACEMENT OF ENTRANCE.
3. CULVERT PLACEMENT MAY BE REQUIRED TO MAINTAIN FLOW.
4. WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.
5. WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.
6. A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.
7. MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

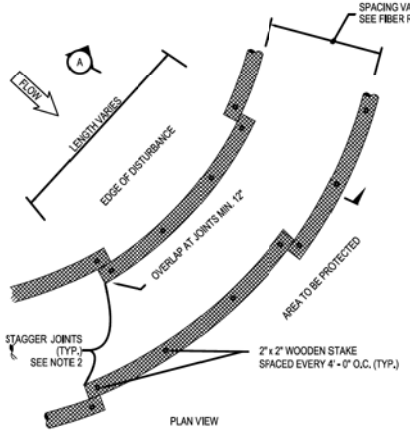


NOTES:

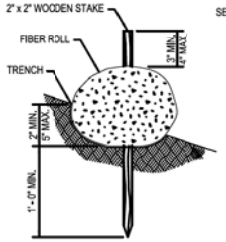
1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 125 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED), EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.
6. BALES CAN BE TWO STACKED OR PARTIALLY EXCAVATED TO REACH 3FT DEPTH (MIN.).
7. PREFABRICATED UNITS MAY BE USED WITH APPROVAL.

DETAIL 2
SCALE: NTS

CONCRETE WASHOUT



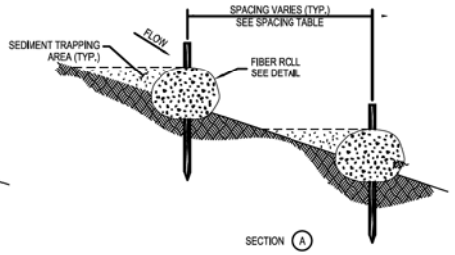
PLAN VIEW



TYPICAL SECTION

SPACING TABLE	
SLOPE	MAXIMUM SPACING
1:1	10' - 0"
2:1	20' - 0"
3:1	30' - 0"
4:1	40' - 0"

* INSTALL FIRST ROW AT TOP OF BANK. INSTALL LAST ROW 10' FROM TOE OF SLOPE.

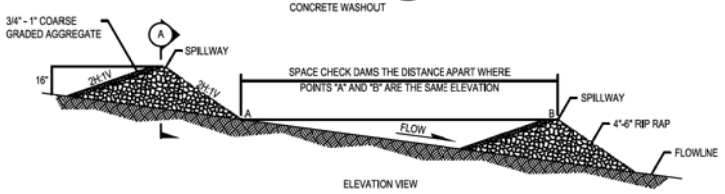


NOTES:

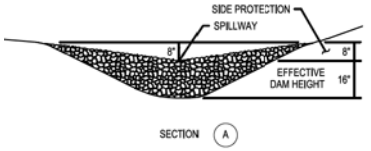
1. INSTALL FIBER ROLLS ALONG CONTOURS DURING FINAL RESTORATION TO CHECK FLOW TO ALLOW ADEQUATE REVEGETATION.
2. ABUT ADJACENT FIBER ROLLS TIGHTLY WHILE OVERLAPPING THE ENDS. STAGGER JOINTS WITH THE NEXT PARALLEL ROW.
3. PILOT HOLES MAY BE DRIVEN THROUGH THE FIBER ROLLS AND INTO THE SOIL WHEN SOIL CONDITIONS REQUIRE.
4. FIBER ROLLS SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
5. A SINGLE ROW MAY BE INSTALLED ON FLAT SLOPES.

DETAIL 3
SCALE: NTS

FIBER ROLL



ELEVATION VIEW



SECTION A

DETAIL 4
SCALE: NTS

ROCK CHECK DAM

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHRISTOPHER C. WILSON
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	S0667O1
CHECKER INITIALS	CNS

APPROVALS			
DATE	INITIALS		REGIONAL ENGINEER
			MGR TECH REC & STD
10/01/2020	CDW		PRINCIPAL ENGINEER

DUKE ENERGY

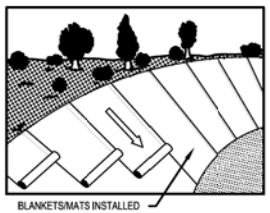
C350 PROJECT
HIGHPOINT PARK STATION
CIVIL DETAILS - 1

HAMILTON COUNTY, OHIO

REF. DWG(S)

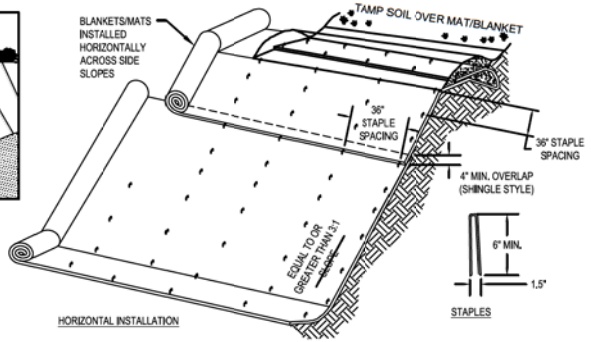
SHEET(S) 11 OF 66	DWG SCALE AS NOTED
DWG DATE 07/26/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-004-0001265	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



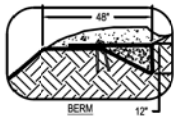
BLANKETS/MATS INSTALLED VERTICALLY ON SEVERE OR LONGER SLOPES, SEE HORIZONTAL INSTALLATION FOR DETAILS.

VERTICAL INSTALLATION



HORIZONTAL INSTALLATION

STAPLES

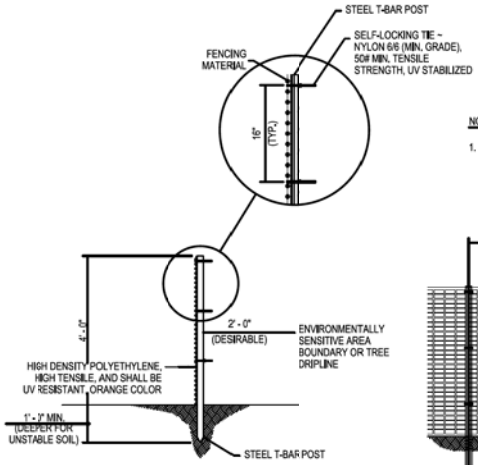


BERM

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. USE ON SIDE SLOPES EXCEEDING A 3:1 SLOPE AND DISTURBED STREAMBANKS.
5. THE FOLLOWING BLANKET TYPES SHALL BE UTILIZED:
   A. LONG-TERM BIODEGRADABLE DOUBLE-NET COCONUT BLANKET ON STREAMBANKS.
   B. SHORT-TERM BIODEGRADABLE DOUBLE-NET STRAW BLANKET ON 3:1 SLOPES OR GREATER.
   C. SHORT-TERM BIODEGRADABLE SINGLE-NET STRAW ON LESSER SLOPES, FLAT FLOODPLAIN, AND WORKSPACE AREAS.
6. FOR STREAMBANK STABILIZATION:
   A. TUCK/UNDERLAP BASE OF BLANKET TO PREVENT HIGH WATER FROM REMOVING BLANKET AND SEED.
   B. STAPLE SPACING MAY NEED TO BE DECREASED.
   C. PREPARE SUBGRADE PRIOR TO INSTALLING BLANKET BY REMOVING DISPLACED ROCKS AND WOODY DEBRIS.

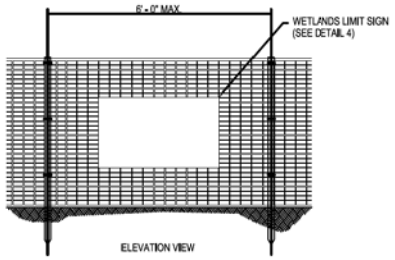
DETAIL 1
SCALE: NTS
EROSION CONTROL BLANKET



TYPICAL SECTION

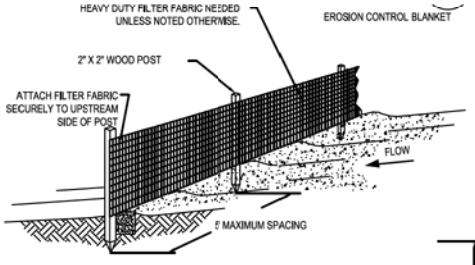
NOTE:

1. POST SHALL HAVE SUFFICIENT STRENGTH AND DURABILITY TO SUPPORT THE FENCE THROUGH THE LIFE OF THE PROJECT.

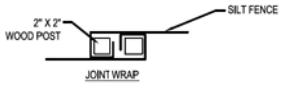


ELEVATION VIEW

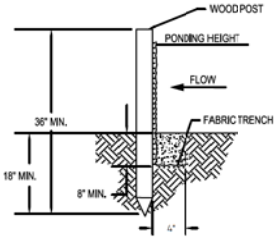
DETAIL 2
SCALE: NTS
CONSTRUCTION BARRIER FENCING



ISOMETRIC VIEW



JOINT WRAP

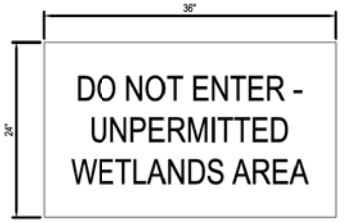


TYPICAL SECTION

NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN IT REACHES ONE-HALF HEIGHT OF FENCE OR FABRIC STARTS TO BULGE.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
4. TURN END OF SILT FENCE UP SLOPE TO PREVENT BYPASS FLOW AND ALLOW FOR PONDING.

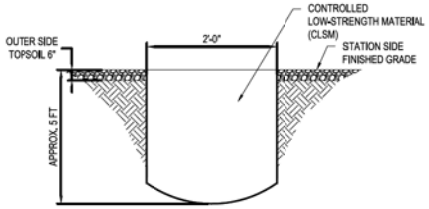
DETAIL 3
SCALE: NTS
SILT FENCE



NOTES:

1. WETLANDS SIGNS SHALL BE SECURED TO ALL CONSTRUCTION BARRIER FENCING. SIGNS SHALL BE SPACED AT A MAXIMUM 75 FEET APART. SIGNS SHALL MATCH THE DIMENSION SHOWN ON THIS DRAWING.
2. SIGN AND LETTERING SHALL BE WATERPROOF AND WEATHERPROOF. LETTERS SHALL BE AT LEAST 7 INCHES TALL.

DETAIL 4
SCALE: NTS
WETLANDS LIMITS SIGN



DETAIL 5
SCALE: NTS
CUTOFF TRENCH

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	S0867O1
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/01/2020	CDW

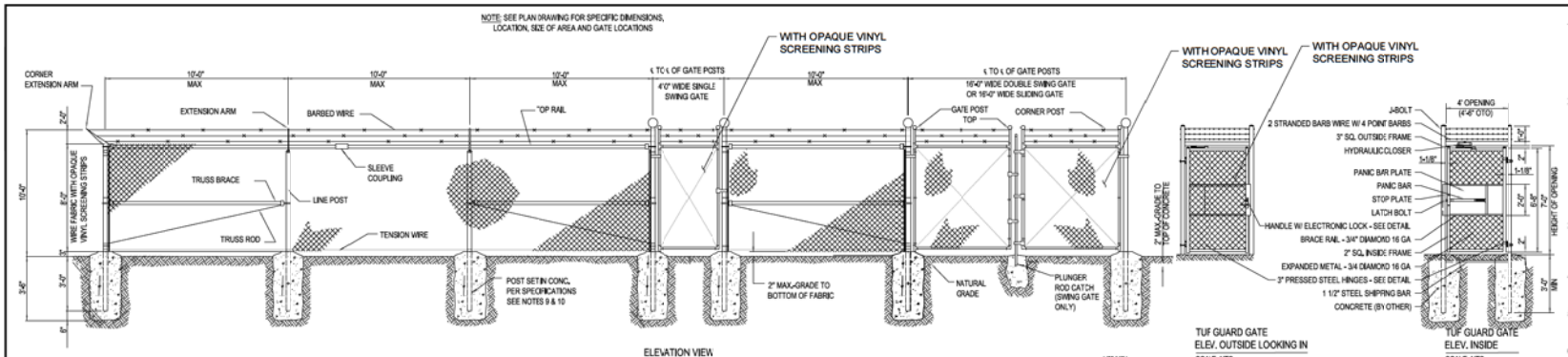
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
CIVIL DETAILS - 2
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 12 OF 66	DWG SCALE AS NOTED
DWG DATE 07/26/2019	SUPERSEDED —

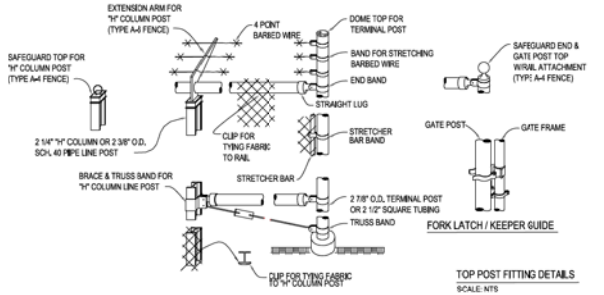
DRAWING NUMBER: PNG -C-004-0001266 — REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER



ELEVATION VIEW
SCALE: NTS

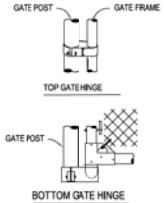
TUF GUARD GATE ELEV. OUTSIDE LOOKING IN
SCALE: NTS

TUF GUARD GATE ELEV. INSIDE
SCALE: NTS

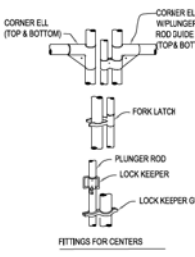


TOP POST FITTING DETAILS
SCALE: NTS

FORK LATCH / KEEPER GUIDE

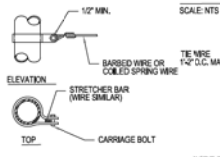


BOTTOM GATE HINGE



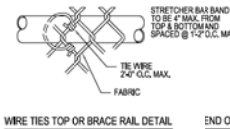
FITTINGS FOR CENTERS

GATE FITTING DETAILS
SCALE: NTS

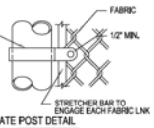


BAND FOR WIRE STRETCHING DETAIL
SCALE: NTS

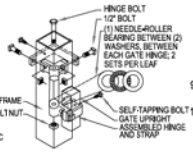
WIRE TIES POST DETAIL
SCALE: NTS



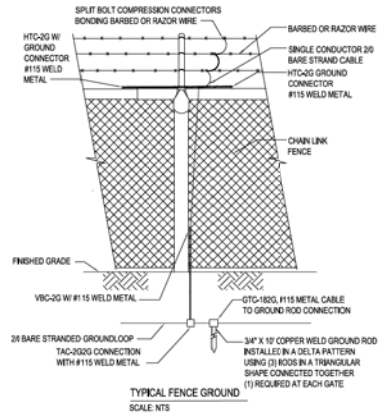
WIRE TIES TOP OR BRACE RAIL DETAIL
SCALE: NTS



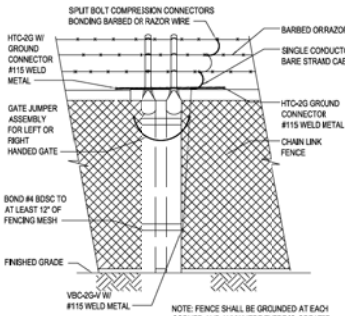
END OR GATE POST DETAIL
SCALE: NTS



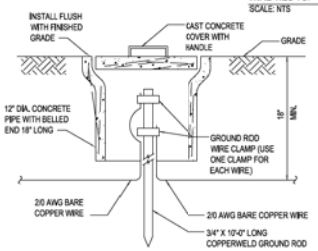
TUF GUARD GATE PRESSED STEEL SQUARE HINGE
SCALE: NTS



TYPICAL FENCE GROUND
SCALE: NTS



TYPICAL GATE GROUND
SCALE: NTS



TYPICAL GROUND ROD TEST WELL
SCALE: NTS

NOTE:
2/0 AWG STRANDED CABLE TO TIE TOP OF A 3/4" GROUND ROD. THE ROD END CAN BE EITHER PLAIN OR THREADED.

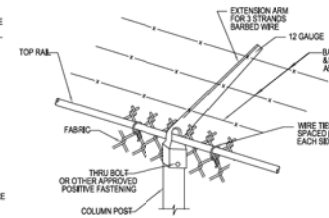
CAN BE USED IN PLACE OF A TYPE GR (DEAD END) BY LETTING THE CONDUCTOR EXTEND ENOUGH PAST THE ROD TO EXIT THE MOLD ON THAT SIDE.

FOR CONDUCTORS 500 KCMIL OR LARGER, IT IS RECOMMENDED THAT A TA CONNECTION BE MADE TO THE 560 KCMIL CONDUCTOR WITH A SHORT STUB OF 4/0 AND WELD THE 4/0 TO THE GROUND ROD.

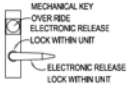
TYPE GT CONNECTION
SCALE: NTS

DETAIL 1
SCALE: NTS

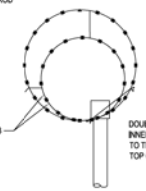
CHAIN-LINK SECURITY FENCE DOUBLE SWING GATE MAN GATE



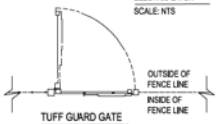
EXTENSION ARM BARBED WIRE DETAIL
SCALE: NTS



TUF GUARD GATE ELECTRIC LATCH
SCALE: NTS



EXTENSION ARM RAZOR WIRE DETAIL
SCALE: NTS



TUFF GUARD GATE
SCALE: NTS

CHAIN LINK FENCE SPECIFICATIONS

1. INSTALLATION OF FENCE ADDITION SHALL BE PLUMB AND TRUE TO LINE, CHAIN LINK FABRIC SHALL BE TAUT AND PROPERLY SECURED, CORNER BRACES AND DIAGONAL BRACES SHALL BE PROPERLY PLACED TO PREVENT SAGGING, THE COMPLETE INSTALLATION SHALL BE INSTALLED BY SKILLED AND EXPERIENCED FENCE ERECTORS, IN A WORKMANLIKE MANNER, IN ACCORDANCE WITH GOOD CONSTRUCTION PRACTICE AND IN ACCORDANCE WITH ALL LOCAL APPLICABLE CODES.
2. MATERIAL SHALL BE HOT-DIP GALVANIZED FENCE CHAIN LINK FABRIC - THE CHAIN LINK FABRIC SHALL BE IN ACCORDANCE WITH ASTM A-392 SPECIFICATIONS AND SHALL BE HOT DIPPED GALVANIZED AFTER WEAVING, HAVING A COATING WEIGHT OF 2 OUNCES OF ZINC PER SQUARE FOOT, MINIMUM, OF UNCOATED WIRE SURFACE (CLASS II). FABRIC SHALL BE NO. 9 GAUGE WIRE WOVEN IN A 2-INCH CHAIN LINK DIAMOND MESH. THE FABRIC SHALL BE FASTENED TO THE LINE POST BY MEANS OF NO. 6 GAUGE ALUMINUM WIRE CLIPS SPACED 12 INCHES ON CENTER. IT SHALL BE ATTACHED TO TOP RAIL WITH NO. 9 GAUGE ALUMINUM TIE WIRES SPACED 24 INCHES ON CENTER. FABRIC SHALL BE ATTACHED TO TERMINAL POST BY MEANS OF A 1/4" X 3/4" TENSION BAR WITH HEAVY GAUGE PRESSED STEEL BAND OR CLIPS SPACED APPROXIMATELY 14 INCHES ON CENTER.
3. BARBED WIRE SHALL BE OF 4 POINT PATTERN, COMPOSED OF TWO STRANDS OF NO. 11-1/2 GAUGE GALVANIZED WIRE WITH LARGE BARBS SPACED APPROXIMATELY 4 TO 5 INCHES ON CENTER. RAZOR WIRE SHALL BE USED WHEN LOCAL ORDINANCE REQUIRES OR AT PROJECT MANAGER'S REQUEST.
4. BOTTOM TENSION WIRE - NO. 7 GAUGE GALVANIZED COIL SPRING TENSION WIRE WITH CLASS I COATING. WIRE TO BE FASTENED TO CHAIN LINK FABRIC WITH NO. 11 GAUGE HOG RINGS ON 18 INCH CENTERS.
5. POST AND OTHER APPURTENANCES - ALL POST AND OTHER APPURTENANCES SHALL BE HOT-DIP GALVANIZED WITH A MINIMUM ZINC COATING OF 2.0 OUNCES PER SQUARE FOOT OF SURFACE (CLASS II COATING ASTM A-392).
6. LINE POST SHALL BE 2-1/4" "H" COLUMN WEIGHING 4.1 LBS. PER FOOT, MINIMUM CARBON CONTENT .35%, MINIMUM TENSILE STRENGTH 75,000 PSI OR 2-3/8" O.D, SCHEDULE 40 PIPE, OF SUFFICIENT LENGTH TO ALLOW FOR INSTALLATION TO A DEPTH OF 3'-0" BELOW GROUND LEVEL. THE POSTS SHALL BE SPACED IN THE LINE OF FENCE, NO FURTHER.
7. TERMINAL POST AND ALL END, CORNER AND PULL POSTS SHALL BE 2-1/2" X 2-1/2" X .1875" W.T. SQUARE TUBING OR 2- 7/8" O.D. SCHEDULE 40 PIPE.
8. GATE POST SHALL BE OF THE FOLLOWING SIZE FOR SINGLE SWING GATES OR ONE LEAF OF DOUBLE GATE.

POST	SIZE	NOM. WT.
UP TO 6' WIDE	2-1/2" SQ. OR 2-7/8" O.D.	SAME AS TERMINAL POST
OVER 6' TO 13'	4" O.D.	9.11 LB/FT

9. EACH POST SHALL BE OF SUFFICIENT LENGTH TO ALLOW FOR INSTALLATION TO A DEPTH OF 3'-0" BELOW GROUND LEVEL.
10. LINE POST AND TERMINAL POST ANCHORAGE SHALL BE SET IN CYLINDRICAL CONCRETE FOUNDATIONS WITH TOP OF FINISH CONCRETE SURFACE 3 INCHES ABOVE FINISH GRADE. EXCAVATION SHALL BE 3'-6" DEEP AND NOT LESS THAN TEN INCHES (10") IN DIAMETER FOR ALL LINE POSTS, AND NOT LESS THAN 3.5 TIMES THE DIAMETER FOR TERMINAL AND GATE POST. CONCRETE SHALL MEET ACI-318 SPECIFICATION FOR 3000 PSI-28 DAY STRENGTH CONCRETE.
11. FENCE SHALL HAVE A CONTINUOUS TOP RAIL FOR ITS FULL LENGTH OF STANDARD GALVANIZED PIPE, 1-5/8" O.D.. THE TOP RAIL SHALL PASS THROUGH OPENINGS PROVIDED FOR THAT PURPOSE IN THE POST TOPS AND EACH LENGTH SHALL BE COUPLED WITH A SLEEVE COUPLING, WITH EXPANSION COUPLING EVERY FIFTH JOINT.
12. TRUSS BRACES SHALL BE STANDARD GALVANIZED 1-5/8" O.D. PIPE 2.71 LB./FT., WITH A 3/8" O.D. TRUSS ROD AND TURNBUCKLE ATTACHMENT SHALL BE INSTALLED BETWEEN EACH END OR GATE POST AND THE ADJACENT LINE POST. TWO TRUSS BRACES SHALL BE FURNISHED ON CORNER OR PULL POSTS.
13. FITTINGS USED IN THE COMPLETE FENCE ASSEMBLY SHALL BE OF MALLEABLE, CAST IRON OR PRESSED STEEL AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
14. EXTENSION ARM LINE POST SHALL BE EQUIPPED WITH EXTENSION ARMS TO WITHSTAND A MINIMUM PULL-DOWN WEIGHT OF 450 LBS. FROM END OF ARM. ARMS TO BE DESIGNED TO EXTEND AT A 45 DEGREE ANGLE WITH LOCKING DEVICE TO SECURELY FASTEN THREE STRANDS OF BARBED WIRE EQUALLY SPACED WITH THE TOP STRAND LOCATED 12 INCHES (12") ABOVE FABRIC AND 12 INCHES (12") OUT FROM THE FENCE LINE.
15. POST TOPS AND ALL END, CORNER, PULL AND GATE POST SHALL BE EQUIPPED WITH TOPS. TUBULAR POST TOPS TO BE SO DESIGNED AS TO EXCLUDE MOISTURE FROM THE POST. ALL LINE POST TOPS DESIGNED TO HOLD THE TOP RAIL AND THE EXTENSION ARM FOR THREE STRANDS OF BARBED WIRE.
16. GATE FRAMES SHALL BE MADE OF 2" X 2" X .110" W.T. SQUARE STEEL TUBING OR 1.9 INCH O.D. SCHEDULE 40, 2.72 LB./FT. STANDARD WEIGHT PIPE, HOT-DIP GALVANIZED, FRAMES TO BE JOINED AT CORNERS TO FORM A RIGID PANEL AND SHALL BE FILLED WITH CHAIN LINK FABRIC OF SAME GAUGE AS USED ON THE FENCE. FABRIC SHALL BE FASTENED IN THE FRAME ON ALL FOUR SIDES BY MEANS OF TENSION BARS AND CLIPS. THREE STRANDS OF BARBED WIRE SHALL BE FASTENED TO THE EXTENDED FRAMES OF GATE. EACH FRAME TO BE EQUIPPED WITH 3/8" DIAMETER ADJUSTABLE TRUSS ROD, HINGES, POSITIVE TYPE LATCHING DEVICE WITH PROVISIONS FOR PADLOCKING. ALL DRIVE GATES TO BE PROVIDED WITH CENTER PLUNGER ROD, CATCH AND SEMI-AUTOMATIC OUTER CATCHES TO SECURE GATES IN OPEN POSITION.
17. FENCE SECTION
    COMPANY TYPE - A-8
    FABRIC HEIGHT - 96"
    TOTAL FENCE HEIGHT - 10'-0"

TUF GUARD GATE

18. SPECIFICATIONS SHOWN CAN BE CHANGED WITH ENGINEERING APPROVAL.
19. FOOTING WIDTH TO BE (4)X POST WIDTH. VERIFY FOOTING DEPTH AND WIDTH WITH LOCAL CODES AND SITE CONDITIONS.
20. ALL COMPONENTS OF THE TUF GUARD WILL BE COATED BLACK, EXCEPT FOR THE HANDLE WITH ELECTRONIC LOCK, PANIC BAR, AND CLOSER.
21. OUTSIDE LOOKING IN, GATE WILL LATCH ON LEFT AND OPEN OUTSIDE OF FENCE LINE.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	S0667O1
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/01/2020	CDW	PRINCIPAL ENGINEER

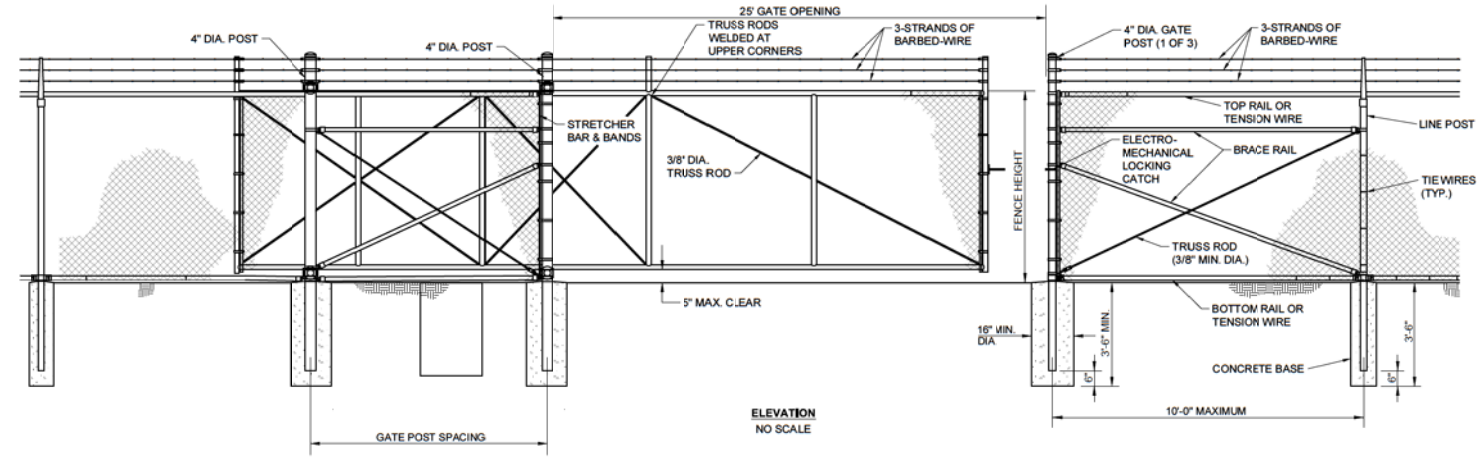
REF. DWG(S)

C350 PROJECT
HIGHPOINT PARK STATION
CIVIL DETAILS - 3

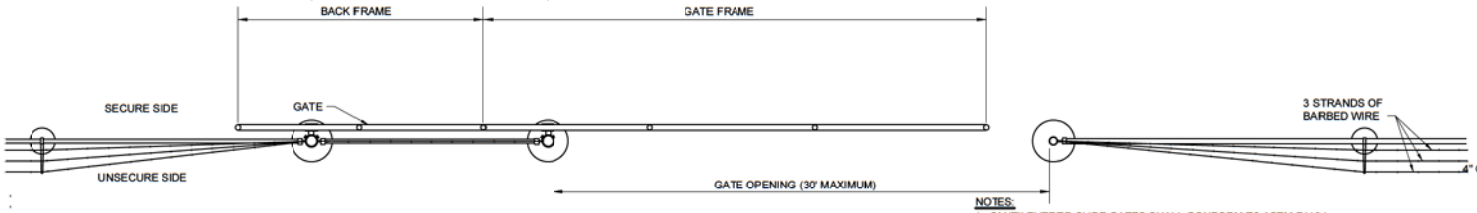
HAMILTON COUNTY, OHIO

SHEET(S)	13 OF 66
DWG SCALE	AS NOTED
DWG DATE	07/26/2019
SUPERSEDED	—
DRAWING NUMBER	PNG -C-004-0001267
REVISION	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

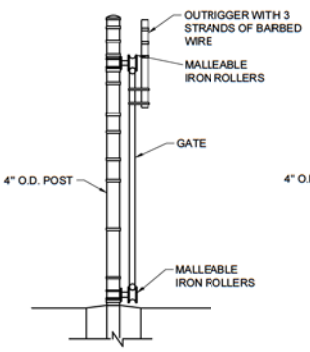


ELEVATION
NO SCALE

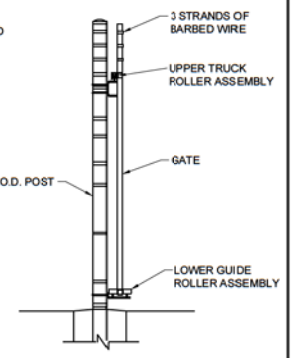


PLAN
NO SCALE

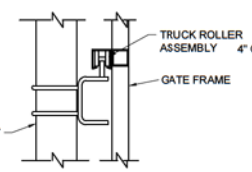
DETAIL 1
SCALE: NTS
SLIDE GATE



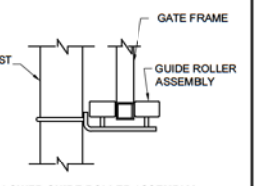
EXTERNAL ROLLERS



INTERNAL ROLLERS

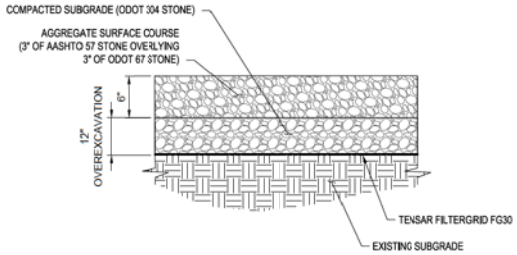


UPPER TRUCK ROLLER ASSEMBLY
NO SCALE

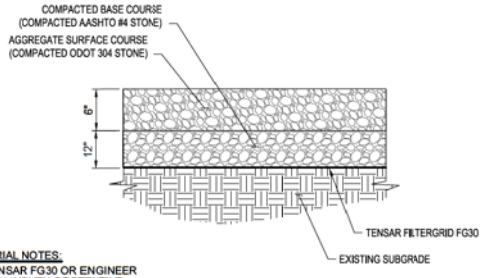


LOWER GUIDE ROLLER ASSEMBLY
NO SCALE

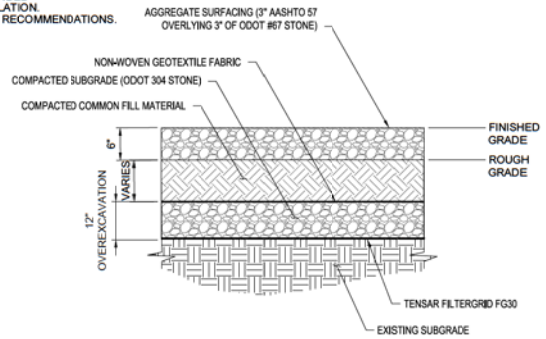
NOTES:
1. CANTILEVERED SLIDE GATES SHALL CONFORM TO ASTM F1184.
2. GATE FRAMES SHALL BE ZINC-COATED STEEL.
3. ROLLERS SHALL BE EITHER INTERNAL OR EXTERNAL.
4. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF GATE SECTIONS AND METHODS OF INSTALLATION.
5. GATE SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



GRAVEL SURFACE COURSE IN CUT SECTIONS



ACCESS ROAD SURFACE COURSE



GRAVEL SURFACE COURSE IN FILL SECTIONS

SURFACE COURSE MATERIAL NOTES:
1. GEOGRID SHALL BE TENSAR FG30 OR ENGINEER APPROVED EQUAL. NON-WOVEN GEOTEXTILE SHALL BE MIRAFI 140N OR ENGINEER-APPROVED EQUAL.

DETAIL 2
SCALE: NTS
SURFACE COURSE MATERIAL

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	JTG	CNS	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	Q3680
PROJECT NUMBER	1880115
DRAWING BY	JTG
STATION ID	S0867O1
CHECKER INITIALS	CNS

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/01/2020	CDW	PRINCIPAL ENGINEER

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
CIVIL DETAILS - 4
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 14 OF 66	DWG SCALE AS NOTED
DWG DATE 07/26/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -C-004-0001268	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

GENERAL NOTES:

1. THESE NOTES AND OTHER DRAWING NOTES CONTAINED WITHIN ARE PROVIDED TO MEET SPECIFIC REQUIREMENTS AND TO SUPPLEMENT THE CONTRACT SPECIFICATIONS. THESE NOTES NEITHER REPLACE NOR OVERRIDE THE PROVISIONS AND REQUIREMENTS OF THE CONTRACT SPECIFICATIONS.
2. CONTRACTOR SHALL COORDINATE ALL STRUCTURAL WORK WITH WORK SHOWN ON ALL OTHER DRAWINGS.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING CONSTRUCTION AND REPORT ANY DISCREPANCIES FROM THE CONTRACT DRAWINGS TO THE ENGINEER PRIOR TO COMMENCING WITH WORK. SCALING OF WORKING DIMENSIONS FROM THE STRUCTURAL DRAWINGS IS PROHIBITED.
4. CONTRACTOR TO FIELD VERIFY ALL FOUNDATION TOPS OF CONCRETE, REVEALS, AND DIMENSIONS PRIOR TO CONSTRUCTION.
5. CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, SHORING AND TEMPORARY BRACING. CONTRACTOR SHALL UNDERTAKE ALL NECESSARY MEASURES TO ENSURE SAFETY OF ALL PERSONS AND STRUCTURES AT THE SITE AND ADJACENT TO THE SITE. VISITS TO THE SITE BY THE COMPANY OR ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF SUCH RESPONSIBILITY.
6. IF CERTAIN FEATURES ARE NOT FULLY SHOWN OR CALLED FOR ON THE CONTRACT DRAWINGS OR SPECIFICATIONS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS FOR SIMILAR CONDITIONS THAT ARE SHOWN OR CALLED FOR WITH THE APPROVAL OF THE ENGINEER. WHERE SECTIONS VARY, CONTRACTOR SHALL PROVIDE FOR SMOOTH TRANSITIONS BETWEEN THEM, UNLESS NOTED OTHERWISE.
7. ALL PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS' WRITTEN INSTRUCTIONS AND RECOMMENDATIONS, UNLESS NOTED OTHERWISE.
8. ITEMS WHICH ARE TO BE FURNISHED AND INSTALLED BY SEPARATE CONTRACTS ARE IDENTIFIED AND LABELED FOR EACH CONTRACT.
9. FOR ADDITIONAL INFORMATION, SUBMITTAL REQUIREMENTS, AND CODES AND STANDARDS, SEE THE CONTRACT SPECIFICATIONS.

DESIGN STANDARDS:

1. PRINCIPAL CODE OF RECORD: INTERNATIONAL BUILDING CODE 2018,
2. AMERICAN CONCRETE INSTITUTE: (ACI)
   a. ACI 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
3. AMERICAN INSTITUTE OF STEEL CONSTUCTION (AISC)
   a. AISC 360-10, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, 14TH EDITION
4. AMERICAN SOCIETY OF CIVIL ENGINEERS: (ASCE)
   a. ASCE 7-10, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
5. AMERICAN WELDING SOCIETY: (AWS)
   a. AWS D1.1, STRUCTURAL WELDING CODE, 2011
6. PROCESS INDUSTRY PRACTICES: (PIP)
   a. STC01015, STRUCTURAL DESIGN CRITERIA
   b. STE05121, ASCE ANCHORAGE DESIGN FOR PETROCHEMICAL FACILITIES
   c. STF05121, ANCHOR FABRICATION AND INSTALLATION INTO CONCRETE
   d. STS03001, PLAIN AND REINFORCED CONCRETE SPECIFICATION
   e. STS03600, NONSHRINK CEMENTITIOUS GROUT SPECIFICATION
   f. STS03601, EPOXY GROUT SPECIFICATION
   g. STS05120, STRUCTURAL MISCELLANEOUS STEEL FABRICATION SPECIFICATION
   h. STS05130, STRUCTURAL AND MISCELLANEOUS STEEL ERECTION SPECIFICATION
7. DUKE ENERGY STANDARDS

STATEMENT OF SPECIAL INSPECTIONS

1. REQUIRED AND PREPARED IN ACCORDANCE WITH IBC 2018 SECTIONS 1704 AND 1705.
2. THE OWNER OR REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE SHALL EMPLOY ONE OR MORE APPROVED AGENCIES/SPECIAL INSPECTORS TO PROVIDE "SPECIAL INSPECTIONS" DURING CONSTRUCTION.
3. THE SPECIAL INSPECTOR(S) SHALL BE QUALIFIED PER IBC 2018 SECTION 1704.2.1.
4. THE SPECIAL INSPECTOR(S) SHALL SUBMIT REPORTS PER IBC 2018 SECTION 1704.2.4.
5. THE SPECIAL INSPECTOR(S) SHALL USE THE LATEST ISSUE OF THE STRUCTURAL DRAWINGS FOR THE INSPECTIONS. SHOP FABRICATION DRAWINGS SHALL NOT BE USED FOR INSPECTION PURPOSES.
6. SPECIAL INSPECTIONS:
   a. STEEL CONSTRUCTION PER IBC 2018 SECTION 1705.2.
   b. CONCRETE CONSTRUCTION PER IBC 2018 SECTION 1705.3 AND TABLE 1705.3.
   c. SOILS PER IBC IBC 2018 SECTION 1705.6 AND TABLE 1705.6.
   d. DRILLED PIERS PER IBC 2018 SECTION 1705.7 AND TABLE 1705.7.

DESIGN LOADS:

1. RISK CATEGORY: 3 PER ASCE 7
2. DEAD LOAD:
   a. EQUIPMENT LOADS ARE ACTUAL WEIGHTS OF EQUIPMENT (EMPTY, OPERATING, AND/OR TESTING WEIGHTS AS PROVIDED BY EQUIPMENT SUPPLIER)
   b. FOUNDATIONS ARE DESIGN FOR EQUIPMENT, WHICH SATISFIES THE CONTRACT SPECIFICATIONS.
3. LIVE LOADS PER ASCE 7:
   a. PLATFORMS AND WALKWAYS: 60 PSF
   b. STAIRS AND EXITWAYS: 100 PSF
   c. LIGHT STORAGE: 125 PSF
4. SNOW LOADS PER ASCE 7:
   a. GROUND SNOW LOAD: 20 PSF
   b. EXPOSURE FACTOR: 0.9
   c. THERMAL FACTOR: 1.2
   d. IMPORTANCE FACTOR: 1.2
5. ICE LOADS PER ASCE 7:
   a. NOMINAL ICE THICKNESS: 0.75 INCH
   b. CONCURRENT WIND SPEED: 30 MPH
   c. IMPORTANCE FACTOR: - MULTIPLIER ON ICE THICKNESS: 1.25 - MULTIPLIER ON CONCURRENT WIND PRESSURE: 1.0
6. WIND LOAD PER ASCE 7:
   a. BASIC WIND SPEED: 120 MPH 3-SECOND GUST - ULTIMATE
   b. BASIC WIND SPEED: 90 MPH 3-SECOND GUST - SERVICE LEVEL
   c. EXPOSURE CATEGORY: C
7. SEISMIC LOAD PER ASCE 7:
   a. MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL RESPONSE ACCELERATIONS: - Ss COEFFICIENT: 0.143g - S1 COEFFICIENT: 0.077g
   b. DESIGN EARTHQUAKE SPECTRAL RESPONSE ACCELERATIONS: - Sds COEFFICIENT: 0.115g - Sd1 COEFFICIENT: 0.087g
   c. IMPORTANCE FACTOR: 1.5
   d. SITE CLASS: D
   e. SEISMIC DESIGN CATEGORY: D
8. FROST DEPTH: 30" (PER 2018 OHIO BUILDING CODE)

SOILS AND FOUNDATIONS:

1. USE SPECIAL CARE DURING EXCAVATION NOT TO DAMAGE EXISTING STRUCTURES. PROVIDE SHEETING OR SHORING WHERE NECESSARY.
2. FOUNDATION CONSTRUCTION SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER OF RECORD.
3. SITE PREPARATION PER TERRACON GEOTECHNICAL ENGINEERING REPORT DATED 04/13/2017 AND C350 CENTRAL CORRIDOR PIPELINE EXPANSION GEOTECHNICAL ENGINEERING REPORT DATED 07/06/2020:
   a. GEOTECHNICAL ENGINEER OF RECORD SHALL OBSERVE SUBGRADE PRIOR TO CONCRETE PLACEMENT.
   b. EXCAVATION, FILL, AND BACKFILL SHALL BE IN ACCORDANCE WITH THE CONTRACT AND SPECIFICATIONS. CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN LOOSE OR SOFT SOILS ARE EXPOSED WHERE SLABS, MATS, OR FOOTINGS ARE TO BE PLACED SO A DETERMINATION MAY BE MADE REGARDING IMPROVEMENT OF THIS POTENTIALLY UNDESIRABLE CONDITION.
   c. EXISTING UNDERGROUND UTILITIES AND FOUNDATIONS SHALL BE LOCATED BY CAREFUL EXCAVATION BEFORE STARTING FOUNDATION OR HYDROEXCAVATION AS REQUIRED. SUPPORT AND PROTECTION OF THESE UTILITIES AND FOUNDATIONS SHALL BE PROVIDED DURING EARTHWORK OPERATIONS.
   d. SHALLOW FOUNDATION GROUND IMPROVEMENTS:
      - SUBGRADE PREP: OVEREXCAVATE AND RE-COMPACT UNCONSOLIDATED NATIVE SITE SOIL 48 INCHES BELOW BEARING ELEVATION, UNLESS OTHERWISE NOTED, 36 INCHES OUTSIDE FOOTING PERIMETER.
      - BACKFILL: STRUCTURAL FILL IS USED BELOW OR WITHIN 10 FEET OF STRUCTURES OR PAVEMENTS. GENERAL FILL IS USED TO ACHIEVE GRADE OUTSIDE OF THESE AREAS. EARTHEN MATERIALS USED FOR STRUCTURAL FILL INCLUDING COHESIVE SOILS, SHALE, AND SMALL PIECES OF LIMESTONE CAN BE INCLUDED IN THE BACKFILL. CONTROLLED LOW STRENGTH MATERIAL MAY ALSO BE USED UNDER FOUNDATIONS WITHOUT GEOGRID LAYERS.
      - COMPACTION: 6 INCH LAYERS, 95% ASTM D 1557
      - ALL SOIL BACKFILL SHOULD BE MOISTURE-CONDITIONED TO WITHIN ±3% OF THEIR OPTIMUM MOISTURE CONTENT, PLACED IN THIN HORIZONTAL LIFTS (8" OR LESS WHEN USING HEAVY COMPACTION EQUIPMENT AND 4" WHEN USING HAND COMPACTION EQUIPMENT), AND COMPACTED TO A MINIMUM 95% IN LAWN, NON-STRUCTURAL AREAS AND 98% TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) IN PAVEMENT AND OTHER STRUCTURAL AREAS.
      - LIME STABILIZATION OF SUBGRADES MAY BE REQUIRED. CONTACT GEOTECHNICAL ENGINEER OF RECORD FOR LIME STABILIZATION IF WET SUBGRADES ARE ENCOUNTERED.
4. FILL AND BACKFILL MATERIALS:
   a. STRUCTURAL FILL: ODOT #304

RECOMMENDED GRADED MATERIALS	
ODOT #304 AGGREGATE BASE	
SIEVE	PERCENT FINER
1"	100
3/4"	90-100
3/8"	20-55
#4	0-10
#8	0-5

   b. CONTROLLED LOW-STRENGTH MATERIAL: ODOT ITEM 613 SPECIFICATION
      - FLOWABLE FILL SHALL BE REMOVABLE WITH A COMPRESSIVE STRENGTH LOWER THAN 150PSI AND SHALL GENERALLY CONFORM TO THE ODOT TYPE 2 MIX. (1)
5. DESIGN PARAMETERS:
   a. MINIMUM STABILITY FACTORS OF SAFETY:
      - OVERTURNING: 1.5
      - UPLIFT: 1.5
      - SLIDING: 1.0
   b. NET ALLOWABLE BEARING PRESSURE: 2000 PSF
   c. COEFFICIENT OF FRICTION: 0.4

MATERIALS:

1. SEE THE CONTRACT SPECIFICATIONS FOR COMPLETE REQUIREMENTS AND COMPLY WITH ALL APPLICABLE OSHA REGULATIONS.
2. REINFORCED CONCRETE:
   a. REINFORCED CONCRETE SHALL BE PREPARED AND PLACED IN ACCORDANCE WITH ACI, PIP STS03001, PROJECT SPECIFICATIONS, AND OWNER STANDARD.
   b. CONCRETE:
      - ALL CONCRETE CONSTRUCTION SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE FOLLOWING ACI CODES: ACI 318, ACI 315, AND ACI 301.
      - ALL CEMENT SHALL BE TYPE I CEMENT AND CONFORM TO ASTM C150, UNLESS OTHERWISE SPECIFIED OR REQUIRED AND HAVE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF f'c 4,500 PSI.
      - MAXIMUM WATER/CEMENT RATIO SHALL BE 0.45.
      - SLUMP OF CONCRETE SHALL BE BETWEEN 3 AND 4 INCHES AS TESTED IN ACCORDANCE WITH ASTM C143. IF CONTRACTOR WISHES TO USE A MIX WITH SLUMP OUTSIDE THE RANGE LISTED ABOVE, WRITTEN APPROVAL FROM ENGINEER OF RECORD IS REQUIRED PRIOR TO MIX DESIGN SUBMITTAL.
      - MIXING WATER SHALL BE POTABLE WATER AND CONFORM TO ASTM C1602.
      - AGGREGATES FOR NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C33 "SPECIFICATION FOR CONCRETE AGGREGATES". THE NOMINAL MAXIMUM SIZE OF THE AGGREGATE SHALL NOT BE MORE THAN 1-1/2".
      - FOR NEW COARSE-AGGREGATE SOURCE, WHEN 3 YEARS' APPROVED SERVICE RECORDS ARE NOT AVAILABLE OR WHEN SERVICE RECORDS ARE UNACCEPTABLE, AGGREGATE SHALL BE EVALUATED FOR POTENTIAL REACTIVITY. AGGREGATE MUST BE CONSIDERED INNOCUOUS IN ACCORDANCE WITH ASTM 1260. IF EVALUATION ABOVE INDICATES REACTIVE AGGREGATES AND ALTERNATE AGGREGATE SOURCES ARE NOT AVAILABLE, REQUEST RE-EVALUATION OF AGGREGATE USING ASTM C1567. COARSE AGGREGATES CONSIDERED DELETERIOUS OR POTENTIALLY DELETERIOUS SHALL NOT BE USED WITHOUT APPROVAL.
      - ADMIXTURES SHALL NOT BE USED WITHOUT THE APPROVAL OF THE ENGINEER'S CONSTRUCTION FIELD REPRESENTATIVE. SHOULD ADMIXTURES BE APPROVED, ALL MATERIALS SHALL BE TESTED IN ACCORDANCE WITH THE LATEST EDITION OF ASTM C260 "STANDARD SPECIFICATION FOR AIR-ENTRAINING ADMIXTURES FOR CONCRETE." (1)
      - CONCRETE FOR ALL PARTS OF THE WORK SHALL BE OF THE SPECIFIED QUALITY, CAPABLE OF BEING PLACED WITHOUT EXCESSIVE SEGREGATION, AND WHEN HARDENED, OF DEVELOPING ALL CHARACTERISTICS REQUIRED BY THESE SPECIFICATIONS AND THE CONTRACT DOCUMENTS. BEFORE CONCRETE WORK BEGINS, THE PROPOSED CONCRETE MIX DESIGN ALONG WITH COLLABORATING DATA SHOWING COMPLIANCE WITH THE SPECIFICATIONS SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
      - ALL REINFORCING STEEL, WIRE MESH, ANCHOR BOLTS, HOLD-DOWN ANCHORS, AND OTHER INSERTS SHALL BE SECURED IN POSITION PRIOR TO PLACING OF CONCRETE.
      - EXPOSED HORIZONTAL CONCRETE SURFACES SHALL BE WOOD FLOATED TO DEPRESS COARSE AGGREGATE AND STEEL TROWELED TO A SMOOTH SURFACE.
      - LL WALKING SURFACES SHALL HAVE A LIGHT BROOM FINISH.
      - CONCRETE SURFACES SHALL BE PROTECTED DURING CURING AGAINST EARLY EVAPORATION OF WATER, ACTION BY SUN, RAIN, WATER, FROST, AND CRACKING.
3. FORMWORK:
   a. CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, ENGINEERING, STRUCTURAL ADEQUACY, AND CONSTRUCTION OF ALL CONCRETE FORMWORK IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
   b. COORDINATE ALL CONCRETE WORK WITH THE PLACEMENT OF PIPING, INSERTS, FLOOR DRAINS, AND OTHER EMBEDDED ITEMS INDICATED ON THE CONTRACT DRAWINGS OR IN THE CONTRACT SPECIFICATIONS.
   c. ALL NEW OR EXISTING PIPING OR UTILITIES PASSING THROUGH NEW CONCRETE SHALL BE SLEEVED 1/2" CLEAR ALL AROUND UNLESS NOTED OTHERWISE. (SEE OTHER DISCIPLINE DRAWINGS FOR SLEEVE DETAILS. CONTRACTOR SHALL PROVIDE MEASURES TO ENSURE THAT SLEEVES REMAIN FREE OF DEBRIS AND WATER DURING CONSTRUCTION).
   d. PROVIDE 1", 45° CHAMFER ON ALL EDGES OF EXPOSED CONCRETE UNLESS CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND.
4. REINFORCING STEEL:
   a. BARS: ASTM A615 GRADE 60
   b. ALL CONCRETE SHALL BE REINFORCED UNLESS SPECIFICALLY MARKED "NOT REINFORCED" OR "UNREINFORCED".
   c. CONTRACTOR SHALL DETAIL AND PLACE ALL REINFORCEMENT IN ACCORDANCE WITH ACI SP-66, ACI 301, ACI 318, AND CRSI MANUAL OF STANDARD PRACTICE.
   d. MINIMUM CONCRETE CLEAR COVER OVER REINFORCEMENT SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
      - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
      - CONCRETE EXPOSED TO EARTH OR WEATHER:
        - #6 THROUGH #18 BARS - 2"
        - #5 AND SMALLER BARS AND WELDED WIRE FABRIC - 1 1/2"
      - CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND:
        - SLABS AND WALLS - #14 AND #18 BARS - 1 1/2"
        - #11 AND SMALLER BARS - 3/4"
      - BEAMS AND COLUMNS, PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS - 1 1/2"
   e. EMBEDMENT AND LAP SPLICE LENGTHS FOR ALL REINFORCING STEEL BARS SHALL CONFORM TO THE FOLLOWING PROVISIONS, UNLESS NOTED OTHERWISE. LAP SPLICES SHALL NOT BE PLACED WITHIN 5FT OF THE LONG END OF THE FOUNDATION.

      MINIMUM STRAIGHT EMBEDMENT LENGTHS:

#3 - 15"	#6 - 29"	#9 - 54"
#4 - 19"	#7 - 42"	#10 - 61"
#5 - 24"	#8 - 48"	#11 - 67"

      MINIMUM LAP SPLICE LENGTHS:

#3 - 19"	#6 - 37"	#9 - 70"
#4 - 25"	#7 - 54"	#10 - 79"
#5 - 31"	#8 - 62"	#11 - 87"

      MINIMUM HOOK EMBEDMENT LENGTHS:

#3 - 8"	#6 - 15"	#9 - 22"
#4 - 10"	#7 - 17"	#10 - 25"
#5 - 12"	#8 - 19"	#11 - 27"

   f. THE MINIMUM LENGTHS SHOWN ABOVE ARE BASED ON THE FOLLOWING CONCRETE COVERAGE AND REINFORCING C/C SPACING:
      BEAMS AND COLUMNS: COVER = 1.0db (BAR DIAMETER)
      CENTER TO CENTER (C/C) SPACING = 2.0db
      ALL OTHERS: COVER = 1.0db (BAR DIAMETER)
      CENTER TO CENTER (C/C) SPACING = 3.0db
   g. THE DEVELOPMENT AND SPLICE LENGTHS SHOWN SHALL NOT APPLY IF ANY OF THE FOLLOWING CONDITIONS OCCUR:
      - f'c < 4,000 PSI
      - fy > 60,000 PSI
   h. THE COVER OR C/C BAR SPACING IS NOT AS LISTED ABOVE.
      - THE REINFORCING STEEL IS EPOXY COATED.
      - LIGHT WEIGHT CONCRETE IS USED.
   i. HORIZONTAL BARS HAVING MORE THAN 12" OF CONCRETE PLACED BELOW THEM SHALL BE CONSIDERED TOP REINFORCEMENT AND SHALL HAVE MINIMUM STRAIGHT EMBEDMENT AND LAP SPLICE LENGTHS INCREASED BY NOT LESS THAN 30% OVER THOSE GIVEN ABOVE.
   j. HOOK EMBEDMENT IS THE MINIMUM STRAIGHT LINE DISTANCE FROM THE CRITICAL SECTION OF THE BAR TO THE FARTHEST EDGE OF THE HOOK.
5. JOINTS:
   a. LOCATE ALL CONSTRUCTION, CONTRACTION, ISOLATION, EXPANSION, AND OTHER JOINTS AS INDICATED OR SPECIFIED, OR OTHERWISE APPROVED BY THE ENGINEER.
   b. SURFACES OF ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS SHALL BE CLEANED OF LAITANCE AND SHALL EXPOSE CLEAN COARSE AGGREGATE SOLIDLY EMBEDDED IN MORTAR MIX TO MINIMUM 1/4" AMPLITUDE. APPLY CONCRETE BONDING AGENT PRIOR TO DEPOSITING CONCRETE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
   c. THESE PROVISIONS SHALL ALSO APPLY WHEN NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE.
   d. PROVIDE WATERSTOPS AT CONCRETE JOINTS WHERE INDICATED ON THE CONTRACT DRAWINGS. ALL WATERSTOPS SHALL BE FUEL RESISTANT TYPE, UNLESS NOTED OTHERWISE.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 92217 — REGISTERED PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW
1	11-30-2020	UPDATED NOTES TO INCLUDE CLSM SPECS AND ASTM C260	HEC	EAB	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0667O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	11/30/2020	CDW	PRINCIPAL ENGINEER

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
STRUCTURAL NOTES (1 OF 2)
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 15 OF 66	DWG SCALE AS NOTED
DWG DATE 05/19/2020	SUPERSEDED —

DRAWING NUMBER	REVISION
PNG -S-004-0001000	1

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

6. STRUCTURAL AND MISCELLANEOUS STEEL:
   a. STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC STEEL CONSTRUCTION MANUAL, 14TH EDITION, PIP STS05120 AND PIP STS05130, AND ALL APPLICABLE OWNER STANDARDS.
   b. TEMPORARY ERECTION BRACING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR AS REQUIRED AND SHALL NOT BE REMOVED UNTL ALL PERMANENT LATERAL-LOAD-RESISTING ELEMENTS AND CONNECTIONS ARE COMPLETELY INSTALLED.
   c. ALL STEEL SHALL BE HOT-DIP GALVANIZED UNLESS NOTED OTHERWISE ON PLANS.
   d. WIDE FLANGE SHAPES AND TEES: ASTM A992, Fy = 50 KSI OR ASTM A572, Fy = 50 KSI
   e. PLATES, ANGLES, AND CHANNELS: ASTM A36, Fy = 36 KSI, UNLESS NOTED OTHERWISE
   f. SQUARE AND RECTANGULAR HOLLOW STRUCTURAL SECTIONS: ASTM A500 GRADE B, Fy = 46 KSI
   g. ROUND HOLLOW STRUCTURAL SECTIONS: ASTM A500 GRADE B, Fy = 42 KSI
   h. PIPE: ASTM A53 GRADE B, Fy = 35 KSI
   i. ALL DOUBLE ANGLE MEMBERS SHALL HAVE SPACER PLATES CONFORMING TO AISC STEEL CONSTRUCTION MANUAL PARAGRAPH E6. SPACER PLATES SHALL BE THE SAME THICKNESS AS THE GUSSET PLATES.
7. BOLTS:
   a. 3/4" DIAMETER ASTM A325 GRADE A325, UNLESS NOTED OTHERWISE.
   b. FRAMING CONNECTIONS: SNUG-TIGHTENED JOINTS WITH STANDARD HOLES, UNLESS NOTED OTHERWISE.
   c. BRACING CONNECTIONS: SNUG-TIGHTENED JOINTS WITH STANDARD HOLES, UNLESS NOTED OTHERWISE.
   d. ON ONE SIDE OF EACH DOUBLE CONNECTION OF BEAMS TO A COLUMN WEB OR A GIRDER WEB DIRECTLY OVER A COLUMN, PROVIDE A TEMPORARY SEAT ANGLE ATTACHED TO COLUMN OR GIRDER WEB AND TO BOTTOM FLANGE OF BEAM. MINIMUM SEAT CONNECTION SHALL BE L4x3x3/8 LLH WITH TWO 3/4" DIAMETER A307 OR A325-ST BOLTS EACH LEG. SINGLE AND DOUBLE STAGGERED CONNECTIONS ARE PROHIBITED WITHOUT THE EXPLICIT PRIOR APPROVAL IN WRITING OF THE STRUCTURAL ENGINEER OF RECORD.
8. WELDING:
   a. IN ACCORDANCE WITH AWS D1.1 USING E70 ELECTRODE
   b. MINIMUM STRUCTURAL WELD REQUIREMENTS ARE SHOWN ON DESIGN DRAWINGS. CLIENT REQUESTS WELDED CONNECTIONS TO BE FINISHED WITH MINIMUM SEAL WELDING ON REMAINDER OF JOINT AT ALL OTHER CREVICES. SEAL WELDING SHALL NOT PRODUCE AN UNSAFE CONDITION FOR HOT-DIP GALVANIZING.
9. ANCHOR BOLTS:
   a. ASTM F1554 GRADE 55 NOTED OTHERWISE ON DRAWINGS.
   b. ANCHOR BOLT HOLES IN BASE PLATES TO BE OVERSIZED TO ACCOUNT FOR CONSTRUCTION TOLERANCES IN ANCHOR BOLT PLACEMENT. HOLES CORRESPONDING TO APPROPRIATE ANCHOR BOLT SIZE SHALL BE NO LARGER THAN THE MAXIMUM RECOMMENDED SIZES IN THE AISC STEEL CONSTRUCTION MANUAL, 14TH EDITION, TABLE 14-2.
   c. PROVIDE PLATE WASHERS AT OVERSIZED ANCHOR BOLT HOLES.
   d. LOCATE ANCHOR BOLTS ACCURATELY, SET WITH TEMPLATE, AND SECURELY HOLD IN POSITION WHILE PLACING CONCRETE. PROTECT IN-PLACE ANCHOR BOLTS FROM CONSTRUCTION ACTIVITY.
   e. THE FOLLOWING ARE PROHIBITED WITHOUT THE EXPLICIT PRIOR APPROVAL IN WRITING OF THE ENGINEER:
      - INSERTING ANCHOR BOLTS INTO FRESH OR PARTIALLY HARDENED CONCRETE.
      - SUBSTITUTING POST-INSTALLED ANCHORS WHERE EMBEDDED ANCHOR BOLTS ARE INDICATED.
      - REPAIRING, REPLACING, OR MODIFYING INSTALLED ANCHOR BOLTS.
   f. ANCHOR BOLT THREADS SHALL BE UNC-2A AND PROTECTED FROM DAMAGE DURING CONSTRUCTION.
   g. SLEEVES FOR STATIONARY EQUIPMENT AND STRUCTURAL BASE PLATES SHALL BE FILLED WITH GROUT WHEN BASE PLATE/EQUIPMENT IS GROUTED IN FINAL LOCATION.
   h. ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE SHIPPED GALVANIZED.
10. POST-INSTALLED ANCHORS:
   a. INSTALL ANCHORS PER MANUFACTURER INSTRUCTIONS INCLUDED IN ANCHOR PACKAGING.
   b. CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED. ENGINEER OF RECORD MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL OF CONTRACTOR'S PERSONNEL WHO INSTALL ANCHORS ARE TRAINED PRIOR TO COMMENCEMENT OF INSTALLING ANCHORS.
   c. ANCHOR CAPACITY IS DEPENDENT ON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON DRAWINGS.
   d. EXISTING REINFORCING BARS IN CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LCCATIONS. REINFORCING BARS SHALL NOT BE CUT UNLESS NOTED ON DRAWINGS THAT BARS CAN BE CUT. CONTRACTOR SHALL CONTACT ENGINEER OF RECORD WHEN INTERFERENCES OCCUR.
   e. PERMITTED POST INSTALLED ANCHORS/EPOXY ARE LISTED AS FOLLOWS (ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY ENGINEER OF RECORD PRIOR TO USE. SUBSTITUTIONS REQUIRE STAMPED CALCULATIONS)
      - WEDGE TYPE - LIFE SAFETY APPLICATIONS:
      - SIMPSON STRONG TIE - STRONG BOLT 2
      - HILTI KWIK BOLT TZ
      - POWERS POWER STUD SD2
      - WEDGE TYPE - NON-LIFE SAFETY APPLICATIONS:
      - SIMPSON STRONG TIE - WEDGE ALL
      - HILTI KWIK BOLT 3
      - POWER POWER STUD SD1
      - UNDERCUT TYPE (USE ONLY WHERE SPECIFICALLY INDICATED ON DRAWINGS):
      - SIMPSON STRONG TIE - TORQUE-CUT
      - HILTI HDA UNDERCUT ANCHOR
      - POWERS ATOMIC + UNDERCUT
      - EPOXY ANCHORS - LIFE SAFETY APPLICATIONS:
      - SIMPSON STRONG TIE - SET XP
      - HILTI HIT-RE500 V3
      - HILTI HIT-HY200
      - POWER PE1000
      - ADHESIVE ANCHORS - FOR NON-VIBRATING EQUIPMENT ANCHORAGE AND OTHER NON-LIFE SAFETY APPLICATIONS:
      - SIMPSON STRONG TIE - AT
      - HILTI HIT-HY200
      - POWER - AC100+ GOLD
   f. CONCRETE ANCHORS:
      - GALVANIZED OR ZINC-COATED CARBON STEEL MANUALLY EXPANDED WEDGE TYPE, UNLESS NOTED OTHERWISE.
   g. ADHESIVE ANCHORS:
      - INSTALL ADHESIVE ANCHORS AS INDICATED ON DRAWINGS.
      - ALL PERSONNEL INSTALLING ADHESIVE ANCHORS SHALL BE ACI ADHESIVE ANCHOR CERTIFIED.
      - ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM AGE OF 21 DAYS AT TIME OF ANCHOR INSTALLATION.
11. GROUT:
   a. NON-SHRINK GROUT IN ACCORDANCE W/ PIP STS03600.
      - NON-METALLIC, HYDRAULIC-CEMENT GROUT IN ACCORDANCE WITH ASTM C1107.
      - MINIMUM COMPRESSIVE STRENGTH = 6,000 PSI @ 28 DAYS.
      - GROUT SHALL BE SUITED FOR OUTDOOR USE.
   b. EPOXY GROUT IN ACCORDANCE W/ PIP STS03601.
      - PROVIDE EPOXY GROUT FOR ALL PUMP BASES
12. STEEL BAR GRATING:
   a. PER VENDOR INSTRUCTIONS

ABBREVIATIONS:

AB	–	ANCHOR BOLT
ABV	–	ABOVE
ACI	–	AMERICAN CONCRETE INSTITUTE
AGGR	–	AGGREGATE
AISC	–	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ANSI	–	AMERICAN NATIONAL STANDARD INSTITUTE
ASTM	–	AMERICAN SOCIETY FOR TESTING OF MATERIALS
AWS	–	AMERICAN WELDING SOCIETY
BBP	–	BOTTOM OF BASE PLATE
BTW	–	BETWEEN
BLDG	–	BUILDING
BM	–	BEAM
BOC	–	BOTTOM OF CONCRETE
BOP	–	BOTTOM OF PIPE
BOS	–	BOTTOM OF STEEL
BOT	–	BOTTOM
CAP	–	CAPACITY
C/C	–	CENTER TO CENTER
CL	–	CENTERLINE
CIR	–	CIRCLE
CJ	–	CONSTRUCTION JOINT
CLR	–	CLEAR
CLJ	–	CONTROL JOINT
COL	–	COLUMN
CONC	–	CONCRETE
CONT	–	CONTINUOUS
COORD	–	COORDINATE
CTR	–	CENTER
db	–	BAR DIAMETER
DET	–	DETAIL
DIA	–	DIAMETER
DIAG	–	DIAGONAL
DIM	–	DIMENSION
DL	–	DEAD LOAD
DN	–	DOWN
DWG	–	DRAWING
DWL	–	DOWEL
EA	–	EACH
EF	–	EACH FACE
EJ	–	EXPANSION JOINT
EL	–	ELEVATION
ELEC	–	ELECTRICAL
ELEV	–	ELEVATION
EMBED	–	EMBEDMENT
EQ	–	EQUAL
EQUIP	–	EQUIPMENT
EQUIV	–	EQUIVALENT
EXIST	–	EXISTING
EXP	–	EXPANSION
EW	–	EACH WAY
f'c	–	SPECIFIED 28-DAY CONCRETE COMPRESSIVE STRENGTH (MINIMUM)
FDN	–	FOUNDATION
FF	–	FAR FACE
FLG	–	FLANGE
FS	–	FAR SIDE
FT	–	FEET
FTG	–	FOOTING
Fy, fy	–	YIELD STRESS
FV	–	FIELD VERIFY
GA	–	GAGE
GALV	–	GALVANIZE
GR	–	GRADE
GRTG	–	GRATING
H	–	HIGH
HORIZ	–	HORIZONTAL
HR	–	HANDRAIL
HS	–	HIGH STRENGTH
IBC	–	INTERNATIONAL BUILDING CODE
ID	–	INSIDE DIAMETER
IF	–	INSIDE FACE
IJ	–	ISOLATION JOINT
INTR	–	INTERIOR
INVT	–	INVERT
JT	–	JOINT
KB	–	KNEE BRACE
KSI	–	KIPS PER SQUARE INCH
L	–	ANGLE
LB	–	POUND
LG	–	LONG
LL	–	LIVE LOAD
LLBB	–	LONG LEG BACK TO BACK
LLH	–	LONG LEG HORIZONTAL
LLV	–	LONG LEG VERTICAL
LONG	–	LONGITUDINAL
LS	–	LAP SPLICE
MATL	–	MATERIAL
MAX	–	MAXIMUM
MECH	–	MECHANICAL
MFR	–	MANUFACTURER
MH	–	MANHOLE
MIN	–	MINIMUM
MISC	–	MISCELLANEOUS
NA	–	NOT APPLICABLE
NF	–	NEAR FACE
NO	–	NUMBER
NOM	–	NOMINAL
NS	–	NEAR SIDE
NTS	–	NOT TO SCALE
OC	–	ON CENTER
OD	–	OUTSIDE DIAMETER
OF	–	OUTSIDE FACE
OPP	–	OPPOSITE
OSHA	–	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PED	–	PEDESTAL
PEN	–	PENETRATE, PENETRATION
PERP	–	PERPENDICULAR
PL	–	PLATE
PROJ	–	PROJECTION
PSF	–	POUNDS PER SQUARE FOOT
PSI	–	POUNDS PER SQUARE INCH
PVC	–	POLYVINYL CHLORIDE
RAD	–	RADIUS
REF	–	REFERENCE
REINF	–	REINFORCE
REQD	–	REQUIRED
REV	–	REVISION
SCHED	–	SCHEDULE
SECT	–	SECTION
SH	–	SHEET
SIM	–	SIMILAR
SLP	–	SLOPE
SPEC	–	SPECIFICATION
SQ	–	SQUARE
STD	–	STANDARD
STIFF	–	STIFFENER
STIR	–	STIRRUP
STL	–	STEEL
STR	–	STRAIGHT
STRL	–	STRUCTURAL
STRUC	–	STRUCTURE
SYMM	–	SYMMETRICAL
T&B	–	TOP & BOTTOM
TOB	–	TOP OF BOLT
TOC	–	TOP OF CONCRETE
TOG	–	TOP OF GRATING
TOS	–	TOP OF STEEL
TYP	–	TYPICAL
UNO	–	UNLESS NOTED OTHERWISE
VAR	–	VARIES
VERT	–	VERTICAL
W	–	WIDE
W/	–	WITH
W/O	–	WITHOUT
WD	–	WIDTH
WF	–	WIDE FLANGE
WP	–	WORK POINT
WT	–	WEIGHT/STRUCTURAL
WWF	–	WELDED WIRE FABRIC
@	–	AT
&	–	AND
#	–	POUNDS OR NUMBER
%	–	PERCENT
Ø	–	DIAMETER

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHRISTOPHER D. WILSON
82211
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0667O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CDW

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
STRUCTURAL NOTES (2 OF 2)

HAMILTON COUNTY, OHIO

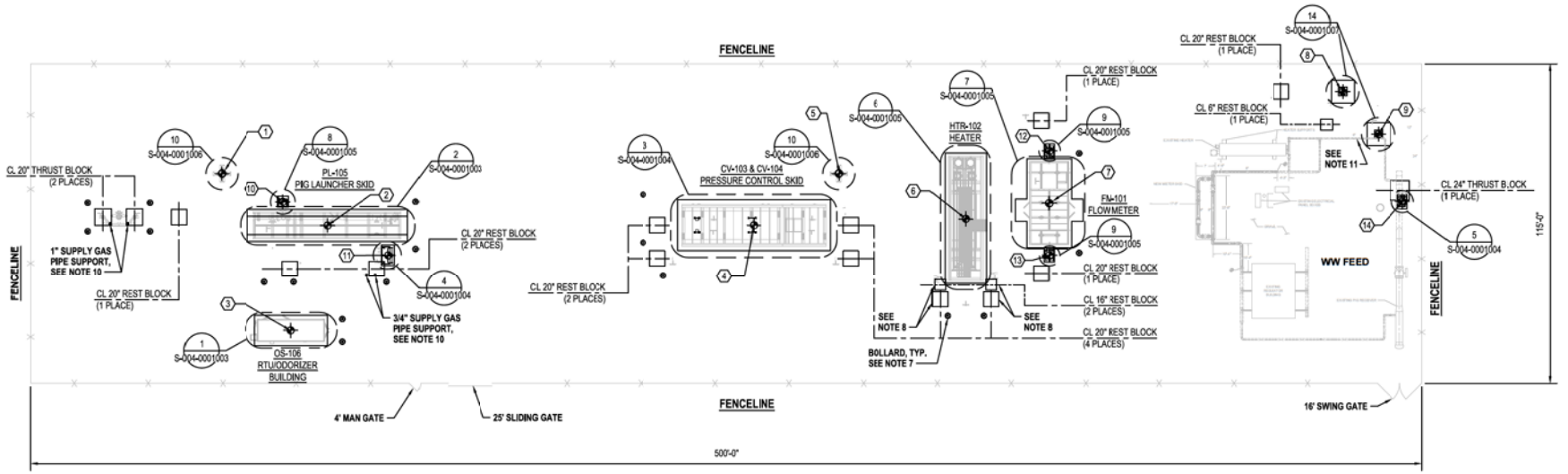
REF. DWG(S)

SHEET(S)	16 OF 66
DWG SCALE	AS NOTED
DWG DATE	05/19/2020
SUPERSEDED	—
DRAWING NUMBER	PNG -S-004-0001001
REVISION	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

EQUIPMENT FOUNDATION TABLE				
POINT #	NORTHING	EASTING	TOC	DESCRIPTION
1	476718.59	1443422.91	874.51'	LIGHT POLE
2	476696.51	1443459.13	874.01'	PIG LAUNCHER SKID
3	476659.89	1443442.59	873.47'	RTU/ODORIZER BUILDING
4	476682.40	1443611.80	873.13'	PRESSURE CONTROL SKID
5	476698.06	1443643.72	873.13'	LIGHT POLE
6	476677.64	1443687.85	872.69'	HEATER
7	476680.45	1443718.20	872.69'	FLOW METER
8	476710.56	1443827.01	873.15'	20" PIPE SUPPORT
9	476694.15	1443838.36	873.15'	20" PIPE SUPPORT

EQUIPMENT FOUNDATION TABLE				
POINT #	NORTHING	EASTING	TOC	DESCRIPTION
10	-	-	874.38'	*MODIFIED 8" ACCESS PLATFORM
11	-	-	874.38'	*DOUBLE WIDE ACCESS PLATFORM
12	-	-	872.69'	*SINGLE WIDE ACCESS PLATFORM
13	-	-	872.25'	*SINGLE WIDE ACCESS PLATFORM
14	-	-	871.98'	*SINGLE WIDE ACCESS PLATFORM WITH LADDER
*PLATFORM LOCATIONS TO BE SET AFTER EQUIPMENT FOUNDATIONS AND VALVES ARE LOCATED				



0 10' 20' 40'
SCALE IN FEET

NOTES:

1. ⊕ DENOTES REFERENCE COORDINATE LOCATION.
2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEER OF RECORD.
3. CONTRACTOR TO VERIFY ALL FOUNDATION LOCATIONS & HEIGHTS PRIOR TO CONSTRUCTION.
4. LOCATE PIPE SUPPORTS, REST & THRUST BLOCKS PER MECHANICAL DWGS.
5. SEE DETAIL 11, DWG S-004-0001006 FOR REST BLOCK DETAILS.
6. SEE DETAIL 12, DWG S-004-0001006 FOR THRUST BLOCK DETAILS.
7. SEE DETAIL 13, DWG S-004-0001007 FOR BOLLARD DETAILS.
8. CONTRACTOR TO INSTALL FRP PAD BETWEEN FOUNDATIONS WITH LESS THAN 6" CLEARANCE.
9. COORDINATES SHOWN ON THIS DRAWING ARE IN OHIO STATE PLANE SOUTH COORDINATES, ZONE 3402, NAD83 HORIZONTAL DATUM AND NAVD88 VERTICAL DATUM.
10. SEE DETAIL 3 ON REFERENCE DWG G-000-0001037 FOR SUPPLY GAS PIPE SUPPORTS. CONTRACTOR TO PROVIDE ALL MATERIALS NEEDED FOR 1" AND 3/4" SUPPLY GAS PIPE SUPPORTS.
11. PIPING BETWEEN NEW WW FEED TIE-IN AND CAP TO BE REMOVED.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW
1	11-30-2020	REMOVED HOLD CLOUDS FROM RTU/ODORIZER BUILDING	HEC	EAB	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0867O1
CHECKER INITIALS	EAB

APPROVALS			
DATE	INITIALS		
		REGIONAL ENGINEER	
DATE	INITIALS		
		MGR TECH REC & STD	
DATE	INITIALS		
11/30/2020	CDW	PRINCIPAL ENGINEER	

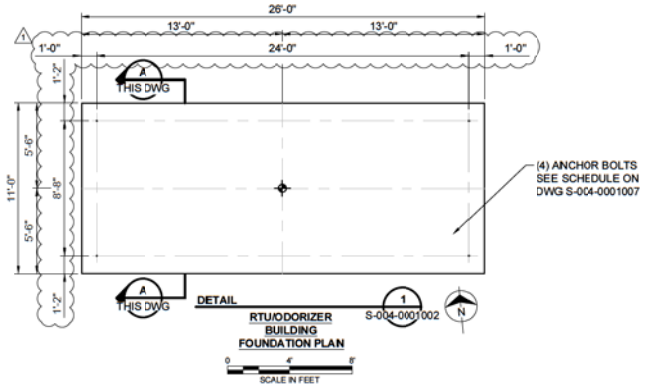
DUKE ENERGY

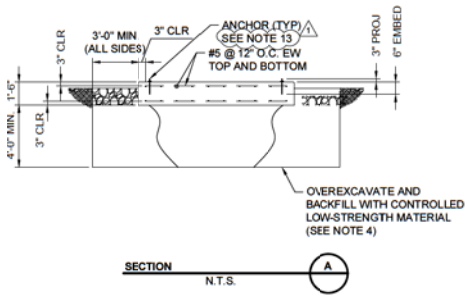
C350 PROJECT
HIGHPOINT PARK STATION
FOUNDATION LOCATION PLAN

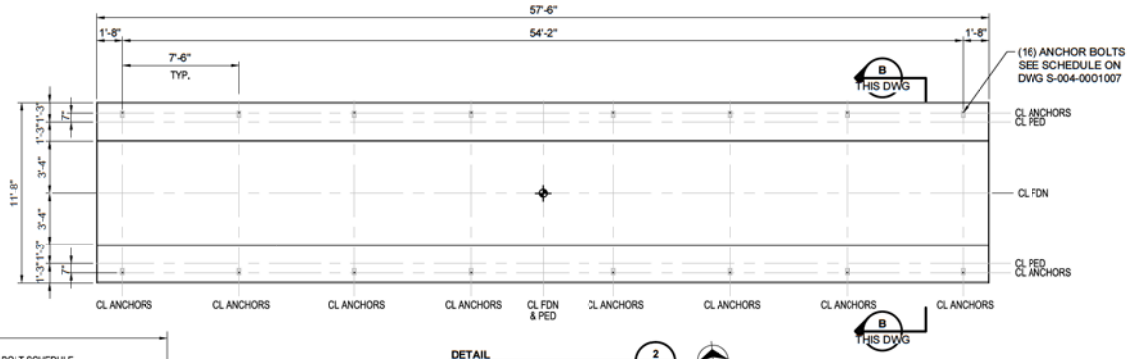
HAMILTON COUNTY, OHIO

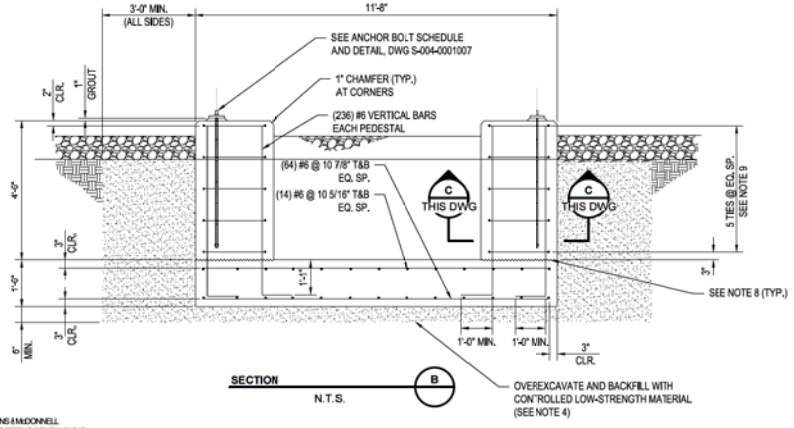
REF. DWG(S)

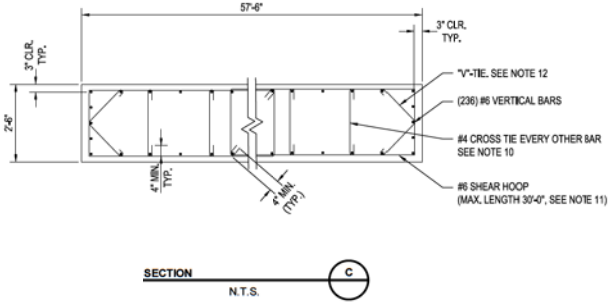
SHEET(S) 17 OF 66	DWG SCALE 1" = 20'
DWG DATE 08/21/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -S-004-0001002	1
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	











NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60.
3. EXPOSED FOUNDATION EDGES SHALL HAVE 1" CHAMFER.
4. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED UNDER FOUNDATION. FILL SHOULD NOT BE PLACED ON A FROZEN SUBGRADE. SEE DWG. PNG-S-004-0001000 FOR CLSM SPECIFICATIONS. 1
5. ⊕ DENOTES REFERENCE COORDINATE LOCATION FROM FOUNDATION LOCATION PLAN.
6. GROUT AVERAGE THICKNESS ADOPTED 1" TO ASSURE PROPER LEVELING AT BOTTOM OF STEEL BETWEEN PIERS. GROUT MAY NOT BE REQUIRED BY OWNER'S DECISION FOR PIERS BUILT WITH THEIR TOP OF CONCRETE HAVING A MAXIMUM DEVIATION OF ± 1" STEEL ELEVATION, AND WITH A SURFACE PROPERLY FINISHED TO ALLOW THE SKID BEAMS TO REST ON ALL PIERS AFTER THE CLAMPS ARE INSTALLED.
7. CONTRACTOR TO VERIFY BASE PLATE SIZES AND BOLT HOLE SIZES & SPACING PRIOR TO CONSTRUCTING FOUNDATIONS.
8. ROUGHEN TO ±1/4" AMPLITUDE, CLEAN EXPOSED AGGREGATE PRIOR TO PEDESTAL POUR.
9. LAP SPLICES REQUIRED. SEE DWG PNG-S-004-0001000 FOR REQUIRED LAP SPLICE LENGTHS AND DETAILS.
10. INSTALL CROSS TIE BARS AT EVERY OTHER VERTICAL BAR SPACING TO COMPLETE CAGE. THESE TIES MAY BE INSTALLED AT THE TOP AND BOTTOM OF THE PEDESTAL.
11. OUTER SHEAR HOOPS SHALL BE NO GREATER THAN 30 FT LONG PER SIDE. SHEAR HOOPS SHALL OVERLAP IN THE MIDDLE OF THE PEDESTAL'S LENGTH.
12. "V"-TIES SHALL BE #4 BARS INSTALLED AT THE SHORT ENDS OF THE PEDESTALS. THESE TIES MAY BE INSTALLED AT THE TOP AND BOTTOM OF THE PEDESTAL. 1
13. INSTALL RTU/ODORIZER ANCHOR BOLTS AFTER ENCLOSURE IS PLACED ON THE FOUNDATION. LOCATIONS SHOWN ARE APPROXIMATE.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHRISTOPHER D. WILSON
82211
REGISTERED PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW
1	11-30-2020	REMOVED HOLD CLOUDS AND UPDATED ANCHOR BOLTS	HEC	EAB	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0867O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	11/30/2020	CDW	PRINCIPAL ENGINEER

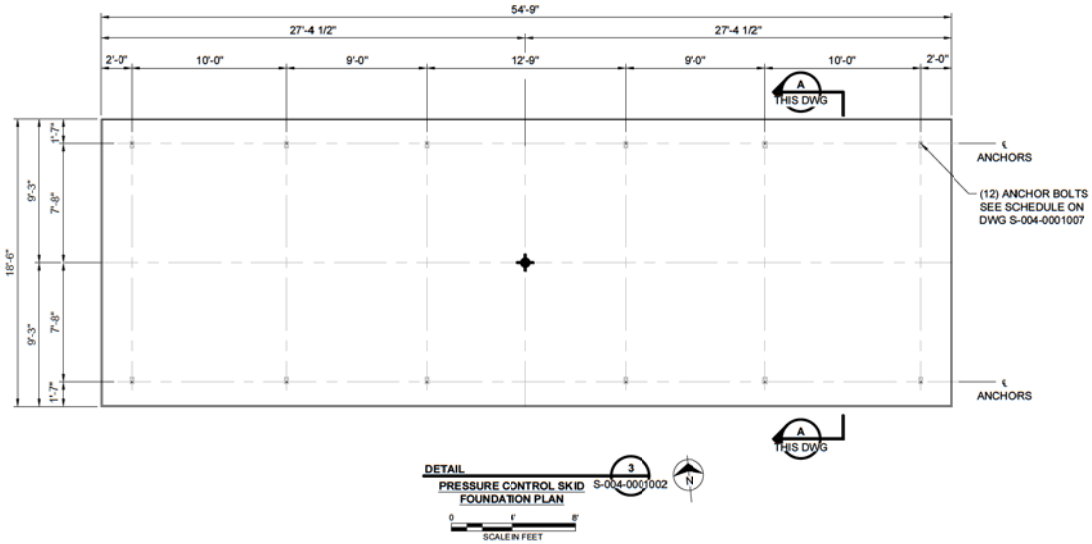
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
FOUNDATION DETAILS 1 OF 5

HAMILTON COUNTY, OHIO

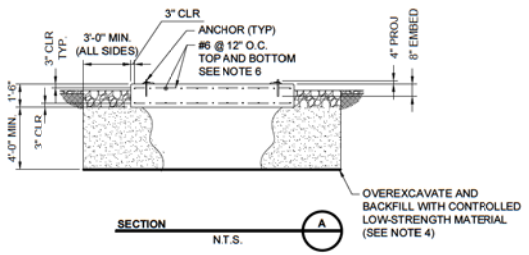
REF. DWG(S)

SHEET(S) 18 OF 66	DWG SCALE AS NOTED
DWG DATE 08/21/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -S-004-0001003	1
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

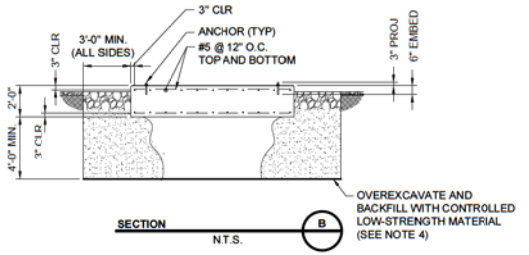


DETAIL 3 — **PRESSURE CONTROL SKID FOUNDATION PLAN** — S-004-0001002

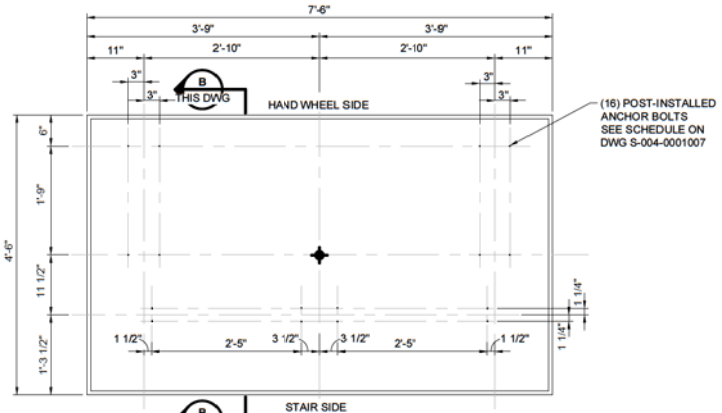
SCALE IN FEET



SECTION A — N.T.S.

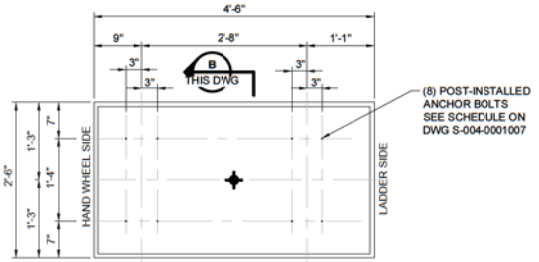


SECTION B — N.T.S.



DETAIL 4 — **DOUBLE WIDE ACCESS PLATFORM FOUNDATION PLAN** — S-004-0001002

SCALE IN FEET



DETAIL 5 — **SINGLE WIDE ACCESS PLATFORM WITH LADDER FOUNDATION PLAN** — S-004-0001002

SCALE IN FEET

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60.
3. EXPOSED FOUNDATION EDGES SHALL HAVE 1" CHAMFER.
4. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED UNDER FOUNDATION. FILL SHOULD NOT BE PLACED ON A FROZEN SUBGRADE, SEE DWG. PNG-S-004-0001000 FOR CLSM SPECIFICATIONS.
5. ✚ DENOTES REFERENCE COORDINATE LOCATION FROM FOUNDATION LOCATION PLAN.
6. LAP SPLICES REQUIRED. SEE DWG PNG-S-004-0001000 FOR REQUIRED LAP SPLICE LENGTHS AND DETAILS.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER

11/30/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW
1	11-30-2020	UPDATED CLSM CALLOUT	HEC	EAB	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0867O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	11/30/2020	CDW	PRINCIPAL ENGINEER

DUKE ENERGY

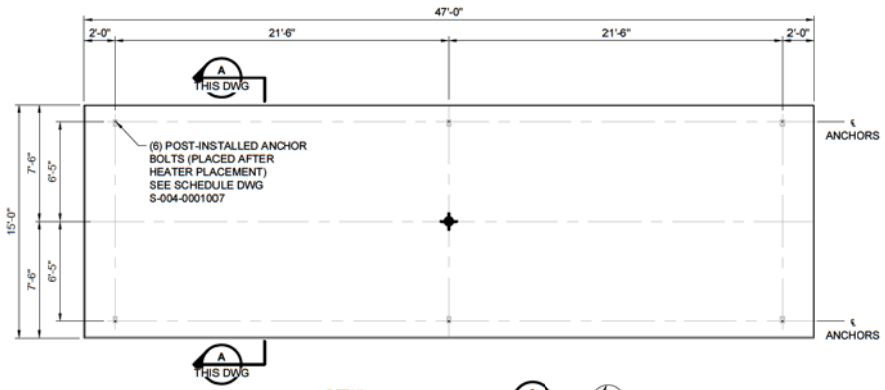
C350 PROJECT
HIGHPOINT PARK STATION
FOUNDATION DETAILS 2 OF 5

HAMILTON COUNTY, OHIO

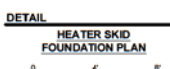
REF. DWG(S)

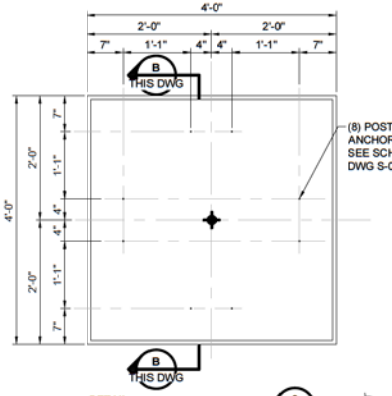
SHEET(S)	19 OF 66
DWG SCALE	VARIES
DWG DATE	08/21/2018
SUPERSEDED	—
DRAWING NUMBER	PNG -S-004-0001004
REVISION	1

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

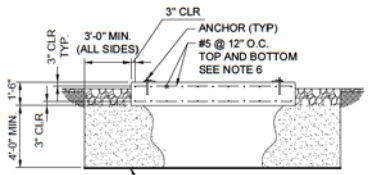


DETAIL 6 S-004-0001002
HEATER SKID FOUNDATION PLAN

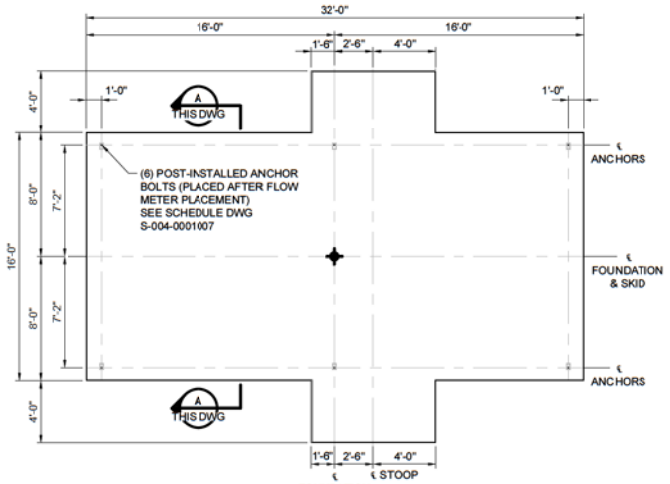




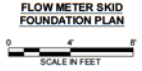
DETAIL 8 S-004-0001002
MODIFIED 9" ACCESS PLATFORM FOUNDATION PLAN

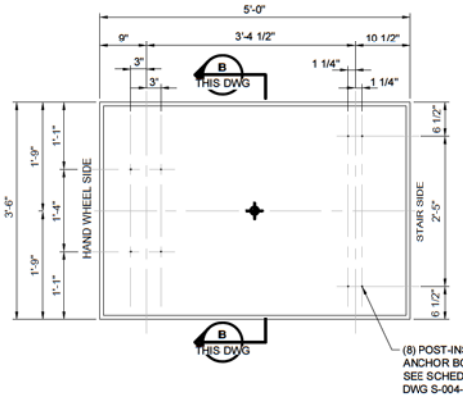


SECTION A
N.T.S.



DETAIL 7 S-004-0001002
FLOW METER SKID FOUNDATION PLAN

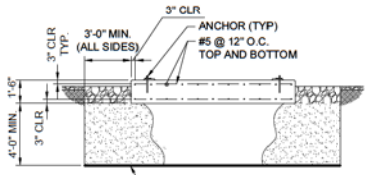




DETAIL 9 S-004-0001002
SINGLE WIDE ACCESS PLATFORM FOUNDATION PLAN

SOUTHERN PLATFORM

NORTHERN PLATFORM



SECTION B
N.T.S.

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60.
3. EXPOSED FOUNDATION EDGES SHALL HAVE 1" CHAMFER.
4. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED UNDER FOUNDATION. FILL SHOULD NOT BE PLACED ON A FROZEN SUBGRADE. SEE DWG PNG-S-004-0001000 FOR CLSM SPECIFICATIONS.
5. ✚ DENOTES REFERENCE COORDINATE LOCATION FROM FOUNDATION LOCATION PLAN.
6. LAP SPLICES ARE REQUIRED. SEE DWG PNG-S-004-0001000 FOR REQUIRED LAP SPLICE LENGTHS AND DETAILS.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW
1	11-30-2020	UPDATED CLSM CALLOUT	HEC	EAB	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0867O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	11/30/2020	CDW

DUKE ENERGY

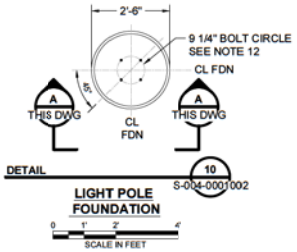
C350 PROJECT
HIGHPOINT PARK STATION
FOUNDATION DETAILS 3 OF 5

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 20 OF 66	DWG SCALE VARIES
DWG DATE 08/21/2018	SUPERSEDED —

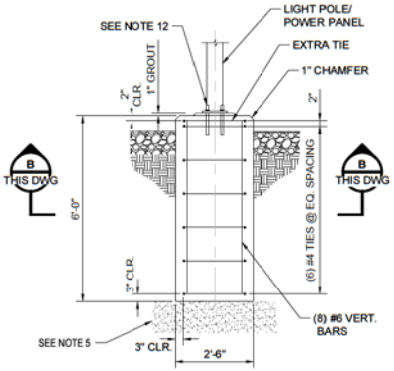
DRAWING NUMBER: PNG -S-004-0001005 — REVISION: 1
DISCIPLINE / RESOURCE CENTER / LINE NUMBER



DETAIL 10 S-004-0001002

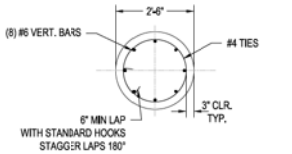
LIGHT POLE FOUNDATION

SCALE IN FEET



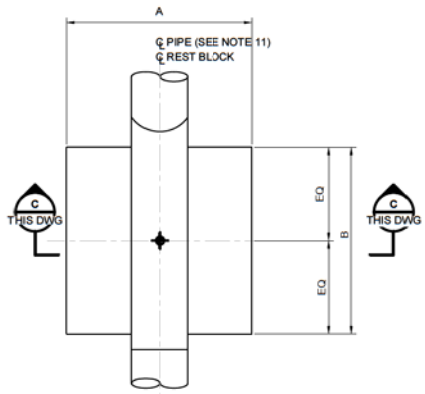
SECTION A

SCALE IN FEET



SECTION B

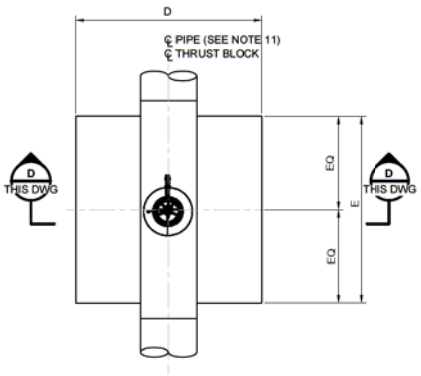
SCALE IN FEET



DETAIL 11 S-004-0001002

REST BLOCK FOUNDATION PLAN

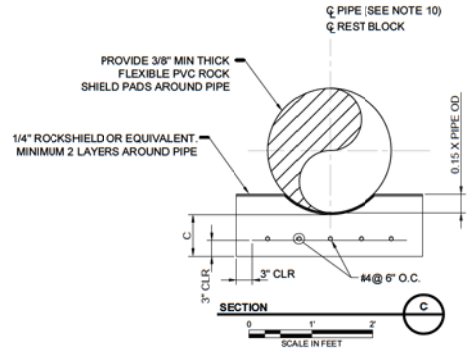
SCALE IN FEET



DETAIL 12 S-004-0001002

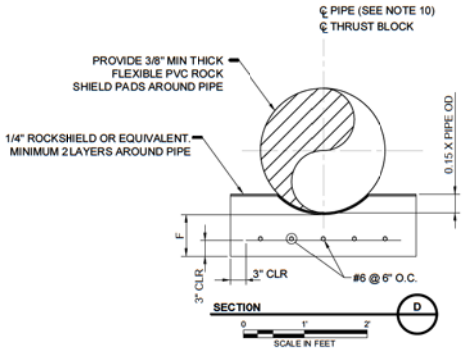
THRUST BLOCK FOUNDATION PLAN

SCALE IN FEET



SECTION C

SCALE IN FEET



SECTION D

SCALE IN FEET

REST BLOCK DIMENSIONS			
PIPE SIZE	A	B	C
6"	2'-0"	2'-0"	6"
16"	4'-0"	4'-0"	6"
20"	5'-6"	5'-6"	6"

THRUST BLOCK DIMENSIONS			
PIPE SIZE	D	E	F
20"	6'-0"	6'-0"	1'-0"
24"	7'-0"	7'-0"	1'-0"

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60.
3. EXPOSED FOUNDATION EDGES SHALL HAVE 1" CHAMFER.
4. ALL BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIP GALVANIZED PER ASTM A-153, UNLESS OTHERWISE NOTED.
5. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED UNDER FOUNDATION. FILL SHOULD NOT BE PLACED ON A FROZEN SUBGRADE. SEE DWG PNG-S-004-0001000 FOR CLSM SPECIFICATIONS.
6. ✦ DENOTES REFERENCE COORDINATE LOCATION FROM FOUNDATION LOCATION PLAN.
7. DEVIATIONS FROM THE DESIGN DRAWINGS SHALL NOT BE PERMITTED WITHOUT PRIOR APPROVAL FROM ENGINEER.
8. ALL REINFORCING AND ANCHOR BOLTS SHALL BE RIGIDLY SECURED PRIOR TO THE PLACING OF CONCRETE.
9. ALL GROUT SHALL BE NON-SHRINK, 2500 PSI MINIMUM. GROUT SHALL ONLY BE INSTALLED UNDERNEATH THE BASE PLATE, EXTENDING AT A 45 DEGREE ANGLE IN ALL DIRECTIONS.
10. INSTALL AND SIZE PIPE WRAP SUCH THAT IT EXTENDS 2 INCHES PAST THE EDGE OF FOUNDATION.
11. REFER TO MECHANICAL DRAWINGS FOR PIPE DIAMETER.
12. LIGHT POLE ANCHORS DESIGNED AND PROVIDED BY VENDOR. CONTRACTOR TO VERIFY ANCHOR PLACEMENT PRIOR TO POURING FOUNDATION.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 92217 — REGISTERED PROFESSIONAL ENGINEER

11/30/2020

PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW
1	11-30-2020	UPDATED CLSM CALLOUT	HEC	EAB	CDW

DESCRIPTION	
AREA CODE	
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0867O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	11/30/2020	CDW	PRINCIPAL ENGINEER

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
FOUNDATION DETAILS 4 OF 5

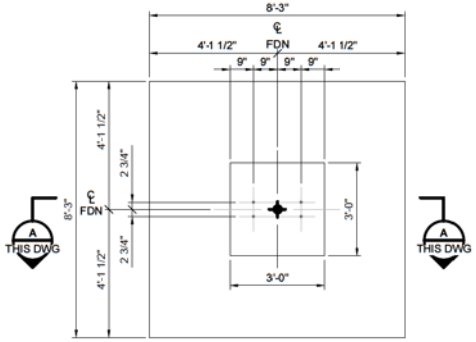
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 21 OF 66	DWG SCALE VARIES
DWG DATE 08/21/2018	SUPERSEDED —

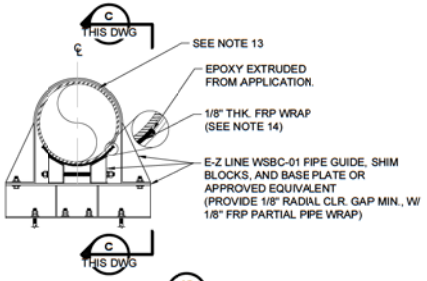
DRAWING NUMBER: PNG -S-004-0001006 — REVISION: 1

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

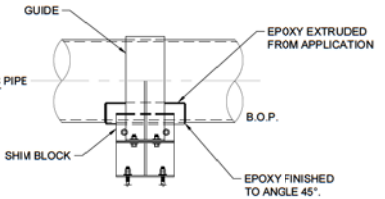


20" CLAMP SUPPORT

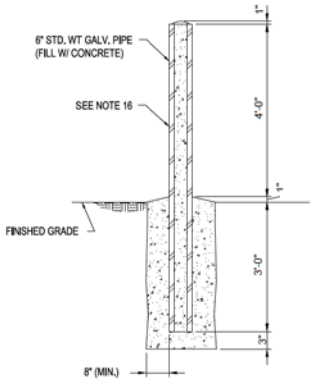
DETAIL 14 — N.T.S. — S-004-0001002



DETAIL 15 — N.T.S. — S-004-0001002

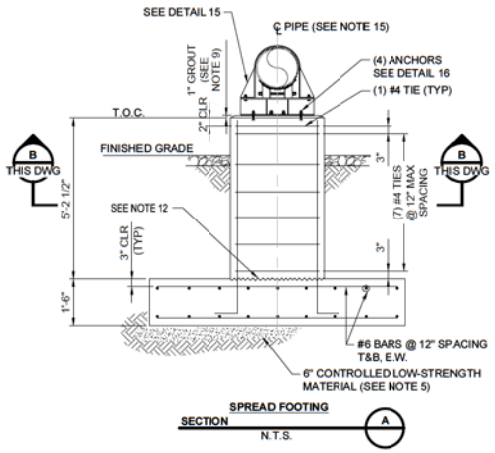


SECTION C — N.T.S.



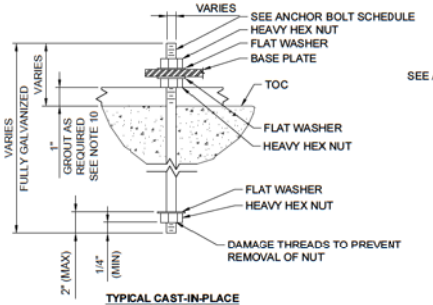
BOLLARD

DETAIL 13 — N.T.S. — S-004-0001002



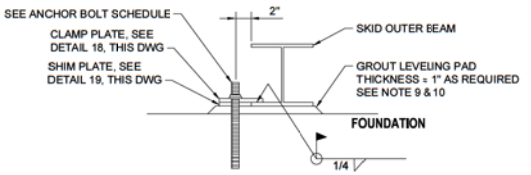
SPREAD FOOTING

SECTION A — N.T.S.



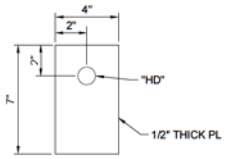
TYPICAL CAST-IN-PLACE ANCHOR BOLT

DETAIL 16 — N.T.S.



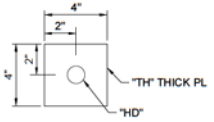
ANCHOR, SKID, GROUT, & CLAMP

DETAIL 17 — N.T.S.



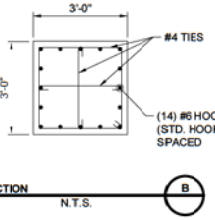
CLAMP PLATE

DETAIL 18



SHIM PLATE

DETAIL 19



SECTION B — N.T.S.

ANCHOR BOLT SCHEDULE

DETAIL	FOUNDATION	AB TYPE	DIA	LENGTH	PROJ	EMBEDMENT	"HD" HOLE DIAMETER	"TH" SHIM PL	NOTES
1	RTU/ODORIZER BUILDING	1 POST-INSTALL.	1/2"	0'-7"	3"	1 0'-4"	5/8"	7/16"	1 HILTI KWIK BOLT 3 HDG
2	PIG LAUNCHER	CAST-IN PLACE	1 1/2"	4'-6"	5"	4'-1"	1 5/8"	9/16"	F1554 GR 105
3	PRESSURE CONTROL SKID	CAST-IN PLACE	1 1/8"	1'-0"	4"	0'-8"	1 1/4"	5/8"	F1554 GR 55
6	HEATER	POST INSTALL	1/2"	0'-7"	4 1/2"	0'-2 1/2"	5/8"	7/16"	HILTI KWIK BOLT 3 HDG
7	FLOW METER	POST INSTALL	1/2"	0'-7"	4 1/2"	0'-2 1/2"	5/8"	7/16"	HILTI KWIK BOLT 3 HDG
4,9,5	DOUBLE WIDE, SINGLE WIDE & ACCESS PLATFORM W/ LADDER	POST INSTAL.	5/8"	0'-7"	4 1/2"	0'-2 1/2"	3/4"	-	HILTI KWIK BOLT 3 HDG
16	20" PIPE SUPPORT	CAST-IN PLACE	7/8"	1'-0"	4"	0'-8"	-	-	F1554 GR 55
8	MODIFIED 9" ACCESS PLATFORM	POST INSTAL.	1/2"	0'-7"	4 1/2"	0'-2 1/2"	9/16	-	HILTI KWIK BOLT 3 HDG

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500PSI AT 28 DAYS.
2. REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60.
3. EXPOSED FOUNDATION EDGES SHALL HAVE 1" CHAMFER.
4. ALL BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIP GALVANIZED PER ASTM A-153, UNLESS OTHERWISE NOTED.
5. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED UNDER FOUNDATION. FILL SHOULD NOT BE PLACED ON A FROZEN SUBGRADE (SEE DWG. PNG-S-004-0001000 FOR CLSM SPECIFICATION.
6. ✚ DENOTES REFERENCE COORDINATE LOCATION FROM FOUNDATION LOCATION PLAN.
7. DEVIATIONS FROM THE DESIGN DRAWINGS SHALL NOT BE PERMITTED WITHOUT PRIOR APPROVAL FROM ENGINEER.
8. ALL REINFORCING AND ANCHOR BOLTS SHALL BE RIGIDLY SECURED PRIOR TO THE PLACING OF CONCRETE.
9. ALL GROUT SHALL BE NON-SHRINK, 2500 PSI MINIMUM. GROUT SHALL ONLY BE INSTALLED UNDERNEATH THE BASE PLATE, EXTENDING AT A 45 DEGREE ANGLE IN ALL DIRECTIONS.
10. GROUT AVERAGE THICKNESS ADOPTED 1" TO ASSURE PROPER LEVELING AT BOTTOM OF STEEL BETWEEN PIERS. GROUT MAY NOT BE REQUIRED BY OWNER'S DECISION FOR PIERS BUILT WITH THEIR TOP OF CONCRETE HAVING MAXIMUM DEVIATION OF ± 1" STEEL ELEVATION, AND WITH A SURFACE PROPERLY FINISHED TO ALLOW THE SKID BEAMS TO REST ON ALL PIERS AFTER THE CLAMPS ARE INSTALLED.
11. CONTRACTOR TO VERIFY BASE PLATE SIZES AND BOLT HOLE SIZES & SPACING PRIOR TO CONSTRUCTING FOUNDATIONS.
12. ROUGHEN TO ±1/4" AMPLITUDE, CLEAN EXPOSED AGGREGATE PRIOR TO PEDESTAL POUR.
13. FIELD TO ENSURE THAT A MINIMUM 1/8" RADIAL CLEARANCE GAP IS MAINTAINED BETWEEN THE PIPE AND THE GUIDE.
14. INSTALL AND SIZE PIPE WRAP SUCH THAT IT EXTENDS 2 INCHES PAST THE EDGE OF FOUNDATION.
15. REFER TO MECHANICAL DRAWINGS FOR PIPE DIAMETER.
16. AFTER INSTALLATION PAINT BOLLARD WITH ALKYD GLOSS ENAMEL (40% SOLIDS BY VOLUME) "SAFETY" YELLOW AT 1.5 MILS DRY FILM THICKNESS.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHRISTOPHER D. WILSON — 82217 — REGISTERED PROFESSIONAL ENGINEER

11/30/2020
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	DJS	EAB	CDW
1	11-30-2020	REMOVED HOLD CLOUD & UPDATED ANCHOR BOLT SCHEDULE	HEC	EAB	CDW

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	DJS
STATION ID	S0867O1
CHECKER INITIALS	EAB

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR. TECH REC & STD
	11/30/2020	CDW	PRINCIPAL ENGINEER

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
FOUNDATION DETAILS 5 OF 5

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 22 OF 66	DWG SCALE VARIES
DWG DATE 08/21/2018	SUPERSEDED —

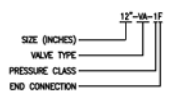
DRAWING NUMBER: PNG -S-004-0001007 — REVISION: 1

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

SYMBOLS AND LEGEND

FLOW TAG

VALVE IDENTIFICATION



VALVE TYPE DESIGNATION

VA	GATE VALVE
VB	BALL VALVE
VC	CHECK VALVE
VF	BUTTERFLY VALVE
VG	GLOBE VALVE
VI	GAUGE VALVE W/ BLEEDER AND PLUG
VN	NEEDLE VALVE
VP	PLUG VALVE
V3	3-WAY VALVE

PRESSURE CLASS DESIGNATION

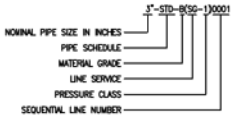
0	ATMOSPHERIC
U	CLASS 125
1	CLASS 150
3	CLASS 300
4	CLASS 400
6	CLASS 600
9	CLASS 900
15	CLASS 1500
20	2000 PSI CWP
30	3000 PSI CWP
60	6000 PSI CWP

NOTE:
SEE PROJECT PIPING MATERIAL SPECIFICATIONS FOR DESIGN PRESSURE AND MAOP FOR SPECIFIC PRESSURE CLASS.

END CONNECTION DESIGNATION

A	SOCKET WELD
B	SCREWED
C	BUTT WELD
E	FLAT FACED FLANGED
F	RAISED FACED FLANGED
G	BUTT WELD X RAISED FACED FLANGED
H	BUTT WELD X RING JOINT FLANGED
J	RING JOINT FLANGED

LINE NUMBER IDENTIFICATION



MATERIAL GRADE DESIGNATION

X65	API 5L X65
X60	API 5L X60
X52	API 5L X52
X42	API 5L X42
AL	ALUMINUM TUBING
B	API 5L GRADE B OR ASTM GRADE B
304L	ASTM A312 GRADE TP
PVC	ASTM D1785 POLYVINYL CHLORIDE
SS	ASTM 316 SS SEAMLESS ANNEALED TUBING

LINE SERVICE DESIGNATION

A	AIR
BG	PILOT GAS (BSD)
CA	COMBUSTION AIR
CO	CARBON DIOXIDE
D	DRAIN
DF	DIESEL FUEL
DW	DOMESTIC WATER
EA	ENGINE AIR
EG	PILOT GAS (ESD)
EX	EXHAUST
FA	FREE AIR
FG	FUEL GAS
FW	FIRE WATER
G	PROCESS GAS
GL	GYLCOL
HD	HYDROCARBON DRAIN
HO	HYDRAULIC OIL
HW	HEATED WATER
IA	INSTRUMENT AIR
IG	INSTRUMENT GAS
L	PROCESS LIQUID
LO	LUBE OIL
M	METHANOL
OW	OILY WATER
PG	POWER GAS
PW	POTABLE WATER
RW	RAW WATER
SG	STARTING GAS
SPG	SECONDARY POWER GAS
UA	UTILITY AIR
V	VENT
WW	WASTE WATER

ABBREVIATIONS

ACP	INST. AIR COMP. CONTROL PANEL
AOV	AIR OPERATED VALVE
AOY	AIR OPERATED SOLENOID
A/M	AUTOMATIC/MANUAL 2 POSITION SWITCH
BSW	BASIC SEDIMENT & WATER
CSC	CAR SEAL CLOSED
CSO	CAR SEAL OPEN
D	DRAIN
DS	DOWNSTREAM
ESD	STATION EMERGENCY SHUTDOWN
	CONTROL PANEL C = "CLOSE"
BSD	BUILDING EMERGENCY SHUTDOWN
	CONTROL PANEL O = "OPEN"
E/H	ELECTRO-HYDRAULIC ACTUATOR
EX	EXHAUST
FC	FAIL CLOSED
FLP	FAIL IN LAST POSITION
FO	FAIL OPEN
GOV	GAS OPERATED VALVE
GOY	GAS OPERATED SOLENOID
HOA	HAND-OFF-AUTO STATION
IAS	INSTRUMENT AIR SUPPLY
IGS	INSTRUMENT GAS SUPPLY
LC	LOCK CLOSED
LCB	LOCAL CONTROL BOARD
LHC	LOCKING HANDLE VALVE CLOSED
LHO	LOCKING HANDLE VALVE OPEN
LO	LOCK OPEN
MCC	MOTOR CONTROL CENTER
MOV	MOTOR OPERATED VALVE
PD	POSITIVE DISPLACEMENT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PP	PERSONNEL PROTECTION
RA	REVERSE ACTING
RCP	REGULATOR STATION CONTROL PANEL
RF	RAISED FACE
RTU	REMOTE TERMINAL UNIT
SCP	STATION CONTROL PANEL
SD	SHUTDOWN
SE	SCREWED END
SP	SET POINT
T/C	THERMOCOUPLE
TDR	TIME DELAY RELAY
UCP	COMPRESSOR CONTROL PANEL
US	UPSTREAM
V	VENT
WE	WELD END
PV	PRESSURE CONTROL VALVE
RO	RESTRICTION ORIFICE

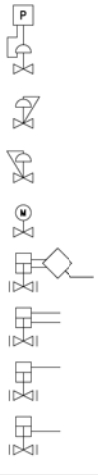
VALVES

NOTE: THE DEFAULT CONFIGURATION FOR VALVE SYMBOLS SHOWN IS WELDED/THREADED/OPEN. FOR FLANGED VALVES OR CLOSED VALVES SEE THE EXAMPLES SHOWN.

ACTUATED VALVES

NOTE: VALVE BODIES IN THIS SECTION ARE SHOWN AS SIMPLE GATE, ANGLE OR THREE WAY VALVES. THE ACTUATOR CAN BE SHOWN ON ANY TYPE OF VALVE.

ACTUATED VALVES



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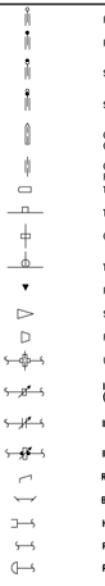
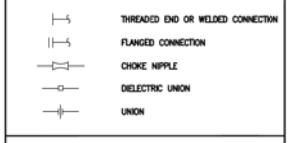
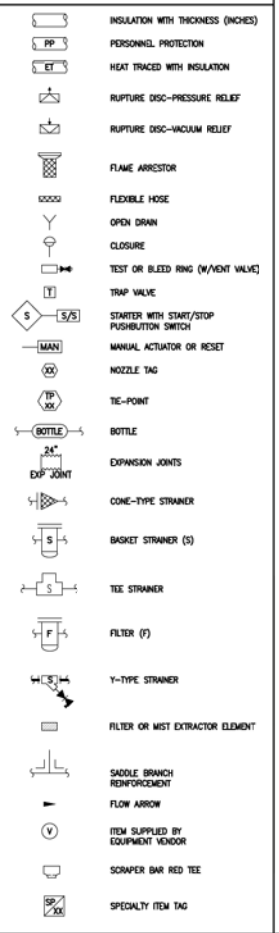


FITTINGS



MISCELLANEOUS



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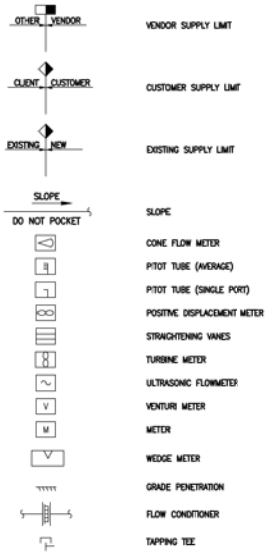


STATE OF OHIO
CHAD A. BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGINEER STAMP

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	CAB	PRINCIPAL ENGINEER

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
P&ID SYMBOLS AND LEGEND-1
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 23 OF 66	DWG SCALE NONE
DWG DATE 05/15/2018	SUPERSEDED

DRAWING NUMBER	REVISION
PNG -D-004-0001010	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

SYMBOLS AND LEGEND

PUMPS


CENTRIFUGAL


CENTRIFUGAL (SIDE VIEW)


POSITIVE DISPLACEMENT


DIAPHRAM

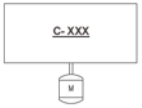

PMP41P LIQUID DRIVE


COMPRESSOR


VOLUME BOTTLE


PUMP


PUMP



RECIP. COMPRESSOR

EQUIPMENT

HORIZONTAL FILTER SEPARATOR

GENERIC EQUIPMENT

HORIZONTAL TANK

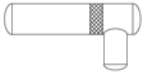
VERTICAL TANK (FLAT BOTTOM)

VERTICAL TANK (ROUNDED BOTTOM)

LAUNCHER/RECEIVER (CONCENTRIC)

LAUNCHER/RECEIVER (ECCENTRIC)


WELLHEAD


HORIZONTAL FILTER SEPARATOR


FILTER

BLOWDOWN SILENCER W/ RAIN HOOD

EQUIPMENT IDENTIFICATION

AC	GAS COOLER
C	COMPRESSOR
E	HEAT EXCHANGER
F	FILTER
FE	FLOW ELEMENT
G	FUEL GAS SCRUBBER
H	HEATER/REBOILER
I	LACT UNIT
L/R	LAUNCHER/RECEIVER
M	MOTOR
P	PUMP
SL	SILENCER
T	CONTACTOR/ACCUMULATOR
TK	TANK
V	VESSEL
W	WELL HEAD
SCP	STATION CONTROL PANEL

MISCELLANEOUS

FAN MOTOR


SATELLITE DISH


SUMP


BLOWER, CENTRIGAL

BLOWER, AXIAL


EXHAUST HOOD/DIFFUSER

AUTOMATIC DAMPER ARROW INDICATES DIRTECTION OF FLOW

RELIEF DAMPER ARROW INDICATES DIRTECTION OF FLOW

MOTORIZED (POSITIONING) DAMPER


FILTER

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS		
DATE	INITIALS	REGIONAL ENGINEER
DATE	INITIALS	MGR TECH REC & STD
DATE	INITIALS	PRINCIPAL ENGINEER
10/08/2020	CAB	

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
P&ID SYMBOLS AND LEGEND-2
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 24 OF 66	DWG SCALE NONE
DWG DATE 05/15/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG D-004-0001011	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

SYMBOLS AND LEGEND

INSTRUMENTATION IDENTIFICATION LETTERS
(USED INSIDE INSTRUMENT BALLOONS) (FROM ISA "TABLE 2")

FIRST LETTER	MEASURED OR INITIATING VARIABLE	CONTROLLING DEVICES: RECORDING	CONTROLLING DEVICES: INDICATING	CONTROLLING DEVICES: BLIND	CONTROLLING DEVICES: SELF-ACTUATED CONTROL VALVE	READOUT DEVICES: RECORDING	READOUT DEVICES: INDICATING	SWITCHES & ALARM DEVICES *: HIGH	SWITCHES & ALARM DEVICES *: LOW	SWITCHES & ALARM DEVICES *: COMBO	TRANSMITTERS: RECORDING	TRANSMITTERS: INDICATING	TRANSMITTERS: BLIND	DEVICES: SOLENOIDS, RELAYS & COMPUTING	PRIMARY ELEMENT	TEST POINT	WELL OR PROBE	VIEWING DEVICE GLASS	SAFETY DEVICE	FINAL ELEMENT
A	ANALYSIS	ARC	AIC	AC		AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW			AV
B	BURNER/COMBUSTION	BRC	BIC	BC		BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE		BW	BG		BZ
C	USER'S CHOICE																			
D	USER'S CHOICE																			
E	VOLTAGE	ERC	EIC	EC		ER	EI	ESH	ESL	ESHL	ERT	EIT	ET	EY	EE					EZ
F	FLOW RATE	FRC	FIC	FC	FCV	FR	FI	FSH	FSL	FSHL	FRT	FIT	FT	FY	FE	FP		FG		FV
FQ	FLOW QUANTITY	FQRC	FQIC			FQR	FQI	FQSH	FQSL			FQIT	FQT	FQY	FQE					FQV
FF	FLOW RATIO	FFRC	FFIC	FFC		FFR	FFI	FFSH	FFSL						FE					FFV
G	USER'S CHOICE																			
H	HAND		HIC	HC						HS										HV
I	CURRENT	IRC	IIC			IR	II	ISH	ISL	ISHL	IRT	IIT	IT	IY	IE					IZ
J	POWER	JRC	JIC			JR	JI	JSH	JSL	JSHL	JRT	JIT	JT	JY	JE					JV
K	TIME	KRC	KIC	KC	KCV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE					KV
L	LEVEL	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL	LRT	LIT	LT	LY	LE		LW	LG		LV
M	USER'S CHOICE																			
N	USER'S CHOICE																			
O	USER'S CHOICE																			
P	PRESSURE/VACUUM	PRC	PIC	PC	PCV	PR	PI	PSH	PSL	PSHL	PRT	PIT	PT	PY	PE	PP			PSV	PV
PD	PRESSURE, DIFFERENTIAL	PDRC	PDIC	PDC	PDCV	PDR	PDI	PDSH	PDSL		PDRT	PDIT	PDT	PDY	PE	PP				PDV
Q	QUANTITY	QRC	QIC			QR	QI	QSH	QSL	QSHL	QRT	QIT	QT	QY	QE					QZ
R	RADIATION	RRC	RIC	RC		RR	RI	RSH	RSL	RSHL	RRT	RIT	RT	RY	RE		RW			RZ
S	SPEED/FREQUENCY	SRC	SIC	SC	SCV	SR	SI	SSH	SSL	SSHL	SRT	SIT	ST	SY	SE					SV
T	TEMPERATURE	TRC	TIC	TC	TCV	TR	TI	TSH	TSL	TSHL	TRT	TIT	TT	TY	TE	TP	TW		TSE	TV
TD	TEMPERATURE, DIFFERENTIAL	TDRC	TDIC	TDC	TDCV	TDR	TDI	TDSH	TDSL		TDRT	TDIT	TDT	TDY	TE	TP	TW			TDV
U	MULTIVARIABLE					UR	UI							UY						UV
V	VIBRATION/MACHINERY ANALYSIS					VR	VI	VSH	VSL	VSHL	VRT	VIT	VT	VY	VE					VZ
W	WEIGHT/FORCE	WRC	WIC	WC	WCV	WR	WI	WSH	WSL	WSHL	WRT	WIT	WT	WY	WE					WZ
WD	WEIGHT/FORCE DIFFERENTIAL	WDRC	WDIC	WDC	WDCV	WDR	WDI	WDSH	WDSL		WDRT	WDIT	WDT	WDY	WE					WDZ
X	UNCLASSIFIED																			
Y	EVENT/STATE/PRESENCE		YIC	YC		YR	YI	YSH	YSL				YT	YY	YE					YZ
Z	POSITION/DIMENSION	ZRC	ZIC	ZC	ZCV	ZR	ZI	ZSH	ZSL	ZSHL	ZRT	ZIT	ZT	ZY	ZE					ZV
ZD	GAUGING/DEVIATION	ZDRC	ZDIC	ZDC	ZDCV	ZDR	ZDI	ZDSH	ZDSL		ZDRT	ZDIT	ZDT	ZDY	ZDE					ZDV

*NOTE: ADDITIONAL INSTRUMENT ABBREVIATIONS, IF REQUIRED, SHALL USE THIS TABLE AS A GUIDE.

"H", "L", "HH", OR "LL" SUFFIXED TO TAGS FOR SWITCHES AND RELATED DEVICES INDICATE ALARM OR SHUTDOWN AS FOLLOWS:

H = HIGH, L = LOW } ALARM

HH = HIGH HIGH, LL = LOW LOW } SHUTDOWN

ZSC = LIMIT SWITCH CLOSE
ZSO = LIMIT SWITCH OPEN
ZLO = SOLENOID VALVE OPEN
ZLC = SOLENOID VALVE CLOSE
IR = FIRE DETECTOR
RO = RESTRICTION ORIFICE
COE = GAS DETECTOR

INSTRUMENT BALLOONS

PLC I/O — AI=ANALOG INPUT AO=ANALOG OUTPUT DI=DIGITAL INPUT DO=DIGITAL OUTPUT

XXXX — LOCAL MOUNTED INSTRUMENT

REMOTE PANEL MOUNTED INSTRUMENT (FRONT OF PANEL) (PRIMARY)

LOCAL PANEL MOUNTED INSTRUMENT (FRONT OF PANEL) (AUXILIARY)

REMOTE PANEL MOUNTED INSTRUMENT (REAR OF PANEL) (PRIMARY)

LOCAL PANEL MOUNTED INSTRUMENT (REAR OF PANEL) (AUXILIARY)

INSTRUMENT FOR TWO MEASURED VARIABLES OR FUNCTIONS (COMMON ENCLOSURE)

PNEUMATIC SUPPLY TO INSTRUMENT

ELECTRICAL SUPPLY TO INSTRUMENT

STATION RTU CONTROL SYSTEM INSTRUMENT WITH COMMON (SHARED) DISPLAY (CRT)

LOCAL PANEL MOUNTED INSTRUMENT WITH COMMON (SHARED) DISPLAY (CRT)

XXXX — STATION PLC FUNCTION OR STATION ESD (PROGRAMMABLE LOGIC CONTROLLER)

XXXX — LOCAL PLC FUNCTION OR UNIT CONTROL PANEL

ESD — EMERGENCY SHUTDOWN (HARDWIRED)

EBD — EMERGENCY BLOWDOWN (HARDWIRED)

MCC — MOTOR CONTROL CENTER

VFD — VARIABLE FEQUENCY DRIVE

MISCELLANEOUS

MISCELLANEOUS

RELAY FUNCTION DESIGNATIONS
(ADJACENT TO INSTRUMENT BALLOON)

- F — CHARACTERIZE
- Σ — SUMMING
- √ — SQUARE ROOT
- ∫ — TOTALIZE
- > — HIGH SIGNAL SELECT
- < — LOW SIGNAL SELECT
- CURRENT REPEATER
- CURRENT TO PRESSURE TRANSDUCER
- PNEUMATIC TO CURRENT TRANSDUCER
- RESISTANCE TO CURRENT CONVERTER
- VOLTAGE TO ELECTROMAGNETIC
- VOLTAGE TO CURRENT

EXAMPLE LOCAL DISPLAY TOTALIZER: XX XXX Σ

LINE SYMBOLS

- CAPILLARY TUBING
- COMPUTER CONNECTION
- ELECTRICAL LEAD
- FIBER OPTIC/ELECTROMAGNETIC SIGNAL
- HYDRAULIC LINE
- SIGNAL PNEUMATIC LINE
- SKID LIMITS

LOGIC

- I — GENERALIZED FOR UNDEFINED OR COMPLEX INTERLOCK LOGIC
- AND — INTERLOCK IS EFFECTIVE ONLY IF ALL INPUTS EXIST
- OR — INTERLOCK IS EFFECTIVE IF ANY ONE OR MORE INPUTS EXIST
- P — PURGE LINE – AIR, GAS, LIQUID
- UNDEFINED CONTROL LOGIC (USUALLY HIGH PRESSURE GAS OR GAS/HYD. VALVE ACTUATORS)

MISCELLANEOUS

- G — RUNNING LIGHT ON (GREEN)
- R — RUNNING LIGHT OFF (RED)
- A — RUNNING LIGHT READY (AMBER)
- S — S/S — STARTER WITH START/STOP PUSHBUTTON SWITCH

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHAD A BACON — PE.85638 — REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	CAB	PRINCIPAL ENGINEER

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
P&ID SYMBOLS AND LEGEND-3
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 25 OF 66 | DWG SCALE NONE
DWG DATE 05/15/2018 | SUPERSEDED
DRAWING NUMBER: PNG -D-004-0001012 | REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER

HIGHPOINT PARK STATION

INLET OPERATING PRESSURE RANGE:	460-670 PSIG
OPERATING TEMPERATURE RANGE:	40-80° F

C350 FLOW METER (FM-101)

DESIGN FLOW:	9,500 MCFH
DESIGN MAOP:	1000 PSIG
OPERATING PRESSURE:	460-670 PSIG
DESIGN FACTOR	0.4

C350 HEATER (HTR-102)

DESIGN FLOW	9,500 MCFH
INLET PRESSURE:	460-670 PSIG
MINIMUM INLET TEMPERATURE:	40° F
HEATER OUTLET TEMPERATURE:	60° F
OPERATING BATH TEMPERATURE:	180° F
PROCESS DUTY:	2.4 MMBTU/HR

C350 CONTROL VALVES (CV-103/104)

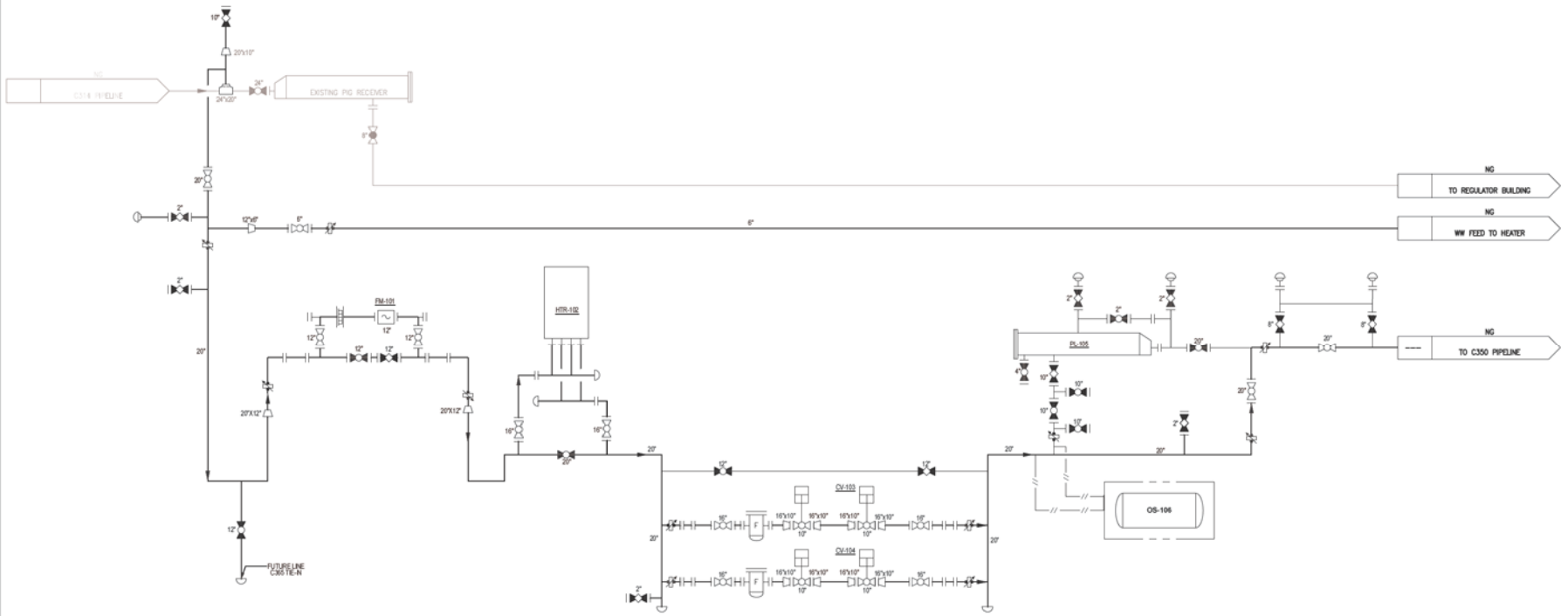
INLET CONDITIONS:	
MIN / MAX PRESSURE:	460-670 PSIG
MIN / MAX FLOW RATE:	500-9500 MCFH (EACH)
2 X 100% CAPACITY RUNS	
DESIGN PRESSURE	1000 PSIG
DESIGN FACTOR:	0.4
OUTLET CONDITIONS:	
SET PRESSURE:	400 PSIG
DESIGN PRESSURE:	500 PSIG
DESIGN FACTOR:	0.2

C350 PIG LAUNCHER (PL-105)

ANSI CLASS 600	
DESIGN PRESSURE:	500 PSIG
DESIGN FACTOR:	0.2

ODORIZER INJECTION SYSTEM(OS-106)

YZ SYSTEMS	
NJEX 8300/7300	
DUAL INJECTION SYSTEM	
MAXIMUM OUTPUT:	68 GAL / DAY
MAOP: 1440 PSIG	
POWER SUPPLY:	120V, 60 HZ AC
30 DAY BATTERY RESERVE	



C350

DESIGN INFORMATION

1000 PSIG	DESIGN PRESSURE				
1000 PSIG	MAXIMUM ALLOWABLE OPERATING PRESSURE				
670 PSIG	MAXIMUM ACTUAL WORKING PRESSURE OF MAIN				
460 PSIG	MIN EXPECTED OPERATING PRESSURE OF MAIN				
500 PSIG	DOWNSTREAM MAOP				
400 PSIG	REQUIRED DELIVERY PRESSURE				
226 MMSCFD	ANTIOPATED LOAD				
-	RATE SCHEDULE				
METER:		CFH CAPACITY @			PSIG INLET
FIRST CUT REGULATOR:					
34,750,000	CFH CAPACITY @	670	INLET	400	OUTLET
20,050,000	CFH CAPACITY @	460	INLET	400	OUTLET
MONITOR PILOT SET PRESSURE:					
AUTOMATIC SHUT-OFF SETTING:					
FIRST CUT RELIEF SET PRESSURE:					
RELIEF:		CFH CAPACITY @			PSIG INLET
SECOND CUT REGULATOR:					
	CFH CAPACITY @		INLET		OUTLET
	CFH CAPACITY @		INLET		OUTLET
AUTOMATIC SHUT-OFF SETTING:					
SECOND CUT RELIEF SET PRESSURE:					
RELIEF:		CFH Capacity @			PSIG INLET

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STATE LICENSE # COA.01557

CHAD A BACON PE.85638 REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

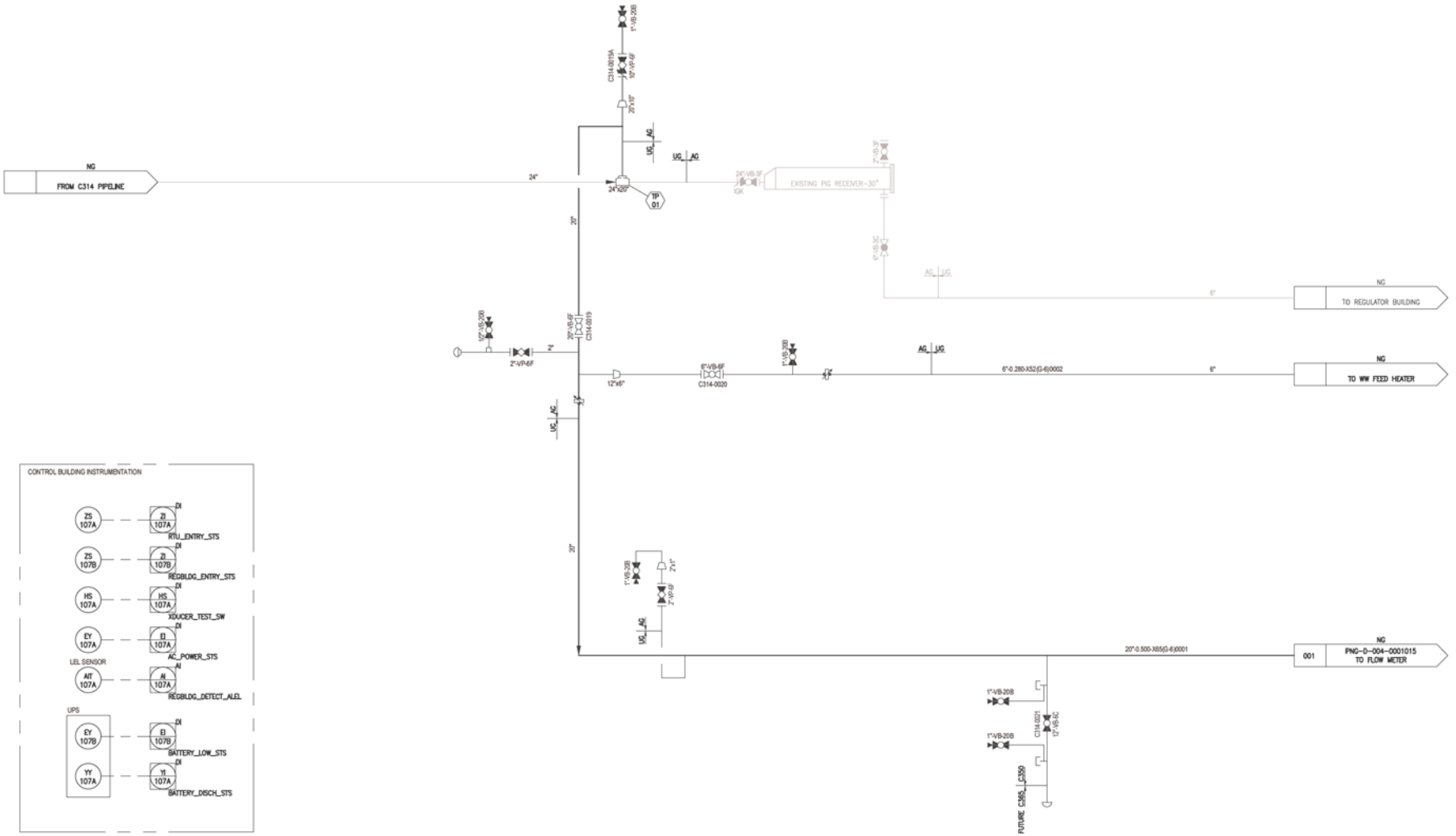
DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
PROCESS FLOW DIAGRAM

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 26 OF 66	DWG SCALE NONE
DWG DATE 06/20/2019	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -D-004-0001013	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



NOTES:

1. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS
2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

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0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
STATION INLET P&ID

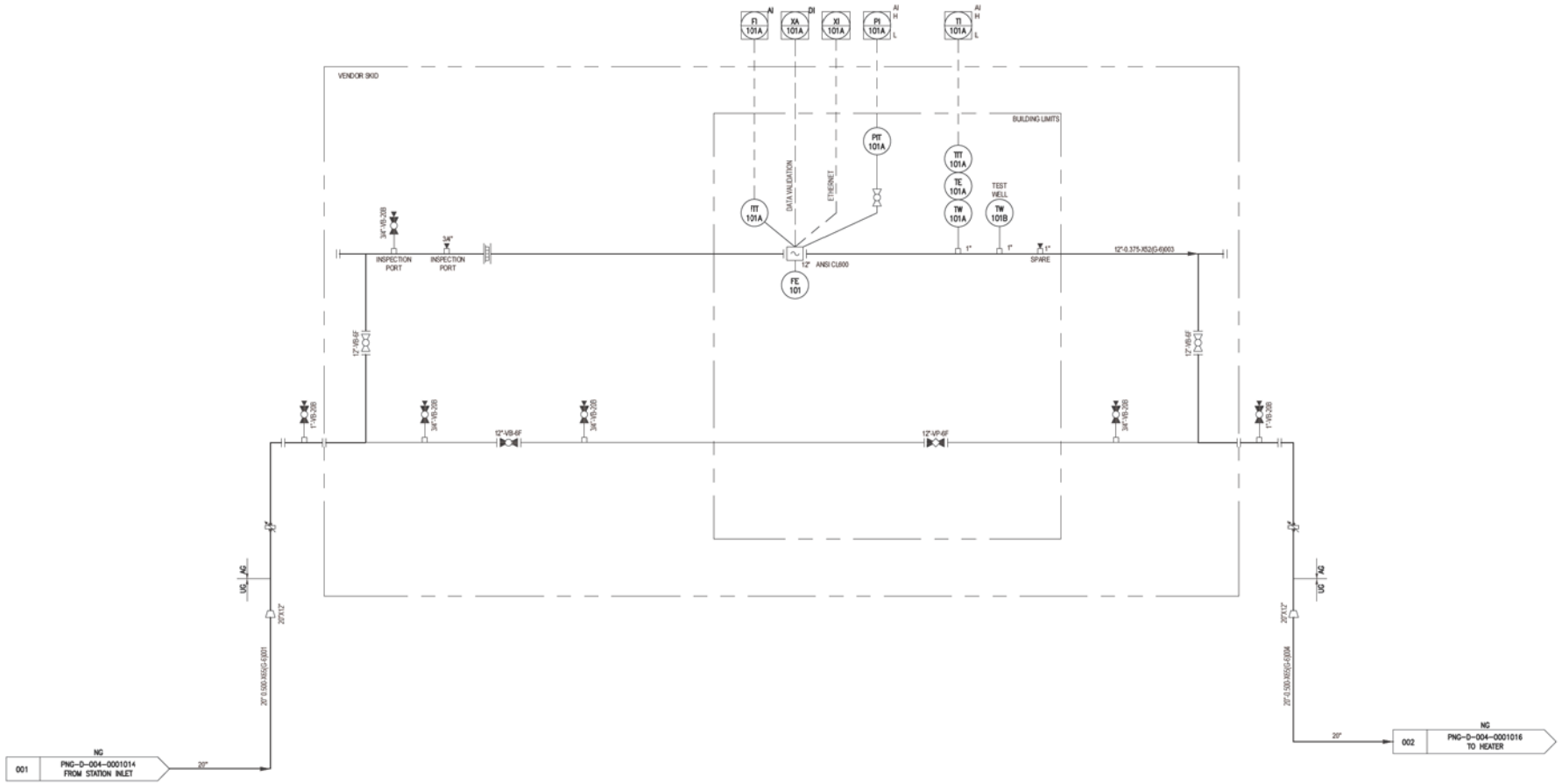
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 27 OF 66	DWG SCALE NONE
DWG DATE 05/14/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -D-004-0001014	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

FLOW METER (FM-101)

DESIGN FLOW:	9,500 MCFH
DESIGN MAOP:	1000 PSIG
OPERATING PRESSURE:	460-670 PSIG
DESIGN FACTOR:	0.4



NOTES:

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2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.

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ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
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PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

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AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
FLOW METER P&ID

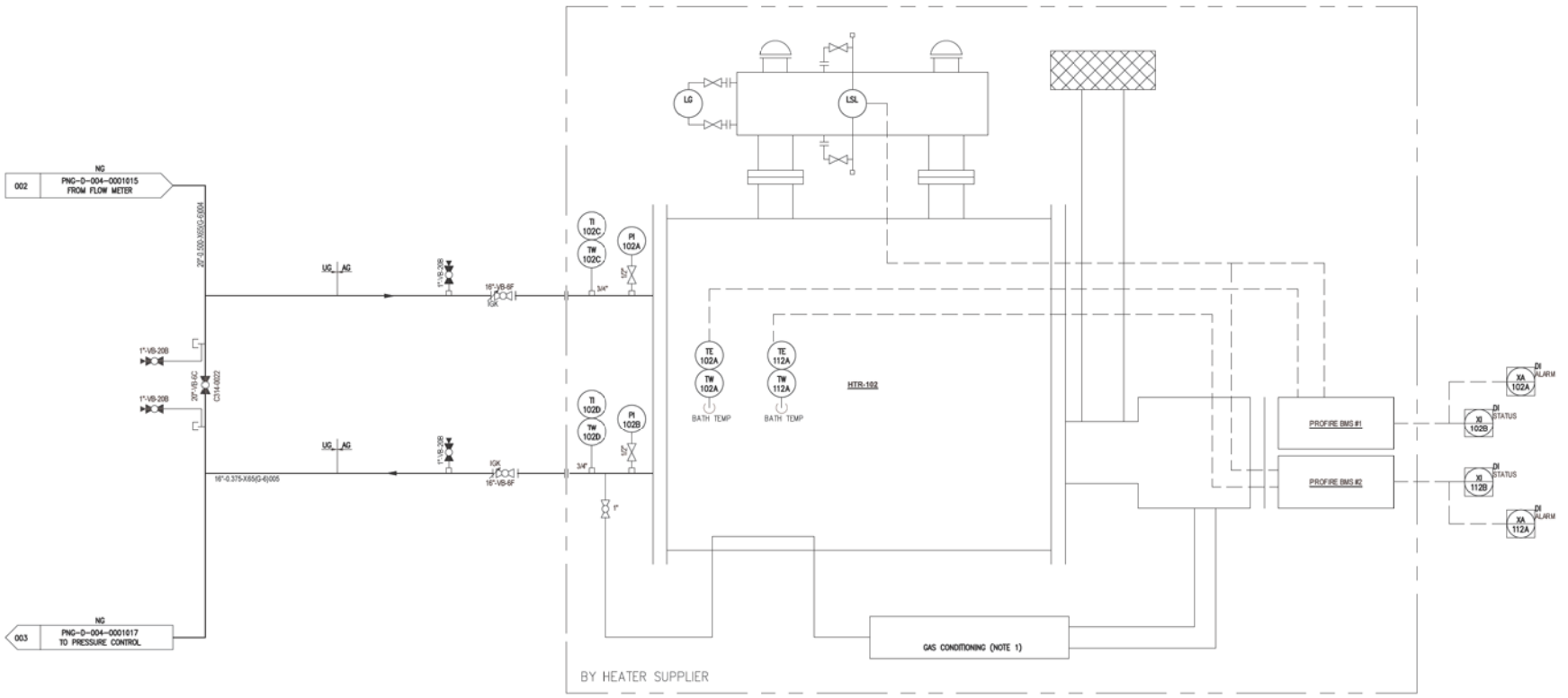
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 28 OF 66	DWG SCALE NONE
DWG DATE 05/14/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -D-004-0001015	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

HEATER (HTR-102)

DESIGN FLOW:	9,500 MCFH
INLET PRESSURE:	460-670 PSIG
MINIMUM INLET TEMPERATURE:	40° F
HEATER OUTLET TEMPERATURE:	60° F
OPERATING BATH TEMPERATURE:	180° F
PROCESS DUTY:	2.4 MMBTU/HR



NOTES:

1. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS REGARDING THE HEATER PIPING, INSTRUMENTATION AND CONTROLS.
2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
HEATER P&ID

HAMILTON COUNTY, OHIO

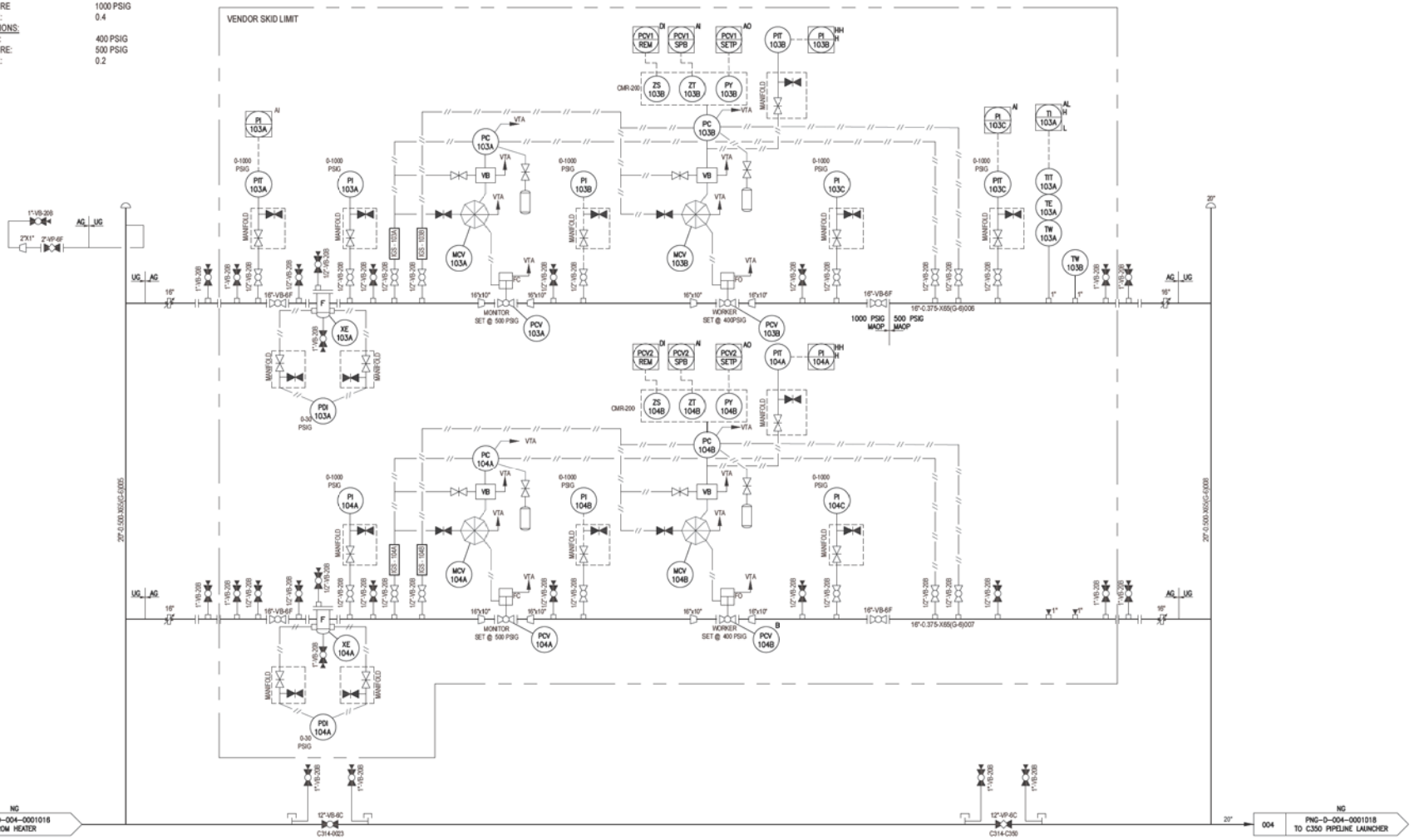
REF. DWG(S)

SHEET(S)	29 OF 66
DWG SCALE	NONE
DWG DATE	05/14/2018
SUPERSEDED	
DRAWING NUMBER	PNG -D-004-0001016
REVISION	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

CONTROL VALVES (CV-103/104)

INLET CONDITIONS:
MIN / MAX PRESSURE: 460-670 PSIG
MIN / MAX FLOW RATE: 500-9500 MCFH (EACH)
2 X 100% CAPACITY RUNS
DESIGN PRESSURE 1000 PSIG
DESIGN FACTOR: 0.4
OUTLET CONDITIONS:
SET PRESSURE: 400 PSIG
DESIGN PRESSURE: 500 PSIG
DESIGN FACTOR: 0.2



NOTES:
1. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAIL.
2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.

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STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS			
DATE	INITIALS		
		REGIONAL ENGINEER	
DATE	INITIALS		
		MGR TECH REC & STD	
DATE	INITIALS		
10/08/2020	CAB	PRINCIPAL ENGINEER	

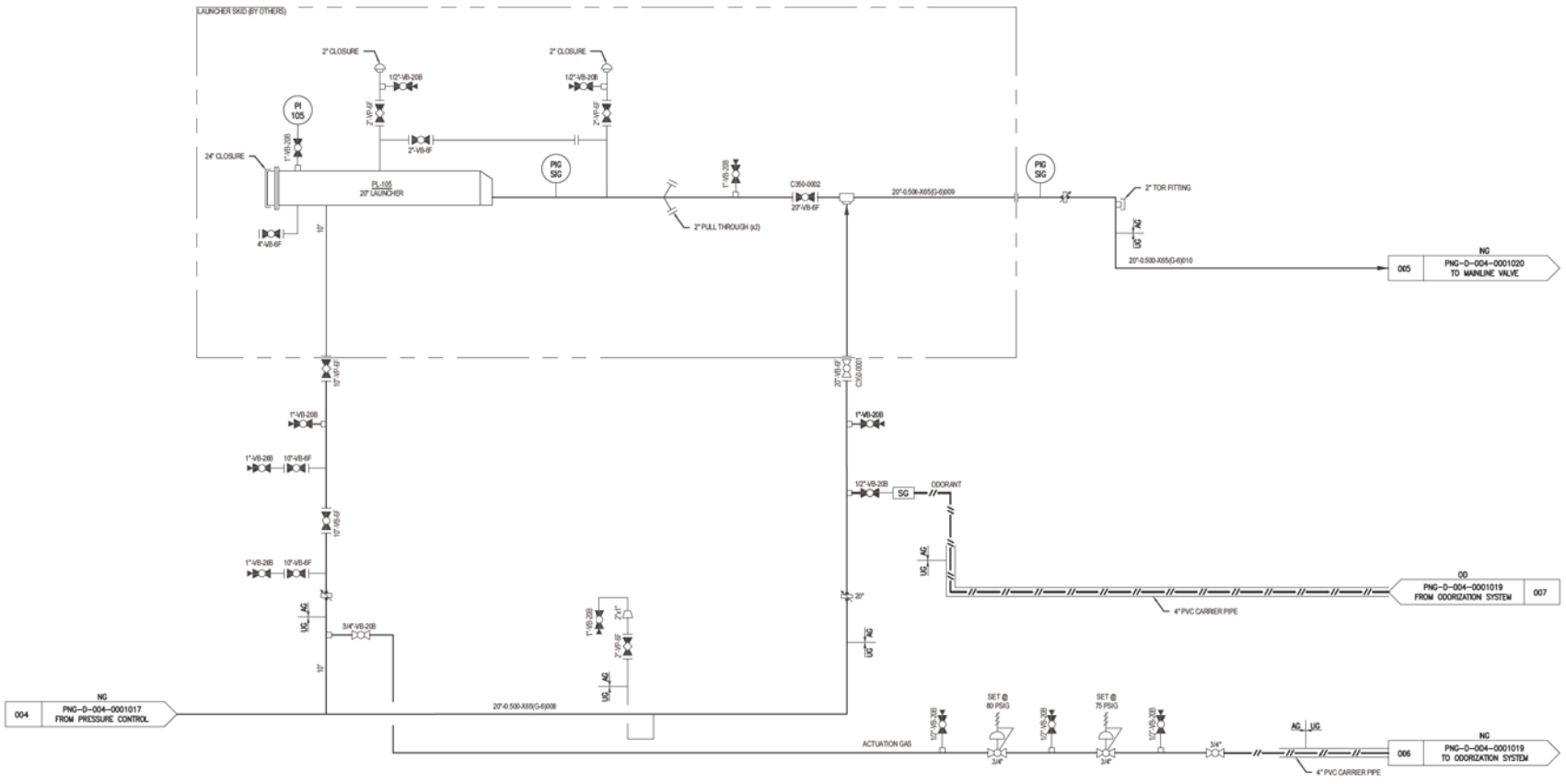
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
PRESSURE CONTROL P&ID
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 30 OF 66	DWG SCALE NONE
DWG DATE 05/14/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG D-004-0001017	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

PIG LAUNCHER (PL-105)
ANSI CLASS 600
DESIGN PRESSURE: 500 PSIG
DESIGN FACTOR: 0.2



NOTES:

1. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
CHAD A BACON
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REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

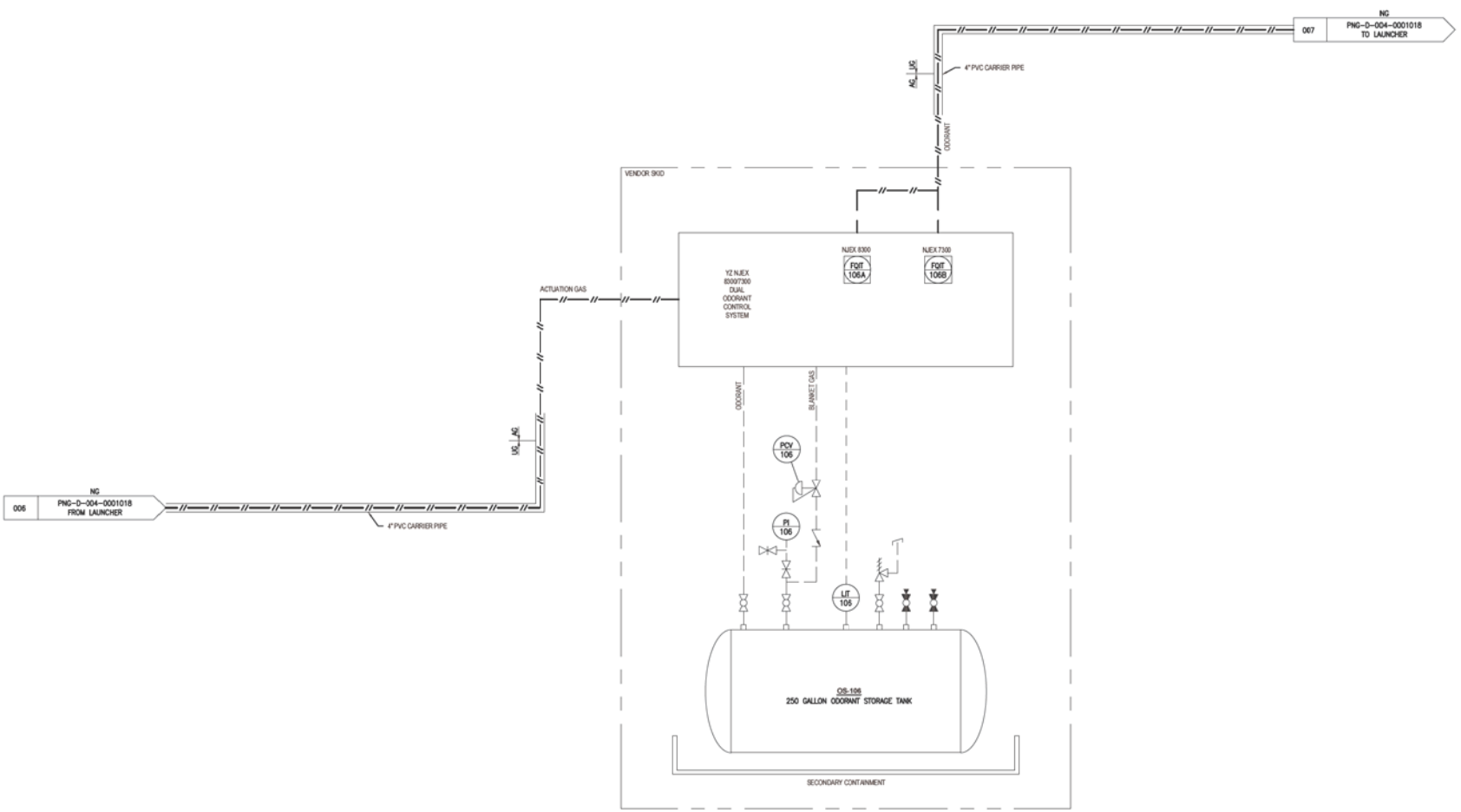
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
PIPELINE LAUNCHER P&ID

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 31 OF 66	DWG SCALE NONE
DWG DATE 05/14/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -D-004-0001018	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



OS-106
ODORIZER INJECTION SYSTEM
YZ SYSTEMS
NJEX 8300/7300
DUAL INJECTION SYSTEM
MAXIMUM OUTPUT: 68 GAL/DAY
MAOP: 1440 PSIG
POWER SUPPLY: 120V, 60HZ AC
30 DAY BATTERY RESERVE

NOTES:

1. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAIL
2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
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STATE OF OHIO
CHAD A BACON
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STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS			
DATE	INITIALS		REGIONAL ENGINEER
			MGR TECH REC & STD
DATE	INITIALS		PRINCIPAL ENGINEER
10/08/2020	CAB		

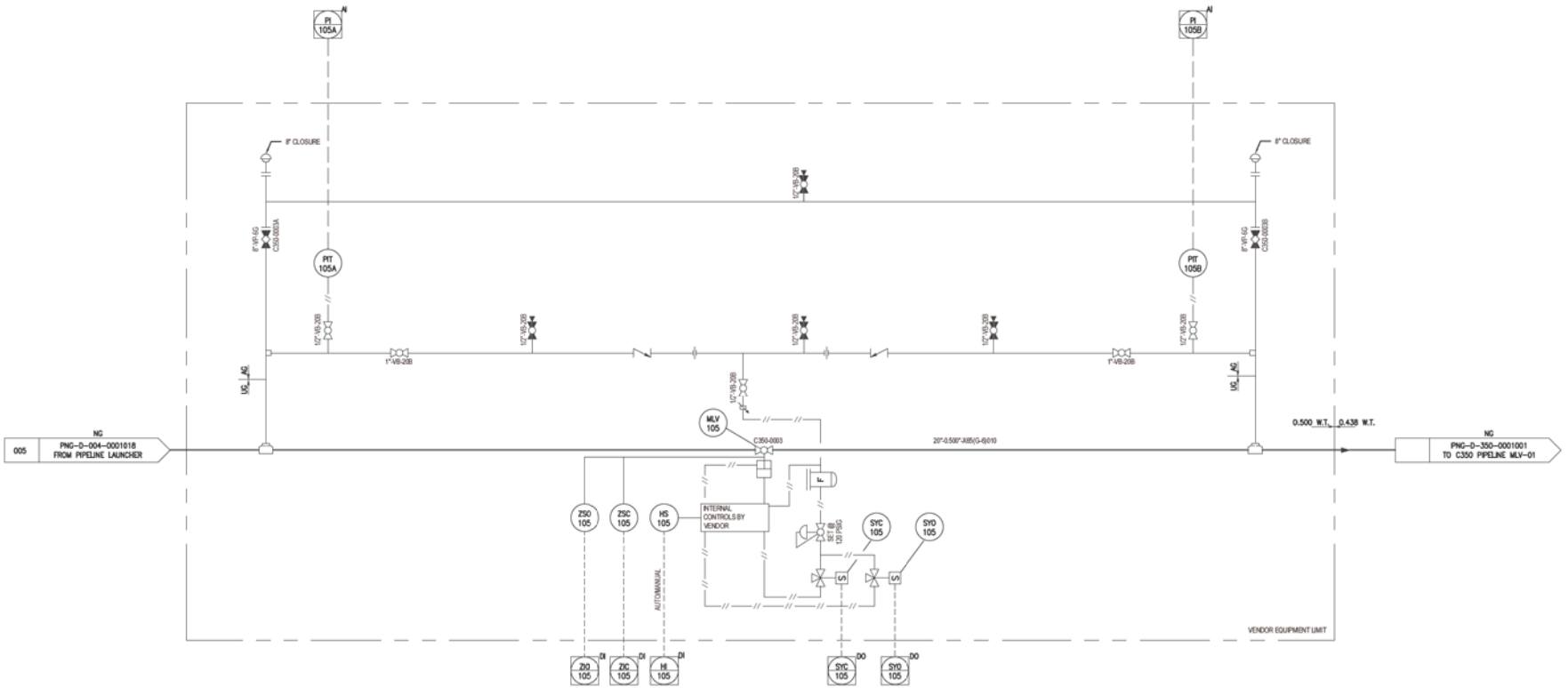
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
ODORIZATION P&ID

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 32 OF 66	DWG SCALE NONE
DWG DATE 05/14/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -D-004-0001019	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



NOTES:

1. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAIL.
2. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
CHAD A BACON
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REGISTERED
PROFESSIONAL ENGINEER
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0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS		
DATE	INITIALS	REGIONAL ENGINEER
DATE	INITIALS	MGR TECH REC & STD
DATE	INITIALS	PRINCIPAL ENGINEER
10/08/2020	CAB	

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
MAINLINE VALVE P&ID

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 33 OF 66	DWG SCALE NONE
DWG DATE 05/14/2018	SUPERSEDED

DRAWING NUMBER	REVISION
PNG -D-004-0001020	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

PIPE CLEANING:

1. THOROUGHLY CLEAN INTERIOR OF ALL PIPE, FITTINGS, AND JOINTS BEFORE INSTALLATION. EXCLUDE ENTRANCE OF FOREIGN MATTER DURING DISCONTINUANCE OF INSTALLATION BY CAPPING OR PLUGGING TO A WATERTIGHT CONDITION AT THE END OF EACH WORK DAY. PRIOR TO FINAL FITTING OF THE SYSTEM, VISUALLY INSPECT ALL LINES AND JOINTS, REMOVE ALL STRUTS, SWEEP AND/OR FLUSH CLEAN TO THE SATISFACTION OF DUKE ENERGY. NOTIFY DUKE ENERGY AT LEAST 24 HOURS IN ADVANCE OF INTENDED CLOSING UP OF A SYSTEM.

2. CONTRACTOR IS RESPONSIBLE FOR PROPERLY CLEANING NEW PIPE TO BE INSTALLED BEFORE RELEASING IT FOR SERVICE. CONTRACTOR SHALL PROVIDE PROCEDURES FOR CLEANING PIPE FOR APPROVAL BY DUKE ENERGY.

PRESSURE AND LEAK TESTING:

1. ALL PIPE SHALL BE PRESSURE TESTED IN ACCORDANCE WITH ASME B31.8 AND CFR 192 AT A PRESSURE DESIGNATED ON THE DRAWINGS. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND MATERIALS ASSOCIATED WITH PRESSURE TESTING. SHOULD SURFACE LEAKS BECOME APPARENT, THE LEAKS SHALL BE LOCATED AND REPAIRED, AND THE LINE RE-TESTED UNTIL IT FULFILLS THE ABOVE REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPAIRS AND RE-TESTING. CONTRACTOR SHALL PROVIDE NOTIFICATIONS TO DUKE ENERGY 48 HOURS PRIOR TO TESTING FOR WITNESS.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, TOOLS, EQUIPMENT, AND PERSONNEL NECESSARY TO CONDUCT THE PRESSURE TEST INCLUDING BUT NOT LIMITED TO AIR COMPRESSOR, TEST MANIFOLDS, DEAD WEIGHT, AND CERTIFIED GAUGES.

3. THE CONTRACTOR IS RESPONSIBLE TO PERFORM INITIAL SERVICE LEAK TESTS IN ACCORDANCE WITH THE REQUIREMENTS OF ASME B31.8

4. A SEALED CERTIFIED TEST RECORD SHALL BE PROVIDED TO DUKE ENERGY WITHIN 30 DAYS OF COMPLETION OF THE TEST. TEST RECORDS SHALL INCLUDE ALL EQUIPMENT CERTIFICATIONS AND PRESSURE AND TEMPERATURE RECORDING CHARTS. DRAFT COPY OF TEST RECORDS SHALL BE PROVIDED TO DUKE ENERGY THE DAY OF THE TEST.

5. CONTRACTOR SHALL ALLOW THE TEST PRESSURE TO REACH EQUILIBRIUM WITH TEMPERATURE, PRIOR TO STARTING THE TEST.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR DE-PRESSURIZATION OF THE TEST MEDIUM TO THE ENVIRONMENT IN A SAFE AND REASONABLE MANNER.

7. TEST PRESSURES SHALL BE 1.5 TIMES DESIGN PRESSURE.

8. ALL PIPING SHALL BE TESTED FOR 8.5 HOURS MINIMUM.

MATERIAL NOTES:

1. MATERIAL LIST SHALL BE CONSIDERED AN ESTIMATE. DUKE ENERGY WILL PROVIDE THE MATERIALS IN THE MATERIALS LIST. CONTRACTOR TO PROVIDE ANY REMAINING MATERIALS NECESSARY TO COMPLETE THE PROJECT.

STEEL PIPE, FITTING, AND VALVE NOTES:

1. ALL STEEL PIPE, FITTINGS, VALVES, AND EQUIPMENT SHALL BE INSTALLED ACCORDING TO ASME B31.8 LATEST EDITION, MANUFACTURER'S RECOMMENDATIONS, AND CONSTRUCTION DRAWINGS.

STEEL PIPE, FITTING, AND VALVE NOTES (CONTINUED):

2. CONTRACTOR TO PROVIDE EXTRA HARDWARE, BEYOND WHAT IS SPECIFIED IN THE BILL OF MATERIALS, AS NECESSARY TO COMPLETE THE CONSTRUCTION AND TESTING OF THE FACILITIES INCLUDING GASKETS, NUTS, AND BOLTS. ONLY NEW GASKETS AND BOLTS SHALL BE USED WHEN CONNECTING FLANGES.

3. FIELD VERIFY ALL DIMENSIONS.

WELDING AND NON-DESTRUCTIVE EXAMINATION:

1. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, TOOLS AND EQUIPMENT REQUIRED FOR SURFACE PREPARATION AND WELDING.

2. WELDING PROCEDURES SPECIFIC TO PROJECT SHALL BE PROVIDED TO ENGINEER AND DUKE ENERGY BY THE CONTRACTOR FOR APPROVAL. WELDING PROCEDURE TO BE QUALIFIED PER API 1104.

3. ALL CONTRACTOR WELDERS MUST HAVE THE APPROPRIATE QUALIFICATION RECORDS TO BE SUBMITTED TO DUKE ENERGY FOR REVIEW PRIOR TO WELDING. DUKE ENERGY INSPECTOR RESERVES THE RIGHT TO WITNESS ANY NEW WELDER QUALIFICATIONS.

4. CONTRACTOR IS RESPONSIBLE FOR COST FOR TESTING AND QUALIFICATION OF WELDERS INCLUDING MATERIALS AND NDE.

5. DUKE ENERGY SHALL HIRE A 3RD PARTY X-RAY COMPANY TO X-RAY 100% OF ALL THE BUTT WELDS. CONTRACTOR TO COORDINATE SCHEDULING WITH X-RAY COMPANY.

6. ALL WELDS SHALL BE EXAMINED PER API 1104.

PAINTING NOTES:

1. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, PAINTS, TOOLS AND EQUIPMENT REQUIRED FOR PAINTING.

2. ALL STEEL SHALL BE THOROUGHLY WIPED DOWN TO REMOVE ALL TRACES OF GRIT OR OTHER CONTAMINANTS. REMOVE ALL WELD SPLATTER AND GRIND SMOOTH THE BURRS ON ANY CUT EDGES AND ROUGH WELDS. SURFACES TO BE PAINTED SHALL BE PRIMED BEFORE ANY RUSTING CAN OCCUR AND, IN ANY CASE, WITHIN 8 HOURS OF COMPLETION OF SURFACE PREPARATION AND UNDER CONTROLLED TEMPERATURE AND HUMIDITY. IF IT CANNOT BE PRIMED WITHIN THE 8-HOUR PERIOD, THEN ANY RUST BLOOM SHALL BE REMOVED BEFORE PAINT APPLICATION BY SUITABLE HAND OR POWER TOOL.

3. THE PIPING AND PIPING COMPONENT PAINTING SHALL BE INSPECTED AND REPAIRED ACCORDINGLY AFTER INSTALLATION.

4. THE FOLLOWING THREE-COAT PAINT SYSTEM SHALL BE USED. ALL COATS SHALL BE APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATION. ABRASIVE BLAST TO SSPC SP-10 WITH A NOMINAL PROFILE OF 2 MILS. FINAL COAT APPLIED WITHIN 30 DAYS OF PRIMER COAT IF EXPOSED TO SUNLIGHT.

   a. COAT NO. 1 - SHERWIN WILLIAMS FAST CLAD HS REINFORCED ZINC 2-PART EPOXY PRIMER-MINIMUM 5 MILS
   b. COAT NO. 2 - SHERWIN WILLIAM MACROPOXY 6462-PART MARINE EPOXY-5MILS
   c. COAT NO. 3 - SHERMAN WILLIAMS ACROLON ULTRA HIGH PERFORMANCE MARINE POLYURETHANE UV ADDITIVE-5 MILS

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS			
DATE	INITIALS		REGIONAL ENGINEER
DATE	INITIALS		MGR TECH REC & STD
10/08/2020	CAB		PRINCIPAL ENGINEER

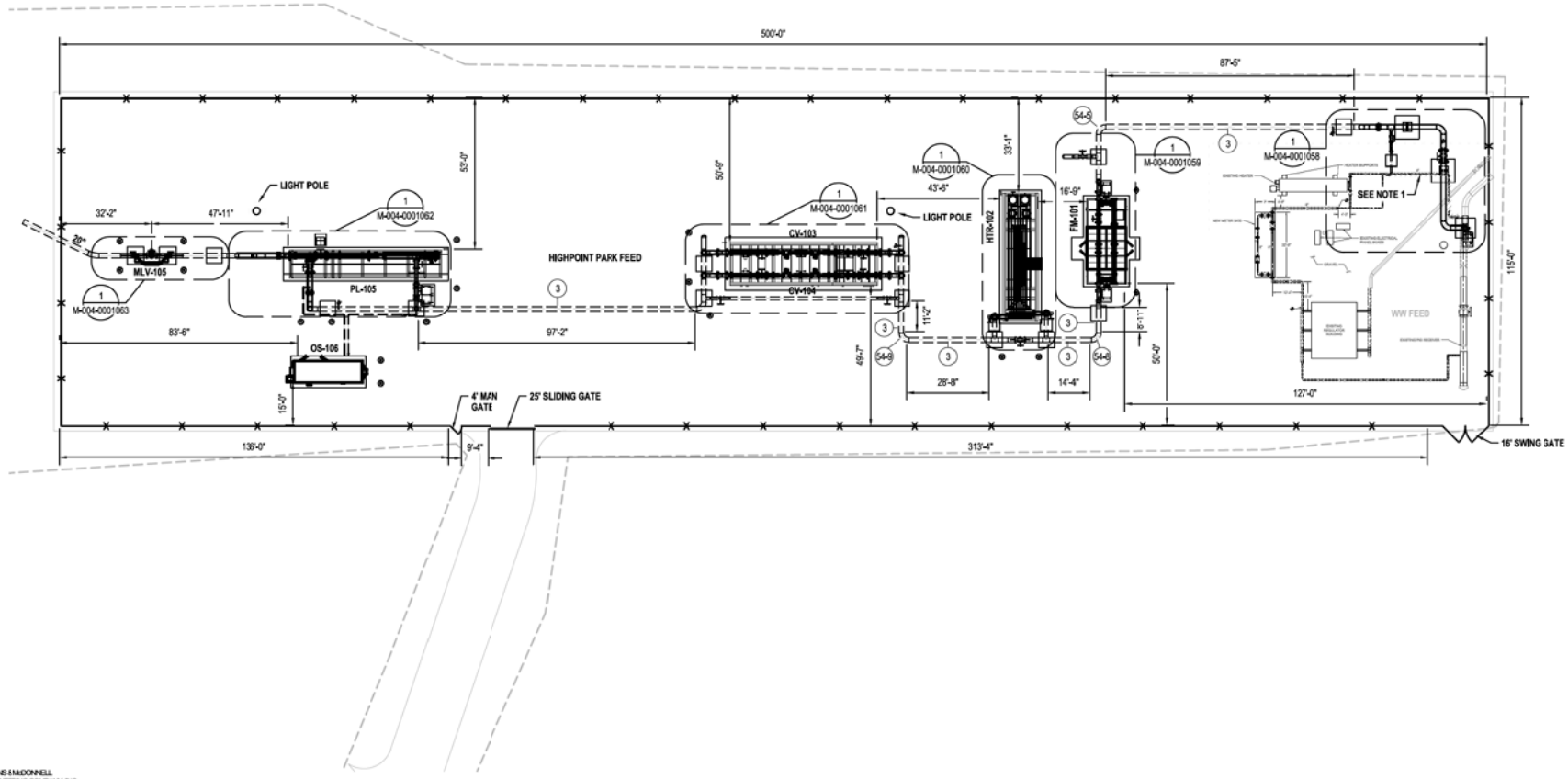
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
MECHANICAL NOTES

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 34 OF 66	DWG SCALE NONE
DWG DATE 08/28/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -M-004-0001056	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



NOTES:

1. PIPING BETWEEN NEW WW FEED TIE-IN THROUGH THE TAP ON LINE C314 IS TO BE REMOVED.
2. LOCATIONS OF EXISTING LINES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY THEIR LOCATION FOR THE TIE-INS.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MAS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

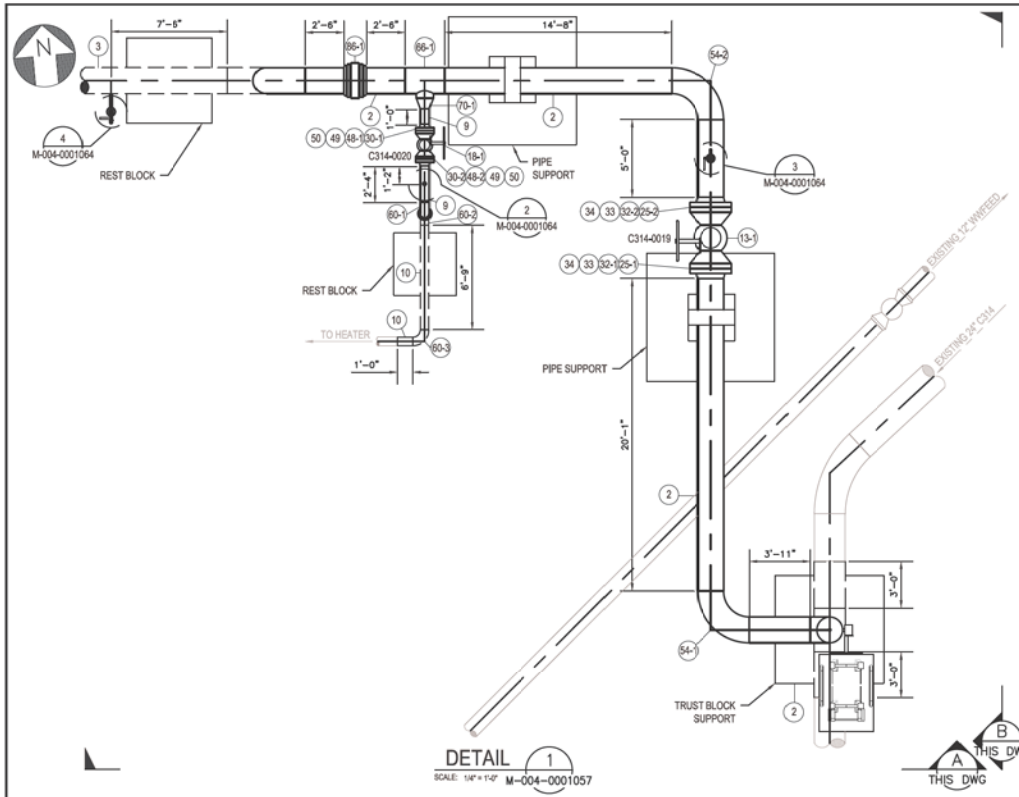
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
MECHANICAL PLOT PLAN

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 35 OF 66	DWG SCALE 1" = 20'
DWG DATE 06/11/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -M-004-0001057	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



DETAIL 1
SCALE: 1/4" = 1'-0" M-004-0001057

A THIS DWG
B THIS DWG

VALVE # C314-0019 SIZE 20"
MANUFACTURER SER. #
MODEL # W.O.G./M.O.P.
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS

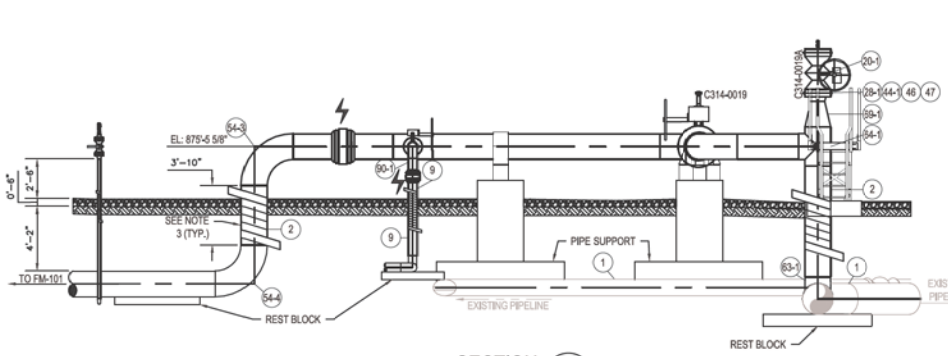
VALVE # C314-0019A SIZE 10"
MANUFACTURER SER. #
MODEL # W.O.G./M.O.P.
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS

VALVE # C314-0020 SIZE 6"
MANUFACTURER SER. #
MODEL # W.O.G./M.O.P.
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS

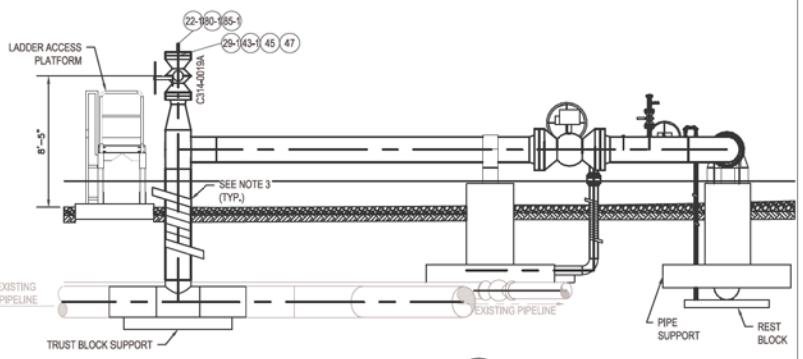
NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
3. CONTRACTOR SHALL APPLY TRENTON MC OUTERWRAP (OR APPROVED EQUAL) TO ALL BELOWGROUND TO ABOVE GROUND PIPE TRANSITIONS. WAX TAPE SHALL BE APPLIED TO ALL ABOVEGROUND FLANGED CONNECTIONS. SEE DUKE CONSTRUCTION MANUAL FOR ADDITIONAL INSTRUCTIONS.
4. CONTRACTOR TO FIELD VERIFY GRADE ELEVATION AND CUT VERTICAL PIPE TRANSITIONS TO LENGTH AS NECESSARY TO MAINTAIN 4'-0" MINIMUM DEPTH OF COVER.

INDICATES ELECTRICALLY ISOLATED.



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



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

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	ACS
STATION ID	S0867O1
CHECKER INITIALS	JFB

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	CAB	PRINCIPAL ENGINEER

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
INLET ISOLATION VALVE

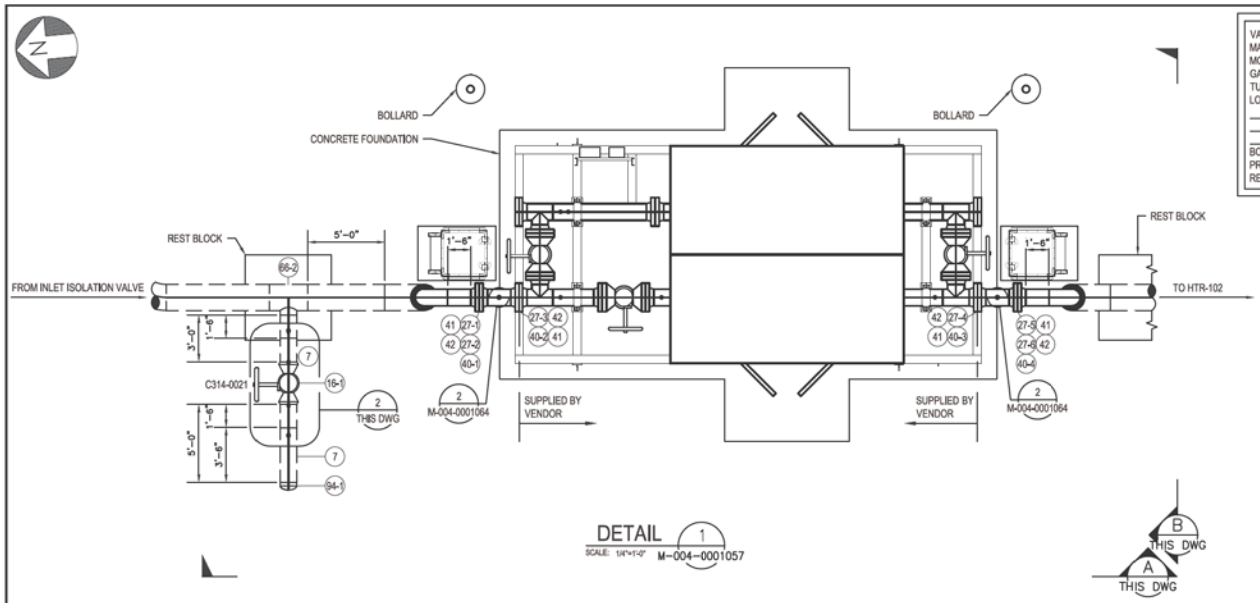
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 36 OF 66	DWG SCALE 1/4" = 1'-0"
DWG DATE 09/05/2018	SUPERSEDED —

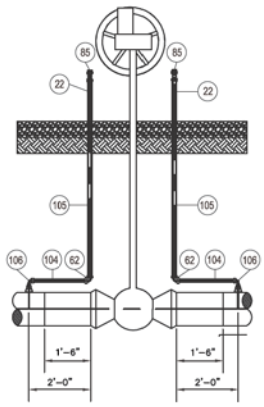
DRAWING NUMBER	REVISION
PNG -M-004-0001058	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

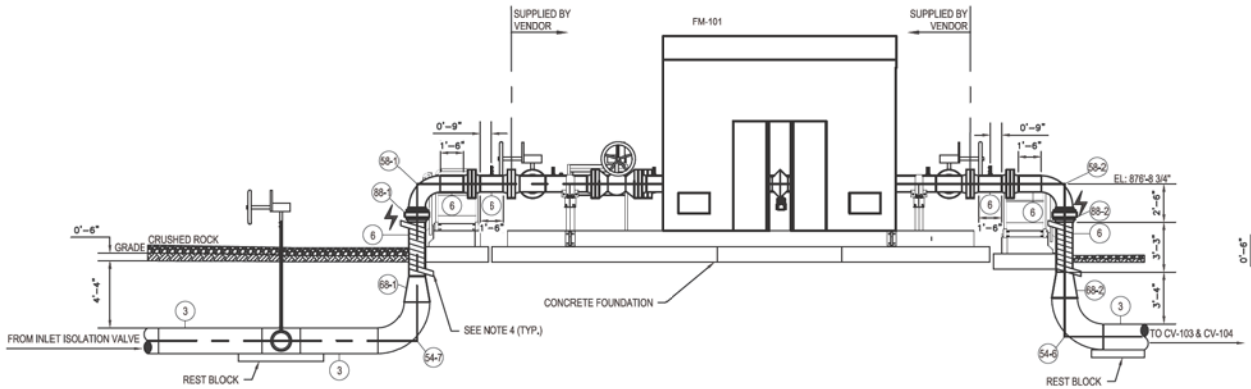


DETAIL 1
SCALE: 1/4"=1'-0" M-004-0001057

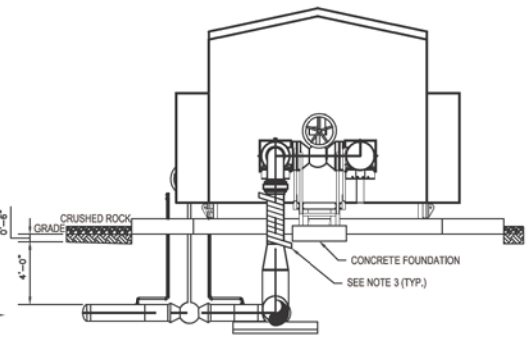
VALVE #	C314-0021 SIZE 12"
MANUFACTURER	SER. #
MODEL #	W.O.G./M.O.P.
GATE ☐	PLUG ☐ OTHER
TURNS TO OPEN	
LOCATION:	
	FT IN
	FT IN
	FT IN
BOX ☐ PIT ☐	COVER AT MAIN , T IN
PRESSURE STEMS LOCATED	N S E W
REMARKS	



DETAIL 2
SCALE: 1/2"=1'-0"
TYPICAL VALVE STEM ASSEMBLY



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



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

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
3. CONTRACTOR SHALL APPLY TRENTON MC OUTERWRAP (OR APPROVED EQUAL) TO ALL BELOWGROUND TO ABOVE GROUND PIPE TRANSITIONS. WAX TAPE SHALL BE APPLIED TO ALL ABOVEGROUND FLANGED CONNECTIONS. SEE DUKE CONSTRUCTION MANUAL FOR ADDITIONAL INSTRUCTIONS.
4. CONTRACTOR TO FIELD VERIFY GRADE ELEVATION AND CUT VERTICAL PIPE TRANSITIONS TO LENGTH AS NECESSARY TO MAINTAIN 4'-0" MINIMUM DEPTH OF COVER.

⚡ INDICATES ELECTRICALLY ISOLATED.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION		APPROVALS		
AREA CODE		DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	AW2123			
PROJECT NUMBER	1880115	DATE	INITIALS	MGR TECH REC & STD
DRAWING BY	ACS			
STATION ID	S0867O1	DATE	INITIALS	PRINCIPAL ENGINEER
CHECKER INITIALS	JFB	10/08/2020	CAB	

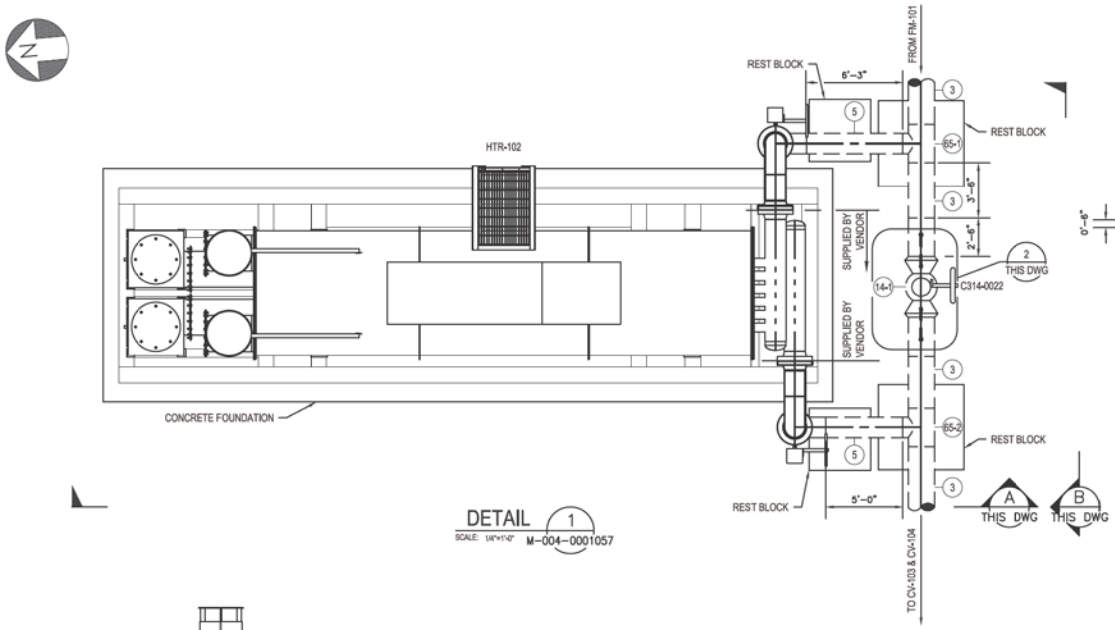
DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
FLOW METER FM-101 PIPING DETAILS

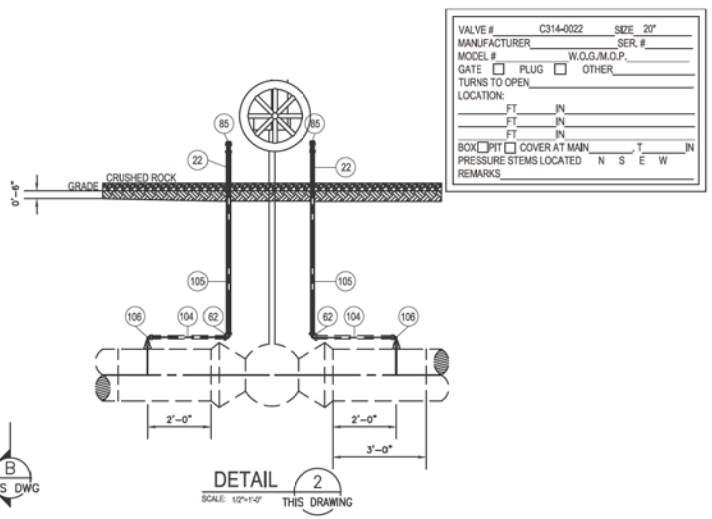
HAMILTON COUNTY, OHIO

REF. DWG(S)

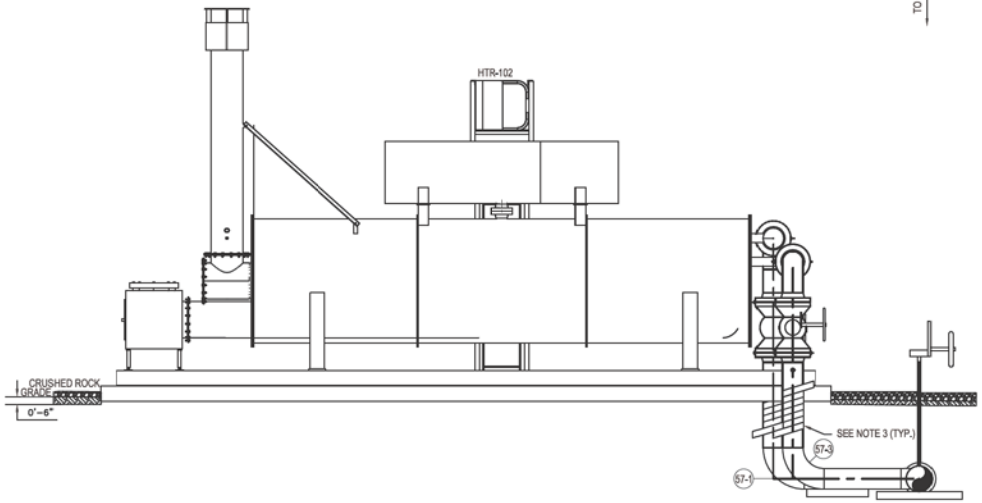
SHEET(S) 37 OF 66	DWG SCALE 1/4" = 1'-0"
DWG DATE 09/05/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -M-004-0001059	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



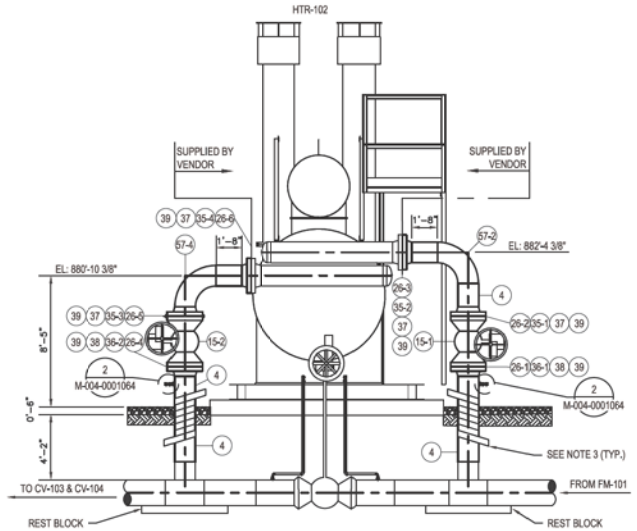
DETAIL 1
SCALE: 1/4"=1'-0" M-004-0001057



DETAIL 2
SCALE: 1/2"=1'-0" THIS DRAWING



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



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

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
3. CONTRACTOR SHALL APPLY TRENTON MC OUTERWRAP (OR APPROVED EQUAL) TO ALL BELOWGROUND TO ABOVE GROUND PIPE TRANSITIONS. WAX TAPE SHALL BE APPLIED TO ALL ABOVEGROUND FLANGED CONNECTIONS. SEE DUKE CONSTRUCTION MANUAL FOR ADDITIONAL INSTRUCTIONS.
4. CONTRACTOR TO FIELD VERIFY GRADE ELEVATION AND CUT VERTICAL PIPE TRANSITIONS TO LENGTH AS NECESSARY TO MAINTAIN 4'-0" MINIMUM DEPTH OF COVER.

INDICATES ELECTRICALLY ISOLATED.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:D1557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-01-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	RDC
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/01/2020	CAB

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
HEATER HTR-102 PIPING DETAIL

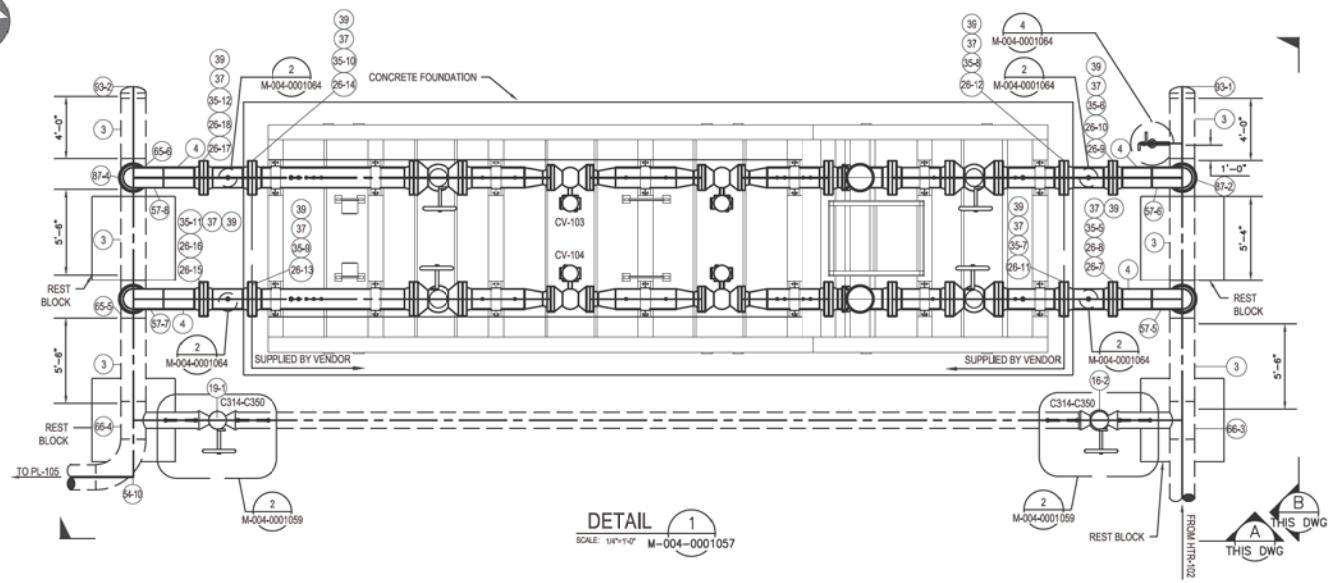
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 38 OF 66	DWG SCALE 1/4" = 1'-0"
DWG DATE 09/05/2018	SUPERSEDED —

DRAWING NUMBER	REVISION
PNG -M-004-0001060	0

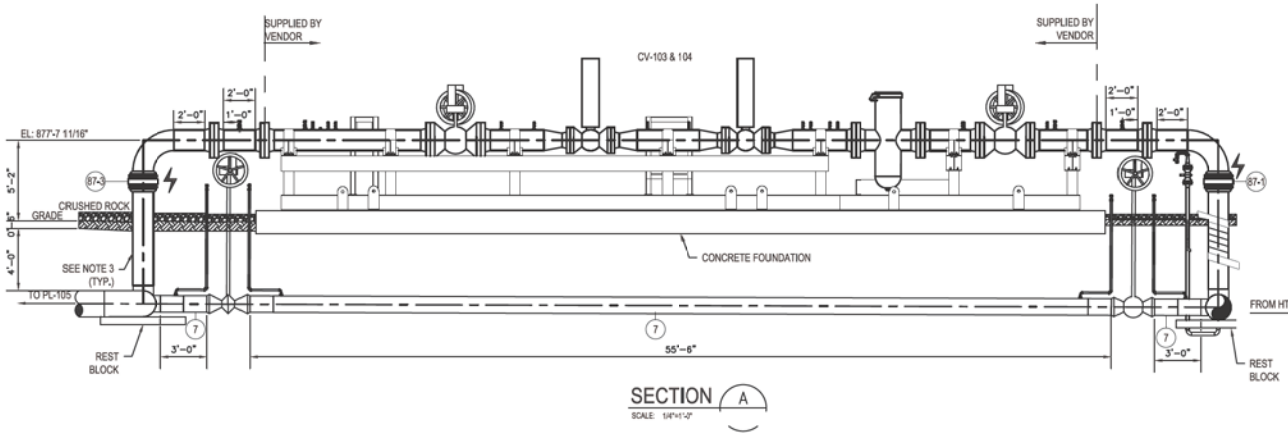
DISCIPLINE / RESOURCE CENTER / LINE NUMBER



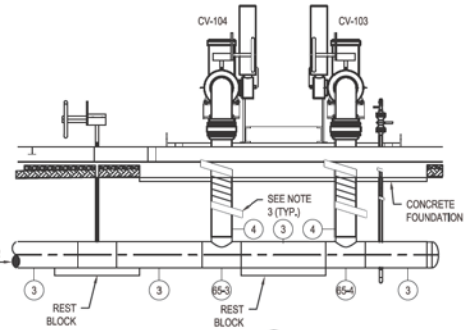
DETAIL 1
SCALE: 1/4"=1'-0" M-004-0001057

VALVE # C314-0023 SIZE 12"
MANUFACTURER SER. #
MODEL # W,O,G,/M.O.P.
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS

VALVE # C314-C350 SIZE 12"
MANUFACTURER SER. #
MODEL # W,O,G,/M.O.P.
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS



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



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

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
3. CONTRACTOR SHALL APPLY TRENTON MC OUTERWRAP (OR APPROVED EQUAL) TO ALL BELOWGROUND TO ABOVE GROUND PIPE TRANSITIONS. WAX TAPE SHALL BE APPLIED TO ALL ABOVEGROUND FLANGED CONNECTIONS. SEE DUKE CONSTRUCTION MANUAL FOR ADDITIONAL INSTRUCTIONS.
4. CONTRACTOR TO FIELD VERIFY GRADE ELEVATION AND CUT VERTICAL PIPE TRANSITIONS TO LENGTH AS NECESSARY TO MAINTAIN 4'-0" MINIMUM DEPTH OF COVER.

ϟ INDICATES ELECTRICALLY ISOLATED.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:D1557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION		APPROVALS		
AREA CODE		DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	AW2123			
PROJECT NUMBER	1880115	DATE	INITIALS	MGR TECH REC & STD
DRAWING BY	RDC			
STATION ID	S0867O1	DATE	INITIALS	PRINCIPAL ENGINEER
CHECKER INITIALS	JBF	10/08/2020	CAB	

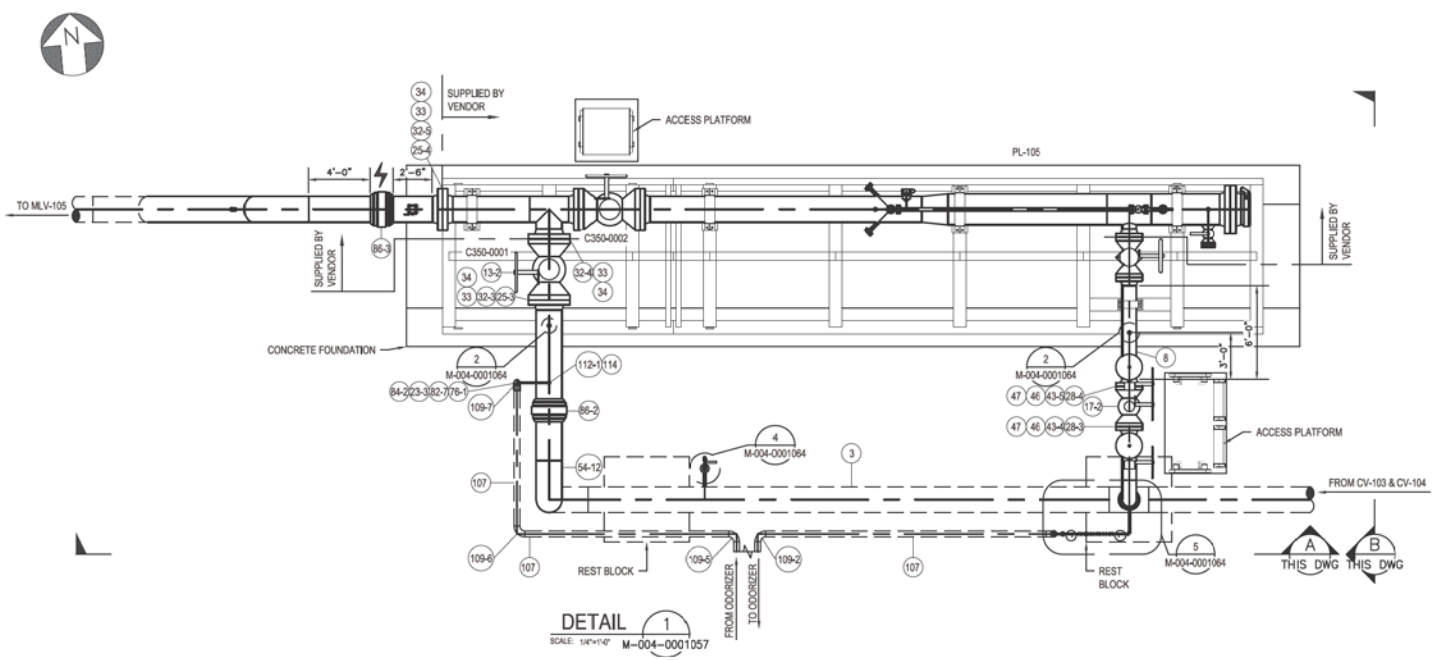
DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
CONTROL VALVES PIPING DETAILS

HAMILTON COUNTY, OHIO

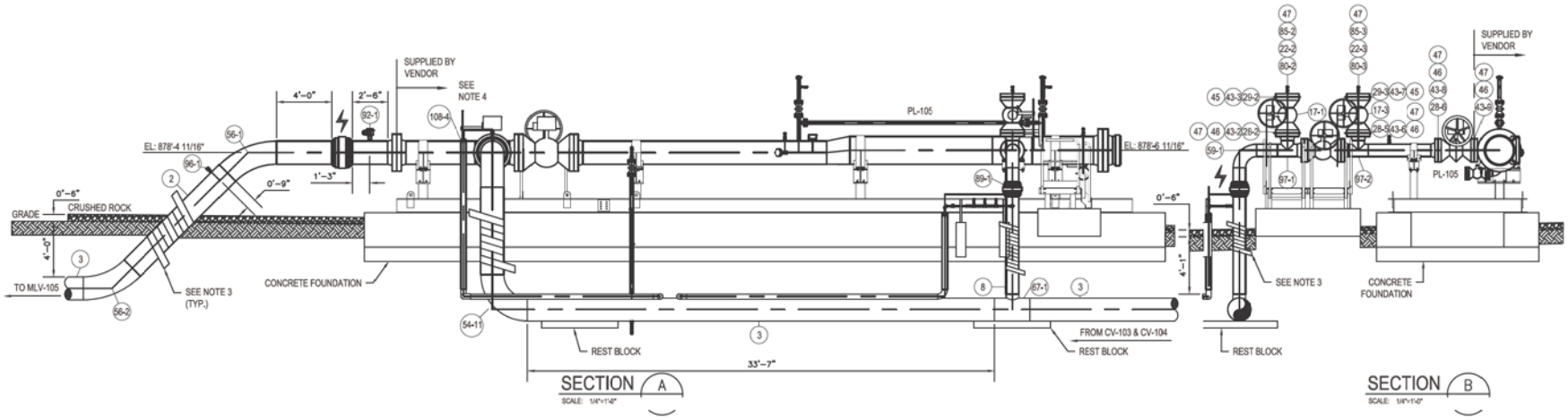
REF. DWG(S)

SHEET(S) 39 OF 66	DWG SCALE 1/4" = 1'-0"
DWG DATE 09/05/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -M-004-0001061	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



VALVE # C350-0001 SIZE 20"
MANUFACTURER SER. #
MODEL # W.O.G./M.O.P.
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS

VALVE # C350-0002 SIZE 20"
MANUFACTURER SER. #
MODEL # W.O.G./M.O.P.
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS



NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
3. CONTRACTOR SHALL APPLY TRENTON MC OUTERWRAP (OR APPROVED EQUAL) TO ALL BELOWGROUND TO ABOVE GROUND PIPE TRANSITIONS. WAX TAPE SHALL BE APPLIED TO ALL ABOVEGROUND FLANGED CONNECTIONS. SEE DUKE CONSTRUCTION MANUAL FOR ADDITIONAL INSTRUCTIONS.
4. CONTRACTOR TO FIELD ROUTE ALL ¾" HEAT TRACE TUBING. USE 4" PVC CARRIER PIPE BELOWGROUND. DRILL HOLE IN CAP FOR TUBE PENETRATION AND SEAL GAPS WITH SILICONE SEALANT. LEAVE THE PVC CAP ON LOOSE, AND USE PVC JOINT COMPOUND ON OTHER FITTING CONNECTIONS.
5. CONTRACTOR TO FIELD VERIFY GRADE ELEVATION AND CUT VERTICAL PIPE TRANSITIONS TO LENGTH AS NECESSARY TO MAINTAIN 4'-0" MINIMUM DEPTH OF COVER.

⚡ INDICATES ELECTRICALLY ISOLATED.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	ACS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

DUKE ENERGY

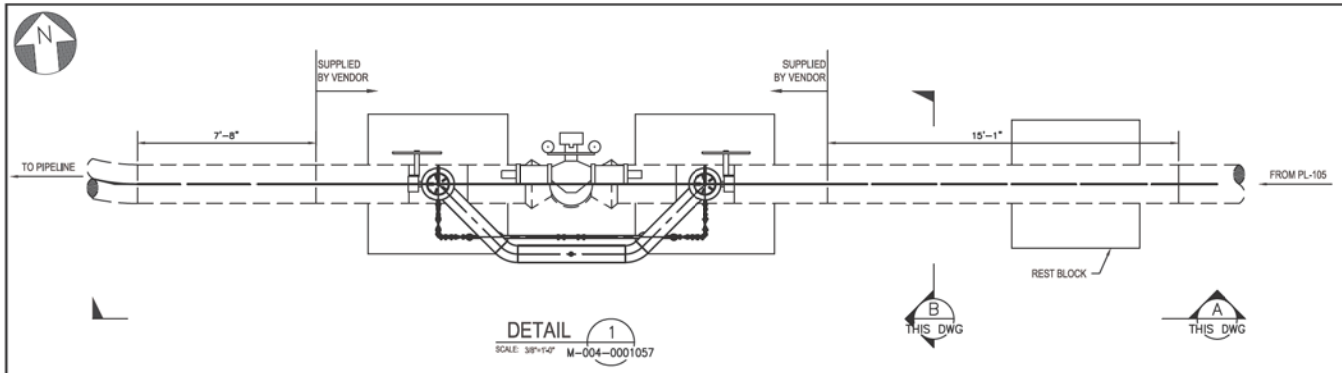
C350 PROJECT
HIGHPOINT PARK STATION
PIG LAUNCHER PL-105 PIPING DETAILS

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 40 OF 66	DWG SCALE AS NOTED
DWG DATE 09/05/2018	SUPERSEDED —

DRAWING NUMBER: PNG -M-004-0001062
REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER

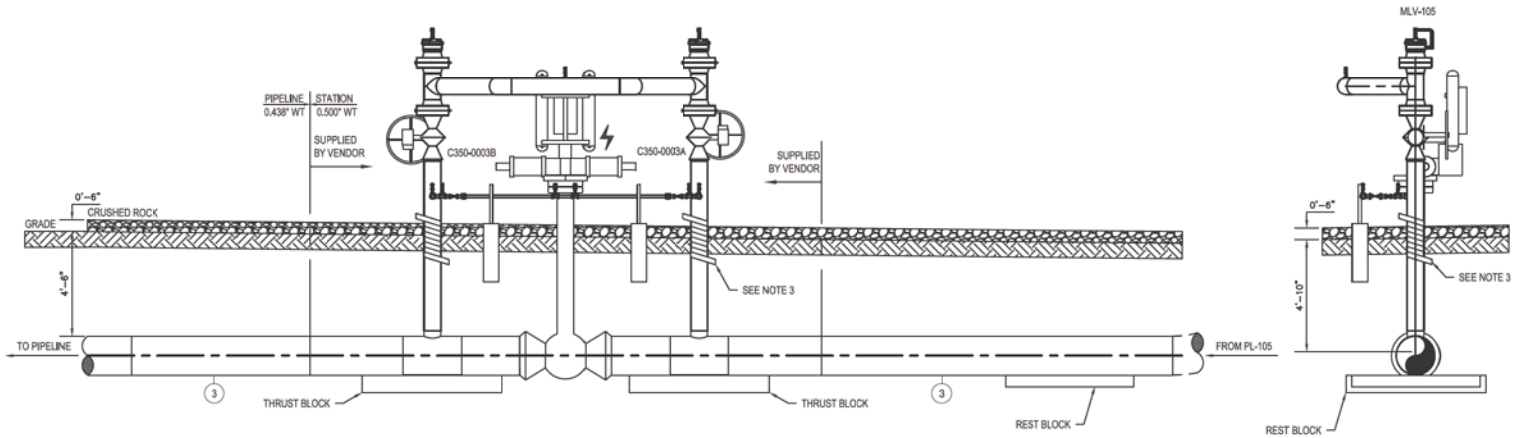


DETAIL 1 — SCALE: 3/8"=1'-0" — M-004-0001057

VALVE # C350-0003A SIZE 8"
MANUFACTURER SER. #
MODEL # W,O,G,M,O,P,
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS

VALVE # C350-0003 SIZE 20"
MANUFACTURER SER. #
MODEL # W,O,G,M,O,P,
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX ☐ PIT ☐ COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS

VALVE # C350-0003B SIZE 8"
MANUFACTURER SER. #
MODEL # W,O,G,M,O,P,
GATE ☐ PLUG ☐ OTHER
TURNS TO OPEN
LOCATION:
FT IN
FT IN
FT IN
BOX PIT COVER AT MAIN , T IN
PRESSURE STEMS LOCATED N S E W
REMARKS



SECTION A — SCALE: 3/8"=1'-0"

SECTION B — SCALE: 3/8"=1'-0"

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
3. CONTRACTOR SHALL APPLY TRENTON MC OUTERWRAP (OR APPROVED EQUAL) TO ALL BELOWGROUND TO ABOVE GROUND PIPE TRANSITIONS. WAX TAPE SHALL BE APPLIED TO ALL ABOVEGROUND FLANGED CONNECTIONS. SEE DUKE CONSTRUCTION MANUAL FOR ADDITIONAL INSTRUCTIONS.
4. CONTRACTOR TO FIELD VERIFY GRADE ELEVATION AND CUT VERTICAL PIPE TRANSITIONS TO LENGTH AS NECESSARY TO MAINTAIN 4'-0" MINIMUM DEPTH OF COVER.

INDICATES ELECTRICALLY ISOLATED.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO — CHAD A BACON — PE.85638 — REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	ACS
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

DUKE ENERGY®

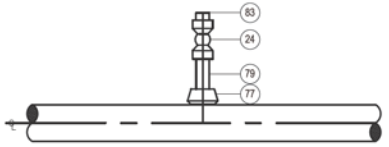
C350 PROJECT
HIGHPOINT PARK STATION
MLV PIPING DETAILS

HAMILTON COUNTY, OHIO

REF. DWG(S)

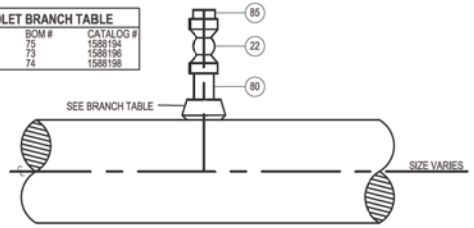
SHEET(S) 41 OF 66	DWG SCALE 3/8" = 1'-0"
DWG DATE 09/05/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -M-004-0001063	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

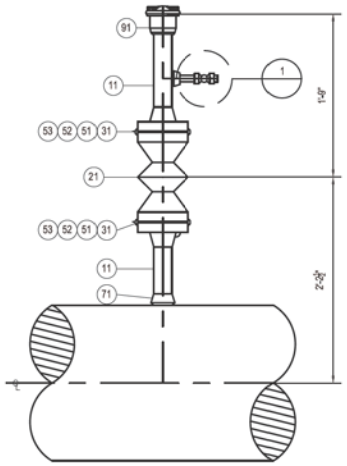


DETAIL 1
SCALE: 3"=1'-0"
TYPICAL 1/2" TAP VALVE

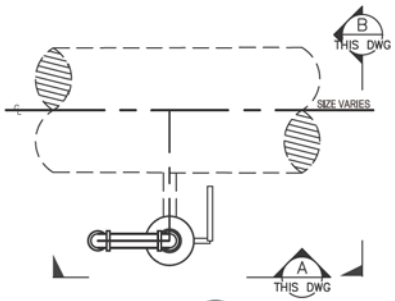
1" THREADOLET BRANCH TABLE		
HEADER SIZE	BOM #	CATALOG #
6"-10"	75	1588194
12",18"	73	1588196
16",20"-24"	74	1588198



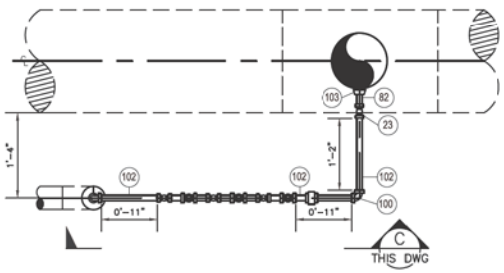
DETAIL 2
SCALE: 3"=1'-0"
TYPICAL 1" TAP VALVE



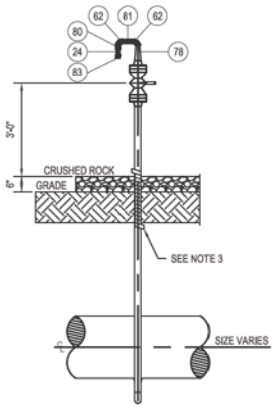
DETAIL 3
SCALE: 1-1/2" = 1'-0"
TYPICAL 2" BLOW-OFF ASSEMBLY



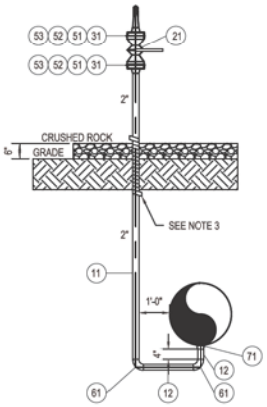
DETAIL 4
SCALE: 1"=1'-0"
TYPICAL 2" DRAIN



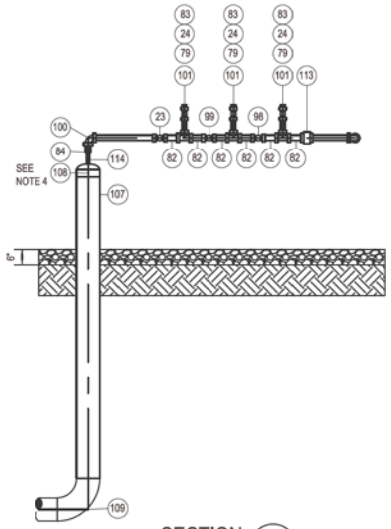
DETAIL 5
SCALE: 1"=1'-0" M-004-0001062
ODORIZER GAS SUPPLY ASSEMBLY



SECTION A
SCALE: 1/2"=1'-0"
TYPICAL 2" DRAIN



SECTION B
SCALE: 1/2"=1'-0"
TYPICAL 2" DRAIN



SECTION C
SCALE: 1"=1'-0"
ODORIZER GAS SUPPLY ASSEMBLY

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. REFER TO VENDOR EQUIPMENT DRAWINGS FOR ADDITIONAL DETAILS.
3. CONTRACTOR SHALL APPLY TRENTON MC OUTERWRAP (OR APPROVED EQUAL) TO ALL BELOWGROUND TO ABOVE GROUND PIPE TRANSITIONS. WAX TAPE SHALL BE APPLIED TO ALL ABOVEGROUND FLANGED CONNECTIONS. SEE DUKE CONSTRUCTION MANUAL FOR ADDITIONAL INSTRUCTIONS.
4. CONTRACTOR TO FIELD ROUTE ALL ¾" HEAT TRACE TUBING. USE 4" PVC CARRIER PIPE BELOWGROUND. DRILL HOLE IN CAP FOR TUBE PENETRATION AND SEAL GAPS WITH SILICONE SEALANT. LEAVE THE PVC CAP ON LOOSE, AND USE PVC JOINT COMPOND ON OTHER FITTING CONNECTIONS.
5. CONTRACTOR TO FIELD VERIFY GRADE ELEVATION AND CUT VERTICAL PIPE TRANSITIONS TO LENGTH AS NECESSARY TO MAINTAIN 4'-0" MINIMUM DEPTH OF COVER.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION		APPROVALS		
AREA CODE		DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	AW2123			
PROJECT NUMBER	1880115	DATE	INITIALS	MGR TECH REC & STD
DRAWING BY	RDC			
STATION ID	S0867O1	DATE	INITIALS	PRINCIPAL ENGINEER
CHECKER INITIALS	JBF	10/08/2020	CAB	

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
MECHANICAL PIPING DETAILS

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 42 OF 66	DWG SCALE AS NOTED
DWG DATE 09/05/2018	SUPERSEDED —

DRAWING NUMBER	REVISION
PNG -M-004-0001064	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

MARK	LEGACY NUMBER	MAXIMO PART #	DATA SHEET?	SOURCE SYSTEM	QTY	RETIRED?	DESCRIPTION	ORDERING INSTRUCTIONS	ORDERING SPECIFICATIONS	MANUF	MODEL	MANUF PART #
1	17110	1551329		PNG	6+34 ft		PIPE, 24" NPS X 0.500 W.T., DBL RANDOM LG, BEVELED ENDS, LONGITUDINAL SUBMERGED ARC WELDED, FBE, STL, API 5L PSL-2, GR X65, NO JOINTERS			UNKNOWN,		1551329
2	NON-STOCK	#N/A	#N/A	#N/A	97+23 ft	#N/A	PIPE, 20" NPS X 0.500 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, BARE, STL, API 5L PSL-2, GR X65, NO JOINTERS	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
3	NON-STOCK	#N/A	#N/A	#N/A	378+22 ft	#N/A	PIPE, 20" NPS X 0.500 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, FBE, STL, API 5L PSL-2, GR X65, NO JOINTERS	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
4	16662	1552348		PNG	52+28 ft		PIPE, 16" NPS X 0.375 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, BARE, STL, API 5L PSL-2, GR X65, NO JOINTERS			UNKNOWN,		1552348
5	16661	1552351		PNG	27+13 ft		PIPE, 16" NPS X 0.375 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, FBE, STL, API 5L PSL-2, GR X65, NO JOINTERS			UNKNOWN,		1552351
6	16393	1552281		PNG	15+35 ft		PIPE, 12" NPS X 0.375 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, BARE, STL, API 5L PSL-2, GR X52, NO JOINTERS			UNKNOWN,		1552281
7	16413	1551302		PNG	63+17 ft		PIPE, 12" NPS X 0.375 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, FBE, STL, API 5L PSL-2, GR X52, NO JOINTERS			UNKNOWN,		1551302
8	16382	1551571		PNG	16+34 ft		PIPE, 10" NPS X 0.365 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, BARE, STL, API 5L PSL-2, GR X52, NO JOINTERS			UNKNOWN,		1551571
9	16835	1552810		PNG	11+39 ft		PIPE, 6" NPS X 0.280 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, BARE, STL, API 5L PSL-2, GR X52, NO JOINTERS			UNKNOWN,		1552810
10	16836	1551340		PNG	6+34 ft		PIPE, 6" NPS X 0.280 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, FBE, STL, API 5L PSL-2, GR X52, NO JOINTERS			IPSCOINC,		1551340
11	16348	1552392		PNG	32+20 ft		PIPE, 2" NPS X 0.218 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, BARE, STL, API 5L PSL-1, GR X52, NO JOINTERS			UNKNOWN,		1552392
12	16403	1552396		PNG	7+33 ft		PIPE, 2" NPS X 0.218 W.T., DBL RANDOM LG, BEVELED ENDS, ELECTRIC RESISTANCE WELD, FBE, STL, API 5L PSL-1, GR X52, NO JOINTERS			UNKNOWN,		1552396
13	16988	1555544		PNG	2		VALVE,BALL, TRUNNION, 20" NPS, ANSI 600, FULL PORT, RF, HANDWHEEL GEAR OPERATED, STL BODY, BOLTED BODY, API 6D, DM-ST-2080, ABOVE GROUND APPLICATION. IF OPERATOR EXTENSION IS ORDERED, BODY DRAIN AND SEALANT PORTS TO BE FACTORY PIPED UP TO THE OPERATOR WITH WELDED AND COATED CS PIPE WITH GIANT BUTTON HEAD GREASE FITTINGS, PER DM-ST-2085.	SPECIFY IF AN OPERATOR EXTENSION IS REQUIRED AND THE EXTENSION LENGTH.	NO EXTENSION REQUIRED	DELTA,GROVE,		FIG 55-20
14	16965	1555732		PNG	1		VALVE,BALL, TRUNNION, 20" NPS, ANSI 600, FULL PORT, WELDED, HANDWHEEL GEAR OPERATED, STL BODY, WELDED BODY, API 6D, DM-ST-2080, IF OPERATOR EXTENSION IS ORDERED, BODY DRAIN AND SEALANT PORTS TO BE FACTORY PIPED UP TO THE OPERATOR WITH WELDED AND COATED CS PIPE WITH GIANT BUTTON HEAD GREASE FITTINGS, PER DM-ST-2085, IF ORDERED, MANUFACTURER TO PROVIDE PIPE PUPS PER DIMENSIONS, TESTING AND DOCUMENTATION REQUIREMENTS OF DM-ST-2085.	SPECIFY NPS, WALL THICKNESS AND MATERIAL YIELD STRENGTH OF MATING PIPE. SPECIFY WHETHER PIPE PUPS ARE REQUIRED. SPECIFY IF AN OPERATOR EXTENSION IS REQUIRED AND THE EXTENSION LENGTH (5.5', 6.0', AND 6.5' ARE COMMON CHOICES). SPECIFY ABOVE GROUND OR BELOW GROUND APPLICATION.	FOR CONNECTION TO 20" NPS, 0.500" WT, API 5L-PSL2, GRADE X52 PIPE, INCLUDE PIPE PUPS OF 1.5"OD, INCLUDE OPERATOR STEM EXTENSION OF 8.5FT AS MEASURED FROM PIPE CENTERLINE TO HANDWHEEL	CAMERON,DELTA,		800602-2-1, FIG 58-20
15	17064	1555587		PNG	2		VALVE,BALL, TRUNNION, 16" NPS, ANSI 600, FULL PORT, RF, HANDWHEEL GEAR OPERATED, STL BODY, BOLTED BODY, API 6D, DM-ST-2080, ABOVE GROUND APPLICATION. IF OPERATOR EXTENSION IS ORDERED, BODY DRAIN AND SEALANT PORTS TO BE FACTORY PIPED UP TO THE OPERATOR WITH WELDED AND COATED CS PIPE WITH GIANT BUTTON HEAD GREASE FITTINGS, PER DM-ST-2085.	SPECIFY IF AN OPERATOR EXTENSION IS REQUIRED AND THE EXTENSION LENGTH.	NO EXTENSION REQUIRED	GROVE,		B5 / V327-199A6AG 6
16	15186	1555727		PNG	2		VALVE,BALL, TRUNNION, 12" NPS, CLASS 600, FULL PORT, WELD X WELD, HANDWHEEL GEAR OPERATED, CS BODY, STD TRIM, API 6D, OPERATOR EXTENSION, BODY DRAIN & SEALANT PORTS TO BE FACTORY PIPED UP TO THE OPERATOR	VALVE,BALL, TRUNNION, 12" NPS, CLASS 600, FULL PORT, WELD X WELD, HANDWHEEL GEAR OPERATED, CS BODY, STD TRIM, API 6D, OPERATOR EXTENSION, BODY DRAIN & SEALANT PORTS TO BE FACTORY PIPED UP TO THE OPERATOR WITH WELDED & COATED CS PIPE	FOR CONNECTION TO 12" NPS, 0.375" WT, API 5L-PSL2, GRADE X52 PIPE, INCLUDE PIPE PUPS OF 1.5"OD, INCLUDE OPERATOR STEM EXTENSION OF 8.5FT AS MEASURED FROM PIPE CENTERLINE TO HANDWHEEL	CAMERON,		12"NPS 800602-2A-1
17	17038	1555581		PNG	3		VALVE,BALL, TRUNNION, 10" NPS, ANSI 600, FULL PORT, RF, HANDWHEEL GEAR OPERATED, STL BODY, BOLTED BODY, API 6D, DM-ST-2080, ABOVE GROUND APPLICATION. IF OPERATOR EXTENSION IS ORDERED, BODY DRAIN AND SEALANT PORTS TO BE FACTORY PIPED UP TO THE OPERATOR WITH WELDED AND COATED CS PIPE WITH GIANT BUTTON HEAD GREASE FITTINGS, PER DM-ST-2085.	SPECIFY IF AN OPERATOR EXTENSION IS REQUIRED AND THE EXTENSION LENGTH.	NO EXTENSION REQUIRED	DELTA,GROVE,		FIG 55-10
18	17037	1555559		PNG	1		VALVE,BALL, TRUNNION, 6" NPS, ANSI 600, FULL PORT, RF, HANDWHEEL GEAR OPERATED, STL BODY, BOLTED BODY, API 6D, DM-ST-2080, ABOVE GROUND APPLICATION. IF OPERATOR EXTENSION IS ORDERED, BODY DRAIN AND SEALANT PORTS TO BE FACTORY PIPED UP TO THE OPERATOR WITH WELDED AND COATED CS PIPE WITH GIANT BUTTON HEAD GREASE FITTINGS, PER DM-ST-2085.	SPECIFY IF AN OPERATOR EXTENSION IS REQUIRED AND THE EXTENSION LENGTH.	NO EXTENSION REQUIRED	GROVE,		1555559
19	NON-STOCK	#N/A	#N/A	#N/A	1	#N/A	VALVE,PLUG, 12" NPS, ANSI 600, WELD ENDS, HANDWHEEL GEAR OPERATED, CS BODY, API 6D, DM-ST-2080, REGULAR PATTERN, PRESSURE BALANCED	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG IT IS FOR CONNECTION TO 12" NPS, 0.375" WT, API 5L-PSL2, GRADE X52 PIPE, INCLUDE PIPE PUPS OF 1.5"OD, INCLUDE OPERATOR STEM EXTENSION OF 8.5FT AS MEASURED FROM PIPE CENTERLINE TO HANDWHEEL	#N/A	#N/A	#N/A
20	13256	1556573		PNG	2		VALVE,PLUG, 10" NPS, ANSI 600, FLG, HANDWHEEL GEAR OPERATED, CS BODY, API 6D, DM-ST-2080, REGULAR PATTERN, PRESSURE BALANCED			SERCKAUDCOVA,		HRG 633
21	11611	1556656		PNG	4		VALVE,PLUG, 2" NPS, ANSI 600, FLG, CS BODY, API 6D, DM-ST-2080, LEVER, REGULAR PATTERN, PRESSURE BALANCED			SERCKAUDCOVA,		HRW 633
22	1570839	1570839		PNG	25		VALVE,BALL, FLOATING, 1", 2-WAY, 2000 PSIG, REDUCED PORT, FPT, LOCKING LEVER OPERATED, CS BODY, 316 SS BALL & STEM, ASME B16.34 OR MSS SP-110, API 607, F/ NATURAL GAS USE			CONBRACOINDU,	APOLLO	73A-145-24-27 A
23	14241	1556269		PNG	3		VALVE,BALL, FLOATING, 3/4", 2-WAY, 2000 PSIG, REDUCED PORT, FPT, LOCKING LEVER OPERATED, CS BODY, 316 SS BALL& STEM, ASME B16.34 OR MSS SP-110, API 607, F/ NATURAL GAS USE			APOLLO		73A-144-24-27 A
24	1570324	1570324		PNG	4		VALVE,BALL, FLOATING, 1/2", 2-WAY, 2000 PSIG, REDUCED PORT, FPT, LOCKING LEVER OPERATED, CS BODY, 316 SS BALL & STEM, ASME B16.34 OR MSS SP-110, API 607, F/ NATURAL GAS USE			CONBRACOINDU,		73A-143-24-27 A
25	17162	1551450		PNG	4		FLANGE,PIPE, WN, RF, 20" NPS, CLASS 600, FORGED STL, MSS SP-44, ASTM A694 GR F65, 125 - 250 MICRO INCHES AARH		FOR CONNECTION TO 20" NPS, 0.500" WT, API 5L-PSL2, GRADE X65 PIPE	UNKNOWN,		1551450
26	12638	1551756		PNG	18		FLANGE,PIPE, WN, RF, 16" NPS, CLASS 600, FORGED STL, MSS SP-44, ASTM A694 GR F65, ASSME B16.5, 125 - 250 MICRO INCHES AARH			HACKNEYLADIS,		1551756
27	12238	1551734		PNG	6		FLANGE,PIPE, WN, RF, 12" NPS, CLASS 600, FORGED STL, MSS SP-44, ASTM A694 GR F52, ASSME B16.5, 125 - 250 MICRO INCHES AARH			GALPERTI,		1551734
28	17249	1551493		PNG	6		FLANGE,PIPE, WN, RF, 10" NPS, CLASS 600, FORGED STL, ASTM A694, ASME B16.5, GR F52, MSS SP-44, 125-250 MICRO INCHES AARH			UNKNOWN		1551493
29	14416	1551980		PNG	3		FLANGE,PIPE, BLIND, RF, 10" NPS, CLASS 600, FORGED STL, MSS SP-44, ASTM A105, ASSME B16.5, 125 - 250 MICRO INCHES AARH		CENTER DRILLED AND TAPPED FOR A 1" TRHEADED BLEED TAP	GALPERTI,		1551980
30	17247	1551475		PNG	2		FLANGE,PIPE, WN, RF, 6" NPS, CLASS 600, FORGED STL, ASTM A694, ASME B16.5, GR F52, MSS SP-44, 125-250 MICRO INCHES AARH			UNKNOWN		1551475
31	17245	1551917		PNG	8		FLANGE,PIPE, WN, RF, 2" NPS, CLASS 600, ASTM A694, GR F52, XS 0.218" WALL THK, MSS SP-44, 1.939" BORE NO INTERNAL TAPER, 125-250 MICRO INCHES AARH			HACKNEYLADIS,		2-RFWN-Y52-600
32	16118	1557023		PNG	5+2		GASKET,SPIRAL WOUND, 20" NPS, CLASS 600, 1/8" THK, 304 SS RIBBON WITH GRAPHITE FILLER, SS INNER RING, CS OUTER RING, ASME B16.20, TYPE E, MSS SP-44			FLEXITALLICI,		1557023
33	17266	1553055		PNG	120+48		BOLT, STUD, 1-5/8" DIA, 1'2" LG, STL, ASTM A193 GR B7			UNKNOWN,		1553055

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. CONTRACTOR SHALL SUPPLY ALL NECESSARY CONSUMABLE ITEMS FOR SITE CONSTRUCTION.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:D1557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

REF. DWG(S)

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION		APPROVALS		
AREA CODE		DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	AW2123			
PROJECT NUMBER	1880115	DATE	INITIALS	MGR TECH REC & STD
DRAWING BY	RDC			
STATION ID	S0867O1	DATE	INITIALS	PRINCIPAL ENGINEER
CHECKER INITIALS	JBF	10/08/2020	CAB	

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
MECHANICAL BILL OF MATERIALS - 1

HAMILTON COUNTY, OHIO

SHEET(S) 43 OF 66	DWG SCALE AS NOTED
DWG DATE 09/05/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -M-004-0001066	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

MARK	LEGACY NUMBER	MAXIMO PART #	DATA SHEET?	SOURCE SYSTEM	QTY	RETIRED?	DESCRIPTION	ORDERING INSTRUCTIONS	ORDERING SPECIFICATIONS	MANUF	MODEL	MANUF PART #
34	12219	1553447		PNG	240=96		NUT,HEX, 1-5/8" DIA, STL, ASTM A194 GR 2H			UNKNOWN,		1553447
35	16086	1557033		PNG	12=3		GASKET,SPIRAL WOUND, 16" NPS, CLASS 600, 1/8" THK, 304 SS RIBBON WITH GRAPHITE FILLER, SS INNER RING, CS OUTER RING, ASME B16.20, TYPE E, MSS SP-44			FLEXITALLICI,		1557033
36	14223	1555792		PNG	2		GASKET, INSULATING KIT, 16" NPS, G10, CLASS 600, THICK, ASME B16.21, 1/8"" THICK GASKET: BUNA-N SEALING ELEMENTS WITH G10 RETAINER OR NEOPRENE-FACED PHENOLIC. SLEEVES: G10. DOUBLE WASHERS: PHENOLIC., TYPE E (FULL FACE), GASKET: NITRILE FACED WITH G10 CORE, SLEEVE: G10, WASHER: G10			GPTINDUSTRIE,		1555792
37	17265	1553052		PNG	240=60		BOLT, STUD, 1-1/2" DIA, 10-1/2" LG, STL, ASTM A193 GR B7			UNKNOWN,		1553052
38	17279	1553078		PNG	40		BOLT, STUD, 1-1/2" DIA, 11" LG, STL, ASTM A193 GR B7			UNKNOWN,		1553078
39	12227	1553414		PNG	560=120		NUT,HEX, 1-1/2" DIA, STL, ASTM A194 GR 2H			UNKNOWN,		1553414
40	14936	1557077		PNG	4=2		GASKET,SPIRAL WOUND, 12" NPS, CLASS 600, 1/8" THK, 304 SS RIBBON WITH GRAPHITE FILLER, SS INNER RING, CS OUTER RING, ASME B16.20, TYPE E, TO SUIT MSS SP-44 FLANGE			FLEXITALLICI,		1557077
41	10797	1551241		PNG	80=40		BOLT, STUD, 1-1/4" DIA, 9" LG, STL, ASTM A193 GR B7, HARD STEEL STUD			HIGHLANDTHRE,		1551241
42	11917	1553419		PNG	160=80		NUT,HEX, 1-1/4" DIA, STL, ASTM A194 GR 2H			UNKNOWN,		1553419
43	14993	1557059		PNG	9=2		GASKET,SPIRAL WOUND, 10" NPS, CLASS 600, 1/8" THK, 304 SS RIBBON WITH GRAPHITE FILLER, SS INNER RING, CS OUTER RING, ASME B16.20, TYPE E, TO SUIT MSS SP-44 FLANGE			FLEXITALLICI,		1557059
44	15175	1556114		PNG	1		GASKET, INSULATING KIT, 10" NPS, G10, CLASS 600, THICK, ASME B16.21, GASKET: BUNA-N SEALING ELEMENTS WITH G10 RETAINER. SLEEVES: MYLAR. DOUBLE WASHERS: G10., TYPE E (FULL FACE), GASKET: NITRILE FACED WITH G10 CORE, SLEEVE: G10, WASHER: G10			GPTINDUSTRIE,		1556114
45	10797	1551241		PNG	144=32		BOLT, STUD, 1-1/4" DIA, 9" LG, STL, ASTM A193 GR B7, HARD STEEL STUD			HIGHLANDTHRE,		1551241
46	13321	1552968		PNG	16		BOLT, STUD, 1-1/4" DIA, 9-1/2" LG, STL, ASTM A193 GR B7, HARD BOLT STUD			HIGHLANDTHRE,		1552968
47	11917	1553419		PNG	320=64		NUT,HEX, 1-1/4" DIA, STL, ASTM A194 GR 2H			UNKNOWN,		1553419
48	14928	1557080		PNG	2=1		GASKET,SPIRAL WOUND, 6" NPS, CLASS 600, 1/8" THK, 304 SS RIBBON WITH GRAPHITE FILLER, SS INNER RING, CS OUTER RING, ASME B16.20, TYPE E, TO SUIT MSS SP-44 FLANGE			FLEXITALLICI,		1557080
49	17262	1553045		PNG	24=12		BOLT, STUD, 1" DIA, 7" LG, STL, ASTM A193 GR B7			UNKNOWN,		1553045
50	11084	1553383		PNG	48=24		NUT,HEX, 1" DIA, STL, ASTM A194 GR 2H		NOTE THAT THIS DESCRIPTION SHOULD SAY 1" DIA	ANVILINTLINC,		1553383
51	14991	1557067		PNG	8=2		GASKET,SPIRAL WOUND, 2" NPS, CLASS 600, 1/8" THK, 304 SS RIBBON W GRAPHITE FILLER, FLEXITALLIC GCI, SS INNER RING, CS OUTER RING, ASME B16.20, TYPE F, TO SUIT MSS SP-44 FLG			FLEXITALLICI,		2"-600-CGI-SS-CS-ASMEB16.20
52	10214	1552875		PNG	64=16		BOLT, STUD, 5/8" DIA, 4-1/2" LG, STL, ASTM A193 GR B7, HARD STEEL STUD			HIGHLANDTHRE,		1552875
53	11213	1553473		PNG	128=32		NUT,HEX, 5/8" DIA, STL, ASTM A194 GR 2H			UNKNOWN,		1553473
54	NON-STOCK	#N/A	#N/A	#N/A	12	#N/A	ELBOW,PIPE, 20" NPS X 0.500 W.T., BW, 90 DEG, 1.5D RADIUS, STL, MSS SP-75, GR Y65, FULLY SEGMENTABLE, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
55	NOT USED	#N/A	#N/A	#N/A	NOT USED	#N/A	#N/A	#N/A		#N/A	#N/A	#N/A
56	NON-STOCK	#N/A	#N/A	#N/A	2	#N/A	ELBOW,PIPE, 20" NPS X 0.500 W.T., BW, 45 DEG, 3D RADIUS, STL, MSS SP-75, GR Y65, FULLY SEGMENTABLE, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
57	16845	1575615		PNG	8		ELBOW,PIPE, 16" NPS X 0.375 W.T., BW, 90 DEG, 1.5D RADIUS, STL, MSS SP-75, GR Y65, FULLY SEGMENTABLE, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4			UNKNOWN,		1575615
58	16714	1552954		PNG	2		ELBOW,PIPE, 12" NPS X 0.375 W.T., BW, 90 DEG, 1.5D RADIUS, STL, MSS SP-75, GR Y52, FULLY SEGMENTABLE, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4			UNKNOWN,		1552954
59	15833	1552865		PNG	1		ELBOW,PIPE, 10" NPS X 0.365 W.T., BW, 90 DEG, 1.5D RADIUS, STL, MSS SP-75, GR Y52, FULLY SEGMENTABLE, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4			HACKNEYLADIS,		1552865
60	15825	1552864		PNG	3		ELBOW,PIPE, 6" NPS X 0.28 W.T., BW, 90 DEG, 1.5D RADIUS, STL, MSS SP-75, GR Y52, FULLY SEGMENTABLE, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4			HACKNEYLADIS,		1552864
61	16269	1575614		PNG	6		ELBOW,PIPE, 2" NPS X 0.218 W.T., BW, 90 DEG, 1.5D RADIUS, STL, MSS SP-75, GR Y52, FULLY SEGMENTABLE, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4			UNKNOWN,		2-940-SEG
62	10022	1552345		PNG	14		ELBOW,PIPE, 1" NPS X 0.179 W.T., FPT, 90 DEG, 1D RADIUS, CLASS 3000, FORGED STL, ASME B16.11, ASTM A105 GR WPB, NON SEGMENTABLE			BOTH-WELLSTE,		1552345
63	17325	1557972		PNG	1		TEE,PIPE REDUCING, 24" NPS X 24" NPS RUN, 20" NPS BRANCH. WELD, STL, MSS SP-75, GR Y65, BBT, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4		20" NPS SHOULD HAVE 0.500" WT	UNKNOWN,		1557972
64	NON-STOCK	#N/A	#N/A	#N/A	1	#N/A	TEE,PIPE, 20" NPS X 20" NPS X 20" NPS X 0.500" W.T., WELD, STL, MSS SP-75, GR Y65, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
65	17315	1570152		PNG	6		TEE,PIPE REDUCING, 20" NPS X 20" NPS RUN, 16" NPS BRANCH. WELD, STL, MSS SP-75, GR Y65, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4		20" NPS SHOULD HAVE 0.500" WT	HACKNEYLADIS,		1570152
66	17314	1570148		PNG	4		TEE,PIPE REDUCING, 20" NPS X 20" NPS RUN, 12" NPS BRANCH. WELD, STL, MSS SP-75, GR Y65, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4		20" NPS SHOULD HAVE 0.500" WT	HACKNEYLADIS,		1570148
67	13556	1570193		PNG	1		TEE,PIPE REDUCING, 20" NPS X 20" NPS RUN, 10" NPS BRANCH. WELD, STL, MSS SP-75, GR Y65, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4		20" NPS SHOULD HAVE 0.500" WT	HACKNEYLADIS,		1570193
68	NON-STOCK	#N/A	#N/A	#N/A	2	#N/A	REDUCER,PIPE, CONCENTRIC, 20" NPS X 0.500 W.T. X 12" NPS X 0.375 W.T., WELD, STL, MSS SP-75, GR Y65, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
69	NON-STOCK	#N/A	#N/A	#N/A	1	#N/A	REDUCER,PIPE, CONCENTRIC, 20" NPS X 0.500 W.T. X 10" NPS X 0.365 W.T., WELD, MSS SP-75, GR Y65, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
70	15303	1553785		PNG	1		REDUCER,PIPE, CONCENTRIC, 12" NPS X 0.375 W.T. X 8" NPS X 0.280 W.T., WELD, STL, MSS SP-75, GR Y52, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4			HACKNEYLADIS,		1553785
71	1588264	1588264		PNG	4		OUTLET,PIPE,WELDOLET,36-20" RUN,2" BRANCH,CS,XS, ATSM A-694,FITTING,DESIGNED TO BE WELDED ON API 5L X65 NPS 20 & 24 LINE PIPE,CMTR REQUIRED			Bonney Forge	WELDOLET	Q1900114-79
72	NOT USED	#N/A	#N/A	#N/A	NOT USED	#N/A	#N/A	#N/A		#N/A	#N/A	#N/A
73	1588196	1588196		PNG	2		OUTLET,PIPE,THREADOLET, 36-12" RUN,1" BRANCH,THD,CS,3000 LB,ATSM A-694,FITTING,DESIGNED TO BE WELDED ON API 5L, X52 NPS 12 & 18" LINE PIPE,CMTR REQUIRED			Bonney Forge	THREDOLET	Q1900114-16
74	1588198	1588198		PNG	7		OUTLET,PIPE,THREADOLET, 36-12" RUN,1" BRANCH,THD,CS,3000 LB,ATSM A-694,FITTING,DESIGNED TO BE WELDED ON API 5L, X65 NPS 16, 20 & 24 LINE PIPE,CMTR REQUIRED			Bonney Forge	THREDOLET	Q1900114-17
75	1588194	1588194		PNG	2		OUTLET,PIPE,THREADOLET,10-6" RUN,1" BRANCH,THD,CS,3000 LB,ATSM A-694,FITTING,DESIGNED TO BE WELDED ON API 5L, X52 NPS 6, 8 & 10 LINE PIPE,CMTR REQUIRED			Bonney Forge	THREDOLET	Q1900114-15
76	1588189	1588189		PNG	1		OUTLET,PIPE,THREADOLET,36-14" RUN,3/4" BRANCH,THD,CS,3000 LB,ATSM A-694,FITTING,DESIGNED TO BE WELDED ON API 5L, X65 NPS 16, 20 & 24 LINE PIPE,CMTR REQUIRED			Bonney Forge	THREDOLET	Q1900114-10
77	1588132	1588132		PNG	1		OUTLET,PIPE,THREADOLET,2-1/2 TO 2" RUN,1/2" BRANCH,THD,CS,3000 LB,ATSM A-694,FITTING,DESIGNED TO BE WELDED ON API 5L X52 NPS 2 LINE PIPE,CMTR REQUIRED			Bonney Forge	THREDOLET	Q1900114-1

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. CONTRACTOR SHALL SUPPLY ALL NECESSARY CONSUMABLE ITEMS FOR SITE CONSTRUCTION.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:D1557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

REF. DWG(S)

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION		APPROVALS		
AREA CODE		DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	AW2123			
PROJECT NUMBER	1880115	DATE	INITIALS	MGR TECH REC & STD
DRAWING BY	RDC			
STATION ID	S0867O1	DATE	INITIALS	PRINCIPAL ENGINEER
CHECKER INITIALS	JBF	10/08/2020	CAB	

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
MECHANICAL BILL OF MATERIALS - 2

HAMILTON COUNTY, OHIO

SHEET(S) 44 OF 66	DWG SCALE AS NOTED
DWG DATE 09/05/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -M-004-0001067	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

MARK	LEGACY NUMBER	MAXIMO PART #	DATA SHEET?	SOURCE SYSTEM	QTY	RETIRED?	DESCRIPTION	ORDERING INSTRUCTIONS	ORDERING SPECIFICATIONS	MANUF	MODEL	MANUF PART #
78	17150	1554620		PNG	3		NIPPLE,PIPE, SWAGE, 2" NPS X 1" NPS X 0.218 W.T., BEVELED LARGE END X THD SMALL END, 6-1/2" LG, STL, MSS SP-95, ASTM A234 GR WPB, BARE, CONCENTRIC			UNKNOWN,		1554620
79	16400	1551462		PNG	4		NIPPLE,PIPE, 1/2" NPS X 0.147 W.T., THD BOTH END, 3" LG, STL, ASTM A733 A106 GR B, SMLS			SWAGELOKCO,UNKNOWN,		S-8-HLN-3.00, 1551462
80	16369	1551456		PNG	17		NIPPLE,PIPE, 1" NPS X 0.179 W.T., THD BOTH END, 3" LG, STL, ASTM A733 A106 GR B, SMLS			UNKNOWN,		1551456
81	16384	1551460		PNG	3		NIPPLE,PIPE, 1" NPS X 0.179 W.T., THD BOTH END, 6" LG, STL, ASTM A733 A106 GR B, SMLS			UNKNOWN,		1551460
82	16440	1551853		PNG	7		NIPPLE,PIPE, 3/4" NPS X 0.154 W.T., THD BOTH END, 3" LG, STL, ASTM A733 A106 GR B			UNKNOWN,		1551853
83	17468	1553210		PNG	4		PLUG,PIPE, 1/2" NPS, HEX HEAD, NPT, CLASS 3000, STL, ASME B16.11, ASTM A105			UNKNOWN,		1553210
84	17285	1553224		PNG	2		PLUG,PIPE, 3/4" NPS, HEX HEAD, NPT, CLASS 3000, STL, ASME B16.11, ASTM A105			UNKNOWN,		1553224
85	11112	50056601		ALL	25		PLUG,PIPE, 1" NPS, SQ HEAD, THD, CLASS 3000, FORGED STL, ASME B16.11, ASTM A105, GR 55			CAPITOLMFGCO, PHOENIXFORGE, BONNEY FORGE		12203310, 5.151410
86	NON-STOCK	#N/A	#N/A	#N/A	3	#N/A	INSULATOR, MONOLITHIC, WELD, 20" NPS, FORGED STL, ASTM A105, CLASS 600, ASME B16.11, W STYLE, API 5L PSL-2, GR X65. PIPE WITH 0.500" W.T, BEVEL ENDS 30 - 35 DEG WITH 1/16" LANDING	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
87	12845	1557618		PNG	4		INSULATOR, MONOLITHIC, WELD, 16" NPS, FORGED STL, ASTM A105, CLASS 600, ASME B16.11, W STYLE, MACHINED TO MATCH API 5L PSL-2, GR X65, PIPE WITH 0.375" W.T, BEVEL ENDS 30 - 35 DEG WITH 1/16" LANDING.			SYPRISTECHOL,		2000320943
88	17429	1557607		PNG	2		INSULATOR, MONOLITHIC, WELD, 12" NPS, FORGED STL, ASTM A105, CLASS 600, ASME B16.11, "W" STYLE, API 5L PSL-2, GR X52, PIPE WITH 0.375" W.T, BEVEL ENDS 30 - 35 DEG WITH 1/16" LANDING.			SYPRISTECHOL,		1000114075
89	16783	1557606		PNG	1		INSULATOR, MONOLITHIC, WELD, 10" NPS, FORGED STL, ASTM A105, CLASS 600, ASME B16.11, W STYLE, MACHINED TO MATCH API 5L PSL-2, PIPE WITH 0.365" W.T, BEVEL, ENDS 30 - 35 DEG WITH 1/16" LANDING.			SYPRISTECHOL,		2000315977
90	16061	1557603		PNG	1		INSULATOR, MONOLITHIC, WELD, 6" NPS, FORGED STL, ASTM A105, CLASS 600, ASME B16.11, W STYLE, MACHINED TO MATCH API 5L PSL-2, PIPE WITH 0.280" W.T, BEVEL, ENDS 30 - 35 DEG WITH 1/16" LANDING.			SYPRISTECHOL,		1000114041
91	11841	1555105		PNG	1		CLOSURE, THREADED CLOSURE, WELD, 2" NPS, CLASS 600, ASME B16.5 , , WELD-ON ASSEMBLY INCLUDES THREADED CLOSURE WITH NITIRILE (NBR) O-RING SEAL; NO HINGE; INCLUDE PRESSURE ALERT VALVE (PAV), AT TIME OF ORDER, SPECIFY "NATURAL GAS USE", THE DESIGN FACTOR, AND THE MATING PIPE'S WALL THICKNESS AND MATERIAL	SPECIFY DESIGN FACTOR, MATING PIPE WALL THK/ MATERIAL	FOR CONNECTION TO 2" NPS, 0.218" WT., API 5L-PSL2, GRADE X52 PIPE, DESIGN FACTOR IS 0.2, DESIGN PRESSURE 500PSIG	YALEMANUFACO,		H-50085
92	16443	1575633		PNG	1		INDICATOR, PIG SIGNAL ASSEMBLY, 3-6" NPS X 0.250-0.500 W.T., SS, FLAG AND MANUAL RESET NONEXTENDED SHAFT ASSEMBLY, 316 SS OMNIDIRECTIONAL PLUG ASSEMBLY, EXPLOSIVE DECOMPRESSION AND EXTRUSION RESISTANT VITON O-RING MATERIAL		NOTE THIS TDW PART NUMBER IS FOR PIPE SIZED 5IN AND GREATER, SO THE DESCRIPTION COULD USE AN UPDATE	TDWILLIAMSON,		04-9548-0000-51
93	NON-STOCK	#N/A	#N/A	#N/A	2	#N/A	CAP,PIPE, 20" NPS X 0.500 W.T., WELD, STL, MSS SP-75, GR Y65	#N/A	THIS COMPONENT DOES NOT EXIST IN THE CATALOG	#N/A	#N/A	#N/A
94	10076	1553765		PNG	1		CAP,PIPE, 12" NPS X 0.375 W.T., WELD, STL, MSS SP-75, GR Y52			HACKNEYLADIS,		1553765
95	15844	1553776		PNG	1		CAP,PIPE, 6" NPS X 0.280 W.T., WELD, STL, MSS SP-75, GR Y52			HACKNEYLADIS,		1553776
96	14151	1553338		PNG	1		FITTING, THREAD-O-RING, 2" X 30-6" NPS WE, STL, ASTM A333 GR. 6 ASME B31.8, , BARE, NIPPLE, ASTM A333. CAP, ASTM A105. PLUG, ASTM B-16 YELLOW BRASS. VITON O-RING			TDWILLIAMSON,		TR-0000-0002-00
97	15837	1570096		PNG	2		TEE,PIPE, 10" NPS X 10" NPS X 10" NPS X 0.365" W.T., WELD, STL, MSS SP-75, GR Y52, PAINTED PREFERRED, BARE ACCEPTABLE., MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG I-4			HACKNEYLADIS,		1570096
98	15098	1555773		PNG	1		REGULATOR,PRESSURE, DIRECT OPERATED, 1000 PSIG INLET, 3/4" NPS FPT, FISHER, 627R, 3/32 ORIFICE, RED SPRING, 70 TO 150 PSIG RANGE, INCLUDES INTERNAL RELIEF , MAIN VALVE INCLUDES (1) DUCTILE IRON BODY (2) DUCTILE IRON SPRING CASE AND DIAPHRAGM CASE (3) NITRILE (NBR) DIAPHRAGM (4) ALUMINUM TRIM (5) NITRILE (NBR) VALVE DISK, INCLUDE SCREENED VENT ASSEMBLY. FOR NATURAL GAS USE., PAINTED ANSI 49 GRAY.(SPRING 10B3079 X012)	SPECIFY SETPOINT. SPECIFY INTERNAL RELIEF SETPOINT. SPECIFY ORIFICE SIZE. SPECIFY MAIN VALVE SPRING (OUTLET PRESSURE RANGE, PART NUMBER, COLOR). UNLESS OTHERWISE SPECIFIED, BODY SPRING CASE ORIENTATION AND SPRING CASE VENT LOCATION TO BE STANDARD POSITION.	SET POINT OF 80 PSIG. INTERNAL RELIEF SETPOINT OF 90 PSIG. ORIFICE SIZE OF 3/32". RED SPRING 10B3079X012	FISHERCONTRO,		627R, UNKNOWN
99	15110	1555760		PNG	1		REGULATOR,PRESSURE, DIRECT OPERATED, 1000 PSIG INLET, 3/4" NPS FPT, FISHER, 627R, 3/32 ORIFICE, BLUE SPRING, 35 TO 80 PSIG RANGE, INCLUDES INTERNAL RELIEF , MAIN VALVE INCLUDES (1) DUCTILE IRON BODY (2) DUCTILE IRON SPRING CASE AND DIAPHRAGM CASE (3) NITRILE (NBR) DIAPHRAGM (4) ALUMINUM TRIM (5) NITRILE (NBR) VALVE DISK, INCLUDE SCREENED VENT ASSEMBLY. FOR NATURAL GAS USE., PAINTED ANSI 49 GRAY.(SPRING 10B3078 X012)	SPECIFY SETPOINT. SPECIFY INTERNAL RELIEF SETPOINT. SPECIFY ORIFICE SIZE. SPECIFY MAIN VALVE SPRING (OUTLET PRESSURE RANGE, PART NUMBER, COLOR). UNLESS OTHERWISE SPECIFIED, BODY SPRING CASE ORIENTATION AND SPRING CASE VENT LOCATION TO BE STANDARD POSITION.	SET POINT OF 75 PSIG. INTERNAL RELIEF SETPOINT OF 85 PSIG. ORIFICE SIZE OF 3/32". BLUE SPRING 10B3078X012	FISHERCONTRO,		627R, UNKNOWN
100	11092	1552355		PNG	2		ELBOW,PIPE, 3/4" NPS X 0.154 W.T., THD, 90 DEG, 1D RADIUS, CLASS 3000, FORGED STL, ASME B16.11, ASTM A105 GR WPB, NON SEGMENTABLE, STREET			BOTH-WELLSTE,		1552355
101	11446	1558058		PNG	3		TEE,PIPE, 3/4" NPS X 3/4" NPS X 1/2" NPS, FNPT, CLASS 3000, FORGED STL, ASME B16.11, ASTM A105			BONNEYFORGEC,		1558058
102	10415	1550783		PNG	4+36 FT		PIPE, 3/4" NPS X 0.154 W.T., DBL RANDOM LG, SQ ENDS, SEAMLESS, BARE, STL, ASTM A106, GR B			UNKNOWN,		1550783
103	1588188	1588188		PNG	1		OUTLET,PIPE,THREADOLET,12-6" RUN,3/4" BRANCH,THD,CS,3000 LB,ATSM A-694,FITTING,DESIGNED TO BE WELDED ON API 5L X52 NPS 6, 8 & 12 LINE PIPE,CMTR REQUIRED		THIS THREADOLET IS FOR NPS 10	Bonney Forge	THREDOLET	Q1900114-9
104	17297	1557796		PNG	16+24 FT		PIPE, 1" NPS X 0.179 W.T., SRL RANDOM LG, BEVELED ENDS, SEAMLESS, FBE, STL, ASTM A106, GR B	Does not come in DRL		UNKNOWN,		1557796
105	17234	1557790		PNG/KY-OH	36+24 FT		PIPE, 1" NPS X 0.179 W.T., 20' RANDOM LG, BEVELED ENDS, SEAMLESS, BARE, STL, ASTM A106, GR B			IPSCOINC		1-179-20LG-AS TMA106-BARE
106	16006	1556900		PNG	8		TEE, SERVICE TEE, 1" NPS, WELD, FORGED STL, ASME B16.11, ASME B16.11, ASTM A105, NO-BLO SERVICE, BARE, CAP, ASTM A105, TAPPING TEE			MUELLERCO,		330H17501
107	NON-STOCK	#N/A	#N/A	#N/A	100 FT	#N/A	PIPE, 4" IPS, SCH 40, POLYVINYL CHLORIDE (PVC)	#N/A		#N/A	#N/A	#N/A
108	NON-STOCK	#N/A	#N/A	#N/A	4	#N/A	CAP,PIPE, 4" IPS, PVC, SCH 40, POLYVINYL CHLORIDE (PVC), SOCKET BY SOCKET	#N/A		#N/A	#N/A	#N/A
109	15391	1552377		PNG	7		ELBOW,PIPE, 4" IPS, 90 DEG, PVC, S X S, SCH 40 4" DIAMETER POLYVINYL CHLORIDE (PVC)90 DEGREE ELBOW SCHEDULE 40 SOCKET BY SOCKET0			NIBCOINC,		1552377
110	50119345	50119345		CH/KT	100 FT		TUBING,METALLIC, 3/8" OD, 20' LG, 0.035" WALL, SEAMLESS 316 SS, ASTM A269			RALEIGHVALVE,SWAGELOKCO,		SS-T6-S-035-20
111	15155	4015958		PNG	1		COUPLING, TUBING, 1/2" NPS TUBE X 3/4" NPS NPT, SS, COMPRESSION			SWAGELOKCO,		SS-810-1-12
112	NON-STOCK	#N/A	#N/A	#N/A	1	#N/A	ODORANT INJECTION PROBE, 3/4" MNPT, WITH SIGHTGLASS	#N/A	WILL BE PROVIDED WITH ODORIZER	#N/A	#N/A	#N/A
113	11322	1553333		PNG	1		UNION,PIPE, 3/4" NPS, FPT, CLASS 3000, FORGED STL, MSS SP-83, ASTM A105, INSULATED UNION, O-RING TYPE, FLAT FACE			GEORGFISCHER,		108757510000
114	16009	1554535		PNG	100 FT		TUBING,METALLIC, JACKETED, 1/4" OD, 100' LG, 0.035" WALL, SEAMLESS 316 SS, ASTM A269, JACKETED, F/ NATURAL GAS USE			DEKORONINC,		2240-27350
115	17509	1554574		PNG	2		SUPPORT, PIPE, 20" NPS, STL, SUPPORT PIPE 20 EZ-LINE TYPE WSBC-01 ADJUSTABLE SUPPORT SHIM BLOCKS WITH CLAMP FOR 20" STEEL PIPE, 1/8" THICK PVC LINING INSIDE CLAMP AND TOP OF SHIM BLOCKS, SHIM BLOCKS AND CLAMP FABRICATED FROM ASTM A-572 GR. 50,, STEEL BASE PLATE WITH 4 SLOTTED HOLES ADJUSTMENT SHIM BLOCKS AND CLAMP TOP PREVENT BOTH LATERAL AND VERTICAL PIPE MOVEMENT, ENTIRE ASSEMBLY TO BE GALVANIZED COATED,, E-Z LINE PIPE SUPPORT CO PART #WSBC-01, PROVIDE ANCHOR BOLTS WITH NUTS AND WASHERS			EZLINEPIPESU,		1554574

NOTES:

1. ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
2. CONTRACTOR SHALL SUPPLY ALL NECESSARY CONSUMABLE ITEMS FOR SITE CONSTRUCTION.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:D1557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

REF. DWG(S)

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB

DESCRIPTION		APPROVALS		
AREA CODE		DATE	INITIALS	REGIONAL ENGINEER
ACCOUNT NUMBER	AW2123			
PROJECT NUMBER	1880115			MGR TECH REC & STD
DRAWING BY	RDC	DATE	INITIALS	
STATION ID	S0867O1			PRINCIPAL ENGINEER
CHECKER INITIALS	JBF	10/08/2020	CAB	

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
MECHANICAL BILL OF MATERIALS - 3

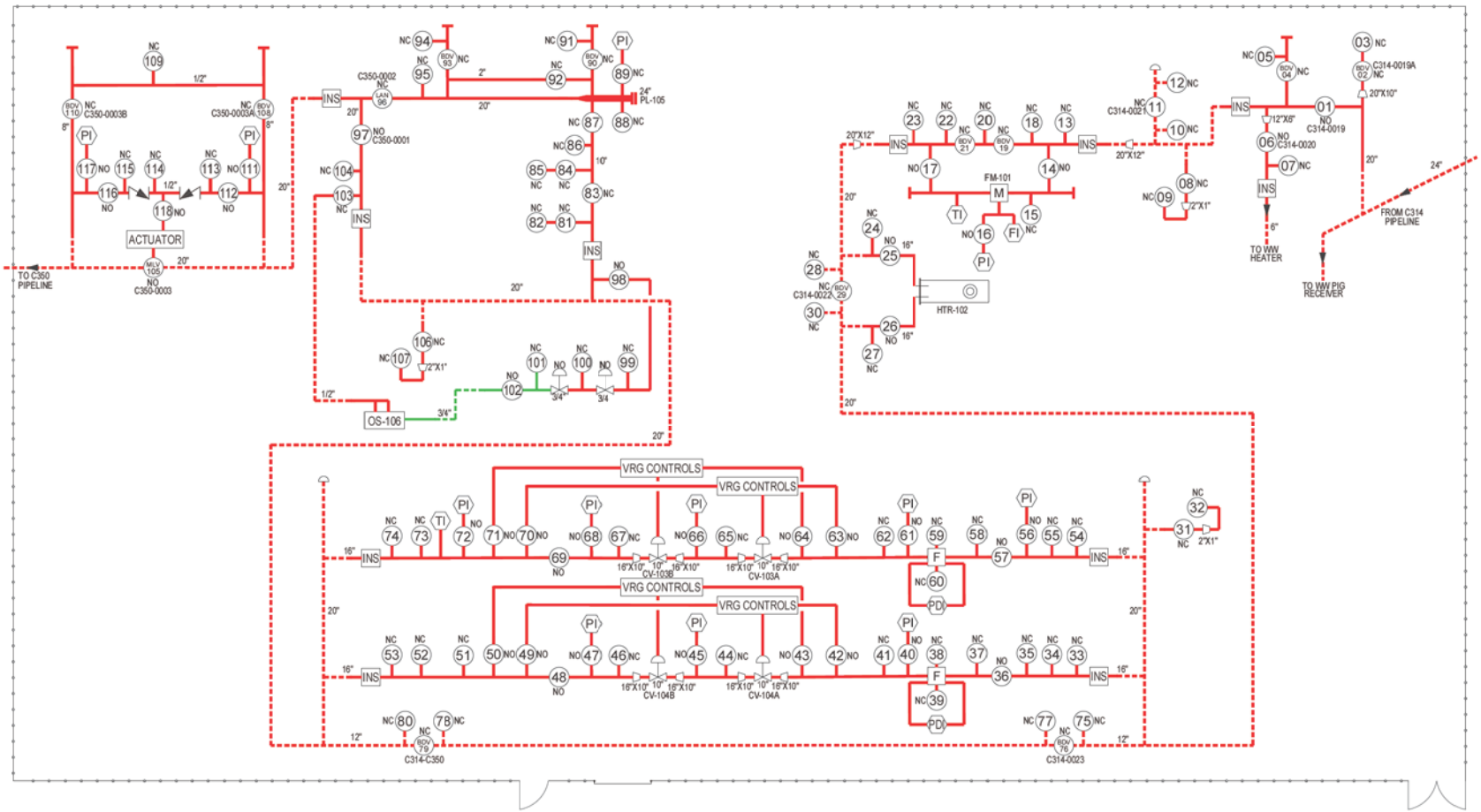
HAMILTON COUNTY, OHIO

SHEET(S) 45 OF 66	DWG SCALE AS NOTED
DWG DATE 09/05/2018	SUPERSEDED —

DRAWING NUMBER: PNG -M-004-0001068 | REVISION: 0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

STATION ID : S0867O1



EMERGENCY SCHEMATIC PLAN
HIGHPOINT PARK
HAMILTON COUNTY, OHIO

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

LEGEND

- NO or NC — VALVE
- REMOTE OPERATED VALVE
- NC — BLOWDOWN VALVE
- NC — BYPASS VALVE
- NO or NC — LAUNCHER VALVE
- NO or NC — RECEIVER VALVE
- NO or NC — VALVE - OTHER - NON PNG
- CHECK VALVE
- RELIEF VALVE
- REGULATOR
- F — FILTER / SEPARATOR
- F/S — FILTER / STRAINER
- M — METER
- INS — INSULATOR
- GAS FLOW
- S — SPECIAL EQUIP (ANNOTATE)
- FIRE EXTINGUISHER

NO = VALVE IS NORMALLY OPEN
NC = VALVE IS NORMALLY CLOSED

- REDUCER
- HEATER — HEATING UNIT
- LAUNCHER / RECEIVER
- FENCING
- GREATER THAN 150 PSI - ABOVE GROUND
- GREATER THAN 150 PSI - BELOW GROUND
- 100 TO 150 PSI - ABOVE GROUND
- 100 TO 150 PSI - BELOW GROUND
- LESS THAN 100 PSI - ABOVE GROUND
- LESS THAN 100 PSI - BELOW GROUND
- BY-PASS LINE - ABOVE GROUND
- BY-PASS LINE - BELOW GROUND

STATE OF OHIO — CHAD A BACON — PE.85638 — REGISTERED PROFESSIONAL ENGINEER
11/30/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10-08-2020	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB
1	11-30-2020	ADDED ADDITIONAL VALVES	RDC	JBF	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	NFH
STATION ID	S0867O1
CHECKER INITIALS	JBF

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	11/30/2020	CAB

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
EMERGENCY SCHEMATIC
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S)	46 OF 66
DWG SCALE	NONE
DWG DATE	06/11/2020
SUPERSEDED	—
DRAWING NUMBER	PNG -X-004-0001020
REVISION	1

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

ELECTRICAL GENERAL NOTES:

1. ALL ELECTRICAL WORKS, ALL MATERIALS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), APPLICABLE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA), AND AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), UNDERWRITERS LABORATORIES (UL), NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE), INSTALLATION DRAWINGS, SPECIFICATIONS AND LOCAL CODES.
   A.) ALL MATERIALS SHALL BE NEW, LISTED AND LABELED BY AN APPROVED ORGANIZATION.
   B.) ALL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER AS DEFINED BY PIPELINE INDUSTRY BEST PRACTICES AND NEC.
2. MANUFACTURER'S MODEL NUMBERS SPECIFIED HEREIN ARE USED FOR FACILITATING DESCRIPTION AND ESTABLISHING A STANDARD OF QUALITY AND REQUIRED DESIGN CHARACTERISTICS.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONSTRUCT ALL ELECTRICAL ITEMS IN FULL ACCORDANCE WITH PROJECT DRAWINGS, NOTES AND THE CLIENT SPECIFICATIONS AND STANDARDS.
4. ALL ELECTRICAL WORK SHALL COMPLY IN THE FOLLOWING ORDER:
   A.) CODES AND REGULATIONS CALLED OUT ABOVE AND CALLED OUT IN DUKE STANDARDS AND SPECIFICATIONS
   B.) DUKE CONSTRUCTION STANDARDS, DUKE ELECTRICAL STANDARDS AND DUKE SPECIFICATIONS
   C.) ELECTRICAL GENERAL NOTES
5. RACEWAY OPENINGS THROUGH GRATING SHALL BE FINISHED IN A NEAT WORKMANLIKE MANNER. OPENINGS FOR MULTIPLE CONDUITS AND CABLES SHALL INCLUDE A KICK PLATE.
6. RACEWAYS OR CONDUITS CROSSING BUILDING OR STRUCTURAL EXPANSION JOINTS SHALL BE PROVIDED WITH 40 PERCENT (40%) FILL SEALS EXPANSION FITTINGS, CROUSE-HINDS TYPE EYSX (OR EQUAL). THESE FITTINGS SHALL BE INSTALLED IN A MANNER THAT WILL ASSURE GROUND PATH CONTINUITY IN EACH CONDUIT OR RACEWAY, WHERE REQUIRED BY NEC. IF EXPANSION FITTINGS DO NOT HAVE AN APPROVED INTEGRAL GROUND, AN EXTERNAL BONDING JUMPER SHALL BE PROVIDED.
7. THE FOLLOWING MOUNTING HEIGHTS SHALL BE USED TO LOCATE THE TOP OF EQUIPMENT ABOVE FINISHED FLOORS OR PLATFORMS UNLESS NOTED OTHERWISE:
   A.) 1 FEET 6 INCHES (18") CONVENIENCE OUTLETS IN FINISHED WALL AREAS.
   B.) 3 FEET (3'-0") CONVENIENCE OUTLETS IN PLANT AREAS.
   C.) 4 FEET 6 INCHES (4'-6") CONTROL STATIONS, POWER RECEPTACLES, MANUAL MOTOR STARTER SWITCHES.
   D.) 6 FEET (6'-0") CONTROLLERS, STARTERS, SAFETY SWITCHES, POWER PANELS, DC PANELS, LIGHTING PANELS, SMALL CONTROL PANELS, JUNCTION BOXES.
8. THE CONTRACTOR SHALL INSTALL ADDITIONAL PULL POINTS (PULL SLEEVES, WIREWAYS, PULL BOXES OR CONDULETS) WHERE REQUIRED TO LIMIT THE NUMBER OF EQUIVALENT 90 DEGREE (90°) BENDS TO THE REQUIREMENTS OF THE NEC. MAXIMUM LENGTH OF RUNS BETWEEN PULL POINTS SHALL BE 250 FEET (250'-0") FOR STRAIGHT RUNS AND NOT TO EXCEED 360 DEGREES (360°). THESE PULL POINTS SHALL BE OF THE TYPE TO MEET AREA ENVIRONMENT REQUIREMENTS, SUCH AS HAZARDOUS AREA CLASSIFICATION AND WEATHER RATING. NUMBER OF PULL POINTS REFLECTED ON DRAWINGS MAY NOT REFLECT TOTAL. WHETHER OR NOT THEY ARE SHOWN ON DRAWINGS, ANY ADDITIONAL PULL POINTS WILL BE PROVIDED BY CONTRACTOR TO MEET REQUIREMENTS PER THESE NOTES AND NEC.
9. ALL ELECTRICAL DEVICES SUCH AS JUNCTION BOXES, PULL BOXES, LIGHTING PANELS, ELECTRONIC PANELS, LOCAL CONTROL STATIONS, LOCAL STARTERS AND SAFETY SWITCHES SHALL BE PROVIDED WITH LAMINATED NAMEPLATES ENGRAVED WITH THE EQUIPMENT NAME AND NUMBER PER OWNER STANDARD.
10. JUNCTION BOXES AND PULL BOXES WHICH CONTAIN BOTH POWER AND CONTROL CIRCUITS SHALL BE LABELED ON THE OUTSIDE OF THE COVER, LISTING THE HIGHEST VOLTAGE. POWER CABLE, CONTROL CABLE AND CABLE OF DIFFERENT VOLTAGE LEVEL SHALL BE SEPARATED PER NEC AND AS SHOWN IN DRAWINGS.
11. CONDUITS TRANSITIONING FROM UNDERGROUND TO ABOVE GROUND OR VICE VERSA SHALL HAVE A 40 PERCENT (40%) CONDUIT SEAL INSTALLED.
12. FOR ALL CONDUITS AND CABLES PENETRATING WALLS OR FLOORS ABOVE THE GROUND FLOOR, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING NECESSARY BLOCK-OUTS OR PIPE SLEEVES (THEY SHALL BE LEVEL AND SYMMETRICAL) FOR CONDUIT PENETRATION, WHETHER SHOWN ON THE DRAWINGS OR NOT. THIS WORK SHALL BE COORDINATED WITH THE CONCRETE POUR TO ELIMINATE AS MUCH CORE DRILLING AS POSSIBLE.
13. ALL CONDUIT 90 DEGREE (90°) BENDS (EITHER FACTORY PURCHASED OR FIELD BENT) SHALL BE OF THE MINIMUM RADIUS SHOWN IN LATEST NEC TABLE 2. ALL OFFSETS AND SWEEPS SHALL BE FIELD BENT TO A MINIMUM RADIUS AS SHOWN IN NEC TABLE 2. ALL FIELD BENDS SHALL BE MADE WITH A MACHINE BENDER.
14. IN ORDER TO PREVENT CABLE DAMAGE, ALL ROUGH EDGES SHALL BE GROUND SMOOTH AFTER INSTALLATION.
15. REDUCERS (SIZE AS REQUIRED) SHALL BE INSTALLED AT EQUIPMENT OR DEVICE CONDUIT OPENINGS TO SUIT CONDUIT AND CABLE SIZE SHOWN ON DRAWINGS.
16. ALL FITTINGS SHALL BE OF THE LONG RADIUS TYPE WITH VOLUMES MEETING THE LATEST NEC REQUIREMENTS. RETAINING CLIP TYPE COVER BOLTS ARE NOT ACCEPTABLE. ALL COVERS SHALL BE PROVIDED WITH NEOPRENE GASKETS.
17. LIQUIDTIGHT FLEXIBLE METAL CONDUIT ARE NOT SHOWN ON PLAN DRAWINGS BUT ALL CONDUIT, WHEN USED, SHALL BE TERMINATED AT MOTORS, DEVICES AND INSTRUMENTATION WITH LIQUIDTIGHT FLEXIBLE CONDUIT EXCEPT WHERE DEVICES ARE MOUNTED ON WALLS OR COLUMNS AND NOT SUBJECT TO MOVEMENT DUE TO VIBRATION OR EXPANSION AND CONTRACTION. FLEXIBLE CONDUIT FOR MOTOR SHALL HAVE EXTERNAL GROUND IF IN CLASS 1 DIVISION 2 AREA AND SHALL BE UL LISTED AND LABELED AS CLASS 1 DIVISION 1 IF IN CLASS 1 DIVISION 1 AREA.
18. ALL CONDUIT AND CABLES FITTINGS, JUNCTION BOXES, PULL BOXES, AND ELECTRICAL EQUIPMENT IN HAZARDOUS AREAS SHALL BE APPROVED FOR USE IN THAT HAZARDOUS AREA AND SHALL BE LABELED AND LISTED FOR THAT AREA. SEALS SHALL BE INSTALLED AS REQUIRED BY THE LATEST NEC.
19. WHERE THERE IS A CHANGE OF ELEVATION IN AN OUTDOOR ABOVE GRADE CONDUIT RUN, INSTALL A FITTING WITH A DRAIN AT THE LOWEST POINT. ADDITIONALLY, CONDUIT SEAL IS REQUIRED WITHIN 10 FEET (10'-0") OF AN AREA CLASS BOUNDARY CHANGES.
20. ALL CONDUIT LEAVING A CLASSIFIED AREA SHALL HAVE A SEAL INSTALLED WITHIN 10 FEET (10'-0") OF A DIVISION LINE.
   - REFER TO AREA CLASSIFICATION DRAWING.
   - REFER TO NEC 501.15(B)(2) AND 501.15(A)(4).
   - EXPLOSION-PROOF ENCLOSURES SHALL HAVE ITS CONDUIT SEALED WITHIN 1 FEET 6 INCHES (18") OF THE ENCLOSURE PER NEC 501,15(B)(1) AND 501.15(A)(1).
21. WHERE APPLICABLE ALL ELECTRICALLY OPERATED DEVICES, MOTORS AND EQUIPMENT SHALL BE PROPERLY MARKED, LABELED, BE TEMPERATURE RATED, AND APPROVED FOR USE IN THAT HAZARDOUS AREA. ALL ELECTRICAL INSTALLATIONS SHALL ADHERE TO NFPA 70 ARTICLE 501.
22. ALL OUTDOOR ENCLOSURES SHALL HAVE A DRAIN FITTING INSTALLED AND A GROUND LUG FOR EXTERNAL CONNECTION TO THE GROUND GRID.
23. STUB-UPS AND BOXES SHALL BE PROVIDED WITH GROUND BUSHINGS. STEEL CONDUITS CONNECTIONS SHALL BE THREADED WRENCH-TIGHT WITH CONDUCTIVE THREAD COMPOUND.
24. ALL SPARE CONDUITS SHALL BE STUBBED-UP AND PLUGGED. ALL UNUSED CONDUIT, CONDUIT ENTRIES IN FITTINGS, JUNCTION BOXES AND EQUIPMENT SHALL BE PLUGGED.
25. CONDUIT SHALL REMAIN PLUGGED ON BOTH ENDS UNTIL WIRE IS PULLED. INSTALL CONDUIT BUSHING AND GROUNDING BUSHING BEFORE PULLING WIRE.
26. MANUFACTURER APPROVED PULLING COMPOUND OR LUBRICANT SHALL BE USED WHERE NECESSARY. GREASE SHALL NOT BE USED. COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURERS RECOMMENDED MAXIMUM PULLING TENSIONS AND SIDEWALL PRESSURE VALUES.
27. AFTER PULLING WIRE, THE CONTRACTOR SHALL PERFORM AN INSULATION RESISTANCE TEST TO ENSURE IT HAS NOT BEEN DAMAGED. THE APPLIED POTENTIAL SHALL BE 500 VOLTS DC FOR 300-V CABLES AND 1000 VOLTS DC FOR 600-V CABLES. TEST DURATION SHALL BE 1 MINUTE. VALUES SHALL NOT BE LESS THAN 50 MEGAOHMS. THESE TESTS SHALL BE DOCUMENTED AND SUBMITTED TO OWNER AND THE REPRESENTATIVE OF THE OWNER.
28. CONTRACTOR SHALL PERFORM CONTINUITY TESTS TO ENSURE CORRECT CABLE CONNECTION. THESE TESTS SHALL BE DOCUMENTED AND SUBMITTED TO OWNER AND THE REPRESENTATIVE OF THE OWNER.
29. CONDUIT DRAINS OR DRAIN SEALS SHALL BE INSTALLED AT ALL LOW POINTS IN THE CONDUIT SYSTEM.
30. ALL SUPPORTING SYSTEM ACCESSORIES AND CONDUIT ATTACHING DEVICES SUCH AS BUT NOT LIMITED TO BOLTS, NUTS, WASHERS, CLAMPS, THREADED RODS SHALL BE HOT-DIPPED GALVANIZED STEEL.
31. ALL CONDUIT AND CABLE SHALL BE MARKED USING APPROVED MANUFACTURED TYPE MARKERS AND LABELS. NO TAPE OR HAND WRITTEN MARKERS ARE PERMITTED.
32. CONTRACTOR SHALL FOLLOW A MINIMUM OF THE FOLLOWING STANDARDS WHEN PERFORMING WORK:
   - NECA 1 STANDARD PRACTICE OF GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION
   - NECA 101 STANDARD FOR INSTALLING STEEL CONDUIT [RIGID METAL CONDUIT (RMC), INTERMEDIATE METAL CONDUIT (IMC), ELECTRICAL METALLIC TUBING (EMT)]
   - NECA 130 STANDARD FOR INSTALLING AND MAINTAINING WIRING DEVICES
   - NECA 331 STANDARD FOR BUILDING AND SERVICE ENTRANCE GROUNDING AND BONDING
   - NECA 505 STANDARD FOR INSTALLING AND MAINTAINING HIGH MAST, ROADWAY AND AREA LIGHTING
   - NECA 90 RECOMMENDED PRACTICE FOR COMMISSIONING BUILDING ELECTRICAL SYSTEMS

BELOW GRADE CONDUIT AND CABLE SYSTEM:

1. ALL CONDUIT AND CABLE RUNS ARE SHOWN DIAGRAMMATICALLY ONLY. THE EXACT ROUTING AND ARRANGEMENT SHALL BE DETERMINED BY THE CONTRACTOR TO SUIT MECHANICAL AND STRUCTURAL CONDITIONS AND GET AN APPROVAL FROM OWNER PRIOR TO INSTALLATION. FINAL ROUTING SHALL BE RECORDED BY THE CONTRACTOR AND SUBMITTED TO OWNER FOR APPROVAL PRIOR TO INSTALLATION. SUPPORTS ARE TO BE PROVIDED BY THE CONTRACTOR AT INTERVALS NOT TO EXCEED CODE REQUIREMENTS. CONDUIT AND CABLE SHALL NOT BE SUPPORTED FROM PIPE HANGERS. CONDUITS AND CABLES SHALL BE INSTALLED PARALLEL TO OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS OR THE INTERSECTION OF VERTICAL PLANES AND CEILINGS UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
2. UNDERGROUND CONDUITS SHALL BE PER DUKE STANDARDS AND SPECIFICATIONS.
3. CONDUITS SHALL SLOPE AT LEAST 3 INCHES (3") PER 100 FEET (100'-0") AND BE ARRANGED TO DRAIN INTO MANHOLES OR CABLE VAULTS. ALL CONDUIT RUNS SHALL BE INSTALLED TO BE FREE OF MOISTURE TRAPS.
4. CONDUIT SIZES SHALL BE AS SHOWN ON THE ASSOCIATED CABLE SCHEDULE AND PLAN DRAWINGS.
5. CONDUIT AND CABLE INSTALLATION SHALL FOLLOW EXCAVATION AS CLOSELY AS PRACTICAL. CONDUIT AND CABLE SHALL BE INSTALLED IN DRY TRENCHES MAINTAINED FREE OF ACCUMULATED WATER. TRENCH BOTTOM SHALL BE GRADED SMOOTH, FREE OF STONES, SOFT SPOTS AND LEVEL WITH SLOPE OF GRADE.
6. WUNPEECE (OR APPROVED EQUAL) PLASTIC SEPARATORS SPACED AT INTERVALS OF NOT MORE THAN 20 FEET (20'-0") SHALL BE PLACED ON THE BOTTOM OF THE TRENCH AND THE FIRST TIER OF THE CONDUITS. THE SEPARATION BETWEEN CONDUITS SHALL BE 3 INCHES (3"), UNLESS NOTED OTHERWISE. SUCCEEDING TIERS SHALL BE LAID ON SPACERS, PLACED ON TOP OF THE TIER BELOW.
7. DUCT BANK SPACERS AND JOINTS IN TIERS OF CONDUITS SHALL BE STAGGERED. THE COMPLETED DUCT BANK SHALL BE TIGHTLY WRAPPED WITH TWO TURNS OF #12 IRON WIRE AT 10 FEET (10'-0") INTERVALS TO MAINTAIN ALIGNMENT OF TIERS. WHERE DUCTS CROSS UNDER ROADWAYS, RAILROADS, DISTURBED SOIL, AND OPEN TRENCHES, SUCH AS FOR SEWERS OR WATER MAINS, A REINFORCED CONCRETE ENCASEMENT SHALL BE PROVIDED.
8. CONDUIT STUB-UPS (INDOOR AND OUTDOOR) SHALL BE TERMINATED WITH A COUPLING 6 INCHES (6") ABOVE THE FLOOR AND DUCT BANK ENCASEMENT FOR EXTENSION OF THE CONDUIT EXCEPT FOR CONDUITS UNDER MAJOR EQUIPMENT WHICH SHALL BE TERMINATED WITH A COUPLING FLUSH WITH THE FLOOR. ABOVE GRADE CONDUIT EXTENSIONS INCLUDING 90 DEGREE (90°) ELBOWS SHALL BE RIGID GALVANIZED STEEL (RGS). CONDUIT STUB-UPS SHALL BE ENCASED IN CONCRETE FROM A POINT 3 FEET (3'-0") FROM THE START OF THE BEND TO FLUSH WITH THE FLOOR UNDER EQUIPMENT OR 6 INCHES (6") ABOVE FLOOR AND GRADE FOR CONDUIT RISERS. ALL SPARE CONDUIT STUB-UPS SHALL BE THREADED, CAPPED AND LABELED "SPARE". INSTALL GROUNDING BUSHINGS AS REQUIRED.
9. PRIOR TO BACKFILL, EACH CONDUIT SHALL BE CLEANED AND TESTED (MANDATORY) WITH A MANDREL WITH DIAMETER NOT MORE THAN ¼ OF AN INCH (1/4") LESS THAN CONDUIT INSIDE DIAMETER (POSSIBLE MANDREL MANUFACTURERS, CONDUX INTL., OR GREENLEE). MANDRELS MUST BE APPROVED AND VERIFIED BY OWNER AND THE OWNER REPRESENTATIVE.
10. ALL BURIED CONDUIT SHALL HAVE A MINIMUM OF 2 FEET (2'-0") OF BELOW GRADE COVERAGE.
11. ALL BELOW GRADE CONDUIT AND CONTINUING FOR A DISTANCE OF 1 FEET 6 INCHES (18") MINIMUM ABOVE GRADE SHALL BE 40 MIL PVC COATED RIGID STEEL CONDUIT.
12. BACKFILL AND COMPACT FILL TO HAVE A MINIMUM OF 2 FEET (2'-0") ABOVE TOP OF DUCT BANK. INSTALL A CONTINUOUS WARNING STRIP OF 6 INCHES (6") WIDE RED DETECTABLE UNDERGROUND TAPE WITH LEGEND "CAUTION-ELECTRIC LINE BURIED BELOW" PANDUIT CATALOG NUMBER HTDU6R-E (OR EQUAL). CONTINUE BACKFILL AND COMPACTING PER SPECIFICATIONS. ALL BELOW GRADE CONDUIT RUNS REQUIRE CAUTION TAPE INSTALLED ABOVE CONDUIT.

UNDERGROUND CONDUIT INSTALLATION:

1. INSTALLATION OF THE CONDUIT AND CABLE SHOULD BEGIN BY PLACING A 2 INCHES (2") LAYER OF GRANULAR FILL MATERIAL IN THE BOTTOM OF THE TRENCH AS A BASE FOR THE BOTTOM CONDUIT TIER. CARE MUST BE TAKEN HOWEVER, TO EXCAVATE MATERIAL FROM UNDER THE CONDUIT AND CABLE COUPLINGS TO ASSURE A SMOOTH HORIZONTAL RUN.
2. WHEN THE CONDUIT AND CABLE HAS BEEN LAID AND THE SEPARATORS POSITIONED BETWEEN THEM, THE FIRST LAYER OF FILL IS ADDED. THE MATERIAL IS NOW TAMPED AS REQUIRED TO ACHIEVE THE DESIRED PROCTOR DENSITY AT WHICH TIME THE SPACERS ARE REMOVED. FILL AND TAMP ALL VOIDS CREATED BY THEIR REMOVAL.
3. THE INSTALLATION IS NOW READY FOR THE SECOND LAYER OF CONDUIT AND CABLE WHICH IS PLACED IN THE SAME MANNER AS THE FIRST LAYER.
4. PLACEMENT OF THE CONDUIT AND CABLE SHALL BE DONE IN SUCH A WAY AS TO STAGGER THE LOCATION OF THE COUPLINGS BOTH HORIZONTALLY AND VERTICALLY.
5. THIS PROCEDURE OF LAYING CONDUIT AND CABLE, BACKFILLING AND TAMPING IS CONTINUED UNTIL THE APPROPRIATE NUMBER OF CONDUITS HAVE BEEN INSTALLED.
6. AFTER THE FINAL LAYER OF TAMPING AND COMB REMOVAL IS COMPLETE, NATIVE MATERIAL MAY BE USED TO FINISH THE BACKFILLING OPERATION UP TO GRADE AS PER PROJECT SPECIFICATIONS.

GROUNDING GENERAL NOTES:

1. ALL GROUNDING MATERIALS - INCLUDING BUT NOT LIMITED TO GROUND CABLE, GROUND RODS, TEST WELLS, CONNECTIONS, NUTS AND BOLTS SHALL BE PROVIDED BY CONTRACTOR UNLESS NOTED OTHERWISE.
2. FINAL EXACT GROUND ROUTING SHALL BE DETERMINED BY CONTRACTOR IN THE FIELD.
3. GROUNDING WORK SHALL CONFORM TO THE LATEST EDITION OF NEC.
4. GROUNDING WORK AND ALL GROUNDING MATERIALS SHALL COMPLY THE CLIENT STANDARDS AND SPECIFICATIONS.
5. THE TOTAL RESISTANCE TO GROUND OF THE COMPLETE GROUNDING SYSTEM SHALL BE LESS THAN 5 OHMS AND SHALL BE RECORDED AND SUBMITTED TO THE CLIENT.
6. GROUNDING SYSTEM SHALL CONSIST OF GALVANIZED STEEL GROUND RODS INTERCONNECTED BY 2/0 AWG 600V SIZE CONDUCTORS AS SHOWN ON THE GROUNDING DRAWINGS.
7. GALVANIZED STEEL GROUND RODS SHALL BE MINIMUM OF (3/4" X 10") 10-MIL THICK. TOP OF GROUND RODS SHALL BE A MINIMUM OF 1.5 FEET (1'-6") BELOW GRADE.
8. CONTRACTOR SHALL USE CORROSION RESISTANT BACKFILL PER NEC 250.62 WHERE APPLICABLE.
9. ALL BURIED GROUND CONDUCTORS TO BE LAID SLACK IN TRENCHES TO PREVENT STRESS AND BREAKAGE. GROUND CABLES SHALL BE INSTALLED
   - A MINIMUM OF 1.5 FEET (1'-6") BELOW GRADE.
   - 3 FEET (3'-0") MINIMUM DISTANCE FROM BUILDING FOOTINGS AND FOUNDATIONS, AND
   - 1 FEET (12") DISTANCE AWAY FROM ALL OTHER UNDERGROUND FACILITIES INCLUDING GAS PIPELINE.
10. PROVIDE MINIMUM 10 FEET (10'-0") OF GROUNDING CONDUCTOR PIGTAIL ABOVE FINISHED FLOOR ELEVATION TO ALLOW FOR CONNECTION TO STRUCTURAL STEEL OR EQUIPMENT UNLESS OTHERWISE NOTED. PIGTAILS SHALL BE CLEARLY MARKED WITH STAKES OR COLORED TAPE. WHERE BURIED LEADS OR TAPS ARE REQUIRED FOR CONNECTIONS NOT AVAILABLE AT TIME OF INSTALLATION SUCH LEADS SHALL BE BROUGHT UP AT OR NEAR THE FUTURE TERMINAL POINT, COILED AND TAGGED.
11. ALL BELOW GRADE GROUNDING CONNECTIONS SHALL BE OF EXOTHERMIC WELD CONNECTOR TYPE.
12. ABOVE GRADE GROUNDING CONNECTIONS SHALL BE BOLTED PRESSURE CONNECTOR TYPE OR MECHANICAL CONNECTION TYPE.
13. EXPOSED GROUNDING CONNECTIONS SHALL BE OF THE MECHANICAL TYPE WITH THE EXCEPTION OF ABOVE GROUND ANODE CONNECTION. THIS CONNECTION SHALL BE OF THE EXOTHERMIC TYPE.
14. A SEPARATELY DERIVED GROUND SYSTEM SHALL BE PROVIDED FOR THE PLANT INSTRUMENT CONTROL SYSTEM (CHASSIS, SIGNAL). THIS GROUND SYSTEM SHALL NOT BE USED FOR POWER EQUIPMENT UNDER ANY CIRCUMSTANCE. MAXIMUM GROUND RESISTANCE SHALL BE LESS THAN 5 OHMS.
15. AFTER COMPLETE INSTALLATION OF THE GROUNDING ELECTRODE SYSTEM THE CONTRACTOR SHALL MEASURE THE GROUNDING RESISTANCE AT THE DESIGNATED TEST POINTS. THIS DATA SHALL BE RECORDED AND SUBMITTED TO OWNER AND OWNER REPRESENTATIVE BY THE CONTRACTOR. THE TOTAL RESISTANCE OF THE GROUND LOOP SYSTEM SHALL BE 5 OHMS OR LESS.
16. GROUND RESISTANCE TESTING SHALL BE ACCOMPLISHED WITH A GROUNDING RESISTANCE DIRECT READING SINGLE TEST METER UTILIZING THE AC FALL OF POTENTIAL METHOD AND TWO REFERENCE ELECTRODES. PROVIDE OWNER AND OWNER REPRESENTATIVE WITH TEST RESULTS IN WRITING INCLUDING TEMPERATURE, HUMIDITY AND CONDITION OF THE SOIL AT THE TIME OF THE TEST.
17. ALL NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT AND INSTALLATIONS SHALL BE CONNECTED TO THE GROUND GRID AS REQUIRED BY THE DRAWINGS. THESE WILL INCLUDE, BUT NOT NECESSARILY LIMITED TO RACEWAYS, ELECTRICAL EQUIPMENT ENCLOSURES, GROUND BUS, TRANSFORMERS, MOTOR FRAMES, TANKS, PIPE RACKS, ELECTRICAL EQUIPMENT RACKS, AND VESSELS.
18. CARE SHALL BE TAKEN TO ASSURE THAT GROUND SYSTEM DOES NOT DIRECTLY CONTACT UNDERGROUND STEEL (INCLUDING BUT NOT LIMITED TO DRIVEN PILES, REBAR AND ANCHOR BOLTS) FOR PURPOSE OF CORROSION PROTECTION, UNLESS INDICATED ON THE PLAN DRAWING.
19. WHERE GROUND RISERS ARE REQUIRED FOR ADDITIONAL SUPPLEMENTAL GRID OR BONDING CASES, BURNDY TYPE "GB" GROUND CLAMPS SHALL BE INSTALLED AT 5 FEET (5'-0") SPACING FOR THE ENTIRE LENGTH OF THE RISER. FASTENERS FOR LIGHTNING PROTECTION RISERS SHALL BE SPACED NOT MORE THAN 3 FEET (3'-0") APART ON ALL CONDUCTORS.
20. ALL ABOVE GROUND SURFACES TO BE GROUNDED SHALL BE THOROUGHLY CLEANED TO BARE METAL BEFORE ATTACHING GROUND CONNECTIONS. WHERE PAINTED SURFACES ARE CLEANED A TOUCH-UP COATING, MATCHING THE ORIGINAL FINISH, SHALL BE APPLIED AFTER GROUND CONNECTION IS COMPLETE.
21. ALL ALTERNATING CURRENT (AC) MOTOR FRAMES SHALL BE GROUNDED INSIDE THE CONDUIT BOX BY MEANS OF AN EQUIPMENT GROUNDING CONDUCTOR RUN IN THE CONDUIT AND CABLE WITH THE POWER CONDUCTORS. THE OTHER END OF THE GROUNDING CONDUCTOR SHALL BE CONNECTED TO THE MOTOR POWER SUPPLY EQUIPMENT GROUND BUS (MCC, PANEL). FLEXIBLE CONDUIT FOR MOTOR SHALL HAVE EXTERNAL GROUND IF IN CLASS 1 DIVISION 2 AREA, AND UL LISTED AND LABELED AS CLASS 1 DIVISION 1 IF IN CLASS 1 DIVISION 1 AREA.
22. TANKS AND VESSELS TIED INTO BELOW GRADE MAIN GAS PIPING SHALL BE CONNECTED TO THE PLANT GROUND GRID NEAR THE EQUIPMENT LOCATION.
23. GEOTECH FABRIC TO BE USED ON ALL NEW COMPACTED AND GRAVELED AREAS.
24. EXISTING FENCING GROUND TO BE CUT AND SPLICED WITH NEW FENCING GROUND ON BOTH SIDES OF NEW GATE.
25. ALL CONNECTORS SHALL COMPLY WITH IEEE 837 AND ANSI/UL 467; LISTED FOR USE FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND CONNECTED ITEMS. CONNECTIONS INTENDED TO BE BURIED SHALL BE LISTED FOR SUCH USE.
26. BONDING STRAPS AND JUMPERS SHALL BE INSTALLED SO VIBRATION BY EQUIPMENT MOUNTED ON VIBRATION ISOLATION HANGERS OR SUPPORTS IS NOT TRANSMITTED TO RIGIDLY MOUNTED EQUIPMENT. BOND STRAPS DIRECTLY TO THE BASIC STRUCTURE AND CARE MUST BE TAKEN NOT TO PENETRATE ANY ADJACENT PARTS. INSTALL STRAPS ONLY IN LOCATIONS ACCESSIBLE FOR MAINTENANCE.
27. TIGHTEN SCREWS AND BOLTS FOR GROUNDING AND BONDING CONNECTIONS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.
28. ALL GROUND WIRE CONDUIT STUB UPS SHALL BE SEALED TO PREVENT WATER, MOISTURE, AND DEBRIS FROM ENTERING CONDUIT.

LIGHTING GENERAL NOTES:

1. MINIMUM SIZE OF RIGID CONDUIT SHALL BE — THREE QUARTER OF AN INCH (3/4").
2. SPLICES IN CABLE UP TO THE SIZE OF 10 AWG FOR LIGHTING AND RECEPTACLE CIRCUITS SHALL BE MADE WITH SOLDERLESS CONNECTORS. SPLICES MAY BE MADE WITH HAND TWIST WIRE JOINTS SIMILAR TO "SCOTCHLOK" AS MANUFACTURED BY 3M COMPANY.
3. SPLICES IN CABLE LARGER THAN 10 AWG SHALL BE MADE WITH SPLIT BOLT CONNECTORS.
4. FIXTURE STEMS (PENDANTS) SHALL NOT EXCEED 5 FEET (5'-0") IN LENGTH IN UNCLASSIFIED AREAS. ALL FIXTURE STEMS (PENDANTS) LOCATED IN CLASS 1 DIVISION 2 AREAS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF NEC CODE. ADDITIONAL SUPPORTING STRUCTURE SHALL BE PROVIDED WHERE REQUIRED.
5. MOUNTING HEIGHT IS TO THE LOWEST PART OF THE FIXTURE FROM THE FINISH ELEVATION.
6. FIXTURES WITHOUT ELEVATIONS NOTED SHALL BE SURFACE OR FLUSH MOUNTED FROM BOTTOM OF STEEL OR CEILING.
7. THE CONTRACTOR SHALL INSTALL ALL FIXTURE WIRE, PENDANT CORD AND ASSOCIATED CONNECTORS REQUIRED TO CONNECT THE FIXTURE TO ITS LIGHTING OUTLET. SUCH MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH THE LIGHTING SYSTEM FIXTURE SCHEDULE AND THE FIXTURE MOUNTING DETAILS AND MANUFACTURER INSTRUCTIONS.
8. THE CONTRACTOR SHALL INSTALL ALL LIGHTING AND POWER DISTRIBUTION PANELS AS NEEDED. THE PANELS SHALL BE AS SPECIFIED AND AS LOCATED ON THE DRAWINGS. A COMPLETE TYPE WRITTEN DIRECTORY CARD FOR EACH PANEL SHALL BE PROVIDED.
9. COMPLETE ROUTING FOR CONDUIT AND CABLE IS NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL ROUTE ALL CONDUITS AND CABLES AS REQUIRED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL FIXTURES AND RACEWAYS AND SHALL REPLACE ALL DAMAGED FIXTURES, BROKEN LAMPS OR LENSES AS REQUIRED TO INSURE A SOUND, OPERATING LIGHTING SYSTEM.
11. ALL FRAMING STRUT TO BE 1-5/8 INCHES (1-5/8") SQUARE GALVANIZED UNLESS OTHERWISE NOTED. INSULATED END CAPS SHALL BE INSTALLED FOR PROTECTION OR EDGES SHALL BE GROUND SMOOTH.

WIRE AND CONDUCTOR GENERAL NOTES:

1. WIRE AND CABLE SHALL BE PER DUKE SPECIFICATION AND PER NEC CODE.
2. WIRE COLOR CODING FOR 277/480 VAC, 3-PHASE, LIGHTING BRANCH CIRCUITS SHALL BE:
   - PHASE A: BROWN (BLACK WITH BROWN TAPE)
   - PHASE B: ORANGE (BLACK WITH ORANGE TAPE)
   - PHASE C: YELLOW (BLACK WITH YELLOW TAPE)
   - NEUTRAL: GRAY
   - GROUND: GREEN (BARE COPPER)
3. WIRE COLOR CODING FOR 120/208 VAC, 3-PHASE SMALL POWER AND LIGHTING BRANCH CIRCUITS SHALL BE:
   - PHASE A: RED
   - PHASE B: BLACK
   - PHASE C: BLUE
   - NEUTRAL: WHITE
   - GROUND: GREEN (BARE COPPER)
4. WIRE COLOR CODING FOR 120/240 VAC, 1-PHASE SMALL POWER AND LIGHTING BRANCH CIRCUITS SHALL BE:
   - HOT (PHASE A): RED
   - HOT (PHASE B): BLACK
   - NEUTRAL: WHITE
   - GROUND: GREEN (BARE COPPER)
5. ALL POWER CABLES WILL BE MARKED WITH APPROPRIATE PHASE MARKING AT BOTH ENDS AND ANY TERMINATION POINTS.

INSTRUMENTATION GENERAL NOTES:

1. ALL CONDUCTORS SHALL BE PERMANENTLY MARKED AND IDENTIFIED WITH DESTINATION MARKING NOMENCLATURE AT ALL TERMINATION POINTS AND PULL BOXES. CABLE MARKING LABELS MANUFACTURED BY BRADY (OR APPROVED EQUAL) SHALL BE USED FOR MARKING CONDUCTORS.
2. INSULATING WIRE FERRULES SHALL BE USED FOR ALL CONDUCTOR TERMINATIONS.
3. ALL INSTRUMENT LOCATIONS AND ELEVATIONS ARE APPROXIMATE. EXACT LOCATIONS ARE TO BE DETERMINED BY THE CONTRACTOR AND APPROVED BY OWNER PRIOR TO INSTALLATION.
4. ALL CONDUIT AND CABLE RUNS TO INSTRUMENTATION SHALL BE ORIENTED SO THAT STUB-UPS WILL CONNECT ON SAME SIDE AS DEVICE CONDUIT CONNECTION AND ALLOW ACCESS TO INSTRUMENT AND ELECTRICAL DEVICE.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS		
DATE	INITIALS	REGIONAL ENGINEER
DATE	INITIALS	MGR TECH REC & STD
DATE 10/08/2020	INITIALS YBK	PRINCIPAL ENGINEER

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
ELECTRICAL GENERAL NOTES

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 47 OF 66	DWG SCALE NONE
DWG DATE 07/10/2019	SUPERSEDED —
DRAWING NUMBER PNG -E-004-0001029	REVISION 0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

CONDUIT AND CABLE

- EXPOSED CONDUIT OR CABLE VISIBLE
- UNDERGROUND OR CABLE HIDDEN
- FLEXIBLE CONDUIT
- CONDUIT OR CABLE CONTINUATION
- CONDUIT OR CABLE TURNING DOWN
- CONDUIT OR CABLE TURNING UP
- CONDUIT WITH BUSHING
- CONDUIT CAPPED FOR FUTURE USE
- CONDUIT CONTINUATION FROM EXISTING CAPPED STUB
- CONDUIT TURNED UP AND CAPPED (CAP AT ELEVATION NOTED) — EL XX' X"
- CONDUIT DROPPING OUT BOTTOM OF EQUIPMENT
- COMMUNICATIONS TEE
- TEE IN HORIZONTAL CONDUIT RUN WITH THE BRANCH GOING HORIZONTAL
- TEE IN HORIZONTAL CONDUIT RUN WITH THE BRANCH GOING UP (AND PIERCING THE PLANE OF PROJECTION)
- TEE IN HORIZONTAL CONDUIT RUN WITH THE BRANCH GOING DOWN
- TEE IN VERTICAL CONDUIT RUN WITH THE BRANCH GOING HORIZONTAL
- NO CONNECTION
- NEUTRAL CONNECTION
- LOOP INDICATES SHIELDED CABLE (SIZE AS REQUIRED)
- CABLE CHANNEL TURNS DOWN
- CABLE CHANNEL TURNS UP
- CONDUIT NUMBER CALLOUT, SEE CABLE SCHEDULE — C##

GROUNDING

- GROUND CABLE BURIED
- GROUND CABLE EXPOSED
- GROUND ROD
- TEST WELL IN ACCESSIBLE BOX WITH COVER
- GROUND CONDUCTOR TURNING UP
- GROUND CONDUCTOR TURNING DOWN
- EXOTHERMIC CONNECTION
- EQUIPMENT, DEVICE, STRUCTURAL, SUPPORT CONNECTION
- GROUND CONDUCTOR PIGTAIL FOR ABOVE GRADE AND FINISHED CONCRETE CONNECTION TO EQUIPMENT AND FUTURE CONNECTION — 10 FT
- AIR TERMINAL (LIGHTNING ROD) CONNECTED TO GROUND CABLE
- GROUND CABLE CONTINUATION
- GROUND BAR

CATHODIC PROTECTION

RECTIFIER AND RECTIFIER JUNCTION BOX FOR CATHODIC PROTECTION

EQUIPMENT


TWO WINDING TRANSFORMER

AUTO TRANSFORMER

POTENTIAL TRANSFORMER


LINE TRAP


CAPACITOR


TRANSFER SWITCH

AIR OR VACUUM CIRCUIT BREAKER


LIGHTNING OR SURGE ARRESTER


GROUND CONNECTION


BATTERY


EQUIPMENT AS NOTED ON PLANS

GAUGEBOARD


DISCONNECT SWITCH


ELECTRICAL DEVICE

THERMOSTAT

JUNCTION BOX

TERMINAL BOX CONTAINING TERMINAL BLOCKS WITH SUFFICIENT NUMBER OF POLES TO TERMINATE ALL CONDUCTORS ENTERING THE BOX

GENERATOR

SURGE SUPPRESSION DEVICE

INDICATING LIGHT (COLOR)
A - AMBER
BL - BLUE
C - CLEAR
G - GREEN
R - RED
W - WHITE
Y - YELLOW

INDICATING LIGHT (FUNCTIONS)
L - LINE POTENTIAL
S - SYNCHRONIZING
SO - SCOPE ON
T - TRIP INDICATION
T&S - TRIP & SUPER-VISING (TWO LIGHTS)

COIL DESIGNATIONS
M - MOTOR STARTER
TDR - TIME DELAY RELAY
C - CONTACTOR
CR - CONTROL RELAY
MX - MOTOR STARTER AUX RELAY (USUALLY PICKS UP THE "M" COIL)
F - FORWARD OR FAST
R - REVERSE
S - SLOW

CONTROL STATION

X - TYPE/DESIGNATION:
A - HAND/OFF/AUTO
B - H/O/A WITH START
C - REMOTE STOP
D - START/STOP
E - AUTO/ON
F - JOG/OFF/AUTO
G - J/O/A WITH START
P - PHOTOCELL
V - VIBRATION SWITCH

DCS INTERFACE SYMBOL W/ SCHEMATIC REFERENCE DRAWING NUMBER

INSTRUMENTATION WITH TAG NUMBER

GENERAL NOTES:

1. NOT ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THE DRAWING ARE USED FOR THIS PROJECT.

CABLE CONDUCTOR COLOR CODING

BK	- BLACK
RD	- RED
BL	- BLUE
OR	- ORANGE
YL	- YELLOW
BR	- BROWN
WH	- WHITE
GN	- GREEN
RD/BK	- RED/BLACK
BL/BK	- BLUE/BLACK
OR/BK	- ORANGE/BLACK
YL/BK	- YELLOW/BLACK
BR/BK	- BROWN/BLACK
BK/RD	- BLACK/RED

ABBREVIATIONS

A	AMPERES
AC	ALTERNATING CURRENT
AGA	AMERICAN GAS ASSOCIATION
AH	ALARM HORN
ALM	ALARM
ANN	ANNUNCIATOR
API	AMERICAN PETROLEUM INSTITUTE
A/R (OR) AR	AS REQUIRED
AS	AMMETER SWITCH
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BAT	BATTERY
BKR	BREAKER
B.O.M. (OR) BOM	BILL OF MATERIALS
C	CONDUIT
CA	CABLE
CB	CIRCUIT BREAKER
CHGR	CHARGER
CKT	CIRCUIT
CTRL	CONTROL
CNVT	CONVERTER
CONT'D	CONTINUED ON DRAWING (OR) CONTINUED
CP	CONTROL PANEL
CS	CIRCUIT SWITCHER
CT	CURRENT TRANSFORMER
DB	DIRECT BURIED
DC	DIRECT CURRENT
DET	DETECTOR
DI	DIGITAL INPUT
DIFF	DIFFERENTIAL
DISC	DISCONNECT
DN	DOWN
DO	DIGITAL OUTPUT
DP	DISTRIBUTION PANEL
DS	DISTRIBUTION SWITCH (OR) DISCONNECT SWITCH
DWG	DRAWING
EL	ELEVATION
ELEC	ELECTRICAL
EMER	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EP	EXPLOSION PROOF
ES (OR) ESD	EMERGENCY STOP (OR) EMERGENCY SHUTDOWN
F (OR) FWD	FORWARD
FDR	FEEDER
FREQ	FREQUENCY
FU	FUSE
GEN	GENERATOR
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
HTR	HEATER
HV	HIGH VOLTAGE
HVS	HIGH VOLTAGE SWITCHGEAR
HZ	HERTZ (FREQUENCY)
INSTR	INSTRUMENT
INTLK	INTERLOCK
I/O	INPUT/OUTPUT FOR CONTROLLER
JB (OR) J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT AMPERES
LP	LIGHTING PANEL, SMALL POWER PANEL
LTG	LIGHTING
LV	LOW VOLTAGE
M	METER
MAN	MANUAL
MISC	MISCELLANEOUS
MTR	MOTOR
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEUT	NEUTRAL
NO	NORMALLY OPEN
NTS	NOT TO SCALE
Ω	OHMMETER
O/H (OR) OH	OVERHEAD
OL	OVERLOAD
OP	OPERATING
P	POLE
PC	PHOTOCELL
P.F. (OR) PF	POWER FACTOR
PH (OR) Ø	PHASE
PNL	PANEL
POT	POTENTIOMETER
PP	POWER PANEL
PS	PRESSURE SWITCH

ABBREVIATIONS CONT'D

PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
PWR	POWER
R (OR) REV	REVERSE
RCT	RECTIFIER
RCPT	RECEPTACLE
REF	REFERENCE
REF DWG #	REFERENCE DRAWING NUMBER (AS INDICATED)
REQ'D	REQUIRED
RES	RESISTOR
RGS	RIGID GALVANIZED STEEL
RMC	RIGID METALLIC CONDUIT
RTD	RESISTANCE TEMPERATURE DETECTOR
SHLD	SHIELDED
SH (OR) SHT	SHEET
SP	SPARE
STA.	STATION
STR	STARTER
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TB	TERMINAL BLOCK
TBD	TERMINAL BOARD
TBX	TERMINAL BOX
TDR	TIME DELAY RELAY
TEL	TELEPHONE
T.O.C. (OR) TOC	TOP OF CONCRETE
T.O.D. (OR) TOD	TOP OF DUCT
T.O.G. (OR) TOG	TOP OF GRATING
T.O.S. (OR) TOS	TOP OF STEEL
TSP	TWISTED SHIELDED PAIR
TYP	TYPICAL
U/G (OR) UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
UV	UNDERVOLTAGE
V	VOLTS (OR) VOLTAGE
VFD	VARIABLE FREQUENCY DRIVE
VS	VOLTMETER SWITCH
W	WATT or WIRE
WP	WEATHERPROOF
WR	WELDING RECEPTACLE
XDCR	TRANSDUCER
XE	MISC. ELECTRICAL EQUIPMENT
XF	POWER TRANSFORMER
XFER	TRANSFER
XFMR	TRANSFORMER
XMTR	TRANSMITTER

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020

PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	YBK	PRINCIPAL ENGINEER

REF. DWG(S)

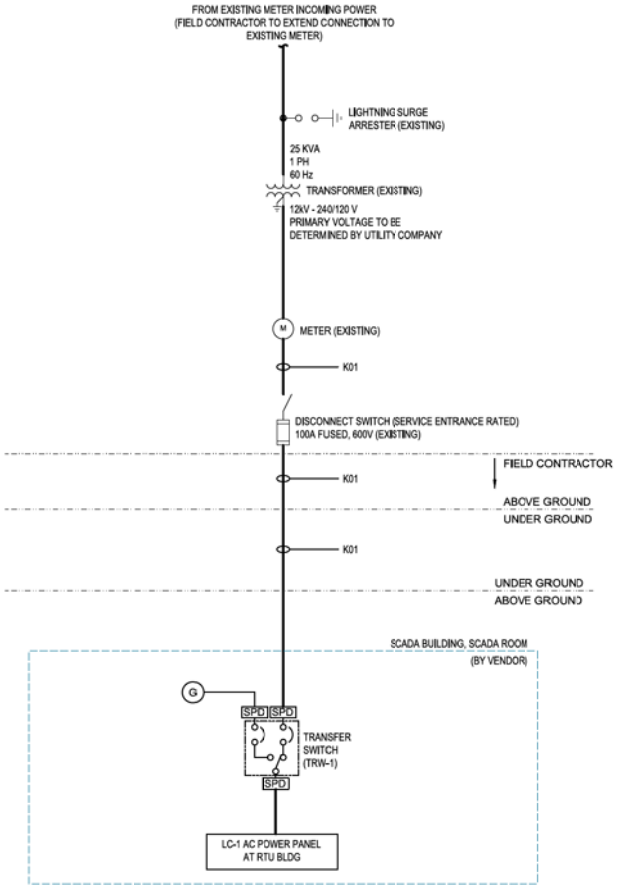
DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
ELECTRICAL LEGEND

HAMILTON COUNTY, OHIO

SHEET(S)	48 OF 66
DWG SCALE	NONE
DWG DATE	07/10/2019
SUPERSEDED	—
DRAWING NUMBER	PNG -E-004-0001030
REVISION	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



PANELBOARD NAME: LC-1 AC POWER PANEL
PANELBOARD TYPE: MAIN CIRCUIT BREAKER
PANEL LOCATION: SCADA BUILDING
SUPPLIED FROM: TRANSFER SWITCH / DISCONNECT

10,000 RMS SYMMETRICAL A.I.C.
SURFACE MOUNTED, NEMA 12 ENCLOSURE
120/240 VOLTS, 1 PHASE, 3 WIRE, 60 Hz

100 AMP TRIP MAIN BREAKER
100 AMP MAINS

CKT NO.	TRIP AMPS	NO. POLES	WIRE / GND / COND	LOAD SERVED	LOAD VA	Ø	LOAD VA	LOAD SERVED	WIRE / GND / COND	NO. POLES	TRIP AMPS	CKT NO.
1	20	1		SCADA BUILDING OUTLET 1 & 2	480	A	240	SCADA BUILDING OUTLET 3		1	20	2
3	20	1		SCADA ROOM LED LIGHT	100	B	100	OS-106 ROOM LED LIGHTS		1	20	4
5	20	2		HVAC UNIT	1800	A	600	OS-101 ROOM HEATER		2	20	6
					1800	B	600					
9	20	1		FL-LED1	125	A	720	YZ SYSTEM POWER (7300 NJEX)		1	20	10
11	20	1		FM-101 POWER FOR LED LIGHTS	100	B	720	YZ SYSTEM POWER (8300 NJEX)		1	20	12
13	20	1		CP RECTIFIER	200	A	720	YZ SYSTEM HEATER (NJEX HEATER)		1	20	14
15	20	1		YARD LIGHT #1	448	B		SPARE			20	16
17	20	1		YARD LIGHT #2	448	A		SPARE			20	18
19	20			SPARE		B		SPARE			20	20
21	20			SPARE		A		SPARE			20	22
23	20			SPARE		B		SPARE			20	24

TOTAL CONNECTED LOAD = 9.2 kVA X 100% DEMAND FACTOR = 9.2 kVA ESTIMATED DEMAND LOAD
PHASE BALANCE (KVA) - A: 5.3 , B 3.9 DESIGN LOAD = 38 AMPERES, TOTAL LOAD WITH EXPANSION = 58 AMPERES

NOTES:

1. TRANSFORMER SIZING, DISCONNECT SWITCH RATING, CABLE SIZES, CONDUIT SIZE ARE BASED ON THE MAXIMUM ESTIMATE 25KVA LOAD REQUIREMENT.
2. MINIMUM REQUIREMENT IS 100 AMP @ 120/240 VAC, SINGLE PHASE SERVICE.
3. CONTRACTOR TO RED-LINE UTILITY'S TRANSFORMER INFORMATION AS NEEDED.
4. FIELD ELECTRICAL CONTRACTOR TO CONNECT POWER FEED FROM EXISTING UTILITY METER. ELECTRICAL SUBCONTRACTOR TO SECURE AND PASS ALL PERMITS AND COORDINATE POWER INSTALLATION WITH UTILITY.
5. FOR MORE INFORMATION, REFER TO ELECTRICAL PLOT PLAN AND ENLARGED PLAN DRAWINGS PNG-E-004-0001035, PNG-E-004-0001036, PNG-E-004-0001037.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
REGISTERED
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10/08/2020
PROFESSIONAL ENGIARCH STAMP

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DESCRIPTION	
AREA CODE	
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STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	YBK

REF. DWG(S)

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
ONE-LINE DIAGRAM & PANELBOARD SCHEDULE

HAMILTON COUNTY, OHIO

SHEET(S) 49 OF 66	DWG SCALE NONE
DWG DATE 07/10/2019	SUPERSEDED —

DRAWING NUMBER: PNG -E-004-0001031
REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER

HIGHPOINT PARK CONDUIT SCHEDULE

CONDUIT NUMBER	CONDUIT SIZE	CONDUIT TYPE	% FILL	CONTENT	FROM	TO	LENGTH (FT.)	NOTES
C01	1.5"	RGS	17.33%	K01	UTILITY METER	SCADA ROOM, LC-1	450	FIELD ROUTE TO EXISTING METER
C02	1"	RGS	13.15%	K02	SCADA ROOM, LC-1	FM-101 POWER, ACJB	400	
C03	1"	RGS	10.15%	K03	SCADA ROOM, RTU	HTR-102 BMS #1 AND BMS #2 POWER	325	POWER BOTH BMSs IN SERIES
C04	1"	RGS	13.15%	K04	SCADA ROOM, LC-1	YARD LIGHT #1	100	ROUTE: LC-1 - YARDLIGHT #1 - YARDLIGHT #2
C05	1"	RGS	13.15%	K05	SCADA ROOM, RTU	YARD LIGHT #2	300	ROUTE: LC-1 - YARDLIGHT #1 - YARDLIGHT #2
C06	1"	RGS	5.36%	K06	SCADA ROOM, RTU	FM-101, EAJB	400	FM-101 ETHERNET
C07	1.5"	RGS	21.25%	K07, K08, K09, K10, K11, K12, K13, K14, K15, K16	SCADA ROOM, RTU	FM-101, DCJB	400	
C08	1.5"	RGS	14.00%	K17, K18, K19, K20	SCADA ROOM, RTU	HTR-102 BMS #1 AND BMS #2	325	
C09	1.5"	RGS	21.25%	K21, K22, K23, K24, K25, K26, K27, K28, K29, K30, K31, K32	SCADA ROOM, RTU	PCV-103 JB	250	
C10	1.5"	RGS	21.25%	K33, K34, K35, K36, K37, K38	SCADA ROOM, RTU	PCV-104 JB	250	
C11	1.5"	RGS	18.83%	K39, K40, K41, K42, K43, K44, K45	SCADA ROOM, RTU	MLV-105, PIT-105A, PIT-105B	75	
C12	3"	RGS	-	RESERVED FOR DUKE'S EXISTING SITE RTU SIGNALS	SCADA ROOM, RTU	RESERVED	450	RESERVED FOR EXISTING SIGNALS (DUKE TO COORDINATE POST CONSTRUCTION)
C13	3"	RGS	-	RESERVED FOR DUKE'S EXISTING SITE RTU SIGNALS	SCADA ROOM, RTU	RESERVED	450	
C14	2"	RGS	-	RESERVED FOF DUKE'S EXISTING AC PANELPOWER FEED	SCADA ROOM, LC-1	RESERVED	450	
C15	1"	RGS	13.15%	K46	SCADA ROOM, LC-1	CP RECTIFIER POWER	75	

SIZES BASED ON DUKE'S TYPICAL PANELBOARD SCHEDULE (240/120 VAC, 100A, 1 PHASE, MAIN BREAKER)

HIGHPOINT PARK CABLE SCHEDULE

CABLE NUMBER	INSTRUMENT TAG	NUMBER OF CABLE	CONDUCTORS COPPER (600V INSULATION)	WORKING VOLTAGE	FROM	TO	LENGTH (FT.)	NOTES
K01	N/A	1	3-1/C #2 AWG + #8 AWG GND, THWN-2	240/120 VAC	UTILITY METER	SCADA ROOM, LC-1	450	FIELD ROUTE TO EXISTING METER
K02	N/A	1	2-1/C #10 AWG + #12 AWG GND, THWN-2	120 VAC	SCADA ROOM, LC-1	FM-101 POWER, ACJB	400	
K03	N/A	1	3/C #14 AWG	24 VDC	SCADA ROOM, RTU	HTR-102 BMS #1 AND BMS #2 POWER	325	POWER BOTH BMSs IN SERIES
K04	N/A	1	2-1/C #10 AWG + #12 AWG GND, THWN-2	120 VAC	SCADA ROOM, LC-1	YARD LIGHT #1	100	ROUTE: LC-1 - YARDLIGHT #1 - YARDLIGHT #2
K05	N/A	1	2-1/C #10 AWG + #12 AWG GND, THWN-2	120 VAC	SCADA ROOM, LC-1	YARD LIGHT #2	300	ROUTE: LC-1 - YARDLIGHT #1 - YARDLIGHT #2
K06	XI-101A	1	CAT5 ETHERNET CABLE	-	SCADA ROOM, RTU	FM-101, EAJB	400	FE/FIT-101A
K07	FIT-101A	1	12PR #18 AWG TSP, THWN-2	24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	FE/FIT-101A
K08	FIT-101A-PWR			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	FE/FIT-101A
K09	XA-101A			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	FE/FIT-101A
K10	PIT-101A			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	UT-101A
K11	TIT-101A			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	UT-101A
K12	LEL-101			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	LEL-101
K13	LEL-101A			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	LEL-101A
K14	FIT-101A-SPARE			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	FE/FIT-101A
K15	PIT-101A-SPARE			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	UT-101A
K16	TIT-101A-SPARE			24 VDC	SCADA ROOM, RTU	FM-101, DCJB	400	UT-101A
K17	XI-102A	1	8PR #18 AWG TSP, THWN-2	24 VDC	SCADA ROOM, RTU	HTR-102 BMS #1	325	
K18	XS-102A			24 VDC	SCADA ROOM, RTU	HTR-102 BMS #1	325	
K19	XI-112A			24 VDC	SCADA ROOM, RTU	HTR-102 BMS #2	325	
K20	XS-112A			24 VDC	SCADA ROOM, RTU	HTR-102 BMS #2	325	
K21	PIT-103A	1	12PR #18 AWG TSP, THWN-2	24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K22	ZS-103B			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K23	ZT-103B			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K24	PY-103B			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K25	PIT-103B			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K26	PIT-103C			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K27	TIT-103A			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K28	PCV-103B-PWR			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K29	PIT-103A-SPARE			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K30	PCV-103B-SPARE			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K31	PIT-103C-SPARE			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K32	TIT-103A-SPARE			24 VDC	SCADA ROOM, RTU	PCV-103 JB	250	
K33	ZS-104B	1	12PR #18 AWG TSP, THWN-2	24 VDC	SCADA ROOM, RTU	PCV-104 JB	250	
K34	ZT-104B			24 VDC	SCADA ROOM, RTU	PCV-104 JB	250	
K35	PY-104B			24 VDC	SCADA ROOM, RTU	PCV-104 JB	250	
K36	PIT-104A			24 VDC	SCADA ROOM, RTU	PCV-104 JB	250	
K37	PCV-104B-PWR			24 VDC	SCADA ROOM, RTU	PCV-104 JB	250	
K38	PCV-104B-SPARE			24 VDC	SCADA ROOM, RTU	PCV-104 JB	250	
K39	ZIO-105	1	8PR #18 AWG TSP, THWN-2	24 VDC	SCADA ROOM, RTU	MLV-105	75	
K40	ZIC-105			24 VDC	SCADA ROOM, RTU	MLV-105	75	
K41	HI-105			24 VDC	SCADA ROOM, RTU	MLV-105	75	
K42	SYO-105			24 VDC	SCADA ROOM, RTU	MLV-105	75	
K43	SYC-105			24 VDC	SCADA ROOM, RTU	MLV-105	75	
K44	PIT-105A	1	1PR #18 AWG TSP, THWN-2	24 VDC	SCADA ROOM, RTU	MLV-105, INLET PIT-105A	75	
K45	PIT-105B	1	1PR # 18 AWG TSP, THWN-2	24 VDC	SCADA ROOM, RTU	MLV-105, OUTLET PIT-105B	75	
K46	N/A	1	2-1/C #10 AWG + #12 AWG GND, THWN-2	120 VAC	SCADA ROOM, LC-1	CP RECTIFIER	75	

SIZES BASED ON DUKE'S TYPICAL PANELBOARD SCHEDULE (240/120 VAC, 100A, 1 PHASE, MAIN BREAKER)

NOTES:

1. FOR MORE INFORMATION, REFER TO ELECTRICAL PLOT PLAN AND ENLARGED PLAN DRAWINGS PNG-E-004-0001035, PNG-E-004-0001036, PNG-E-004-0001037

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01957

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	YBK	PRINCIPAL ENGINEER

DUKE ENERGY®

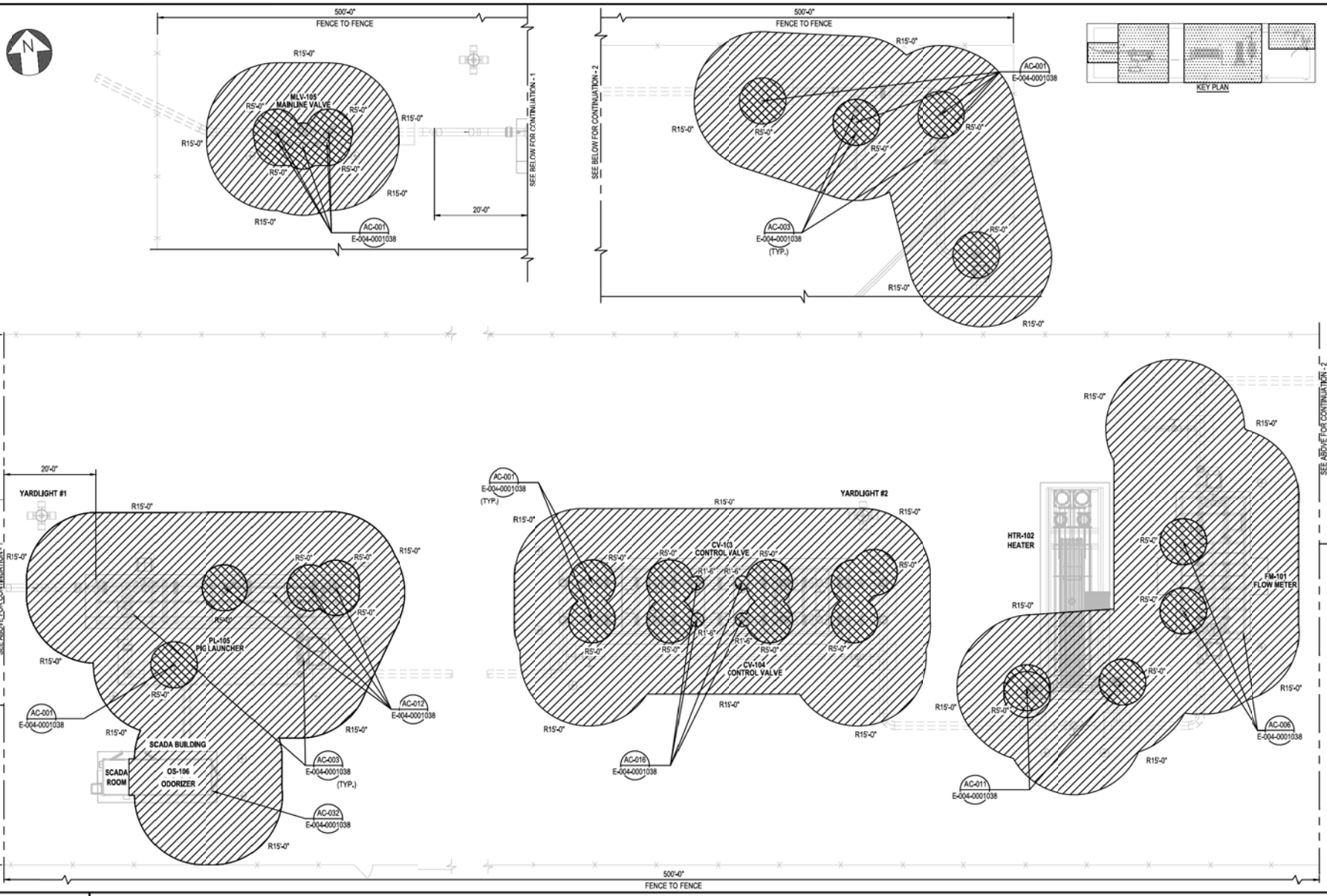
C350 PROJECT
HIGHPOINT PARK STATION
CABLE AND CONDUIT SCHEDULE

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 50 OF 66	DWG SCALE NONE
DWG DATE 07/19/2019	SUPERSEDED —

DRAWING NUMBER: PNG -E-004-0001032
REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER



LEGEND:

- CLASS 1, DIVISION 1, GROUP D, T1
- CLASS 1, DIVISION 2, GROUP D, T1
- UNCLASSIFIED

NOTES:

1. AREA CLASSIFICATION ARE PER THE LATEST EDITION OF AMERICAN GAS ASSOCIATION AGA-XL1001
2. ELECTRICAL WORK IN AREA CLASSIFICATION SHALL BE IN COMPLIANCE WITH THE LATEST EDITION OF NATIONAL ELECTRIC CODE, ARTICLE 500, 501 AND 504, AND PER STATE, LOCAL AND OSHA REGULATIONS.
3. DUKE ENERGY HAVING AUTHORITY OF JURISDICTION HAS AUTHORIZED TO EXTEND THE ELECTRICAL HAZARDOUS AREA CLASSIFICATION PAST THE FENCE. DUKE ENERGY TO MEET NATURAL GAS SAFETY COMPLIANCE.

SCALE IN FEET

REF. DWG(S)

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGINEER STAMP

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA.01557

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	YBK

DUKE ENERGY

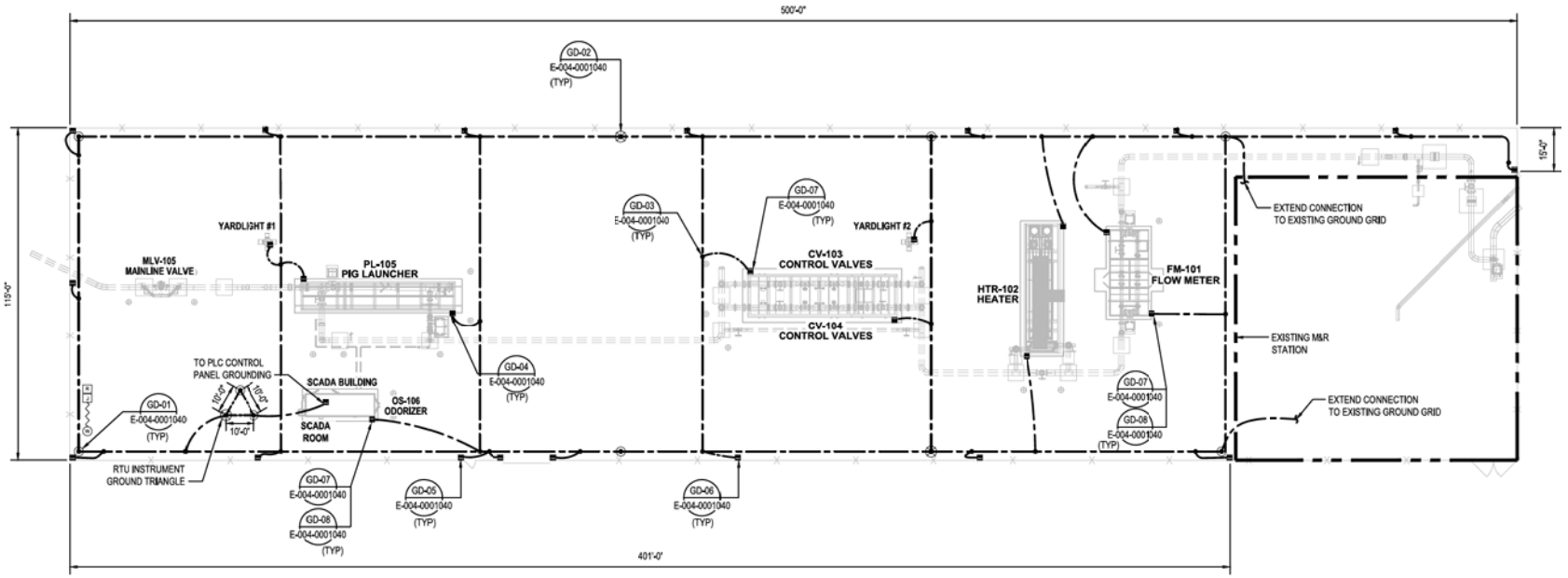
C350 PROJECT
HIGHPOINT PARK STATION
HAZARDOUS AREA CLASSIFICATION PLAN

HAMILTON COUNTY, OHIO

SHEET(S) 51 OF 66	DWG SCALE 1" = 10'
DWG DATE 06/11/2019	SUPERSEDED —

DRAWING NUMBER	REVISION
PNG -E-004-0001033	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



NOTES:

1. GROUNDING INSTALLATION MUST COMPLY WITH OSHA AND NATIONAL ELECTRICAL CODE REQUIREMENTS, EXCEPT WHERE LOCAL CODE PREVAILS.
2. A TEST MEASUREMENT OF THE RESISTANCE OF THE GROUNDING SYSTEM MUST BE TAKEN WHEN INSTALLED. IF THE RESISTANCE TO GROUND IS GREATER THAN 5 OHMS, ADDITIONAL GROUND RODS MUST BE INSTALLED UNTIL A COMBINED RESISTANCE OF 5 OHMS OF LESS IS OBTAINED.
3. THE GROUNDING SYSTEM IS SHOWN DIAGRAMMATICALLY SO THAT APPROXIMATE ROUTING OF GROUNDING CONDUCTORS AND LOCATIONS OF TAPS, WELLS AND GROUND RODS CAN BE ACCOMPLISHED.
4. FOR MORE INFORMATION ON SCADA BUILDING, SEE VENDOR DRAWING# 20,4212.

0 10' 20' 40'
SCALE IN FEET

REF. DWG(S)

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS		
DATE	INITIALS	REGIONAL ENGINEER
DATE	INITIALS	MGR TECH REC & STD
DATE 10/08/2020	INITIALS YBK	PRINCIPAL ENGINEER

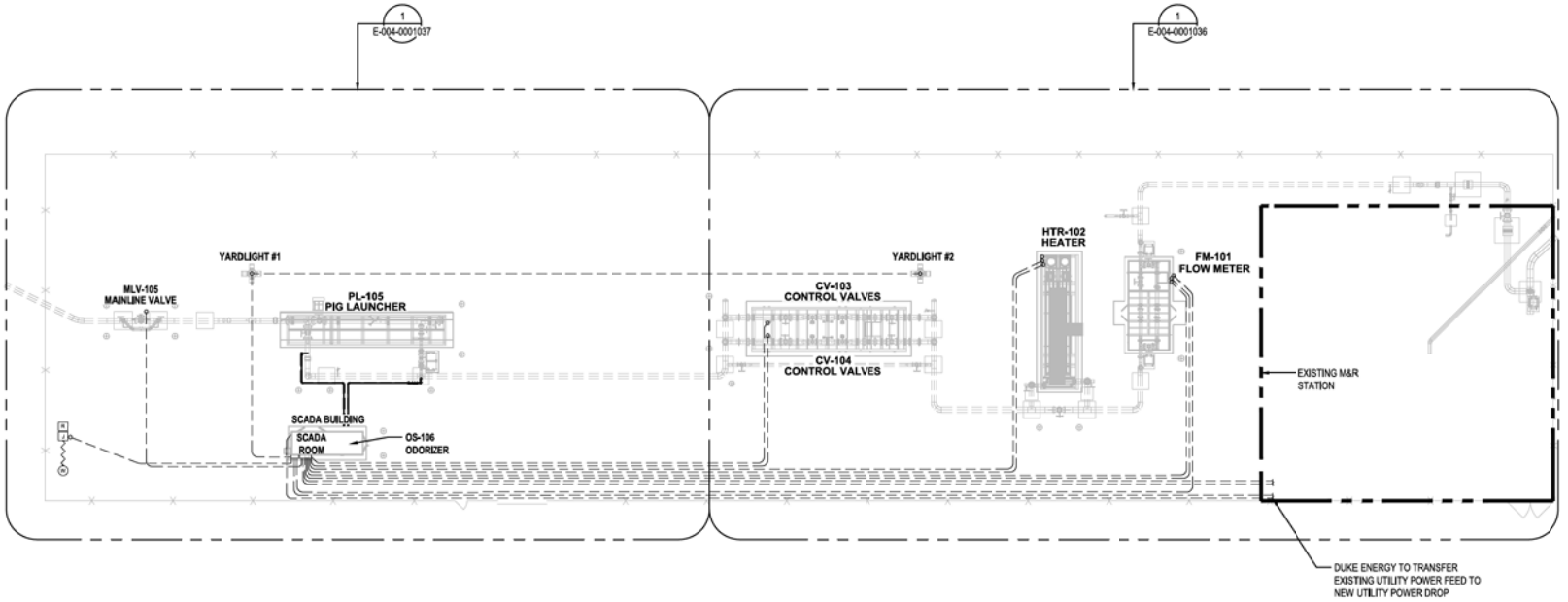
DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
ELECTRICAL GROUNDING PLAN

HAMILTON COUNTY, OHIO

SHEET(S) 52 OF 66	DWG SCALE 1" = 20'
DWG DATE 06/11/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -E-004-0001034	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

0 10' 20' 40'
SCALE IN FEET

REF. DWG(S)

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	YBK

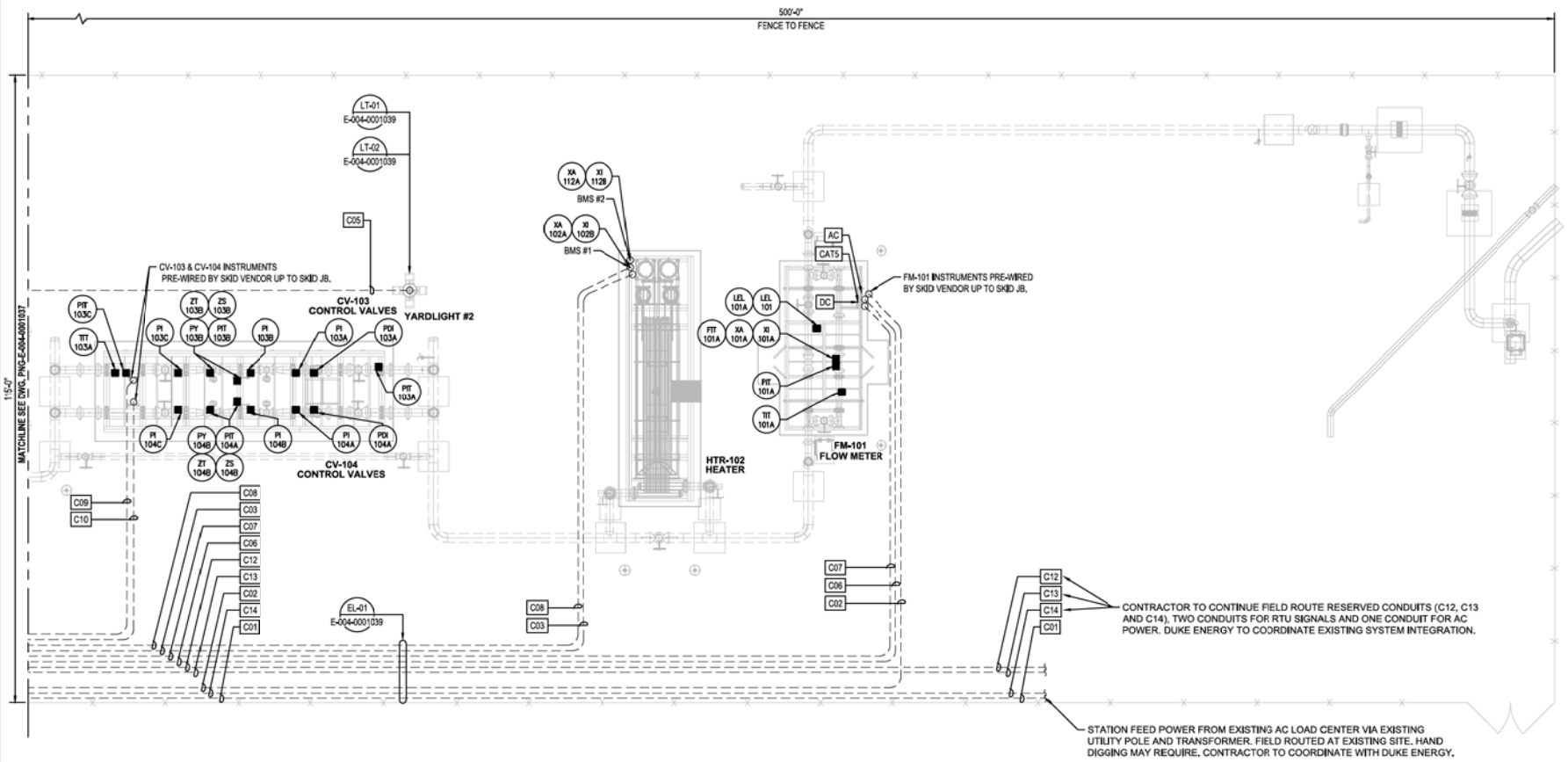
DUKE ENERGY®

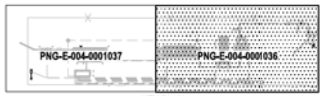
C350 PROJECT
HIGHPOINT PARK STATION
ELECTRICAL PLOT PLAN

HAMILTON COUNTY, OHIO

SHEET(S) 53 OF 66	DWG SCALE 1" = 20'
DWG DATE 06/11/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -E-004-0001035	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER





KEY PLAN

NOTES:
1. CONDUIT RUNS ARE SHOWN DIAGRAMMATICAL IN NATURE. CONTRACTOR TO FIELD ROUTE CONDUITS IN ACCORDANCE WITH NEC REQUIREMENT AND AS DIRECTED BY OWNER'S REPRESENTATIVE.
2. REFER TO CABLE SCHEDULE FOR CABLE AND CONDUIT INFORMATION.
3. REFER TO INSTALLATION DETAILS ON DRAWING PNG-E-004-0001039, PNG-E-004-0001040.
4. COMBINATION METER, DISCONNECT, CIRCUIT PANEL BY ELECTRICAL SUBCONTRACTOR. ELECTRICAL SUBCONTRACTOR TO SECURE AND PASS ALL PERMITS AND COORDINATE POWER INSTALLATION WITH UTILITY. 100 AMP @ 110/240 VAC, SINGLE PHASE SERVICE.
5. SCADA BUILDING SHOWN BASED ON TYPICAL DUKE ENERGY STANDARDS LAYOUT. CONTRACTOR SHALL VERIFY EXACT DIMENSIONS, LAYOUT AND ORIENTATION WITH OWNER PRIOR TO COMMENCING WORK.

0 10' 20'
SCALE IN FEET

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

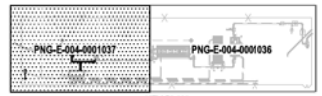
APPROVALS		
DATE	INITIALS	
		REGIONAL ENGINEER
DATE	INITIALS	
		MGR TECH REC & STD
DATE	INITIALS	
10/08/2020	YBK	PRINCIPAL ENGINEER

DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
CONDUIT AND INSTRUMENT ENLARGED PLAN
HAMILTON COUNTY, OHIO

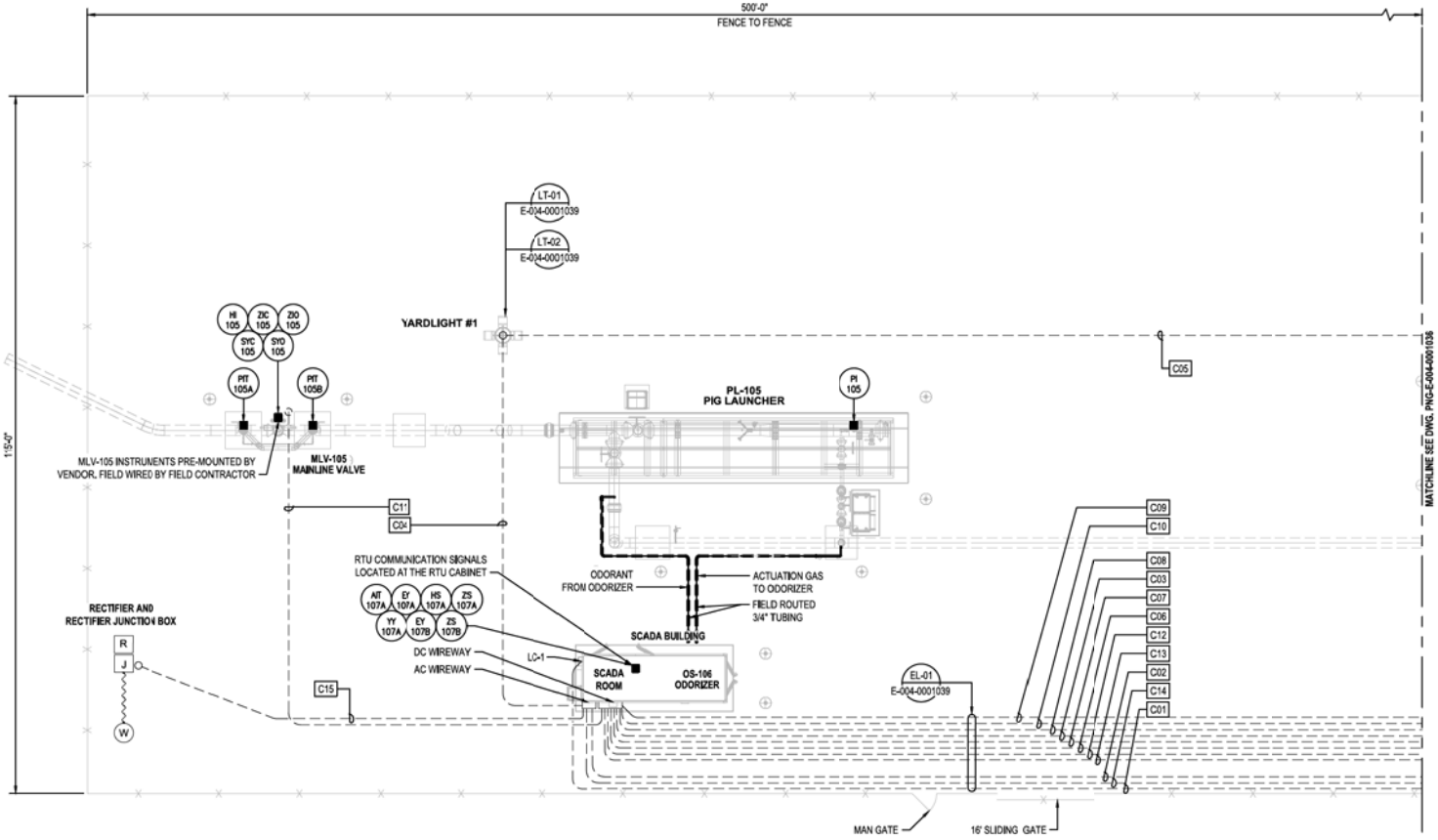
REF. DWG(S)

SHEET(S) 54 OF 66	DWG SCALE 1" = 10'
DWG DATE 06/11/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -E-004-0001036	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



KEY PLAN

NOTES:
1. CONDUIT RUNS ARE SHOWN DIAGRAMMATICAL IN NATURE. CONTRACTOR TO FIELD ROUTE CONDUITS IN ACCORDANCE WITH NEC REQUIREMENT AND AS DIRECTED BY OWNER'S REPRESENTATIVE.
2. REFER TO CABLE SCHEDULE FOR CABLE AND CONDUIT INFORMATION.
3. REFER TO INSTALLATION DETAILS ON DRAWING PNG-E-004-0001039, PNG-E-004-0001040.
4. SCADA BUILDING SHOWN BASED ON TYPICAL DUKE ENERGY STANDARDS LAYOUT. CONTRACTOR SHALL VERIFY EXACT DIMENSIONS, LAYOUT AND ORIENTATION WITH OWNER PRIOR TO COMMENCING WORK.
5. FOR MORE INFORMATION ON SCADA BUILDING, SEE VENDOR DRAWING# 20.4212.



0 10' 20'
SCALE IN FEET

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGARCH STAMP

REF. DWG(S)

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

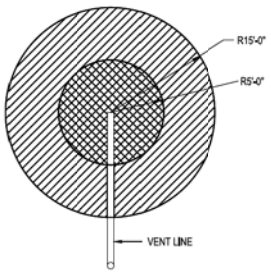
DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS		
DATE	INITIALS	REGIONAL ENGINEER
DATE	INITIALS	MGR TECH REC & STD
10/08/2020	YBK	PRINCIPAL ENGINEER

DUKE ENERGY®

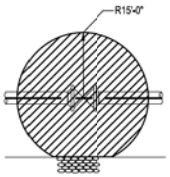
C350 PROJECT
HIGHPOINT PARK STATION
CONDUIT AND INSTRUMENT ENLARGED PLAN
HAMILTON COUNTY, OHIO

SHEET(S) 55 OF 66	DWG SCALE 1" = 10'
DWG DATE 06/11/2018	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -E-004-0001037	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	



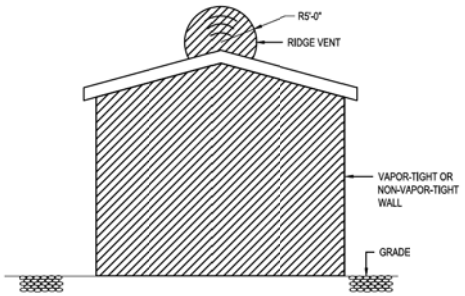
DETAIL AC-001
SCALE: N.T.S.

(REF: AGA XL1001, FIG. 1)
VENT RELIEF VALVE OR BLOWDOWN IN ADEQUATELY VENTILATED NON-ENCLOSED AREA



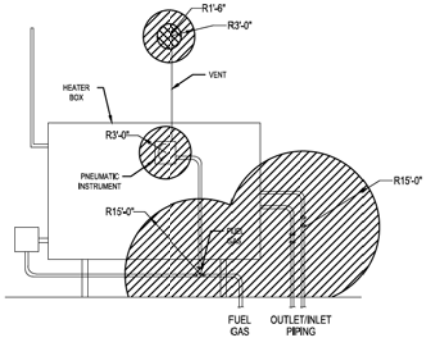
DETAIL AC-003
SCALE: N.T.S.

(REF: AGA XL1001, FIG. 3)
VALVES, FLANGES, SCREWED FITTINGS - ADEQUATELY VENTILATED ENCLOSED AND NON-ENCLOSED AREA



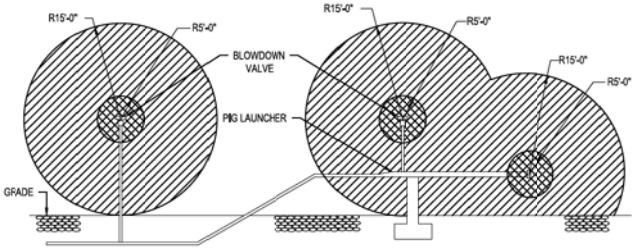
DETAIL AC-006
SCALE: N.T.S.

(REF: AGA XL1001, FIG. 6)
CLASS 1 DIVISION 2 ENCLOSURE



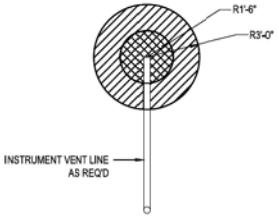
DETAIL AC-011
SCALE: N.T.S.

(REF: AGA XL1001, FIG. 11)
FIRED EQUIPMENT: INDIRECT/DIRECT-FIRED HEATERS



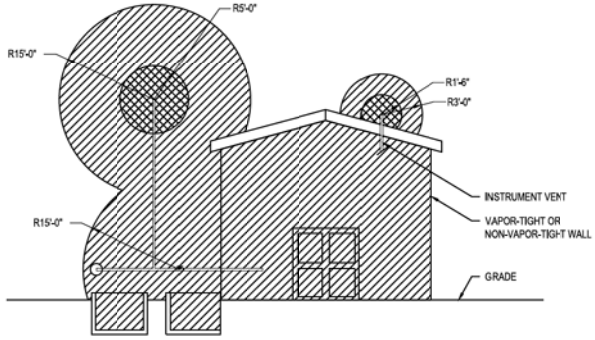
DETAIL AC-012
SCALE: N.T.S.

(REF: AGA XL1001, FIG. 12)
PIG LAUNCHERS / RECEIVERS AND BLOW OFF



DETAIL AC-016
SCALE: N.T.S.

(REF: AGA XL1001, FIG. 16)
INSTRUMENT OR CONTROL DE/ICE VENT IN ADEQUATELY VENTILATED NON-ENCLOSED AREA



DETAIL AC-032
SCALE: N.T.S.

(REF: AGA XL1001, FIG. 32)
ADEQUATELY VENTILATED ENCLOSED AREA

LEGEND:

- CLASS 1, DIVISION 1, GROUP D, T1
- CLASS 1, DIVISION 2, GROUP D, T1
- UNCLASSIFIED

NOTES:

1. AREA CLASSIFICATIONS ARE PER THE LATEST EDITION OF AMERICAN GAS ASSOCIATION AGA-XL1001.
2. ELECTRICAL WORK AND EQUIPMENT INSTALLED IN AREA CLASSIFICATION SHALL BE IN COMPLIANCE WITH THE LATEST EDITION OF NATIONAL ELECTRIC CODE, ARTICLE 500, 501, AND 504, PER INDUSTRY STANDARDS, AND PER STATE, LOCAL, AND OSHA REGULATIONS.
3. HAZARDOUS AREA CLASSIFICATION BASED ON:
   CLASS 1 - FLAMMABLE GASES OR VAPORS
   DIVISION 1 - NORMALLY HAZARDOUS *
   DIVISION 2 - NOT NORMALLY HAZARDOUS OR EXTENSION OF DIVISION 1*
   GROUP D - NATURAL GAS
   (*DEFINED BY NEC ARTICLE 500-5)
4. ENSURE THAT ELECTRICAL EQUIPMENT ENCLOSURES INCLUDING JUNCTION BOXES, AND CONDUIT FITTINGS DO NOT HAVE CL.1 DIV.1 INSTALLATION, OR SHALL MEET HAZARDOUS AREA CLASSIFICATION AS INDICATED ON THE DRAWINGS.
5. SOLENOIDS AND VALVES SHALL BE HAZARDOUS RATED AND STAMPED CL.1 DIV. 2 GROUP D, T1. VENTS OFF OF BLOW DOWN VALVES SHALL BE PIPED AT LEAST 5 FT. ABOVE ANY ELECTRICAL COMPONENTS OF THE VALVES.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	YBK	PRINCIPAL ENGINEER

DUKE ENERGY®

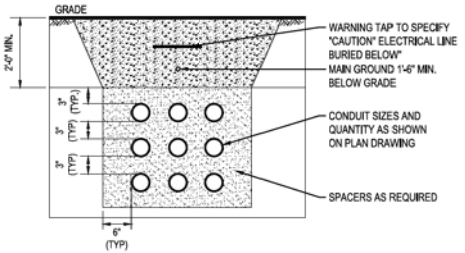
C350 PROJECT
HIGHPOINT PARK STATION
HAZARDOUS AREA CLASSIFICATION DETAILS

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 56 OF 66	DWG SCALE AS NOTED
DWG DATE 07/11/2019	SUPERSEDED —

DRAWING NUMBER: PNG -E-004-0001038
REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER

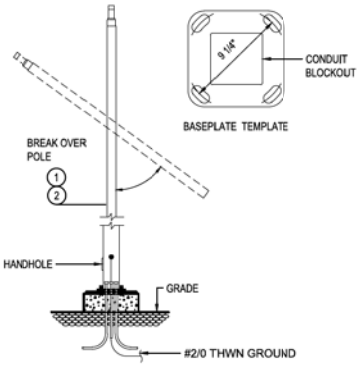


NOTES:
1. RESTORE SURFACE (GRADE) TO EXISTING CONDITIONS.
2. FOR PAVEMENT REPLACEMENT, THICKNESS OF ALL REPLACEMENT COURSES SHALL BE EQUAL TO EXISTING BUT ASPHALTIC CONCRETE SHALL NOT BE LESS THAN 2 INCHES AND AGGREGATE BASE COURSE SHALL NOT BE LESS THAN 6 INCHES. EXISTING PAVEMENT TO BE REMOVED SHALL BE SAWCUT, EXTEND AGGREGATE BASE COURSE 1'-0" BEYOND EXCAVATION LIMITS AND EXTEND ASPHALTIC CONCRETE 1'-0" BEYOND THE AGGREGATE BASE COURSE LIMITS. APPLY TACK COAT TO THE EXPOSED EXISTING ASPHALTIC CONCRETE SURFACES.

DETAIL EL-01
SCALE: NOT TO SCALE

TYPICAL DIRECT BURIED CONDUIT

ITEM	QTY.	DESCRIPTION
1	1	SQUARE HINGED STEEL POLE, 20' TALL, W/4" TENON, 6RD, LUG, 9 1/4" BOLT CIRCLE, 3/4" DIA. BOLTS, VALMONT #DSF10-400F200, W/ P2
2	1	LOWERING WINCH VALMONT #M136 (ONLY ONE NEEDED PER SITE)

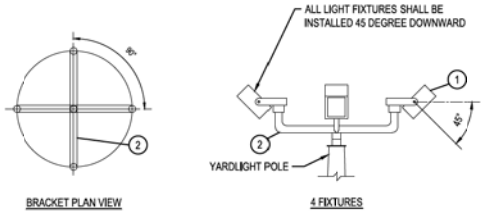


NOTES:
1. REFER TO STRUCTURAL DETAILS FOR FOUNDATION DESIGN
2. LIGHT POLE IS BREAK OVER POLE. CONTRACTOR SHALL INSTALL LIGHT POLE WITH 20' CLEARANCE IN THE DIRECTION THAT THE LIGHT POLE SHALL SWING DOWNWARD. NO STRUCTURE SHALL BE ON THE PATH WHERE LIGHT POLE SWING DOWNWARD.

DETAIL LT-01
SCALE: N.T.S.

LIGHT POLE

ITEM	QTY.	DESCRIPTION
1	4	FLOODLIGHT, C-H, #FMV-13L-C-Y/120 WITH FACTORY INSTALLED PHOTOCELL, CH #EV21H20
2	1	BULLHORN BRACKET, 4 TENON, 90°, 2 3/8" O.D, VALMONT #MX104-040-010



DETAIL LT-02
SCALE: N.T.S.

LIGHT FIXTURE

NOTES:
1. BILL OF MATERIALS SHALL BE AS DESCRIBED IN DETAIL OR APPROVED EQUAL BY OWNER PRIOR TO INSTALLATION.

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
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10/08/2020
PROFESSIONAL ENGINEER STAMP

REF. DWG(S)

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS		
DATE	INITIALS	REGIONAL ENGINEER
DATE	INITIALS	MGR TECH REC & STD
DATE 10/08/2020	INITIALS YBK	PRINCIPAL ENGINEER

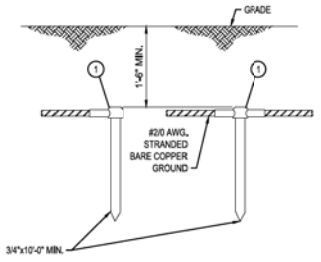
DUKE ENERGY®

C350 PROJECT
HIGHPOINT PARK STATION
ELECTRICAL DETAILS: MISCELLANEOUS

HAMILTON COUNTY, OHIO

SHEET(S) 57 OF 66	DWG SCALE AS NOTED
DWG DATE 07/11/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -E-004-0001039	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

ITEM	QTY.	DESCRIPTION (QUANTITY ARE FOR ONE INSTALLATION)
1	A/R	GALVANIZED STEEL COATED GROUND ROD, 3/4"x10'-0", 10MIL THICK MIN



TYPE: 1 TYPE: 2

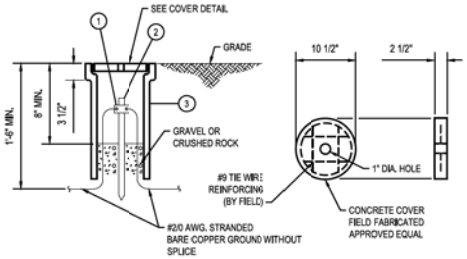
NOTES:

1. MAIN GROUND GRID SHALL BE #2/0 AWG. STRANDED BARE COPPER WIRE.

DETAIL GD-01

SCALE: N.T.S.
GROUND ROD

ITEM	QTY.	DESCRIPTION (QUANTITY ARE FOR ONEINSTALLATION)
1	1	GROUND CONNEC'OR BURNDY TYPE "YGHR-C"
2	1	GALV. STEEL COATED GROUND ROD, 3/4"x10'-0", 10MIL THICK MIN. COATED
3	1	8" X 1'-6" VITRIFIEDCLAY PIPE



GROUND WELL ASSEMBLY COVER DETAIL

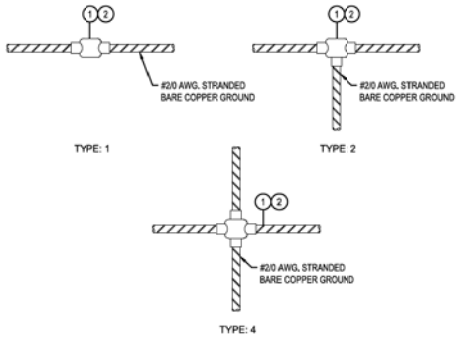
NOTES:

1. MAIN GROUND GRID SHALL BE #2/0 AWG. STRANDED BARE COPPER WIRE

DETAIL GD-02

SCALE: N.T.S.
TEST WELL

ITEM	QTY.	DESCRIPTION (QUANTITY ARE FOR ONE INSTALLA'ION)
1	A/R	EXOTHERMIC WELD, CABLE TO CABLE, CADWELD TYPE.
2	A/R	EXOTHERMIC WELD, TEE TYPE, BURNDY 8CS-1 (OR) BCS-2 (OR) BCS-4



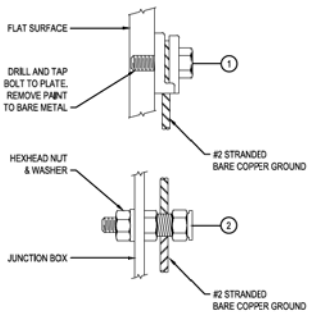
NOTES:

1. MAIN GROUND GRID SHALL BE #2/0 AWG. STRANDED BARE COPPER WIRE

DETAIL GD-03

SCALE: N.T.S.
EXOTHERMIC WELD CONNECTION

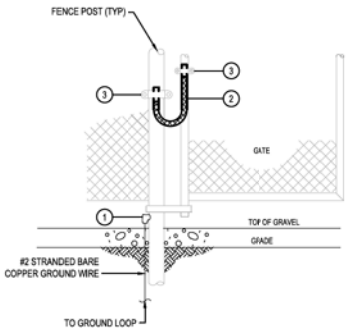
ITEM	QTY.	DESCRIPTION (QUANTITY ARE FOR ONE INSTALLATION)
1	1	GROUNDING, POST BURNDY# G24C-12
2	1	GROUNDING, SERVIT POST BURNDY# KC23



DETAIL GD-04

SCALE: N.T.S.
EQUIPMENT GROUNDING

ITEM	QTY.	DESCRIPTION (QUANTITY ARE FOR ONE INSTALLATION)
1	1	EXOTHERMIC WELD, CABLE TO STEEL PIPE, TYPE BURNDY BCS-3 - NOTE 2
2	1	FLEXIBLE COPPER BRAID, BURNDY TYPE BD, LENGTH AS REQUIRED
3	2	GROUND CONNECTOR, BURNDY TYPE GAR, SIZE AS REQ,D



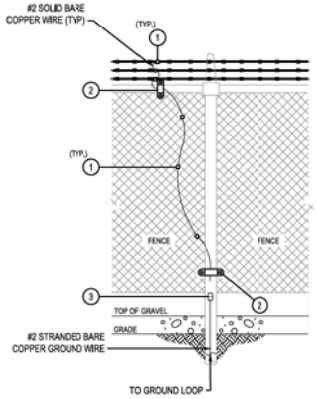
NOTES:

1. FOR DOUBLE GATE APPLICATION EACH GATE SHALL BE GROUNDED AS SHOWN.
2. REFERENCE BURNDY CATALOG FOR COMPLETE MODEL NO.

DETAIL GD-05

SCALE: N.T.S.
GATE GROUNDING

ITEM	QTY.	DESCRIPTION (QUANTITY ARE FOR ONE INSTALLATION)
1	A/R	COPPER COMPRESSION TAP, BURNDY #YGHC2C2
2	2	GROUND CONNECTOR, BURNDY TYPE GAR, SIZE AS REQ,D
3	1	EXOTHERMIC WELD, CABLE TO STEEL PIPE, TYPE BURNDY BCS-3 - NOTE 2



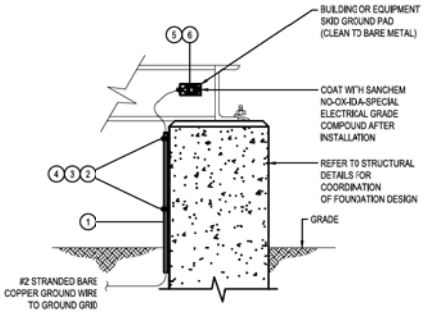
NOTES:

1. #6 WIRE SHALL BE LOOPED THROUGH GROUND WIRE CLAMPS AND FENCE CLAMPS TO KEEP WIRE SPLICES TO A MINIMUM.
2. REFERENCE BURNDY CATALOG FOR COMPLETE MODEL NO.

DETAIL GD-06

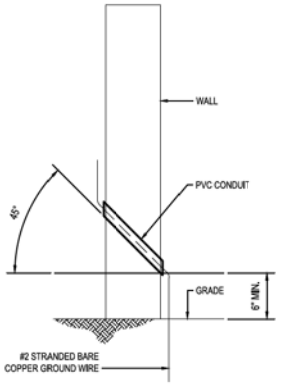
SCALE: N.T.S.
FENCE GROUNDING

ITEM	QTY.	DESCRIPTION (QUANTITY ARE FOR ONE INSTALLATION)
1	1	CONDUIT, 1" PVC, SCHEDULE 40 (LENGTH AS REQ.)
2	2	CONDUIT STRAP, 1", ONE HOLE, O-Z GEDNEY 14-100G
3	2	BOLT, 1/4"-20x1", CADMIUM-PLATED
4	2	ANCHOR, MASONRY, FOR 1/4"-20 BOLT, RAWL 9320
5	1	COMPRESSION LUG, TWO-HOLE, 2/0 AWG, BURNDY YA262LN
6	1	HEX SCREW, NUT 1/2-13 x 1" S.S



DETAIL GD-07

SCALE: N.T.S.
BUILDING & SKID GROUNDING



DETAIL GD-08

SCALE: N.T.S.
BUILDING GROUND PENETRATION

NOTES:

1. GROUNDING INSTALLATION MUST COMPLY WITH OSHA AND NATIONAL ELECTRICAL CODE REQUIREMENTS, EXCEPT WHERE LOCAL CODE PREVAILS.
2. A TEST MEASUREMENT OF THE RESISTANCE OF THE GROUNDING SYSTEM MUST BE TAKEN WHEN INSTALLED. IF THE RESISTANCE TO GROUND IS GREATER THAN 5 OHMS. ADDITIONAL GROUND RODS MUST BE INSTALLED UNTIL A COMBINED RESISTANCE OF 5 OHMS OR LESS IS OBTAINED.
3. THE GROUNDING SYSTEM IS SHOWN DIAGRAMMATICALLY SO THAT APPROXIMATE ROUTING OF GROUNDING CONDUCTORS AND LOCATIONS OF TAPS, WELLS AND GROUND RODS CAN BE ACCOMPLISHED.
4. WHERE GROUNDING CONDUCTORS ARE ROUTED EXPOSED, THEY MUST BE SECURED MINIMUM EVERY 24".
5. BILL OF MATERIALS SHALL BE AS DESCRIBED IN DETAIL OR APPROVED EQUAL BY OWNER PRIOR TO INSTALLATION.

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
YEVGENIY KHISLAVSKIY
E-84164
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	MCH	YBK

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	KM

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	YBK	PRINCIPAL ENGINEER

DUKE ENERGY®

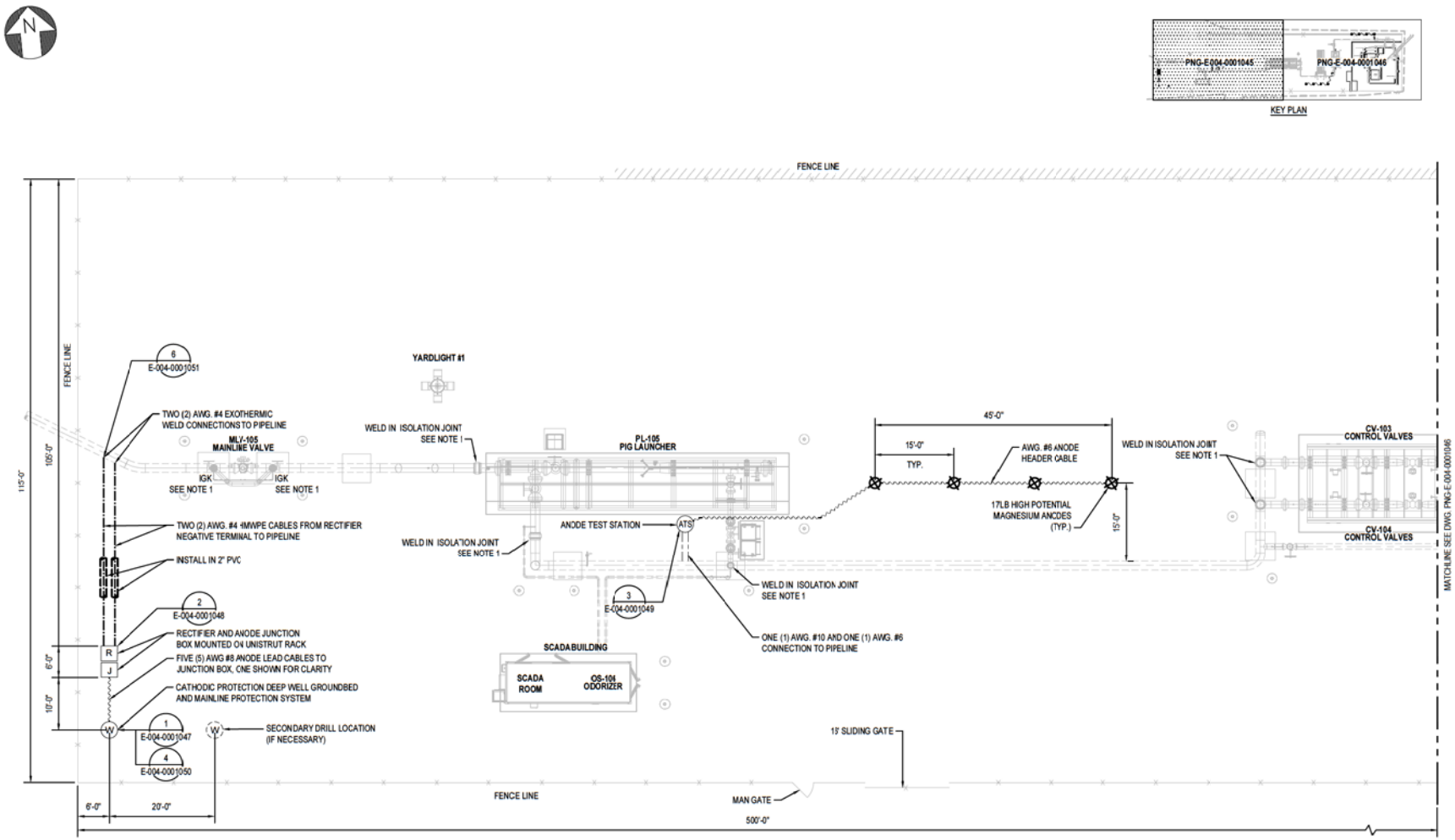
C350 PROJECT
HIGHPOINT PARK STATION
ELECTRICAL DETAILS: GROUNDING

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 58 OF 66	DWG SCALE AS NOTED
DWG DATE 07/11/2019	SUPERSEDED —
DRAWING NUMBER	REVISION
PNG -E-004-0001040	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



PLAN VIEW

SCALE: AS NOTED BELOW

NOTE:

1. INSTALL ISOLATION PROTECTION PER DWG. PNG-E-004-001050, DETAIL 5

LEGEND:

- R — RECTIFIER
- J — ANODE JUNCTION BOX
- W — CATHODIC PROTECTION ANODE DEEP WELL
- ATS — ANODE TEST STATION
- ⊠ — 17 LB MAGNESIUM ANODE

0 10' 20'
SCALE IN FEET

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	FFO	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	FFO

APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR. TECH REC & STD
	10/08/2020	CAB	PRINCIPAL ENGINEER

DUKE ENERGY

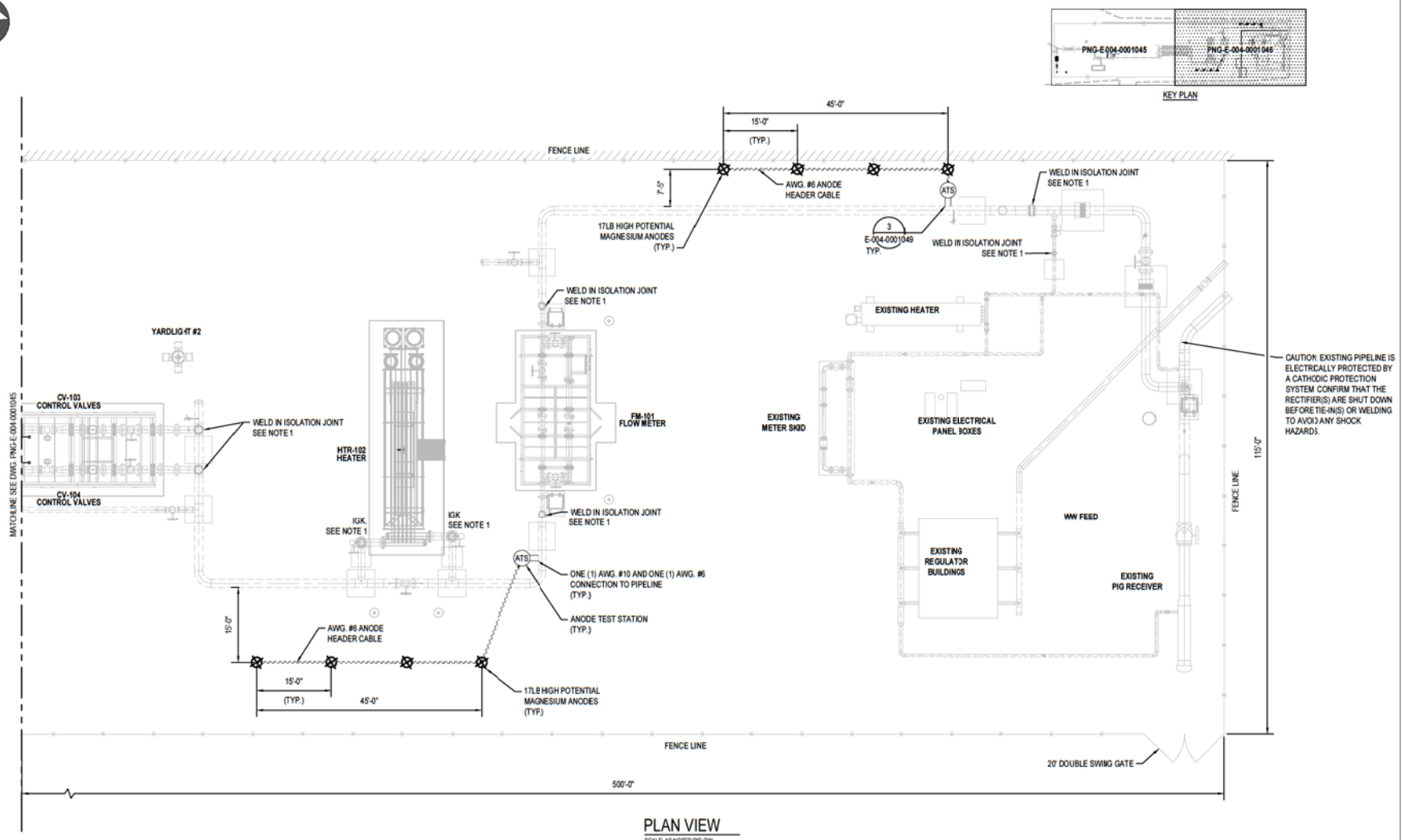
C350 PROJECT
HIGHPOINT PARK STATION
CATHODIC PROTECTION SITE PLAN 1

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 59 OF 66	DWG SCALE 1" = 10'
DWG DATE 05/04/2020	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -E-004-0001045	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



PLAN VIEW

SCALE: AS NOTED BELOW

NOTE:

1. INSTALL ISOLATION PROTECTION PER DWG. PNG-E-004-001050, DETAIL 5

LEGEND:

- R — RECTIFIER
- J — ANODE JUNCTION BOX
- W — CATHODIC PROTECTION ANODE DEEP WELL
- ATS — ANODE TEST STATION
- ⊠ — 17 LB MAGNESIUM ANODE

0 10' 20'
SCALE IN FEET

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA01557

CHAD A BACON PE.85638 REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGINEER STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	FFO	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	FFO

APPROVALS	DATE	INITIALS
REGIONAL ENGINEER		
MGR TECH REC & STD		
PRINCIPAL ENGINEER	10/08/2020	CAB

DUKE ENERGY

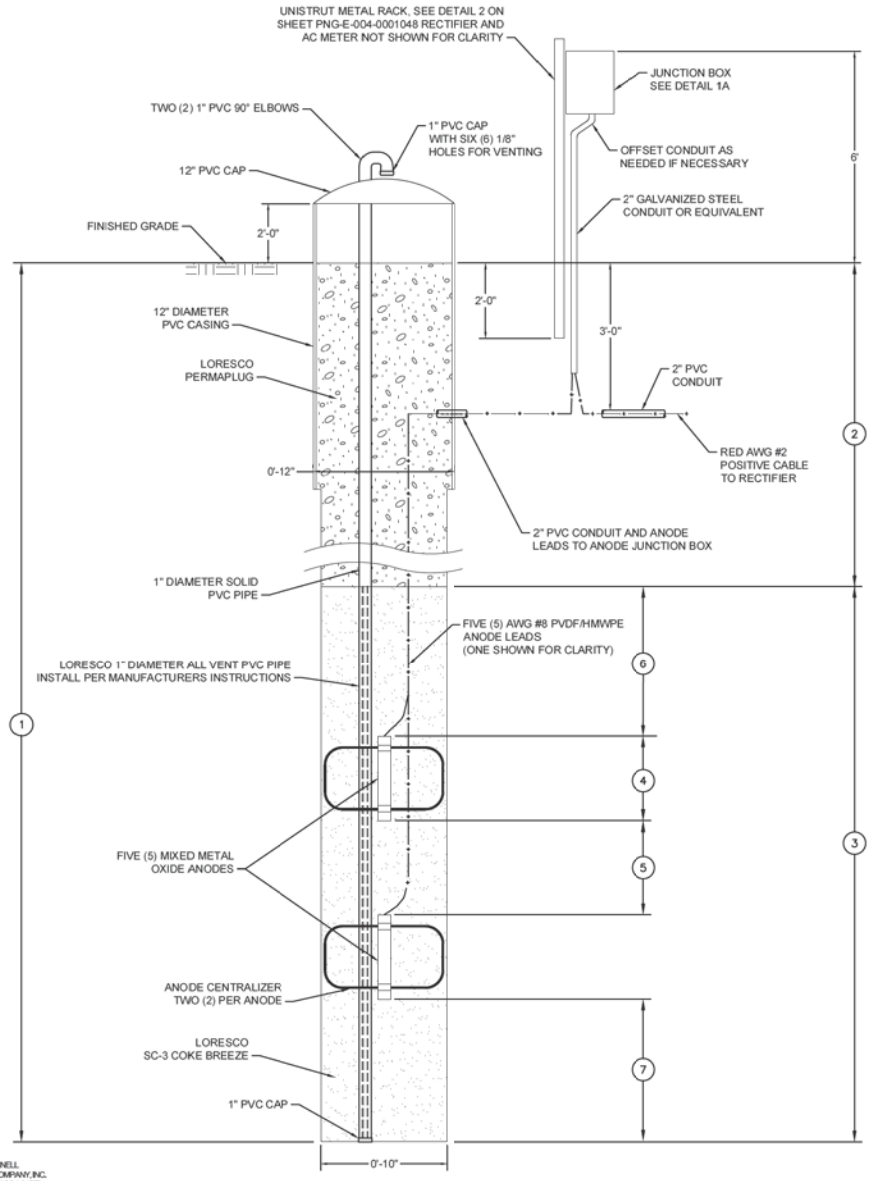
C350 PROJECT
HIGHPOINT PARK STATION
CATHODIC PROTECTION SITE PLAN 2

HAMILTON COUNTY, OHIO

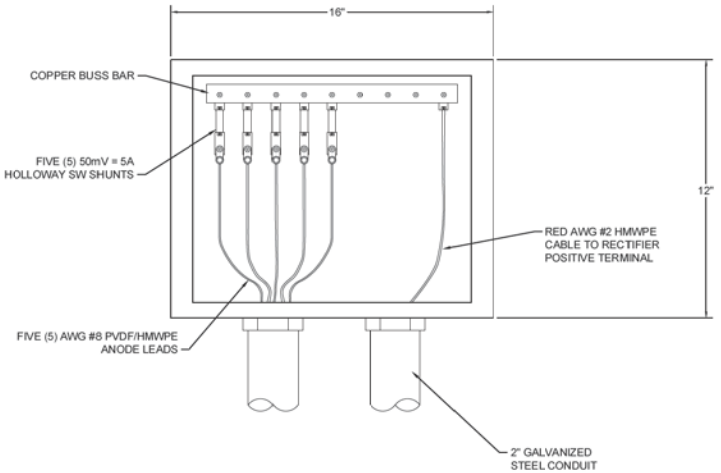
REF. DWG(S)

SHEET(S) 60 OF 66	DWG SCALE 1" = 10'
DWG DATE 05/04/2020	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -E-004-0001046	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



DEEP WELL GROUNDBED DETAIL 1
SCALE: NOT TO SCALE



ANODE JUNCTION BOX DETAIL 1A
SCALE: NOT TO SCALE

HIGHPOINT PARK STATION DEEP WELL DIMENSIONS	
1. TOTAL WELL DEPTH	180'
2. INACTIVE COLUMN LENGTH	100'
3. ACTIVE COLUMN LENGTH	80'
4. ANODE LENGTH	19.7"
5. DISTANCE BETWEEN ANODES	12'
6. DISTANCE FROM TOP OF ACTIVE COLUMN TO FIRST ANODE	12'
7. DISTANCE FROM BOTTOM OF ACTIVE COLUMN TO LAST ANODE	12'
N. NUMBER OF ANODES	5

BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	FFO	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	FFO

APPROVALS			
DATE	INITIALS		REGIONAL ENGINEER
DATE	INITIALS		MGR TECH REC & STD
10/08/2020	CAB		PRINCIPAL ENGINEER

DUKE ENERGY

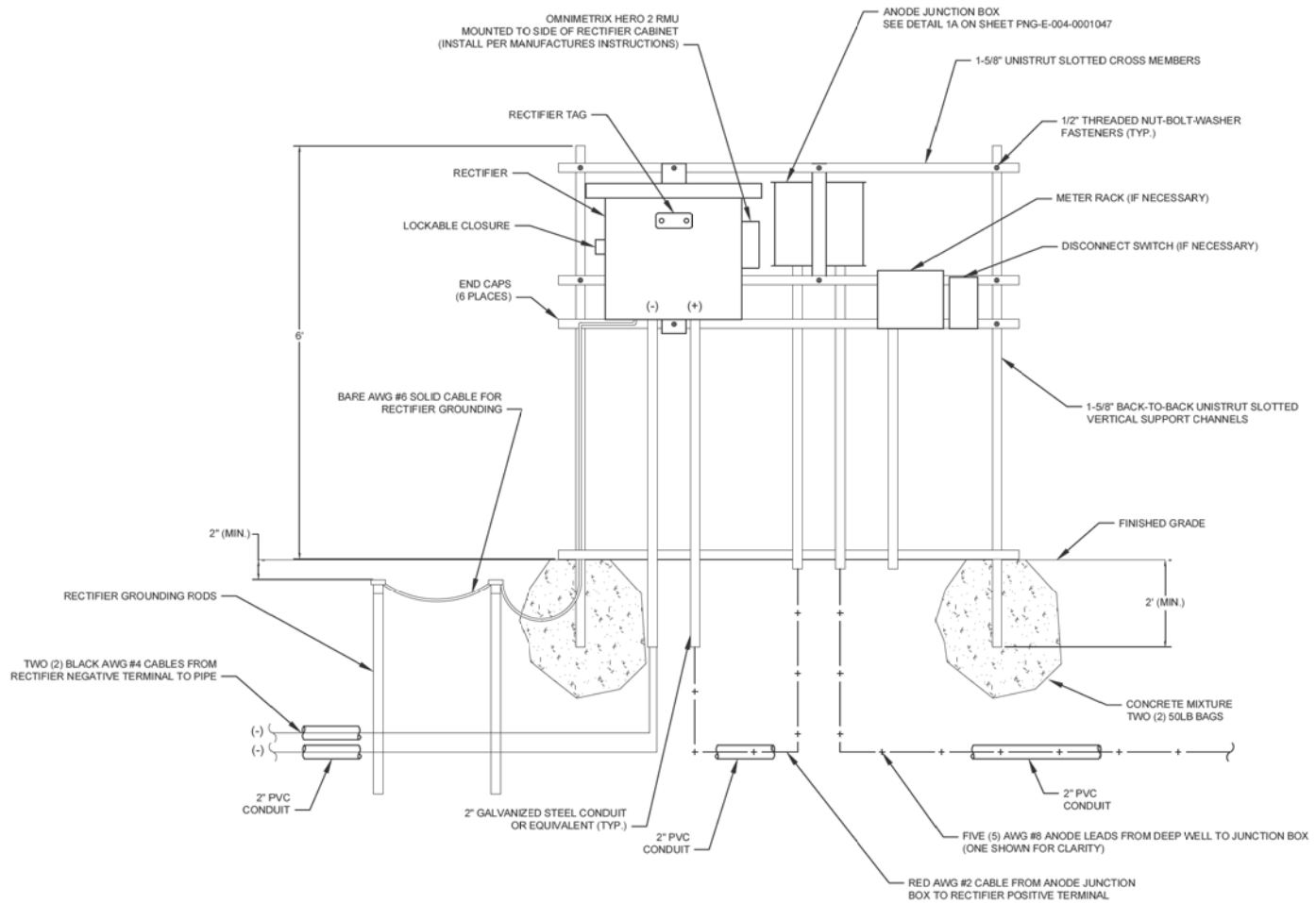
C350 PROJECT
HIGHPOINT PARK STATION
CP DEEP WELL GROUNDBED

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 61 OF 66	DWG SCALE NONE
DWG DATE 05/04/2020	SUPERSEDED

DRAWING NUMBER: PNG -E-004-0001047
REVISION: 0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER



CATHODIC PROTECTION RECTIFIER
DETAIL 2
SCALE: NOT TO SCALE

BURNS & McDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A
BACON
PE.85638
REGISTERED
PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENG/ARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	FFO	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	FFO

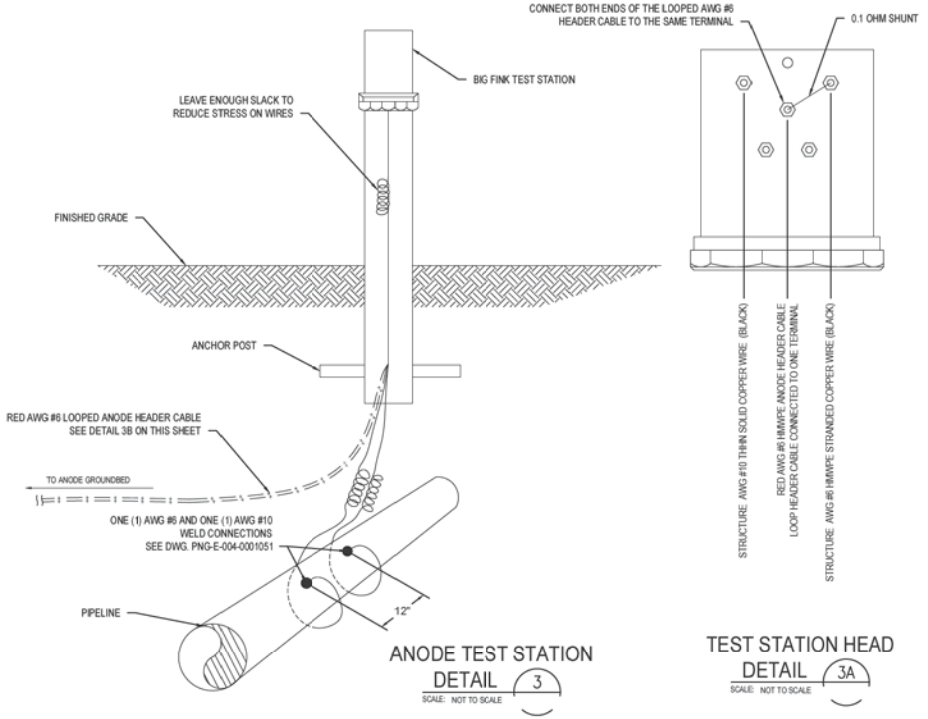
APPROVALS	DATE	INITIALS	
			REGIONAL ENGINEER
			MGR TECH REC & STD
	10/08/2020	CAB	PRINCIPAL ENGINEER

DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
CATHODIC PROTECTION RECTIFIER
HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 62 OF 66	DWG SCALE NONE
DWG DATE 05/04/2020	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -E-004-0001048	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

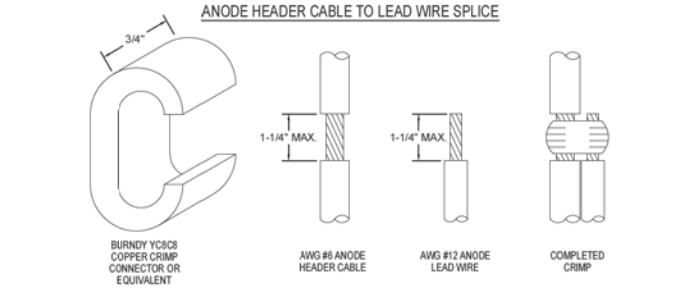


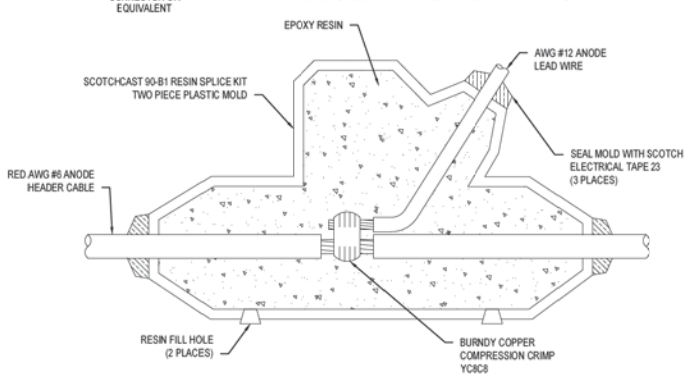
ANODE TEST STATION DETAIL 3

SCALE: NOT TO SCALE

TEST STATION HEAD DETAIL 3A

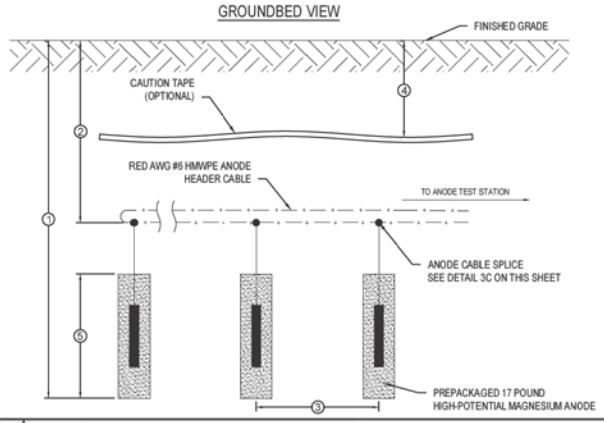
SCALE: NOT TO SCALE





ANODE CABLE SPLICE DETAILS DETAIL 3C

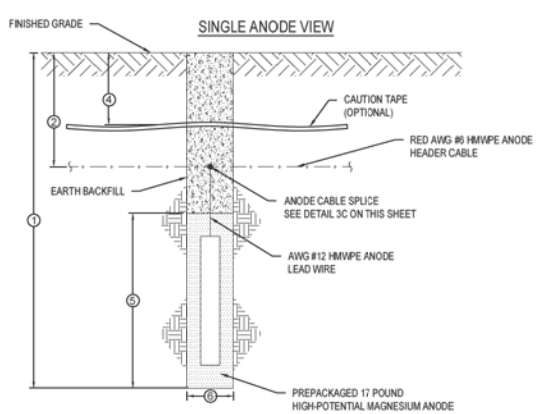
SCALE: NOT TO SCALE



ANODE GROUNDBED SPECIFICATIONS		
1.	ANODE DEPTH	7-FT
2.	CABLE DEPTH	3-FT
3.	DISTANCE BETWEEN ANODES	15-FT
4.	WARNING TAPE DEPTH	2-FT
5.	PREPACKAGED ANODE LENGTH	29-IN
6.	PREPACKAGED ANODE DIAMETER	6.5-IN
7.	TOTAL NUMBER OF ANODES	4 PER GROUNDBED

GALVANIC ANODE GROUNDBED DETAIL 3B

SCALE: NOT TO SCALE



BURNS & McDONNELL ENGINEERING COMPANY, INC.
STATE LICENSE # COA:01557

STATE OF OHIO
CHAD A BACON
PE.85638
REGISTERED PROFESSIONAL ENGINEER
10/08/2020
PROFESSIONAL ENGIARCH STAMP

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD
0	10/08/2020	ISSUED FOR CONSTRUCTION	MCR	FFO	CAB

DESCRIPTION	
AREA CODE	
ACCOUNT NUMBER	AW2123
PROJECT NUMBER	1880115
DRAWING BY	MCR
STATION ID	S0867O1
CHECKER INITIALS	FFO

APPROVALS		
DATE	INITIALS	
		REGIONAL ENGINEER
		MGR TECH REC & STD
10/08/2020	CAB	PRINCIPAL ENGINEER

DUKE ENERGY

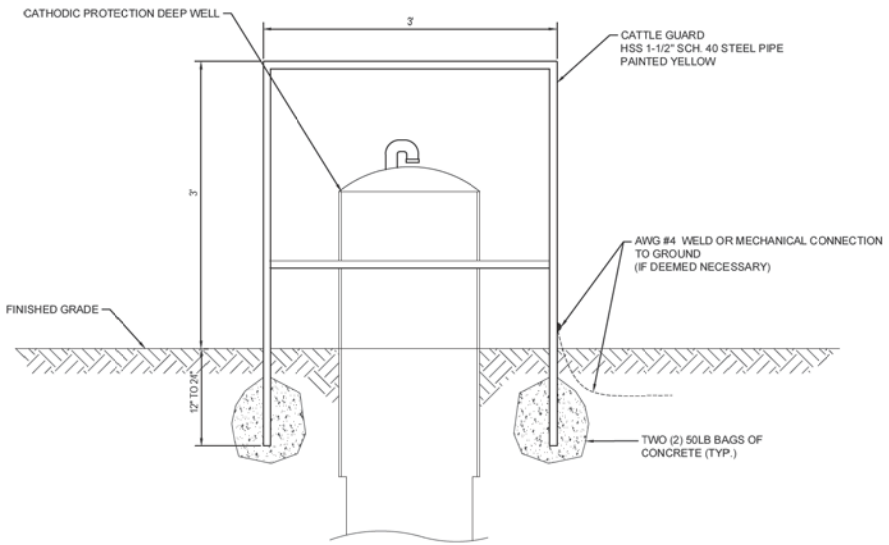
C350 PROJECT
HIGHPOINT PARK STATION
ANODE TEST STATION

HAMILTON COUNTY, OHIO

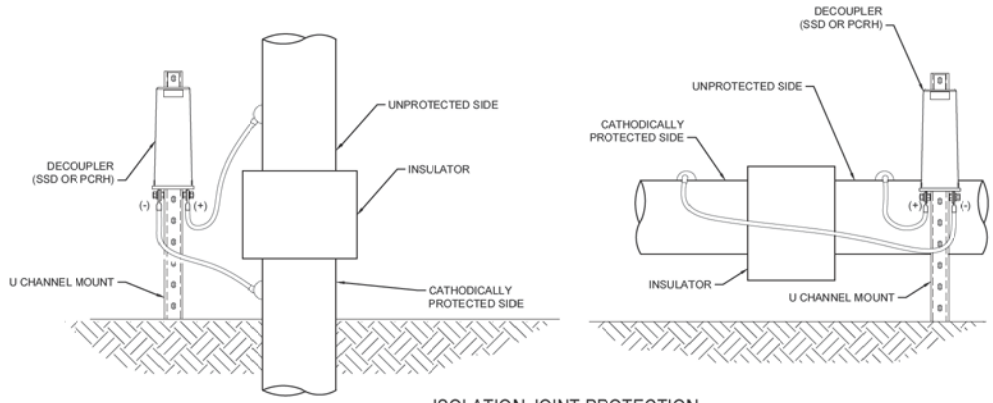
REF. DWG(S)

SHEET(S) 63 OF 66	DWG SCALE NONE
DWG DATE 05/04/2020	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -E-004-0001049	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER



PROTECTIVE BOLLARDS
DETAIL 4
SCALE: NOT TO SCALE



ISOLATION JOINT PROTECTION
DETAIL 5
SCALE: NOT TO SCALE

INSTALLATION NOTES:

1. AT LOCATIONS WHERE ONE SIDE OF THE FLANGE IS CATHODICALLY PROTECTED AND THE OPPOSITE SIDE OF THE FLANGE IS UNPROTECTED, CONNECT NEGATIVE TERMINAL OF DECOUPLER TO CATHODICALLY PROTECTED SIDE OF FLANGE.
2. MINIMIZE DISTANCE BETWEEN DECOUPLER AND ISOLATION JOINT TO KEEP WIRE LENGTH AS SHORT AS POSSIBLE.
3. INSTALL SSD IN CLASS 1, DIV 2 LOCATIONS
4. INSTALL PCRH IN CLASS 1, DIV 1 LOCATIONS

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DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
BOLLARDS & ISOLATION JOINT PROTECTION
HAMILTON COUNTY, OHIO

SHEET(S) 64 OF 66	DWG SCALE NONE
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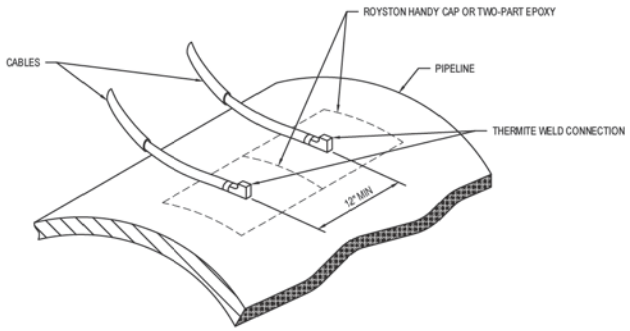
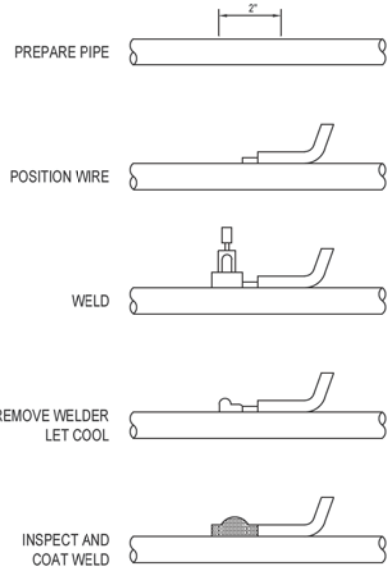
PNG -E-004-0001050	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

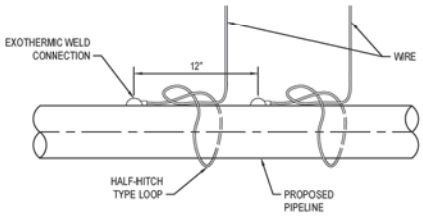
CABLE TO PIPELINE CONNECTIONS



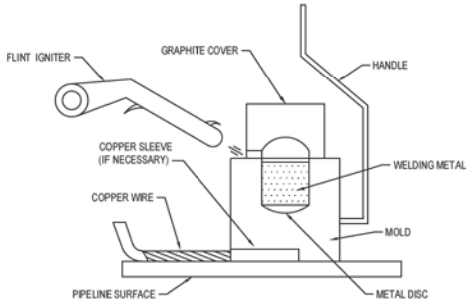
WELDING PROCEDURE



CABLE ROUTING DETAIL



WELDING MOLD SET UP



STEPS FOR PREPARING PIPELINE SURFACE

1. REMOVE A 2" SQUARE SECTION OF COATING, FILE SURFACE TO BRIGHT METAL AND DRY.
2. PIPE MUST BE TESTED FOR WALL LAMINATIONS PRIOR TO WELDING. ULTRASONIC WALL THICKNESS MEASUREMENTS MUST BE TAKEN AT THE LOCATION OF ALL WELDS, TO VERIFY ADEQUATE WALL THICKNESS.
3. WRAP TEST WIRE AROUND THE PIPE OR LEAVE ENOUGH SLACK ON THE WIRE TO REDUCE STRAIN ON WELD. NEVER WRAP CASING WIRE AROUND PIPELINE.
4. STRIP INSULATION FROM WIRE, SLIP ON COPPER SLEEVE (#8 WIRE AND SMALLER) AND CRIMP. PLACE WIRE AGAINST METAL SURFACE.
5. PLACE PREPARED WELDER OVER WIRE AND HOLD FIRMLY WHILE MAKING CONNECTION. APPLY SPARK TO SIDE OF WELDER WITH FLINT GUN.
6. REMOVE MOLD AND LET COOL.
7. AFTER WELD HAS COOLED, HIT WELD SEVERAL TIMES WITH HAMMER TO ENSURE WELD IS INTACT.
8. PROTECT WELDMENT AS REQUIRED.

STEPS FOR PREPARING WELDER

1. PLACE METAL DISC IN BOTTOM OF GRAPHITE MOLD.
2. OPEN CARTRIDGE AND POUR CHARGE IN MOLD USE MAXIMUM 15 GRAM CHARGE.
3. SQUEEZE BASE OF CARTRIDGE AND REMOVE STARTING POWDER.
4. CLOSE COVER AND PLACE WELDER OVER WIRE.

EXOTHERMIC WELDING DETAIL 6

SCALE: NOT TO SCALE

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DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
EXOTHERMIC WELDING

HAMILTON COUNTY, OHIO

REF. DWG(S)

SHEET(S) 65 OF 66	DWG SCALE NONE
DWG DATE 05/04/2020	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -E-004-0001051	0

DISCIPLINE / RESOURCE CENTER / LINE NUMBER

CATHODIC PROTECTION BILL OF MATERIALS

ITEM NO	EST QTY	UOM	AS-BUILT QTY	DESCRIPTION	MAXIMO PART X	NOTES	MODEL NO	MATERIAL SOURCE
				CAD WELDS & CONNECTIONS				
1	3	PKG		CA-15 WELD METAL (20/PACK)	NON-STOCK	WELD METAL, CABLE TO PIPE CONNECTIONS	CA-15	ERICO
2	1	EA		CAHAA-1L, AWG #4 STRANDED CABLE WELDER	NON-STOCK	AWG #4 CABLE TO PIPE CONNECTION	CAHAA-1L	ERICO
3	1	EA		CAHAA-1H, AWG #6 STRANDED CABLE WELDER	NON-STOCK	AWG #6 CABLE TO PIPE CONNECTION	CAHAA-1H	ERICO
4	5	EA		CAB-133-1H, ADAPTER SLEEVE FOR AWG #10, FOR USE IN AWG #6 WELDER	NON-STOCK	AWG #10 CABLE TO PIPE CONNECTION	CAB-133-1H	ERICO
5	1	EA		FLINT IGNITOR FOR THERMITE WELDING, T320	NON-STOCK	CADWELD IGNITOR	T320	ERICO
6	10	EA		ROYSTON HANDY CAP	1552880	CABLE TO PIPE WELD PROTECTION		ROYSTON
7	1	EA		TC 7000 EPOXY COATING, TWO PART	NON-STOCK	CABLE TO PIPE WELD PROTECTION	TC 7000	TAPECOAT
8	12	EA		BURNDY YC8C8 COPPER CRIMP	NON-STOCK	ANODE HEADER CABLE TO ANODE LEAD CRIMP	YC8C8	BURNDY
9	12	EA		90-B1N RESIN SPLICE KIT	NON-STOCK	HEADER CABLE TO ANODE LEAD SPLICE KIT	90-B1N	3M
10	3	EA		SUPER 88 TAPE, 66FT ROLL	NON-STOCK	HEADER CABLE TO ANODE SPLICE PROTECTION		3M
11	3	EA		SCOTCH 23 HIGH VOLTAGE TAPE	NON-STOCK	HEADER CABLE TO ANODE SPLICE PROTECTION		3M
				WIRE				
12	250	FT		BLACK AWG #10, THHN COATED SOLID COPPER WIRE	NON-STOCK	TEST STATION TO PIPE CONNECTION		GENERIC
13	250	FT		BLACK AWG #6, THHN COATED STRANDED COPPER WIRE	NON-STOCK	TEST STATION TO PIPE CONNECTION		GENERIC
14	750	FT		RED AWG #6, THHN COATED STRANDED COPPER WIRE	NON-STOCK	TEST STATION TO PIPE CONNECTION		GENERIC
15	50	FT		BARE AWG #6 SOLID COPPER WIRE	NON-STOCK	RECTIFIER GROUNDING CONNECTION		GENERIC
16	350	FT		BLACK AWG #4, HMWPE COATED STRANDED COPPER WIRE	NON-STOCK	RECTIFIER TO PIPE CONNECTION, ISOLATION JOINT PROTECTION		GENERIC
17	150	FT		BLACK AWG #2, HMWPE COATED STRANDED COPPER WIRE	NON-STOCK	ISOLATION JOINT PROTECTION		GENERIC
18	50	FT		RED AWG #2, HMWPE COATED STRANDED COPPER WIRE	NON-STOCK	ANODE JUNCTION BOX TO RECTIFIER POSITIVE TERMINAL CONNECTION		GENERIC
				TEST STATIONS & JUNCTION BOXES				
19	3	EA		BIG FINK 5 TERMINAL TEST STATION WITH 3" DIA. SUPPORT POST, 6' HEIGHT, YELLOW POST, YELLOW TEST HEAD	1555422	CP TEST STATION	300-B5C-Y/Y	COTT
20	3	EA		COTT SHUNT RED - 0.1 OHM, 2 AMP	NON-STOCK	ANODE TEST STATION SHUNT		COTT
21	1	EA		12" H X 16" W GALVANIZED ENCLOSURE WITH ONE (1) COPPER BUSS BAR, FIVE (5) 50 MV = 5 A HOLLOWAY SW SHUNTS, FIVE (5) KA-4C CIRCUIT LUGS FOR AWG #8 CABLE, ONE (1) KPA-25 HEADER LUG FOR AWG #2 CABLE, TWO (2) 2" STEEL CONDUIT POSTS	NON-STOCK	DEEP WELL ANODE JUNCTION BOX		UNIVERSAL
				DEEP WELL				
22	3	EA		SOLID PVC CASING, 12" DIA. X 20' LENGTHS, BELL ENDS	NON-STOCK	DEEP WELL PASSIVE ZONE PVC CASING		GENERIC
23	4	EA		ALL-VENT 1" DIA. PVC PIPE, 20' LENGTHS	NON-STOCK	DEEP WELL ACTIVE ZONE VENT PIPE		LORESCO
24	10	EA		10" VENTRALIZER (CENTRALIZER), TWO PER ANODE	NON-STOCK	ANODE CENTRALIZER	VENTRALIZER	ELTECH
25	1	EA		12" DIA. PVC CAP	NON-STOCK	DEEP WELL CAP		GENERIC
26	5	EA		1" DIA. SOLID PCV PIPE, 20' LENGTHS	NON-STOCK	DEEP WELL PASSIVE ZONE VENT PIPE		GENERIC
27	2	EA		1" DIA. PVC CAP	NON-STOCK	VENT PIPE CAP		GENERIC
28	20	EA		1" DIA. PVC COUPLINGS	NON-STOCK	VENT PIPE COUPLINGS		GENERIC
29	2	EA		1" DIA. 90 DEGREE SOLID PVC ELBOWS	NON-STOCK	VENT PIPE ELBOWS		GENERIC
30	6	FT		2" PVC CONDUIT, 20' LENGTHS	NON-STOCK	RECTIFIER/ANODE CABLE CONDUIT		GENERIC
				RECTIFIER				
31	1	EA		24V/10A AIR-COOLED RECTIFIER, TYPE: ASAI2410AACR WITH 50 MV = 10 A HOLLOWAY SW SHUNT, HOT DIPPED	NON-STOCK	RECTIFIER	ASAI5015AACR	UNIVERSAL
32	1	EA		OMNIMETRIX HERO 2 RMU	NON-STOCK	REMOTE MONITORING UNIT	HERO 2	OMNIMETRIX
33	2	EA		CONDUIT RIDGED STEEL, 2", 20' LENGTHS	NON-STOCK	RECTIFIER/JUNCTION BOX CABLE CONDUIT		GENERIC
34	8	EA		GALVANIZED STEEL CLAMPS, 2"	NON-STOCK	RECTIFIER/JUNCTION BOX CABLE CONDUIT		GENERIC
35	8	EA		LOCKNUTS, 2"	NON-STOCK	RECTIFIER/JUNCTION BOX CABLE CONDUIT		GENERIC
36	8	EA		INSULATING HUB, 2"	NON-STOCK	RECTIFIER/JUNCTION BOX CABLE CONDUIT		GENERIC
37	4	EA		GROUND ROD, 5/8" X 8' COPPER	NON-STOCK	RECTIFIER GROUNDING		GENERIC
38	4	EA		GROUND ROD CLAMP, 5/8"	NON-STOCK	RECTIFIER GROUNDING		GENERIC
39	4	EA		CONCRETE, 50LB BAG	NON-STOCK	RECTIFIER/JUNCTION RACK FOUNDATION		GENERIC
40	2	EA		1-5/8" X 3-1/4", 12 GAGE BACK-TO-BACK SLOTTED UNISTRUT, 8-FT LENGTHS	NON-STOCK	RECTIFIER RACK, VERTICAL MEMBERS	P1001T	UNISTRUT
41	4	EA		1-5/8" X 1-5/8", 12 GAGE SLOTTED UNISTRUT, 6-FT LENGTHS	NON-STOCK	RECTIFIER RACK, HORIZONTAL MEMBER	P1000T	UNISTRUT
42	6	EA		1-5/8" WHITE PLASTIC END CAPS	NON-STOCK	RECTIFIER RACK END CAPS	P2860	UNISTRUT
43	1	PKG		1/2" HEX BOLT, 1-1/2" LENGTH (50/BOX)	NON-STOCK	RECTIFIER RACK FASTENERS		GENERIC
44	1	PKG		1/2" FLAT WASHER (50/BOX)	NON-STOCK	RECTIFIER RACK FASTENERS		GENERIC
45	1	PKG		1/2" HEX NUT (50/BOX)	NON-STOCK	RECTIFIER RACK FASTENERS		GENERIC
				ANODES & BACKFILL				
46	12	EA		PACKAGED ULTRAMAG 17D3 HIGH POTENTIAL MAGNESIUM ANODE, 10FT AWG #12 CABLE	1552969	GALVANIC ANODES	17D3	FARWEST
47	5	EA		MIXED METAL OXIDE TUBULAR ANODE, 1" DIA. X 20" LENGTH WITH 220' AWG #8 PVDF/HMWPE CABLE	NON-STOCK	DEEP WELL ANODES	2.5/50	DE NORA
48	70	EA		LORESCO SC-3 (50LB BAGS)	NON-STOCK	DEEP WELL ACTIVE ZONE BACKFILL	SC-3	LORESCO
49	110	EA		LORESCO PERMAPLUG (50LB BAGS)	NON-STOCK	DEEP WELL PASSIVE ZONE BACKFILL	PERMAPLUG	LORESCO
				ISOLATION JOINT PROTECTION				
50	10	EA		SOLID STATE DECOUPLER	NON-STOCK	ISOLATION JOINT PROTECTION (CLASS 1, DIV 2)	SSD-2/2-5.0-100-R	DAIRYLAND
51	5	EA		PCRH	NON-STOCK	ISOLATION JOINT PROTECTION (CLASS 1, DIV 1)	PCRH-5KA-BCD	DAIRYLAND
52	5	EA		ACL KIT	NON-STOCK	PCRH LEAD KIT	ACL - "X"	DAIRYLAND
53	4	EA		AP KIT	NON-STOCK	PCRH ADAPTER PLATES FOR FLANGE/IGK LOCATIONS	AP - "D"	DAIRYLAND
54	15	EA		U-CHANNEL POST WITH ANCHOR, 6'	NON-STOCK	DECOUPLER MOUNTING		GENERIC

NOTE: CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS PARTS TO COMPLETE PROJECT PER CONTRACT DRAWINGS, CONTRACT SPECIFICATIONS, ELECTRICAL CODES, STATE AND LOCAL CODES AND STANDARDS, AND LOCAL ELECTRICAL DISTRIBUTION COMPANY REQUIREMENTS. PARTS INCLUDE, BUT ARE NOT LIMITED TO, WIRING AND MOUNTING MATERIALS, METER SOCKET, DISCONNECT EQUIPMENT, ENCLOSURES, TRANSIENT VOLTAGE SURGE SUPPRESSORS, AC MAIN BUSS TERMINATION, CIRCUIT BREAKERS, AND OTHER ELECTRICAL EQUIPMENT REQUIRED. ACTUAL LENGTH WIRING IS DEPENDENT ON DISTANCE FROM INSTALLATION.

BURNS & McDONNELL
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DUKE ENERGY

C350 PROJECT
HIGHPOINT PARK STATION
CATHODIC PROTECTION BOM
HAMILTON COUNTY, OHIO

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