

**DUKE ENERGY – WOODSDALE STATION
FUEL OIL SYSTEM INSTALLATION PROJECT
PRELIMINARY ENGINEERING REPORT
S&L REPORT NUMBER SL-013850
REV. 1 – FOR PERMIT APPLICATION**

APRIL 28, 2017

PROJECT NUMBER 13371-035

PREPARED FOR:



PREPARED BY

Sargent & Lundy^{LLC}

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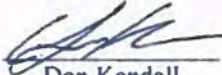
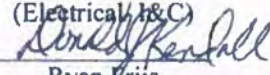

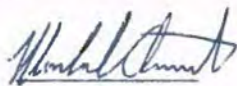
Duke Energy
Woodsdale Station
Fuel Oil Installation Project
Preliminary Engineering Report

Sargent & Lundy

Project No.: 13371-035
S&L Report No. SL-013850
Rev. 1

DUKE ENERGY
WOODSDALE STATION
PRELIMINARY ENGINEERING REPORT
FUEL OIL INSTALLATION PROJECT
ISSUE SUMMARY, APPROVAL AND CERTIFICATION PAGE

This is to confirm that this Summary Report has been prepared, reviewed and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASQC Q9001 Quality Management Systems.

<u>Issue Purpose</u>	<u>Issue Date</u>	<u>Prepared by:</u>	<u>Reviewed by:</u>	<u>Approved by:</u>
For Permit Application	04/28/17	Michael Aument	Caleb Kadera  Don Kendall (Electrical/H&C)  Ryan Friis (Structural) 	Michael Aument 

I certify that this Summary Report was prepared by me or under my supervision and that I am a registered professional engineer under the laws of the State of Kentucky.

Certified By:  Date: 04/28/17

Seal:



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101. INTRODUCTION & PROJECT BASIS

101.1 Project Basis

Duke Energy's Woodsdale Station is a six (6) unit simple cycle combustion turbine station. ABB is the original turbine manufacturer, which has since been purchased by General Electric (GE). The six (6) units are GT11N turbines configured identically. Natural gas is the primary operating fuel. Historically propane was used as a secondary fuel but is no longer obtainable for back-up fuel operation due to closure of the supply caverns. Woodsdale Station sells the power it generates into the PJM Interconnection. Starting in June 2019, Woodsdale Station will be subject to Capacity Performance (CP) penalties from the PJM Interconnection for being unable to operate when requested. There is potential for natural gas to be unavailable, historically during extreme cold temperatures, for power generation when Woodsdale is called upon to operate. Duke Energy is pursuing decommissioning and demolition of the existing propane fuel system and the addition of No. 2 fuel oil firing capability to all six (6) units at Woodsdale Station as a secondary fuel. The new fuel oil system will include on-site fuel oil unloading and storage.

101.2 Project Background

Duke Energy (DE) retained Sargent & Lundy (S&L) to develop the preliminary engineering report, develop technical equipment and procurement specifications, and design the balance-of-plant (BOP) upgrades, as part of Duke Energy's project to add No. 2 fuel oil as a back-up fuel at Woodsdale Station. General Electric (GE) shall design and furnish the conversion equipment required at the turbine combustion chambers, fuel oil collectors, fuel oil processing and forwarding block, and nozzle air cooler. Sargent & Lundy shall design and support procurement of the fuel oil storage system, unloading system, low pressure fuel oil forwarding system, fire protection/detection system upgrades, storm water, potable water and instrument air system upgrades.

101.3 Preliminary Engineering Report

The preliminary engineering report includes the design basis and scope for the new fuel oil system equipment and facilities based on preliminary evaluations. The scope for these facilities was based on the follow items:

- Design basis

- General arrangements
- New foundations and structures
- Site improvements
- Mechanical interconnects and systems
- Power supply and electrical systems
- Control system integration

The preliminary engineering report also includes the following project controls basis:

- Contracting approach
- Engineering and construction schedule
- Capital Cost Estimate

101.4 Objectives

The Preliminary Engineering Report objective is to define the design scopes of major project components and provide adequate information to support the following activities:

- Establish design basis for major equipment and technology to be used
- Establish design configurations
- Develop a preferred contracting approach
- Prepare project schedule
- Prepare project cost estimate

102. **TECHNOLOGY SELECTION**

ASEA Brown Boveri (ABB), acquired by General Electric – Alstom (GE), is the original equipment manufacturer (OEM) of the six (6) combustion turbines at Woodsdale station. GE was selected to provide the necessary equipment and modifications to ensure proper operation of the units on fuel oil. GE has experience installing the required equipment and modifications for fuel oil operation on the GT11N model turbines at other locations during initial plant design and installation.

103. PROJECT SCOPE & DESIGN INFORMATION

103.1 Scope

The fuel oil system installation project scope includes the equipment, buildings, and demolition defined in this report. A complete fuel oil unloading, storage, forwarding, and injection system shall be provided and incorporated into the existing Woodsdale Station electrical and control system. Additions and modifications of the existing plant fire protection, instrument air, site drainage, potable water, and propane fuel systems are included in order to complete the fuel oil and ancillary system installation scope.

103.2 System Description

The fuel oil system includes a complete unloading and storage system. There will be four truck unloading stations, each able to operate simultaneously and independently. The unloading trains are each capable of unloading into either of two (2) storage tanks. The unloading system will be configured to allow transfer of fuel oil from one tank to the other. Each unloading station train also will have filtration, an air eliminator, and metering station. Two floating roof storage tanks, each with approximately 2 million gallons of storage, are sized to provide 72 hours of full load operation for all six (6) units. A low pressure forwarding system, utilizing 2x100% centrifugal pumps with a recirculation loop, supply fuel oil to each unit. The low pressure fuel oil routes through unitized preheaters and into the GE supplied fuel oil block. The GE fuel oil block includes 2x100% high pressure forwarding pumps, which supply fuel oil to each turbine's combustor. Fuel flow to the unit is controlled via a servo-motor valve, with excess oil recirculated to the fuel oil block and storage tanks. An oil collection tank shall be installed below the combustion turbine to collect unburnt fuel and return it to a leakage tank provided on the fuel oil block. The complete fuel oil system will include electric motor operated valves and instrumentation required to adequately operate the system utilizing the existing Woodsdale Station Distributed Control System (DCS.)

103.3 Siting & Arrangement

The new fuel oil storage tanks, unloading system, and low pressure forwarding system shall be located in the southeast corner of the Woodsdale site. This area was designated for fuel oil system equipment when the plant was initially designed, but the only items installed for the system were buried fuel oil and fire protection piping and an electrical ductbank. A preheater

and fuel oil block are provided for each unit and shall be located inside the existing propane boiler buildings, which will be renamed as the 'HP fuel forwarding buildings'. All existing propane fuel equipment within these building shall be removed. The combustion turbine combustor and turbine modifications and the fuel collector tank shall be located within the existing combustion turbine building. Refer to Appendix A for the site arrangement drawings.

103.4 Site Improvements

The fuel oil tanks will be located in a lined containment with an earthen berm. Site access roads will be added around the containment for the fuel oil truck traffic. The existing site access road will be widened and an unloading containment system added at the fuel oil truck unloading area. Drainage from the fuel oil containment shall be routed through a new oil-water separator and tie into the existing station storm drainage system. The fuel oil unloading area containment shall be routed to a single sump which shall be drained on an as needed basis by an outside source.

A new fuel oil mechanical and electrical equipment building will be added outside of the storage tank containment. This building will house the low pressure fuel oil forwarding pumps, storage tank and forwarding pump foam fire suppression systems, fuel unloading system workstation, and electrical equipment. A safety eyewash shall be provided outdoors near the fuel oil unloading area.

The fire protection system shall be expanded to provide additional hydrants at the fuel oil storage and unloading area. New foam suppression systems shall be provided at the fuel oil storage tanks, fuel oil low pressure forwarding pumps, and the high pressure fuel oil blocks located in the repurposed propane boiler buildings.

103.5 Foundations and Structures

Foundation design will be based on the site geotechnical report prepared by Westinghouse Environmental Services dated May 16, 1989 and supplemental testing to be performed by a geotechnical firm retained by Duke Energy. Based upon the available geotechnical information, shallow mat and spread foundations are anticipated for all structures.

Foundations will be supplied for the two (2) fuel oil storage tanks, fuel oil mechanical & electrical equipment building, truck unloading containment, and fuel oil unloading skid. New structures include the field fabricated, floating-roof fuel oil storage tanks and the fuel oil mechanical & electrical equipment building, which will be pre-engineered. The existing propane boiler buildings and foundations will be reutilized to locate the preheaters, fuel oil blocks, and motor control centers.

All fuel oil piping shall be routed above ground or in grating topped, precast concrete trenches. Piping at the truck unloading area and the low pressure forwarding system shall be installed in trenches.

103.6 Mechanical Interconnects and Systems

The fuel oil system piping is shown on the piping & instrumentation diagrams (P&IDs) included in Appendix B. The scope of the new piping includes truck unloading piping from the truck connections to the storage tanks, forwarding piping from the fuel oil tanks through a recirculation loop with branches to each unit's fuel oil block, and supply piping from the fuel oil block to the combustor, and fuel oil return and drainage piping from the combustor and combustion turbine back to the fuel oil block. Additionally, the buried fire mains shall be expanded to cover the fuel oil storage tank and unloading area, supply to the storage tank foam suppression system, and individual connections to each unit's foam suppression system at the fuel oil blocks. The potable water system shall be expanded from the existing storage warehouse to the eyewash at the fuel oil unloading area. Instrument air shall also be supplied from the propane boiler building to the fuel oil blocks for purge and cooling at shutdown.

103.7 Power Supply and Electrical Systems

The common fuel unloading equipment will be fed from new redundant 480 volt motor control centers located in the fuel oil mechanical & electrical equipment building. The motor control centers will be fed from new 480 volt switchgear or from existing 480 volt Switchgear C and D located in the turbine building. The motor control centers will feed the fuel oil unloading loads and electrical loads such as heat tracing, cathodic protection, lighting, building HVAC, eyewash station, and new Distributed Controls System I/O drops and workstation.

Two 480 volt switchgear will feed each unit's HP fuel oil forwarding loads in a new building (PDC or similar) located by one of the valve house buildings, to feed the new unit fuel oil loads. Heat tracing will be fed from heat trace panels located in the turbine building. One new 480 volt switchgear bus will feed the loads for Units 1, 3 and 5, and a second 480 volt switchgear bus will feed the loads for Units 2, 4 and 6, to be consistent with how the existing black start equipment is fed. The new 480 volt switchgear buses will be fed from existing 4160 volt switchgear 14 and 15 stepped down through new 4160-480/277 volt transformers, and the new 480 volt switchgear buses will be connected through a tie breaker sized to handle the coincidental load of both buses.

480 volt Switchgear D will also feed a new 100 horsepower compressor, to replace the existing 60 horsepower compressor, if analysis indicates a new air compressor is required. Preliminary loading of the existing and new equipment is (kVA is coincidental (running) and not connected):

Elect Equip	Load Change	Added kVA	Deleted kVA	Net kVA
480V Buses C and D	Present Load = 2058 kVA			2058
	Propane Unit Loads Removed		316	1742
	Fuel Oil Unloading Added & Compressor Change	416		2158
New 480V Switchgear	Fuel Oil Unit Loads Added	3,008		
4160V Buses 14 & 15	Propane Common Loads Removed		316	Existing load - 316
	New 480V Switchgear	3,008		Existing load + 2,692
	Buses C & D Net Change	100		Existing load + 2,792

103.8 Control System Integration

The fuel oil mechanical & electrical equipment building will have an Emerson Ovation Distributed Control System work station and I/O drop and controller, to enable unloading operations to occur at the unloading area. The work station and operator will be provided with a large window overlooking the unloading area, so that the operator can observe the unloading operations.

The I/O for each unit's fuel oil equipment in the HP fuel oil forwarding buildings and new Fuel Oil Electrical Building will be hard-wired to the AA Module's Distributed Controls System (DCS) I/O cabinets and the Valve Houses' DCS I/O cabinets, respectively, using spare I/O cards and / or new cards (if sufficient spare I/O is not available).

Fuel oil flow meter and pressure signals will be wired into the AA Module's Distributed Controls System I/O cabinets.

103.9 Propane System Demolition

The existing propane system includes an unloading and storage system common to all six (6) units. Each unit has a propane boiler, vaporizer, and superheater which would supply propane vapor to the turbine combustor. The Todhunter propane caverns that were used for propane storage and supply to Woodsdale station were closed due to leakage. The caverns are not anticipated to be capable successful repair and testing for future propane storage. Therefore the propane system at Woodsdale Station is predicted to not be required for future use. The existing on-site storage systems consists of six (6) approximately 100,000 gallons fuel storage tanks, with a truck unloading station, metering/conditioning station from the Todhunter caverns, and forwarding system. This common equipment shall be removed as a part of the fuel oil system installation. Except for the tanks and associated piping, underground propane piping shall be purged, filled with an inert media, and capped, not removed. At each unit the propane boiler and all associated piping and appurtenances shall be removed. Each unit's propane system shall be demolished, including the propane boiler, vaporizer, and superheater, along with their associate piping and appurtenances. Refer to Appendix E for drawings showing the propane system demolition scope.

103.10 Environmental & Permitting

Fuel oil combustion is currently reflected in the station Title V permit, as was the case with all prior construction/operating related permits (PTI/PTO/Title V) which were issued since the facility was commissioned in the early 1990s. Given the existing station permits reflect the unit's ability to combust fuel oil and based on review of applicable regulations and initial discussions with Ohio EPA representatives, installation of fuel oil combustion hardware on the

units will not trigger the need for any new construction related permits. Rather the installation and operation of fuel oil related combustion hardware will be incorporated into the existing station permit via a Title V permit modification. Existing mass (tpy)/concentration (ppmdv) based permit limitations and emission controls (water injection) are anticipated to remain intact with a NOx limit of 65 ppm.

The project will also require installation of two (2) bulk oil storage tanks at the facility, which will require submittal of a permit-to-install (PTI) application and will also be incorporated into the station Title V permit as part of the permit modification described above. No specific emission limitations are anticipated in relation to installation/operation of the tanks. Emission controls associated with the tanks will need to meet Best Available Technology (BAT) which will be comprised of submerged fill and a sealed floating roof.

104. FUEL OIL OPERATION PLAN

104.1 Fuel Oil Delivery

Fuel oil will be delivered to Woodsdale station via Duke Energy's regional alliance partner, Hightower Petroleum Company (3577 Commerce Dr., Middletown, OH 45005) which is located approximately 11 miles from Woodsdale Station. Hightower Petroleum also supplies Duke Energy's East Bend station with fuel oil. East Bend is a 648 MW base load coal unit which utilizes fuel oil for startup purposes.

104.2 Start-up and Testing

An estimated two (2) million gallons of fuel oil will be needed for startup, commissioning, and stack testing for all 6 units. The 2 million gallon estimate is based on data supplied by GE-Alstom for similar fuel oil conversions performed on similar GT 11N units. The estimated cost for the initial 2,000,000 gallons of fuel oil at \$1.75 per gallon for 2018 delivery is \$3.5 million. This cost estimate is based on predicted fuel costs from the Duke Energy fuels department.

104.3 Fuel Oil System Operation

Periodic fuel oil operation will be incorporated in the Woodsdale Station operations plan for all six (6) units to ensure the fuel oil delivery and combustion system functions properly. There will be testing, approximately once per month, to be performed while the units are running on natural gas under a normal dispatch opportunity, if possible. The units would be transferred from natural gas to fuel oil for a limited amount of time and then transferred back to natural gas. There will also be a regular test that will start up and shut down all six (6) units operating only with fuel oil to ensure the system operates properly if natural gas was not available at the station due to constraints on the natural gas supply. The quarterly test will replace the typical monthly test. Black start operation testing will also typically be conducted using fuel oil. Only two (2) units per year will undergo black start testing. Additionally, there will be fuel oil system testing when weather indicates that a Capacity Performance (CP) penalty period may be imminent. Since CP periods can happen at any time with little or no warning, the fuel oil system will be exercised and tested ahead of predicted CP events. The CP periods are typically driven by extreme cold temperatures. On average there are 4 – 5 yearly opportunities for CP periods. The CP testing procedures would mirror the monthly testing procedure. Relative Accuracy Test Audit (RATA) will also be performed every 5 years. The RATA is a 24 hour test that will be conducted at various unit loads.

The following is the expected annual testing and annual fuel oil consumption.

- Monthly/Quarterly testing – 1 hour of operation of fuel oil at full load for 6 units – 600,000 gallons/year
- Capacity Performance Testing (5 times per year) – 1 hour of operation at full load for all 6 units – 250,000 gallons/year
- Black start testing (once per year) – 1 hour of operation at minimum load for 2 units – 6,000 gallons/year
- RATA testing – 12 hours at full load (average) for all 6 units – 600,000 every 6 years, 120,000 gallons/year.

The estimated total yearly average of fuel oil usage is approximately 976,000 gallons/year. Biocides and/or other additives such as anti-coagulators and smoke inhibitors will not be needed since more than half the capacity of a single storage tank will be used each year for testing purposes. Therefore, the full capacity of the fuel oil system will be turned over

approximately every four years. The average useful life of oil storage is estimated to be five to seven years.

105. CONTRACTING APPROACH

The fuel oil system installation project is based on a multiple contract approach. There are three major contracting categories; equipment supply, furnish and build contracts and general construction contracts. This section provides the anticipated division of responsibility between the contractors, engineer, and Duke Energy. Multiple independent contractors are anticipated to be used throughout the project. There will be at least three equipment supply contracts: combustion turbine conversion equipment (by GE), fuel oil unloading & forwarding equipment, and the Motor Control Centers (MCC). If new equipment is required for the Distributed Control System (DCS), Emerson will be provided with input / output and graphic requirements, to be engineered and furnished by Emerson under their existing contract with Duke Energy. The fuel oil storage tanks shall be a furnish & build contract. Finally, a single General Work Contractor (GWC) shall be responsible for receiving, storage, and installing the equipment as well as installation of the complete fuel oil system. The general work contractor shall be responsible for the appropriate sub-contractors, as needed, to complete the fuel oil system installation. For example, a fire protection sub-contractor shall be retained by the GWC.

Table 1 - Project Division of Responsibility Matrix

	ITEM	Engineer and Design	Material and/or Equipment Supply	Erect and/or Install
1.	Combustion Turbine & Fuel Oil Nozzle Modifications	GE	GE	GE
2.	Fuel Oil Block	GE	GE	GWC
3.	Fuel Oil Preheater	FOEQPT	FOEQPT	GWC
4.	Fuel Oil Low Pressure Forwarding Pump	FOEQPT	FOEQPT	GWC
5.	Fuel Oil Unloading Skid	FOEQPT	FOEQPT	GWC
6.	Fuel Oil Tank Containment and Foundation	S&L	GWC	GWC
7.	Fuel Oil Storage Tanks	TANK	TANK	TANK
8.	Site Road Additions/Modifications	S&L	GWC	GWC
9.	Interconnecting Piping	S&L	GWC	GWC
10.	MCCs & Electrical Equipment	MCC	MCC	GWC
11.	Distributed Control System	S&L/DCS	DCS	GWC
12.	Electrical/Control Wiring	GWC	GWC	GWC
13.	Fire Protection System	S&L/GWC	GWC	GWC
14.	Propane System Demolition	GWC	GWC	GWC
15.	Fuel Oil Mech & Elec Building	S&L OR BLDG	BLDG OR GWC	GWC
16.	Cathodic Protection	GWC	GWC	GWC
17.	Heat Trace (Freeze Protection)	S&L/GWC	GWC	GWC
18.	Arc Flash Labeling	OWNER	OWNER	OWNER

Key to Abbreviations Used in DOR	
Duke Energy	OWNER
Sargent & Lundy	S&L
General Electric	GE
General Work Contractor	GWC
Tank Supplier	TANK
Distributed Control System	DCS
Motor Control Centers	MCC
Fuel Oil Forwarding/Unloading Equipment	FOEQPT
Pre-Engineered Building	BLDG

106. SCHEDULE

The current project schedule is based on a full notice to proceed on equipment procurement for the Woodsdale Station fuel oil system installation project by November 15, 2017 and the system in service for all six (6) units April 2019. Table 2 includes key project milestone dates from the project schedule included in Appendix F.

Table 2 - Fuel Oil System Installation Key Milestone Dates

Milestone	Date
Engineering & Permitting Complete for CPCN Filing	4/27/2017
CPCN Petition Filing	5/05/2017
Obtain Title V Air Permit	07/15/2017
Obtain Storage Tank Construction Permit	11/15/2017
Anticipated CPCN Approval	12/01/2017
Purchase Long Lead Materials & Equipment	12/15/2017
Start of Construction	2/15/2018
Engineering & Design Complete	4/1/2018
Unit 1 & 2 Outage ¹	11/2018
Unit 3 & 4 Outage	03/2019
Unit 5 & 6 Outage	04/2019
Unit 1-6 Construction Complete	4/15/2019
Unit 1-6 In-Service	4/30/2019

Note 1: Unit 1 & 2 outage schedule is a targeted date to facilitate cold weather system testing and tuning. Durations for achieving this date are based on material, equipment, and labor contract durations that have yet to be awarded and the anticipated CPCN approval date and will be revisited after CPCN approval.

The project schedule is dependent on project approvals, in particular the Certificate of Public Convenience and Necessity (CPCN) permit and environmental permit approvals. Equipment procurement and construction cannot begin until these permit approvals are received.

The schedule is based on the long procurement duration for the fuel oil blocks from GE and the procurement and installation of the field fabricated tanks. Vendor submittals are required from each equipment supplier in order to coordinate the design of the infrastructure and tie-ins, including foundation, piping, wiring, and control system design. The schedule has included sufficient time for the Engineer to perform the detailed design and obtain competitive, lump sum bids for the civil, mechanical, and electrical construction by the general work contractor.

107. COST ESTIMATE

An initial capital cost estimate has been prepared for the proposed scope of work on the Woodsdale Station fuel oil system installation project. Based on the level of project design, the estimate is categorized as Class 3 per AACE standard.

107.1 Estimate Basis and Assumptions

Key points of the estimate basis and notable assumptions are provided below.

- Major equipment vendor pricing was obtained for the following items:
 - GE's conversion of the combustion turbines to dual fuel
 - Floating Roof Fuel Oil Storage Tanks
- Equipment and commodity take-off quantities were used to develop the estimate based on recent pricing from similar projects.
- The contracting strategy is multiple lump sum as detailed in section 104.
- Labor wages were based on labor available near Cincinnati, OH with a 5x10 work schedule.
- 2016 costs are used with escalation on material and equipment.
- The following costs are not included:
 - Taxes
 - Permitting

107.2 Estimate Summary

The following scope of work is included in the cost estimate.

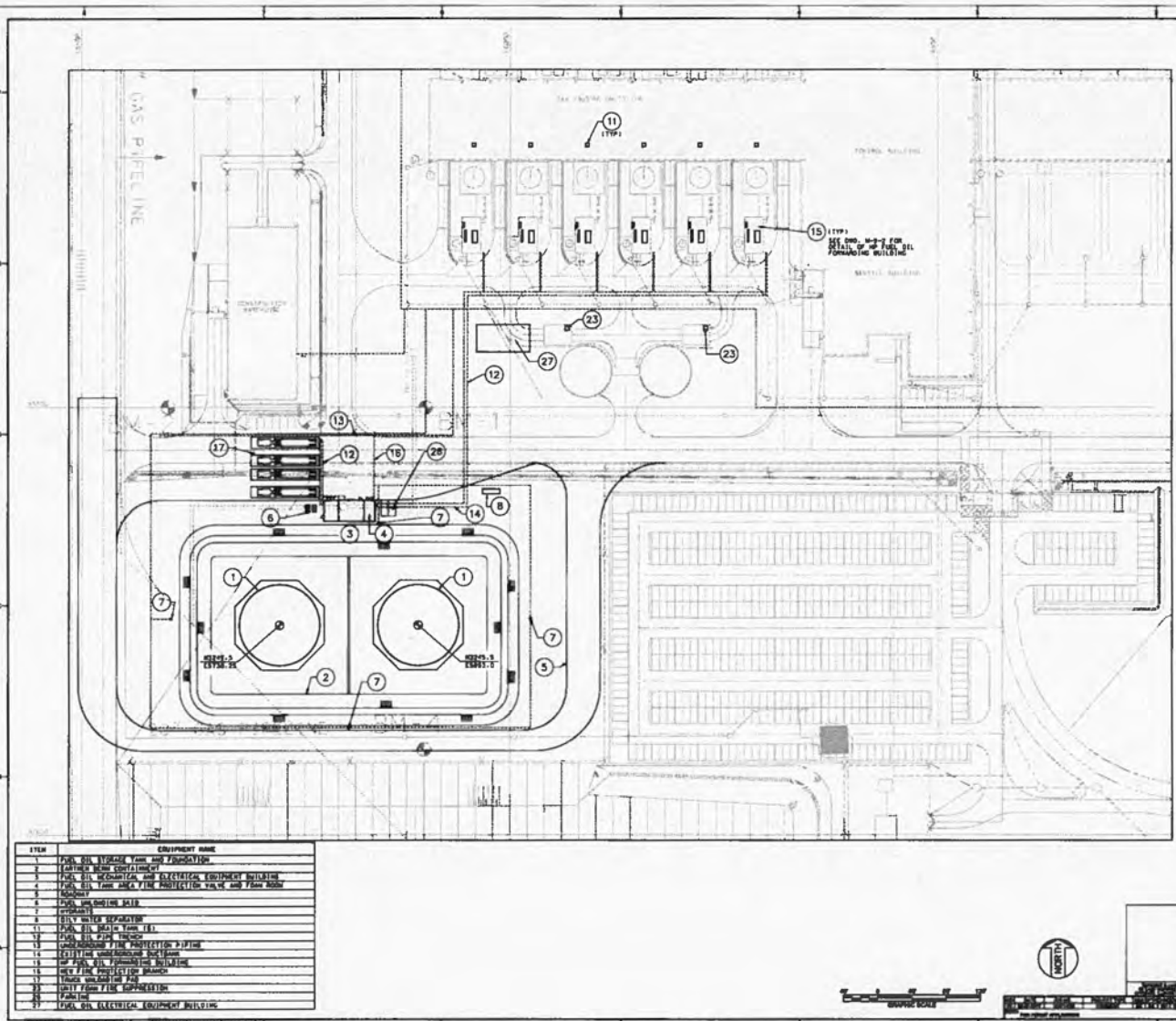
- Existing propane system retirement and demolition
- Civil work, including fuel oil storage tank and truck unloading containments
- Building and tank foundations
- Electrical and mechanical equipment building
- Fuel oil and unloading equipment
- Fuel oil system piping, valves, supports, etc.
- Electrical equipment
- Cable, raceway, and grounding
- Cathodic Protection
- Heat Tracing

- Expansion of balance of plant systems; including fire protection, instrument air, and potable water
- Control system updates
- Installation, engineering, and Duke Energy support labor
- Construction equipment costs
- Labor and construction indirect costs
- Overhead costs
- Accumulated Funds Used During Construction (AFUDC) costs are included.
- Fuel oil cost for start-up testing, tuning, and Relative Accuracy Test Audit (RATA) testing are included.

107.3 Contingency

The project estimate includes three different rates of contingency. The fuel oil tank costs have a 5% contingency included in the estimate. This contingency value was chosen based on obtaining vendor estimates on a well-defined scope of supply. The GE conversion scope of supply has a 15% contingency included in the estimate. This contingency value was chosen based on obtaining vendor estimates on a scope of supply that is not finalized. The remaining costs in the project include a 20% contingency. This value accounts for pricing and quantity variation in the specific scope included in the estimate. The contingency is not intended to cover additional scope that was not included in the estimate.

Appendix A General Arrangement Drawings



FOR PERMITTING PURPOSES ONLY

NOTES

- 1 COORDINATES SHOWN ON THE DRAWINGS ARE PLANT COORDINATES. TO CORRECT TO THE STATE PLANT COORDINATE SYSTEM AND LINE AND POINT TO THE EAST COORDINATES AND 1000-FOOT FEET TO THE EAST COORDINATES, EXPANSIONS SHOWN ON THE DRAWINGS ARE TO BE MADE NEAR SEA LEVEL. MAKE THE ADJUSTMENT.
- 2 FORMALLY DRAWING SG-6220181006.

REFERENCE DRAWINGS

- C-1 SITE GENERAL ARRANGEMENT KEY PLAN & GENERAL NOTES
- E-90 OUTDOOR ELECTRICAL DUCTRUM PLAN
- M-37 OUTDOOR PIPING FINE PROTECTION
- M-43 OUTDOOR PIPING FUEL OIL
- M-9-2 M/FUEL OIL STORAGE BUILDING & FUEL OIL MICH. & ELECT. EQUIPMENT BUILDING

FUEL OIL SYSTEM ADDITION
SITE GENERAL ARRANGEMENT

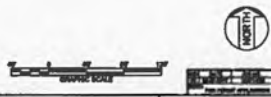
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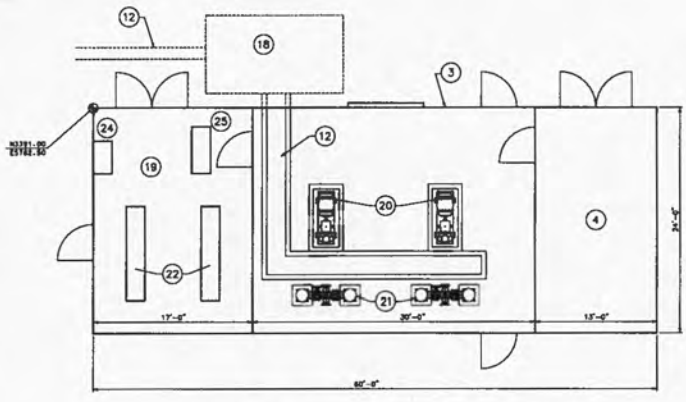
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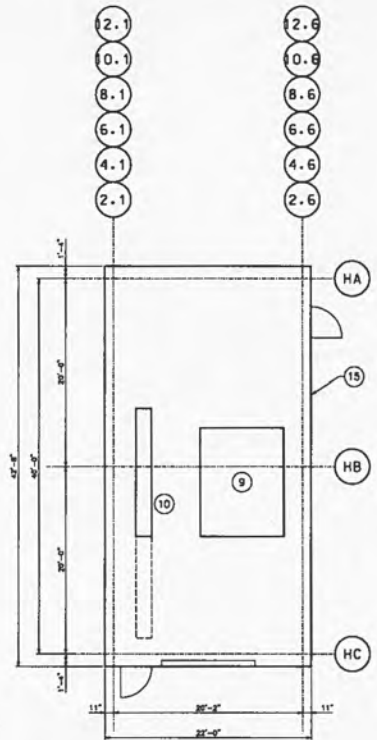
M-9-1 DC

ITEM	EQUIPMENT NAME
1	FUEL OIL STORAGE TANK AND TANKS/TYPE
2	ANTIFIRE BEAM CONTROLLER
3	FUEL OIL WINDMILL AND ELECTRICAL EQUIPMENT BUILDING
4	FUEL OIL LINE JACKS FIRE PROTECTION VALVE AND FLOW STOP
5	Manhole
6	FUEL WINDMILL ASER
7	Manhole
8	City Water Separator
9	City Water Tank (E)
10	FUEL OIL PUMP TRUCK
11	UNDERGROUND FIRE PROTECTION PIPING
12	EXISTING UNDERGROUND DUCTRUM
13	M/F FUEL OIL STORAGE BUILDING
14	M/F FUEL PROTECTION BRANCH
15	TRUCK WINDMILL PUMP
16	WATER PUMP FIRE PROTECTION
17	Manhole
18	Manhole
19	Manhole
20	Manhole
21	Manhole
22	Manhole
23	Manhole
24	Manhole
25	Manhole
26	Manhole
27	Manhole
28	Manhole
29	Manhole





FUEL OIL MECHANICAL AND ELECTRICAL EQUIPMENT BUILDING



HP FUEL OIL FORWARDING BUILDING

FOR PERMITTING PURPOSES ONLY

NOTES

1 COORDINATES SHOWN ON THE DRAWINGS ARE PLANT COORDINATES. TO CORRECT TO THE STATE PLANE COORDINATE SYSTEM AND ELEVATION FEET TO THE NORTH COORDINATE AND 1 FOOT PER FOOT TO THE EAST COORDINATE, EXISTING DATA ON THE DRAWINGS ARE TO BE ADJUSTED TO THE 1983 ADJUSTMENT.

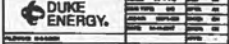
2 DIMENSIONS FOR USE.

REFERENCE DRAWINGS

D-1 SITE GENERAL ARRANGEMENT KEY PLAN & BOUNDARY NOTES

M-9-1 FUEL OIL SYSTEM ADDITION SITE GENERAL ARRANGEMENT

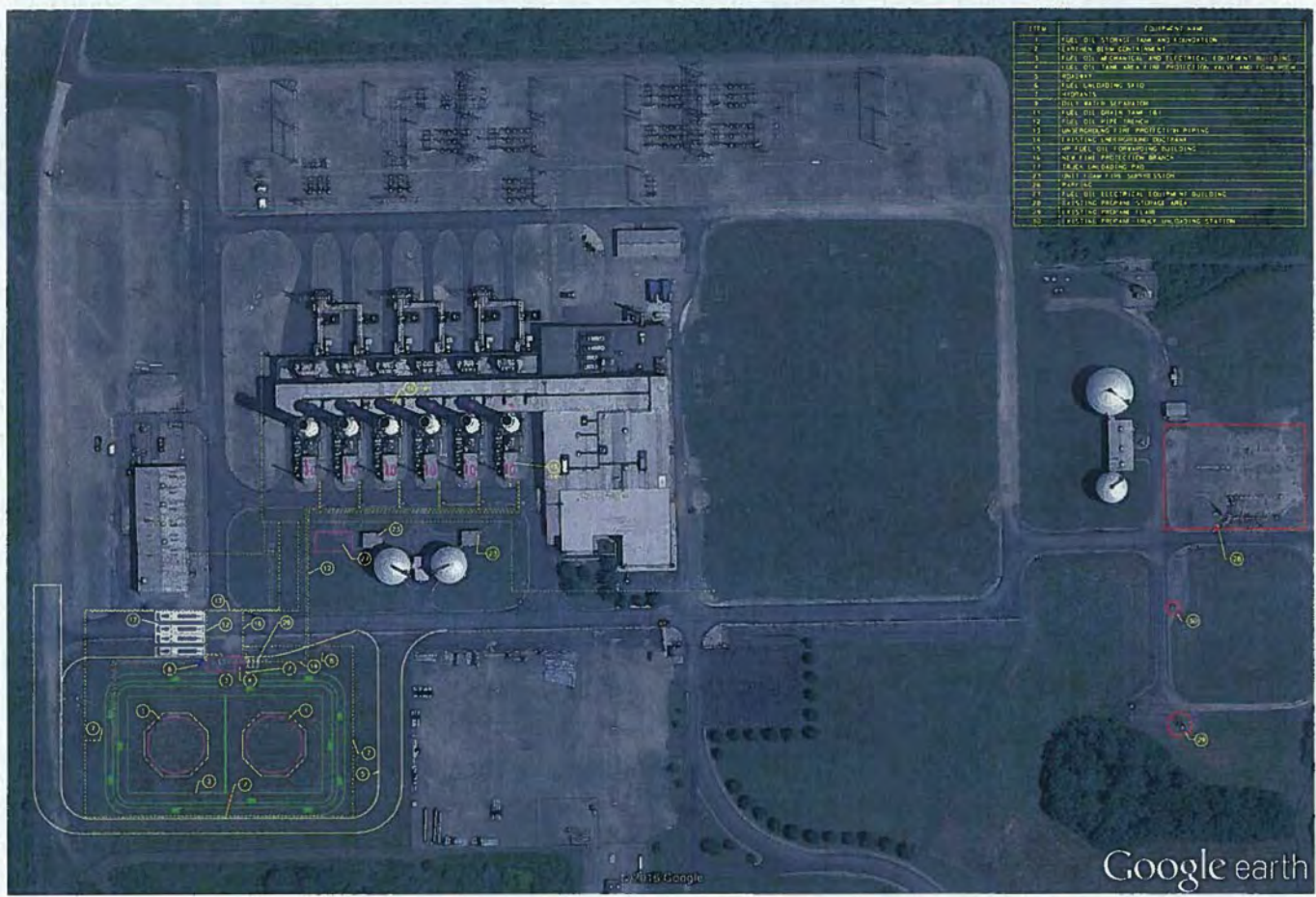
FUEL OIL SYSTEM ADDITION GENERAL ARRANGEMENT HP FUEL OIL FORWARDING BUILDING & FUEL OIL MECH. AND ELEC. EQUIPMENT BUILDING WOODDALE GENERATING STATION



ITEM	COMPONENT NAME
3	FUEL OIL MECHANICAL AND ELECTRICAL EQUIPMENT BUILDING
4	FUEL OIL PUMP AREA FIRE PROTECTION VOLUME AND PUMP ROOM
7	FUEL OIL TANK (1)
10	FUEL OIL PROGRESSOR (1)
12	FUEL OIL STORAGE TRENCH
15	HP FUEL OIL FORWARDING BUILDING
18	FUEL OIL SHOP
19	ELECTRICAL EQUIPMENT ROOM
20	FUEL OIL TRANSFER PUMP
21	FUEL OIL TRANSFER PUMP SKID/RAIL
22	WATER CONTROL SYSTEM
24	FOUNDATION
25	TELEPHONE CONTROL SYSTEM



DATE	BY	CHECKED	APPROVED



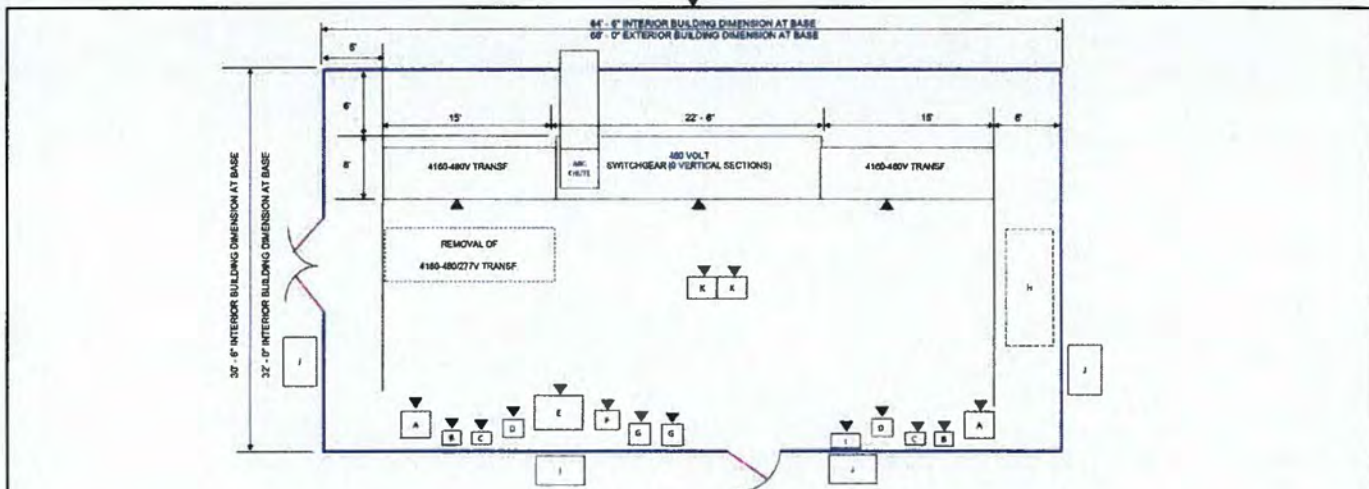
ITEM	EQUIPMENT NAME
1	FUEL OIL STORAGE TANK AND FOUNDATION
2	EXISTING DIESEL GENERATOR
3	FUEL OIL ELECTRICAL AND ELECTRICAL EQUIPMENT BUILDING
4	FUEL OIL TANK AREA FIRE PROTECTION, EXIST AND PROPOSED
5	WATERWAY
6	FUEL UNLOADING SAID
7	DISPENSER
8	DIESEL WATER SEPARATOR
9	FUEL OIL DIESEL TANK (B)
10	FUEL OIL PIPE TRENCH
11	UNWELDED PIPE PROTECTIVE PIPING
12	EXISTING DIESEL GENERATOR TANK
13	NEW FUEL OIL FORWARDING BUILDING
14	NEW FIRE PROTECTIVE BRANCH
15	TANKS, UNLOADING
16	UNLOADING PIPE SUPPORT SYSTEM
17	WATERWAY
18	FUEL OIL ELECTRICAL EQUIPMENT BUILDING
19	EXISTING DIESEL STORAGE AREA
20	EXISTING DIESEL TANK
21	EXISTING DIESEL TANK
22	EXISTING DIESEL TANK
23	EXISTING DIESEL TANK
24	EXISTING DIESEL TANK
25	EXISTING DIESEL TANK
26	EXISTING DIESEL TANK
27	EXISTING DIESEL TANK
28	EXISTING DIESEL TANK

Google earth

FOR PERMITTING PURPOSES ONLY



FUEL OIL SYSTEM ADDITION SITE GENERAL ARRANGEMENT (PHOTO)	
WOODSDALE GENERATING STATION	
	PROJECT NO. SK-GA-04272017 SHEET NO. A



NOT TO SCALE

Sketch ESK-FO-001 Rev. 0
Wooddale 480V Fuel Oil Electrical Equipment Building

NOTES:

1. FRONT OF EQUIPMENT IS DENOTED BY THE SYMBOL
2. COMPLIES WITH NEC WORKING SPACE REQUIREMENTS.
3. FLOOR SHOWN BUT MAY BE WALL MOUNTED.
4. TOP OF SWITCHGEAR IS 9'-0" BUILDING HEIGHT NEEDS TO BE MINIMUM 18" TALL TO ACCOMMODATE TRAYS AND LIGHTING
5. FOUR HVAC UNITS WITH LOCATIONS SHOWN ARBITRARILY (PDC VENDOR WILL SELECT LOCATIONS FOR OPTIMAL AIR FLOW)

WALL AND FLOOR MOUNTED INCLUDES:

EQUIPMENT	[INCHES]		MTA	NO.
	WIDTH	DEPTH		
480V SWITCHGEAR	270	72	FLOOR	1
4180-480/277V UNIT SUB	180	60	FLOOR	2
A. 480-480/277V TRANSFORMER 150 KVA	32	27	FLOOR	2
B. 480/277 VAC PANEL	28	12	WALL	2
C. 120/208V PANEL	20	12	WALL	2
D. 480-120/208V TRANSFORMER 45 KVA	20	20	FLOOR	2
E. 125 VOC BATTERY (SEALED)	48	36	FLOOR	1
F. 125 VOC PANEL	24	20	NOTE 3	1
G. BATTERY CHARGER	20	20	WALL	2
H. SWITCHGEAR BREAKER TEST CABINET	120	60	FLOOR	1
I. FIRE PANEL (IF REQUIRED)	24	20	WALL	1
J. PDC HVAC UNIT	48	30	WALL	4
K. DCB I/O CABINETS	30	24	FLOOR	2

6" SPACING BETWEEN DEVICES IS INCLUDED

DRAWING RELEASE RECORD


REV	DATE	PREPARED	REVIEWED	APPROVED	PURPOSE
0	04/25/2017	A WELLER	D KENDALL	--	CLIENT COMMENTS

SIZE

PROJECT NUMBER	13371-035
----------------	-----------

GENERAL ARRANGEMENT

480 V Fuel Oil Electrical Equipment Building
WOODSDALE FUEL OIL CONVERSION
DUKE ENERGY



SHEET: ESK-FO-001
PAGE 1 OF 1
DWG CLASS:
Product of PLADDS

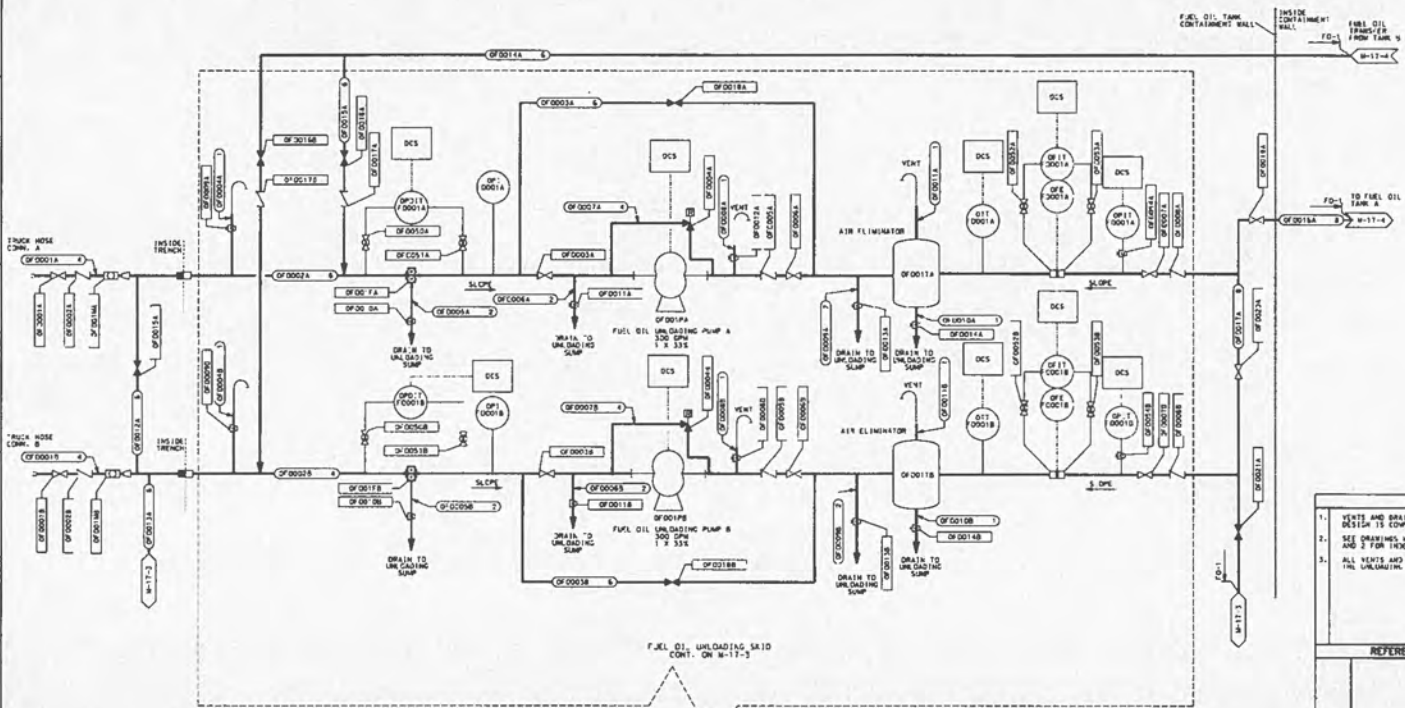
REV	0
-----	---

Revision: ESK-FO-001-REV-000

Appendix B Piping and Instrumentation Diagrams

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FOR PERMITTING PURPOSES ONLY



FUEL OIL UNLOADING SKID
CONT. ON M-17-3

- NOTES**
1. VENTS AND DRAINS TO BE ADDED AS PHYSICAL INSTR. IS COMPLETED.
 2. SEE DRAWINGS M-17-3, 1 AND M-17-4, SHT. 1 AND 2 FOR THESE AND SYMBOLS, RESPECTIVELY.
 3. ALL VENTS AND DRAINS SHALL BE ROUTED TO THE UNLOADING DRAIN POND.

REFERENCE DRAWINGS

FUEL OIL SYSTEM
FUEL OIL ADDITION PROJECT
PIPING & INSTRUMENTATION DIAGRAM
FUEL OIL UNLOADING
WOODSDALE GENERATING STATION



PDC NUMBER	DESIGN PRESSURE (PSIG)	DESIGN TEMP (DEG. F)	MAX OPER. PRESSURE (PSIG)	MAX OPER. TEMP (DEG. F)	PIPE CLASS	PD	INSUR. PIPE CLASS	INSUR. PD	INSUL. TYPE	FIELD TEST PRESSURE (PSIG)	REMARKS
F-D-1	25	100	18	93	0	58L D-05	0	34L D659	A	40	CARBON STEEL

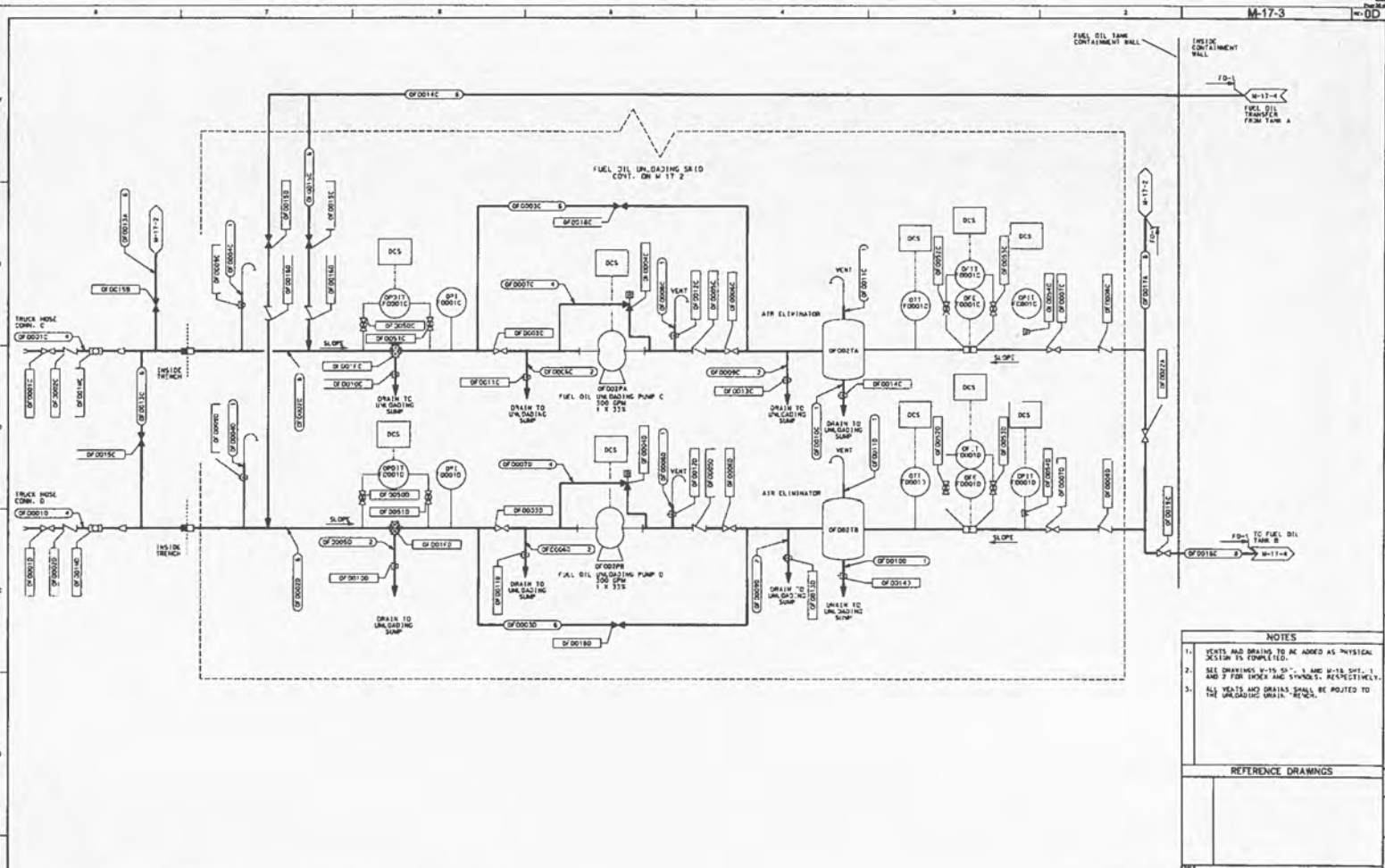
DATE	BY	APP'D	REVISION	DESCRIPTION

PLUMBING SYMBOLS

SCALE: 1" = 10'-0"

PROJECT: M-17-2

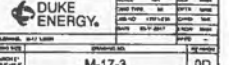
00



- NOTES**
1. SIZES AND DRAINS TO BE ADDED AS PHYSICAL SECTION IS COMPLETED.
 2. SEE DRAWINGS M-17-5, M-17-6, M-17-7, M-17-8, M-17-9, M-17-10, M-17-11, M-17-12, M-17-13, M-17-14, M-17-15, M-17-16, M-17-17, M-17-18, M-17-19, M-17-20, M-17-21, M-17-22, M-17-23, M-17-24, M-17-25, M-17-26, M-17-27, M-17-28, M-17-29, M-17-30, M-17-31, M-17-32, M-17-33, M-17-34, M-17-35, M-17-36, M-17-37, M-17-38, M-17-39, M-17-40, M-17-41, M-17-42, M-17-43, M-17-44, M-17-45, M-17-46, M-17-47, M-17-48, M-17-49, M-17-50, M-17-51, M-17-52, M-17-53, M-17-54, M-17-55, M-17-56, M-17-57, M-17-58, M-17-59, M-17-60, M-17-61, M-17-62, M-17-63, M-17-64, M-17-65, M-17-66, M-17-67, M-17-68, M-17-69, M-17-70, M-17-71, M-17-72, M-17-73, M-17-74, M-17-75, M-17-76, M-17-77, M-17-78, M-17-79, M-17-80, M-17-81, M-17-82, M-17-83, M-17-84, M-17-85, M-17-86, M-17-87, M-17-88, M-17-89, M-17-90, M-17-91, M-17-92, M-17-93, M-17-94, M-17-95, M-17-96, M-17-97, M-17-98, M-17-99, M-17-100.
 3. ALL WEATS AND DRAINS SHALL BE POINTED TO THE UNLOADING GRIDS, RESPECTIVELY.

REFERENCE DRAWINGS

FUEL OIL SYSTEM
 FUEL OIL ADDITION PROJECT
 PIPING & INSTRUMENTATION DIAGRAM
 FUEL OIL UNLOADING
 WOODSDALE GENERATING STATION



PRELIMINARY
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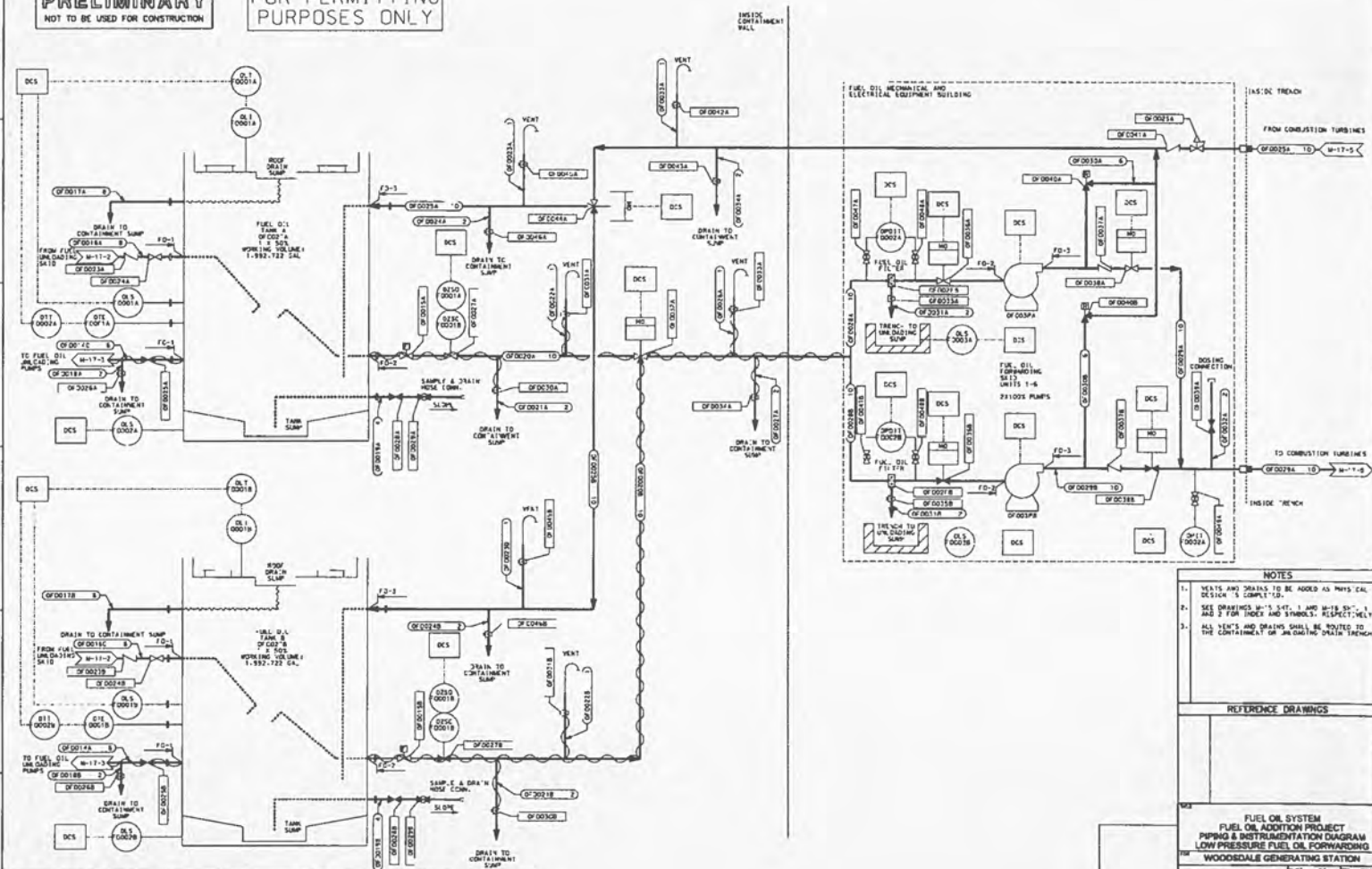
FOR PERMITTING
 PURPOSES ONLY

PDC NUMBER	DESIGN PRESSURE (PSIG)	DESIGN TEMP (DEG.F)	MAX OPER. PRESSURE (PSIG)	MAX OPER. TEMP (DEG.F)	PIPE CLASS	POT	INST. PIPE CLASS	INST. SIZE	INSUL. TYPE	FIELD TEST PRESSURE (PSIG)	REMARKS
FD-1	25	105	18	93	D	58L 0105	D 54L 2659	4	40	40	CARBON STEEL

DATE	BY	CHKD	REVISED	DESCRIPTION

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FOR PERMITTING
PURPOSES ONLY



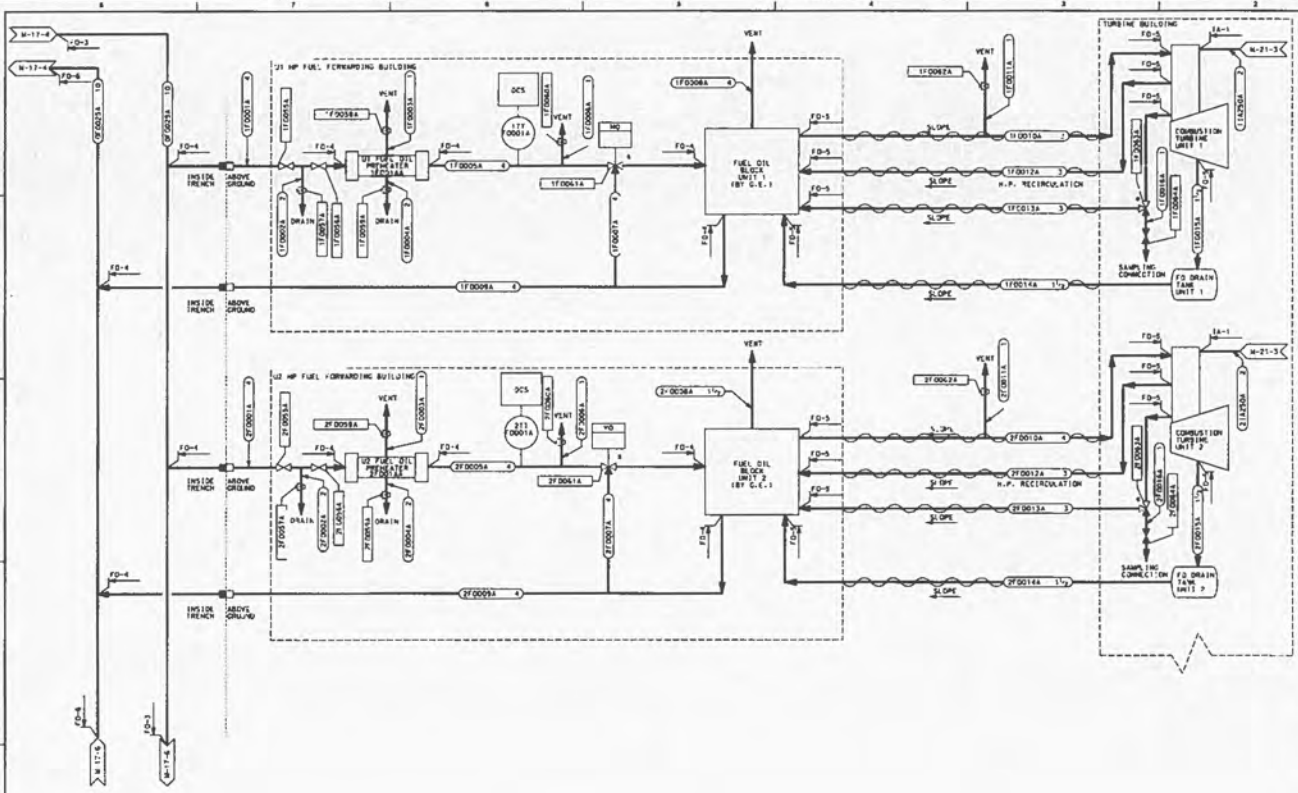
- NOTES**
1. YEARS AND DRAINS TO BE ADDED AS PHYSICAL DESIGN IS COMPLETED.
 2. SEE DRAWINGS M-17-1, M-17-2, M-17-3, M-17-4, M-17-5, M-17-6, M-17-7, M-17-8, M-17-9, M-17-10, M-17-11, AND 1 FOR INDEX AND SYMBOLS. RESPECTIVELY.
 3. ALL VENTS AND DRAINS SHALL BE ROUTED TO THE CONTAINMENT OR AN EXISTING DRAIN TRENCH.

REFERENCE DRAWINGS

M-17-1
M-17-2
M-17-3
M-17-4
M-17-5
M-17-6
M-17-7
M-17-8
M-17-9
M-17-10
M-17-11

**FUEL OIL SYSTEM
FUEL OIL ADDITION PROJECT
PIPING & INSTRUMENTATION DIAGRAM
LOW PRESSURE FUEL OIL FORWARDING
WOODSDALE GENERATING STATION**

PIPE NUMBER	DESIGN PRESSURE (PSIG)	DESIGN TEMP. (°F)	MAX. OPER. PRESSURE (PSIG)	MAX. OPER. TEMP. (°F)	PIPE CLASS	PVT	INSTR. PIPE CLASS	INSUL. TYPE	FIELD TEST PRESSURE (PSIG)	REMARKS
FO-1	25	105	18	93	D	S&L 0105	D	S&L 0659	40	CARBON STEEL
FO-2	35	105	30	93	D	S&L 0105	D	S&L 0655	55	CARBON STEEL
FO-3	100	105	93	93	D	S&L 0105	D	S&L 0655	150	CARBON STEEL



- NOTES**
1. VENTS AND DRAINS TO BE MADE AS PHYSICAL DESIGN IS COMPLETED.
 2. VALVING FOR M-15, M-17, AND M-18, UNIT 1, AND 2 FOR "LOCK AND SYMBOLS, RESPECTIVELY."
 3. ITEMS DESIGNATED BY (*) ARE PROVIDED BY C-1.

REFERENCE DRAWINGS

FUEL OIL SYSTEM
 FUEL OIL ADDITION PROJECT
 PIPING & INSTRUMENTATION DIAGRAM
 HIGH PRESSURE FUEL OIL SYSTEM
 WOODSDALE GENERATING STATION

DUKE ENERGY

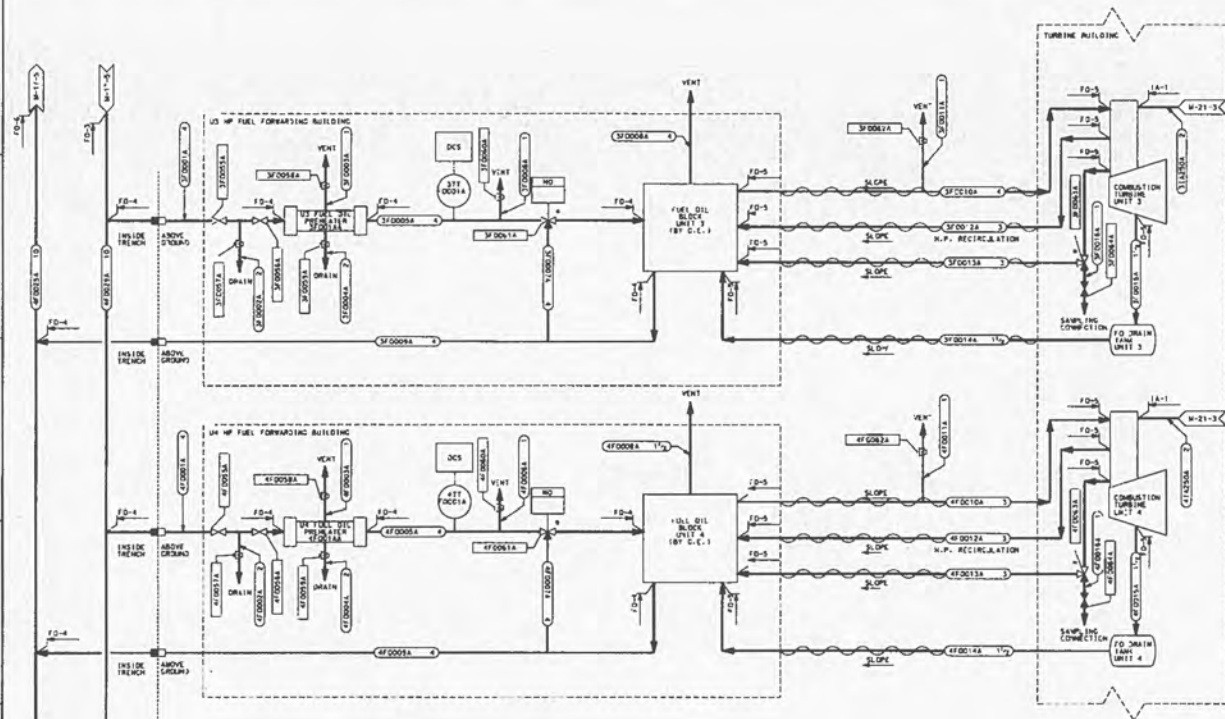
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DATE: 11/15/00
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Name]

PIPE NUMBER	DESIGN PRESSURE (PSIG)	DESIGN TEMP (°F)	MAX OPER. PRESSURE (PSIG)	MAX OPER. TEMP (°F)	#/IN. C-455	POT	INSUL. P. NO.	INSUL. SET	INSUL. AT 0°F TYPE	FILL & TEST PRESSURE (PSIG)	REMARKS
FD-3	120	120	90	83	D	SAL 0105	D	SAL 0659	A	130	CARBON STEEL
FD-4	215	170	90	150	D	SAL 0309	D	SAL 0659	A	315	CARBON STEEL
FD-5	2325	170	1300	150	D	SAL 1305	D	SAL 1559	A	3500	CARBON STEEL
FD-6	235	170	90	150	D	SAL 0105	D	SAL 0659	A	315	CARBON STEEL
1A-1	T80	T80	T80	T80	D	SAL 0105	D	SAL 0659	#	T80	CARBON STEEL

PRELIMINARY
 NOT TO BE USED FOR CONSTRUCTION

FOR PERMITTING PURPOSES ONLY



- NOTES**
1. VENTS AND LA'S TO BE ADDED AS PHYSICAL DESIGN IS COMPLETED.
 2. SEE DRAWINGS M-15, DET. 1 AND M-16, DET. 1 AND 2 FOR TRADE AND SYMBOLS, RESPECTIVELY.
 3. ITEMS DESIGNATED BY I-# ARE PROVIDED BY C.E.

REFERENCE DRAWINGS

FUEL OIL SYSTEM
 FUEL OIL ADDITION PROJECT
 PIPING & INSTRUMENTATION DIAGRAM
 H.P. FUEL OIL SYSTEM
 WOODSDALE GENERATING STATION

DUKE ENERGY

NAME: W. F. HARRIS
 TITLE: SENIOR ENGINEER
 DATE: 10/15/80
 PROJECT: M-17-8
 SHEET: DD

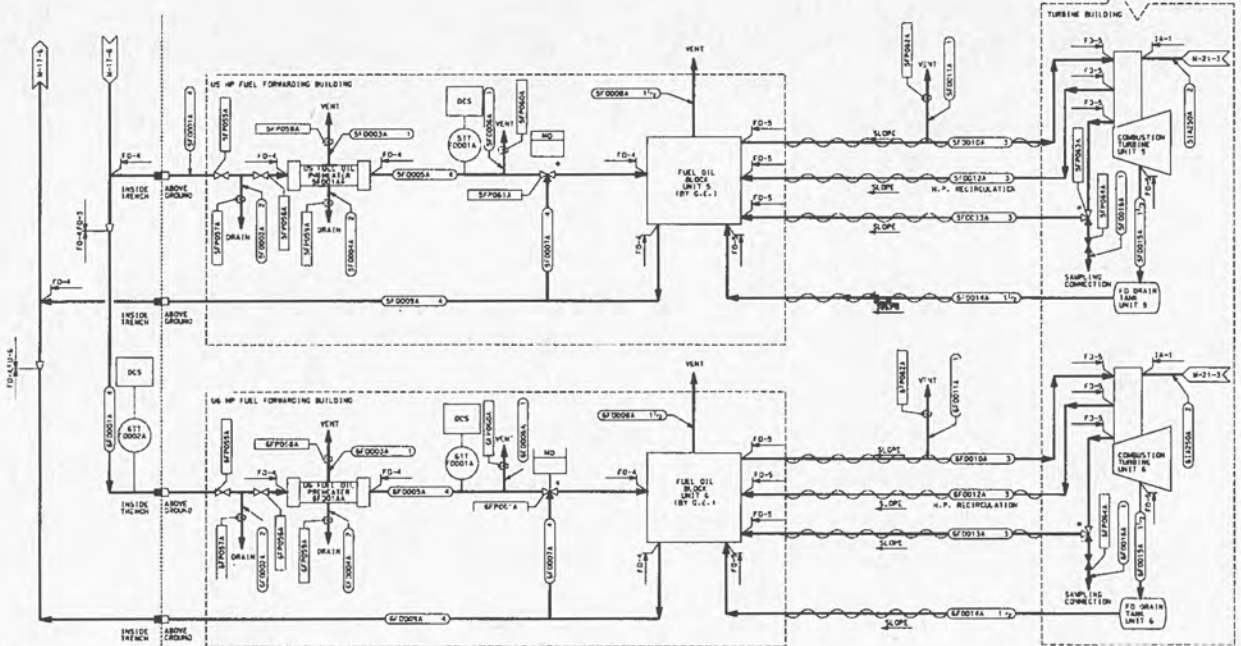
NO.	DESIGN PRESSURE (PSIG)	DESIGN TEMP. (°F)	MAX. OPER. PRESSURE (PSIG)	MAX. OPER. TEMP. (°F)	PIPE CLASS.	POST.	INSUL. TYPE	INSUL. CLASS.	INSUL. THICK. (IN)	FIELD TEST PASSED (Y/N)	REMARKS
FD-3	100	105	90	93	SAL 0105	D	SAL 0658	A	180		CARBON STEEL
FD-4	235	170	80	150	SAL 0205	D	SAL 0658	A	275		CARBON STEEL
FD-5	2375	170	1300	130	SAL 1505	D	SAL 1559	A	3500		CARBON STEEL
FD-6	235	170	90	130	SAL 0105	D	SAL 0658	A	315		CARBON STEEL
LA-1	180	190	180	180	SAL 0105	D	SAL 0658	H	180		CARBON STEEL

PRELIMINARY
 NOT TO BE USED FOR CONSTRUCTION

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PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FOR PERMITTING
PURPOSES ONLY

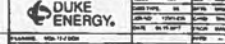


- NOTES**
1. VENTS AND DRAINS TO BE ADDED AS PHYSICAL DESIGN IS COMPLETED.
 2. SEE DRAWINGS M-15 SH-1 AND M-16 SH-1 AND 2 FOR THICKS AND SYMBOLS, RESPECTIVELY.
 3. ITEMS DESIGNATED BY (P&ID) PROVIDED BY (P&ID).

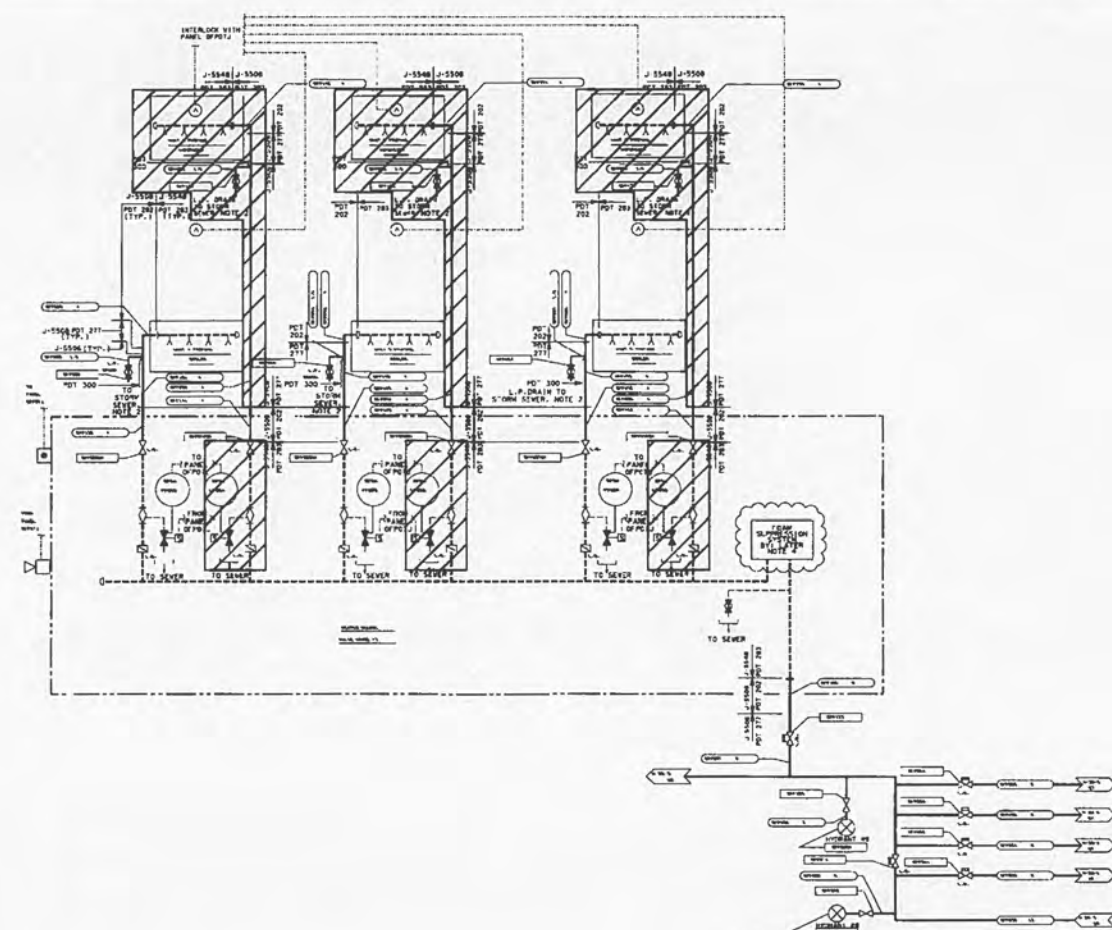
REFERENCE DRAWINGS

NO.	DESCRIPTION

FUEL OIL SYSTEM
FUEL OIL ADDITION PROJECT
PIPING & INSTRUMENTATION DIAGRAM
HIGH PRESSURE FUEL OIL SYSTEM
WOODSDALE GENERATING STATION



NO.	DESIGN PRESSURE (PSIG)	DESIGN TEMPERATURE (°F)	MAX. OPER. PRESSURE (PSIG)	MAX. OPER. TEMPERATURE (°F)	PIPE CLASS.	PIPE SIZE (IN.)	INSUL. TYPE	INSUL. THICKNESS (IN.)	INSUL. CLASS.	FIELD TEST PRESSURE (PSIG)	REMARKS
FD-3	100	100	90	93	D	54L 0170	D	54L 0659	A	1100	CARBON STEEL
FD-4	235	170	90	150	D	54L 0300	D	54L 0659	A	315	CARBON STEEL
FD-5	2325	170	1300	150	D	54L 1505	D	54L 1599	A	3500	CARBON STEEL
FD-6	235	170	90	150	D	54L 0170	D	54L 0659	A	315	CARBON STEEL
FA-1	180	180	180	180	D	54L 0170	D	54L 0659	H	180	CARBON STEEL



- NOTES:
1. FOR GENERAL NOTES SEE ENG. M-15
 2. DELUGE SYSTEM ON POINT DRAINS THE DRG DRAIN TO THE OFFICE. 3. FOR CONTINUATION SEE ENG. M-42
 3. DELUGE SYSTEMS MUST BE OBTAINED AS TO LOCALS.
 4. ALL FOAM FIRE SUPPRESSION SYSTEMS SHALL BE DESIGNED, INSTALLED, AND TESTED BY A STATE OF OHIO LICENSED FIRE PROTECTION CONTRACTOR.

DEMOLITION NOTES

1. Hatched area indicates material to be removed.
2. CONTRACTOR SHALL WORK WITH STATION ON SYSTEM REMOVAL AND SALVAGE. CONTRACTOR TO VERIFY ALL DEMOLITION WORK. CLIENT ASKED TO PERFORMING WORK.
3. NO BURIED IMPLIC SHALL BE REMOVED. CONNECTIONS TO BURIED POINTS SHALL BE CAPPED.

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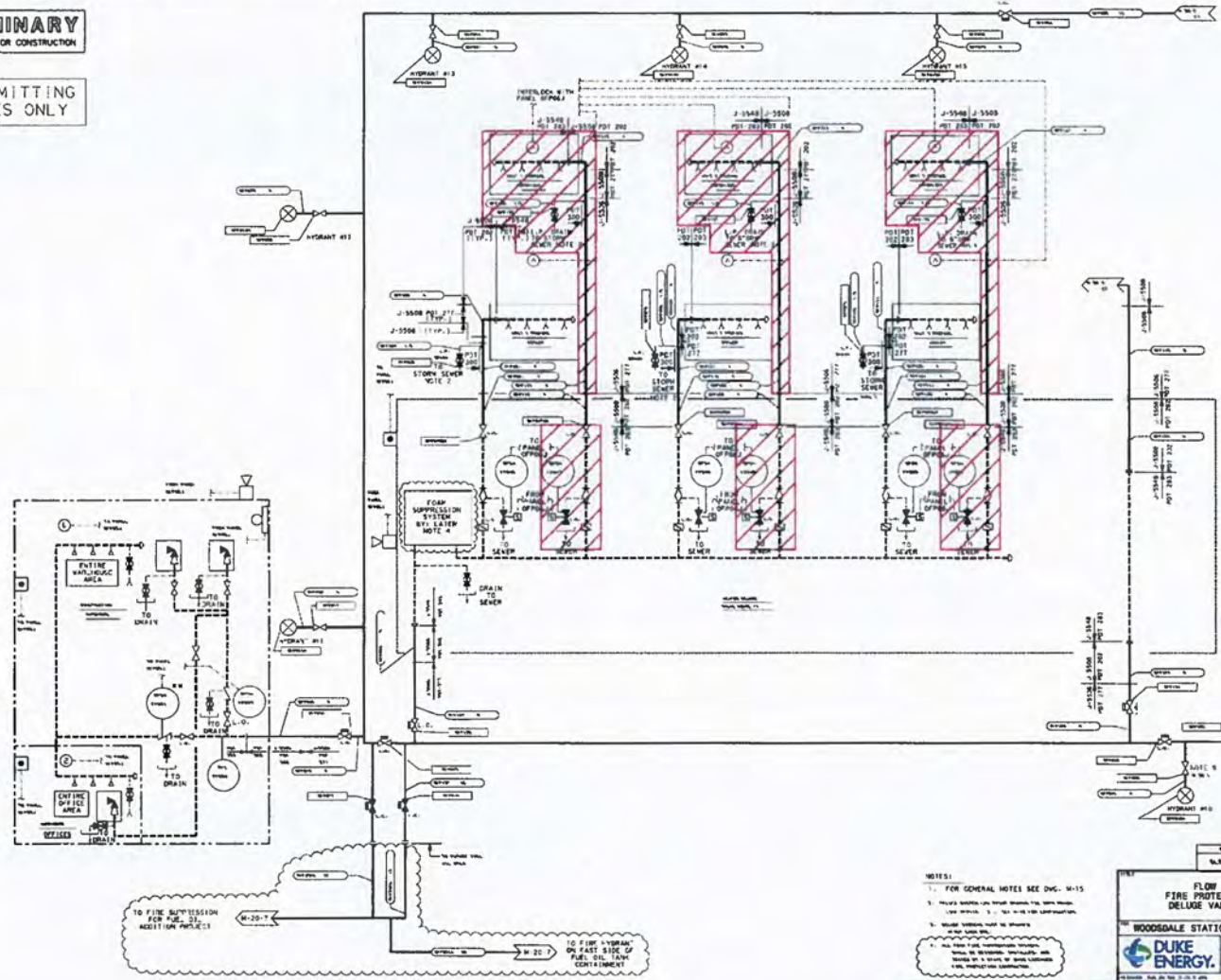
WOODDALE STATION - UNITS 4, 5, 6

DUKE ENERGY

DATE: 10/15/14
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 PROJECT NO: M-20-4

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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PURPOSES ONLY



NOTES:

- FOR GENERAL NOTES SEE DWG. M-15
- FIELD VERIFY AND REPORT ANY DISCREPANCIES TO THE DESIGNER.
- FIELD VERIFY AND REPORT ANY DISCREPANCIES TO THE DESIGNER.
- FIELD VERIFY AND REPORT ANY DISCREPANCIES TO THE DESIGNER.

WOODDALE STATION - UNITS 1, 2, 3

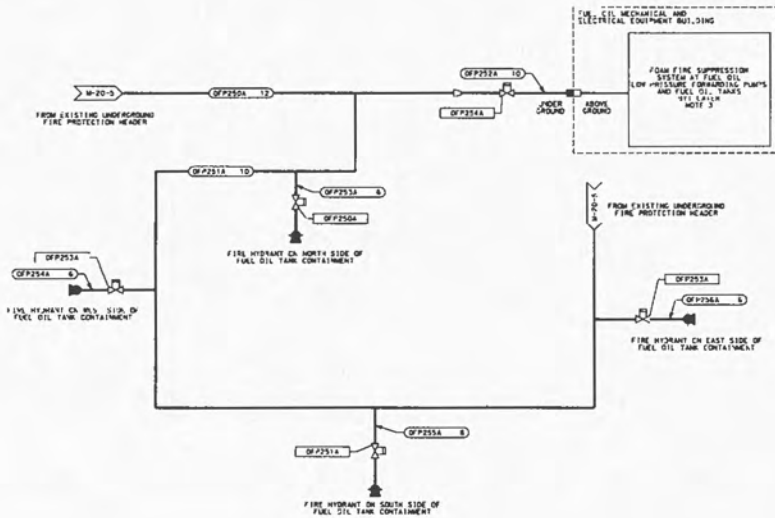
DUKE ENERGY

M-20-5 2C

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

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PURPOSES ONLY



NOTES

1. FIRE HYDRANT AND POST INDICATOR VALVES SHALL BE AS LISTED AND/OR AS APPROVED.
2. SEE DRAWINGS W-20-5, W-20-6, W-20-7, W-20-8, W-20-9, W-20-10, W-20-11, AND W-20-12 FOR INDEX AND SYMBOLS, RESPECTIVELY.
3. ALL FOAM FIRE SUPPRESSION SYSTEMS SHALL BE DESIGNED, INSTALLED, AND TESTED BY A STATE OR NDIS LICENSED FIRE PROTECTION CONTRACTOR.

REFERENCE DRAWINGS

W-20-4 FIRE PROTECTION SYSTEM DELUGE VALVE HOUSE #2
W-20-5 FIRE PROTECTION SYSTEM DELUGE VALVE HOUSE #1

TITLE

**FIRE PROTECTION SYSTEM
FUEL OIL ADDITION PROJECT
PIPING & INSTRUMENTATION DIAGRAM**

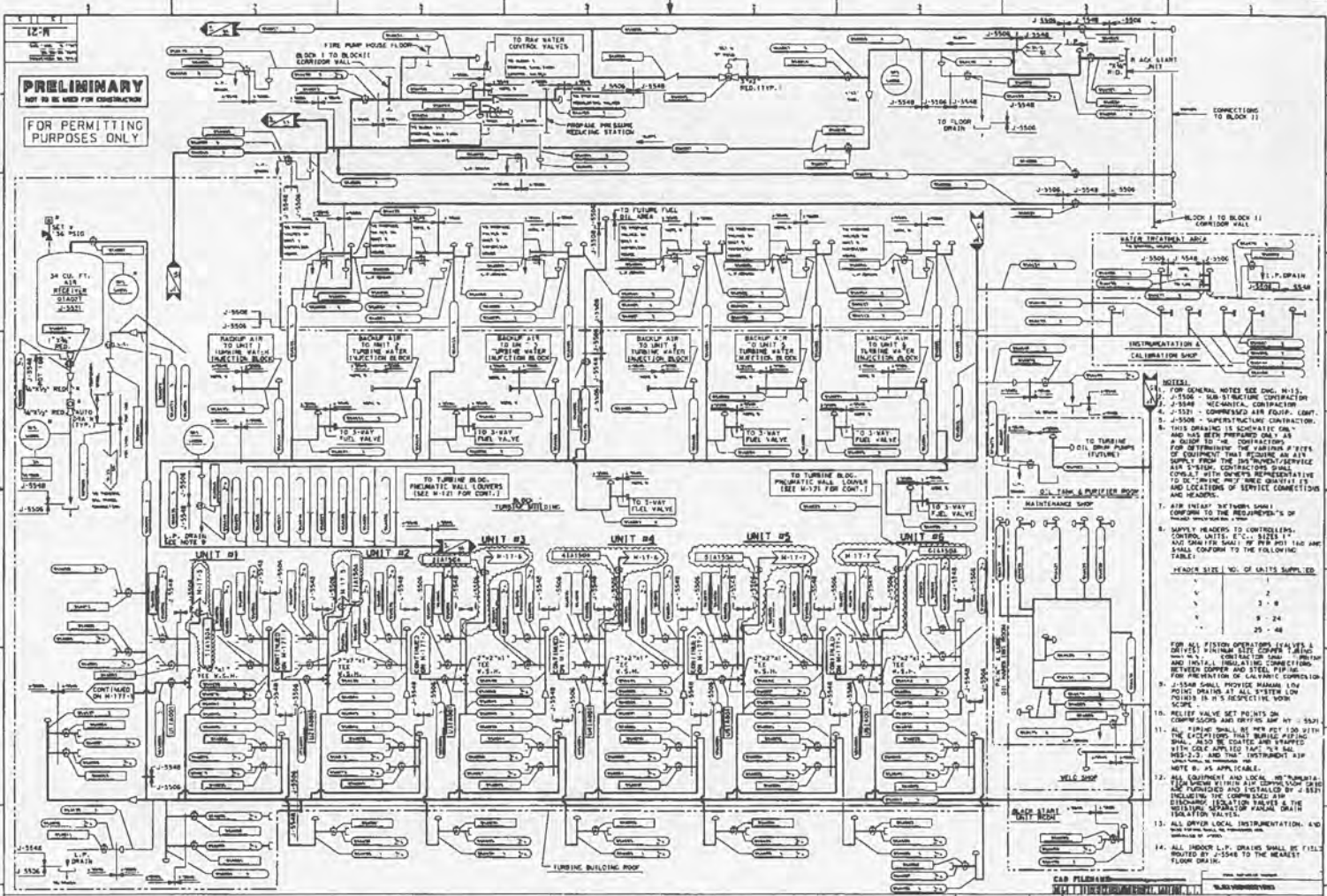
WOODSDALE GENERATING STATION

DUKE ENERGY

DATE: 11/11/11
DRAWN BY: J. WATSON
CHECKED BY: J. WATSON
APPROVED BY: J. WATSON

M-20-7 00

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION
FOR PERMITTING PURPOSES ONLY



- NOTES:**
1. FOR GENERAL NOTES SEE ENG. M-13.
 2. J-5508 - SUB-STRUCTURE CONTRACTOR.
 3. J-5548 - MECHANICAL CONTRACTOR.
 4. J-5521 - COMPRESSED AIR EQUIP. CONT.
 5. J-5508 - SUPERSTRUCTURE CONTRACTOR.
 6. THIS DRAWING IS CONTRACTOR'S ONLY AND HAS BEEN PREPARED ONLY AS A GUIDE TO THE CONTRACTOR'S WORK FOR OBTAINING THE VARIATION OF SIZES OF EQUIPMENT THAT REQUIRE AN AIR SUPPLY FROM THE INSTRUMENT/SERVICE AND PNEUMATIC CONTRACTORS SHALL TO BE CONSULTED WITH OWNER REPRESENTATIVE AND LOCATIONS OF SERVICE CONNECTIONS AND LOCATIONS.
 7. AIR INLET TO TURBINE SHALL CONFORM TO THE REQUIREMENTS OF THE MANUFACTURER'S DATA.
 8. SAFETY HEADERS TO CONTROLS, CONTROL UNITS, ETC., SHALL BE 1" AND SHALL CONFORM TO THE FOLLOWING TABLE:
- | HEADER SIZE | NO. OF UNITS SUPPLIED |
|-------------|-----------------------|
| 1" | 3 - 8 |
| 1 1/2" | 9 - 24 |
| 2" | 25 - 48 |
9. FOR ALL SYSTEM OPERATIONS VALVES AND INSTRUMENTS SHALL BE INSTALLED AND INITIAL ISOLATING CONNECTIONS BETWEEN COPPER AND STEEL PIPE FOR PREVENTION OF GALVANIC CORROSION.
 10. J-5548 SHALL PROVIDE MAXIMUM 15% POINT DRAINS AT ALL SYSTEM LOW POINTS IN ITS RESPECTIVE ZONE.
 11. RELIEF VALVE SET POINTS ON GAS SYSTEMS ARE 150% OF THE SET POINT.
 12. ALL EQUIPMENT AND LOCAL INSTRUMENTATION SHALL BE PROVIDED AND INSTALLED BY J-5521 INCLUDING THE CORROSION PROTECTIVE DISCONNECT ISOLATION VALVES & THE RELIEF VALVES OF PNEUMATIC DRAIN ISOLATION VALVES.
 13. ALL OTHER LOCAL INSTRUMENTATION, AND THE INSTRUMENTS, SHALL BE PROVIDED BY OTHERS.
 14. ALL PNEUMATIC DRAIN SHALL BE FILL DRAINS BY J-5548 TO THE HIGHEST FLOOR DRAIN.

NO.	DESCRIPTION	DATE	BY	CHECKED	APPROVED
1	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
2	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
3	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
4	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
5	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
6	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
7	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
8	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
9	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508
10	ISSUED FOR PERMITTING PURPOSES ONLY	11/15/2011	J-5508	J-5508	J-5508



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FOR PERMITTING
PURPOSES ONLY

NOTES

1. SEE DRAWINGS M-1 SHEET 1 AND M-16 SHEET 1 AND 2 FOR NOTES AND SYMBOLS, RESPECTIVELY.

REFERENCE DRAWINGS

A-200 SCHEMATIC PLUMBING DIAGRAM
C-7 GRADING, DRAINAGE AND PAVING PLAN SHEET 5

**POTABLE WATER SYSTEM
FUEL OIL ADDITION PROJECT
PIPING & INSTRUMENTATION DIAGRAM**

WOODSDALE GENERATING STATION

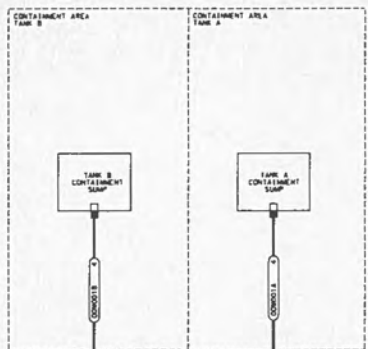
DUKE ENERGY

DATE	BY	CHKD	APP'D
08/11/09	J. W. WOOD	J. W. WOOD	J. W. WOOD
08/11/09	J. W. WOOD	J. W. WOOD	J. W. WOOD
08/11/09	J. W. WOOD	J. W. WOOD	J. W. WOOD

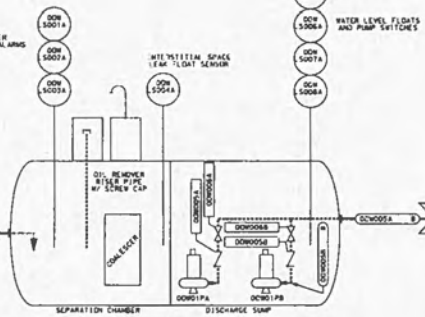
Project No. M-27-4

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FOR PERMITTING
PURPOSES ONLY



OIL & WATER
LEVEL FLOATS/ALARMS



OILY WATER
SEPARATOR
D00015A

WATER LEVEL FLOATS
AND PUMP SWITCHES

- NOTES**
- UNDERGROUND VALVES SHALL BE PROVIDED WITH BALL JOINT AND KEYS TO OPERATE VALVE FROM GRADE.
 - SEE DRAWINGS W-18 SH-1 AND W-18 SH-1, AND 2 FOR INCH AND 5" SIZES, RESPECTIVELY.

REFERENCE DRAWINGS

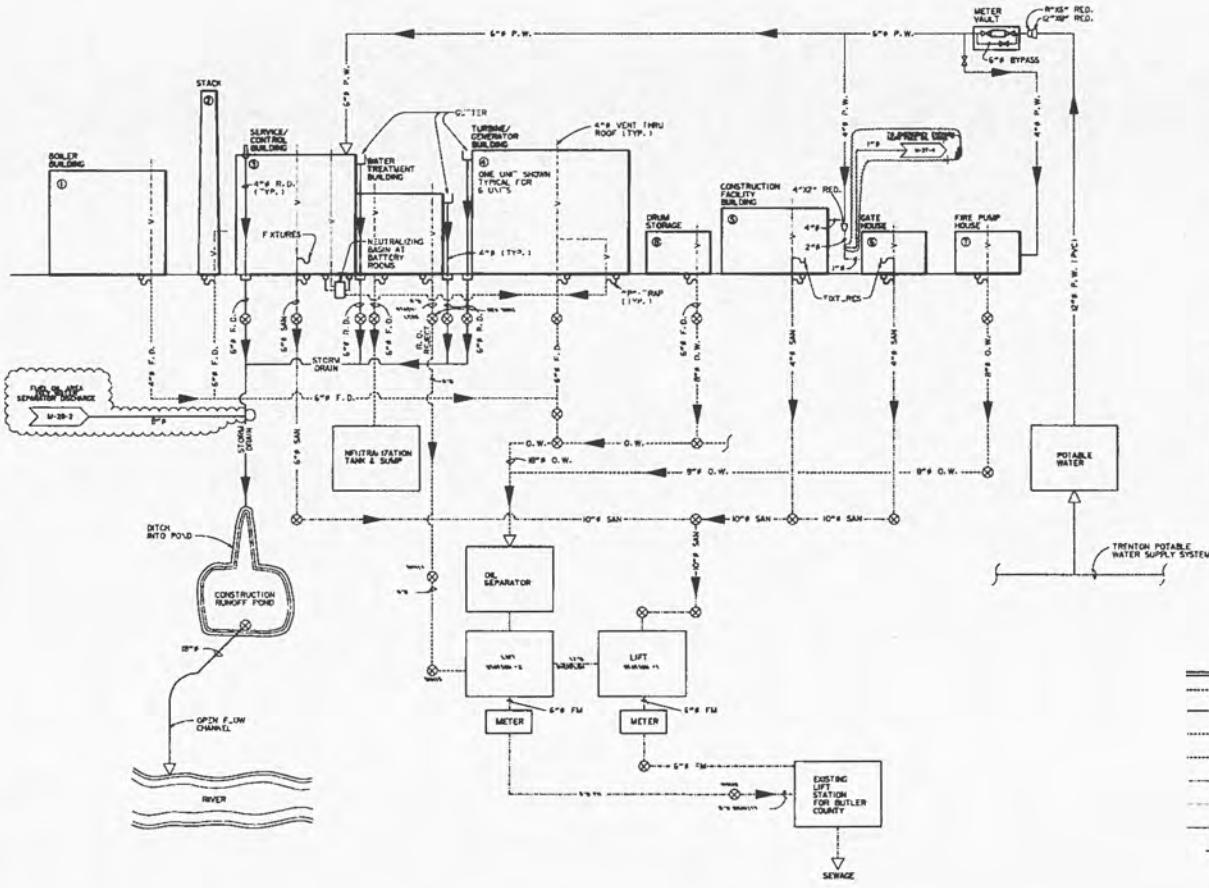
- C-1 SITE GENERAL ARRANGEMENT
- C-14 GRADING, DRAINAGE, AND PAVING PLAN SH. 12

**UNDERGROUND DRAINAGE SYSTEM
FUEL OIL ADDITION PROJECT
PIPING & INSTRUMENTATION DIAGRAM**

WOODSDALE GENERATING STATION

DUKE ENERGY

DATE	BY	CHKD	REVISED	REVISION
08/14/07	J. H. [unclear]	[unclear]		
M-28-2				
0E				



NOTES

- ALL WORK SHOWN ON THIS DRAWING BELOW 1' ABOVE GRADE IS PERMITTED & SHALL BE IN ACCORDANCE WITH THE CITY OF CHICAGO ORDINANCES AND SPECIFICATIONS FOR THE CONSTRUCTION OF SEWERAGE AND SANITATION SYSTEMS. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF CHICAGO ORDINANCES AND SPECIFICATIONS FOR THE CONSTRUCTION OF SEWERAGE AND SANITATION SYSTEMS. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF CHICAGO ORDINANCES AND SPECIFICATIONS FOR THE CONSTRUCTION OF SEWERAGE AND SANITATION SYSTEMS.
- NO WORK SHALL BE PERMITTED ON THIS PROJECT UNLESS THE CONTRACTOR HAS OBTAINED THE NECESSARY PERMITS FROM THE CITY OF CHICAGO AND THE STATE OF ILLINOIS.

- LEGEND**
- D.W. DILY WASTE
 - R.D. ROOF DRAIN
 - F.D. FLOOR DRAIN
 - E.D. EQUIPMENT DRAIN
 - SAN SANITARY DRAIN
 - V VENT
 - P.W. POTABLE WATER
 - (Symbol) MANHOLE

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FOR PERMITTING PURPOSES ONLY

SCHEMATIC PLUMBING DIAGRAM

WOODSDALE GENERATING STATION

DUKE ENERGY

PLUMBING: [Name], DATE: [Date], DRAWING NO: A-205, SHEET NO: 38

Appendix C Electrical Load List

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
PRELIMINARY FUEL OIL UNLOADING STATION LOADS

FROM EQUIPMENT		TO EQUIPMENT (FUEL OIL STORAGE TANKS)				NAMEPLATE					COINCIDENTAL				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	Height	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
		0APXXJ	480V FUEL OIL UNLOADING MCC A 800 AT (NEW)				24	88	273			444		188	204
0APXXJ	480V FUEL OIL UNLOADING MCC A		480-208/120V TRANSF PUMP HOUSE			70 AT	6		45	480	3	54	0.8	27	32
0APXXJ	480V FUEL OIL UNLOADING MCC A		DIST FUEL LP FUEL FWD PUMP 1		FVNR 3		18	50		480	3	61	0.85	41	52
0APXXJ	480V FUEL OIL UNLOADING MCC A		FUEL OIL TANK 1 DISCHARGE MOV		FVR 1		18	1		480	3	1	0	0	0
0APXXJ	480V FUEL OIL UNLOADING MCC A		FUEL OIL RECIRCULATION 3-WAY MOV		FVR 1		18	0.10		480	3	0	0	0	0
0APXXJ	480V FUEL OIL UNLOADING MCC A		FUEL OIL UNLOADING PUMP 3		FVNR 2		12	20		480	3	24	0	0	0
0APXXJ	480V FUEL OIL UNLOADING MCC A		FUEL OIL UNLOADING PUMP 4		FVNR 2		12	20		480	3	24	0	0	0
0APXXJ	480V FUEL OIL UNLOADING MCC A		FUEL OIL UNLOADING AREA HEAT TRACE TRANSF NORMAL FEED				125 AT	8	75	480	3	90	0.5	38	45
0APXXJ	480V FUEL OIL UNLOADING MCC A		OILY WATER SEPARATOR CONTROL PANEL				20 AT	8	2.2	480	3	3	1	1	2
0APXXJ	480V FUEL OIL UNLOADING MCC A		PUMP HOUSE UNIT HEATER 1				15 AT	8	7.5	480	3	9	0.8	6	7
0APXXJ	480V FUEL OIL UNLOADING MCC A		PUMP HOUSE UNIT HEATER 2				15 AT	8	7.5	480	3	9	0.8	6	7
0APXXJ	480V FUEL OIL UNLOADING MCC A		PUMP HOUSE UNIT HEATER 3				15 AT	8	7.5	480	3	9	0.8	6	7
0APXXJ	480V FUEL OIL UNLOADING MCC A		PUMP HOUSE VENT FAN 1				15 AT	8	1.5	480	3	2	0.85	1	2
0APXXJ	480V FUEL OIL UNLOADING MCC A		DCS UPS CABINET 1 NORMAL FEED				15 AT	8	10	480	3	12	0.80	6	10
0APXXJ	480V FUEL OIL UNLOADING MCC A		FUEL OIL UNLOADING AREA WELDING RECEPTACLE #1				80 AT	8	50	480	3	60	0	0	0
0APXXJ	480V FUEL OIL UNLOADING MCC A		EYEWASH STATION				40 AT	8	25	480	3	30	0.25	6	8
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE		FVNR 1		12				3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE		FVNR 1		12				3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE		FVNR 2		12				3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE		FVNR 2		12				3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE		FVR 1		18				3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE				80 AT	8			3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE				70 AT	8			3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE				30 AT	8			3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE				20 AT	8			3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE				20 AT	8			3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		SPARE				15 AT	8			3				
0APXXJ	480V FUEL OIL UNLOADING MCC A		480V 8U8 VOLTMETER 1Q130 (OR EQUAL)				12								
0APXXJ	480V FUEL OIL UNLOADING MCC A		MCC 480-208/120V 45 KVA TRANSFORMER				70 AT	36	45	480	3	54	0.8	27	32
0APXXJ	480V FUEL OIL UNLOADING MCC A		MCC 480-208/120V 42 CIRCUIT PANELBOARD				175 AT	48		480	3				

8.0 VERTICAL SECTIONS

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-036
PRELIMINARY FUEL OIL UNLOADING STATION LOADS

FROM EQUIPMENT		TO EQUIPMENT (FUEL OIL STORAGE TANKS)				NAMEPLATE						COINCIDENTAL				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	Height	HP	KVA / KW	VOLTS	# PH	AMPB	LOAD FACTOR	KVA	AMPB	
		DAPYYJ	480V FUEL OIL UNLOADING MCC B 850 AT (NEW)				24	93	278			448		177	218	
DAPYYJ	480V FUEL OIL UNLOADING MCC B		480-208Y/120V TRANSF PUMP HOUSE				70 AT	6	45	480	3	54	0.6	27	32	
DAPYYJ	480V FUEL OIL UNLOADING MCC B		DIST FUEL LP FUEL PWD PUMP 2 (STANDBY)		FVNR 3		18	50		480	3	61	0.85	41	52	
DAPYYJ	480V FUEL OIL UNLOADING MCC B		FUEL OIL TANK 1 DISCHARGE MOV		FVR 1		18	1		480	3	1	0	0	0	
DAPYYJ	480V FUEL OIL UNLOADING MCC B		FUEL OIL UNLOADING PUMP 3		FVNR 2		12	20		480	3	24	0	0	0	
DAPYYJ	480V FUEL OIL UNLOADING MCC B		FUEL OIL UNLOADING PUMP 4		FVNR 2		12	20		480	3	24	0	0	0	
DAPYYJ	480V FUEL OIL UNLOADING MCC B		FUEL OIL UNLOADING AREA HEAT TRACE TRANSF ALTERNATE FEED				125 AT	8		75	480	3	80	0.5	38	45
DAPYYJ	480V FUEL OIL UNLOADING MCC B		480-208Y/120V FUEL OIL UNLOADING AREA LIGHTING TRANSFORMER				50 AT	6		30	480	3	36	0.8	18	22
DAPYYJ	480V FUEL OIL UNLOADING MCC B		PUMP HOUSE UNIT HEATER 4				15 AT	6		7.5	480	3	9	0.8	6	7
DAPYYJ	480V FUEL OIL UNLOADING MCC B		PUMP HOUSE UNIT HEATER 5				15 AT	6		7.5	480	3	9	0.8	6	7
DAPYYJ	480V FUEL OIL UNLOADING MCC B		PUMP HOUSE UNIT HEATER 6				15 AT	6		7.5	480	3	9	0.8	6	7
DAPYYJ	480V FUEL OIL UNLOADING MCC B		PUMP HOUSE VENT FAN 2				15 AT	6	1.5		480	3	2	0	0	0
DAPYYJ	480V FUEL OIL UNLOADING MCC B		DCS UPS CABINET 1 ALTERNATE FEED				15 AT	6		10	480	3	12	0.80	6	10
DAPYYJ	480V FUEL OIL UNLOADING MCC B		FUEL OIL UNLOADING AREA WELDING RECEPTACLE #2				80 AT	6		50	480	3	60	0	0	0
DAPYYJ	480V FUEL OIL UNLOADING MCC B		ROLLING STEEL DOOR				15 AT	6	0.75		480	3	1	0.25	0.2	0.2
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE		FVNR 1		12				3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE		FVNR 1		12				3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE		FVNR 2		12				3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE		FVNR 2		12				3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE		FVR 1		18				3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE		FVR 1		18				3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE				80 AT	6			3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE				70 AT	6			3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE				30 AT	6			3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE				20 AT	6			3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE				20 AT	6			3					
DAPYYJ	480V FUEL OIL UNLOADING MCC B		SPARE				15 AT	6			3					
DAPYYJ	480V FUEL OIL UNLOADING MCC A		480V BUS VOLTMETER 1Q130 (OR EQUAL)				12									
DAPYYJ	480V FUEL OIL UNLOADING MCC B		MCC 480-208/120V 45 KVA TRANSFORMER				70 AT	36		45	480	3	54	0.6	27	32
DAPYYJ	480V FUEL OIL UNLOADING MCC B		MCC 480-208/120V 42 CIRCUIT PANELBOARD				175 AT	48		480	3	0	0.8	0	0	0

5.0 VERTICAL SECTIONS

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
EXISTING PROPANE COMMON LOADS

FROM EQUIPMENT		TO EQUIPMENT (EXIST. PROPANE STORAGE BLDG.)				NAMEPLATE				COINCIDENTAL		ASSUMPTIONS									
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS		LOAD FACTOR	kVA	AMPS						
GAP08J	480V SUS BUS E	GAP14J	480V PROPANE STORAGE MCC P8-E	1FQX																	
			TOTAL LOAD												228	119	480	3	418	228	277
			RETAINED LOAD AFTER FO MODS												0	88	480	3	193	73	87
			RETIRED PROPANE LOADS												228	33	480	3	315	152	190
GAP14J	480V PROPANE STORAGE MCC P8-E	GPO10J	ODOORIZING JB	2FGL		40 AT		33	480	3	40	0.85	28	34	40A BREAKER, LOAD = 80% BKR RATING						
GAP14J	480V PROPANE STORAGE MCC P8-E	GPL301PC	PROPANE LIQUID PUMP	2FMT	FVNR 4		75		480	3	92	0.85	62	78	ASSUMED 2 OF 3 PUMPS ARE ON SIMULTANEOUSLY						
GAP14J	480V PROPANE STORAGE MCC P8-E	GPL301PA	PROPANE LIQUID PUMP	4FAH	FVNR 4		75		480	3	92	0.85	62	78							
GAP14J	480V PROPANE STORAGE MCC P8-E	GPL301PE	PROPANE LIQUID PUMP	3FIP	FVNR 4		75		480	3	92	0	0	0							
GAP14J	480V PROPANE STORAGE MCC P8-E	GAP14JT	480V TRANSFORMER	1FAF		40 AT		15	480	3	16	0.85	13	15							
GAP14J	480V PROPANE STORAGE MCC P8-E	-	SEWAGE LIFT STATION RESERVE FEED	1FGL		100 AT		30.5	480	3	37	0.85	29	31							
GAP14J	480V PROPANE STORAGE MCC P8-E	-	CATHODIC PROTECTION RECTIFIER #1	2FAF		15 AT		10	480	3	12	0.85	9	10	15A BREAKER, LOAD = 80% BKR RATING						
GAP14J	480V PROPANE STORAGE MCC P8-E	-	SEWAGE LIFT STATION #2 NORMAL FEED	4FOT		100 AT		30	480	3	38	0.85	28	31							
GAP14J	480V PROPANE STORAGE MCC P8-E	-	BLANK (SPACE, FORMERLY PROP LIQ PU GPL301PG)	3FAH																	
GAP14J	480V PROPANE STORAGE MCC P8-E	-	BLANK (SPACE)	1FMP																	
GAP14J	480V PROPANE STORAGE MCC P8-E	-	BLANK (SPACE)	2FUX																	
GAP14J	480V PROPANE STORAGE MCC P8-E	-	BLANK (SPACE)	3FAH																	
GAP14J	480V PROPANE STORAGE MCC P8-E	-	SPARE	4FIP	FVNR 4																
GAP14J	480V PROPANE STORAGE MCC P8-E	-	SPARE	3FQX	FVNR 4																

FROM EQUIPMENT		TO EQUIPMENT (EXIST. PROPANE STORAGE BLDG.)				NAMEPLATE				COINCIDENTAL		ASSUMPTIONS									
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS		LOAD FACTOR	kVA	AMPS						
GAP08J	480V SUS BUS F	GAP18J	480V PROPANE STORAGE MCC P8-F	1FQX																	
			TOTAL LOAD												228	188	480	3	481	201	248
			RETAINED LOAD AFTER FO MODS												0	104	480	3	124	37	44
			RETIRED PROPANE LOADS												228	81	480	3	337	168	204
GAP15J	480V PROPANE STORAGE MCC P8-F	GAP42J	PROPANE STORAGE DIST. PNL P.D.P. *P81	2FGL		125 AT		0	51	480	3	81	40	48							
GAP15J	480V PROPANE STORAGE MCC P8-F	GPL301PD	PROPANE LIQUID PUMP	2FMT	FVNR 4		75		480	3	92	0.85	62	78	ASSUMED 2 OF 3 PUMPS ARE ON SIMULTANEOUSLY						
GAP15J	480V PROPANE STORAGE MCC P8-F	GPL301PF	PROPANE LIQUID PUMP	3FOX	FVNR 4		75		480	3	92	0.85	62	78							
GAP15J	480V PROPANE STORAGE MCC P8-F	GPL301PB	PROPANE LIQUID PUMP	4FAH	FVNR 4		75		480	3	92	0	0	0							
GAP15J	480V PROPANE STORAGE MCC P8-F	-	MICROWAVE BLDG SERVICE	1FAF		70 AT		33	480	3	40	0.85	28	34							
GAP15J	480V PROPANE STORAGE MCC P8-F	-	SEWAGE LIFT STATION NORMAL FEED	1FGL		100 AT		31	480	3	37	0	0	0	ASSUMED TO BE RESERVE FEED						
GAP15J	480V PROPANE STORAGE MCC P8-F	-	CATHODIC PROTECTION RECTIFIER #2	2FAF		15 AT		10	480	3	12	0.85	9	10	15A BREAKER, LOAD = 80% BKR RATING						
GAP15J	480V PROPANE STORAGE MCC P8-F	-	SEWAGE LIFT STATION #2 RESERVE FEED	4FOT		100 AT		30	480	3	38	0	0	0							
GAP15J	480V PROPANE STORAGE MCC P8-F	-	BLANK (SPACE)	1FMP																	
GAP15J	480V PROPANE STORAGE MCC P8-F	-	BLANK (SPACE)	2FUX																	
GAP15J	480V PROPANE STORAGE MCC P8-F	-	SPARE	3FAH	FVNR 4																
GAP15J	480V PROPANE STORAGE MCC P8-F	-	SPARE	3FIP	FVNR 4																
GAP15J	480V PROPANE STORAGE MCC P8-F	-	SPARE	4FIP	FVNR 4																

FROM EQUIPMENT		TO EQUIPMENT (EXIST. PROPANE BOILER BLDG.)				NAMEPLATE				COINCIDENTAL		ASSUMPTIONS		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS		LOAD FACTOR	kVA	AMPS
GAP18J	480V PROPANE STORAGE MCC P8-F	GAP42J	DIST. PNL P.D.P. *P81	INCOMING	3	100 AT	0	81	480	3	81		48	48
GAP42J	DIST. PNL P.D.P. *P81	0VV01A	DUCT HEATER 0VV01A	1	3	20 AT		10	480	3	12	0.85	9	10
GAP42J	DIST. PNL P.D.P. *P81	-	TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	18	1	7.02	8
GAP42J	DIST. PNL P.D.P. *P81	0SH42A	UNIT HEATER	3	3	20 AT		5	480	3	6	1	5	6
GAP42J	DIST. PNL P.D.P. *P81	0VV07C	CONDENSING UNIT	4	3	20 AT		8	480	3	11	0.85	8	9
GAP42J	DIST. PNL P.D.P. *P81	GPO01D	HEATER	5	3	20 AT		3	480	3	4	1	3	4
GAP42J	DIST. PNL P.D.P. *P81	GAP42JT	PROPANE PUMP MOTOR HEATER TRANSF	6	3	20 AT		9	480	3	11	1	9	11
GAP42J	DIST. PNL P.D.P. *P81	-	SPARE	7	3	20 AT								
GAP42J	DIST. PNL P.D.P. *P81	-	SPARE	8	3	20 AT								

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
EXISTING PROPANE COMMON LOADS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)			CONNECTED						COINCIDENTAL			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
DAP12J	480V PROPANE BOILER MCC PB-2C	-	TRANSFORMER 480-120/208V 15 KVA	INCOMING	3	88 AT	0	7.92	120	3	88.8		7.82	88
	TRANSFORMER 480-120/208V 15 KVA	-	LIGHTING	1	1	20 AT		0.600	120	1	5.8	1	1	8
	TRANSFORMER 480-120/208V 15 KVA	-	RECEPTACLES	2	1	20 AT		0.900	120	1	7.5	1	1	8
	TRANSFORMER 480-120/208V 15 KVA	-	LIGHTING	3	1	20 AT		0.550	120	1	4.8	1	1	8
	TRANSFORMER 480-120/208V 15 KVA	-	RECEPTACLES	4	1	20 AT		0.900	120	1	7.5	1	1	8
	TRANSFORMER 480-120/208V 15 KVA	-	LIGHTING	5	1	20 AT		0.280	120	1	2.3	1	0	2
	TRANSFORMER 480-120/208V 15 KVA	0VV018	FAN COIL UNIT	6	1	20 AT		0.938	120	1	7.8	1	1	8
	TRANSFORMER 480-120/208V 15 KVA	0VV08C	EXHAUST FAN	7	1	20 AT		0.375	120	1	3.1	1	0	3
	TRANSFORMER 480-120/208V 15 KVA	-	MOTOR OPERATED LOUVER	8	1	20 AT		0.300	120	1	2.5	0	0	0
	TRANSFORMER 480-120/208V 15 KVA	-	2 MOTOR OPERATED LOUVERS	9	1	20 AT		0.600	120	1	5.0	0	0	0
	TRANSFORMER 480-120/208V 15 KVA	OPL100	RTU #2	10	1	20 AT		1.080	120	1	9.1	1	1	8
	TRANSFORMER 480-120/208V 15 KVA	-	SPARE	11	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	QFM-PV100	12	1	20 AT		1.30	120	1	10.8	1	1	11
	TRANSFORMER 480-120/208V 15 KVA	-	SPARE	13	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPARE	14	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPARE	15	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPARE	16	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPARE	17	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPARE	18	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPACE	19	1				120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPACE	20	1				120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPACE	21	1				120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPACE	22	1				120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPACE	23	1				120	1				
	TRANSFORMER 480-120/208V 15 KVA	-	SPACE	24	1				120	1				

NOTES:

1. SHOWN ON KEY DIAGRAM E-208-4
2. BLUE SHADING = "RETIRED AFTER THE FUEL OIL PROJECT MODIFICATIONS ARE COMPLETED"

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
EXISTING PROPANE UNIT LOADS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
DAPO2J	4180V BUS 14 1200 AT	DAPO6J	480V BUS BUS C 3200 AT (EXISTING)	1B			1200	492	480	3	2468		1602	1978
DAPO6J	480V BUS BUS C	DAAD1CA	AIR COMPRESSOR A	1C		200 AT	100		480	3	122	0.85	83	104
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	2A						3				
DAPO6J	480V BUS BUS C	DAPI0J	WATER TREATMENT MCC WT-C	2B		800 AT	276	265	480	3	1058		654	797
DAPO6J	480V BUS BUS C	DAPI2J	PROPANE BOILER MCC PB-2C	2C		800 AT	208	227	480	3	525		347	428
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	2D						3				
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	3A						3				
DAPO6J	480V BUS BUS C	QVM03PA	REVERSE OSMOSIS PUMP 1C	3B		400 AT	250		480	3	308	0.85	207	260
DAPO6J	480V BUS BUS C	QVM02PA	RAW WATER PUMP A	3C		200 AT	125		480	3	153	0.85	104	130
DAPO6J	480V BUS BUS C	QVM03PC	REVERSE OSMOSIS PUMP 1A	3D		400 AT	250		480	3	308	0.85	207	260
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	4A						3				
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	4B						3				
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	4C						3				
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	4D						3				
DAPO6J	480V BUS BUS C		BUS C-D TIE BREAKER	5A		1800AT				3				
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	5B						3				
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	5C						3				
DAPO6J	480V BUS BUS C		BLANK (NO BREAKER)	5D						3				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
DAPO6J	480V BUS BUS C 800 AT	DAPI2J	480V PROPANE BOILER MCC PB-2C	1FAD, 2FAD			208	227	480	3	828		347	428
DAPI2J	480V PROPANE BOILER MCC PB-2C	Q3BV802P	PROPANE BOILER CIRC PUMP	1FGL	FVNR 3		40		480	3	49	0.85	33	42
DAPI2J	480V PROPANE BOILER MCC PB-2C	Q2BV802P	PROPANE BOILER CIRC PUMP	1FMR	FVNR 3		40		480	3	49	0.85	33	42
DAPI2J	480V PROPANE BOILER MCC PB-2C	Q1BV802P	PROPANE BOILER CIRC PUMP	1FSX	FVNR 3		40		480	3	49	0.85	33	42
DAPI2J	480V PROPANE BOILER MCC PB-2C	Q1BV801B	PROPANE BOILER BLOWER	2FGL		30AT		15	480	3	18	0.85	13	15
DAPI2J	480V PROPANE BOILER MCC PB-2C	Q2BV801B	PROPANE BOILER BLOWER	2FMR		30AT		15	480	3	18	0.85	13	15
DAPI2J	480V PROPANE BOILER MCC PB-2C	Q3BV801B	PROPANE BOILER BLOWER	3FSX		30AT		15	480	3	18	0.85	13	15
DAPI2J	480V PROPANE BOILER MCC PB-2C	CPR8E	CATHODIC PROTECTION RECTIFIER E (NORTH)	3FAF		30AT		20	480	3	24	0.85	17	20
DAPI2J	480V PROPANE BOILER MCC PB-2C	DAPI2JT	480V TRANSFORMER	3FGL		40AT		15	480	3	18	0.8	9	11
DAPI2J	480V PROPANE BOILER MCC PB-2C	QVM07J	DEMIN WATER TANK HEATING	3FMR		70AT		42	480	3	51	1	42	51
DAPI2J	480V PROPANE BOILER MCC PB-2C	1AP01J	PROPANE BOILER DIST. PNL	4FAF		100AT	1	35	480	3	43		24	29
DAPI2J	480V PROPANE BOILER MCC PB-2C	2AP01J	PROPANE BOILER DIST. PNL	4FGL		100AT	1	35	480	3	43		24	29
DAPI2J	480V PROPANE BOILER MCC PB-2C	TP-2	DEMIN WATER TRANSFER PUMP #1	4FMT	FVNR 4		75		480	3	92	0.85	82	78
DAPI2J	480V PROPANE BOILER MCC PB-2C	QVM05PA	REGENERATION PUMP	4FUX	FVNR 1		7.5		480	3	9	0.85	8	8
DAPI2J	480V PROPANE BOILER MCC PB-2C	3AP01J	PROPANE DIST. PNL	5FAF		100AT	1	35	480	3	43		24	29
DAPI2J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	2FSX						3				
DAPI2J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	5FGL						3				
DAPI2J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	5FMR						3				
DAPI2J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	5FSX						3				

Load List

DUKE ENERGY WOODDALE FUEL OIL PROJECT 13371-035
EXISTING PROPANE UNIT LOADS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)			NAMEPLATE						COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
QAP06J	480V BUS BUS C 800 AT	QAP18J	480V WATER TREATMENT MCC WT-C	1FAD, 2FAD			278	288	480	3	1086		664	787
QAP10J	480V WATER TREATMENT MCC WT-C	QMM04PC	DECARBONATOR TRANSFER PUMP	1FEJ	FVNR 3		50		480	3	61	0.85	41	52
QAP10J	480V WATER TREATMENT MCC WT-C	QMM04PA	DECARBONATOR TRANSFER PUMP	1FKP	FVNR 3		50		480	3	61	0.85	41	52
QAP10J	480V WATER TREATMENT MCC WT-C	QMM01CA	MEDIA FILTER BLOWER	1FOX	FVNR 4		75		480	3	92	0.85	62	78
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	2FGL		30AT								
QAP10J	480V WATER TREATMENT MCC WT-C	QMM07EA	480V TRANSFORMER	2FMR				15	480	3	18	0.6	9	11
QAP10J	480V WATER TREATMENT MCC WT-C	QMM06FA	OSMOSIS CLEAN-UP PUMP	2FSX	FVNR 3		30		480	3	37	0.85	25	31
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08A	REGEN IN-LINE HEATER	3FAX				250	480	3	301	1	250	301
QAP10J	480V WATER TREATMENT MCC WT-C	QMM03CA	FD AERATOR COMPRESSOR	4FCF	FVNR 1		7.5		480	3	9	0.6	4	6
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08PA	COAGULANT FEED PUMP	4FGJ	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08S	POT PERMANG TANK MIXER	4FKV	FVNR 1		0.3		480	3	0	0.85	0	0
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08S	COAGULANT TANK MIXER	4FOR	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QET01PA	CHEMICAL SUMP PUMP	4FSX	FVNR 3		30		480	3	37	0	0	0
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	5FAD		40AT								
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08PA	POT PERMANG FEED PUMP	5FEH	FVNR 1		1.5		480	3	2	0.85	1	2
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	5FIL	FVNR 1									
QAP10J	480V WATER TREATMENT MCC WT-C	QMM13PA	CAUSTIC DILUTION FEED PUMP	5FMP	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QMM11PA	ACID DILUTION FEED PUMP	5FQT	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QMM02CA	MIXED BED BLOWER	5FUX	FVNR 2		20		480	3	24	0.85	17	21
QAP10J	480V WATER TREATMENT MCC WT-C	QAP38J	POWER DISTR POWER	6FAL					480	3	400	0.6	200	240
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	6FMP	FVNR 1									
QAP10J	480V WATER TREATMENT MCC WT-C	QET02PA	BACKWASH SUMP PUMP	6FQT	FVNR 1		7.5		480	3	9	0	0	0
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	8FUX	FVNR 2									

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)			NAMEPLATE						COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
QAP03J	4180V BUS 15 1200 AT	QAP07J	480V BUS BUS D 3200 AT (EXISTING)	1B			878	810	480	3	1854		486	560
QAP07J	480V BUS BUS D	QIA01CB	AIR COMPRESSOR B	1C		200 AT	60		480	3	73	0.65	50	62
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	2A										
QAP07J	480V BUS BUS D	QAP11J	WATER TREATMENT MCC WT-D	2B		800 AT	232	283	480	3	600		48	59
QAP07J	480V BUS BUS D	QAP13J	PROPANE BOILER MCC PB-5D	2C		800 AT	208	247	480	3	552		358	439
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	2D										
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	3A										
QAP07J	480V BUS BUS D	QMM03PB	REVERSE OSMOSIS PUMP 1B	3B		400 AT	250		480	3	308	0	0	0
QAP07J	480V BUS BUS D	QMM02PB	RAW WATER PUMP B	3C		200 AT	125		480	3	153	0	0	0
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	3D										
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	4A										
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	4B										
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	4C										
QAP07J	480V BUS BUS D		SPARE	4D		200 AT								
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	5A										
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	5B										
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	5C										
QAP07J	480V BUS BUS D		BLANK (NO BREAKER)	5D										

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
EXISTING PROPANE UNIT LOADS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE						COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP07J	480V BUS BUS D 800 AT	0AP13J	480V PROPANE BOILER MCC PB-0D	1FAD, 2FAD			298	247	480	3	882		388	439
0AP13J	480V PROPANE BOILER MCC PB-0D	089W802P	PROPANE BOILER CIRC PUMP	1FGL	FVNR 3		40		480	3	49	0.85	33	42
0AP13J	480V PROPANE BOILER MCC PB-0D	059W802P	PROPANE BOILER CIRC PUMP	1FMR	FVNR 3		40		480	3	49	0.85	33	42
0AP13J	480V PROPANE BOILER MCC PB-0D	049W802P	PROPANE BOILER CIRC PUMP	1FBX	FVNR 3		40		480	3	49	0.85	33	42
0AP13J	480V PROPANE BOILER MCC PB-0D	059W801B	PROPANE BOILER BLOWER	2FGL		3DAT	15		480	3	18	0.85	13	15
0AP13J	480V PROPANE BOILER MCC PB-0D	049W801B	PROPANE BOILER BLOWER	2FMR		3DAT	15		480	3	18	0.85	13	15
0AP13J	480V PROPANE BOILER MCC PB-0D	089W801B	PROPANE BOILER BLOWER	3FBX		3DAT	15		480	3	18	0.85	13	15
0AP13J	480V PROPANE BOILER MCC PB-0D	CPR5F	CATHODIC PROTECTION RECTIFIER F (NORTH)	3FAF		3DAT	20		480	3	24	0.85	17	20
0AP13J	480V PROPANE BOILER MCC PB-0D	0AP13JT	480V TRANSFORMER	3FGL		4DAT	15		480	3	18	0.8	9	11
0AP13J	480V PROPANE BOILER MCC PB-0D	0VM08J	DEMIM WATER TANK HEATING	3FMR		7DAT	42		480	3	51	1	42	51
0AP13J	480V PROPANE BOILER MCC PB-0D	5AP01J	PROPANE BOILER DIST. PNL	4FAF		100AT	1	35	480	3	43		24	29
0AP13J	480V PROPANE BOILER MCC PB-0D	6AP01J	PROPANE BOILER DIST. PNL	4FGL		100AT	1	35	480	3	43		24	29
0AP13J	480V PROPANE BOILER MCC PB-0D	TP-1	DEMIM WATER TRANSFER PUMP #2	4FMT	FVNR 4		75		480	3	92	0.85	62	78
0AP13J	480V PROPANE BOILER MCC PB-0D	0VM05PB	REGENERATION PUMP	4FUX	FVNR 1		10		480	3	12	0	0	0
0AP13J	480V PROPANE BOILER MCC PB-0D	4AP01J	PROPANE DIST. PNL	5FAF		100AT	1	35	480	3	43		24	29
0AP13J	480V PROPANE BOILER MCC PB-0D	CPR5G	CATHODIC PROTECTION RECTIFIER G (SOUTH)	5FGL		3DAT	20		480	3	24	0.85	17	20
0AP12J	480V PROPANE BOILER MCC PB-0D		SPARE	2FBX	FVNR 3									
0AP12J	480V PROPANE BOILER MCC PB-0D		BLANK (SPACE)	5FMR										
0AP12J	480V PROPANE BOILER MCC PB-0D		BLANK (SPACE)	5FBX										

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE						COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP12J	480V PROPANE BOILER MCC PB-2C	1AP01J	PROPANE BOILER DIST. PNL	INCOMING	3	198 AT	1	38	480	3	43		24	29
1AP01J	PROPANE BOILER DIST. PNL		EXHAUST FAN	1	3	20 AT	0.5		480	3	0.6	0.85	0	0.5
1AP01J	PROPANE BOILER DIST. PNL		TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	18	1	3.96	5
1AP01J	PROPANE BOILER DIST. PNL		UNIT HEATER	3	3	20 AT		10	480	3	12	1	10	12
1AP01J	PROPANE BOILER DIST. PNL		SPARE	4	3	20 AT								
1AP01J	PROPANE BOILER DIST. PNL		UNIT HEATER	5	3	20 AT		10	480	3	12	1	10	12
1AP01J	PROPANE BOILER DIST. PNL		SPARE	8	3	20 AT								
1AP01J	PROPANE BOILER DIST. PNL		MOTOR OPERATED DOOR	7	3	20 AT	0.5		480	3	0.8	0	0	0
1AP01J	PROPANE BOILER DIST. PNL		SPARE	8	3	20 AT								

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				CONNECTED						COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP12J	480V PROPANE BOILER MCC PB-2C		TRANSFORMER 480-120/208V 18 KVA	INCOMING	3	89 AT	0	3.98	120	3	33		3.98	33
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	1	1	20 AT		0.420	120	1	3.5	1	0	3.5
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	2	1	20 AT		0.720	120	1	6.0	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	3	1	20 AT		0.890	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	4	1	20 AT		0.720	120	1	6.0	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	5	1	20 AT		0.890	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		PROPANE VAPORIZER LTG REC & HTG	6	1	20 AT		0.820	120	1	5.2	1	1	5
	TRANSFORMER 480-120/208V 15 KVA		SPARE	7	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	8	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	9	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	10	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		LOLVERS	11	1	20 AT		0.100	120	1	0.8	1	0	1
	TRANSFORMER 480-120/208V 15 KVA		SPARE	12	1	20 AT			120	1				

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
EXISTING PROPANE UNIT LOADS

EQUIP NO	FROM EQUIPMENT EQUIP DESCRIPTION (SOURCE)	EQUIP NO	TO EQUIPMENT (EXIST PROPANE BOILER BLDG) EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	NAMEPLATE					COINCIDENTAL (EST)		
							HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP07J	480V BUS BUS D	0AP11J	480V WATER TREATMENT MCC WT-D	1FAD, 2FAD			232	262	480	3	600		48	89
0AP11J	480V WATER TREATMENT MCC WT-D	0MM08PB	OSMOSIS CLEAN-UP PUMP	1FEJ	FVNR 3		30		480	3	37	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0MM04PB	DECARBONATOR TRANSFER PUMP	1FKP	FVNR 3		50		480	3	61	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0MM01CB	MEDIA FILTER BLOWER	1FQX	FVNR 4		75		480	3	92	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0ETD1PB	CHEMICAL BUMP PUMP	2FEJ	FVNR 3		30		480	3	37	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0MM07EB	480V TRANSFORMER	2FKP		30AT		15	480	3	18	0.8	9	11
0AP11J	480V WATER TREATMENT MCC WT-D		SPARE	2FQX		150AT				3				
0AP11J	480V WATER TREATMENT MCC WT-D	0MM07A	REGEN IN-LINE HEATER	3FAX	FVC 8			200	480	3	241	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0MM02CB	MIXED BED BLOWER	4FCF	FVNR 2		20		480	3	24	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0MM03CB	FD AERATOR COMPRESSOR	4FQJ	FVNR 1		7.5		480	3	9	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0MM09PB	COAGULANT FEED PUMP	4FKN	FVNR 1		1		480	3	1	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D		SPARE	4FOR	FVNR 1					3				
0AP11J	480V WATER TREATMENT MCC WT-D	0MM07EE	480V TRANSFORMER	4FSX		50AT		30	480	3	36	0.8	18	22
0AP11J	480V WATER TREATMENT MCC WT-D		SPARE	5FAD	FVNR 2					3				
0AP11J	480V WATER TREATMENT MCC WT-D	0MM05A	OSMOSIS CLEAN-UP HEATER	5FEH	FVC 2			18	480	3	22	0.85	15	18
0AP11J	480V WATER TREATMENT MCC WT-D	0MM08PB	POT PERMANG FEED PUMP	5FIL	FVNR 1		1.5		480	3	2	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D		SPARE	5FMP	FVNR 1					3				
0AP11J	480V WATER TREATMENT MCC WT-D	0MM13PB	CAUSTIC DILUTION FEED PUMP	5FQT	FVNR 1		1		480	3	1	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D	0MM11PB	ACID DILUTION FEED PUMP	5FUX	FVNR 1		1		480	3	1	0	0	0
0AP11J	480V WATER TREATMENT MCC WT-D		BLANK	6FAD						3				
0AP11J	480V WATER TREATMENT MCC WT-D		BLANK	6FEH						3				
0AP11J	480V WATER TREATMENT MCC WT-D		SPARE	6FIL	FVNR 2					3				
0AP11J	480V WATER TREATMENT MCC WT-D	0ET01TE	DEMINSREG/UNIT TANK AGITATOR	6FMP	FVNR 1		7.5		480	3	9	0.85	8	8
0AP11J	480V WATER TREATMENT MCC WT-D		SPARE	6FQT	FVNR 1					3				
0AP11J	480V WATER TREATMENT MCC WT-D	0ET02PB	BACKWASH BUMP PUMP	6FUX	FVNR 1		7.5		480	3	9	0	0	0

NOTES:

1. SHOWN ON KEY DIAGRAM E-208-3
2. WATER TREATING REDUNDANT LOADS HAVE THE RUNNING LOAD ON THE "A" BUS AND THE "OFF" LOAD ON THE "B" BUS, TO LOAD THE "A" BUS AS HIGH AS POSSIBLE (I.E., A CONSERVATIVE BUT ALSO A POSSIBLE SCENARIO)
3. FOR CATHODIC PROTECTION LOADS, USE 80% OF BREAKER TRIP RATING
4. "AVAILABLE HEIGHT" MEANS HEIGHT AVAILABLE FOR REUSE WHEN CONVERTING FROM PROPANE TO FUEL OIL
5. SWGR LOAD AND HARDWARE ARE BASED ON 4-8-17 WALK DOWN AND NOT ON DWG E-207 SHEETS 3 & 4.
6. EXISTING MCC FEEDS ARE ASSUMED TO BE LOADED AT 85% OF NAMEPLATE RATING (CONSERVATIVE)
7. REFERENCES: E-208 SH 1 FOR 4180V BUSES 14 & 15, E-207 SH 3, 4 & 5 FOR 480V BUSES C, D, E & F, E-208 SH 4 FOR MCCS PS-E & PS-F, E-208 SH 3 FOR MCCS PB-2C & PB-5D
8. BLUE SHADING = "RETIRED AFTER THE FUEL OIL PROJECT MODIFICATIONS ARE COMPLETED"
9. UNIT 1 PROPANE BOILER DISTRIBUTION PANEL 1AP01J LOADS ARE SHOWN, OTHER UNITS (2AP01J, 3AP01J, 4AP01J, 5AP01J, 6AP01J) ARE NOT SHOWN BUT ARE IDENTICAL.

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
480V SWITCHGEAR C & D AND PROPANE MCC LOADING AFTER PROPANE LOADS ARE REMOVED & FUEL OIL MODIFICATIONS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
0AP02J	4180V BUS 14 1200 AT	0AP06J	480V BUS BUS C 3200 AT (EXISTING)	1B				1181	720	480	3	2711	1831	2009
0AP06J	480V BUS BUS C	0A01CA	AIR COMPRESSOR A	1C		200 AT	100		480	3	122	0.85	83	104
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	2A						3				
0AP06J	480V BUS BUS C	0AP10J	WATER TREATMENT MCC WT-C	2B		800 AT	278	285	480	3	1058		654	797
0AP06J	480V BUS BUS C	0AP12J	PROPANE BOILER MCC PB-2C	2C		800 AT	88	182	480	3	324		208	253
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	2D						3				
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	3A						3				
0AP06J	480V BUS BUS C	0VM03PA	REVERSE OSMOSIS PUMP 1C	3B		400 AT	250		480	3	308	0.85	207	260
0AP06J	480V BUS BUS C	0VM02PA	RAW WATER PUMP A	3C		200 AT	125		480	3	153	0.85	104	130
0AP06J	480V BUS BUS C	0VM03PC	REVERSE OSMOSIS PUMP 1A	3D		400 AT	250		480	3	308	0.85	207	260
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	4A						3				
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	4B						3				
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	4C						3				
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	4D						3				
0AP06J	480V BUS BUS C		BUS C-D TIE BREAKER	5A		3200AT				3				
0AP06J	480V BUS BUS C	0AP00J	480V FUEL OIL UNLOADING MCC A 800 AT (NEW)	5B		800 AT	95	273	480	3	444	0	188	204
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	5C						3				
0AP06J	480V BUS BUS C		BLANK (NO BREAKER)	5D						3				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
0AP06J	480V BUS BUS C 800 AT	0AP12J	480V PROPANE BOILER MCC PB-2C	1FAD, 2FAD			88	182	480	3	324		208	253
0AP12J	480V PROPANE BOILER MCC PB-2C		SPARE	1FGL	FVNR 3					3				
0AP12J	480V PROPANE BOILER MCC PB-2C		SPARE	1FMR	FVNR 3					3				
0AP12J	480V PROPANE BOILER MCC PB-2C		SPARE	1FSX	FVNR 3					3				
0AP12J	480V PROPANE BOILER MCC PB-2C		SPARE	2FGL		30AT				3				
0AP12J	480V PROPANE BOILER MCC PB-2C		SPARE	2FMR		30AT				3				
0AP12J	480V PROPANE BOILER MCC PB-2C		SPARE	3FSX		30AT				3				
0AP12J	480V PROPANE BOILER MCC PB-2C	CPR5E	CATHODIC PROTECTION RECTIFIER E (NORTH)	3FAL		30AT		20	480	3	24	0.85	17	20
0AP12J	480V PROPANE BOILER MCC PB-2C	0AP12JT	480V TRANSFORMER	3FAL		40AT		15	480	3	18	0.8	9	11
0AP12J	480V PROPANE BOILER MCC PB-2C	0VM07J	DEMINE WATER TANK HEATING	3FMR		70AT		42	480	3	51	1	42	51
0AP12J	480V PROPANE BOILER MCC PB-2C	1AP01J	PROPANE BOILER DIST PNL	4FAF		125AT	1	35.0	480	3	43		24	29
0AP12J	480V PROPANE BOILER MCC PB-2C	2AP01J	PROPANE BOILER DIST PNL	4FGL		125AT	1	35.0	480	3	43	0	24	29
0AP12J	480V PROPANE BOILER MCC PB-2C	TP-2	DEMINE WATER TRANSFER PUMP #1	4FMT	FVNR 4		75		480	3	92	0.85	62	78
0AP12J	480V PROPANE BOILER MCC PB-2C	0VM05PA	REGENERATION PUMP	4FUX	FVNR 1		7.5		480	3	9	0.85	6	8
0AP12J	480V PROPANE BOILER MCC PB-2C	3AP01J	PROPANE DIST PNL	5FAF		125AT	1	35.0	480	3	43	0	24	29
0AP12J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	2FSX						3				
0AP12J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	5FGL						3				
0AP12J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	5FMR						3				
0AP12J	480V PROPANE BOILER MCC PB-2C		BLANK (SPACE)	5FSX						3				

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
480V SWITCHGEAR C & D AND PROPANE MCC LOADING AFTER PROPANE LOADS ARE REMOVED & FUEL OIL MODIFICATIONS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE						COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
QAP06J	480V BUS BUS C 800 AT	QAP10J	480V WATER TREATMENT MCC WT-C	1FAD, 2FAD				278	285	480	3	1056	884	787
QAP10J	480V WATER TREATMENT MCC WT-C	QMM04PC	DECARBONATOR TRANSFER PUMP	1FEJ	FVNR 3		50		480	3	61	0.85	41	52
QAP10J	480V WATER TREATMENT MCC WT-C	QMM04PA	DECARBONATOR TRANSFER PUMP	1FKP	FVNR 3		50		480	3	61	0.85	41	52
QAP10J	480V WATER TREATMENT MCC WT-C	QMM01CA	MEDIA FILTER BLOWER	1FOX	FVNR 4		75		480	3	92	0.85	62	78
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	2FQL							3			
QAP10J	480V WATER TREATMENT MCC WT-C	QMM07EA	480V TRANSFORMER	2FMR		40AT		15	480	3	18	0.8	9	11
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08PA	OSMOSIS CLEAN-UP PUMP	2FSX	FVNR 3		30		480	3	37	0.85	25	31
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08A	REGEN IN-LINE HEATER	3FAX	FVC 8			250	480	3	301	1	250	301
QAP10J	480V WATER TREATMENT MCC WT-C	QMM03CA	FD AERATOR COMPRESSOR	4FCF	FVNR 1		7.5		480	3	9	0.6	4	8
QAP10J	480V WATER TREATMENT MCC WT-C	QMM09PA	COAGULANT FEED PUMP	4FGJ	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QMM09S	POT PERMANG TANK MIXER	4FKM	FVNR 1		0.3		480	3	0	0.85	0	0
QAP10J	480V WATER TREATMENT MCC WT-C	QMM09S	COAGULANT TANK MIXER	4FOR	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QET01PA	CHEMICAL SUMP PUMP	4FSX	FVNR 3		30		480	3	37	0	0	0
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	5FAD		40AT					3			
QAP10J	480V WATER TREATMENT MCC WT-C	QMM08PA	POT PERMANG FEED PUMP	5FEH	FVNR 1		1.5		480	3	2	0.85	1	2
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	5FIL	FVNR 1						3			
QAP10J	480V WATER TREATMENT MCC WT-C	QMM13PA	CAUSTIC DILUTION FEED PUMP	5FMP	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QMM11PA	ACID DILUTION FEED PUMP	5FQT	FVNR 1		1		480	3	1	0.85	1	1
QAP10J	480V WATER TREATMENT MCC WT-C	QMM02CA	MIXED BED BLOWER	5FLX	FVNR 2		20		480	3	24	0.85	17	21
QAP10J	480V WATER TREATMENT MCC WT-C	QAP38J	POWER DISTR POWER	5FAL		400AT			480	3	400	0.8	200	240
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	5FMP	FVNR 1						3			
QAP10J	480V WATER TREATMENT MCC WT-C	QET02PA	BACKWASH SUMP PUMP	5FQT	FVNR 1		7.5		480	3	9	0	0	0
QAP10J	480V WATER TREATMENT MCC WT-C		SPARE	5FLX	FVNR 2						3			

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE						COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
QAP12J	480V PROPANE BOILER MCC PB-2C	1AP01J	PROPANE BOILER DIST. PNL.	INCOMING	3	100 AT	1	35	480	3	43		24	29
1AP01J	PROPANE BOILER DIST PNL		EXHAUST FAN	1	3	20 AT	0.5		480	3	0.6	0.85	0	0.5
1AP01J	PROPANE BOILER DIST PNL		TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	18	1	3.34	4
1AP01J	PROPANE BOILER DIST PNL		UNIT HEATER	3	3	20 AT		10	480	3	12	1	10	12
1AP01J	PROPANE BOILER DIST PNL		SPARE	4	3	20 AT					3			
1AP01J	PROPANE BOILER DIST PNL		UNIT HEATER	5	3	20 AT		10	480	3	12	1	10	12
1AP01J	PROPANE BOILER DIST PNL		SPARE	6	3	20 AT					3			
1AP01J	PROPANE BOILER DIST PNL		MOTOR OPERATED DOOR	7	3	20 AT	0.5		480	3	0.6	0	0	0
1AP01J	PROPANE BOILER DIST PNL		SPARE	8	3	20 AT					3			

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
480V SWITCHGEAR C & D AND PROPANE MCC LOADING AFTER PROPANE LOADS ARE REMOVED & FUEL OIL MODIFICATIONS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				CONNECTED				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
OAP12J	480V PROPANE BOILER MCC PB-2C		TRANSFORMER 480-120/208V 18 KVA	INCOMING	3	90 AT	0	3.34	120	3	28		3.34	28
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	1	1	20 AT		0.420	120	1	3.5	1	0	3.5
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	2	1	20 AT		0.720	120	1	6.0	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	3	1	20 AT		0.690	120	1	5.6	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	4	1	20 AT		0.720	120	1	6.0	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	5	1	20 AT		0.690	120	1	5.6	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		SPARE	6	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	7	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	8	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	9	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	10	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		LOUVERS	11	1	20 AT		0.100	120	1	0.8	1	0	1
	TRANSFORMER 480-120/208V 15 KVA		SPARE	12	1	20 AT		120	1					

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
OAP12J	480V PROPANE BOILER MCC PB-2C	ZAP01J	PROPANE BOILER DIST. PNL.	INCOMING	3	100 AT	1	38	480	3	43		24	29
ZAP01J	PROPANE BOILER DIST PNL		EXHAUST FAN	1	3	20 AT	0.5		480	3	0.6	0.85	0	0.5
ZAP01J	PROPANE BOILER DIST PNL		TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	16	1	3.34	4
ZAP01J	PROPANE BOILER DIST PNL		UNIT HEATER	3	3	20 AT		10	480	3	12	1	10	12
ZAP01J	PROPANE BOILER DIST PNL		SPARE	4	3	20 AT				3				
ZAP01J	PROPANE BOILER DIST PNL		UNIT HEATER	5	3	20 AT		10	480	3	12	1	10	12
ZAP01J	PROPANE BOILER DIST PNL		SPARE	6	3	20 AT				3				
ZAP01J	PROPANE BOILER DIST PNL		MOTOR OPERATED DOOR	7	3	20 AT	0.5		480	3	0.8	0	0	0
ZAP01J	PROPANE BOILER DIST PNL		SPARE	8	3	20 AT				3				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				CONNECTED				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
OAP12J	480V PROPANE BOILER MCC PB-2C		TRANSFORMER 480-120/208V 18 KVA	INCOMING	3	90 AT	0	3.34	120	3	28		3.34	28
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	1	1	20 AT		0.420	120	1	3.5	1	0	3.5
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	2	1	20 AT		0.720	120	1	6.0	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	3	1	20 AT		0.690	120	1	5.6	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	4	1	20 AT		0.720	120	1	6.0	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	5	1	20 AT		0.690	120	1	5.6	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		SPARE	6	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	7	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	8	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	9	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		SPARE	10	1	20 AT		120	1					
	TRANSFORMER 480-120/208V 15 KVA		LOUVERS	11	1	20 AT		0.100	120	1	0.8	1	0	1
	TRANSFORMER 480-120/208V 15 KVA		SPARE	12	1	20 AT		120	1					

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
480V SWITCHGEAR C & D AND PROPANE MCC LOADING AFTER PROPANE LOADS ARE REMOVED & FUEL OIL MODIFICATIONS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
DAP12J	480V PROPANE BOILER MCC PB-2C	3AP81J	PROPANE BOILER DIST. PNL	INCOMING	3	100 AT	1	38	480	3	43		24	29
DAP01J	PROPANE BOILER DIST PNL		EXHAUST FAN	1	3	20 AT	0.5		480	3	0.8	0.85	0	0.5
DAP01J	PROPANE BOILER DIST PNL		TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	18	1	3.34	4
DAP01J	PROPANE BOILER DIST PNL		UNIT HEATER	3	3	20 AT		10	480	3	12	1	10	12
DAP01J	PROPANE BOILER DIST PNL		SPARE	4	3	20 AT				3				
DAP01J	PROPANE BOILER DIST PNL		UNIT HEATER	5	3	20 AT		10	480	3	12	1	10	12
DAP01J	PROPANE BOILER DIST PNL		SPARE	6	3	20 AT				3				
DAP01J	PROPANE BOILER DIST PNL		MOTOR OPERATED DOOR	7	3	20 AT	0.5		480	3	0.8	0	0	0
DAP01J	PROPANE BOILER DIST PNL		SPARE	8	3	20AT				3				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				CONNECTED					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
DAP12J	480V PROPANE BOILER MCC PB-2C		TRANSFORMER 480-120/208V 15 KVA	INCOMING	3	80 AT	0	3.34	120	3	28		3.34	28
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	1	1	20 AT		0.420	120	1	3.5	1.00	0	3.5
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	2	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	3	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	4	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	5	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		SPARE	6	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	7	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	8	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	9	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	10	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		LOUVERS	11	1	20 AT		0.100	120	1	0.8	1.0	0	1
	TRANSFORMER 480-120/208V 15 KVA		SPARE	12	1	20 AT			120	1				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
DAP03J	4180V BUS 15 1200 AT	DAP07J	480V BUS BUS D 3200 AT (EXISTING)			1B		888	743	480	3	1980	827	844
DAP07J	480V BUS BUS D	0A01CB	AIR COMPRESSOR B (REPLACES EXISTING 50 HP COMPRESSOR)			1C		200 AT	100	480	3	122	0.85	83
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			2A				3				
DAP07J	480V BUS BUS D	DAP11J	WATER TREATMENT MCC WT-D			2B		800 AT	232	263	480	3	600	0.00
DAP07J	480V BUS BUS D	DAP13J	PROPANE BOILER MCC PB-5D			2C		800 AT	68	202	480	3	351	218
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			2D				3				
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			3A				3				
DAP07J	480V BUS BUS D	0MM03PB	REVERSE OSMOSIS PUMP 1B			3B		400 AT	250	480	3	308	0	0
DAP07J	480V BUS BUS D	0MM02PB	RAW WATER PUMP B			3C		200 AT	125	480	3	153	0	0
DAP07J	480V BUS BUS D	DAPYYJ	480V FUEL OIL UNLOADING MCC B 800 AT (NEW)			4C		800 AT	93	278	480	3	448	177
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			4A				3				
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			4B				3				
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			4C				3				
DAP07J	480V BUS BUS D		SPARE			4D		400 AT		3				
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			5A				3				
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			5B				3				
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			5C				3				
DAP07J	480V BUS BUS D		BLANK (NO BREAKER)			5D				3				

Load List

DUKE ENERGY WOODSDALE FUEL OIL ROJECT 13371-038
480V SWITCHGEAR C & D AND PROPANE MCC LOADING AFTER PROPANE LOADS ARE REMOVED & FUEL OIL MODIFICATIONS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
GAP07J	480V BUS BUS D 800 AT	GAP13J	480V PROPANE BOILER MCC PB-5D	1FAD, 2FAD			88	202	480	3	381		218	268
GAP13J	480V PROPANE BOILER MCC PB-5D		SPARE	1FGL	FVNR 3					3				
GAP13J	480V PROPANE BOILER MCC PB-5D		SPARE	1FMR	FVNR 3					3				
GAP13J	480V PROPANE BOILER MCC PB-5D		SPARE	1FSX	FVNR 3					3				
GAP13J	480V PROPANE BOILER MCC PB-5D		SPARE	2FGL		30AT				3				
GAP13J	480V PROPANE BOILER MCC PB-5D		SPARE	2FMR		30AT				3				
GAP13J	480V PROPANE BOILER MCC PB-5D		SPARE	3FBX		30AT				3				
GAP13J	480V PROPANE BOILER MCC PB-5D	CPR8F	CATHODIC PROTECTION RECTIFIER F (NORTH)	3FAP		30AT		20	480	3	24	0.85	17	20
GAP13J	480V PROPANE BOILER MCC PB-5D	GAP13JT	480V TRANSFORMER	3FGL		40AT		15	480	3	18	0.8	9	11
GAP13J	480V PROPANE BOILER MCC PB-5D	QMM08J	DEMIM WATER TANK HEATING	3FMR		70AT		42	480	3	51	1	42	51
GAP13J	480V PROPANE BOILER MCC PB-5D	SAP01J	PROPANE BOILER DIST PNL	4FAP		125AT	1	35.0	480	3	43	0.0	24	29
GAP13J	480V PROPANE BOILER MCC PB-5D	SAP01J	PROPANE BOILER DIST PNL	4FGL		125AT	1	35.0	480	3	43	0.0	24	29
GAP13J	480V PROPANE BOILER MCC PB-5D	TP-1	DEMIM WATER TRANSFER PUMP #2	4FMT	FVNR 4		75		480	3	82	0.85	82	78
GAP13J	480V PROPANE BOILER MCC PB-5D	QMM05PB	REGENERATION PUMP	4FUX	FVNR 1		10		480	3	12	0	0	0
GAP13J	480V PROPANE BOILER MCC PB-5D	HAPO1J	PROPANE DIST PNL	5FAP		125AT	1	35.0	480	3	43	0.0	24	29
GAP13J	480V PROPANE BOILER MCC PB-5D	CPR8G	CATHODIC PROTECTION RECTIFIER G (SOUTH)	5FGL		30AT		20	480	3	24	0.85	17	20
GAP12J	480V PROPANE BOILER MCC PB-5D		SPARE	2FBX	FVNR 3									
GAP12J	480V PROPANE BOILER MCC PB-5D		BLANK (SPACE)	5FMR										
GAP12J	480V PROPANE BOILER MCC PB-5D		BLANK (SPACE)	5FBX										

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	COMPT	STARTER	BKR	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
GAP07J	480V BUS BUS D	GAP11J	480V WATER TREATMENT MCC WT-D	1FAD, 2FAD			232	283	480	3	500		48	88
GAP11J	480V WATER TREATMENT MCC WT-D	QMM08PB	OSMOBIS CLEAN-UP PUMP	1FEJ	FVNR 3		30		480	3	37	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QMM04PB	DECARBONATOR TRANSFER PUMP	1FKP	FVNR 3		50		480	3	81	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QMM01CB	MEDIA FILTER BLOWER	1FOX	FVNR 4		75		480	3	82	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QETD1PB	CHEMICAL SUMP PUMP	2FEJ	FVNR 3		30		480	3	37	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QMM07EB	480V TRANSFORMER	2FKP		30AT		15	480	3	18	0.8	9	11
GAP11J	480V WATER TREATMENT MCC WT-D		SPARE	2FOX		150AT				3				
GAP11J	480V WATER TREATMENT MCC WT-D	QMM07A	REGEN IN-LINE HEATER	3FAX	FVC 8			200	480	3	241	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QMM02CB	MIXED BED BLOWER	4FCF	FVNR 2		20		480	3	24	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QMM03CB	FD AERATOR COMPRESSOR	4FQJ	FVNR 1		7.5		480	3	9	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QMM08PB	COAGULANT FEED PUMP	4FKH	FVNR 1		1		480	3	1	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D		SPARE	4FOR	FVNR 1					3				
GAP11J	480V WATER TREATMENT MCC WT-D	QMM07EE	480V TRANSFORMER	4FBX		50AT		30	480	3	38	0.8	18	22
GAP11J	480V WATER TREATMENT MCC WT-D		SPARE	5FAD	FVNR 2					3				
GAP11J	480V WATER TREATMENT MCC WT-D	QMM05A	OSMOBIS CLEAN-UP HEATER	5FEH	FVC 2			18	480	3	22	0.85	15	18
GAP11J	480V WATER TREATMENT MCC WT-D	QMM08PB	POT PERMANG FEED PUMP	5FIL	FVNR 1		1.5		480	3	2	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D		SPARE	5FMP	FVNR 1					3				
GAP11J	480V WATER TREATMENT MCC WT-D	QMM13PB	CAUSTIC DILUTION FEED PUMP	5FQT	FVNR 1		1		480	3	1	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D	QMM11PB	ACID DILUTION FEED PUMP	5FUX	FVNR 1		1		480	3	1	0	0	0
GAP11J	480V WATER TREATMENT MCC WT-D		BLANK	8FAD						3				
GAP11J	480V WATER TREATMENT MCC WT-D		BLANK	8FEH						3				
GAP11J	480V WATER TREATMENT MCC WT-D		SPARE	8FIL	FVNR 2					3				
GAP11J	480V WATER TREATMENT MCC WT-D	QETD1TE	DEMIMREQ/NUT TANK AGITATOR	8FMP	FVNR 1		7.5		480	3	9	0.85	8	8
GAP11J	480V WATER TREATMENT MCC WT-D		SPARE	8FQT	FVNR 1					3				
GAP11J	480V WATER TREATMENT MCC WT-D	QET02PB	BACKWASH SUMP PUMP	8FUX	FVNR 1		7.5		480	3	9	0	0	0

Load List

DUKE ENERGY WOODSDALE FUEL OIL ROJECT 13371-035
480V SWITCHGEAR C & D AND PROPANE MCC LOADING AFTER PROPANE LOADS ARE REMOVED & FUEL OIL MODIFICATIONS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP13J	480V PROPANE BOILER MCC PB-5D	4AP01J	PROPANE BOILER DIST. PNL.	INCOMING	3	100 AT	1	38	480	3	43		24	29
4AP01J	PROPANE BOILER DIST PNL		EXHAUST FAN	1	3	20 AT	0.5		480	3	0.6	0.85	0	0.5
4AP01J	PROPANE BOILER DIST PNL		TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	18	1	3.34	4
4AP01J	PROPANE BOILER DIST PNL		UNIT HEATER	3	3	20 AT		10	480	3	12	1	10	12
4AP01J	PROPANE BOILER DIST PNL		SPARE	4	3	20 AT				3				
4AP01J	PROPANE BOILER DIST PNL		UNIT HEATER	5	3	20 AT		10	480	3	12	1	10	12
4AP01J	PROPANE BOILER DIST PNL		SPARE	6	3	20 AT				3				
4AP01J	PROPANE BOILER DIST PNL		MOTOR OPERATED DOOR	7	3	20 AT	0.5		480	3	0.6	0	0	0
4AP01J	PROPANE BOILER DIST PNL		SPARE	8	3	20AT				3				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				CONNECTED				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP13J	480V PROPANE BOILER MCC PB-5D		TRANSFORMER 480-120/208V 15 KVA	INCOMING	3	60 AT	0	3.34	120	3	28		3.34	28
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	1	1	20 AT		0.420	120	1	3.5	1.00	0	3.5
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	2	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	3	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	4	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	5	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		SPARE	6	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	7	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	8	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	9	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	10	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		LOUVERS	11	1	20 AT		0.100	120	1	0.8	1.0	0	1
	TRANSFORMER 480-120/208V 15 KVA		SPARE	12	1	20 AT			120	1				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE				COINCIDENTAL (EST)				
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP13J	480V PROPANE BOILER MCC PB-5D	4AP01J	PROPANE BOILER DIST. PNL.	INCOMING	3	100 AT	1	38	480	3	43		24	29
4AP01J	PROPANE BOILER DIST PNL		EXHAUST FAN	1	3	20 AT	0.5		480	3	0.6	0.85	0	0.5
4AP01J	PROPANE BOILER DIST PNL		TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	18	1	3.34	4
4AP01J	PROPANE BOILER DIST PNL		UNIT HEATER	3	3	20 AT		10	480	3	12	1	10	12
4AP01J	PROPANE BOILER DIST PNL		SPARE	4	3	20 AT				3				
4AP01J	PROPANE BOILER DIST PNL		UNIT HEATER	5	3	20 AT		10	480	3	12	1	10	12
4AP01J	PROPANE BOILER DIST PNL		SPARE	6	3	20 AT				3				
4AP01J	PROPANE BOILER DIST PNL		MOTOR OPERATED DOOR	7	3	20 AT	0.5		480	3	0.6	0	0	0
4AP01J	PROPANE BOILER DIST PNL		SPARE	8	3	20AT				3				

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-038
480V SWITCHGEAR C & D AND PROPANE MCC LOADING AFTER PROPANE LOADS ARE REMOVED & FUEL OIL MODIFICATIONS

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				CONNECTED					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
QAP13J	480V PROPANE BOILER MCC PB-5D		TRANSFORMER 480-120/208V 15 KVA	INCOMING	3	60 AT	0	3.34	120	3	28		3.34	28
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	1	1	20 AT		0.420	120	1	3.5	1.00	0	3.5
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	2	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	3	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	4	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	5	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		SPARE	6	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	7	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	8	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	9	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	10	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		LOUVERS	11	1	20 AT		0.100	120	1	0.8	1.0	0	1
	TRANSFORMER 480-120/208V 15 KVA		SPARE	12	1	20 AT			120	1				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				NAMEPLATE					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
QAP13J	480V PROPANE BOILER MCC PB-5D	QAP01J	PROPANE BOILER DIST. PNL.	INCOMING	3	100 AT	1	35	480	3	43		24	29
QAP01J	PROPANE BOILER DIST PNL		EXHAUST FAN	1	3	20 AT	0.5		480	3	0.6	0.65	0	0.5
QAP01J	PROPANE BOILER DIST PNL		TRANSFORMER 480-120/208V 15 KVA	2	3	30 AT		15	480	3	18	1	3.34	4
QAP01J	PROPANE BOILER DIST PNL		UNIT HEATER	3	3	20 AT		10	480	3	12	1	10	12
QAP01J	PROPANE BOILER DIST PNL		SPARE	4	3	20 AT				3				
QAP01J	PROPANE BOILER DIST PNL		UNIT HEATER	5	3	20 AT		10	480	3	12	1	10	12
QAP01J	PROPANE BOILER DIST PNL		SPARE	6	3	20 AT				3				
QAP01J	PROPANE BOILER DIST PNL		MOTOR OPERATED DOOR	7	3	20 AT	0.5		480	3	0.6	0	0	0
QAP01J	PROPANE BOILER DIST PNL		SPARE	8	3	20 AT				3				

FROM EQUIPMENT		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)				CONNECTED					COINCIDENTAL (EST)			
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)	BKR NO	POLES	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	kVA	AMPS
QAP13J	480V PROPANE BOILER MCC PB-5D		TRANSFORMER 480-120/208V 15 KVA	INCOMING	3	60 AT	0	3.34	120	3	28		3.34	28
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	1	1	20 AT		0.420	120	1	3.5	1.00	0	3.5
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	2	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	3	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		RECEPTACLES	4	1	20 AT		0.720	120	1	6.0	1.00	1	6
	TRANSFORMER 480-120/208V 15 KVA		LIGHTING	5	1	20 AT		0.690	120	1	5.8	1	1	6
	TRANSFORMER 480-120/208V 15 KVA		SPARE	6	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	7	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	8	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	9	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		SPARE	10	1	20 AT			120	1				
	TRANSFORMER 480-120/208V 15 KVA		LOUVERS	11	1	20 AT		0.100	120	1	0.8	1.0	0	1
	TRANSFORMER 480-120/208V 15 KVA		SPARE	12	1	20 AT			120	1				

NOTES:

- SHOWN ON KEY DIAGRAM E-208-3
- WATER TREATING REDUNDANT LOADS HAVE THE RUNNING LOAD ON THE "A" BUS AND THE "OFF" LOAD ON THE "B" BUS, TO LOAD THE "A" BUS AS HIGH AS POSSIBLE (I.E., A CONSERVATIVE BUT ALSO A POSSIBLE SCENARIO)
- FOR CATHODIC PROTECTION LOADS, USE 80% OF BREAKER TRIP RATING
- SWGR LOAD AND HARDWARE ARE BASED ON 4-6-17 WALK DOWN AND NOT ON DWG E-207 SHEETS 3 & 4.
- REFERENCES: E-208 SH 1 FOR 4150V BUSES 14 & 15; E-207 SH 3, 4 & 5 FOR 480V BUSES C, D, E & F; E-208 SH 4 FOR MCCS PB-E & PB-F; E-208 SH 3 FOR MCCS PB-2C & PB-5D
- CHANGES DUE TO FUEL OIL MODIFICATIONS ARE SHOWN IN BLUE SHADING
- 480V SWITCHGEAR BUS TIE BREAKER NEEDS TO BE REPLACED AS WELL AS (1) INTERNAL BUS CONNECTIONS TO BUS C AND (2) EXTERNAL CABLE OR BUS CONNECTIONS TO BUS D

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
PRELIMINARY UNIT FUEL OIL 480V SWITCHGEAR LOADING

480V FUEL OIL SKID SWITCHGEAR 135 (NEW)		TO EQUIPMENT (NEW FUEL OIL ELECTRICAL BUILDING)		NAMEPLATE						COINCIDENTAL (EST)			
FROM EQUIPMENT				BKR FRAME	BKR TRIP	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)										
0AP02J	4160V SWITCHGEAR BUS 14 (EXISTING)	0APXXJ	4160-480/277V 2800/3333 KVA TRANSFORMER			1608	900	4160	3	288		1604	289
0APXXJ	4160-480/277V 2800/3333 KVA TRANSFORMER	1APXYJ	480V FUEL OIL SKID SWGR 135 (NEW)	4000 AF	4000 AT	1608	900	480	3	3195		1604	1847
0APXYJ	480V FUEL OIL SKID SWGR 135		480V FUEL OIL SKID SWGR 135-246 TIE BREAKER (NORMALLY	4000 AF	4000 AT			480	3	3195		0	0
0APXYJ	480V FUEL OIL SKID SWGR 135		HP FUEL OIL FORWARDING SKID #1 PUMP 1	800 AF	400 AT	268		480	3	328	0.85	222	278
0APXYJ	480V FUEL OIL SKID SWGR 135		HP FUEL OIL FORWARDING SKID #1 PUMP 2	800 AF	400 AT	268		480	3	328	0	0	0
0APXYJ	480V FUEL OIL SKID SWGR 135		FUEL OIL FORWARDING SKID #1 HEATER	800 AF	400 AT		250	480	3	301	1	250	301
0APXYJ	480V FUEL OIL SKID SWGR 135		HP FUEL OIL FORWARDING SKID #3 PUMP 1	800 AF	400 AT	268		480	3	328	0.85	222	278
0APXYJ	480V FUEL OIL SKID SWGR 135		HP FUEL OIL FORWARDING SKID #3 PUMP 2	800 AF	400 AT	268		480	3	328	0	0	0
0APXYJ	480V FUEL OIL SKID SWGR 135		FUEL OIL FORWARDING SKID #3 HEATER	800 AF	400 AT		250	480	3	301	1	250	301
0APXYJ	480V FUEL OIL SKID SWGR 135		HP FUEL OIL FORWARDING SKID #5 PUMP 1	800 AF	400 AT	268		480	3	328	0.85	222	278
0APXYJ	480V FUEL OIL SKID SWGR 135		HP FUEL OIL FORWARDING SKID #5 PUMP 2	800 AF	400 AT	268		480	3	328	0	0	0
0APXYJ	480V FUEL OIL SKID SWGR 135		FUEL OIL FORWARDING SKID #5 HEATER	800 AF	400 AT		250	480	3	301	1	250	301
0APXYJ	480V FUEL OIL SKID SWGR 135		480-480/277 TRANSFORMER 150 KVA	800 AF	225 AT	150	480	3	325	0	88	108	
0APXYJ	480V FUEL OIL SKID SWGR 135		SPARES (QUANTITY LATER)	800 AT				3					

480V POWER PANEL 123 (NEW)		TO EQUIPMENT (NEW FUEL OIL ELECTRICAL BUILDING)		NAMEPLATE						COINCIDENTAL (EST)			
FROM EQUIPMENT				BKR FRAME	RATING	HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)										
0APXYJ	480V FUEL OIL SKID SWGR 135		480-480/277 TRANSFORMER 135, 186 KVA	250 AF	225 AT	23	270	480	3	325		88	108
	480-480/277 TRANSFORMER 135		480/277V 3 PHASE POWER PANEL (24 CIRCUITS)	150 AF	150 AT	23	270	480	3	356		88	108
	480/277V POWER PANEL 135		FORWARDING SKID #1 FUEL OIL LEAKAGE PUMP LOCAL STARTER	150 AF	15 AT	7.5		480	3	9	0.85	8	8
	480/277V POWER PANEL 135		FORWARDING SKID #3 FUEL OIL LEAKAGE PUMP LOCAL STARTER	150 AF	15 AT	7.5		480	3	9	0.85	8	8
	480/277V POWER PANEL 135		FORWARDING SKID #5 FUEL OIL LEAKAGE PUMP LOCAL STARTER	150 AF	15 AT	7.5		480	3	9	0.85	8	8
	480/277V POWER PANEL 135		30 KVA TRANSFORMER FOR PDC INTERIOR LIGHTING	150 AF	90 AT		30	480	3	37.7	0.8	18	22.6
	480/277V POWER PANEL 135		30 KVA TRANSFORMER FOR PDC EXTERIOR LIGHTING	150 AF	90 AT		30	480	3	37.7	0.8	18	22.6
	480/277V POWER PANEL 135		PDC HVAC #1	150 AF	40 AT		25	480	3	30	0.5	13	15
	480/277V POWER PANEL 135		PDC HVAC #2	150 AF	40 AT		25	480	3	30	0.5	13	15
	480/277V POWER PANEL 135		MOTOR OPERATED DOOR (IF REQUIRED)	150 AF	20 AT	0.5		480	3	0.6	0	0	0
	480/277V POWER PANEL 135		FUEL OIL SKID AREA WELDING RECEPTACLES #1, 3, 5	150 AF	125 AT		150	480	3	180	0	0	0
	480/277V POWER PANEL 135		BATTERY CHARGER #1	150 AF	15 AT		10	480	3	12	0.8	8	10
	480/277V POWER PANEL 135		SPARES (QUANTITY LATER)	150 AF	20AT				3				

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
PRELIMINARY UNIT FUEL OIL 480V SWITCHGEAR LOADING

120/208V PANEL 123 (NEW)		TO EQUIPMENT (NEW FUEL OIL ELECTRICAL BUILDING)		BKR FRAME	RATING	CONNECTED					COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)			HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
	480/277V 3 PHASE POWER PANEL (30 CIRCUITS)		TRANSFORMER 480-120/208V 45 KVA	125 AF	80 AT	0	11	120	3	88		0	72
	TRANSFORMER 480-120/208V 45 KVA		120/208V PANEL 135, 30 CIRCUITS	125 AF	20 AT		10.61	120	3	88.4		0	72
	120/208V PANEL 135		UNIT 1 FUEL OIL METER	125 AF	20 AT		0.60	120	1	5.0	1	1	5
	120/208V PANEL 135		UNIT 3 FUEL OIL METER	125 AF	20 AT		0.60	120	1	5.0	1	1	5
	120/208V PANEL 135		UNIT 5 FUEL OIL METER	125 AF	20 AT		0.60	120	1	5.0	1	1	5
	120/208V PANEL 135		FIRE PROTECTION SYSTEM (IF REQ'D MAY BE ONLY DETECTORS)	125 AF	20 AT		0.25	120	1	2.1	1	0	2
	120/208V PANEL 135		480V FUEL OIL SKID SWGR 135 SPACE HEATERS	125 AF	20 AT		1.50	120	1	12.6	1	2	13
	120/208V PANEL 135		HP FUEL OIL FORWARDING SKID #1 PUMP 1 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 135		HP FUEL OIL FORWARDING SKID #1 PUMP 2 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 135		HP FUEL OIL FORWARDING SKID #3 PUMP 1 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 135		HP FUEL OIL FORWARDING SKID #3 PUMP 2 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 135		HP FUEL OIL FORWARDING SKID #5 PUMP 1 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 135		HP FUEL OIL FORWARDING SKID #5 PUMP 2 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 135		RECEPTACLES	125 AF	20 AT		0.72	120	1	6.0	1	1	8
	120/208V PANEL 135		RECEPTACLES	125 AF	20 AT		0.72	120	1	6.0	1	1	8
	120/208V PANEL 135		RECEPTACLES	125 AF	20 AT		0.72	120	1	6.0	1	1	8
	120/208V PANEL 135		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 135		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 135		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 135		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 135		PHOTOELECTRIC CONTROL FOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 135		SPARES (QUANTITY LATER)	125 AF	20 AT					3			
	120/208V PANEL 135		SPARES (QUANTITY LATER)	125 AF	20 AT					2			
	120/208V PANEL 135		SPARES (QUANTITY LATER)	125 AF	20 AT					1			

125 VDC DISTRIBUTION PANEL (NEW)		TO EQUIPMENT (NEW FUEL OIL ELECTRICAL BUILDING)		BKR FRAME	RATING	CONNECTED					COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)			HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
	BATTERY (USE FUSES, NOT BREAKERS)		125V DC DISTRIBUTION PANEL, 100A, 24 CIRCUITS	125 AF	100 AT								
	BATTERY CHARGER #1		125V DC DISTRIBUTION PANEL	125 AF	30 AT	0	14	125	2	112		12	96
	BATTERY CHARGER #2		125V DC DISTRIBUTION PANEL	125 AF	30 AT								
	125V DC DISTRIBUTION PANEL		480V SWITCHGEAR BREAKER TEST CABINET	125 AF	30 AT		2	125	2	16	0	0	0
	125V DC DISTRIBUTION PANEL		480V SWITCHGEAR 123 CONTROL POWER	125 AF	50 AT		5	125	2	40	1	5	40
	125V DC DISTRIBUTION PANEL		480V SWITCHGEAR 123 TRIP & COMMUNICATION POWER	125 AF	20 AT		1	125	2	8	1	1	8
	125V DC DISTRIBUTION PANEL		480V SWITCHGEAR 456 CONTROL POWER	125 AF	50 AT		5	125	2	40	1	5	40
	125V DC DISTRIBUTION PANEL		480V SWITCHGEAR 456 TRIP & COMMUNICATION POWER	125 AF	20 AT		1	125	2	8	1	1	8
	125V DC DISTRIBUTION PANEL		SPARES (QUANTITY LATER)	125 AF	LATER								

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
PRELIMINARY UNIT FUEL OIL 480V SWITCHGEAR LOADING

480V FUEL OIL SKID SWITCHGEAR 246 (NEW)		TO EQUIPMENT (EXIST PROPANE BOILER BLDG)		BKR FRAME	BKR	NAMEPLATE					COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)			HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
0AP03J	4180V SWITCHGEAR BUS 16 (EXISTING)	0APYYJ	4180-480/277V 2600/3333 KVA TRANSFORMER			1608	900	4160	3	368		1604	209
0APYYJ	4180-480/277V 2600/3333 KVA TRANSFORMER	0APYZJ	480V FUEL OIL SKID SWGR 246 (NEW)	4000 AF	4000 AT	1608	900	488	3	3188		1604	1847
0APYZJ	480V FUEL OIL SKID SWGR 246		HP FUEL OIL FORWARDING SKID #2 PUMP 1	800 AF	400 AT	268		480	3	328	0.85	222	279
0APYZJ	480V FUEL OIL SKID SWGR 246		HP FUEL OIL FORWARDING SKID #2 PUMP 2	800 AF	400 AT	268		480	3	328	0	0	0
0APYZJ	480V FUEL OIL SKID SWGR 246		FUEL OIL FORWARDING SKID #2 HEATER	800 AF	400 AT		250	480	3	301	1	250	301
0APYZJ	480V FUEL OIL SKID SWGR 246		HP FUEL OIL FORWARDING SKID #4 PUMP 1	800 AF	400 AT	268		480	3	328	0.85	222	279
0APYZJ	480V FUEL OIL SKID SWGR 246		HP FUEL OIL FORWARDING SKID #4 PUMP 2	800 AF	400 AT	268		480	3	328	0	0	0
0APYZJ	480V FUEL OIL SKID SWGR 246		FUEL OIL FORWARDING SKID #4 HEATER	800 AF	400 AT		250	480	3	301	1	250	301
0APYZJ	480V FUEL OIL SKID SWGR 246		HP FUEL OIL FORWARDING SKID #6 PUMP 1	800 AF	400 AT	268		480	3	328	0.85	222	279
0APYZJ	480V FUEL OIL SKID SWGR 246		HP FUEL OIL FORWARDING SKID #6 PUMP 2	800 AF	400 AT	268		480	3	328	0	0	0
0APYZJ	480V FUEL OIL SKID SWGR 246		FUEL OIL FORWARDING SKID #6 HEATER	800 AF	400 AT		250	480	3	301	1	250	301
0APYZJ	480V FUEL OIL SKID SWGR 246		480-480/277 TRANSFORMER 150 KVA	800 AF	225 AT	150		480	3	325	0	88	108
0APYZJ	480V FUEL OIL SKID SWGR 246		BPARES (QUANTITY LATER)	800 AT	LATER				3				

480V POWER PANEL 246 (NEW)		TO EQUIPMENT (NEW FUEL OIL ELECTRICAL BUILDING)		BKR FRAME	RATING	NAMEPLATE					COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)			HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
	480V FUEL OIL SKID SWGR 246		480-480/277 TRANSFORMER 246, 150 KVA	800 AT	225 AT	22.5	279	480	3	325		88	108
	480-480/277 TRANSFORMER 246		480/277V 3 PHASE POWER PANEL (24 CIRCUITS)	125 AF	150 AT	22.5	270	480	3	355		88	108
	480/277V POWER PANEL 246		FORWARDING SKID #2 FUEL OIL LEAKAGE PUMP LOCAL STARTER	125 AF	15 AT	7.5		480	3	9	0.85	8	8
	480/277V POWER PANEL 246		FORWARDING SKID #4 FUEL OIL LEAKAGE PUMP LOCAL STARTER	125 AF	15 AT	7.5		480	3	9	0.85	8	8
	480/277V POWER PANEL 246		FORWARDING SKID #6 FUEL OIL LEAKAGE PUMP LOCAL STARTER	125 AF	15 AT	7.5		480	3	9	0.85	8	8
	480/277V POWER PANEL 246		30 KVA TRANSFORMER FOR PDC INTERIOR LIGHTING	125 AF	90 AT		30	480	3	37.7	0.8	18	22.6
	480/277V POWER PANEL 246		30 KVA TRANSFORMER FOR PDC EXTERIOR LIGHTING	125 AF	90 AT		30	480	3	37.7	0.6	18	22.6
	480/277V POWER PANEL 246		PDC HVAC #3	125 AF	40 AT		25	480	3	30	0.5	13	15
	480/277V POWER PANEL 246		PDC HVAC #4	125 AF	40 AT		25	480	3	30	0.5	13	15
	480/277V POWER PANEL 246		FUEL OIL SKID AREA WELDING RECEPTACLES #2, 4, 8	125 AF	125 AT		150	480	3	180	0	0	0
	480/277V POWER PANEL 246		BATTERY CHARGER #2	125 AF	15 AT		10	480	3	12	0.8	8	10
	480/277V POWER PANEL 246		BPARES (QUANTITY LATER)	125 AF	20AT				3				

Load List

DUKE ENERGY WOODSDALE FUEL OIL PROJECT 13371-035
PRELIMINARY UNIT FUEL OIL 480V SWITCHGEAR LOADING

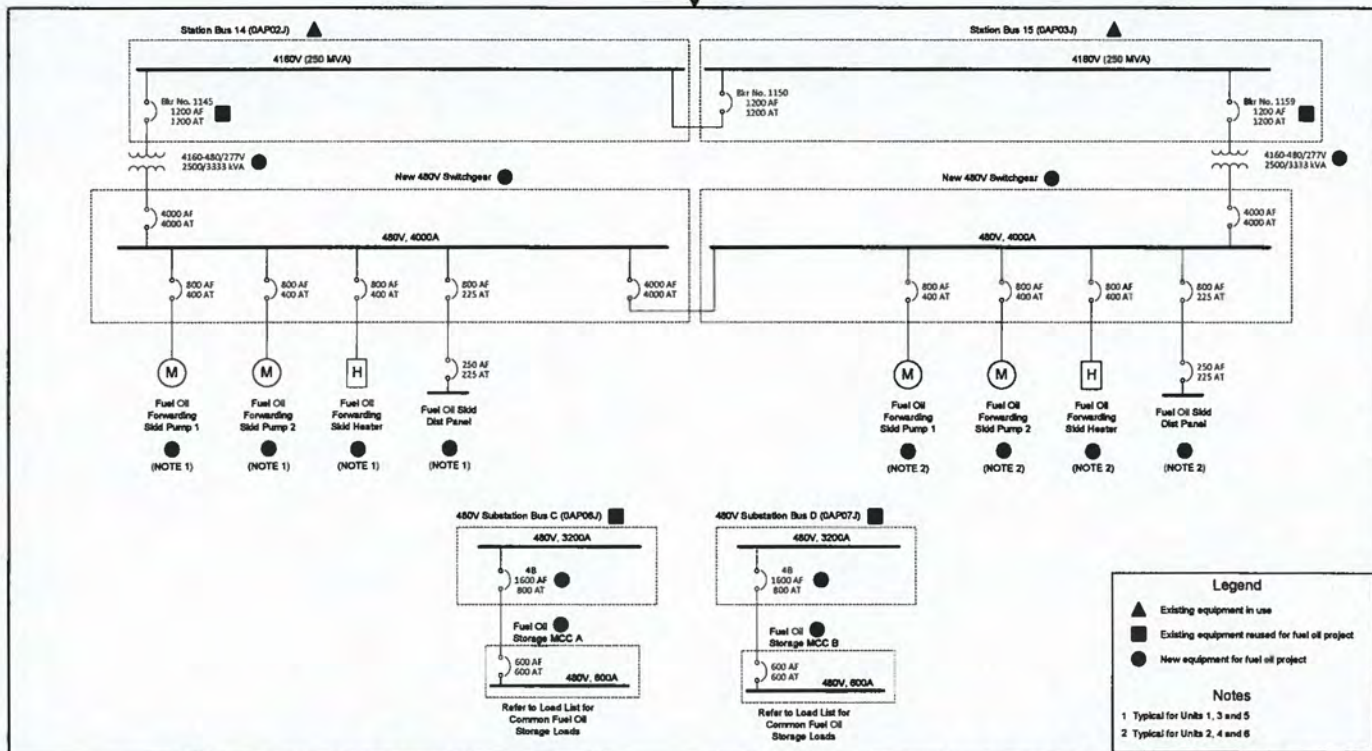
120/208V PANEL 246 (NEW)

FROM EQUIPMENT		TO EQUIPMENT (NEW FUEL OIL ELECTRICAL BUILDING)		BKR FRAME	RATING	CONNECTED					COINCIDENTAL (EST)		
EQUIP NO	EQUIP DESCRIPTION (SOURCE)	EQUIP NO	EQUIP DESCRIPTION (LOAD)			HP	KVA / KW	VOLTS	# PH	AMPS	LOAD FACTOR	KVA	AMPS
	480/277V 3 PHASE POWER PANEL (30 CIRCUITS)		TRANSFORMER 480-120/208V 45 KVA	125 AF	60 AT	0	18.98	120	3	91.33		9	75
	TRANSFORMER 480-120/208V 45 KVA		120/208V PANEL 246, 30 CIRCUITS	125 AF	20 AT		10.96	120	3	91.33		9	75
	120/208V PANEL 246		UNIT 2 FUEL OIL METER	125 AF	20 AT		0.80	120	1	5.0	1	1	5
	120/208V PANEL 246		UNIT 4 FUEL OIL METER	125 AF	20 AT		0.80	120	1	5.0	1	1	5
	120/208V PANEL 246		UNIT 6 FUEL OIL METER	125 AF	20 AT		0.80	120	1	5.0	1	1	5
	120/208V PANEL 246		480V FUEL OIL SKID SWGR 246 SPACE HEATERS	125 AF	20 AT		1.50	120	1	12.5	1	2	13
	120/208V PANEL 246		HP FUEL OIL FORWARDING SKID #2 PUMP 1 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 246		HP FUEL OIL FORWARDING SKID #2 PUMP 2 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 246		HP FUEL OIL FORWARDING SKID #4 PUMP 1 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 246		HP FUEL OIL FORWARDING SKID #4 PUMP 2 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 246		HP FUEL OIL FORWARDING SKID #6 PUMP 1 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	0	0	0
	120/208V PANEL 246		HP FUEL OIL FORWARDING SKID #6 PUMP 2 MOTOR HEATER	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 246		RECEPTACLES	125 AF	20 AT		0.72	120	1	6.0	1	1	6
	120/208V PANEL 246		RECEPTACLES	125 AF	20 AT		0.72	120	1	6.0	1	1	6
	120/208V PANEL 246		RECEPTACLES	125 AF	20 AT		0.72	120	1	6.0	1	1	6
	120/208V PANEL 246		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 246		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 246		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 246		PDC INTERIOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 246		PHOTOELECTRIC CONTROL FOR LIGHTING	125 AF	20 AT		0.50	120	1	4.2	1	1	4
	120/208V PANEL 246		SPARES (QUANTITY LATER)	125 AF	20 AT				3				
	120/208V PANEL 246		SPARES (QUANTITY LATER)	125 AF	20 AT				2				
	120/208V PANEL 246		SPARES (QUANTITY LATER)	125 AF	20 AT				1				

NOTES:

- EQUIPMENT NUMBERS AND SWITCHGEAR & TRANSFORMER DESCRIPTIONS ARE PLACEHOLDERS UNTIL FUEL OIL NUMBERING SYSTEM IS ESTABLISHED.
- FOR EACH SWITCHGEAR, ONE OF THE TWO UNIT HP FO FORWARDING PUMPS IS ON FOR TWO UNITS AND BOTH ARE ON FOR THE THIRD UNIT. UNITS 1 & 4 WERE ARBITRARILY SHOWN AS THE UNITS WITH BOTH PUMPS ON

Appendix D Single Line Diagram Sketch: ESE-001



Legend

- ▲ Existing equipment in use
- Existing equipment reused for fuel oil project
- New equipment for fuel oil project

Notes

- 1 Typical for Units 1, 3 and 5
- 2 Typical for Units 2, 4 and 6

DRAWING RELEASE RECORD					PURPOSE
REV	DATE	PREPARED	REVIEWED	APPROVED	CLIENT COMMENTS
0	04/25/2017	A WELLS	D KENDALL		

SIZE	
PROJECT NUMBER	13371-035

**SINGLE LINE DIAGRAM
AUXILIARY POWER SYSTEM
PRELIMINARY LAYOUT
480V OPTION**

WOODSDALE FUEL OIL CONVERSION

DUKE ENERGY

Bergend & Lundy

SHEET: ESE-001-480V

PAGE 1 OF 1

DWG CLASS:

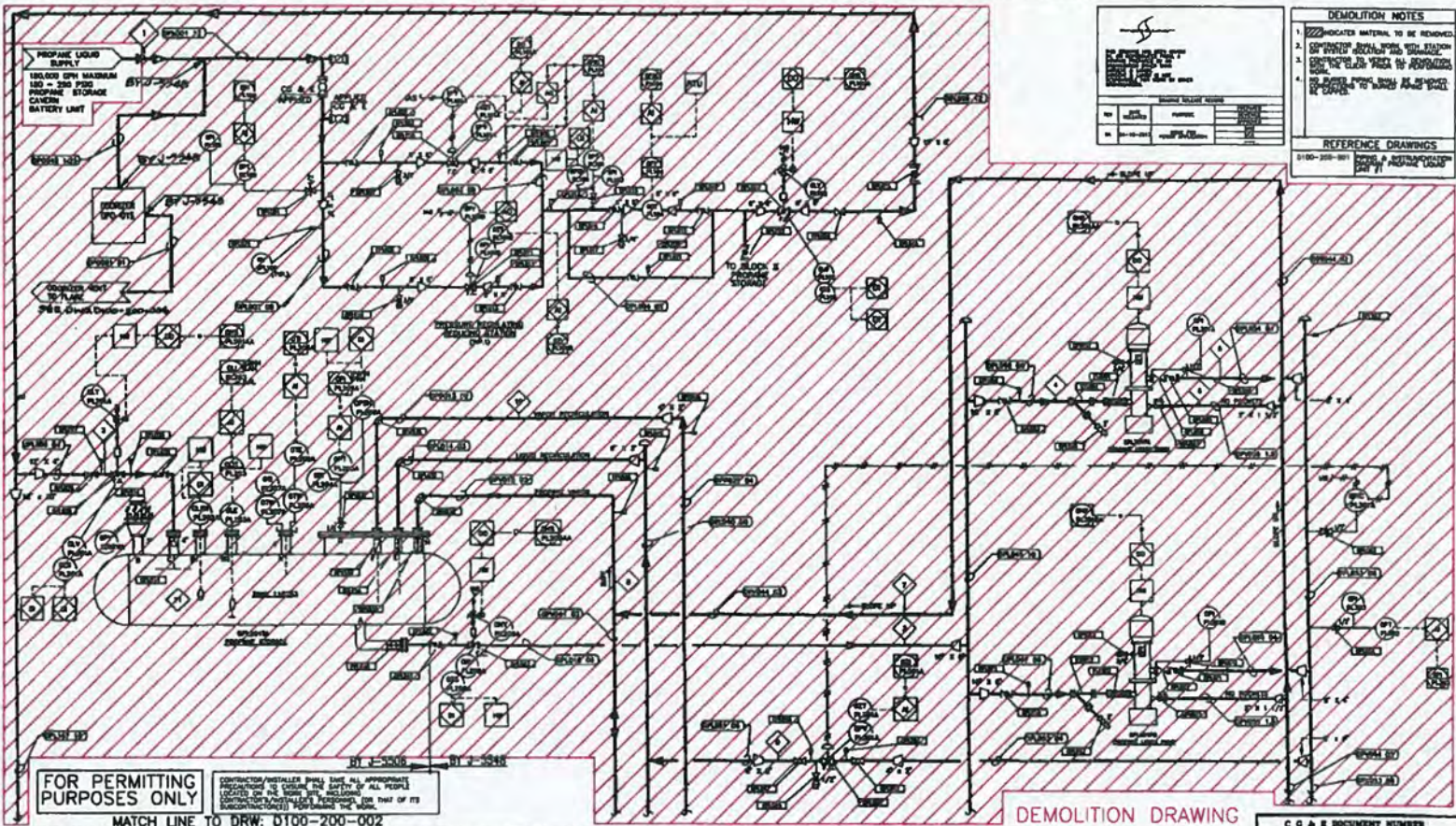
Product of PLADES

REV. 0

Plades 4.57.17 WOODSDALE FO IL 480V BR005 V02

Appendix E Demolition Drawings

9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1



REVISIONS

NO.	DATE	BY	REVISION
1	11-10-00	W.D.	ISSUED FOR CONSTRUCTION

DEMOLITION NOTES

1. Hatched areas indicate material to be removed.
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES AND REMOVE THEM AS SHOWN ON THIS DRAWING.
3. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES AND REMOVE THEM AS SHOWN ON THIS DRAWING.
4. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES AND REMOVE THEM AS SHOWN ON THIS DRAWING.

REFERENCE DRAWINGS

D100-200-001
D100-200-002

FOR PERMITTING PURPOSES ONLY

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO PROTECT THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR/INSTALLER PERSONNEL, FOR THAT OF ITS SUBCONTRACTORS) PERFORMING THE WORK.

MATCH LINE TO DRW: D100-200-002

DEMOLITION DRAWING

C & E DOCUMENT NUMBER
AP0810020100107

ITEM NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL	REMARKS
1
2
3
4
5
6
7
8
9

APPLIED ENGINEERING COMPANY
ORANGEBURG, S.C.

GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

THE CONSOLIDATED GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION
PIPING & INSTRUMENTATION DIAGRAM

DATE: 11-10-00
DRAWN: W.D.
CHECKED: J.M.
APPROVED FOR CONSTRUCTION: J.M.

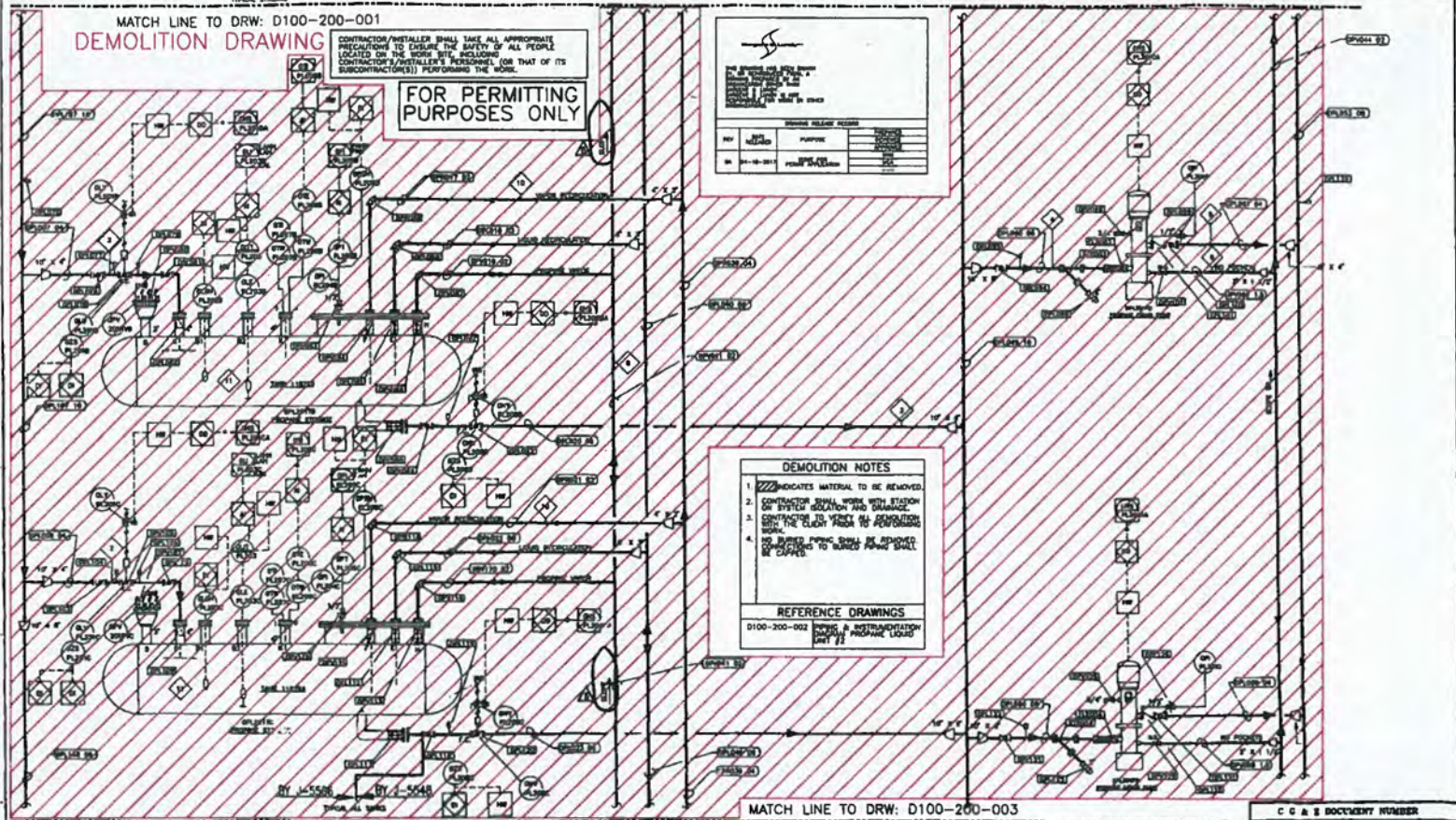
PROJECT NO: 4888
DRAWING NO: D100-200-001-0

MATCH LINE TO DRAW: D100-200-001
DEMOLITION DRAWING

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

FOR PERMITTING PURPOSES ONLY

PROJECT NO. 44-18-001 PROJECT NAME: WOODDALE GENERATING STATION DATE: 11/18/2011	
REVISION NO. DATE BY CHECKED	PURPOSE PROJECT LOCATION PROJECT NUMBER



DEMOLITION NOTES

1. Hatched areas indicate material to be removed.
2. CONTRACTOR SHALL WORK WITH STATION OR SYSTEM ISOLATION AND SHUTDOWN.
3. CONTRACTOR IS TO VERIFY THE DEMOLITION WITH THE CLIENT PRIOR TO DEMOLITION WORK.
4. NO REMOVED PIPING SHALL BE REUSED OR REINSTALLED IN ANY MANNER.

REFERENCE DRAWINGS

D100-200-002 PIPING & INSTRUMENTATION DIAGRAM

MATCH LINE TO DRAW: D100-200-003

C C & S DOCUMENT NUMBER
 AP88100020/000108

ITEM NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
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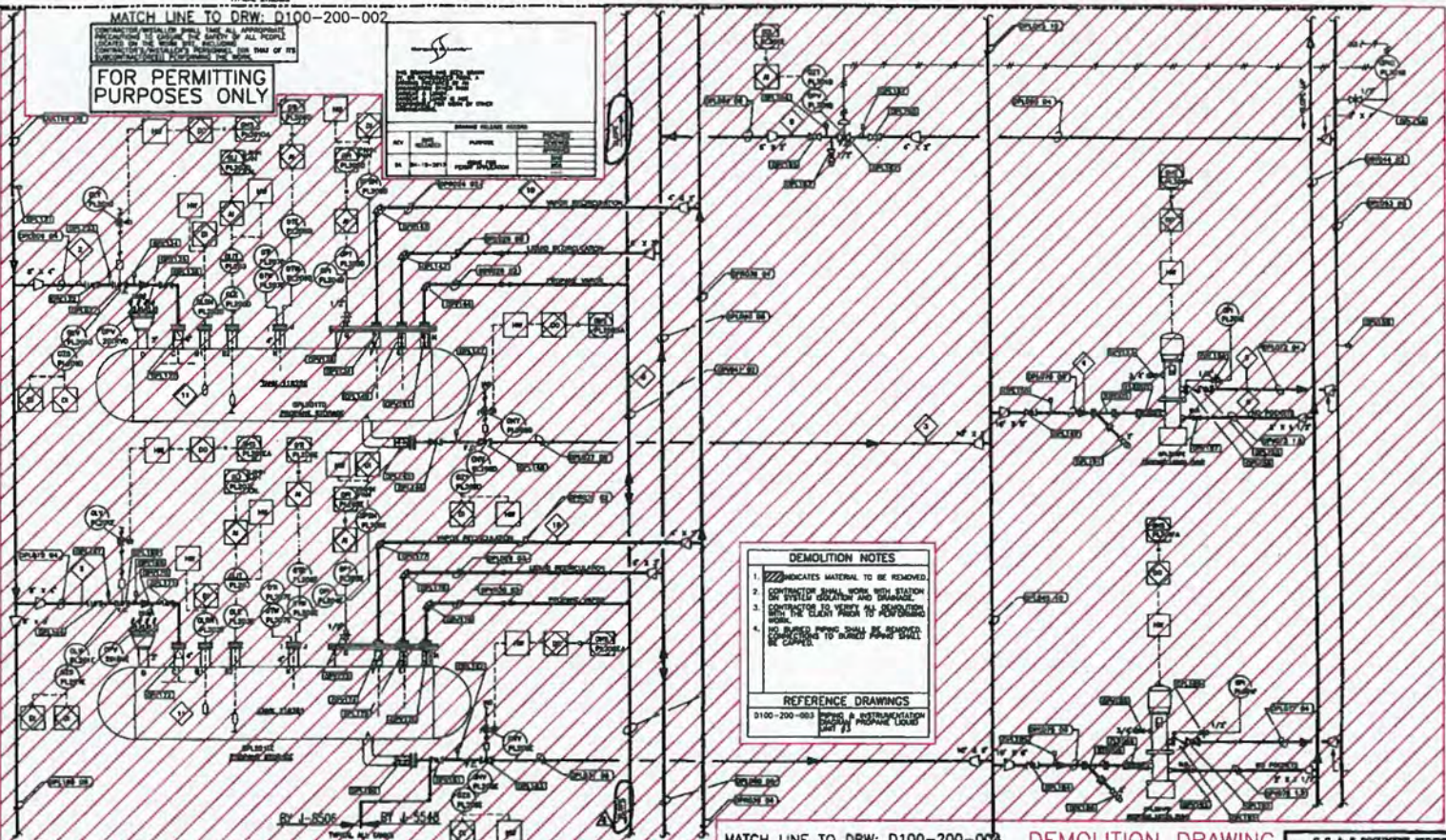
1
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APPLIED ENGINEERING COMPANY
 ORLANDO, FL
 GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA

DESIGNED BY: ...
 CHECKED BY: ...
 APPROVED FOR CONSTRUCTION: ...
 DATE: 5/25/00

THE CINCINNATI GAS & ELECTRIC COMPANY
 WOODDALE GENERATING STATION
 PIPING & INSTRUMENTATION DIAGRAM

DATE: 11/18/2011
 DRAWN BY: ...
 CHECKED BY: ...
 APPROVED BY: ...



MATCH LINE TO DRAW: D100-200-002

FOR PERMITTING PURPOSES ONLY

STEAM RELEASE SYSTEM

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMITTING	12/15/70
2	REVISED FOR PERMITTING	12/15/70

DEMOLITION NOTES

1. Hatched area indicates material to be removed.
2. CONTRACTOR SHALL WORK WITH STATION OR TOWER LOCATION AND DEMOLITION CONTRACTOR TO VERIFY % DEMOLITION WORK.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMITS AND NECESSARY APPROVALS.
4. TO BE DEMOLISHED SHALL BE SHOWN BY HATCHING TO BE CAPPED.

REFERENCE DRAWINGS

D100-200-003 PIPING & INSTRUMENTATION DRAWING PROPOSED LAYOUT

MATCH LINE TO DRAW: D100-200-004 **DEMOLITION DRAWING** **C & S DOCUMENT NUMBER** APES/002301700104

TYPICAL STREAM

STREAM NUMBER	1	2	3	4	5	6	7	8	9
STEAM LEVEL 3 (PSI)	100	100	100	100	100	100	100	100	100
FLOW (GPM)	100	100	100	100	100	100	100	100	100
TEMPERATURE (°F)	100	100	100	100	100	100	100	100	100

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMITTING	12/15/70
2	REVISED FOR PERMITTING	12/15/70

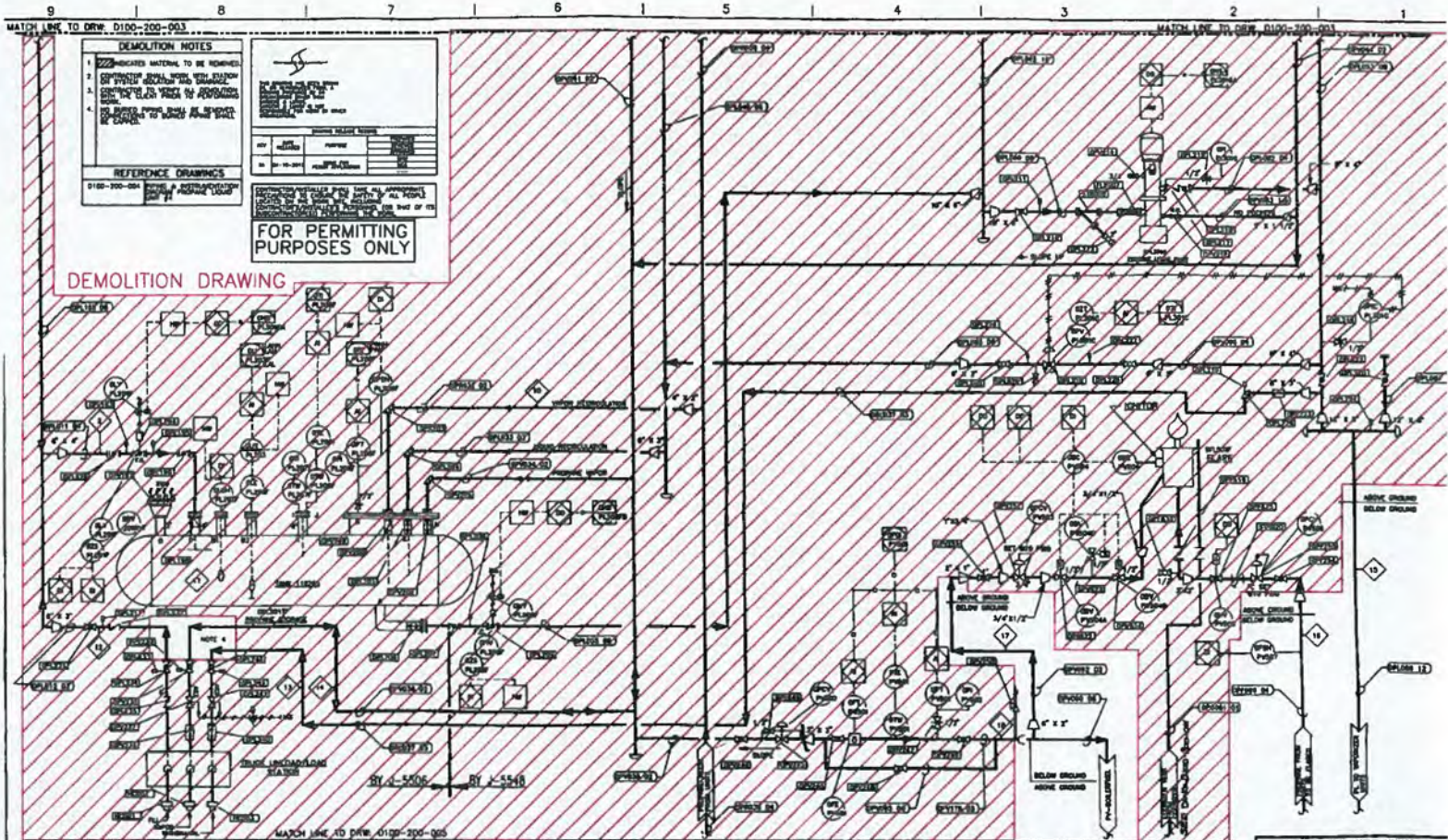
APPLIED ENGINEERING COMPANY
ORANGEBURG, S.C.

GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

THE CINCINNATI GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION

PIPING & INSTRUMENTATION DIAGRAM

4888 D100-200-003-D



DEMOLITION NOTES

1. Hatched areas indicate material to be removed.
2. DEMOLITION SHALL BE DONE IN ACCORDANCE WITH THE CITY OF GRANDBORO, MISSISSIPPI, ORDINANCE NO. 1987-001.
3. DEMOLITION SHALL BE DONE IN ACCORDANCE WITH THE CITY OF GRANDBORO, MISSISSIPPI, ORDINANCE NO. 1987-001.
4. ALL DEMOLITION SHALL BE DONE IN ACCORDANCE WITH THE CITY OF GRANDBORO, MISSISSIPPI, ORDINANCE NO. 1987-001.

REFERENCE DRAWINGS

D100-200-004
D100-200-005
D100-200-006
D100-200-007
D100-200-008
D100-200-009
D100-200-010
D100-200-011
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DEMOLITION DRAWING

TYPICAL SPECIFICATIONS									
ITEM NO.	1	2	3	4	5	6	7	8	9
DESCRIPTION	STEAM GENERATOR	CONDENSER	ECONOMIZER	PIPE	VALVE	PUMP	CONTROL VALVE	INSTRUMENT	WIRE
QUANTITY	1	1	1	10	10	10	10	10	10
UNIT	EA	EA	EA	LN	LN	LN	LN	LN	LN
TOTAL QUANTITY	1	1	1	10	10	10	10	10	10
PRICE PER UNIT	10000	5000	2000	100	50	100	50	100	50
TOTAL PRICE	10000	5000	2000	1000	500	1000	500	1000	500

NO.	DESCRIPTION	DATE	BY	CHKD.	APP'D.
1	ISSUED FOR PERMITS	05/21/78	W.P.	A.A.	E.A.
2	REVISED PER COMMENTS	05/21/78	W.P.	A.A.	E.A.
3	ISSUED FOR CONSTRUCTION	05/21/78	W.P.	A.A.	E.A.
4	REVISED PER COMMENTS	05/21/78	W.P.	A.A.	E.A.
5	ISSUED FOR CONSTRUCTION	05/21/78	W.P.	A.A.	E.A.
6	REVISED PER COMMENTS	05/21/78	W.P.	A.A.	E.A.
7	ISSUED FOR CONSTRUCTION	05/21/78	W.P.	A.A.	E.A.
8	REVISED PER COMMENTS	05/21/78	W.P.	A.A.	E.A.

APPLIED ENGINEERING COMPANY
GRANDBORO, S.C.

GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

DESIGNED BY: DORIS DOUGLAS
CHECKED BY: JERRY WATKINS
DRAWN BY: JERRY WATKINS
SCALE: AS SHOWN

APPROVED FOR CONSTRUCTION

C & E DOCUMENT NUMBER
APE211003201000108

THE CINCINNATI GAS & ELECTRIC COMPANY
WOODBRIDGE GENERATING STATION

PIPING & INSTRUMENTATION DIAGRAM

DATE: 4/68
PROJECT: D100-200-004-D

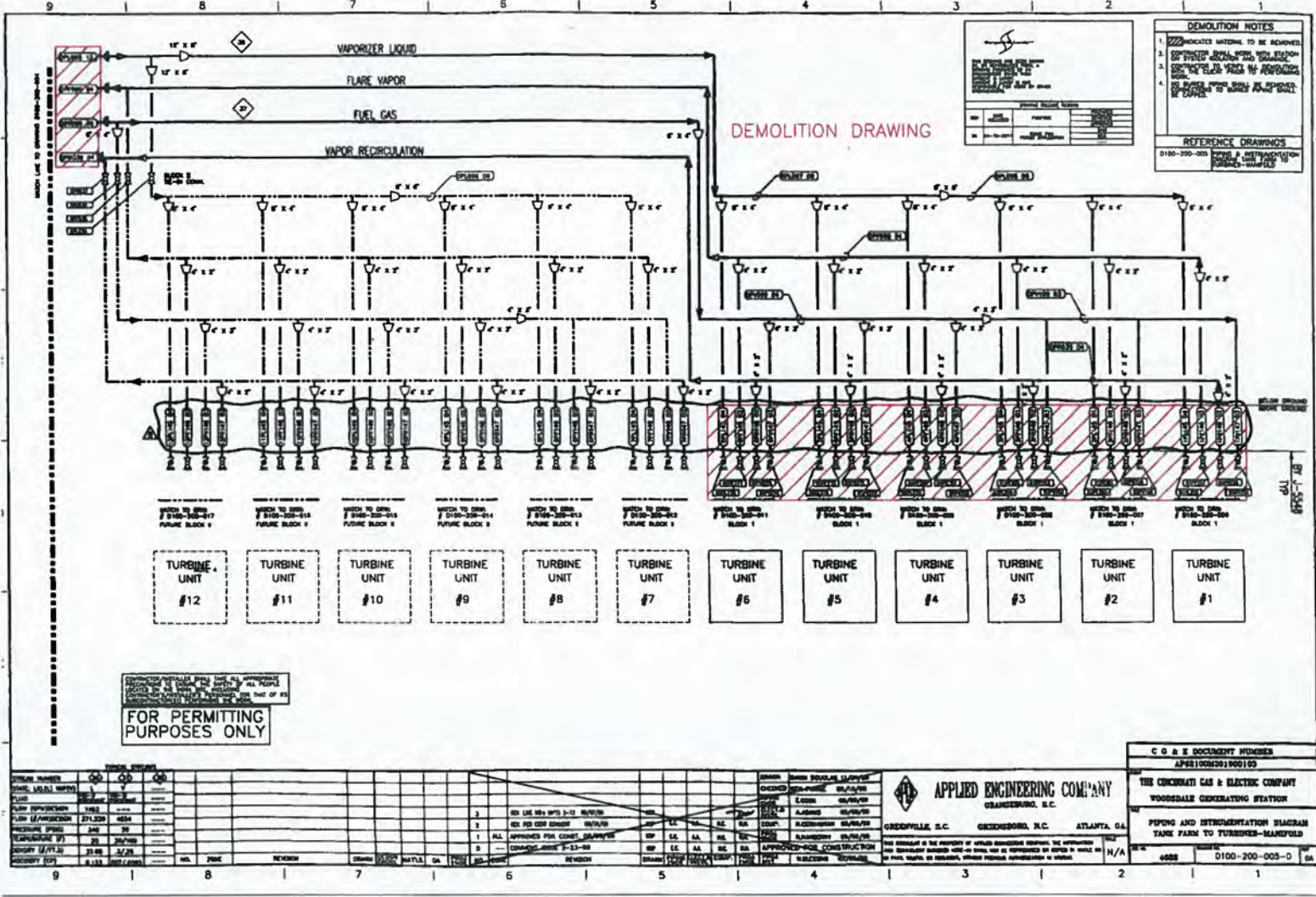
DEMOLITION DRAWING

DEMOLITION NOTES

1. Hatched area to be removed.
2. EXISTING AREA WITH NEW STATION TO BE DEMOLISHED AND DEMOLISHED AREA TO BE RECONSTRUCTED.
3. EXISTING AREA WITH NEW STATION TO BE DEMOLISHED AND DEMOLISHED AREA TO BE RECONSTRUCTED.
4. EXISTING AREA WITH NEW STATION TO BE DEMOLISHED AND DEMOLISHED AREA TO BE RECONSTRUCTED.

REFERENCE DRAWINGS

D100-200-003 TANK & INSTRUMENTATION
D100-200-004 TANK & INSTRUMENTATION



FOR PERMITTING PURPOSES ONLY

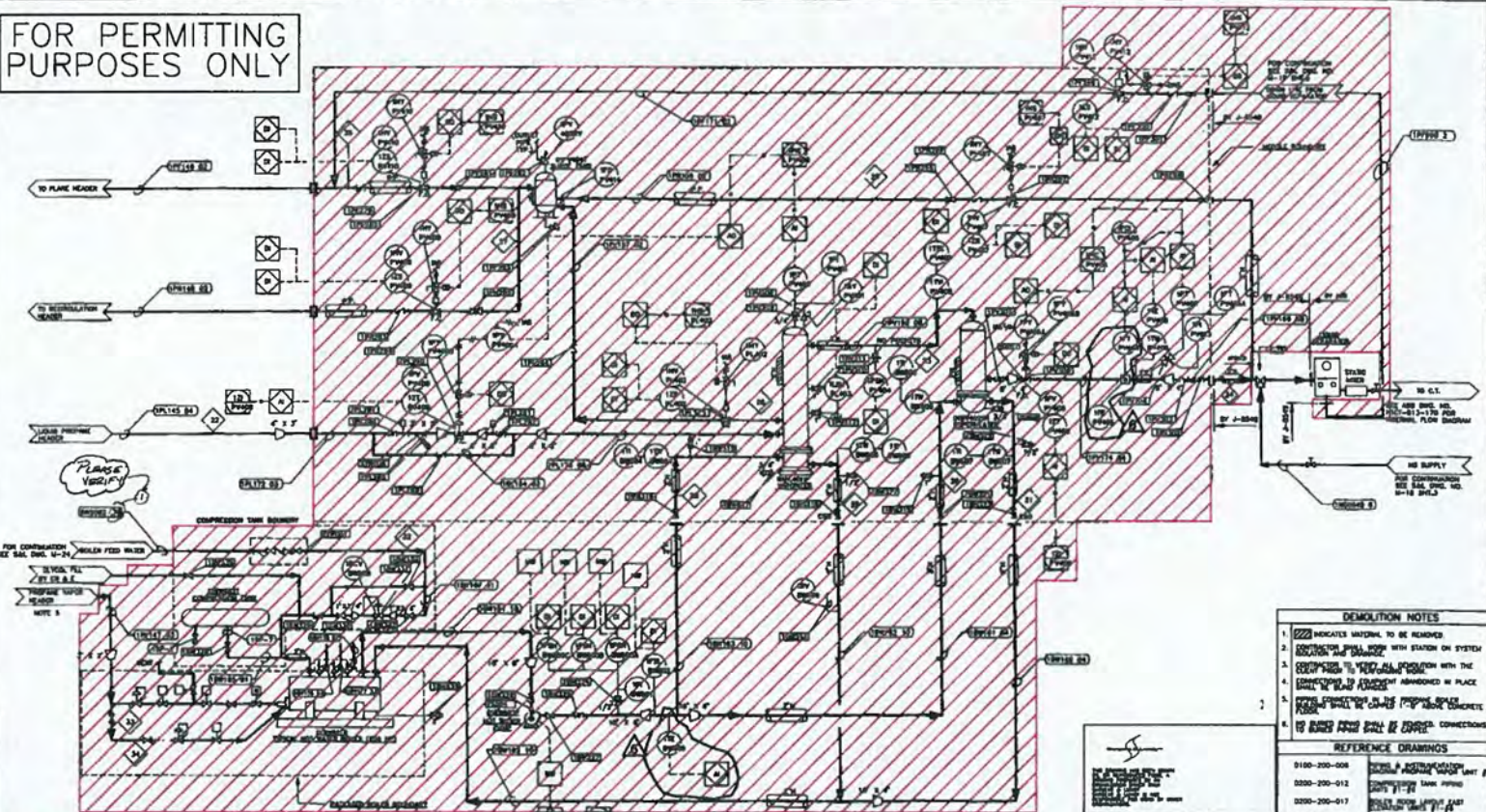
NO.	DATE	DESCRIPTION	BY	CHECKED	APPROVED
1	11/12/88	ISSUED FOR PERMITTING PURPOSES ONLY	J. L. ...	J. L. ...	J. L. ...
2	11/12/88	REVISION	J. L. ...	J. L. ...	J. L. ...
3	11/12/88	REVISION	J. L. ...	J. L. ...	J. L. ...

APPLIED ENGINEERING COMPANY
GREENSBORO, N.C.

GREENSBORO, N.C. GREENSBORO, N.C. ATLANTA, GA.

C & E DOCUMENT NUMBER	
APE1000003100103	
THE CONCRETE GAS & ELECTRIC COMPANY	
WOODSDALE GENERATING STATION	
TANK FARM TO TURBINES-MANHOLD	
NO.	D100-200-003-D
REV.	4888

FOR PERMITTING PURPOSES ONLY



DEMOLITION DRAWING

- DEMOLITION NOTES**
1. [Symbol] INDICATES MATERIAL TO BE REMOVED
 2. [Symbol] INDICATES MATERIAL TO BE REMOVED WITH SECTIONS ON SYSTEM
 3. [Symbol] INDICATES MATERIAL TO BE REMOVED WITH THE EXISTING SYSTEM
 4. [Symbol] INDICATES MATERIAL TO BE REMOVED WITH THE EXISTING SYSTEM AND ABANDONED IN PLACE
 5. [Symbol] INDICATES MATERIAL TO BE REMOVED WITH THE EXISTING SYSTEM AND ABANDONED IN PLACE
 6. [Symbol] INDICATES MATERIAL TO BE REMOVED WITH THE EXISTING SYSTEM AND ABANDONED IN PLACE
- REFERENCE DRAWINGS**
- 0100-200-008 [Symbol] & INSTRUMENTATION
 - 0200-200-012 [Symbol] INSTRUMENTATION
 - 0300-200-017 [Symbol] INSTRUMENTATION
 - M-175 [Symbol] INSTRUMENTATION
- C S & E DOCUMENT NUMBERS**
- APR81R308000100

ITEM NO.	REV.	DATE	DESCRIPTION	BY	CHKD.	APP'D.	REVISION
1	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
2	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
3	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
4	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
5	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
6	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
7	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
8	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	
9	1	08/16/90	ISSUED FOR PERMITTING PURPOSES ONLY	E.C.	A.A.	K.C.	

APPLIED ENGINEERING COMPANY
 GRANDFORD, S.C.

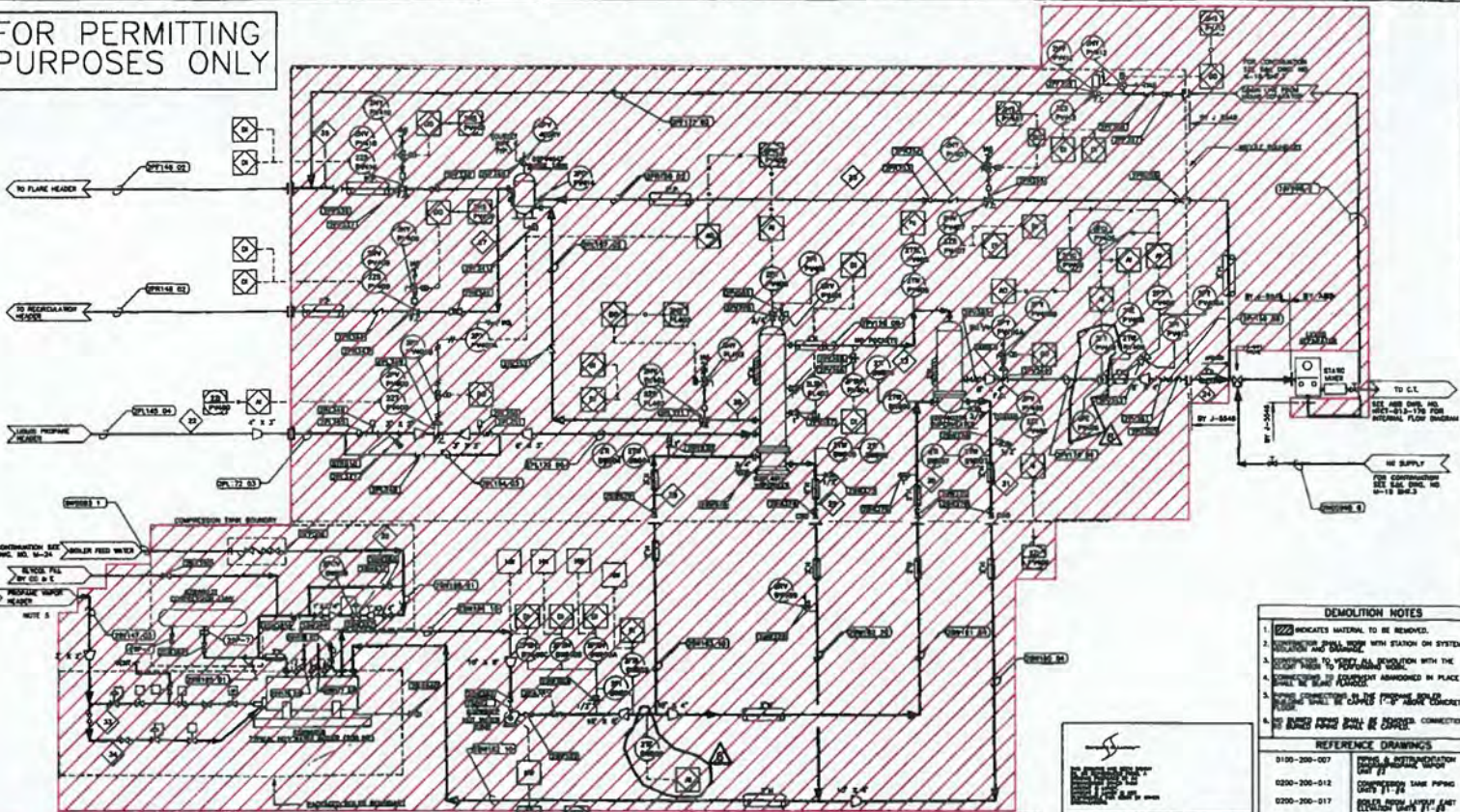
CREDFVILLE, S.C. CREDCHSBO, S.C. ATLANTA, GA.

THE CONCRETE GAS & ELECTRIC COMPANY
 WOODDALE GENERATING STATION

PIPING & INSTRUMENTATION DIAGRAM
 PROPANE VAPOR UNIT #1

4688 0100-200-006-D 08

FOR PERMITTING PURPOSES ONLY



DEMOLITION DRAWING

DEMOLITION NOTES

1. Hatched material to be removed.
2. Equipment shall remain with station on system.
3. Equipment to be removed shall be tagged in place.
4. Equipment to be removed shall be tagged in place.
5. Equipment to be removed shall be tagged in place.
6. Equipment to be removed shall be tagged in place.

REFERENCE DRAWINGS

0100-200-007	PUMP & INSTRUMENTATION UNIT #1
0200-200-012	CONDENSING TANK PIPING
0200-200-017	CONDENSING TANK PIPING
M-175	CONDENSING TANK PIPING
M-175	CONDENSING TANK PIPING

C & E DOCUMENT NUMBER: AP2102828100108

CONTRACTOR/INSTALLER SHALL MAKE ALL APPROPRIATE REVISIONS TO MAINTAIN THE SAFETY OF ALL PEOPLE LOCATED IN THE WORK AREA. ALL REVISIONS SHALL BE APPROVED BY THE PROJECT MANAGER.

STEEL STORAGE

ITEM NO.	QTY	UNIT	DESCRIPTION	PRICE	TOTAL
1	1	EA	STEEL STORAGE	100.00	100.00
2	2	EA	STEEL STORAGE	150.00	300.00
3	3	EA	STEEL STORAGE	200.00	600.00
4	4	EA	STEEL STORAGE	250.00	1000.00
5	5	EA	STEEL STORAGE	300.00	1500.00
6	6	EA	STEEL STORAGE	350.00	2100.00
7	7	EA	STEEL STORAGE	400.00	2800.00
8	8	EA	STEEL STORAGE	450.00	3600.00
9	9	EA	STEEL STORAGE	500.00	4500.00
10	10	EA	STEEL STORAGE	550.00	5500.00
11	11	EA	STEEL STORAGE	600.00	6600.00
12	12	EA	STEEL STORAGE	650.00	7800.00
13	13	EA	STEEL STORAGE	700.00	9100.00
14	14	EA	STEEL STORAGE	750.00	10500.00
15	15	EA	STEEL STORAGE	800.00	12000.00
16	16	EA	STEEL STORAGE	850.00	13600.00
17	17	EA	STEEL STORAGE	900.00	15300.00
18	18	EA	STEEL STORAGE	950.00	17100.00
19	19	EA	STEEL STORAGE	1000.00	19000.00
20	20	EA	STEEL STORAGE	1050.00	21000.00
21	21	EA	STEEL STORAGE	1100.00	23100.00
22	22	EA	STEEL STORAGE	1150.00	25300.00
23	23	EA	STEEL STORAGE	1200.00	27600.00
24	24	EA	STEEL STORAGE	1250.00	30000.00
25	25	EA	STEEL STORAGE	1300.00	32500.00
26	26	EA	STEEL STORAGE	1350.00	35100.00
27	27	EA	STEEL STORAGE	1400.00	37800.00
28	28	EA	STEEL STORAGE	1450.00	40600.00
29	29	EA	STEEL STORAGE	1500.00	43500.00
30	30	EA	STEEL STORAGE	1550.00	46500.00
31	31	EA	STEEL STORAGE	1600.00	49600.00
32	32	EA	STEEL STORAGE	1650.00	52800.00
33	33	EA	STEEL STORAGE	1700.00	56100.00
34	34	EA	STEEL STORAGE	1750.00	59500.00
35	35	EA	STEEL STORAGE	1800.00	63000.00
36	36	EA	STEEL STORAGE	1850.00	66600.00
37	37	EA	STEEL STORAGE	1900.00	70300.00
38	38	EA	STEEL STORAGE	1950.00	74100.00
39	39	EA	STEEL STORAGE	2000.00	78000.00
40	40	EA	STEEL STORAGE	2050.00	82000.00
41	41	EA	STEEL STORAGE	2100.00	86100.00
42	42	EA	STEEL STORAGE	2150.00	90300.00
43	43	EA	STEEL STORAGE	2200.00	94600.00
44	44	EA	STEEL STORAGE	2250.00	99000.00
45	45	EA	STEEL STORAGE	2300.00	103500.00
46	46	EA	STEEL STORAGE	2350.00	108100.00
47	47	EA	STEEL STORAGE	2400.00	112800.00
48	48	EA	STEEL STORAGE	2450.00	117600.00
49	49	EA	STEEL STORAGE	2500.00	122500.00
50	50	EA	STEEL STORAGE	2550.00	127500.00

APPLIED ENGINEERING COMPANY
ORANGEBURG, S.C.

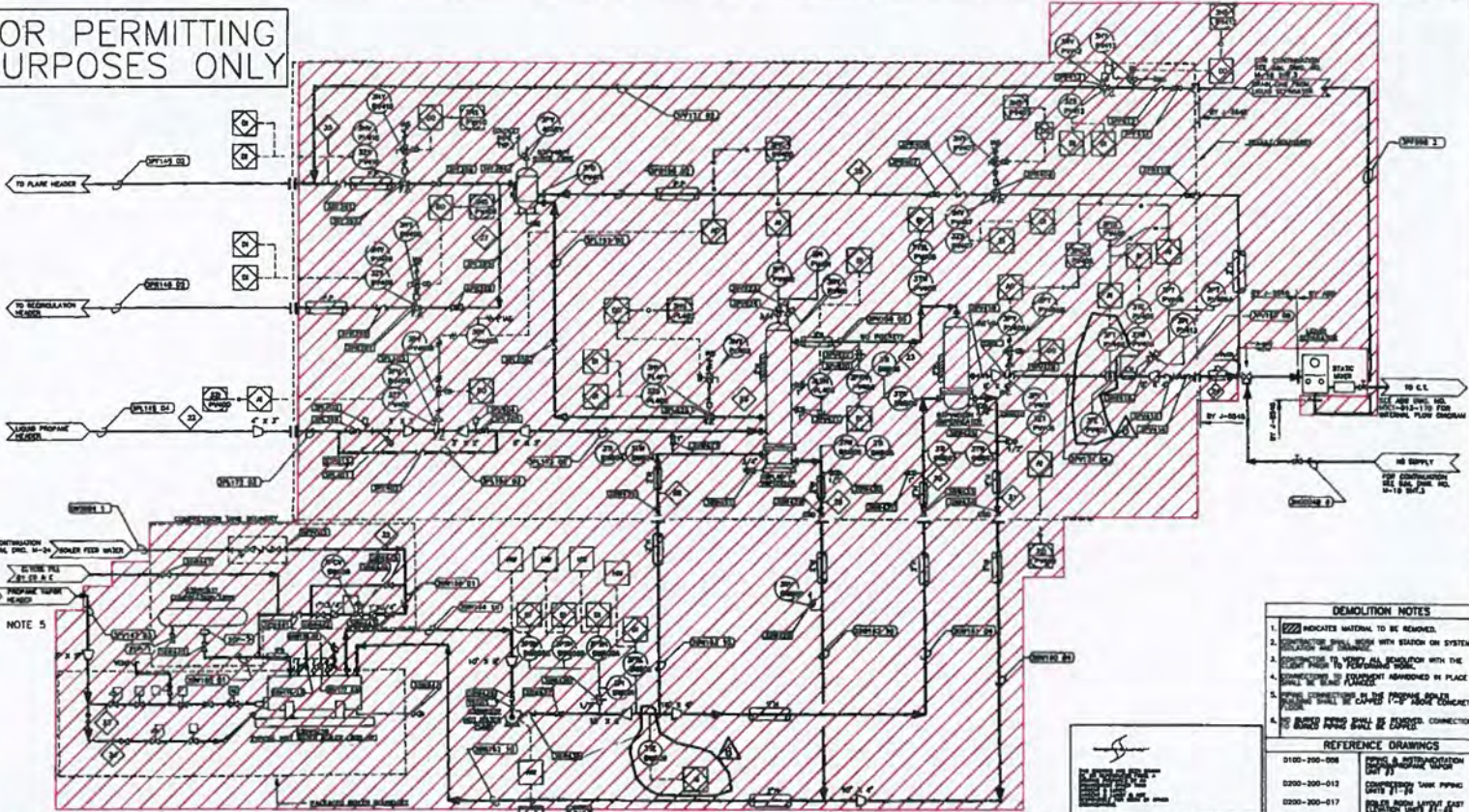
GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

THE CONDUIT GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION

PIPING & INSTRUMENTATION DIAGRAM
PROPANE VAPOR UNIT #8

4682 0100-200-007-D 08

FOR PERMITTING PURPOSES ONLY



DEMOLITION DRAWING

ITEM NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
1	DEMOLITION OF ...	1	EA	...	...
2	DEMOLITION OF ...	1	EA	...	...
3	DEMOLITION OF ...	1	EA	...	...
4	DEMOLITION OF ...	1	EA	...	...
5	DEMOLITION OF ...	1	EA	...	...
6	DEMOLITION OF ...	1	EA	...	...
7	DEMOLITION OF ...	1	EA	...	...
8	DEMOLITION OF ...	1	EA	...	...
9	DEMOLITION OF ...	1	EA	...	...
10	DEMOLITION OF ...	1	EA	...	...
11	DEMOLITION OF ...	1	EA	...	...
12	DEMOLITION OF ...	1	EA	...	...
13	DEMOLITION OF ...	1	EA	...	...
14	DEMOLITION OF ...	1	EA	...	...
15	DEMOLITION OF ...	1	EA	...	...
16	DEMOLITION OF ...	1	EA	...	...
17	DEMOLITION OF ...	1	EA	...	...
18	DEMOLITION OF ...	1	EA	...	...
19	DEMOLITION OF ...	1	EA	...	...
20	DEMOLITION OF ...	1	EA	...	...
21	DEMOLITION OF ...	1	EA	...	...
22	DEMOLITION OF ...	1	EA	...	...
23	DEMOLITION OF ...	1	EA	...	...
24	DEMOLITION OF ...	1	EA	...	...
25	DEMOLITION OF ...	1	EA	...	...
26	DEMOLITION OF ...	1	EA	...	...
27	DEMOLITION OF ...	1	EA	...	...
28	DEMOLITION OF ...	1	EA	...	...
29	DEMOLITION OF ...	1	EA	...	...
30	DEMOLITION OF ...	1	EA	...	...
31	DEMOLITION OF ...	1	EA	...	...
32	DEMOLITION OF ...	1	EA	...	...
33	DEMOLITION OF ...	1	EA	...	...
34	DEMOLITION OF ...	1	EA	...	...
35	DEMOLITION OF ...	1	EA	...	...
36	DEMOLITION OF ...	1	EA	...	...
37	DEMOLITION OF ...	1	EA	...	...
38	DEMOLITION OF ...	1	EA	...	...
39	DEMOLITION OF ...	1	EA	...	...
40	DEMOLITION OF ...	1	EA	...	...
41	DEMOLITION OF ...	1	EA	...	...
42	DEMOLITION OF ...	1	EA	...	...
43	DEMOLITION OF ...	1	EA	...	...
44	DEMOLITION OF ...	1	EA	...	...
45	DEMOLITION OF ...	1	EA	...	...
46	DEMOLITION OF ...	1	EA	...	...
47	DEMOLITION OF ...	1	EA	...	...
48	DEMOLITION OF ...	1	EA	...	...
49	DEMOLITION OF ...	1	EA	...	...
50	DEMOLITION OF ...	1	EA	...	...

DEMOLITION NOTES

1. [Hatched] INDICATES MATERIAL TO BE REMOVED.
2. DEMOLITION SHALL BE DONE WITH REGARD TO SYSTEM.
3. DEMOLITION TO BE DONE WITH CARE TO AVOID DAMAGE TO ADJACENT STRUCTURES.
4. DEMOLITION SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
5. ALL DEMOLITION SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
6. ALL DEMOLITION SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.

REFERENCE DRAWINGS

- D100-200-008
- D100-200-012
- D100-200-017
- M-175

C & E DOCUMENT NUMBER
AP021002000108

THE CHEMICAL GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION

Piping & Instrumentation Diagram
PROPANE VAPOR UNIT #2

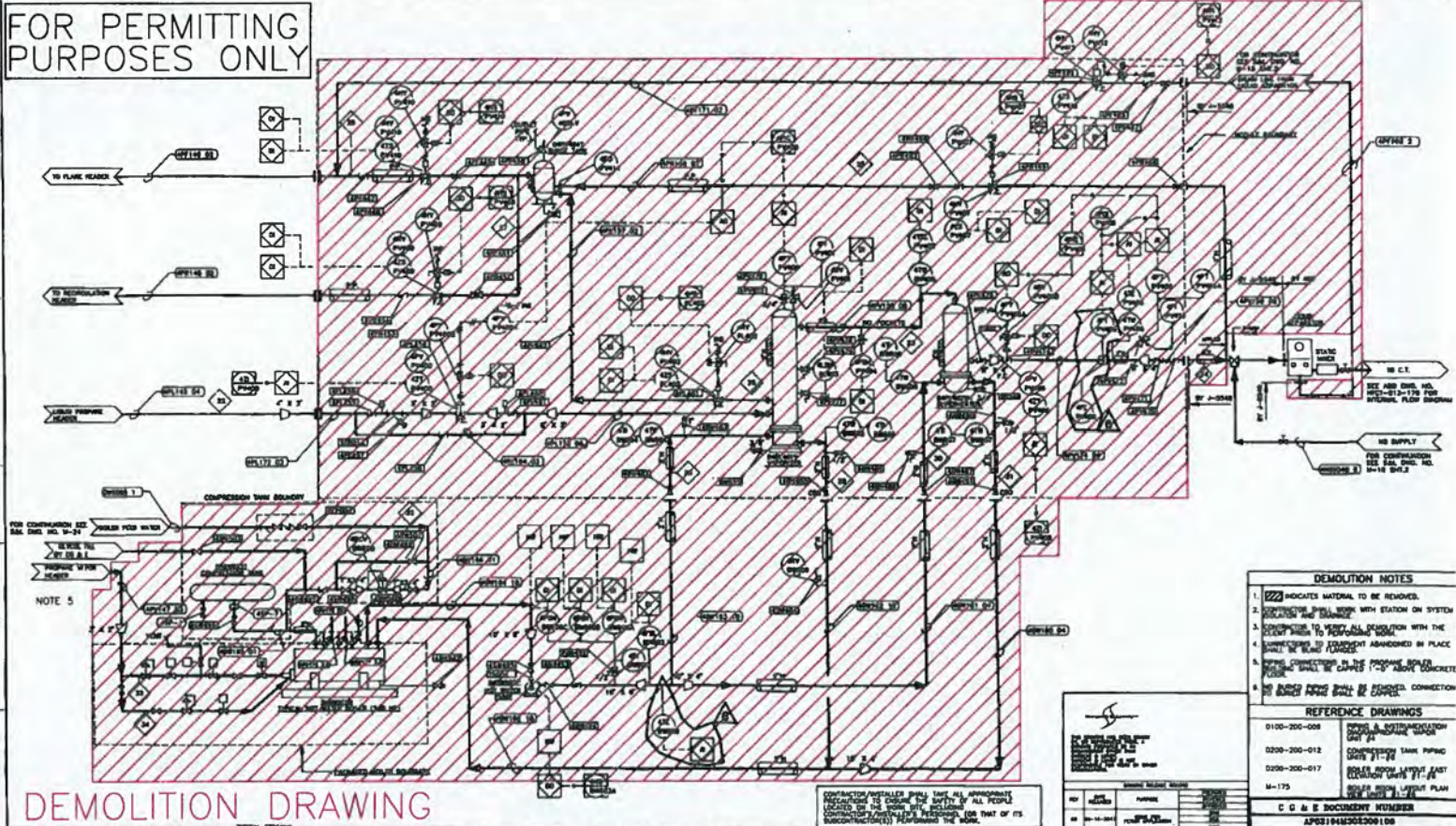
APPLIED ENGINEERING COMPANY
GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

APPROVED FOR CONSTRUCTION

DATE: 11/10/78

BY: [Signature]

FOR PERMITTING PURPOSES ONLY



DEMOLITION DRAWING

- DEMOLITION NOTES**
1. Hatched areas indicate material to be demolished.
 2. Demolition shall be done with care to avoid damage to adjacent equipment and structures.
 3. Demolition shall be done in accordance with the specifications and standards of the local authorities.
 4. Demolition shall be done in a safe and sound manner.
 5. Demolition shall be done in a timely manner.
 6. Demolition shall be done in a clean and orderly manner.
 7. Demolition shall be done in a safe and sound manner.
 8. Demolition shall be done in a timely manner.
 9. Demolition shall be done in a clean and orderly manner.
- REFERENCE DRAWINGS**
- D100-200-008 Piping & Instrumentation Diagram
 - D200-200-012 Tank Piping
 - D200-200-017 Boiler Piping
 - M-175 Boiler Room Layout Plan
- C & E DOCUMENT NUMBER**
APOST48303000100

ITEM NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL	DATE	BY	CHKD	APP'D
1	STEEL	100	LB	0.10	10.00	10/10/78	J.D.	J.D.	J.D.
2	IRON	200	LB	0.10	20.00	10/10/78	J.D.	J.D.	J.D.
3	COPPER	50	LB	1.00	50.00	10/10/78	J.D.	J.D.	J.D.
4	ALUMINUM	100	LB	0.50	50.00	10/10/78	J.D.	J.D.	J.D.
5	ZINC	50	LB	0.50	25.00	10/10/78	J.D.	J.D.	J.D.
6	LEAD	50	LB	1.00	50.00	10/10/78	J.D.	J.D.	J.D.
7	BRASS	50	LB	1.00	50.00	10/10/78	J.D.	J.D.	J.D.
8	STAINLESS STEEL	50	LB	2.00	100.00	10/10/78	J.D.	J.D.	J.D.
9	TOTAL				425.00				

APPLIED ENGINEERING COMPANY
ORANGESTOWN, S.C.

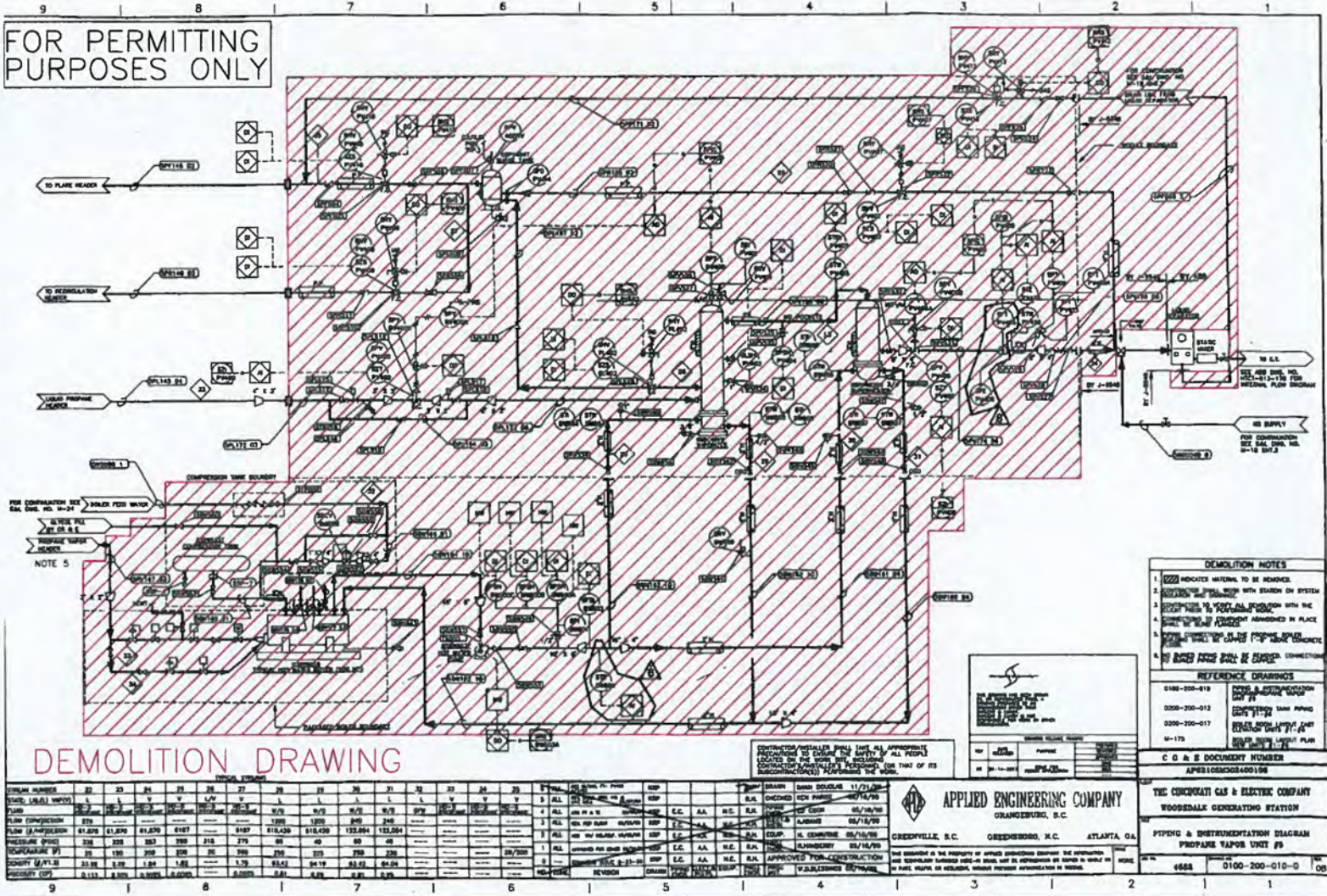
GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

THE CHESAPEAKE GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION

PIPING & INSTRUMENTATION DIAGRAM
PROPANE VAPOR UNIT #4

4882 D100-200-008-D

FOR PERMITTING PURPOSES ONLY



DEMOLITION DRAWING

- DEMOLITION NOTES**
1. Hatched areas indicate materials to be removed.
 2. Removal of all piping with season on system.
 3. Remove valves to vent all piping with the season on system.
 4. Remove all piping and equipment in place.
 5. Remove all piping and equipment in place.
 6. Remove all piping and equipment in place.
 7. Remove all piping and equipment in place.
- REFERENCE DRAWINGS**
- 0100-200-019 PIPING & INSTRUMENTATION DIAGRAM UNIT #8
 - 0200-200-012 PIPING & INSTRUMENTATION DIAGRAM UNIT #8
 - 0300-200-017 PIPING & INSTRUMENTATION DIAGRAM UNIT #8
 - M-175 PIPING & INSTRUMENTATION DIAGRAM UNIT #8
- C & E DOCUMENT NUMBER**
AP0510202400108

CONTRACTOR SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED BY THE WORK. THE DESIGN CONTRACTOR/INSTALLER'S RESPONSIBILITY IS LIMITED TO THAT OF ITS SUBCONTRACTORS' PERFORMANCE OF THE WORK.

ITEM NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL	REVISION	DATE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
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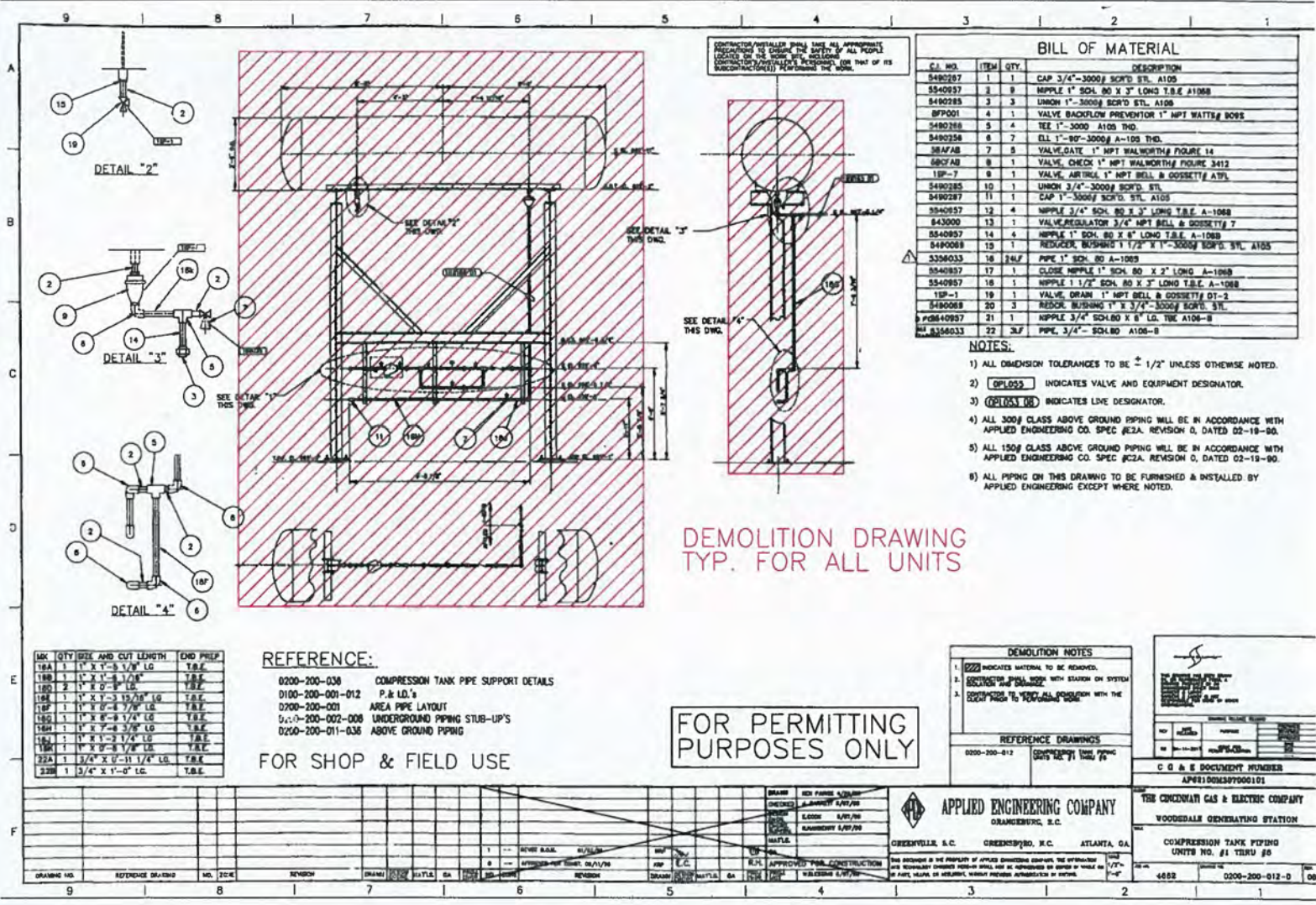
APPLIED ENGINEERING COMPANY
ORANGEBURG, S.C.

GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

THE CONCRETE GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION

PIPING & INSTRUMENTATION DIAGRAM
PROPANE VAPOR UNIT #8

NO. 4668 0100-200-010-C 00



BILL OF MATERIAL			
QTY.	ITEM	DESCRIPTION	QTY.
1	1	CAP 3/4"-3000# SCHD. STL. A108	
1	8	NIFFLE 1" SCH. 80 X 3" LONG T.B.E. A-108B	
3	3	UNION 1"-3000# SCHD. STL. A108	
4	1	VALVE BACKFLOW PREVENTOR 1" NPT WATTS# BOSS	
5	4	TEE 1"-3000 A108 THD.	
6	7	ELL 1"-90°-3000# A-108 THD.	
7	5	VALVE GATE 1" NPT WALTHAM# FIGURE 14	
8	1	VALVE CHECK 1" NPT WALTHAM# FIGURE 3412	
9	1	VALVE AIRTRIAL 1" NPT BELL & GOSSETT# ATPL	
10	1	UNION 3/4"-3000# SCHD. STL.	
11	1	CAP 1"-3000# SCHD. STL. A108	
12	4	NIFFLE 3/4" SCH. 80 X 3" LONG T.B.E. A-108B	
13	1	VALVE REGULATOR 3/4" NPT BELL & GOSSETT# 7	
14	4	NIFFLE 1" SCH. 80 X 8" LONG T.B.E. A-108B	
15	1	REDUCER BUSHING 1 1/2" X 1"-3000# SCHD. STL. A108	
16	24 1/2	PIPE 1" SCH. 80 A-108B	
17	1	CLOSE NIFFLE 1" SCH. 80 X 3" LONG A-108B	
18	1	NIFFLE 1 1/2" SCH. 80 X 3" LONG T.B.E. A-108B	
19	1	VALVE DRAIN 1" NPT BELL & GOSSETT# DT-2	
20	3	REDUCER BUSHING 1" X 3/4"-3000# SCHD. STL.	
21	1	NIFFLE 3/4" SCH. 80 X 6" LG. T.B.E. A108-B	
22	3 1/2	PIPE 3/4" SCH. 80 A108-B	

- NOTES:**
- 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/2"$ UNLESS OTHERWISE NOTED.
 - 2) (OP)55 INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 - 3) (OP)55 (L) INDICATES LINE DESIGNATOR.
 - 4) ALL 300# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #E2A. REVISION 0, DATED 02-19-80.
 - 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #C2A. REVISION 0, DATED 02-19-80.
 - 6) ALL PIPING ON THIS DRAWING TO BE FURNISHED & INSTALLED BY APPLIED ENGINEERING EXCEPT WHERE NOTED.

DEMOLITION DRAWING
TYP. FOR ALL UNITS

QTY.	SIZE AND CUT LENGTH	END PREP
18A	1" X 1'-3 1/2" LG.	T.B.E.
18B	1" X 1'-3 1/2" LG.	T.B.E.
18C	1" X 0'-8" LG.	T.B.E.
18D	1" X 7'-3 15/16" LG.	T.B.E.
18E	1" X 0'-8 1/2" LG.	T.B.E.
18F	1" X 8'-8 3/8" LG.	T.B.E.
18G	1" X 7'-8 3/8" LG.	T.B.E.
18H	1" X 7'-3 1/4" LG.	T.B.E.
18I	1" X 0'-8 1/2" LG.	T.B.E.
22A	3/4" X 0'-11 1/4" LG.	T.B.E.
22B	3/4" X 1'-0" LG.	T.B.E.

REFERENCE:

- 0200-200-038 COMPRESSION TANK PIPE SUPPORT DETAILS
- 0100-200-001-012 P & L.D.'s
- 0700-200-001 AREA PIPE LAYOUT
- 010-200-002-008 UNDERGROUND PIPING STUB-UP'S
- 0200-200-011-036 ABOVE GROUND PIPING

FOR SHOP & FIELD USE

FOR PERMITTING
PURPOSES ONLY

DEMOLITION NOTES	
1	INDICATES MATERIAL TO BE REMOVED.
2	CONTRACTOR SHALL WORK WITH STATION ON SYSTEM TO REMOVE THIS DEMOLITION.
3	CONTRACTOR SHALL WORK WITH STATION ON SYSTEM TO REMOVE THIS DEMOLITION.

APPLIED ENGINEERING COMPANY	
WOODDALE GENERATING STATION	
COMPRESSION TANK PIPING	
UNITS NO. #1 TIERU #8	
C & E DOCUMENT NUMBER	
APR81 D06347000101	

NO.	DATE	BY	CHKD.	REVISION	DESCRIPTION
1					
2					
3					
4					
5					
6					
7					
8					
9					

APPLIED ENGINEERING COMPANY
WOODDALE, S.C.

GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

THE CONZON GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION
COMPRESSION TANK PIPING
UNITS NO. #1 TIERU #8

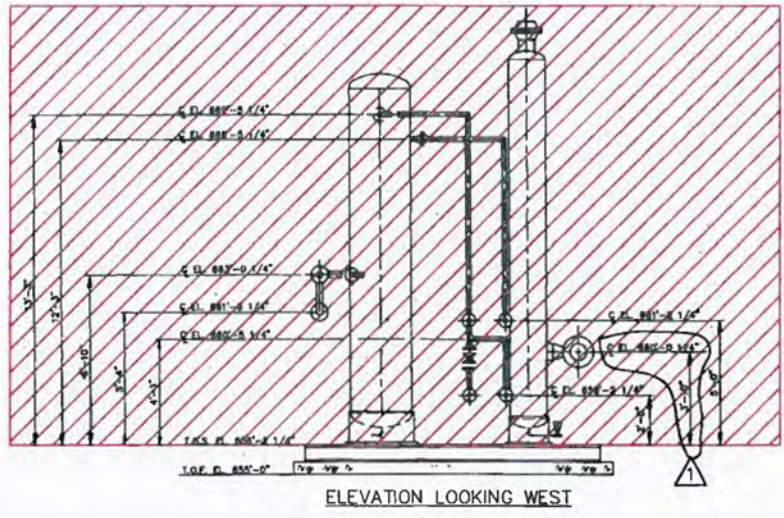
4888 0200-200-012-0 08

DEMOLITION NOTES 1. Hatched area indicates material to be removed. 2. CONCRETE SHALL BE REMOVED WITH EXCAVATOR. 3. CONCRETE SHALL BE REMOVED TO UNDESIGNED LEVEL. 4. ALL REINFORCING BARS SHALL BE REMOVED TO UNDESIGNED LEVEL. 5. ALL REINFORCING BARS SHALL BE REMOVED TO UNDESIGNED LEVEL.	
REFERENCE DRAWINGS 0200-200-011 AREA ELEVATION LAYOUT 0200-200-014 AREA ELEVATION LAYOUT	

REV	DATE	BY	CHKD	DESCRIPTION
1	06/28/90	E.C.	R.J.H.	APPROVED FOR CONSTRUCTION
2	03/07/91	K.R.P.	R.J.H.	CHANGE ELEVATION

- NOTES:**
- 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/8"$ UNLESS OTHERWISE NOTED.
 - 2) **VALVE** INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 - 3) **LINE NO.** INDICATES LINE DESIGNATOR.
 - 4) ALL 300# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #CEA, REVISION 0, DATED 02-18-90.
 - 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #CEA, REVISION 0, DATED 02-18-90.
 - 6) ALL PIPING ON THIS DRAWING TO BE FINISHED AND ASSEMBLED BY CONTRACTOR APPLIED ENGINEERING CO.
 - 7) ALL PIPING CONNECTIONS TO MODULE TO BE INSTALLED BY CONTRACTOR J-5548.
 - 8) SEE ISO'S FOR DETAILED PIPE RUNS OF THIS MODULE. PIPE RUNS CAN BE CROSS REFERENCED BY LINE NO. REFERENCE DWG'S 0200-200-016 & 015 FOR ELEVATIONS.

- REFERENCE:**
- 0100-200-001-012 P & ID's
 - 0200-200-001 AREA PIPE LAYOUT
 - 0200-200-002-008 UNDERGROUND PIPING SUB-UP'S
 - 0200-200-011-036 ABOVE GROUND PIPING
 - 0200-400-001-014 MODULE ISO'S



ELEVATION LOOKING WEST

FOR PERMITTING PURPOSES ONLY

DEMOLITION DRAWING (TYP. ALL UNITS)

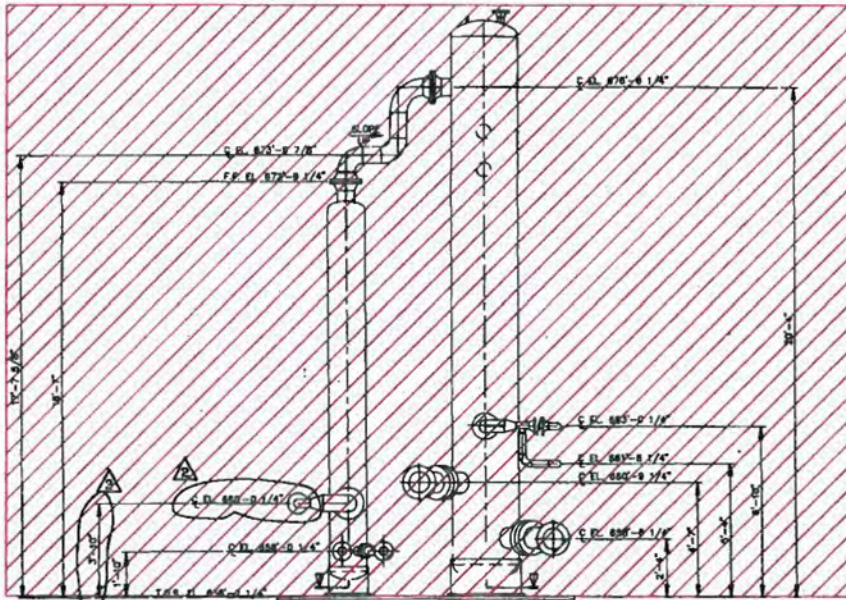
C & E DOCUMENT NUMBER AP221006308900191									
THE CINCINNATI GAS & ELECTRIC COMPANY WOODSDALE GENERATING STATION MODULE ELEVATION LOOKING WEST UNITS #1 THRU #8									
GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.									
THIS DRAWING IS THE PROPERTY OF APPLIED ENGINEERING COMPANY. THE INFORMATION AND TECHNICAL DATA HEREON SHALL NOT BE REPRODUCED OR USED IN WHOLE OR IN PART, WITHOUT THE WRITTEN PERMISSION OF APPLIED ENGINEERING COMPANY.									
DRAWN: KEN PARSONS 6/22/90 CHECKED: JERRY PARSONS 6/22/90 DESIGNED: E. COOK 6/22/90 DATE: R. HANBERRY 7/22/90									
1 - CHANGE ELEVATION 03/07/91 KRP 0 - APPROVED FOR CONSTRUCTION 06/28/90 E.C.									
APPROVED FOR CONSTRUCTION W. BLESSING 8/22/90									
9	8	7	6	5	4	3	2	1	

APPLIED ENGINEERING COMPANY 1000 W. 10th Street Greenville, S.C. 29604 Phone: (803) 233-1111	WOODBRIDGE GENERATING STATION AREA PIPE LAYOUT UNDERGROUND PIPING STUB-UP'S ABOVE GROUND PIPING MODULE ELEVATION

DEMOLITION NOTES	
1.	INDICATES MATERIAL TO BE REMOVED.
2.	CONTRACTOR SHALL REMOVE ALL MATERIAL TO BE DEMOLISHED AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS AND ORDINANCES.
3.	CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL AFFECTED AGENCIES.
4.	ALL DEMOLITION WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.
REFERENCE DRAWINGS	
0200-200-014	MODULE ELEVATION LOOKING EAST
0200-200-018	MODULE ELEVATION LOOKING WEST

FOR PERMITTING PURPOSES ONLY

DEMOLITION DRAWING (TYP. ALL UNITS)



ELEVATION LOOKING EAST

- NOTES:**
- 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/2"$ UNLESS OTHERWISE NOTED.
 - 2) **VALVE** INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 - 3) **LINE DESIGNATOR** INDICATES LINE DESIGNATOR.
 - 4) ALL 300# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. #23A, REVISION 0, DATED 02-18-90.
 - 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. #23A, REVISION 0, DATED 02-18-90.
 - 6) ALL PIPING ON THIS DRAWING TO BE FURNISHED AND ASSEMBLED BY CONTRACTOR APPLIED ENGINEERING CO.
 - 7) ALL PIPING CONNECTIONS TO MODULE TO BE INSTALLED BY CONTRACTOR J-8548.
 - 8) SEE ISO'S FOR DETAILED PIPE RUNS OF THIS MODULE. PIPE RUNS CAN BE CROSS REFERENCED BY LINE NO. REFERENCE DWG'S 0200-200-018 & 014 FOR ELEVATION & PLAN.

REFERENCE:

- 0100-200-001-012 P.B. LD.'s
- 0200-200-001 AREA PIPE LAYOUT
- 0200-200-002-006 UNDERGROUND PIPING STUB-UP'S
- 0200-200-011-035 ABOVE GROUND PIPING
- 0200-400-001-014 MODULE ISO'S

<table border="1"> <tr> <td> 2 - CHANGE ELEVATION 03/07/91 1 - ROTATE PL403 07/25/91 0 - APPROV FOR CONST. 06/25/90 </td> <td> K. PARISE E. COOK R. HANBERRY R.H. </td> <td> 08/22/90 06/22/90 06/28/90 </td> <td> APPLIED ENGINEERING COMPANY ORANGETOWN, S.C. GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA. </td> <td> THE CINCINNATI GAS & ELECTRIC COMPANY WOODBRIDGE GENERATING STATION MODULE ELEVATION LOOKING EAST UNITS #1 THRU #8 </td> </tr> </table>										2 - CHANGE ELEVATION 03/07/91 1 - ROTATE PL403 07/25/91 0 - APPROV FOR CONST. 06/25/90	K. PARISE E. COOK R. HANBERRY R.H.	08/22/90 06/22/90 06/28/90	APPLIED ENGINEERING COMPANY ORANGETOWN, S.C. GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.	THE CINCINNATI GAS & ELECTRIC COMPANY WOODBRIDGE GENERATING STATION MODULE ELEVATION LOOKING EAST UNITS #1 THRU #8	C & E DOCUMENT NUMBER APR100300700108
2 - CHANGE ELEVATION 03/07/91 1 - ROTATE PL403 07/25/91 0 - APPROV FOR CONST. 06/25/90	K. PARISE E. COOK R. HANBERRY R.H.	08/22/90 06/22/90 06/28/90	APPLIED ENGINEERING COMPANY ORANGETOWN, S.C. GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.	THE CINCINNATI GAS & ELECTRIC COMPANY WOODBRIDGE GENERATING STATION MODULE ELEVATION LOOKING EAST UNITS #1 THRU #8											
DRAWING NO. 9	REFERENCE DRAWING 8	NO. 2004	REVISION	DRAWN	CHECKED	DATE	SCALE	SHEET NO. 4888	TOTAL SHEETS 0200-200-015-01						

FOR PERMITTING PURPOSES ONLY

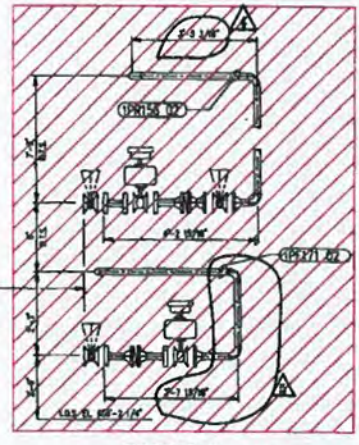
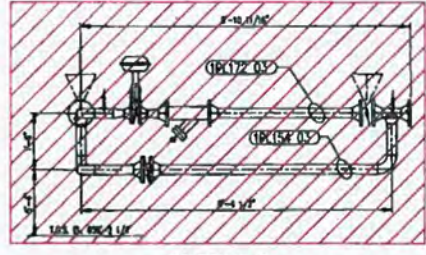
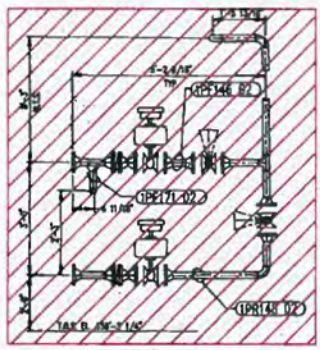
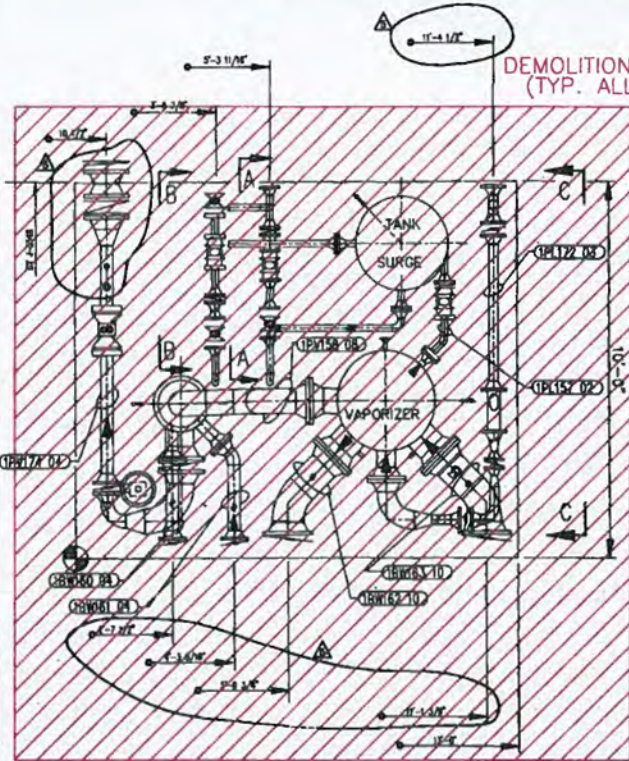
NO.	DATE	BY	REVISION
1	02-18-90	J.S.	ISSUED FOR PERMITTING PURPOSES ONLY

DEMOLITION NOTES	
1	INDICATES MATERIAL TO BE REMOVED.
2	CONTRACTOR SHALL VERIFY WITH STATION BY FIELD RELEASED AND UNRELEASED.
3	CONTRACTOR SHALL VERIFY WITH STATION BY FIELD RELEASED AND UNRELEASED.
4	ALL DIMENSIONS SHALL BE AS SHOWN UNLESS OTHERWISE NOTED.

REFERENCE DRAWINGS	
0200-200-014	AREA PIPE LAYOUT
0200-200-015	UNDERGROUND PIPING SUB-UPS
0200-200-016	ABOVE GROUND PIPING
0200-200-017	MODULE EG'S
0200-200-018	CLIENT PIPING TIE-IN AND CONNECTION DNG.

- NOTES:**
- 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/2"$ UNLESS OTHERWISE NOTED.
 - 2) **VALVE** INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 - 3) **LINE** INDICATES LINE DESIGNATOR.
 - 4) ALL 300# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. (E.C.A. REVISION 0, DATED 02-18-90).
 - 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. (E.C.A. REVISION 0, DATED 02-18-90).
 - 6) ALL PIPING ON THIS DRAWING TO BE FURNISHED AND ASSEMBLED BY CONTRACTOR APPLIED ENGINEERING CO.
 - 7) ALL PIPING CONNECTIONS TO MODULE TO BE INSTALLED BY CONTRACTOR J-5548.
 - 8) SEE 150# FOR DETAILED PIPING RUNS OF THIS MODULE. PIPING RUNS CAN BE CROSS REFERENCED BY LINE NO. REFERENCE DWG'S 0200-200-014 & 015 FOR ELEVATIONS.

- REFERENCE:**
- 0100-200-001-012 P.R.L.D.'s
 - 0200-200-001 AREA PIPE LAYOUT
 - 0200-200-002-008 UNDERGROUND PIPING SUB-UPS
 - 0200-200-011-031 ABOVE GROUND PIPING
 - 0200-400-001-014 MODULE EG'S
 - 0200-200-037 CLIENT PIPING TIE-IN AND CONNECTION DNG.



NO.	DATE	BY	REVISION	DESCRIPTION	DESIGNED	CHECKED	DATE	APPROVED	DATE
5	02/11/90	J.S.	1	ISSUED FOR PERMITTING PURPOSES ONLY	J.S.	J.S.	02/11/90	J.S.	02/11/90
4	02/11/90	J.S.	1	ISSUED FOR PERMITTING PURPOSES ONLY	J.S.	J.S.	02/11/90	J.S.	02/11/90
3	02/11/90	J.S.	1	ISSUED FOR PERMITTING PURPOSES ONLY	J.S.	J.S.	02/11/90	J.S.	02/11/90
2	02/11/90	J.S.	1	ISSUED FOR PERMITTING PURPOSES ONLY	J.S.	J.S.	02/11/90	J.S.	02/11/90
1	02/11/90	J.S.	1	ISSUED FOR PERMITTING PURPOSES ONLY	J.S.	J.S.	02/11/90	J.S.	02/11/90

DRWG. NO.	REFERENCE DRAWING	NO.	ZONE	REVISION	DATE	BY	DATE	BY
0200-200-018	0200-200-014	1	01	1	02/11/90	J.S.	02/11/90	J.S.

APPLIED ENGINEERING COMPANY
ORANGEBURG, S.C.

GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

C & E DOCUMENT NUMBER
AP28100306000103

THE CONDUIT GAS & ELECTRIC COMPANY
WOODDALE GENERATING STATION

MODULE LAYOUT PLAN VIEW
MODULES #1 THRU #6

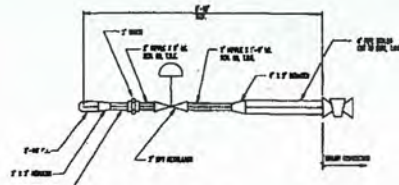
0200-200-018-D

NOTES:

- 1) DIMENSION TOLERANCES $\pm 1/2"$.
- 2) ALL PIPING SHOWN IS TYPICAL FOR ALL SIX BOILER ROOM LOCATIONS (EXCLUDING EAST COORDINATES, WHICH WILL BE SPACED AT 60'-0" CENTERS.)
- 3) ALL PIPING ON THIS DRAWING TO BE FURNISHED AND INSTALLED BY ABOVE GROUND CONTRACTOR J-5548.
- 4) ALL 300# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #E2A, REVISION D, DATED 02-19-80.
- 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #E2A, REVISION D, DATED 02-19-80.
- 6) **OP1000** INDICATES VALVE AND EQUIPMENT DESIGNATOR.
- 7) **OP1001** INDICATES LINE DESIGNATOR.
- 8) **411-1** INDICATES PIPE SUPPORT TAG NUMBER.
- 9) SEE DWG. NO. D200-200-021 FOR BOILER ROOM AREA PIPE SUPPORT DETAILS.

REFERENCES:

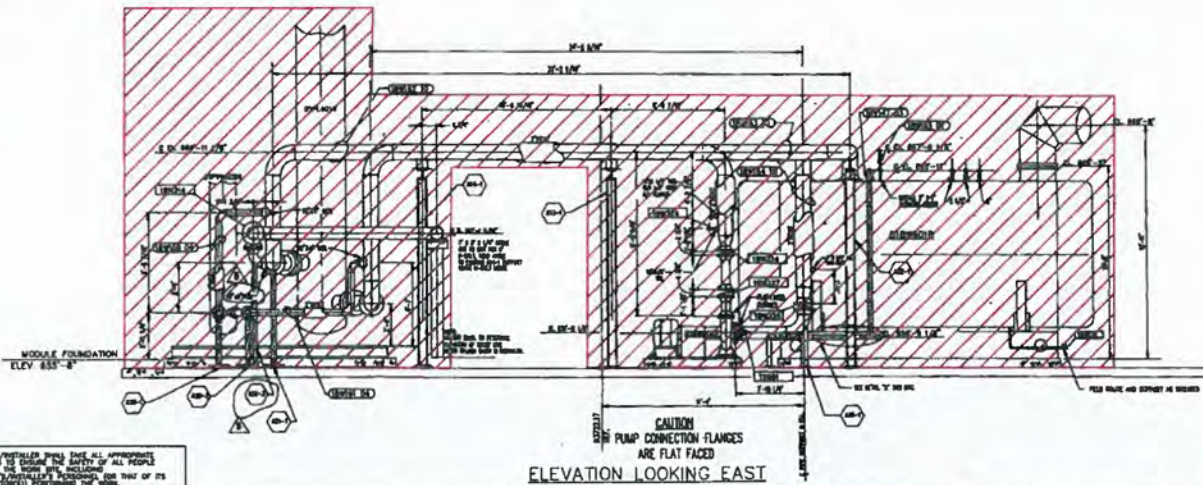
- D100-200-001 THRU 012
 - D200-200-002 THRU 006
 - D200-200-001
 - D200-200-021
 - D200-200-020
 - D200-200-014 THRU 016
 - D200-200-011
 - D200-200-012 & 038
 - D200-400-001 THRU 014
- P. & I.D.'S
UNDERGROUND PIPING STUB-UP'S
AREA PIPING LAYOUT
BOILER ROOM ELEV. LOOKING NORTH
BOILER ROOM LAYOUT PLAN VIEW
MODULE DETAIL LAYOUT
TURBINE PIPING DETAIL
COMPRESSION TANK DETAILS
MODULE ISOMETRIC'S



DETAIL "A"
ELEVATION LOOKING EAST

FOR PERMITTING PURPOSES ONLY

DEMOLITION DRAWING
TYP. FOR ALL UNITS



ELEVATION LOOKING EAST

<p>APPLIED ENGINEERING COMPANY GREENVILLE, S.C.</p>	
<p>DEMOLITION NOTES</p> <ol style="list-style-type: none"> 1. INDICATES MATERIAL TO BE REMOVED. 2. SECTION TO BE REMOVED WITH STATION ON SYSTEM. 3. SECTION TO BE REMOVED WITH THE SECTION TO WHICH IT IS CONNECTED. 4. CONSTRUCTION IS TO BE COMPLETED IN PLACE. 5. SECTION TO BE REMOVED SHALL BE CAPPED. 6. SECTION TO BE REMOVED SHALL BE CAPPED. 7. SECTION TO BE REMOVED SHALL BE CAPPED. 	
<p>REFERENCE DRAWINGS</p> <p>D200-200-017 ELEVATION UNIT #1 THRU #6</p>	
<p>C.C.R.E. DOCUMENT NUMBER</p> <p>AP48102030000108</p>	
<p>THE CONCRETE GAS & ELECTRIC COMPANY WOODDALE GENERATING STATION</p>	
<p>BOILER ROOM LAYOUT EAST ELEVATION UNIT #1 THRU #6 (TYP)</p>	
<p>DATE</p> <p>4882</p>	<p>PROJECT NO.</p> <p>D200-200-017-D 08</p>

NO.	DESCRIPTION	DATE	BY	CHECKED	APP'D
1	WELD-O-LET & SUPPORT	01/23/80	R.H. JONES	J. WARE	J. WARE
2	LINE TAG-AND	11/20/80	R.H. JONES	J. WARE	J. WARE
3	ADD RELIEF PIPE	8/23/80	R.H. JONES	J. WARE	J. WARE
4	ADD RELIEF COHN	7/23/80	R.H. JONES	J. WARE	J. WARE
5	APPROVED FOR CONSTRUCTION	02/23/80	R.H. JONES	J. WARE	J. WARE
6	CONTRACT ISSUE	02/23/80	R.H. JONES	J. WARE	J. WARE

APPLIED ENGINEERING COMPANY
GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.

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9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

FOR PERMITTING PURPOSES ONLY

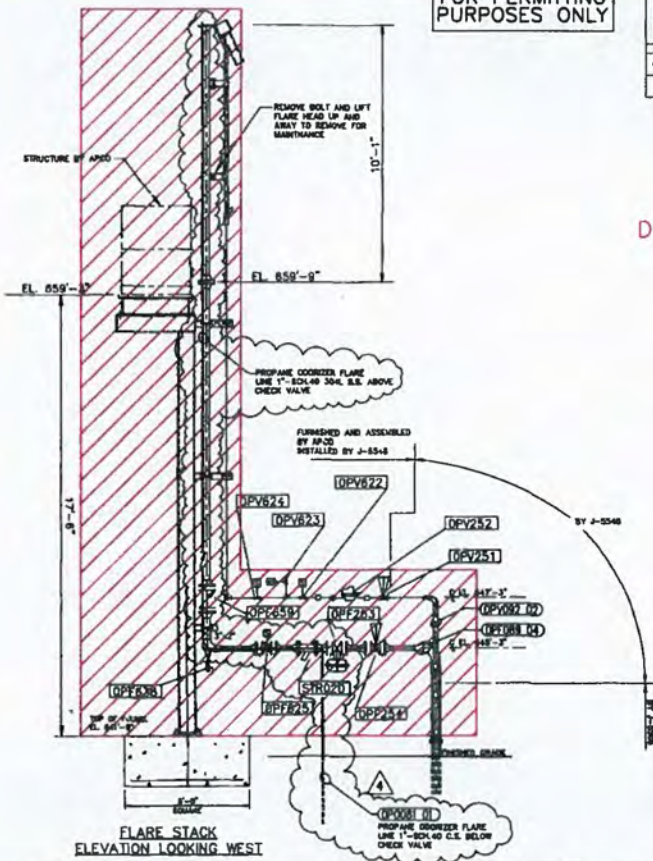
NO.	DATE	BY	DESCRIPTION
1	10/15/80	W. BRESSING	ISSUED FOR PERMITTING PURPOSES ONLY
2	10/15/80	W. BRESSING	ISSUED FOR PERMITTING PURPOSES ONLY

DEMOLITION NOTES	
1	INDICATES MATERIAL TO BE REMOVED.
2	CONTINUED FROM PREVIOUS SHEET.
3	SEE THE OTHER SIDE OF DRAWING FOR ADDITIONAL NOTES.
4	NO DIMENSIONS TO BE SHOWN AS TO BE REMOVED.

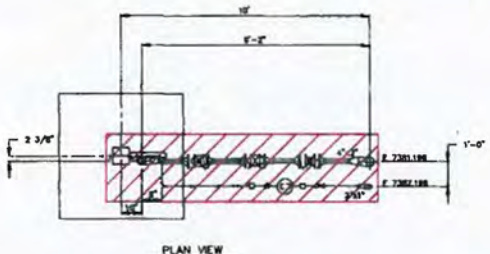
REFERENCE DRAWINGS	
0200-200-018	FLARE STATION DETAIL & ELEVATION

- NOTES:**
- 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/2"$ UNLESS OTHERWISE NOTED.
 - 2) **OPL055** INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 - 3) **OPL051 08** INDICATES LINE DESIGNATOR.
 - 4) ALL 300# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #E-A. REVISION 0, DATED 02-19-80.
 - 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #C2A. REVISION 0, DATED 02-19-80.

DEMOLITION DRAWING



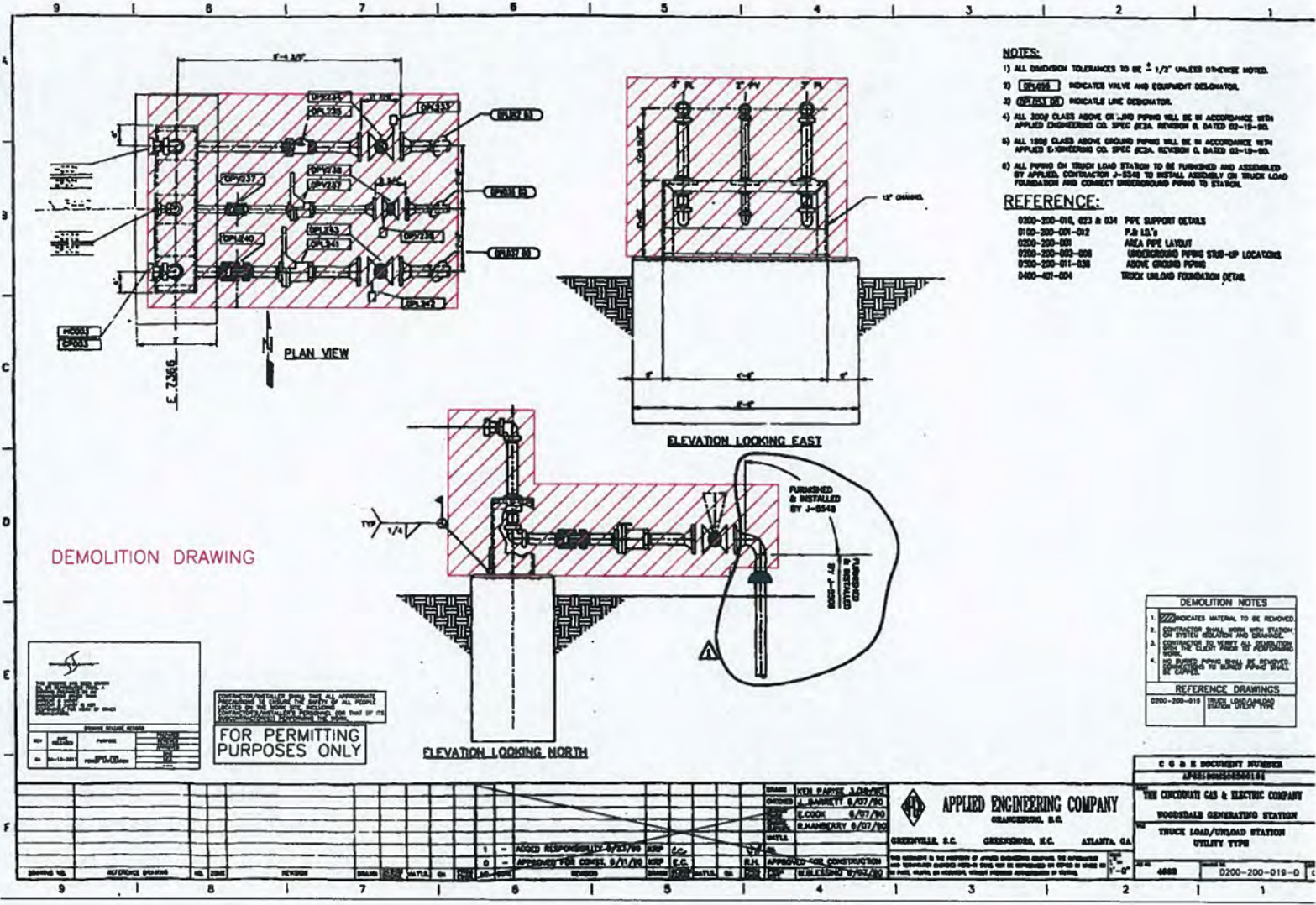
- REFERENCE:**
- D100-200-001-012 P & I D's
 - D200-200-001 AREA PIPE LAYOUT
 - D200-200-002-005 UNDERGROUND PIPING STUB-UP'S
 - D200-200-011-036 ABOVE GROUND PIPING



NO.	DESCRIPTION	DATE	BY	CHKD.	APPV.
4	DOORER PIPING	11/16/81	W.B.	W.B.	W.B.
3	DOORER PIPING	06/22/81	W.B.	W.B.	W.B.
2	ADD SOL. VLV & STR.	07/21/81	W.B.	W.B.	W.B.
1	APPROVE FOR CONSTRUCTION	9/13/81	W.B.	W.B.	W.B.
0	CONCEPT FILE	10/03/80	W.B.	W.B.	W.B.

DRWING NO.	APPROVED DRAWING	NO. 200	REVISION	DATE	BY	CHKD.	APPV.
9		8		7		6	

<p>APPLIED ENGINEERING COMPANY ORANGEBURG, S.C.</p> <p>GREENVILLE, S.C. GREENSBORO, N.C. ATLANTA, GA.</p>	C & E DOCUMENT NUMBER	APR87D02058400104
	THE CINCINNATI GAS & ELECTRIC COMPANY	
	WOODDALE GENERATING STATION	
	FLARE STATION DETAIL & ELEVATION	
<p>THIS DRAWING IS THE PROPERTY OF APPLIED ENGINEERING COMPANY. THE INFORMATION AND KNOWLEDGE CONTAINED HEREIN IS SOLELY FOR THE USE OF THE CLIENT AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT WRITTEN PERMISSION OF APPLIED ENGINEERING COMPANY.</p>	<p>APPROVED FOR CONSTRUCTION</p> <p>W. BRESSING 10/15/80</p>	<p>DATE</p> <p>10/15/80</p> <p>BY</p> <p>W. BRESSING</p>



- NOTES:**
- 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/2"$ UNLESS OTHERWISE NOTED.
 - 2) **OPV** INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 - 3) **OPV** INDICATES LINE DESIGNATOR.
 - 4) ALL 200# CLASS ABOVE OR LOW PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC (ISA, REVISION 0, DATED 02-18-95).
 - 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC (ISA, REVISION 0, DATED 02-18-95).
 - 6) ALL PIPING ON TRUCK LOAD STATION TO BE FURNISHED AND ASSEMBLED BY APPLIED CONTRACTOR J-8548 TO INSTALL ASSEMBLY ON TRUCK LOAD FOUNDATION AND CONNECT UNDERGROUND PIPING TO STATION.
- REFERENCE:**
- 0200-200-010, 023 & 024 PPE SUPPORT DETAILS
 - 0100-200-001-012 P.B. I.D.'S
 - 0200-200-001 AREA PIPE LAYOUT
 - 0200-200-002-008 UNDERGROUND PIPING STOP-UP LOCATIONS
 - 0200-200-011-028 ABOVE GROUND PIPING
 - 0400-021-024 TRUCK UNLOAD FOUNDATION DETAIL

DEMOLITION DRAWING

FOR PERMITTING PURPOSES ONLY

DEMOLITION NOTES	
1. Hatched area indicates material to be removed.	
2. CONTRACTOR SHALL VERIFY WITH LOCATION OF EXISTING UTILITIES AND CONNECTIONS.	
3. EXISTING CLEAN VALVES TO REMAIN.	
4. NO EXISTING PIPING SHALL BE SPOTTED OR REWORKED TO MATCH PIPING SHALL BE EXPOSED.	
REFERENCE DRAWINGS	
0200-200-010	PIPE SUPPORT DETAILS
0100-200-001-012	P.B. I.D.'S
0200-200-001	AREA PIPE LAYOUT
0200-200-002-008	UNDERGROUND PIPING STOP-UP LOCATIONS
0200-200-011-028	ABOVE GROUND PIPING
0400-021-024	TRUCK UNLOAD FOUNDATION DETAIL

NO.	DATE	BY	REVISION
1	8/1/78	J.P.	ISSUED FOR PERMITTING PURPOSES ONLY

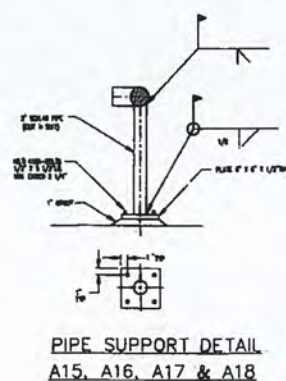
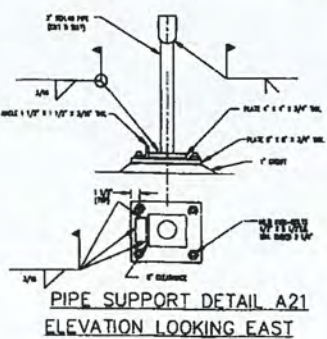
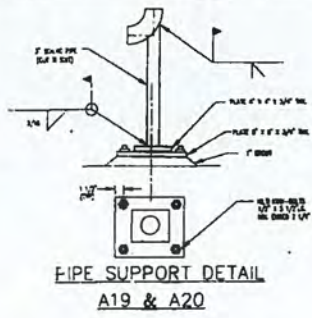
NO.	DATE	BY	REVISION	DESCRIPTION	APPROVED FOR CONSTRUCTION	DATE	BY	DESCRIPTION
1	8/1/78	J.P.		ISSUED FOR PERMITTING PURPOSES ONLY				

APPLIED ENGINEERING COMPANY
GREENVILLE, S.C.

THE CONSOLIDATED GAS & ELECTRIC COMPANY
WOODDALE GENERATION STATION
TRUCK LOAD/UNLOAD STATION
UTILITY TYPE

GREENVILLE, S.C. GREENBORO, S.C. ATLANTA, GA.

4888 0200-200-010-0

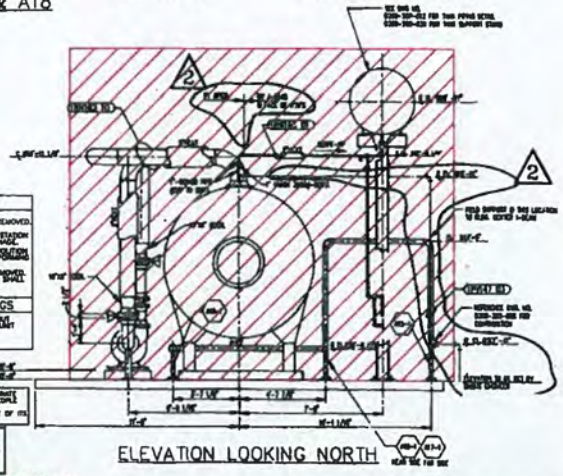
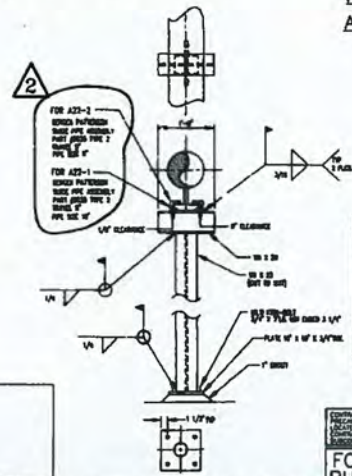
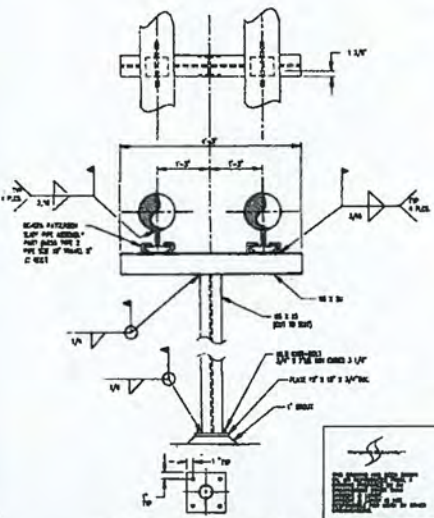


NOTES:

- 1) DIMENSION TOLERANCES $\pm 1/2"$.
- 2) ALL PIPING SHOWN IS TYPICAL FOR ALL SIX BOILER ROOM LOCATIONS (EXCLUDING EAST COORDINATES, WHICH WILL BE SPACED AT 66'-0" CENTERS).
- 3) ALL PIPING ON THIS DRAWING TO BE FURNISHED AND INSTALLED BY ABOVE GROUND CONTRACTOR J-1548.
- 4) ALL 300# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #22A, REVISION 0, DATED 02-19-90.
- 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC #22A, REVISION 0, DATED 02-19-90.
- 6) (V) INDICATES VALVE AND EQUIPMENT DESIGNATOR.
- 7) (P) INDICATES LINE DESIGNATOR.

REFERENCES:

- D100-200-001 THRU 012 P. & I/D'S UNDERGROUND PIPING STUB-UP'S
 D200-200-008 AREA PIPING LAYOUT
 D200-200-001 BOILER ROOM LAYOUT PLAN VIEW
 D200-200-020 BOILER ROOM ELEV. LOOKING EAST
 D200-200-017 MODULE DETAIL LAYOUT
 D200-200-013 THRU 016 TURBINE PIPING DETAIL
 D200-200-011 COMPRESSION TANK DETAILS
 D200-200-012



DEMOLITION NOTES

1. INDICATES MATERIAL TO BE REMOVED.
2. CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL LOCAL ORDINANCES AND REGULATIONS.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATIONS OF ALL PIPING AND EQUIPMENT TO BE REMOVED.
4. THE REMOVAL SHALL BE IN ACCORDANCE WITH ALL LOCAL ORDINANCES AND REGULATIONS.

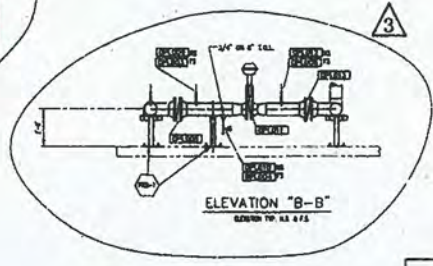
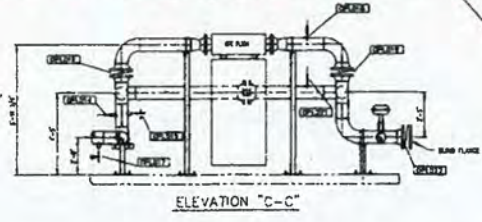
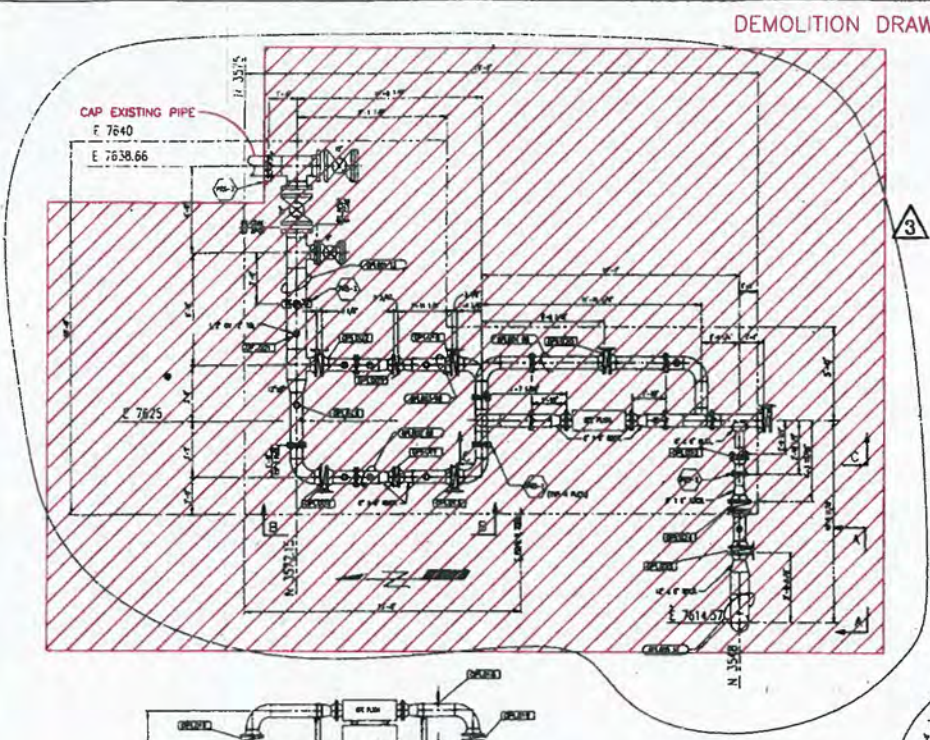
REFERENCE DRAWINGS

D200-200-021 BOILER ROOM LAYOUT PLAN VIEW

NO.	DATE	BY	CHKD.	APP'D.	REVISION
1	02/15/90	E.C.	KAP	E.C.	REV. PER CLIENT
2	02/25/90	E.C.	KAP	E.C.	APPROV. FOR CONSTRUCTION

9		8		7		6		5		4		3		2		1																			
<p>APPLIED ENGINEERING COMPANY ORANGEBURG, S.C.</p> <p>GREENVILLE, S.C. CRESSKOPF, N.C. ATLANTA, GA.</p>																																			
<p>DEMOLITION DRAWING (TYP. ALL UNITS)</p>																																			
<p>FOR PERMITTING PURPOSES ONLY</p>																																			
<p>REVISIONS:</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>CHKD.</th> <th>APP'D.</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>02/15/90</td> <td>E.C.</td> <td>KAP</td> <td>E.C.</td> <td>REV. PER CLIENT</td> </tr> <tr> <td>2</td> <td>02/25/90</td> <td>E.C.</td> <td>KAP</td> <td>E.C.</td> <td>APPROV. FOR CONSTRUCTION</td> </tr> </tbody> </table>																		NO.	DATE	BY	CHKD.	APP'D.	REVISION	1	02/15/90	E.C.	KAP	E.C.	REV. PER CLIENT	2	02/25/90	E.C.	KAP	E.C.	APPROV. FOR CONSTRUCTION
NO.	DATE	BY	CHKD.	APP'D.	REVISION																														
1	02/15/90	E.C.	KAP	E.C.	REV. PER CLIENT																														
2	02/25/90	E.C.	KAP	E.C.	APPROV. FOR CONSTRUCTION																														
<p>CG & E DOCUMENT NUMBER AP02100200100100</p> <p>THE CINCINNATI GAS & ELECTRIC COMPANY WOODSBALK GENERATING STATION</p> <p>BOILER ROOM LAYOUT NORTH ELEVATION UNIT #1 THRU #6 (TYP.)</p>																																			

DEMOLITION DRAWING



REV	DATE	DESCRIPTION
1	06-10-90	ISSUED FOR PERMITTING

DEMOLITION NOTES

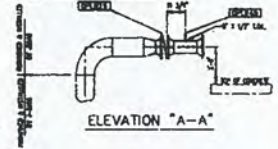
1. (XXXX) INDICATES MATERIAL TO BE REMOVED.
2. (XXXX) INDICATES VALVE AND MISC. EQUIP. TO BE REMOVED.
3. (XXXX) INDICATES PIPE TO BE REMOVED.
4. (XXXX) INDICATES PIPE TO BE REMOVED TO A SPECIFIED ELEVATION.

REFERENCE DRAWINGS

0200-200-023	PIPE SUPPORT DETAILS
0200-200-024	FOUNDATION DETAIL
0200-200-025	AREA PIPE LAYOUT
0200-200-026	UNDERGROUND PIPING STUD-UP LOGS
0200-200-027	P. & I'S
0200-200-028	PIPE SUPPORT SCHEDULE

- NOTES:**
- 1) DIMENSION TOLERANCES TO BE ± 1/16" UNLESS OTHERWISE NOTED
 - 2) COORDINATE TOLERANCES TO BE ± 3" UNLESS OTHERWISE NOTED
 - 3) ALL 150# CLASS ABOVE GROUND PIPING SHALL BE IN ACCORDANCE WITH APPLICABLE EDITIONS OF SPEC. SECT. 02-11.10-10.
 - 4) ALL 150# CLASS ABOVE GROUND PIPING SHALL BE IN ACCORDANCE WITH APPLICABLE EDITIONS OF SPEC. SECT. 02-11.10-10.
 - 5) (XXXX) INDICATES LINE NUMBER DESIGNATOR.
 - 6) (XXXX) INDICATES VALVE AND MISC. EQUIP. DESIGNATOR.
 - 7) (XXXX) INDICATES PIPE SUPPORT TAG NUMBER.
 - 8) ALL DRAIN VALVES REQ. PIPE SIZE 2 1/4" DIA. AND 3/4" X 3" THE NIPPLE.
 - 9) ALL HYDRO'S REQ. PIPE SIZE 2 1/2" DIA.

FOR PERMITTING PURPOSES ONLY

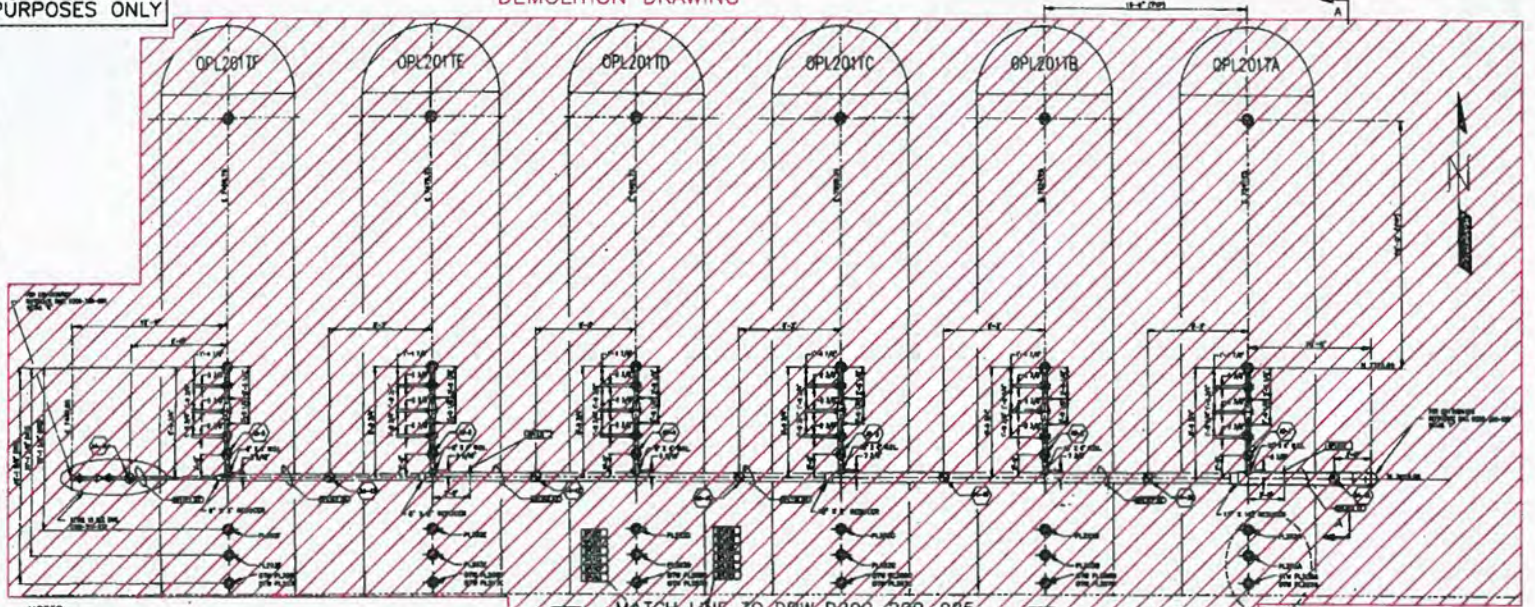


C & E DOCUMENT NUMBER	APER100M305200103
THE CONCRETE GAS & ELECTRIC COMPANY	WOODDALE GENERATING STATION
APPLIED ENGINEERING COMPANY	ORANDEBURG, S.C.
GRANDVILLE, S.C.	GREENSBORO, N.C.
ATLANTA, GA.	
DATE	0200-200-022-D

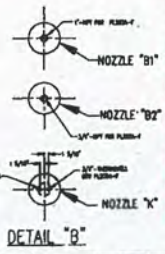
DESIGNED BY	WEN PARKS	DATE	10/20/90
CHECKED BY	BARRETT	DATE	6/11/90
APPROVED BY	COOK	DATE	6/11/90
REVISIONS	REVISIONS	DATE	6/11/90

FOR PERMITTING PURPOSES ONLY

DEMOLITION DRAWING



- NOTES:**
- 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/8"$ UNLESS OTHERWISE NOTED.
 - 2) INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 - 3) INDICATES LINE DESIGNATOR.
 - 4) ALL 200# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. (ISA, REVISION A, DATED 02-10-90).
 - 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. (ISA, REVISION C, DATED 02-10-90).
 - 6) ALL PIPING ON THIS DRAWING TO BE FURNISHED AND INSTALLED BY CONTRACTOR - 2-BASE.
 - 7) INDICATES PIPE SUPPORT LOCATION.
 - 8) ALL PIPE SUPPORT LOCATIONS TO BE 4" TO 6" TO ALLOW FOR CLEARANCE OF INSTRUMENTATION INTERFERENCE.
 - 9) INDICATES PIPE SUPPORT TAG NUMBER.
 - 10) ALL TYPICAL PIPE SUPPORT DETAIL.



MATCH LINE TO DRAW D200-200-025

- REFERENCE:**
- D200-200-010, 012 & 014 PIPE SUPPORT DETAILS
 - D200-200-020-012 P.A. L&L'S
 - D200-200-001 AREA PIPE LAYOUT
 - D200-200-002-008 UNDERGROUND PIPING SUB-UP LOCATIONS
 - D200-200-011-010 ABOVE GROUND PIPING
 - D200-200-013 PIPE SUPPORT SCHEDULE
 - D200-200-009 PIPE SUPPORT LOCATIONS & IDENTIFICATION

- DEMOLITION NOTES**
1. INDICATED MATERIAL TO BE REMOVED
 2. CONTRACTOR SHALL VERIFY THE EXISTENCE OF ALL PIPING AND REMOVE THE SAME TO THE EXISTING FACE OF ADJACENT WALLS.
 3. TO BE REMOVED BY CONTRACTOR AS SHOWN ON THIS DRAWING.

REFERENCE DRAWINGS

- D200-200-024 PROPANE TANK LAYOUT

C & E DOCUMENT NUMBER
APR2100M008-001008

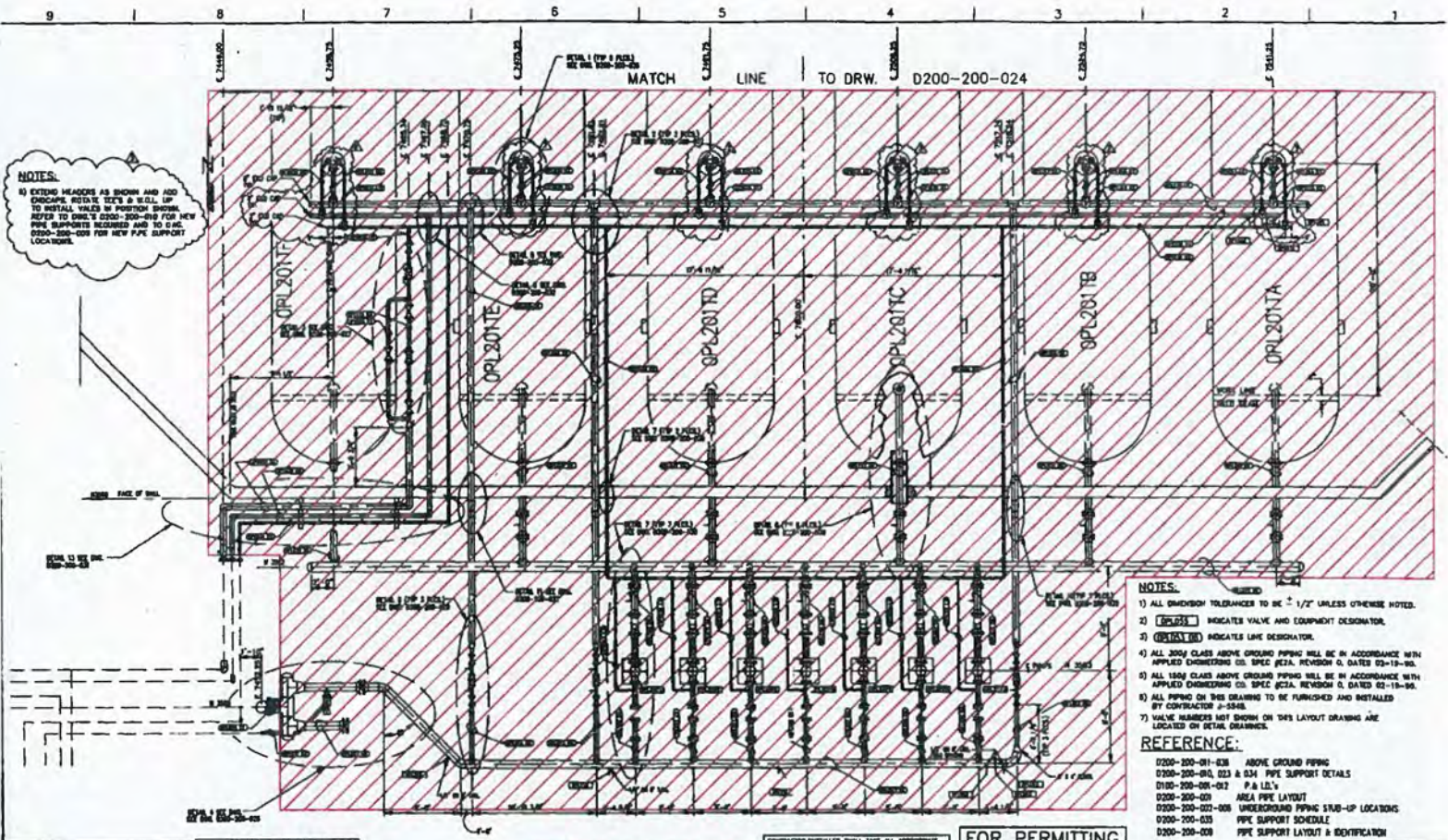
THE CHOCOLATI GAS & ELECTRIC COMPANY
WOODSDALE GENERATING STATION

PROPANE TANK LAYOUT
PLAN & ELEVATION

NO.	DATE	REVISION	BY	CHKD.	APP'D.	DESCRIPTION
2	9/25/90	REV. PER CLIENT	J.P.	J.P.	J.P.	
1	8/13/90	APPROVED FOR CONSTRUCTION	J.P.	J.P.	J.P.	
0	3/26/90	COMMENT ISSUE	J.P.	J.P.	J.P.	

DESIGNED	J.P.	DATE	9/25/90
CHECKED	J.P.	DATE	9/25/90
ENGINEER	J.P.	DATE	9/25/90
APPROVED FOR CONSTRUCTION	J.P.	DATE	9/25/90

APPLIED ENGINEERING COMPANY	ORANGEBURG, S.C.
GREENVILLE, S.C.	GREENSBORO, N.C.
ATLANTA, GA.	



NOTES:
 1) EXTEND HEADERS AS SHOWN AND ADD CHANGES WITHIN 10' OF W.E.L.L. UP TO INSTALL VALVES IN PROPOSED SPACES. REFER TO DRW.'S D200-200-010 FOR NEW PIPE SUPPORTS REQUIRED AND TO E.C. D200-200-008 FOR NEW PIPE SUPPORT LOCATIONS.

NOTES:
 1) ALL DIMENSION TOLERANCES TO BE $\pm 1/2"$ UNLESS OTHERWISE NOTED.
 2) **OPV** INDICATES VALVE AND EQUIPMENT DESIGNATOR.
 3) **ORL** INDICATES LINE DESIGNATOR.
 4) ALL 200# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. REVISION D, DATED 02-18-90.
 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH APPLIED ENGINEERING CO. SPEC. REVISION D, DATED 02-18-90.
 6) ALL PIPING ON THIS DRAWING TO BE FURNISHED AND INSTALLED BY CONTRACTOR J-5548.
 7) VALVE NUMBERS NOT SHOWN ON THIS LAYOUT DRAWING ARE LOCATED ON OTHER DRAWINGS.

REFERENCE:
 D200-200-011-CB ABOVE GROUND PIPING
 D200-200-012, D24 PIPE SUPPORT DETAILS
 D100-200-001-012 P & I E.L.V.
 D200-200-009 AREA PIPE LAYOUT
 D200-200-002-006 UNDERGROUND PIPING STR-UP LOCATIONS
 D200-200-003 PIPE SUPPORT SCHEDULE
 D200-200-008 PIPE SUPPORT LAYOUT & IDENTIFICATION

DEMOLITION NOTES	
1	INDICATED MATERIAL TO BE REMOVED
2	CONTRACTOR SHALL VERIFY WITH 200# OR 150# PIPING DESIGN AND MATERIAL CONTRACTOR TO VERIFY ALL DIMENSIONS TO BE REMOVED
3	TO BE REMOVED SHALL BE IDENTIFIED BY CONTRACTOR

REFERENCE DRAWINGS	
D200-200-002	UNDERGROUND PIPING STR-UP LOCATIONS
D200-200-003	PIPE SUPPORT SCHEDULE
D200-200-008	PIPE SUPPORT LAYOUT & IDENTIFICATION

DEMOLITION DRAWING

FOR PERMITTING PURPOSES ONLY

NO.	DESCRIPTION	DATE	BY	CHKD.	APP'D.
3	MAINWAY PIPE ROUTING 11/18/90	11/18/90	KEN PARSONS	J. SPOWETT	8/12/90
2	REV. PIPE BRIDGE 01/23/91	01/23/91	E. COOK	8/12/90	
1	APPRO. FOR CONSTRUCTION 01/19/90	01/19/90	J. H. HANCOCK	8/12/90	
0	CONCEPT DESIGN 3/14/90	3/14/90	E.C.	J.A.	

APPLIED ENGINEERING COMPANY
 ORANGEBURG, S.C.

GREENVILLE, S.C. GREENSBORO, S.C. ATLANTA, GA.

THIS DRAWING IS THE PROPERTY OF APPLIED ENGINEERING COMPANY. THE INFORMATION AND KNOWLEDGE HEREON ARE TO BE FURNISHED BY CONTRACTOR TO BE USED IN THE PROJECT ONLY, AND NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSIBLE PERMISSION IN WRITING.

C & E DOCUMENT NUMBER	
AP88100808000103	

THE CONCRETE GAS & ELECTRIC COMPANY
 WOODDALE GENERATING STATION
 PROPANE TANK PIPING LAYOUT
 PLAN VIEW

4688 D200-200-025-0 0A

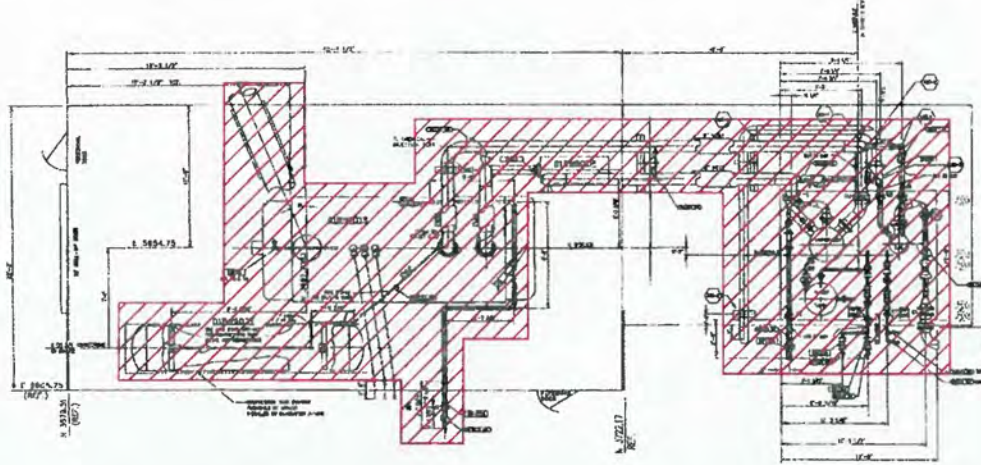
FOR PERMITTING PURPOSES ONLY

NOTES:

- 1) DIMENSION TOLERANCES ± 1/8"
- 2) ALL PIPING SHALL BE TYPICAL FOR ALL BOILER ROOM LOCATIONS (EXCLUDING EAST COORDINATE) WHICH WILL BE SPACED AT 48" ON CENTER.
- 3) ALL PIPING ON THIS DRAWING TO BE FURNISHED AND INSTALLED BY THE BOILER ROOM CONTRACTOR.
- 4) ALL 200# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH AMERICAN ENGINEERING CO. SPEC. #33A, PARAGRAPH 3, DATED 10-19-80.
- 5) ALL 150# CLASS ABOVE GROUND PIPING WILL BE IN ACCORDANCE WITH AMERICAN ENGINEERING CO. SPEC. #33A, PARAGRAPH 3, DATED 10-19-80.
- 6) (S) INDICATES VALVE AND EQUIPMENT CONNECTION.
- 7) (S) INDICATES LINE CONNECTION.
- 8) (A) INDICATES PIPE SUPPORT TAG NUMBER.
- 9) SEE DWG. NO. 2250-300-001 FOR BOILER ROOM AREA PIPE SUPPORT DETAILS.
- 10) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELIEF AND SPARING PIPING AS NECESSARY.
- 11) FOR BLENDING NOT SHOWN REFERENCE ASSEMBLY LAYOUTS AND SECT.
- 12) PER 8 TO ROUTE AND SUPPORT RELIEF LINE TO OPENED TANK. SHARPEN & LEAN TO LOCK. SPRAY: 6" DIA. WITHIN 30' OF RELIEF VALVE IN-AREA 100001.

CONNECTION SCHEDULE

- 1 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB
- 2 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB
- 3 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB
- 4 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB
- 5 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB
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- 98 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB
- 99 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB
- 100 - 1" - 150# CLASS - PROPANE VAPOR TO PLUMB



DEMOLITION NOTES

1. DEMOLISH MATERIAL TO BE REMOVED.
2. DEMOLISH MATERIAL WITH STATION ON SYSTEM.
3. DEMOLISH MATERIAL WITH THE CONNECTION TO REMAIN IN PLACE.
4. DEMOLISH MATERIAL WITH THE CONNECTION TO REMAIN IN PLACE.
5. DEMOLISH MATERIAL WITH THE CONNECTION TO REMAIN IN PLACE.
6. DEMOLISH MATERIAL WITH THE CONNECTION TO REMAIN IN PLACE.

REFERENCE DRAWINGS

M-175 BOILER ROOM LAYOUT FOR REF

DEMOLITION DRAWING TYP. FOR ALL UNITS

NOTES:

1. THIS DRAWING IS A PERMIT DRAWING FOR THE BOILER ROOM LAYOUT. IT IS NOT TO BE USED FOR CONSTRUCTION OF THE BOILER ROOM.

- REFERENCES:**
- ASME SECTION I - 1980 EDITION
 - ASME SECTION VIII - 1980 EDITION
 - ASME SECTION IX - 1980 EDITION
 - ASME SECTION X - 1980 EDITION
 - ASME SECTION XI - 1980 EDITION
 - ASME SECTION XII - 1980 EDITION
 - ASME SECTION XIII - 1980 EDITION
 - ASME SECTION XIV - 1980 EDITION
 - ASME SECTION XV - 1980 EDITION
 - ASME SECTION XVI - 1980 EDITION
 - ASME SECTION XVII - 1980 EDITION
 - ASME SECTION XVIII - 1980 EDITION
 - ASME SECTION XIX - 1980 EDITION
 - ASME SECTION XX - 1980 EDITION
 - ASME SECTION XXI - 1980 EDITION
 - ASME SECTION XXII - 1980 EDITION
 - ASME SECTION XXIII - 1980 EDITION
 - ASME SECTION XXIV - 1980 EDITION
 - ASME SECTION XXV - 1980 EDITION
 - ASME SECTION XXVI - 1980 EDITION
 - ASME SECTION XXVII - 1980 EDITION
 - ASME SECTION XXVIII - 1980 EDITION
 - ASME SECTION XXIX - 1980 EDITION
 - ASME SECTION XXX - 1980 EDITION

REV	DATE	DESCRIPTION
1	10-11-80	ISSUED FOR PERMITTING PURPOSES

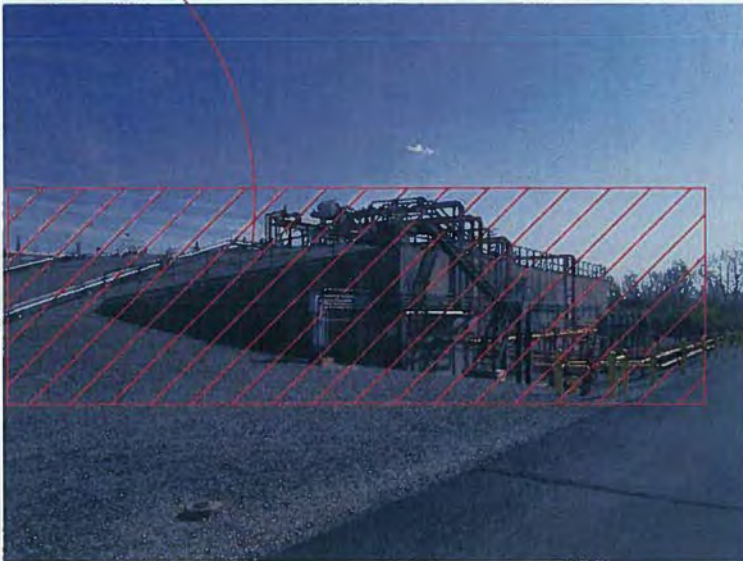
CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO PROTECT THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR/INSTALLER'S PERSONNEL, FOR THE USE OF ITS SUBCONTRACTORS' PERSONNEL ON THE WORK.

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR PERMITTING PURPOSES	10-11-80	J. S. [Signature]

FOR PERMITTING PURPOSES ONLY

DEMOLITION DRAWING

SIX (6) BURIED PROPANE STORAGE TANKS



CAP UNDERGROUND SUPPLY PIPE HERE

PROPANE STORAGE AND FORWARDING AREA

- DEMOLITION NOTES**
1. Hatched area indicates material to be removed.
 2. CONTRACTOR SHALL WORK WITH STATION ON SYSTEM ISOLATION AND DRAINAGE.
 3. CONTRACTOR TO VERIFY ALL DEMOLITION WITH THE CLEAR AREA TO PERFORMED WORK.
 4. ALL BURIED PIPING SHALL BE REMOVED. CONDITIONS TO BURIED PIPING SHALL BE CAPPED.
- REFERENCE DRAWINGS**
- 2200-200-024 - PROPANE TANK LAYOUT PLAN & ELEVATION - DEMOLITION
 - 2200-200-025 - PROPANE TANK PIPING LAYOUT PLAN VIEW - DEMOLITION

PROPANE TANKS & FEED PUMPS FUEL OIL ADDITION PROJECT DEMOLITION DRAWINGS

WOODSDALE GENERATING STATION

DUKE ENERGY

DATE	BY	CHKD	APP'D

MSK-041417-001 0A

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE INCLUDING CONTRACTOR'S OWN PERSONNEL. FOR THAT OF ITS OWNERS AND THE PUBLIC.

FOR PERMITTING PURPOSES ONLY

DEMOLITION DRAWING



DEMO PROPANE BOILER STACKS
ONE (1) PER UNIT FOR TOTAL OF SIX (6)

PROPANE BOILER BUILDING AREA

- DEMOLITION NOTES**
1. HATCHING INDICATES MATERIAL TO BE REMOVED.
 2. CONTRACTOR SHALL WORK WITH STATION ON SYSTEM ISOLATION AND DRAINAGE.
 3. CONTRACTOR TO VERIFY ALL DEMOLITION WITH THE CLIENT PRIOR TO PERFORMING WORK.

REFERENCE DRAWINGS

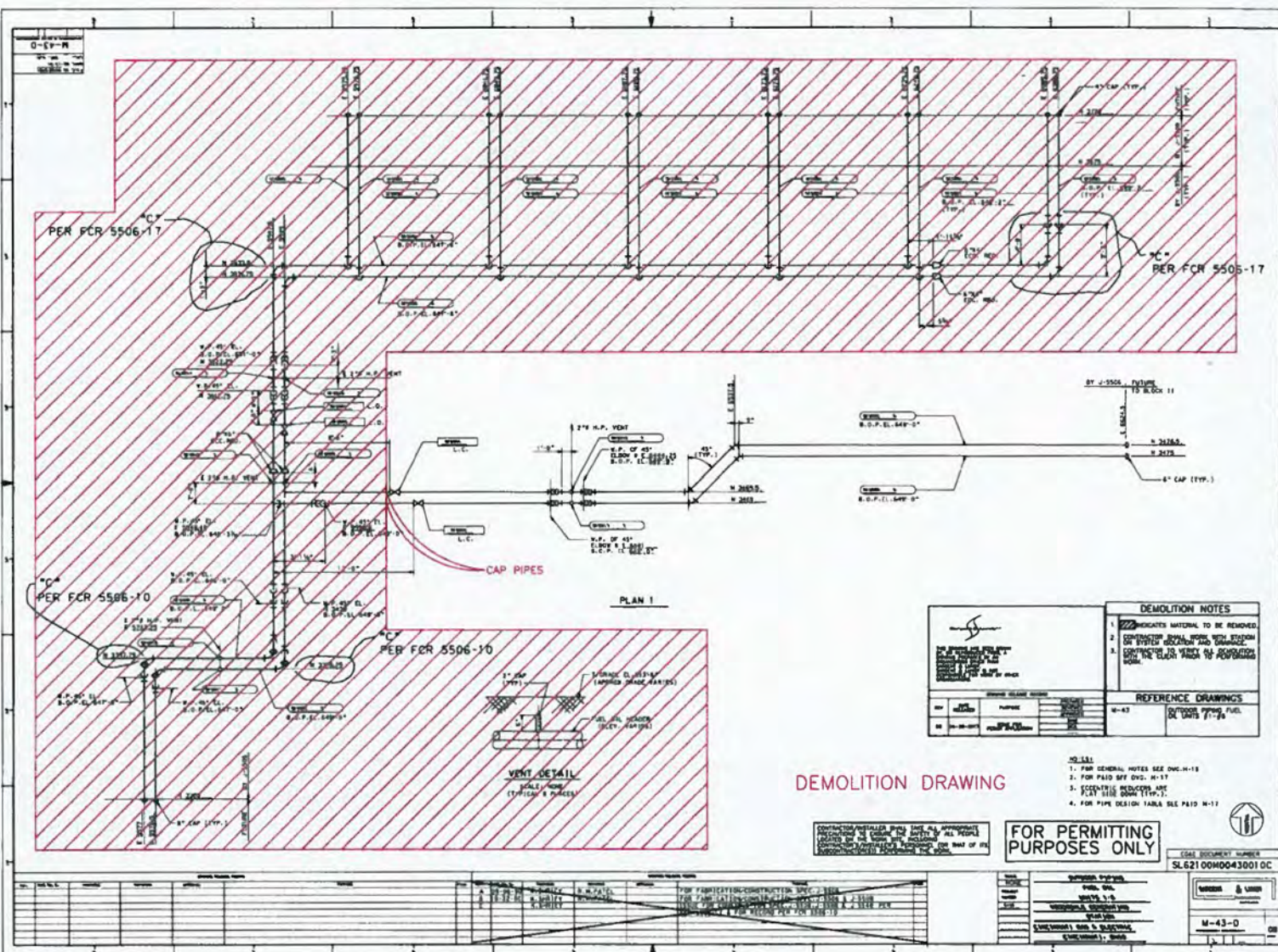
PROPANE BOILER STACK FUEL OIL ADDITION PROJECT DEMOLITION DRAWING

WOODSDALE GENERATING STATION

DUKE ENERGY

DATE	BY	CHKD	APP'D

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S PARTIAL/EMP'S PERSONNEL. (SEE THAT OF THE CONTRACTOR'S OWNERS, THE STATE, AND FEDERAL AGENCIES)



DESTRUCTION NOTES	
1	INDICATES MATERIAL TO BE REMOVED
2	CONTRACTOR SHALL VERIFY WITH STUDENT ON SYSTEM DESIGN AND DRAINAGE
3	CONTRACTOR TO VERIFY ALL PROVISIONS WITH THE CLEARANCE OF APPROVED
REFERENCE DRAWINGS	
M-63	ON-THE-SPOT FUEL
	DATE: 1/28

- NO. 131
- FOR GENERAL NOTES SEE DWG. H-13
 - FOR PAID BY DWG. H-17
 - CONCENTRIC REDUCERS ARE FCA 1118 DWG. (TYP.)
 - FOR PIPE DESIGN TABLES SEE PAID H-11

FOR PERMITTING PURPOSES ONLY

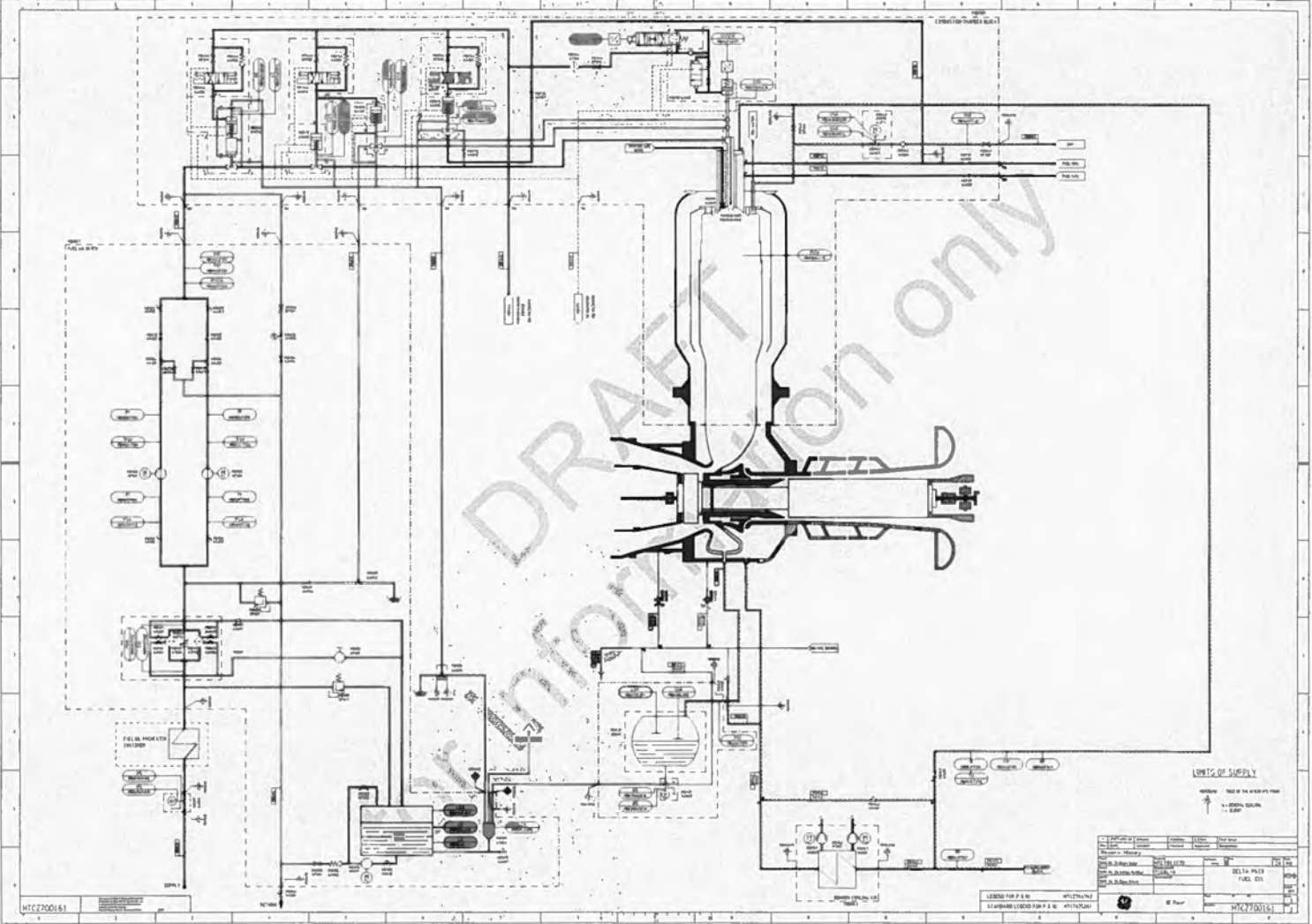
CS&S DOCUMENT NUMBER
SL621 00M0043001 0C

NO.	DATE	DESCRIPTION	BY	CHECKED
1	1/28	ISSUED FOR PERMITTING PURPOSES ONLY		

Appendix F Project Schedule

Woodsdale Fuel Oil System Installation		Duke Energy Woodsdale Fuel Oil System				Gantt Chart																	
Activity ID	Activity Name	Start	End	Finish	Predecessors	2017			2018			2019			2020								
						J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Woodsdale Fuel Oil System Installation																							
Project Initiation		75d	05-Jul-16 A	07-May-17																			
002	Project Authorized (LNTF)	0d		28-Jul-16 A																			
003	Data & Drawing Collection	10d	01-Aug-16 A	12-Aug-16 A	002																		
004	Site Kickoff Meeting & Walkdown	0d		15-Aug-16 A	003																		
005	Project Authorization (FNTP)	0d		16-Sep-16 A	108																		
BOP Engineering & Design (LNTF)		71d	15-Sep-16 A	27-Dec-16 A																			
007	Design Criteria Development	33d	15-Sep-16 A	01-Nov-16 A	003																		
008	QA Development	41d	27-Oct-16 A	27-Dec-16 A	007																		
009	Update Project Cost Estimate	18d	21-Oct-16 A	11-Nov-16 A	007																		
010	Update Project Schedule	6d	29-Oct-16 A	02-Nov-16 A	007																		
Major Project Milestones		75d	23-Jan-17 A	22-Apr-17																			
012	Duke Project Whitepaper Submittal	0d		23-Jan-17 A																			
013	TRC Review & Approval	20d	25-Jan-17 A	21-Feb-17 A																			
015	Duke Air & Water Permit Application	0d		28-Feb-17																			
016	Engineering & Permitting Complete for CPCN Filing	0d		14-Apr-17																			
017	CPCN Petition Filing	0d		05-May-17																			
018	Anticipated CPCN Approval	0d		01-Dec-17																			
019	Purchase Long Lead Materials & Equipment	0d		15-Dec-17																			
020	Obtain Air & Water Permits Approvals	0d		15-Dec-17																			
021	Start of Construction	0d	28-Feb-18		167																		
022	Engineering & Design Complete (IFC Deliverables)	0d		30-Mar-18	041, 051, 106																		
022.1	Unit 1 & 2 Outage	32d	15-Nov-18	14-Dec-18																			
022.2	Unit 3 & 4 Outage	22d	01-Mar-19	01-Apr-19																			
022.3	Unit 5 & 6 Outage	22d	15-Mar-19	15-Apr-19																			
024	Units 1-6 Construction Complete	0d		23-Apr-18	174																		
025	Unit 1-6 In-Service	0d		22-Apr-18	173.3																		
BOP Engineering & Design (FNTP)		315d	05-Jan-17 A	30-Mar-18																			
Mechanical		215d	05-Jan-17 A	30-Mar-18																			
Mechanical Detailed Design		315d	05-Jan-17 A	30-Mar-18																			
029	Demolition & Relocation Drawings (CPCN)	72d	06-Jan-17 A	17-Apr-17	005, 008, 016																		
030	Demolition & Relocation Drawings (Construction)	38d	05-May-17	28-Jun-17	017																		
031	Mechanical Equipment Location Drawing(s)	20d	18-Oct-17	14-Nov-17	118, 144																		
032	Mechanical General Notes & Details	40d	01-Dec-17	26-Jan-18	005, 008, 016																		
PAIDs		133d	22-Feb-17	18-Jul-17																			
034	CPCN PAID Package	40d	22-Feb-17	18-Apr-17	116																		
035	PAIDs Symbols Sheet	50d	27-Mar-17	05-Jun-17	007, 119																		
036	Fuel Oil PAIDs	80d	27-Mar-17	18-Jul-17	119																		
037	Instrument and/or Service Air PAIDs	80d	27-Mar-17	18-Jul-17	119																		
038	Fuel Oil Feed, Recirculation, & Drains PAID	80d	27-Mar-17	18-Jul-17	119																		
178	Misc BOP Systems PAIDs	80d	27-Mar-17	18-Jul-17	119																		
Piping Instruments (LI)		143d	05-Jul-17	30-Sep-18																			
040	Fuel Oil Unloading & Transfer Piping (LB) - Prepare & Bid Issue	80d	02-Aug-17	25-Oct-17	038																		
041	Fuel Oil Unloading & Transfer Piping (LB) - Update & IFC	30d	19-Feb-18	30-Mar-18	135, 147, 124.2																		
042	Instrument and/or Service Air Piping (LB) - Prepare & Bid Issue	60d	05-Jul-17	27-Sep-17	027																		
043	Instrument and/or Service Air Piping (LB) - Update & IFC	30d	01-Nov-17	14-Dec-17	123																		
044	Fuel Oil Feed, Recirculation, & Drains Piping (LB) - Prepare & Bid Issue	80d	05-Jul-17	27-Sep-17	038																		
045	Fuel Oil Feed, Recirculation, & Drains Piping (LB) - Update & IFC	30d	15-Dec-17	26-Jan-18	123, 135																		
180	Misc BOP Systems Piping - Prepare & Bid Issue	60d	05-Jul-17	27-Sep-17	179																		
181	Misc BOP Systems Piping - Update & IFC	30d	01-Nov-17	14-Dec-17	123																		
Pipe Supports		133d	21-Sep-17	20-May-18																			
047	Small Bore Pipe Routing & Support Cookbook	20d	18-Oct-17	14-Nov-17	161																		
048	Fuel Oil Unloading & Transfer Pipe Supports (LB) - Prepare & Bid Issue	40d	21-Sep-17	15-Nov-17	040																		
049	Instrument and/or Service Air Supports (LB) - Prepare & Bid Issue	40d	28-Sep-17	22-Nov-17	042																		
050	Fuel Oil Feed, Recirculation, & Drains Supports (LB) - Prepare & Bid Issue	40d	28-Sep-17	22-Nov-17	044																		

Appendix G General Electric System Drawing



UNITS OF SUPPLY

NOTE: SEE THE WORK FOR THE

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1	DELTA P-112				
2	FUEL OIL				

UNITS OF SUPPLY

NOTE: SEE THE WORK FOR THE

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1	DELTA P-112				
2	FUEL OIL				

UNITS OF SUPPLY

NOTE: SEE THE WORK FOR THE

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1	DELTA P-112				
2	FUEL OIL				

HTCZ700161

UNITS OF SUPPLY


HTCZ700161

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Legend for P&ID

Woodsdale 6 x GT11N Fuel Oil Conversion


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Prepared: 2017-04-27 Mettler	Checked: 2017-04-10 A.Mettler	Customer Document Ident. No.	Rev.: - 2017-04-10	Issue:	Lang: EN
Approved: 2017-04-10 C.Eifert	Derived from:		Resp. Dept.: TSGBC-A	Take over Dept.:	Total Pages: 6
 GE Power			Doc. Type:	Document Ident. No.:	Page:
			Format: A4	HTCZ740762	1


KKS No.	Description	Short description	Function	P&ID / Sh. / Sq. / Rev.	Rev
MBA30AA001	SHOT-OFF VALVE WATER DRAIN	SOV WTR DRN		HTCZ700161 / 1 / H10 / -	
MBA30AA004	SHOT-OFF VALVE WATER DRAIN	SOV WTR DRN		HTCZ700161 / 1 / H09 / -	
MBA31AA003H	POSITION OPEN SHUT-OFF VALVE FUEL/WATER DRAIN	POS FAW DRN SOV OPEN	GS	HTCZ700161 / 1 / L09 / -	
MBA31AA003L	POSITION CLOSE SHUT-OFF VALVE FUEL/WATER DRAIN	POS FAW DRN SOV CL	GS	HTCZ700161 / 1 / J05 / -	
MBA31BB001	TANK FUEL/WATER DRAIN	TANK FWTR DRAIN		HTCZ700161 / 1 / K08 / -	
MBA31CL001	MEASUREMENT LEVEL IN TANK FUEL/WATER DRAIN	LEVEL TANK FWTR DRN	LSA	HTCZ700161 / 1 / J09 / -	
MBA31CL002	MEASUREMENT LEVEL IN TANK FUEL/WATER DRAIN	LEVEL TANK FWTR DRN	LSA	HTCZ700161 / 1 / J09 / -	
MBA31CT001	MEASUREMENT TEMPERATURE FUEL DRAIN	TEMP FUEL DRAIN	TSZ	HTCZ700161 / 1 / K10 / -	
MBH40AA001	BYPASS VALVE	BYPASS VALVE		HTCZ700161 / 1 / L12 / -	
MBH40AA002	WATER DRAIN COCK	WATER DRAIN COCK		HTCZ700161 / 1 / J10 / -	
MBH40CT001	MEASURING POINT TEMPERATURE COOLING AIR BURNER	TEMP CLG AIR BRN	TP	HTCZ700161 / 1 / M13 / -	
MBH41AA001	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / L11 / -	
MBH41AA003	MOTOR SHUT-OFF VALVE BURNER COOLING AIR	MOT SOV BNR CLG AIR		HTCZ700161 / 1 / B12 / -	
MBH41AA003H	POS MOTOR SHUT-OFF VALVE BURNER COOLING AIR OPEN	POS SOV CLGAIR OPEN	GSA	HTCZ700161 / 1 / B11 / -	
MBH41AA003L	POS MOTOR SHUT-OFF VALVE BURNER COOLING AIR CLOSED	POS SOV CLGAIR CL	GSA	HTCZ700161 / 1 / B11 / -	
MBH41AA004	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / B12 / -	
MBH41AC002	BURNER COOLING AIR COOLER	BRNR CLNG COOLER		HTCZ700161 / 1 / L11 / -	
MBH41AH003	HEATER TO SHUT-OFF VALVE BURNER COOLING AIR	HEATER SOV CLNG AIR		HTCZ700161 / 1 / B12 / -	
MBH41AN001	FAN BURNER COOLING AIR COOLER	FAN COOLER CLNG AIR		HTCZ700161 / 1 / L11 / -	
MBH41AN002	FAN BURNER COOLING AIR COOLER	FAN COOLER CLNG AIR		HTCZ700161 / 1 / L12 / -	
MBH41BP002	ORIFICE	ORIFICE		HTCZ700161 / 1 / B13 / -	
MBH41BP006	ORIFICE	ORIFICE		HTCZ700161 / 1 / B11 / -	
MBH41CF001	MEASUREMENT FLOW BURNER COOLING AIR	FLOW BRN CLG AIR	FP	HTCZ700161 / 1 / K14 / -	
MBH41CP001	MEASUREMENT PRESSURE BURNER COOLING AIR	PRESS BRN CLG AIR	PP	HTCZ700161 / 1 / K14 / -	
MBH41CP002	MEASUREMENT PRESSURE BURNER COOLING AIR	PRESS BRN CLG AIR	PIA	HTCZ700161 / 1 / B13 / -	
MBH41CT001	MEASUREMENT TEMPERATURE BURNER COOLING AIR	TEMP BRN CLG AIR	TI	HTCZ700161 / 1 / K13 / -	
MBH41CT001L	MEASUREMENT TEMPERATURE BURNER COOLING AIR	TEMP BRN CLG AIR	TA	HTCZ700161 / 1 / K13 / -	
MBM01	COMBUSTION CHAMBER BLOCK	COMBUSTION CHAMBER BLOCK		HTCZ700161 / 1 / A13 / -	
MBM30AX010	MEASUREMENT COMBUSTOR PULSATION	COMBUSTOR PULSATION	PIZA	HTCZ700161 / 1 / D11 / -	
MBM31AV001	FUEL OIL NOZZLE	FUEL OIL NOZZLE		HTCZ700161 / 1 / C10 / -	
MBM31AV002	FUEL GAS BURNER	FUEL GAS BURNER		HTCZ700161 / 1 / C10 / -	
MBM31AV003	IGNITION TORCH	IGNITION TORCH		HTCZ700161 / 1 / C10 / -	
MBN31	FUEL OIL SUPPLY SYSTEM	FOIL SUPPLY SYSTEM		HTCZ700161 / 1 / H06 / -	
MBN31AA001	MAIN SHUT-OFF VALVE FUEL OIL	MAIN SOV FUEL OIL		HTCZ700161 / 1 / L03 / -	
MBN31AA001H	POSITION MAIN SHUT-OFF VALVE FUEL OIL OPEN	POS MN SOV FOIL OPN	GS	HTCZ700161 / 1 / L02 / -	
MBN31AA001L	POSITION MAIN SHUT-OFF VALVE FUEL OIL CLOSED	POS MN SOV FOIL CL	GS	HTCZ700161 / 1 / L02 / -	
MBN31AA006	DRAIN VALVE FILTER FUEL OIL	DRAIN VALVE FOIL		HTCZ700161 / 1 / J03 / -	

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MBN31AA006	DRAIN VALVE FILTER FUEL OIL	DRAIN VALVE FOIL		HTCZ700161 / 1 / J03 / -	
MBN31AA007	VENT VALVE FILTER FUEL OIL	VENT VALVE FOIL		HTCZ700161 / 1 / J03 / -	
MBN31AA008	VENT VALVE FILTER FUEL OIL	VENT VALVE FOIL		HTCZ700161 / 1 / J03 / -	
MBN31AA012	SWITCH-OVER VALVE FILTER FUEL OIL	SW-OVER VLV FTR FOIL		HTCZ700161 / 1 / J03 / -	
MBN31AA102	ISOLATION VALVE BEFORE FUEL OIL PUMP 1	ISOV BFR FOIL PUMP 1		HTCZ700161 / 1 / H03 / -	
MBN31AA202	ISOLATION VALVE BEFORE FUEL OIL PUMP 2	ISOV BFR FOIL PUMP 2		HTCZ700161 / 1 / H03 / -	
MBN31AP011	FUEL OIL-DRAIN PUMP	FUEL OIL-DRAIN PUMP		HTCZ700161 / 1 / J05 / -	
MBN31AT001	FILTER FUEL OIL	FLTR FOIL		HTCZ700161 / 1 / J03 / -	
MBN31AT002	FILTER FUEL OIL	FLTR FOIL		HTCZ700161 / 1 / J03 / -	
MBN31AX001	SIGHT GLASS	SIGHT GLASS		HTCZ700161 / 1 / J04 / -	
MBN31CP002	MEASUREMENT DIFFERENTIAL PRESSURE FILTER FUEL	DIFF PRESS FLTR FUEL	PDA	HTCZ700161 / 1 / H04 / -	
MBN31CP103	MEASUREMENT PRESSURE BEFORE FUEL OIL PUMP 1	P BFR FOIL PUMP 1	PSA	HTCZ700161 / 1 / G02 / -	
MBN31CP104	MEASUREMENT PRESSURE BEFORE FUEL OIL PUMP 1	P BFR FOIL PUMP 1	PI	HTCZ700161 / 1 / G02 / -	
MBN31CP203	MEASUREMENT PRESSURE BEFORE FUEL OIL PUMP 2	P BFR FOIL PUMP 2	PSA	HTCZ700161 / 1 / G03 / -	
MBN31CP204	MEASUREMENT PRESSURE BEFORE FUEL OIL PUMP 2	P BFR FOIL PUMP 2	PI	HTCZ700161 / 1 / G03 / -	
MBN31DP001	PRESSURE REDUCTION VALVE	PRESS RED VLV		HTCZ700161 / 1 / H04 / -	
MBN32AA002	FILLING/SHUT OFF VALVE	FILL/SHUT OFF VALVE		HTCZ700161 / 1 / B04 / -	
MBN32AA002H	POSITION OPEN FILLING/SHUT-OFF VALVE	POS OPEN SOV	GS	HTCZ700161 / 1 / A04 / -	
MBN32AA002L	POSITION CLOSED FILLING/SHUT-OFF VALVE	POS CLOSE SOV	GS	HTCZ700161 / 1 / A04 / -	
MBN32AA005	TRIP SHUT-OFF VALVE	TRIP SHUT-OFF VALVE		HTCZ700161 / 1 / F14 / -	
MBN32AA005H	POSITION OPEN TRIP SHUT-OFF VALVE	POS OPN TRIP SOV	GSA	HTCZ700161 / 1 / B05 / -	
MBN32AA005L	POSITION CLOSED TRIP SHUT-OFF VALVE	POS CL TRIP SOV	GSA	HTCZ700161 / 1 / B05 / -	
MBN32AA007	CONTROL SERVO MOTOR	CTRL SERVO MOTOR		HTCZ700161 / 1 / B06 / -	
MBN32AA007L	FUEL OIL VALVE POSITION CLOSED	FOIL VLV POS CL	GOS	HTCZ700161 / 1 / B10 / -	
MBN32AA101	MINIMUM FLOW VALVE FUEL OIL PUMP 1	MINFV FOIL PUMP 1		HTCZ700161 / 1 / E03 / -	
MBN32AA102	NON-RETURN VALVE AFTER FUEL OIL PUMP 1	NRV FOIL PUMP 1		HTCZ700161 / 1 / E03 / -	
MBN32AA103	ISOLATION VALVE AFTER FUEL OIL PUMP 1	ISOV AFT FOIL PUMP 1		HTCZ700161 / 1 / E03 / -	
MBN32AA201	MINIMUM FLOW VALVE FUEL OIL PUMP 2	MINFV FOIL PUMP 2		HTCZ700161 / 1 / E03 / -	
MBN32AA202	NON-RETURN VALVE AFTER FUEL OIL PUMP 2	NRV FOIL PUMP 2		HTCZ700161 / 1 / E03 / -	
MBN32AA203	ISOLATION VALVE AFTER FUEL OIL PUMP 2	ISOV AFT FOIL PUMP 2		HTCZ700161 / 1 / E03 / -	
MBN32AP101	FUEL OIL PUMP 1	FUEL OIL PUMP 1		HTCZ700161 / 1 / G03 / -	
MBN32AP201	FUEL OIL PUMP 2	FUEL OIL PUMP 2		HTCZ700161 / 1 / G04 / -	
MBN32AU007	FUEL OIL CONTROL VALE SERVO POSITION	FOIL CV SERVO POS	GC	HTCZ700161 / 1 / A08 / -	
MBN32CF001	MEASUREMENT FUEL OIL FLOW	FUEL OIL FLOW	FQI	HTCZ700161 / 1 / F04 / -	
MBN32CG007	FUEL OIL CONTROL VALVE POSITION	FOIL CTRL V POS	GCSZA	HTCZ700161 / 1 / A10 / -	
MBN32CP001	MEASUREMENT PRESSURE AFTER FUEL OIL PUMPS	P AFT FOIL PUMPS	PISZA	HTCZ700161 / 1 / D03 / -	
MBN32CP100	MEASUREMENT PRESSURE AFTER FUEL OIL PUMP 1	P AFT FOIL PUMP 1	PI	HTCZ700161 / 1 / F03 / -	


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MBN32CP200	MEASUREMENT PRESSURE AFTER FUEL OIL PUMP 2	P AFT FOIL PUMP 2	PI	HTCZ700161 / 1 / F04 / -	
MBN32CT104	MEASUREMENT TEMPERATURE AFTER FUEL OIL PUMP 1	T AFT FOIL PUMP 1	TISA	HTCZ700161 / 1 / F02 / -	
MBN32CT204	MEASUREMENT TEMPERATURE AFTER FUEL OIL PUMP 2	T AFT FOIL PUMP 2	TISA	HTCZ700161 / 1 / F03 / -	
MBN34AA003	VALVE FUEL OIL RETURN CIRCULATION	V FUEL OIL RTN CIRCL		HTCZ700161 / 1 / E04 / -	
MBN34AA004	NON-RETURN VALVE FUEL OIL RETURN CIRCULATION	NRV FUEL OIL RTN		HTCZ700161 / 1 / E04 / -	
MBN34AA005	VALVE FUEL OIL RETURN	V FUEL OIL RETURN		HTCZ700161 / 1 / K03 / -	
MBN34AA101	NON-RETURN VALVE FUEL OIL RETURN	NRV FOIL RETURN		HTCZ700161 / 1 / F14 / -	
MBN34AA201	NON-RETURN VALVE FUEL OIL RETURN	NRV FOIL RETURN		HTCZ700161 / 1 / F14 / -	
MBN34BP001	ORIFICE	ORIFICE		HTCZ700161 / 1 / E04 / -	
MBN34DP001	PRESSURE REDUCTION VALVE	PRESS RED VLV		HTCZ700161 / 1 / C10 / -	
MBN35AA001	FUEL OIL DRAIN VALVE	FOIL DRAIN VALVE		HTCZ700161 / 1 / B05 / -	
MBN35AA001H	POS FUEL OIL DRAIN VALVE OPEN	FOIL DRN V OPEN	GSA	HTCZ700161 / 1 / B06 / -	
MBN35AA001L	POS FUEL OIL DRAIN VALVE CLOSED	FOIL DRN V CLOSE	GSA	HTCZ700161 / 1 / B06 / -	
MBN35AA002	THREE WAY VALVE FLOW FUEL OIL LEAKAGE	VALVE FOIL LEAKAGE		HTCZ700161 / 1 / H05 / -	
MBN35AA003	NON-RETURN VALVE AFT SUMP PUMP	NRV AFT SUMP PUMP		HTCZ700161 / 1 / M05 / -	
MBN35AA004	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / H05 / -	
MBN35AA005	DRAIN VALVE SUMP TANK	DRNV SUMP TANK		HTCZ700161 / 1 / M06 / -	
MBN35AA007	DRAIN VALVE SUMP TANK	DRNV SUMP TANK		HTCZ700161 / 1 / M07 / -	
MBN35AA008	THREE WAY VALVE FLOW FUEL OIL LEAKAGE	VALVE FOIL LEAKAGE		HTCZ700161 / 1 / J06 / -	
MBN35AA010	FUEL OIL DRAIN VALVE	FOIL DRAIN VALVE		HTCZ700161 / 1 / B06 / -	
MBN35AA010H	POS FUEL OIL DRAIN VALVE OPEN	FOIL DRN V OPEN	GS	HTCZ700161 / 1 / B07 / -	
MBN35AA010L	POS FUEL OIL DRAIN VALVE CLOSED	FOIL DRN V CLOSE	GS	HTCZ700161 / 1 / B07 / -	
MBN35AP001	SUMP PUMP	SUMP PUMP		HTCZ700161 / 1 / K02 / -	
MBN35AT001	FILTER	FILTER		HTCZ700161 / 1 / M07 / -	
MBN35BB001	TANK FUEL OIL LEAKAGE	TANK FOIL LEAKAGE		HTCZ700161 / 1 / M06 / -	
MBN35BP004	ORIFICE AFT SUMP PUMP	ORF AFT SUMP PUMP		HTCZ700161 / 1 / M05 / -	
MBN35BP005	ORIFICE AFT SUMP PUMP	ORF AFT SUMP PUMP		HTCZ700161 / 1 / L05 / -	
MBN35CL001	MEASUREMENT LEVEL SUMP TANK	LEVEL SUMP TANK	LS	HTCZ700161 / 1 / L06 / -	
MBN35CL002	MEASUREMENT LEVEL SUMP TANK	LEVEL SUMP TANK	LS	HTCZ700161 / 1 / L06 / -	
MBN35CL003	MEASUREMENT LEVEL SUMP TANK	LEVEL SUMP TANK	LSA	HTCZ700161 / 1 / L06 / -	
MBN35CL004	LEVEL CENTRIFUGAL EXTRACTOR	LEVEL EXTRACTOR	LZA	HTCZ700161 / 1 / L07 / -	
MBP31AA008	NON-RETURN VALVE FUEL GAS	NRV FUEL GAS		HTCZ700161 / 1 / C13 / -	
MBP31AA009	NON-RETURN VALVE FUEL GAS	NRV FUEL GAS		HTCZ700161 / 1 / C13 / -	
MBP35AA001	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / B07 / -	
MBP35AA002	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / C06 / -	
MBX44AA001	PILOT VALVE FILLING/SHUT-OFF VALVE FUEL OIL	PLT V FILL/SOV FOIL		HTCZ700161 / 1 / B03 / -	
MBX44AA002	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / A04 / -	

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KKS No.	Description	Short description	Function	P&ID / Sh. / Sq. / Rev.	Rev
MBX44AA003	PILOT VALVE TRIP SHUT-OFF VALVE FUEL OIL	PLT V TRIP SOV FOIL		HTCZ700161 / 1 / B04 / -	
MBX44AA004	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / A05 / -	
MBX44AA005	PILOT VALVE NOZZLE BLOW-OFF VALVE LIQUID FUEL	PLT V NOZ BLWOFF V		HTCZ700161 / 1 / B06 / -	
MBX44AA006	NON-RETURN VALVE	NRV		HTCZ700161 / 1 / A07 / -	
MBX44AT001	DIRT TRAP	DIRT TRAP		HTCZ700161 / 1 / A08 / -	
MBX44BP001	ORIFICE	ORIFICE		HTCZ700161 / 1 / A03 / -	
MBX44BP002	ORIFICE	ORIFICE		HTCZ700161 / 1 / A05 / -	
MBX44BP003	ORIFICE	ORIFICE		HTCZ700161 / 1 / A06 / -	
MBX44BP004	ORIFICE	ORIFICE		HTCZ700161 / 1 / A08 / -	

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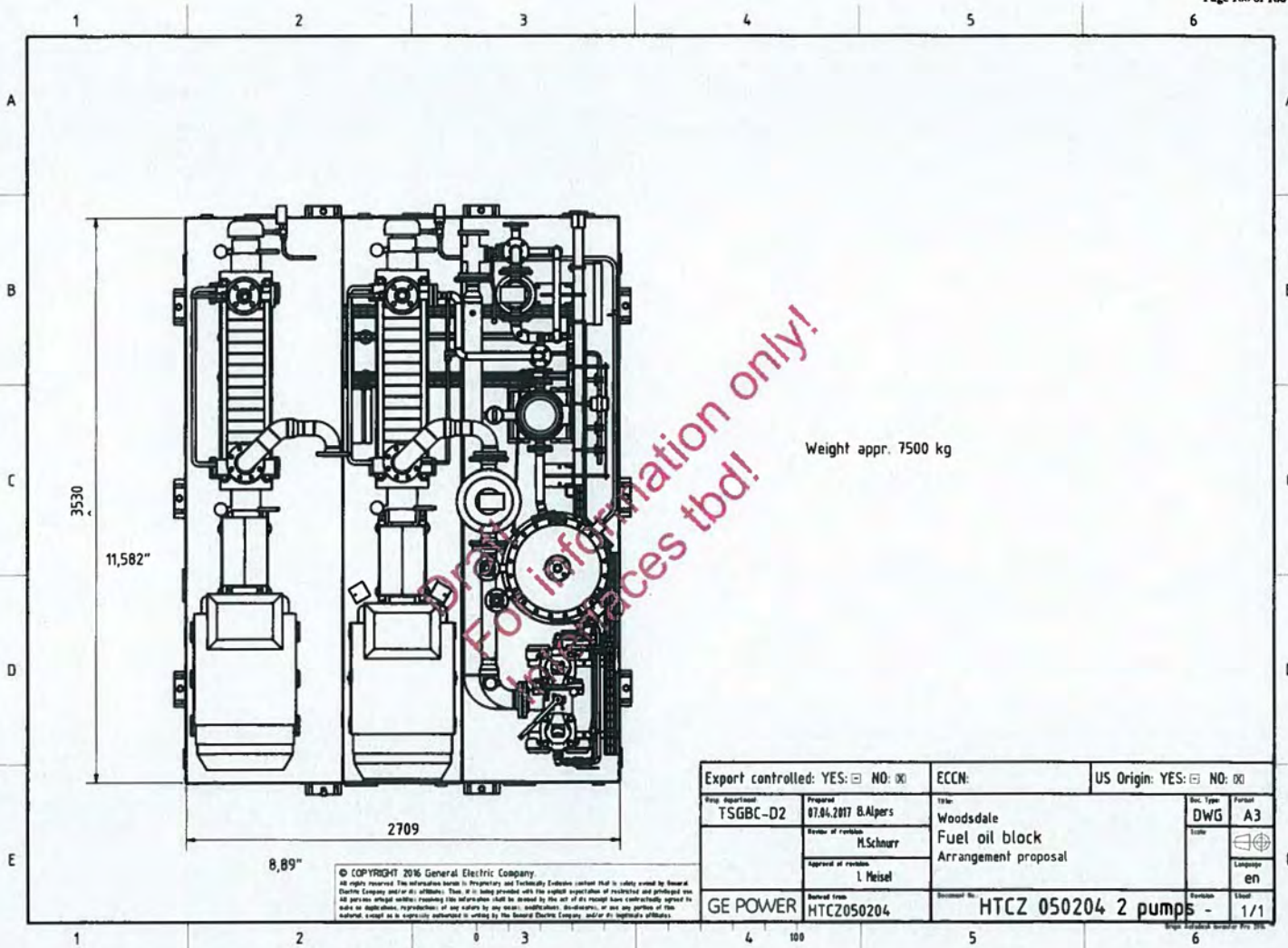
No of records: 120

Fields used for revisioning	Yes	No
KKS No.		Keyfield
PID DWG (Drawing)	*	
Rev (Revision PID DWG)		*
Sht (Sheet)	*	
Sq (Square)		*
DESCRIPTION	*	
SHORT DESCRIPTION	*	
FUNCTION	*	

Revision marker	
Rev.Index	R@ inserted
Rev.Index	R# erased
Rev.Index	R modified

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1 FUNCTION

The liquid fuel system (MBN) supplies fuel oil to the combustion chamber fuel oil system in the combustion chamber block (MBM01) at a controlled flow rate and pressure. Fuel oil flow is controlled based on the gas turbine loading. The liquid fuel system includes a trip valve arrangement to immediately interrupt the supply of fuel to the burner whenever an emergency trip is initiated.

2 DESIGN

Fuel oil is supplied to the liquid fuel system from a plant supply fuel tank (customer scope). The liquid fuel system provides delivery, filtration, fuel leakage collection, and pressure and flow regulation. The draft delta P&ID [1] [2] shows the flow path of fuel oil from the plant supply connection to the main shutoff valve, booster pumps, fuel filter, flow transmitter, shutoff valve, trip valve, and into the fuel nozzle in the combustion chamber fuel oil system (MBM01). All components are located together in the fuel pump block (MBN01) except for the main shutoff valve, the interconnecting piping, the fuel leakage tank (MBM35BB001, tbd) and the valves located on the combustor.

3 SYSTEM DESCRIPTION

MAIN SHUTOFF VALVE (MBN31AA001)

The main shutoff valve stops the flow of fuel oil from the plant supply fuel tank to the liquid fuel supply system (MBN31). The main shutoff valve has an AC motor that operates a ball valve. The valve is also equipped with a backup manual drive. Remote indication of the valve position is provided by "open" limit switch (MBN31AA001H) and by "closed" limit switch (MBN31AA001L). The "closed" limit switch signals a remote alarm if the valve fails to fully close during a closing sequence.

PRESSURE LIMITING VALVE (MBN31DP001)

A pressure limiting valve is included in the liquid fuel supply system to protect the system and its components from over-pressurization. Over-pressurization could occur if the system was shut down and the ambient temperature increased (causing liquid expansion). The valves are opened by system pressure operating against pre-set spring pressure. Pressure limiting valve MBN31 DP001 directs the flow of fuel oil to the leakage fuel return system (MBN35) and into the sump tank (MBN35 BB001) when relieving excessive pressure in the fuel supply system after the main shutoff valve.

FUEL FILTERS (MBN31AT001/2)

The fuel filters remove foreign material from the liquid fuel oil to prevent fouling of the downstream components. The liquid fuel filters inlet piping also contains manually operated drain and vent valve and piping for draining fuel oil or venting air from the fuel filter. The vented air-fuel mixture is directed to the leakage fuel return system (MBN35). Drain and vent valves must remain closed during operation. A differential pressure transmitter (MBN31CP002) monitors the pressure drop across the fuel filter. An alarm appears remotely if the pressure transmitter detects a rise in the differential pressure above the pre-set limit indicating the filter needs cleaning.

FUEL PUMPS (MBN32AP101/201)

The fuel pumps supply oil from the liquid fuel supply system (MBN31) to the liquid fuel system (MBN32). The fuel pump provides the increased pressure required for proper atomization of the fuel for combustion.

There are two pumps installed in parallel, each pump is capable to supply the full amount of fuel oil flow needed to operate the gas turbine. A switch over from one pump to the other during operation is not possible. Switch over is only allowed if the fuel oil system is not in operation. It is done manually by operating the isolation valves (MBN31AA102 MBN31AA202, MBN32AA103, MBN32AA 203). The fuel pumps are centrifugal pumps. A minimum flow of fuel is provided by system design to prevent overheating and damage to the pump.

Upstream of the fuel pump is a remote pressure switch assembly (MBN31CP103/104). The pressure switch must signal that fuel pressure is above minimum during a gas turbine start-up to allow start-up of the fuel pump. Downstream of the fuel pumps is a temperature indicator (MBN32CT104/204) which provides a remote indication of fuel temperature. A pressure transmitter assembly (MBN32CP001) is also located downstream of the fuel pumps. If the pressure transmitter senses fuel pump discharge pressure dropping below a pre-set minimum, a signal is sent to the control system to initiate a trip of the gas turbine.

RECIRCULATION CONTROL VALVES (MBN32AA101/201)

The recirculation control valves provide a flow of fuel oil from the fuel pump discharge back into the plant supply tank through the fuel return system (MBN34) to prevent overheating the pump before the gas turbine has reached rated speed. A centrifugal pump which does not have sufficient discharge flow rate will develop high internal temperatures due to internal recirculation. A pressure limiting valve (MBN34DP001) protects the fuel return system from excessive pressure by relieving pressure to the inlet of the fuel oil pump.

Downstream is the return line from the fuel leakage return system from the sump pump (MBN35AP001) through a shutoff valve (MBN35AA005). Non-return valve (MBN34AA101/201) prevents fuel from flowing back through the fuel return system from the plant supply tank. Shutoff valve MBN34AA005 allows supply tank isolation during maintenance. The shutoff valve is located on the plant supply fuel tank. The shutoff valve must remain open during operation to ensure a flow path for the fuel return system to the plant supply tank.

FLOW TRANSMITTER (MBN32CF001)

A Flow transmitter is installed downstream of the minimum flow valves (MBN32AA101/102). The flow transmitter provides local and remote indication of the fuel flow rate.

SHUTOFF VALVE (MBN32AA002)

The shutoff valve is installed in the combustion chamber block, and is used in conjunction with the trip valve (MBN32AA005) to immediately stop the flow of fuel oil to the combustor during a gas turbine trip. The shutoff valve is downstream from the fuel oil pump, and is provided to allow opening of the trip valve since the trip valve is unable to open against full pump discharge pressure. Once the trip valve is opened, the shutoff valve is opened. A "closed" limit switch (MBN32AA002L) provides remote indication of the shutoff valve position.

TRIP SHUTOFF VALVE (MBN32AA005)

The trip shutoff valve is located upstream of the combustor. It is installed in the combustion chamber block (MBM01) and is used to immediately stop the flow of fuel oil during a gas turbine trip. The valve is a piston-operated, fast closing valve designed to quickly isolate the fuel supply to the combustor fuel system. Remote trip valve position indication is provided by an "open" limit switch (MBN32AA005H) and a "closed" limit switch (MBN32AA005L).

CONTROL SERVOMOTOR (MBN32AA007)

The control servomotor is mounted on top of the combustor. The servomotor controls the setting of the fuel nozzle, and with it the fuel oil flow, according to the power output required from the gas turbine. A "closed" position indicator (MBN32CG007) is provided to signal remotely when the fuel oil nozzle is closed. The control servomotor is positioned with a servo valve supplied with oil from the Hydraulic Trip Circuit (MBX41). The servo directs the power oil (MBX44) to open or close the control servomotor which in turn opens or closes the fuel oil nozzle.

LEAKAGE VALVE (MBN35AA001)

The leakage valve is built into the leakage fuel oil return system and is mounted on top of the combustor. The valve is opened to collect fuel oil leakage from the control servomotor (MBN32AA007) when the gas turbine is operating on fuel oil. When operating the gas turbine on gas fuel, the fuel oil leakage valve is closed to prevent hot gases from the combustor (MBM30) from entering the sump tank (MBN35BB001). Remote leakage valve position indication is provided by an "open" limit switch (MBN35AA001H) and a "closed" limit switch (MBN35AA001L).

NOZZLE BLOWOUT VALVE (MBN35AA010)

The nozzle blowout valve allows to blow any residual fuel oil into the combustor to prevent nozzle damage.

SWITCHOVER VALVE (MBN35AA002)

The switchover valve receives leakage collected by the fuel oil leakage valve (MBN35AA001) and directs it through a non-return valve (MBN35AA004) to the suction piping of the fuel oil pumps (MBN32AP101/201). Fuel oil samples can also be taken of the leakage collected by opening the switch over valve to the sample position.

SWITCHOVER VALVE (MBN35AA008)

The switchover valve receives leakage from the trip valve (MBN32AA005), shutoff valve (MBN32AA002), leakage valve (MBN35AA001), nozzle blowout valve (MBN35AA010) and the control servomotor (MBN32AA007) and directs it to the extractor (MBN35BT001). Leakage fuel oil samples can also be collected by opening the switchover valve to the sample position.

CENTRIFUGAL EXTRACTOR (MBN35AT001)

Fuel oil leakages collected from the fuel oil valves on the combustor (via MBN35AA008) are directed to the centrifugal extractor. The centrifugal extractor separates air from the fuel oil. Air is vented to atmosphere outside the fuel pump block (MBN01). The fuel is then directed into the sump tank. The centrifugal extractor contains a level switch (MBN35CL004) which will send a signal to reduce gas turbine output if the sump tank level rises to the centrifugal extractor.

SUMP TANK (MBN35BB001)

Fuel oil leakage is directed to the sump tank where the leakage is collected until a sufficient volume is available to be pumped back into the plant supply tank. Fuel leakage from the manual drain path from the fuel filters (MBN31AT001/2) is directly drained into the sump tank. The sump tank contains a sump level switch which provides signals to control the sump pump (MBN35AP001). When the fuel level reaches the upper limit (MBN35CL002), a signal is sent to start the sump pump to drain the sump tank. Once the fuel level drops to the lower limit, a signal is sent to stop the sump pump (MBN35CL001). A level switch (MBN35CL003), set at a higher level in the tank, sends a signal to start the sump

pump and sounds an alarm remotely. The second level switch backs up the first signal and provides indication of a malfunction.

SUMP PUMP (MBN35AP001)

The sump pump is provided to maintain the collected fuel leakage level in the sump tank (MBN35BB001). The sump pump is started and stopped based on sump tank level. An AC motor drives the pump which transfers the fuel oil from the sump tank (MBN35 BB001) back to the plant supply tank. A drain valve (MBN35AA005) isolates the suction side of the sump pump from the sump tank for service or maintenance. A minimum flow recirculation line prevents pump overheating and damage. The recirculation line contains an orifice (MBN35BP005) on the discharge of the pump to limit the recirculation to the minimum necessary.

VENTILATION / FIRE PROTECTION

The ventilation fan(s) removes fuel oil fumes from the fuel pump block (MBN01). Ventilation and fire protection systems of the building where the fuel oil block is located is in the scope of the customer.

4 PRINCIPLES OF OPERATION

4.1 STANDSTILL CONDITION

While the gas turbine is at a standstill, the main shutoff valve (MBN31AA001), shutoff valve (MBN3AA002), trip valve (MBN32AA005), control servomotor (MBN32AA007), and leakage valve (MBN35AA001) are closed. The nozzle blow-out valve (MBN35AA010) is open.

WARNING

Shutoff valve MBN34A005 (isolation for the fuel oil return to the plant supply fuel oil tank) is closed only for maintenance and service work. Operation with this valve shut could result in fuel oil pump overheating and system damage. The fuel filter drain and vent valves (MBN31AA005/6/7/8) are opened only for maintenance and service work. Operation with these valves open could result in fuel oil pump overheating and system damage.

4.2 START-UP

Once "Automatic Start" has been selected, the main shutoff valve (MBN31AA001) opens. The ventilation fan(s) switches on. Pressure builds up in the fuel supply system up to the fuel pump in use (MBN32AP101 or MBN32AP201). Once pressure switch MBN31CP103 or MBN31CP203 senses the pre-set minimum pressure, the corresponding fuel pump starts, pressurizing the line to the shutoff valve (MBN32AA002).

Until the gas turbine has reached nominal speed, fuel flows through the fuel return system (MBN34). The recirculation valve (MBN32AA101 or MBN32AA201) limits the amount of fuel flow to the minimum required to prevent fuel pump overheating and damage. The fuel flow through the return system is directed back to the plant supply fuel tank. The ignition fuel system (MBQ30) starts once the gas turbine ignition speed has been attained. The three flame monitors are activated. The trip valve (MBN32AA005), shutoff valve (MBN32AA002), and fuel leakage valve (MBN35AA001) open, and the nozzle blow-out valve (MBN35AA010) closes. The control servomotor (MBN32AA007) opens the fuel nozzle to its minimum stroke position. Ignition fuel flows into the combustor and is ignited by the ignitor. The combustion of the ignition fuel ignites the fuel oil. After ignition of the main flame, the ignition fuel system is switched off. The control servomotor (MBN32AA007) slowly opens the fuel nozzle. As fuel flow increases, the gas turbine is brought up to nominal speed. Once enough fuel is flowing into direction of the GT, the recirculation valve (MBN32AA101 or MBN32AA201) closes automatically because the fuel flow to the combustor is sufficient to prevent fuel pump damage.

4.3 OPERATION

While the gas turbine is in operation, the control servomotor (MBN32AA007) regulates the setting of the fuel nozzle according to the power output required from the gas turbine. This control is based on either gas turbine outlet stack temperature or gas turbine speed, depending on the control mode selected.

Leakage from the fuel nozzle is returned to the fuel supply system upstream of the fuel pump. Switchover valve MBN35AA002 is provided for fuel sampling or leakage measurement.

Leakage from the valves on the combustor (shutoff valve / nozzle blowout valve, trip valve, and control servomotor) flows into the centrifugal extractor (MBN35AT001) where air is separated from the fuel and then the fuel drains into the sump tank (MBN35BB001). Leakage rate can be measured through the switchover valve (MBN35AA008).

When the fuel level in the sump tank reaches the set upper level, the sump pump (MBN35AP001) switches on and pumps the fuel through the fuel return system into the plant supply fuel tank. Once the fuel level in the tank reaches the set lower level, the sump pump is switched off.

4.4 SHUTDOWN

During a normal shutdown of the gas turbine, the control servomotor (MBN32AA007) slowly closes the fuel nozzle until electrical load is removed. The gas turbine generator is then disconnected from the grid. In order to reduce the thermal shock to the turbine blading during the shutdown, the rate of gas turbine coast down is "controlled" with the liquid fuel system in operation until the turbine speed has dropped below a certain rated speed. Once the turbine has slowed beyond the rated speed, the trip valve (MBN32AA005), shutoff valve (MBN32AA002), and leakage valve (MBN35AA001) close. The nozzle blow-out valve (MBN35AA010) opens and the fuel remaining in the fuel nozzle and line is blown out into the sump tank by the pressurized air from the combustor. This prevents the remaining fuel from dripping into the combustor. The fuel pump (MBN32AP101 or MBN32AP201), ventilation fan(s) are shut off. The fuel nozzle and the main shutoff valve (MBN31AA001) close.

4.5 TRIP

When a gas turbine trip is initiated, the shutoff valve (MBN32AA002) and the trip valve (MBN32AA005) close immediately to cause a "Flame Off." The machine is disconnected from the grid. The remainder of the shutdown is the same as for a normal shutdown but without the "controlled" rundown. (See 4.4 for details.)

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5 References

- [1] D. Kusic and A. Mettler, "Delta P&ID Fuel Oil," no. HTCZ700161 Draft, 2017.
- [2] D. Kusic and A. Mettler, "Legend for Delta P&ID Fuel Oil," no. HTCZ740762, 2017.

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