

September 4, 2020

Ms. Melanie Bachman, Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Petition 1371: 667 Line Rebuild Project
Petition Amendment

Dear Ms. Bachman:

The Connecticut Light and Power Company doing business as Eversource Energy (Eversource) submitted a Petition on May 10, 2019 to the Connecticut Siting Council (Council) requesting a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need was required for the proposed modifications to approximately 6.1 miles of the 69-kilovolt transmission line (667 Line) in the Towns of Canaan (Falls Village), Sharon and Salisbury, Connecticut (Petition). On June 7, 2019 the Council issued the declaratory ruling requested in the Petition and found that the modifications of the 667 Line would not have a substantial adverse environmental effect.

As described in the attached Amendment, Eversource has determined that it is necessary to install temporary back-up generation to support the power supply needs of the customers served by the Falls Village Substation during the outage for the 667 Line construction. Eversource now seeks Council staff approval of the proposed modifications to the Falls Village Substation.

Eversource has notified the representative of the Town of Falls Village of the proposed modifications in the Amendment and has provided direct abutters with written notice of this submission. A hard copy of this Amendment will be delivered to your office. Should you have any questions regarding this submission, please do not hesitate to contact me at kathleen.shanley@eversource.com or telephone at 860 728-4527.

Sincerely,



Enclosure: Amendment

Cc: Henry Todd, First Selectman, Town of Canaan (Falls Village)

**THE CONNECTICUT LIGHT AND POWER COMPANY
doing business as
EVERSOURCE ENERGY**

**AMENDMENT TO PETITION NO. 1371
PROPOSED MODIFICATIONS TO THE 667 LINE
Towns of Canaan, Sharon and Salisbury**

On May 10, 2019, The Connecticut Light and Power Company doing business as Eversource Energy (“Eversource”) filed a petition with the Connecticut Siting Council (“Council”) requesting a declaratory ruling that a Certificate of Environmental Compatibility and Public Need was not needed for proposed modifications to a 69-kV transmission line in Canaan (“Falls Village”), Sharon and Salisbury, Connecticut, because the proposed activities would not result in substantial adverse environmental effects (Petition No. 1371, the “Petition”). The proposed modifications to the transmission line (the “667 Line”) to meet reliability criteria generally consisted of replacing 52 structures and conductors and replacing shield wire with fiber optic ground wire (“OPGW”). On June 7, 2019, the Council issued its declaratory ruling and found that the proposed modifications to the 667 Line would not have a substantial adverse environmental effect. Construction of the Project commenced on or about April 22, 2020 and is currently underway.

On June 18, 2020, during Eversource’s Single Contingency Line Loss (“SCLL”) Committee’s review of the 667 Line outage plan, the Project team was tasked to evaluate a potential SCLL condition at Falls Village Substation. Among many other customers, the Substation serves Becton-Dickinson (“B-D”), located in North Canaan. During this evaluation, the Project team learned that B-D had modified its operations to produce COVID-19 test kits and syringes for

vaccine applications and was currently operating at full capacity, utilizing round the clock shifts. Due to the urgent importance of this level of production, B-D's operations cannot sustain an electrical outage, since the facility is not equipped with sufficient emergency generation to support its current operations. Given these factors B-D is now considered a "sensitive customer", as defined in the SCLL protocol¹ and cannot tolerate any electrical interruption for the duration of the Project's construction. As a result, under the current construction execution plan, it was determined that the Project created an SCLL condition for Falls Village Substation that must be mitigated before the 667 Line outage could move forward. Without mitigation, a loss of the 115kV/69kV autotransformer at Torrington Terminal during the 667 Line outage would result in an interruption of supply to the Substation.

By way of background, all transmission projects are analyzed to determine whether the work and associated outages will cause an SCLL condition. Should the SCLL event result in a loss of load to greater than 50,000 customers or a known sensitive customer for greater than 4 hours ("recall time") contingency plans must be put in place. In 2018, when the Project was being planned and the outages were being scheduled, the SCLL review committee requested a contingency plan for customers served by the Salisbury Substation. That SCLL contingency plan consisted of enacting a distribution solution, which has been implemented. At the time that the Petition was filed in 2019, B-D was not producing COVID-related products and was yet to be identified as "sensitive customer". Therefore, the need for an SCLL contingency plan for Falls Village Substation was not triggered at that time. Construction of the approved

¹ Examples of "sensitive customers" from Eversource's System Operating Procedure ("ESOP 28") "Single Contingency Line Loss", dated April 29, 2019, include hospitals, municipal facilities and significant commercial and industrial customers.

667 Line project was delayed until 2020 and it became necessary to schedule new outages, which prompted additional SCLL review. That evaluation included a review of the outages that could affect the Falls Village Substation. Given the importance of B-D's increased production levels to support the response of the COVID 19 pandemic, this later review determined that B-D was now a "sensitive customer" according to ESOP-28. Accordingly, the SCLL threshold was triggered and a solution must be implemented to serve the load at the Falls Village Substation.

To mitigate the risk of the SCLL, Eversource evaluated several potential solutions, including modifications to the distribution system, modifications to the transmission system or temporary back-up generation at multiple substations.

Analysis of Potential Distribution Solutions

The only possible distribution solution would be to construct distribution line ties from Torrington Terminal Substation to Falls Village Substation. This is not feasible due to the fact that there is no source of power to Torrington Terminal that would provide a distribution level source. A new stepdown transformer and a reconfiguration of that substation would be required to provide distribution level voltage between Torrington Terminal and Falls Village substations. Even if there were a source of distribution level power, there would be a need for several miles of distribution ties- traversing four towns. Due to the impacts to cost and schedule, a distribution solution was determined not to be feasible to address the SCLL risk created by the 667 Line outage.

1. Analysis of Potential Transmission Solutions

The only possible transmission solution identified to address the SCLL risk would be to install a spare mobile 115kV/69kV autotransformer at Torrington Terminal. This solution was deemed infeasible because the duration of the engineering, delivery time frame and commissioning would not support a September construction schedule. Additionally, this potential solution is more expensive than the other alternatives.

Analysis of Potential Stand-By Generation Solutions

Five potential stand by generation solutions were identified and analyzed:

1. Install mobile generation at Falls Village Substation (20 MVA total).
2. Install mobile generation at Falls Village Substation (14 MVA total) and at the B-D facility (8 MVA total).
3. Install mobile generation at North Canaan Substation (18 MVA total).
4. Install mobile generation at North Canaan Substation (10 MVA total) and at the B-D facility (8 MVA total).
5. Utilize the existing jet unit at Torrington Terminal (up to 20 MVA), which is owned by NRG or its successor (“NRG”).

Options 3 and 4, which involve the North Canaan Substation were eliminated as possible solutions because the site is too small to accommodate the required equipment. Option 5 was determined not to be a viable solution. If the autotransformer at Torrington Terminal tripped out-of-service, the customers served by both Falls Village and North Canaan and the jet unit itself would be disconnected from the power grid. As the jet unit does not have “black start” capabilities (i.e., the ability to start without an external electric power source), it would not be available to generate power required to serve the customers impacted by the

transformer outage, unless it was running before the transformer outage. Even if the jet unit did have “black start” capability, it would have to operate in “island” or “isochronous” mode managing frequency regulation (i.e., as a standalone generator capable of maintaining acceptable AC frequency) as loads dynamically change. The Torrington Jet (and most generators) does not have this capability.

Options 1 and 2 were considered to be the most feasible solutions but, of the two, Option 1 was the preferred option for the following reasons:

- Falls Village Substation has sufficient space to accommodate 20 MVA of mobile generation;
- Installation on one site is more efficient than utilizing two sites;
- Eversource has site control at Falls Village and would not need to enter into an agreement with B-D for use of its property and install a mobile generator interconnection;
- Option 1 is less expensive than Option 2 due to the efficiencies of utilizing a single site and eliminating the need for civil construction, other improvements and complicated switching plans that would be needed at the B-D site.²

Based on the foregoing, the preferred solution is to install 20 MVA of temporary mobile generation at Falls Village Substation.

² The total load for customers served by the Falls Village Substation is approximately 20 MW. B-D's load is approximately 6.5 MW. The load for the remaining customers is approximately 13.5 MW. In Option 2, four 2-MW generators (8 MW) are required to serve B-D's 6.5 MW load, operating as an island. The rest of the system, operating as a second island, requires seven 2-MW generators (14 MW) to cover the 13.5 MW load. The combined total is 22 MW. Option 1 can cover the entire load requirement (20 MW) with ten 2-MW generators.

Proposed Amendments to Approved Scope of Work

The solution to address the SCLL condition is to install temporary, trailer-mounted, diesel-fired stand by generators at the Falls Village Substation to be located within Eversource's easement area, outside of the existing Substation fence. The stand by generators and associated support equipment would be arrive on 14 trailers, each approximately 53 feet long, which would be stationed in an approximately 200 feet by 200 feet area on temporary construction matting on the west side of the Substation (See Attachment A – Site Layout). There would be 10 2-megawatt generators (1 unit per trailer) , 6 2500-KVA transformers (2 units per trailer), 1 10,000-KVA transformer (on its own trailer) and associated cables to connect the generators to the Falls Village Substation mobile generator position. Each generator is installed within a sound attenuating enclosure with approximate dimensions of 14 feet tall, 8 feet wide and 40 feet long (see Attachment B - Equipment Descriptions). Each unit is also equipped with a self-contained diesel fuel tank (1000 gallons tank capacity, 5 hour run time per tank). All of the trailers/units will be positioned within an impermeable inflatable berm to provide containment. Though not anticipated, any refueling of the stand by generators will be undertaken within the containment area.

It is not expected that units will run except during commissioning or in the unlikely event of loss of load during the 667 Line outage. The maximum run time would be 120 hours. Under the current project schedule the units would be in place for installation and testing in September and would remain on-site until December.

Proposed Amendments to Scope of Work – Environmental Considerations

The temporary stand by generators would be located in an area that is currently developed by electric utility uses including the Falls Village Substation, a separate switchyard, and

distribution and transmission lines (see Attachment A). This facility is located on a flat terrace along the east side of the Housatonic River. Areas adjacent to the fenced utility facilities, is maintained as lawn. There is a buffer of trees along the west side of area that would not be disturbed (see Figure 1 – Site Overview).

Figure 1 – Site Overview



There are no wetlands, watercourses or other natural resources present in the area of the temporary installation. There are no Natural Diversity Database or cultural resource areas. However, there are two environmental considerations that will be managed and mitigated: location within the Housatonic River Floodplain and the potential for air emissions.

1.Housatonic River Floodplain - The site is located within the 100-year elevation of the Housatonic River. Floodplain limits are shown on Attachment A which depicts regulatory flood boundaries from the Federal Emergency Management Agency. To mitigate the potential risks of a flood, a Flood Contingency Plan (“Plan”) will be developed by the contractor prior to the start of construction. The Plan will require the contractor to monitor local weather conditions, secure the work site before predicted major storms and take measures to protect and secure materials, equipment and to protect personnel.³ During construction, the contractor will also adhere to the procedures set forth in the “Construction & Maintenance Environmental Requirements, Best Management Practices Manual for Massachusetts and Connecticut”, September 2016” (“BMPs”), which addresses the need for the contractor to maintain a stable work area. Eversource would assign an environmental inspector to the Project to ensure compliance with the provisions of the BMPs and to oversee the contractor’s work for the duration of the Project as necessary to ensure compliance with all applicable environmental requirements and permit conditions. No fuel or other hazardous materials will be stored, except those within the generator tanks or transformers, within the 100-year floodplain at any time.

2.Potential Air Emissions – As described above, the diesel-fired stand by generators are not expected to run except for a limited duration during commissioning or unless there is a loss of load during the outage. The stand-by generators are “emergency engines” as defined in the Regulations of Connecticut State Agencies Section 22a-174-22e(13).

³ A major storm shall be defined as a storm predicted by the National Oceanic and Atmospheric Administration weather service with warnings of flooding, severe thunderstorms, or similarly severe weather conditions or effects.

Qualifying emergency engines can operate without being required to obtain a New Source Review Air Permit as long as they comply with the Regulations of Connecticut State Agencies Section 22a-174-3b. For an emergency engine the following requirements apply:

- Operation of engine does not exceed 300 hours during any twelve (12) month rolling aggregate.
- Fuel consumed by the engine shall not exceed the sulfur content of motor vehicle diesel fuel.
- Maintain records for five (5) years detailing the hours of operation of the engine and the amount of fuel consumption.

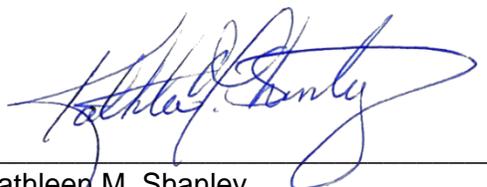
The proposed modifications to the 667 Line would not substantially change the environmental effects and mitigation measures, and would not alter the construction procedures, work hours, or construction sequencing described in the Petition. Eversource would perform the 667 Line work, including the proposed modifications, in accordance with its BMPs, as well as with all applicable regulatory approvals which include the U.S. Army Corps of Engineers (Clean Water Act, Section 404 permit) and the Connecticut Department of Energy and Environmental Protection (Clean Water Act, Section 401 water quality certification and the *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities*), as well as with any additional conditions in a Council approval of this Petition Amendment.

According to the current schedule, construction of modifications described in this amendment would commence in September 2020. Project completion, including restoration, is expected by December 2020 (see Attachment C – Proposed Schedule).

Prior to submitting this Amendment, Eversource representatives briefed the Town of Falls Village officials concerning the proposed modifications. In addition, Eversource provided direct abutters with written notice of the filing of the Amendment (see Attachment D – Abutter Notice and Affidavit). As stated in in the original Petition, Eversource representatives will continue proactive outreach to impacted property owners throughout the siting, construction, and restoration of the modifications and the original Project.

Communications regarding this Petition Amendment should be directed to:

Kathleen M. Shanley
Manager – Transmission Siting
Eversource Energy
P.O. Box 270
Hartford, CT 06141-0270
Telephone: (860) 728-4527



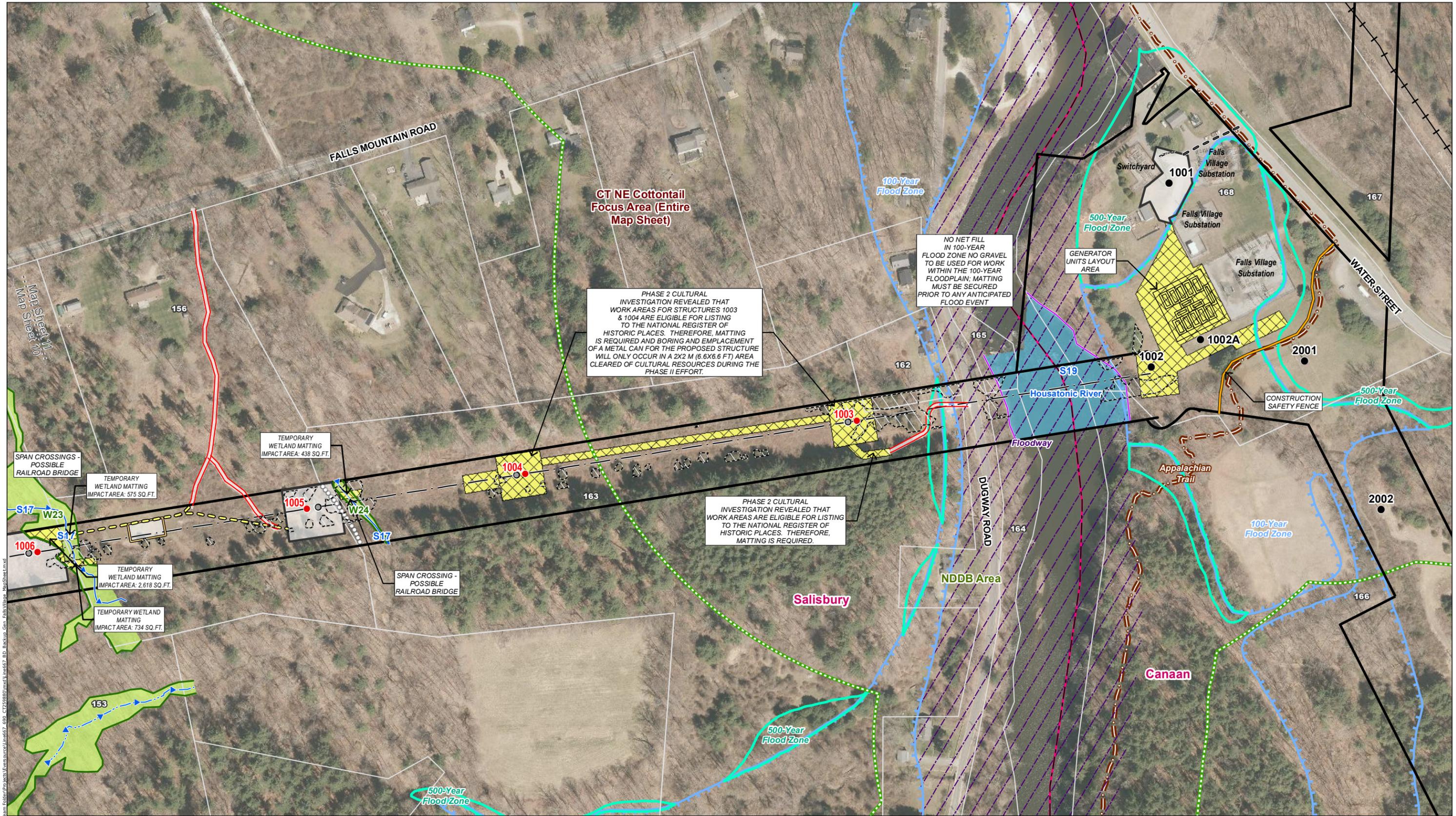
By:

Kathleen M. Shanley
Manager- Transmission Siting

List of Attachments:

- Attachment A – Site Layout
- Attachment B – Equipment Descriptions
- Attachment C – Proposed Schedule
- Attachment D – Abutter Notice and Affidavit

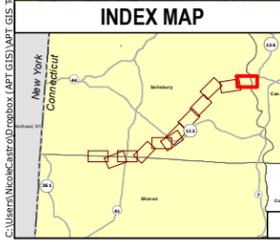
Attachment A
Site Layout



PHASE 2 CULTURAL INVESTIGATION REVEALED THAT WORK AREAS FOR STRUCTURES 1003 & 1004 ARE ELIGIBLE FOR LISTING TO THE NATIONAL REGISTER OF HISTORIC PLACES. THEREFORE, MATTING IS REQUIRED AND BORING AND EMPLACEMENT OF A METAL CAN FOR THE PROPOSED STRUCTURE WILL ONLY OCCUR IN A 2X2 M (6.6X6.6 FT) AREA CLEARED OF CULTURAL RESOURCES DURING THE PHASE II EFFORT.

PHASE 2 CULTURAL INVESTIGATION REVEALED THAT WORK AREAS ARE ELIGIBLE FOR LISTING TO THE NATIONAL REGISTER OF HISTORIC PLACES. THEREFORE, MATTING IS REQUIRED.

NO NET FILL IN 100-YEAR FLOOD ZONE NO GRAVEL TO BE USED FOR WORK WITHIN THE 100-YEAR FLOODPLAIN; MATTING MUST BE SECURED PRIOR TO ANY ANTICIPATED FLOOD EVENT



| Legend | | Map Sheet Matchline | |
|------------------------------------|------------------------------------|--|-------------------------|
| ● Proposed Structure | ○ Culvert | --- Delineated Intermittent Watercourse | --- Map Sheet Matchline |
| ● Existing Structure | ○ Existing Access | --- Drainage Channel | |
| ○ Existing Structure to be removed | ○ Proposed Access | --- Confirmed Vernal Pool Extent | |
| --- Existing Right-of-Way (ROW) | ○ Proposed Alternate Access | --- 100' Vernal Pool Envelope | |
| --- Overhead Eversource Line | --- Access Road to be Improved | --- Delineated Wetland Boundary Outline | |
| ○ Stone Wall | --- Temporary Construction Matting | --- Field Delineated Federal Wetland | |
| --- Fence | --- Stone Work Pad | --- Field Delineated Connecticut Wetland Only | |
| --- Construction Safety Fence | --- Pull Pad | --- Open Water | |
| ○ Gate | --- Clearing Area | --- Critical Habitat Fen | |
| | --- Ordinary High Watermark | --- Delineated Perennial Watercourse | |
| | --- Critical Habitat (2009) | | |
| | | --- Natural Diversity Database Area (June 2020) | |
| | | --- CT New England Cottontail Final Focus Area | |
| | | --- State-Owned Property (none in mapped extent) | |
| | | --- Eversource Owned Property | |
| | | --- Parcel Boundary | |
| | | --- FEMA 100-Year Flood Zone | |
| | | --- 500 Year Flood Zone | |
| | | --- FEMA Floodway | |
| | | --- Appalachian Trail | |
| | | --- Railroad | |
| | | --- Municipal Boundary | |

Map Notes
Parcel boundaries provided by Eversource on 4/17/2017 (not from survey). ROW boundary provided by Eversource (not from survey).
Field Investigation Data by APT/Davison Environmental.

1 inch = 200 feet
0 50 100 200 Feet

EVERSOURCE ENERGY

**Salisbury Substation to Falls Village Substation
667 Line
Reconductoring & Structure Replacement Project**

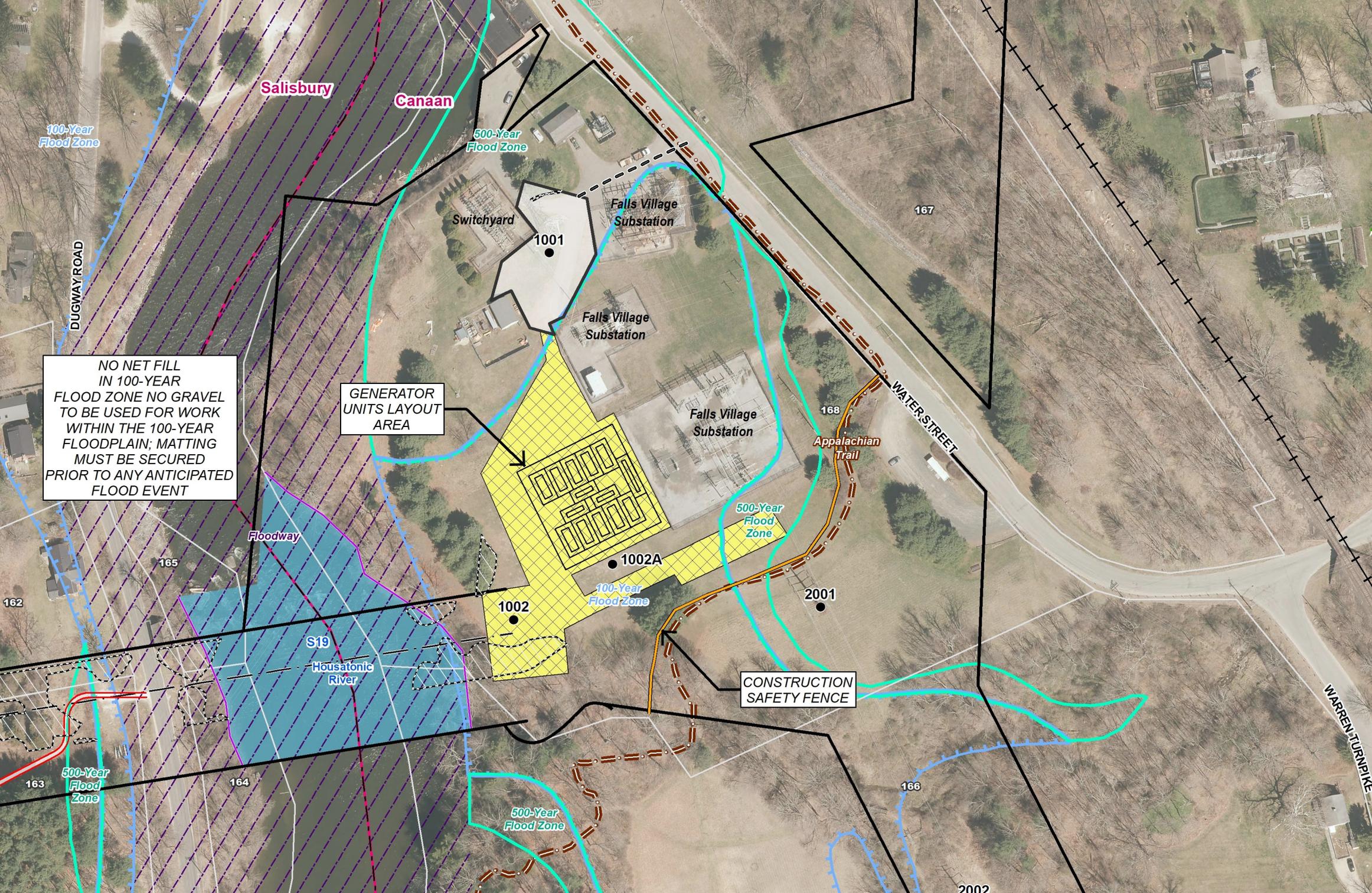
Canaan/Salisbury, CT

Map Sheet 11 of 11

August, 2020

NO. DATE REVISIONS BY CHK APP APP

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Salisbury

Canaan

100-Year Flood Zone

500-Year Flood Zone

DUGWAY ROAD

Switchyard

1001

Falls Village Substation

167

NO NET FILL
IN 100-YEAR
FLOOD ZONE NO GRAVEL
TO BE USED FOR WORK
WITHIN THE 100-YEAR
FLOODPLAIN; MATTING
MUST BE SECURED
PRIOR TO ANY ANTICIPATED
FLOOD EVENT

GENERATOR
UNITS LAYOUT
AREA

Falls Village
Substation

Falls Village
Substation

WATER STREET

168

Appalachian
Trail

500-Year
Flood
Zone

1002A

100-Year
Flood Zone

2001

1002

Floodway

165

S19

Housatonic
River

CONSTRUCTION
SAFETY FENCE

500-Year
Flood
Zone

163

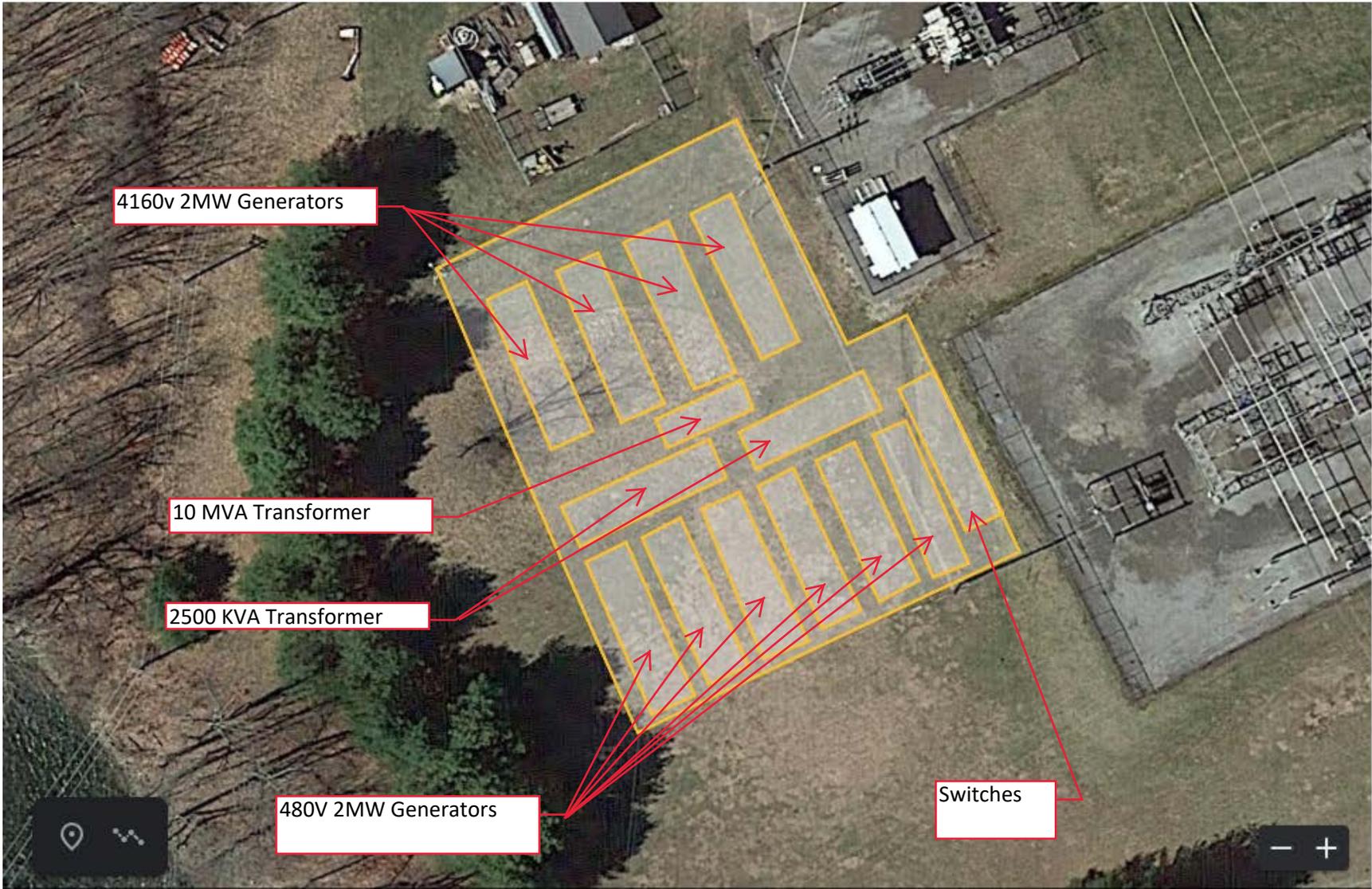
164

500-Year
Flood
Zone

166

WARREN TURNPIKE

2002



4160v 2MW Generators

10 MVA Transformer

2500 KVA Transformer

480V 2MW Generators

Switches

Attachment B
Equipment Descriptions



Image shown may not reflect actual package

STANDBY 2000 kW PRIME 1825 kW POWER MODULE 50/60 Hz

| Frequency | Voltage | Standby kW (kVA) | Prime kW (kVA) |
|-----------|----------|------------------|----------------|
| 60 | 480/277V | 2000 (2500) | 1825 (2281) |
| 50 | 400V | 1440 (1800) | 1310 (1638) |

FEATURES

EPA TIER 2 and CARB certified for non-road mobile applications. Factory designed, certified prototype tested with torsional analysis. Production tested and delivered in a package that is ready to be connected to your fuel and power lines. Supported 100% by your Caterpillar® dealer with warranty on parts and labor. Extended warranty available in some areas. The generator set is designed and manufactured in an ISO 9001:2000 compliant facility. Generator set and components meet or exceed the following specifications: AS1359, AS2789, ABGSM TM3, BS4999, DIN6271, DIN6280, EGSA101P, JEM1359, IEC 34/1, ISO3046/1, ISO8528, NEMA MG1-22

CATERPILLAR SR4B GENERATOR

Single bearing, wye-connected, static regulated, brushless permanent magnet excited generator designed to match the performance and output characteristics of the Caterpillar diesel engine driving it.

RELIABLE, FUEL EFFICIENT DIESEL ENGINE

The compact, four-stroke-cycle diesel engine combines durability with minimum weight while providing dependability and economy. The fuel system operates on a variety of fuels.

CATERPILLAR COOLING SYSTEM

Sized compatible to rating with energy efficient fan and core.

CATERPILLAR SWITCHGEAR

Provides single unit and/or multi-unit/utility paralleling components. Standby, load sense/load demand, import, export, and base load modes. Comes standard with Basler Utility Multi-function Relay IPS-100.

EXCLUSIVE CATERPILLAR DIGITAL VOLTAGE REGULATOR (CDVR)

Three-phase sensing and adjustable Volts-per-Hertz regulation give precise control, excellent block loading, and constant voltage in the normal operating range.

ENVIRONMENTALLY FRIENDLY

110% spill containment of onboard engine fluids.

SOUND ATTENUATED CONTAINER

For ease of transportation and protection. Meets 75 dB(A) at 50 ft or below per SAE J1074 measurement procedure at 110% prime load.

FACTORY INSTALLED STANDARD EQUIPMENT

| SYSTEM | STANDARD EQUIPMENT |
|--------------------------------------|---|
| Engine | <p>EPA approved Tier 2 3516C Caterpillar engine Heavy duty air cleaner with service indicator 60-Amp charging alternator Fuel filters – primary and duplex secondary with integral water separator and change-over valve Lubricating oil system with spin-on, full flow oil filters and water cooled oil cooler Oil drain lines routed to engine rail Jacket water heater Fuel cooler and priming pump Electronic ADEM™ A3 controls 24V electric starting motors with battery rack and cables</p> |
| Generator | <p>SR-4B brushless, permanent magnet excited, three-phase with Caterpillar digital voltage regulator (CDVR), space heater, 6-lead design, Class H insulation operating at Class F temperature for extended life, winding temperature detectors and anti-condensation space heaters (120/240V 1.2 kW)</p> |
| Containerized Module | <p>40' ISO high cube container, CSC certified 3-axle, 40' ISO container chassis Seven (7) sound attenuated air intake louvers and 4 lockable personnel doors with panic release Side bus bar access door, external access load connection bus bars Shore power connection via distribution block connections for jacket water heater, battery charger, space heaters, and generator condensate heaters Standard lighting 3 AC/4 DC, one (1) single duplex service receptacle, 2 external break-glass emergency stop push buttons 1,250 gal fuel tank, UL listed, double wall, 9 hr runtime @ prime rating Sound attenuated 75 dB(A) @ 50 ft Spill containment 110% of all engine fluids Four (4) oversized maintenance-free batteries, battery rack and 20-Amp battery charger Hospital grade, internally insulated, rectangular exhaust silencer with vertical discharge Vibration isolators, corrosion resistant hardware and hinges External drain access to standard fluids Fire extinguishers (Qty 2) Standard Cat rental decals and painted standard Cat power module white Interior walls and ceilings insulated with 100 mm of acoustic paneling Floor of container insulated with acoustic glass and covered with galvanized steel</p> |
| Cooling | <p>Standard cooling provides 43° C ambient capability (60 Hz) at prime +10% rating Vertically mounted, separate ATAAC and JW cores with vertical air discharge</p> |
| Generator Paralleling Control | <p>Custom switchgear control with EMCP 3.3 genset mounted controller and wall mounted paralleling controls Automatic start/stop with cool down timer Protections: 25, 27/59, 40, 32, 81 O/U Utility multi-function relay protections: 25,27/59, 32, 47, 50/51, 62, 67, 81 O/U UMR is IEEE 1547-2003 compliant in most applications Reverse compatibility module provided for interface to legacy power modules Touch screen controls with event log Multi-mode operation (island, multi-island and utility parallel), load sharing (multi-unit only) Import & export control (utility parallel only), manual and automatic paralleling capability Touch screen display (status and alarms) Metering display: voltage, current, frequency, power factor, kW, WHM, kVAR, and synchroscope</p> |
| Quality | <p>Standard genset and package factory tested UL, NEMA, ISO and IEEE standards O&M manuals</p> |

SPECIFICATIONS

CAT SR4B GENERATOR

Frame Size 825
 Pitch 0.6667
 No. of poles 4
 Excitation Static regulated brushless PM excited
 Constructions Single bearing, close coupled
 Insulation Class H
 Enclosure Drip proof IP22
 Alignment Pilot shaft
 Overspeed capability – % of rated 125% of rated
 Voltage regulator 3 phase sensing with Volts-per-Hertz
 Voltage regulation Less than $\pm 1/2\%$ voltage gain
 Adjustable to compensate for engine speed droop and line loss
 Wave form deviation Less than 5% deviation
 Telephone Influence Factor (TIF) Less than 50
 Harmonic Distortion (THD) Less than 5%

CAT 3516C DIESEL ENGINE

3516C, 4-Stroke diesel
 Bore – mm (in) 170 (6.7)
 Stroke – mm (in) 190 (7.5)
 Displacement – L (cu in) 69 (4,210)
 Compression ratio 15:1
 Aspiration ATAAC
 Fuel system EU1
 Governor type Caterpillar ADEM™ A3 Control System

TECHNICAL DATA

Materials and specifications are subject to change without notice.

| Generator Set Technical Data | Units | 50 Hz | | 60 Hz | |
|---|---------------------------|----------------|----------------|---------------|----------------|
| | | Prime | Standby | Prime | Standby |
| Performance Specification | | DM8754 | | DM8264 | |
| Power Rating | kW (kVA) | 1310 (1637) | 1440 (1800) | 1825 (2281) | 2000 (2500) |
| Lubricating System | | | | | |
| Oil pan capacity | L (gal) | 401.3 (106) | | 401.3 (106) | |
| Fuel System | | | | | |
| Fuel Consumption | | | | | |
| 100% load | L (gal) | 350.1 (92.5) | 372.9 (98.5) | 483.2 (127.6) | 525.7 (138.9) |
| 75% load | L (gal) | 281.9 (74.5) | 302.8 (80) | 380 (100.4) | 408.2 (107.8) |
| 50% load | L (gal) | 205.5 (54.3) | 350.1 (92.4) | 270.5 (71.5) | 294.2 (77.7) |
| Fuel tank capacity | L (gal) | 4731 (1,250) | | 4731 (1,250) | |
| Running time @ 75% rating | Hours | 16.7 | 15.6 | 12.5 | 11.5 |
| Cooling System | | | | | |
| Radiator coolant capacity including engine | L (gal) | 630 (166) | | 630 (166) | |
| Air Requirements | | | | | |
| Combustion air flow | m ³ /min (cfm) | 114.8 (4052) | 118.1 (4173) | 174.7 (6169) | 180.3 (6367) |
| Maximum air cleaner restriction | kPa (in H ₂ O) | 6.2 (24.9) | | 6.2 (24.9) | |
| Generator cooling air | m ³ /min (cfm) | 140 (5,933) | | 168 (4,995) | |
| Exhaust System | | | | | |
| Exhaust flow at rated kW | m ³ /min (cfm) | 311.3 (10,993) | 320.8 (11,335) | 404 (14,260) | 428.6 (15,137) |
| Exhaust stack temperature at rated kW – dry exhaust | °C (°F) | 502.1 (935.8) | 513.1 (955.6) | 387 (728) | 405 (762) |
| Noise Rating (with enclosure) | | | | | |
| @ 7 meters (23 feet) | dB(A) | 77 | 78 | 78 | 79 |
| @ 15 meters (50 feet) | dB(A) | 73 | 74 | 74 | 75 |

| Model | Length mm (in) | Width mm (in) | Height mm (in) | Weight | |
|--------------------|-------------------|------------------|-------------------|---|---|
| | | | | With Lube Oil and Coolant kg (lb) | With Fuel, Lube Oil and Coolant kg (lb) |
| XQ2000 w/o Chassis | 12 192 (480) | 2438 (96) | 2896 (114) | 34 019 (75,000) | 38 102 (84,000) |
| XQ2000 w/Chassis | 12 192 (480) | 2438 (96) | 4267 (168) | 38 102 (84,000) | 42 184 (93,000) |

RATING DEFINITIONS

Standby – Applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings. The generator on the generator set is peak prime rated (as defined in ISO8528-3) at 30° C (86° F).

Prime – Applicable for supplying continuous electrical power (at variable load) in lieu of commercially purchased power. There is no limitation to the annual hours of operation and the generator set can supply 10% overload power for 1 hour in 12 hours.

STANDARD FEATURES

GENERATOR SET EMCP 3.3 LOCAL CONTROL PANEL

- Generator mounted EMCP 3.3 provides power metering, protective relaying and engine and generator control and monitoring.
- Provides MODBUS datalink to paralleling control for monitoring of engine parameters.
- Convenient service access for Caterpillar service tools (not included).
- Integration with the CDVR provides enhanced system monitoring.
- Ability to view and reset diagnostics of all controls networked on J1939 datalink.
- Network modules via the control panel removes the need for a separate service tool for troubleshooting.
- Real-time clock allows for date and time stamping of diagnostics and events.

EMCP 3.3 ENGINE OPERATOR INTERFACE

- Graphical display with positive image, transfective LCD, adjustable white backlight/contrast.
- Two LED status indicators (1 red, 1 amber).
- Three engine control keys and status indicators (Run/Auto/Stop).
- Lamp test key.
- Alarm acknowledgement key.
- Display navigation keys.
- Two shortcut keys: Engine Operating Parameters and Generator Operating Parameters.
- Fuel level monitoring and control.

CIRCUIT BREAKER

- 3000A fixed type, 3 poles, genset mounted, electrically operated, insulated case circuit breaker.
- Solid state trip unit for overload (time overcurrent) and fault (instantaneous) overcurrent protection.
- Includes DC shunt trip coil activated on any monitored engine or electrical fault, 100 KA-interrupting capacity at 480 VAC.

VOLTAGE REGULATION AND POWER FACTOR CONTROL CIRCUITRY

- Generator mounted automatic voltage regulator, microprocessor based.
- Manual raise/lower voltage adjust capability and VAR/power factor control circuitry for maintaining constant generator power factor while paralleled with the utility.
- Includes RFI suppression, exciter limiter and exciter diode monitoring.
- Voltage and power factor adjustments are performed on the setting screen of the HMI touch screen.

FUEL TANK

- UL Listed 1250 gallon double walled.
- Fuel transfer system

CURRENT TRANSFORMERS

- CT's rated 3000:5 with secondaries wired to shorting terminal strips.

POTENTIAL TRANSFORMERS

- 4:1 ratio with primary and secondary fuse protection.

BUS BARS

- Three phase, plus full rated neutral, bus bars are tin-plated copper with NEMA standard hole pattern for connection of customer load cables and generator cables.
- Bus bars are sized for full load capacity of the generator set at 0.8 power factor.
- Includes ground bus, tin-plated copper, for connection to the generator frame ground and field ground cable.

AC DISTRIBUTION

- Provides 240 VAC for all module accessories.
- Includes controls to de-energize jacket water heaters and generator space heater when the engine is running.

SHORE POWER TWO (2)

- One (1) shore power connection distribution block for jacket water heaters.
- One (1) for generator space, battery charger, and fuel pump.

INTERNAL LIGHTING

- Four (4) internal DC lights with one (1) timer and two switches installed at each side of the container door.
- Three (3) internal AC lights.
- One (1) single duplex service receptacle.

BATTERY CHARGER AND BATTERIES

- 24 VDC/20A battery charger with float/equalize modes and charging ammeter.
- Maintenance free batteries.

EMERGENCY STOP PUSHBUTTON

- Two external ESPs located near each access door.

MODES OF OPERATION

Caterpillar utility paralleling controls are intended for automatic or manual paralleling with a utility power source as a load management system, with provisions for standby operation feeding an isolated load network. Load management operation involves microprocessor-based automatic loading controls with soft loading, base load, Import/Export control and soft unloading. For Standby operation, the generator operates as an isochronous machine isolated from the utility supply. The controls allow for automatic operation, initiated locally or remotely by the customer's SCADA system. Detailed modes of operation are listed below:

SINGLE UNIT ISLAND AND MULTI-UNIT ISLAND OPERATION

1. Utility Standby Mode (Normal)
 - a. The utility is providing power for the plant loads.
 - b. The Power Module Generator breaker is open.
 - c. The pm is in automatic standby mode to respond to a utility failure.
2. Emergency Mode (Emergency)
 - a. Utility Failure
 - 1) The customer protective relaying senses a utility abnormal condition.
 - 2) A run request is sent to the Power Module Generator plant.
 - 3) The first Power Module Generator reach rated to voltage and frequency is closed to the bus.
 - 4) In Multi-Unit Island Mode, the remaining Power Module Generators are paralleled to the bus as they reach rated voltage and frequency. This function is performed via the ModBus Plus data link connected between the Power Modules.
 - 5) Plant load is transferred to the Power Modules, which share load equally via ModBus Plus data link.
 - 6) The system is now in Emergency Mode.

GENERATOR DEMAND PRIORITY CONTROL

The System Controls include a Generator Demand Priority Control function to automatically match the on-line Power Module Generator capacity to the loads in order to avoid unnecessary operation of all the Power Module Generators when the plant loads are low.

The following controls are provided for each Power Module Generator:

- a. User-settable Generator Priority Selector
- b. Status indicator for the Generator Priority selected
- c. Status indicator for Power Module Generator on-line or off-line
- d. Generator Demand Priority Control Switch (On/Off)
- e. User-settable Generator Remove Level (% as a function of single generator capacity)
- f. User-settable Generator Remove Time Delay
- g. User-settable Generator Add Level (% as a function of single generator capacity)
- h. User-settable Generator Add Time Delay

Upon entrance into Emergency Mode, all generators will be started and paralleled to the bus. After the Remove Time Delay, Power Module Generators will be removed from the bus as a function of the generator percentage loading. Generators will be removed from the bus in descending priority order.

Should the generator percentage loading increase to the user-selected Generator Add Level after the user-selected Generator Add Time Delay, the next priority generator will be started, synchronized and paralleled to the bus. Should the Power Module Generator plant ever reach 100% loading, the next priority generator will be started and added to the bus, bypassing the Generator Add Time Delay.

MODES OF OPERATION (continued)

SINGLE UNIT IMPORT, EXPORT OR BASE LOAD OPERATION

During periods of peak demand the system may be placed in operation using the operator interface panel on the front of the switchgear.

1. Entry – Local

- a. The operator places the System Control Switch into Load Management.
- b. The operator selects Import, Export or Base Load Operation.
- c. The Load Management Setpoint is the amount of power Imported, Exported or Base-Loaded. A 4-12-20mA signal is provided by the customer and is linearly proportional to the utility load, with 12mA equaling 0 kW. The 4-12-20mA utility load signal is wired to one and only one Power Module. If the Power Module selected for Load Management is not available, the 4-12-20mA signal will be routed to a different Power Module.
- d. The operator sets the Load Management Setpoint and Power Factor Setpoint.
- e. A Run request signal is received by the Single Unit Power Module.
- f. The Power Module Generator is started and will run for a predetermined warm-up time before it is synchronized and paralleled to the utility.

- g. When the generator is on the bus, it is soft-ramp-loaded until the generator output reaches the Load Management Setpoint.
- h. The generator output is dynamically adjusted to maintain the Load Management Setpoint.
- i. Should the utility fail during Load Management Operation, the Protective Relay will cause the Paralleling Circuit Breaker 52G to open and be locked out until the Lockout Relay is manually reset by an operator on site. The generator is allowed to run for the duration of the cooldown time.

2. Exit – Local

- a. The Run Request signal is removed from the power module.
- b. The generator is soft-ramp-unloaded until the plant load is fully supported by the utility.
- c. The Paralleling Circuit Breaker 52G is opened.
- d. The generator is allowed to run for the duration of the cooldown time.

STANDARD PARALLELING CONTROL

GENERATOR PARALLELING CONTROLS

The switchgear includes:

- Single unit island mode.
- Multiple unit island mode.
 - Includes Load Sense/Load Demand control.
 - Load sharing capability is provided via network communication.
- Single unit utility parallel mode.
 - Selectable for Import/Export control.
 - If import or export control is selected a 4-12-20mA signal is required (provided by others) scalable to the utility contribution.
- 6 inch black and white HMI touch screen.
- Reverse compatibility module provided for interface to legacy designed Power Module Switchgear. Includes PLC, load share and voltage droop.

Incoming Utility Breaker Status Circuit – Circuit to accept customer's contact from remote utility disconnect device. Customer to provide a normally open form 'a' contact to indicate when the local load network is connected to the utility grid.

Utility Transfer Trip Circuit – Circuit accepts input (normally open dry contact) from customer's system protective relay(s) or other controlling device. Operation of contacts causes tripping of the generator circuit breaker via the generator (software) 86 lock-out function and places the engine in cooldown mode. Circuit is disabled when operating in single unit or multiple unit island.

GENERATOR PARALLELING CONTROLS OPERATOR INTERFACE

Graphical mimic one line diagram that shows generator with its respective circuit breaker in a one-line representation of the system. The graphics utilize black and white indicators and bar graphs while actively displaying the following information:

- Utility CB Open/Closed. Input contacts provided by others.
- Utility kW 4-12-20mA signal required and provided by customer that is scalable to the utility contribution.
- Generator CB Open/Closed/Tripped.
- Generator Volts/Amps/kW/Frequency.
- Engine Stopped/Running/Cooldown/Pre-Alarm/Shutdown.
- Engine ECS Position Stop/Auto/Run.
- Utility Output kW.
- System Summary Alarm.

Event logging is also included with up to 500 stored events.

GENERATOR METERING AND PROTECTION

Generator metering that will graphically display 3Ø Voltage, 3Ø Current, Frequency, Power Factor, kW, kVAR and a Synchroscope Display of EMCP 3.3 faults, CDVR or ADEM 3 will be provided via Modbus RTU interface to EMCP 3.3.

Generator/Intertie Protective Relaying including:

- Device 27/59 – Under/Over Voltage.
- Device 81O/U – Under/Over Frequency.
- Device 40 – Loss of Excitation.
- Device 32 – Reverse Power.
- Device 25 – Synchronizing Check.
- Device 15 – Auto Synchronizer.
- Device 65 – Governor Load Sharing, Soft Loading Control.
- Device 90 – VAR/PF and Cross Current Compensation Controller.

PROGRAMMING AND DIAGNOSTICS

Includes field programmable set points for engine control and monitoring variables and self-diagnosis of the EMCP 3.3 system component and wiring failures.

ENGINE CONTROL SWITCH

Keypad selectable, four (4) positions – Off, Auto, Man, Cool:

- Off for engine shutdown and resetting faults.
- Auto for local or remote automatic operation when initiated by switch operation or contact closure.
- Man for local starting and manual paralleling.
- Cool for normal engine shutdown with timed cool-down cycle.

CIRCUIT BREAKER CONTROL SWITCH

Heavy duty, three- (3) position spring return to center with momentary trip and close position and slip contacts for automatic closing. Includes circuit breaker position indicating lamps.

EMERGENCY STOP PUSHBUTTON

- Mushroom head, twist to reset, causes engine shutdown and tripping of the generator circuit breaker. Prevents engine starting when depressed.

STANDARD PARALLELING CONTROL (continued)

ELECTRONIC LOAD SHARING GOVERNOR

- Includes speed adjustment, and auto load share capability when in parallel with legacy power modules.

ALARM MODULE

- Dedicates annunciator screens for warning and shutdown faults. Includes external mounted horn and acknowledge push-button.

AUTOMATIC/MANUAL PARALLELING

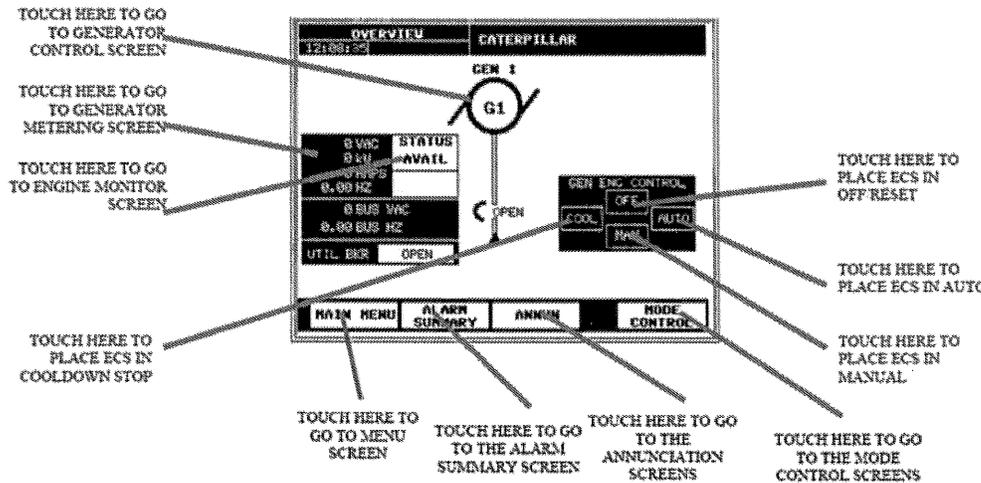
- Automatically synchronizes and parallels the generator with another power source.
- Includes provisions for manual permissive paralleling.

HUMAN MACHINE INTERFACE (HMI) HIGHLIGHTS

- Engine/Generator function is performed through the 6" HMI touch screen interface.

Overview Screen (Typical)

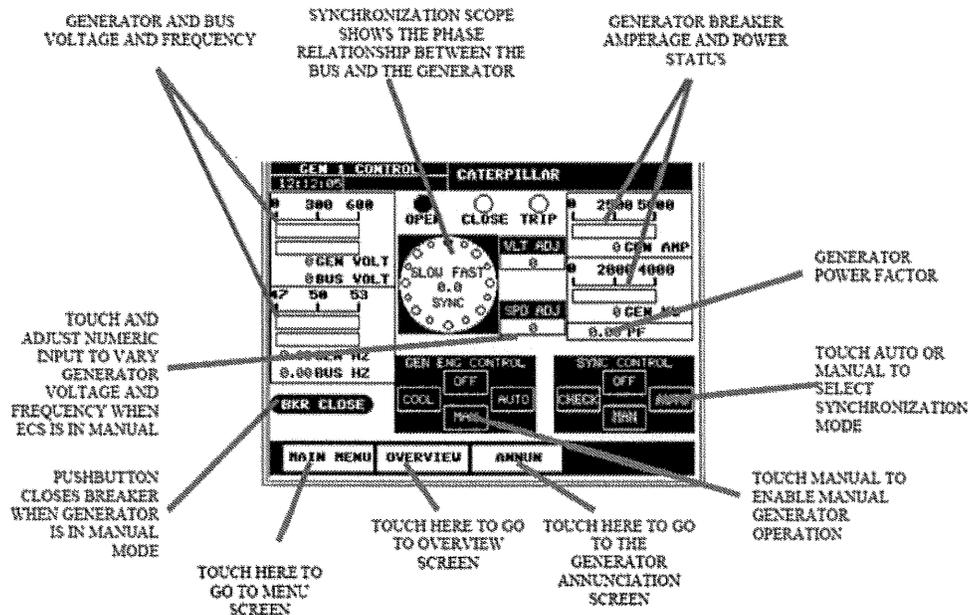
Shows the generator status, generator metering data, bus metering data, ECS position, and generator/utility breaker status.



STANDARD PARALLELING CONTROL (continued)

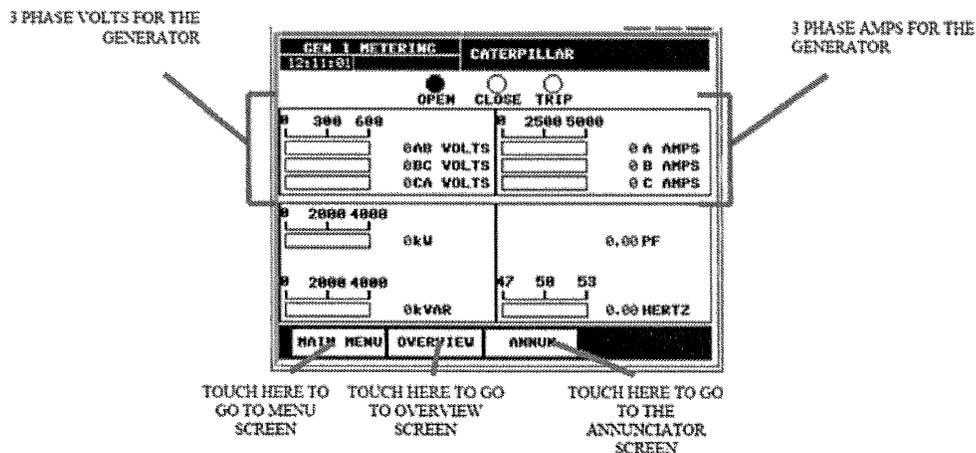
Generator Control Screen (Typical)

It allows the operator to observe the automatic synchronization and transfer of the load to and from the generator. Engine control allows the operator to run the engine in manual, or switch to automatic modes. Voltage and frequency offset adjustment allows the operator to control generator frequency and voltage.



Generator Metering Screen (Typical)

Allows the operator to view three phases of voltage and amperage for the bus and the generator.



STANDARD PARALLELING CONTROL (continued)

Engine Monitoring Screen (Typical)

Engine status is obtained directly from the EMCP 3. Engine starts and total hours can be used by the operator to determine when regular preventive maintenance is required. Other metering includes engine battery and oil filter health.

EMCP 3.3 ENGINE DATA

| GEN 1 ENG MONITOR | | CATERPILLAR | |
|--------------------------|-----|----------------|--|
| 15:42:12 | | | |
| ENGINE OIL PRESSURE | 0 | kPa | |
| ENGINE COOLANT TEMP | 0 | C | |
| BATTERY VOLTS | 0.0 | VOLTS | |
| ENGINE RPM | 0 | RPM | |
| ENGINE HOURS | 0 | HOUR | |
| AUTOMATIC START | | | |
| NUMBER OF CRANK ATTEMPTS | 0 | | |
| NUMBER OF SUCCESS STARTS | 0 | | |
| EXHAUST MANIFOLD 1 TEMP | 0 | C | |
| EXHAUST MANIFOLD 2 TEMP | 0 | C | |
| ENGINE OIL TEMPERATURE | 0 | C | |
| MAIN MENU | | OVERVIEW ANNUN | |

| GEN 1 ENG MONITOR | | CATERPILLAR | |
|-----------------------------|-----------------|----------------|--|
| 15:44:23 | | | |
| CRANKCASE PRESSURE | 0 | kPa | |
| BOOST PRESSURE | 0 | kPa | |
| AIR FILTER DIFFERENTIAL | 0 | kPa | |
| TOTAL FUEL CONSUMPTION | 0 | L | |
| INSTANEOUS FUEL CONSUMPTION | 0 | L | |
| ATMOSPHERIC PRESSURE | 0 | kPa | |
| ENGINE OPERATING MODE | STOP | | |
| ENGINE STATUS | NOT READY TO GO | | |
| FUEL PRESSURE | 0 | kPa | |
| OIL FILTER DIFF PRESS | 0 | kPa | |
| FUEL FILTER DIFF PRESS | 0 | kPa | |
| MAIN MENU | | OVERVIEW ANNUN | |

TOUCH HERE TO GO TO MENU SCREEN

TOUCH HERE TO GO TO OVERVIEW SCREEN

TOUCH HERE TO VIEW ADDITIONAL ENGINE DATA

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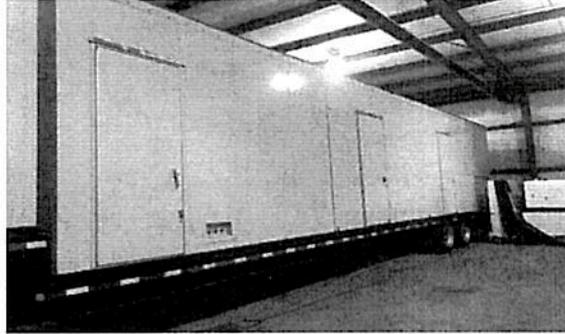
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SUNBELT. RENTALS

PUMP & POWER
SERVICES

MTU 2000 KW Portable Diesel Generator Sets



We are excited to announce that Power and HVAC has added (6) 2 MW 4160 Volt Power Modules to our fleet!! The addition of these units represents a unique product offering for your customers! Very quickly you can supply 4160 or 2400 volts to your customers without the need for a step-up transformer and all the 480 volt 4/0 Cabling. With only 4 cables you can provide your customer 2 MW worth of power.

These machines are ideal for utility, industrial, and municipal customers looking for medium voltage power for prime power, standby, or peak shaving applications. They will parallel with our existing fleet of generators and will add a very valuable tool to your tool box!

Product Details

- MTU 16V400 diesel engines with less than 1000 hours each
 - Packaged by Enercon
- Beckwith Generator Protection Relay
- Generator end rated at 4160V or 2400 V 3Ph 60HZ
- Detroit/MTU Digital controls
- Generator Operator Modes
 - Peak Shaving
 - Standalone / Island
 - Multiple Generator (Parallel)
- Operator control room with paralleling gear and engine controls separate from generator enclosure. Provides a safe and quiet room for operator.
- 53' portable sound attenuated weather protective enclosure
- Critical exhaust silencer
- New 24V starting batteries with rack and cables
- Dual Battery chargers
- Engine coolant heaters with circulation pumps
- No transformer needed for quick deployment!!
- 1350 Gallon Fuel Tank with Racor change on the fly fuel filtration system
- Extremely quiet!
- These machines are also great for long cable runs where you can run 1 per phase 4/0 Type SH (shielded) power cable then put a transformer to step the voltage down to 480 V / 208 V.
- Each machine will have 100' of 4/0 Type SH Portable Power Cable on board!

SUNBELT[®] RENTALS

PUMP & POWER
SERVICES

Model: **2500REOZD**

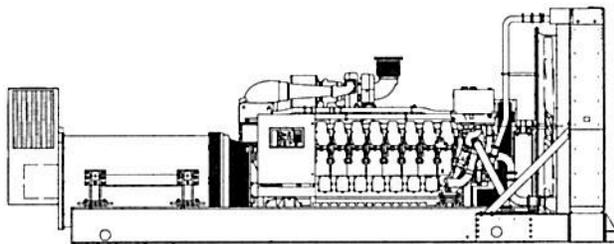
KOHLER POWER SYSTEMS

380V-13.8kV Diesel



Ratings Range

| | 60 Hz | 50 Hz |
|----------|---------------|-------|
| Standby: | kW 2500 | 2240 |
| | kVA 3125 | 2800 |
| Prime: | kW 2250-2270 | 2000 |
| | kVA 2813-2838 | 2500 |



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- At 60 Hz, the generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- The generator set complies with ISO 8528-5, Class G3, requirements for transient performance.
- A one-year limited warranty covers all systems and components.
- Alternator features:
 - The pilot-excited, permanent-magnet (PM) alternator provides superior short-circuit capability.
 - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
 - The generator set is direct-mounted to the skid.
 - Electronic engine controls manage the engine.

Generator Set Ratings

| Alternator | Voltage | Ph | Hz | 130° C Rise Standby Rating | | 105° C Rise Prime Rating | |
|------------|------------|----|----|----------------------------|------|--------------------------|------|
| | | | | kW/kVA | Amps | kW/kVA | Amps |
| 10M1003 | 277/480 | 3 | 60 | 2500/3125 | 3759 | 2250/2813 | 3383 |
| | 277/480 | 3 | 60 | 2500/3125 | 3759 | 2270/2838 | 3413 |
| 10M1004 | 220/380 | 3 | 50 | 2240/2800 | 4254 | 2000/2500 | 3798 |
| | 220/380 | 3 | 50 | 2240/2800 | 4254 | 2000/2500 | 3798 |
| 10M1005 | 220/380 | 3 | 50 | 2240/2800 | 4254 | 2000/2500 | 3798 |
| 10M1014 | 347/600 | 3 | 60 | 2500/3125 | 3007 | 2270/2838 | 2730 |
| 10M1016 | 347/600 | 3 | 60 | 2500/3125 | 3007 | 2250/2813 | 2706 |
| 10M1204 | 1905/3300 | 3 | 50 | 2240/2800 | 490 | 2000/2500 | 437 |
| 10M1210 | 2400/4160 | 3 | 60 | 2500/3125 | 434 | 2250/2813 | 390 |
| | 2400/4160 | 3 | 60 | 2500/3125 | 434 | 2270/2838 | 394 |
| 10M1211 | 1905/3300 | 3 | 50 | 2240/2800 | 490 | 2000/2500 | 437 |
| | 1905/3300 | 3 | 50 | 2240/2800 | 490 | 2000/2500 | 437 |
| 10M1316 | 3810/6600 | 3 | 50 | 2240/2800 | 245 | 2000/2500 | 219 |
| 10M1324 | 3810/6600 | 3 | 50 | 2240/2800 | 245 | 2000/2500 | 219 |
| | 7200/12470 | 3 | 60 | 2500/3125 | 145 | 2250/2813 | 130 |
| 10M1414 | 7620/13200 | 3 | 60 | 2500/3125 | 137 | 2250/2813 | 123 |
| | 7970/13800 | 3 | 60 | 2500/3125 | 131 | 2250/2813 | 118 |
| 10M1428 | 7200/12470 | 3 | 60 | 2500/3125 | 145 | 2270/2838 | 131 |
| | 7620/13200 | 3 | 60 | 2500/3125 | 137 | 2270/2838 | 124 |
| 10M1447 | 7970/13800 | 3 | 60 | 2500/3125 | 131 | 2270/2838 | 119 |
| | 6350/11000 | 3 | 50 | 2240/2800 | 147 | 2000/2500 | 131 |
| 10M1452 | 6350/11000 | 3 | 50 | 2240/2800 | 147 | 2000/2500 | 131 |

RATINGS: All three-phase units are rated at 0.8 power factor. **Standby Ratings:** Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. **Prime Power Ratings:** Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. **GENERAL GUIDELINES FOR DERATION:** ALTITUDE: Derate 1% per 100 m (328 ft.) elevation above 400 m (1312 ft.). TEMPERATURE: Derate 2.0% per 5° C (9° F) temperature above 40° C (104° F).

Alternator Specifications

| Specifications | Generator |
|---|--|
| Type | 4-Pole, Rotating-Field |
| Exciter type | Brushless, Permanent-Magnet |
| Voltage regulator | Solid State, Volts/Hz |
| Insulation: | NEMA MG1 |
| Material | Class H (380–4160 V), Class F (6600 V) Synthetic, Nonhygroscopic |
| Temperature rise | 130°C Standby |
| Bearing: quantity, type | 2, Sealed |
| Coupling | Flexible Coupling |
| Amortisseur windings | Full |
| Rotor balancing | 125% 60 Hz, 150% 50 Hz |
| Voltage regulation, no-load to full-load (with <0.5% drift due to temp. variation) | 3-Phase Sensing, ±0.25% |
| One-step load acceptance at 60 Hz | 100% of Rating |
| Unbalanced load capability | 100% of Rated Standby Current |
| Peak motor starting kVA: | (35% dip for voltages below) |
| 480V 10M1003 (4 bus bar) | 5656 (60 Hz), — (50 Hz) |
| 480V, 380V 10M1004 (4 bus bar) | 6269 (60 Hz), 4799 (50 Hz) |
| 380V 10M1005 (4 bus bar) | — (60 Hz), 5931 (50 Hz) |
| 600V 10M1014 (4 bus bar) | 7112 (60 Hz), — (50 Hz) |
| 600V 10M1016 (4 bus bar) | 6300 (60 Hz), — (50 Hz) |
| 3300V 10M1204 (6 lead) | — (60 Hz), 5247 (50 Hz) |
| 4160V 10M1210 (6 lead) | 5122 (60 Hz), — (50 Hz) |
| 4160V, 3300V 10M1211 (6 lead) | 6402 (60 Hz), 3935 (50 Hz) |
| 6600V 10M1316 (6 lead w/4 bus bar) | — (60 Hz), 5412 (50 Hz) |
| 6600V 10M1324 (6 lead w/4 bus bar) | — (60 Hz), 5141 (50 Hz) |
| 12470V 10M1414 (6 lead w/4 bus bar) | 5394 (60 Hz), — (50 Hz) |
| 13200V 10M1414 (6 lead w/4 bus bar) | 5822 (60 Hz), — (50 Hz) |
| 13800V 10M1414 (6 lead w/4 bus bar) | 6178 (60 Hz), — (50 Hz) |
| 12470V 10M1428 (6 lead w/4 bus bar) | 5737 (60 Hz), — (50 Hz) |
| 13200V 10M1428 (6 lead w/4 bus bar) | 6206 (60 Hz), — (50 Hz) |
| 13800V 10M1428 (6 lead w/4 bus bar) | 6591 (60 Hz), — (50 Hz) |
| 11000V 10M1447 (6 lead w/4 bus bar) | — (60 Hz), 5412 (50 Hz) |
| 11000V 10M1452 (6 lead w/4 bus bar) | — (60 Hz), 5104 (50 Hz) |

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Superior voltage waveform from two-thirds pitch windings and skewed stator.
- Digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- Brushless alternator with brushless pilot exciter for excellent load response.

Application Data

Engine

| Engine Specifications | 60 Hz | 50 Hz |
|--|---------------------------------------|------------------------|
| Manufacturer | Detroit Diesel/MTU | |
| Engine: model | 20V4000 (T203-7M36) | 20V4000 (T203-7M35) |
| Engine: type | 4-Cycle, Turbocharged, Intercooled | |
| Cylinder arrangement | 20V | |
| Displacement, L (cu. in.) | 89.81 (5480) | |
| Bore and stroke, mm (in.) | 165 (6.5) x 210 (8.3) | |
| Compression ratio | 15.5:1 | |
| Piston speed, m/min. (ft./min.) | 756 (2480) | 630 (2067) |
| Rated rpm | 1800 | 1500 |
| Max. power at rated rpm, kWm (BHP) | 2740 (3675) | 2420 (3245) |
| Cylinder head material | Cast Iron | |
| Crankshaft material | Forged Steel | |
| Valve (exhaust) material | High Alloy Steel | |
| Governor: type, make/model | MDEC Electronic Control | |
| Frequency regulation, no-load to full-load | Isochronous | |
| Frequency regulation, steady state | ±0.25% | |
| Frequency | Fixed | |
| Air cleaner type, all models | Dry | |

Exhaust

| Exhaust System | 60 Hz | 50 Hz |
|---|-----------------|-------------|
| Exhaust manifold type | Dry | |
| Exhaust flow at rated kW, m ³ /min. (cfm) | 558 (19705) | 456 (16103) |
| Exhaust temperature at rated kW, dry exhaust, °C (°F) | 470 (878) | 495 (923) |
| Maximum allowable back pressure, kPa (in. Hg) | 5.1 (1.5) | |
| Exhaust outlet size at engine hookup, mm (in.) | 2 @ 270 (10.63) | |

Engine Electrical

| Engine Electrical System | 60 Hz | 50 Hz |
|--|-------|------------|
| Battery charging alternator: | | |
| Ground (negative/positive) | | Negative |
| Volts (DC) | | 24 |
| Ampere rating | | 70 |
| Starter motor rated voltage (DC) | | Dual, 24 |
| Battery, recommended cold cranking amps (CCA): | | |
| Quantity, CCA rating each | | Four, 1150 |
| Battery voltage (DC) | | 12 |

Application Data

Fuel

| Fuel System | 60 Hz | 50 Hz |
|---|-----------------|------------|
| Fuel supply line, min. ID, mm (in.) | 20 (0.79) | |
| Fuel return line, min. ID, mm (in.) | 20 (0.79) | |
| Max. fuel flow, Lph (gph) | 1800 (475) | 1440 (380) |
| Min./max. fuel pressure at engine supply connection, kPa (in. Hg) | -10/150 (-3/44) | |
| Fuel filter | 2, Secondary | |
| Recommended fuel | #2 Diesel | |

Lubrication

| Lubricating System | 60 Hz | 50 Hz |
|---|---------------|-------|
| Type | Full Pressure | |
| Oil pan capacity, dipstick mark max., L (qt.) | 340 (359) | |
| Engine oil capacity, initial filling, L (qt.) | 390 (412) | |
| Oil filter: quantity, type | 4, Spin-On | |
| Oil cooler | Water-Cooled | |

Cooling

| Radiator System | 60 Hz | 50 Hz |
|--|--------------|-------------|
| Ambient temp., standby rating, °C (°F) | 40 (104) | 45 (113) |
| Ambient temp., prime rating, °C (°F) | 45 (113) | 50 (122) |
| Engine water capacity, L (gal.) | 260 (69) | |
| Radiator system capacity, including engine, L (gal.) | 757 (200) | |
| Engine jacket water flow, Lpm (gpm) | 1665 (440) | 1383 (365) |
| Charge cooler water flow, Lpm (gpm) | 632 (167) | 500 (132) |
| Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.) | 1100 (62555) | 930 (52888) |
| Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.) | 650 (36964) | 440 (25022) |
| Water pump type | Centrifugal | |
| Fan diameter, including blades, mm (in.) | 2362 (93) | |
| Fan, kWm (HP) | 98 (131) | 86 (115) |
| Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O) | 0.125 (0.5) | |

| Remote Radiator System* | 60 Hz | 50 Hz |
|--|-----------------------|-------|
| Connection sizes: | Class 150 ANSI Flange | |
| Water inlet, mm (in.) | 191 (7.5) Bolt Circle | |
| Water outlet, mm (in.) | 191 (7.5) Bolt Circle | |
| Intercooler inlet/outlet, mm (in.) | 152 (6.0) Bolt Circle | |
| Static head allowable above engine, kPa (ft. H ₂ O) | 149 (50) | |

* Contact your local distributor for cooling system options and specifications based on your specific requirements.

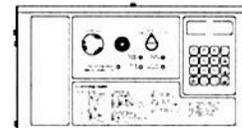
Operation Requirements

| Air Requirements | 60 Hz | 50 Hz |
|---|---------------|---------------|
| Radiator-cooled cooling air, m ³ /min. (scfm) [‡] | 3539 (125000) | 3047 (107600) |
| Cooling air required for generator set when equipped with CWC or remote radiator, based on 14°C (25°F) rise, m ³ /min. (scfm) [‡] | 759 (26800) | |
| Combustion air, m ³ /min. (cfm) | 228 (8052) | 180 (6356) |
| Heat rejected to ambient air: | | |
| Engine, kW (Btu/min.) | 105 (5971) | |
| Generator, kW (Btu/min.) | 107 (6084) | |

[‡] Air density = 1.20 kg/m³ (0.075 lbm/ft³).

| Fuel Consumption | 60 Hz | 50 Hz |
|------------------------------------|-----------------------|---------------|
| Diesel, Lph (gph) at % load | Standby Rating | |
| 100% | 647.3 (171.0) | 551.4 (145.7) |
| 75% | 504.9 (133.4) | 417.9 (110.4) |
| 50% | 352.8 (93.2) | 287.1 (75.9) |
| 25% | 196.5 (51.9) | 155.7 (41.1) |
| Diesel, Lph (gph) at % load | Prime Rating | |
| 100% | 593.9 (156.9) | 498.7 (131.7) |
| 75% | 461.1 (121.8) | 381.8 (100.9) |
| 50% | 327.8 (86.6) | 263.6 (69.7) |
| 25% | 180.2 (47.6) | 143.5 (37.9) |

Controller



Decision-Maker™ 550 Controller

Audiovisual annunciation with NFPA 110 Level 1 capability.
 Programmable microprocessor logic and digital display features.
 Alternator safeguard circuit protection.
 24-volt engine electrical system capability.
 Remote start, remote annunciation, and remote communication options.
 Refer to G6-46 for additional controller features and accessories.

Additional Standard Features

- Alternator Protection
- Alternator Strip Heater (standard on 3300 volt and above)
- Oil Drain Extension
- Operation and Installation Literature
- Pilot-Excited, Permanent-Magnet Generator
- Flexible Exhaust Connector, Stainless Steel

Available Accessories

Open Unit

- Exhaust Silencer, Critical Kit: GM30322-KP1
- Exhaust Silencer, Hospital Kit: GM30321-KP1

Cooling System

- Block Heater
(recommended for ambient temperatures below 10°C [50°F])
- City Water Cooling
- Remote Radiator Cooling

Fuel System

- Flexible Fuel Lines
- Fuel Pressure Gauge
- Fuel/Water Separator
- Subbase Fuel Tank with Day Tank

Electrical System

- Battery
- Battery Charger, Equalize/Float Type
- Battery Charger, Equalize/Float Type Installed
- Battery Heater
- Battery Rack and Cables

Engine and Generator

- Air Cleaner Restriction Indicator
- Alternator Strip Heater (available up to 600 volt)
- Engine Fluids (oil and coolant) Added
- Winding RTDs (standard on 4160-6600V)
- Line Circuit Breaker (NEMA type 1 enclosure)
- Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)
- Optional Generators
- Rated Power Factor Testing
- Spring Isolators (50/60 Hz)

Paralleling System

- Voltage Adjust Control

Maintenance and Literature

- General Maintenance Literature Kit
- Maintenance Kit
- NFPA 110 Literature
- Overhaul Literature Kit
- Production Literature Kit

Controller

- Common Failure Relay Kit
- Communication Products and PC Software
- Customer Connection Kit
- Dry Contact Kit (isolated alarm)
- Prime Power Switch
- Remote Annunciator Panel
- Remote Audiovisual Alarm Panel
- Remote Emergency Stop Kit
- Remote Mounting Cable
- Run Relay Kit

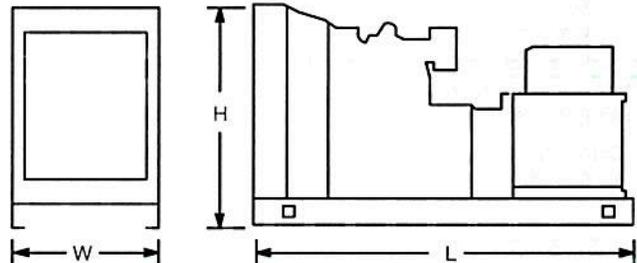
Miscellaneous Accessories

- _____
- _____
- _____
- _____
- _____

Dimensions and Weights

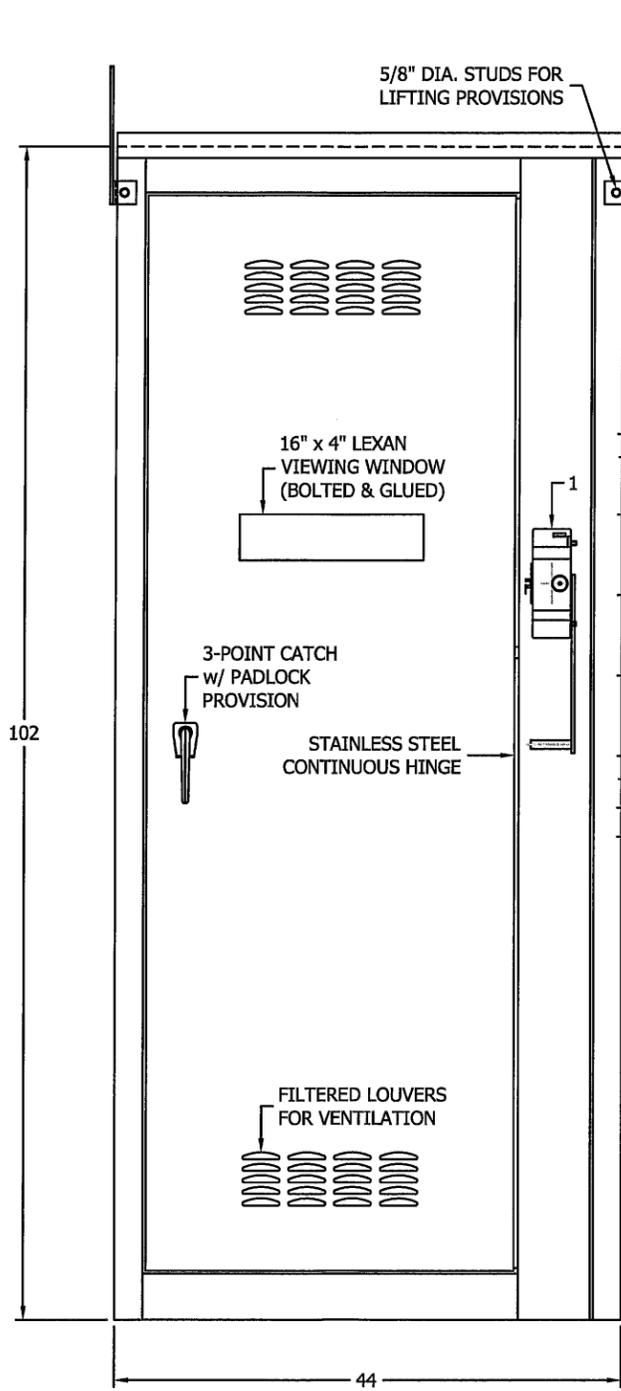
Overall Size, L x W x H, max., mm (in.): 7601-8020 x 2765 x 3107
 (299.3-315.7 x 108.9 x 122.3)
 Weight (radiator model), wet, max., kg (lb.): 26308 (58000)

Note: See ADV drawing for specific dimensions and weight based on generator selection.



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

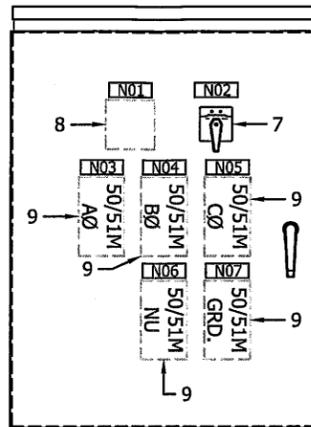
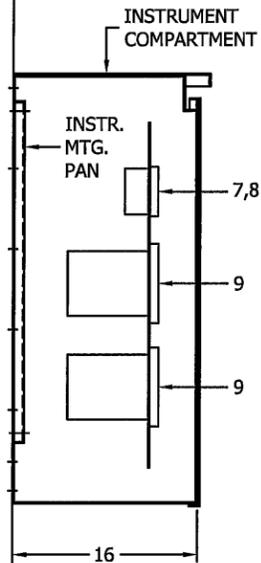
DISTRIBUTED BY:



FRONT VIEW

NOTES:

- 1) ALL DIMENSIONS IN INCHES, UNLESS OTHERWISE NOTED.
- 2) NEMA-3R BOLTED CONSTRUCTION OF #10 & #12 GA. SHEET STEEL.
- 3) UNIT FINISH: MUNSELL GREEN.
- 4) KIRK KEY INTERLOCKS ARE NOT PROVIDED, PER CUSTOMERS REQUEST. SWITCH HANDLE CAN BE PADLOCKED IN THE OPEN OR CLOSED POSITION.
- 5) MINIMUM CLEARANCE - 6.0" BETWEEN LIVE PARTS (PHASE TO PHASE) & 6.0" TO GROUND OR NON-CURRENT CARRYING PARTS.
- 6) **120VAC HEATER SOURCE BY OTHERS.**
- 7) (4) UNITS ARE REQUIRED ON THIS SALES ORDER. (2) UNITS SET UP FOR 15KV, (2) UNITS SET UP FOR 5KV (LABELED FOR 15KV SERVICE).
- 8) ALL BUS TO BE INSULATED.



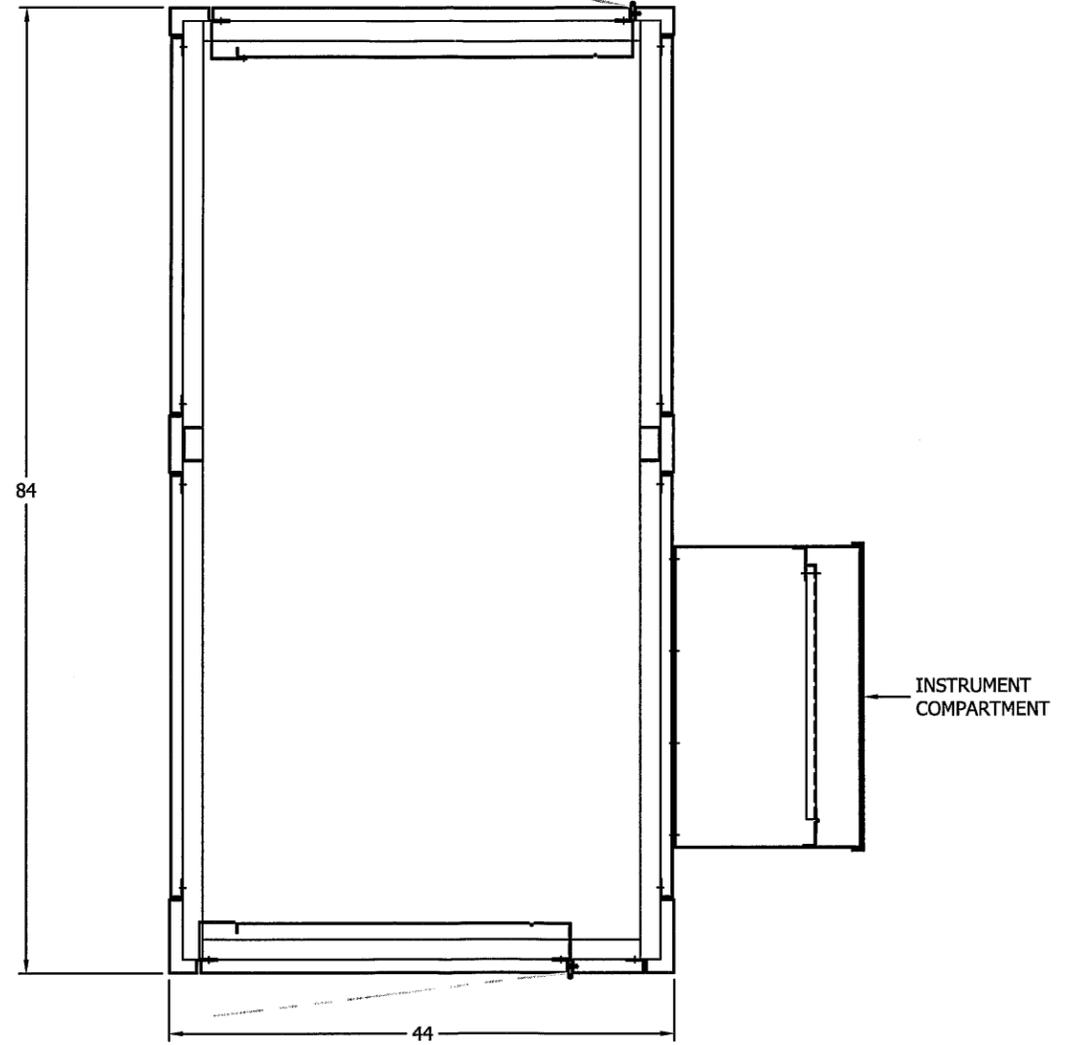
INSTRUMENT COMPARTMENT

SWITCH RATING:

- 13.8KV - NOMINAL
- 15KV - MAXIMUM
- 36KV - 60Hz WITHSTAND
- 95KV - BASIC IMPULSE LEVEL
- 1200A - CONTINUOUS LOAD
- 40KA - FAULT CLOSE
- 61KA - MOMENTARY

BREAKER RATING:

- 15KV - MAXIMUM
- 95KV - BASIC IMPULSE LEVEL
- 1200A - CONTINUOUS LOAD
- 31.5KA - INTERRUPTING CURRENT



PLAN VIEW

| | | | |
|------|----------|-----|----------------|
| 6 | | | |
| 5 | | | |
| 4 | | | |
| 3 | | | |
| 2 | | | |
| 1 | 08-07-13 | PRS | REVISED NOTE 7 |
| REV. | DATE | BY | CHANGES MADE |

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 www.pennpanel.com E-mail: info@pennpanel.com
 Custom Designed Electric Power Equipment Since 1938

SOLD TO:
 PHILIPS BROTHERS ELECTRICAL CONTRACTORS, INC.
 235 SWEET SPRING ROAD
 GLENMOOR, PA 19343

PROJECT/END-USER:
 (STOCK)

SCALE: N.T.S.
 DATE: 06-19-13 DRAWN BY: PRS

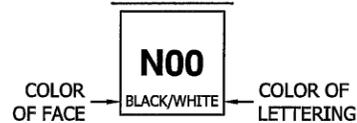
CUST. P.O.: 35100
 SHOP No.: 130216-01
 DWG. No.: 14594-FV1
 REV.: 01

JOB DESCRIPTION:
 (4) NEMA-3R 15KV 1200A METAL ENCLOSED UNFUSED SWITCH & FIXED MOUNT BREAKER
 (2) SET UP FOR 5KV OPERATION

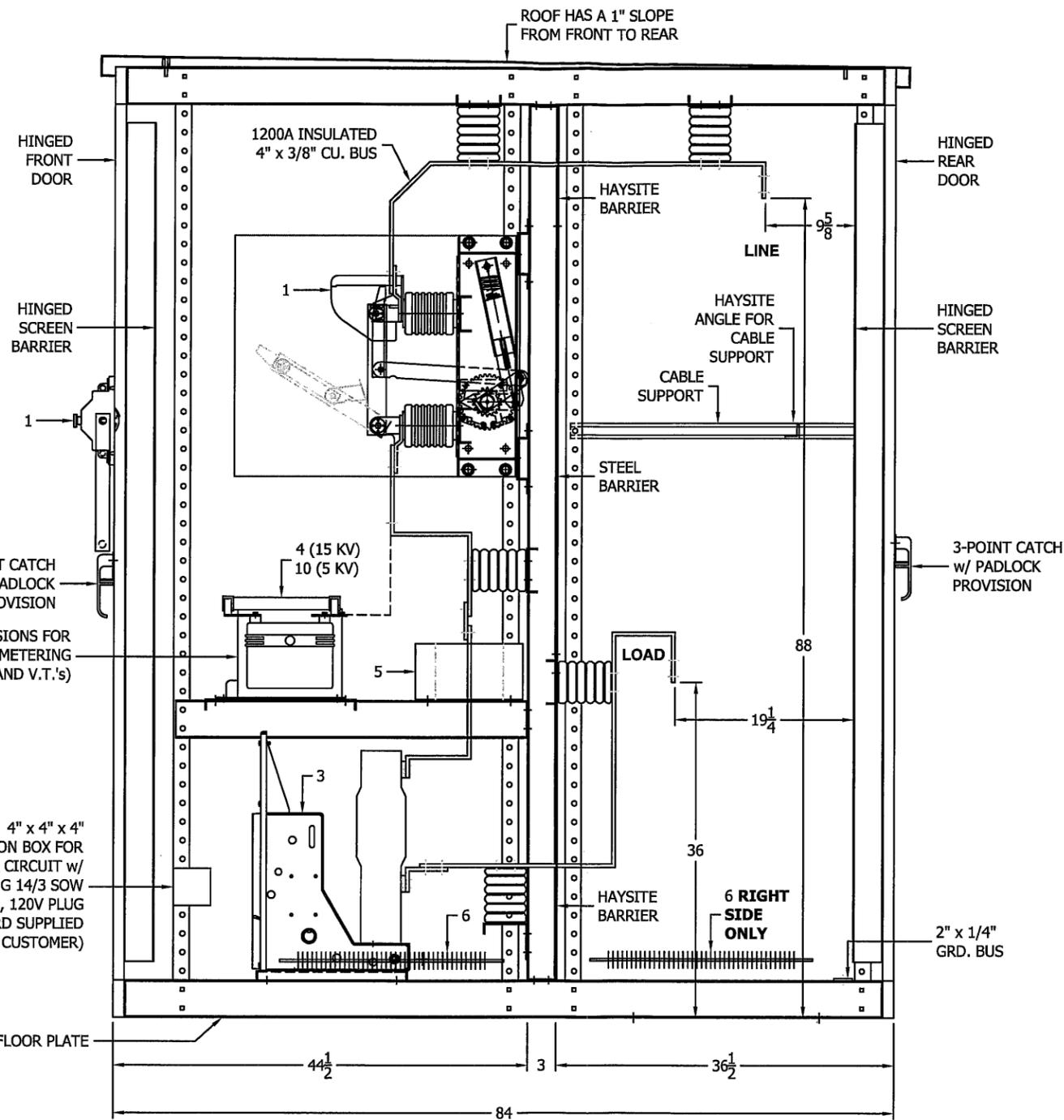
| # | NAMEPLATE DATA | | # |
|--|----------------------------------|----------------------------------|--|
| N01 <small>BLACK/WHITE (4) RQD.</small> | MULTI METER | BREAKER CONTROL SWITCH | N02 <small>BLACK/WHITE (4) RQD.</small> |
| N03 <small>BLACK/WHITE (4) RQD.</small> | 50/51M A PHASE OVERCURRENT RELAY | 50/51M B PHASE OVERCURRENT RELAY | N04 <small>BLACK/WHITE (4) RQD.</small> |
| N05 <small>BLACK/WHITE (4) RQD.</small> | 50/51M C PHASE OVERCURRENT RELAY | 50/51M NEUTRAL OVERCURRENT RELAY | N06 <small>BLACK/WHITE (4) RQD.</small> |
| N07 <small>BLACK/WHITE (4) RQD.</small> | 50/51M GROUND OVERCURRENT RELAY | | N08 <small>BLACK/WHITE (4) RQD.</small> |

****COLOR LEGEND****

EXAMPLE

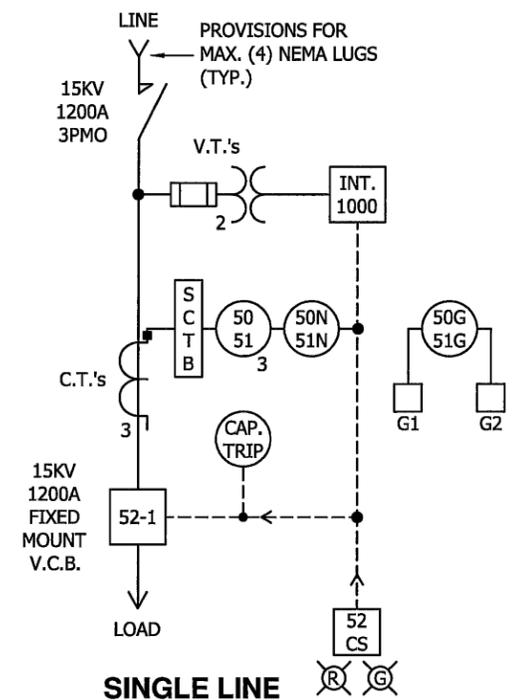


ALL NAMEPLATES 1" x 3" PHENOLIC SCREW-ON w/ 2 1/2" HOLE CENTERS UNLESS OTHERWISE NOTED.

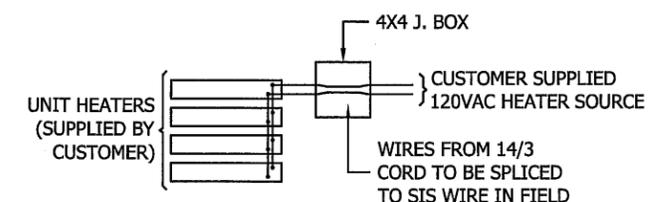


RIGHT SIDE SECTION VIEW

| BILL OF MATERIAL (PER UNIT) | | | |
|-----------------------------|----------------|------|---|
| NO. | MFG. | QTY. | DESCRIPTION |
| 1 | POWER-CON | 1 | 15KV 1200A 3P MANUALLY OPERATED SWITCH w/ FRONT OPERATING HANDLE & INSULATING BARRIER KIT CAT. #541-029-A1-B1 |
| 2 | | | |
| 3 | ABB | 1 | ADVAC 15KV 1200A 750MVA FIXED MOUNT BREAKER CAT. #AF3H111100000U0 |
| 4 | G.E. | 2 | VOLTAGE TRANSFORMERS, 14,400-120V CAT. #765X021030 (15KV SETUP) |
| 5 | ITI | 3 | CURRENT TRANSFORMERS, 1200:5A CAT. #781-122MR |
| 6 | - | 3 | HEATERS (SUPPLIED BY CUSTOMER) |
| 7 | ELECTRO SWITCH | 1 | BREAKER CONTROL SWITCH w/ GREEN & RED L.E.D. LIGHTS |
| 8 | CROMPTON | 1 | INTEGRA 1000 MULTIMETER (SUPPLIED BY CUSTOMER) |
| 9 | BASSLER | 5 | BE1-50/51M RELAYS (SUPPLIED BY CUSTOMER) |
| 10 | G.E. | 2 | VOLTAGE TRANSFORMERS, 4,200-120V 35:1 RATIO, DUAL FUSED CAT. #763X021018 (5KV SETUP) |



SINGLE LINE



HEATER DETAIL

| REV. | DATE | BY | CHANGES MADE |
|------|----------|-----|--|
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 3 | | | |
| 2 | | | |
| 1 | 08-07-13 | PRS | REVISED ITEM 4 DESCRIPTION, ADDED ITEM 10, QTY. OF ITEM 6 TO 3 |

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PROJECT/END-USER: (STOCK)

SCALE: N.T.S.
 DATE: 06-19-13 DRAWN BY: PRS
 STD. DWG.:

CUST. P.O.: 35100
 SHOP No.: 130216-01
 DWG. No.: 14594-SV1
 REV.: 01

JOB DESCRIPTION:
 (4) NEMA-3R 15KV 1200A METAL ENCLOSED UNFUSED SWITCH & FIXED MOUNT BREAKER
 (2) SET UP FOR 5KV OPERATION

Attachment C
Proposed Schedule

Attachment D
Abutter Notice and Affidavit

August 31, 2019

Dear Neighbor,

Maintaining infrastructure is one of the many ways Eversource supports the safe and secure transmission of electricity throughout the region. We are writing today to let you know we are submitting an amendment to the Connecticut Siting Council (CSC) regarding Petition No. 1371.

We're Always Working to Serve You Better

On June 7, 2019, the Council issued a declaratory ruling on Petition No. 1371 and found that the proposed modifications to the 667 Line as part of the 667 Line Rebuild Project ("Project") would not have a substantial adverse environmental effect. Construction of the Project commenced on or about April 22, 2020 and is currently ongoing in Sharon, Salisbury, and Canaan, Connecticut.

Eversource is now requesting the CSC approve a plan to install temporary stand-by generation at the Falls Village Substation located at 35 Water Street in Canaan, CT. We are making this request in the event of an inadvertent interruption of the supply of power occurs during construction of the Project. This contingency plan would help avoid a potential outage for approximately 8,000 customers in the nearby communities.

If the CSC approves the amendment, temporary wood matting and trucks supplying the generation are expected to be installed at the Falls Village Substation in September. Based on the current Project schedule, the matting and trucks would remain in the area until December. Please note this schedule is approximate and subject to change. The generation units will not run constantly; they are planned to run during commissioning and in the unlikely event of a loss of load during the Project.

Contact Information

Eversource is committed to being a good neighbor and doing our work with respect for you and your property. For more information please call our projects hotline at 1-800-793-2202 or send an email to ProjectInfo@eversource.com.

If you would like to send comments regarding Eversource's petition amendment to the CSC, please send them via email to siting.council@ct.gov or send a letter to the following address: Melanie Bachman, Executive Director, Connecticut Siting Council, Ten Franklin Square, New Britain, CT 06051.

Sincerely,



Ciara Stage
Eversource Project Manager – 667 Line Rebuild Project

COVID-19 Safety Information

Meeting Customer Needs During this Critical Time

Safety First and Always

The safety of our employees, our customers and the public is our top priority during the ongoing coronavirus public health crisis. Our commitment to safety, first and always, is continuous.

Providing Reliable Service to Customers

Eversource is committed to delivering safe, reliable service to our customers. This commitment has taken on even more importance during these unsettled times. We continue to call on our employees and contractors to perform essential work in the field that maintains and improves the reliability of our networks and serves customers' best interests, while also adapting our work practices to incorporate social distancing, proper protective equipment, heightened hygiene, and other best practices to protect their, and the public's, health and avoid the spread of coronavirus.

Safely Performing Our Work

Essential work is activity that maintains or improves the condition of our system and supports our delivery of safe and reliable energy and other services, including the replacement or installation of electrical lines, structures/poles, and related equipment.

In addition to relying on alternate communications channels to keep customers safe and informed (letters, emails and phone calls), we will resume our use of door hangers as a part of our outreach efforts. Eversource representatives will leave these notifications that include information on our work in rights-of-way and who to contact with any questions — without knocking on doors. Eversource representatives will continue to abide by all COVID-19 safety guidelines, which include wearing personal protective equipment, following social distancing, enhanced sanitizing requirements and other federal and state health and safety guidelines.

Questions and More Information

For any questions regarding essential work in your area, please call **1-800-793-2202** or email us at ***ProjectInfo@eversource.com***.

AFFIDAVIT OF SERVICE OF NOTICE

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Sec. 16-50j-40 of the Regulations of Connecticut State Agencies ("RCSA") provides that proof of notice to the affected municipalities, property owners and abutters shall be submitted with a petition for declaratory ruling to the Connecticut Siting Council ("Council"). In accordance with that RCSA section, I hereby certify that I caused notice of the petition for a declaratory ruling of The Connecticut Light and Power Company doing business as Eversource Energy to be served by mail or courier upon the following municipal official:

- Henry Todd, First Selectman
Town of Canaan (Falls Village)
Falls Village Town Hall
108 Main Street
P.O. Box 47
Falls Village, CT 06031

I also certify that I caused notice of the proposed modifications to be served by mail or courier upon the owner of the directly abutting property:

- First Light Hydro Generating Co.
P.O. Box 5002
New Milford, CT 06776
- U.S. Department of Interior
1849 C Street Northwest
Washington, D.C. 20240

Ciara Stage 8/31/2020
Ciara Stage
Project Manager

On this the 31st of August 2020, before me, the undersigned representative, personally appeared, Ciara Stage, known to me (or satisfactorily proven) to be the person whose name is subscribed to the foregoing instrument and acknowledged that she executed the same for the purposes therein contained.

In witness whereof, I hereunto set my hand and official seal.

Andrew W. Loul / 413393

Officer of the Superior Court/Juris No.