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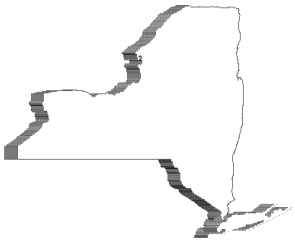
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242



ADDENDUM NO. 2 TO PROJECT NO. 45106

HVAC WORK AND ELECTRICAL WORK
REPLACE EMERGENCY GENERATORS
FINGER LAKES RESIDENTIAL CENTER
250 AUBURN ROAD
LANSING, NY 14882

January 7, 2016

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

ELECTRICAL WORK SPECIFICATIONS

1. SECTION 263215 PARALLELING DIESEL-ALTERNATOR POWER SYSTEM: Discard the Section bound in the Project Manual and substitute the attached Section (pages 263215-1 thru 263215-15). Noted "REVISED 01/06/2016".

ELECTRICAL WORK DRAWINGS

2. Revised Drawings:
   a. Drawing Nos. E-101, E-503, and E-602 noted "REVISED DRAWING 1/06/2016" accompany this Addendum and supersede the same numbered originally issued drawings.

END OF ADDENDUM

Margaret F. Larkin
Executive Director
Design and Construction

SECTION 263215 - PARALLELING DIESEL-ALTERNATOR POWER SYSTEM

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Automatic Transfer Switch: Section 263623.

1.02 SYSTEM DESCRIPTION

A. Design Criteria: The paralleling, diesel-alternator units are required to:
1. Supply power for up to 4000 hours annually or up to 40,000 hours during the initial 10 years of operation.
2. Operate 20,000 hours without major repairs or overhauls, and be completely rebuildable.
3. Deliver the specified output and have the capability to supply at least 10 percent additional output for up to 2 hours in any 24 hour period.
4. Operate in coordination with all automatic transfer switches installed under this project.

B. Description of System:
1. The paralleling, diesel-alternator power system powers electrical equipment inside designated buildings of this facility in the event of failure of normal power source.
2. In normal operating condition, the mechanism of the transfer switches is in the normal position and the diesel-alternator units are shut down. Sequence of transfer operation occurs as follows:
    a. Upon signal from a designated automatic transfer switch, the diesel-alternator power system will automatically start.
    b. Complete transition from onset of normal service failure to diesel-alternator power system transfer shall not exceed 10 seconds.
    c. If load is determined to be 50% or under a single generator's capacity then generator A shall remain running and generator B shall shut off. Alternate between generators every time normal power is lost, in order to equalize run time hours between generators.
        i. If at any time load increases to 75% of primary generator's capacity then secondary generator shall start and connect to the bus to share the load.
        ii. If at any time load decreases to below 66% of primary generator's capacity then the secondary generator is to turn off and disconnect from the bus.
    d. The diesel-alternator power system continue to run until the related automatic transfer switch(es) signal for the units to shut down.

C. Fuel Pumping System(s):
1. Provide fuel pumping system(s) to pump fuel from existing 2000 gallon above ground fuel tank to generator(s) sub base tank(s) as described in contract documents within the sub base tank(s).

1.03 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Submittals Package: Submit the product data, shop drawings, and quality control submittals specified below all at the same time as a package for preliminary approval. After preliminary approval, perform factory test and submit the factory test report for final approval.

C. Shop Drawings:
1. Show the construction (outline) of the paralleling diesel-alternator units and accessories.
2. Installation details.
3. Project specific power and control wiring diagrams that show all required wiring and clearly identify factory installed wiring and field installed wiring.
4. Project specific plans and details for the weatherproof, sound attenuated enclosure including layout of equipment, raceways, piping, etc.
5. Detailed drawings showing generator on sub base tank, pump compartment and fuel piping to outside of pump compartment; pump, valve, piping data and accessories.

D. Product Data:
1. Catalog sheets, specifications and installation instructions.
2. Bill of materials.
3. Detailed sequence of operations (format similar to 1.02 B. Description of System).
4. Company's data indicating fuel consumption with the unit operating at 1/2, 3/4 and full load (include fuel specifications).
5. Name, address and telephone number of nearest fully equipped service organization.
6. State where factory test will be held. Include data which proves that equipment available and capabilities of test site are adequate and designed for the tests required, including full load and 110 percent full load tests at .8 PF.
7. Subbase tank fuel system controller, including control sequence, alarms and wiring diagrams.

E. Quality Control Submittals.
1. Design Data:
   a. Company's data indicating HP, KW and KVA ratings with proof that the unit will meet the full load test without exceeding NEMA temperature rise specified at 100 percent & 110 percent full load (.8 PF).
   b. Certified data from the Company proving that the unit will meet the requirements of 1.02 A. Design Criteria.
   c. Torsional stress compatibility analysis for the proposed diesel/alternator combination proving that the torsional stress will not exceed the specified limit.
   d. Ampere requirements of the starting system (at the batteries specified minimum ambient temperature) during cranking.
      1) Include engine manufacturer's recommended battery ampere-

hour capacity at the minimum ambient temperature condition for the specified duration and number of crank cycles.

2) Include battery manufacturer's data proving that the batteries will meet the ampere-hour requirements at the batteries minimum ambient temperature.

3) Include details of battery charger and battery rack recommended by battery manufacturer.

2. Factory Test Report.

3. Company Field Advisor Data: Include:

a. Name, business address and telephone number of Company Field Advisor secured for the required services.

b. Certified statement from the Company listing the qualifications of the Company Field Advisor.

c. Services and each product for which authorization is given by the Company, listed specifically for this project.

4. Completed Installation Lists.

F. Contract Closeout Submittals:

1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director's Representative. Include name, address and telephone number of nearest fully equipped service organization.

2. Test Report: System acceptance test report.

3. Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly. Include fuel transfer pump test data.

4. Photographs:

a. After completion of the work take color photographs of the completed Work of this Section, as follows:

1) 3 of Diesel-alternator from different positions.

2) 1 overall view of diesel-alternator.

3) Nameplate(s)

b. Use a digital camera. Use wide angle lens for overall view. Use electronic flash capable of supplying sufficient light to evenly illuminate the overall subject.

c. Minimum digital requirements:

1) Format shall be .jpg or .tif

2) The resolution shall be 12 Megapixels or greater.

d. Submit photographs to electronic submittal website for approval and record.

1.04 QUALITY ASSURANCE

A. Equipment Qualifications For Products Other Than Those Specified:

1. At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.

2. If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Company Field Advisor.

   a. Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.

   b. Only references from the actual owner or owner’s representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.

      1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.

3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.

   a. Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.

4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

B. Source Quality Control: The Company producing the diesel-alternator unit shall have test facilities available which can demonstrate that the proposed system meets contract requirements.

C. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 24 working hours for the following:

1. Render advice regarding installation and final adjustment of the system.
2. Witness final system test and then certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
3. Train facility personnel on the operation and maintenance of the system (minimum of two 2 hour sessions).
4. Explain available service programs to facility supervisory personnel for their consideration.

D. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed Work.

E. Factory Test:

1. Test facility shall be:
   a. Sheltered from precipitation.
   b. A minimum of 50 degrees F (10 degrees C).
   c. Safe from electric hazard for test observers.

2. Preparation: The unit shall be completely assembled and all preliminary adjustments made before the factory test is initiated.

   a. Run unit long enough to assure the unit is running properly.
   b. A suitable muffler and radiator, if available at the test site, may be used for the factory test in lieu of delivering the project muffler and radiator to the test site.

3. Run a preliminary test for the purpose of:
   a. Determining whether the unit is in suitable condition to conduct the factory test.
   b. Checking the test setup and equipment to verify that all required test data can be obtained during the factory test.

4. Two representatives of the State shall witness factory test of the diesel-alternator unit.
   a. Notify the Director's Representatives at least 2 weeks in advance of test.
   b. Have sketch or diagram available showing how test equipment is connected, including metering, pt's, ct's, and power transformers (if used).
   c. Have metering located so that they are easily observable.

5. The object of the factory test is to determine:
   a. The net power output.
   b. Fuel consumption.
   c. That diesel-alternator operational functions are within specified parameters.
   d. That alternator temperature rise does not exceed specified limit (test at .8 PF).

6. Schedule of Tests:
   a. Test diesel-alternator unit at .8 PF in the following sequence:
      1) 1/2 hour at half load.
      2) 1/2 hour at 3/4 load.
      3) 2 hours at full load.
      4) 2 hours at 110 percent full load.
      5) 1 hour at full load.

   b. Run each load test segment continuously. Run all load test segments consecutively with no steps or delays between each test segment.

7. Measurements, Observations and Data:
   a. Provide the following information:
      1) Barometric pressure.
      2) Intake air temperature.
      3) Speed in revolutions per minute.
      4) Frequency in cycles per second.
      5) Output voltage (per phase).
      6) Output amperes (per phase).
      7) Power factor.
      8) Gross kilowatts output.
      9) Gross kilowatt-hours during test period.
      10) Temperature of alternator windings at full load and 110 percent full load.
      11) Fuel rate (gph).
      12) Fuel characteristics (weight per gal & BTU/lb).

   b. Before each test, bring the engine to a steady state under the condition of the test. The attainment of steady state is to be determined by readings which are to be made part of the record.

   c. During each test period, take readings and record results at the beginning and end of test and at 15 minute intervals during test.

   d. Demonstrate that:
      1) Unit maintains precise isochronous control.
      2) Voltage regulation and transient voltage dip are within specified parameters.
      3) Stable alternator operating conditions are reestablished within specified parameters between no load/full load.

   e. Perform tests under the supervision of a factory engineer.

   f. Submit factory test report for approval. Do not ship unit to site until final approval is received.

8. Instruments and Apparatus:
   a. Provide the following instruments and apparatus for the tests (available instruments at the factory may be used to the extent possible):

      1) Tanks, scales or meters arranged for measuring fuel consumed.
      2) Pressure gages.
      3) Temperature measuring devices.
      4) A tachometer or frequency indicator.
      5) A stop watch or electrical timing apparatus.
      6) Electrical instruments to measure kilowatts, volts, amperes, power factor and gross kilowatt-hour output of the unit.
      7) Steady load of uniform power factor (.8) for simulated load conditions.

   b. Instruments and apparatus shall have recent calibration certification. Make available data that certifies the dates the instruments and apparatus have been calibrated.

1.05 PROJECT CONDITIONS

A. The diesel-alternator unit shall meet all requirements at the following elevation and ambient temperatures (actual site conditions):
   1. Elevation Above Sea Level: 941 feet.
   2. Maximum Ambient Temperature: 120 degrees F.
   3. Minimum Ambient Temperature: -10 degrees F.

1.06 MAINTENANCE

A. Spare Parts:
   1. Two sets of gaskets for routine engine maintenance.
   2. Two spare heating elements for water jacket heater. Furnish spare water jacket heater if elements are not replaceable.
   3. Set of belts.
   4. Set of oil filter elements.
   5. Set of fuel filter elements.
   6. Set of air cleaner elements.
   7. Hydrometer for testing anti-freeze solution.
   8. Test kit for checking chemical condition of coolant.
   9. One year supply of coolant conditioner.
   10. Special tools if required for the regular maintenance and minor repairs of the unit.

PART 2 - PRODUCTS

2.01 PARRALLELING DIESEL-ALTERNATOR UNIT

A. Rating: 400KW (500KVA at 0.8 power factor), 277/480 volts, 3 phase, 4 wire, 60 Hertz. (Note: Unit is required to meet 110 percent full load test at .8 PF for 2 hours).

B. Acceptable Companies: Generac Power Corp. Or approved equal.

C. Base: Rigid, electrically welded structural steel base with diesel-alternator mounted directly thereon complete with spring type vibration isolators, provisions for foundation bolts and provisions for lifting entire unit.

D. Engine:

1. Industrial type diesel engine, turbocharged, water cooled, pressure lubricated, 1800 rpm maximum, full diesel with mechanical fuel injection. Engine shall be capable of starting cold, solely from the heat of compression, operating on No. 2 diesel fuel.
2. Torsional stress of the engine crankshaft and alternator rotor shaft shall not exceed 5000 pounds per square inch when operating as an assembled unit at rated speed and power output.
3. Average fuel consumption: 27.8 gallons per hour at rated full load.
4. Engine Accessories: Equip engine with company's standard accessories. Exception: In addition to, or in lieu of the company's standard accessories for the following, equip engine with:

    a. Electric starting system, 24 V dc minimum.
    b. Fuel filters, spin on type.
    c. Dry type air cleaner (replaceable element).
    d. Manual priming pump for fuel.
    e. Motor driven pre-lube pump unless recommended otherwise by engine manufacturer. Pump to start and build up sufficient oil pressure before engine is cranked. Pre-lube pump parameters (pressure, flow, etc.) as recommended by engine manufacturer.
    f. Lubricating oil filters, full flow (with by-pass valve), spin-on type.
    g. Oil dipstick system that allows lubricating oil level to be checked while engine is running and stopped.
    h. Governor which maintains speed at precise isochronous control for 60 Hz operation. The frequency at any constant load (including no load) shall remain within a steady state band width of + 0.25 percent of rated frequency. Frequency modulation (defined as the number of times per second that the frequency varies from the average frequency in cyclic manner) shall not exceed one cycle per second.

E. Engine Control and Instrumentation:

1. Timer for selective number of cranking cycles.
2. Circuit for bypassing oil pressure protective device during starting.
3. Selector switch for stop, automatic and manual positions.
4. Indicating Instruments and Safety Devices:
   a. Audible alarm to sound when any safety device operates.
   b. High water temperature cutout and indicating light.
   c. Low lubricating oil pressure cutout and indicating light.
   d. Overspeed shutdown and indicating light.
   e. Overcranking cutout and indicating light.
   f. Alarm system reset.
   g. Lamp test switch.
   h. Fuel pressure gage (injection pump).
   i. Lubricating oil pressure gage.
   j. Jacket water temperature gage.
   k. Running time meter.
   l. Sensor and warning device to indicate jacket water temperature below 70 degrees F.
   m. Charging pressure gage (turbocharged engine).
   n. Lubricating oil temperature gage.
   o. Weak battery (alarm).
   p Low fuel sub base tank (alarm).
   q. Leak Detection (alarm).
5. Provisions for remote annunciation.
6. Engine gages and control switches may be installed directly on an engine mounted panel or on instrument panel of an engine starting control panel.
   a. Locate panel so that it may be observed conveniently by Facility operating personnel.
   b. Equip panel with strip heater to control condensation.

F. Engine Cooling and Heating Equipment:

1. Radiator:
   a. Cooling capacity as recommended by engine manufacturer.
   b. Factory mounted and piped to generator engine mounting frame.
   c. Factory test pressure of 20 pounds per square inch, operating pressure as required by the engine manufacturer.
   d. Maximum operating temperature of 250 degrees F.
   e. Cooling core guard.
   f. OSHA approved fan guard.
   g. Surge tank as recommended by radiator manufacturer.
   h. Sight glass for coolant level indication.
   i. Spring type vibration isolators.
2. Insulating blankets for exhaust manifold or other suitable means to protect personnel from hot exhaust parts, to prevent excessive heat rejection to the room from the exhaust manifold and to prevent excessive heat build-up in engine and accessories due to lack of cooling air flow over engine and accessories.

3. Permanent type anti-freeze (ethylene glycol) for the cooling system; Dow Chemical Co.'s Dow Therm SR-1. Coolant mixture suitable for use to minus 50 degrees F.
4. Engine mounted radiator system and pusher type fan designed to cool the jacket water and lubricating oil.
5. Coolant conditioner corrosion prohibitive chemical additive which controls acidity, softens water and leaves protective film on cooling passages. Type and method of application as recommended by engine manufacturer.
6. Thermostatically controlled electric water jacket heater in the cooling system to maintain engine temperature at minimum 70 degrees F.
7. Lube oil cooler.

G. Engine Exhaust Equipment:

1. Silencer: Generator enclosure interior mounted suitable for critical noise areas; Burgess-Mannings' BEO, Donaldson Co. Inc.'s TCU, Riley-Beaird Inc.'s Maxim Model M51, or Universal Silencer's EN5 with:
   a. Flanges.
   b. Hangers and supports (vibration isolation type).

2. Exhaust Pipe: Schedule 40 black steel pipe with:
   a. Corrugated stainless steel flexible section for connection between exhaust manifold and exhaust pipe.
   b. Hangers and supports.
   c. Condensate drain at low point. d. Rain cap (vertical pipe).
   e. Bird screen (horizontal pipe).

3. Insulation: 3 inch thick calcium silicate pipe insulation; Manville's Thermo-12, or Owens-Corning's Kaylo with Type 304 stainless steel metal jacketing, .010 inch thick, held in place with snap-in locking joints and stainless steel bands with snap straps.
4. Exhaust Pipe: Selkirk Metalbestos Model PS Diesel Engine Exhaust System.

H. Alternator and Accessories: Multipole, revolving field alternator meeting NEMA Standards, having:
1. Brushless solid state permanent magnet (PMG) exciter system.
2. Temperature compensated solid state voltage regulator. Voltage regulation within plus or minus 2 percent of rated voltage from no load to full load. Transient voltage dip not greater than 20 percent of rated voltage when full load at rated power factor is applied to the alternator.
3. Stable alternator operating conditions re-established within 2 seconds following any change in load between no load and full load or between full load and no load.
4. Temperature rise in accordance with NEMA MG1-22.40, determined by resistance method, rated on continuous basis at full load and standby basis at 110 percent full load, reference ambient temperature 40 degrees C, .8 PF:

INSULATION SYSTEM	RISE (Full Load)	RISE (110 Percent Full Load)
Class B	80 degrees C	105 degrees C
Class F	105 degrees C	130 degrees C
Class H	125 degrees C	150 degrees C

5. Temperature rise in accordance with NEMA MG1-22.40, determined by resistance, rated on continuous duty basis at 110 percent full load, reference ambient temperature 40 degrees C, .8 PF:

INSULATION SYSTEM	MAX. RISE AT 110 PERCENT FULL LOAD
Class B	80 degrees C
Class F	105 degrees C
Class H	125 degrees C

6. Alternator heating units as recommended by alternator manufacturer to maintain the temperature of the alternator at 5 degrees above the ambient.
7. Rheostat for plus or minus 5 percent voltage adjustment.
8. Amortisseur windings, suitable for paralleling.
9. Alternator directly connected to engine and driven through a semi-flexible driving flange.
10. Main circuit breaker mounted on unit, or on mounting frame adjacent to unit. Circuit breaker shall meet the requirements of Section 262817 - Enclosed Circuit Breakers. Field circuit breaker not acceptable as the main circuit breaker.
11. Instruments in panel, shock mounted on the unit:
    a. Dial type frequency meter.
    b. Rheostat Control.
    c. AC voltmeter.
    d. AC ammeter.
    e. Individual or combination type selector switches for the voltmeter and ammeter.
    f. Panel lights and switch.

2.02 BATTERIES AND ACCESSORIES

A. Nickel-cadmium batteries; Hoppeke Battery Systems Inc.'s FNC, Marathon's Alcad UHP, McGraw Edison Power Systems Div.'s Americad HED, or SAB Nife Inc.'s Block Battery Type H, with:
1. Number of cell units as required for voltage of starting system. (Cell voltage shall be based on 1.2 volts per cell.)
2. Plastic cell containers.
3. Ampere-hour capacity as recommended by engine manufacturer for a minimum of 3 consecutive starting attempts of 15 seconds each.
4. Ampere-hour capacity as recommended by engine manufacturer for 60 seconds of continuous cranking. Note: Engine overcrank device shall terminate cranking with enough reserve power to permit additional cranking after an investigation to find the reason for a failure to start.
5. Full ampere-hour capacity delivered at ambient temperature of -10 degrees F.

B. Battery Charger: Constant voltage, current limiting type as recommended by the battery manufacturer, having:
   1. Fully automatic, 2 rate (float and high-rate/equalize) charging control.
   2. DC ammeter.
   3. DC voltmeter.
   4. High-rate indicator light.
   5. Common audible alarm and individual indicating lights (with provision for connection to remote annunciator) for:
      a. Ground fault (if ungrounded type dc system).
      b. AC input failure.
      c. Low dc voltage.
      d. High dc voltage.
      e. No dc voltage at batteries.

   6. Remote annunciator panel with common audible alarm and individual indicating lights for:
      a. Ground fault (if ungrounded type dc system).
      b. AC input failure.
      c. Low dc voltage.
      d. High dc voltage.
      e. Fuel Transfer Pump Failures.
      f. High fuel level in sub base tank.
      g. No dc voltage at batteries.

   7. Common audible alarm and individual indicating lights for:
      a. Ground fault (if ungrounded type dc system).
      b. AC input failure.
      c. Low dc voltage.
      d. High dc voltage.
      e. No dc voltage at batteries.

C. Battery Rack: As recommended by battery manufacturer

2.03 HOUSING

A. Factory installed level 2 sound enclosure, completely enclosing unit, having:
   1. Minimum 16 gage sheet steel construction. All metal painted with rust inhibiting primer and minimum 2 coats of finish paint.
   2. Louvered openings in both sides plus screened, free openings at base, for heat removal air flow.
   3. Front flange for connection to ductwork.
   4. Two removable doors on each side to allow access to the unit.
   5. Rear housing panel with hinged door to allow access to the instrument panel.

2.04 ENGINE FUEL EQUIPMENT

A. Tanks:

1. For each generator provide a unit Mounted sub base Tank: Generator shall sit on top of sub base tank. Provide a sub base fuel tank with minimum 946 gallon capacity, UL listed with rupture basin and leak detection. The sub base tank shall have an enclosed pump compartment for two supply pumps and one return pump. The pumps shall be piped by the manufacturer to the tank and to outside the pump compartment with 1" connections and capped. The pump control panel shall be located on the generator. Pump controller to be Global power components series 400 or approved equal. The control panel shall contain all lights, wiring terminals, etc.

B. Equipment:

1. Pump: 2GPM self-priming positive displacement rotary gear pump with corrosion resistance bronze housing. Gear to have self-lubricating carbon bearings with lip-seals. Provide built in relief valve. The motor mounts directly by carbonated style split-tang shaft coupling. 2GPM @ 20PSIG.

2. Motor: 1/3hp, single phase, open dry proof bearing supported shaft, auto thermal protected class B insulation for continuous 40°C operation, 115V, 60Hz.

3. Solenoid Valve: Pipe size, ½". Forged brass body, conduit housing, voltage 12VDC with 24" lead length.

C. Sequence of Operation:

1. Subbase Tank Filling
   a. Each Supply pump's HOA switch should be auto position for automatic activation and alternation of supply pumps.

   b. Tank filling is controlled by on/off float switches for each pump. The lead pump float switch is set for on at 50% (480 gallons) and off at 88% (845 gallons).The Lag pump float switches are set for on at 42% (403 gallons) and off at 80% (770 gallons).

   c. With the HOA switch in auto, and the tank level drops to 50%, the lead pump is activated, the pump running light is illuminated and the inlet solenoid valve opens. When the tank level reaches 88%, the lead pump is deactivated, the pump running light is off and the inlet solenoid valve closes. On the next start the auto transfer switch will automatically alternate the opposite pump to lead pump.

   d. In the event fuel is being consumed at a rate greater than the lead pump can supply and the fuel level falls to 42%, the lag be is activated, its running light is illuminated and the inlet solenoid valve remains open. Lag pump assists the lead pump until the tank reaches 80% capacity.

2. Return Pump

   a. The return pump is activated by float switch set at 90% (864 gallons). When the return pump is activated, its running light is illuminated and the pump runs until the tank reaches 80% (770 gallons).

3. Alarms and Lights

   a. A green Power Available light will be illuminated as long as control power is present.

   b. Low Level Light will be illuminated when the tank level reaches 20% (190) gallons; dry contacts close and alarm is sent.

   c. Critical Low Level light will be illuminated when the tank level reaches 15% (144 gallons).

   d. High Level Alarm light will illuminate when the tank level reaches 90% (864 gallons)

   e. Critical High Level Alarm light will illuminate when the tank level reaches 93% (900 gallons), inlet solenoid valve will close, alarm contacts will close and supply (s) will shut down.

   f. System Off light will illuminate when pump HOA switch is in the off position.

   g. Each pump's running light is illuminated when the pump is running.

   h. Leak Alarm will activate when there is fuel in the rupture tank.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Connections: Make all connections to unit with flexible connections designed for the specific purpose.
   1. Generators must have system acceptance test completed prior to fuel connections to existing 2000 gal tank.
   2. Before connections to existing 2000 gal tank, generator sub base tank(s) must be filled and tested per manufactures requirements.
   3. Install fuel pumping system(s) per manufactures written instructions. Perform testing of fuel pumping system(s) under the direction of manufactures certified representative, and provide manufactures operational acceptance certificate.

B. Diesel Fuel:
   1. Provide diesel fuel as required to initially fill the sub base tank(s) before commencing the preliminary system test.
   2. Upon completion of all tests provide additional diesel fuel as required to fill the sub base tank(s).

3. Diesel fuel shall have characteristics as recommended by the diesel-alternator unit engine manufacturer.

C. Phase Relationship: Correctly phase emergency and normal service so that motor rotation will not reverse upon transfer from normal to emergency feeder.

3.02 FIELD QUALITY CONTROL

A. Preliminary System Test:
1. Preparation: Have the Company Field Advisor adjust the completed system (with the contract automatic transfer switch connected). Coordinate with automatic transfer switch company field advisor preliminary switch/system test requirements. Operate it long enough to assure that it is performing properly.
2. Run a preliminary test for the purpose of:
   a. Determining whether the system is in a suitable condition to conduct an acceptance test.
   b. Checking and adjusting equipment.
   c. Training Facility personnel.

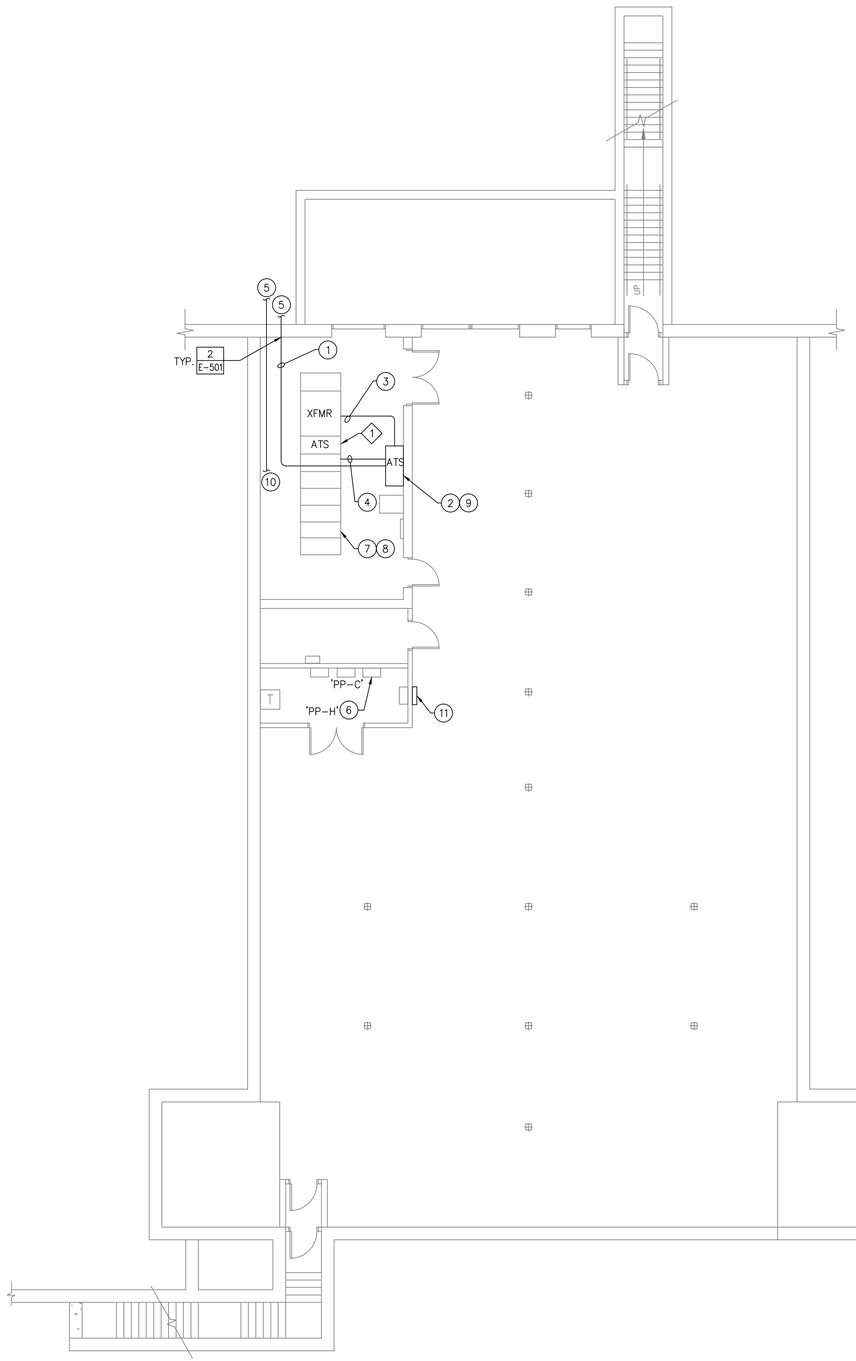
B. System Acceptance Test:
1. Preparation: Coordinate test with automatic transfer switch manufacturer and notify the Director's Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.

2. Make the following Tests:
   a. Test each system function step by step as summarized under SYSTEM DESCRIPTION.
   b. Test starting system and battery capacity. Crank engine for the required time and number of consecutive starting attempts.
   c. Load Test: Using the facility system as load to the extent possible plus supplemental load banks, run the following test at rated voltage:
      1) Four hours at full load. Provide supplemental load banks to bring load to full rating of diesel-alternator unit (load not to exceed rating of unit). Connect the supplementary load banks to the secondary side of selected pad mounted transformers.
      2) During the test period take voltage, current, frequency and all engine instrument readings. Record results at the beginning and end of test and at fifteen minute intervals during test.

3. Supply equipment necessary for system adjustment and testing.

4. Submit written report of test results signed by Company Field Advisor and the Director's Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly adjacent to the engine instrument panel.

END OF SECTION



ELECTRICAL BASEMENT PLAN
1/8"=1'-0"

REVISED DRAWING –
JANUARY 6, 2016

GRAPHIC SCALE (FEET)
1/8"=1'
0' 8' 16' 24' 32' 40'

REMOVAL CODED NOTE

1. DISCONNECT AND REMOVE AUTOMATIC TRANSFER SWITCH. REMOVAL TO INCLUDE WIRING TO SOURCE AND LOADS. REFER TO DRAWING E–601 FOR ADDITIONAL REMOVAL REQUIREMENTS.

CODED NOTES

1. PROVIDE SURFACE MOUNTED CONDUIT AND WIRING TO AUTOMATIC TRANSFER SWITCH (ATS) FROM 'SDP'. SEE ONE LINE DIAGRAM AND PANEL SCHEDULE FOR ADDITIONAL INFORMATION.
2. PROVIDE FLOOR MOUNTED 480/277V, NEMA 3R, 1600A AUTOMATIC TRANSFER SWITCH (ATS). REFER TO ELECTRICAL ONE–LINE DIAGRAMS FOR ADDITIONAL INFORMATION.
3. PROVIDE SURFACE MOUNTED CONDUIT AND WIRING TO ATS FROM TRANSFORMER (XFMR). SEE ONE LINE DIAGRAM FOR ADDITIONAL INFORMATION.
4. PROVIDE SURFACE MOUNTED CONDUIT AND WIRING TO ATS FROM SWITCH GEAR. SEE ONE LINE DIAGRAM.
5. REFER TO ELECTRICAL ONE–LINE DIAGRAMS AND ELECTRICAL SITE PLAN FOR ADDITIONAL INFORMATION FOR ADDITIONAL INFORMATION.
6. DISCONNECT SHUNT TRIP WITHIN PANEL 'PP–H' FOR SHUT DOWN OF PANEL 'PP–C' UPON LOSS OF NORMAL POWER.
7. DISCONNECT SHUT TRIP FOR CHILLER 1 AND 2 FOR SHUT DOWN UPON LOSS OF NORMAL POWER.
8. SMART EDGE SOFTWARE TO BE REPROGRAMMED FOR MANUAL START UP OF EACH CHILLER AFTER NORMAL POWER HAS BEEN LOST. SMART EDGE TO BE PROGRAMMED TO START (1) CHILLER AT A TIME AFTER 30 MINUTES OF LOSS OF NORMAL POWER OR AFTER TRANSFER BACK TO UTILITY POWER. SMART EDGE CONTACT: STEVE WALK 315–313–2924. (1)
9. PROVIDE 3/4" CONDUIT WITH COMMUNICATION CABLING TO SMART EDGE BMS SYSTEM INPUT/OUTPUT BOARD WITHIN BASEMENT.
10. PROVIDE CONDUIT AND WIRING TO ANNUNCIATOR LOCATED IN CSU. ROUTE WIRING THROUGH MEZZANINE IN CORRIDOR.
11. EXISTING SMART EDGE EQUIPMENT.

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANT

CHA
III Winners Circle, PO Box 5269 • Albany, NY 12205-0269
Main: (518) 453-4500 • www.chacompanies.com

STATE OF NEW YORK · MICHELLE LEE SMITH · LICENSED PROFESSIONAL ENGINEER · 085756

CONTRACT:
ELECTRICAL

TITLE:
REPLACE EMERGENCY GENERATORS

LOCATION:
FINGER LAKES RESIDENTIAL CENTER
250 AUBURN ROAD
LANSING, NY 14882

CLIENT:
NYS OFFICE OF
GENERAL SERVICES

MARK	DATE	DESCRIPTION
1	12/11/15	ADDENDUM #1
	8/21/15	BID DOCUMENTS

PROJECT NUMBER:	45106 – E
DESIGNED BY:	MPI
DRAWN BY:	DAS
FIELD CHECK:	–
APPROVED:	FI

SHEET TITLE:
ELECTRICAL BASEMENT PLAN

DRAWING NUMBER:
E–101

SHEET 8 OF 15

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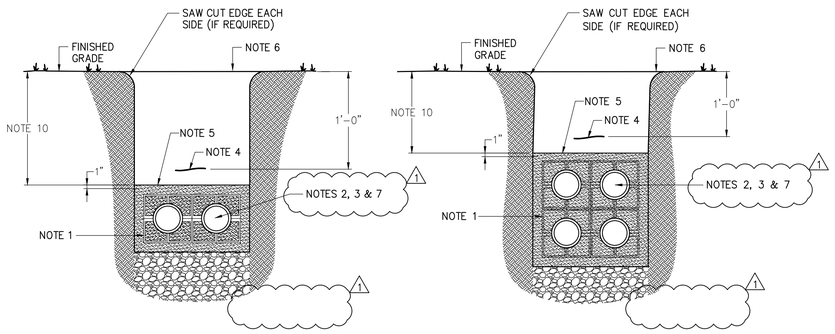


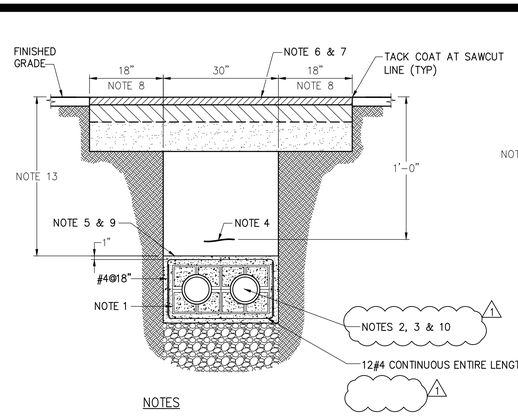
NOTES

1. PROVIDE BASE SPACERS AND INTERMEDIATE SPACERS AT 8'-0" ON CENTER.
2. PROVIDE A MINIMUM OF (3) PULL WIRES IN EACH INNERDUCT AND CONDUIT. REFER TO RACEWAY RISER DIAGRAM FOR ADDITIONAL INFORMATION.
3. MINIMUM 48" RADIUS FOR CONDUIT BENDS.
4. PROVIDE BLUE 6" WIDE CONDUCTIVE MARKING TAPE LABELED: 'COMMUNICATION CONDUITS' AND 'HIGH VOLTAGE CONDUITS' (INSTALL ABOVE THE ENTIRE LENGTH OF THE DUCTBANK).
5. ENCASE CONDUITS WITH 3" COVER, ALL SIDES SAND ENVELOPE. THE SLOPE OF DUCTBANK SHALL BE LIMITED TO 5% MAXIMUM. DUCTBANK SHALL BE SLOPED AWAY FROM EACH BUILDING ENTRANCE.
6. REPLACE EXISTING SURFACE CONDITIONS IN KIND TO INCLUDE, BUT NOT LIMITED TO: CONCRETE, CRUSHED STONE, SELECT GRAVEL, ASPHALT, TOPSOIL, GRASS, ETC. REPLACE SELECT BACKFILL IN 6" LIFTS, COMPACT EACH PLACEMENT.
7. UNDERGROUND CONDUIT REFER TO SITE PLAN AND RISER DIAGRAM FOR QUANTITY AND TYPE OF CONDUIT.

1

10. DEPTH SHALL BE 36."
11. 3" MINIMUM SEPARATION BETWEEN SECONDARY VOLTAGE CONDUITS.
12. 8" MINIMUM SEPARATION BETWEEN PRIMARY VOLTAGE CONDUITS.
13. COMMUNICATION CONDUITS MUST BE 12" MINIMUM FROM VOLTAGE CONDUITS.

1 UNDERGROUND DUCTBANK
– NOT TO SCALE



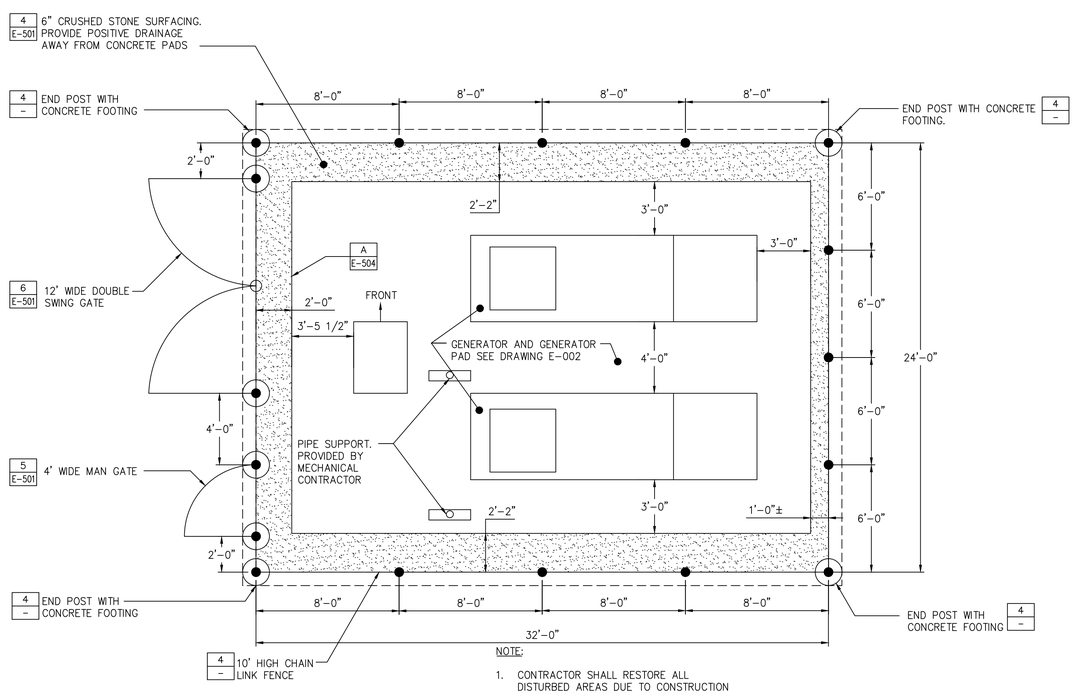
NOTES

1. PROVIDE BASE SPACERS AND INTERMEDIATE SPACERS AT 8'-0" ON CENTER.
2. PROVIDE (3) PULL WIRES IN EACH INNERDUCT AND CONDUIT. REFER TO RACEWAY RISER DIAGRAM FOR ADDITIONAL INFORMATION.
3. MINIMUM 48" RADIUS FOR CONDUIT BENDS.
4. PROVIDE BLUE 6" WIDE CONDUCTIVE MARKING TAPE LABELED: 'COMMUNICATION CONDUITS' AND 'HIGH VOLTAGE CONDUITS' (INSTALL ABOVE THE ENTIRE LENGTH OF THE DUCTBANK).
5. ENCASE CONDUITS WITH 4" OF CONCRETE (MINIMUM 3500 PSI) COVER, ALL SIDES ENVELOPE. THE SLOPE OF DUCTBANK SHALL BE LIMITED TO 5% MAXIMUM. DUCTBANK SHALL BE SLOPED AWAY FROM EACH BUILDING ENTRANCE.
6. REPLACE EXISTING SURFACE CONDITIONS IN KIND TO INCLUDE, BUT NOT LIMITED TO: CONCRETE, CRUSHED STONE, SELECT GRAVEL, ASPHALT, TOPSOIL, GRASS, ETC. REPLACE SELECT BACKFILL IN 6" LIFTS, COMPACT EACH PLACEMENT.
7. TO BE APPLIED IN ALL LOCATIONS WHERE EXISTING PAVEMENT IS DISTURBED BY CONSTRUCTION OPERATIONS.
8. PAVEMENT SHALL BE SAWCUT AND REPLACED 18" BEYOND ACTUAL LIMITS OF DISTURBANCE.
9. CONCRETE ENCASEMENT DETAIL IS TYPICAL FOR ALL ROADWAY CROSSINGS AND WHERE THE DEPTH OF BEDROCK PROHIBITS THE INSTALLATION OF CONDUIT WITH THE REQUIRED 18" COVERAGE.
10. UNDERGROUND CONDUIT REFER TO SITE PLAN AND RISER DIAGRAM FOR QUANTITY AND TYPE OF CONDUIT.

1

13. DEPTH SHALL BE 36."
14. 3" MINIMUM SEPARATION BETWEEN SECONDARY VOLTAGE CONDUITS.
15. 8" MINIMUM SEPARATION BETWEEN PRIMARY VOLTAGE CONDUITS.
16. COMMUNICATION CONDUITS MUST BE 12" MINIMUM FROM VOLTAGE CONDUITS.

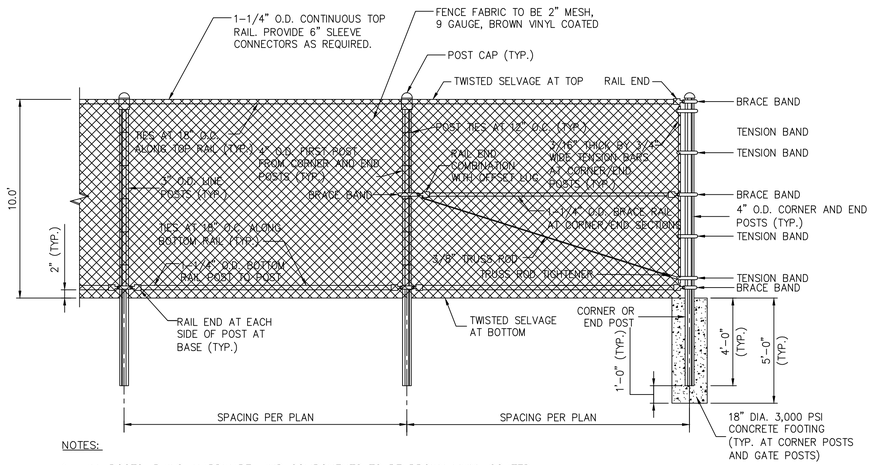
2 CONCRETE ENCASED DUCTBANK
– NOT TO SCALE



NOTE:

1. CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS DUE TO CONSTRUCTION TO EXISTING OR BETTER CONDITION.

3 GENERATOR LAYOUT
– 1/4" = 1'-0"



NOTES:

1. ALL POSTS, RAILS, HARDWARE, AND COMPONENTS TO BE BROWN VINYL COATED.
2. ALL TIES TO BE 9 GAUGE.
3. INSTALL BRACE RAIL ASSEMBLIES IN EACH DIRECTION FROM CORNER POSTS, AND AT ALL END POSTS
4. BRACE/TENSION BANDS TO BE 1/8"X1" AND FASTENED WITH 3/8"X1-1/2" CARRIAGE BOLTS.

4 10'-0" CHAIN LINK FENCE
– NOT TO SCALE

REVISED DRAWING – JANUARY 6, 2016

GRAPHIC SCALE (FEET)
1/4"=1' 0' 4' 8' 12' 16' 20'

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DESIGN & CONSTRUCTION

CONSULTANT
CHA
III Winners Circle, PO Box 5269 • Albany, NY 12205-0269
Main: (518) 453-4500 • www.chacompanies.com

STATE OF NEW YORK · MICHELLE LEE SMITH · 085756 · LICENSED PROFESSIONAL ENGINEER

CONTRACT:
ELECTRICAL

TITLE:
REPLACE EMERGENCY GENERATORS

LOCATION:
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250 AUBURN ROAD
LANSING, NY 14882

CLIENT:
NYS OFFICE OF GENERAL SERVICES

MARK	DATE	DESCRIPTION
1	12/11/15	ADDENDUM #1
	8/21/15	BID DOCUMENTS

PROJECT NUMBER:	45106 - E
DESIGNED BY:	MPI
DRAWN BY:	DAS
FIELD CHECK:	–
APPROVED:	FI

SHEET TITLE:
ELECTRICAL DETAILS

DRAWING NUMBER:
E-503

SHEET 11 OF 15

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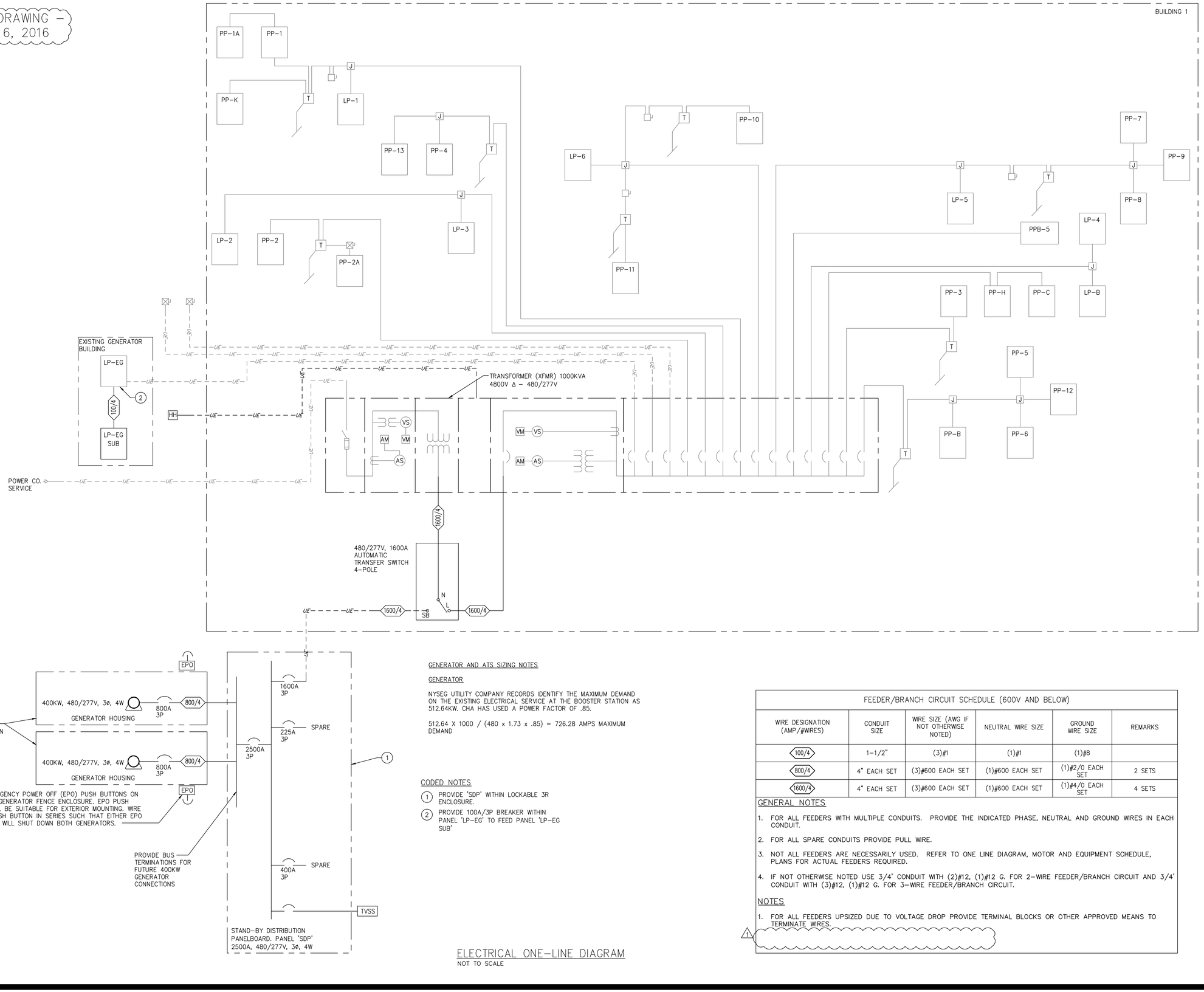
REVISED DRAWING – JANUARY 6, 2016

BUILDING 1



GENERATOR AND ATS SIZING NOTES

GENERATOR

NYSEG UTILITY COMPANY RECORDS IDENTIFY THE MAXIMUM DEMAND ON THE EXISTING ELECTRICAL SERVICE AT THE BOOSTER STATION AS 512.64KW. CHA HAS USED A POWER FACTOR OF .85.

512.64 X 1000 / (480 x 1.73 x .85) = 726.28 AMPS MAXIMUM DEMAND

CODED NOTES

1. PROVIDE 'SDP' WITHIN LOCKABLE 3R ENCLOSURE.
2. PROVIDE 100A/3P BREAKER WITHIN PANEL 'LP-EG' TO FEED PANEL 'LP-EG SUB'

ELECTRICAL ONE-LINE DIAGRAM
NOT TO SCALE

FEEDER/BRANCH CIRCUIT SCHEDULE (600V AND BELOW)

WIRE DESIGNATION (AMP/#WIRES)	CONDUIT SIZE	WIRE SIZE (AWG IF NOT OTHERWISE NOTED)	NEUTRAL WIRE SIZE	GROUND WIRE SIZE	REMARKS
100/4	1-1/2"	(3)#1	(1)#1	(1)#8	
800/4	4" EACH SET	(3)#600 EACH SET	(1)#600 EACH SET	(1)#2/0 EACH SET	2 SETS
1600/4	4" EACH SET	(3)#600 EACH SET	(1)#600 EACH SET	(1)#4/0 EACH SET	4 SETS

GENERAL NOTES

1. FOR ALL FEEDERS WITH MULTIPLE CONDUITS. PROVIDE THE INDICATED PHASE, NEUTRAL AND GROUND WIRES IN EACH CONDUIT.
2. FOR ALL SPARE CONDUITS PROVIDE PULL WIRE.
3. NOT ALL FEEDERS ARE NECESSARILY USED. REFER TO ONE LINE DIAGRAM, MOTOR AND EQUIPMENT SCHEDULE, PLANS FOR ACTUAL FEEDERS REQUIRED.
4. IF NOT OTHERWISE NOTED USE 3/4" CONDUIT WITH (2)#12, (1)#12 G. FOR 2-WIRE FEEDER/BRANCH CIRCUIT AND 3/4" CONDUIT WITH (3)#12, (1)#12 G. FOR 3-WIRE FEEDER/BRANCH CIRCUIT.

NOTES

1. FOR ALL FEEDERS UPSIZED DUE TO VOLTAGE DROP PROVIDE TERMINAL BLOCKS OR OTHER APPROVED MEANS TO TERMINATE WIRES.

1

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DRAWN BY:	DAS
FIELD CHECK:	–
APPROVED:	FI

SHEET TITLE:
ELECTRICAL ONE-LINE DIAGRAM

DRAWING NUMBER:
E-602

SHEET 14 OF 15