



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Administration
DIVISION OF PURCHASES
One Capitol Hill
Providence, RI 02908-5855

Tel: (401) 574-8100
Fax: (401) 574-8387
Website: www.purchasing.ri.gov

November 30, 2018
ADDENDUM NUMBER THREE
RFQ # 7597618

TITLE: EMERGENCY GENERATORS AT STEDMAN CENTER AND HARRINGTON HALL

Closing Date and Time: 12/14/18 AT 10:30AM (NOTE CHANGE)

Per the issuance of this ADDENDUM #3 (7 pages) the following is noted:

This addendum changes bid closing date and time.
This addendum posts additional clarification to bid specifications.
See attached transformer specification.

Drawing 00-E-2

Clarification on concrete encasement:

All primary ductbanks shall be concrete encased. Secondary ductbanks shall be concrete encased where run under roadway.

Harrington/Stedman Building Outages:

Requirements shall be revised as follows:

1. Any building outage will require that the contractor provide a standby generator. Generator shall be sized equal to proposed generator at each site. Contractor shall be required to provide any and all connections required for standby generator operation.
2. Each outage will require a risk assessment meeting to be held at DOA office.
3. Outages will be performed off hours.

2400 volt Padmount Switches

1. Generator backup for these outages will not be required. However the contractor shall be required where necessary as deemed so by DOA to perform switching at transformers or 2400 volt switches to switch from preferred to alternate feeder during outage and to connect back to preferred after outage. Contractor shall check phasing, etc as required. This work will be done two hours prior and immediately after scheduled outage.
2. Outages will be performed off hours.
3. Each outage will require a risk assessment meeting to be held at DOA office.

SECTION 16321 - PAD-MOUNTED TRANSFORMERS

PART 1 GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install the pad-mounted transformer(s) as specified herein and as shown on the contract drawings.

1.02 RELATED SECTIONS

1.03 REFERENCES

- A. The pad-mounted transformer(s) and all components shall be designed, manufactured and tested in accordance with the latest applicable NEMA (NEMA 210), IEEE and ANSI standards (ANSI C57).

1.04 SUBMITTALS – FOR REVIEW/APPROVAL

- A. The following information shall be submitted to the Engineer:
 - 1. Front view elevation or outline drawing and weight
 - 2. Nameplate diagram
 - 3. Conduit entry/exit locations
 - 4. Ratings (on nameplate) including:
 - a. kVA
 - b. Primary and secondary voltage
 - c. Taps
 - d. Basic Impulse level
 - e. Impedance
 - 5. Product data sheets
- B. Where applicable, the following additional information shall be submitted to the Engineer:
Specified accessories

1.05 SUBMITTALS – FOR CONSTRUCTION

- A. The following information shall be submitted for record purposes:
 - 1. Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process
 - 2. Wiring diagrams
 - 3. Production test reports
 - 4. Installation information
 - 5. Seismic certification as specified

1.06 QUALIFICATIONS

- A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.
- B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.08 OPERATION AND MAINTENANCE MANUALS

- A. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets, instruction bulletins and renewal parts lists where applicable, for the complete assembly and each major component.

1.09 FIELD MEASUREMENTS

- A. Measure primary and secondary voltages and make appropriate tap adjustments.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cooper
- B. Howard
- C. ABB

The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will be considered.

- D. The ratings of the transformer shall be as follows or as shown on the drawings:

kVA Rating	·as indicated		
Impedance	·5.75	%* ANSI Standard Tolerance	
HV	·2.4	kV *Delta	
HV BIL	·45 kV		
HV de-energized Taps	· 2	+/- 2 - 2-1/2% full capacity	
LV	·as indicated	Volts *Wye	

2.02 CONSTRUCTION

- A. The unit shall be biodegradable electrical insulating fluid from high oleic vegetable oil sources filled and shall be in accordance with the latest edition of the NEC. High fire point fluids shall be Factory Mutual and UL approved.
- B. The transformer shall carry its continuous rating with average winding or temperature rise by resistance that shall not exceed 65 degrees C rise, based on an average ambient of 30 degrees C over 24 hours with a maximum of 40 degrees C.
- C. The transformer shall be designed to meet the sound level standards for liquid transformers as defined in NEMA and ANSI.
- D. High-voltage and low-voltage windings shall be aluminum. Insulation between layers of the windings shall be by thermally set insulating paper or equal.
- E. The main transformer tank and attached components shall be designed to withstand pressures greater than the required operating design value without permanent deformation. Construction shall consist of carbon steel reinforced with external, internal or sidewall braces. All seams and joints shall be continuously welded.
- F. The assembly shall be individually welded and receive a quality control pressurized check for leaks. The entire tank assembly shall receive a similar leak test before tanking. A final six-hour leak test shall be performed.
- G. The transformer(s) shall be compartmental-type, self-cooled and tamper-resistant for mounting on a pad. The unit shall restrict the entry of water (other than flood water) into the compartments so as not to impair its operation. There shall be no exposed screws, bolts or other fastening devices which are externally removable.
- H. The transformer(s) shall consist of a transformer tank and full-height, bolt-on high- and low-voltage cable terminating compartments located side-by-side separated by a rigid metal barrier. Each compartment shall have separate doors, designed to provide access to the high-voltage compartment only after the low-voltage has been opened. There shall be at least one additional fastening device accessible only after the low-voltage door has been opened, which must be removed to open the high-voltage door. Doors shall be mounted flush with the cabinet frame. The low-voltage door shall have a handle-operated, three-point latching mechanism designed to be secured with a single padlock. A hex-head or penta-head bolt shall be incorporated into the low-voltage door latching mechanism. Both high and low-voltage doors shall be incorporated into the low-voltage door latching mechanism. Both high and low-voltage doors shall be equipped with stainless steel hinges and door stops to secure them in the open position.
- I. Compartment sills, doors and covers shall be removable to facilitate cable pulling and installation. The high-voltage door shall be on the left with the low-voltage door on the right. Compartments shall be designed for cable entry from below.
- J. Transformer(s) shall be supplied with a welded or bolted main tank cover and be of a sealed-tank construction designed to withstand a pressure of 7 psig without permanent distortion. The tank cover shall be designed to shed water and be supplied with a tamper-resistant access handhole sized to allow access to internal bushing and switch connections. Transformers supplied with "less flammable" fluids shall be manufactured to withstand 12 psig without rupture. The transformer shall remain effectively sealed for a top-oil temperature of -5 degrees C to 105 degrees C. When necessary to meet the temperature rise rating specified, cooling panels shall be provided.

- K. The transformer manufacturer shall certify that the transformer is non-PCB containing less than 1 part per million detectable PCBs. Nonflammable transformer liquids including askarel and insulating liquids containing tetrachloroethylene, perchloroethylene, chlorine compounds, or halogenated compounds are not acceptable and shall not be provided.
- L. When high-voltage taps are specified above, full-capacity taps shall be provided with a tap changing mechanism designed for de-energized operation. The tap changer operator shall be located within one of the compartments.
- M. The coil windings shall be designed to reduce losses and manufactured with the conductor material as specified above. All insulating materials shall be rated for 120 degrees C class.
- N. For grounded wye to grounded wye application, the core assembly shall be a 5-legged, distributed-gap, wound core, designed to meet NEMA TR-1 sound levels measured per ANSI standards. For ratings above 2500 kVA, a stacked core design may be utilized.
- O. The core material shall be high-grade, grain-oriented, non-aging silicon core steel with high magnetic permeability, low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below saturation to allow for a minimum of 10 percent overvoltage excitation. The cores shall be properly annealed to reduce stresses induced during the manufacturing processes and reduce core losses.
- P. The core frame shall be designed to provide maximum support of the core and coil assembly. The core frame shall be welded or bolted to ensure maximum short-circuit strength.
- Q. The core and coil assembly shall be designed and manufactured to meet the short-circuit requirements of ANSI C57.12.90. The core and coil assembly shall be baked in an oven prior to tanking to "set" the epoxy coating on the insulating paper and remove moisture from the insulation prior to vacuum filling.
- R. Transformer shall be vacuum-filled with the appropriate fluid as indicated above. The process shall be of sufficient vacuum and duration to ensure that the core and coil assembly is free of moisture prior to filling the tank.

2.03 ACCESSORIES

A. Transformer features and accessories shall include:

1. Dial-type thermometer
2. Liquid level gauge
3. Pressure-vacuum gauge
4. Drain valve with sample valve
5. Pressure relief valve
6. Non-PCB label
7. Upper fill/filter press connection or valve

2.04 PRIMARY CONNECTIONS

- #### A. Transformer primary connections shall be 600 A dead break wells and inserts for cable sizes shown on the drawings.

2.05 HIGH-VOLTAGE SWITCHING

- A. Where a radial feed switch is shown on the drawings, provide a two-position, oil-immersed, gang-operated, rotary, load-break switch. The switch mechanism shall be spring loaded and the operation shall be independent of operator speed. The switch shall have the following ratings:
 - 1. Continuous current 600 amperes. Momentary current 10,000 amps symmetrical (2 seconds). 10,000 amps symmetrical (10 cycles). Make and latch 10,000 amps symmetrical. Load interrupting 600 amps
- B. Where a loop-feed operation (sectionalizing switch) is shown on the drawings, provide a four-position configuration arrangement, oil-immersed, gang-operated, rotary, load-break switch. The switch mechanism shall be spring-loaded and the operation shall be independent of operator speed. The switch shall have the following ratings:
 - 1. Continuous current 600 amperes. Maximum phase-to-phase 15 kV, maximum phase-to-ground 8.3 kV. Momentary 10,000 amps for 10 cycles symmetrical

2.06 PRIMARY FUSING

- A. Where shown on the drawings, provide the following fuses:
 - 1. Provide oil-immersed, loadbreak bay-o-net overload sensing fuses

2.07 FINISH

- A. Transformer units shall include suitable outdoor or indoor paint finish. The paint shall be applied using an electrostatically deposited dry powder system to a minimum of three (3) mils average thickness. Units shall be painted padmount green, Munsell No.7GY3.29/1.5.

PART 3 EXECUTION

3.01 FACTORY TESTING

- A. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest applicable ANSI and NEMA standards.
 - 1. Resistance measurements of all windings on the rated voltage connection
 - 2. Ratio tests on the rated voltage connection and on all tap connections
 - 3. Polarity and phase-relation tests on the rated voltage connections
 - 4. No-load loss at rated voltage on the rated voltage connection
 - 5. Exciting current at rated voltage on the rated voltage connection
 - 6. Impedance and load loss at rated current on the rated voltage connection
 - 7. Applied potential test
 - 8. Induced potential tests
- B. The manufacturer shall provide three (3) certified copies of factory test reports to the Engineer upon request.

3.02 FIELD QUALITY CONTROL

- A. Provide the services of a qualified factory-trained manufacturer's representative to assist the Contractor in installation and startup of the equipment specified under this section for a period

of one working day. The manufacturer's representative shall provide technical direction and assistance to the Contractor in general assembly of the equipment, connections and adjustments, and testing of the assembly and components contained herein.

- B. The Contractor shall provide three (3) copies of the manufacturer's field startup report.

3.03 MANUFACTURER'S CERTIFICATION

- A. A qualified factory-trained manufacturer's representative shall certify in writing that the equipment has been installed, adjusted and tested in accordance with the manufacturer's recommendations.
- B. The Contractor shall provide three (3) copies of the manufacturer's representative's certification.

3.04 INSTALLATION

- A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.
- B. All necessary hardware to secure the assembly in place shall be provided by the contractor.

3.05 FIELD ADJUSTMENTS

- A. Adjust taps to deliver appropriate secondary voltage.

3.06 FIELD TESTING

- A. Measure primary and secondary voltages for proper tap settings.
- B. Megger primary and secondary windings
- C. Liquid transformers – Test oil for dielectric strength