

## Q & A Pre-Bid 623-12-101 Full Facility Generator

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1. At the pre-bid meeting it was discussed that additional information would be provided concerning the electrical tie-in to the existing photovoltaic panels. Please advise.  
See attached PDF "SOLECTRIA GEN\_PV Control". This contains contact info, part number and installation line items needed for the remote shutdown of Inverter PVI 60 Located in the penthouse. The input required is an isolated 24VDC signal that is wired to the terminals for the remote shutdown of the Inverter PVI 60 located in the penthouse of building 53.

The two Solar Inverters, SGI 225 at the lower parking lots 1 & 14 feature a remote shutdown input terminals already. Although the feature is available at both parking lot inverters it still requires the conductors to be pulled to the terminal blocks in the invertors to the new master control cabinet as indicated on drawing sheet 60E6. The inverter in parking lot 1 is approximately 325 feet from building 53, first floor, east Electrical/mechanical room and the inverter in parking lot 14 is approximately 705 feet from same location. The input required is an isolated 24VDC signal that is wired to the terminal blocks on the back panel of the inverter by the installer. Once the signal is activated, the inverter will slowly ramp down power and then disconnect from the grid. The inverter will not reconnect until the signal is removed. The remote shutdown feature will not result in an instantaneous shutdown of the inverter.

2. Project # 623-12-101, Solicitation # VA256-14-B-0782, please provide specification for load bank.

See Attached Specification 26 32 15 "Medium Voltage Load Banks".

3. Is there a detailed load bank specification? Same question and response for #2
4. The specification and drawings call for a 660 gallon day tank to be shared by two 2750 KW generators. The engines at 100% load have a maximum fuel flow of 428 gallons per hour (that is a total of 856 gallons per hour). Fuel consumption at full load is 187 gallons per hour (for a total of 374 gallons per hour). That means that there will be 482 gallons per hour of fuel returning to the main tanks and the fuel pump on the day tank will be running constantly during operation. It would appear that either a larger tank should be shared by the two engines or a 660 gallon tank should be provided for each engine.

No. Reference IBC Table 307.1(1) footnote "I" which limits the size of the day tank(s).

5. Do the generator starting circuit's power the control dampers, or do they need to energize a contactor or contactors to operate the control dampers?

Generator master controls provide control contact only. Contact wetted externally. Reference drawing 60E6 keynote 5.

- a. If the dampers need to be controlled by a contactor do we need to provide individual ones for each damper or one for all?

All dampers open simultaneously when one or more generators start reference drawing 60E6 keynote 5. Provide same quantity of contactors as generators (two or three depending on bid alternates) for redundancy.

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6. Which panel do you want the circuits for the dampers to originate from, if contactors are used?

Panel S2LA.

7. What route will have to be taken to run conduit from the solar system at the first floor of building 53 to the penthouse of building 53?

There are existing routes in building 53 for existing panel feeders that traverse thru building 53 interstitial spaces between each floor and vertical chases from the basement level to the 5<sup>th</sup> floor interstitial space and from there is a path to the penthouse.

8. How thick is the slab in building 52?

The slab that is elevated is 5" per construction plans.

9. How thick is the slab in building 54?

8" per construction plans.

10. How thick are the footings under building 54?

Grade beam and pier foundation system. Refer to detail 2 of drawing EP1 for pier locations. Grade beam at duct bank entry is 14" wide by 36" high per construction plans.

11. How thick are the footings under building 52?

Building 52 slab is elevated at duct bank entrance to building 52. See attached PDF "Building 52 West Images".

12. How much area will be available for a laydown/storage area?

There is no designated area for laydown and storage other than what is shown for the construction area in the construction drawings. Contractors in the past have made arrangements with the City of Muskogee or the 5 Civilized Tribes Museum located north of the VA Facility for a staging and storage area.

- a. Where will area be located? See comments above
- b. Will parking spaces be designated for use? NO

There is no parking designated for Contractors; parking is for patients and employees only. Contractor will be required to make other arrangements for parking.

13. Due to long lead times for the generators, construction constraints in setting fuel tanks in the lower floor and commissioning can the period of performance be extended to 300+ days?

No. If submittals meet the specifications and are submitted properly there should be no issue with the long lead items.

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14. Who is responsible for providing testing fuel & final filling of the fuel tanks?

The contractor awarded the construction project will be responsible for providing the fuel for testing and for final filling.

15. Is there a tank specification that can be provided?

Refer to specification section 23 10 00 "Facility Fuel Systems". Fuel storage tanks shall be 20,000 gallons each.

16. Will the upper and lower parking area be vacant during construction?

No, vehicles will be parking Monday thru Friday during normal working hours in the parking lots except where determined; most likely the parking spaces located next to the east curb of the lower parking lot will have to be closed for construction. Also see SOW.

17. Will there be space available for laydown or storage? See Answer to Question 12

18. Will a dumpster be allowed on-site, or will we be required to remove debris daily? RE: G-002 General Note #4

Dumpster will be allowed on site, it shall be located in the confines of the construction area. Construction area is to be maintained in a safe and clean manner. Any hazardous material would be required to be removed daily.

19. Will the loading dock need to be kept available throughout the project?

Yes, Monday thru Friday except holidays during regular business hours, see SOW.

20. Utilities will need to be located prior to any construction; can the VA provide their contact?

I have no additional information other than the name BP Utility Locating. Contractors are to be aware that underground utility locating on the VA campus is not provided for by USIC or CALL-OKIE or any other public service locating company. Contractor will have to provide locating equipment or hire services for underground locating of utilities.

21. Will any fireproofing be required, or will all structural steel be encased in concrete?

No fireproofing will be required on this project.

22. What type of controls will be required for the mechanical system? Is there a proprietary system in place?

Direct Digital Controls is a Schneider IA system, please review Specification Section 230923. Controls shall be integrated back to the Schneider IA system that is on a Niagara AX Enterprise server. Typical control vender used in the past would be Automated Building Systems located in Tulsa Oklahoma.

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23. Is the period of performance negotiable?

No

24. Is this project tax exempt?

No, not in Oklahoma.



# SOLECTRIA RENEWABLES

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Quote

Quote #

Bill To:

Ship To:

P.O. Number	Terms	Rep	Account #	DESIRED SHIP DATE	Ship Via
		Customer Service			
Line #	Item	Description	Ordered	Rate	Amount
1	OPT-Misc	PVI Remote Shutdown 24vdc Upgrade Kit			
2	Labor-Service	Installation of Remote Shutdown 24vdc Upgrade Kit, PVI-60kW S/N: 121105-24			
3	Travel	Travel & Per Diem			
4	LABOR- discount	Courtesy discount			


Thank you for allowing Solectria Renewables LLC the opportunity to quote the above.

\*Quote is valid for 24 hours from the time and date of issue\*

Total

Signature \_\_\_\_\_





bottom of 5" Slab

The image shows the underside of a concrete slab. A red arrow points to the bottom edge of the slab. Below the slab, there are several horizontal pipes. One pipe is a large, light-colored duct. To the left, there are several vertical pipes. Below the pipes is a dirt area with some vegetation. A blue arrow points from a text box to this dirt area. Another blue arrow points from a text box to a horizontal beam in the dirt area.

Approx. Location of  
New Duct-Bank

Grade-beam under  
Building 52.



Duct-Bank path





**SECTION 26 32 15**  
**MEDIUM-VOLTAGE LOAD BANKS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies the furnishing, installation, connection and testing of medium-voltage load banks.

**1.2 RELATED WORK**

- A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements that are common to more than one section of Division 26.
- B. Section 26 05 13, MEDIUM-VOLTAGE CABLES: Medium voltage cables and splices.
- C. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Cables and wiring.
- D. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path to ground for possible ground fault currents.
- E. Section 26 05 71, ELECTRICAL SYSTEM PROTECTIVE DEVICE STUDY: Short circuit and coordination study.
- F. Section 26 13 13, GENERATOR PARALLELING CONTROLS: For load bank connections to generator paralleling system.

**1.3 QUALITY ASSURANCE**

- A. Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- B. The load bank shall be manufactured by a company regularly engaged in the manufacture of load banks and who can demonstrate at least five (5) installations of load banks similar to the one specified for this project.
- C. The manufacturer shall have a written quality control procedure available for review by the COR which documents all phases of operations, engineering, and manufacturing.

**1.4 FACTORY TESTS**

- A. Medium-voltage load banks shall be thoroughly tested at the factory to assure that there are no electrical or mechanical defects. Tests shall be conducted as per UL and ANSI Standards. Factory tests shall be certified.
- B. Each load step shall be cold resistance checked to verify proper calibration of the resistive load steps and proper ohm value.
- C. All electrical circuits shall have a high potential insulation resistance test performed at twice rated voltage plus 1000 volts AC.

- D. All quality control test equipment shall be regularly maintained and calibrated to traceable national standards.
- E. Furnish four (4) copies of certified manufacturer's factory test reports to the COR prior to shipment of the load bank to ensure that the load bank has been successfully tested as specified.
- F. The Government shall have an option to witness the factory tests. All expenses of the Government Representative's trips to witness the testing will be paid by the Government. Notify the COR not less than 30 days prior to making tests at the factory.

#### **1.5 SUBMITTALS**

- A. In accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, submit the following:
- B. Shop Drawings:
  - 1. Provide detailed drawings with sufficient information, clearly presented, to determine compliance with drawings and specifications.
  - 2. Prior to fabrication of load bank, submit four copies of the following data for approval:
    - a. Complete electrical ratings
    - b. Safety features
    - c. Accessories and nameplate data
    - d. Elementary and interconnection wiring diagrams.
    - e. Technical data for each component.
    - f. Dimensioned exterior views of the load bank.
    - g. Dimensioned section views of the load bank.
    - h. Provisions and required locations for external conduit and wiring entrances.
    - i. Dimensions and approximate design weights.
  - 3. Provide facility and contact person names and telephone numbers for five similar installations for verification of manufacturer qualifications.
- C. Manuals:
  - 1. Submit, simultaneously with the shop drawings, companion copies of complete maintenance and operating manuals, including technical data sheets, wiring diagrams, and information for ordering replacement parts.
    - a. Include complete interconnection diagrams that show all components of the load bank.
    - b. Include complete diagrams of the internal wiring for each of the items of equipment.
    - c. The diagrams shall identify the terminals to facilitate in the installation, maintenance and operation.

- d. Approvals will be based on complete submissions of manuals together with shop drawings.
- 2. Two weeks prior to the project final inspection or the inspection of the applicable phase that includes load bank installation, submit four copies of a final updated maintenance and operating manual to the COR. Update the manual to include any information necessitated by shop drawing approval.
- D. Test Reports:
  - 1. Submit four copies of certified conformance test reports for approval.
- E. Certification: Two weeks prior to final inspection, submit four copies of the following to the COR:
  - 1. Certification by the manufacturer that the materials conform to the requirements of the drawings and specifications.
  - 2. Certification by the Contractor that the materials have been properly installed, adjusted, and tested.

#### **1.6 APPLICABLE PUBLICATIONS**

- A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. American National Standards Institute (ANSI):
  - C37.47.....Medium voltage Current-Limiting Type  
Distribution Class Fuses and Fuse Disconnecting  
Switches
  - C39.1.....Electrical Analog Indicating Instruments,  
Requirements for
- C. Institute of Electrical and Electronics Engineers (IEEE):
  - C37.48.....Guide for Application, Operation and Maintenance  
of Medium voltage Fuses, Distribution Enclosed  
Single Pole Air Switches, Fuse Disconnection  
Switches and Accessories
  - C37.90.....Standard for Relays and Relay Systems Associated  
with Electric Power Apparatus
  - C57.13-93 Standard Requirements for Instrument  
Transformers
- D. National Electrical Manufacturers Association (NEMA):
- E. National Fire Protection Association (NFPA):
  - 70.....National Electrical Code (NEC)

## **PART 2-PRODUCTS**

### **2.1 GENERAL REQUIREMENTS**

- A. The medium-voltage load bank shall be air cooled, outdoor, resistive type.
- B. The load bank purpose is for periodic testing and maintenance of engine generators.
- C. The load bank will be located outdoors as a permanent installation.
- D. The control panel will be remote and located indoors.

### **2.2 RATINGS**

- A. The total capacity of the load bank shall be rated 3,000kW at 12,470 volts, 3-phase, 3-wire, 60 hertz, at unity power factor and 500kW load step resolution.
- B. Load bank shall be designed for continuous duty cycle operation with no limitations. The load bank shall operate properly in an ambient temperature of -28 degrees Centigrade to 49 degrees Centigrade.
- C. Load bank shall be capable of withstanding a shutdown of cooling air simultaneously with shutdown of load elements without damage to load bank unit.
- D. Load bank shall be a true medium voltage direct connect unit. Use of a medium voltage step down transformer and low voltage load bank system shall not be accepted.

### **2.3 MATERIAL AND CONSTRUCTION**

- A. The load bank shall be outdoor construction, suitable for installation on a flat concrete pad.
- B. Load banks shall be vertical airflow type with air entering bottom and exiting top.
- C. All exterior fasteners shall be stainless steel.
- D. The load bank shall include legs as necessary to allow airflow into the load bank.
- E. The load bank frame shall be fabricated from formed and welded steel to form a rigid, weatherproof structure.
- F. The finish shall be manufacturer standard primer and paint, gray color, suitable for outdoor installation.
- G. The load bank shall accept medium-voltage conduit and conductors as shown on drawings. Field connection shall be standard copper bus suitable for 2-hole standard lugs. Provide space in termination cabinet for stress cone terminations.
- H. Vacuum load contactors shall be provided for control of load steps and shall be located in a dedicated medium voltage enclosure.

- I. A dedicated low-voltage enclosure shall be provided for control devices, fuses, blower starters, blower relays, and safety circuits.
- J. Medium and low-voltage enclosures shall be factory assembled as part of the load bank package.
- K. Thermostatically controlled heaters shall be provided in the medium and low voltage enclosures to eliminate moisture and condensation.
- L. Airflow through the load bank resistor section shall be vertical. Ambient intake air shall be drawn in at the base of the unit and heated air exhausted out the top. Intake openings shall be designed to prevent objects over 0.5 inches in diameter from entering the unit.
- M. The load bank exhaust hoods shall be angled and include interior baffle plates to direct falling rain from the interior of the load bank. The exhaust hoods shall be constructed from corrosion resistant aluminum with stainless steel exhaust screens.
- N. Load elements shall be contained in multiple resistor cases or trays. Each case or tray shall be removable for inspection or replacement.

#### **2.4 Resistive Load Elements**

- A. Load elements shall operate and  $\frac{1}{2}$  or less of continuous load rating of wire.
- B. Load elements shall be continuously supported on insulating material.
- C. The load bank shall provide -0% to +5% of rated load at rated voltage.

#### **2.5 Cooling**

- A. Cooling shall be by integral TEFC motors direct coupled to cooling fan blades. The fan motors shall have NEMA rated starters and properly sized thermal overloads on all three phases.
- B. Single point external 480 volt three phase power shall be used for cooling fans and control system.
- C. Provide control power transformer for load bank control system, integral to load bank unit. Provide primary and secondary overcurrent protection for control power transformer.
- D. The fan blade shall be non-corroding material.

#### **2.6 Protective Devices**

- A. Provide differential pressure device for each fan to detect loss of airflow and prevent load from being applied without airflow.
- B. Provide overtemperature sensor in each load section and disconnect load in case of high temperature.
- C. Provide warning labels on enclosure where appropriate for safety of personnel.

#### **2.7 Control Panel**

- A. The control panel shall be remote and located indoors.
- B. Control panel shall be in a metal enclosure, NEMA rated.

- C. The control panel shall have the following manual controls:
  - 1. Power on/off switch.
  - 2. Blower start/stop switch.
  - 3. Master load on/off switch.
  - 4. Load step switches for each step to provide 500kW resolution as specified.
- D. The control panel shall have the following visible lights
  - 1. Power on.
  - 2. Blower on.
  - 3. Blower/air flow failure.
  - 4. Overtemperature.
- E. The control panel shall include a load dump feature that disconnects the load bank elements from the engine generator paralleling control system. This is used to disconnect the load bank if a power failure occurs while it is being used so that generators can be used for facility load.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install the load bank in accordance with the NEC, as shown on the drawings, and as recommended by the manufacturer.
- B. Anchor load bank to the slab with plated 1/2 inch [12.5mm] minimum anchor bolts, or as recommended by the manufacturer.

### **3.2 Acceptance Checks and Tests**

- A. An authorized representative of the load bank manufacturer shall technically supervise and participate during all of the field adjustments and tests. Major adjustments and field tests shall be witnessed by the COR. The manufacturer's representative shall certify in writing that the equipment has been installed, adjusted and tested in accordance with the manufacturer's recommendations.
- B. Perform manufacturer's required field tests in accordance with the manufacturer's recommendations. In addition, include the following visual and mechanical inspections and electrical tests:
  - 1. Visual and Mechanical Inspection
    - a. Compare equipment nameplate data with specifications and approved shop drawings.
    - b. Inspect physical, electrical, and mechanical condition.
    - c. Confirm correct application of manufacturer's recommended lubricants.
    - d. Verify appropriate anchorage, required area clearances, and correct alignment.

- e. Verifying tightness of accessible bolted electrical connections by calibrated torque-wrench method, or performing thermographic survey after energization.
- g. Verify appropriate equipment grounding.
- h. Confirm correct operation and sequencing of electrical and mechanical interlock systems.
- i. Clean load bank.
- j. Inspect insulators for evidence of physical damage or contaminated surfaces.
- k. Exercise all active components.
- l. Verify the correct operation of all sensing devices, alarms, and indicating devices.
- m. Verify that vents are clear.
- n. Inspect control power transformers.

### **3.3 FOLLOW-UP VERIFICATION**

Upon completion of acceptance checks, settings, and tests, the Contractor shall show by demonstration in service that the load bank is in good operating condition and properly performing the intended function.

### **3.4 TEMPORARY HEATING**

Apply temporary heat to load bank, according to manufacturer's written instructions, throughout periods when load bank environment is not controlled for temperature and humidity within manufacturer's stipulated service conditions.

### **3.5 INSTRUCTION**

- A. A complete set of operating instructions for the load bank shall be laminated or mounted under acrylic glass and installed in a frame on the wall next to load bank control panel.
- B. Furnish the services of a factory-trained engineer for two, 4-hour training periods for instructing personnel in the maintenance and operation of the equipment, on the dates requested by the COR.

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