City of Oak Ridge, Tennessee
* * * * REQUEST FOR QUOTATION * * * *

Page - 1
Date - 2/25/14
Order No. - 137864-000 OQ
Brn/Plt - 22180

Vendor Name:_____
Payment Terms:_____
F.O.B,:_____
Delivery Date:_____
Ship Via:_____
Signature:_____ _____

SHIP TO City of Oak Ridge - Materials Management
100 Woodbury Lane / P.O. Box 1
Oak Ridge, TN 37830
(865) 425-1819 FAX (865) 482-8475
Lyn Majeski lmajeski@oakridgetn.gov

Ordered - 02/25/14 Freight - Default - Handling Code
Requested - 03/20/14 Taken By -
Delivery - Deliveries are accepted 8 a.m. TO 3 p.m.

Description / Supplier Item		UM	Unit Cost		Extension	Req. Dt
PORTABLE GENERATOR PER THE ATTACHED SPECIFICATIONS	1	EA		EA		03/20/14

Total Order

CITY OF OAK RIDGE, TENNESSEE
SPECIFICATIONS FOR
PORTABLE GENERATOR
RFQ #137864

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. It is the intent of this specification to secure an engine driven generator set that has been prototype tested, factory built, production tested, and site tested, together with all accessories necessary for a complete installation as shown on the plans and drawings and specified herein.

B. The generator set shall be provided on the basis of a turbocharged diesel driven engine generator set as further described in these specifications.

1.02 GENERAL REQUIREMENTS

A. It is the intent of this specification to secure a generator set system that has been tested during design verification, in production, and at the final job site. The generator set will be a commercial design and will be complete with all of the necessary accessories for complete installation as shown on the plans, drawings, and specifications herein. The equipment supplied shall be design such that the installation can meet the requirements of the National Electrical Code.

B. All equipment shall be new and of current production of a national firm which manufactures the generator sets and controls, transfer switches, and assembles the generator sets as a complete and coordinated system. There will be one source responsibility for warranty, parts, and service through a local representative with factory-trained servicemen.

1.03 SUBMITTAL

A. The submittal shall include specification sheets showing all standard and optional accessories to be supplied, schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number, each required interconnection between the generator set, the transfer switch, and the SCADA system.

1.04 CODES AND STANDARDS

A. The generator set shall conform to the requirements of the following codes and standards:
   1. NEMA MG-1, Motors and Generators
   2. ISO 8528-1
   3. ISO 8528-4, Reciprocating Internal Combustion Engine Driven Alternating Current Generating Sets

1.04 CODES AND STANDARDS, continued

4. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702

1.05 TESTING

A. To ensure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and/or local representative shall be responsible for these separate tests: final production tests and site tests.

B. Final Production Tests. Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
   1. Single-step load pickup.
   2. Transient and steady-state governing.
   3. Safety shutdown device testing.
   4. Voltage regulation.
   5. Rated Power @ 0.8 PF
   6. Maximum Power.
   7. Upon request a certified test record will be sent to the customer.

C. Site Tests. An installation check, start-up, and building load test shall be performed by the manufacturer's local representative. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:
   1. Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.
   2. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. These shall include: block heaters, battery charger.
   3. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and frequency, and phase rotation.
   4. Automatic start-up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator voltage, amperes, and frequency shall be monitored throughout the test. An external load bank shall be connected to the system if sufficient station load is unavailable to load the generator to the nameplate kW rating.

PART 2 – PRODUCTS

2.01 EQUIPMENT

A. The generator set shall be Kohler 200REOZT. It shall be capable of providing 200 kW when operating at 480 volts, 180 KW when operating at 120/208, 150 Kw when operated at 120/240 single phase, 0.80 power factor Wye connected, 3 phase, 60 hz. The generator set shall be capable of this rating while operating in an ambient condition of 104°F (40°C) and 984 feet above sea level.

B. The generator voltage rating shall be selectable with voltage selector for 120/240 Single Phase, 120/208 Three phase, 277/480 volts, 3-phase, 4-wire wye, 60 Hz.

C. Motor starting performance and voltage dip determinations shall be based on the complete generator set. The generator set shall be capable of supplying 400 LRKVA AT 480 VOLTS for starting motor loads with a maximum instantaneous voltage dip of 35%, as measured by a digital RMS transient recorder in accordance with IEEE standard 115.

D. Engine brake horsepower shall be sufficient to deliver full rated generator set kW/kVA when operated at rated rpm and equipped with all engine-mounted parasitic and external loads such as radiator fan and power generator.

E. Vibration isolators shall be provided between the engine-generator and heavy-duty steel base.

F. The generator set shall be sound attenuated to a level suitable for a residential area. (69dBA at 7 meters)

2.02 ENGINE

A. The engine shall deliver the required electrical power at a governed speed of 1800 rpm. The engine shall be equipped with the following:
   1. An electronic governor capable of ±2.5% steady-state frequency regulation.
   2. 12 Volt positive engagement solenoid shift-starting motor.
   3. Automatic battery charging alternator with solid-state voltage regulation.
   4. Positive displacement, full pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain.
   5. Dry-type replaceable air cleaner elements for normal applications.
   6. Engine-driven or electric fuel-transfer pump including fuel filter and electric solenoid fuel shutoff valve capable of lifting fuel.
   7. Batteries shall be heavy duty SLI lead acid type with battery charger.

2.02 ENGINE, continued

B. The turbocharged, air-cooled engine shall be fueled by diesel.

C. The engine shall have a minimum of 6 cylinders, and be liquid-cooled by a unit-mounted radiator, blower fan, water pump, and thermostats. This system shall properly cool the engine with up to 0.5 inches water column static pressure on the fan in an ambient temperature up to 122F (50C).

D. The engine shall be EPA certified.

2.03 ALTERNATOR

A. The alternator shall be salient-pole, brushless, 2/3-pitch, 12 lead, self-ventilated with drip-proof construction and amortisseur rotor windings and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be a fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to Standby 130°C. The excitation system shall be of brushless construction controlled by a solid- state voltage regulator capable of maintaining voltage within ±.1.0% at any constant load from 0% to 100% of rating. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating.

B. The alternator excitation shall be of a shunt exciter design.

C. The alternator shall have a single maintenance-free bearing. The alternator shall be directly connected to the flywheel.

2.04 CONTROLLER

A. Standards
   1. The controller shall be UL 508 listed.
   2. Controller shall have an OFF/ON key switch to meet local code requirements.
   3. The controller's environmental specification shall be: -40°C to 70°C operating temperature range and 5-95% humidity, non-condensing.

B. The Controller shall include:
   1. User buttons for start, stop, and menu scroll and selection.
   2. Emergency stop button.
   3. LED indication for status.
   4. LCD display for system information and status.
   5. Panel lights shall be supplied as standard.
   6. Panel mounted battery fuse.

2.04 CONTROLLER, continued

C. Control Function Requirements

1. View and adjust system operation parameters including:
   a) Mode of operation
   b) Battery voltage
   c) Frequency
   d) Time delay countdown
   e) Hourmeter
   f) Engine speed
   g) Fuel level (%)
   h) Coolant temperature
   i) Oil pressure
   j) Voltage: phase, phase-to-neutral, total voltage
   k) Current
2. View system faults including:
   a) Overspeed
   b) Overcrank
   c) Low fuel level
   d) Coolant temperature
   e) Oil pressure
   f) Battery charger
   g) Frequency meter, ammeter, voltmeter
3. Emergency stop
4. Automatic control
   a) The generator control must be capable of accepting remote start/stop control functions in order to be interfaced with remote control systems.
5. Generator controls must be capable of being interfaced with remote controllers that will periodically exercise the generator by starting and stopping the generator.

D. Power Distribution Panel

1. The towable generator shall be furnished with a power distribution panel with the following features:
   a) Two 20-amp 120 V, 1-phase, GFCI duplex receptacles
   b) Two 50-amp 120/240 V twistlock receptacles (shore power)
   c) Individual receptacle circuit breakers
   d) Main bus connection studs enclosed behind a lockable access door for easy access and operator safety
   e) The main bus bar connection shall be furnished with cable strain relief to prevent cables from being pulled free from bus

2.05 ACCESSORIES

A. Battery Charger. A 6-ampere automatic float to equalize battery charger with the following features:
   1. 12 DC output
   2. Voltage regulation of 1% from no to full load over 10% AC input line voltage variations
   3. Current limited during engine cranking, short circuit, and reverse polarity conditions
   4. Temperature compensated for ambient temperatures for -40°C to 60°C
   5. UL Listed

B. Block Heater: The block heater shall be thermostatically controlled and sized to maintain the manufacturers recommended engine coolant temperature to meet the start-up requirements.

C. Circuit Breaker: A UL listed, 80% rated line circuit breaker of 400 amperes (at 480 Volts), molded-case type, generator-mounted with load side lugs.

D. Critical Silencer: The engine exhaust silencer shall be temperature and rust resistant.

E. Standard Air Cleaner: The air cleaner shall provide engine air filtration which meets the engine manufacturer's specifications under typical operating conditions.

2.06 DOUBLE WALL SECONDARY CONTAINMENT FUEL TANK

A. A fuel tank used in conjunction with a diesel powered generator set of 200kW will contain 200 gallons of fuel to support the generator set for a period of 12 hours at 100% of rated load and 24 hours at 75% of rated load.

2.07 GENERATOR WEATHER PROTECTIVE AND SOUND ENCLOSURE

A. All enclosures are to be constructed from high strength, low alloy steel, aluminum or galvanized steel.

B. The enclosure shall be finish coated with powder baked paint for superior finish, durability and appearance. Enclosures will be finished in the manufacturer's standard color.

C. The enclosures shall allow the generator set to operate at full load in an ambient of 40°C - 45°C with no additional derating of the electrical output.

D. Enclosures shall be equipped with sufficient side and end doors to allow access for operation, inspection, and service of the unit and all options. Minimum requirements are two doors per side. When the generator set controller faces the rear of the generator set, an additional rear facing door is required. Access to the controller and main line circuit breaker must meet the requirements of the National Electric Code.

2.07 GENERATOR WEATHER PROTECTIVE AND SOUND ENCLOSURE, continued

E. Doors must be hinged with stainless steel hinges and hardware and be removable.

F. Doors shall be equipped with lockable latches. Locks must be keyed alike.

G. The enclosure roof shall be pitched to prevent accumulation of water.

H. A duct between the radiator and air outlet shall be provided to prevent re-circulation of hot air.

I. The complete exhaust system shall be internal to the enclosure or optional with external mounted silencer.

J. All acoustical insulation shall be fixed to the mounting surface with pressure sensitive adhesive or mechanically fastened. In addition, all acoustical insulation mounted on a horizontal plane shall be mechanically fastened. The acoustical insulation shall be flame retardant.

K. The enclosures shall include an exhaust scoop to direct the cooling air in a vertical direction.

L. The generator set shall be sound attenuated to a level suitable for a residential area. The generator set shall be provided with a sound attenuated enclosure. The generator set shall also include an exhaust silencing system and an air intake silencing system. The overall sound attenuating enclosure design shall reduce sound levels to a level to 69 dBA at 7 meters in open area.

2.07 TRAILER

A. The complete generator set shall be designed to be towable.

B. The generator set shall be furnished with a trailer so that it is completely portable and can be moved from location to location.

C. The trailer shall be furnished complete with the following features:
1. 2-5/16" ball hitch coupler with adaptability for a Lunette eye.
2. Lunette eye
3. Lockable utility tool box.
4. Running lights with 7-wire harness and connector.
5. Dual-axel trailer with electric brake system including breakaway battery backup. 6000 lb rating per axle.
6. Rear stabilizer trailer jacks.
7. Cable rack with a welding style cable and correct Arktite End to mate with existing Crouse Hinds AR 2041 receptacle. Cable shall be able to carry a minimum of 200 amps of 480 volts.
8. Bottle Jack
9. Fire Extinguisher

2.08 QUALITY ASSURANCE

A. The complete power generation system, including engine, generator, and switchgear, shall be the product of one manufacturer who has been regularly engaged in the production of complete generating systems for a least twenty (20) years. All components shall have been designed to achieve optimum physical and performance compatibility and prototype tested to prove integrated design capability. The complete system shall have been factory fabricated, assembled, and production tested. The naming of a specific manufacturer does not waive any requirements of this specification. Any exceptions or variations must be noted.

2.09 RESPONSIBILITY

A. The responsibility for performance to this specification shall not be divided among individual component manufacturers, but must be assumed solely by the primary manufacturer. This includes generating system design, manufacture, test, and having a local supplier responsible for service, parts, and warranty for the total system.

2.10 MINIMUM SERVICE AND WARRANTY QUALIFICATIONS

A. The generator set manufacturer and its distributor shall maintain a 24-hour parts and service organization. This organization shall regularly engage in maintenance contract programs to perform preventive maintenance and service on equipment similar to that specified. A service agreement shall be available and shall include system operation under simulated operating conditions; adjustment to the generator set, transfer switch, and switchgear controls as required, and certification in the owner's maintenance log of repairs made and function tests performed on all systems.

2.11 WARRANTY TERMS

A. The manufacturer's and dealer's extended warranty shall in no event be for a period of less than one (1) year from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the jobsite, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Applicable deductible costs shall be specified in the manufacturer's warranty. Submittals received without written warranties as specified will be rejected in their entirety.

2.12 CONTRACT MAINTENANCE

A. The system manufacturer's authorized dealer shall furnish the owner's engineer with a copy of any contract maintenance agreement negotiated relative to the equipment specified in this section. The contract information shall detail agreed maintenance intervals, work to be performed at each interval, reimbursement schedule for maintenance work, and owner's responsibilities versus dealer's responsibilities.

2.13 DOCUMENTATION AND TRAINING

A. Furnish the services of a factory-authorized service representative to instruct owner's personnel in the operation, maintenance, and adjustment of the generator and related equipment. Provide a minimum of four (4) hours instruction scheduled seven (7) days in advance.