FINANCE

INVITATION TO BID

TOWN OF NORTH HAVEN

Sealed bids for a generator, Bid #16-17, as specified, will be received at the Finance Office, Memorial Town Hall, 18 Church Street, North Haven, Connecticut, until 10:00 AM on Thursday, December 3, 2015 at which time and place they will be opened and publicly read. Specifications may be obtained from the Finance Office. After bids are received the Director of Finance/Administration may analyze whether vendors have submitted comparable bids and meet the requirements called for. In reviewing the bids, the Director of Finance/Administration may consider the past performance, financial responsibility, and sales and service experience of the vendors. The Director of Finance/Administration reserves the right to reject any or all bids, to waive any defects in same, or to choose to make purchases other than strictly in accordance with price considerations, and/or to choose other than the lowest bidder, if it be deemed in the best interest of the Town of North Haven. **Bidders are advised hereby of the existence of an Ordinance concerning Bid Preference for Town-Based Businesses.**

Edward J. Swinkoski, CPA
Director of Finance/Administration

SPECIFICATION

PACKAGE GENERATOR SET

PART 1 GENERAL

1.01 REFERENCES AND STANDARDS

The generator set covered by these specifications shall be designed, tested, rated, assembled and installed in strict accordance with all applicable standards below:

- CSA C22.2 No14
- CSA 282
- CSA 100
- EN61000-6
- EN55011
- FCC Part 15 Subpart B
- ISO8528
- IEC61000
- UL508
- UL2200
- Designed to allow for installed compliance to NFPA 70, NFPA99 and NFPA 110

1.02 REQUIREMENTS, CODES AND REGULATIONS

The equipment supplied and installed shall meet the requirements of the NEC and all applicable local codes and regulations. All equipment shall be of new and current production by a MANUFACTURER who has 25 years of experience building this type of equipment. Manufacturer shall be ISO9001 certified.

1.03 SUBSTITUTION

Proposed deviations from the specifications shall be treated as follows:

1.04 SUBSTITUTION TIME REQUIREMENT

Requests for substitutions shall be made a minimum of ten (10) days prior to bid date. Manufacturers catalog data shall accompany each request and authorized acceptance shall be addenda only.

1.05 SUBSTITUTION RESPONSIBILITY

The power system has been designed to the specified manufacturer's electrical and physical characteristics. The equipment sizing, spacing, amounts, electrical wiring, ventilation equipment, fuel, and exhaust components have all been sized and designed around CATERPILLAR supplied equipment. Gen-set shall be Caterpillar Olympian model G60LG2 rated 60kw standby. Should any substitutions be made, the CONTRACTOR shall bear responsibility for the installation, coordination and operation of the system as well as any engineering and redesign costs, which may result from such substitutions.

1.06 SUBMITTALS

Engine-generator submittals shall include the following information:

1. Factory published specification sheet.
2. Manufacturer's catalog cut sheets of all auxiliary components such as battery charger, control panel, enclosure, etc.
3. Dimensional elevation and layout drawings of the generator set, enclosure and transfer switchgear and related accessories.
4. Weights of all equipment.
5. Concrete pad recommendation, layout and stub-up locations of electrical and fuel systems.
6. Interconnect wiring diagram of complete emergency system, including generator, switchgear, battery charger, control panel, and remote alarm indications.
7. Engine mechanical data, including heat rejection, exhaust gas flows, combustion air and ventilation air flows, fuel consumption, etc.
8. Generator electrical data including temperature and insulation data, cooling requirements, excitation ratings, voltage regulation, voltage regulator, efficiencies, waveform distortion and telephone influence factor.
9. Generator resistances, reactances and time constants.
10. Generator locked rotor motor starting curves.
11. Manufacturer's documentation showing maximum expected transient voltage and frequency dips, and recovery time during operation of the generator set at the specified site conditions with the specified loads.
12. Manufacturer's and dealer's written warranty.

1.07 SYSTEM RESPONSIBILITY

The completed engine generator set shall be supplied by the *Manufacturer's* authorized distributor only.

1.08 WARRANTY

Coverage shall be provided for a period of 2 years, and shall include no deductible. Coverage provides for 100 percent of usual and customary parts and labor costs for failures due to defects in materials and workmanship to the “as shipped consist” from the factory, excluding filters, fluids, vee belts, hoses, power take-offs, paint, batteries and clutches. Platinum Extended Service Coverage provides for a rental power unit due to unscheduled failures causing unexpected downtime to the customer in excess of 48 hours from the time of diagnoses. All repairs will be performed by factory trained dealer service personnel, and allows for repairer travel and mileage for all repairs up to 8 hours and 320 miles per incident.

1.10 PARTS AND SERVICE QUALIFICATIONS

A. Service Facility

The engine-generator supplier shall maintain 24-hour parts and service capability within 50 miles of the project site. The distributor shall stock parts as needed to support the generator set package for this specific project. The supplier must carry sufficient inventory to cover no less than 80% parts service within 24hrs and 95% within 48 hours.

B Service Personnel

The dealer shall maintain qualified factory trained service personnel.

PART 2 PRODUCT SPECIFICATIONS

2.01 GEN-SET REQUIREMENTS

The generator set shall be Standby Duty rated at 60 ekW, 1800 RPM, 0.8 power factor, 208 V, 3-Phase, 60 hertz, excluding radiator fan and all parasitic loads. Generator set shall be sized to operate at the specified load at a maximum ambient of 100F (37.8C) and altitude of 500.0 feet (152.4 m).

2.02 MATERIAL AND PARTS

All materials and parts comprising the unit shall be new and unused.

2.03 ENGINE

The engine shall be an Olympian gaseous fuel, In-Line 10 Cylinder, 6.8L Vee type engine, four (4) cycle, turbocharged/After cooled, while operating at 1800 RPM. The engine shall comply with the State Emission regulations at the time of installation/commissioning.

2.04 ENGINE GOVERNING
The engine governor shall be electronic with isochronous frequency regulation, and a steady state regulation of +/- 0.25%.

2.05 GENERATOR

A. The four-pole revolving field generator shall be two bearings with a direct flexible disc coupling, self ventilated, and drip proof. The generator rating and performance shall be in accordance with ISO 8528-5 and ISO 3046. The excitation system shall Permanent Magnet, with an 18-pole exciter, magnetically coupled with DC current. The rotor and stator insulations shall meet Class H specifications. Total Harmonic Distortion shall be less than 3%.

B. Digital Voltage Regulator
Digital Voltage Regulator
The digital voltage regulator shall be internal to the control panel with an external power stage. The regulator shall maintain generator output voltage within +/- 1% for any constant load between no load and full load. The regulator shall be capable of sensing true RMS in three phases of alternator output voltage

C. Motor Starting
Provide locked rotor motor starting capability of 110 skVA at 30% instantaneous voltage dip as defined per NEMA MG 1. Sustained voltage dip data is not acceptable.

D. Circuit Breaker Specifications
Provide a generator mounted 80% circuit breaker, molded case, 300A, 3 pole NEMA 1/IP22. Breakers shall utilize a solid state trip unit. The breaker shall be UL/CSA Listed and connected to engine/generator safety shutdowns. Breaker shall be housed in an extension terminal box which is isolated from vibrations induced by the generator set. Mechanical type lugs, sized for the circuit breaker feeders shown on drawing, shall be supplied on the load side of breaker.

2.06 CONTROLS – GENERATOR SET MOUNTED

A. Requirements and Codes
1. Meets NFPA 99 and 110
2. Temperature Range of -40 to 70 degrees Celsius.

B. Digital Microprocessor

The following functionality shall be integral to the control panel.

1. Two 4 line x 20 Displays,
2. Full system status
3. Three phase sensing voltage regulator,
4. RS232, RS485, and Canbus Remote Ports
5. Waterproof Connections
6. Built in PLC
7. All Engine sensors shall be 4-20mA for minimal interference

C. Engine Function Monitoring and Control

i. Full Range Stand-by Operation
   1. Programmable auto crank
   2. Emergency Stop
   3. On / Off Manual Switch

ii. Full System Status
   1. Three Phase AC Volts
   2. Three Phase Amps
   3. KW
   4. Power Factor
   5. Reactive Power
   6. Oil Pressure
   7. Water Temperature
   8. Water Level
   9. Fuel Pressure
   10. Engine Speed
   11. Battery Voltage
   12. Alternator Frequency
   13. Date and Time
   14. Transfer Switch Status
   15. Run Hours
   16. Service Reminders
   17. Trending
   18. Fault History
   19. Built in PLC
   20. Audible Alarm for Fault Condition
   21. Isochronous Governor
   22. Digital Voltage Regulator with three phase sensing

D Shutdowns

1. Overvoltage
2. Over Speed
3. Low Oil Pressure
4. High Coolant Temperature
5. Low Coolant Level

2.07 COOLING SYSTEM

The generator set shall be equipped with a rail-mounted, engine-driven radiator with blower fan and all accessories. The cooling system shall be sized to operate at full load conditions and 104 F* ambient air entering the enclosure. The generator set supplier is responsible for providing a properly sized cooling system based on the enclosure static pressure restriction and supply a minimum air at radiator capability of 122 deg F.

2.08 FUEL SYSTEM

A. The fuel system shall be integral with the engine. Provide an energized to run shut off solenoid, fuel filter and gas regulator as a complete packaged gas fuel train. Also provide stainless steel flexible connectors between the engine and fuel train.

2.09 STARTING SYSTEM

A. Starting Motor

A DC electric starting system with positive engagement shall be furnished. The motor voltage shall be as recommended by the engine manufacturer.

B. Jacket Water Heater

Jacket water heater shall be provided and shall be sized to insure that gen-set will start within the specified time period and ambient conditions. Minimum size shall be 2kw.

C. Batteries

Batteries - A lead-acid storage battery set of the heavy-duty diesel starting type shall be provided. Minimum cold cranking amps of 1155 shall be provided with 225 amp hours available. Battery voltage and starting system shall be 24V.

D. Battery Charger

Battery Charger - A current limiting battery charger shall be furnished to automatically recharge batteries. The charger shall be dual charge rate with automatic switching to the boost rate when required. The battery charger shall be mounted on the gen-set package or inside the gen-set enclosure/room. Minimum rating shall be 10A. Alarms for AC input failure and high/low DC voltage output.

2.10 SOUND ATTENUATED ENCLOSURE

The complete engine generator set, including generator control panel and engine starting batteries, shall be enclosed in a factory assembled, sound attenuated enclosure mounted on the fuel tank base.

A. A weather resistant, sound attenuated enclosure of steel with electrostatically applied powder coated baked polyester paint. The enclosure shall have a resulting average sound level not to exceed 73 dba @ 23 ft with the gen-set running under full load. It shall consist of a roof, side walls, and end walls. Fasteners shall be either zinc plated or stainless steel.

B. Enclosure Sound Attenuation: Acoustical foam shall be provided between all supports and inside doors and sound baffles on air intake and air discharge.

C. Enclosure to be constructed with catch basin to capture fluids that make leak from a ruptured hose or fitting.

2.11 EXHAUST SYSTEM

A. Provide critical grade exhaust system with stainless steel flex connector and silencer for installation inside of enclosure.

B. Provide oxidation catalyst to reduce CO and Hydrocarbons to EPA compliance levels.

PART 3 EXECUTION

3.01 INSTALLATION

Install equipment in accordance with manufacturer's recommendations, the project drawings and specifications, and all applicable codes.

3.02 START UP AND TESTING

A. The installation shall be performed in accordance with shop drawings, specifications, and the manufacturer's instructions; and shall comply with applicable state and local codes.

B. The generator set shall be tested in accordance with NFPA110 to show it is free of any defects and will start automatically and carry full load. This testing is to be performed at the jobsite. Testing shall be completed in the presence of the owner’s engineer or his appointed representative. With the exception of fuel, all consumables necessary for testing shall be furnished by the bidder. Any defects which become evident during the test shall be corrected by the bidder at his own expense.

C. Proper operation of the following shall be demonstrated:

1. All auxiliary equipment supplied to this specification.

2. Starting and charging system components.
   All controls, engine shutdowns, and safety devices

D. Cold start test:
The unit shall demonstrate the ability to start from a "cold" standby condition (ie. normal standby mode with engine coolant temperature at normal temperature established by properly functioning jacketwater heater.

E. Load Bank Test:
The unit shall be operated at 75% of full load rating for one hour followed by three hours operation at 100% full load. After the first half-hour stabilization period at full load, the following shall be recorded at fifteen minute intervals:

Voltage, amperage and frequency
Fuel pressure, oil pressure and water temperature
Exhaust gas temperature at engine exhaust outlet
Ambient temperature

3.03 OPERATION AND MAINTENANCE MANUALS

Provide two (2) sets of operation and maintenance manuals covering the generator, switchgear, and auxiliary components. Include final as-built wiring interconnect diagrams and recommended preventative maintenance schedules.

3.04 TRAINING

Provide on-site training to instruct the owner's personnel in the proper operation and maintenance of the equipment. Review operation and maintenance manuals, parts manuals, and emergency service procedures.

3.05 SCHEDULED OIL SAMPLING

In order to forecast and minimize engine failure, the supplier of the equipment must provide an oil sampling analysis kit which operating personnel shall utilize for scheduled oil sampling.

The laboratory to which oil samples will be sent shall be located at and be a part of the local generator set supplier's facility, and shall be open to inspection during normal working hours. Independent laboratories not a part of the engine supplier's facility are disallowed as to conformance with this specification.

Scheduled oil sampling shall be of the atomic absorption spectrophotometer method as opposed to the spectrographic analysis method and shall be accurate to within a fraction of one part per million for the following elements:

a. Iron
b. Chromium
c. Copper
d. Aluminum
e. Silicon
f. Lead

In addition, the sample shall be tested for the presence of water, fuel dilution, and anti-freeze

All equipment needed to take oil samples shall be provided a kit at the time of acceptance and shall include the following:

a. Sample extraction gun (1)
b. Bottle (10)
c. Postage paid mailers (10)
d. Written instructions (1)

IMMEDIATE notification shall be provided to the owner when analysis shows any critical reading. If readings are normal a report showing that the equipment is operating within established parameters shall be provided.

This scheduled oil sampling kit shall be made available, at additional cost, to the owner beyond the mandatory starter kit specified previously and shall be optional for the owner to continue purchasing after the starter kit has been depleted.
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NOTES TO BIDDERS:

1. Bids must be on this form
2. All bids to be held firm until awarded.
3. All prices are to be FOB, North Haven, CT.
4. Vendor will deliver and install generator to the Montowese Firehouse, 282 Qunnipiac Avenue, North Haven during normal working hours.
5. Delivery time will affect award. Time is of the essence.
6. Point of Contact – Fire Chief, 239-5321 x100.

BID PRICE $_____

Bids Submitted By: Date:_____

_____ _____
Name of Firm Telephone Number Fax Number

_____ _____
Address Printed Name Title

_____ _____
City, State, Zip Authorized Signature