

SECTION 16231

PACKAGED ENGINE GENERATOR

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The engine generator set will be purchased by the owner. Contractor is required to install and place into operation according to manufacturer's recommendations.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. This Section describes the packaged engine-generator sets for standby power supply with the following features:
 - 1. Diesel engine.
 - 2. Unit-mounted cooling system.
 - 3. Unit-mounted control and monitoring.
 - 4. Performance requirements for sensitive loads.
 - 5. Load banks.
 - 6. Outdoor sound enclosure.
 - 7. Base-mounted fuel oil tank.
- B. Related Sections include the following:
 - 1. Division 1 Section 01200 – “Project Meetings”
 - 2. Division 16 Sections 16170 – “Disconnect Switches” and 16450 – “Grounding.”

1.4 SUBMITTALS

Installation contractor will be provided with the following:

- A. Product Data: Relevant product data as supplied by the manufacturer.

- B. Shop Drawings: Detail equipment assemblies indicating dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
 - 1. Maintenance Proximity: Not more than four (4) hours' normal travel time from Installer's place of business to Project site.
 - 2. Installer is required to have a minimum of five (5) years installation experience of this type of equipment.
- B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL), and that is acceptable to authorities having jurisdiction.
 - 1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
 - 1. Notify and schedule with the Clinical Manager and Project Manager no fewer than seven (7) days in advance of proposed interruption of electrical service. No interruptions during facility operating hours.
 - 2. Do not proceed with interruption of electrical service without Owner's written permission.

1.7 COORDINATION

- A. Contractor shall schedule all work hours, shutdowns, and use of facility with the Clinical Manager and Project Manager.
- B. Coordinate size and location of concrete bases for package engine generators. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

1.8 WARRANTY

1. Contactor shall warranty the installation for a period of one (1) year from date of Substantial Completion of installation or hand over to the owner, whichever comes later.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide twelve (12) months' full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
- B. Provide separate price for this item of work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, products by one of the following manufacturers will be supplied:
 1. Caterpillar; Engine Div.
 2. Kohler Co.; Generator Division.
 3. Magnetek, Inc.
 4. Onan/Cummins Power Generation; Industrial Business Group.

2.2 ENGINE-GENERATOR SET

- A. Factory-assembled and -tested, engine-generator set.
- B. Capacities and Characteristics:
 1. As indicated on the manufacturer's submittals.

2.3 ENGINE

- A. Fuel: Diesel.
- B. Rated Engine Speed: 1800 rpm.
- C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).

2.4 FUEL OIL STORAGE

1. The generator will be supplied with base-mounted fuel oil tank.

2.5 CONTROL AND MONITORING

- A. As indicated on the manufacturer's submittals.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.
- B. Before performing any work to the exterior of the building or performing any site work, the contractor must contact Dig Safe or whatever company is used to locate buried services. Once the site is marked, contact FMC's Project Manager to obtain go ahead. FMC's Project Manager will be responsible for contacting the leasing department and ensuring that the lease has been amended if required and landlord approval is obtained before site work or any cosmetic changes are made to the property. Exact location of generator and routing of conduits will also be part of this confirmation.
- C. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.
- B. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.
- C. Install packaged engine generator on concrete base. Use FMC's standard details for size and thickness of the pad. Secure sets to anchor bolts installed in concrete bases. Concrete base construction is specified in Division 16 Section "Supporting Devices."
- D. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

- E. FMC-NA requires that a fused disconnect be installed on the line side of the Automatic Transfer Switch (ATS) if there is no over current protection present. FMC also requires a non-fused disconnect on the emergency feed from the generator as close as physically possible to ATS for safety lockout purposes.
- F. Contractor shall obtain diesel storage permits and relay any special requirements back to the engine generator manufacturer. Contractor shall be responsible for the initial fuel fill.
- G. Excavate trench from point of entry to building or ATS over to generator pad location. Trench shall conform to local building code requirements and repaired to existing conditions.
- H. Furnish and install steel concrete bollards per FMC-NA specifications.
- I. Furnish and install necessary conduits and conductors for complete generator installation, conduits to include but not limited to feeder from generator to ATS, start circuit, power for charger and block heater, remote annunciator, and in some cases a heater for the ATS housing.
- J. Schedule and take delivery of generator. This shall include the offloading of the generator at the site.
- K. In some cases, other items may be required such as a fence, special barrier, or even plantings as shown on contract drawings.
- L. Site is to be cleaned and returned to original state after construction completion.

3.3 CONNECTIONS

- A. Ground equipment according to Division 16 Section 16450 - "Grounding"
- B. Connect wiring according to Division 16 Section 16120 - "Wire and Cables – 600V and Under"

3.4 IDENTIFICATION

- A. Identify system components according to Division 15 Section "Mechanical Materials and Methods" and Division 16 Section "Special Provision for Electrical Work."

3.5 FIELD QUALITY CONTROL AND START-UP

- A. Once start-up checklist is completed (see Section 01200 – Project Meetings) and faxed or e-mailed to the generator manufacturer and FMC Project Manager, contact the manufacturer to schedule start-up. During the start-up, contractor and FMC facility representative shall be present.

- B. Testing: The generator manufacturer has included the field testing to perform tests and inspections and prepare test reports.
- C. Contractor shall coordinate programming of transfer switch with the generator manufacturer's technician at start-up.

END OF SECTION