ALL REVISIONS ARE DELTA 1 DATED 9-4-24

SECTION 262620

EMERGENCY GENERATOR

PART 1 – GENERAL (Not Used)

PART 2 - PRODUCTS

2.1 PRODUCTS
Provide a complete emergency power system including power plant powered by diesel engine driven generator and operated by means of a signal from an automatic transfer switch. The system shall be complete, tested, and meet all the functional requirements of a fully automatic emergency power source, serving full load power stabilized at rated voltage and frequency within 10 seconds after normal power source fails.

2.2 The power plant supplier shall be a factory authorized distributor and/or dealer with parts stocking within a 50 mile radius of job site, he shall run factory and field tests on the assembled power plant and shall give a 2 year warranty. All field installation, tests, and operational problems during warranty shall be his sole responsibility. He shall furnish factory trained Engineer for a minimum 2 working days or as needed to satisfy Architect and Owner that system is functioning properly.

~~2.3~~ Acceptable suppliers are Caterpillar ~~or Onan no substitutes. (Olympian generators are not acceptable.)~~

2.4 Power Plant:

A. EPA Certified Tier II ~~2~~/UL 2200 listed & IBC Certified RATED per plans.
B. Rating based on continuous power stand-by rating of generator and with capabilities to carry 100% full load for 1 hour without damage to engine, generator or components, and with capabilities or motor starting while carrying full connected load as shown on drawings. C. Common base, capable of skidding into place.
D. Minimum 18" flexible section in all electrical, fuel and exhaust lines at connection to power plant.
E. Flexible steel disc coupling to engine generator.
F. Lifting brackets.
G. Factory finish in corrosion resistant ~~light grey~~ white.
H. Necessary filters, after burners, or equipment required so that all local, state and government regulations are met with regard to antipollution during start as well as run period for emergency power plant.
I. Vibration isolator springs by Caldyn.
J. Restraint brackets to prevent vertical or horizontal movement of over 1/2" during seismic shock.
K. E-STOP button on exterior of genset, additional E-Stop button provided for remote installation by contractor
L. Critical quality muffler/Residential Silencer
M. Sound Attenuated Outdoor enclosure level 2 with removable panels for equipment access (unless noted otherwise on the plans), 75 dba SPL at 7 meters.
~~N. Active Particulate Filter shall be provided by the contractor to meet City of L.A. air quality requirements~~

2.5 ENGINE

A. 1800 rpm, naturally aspirated or turbo-charged. Inter-cooling or after cooling is not acceptable.
B. Starting with battery driven starter. Include charging generator with voltage regulator; cranking sequencer which will give four start attempts before locking out; over-cranking protection; pre-wired adjustable (120-140 F) water jacket heater thermostatically controlled or 'Kim Hotstart' pre-heater, and wired through an oil pressure disconnect switch to a terminal strip for remote source.
C. Governor high speed electronic as required to maintain generated frequency at 60 Hz at 75% full load within a steady state band width of +/- .25%. Frequency shall not vary over 3% from no load to full load. Governors using engine crankcase lube oil will not be acceptable. Include a safety break-up centrifugal type limiting speed governor as part of the fuel system to limit speed to 110% of rated RPM.
D. Fuel and lubrication systems for diesel engine, complete with replaceable element type air cleaner; primary and secondary fuel filter and oil filter; full pressure lubrication system with positive displacement

lube oil pump and spring loaded bypass valve & lube oil cooler. Main fuel tank to be contained within the skid frame base and shall be minimum ~~400~~ 1000 gallon capacity.

E. Factory Test reports

F. Cooling system with sufficient capacity for cooling engine when generator is delivering ~~115%~~ 100% full load for two hours at ambient of 100 degrees F. Include water circulating pump and thermostatic valve to maintain recommended engine temperature; radiator with drain and air vent and fan with protective guard; two jacket water corrosion resistant elements. Radiant shall be filled with antifreeze solution of strength as recommended by manufacturer.

G. Remote annunciator panel

H. Exhaust system with critical silencer; flexible 18" minimum length exhaust adapter, sized as recommended by engine supplier for each exhaust on engine; and drawing with shut-off valve at lowest point of silencer.

I. Battery for engine start, 12 volt DC, sized for four starts at 30 seconds cranking duration each, with ambient of 15 degrees F., mounted on earth quake proof tray with all necessary battery cables, hydrometer, and including separate battery charger with high rate and trickle charge and with DC voltmeter, DC ammeter and circuit for low voltage alarm.

J. Circuit breakers as noted on construction documents

K. Auxiliary switches for overspeed trip and automatic overspeed shutdown by air door control at a speed 10% greater than the normal specified operating RPM. The engine shall shut down on overspeed, low oil pressure, high oil temperature, and high water temperature by means of auxiliary switches, actuating signal lights and alarms.

L. NFPA 110 upgrade, UL 2200 Package Annunciator Panel

M. Temporary batteries may be used for testing but new, unused batteries shall be furnished after final testing is complete and before acceptance.

2.6 GENERATOR

A. Voltage and phases per plans, 60 Hz, 12 wire rated at 0.8 power factor stand-by service and rating as shown on drawings.

B. Brushless, balanced 4 pole revolving field type with rotating rectifier exciter mounted on end of shaft, single ball bearing support to stator housing rotor connected by semi-flexible steel disc coupling to engine flywheel to assure permanent alignment free of injurious torsional vibrations at speeds up to 125% of synchronous.

C. Insulation in accordance with latest NEMA standards using minimum Class F materials.

D. Voltage regulator of static solid state design to give plus or minus 2% regulation from no-load to full-load; instantaneous voltage dip less than 20% of rating when full-load at rated power factor suddenly applied: and recovery to stable operation of voltage within 1% of rating within 4 seconds. Manual adjustment of plus or minus 5% of normal to be included by a lockable device or screwdriver slot in rheostat shaft. All voltage sensing 3-phase. Include field forcing to assure 300% full load current during fault.

E. Shielding of generator, exciter and regulator in accordance with most recent mil specification to prevent radio frequency interference.

2.7 CONTROL EQUIPMENT

A. Panel mounted with vibration isolators to plant frame.

B. Panel to include self illumination from generator circuit.

C. Devices - frequency meter; running time meter, voltage adjusting rheostat; AC voltmeter, ammeter and respective 3-phase selector switches; 3 current transformers; manually operated molded case circuit breaker; engine water temperature gauge with high temperature cut out and red warning light; engine oil pressure gauge with low pressure cut out and red warning light; overspeed cut out with red warning light; overcrank red indicator light; low battery voltage red indicator light; low battery voltage red indicator light; engine control switch labeled “OFF”, “AUTOMATIC”, “MANUAL”, and “TEST”, with red indicating light when switch in other than automatic position; vernier throttle or speed control to permit manual adjustment to within 1/4 Hz; nameplates giving designations of all devices and one reading “WARNING”. Return to automatic position for generator to function; instrument scales shall not exceed 150% of unit full load rating; all devices wired through terminal blacks so signal and alarm circuits can be readily wired to remote locations.

D. Provide remote indicator building panel ~~in the manager's office (24 light NFPA standard panel)~~ with the following devices ~~in the security office~~:

1. Green pilot light with engraving to indicate ‘engine running’.
2. One audible alarm with silencing switch and red warning light to indicate engine start failure.

3. Engrave alarm silencing switch “ON” and “OFF”. Provide warning on switch to return to “ON” position when trouble has been corrected.

PART 3 - EXECUTION

3.1 The engine generator set shall be mounted on a rigid steel chassis suitable for installations of spring isolators.

3.2 Bolt the isolators to anchors fastened in the floor slab. When anchors are set in the slab, the bolts shall be in place when concrete is poured to prevent filling of anchor holes. The generator frame shall be grounded to local grounding system.

3.3 Ground generator neutral solidly to system ground electrode.

3.4 Provide seismic restraints to limit vertical and horizontal movement to 1/2" during seismic shock.

3.6 Upon approval of the preliminary performance, the sets, complete with equipment and controls, shall be delivered to the site and installed by the Electrical Contractor at least 30 days before completion of the contract. Wiring diagrams for the complete installation shall be framed and mounted on the wall in generator room.

3.7 Upon completion of the installation work, including electrical connections, grounding, and controls; the Electrical Contractor shall provide all necessary facilities, instruments and equipment, including approved electrical loads required for the load tests, arrange for test runs as follows:

A. Load tests a 0, 1/4, 1/2, and 3/4 until readings are constant for 10 minutes. (Each load test is a 20 minute minimum).
B. 100% full load test for ~~4 hours~~ 1 hour shall be made consecutively with the above test.
C. Vibration analysis to ensure that final installation conforms to engine and generator manufacturer's certified performance.

3.8 After complete emergency facilities are connected, load tests shall be run as under and above up to the maximum actual load available from connected equipment. Contractor shall schedule both tests with the Owner's representative and notify the Architect of the schedule so that final tests may be witnessed.

3.9 Readings required during both preliminary and final tests shall be taken and shall include the following:

A. Frequency
B. Voltage
C. Current
D. Wattage
E. Ambient temperature
F. Water Temperature
G. Exhaust air temperature
H. Generator frame temperature I. Oil pressure and temperature.

3.10 Furnish complete records of the preliminary factory and field tests and of the actual total load tests in quintuplicate to the Owner for review. This data must be submitted before equipment will be accepted.

3.11 Emergency Generator Unit shall be in a weather protective housing with factory installed exhaust silencer.

3.12 (4) sets of factory maintenance and factory instruction manuals shall be provided.

3.13 5 year platinum warranty & maintenance package to be included with project installation including yearly load test with external load bank

3.14 Delivery to jobsite

~~3.15 Generator start-up – 2 hour load bank test, 15 minutes each at 25%, 50% & 75% & 30 minutes at 100%.~~

3.16 Contractor to supply 400 gallons of fuel prior to testing. **END OF SECTION**