

# CITY OF ALAMO

## Request for Diesel Engine Generator Bid

The City of Alamo hereby requests sealed bids for the following:

### **DIESEL ENGINE GENERATOR BID**

Sealed bids addressed to Adela Perez, Purchasing Agent, will be accepted at the Alamo City Hall Purchasing Department, 420 N. Tower Rd, Alamo, Texas 78516, until **3:00 p.m.** on, **February 2, 2022**, at which time they will be opened and read aloud. Please mark envelope, “**Sealed Bid – Diesel Engine Generator Bid.**”

Potential Bidders/Respondents are advised that the bidding documents can be downloaded from the City of Alamo web page address: [www.alamotexas.org](http://www.alamotexas.org), and may also be secured at the Alamo City Hall Purchasing Department, 420 N. Tower Rd., Alamo, Texas, or by calling 956/787-0006 ext., 141. Be advised that if your company is contemplating on bidding this project you must contact the Purchasing Department, so that any changes/additions via addendum form can be forwarded to your company. (Please include your company name, address, telephone, fax, and email as well as contact person).

All bids shall be accompanied by a cashier’s check or certified check upon a national or state bank in the amount of five (5%) percent of the total maximum bid price, payable without recourse to the City of Alamo or a bid bond in the same amount from a reliable surety company as a guarantee that the Contractor will enter into a contract.

The City of Alamo reserves the right to accept or reject any and all bids and to accept the bid to be the best and most advantageous to the City and to hold bids for a period of forty-five (45) days without taking action. Bids submitted past the aforementioned date and time will not be accepted.

City of Alamo  
Adela Perez  
Purchasing Agent

## SECTION 16210

### DIESEL ENGINE GENERATOR

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES:

- A. This section specifies the furnishing and installation of a packaged electric generating plant.
- B. The packaged, diesel engine-electric generating plant shall be pre-wired, pre-piped, assembled, and aligned on a single skid type base. The packaged system of new, unused equipment of the manufacturer's latest design includes all necessary instruments, devices, switches, and other appurtenances for proper operation of the unit: supplies steel safety guards around all external rotating parts, and provides a unit on which adjustments, repairs, and normal maintenance are possible without the use of special tools. The supplier will be responsible for the proper performance of the complete unit and support systems. The supplier must have complete parts and service available on a 24-hour basis in the area of the job site. Stock for replacement parts of the engine/generator must be maintained by the supplier.
- C. All equipment provided shall be manufactured by a single source of supply, and supplied by a manufacturer who has been continuously engaged in the manufacture of industrial grade Power System products for a minimum of 25 years. The manufacturer shall have test facilities available to test the proposed equipment and demonstrate the equipment will meet the project specifications.

##### 1.2 GUARANTEE:

- A. All systems and components supplied under this specification shall be guaranteed against defective material, poor workmanship, design deficiencies, and failure during normal usage for a minimum of 12 months after the date of acceptance by Engineer. Vendor shall make necessary corrections to all deficiencies noted within this time, without expense to purchaser. Satisfactory warranty documents must be provided.

##### 1.3 STANDARDS AND CODES:

- A. All material and equipment supplied under this specification shall be designed, assembled, and tested in full compliance with the latest edition of the following codes and standards:
  - 1. NEC - National Electric Code
  - 2. IEEE - Institute of Electrical and Electronic Engineers
  - 3. UL - Underwriters' Laboratories
  - 4. NEMA - National Electronic Manufacturers Association
  - 5. ASA - American Standards Association
  - 6. ANSI - American National Standards Institute

1.4 All components used shall be UL labeled or listed whenever such recognition is available.

1.5 DRAWINGS AND DATA:

A. The following items shall be submitted with vendor's proposal:

1. Outline dimensions and weights.
2. Descriptive literature describing the standard series specified (not a one-of-a-kind fabrication).
3. Drawing submittal schedule with approval allowance requirements.
4. Shipping time after receipt of order.
5. Exceptions and clarifications to this specification.
6. Factory testing procedures.
7. Submit manufacturer's detailed sizing report indicating compliance with the parameters and load starting sequence as indicated in Section 2.02. Genset size indicated in Section 2.02B is allowed only if manufacturer's sizing report produced by generator manufacturer's representative indicates full compliance with all aspects of the parameters and loads listed in section 2.02.

B. The following items are required of the successful bidder prior to manufacture:

1. Certified dimensional drawings showing weight, outline dimensions, bolting and drilling details, clearances for installation, operation and maintenance, and required ventilation.
2. Elevation views, showing and identifying all items furnished and section views as required to locate all components.
3. Bill of material describing all components and recommended spare parts with pricing and delivery.
4. Brochures on engine, generator, muffler, batteries, charger, fuel tank, control panel, and any accessory equipment showing ratings, construction features, and performance characteristics.
5. Schematic and wiring diagrams of the electrical system showing all factory wiring and clearly indicating wiring and voltage of any electrical strip heaters. Also, submit fully detailed inter-connection drawings indicating each individual connection to any remote equipment, including a separate connection drawing to show point to point electrical wiring connections.
6. Submit documentation indicating compliance with EPA/TCEQ emission requirements for the location and EPA "Tier" rating.

7. Submit documentation for sound test data, based on free field environment.

1.6 SUBMITTALS AFTER MANUFACTURE:

- A. Factory and Field Tests - Provide each factory and field test report on the actual packaged electric generating plant provided, indicating results for all tests described herein.
- B. Operation and Maintenance Manuals - Two weeks prior to final inspection, provide the manufacturer's operation and maintenance manuals pertaining directly to the unit provided. Include the following information:
  1. Project record drawings clearly indicating operating features and including as-built shop drawings, outline drawings, schematic and wiring diagrams.
  2. Instructions for erection and alignment, including tolerances and preparation for use.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Diesel Engine Driven Generator Set, complete with accessories, shall be:
  1. Cummins/Onan
  2. Caterpillar
  3. MTU Onsite
  4. Kohler
  5. Taylor Power Systems
  6. or Pre-Approved equal.
- B. Engine shall be:
  1. Perkins
  2. Cummins
  3. MTU
  4. John Deere
  5. Volvo

2.2 RATINGS:

- A. VOLTAGE AND CONNECTION – 480V/277V, 3 Phase, 4 Wire, 60 Hertz, 0.8 Power Factor.
- B. POWER – 900KW, 1,125KVA
- C. LOADS & STARTING SEQUENCE – Generator set shall be capable of starting the following loads in the sequence shown:
  1. Lighting and control loads of 222KVA, three-phase.

2. One (1) 3 HP motor, 1.15 service factor, code letter K, full voltage starting; One (1) 5 HP motor, 1.15 service factor, code letter K, full voltage starting; and One (1) 3/4 HP motor, 1.15 service factor, code letter K, full voltage starting.
  3. One (1) 10 HP motor, 1.15 service factor, code letter G, 6-Pulse VFD; One (1) 1 HP motor, 1.15 service factor, code letter K, full voltage starting; Four (4) 2 HP motors, 1.15 service factor, code letter K, full voltage starting; and Four (4) 1.5 HP motors, 1.15 service factor, code letter K, 6-Pulse VFD.
  4. One (1) 7.5 HP motor, 1.15 service factor, code letter G, full voltage starting.
  5. Four (4) 10 HP motors, 1.15 service factor, code letter G, full voltage starting.
  6. Two (2) 10 HP motors, 1.15 service factor, code letter G, 6-Pulse VFD.
  7. One (1) 15 HP motor, 1.15 service factor, code letter G, 6-Pulse VFD.
  8. One (1) 25 HP motor, 1.15 service factor, code letter G, full voltage starting.
  9. One (1) 25 HP motor, 1.15 service factor, code letter G, full voltage starting.
  10. One (1) 50 HP motor, 1.15 service factor, code letter G, full voltage starting.
  11. One (1) 50 HP motor, 1.15 service factor, code letter G, full voltage starting.
  12. One (1) 125 HP motor, 1.15 service factor, code letter G, 6-Pulse VFD.
  13. One (1) 125 HP motor, 1.15 service factor, code letter G, 6-Pulse VFD.
  14. One (1) 125 HP motor, 1.15 service factor, code letter G, 6-Pulse VFD.
- D. Generator shall be capable of starting loads in the above sequence with not more than 20% instantaneous terminal voltage drop, and not more than 10% sustained terminal voltage drop with the specified KVA load at near zero power factor applied to the generator set. See section 1.05 A 7.
- E. Generator shall be capable of starting loads in the above sequence with not more than 5% instantaneous terminal frequency drop. See section 1.05 A 7.
- F. Site operating parameters shall be 100 ft. altitude and an ambient temperature of 95 degrees F.

- G. Contractor will be responsible for verifying generator operations by executing procedures in the generator checklist attached to this specification. The checklist includes a load bank test.

2.3 ENGINE:

- A. Type - Liquid cooled, full diesel compression ignition engine, either naturally aspirated or turbocharged. 4-cycled engine required, or as approved by the ENGINEER.
- B. Rating - Provide an engine with brake horsepower not less than required by the full load rating of the generator, including losses, and with all accessories attached.
- C. Speed - The engine speed will be suitable for direct connection to the generator without exceeding engine manufacturer's published curves. Speed must not exceed 1800 PRM.
- D. BMEP - The engine BMEP will not exceed 351 PSI, when producing rated load. Piston speed shall be 2250 feet per minute or less.
- E. Construction:
  - 1. Replaceable liners.
  - 2. Two (2) valves per cylinder.
  - 3. Full pressure lube system with crank shaft driven oil pump.
  - 4. Unit injectors.
  - 5. Full flow replaceable oil filter.
  - 6. Primary and secondary fuel oil filters.
  - 7. Replaceable fuel transfer pump suitable for a maximum of 4 feet suction lift.
  - 8. Oil bath or dry type air intake cleaner.
- F. Starting System:
  - 1. Heavy duty, battery driven electric starter motor.
  - 2. A fully charged 24 volt lead acid, impact resistant, storage battery or batteries mounted on the unit. Make battery capacity sufficient for four cranking cycles at firing speed of 10 seconds duration each, with 15 seconds rest periods- Provide all battery cables, connections, electrolyte, and a hydrometer.
- G. Cooling System - The generator set will be furnished with a unit mounted radiator having sufficient capacity for cooling the engine when delivering full rated horsepower at the design ambient. The fan is to be engine driven pusher type. An immersion heater shall be furnished in the jacket water system.
- H. Exhaust System - High degree, critical-rated muffler with maximum silencing capacity mounted on unit. Include a suitable length of flexible exhaust tubing for mounting between engine and muffler. When V type engines are used, a wye type flex will be furnished. All exhaust equipment and hardware mounted to the exterior of the generator enclosure shall be stainless steel.

- I. Fuel System:
  - 1. Engine driven, self-priming fuel pump suitable for unassisted transfer of fuel from the fuel tank to the engine.
  - 2. Subbase fuel tank to be UL 142 listed, double-wall, welded steel, with leak detector system. The tank shall be handled in accordance with current installation instructions provided with the tank.
  - 3. Subbase fuel tank capacity shall be sufficient for 36 hours of continuous operation at full rated load of the generator.
  - 4. Full flow replaceable element fuel filter.
  - 5. Fuel connection lines between tank and engine.
  - 6. Mechanical fuel level gauge.
  - 7. Lockable fuel fill.
  - 8. Contractor shall provide all fuel required for use during construction and a full fuel tank at project acceptance.
- J. Governor - Provide governor of the electric type, Woodward, Onan or an approved equal, to maintain frequency stability at any constant load, including no load, within plus or minus ¼ percent, and to maintain frequency regulation between no load steady state and full load steady within .5 percent.
- K. Battery Charger - A static, solid state type battery charger unit which automatically controls the charge rate. Include a charging rate ammeter, thermal overload circuit and transformer. The charge shall be suitable for operation at 120 volts single phase, 60 Hertz. The maximum charging time to bring the batteries up to full charge will be 12 hours. Mount charger on unit, using adequate vibration devices. Charger shall be of the dual rate type.
- L. Emissions – Engines used in proposed generator set to be certified to comply with current US EPA and CARB Mobile Off-Highway emission limits when tested per ISO 8178 D2. Engines used shall also comply with TCEQ air quality regulations at the project location and time of installation.

#### 2.4 GENERATOR:

- A. Type - Furnish a direct coupled, synchronous, brushless type generator with amortisseur windings, revolving field, exciter, and built-in static rectifier and statically regulated excitation system.
- B. Insulation System - Class H, minimum, with temperature rise limited to 105C over a 40C ambient under the application of full plant load conditions.
- C. Temperature Rise: 105C.
- D. Instantaneous Voltage Dip - Less than 20 percent when sequenced load is applied to the unit.

- E. Voltage Stability - Maintain within plus or minus 1 percent of rated voltage at any constant from no load to full load.
- F. Voltage Regulation - Maintain within plus or minus 1 percent deviation from rated voltage between no load steady state and full load steady state.
- G. Coupling - From engine, drive rotor through a semi-flexible coupling to ensure permanent alignment.
- H. Strip Heaters - Provide thermostatically controlled, low surface temperature space heaters to prevent condensation.
- I. Generator Set Control and Protection - Provide comprehensive monitoring and control system integral to the Generator Set control to guard the electrical integrity of the alternator and power system. Provide single and 3-phase fault current regulation, so that downstream protective devices have the maximum current available to quickly clear fault conditions, without subjecting the alternator to potentially catastrophic failure conditions. Include provisions to either prevent over voltage due to single phase faults, or to shut down the generator set if line to neutral voltage on any phase exceeds 115% for more than 0.5 seconds. Submittals shall demonstrate that the protective device provides proper protection for the alternator by a comparison of the trip characteristic of the breaker with the thermal damage characteristic of the alternator. Field circuit breakers shall not be acceptable for generator overcurrent protection.

2.5 CONTROL PANEL:

- A. General - Provide a control panel mounted to unit which includes, but is not limited to, the following instruments and protective devices.
  - 1. AC ammeter.
  - 2. Phase selector switch.
  - 3. Current transformers.
  - 4. AC voltmeter.
  - 5. Automatic solid state voltage regulator.
  - 6. Rheostat for adjusting voltage plus or minus 5 percent of rated voltage.
  - 7. Engine Malfunction Warning Lights:
    - a. Low oil pressure.
    - b. High water temperature.
    - c. Engine overcrank.
    - d. Engine overspeed.
  - 8. Frequency meter.

9. Non-resettable elapsed time meter with a 9,999.9 hour maximum indication.
  10. Coolant temperature gage.
  11. Oil pressure gage.
  12. 100% rated main circuit breaker with adjustable trip settings. For breakers rated 1,000A and larger, provide a ground fault indication alarm. Alarm shall be wired to generator controller to trigger a generator general fault alarm to notify operations staff.
  13. Provide a second output circuit breaker if shown on construction drawings. Second output breaker shall be 100% rated with adjustable trip settings. For breakers 1,000A and larger, provide a ground fault indication alarm. Alarm shall be wired to generator controller to trigger a generator general fault alarm to notify operations staff.
  14. Combination alarm-shutdown system with manual reset and indicating lights for high engine temperature, low oil pressure, engine overspeed, and engine fail-to-start. Include an additional set of contacts for remote alarms.
  15. Manual start/stop switch for control of engine.
  16. Alarm dry contact closures as follows:
    - a. Low oil pressure
    - b. High water temperature
    - c. Engine overcrank
    - d. Engine run
    - e. Fuel low level
    - f. Leak in subbase tank
    - g. General failure alarm for any active generator/fuel tank alarm
  17. Remote control contacts as follows: Engine start via transfer switch (which will include power transfer).
  18. Provide latest electronic control panel at engine and with remote control panel at transfer switch. Remote panel to have full functions.
- B. All interface wiring connections shall be made in the control panel.
- C. Control panel heater - Provide thermostatically controlled, low surface temperature space heaters to prevent condensation.
- D. Remote alarm annunciator – Comply with NFPA 110. An LED labeled with proper alarm conditions shall identify each alarm even and a common audible signal shall sound for each alarm condition. For outdoor annunciator installations, install the annunciator inside the automatic transfer switch with a viewing window or in a metal enclosure with a viewing window and sun shade of the same NEMA rating as specified for the automatic transfer switch.

2.6 ENGINE START/STOP CONTROLS:

- A. The engine controls shall be provided with bypassing of the low oil pressure shutdown circuitry during start-up.
- B. If unit fails to start in an appropriate time (normally 30 seconds), the starting circuit shall shut down for an appropriate time (approximate 10 seconds) and then repeat the start cycle. If the unit still fails to start after approximately four start attempts, the overcrank alarm shall activate and the starting circuit shall shut down.
- C. The engine start/stop control shall be static solid state.

2.7 BASE:

- A. Mount the assembled packaged unit on a base of welded structural steel, box type construction. Prime all exposed metal parts with a rust inhibitor and finish in durable machinery enamel (Design for mounting on subbase tank).
- B. Vibration isolators shall be provided with elastomeric isolator pads integral to the generator, unless the engine manufacturer requires the use of steel spring isolation.

2.8 WEATHERPROOF SOUND ATTENUATING HOUSING:

The enclosure shall meet the following criteria: rigidity wind test equal to 100 MPH, roof load equal to 40 lbs. per sq. ft., and rain test equal to 4" per hour.

A. Construction:

- 1. Provide an overall weatherproof prefabricated drop over sound attenuating steel enclosure. Instruments, controls, and battery system shall be mounted within enclosure.
- 2. Doors – Hinged with padlocking provisions. Restraint/Hold back hardware to keep door open at 180 degrees during maintenance. Rain lips over all doors.
- 3. Panels – Removable side panels, when equipped, shall be lockable and provide adequate access to components requiring maintenance.
- 4. Louvers – Equipped with bird screen to permit air circulation when engine is not running while excluding bird and rodents.
- 5. Hardware – All hardware and hinges shall be stainless steel.
- 6. Mounting Base – Suitable for mounting on sub-base fuel tank or housekeeping pad.

B. Engine Cooling:

- 1. Housing shall provide ample airflow for engine generator operation at rated load in an ambient temperature of 40 deg C. The enclosure shall

not exceed the generator manufacturer's recommendations for total external static pressure to ensure adequate airflow for cooling and combustion.

C. Sound Performance:

1. Reduce the sound level of the engine generator while operating at full load to a maximum of 75 dBA measured at any location 23 feet (7 meters) from the engine generator in a free field environment.

D. Painting:

1. Prime all exposed metal parts with a suitable rust inhibitor applied to the clean, bare metal, followed by two coats of an epoxy paint of powder-coated and baked for exterior weather.

E. Site Provisions:

1. The complete assembly of engine generator, enclosure, and sub based fuel tank (when applicable) shall be designed to be lifted into place as a single unit.

F. Interior Lighting:

1. Provide two (2) 120V fluorescent strip, compact fluorescent, or LED fixtures rated vapor-tight and for wet location. Provide two (2) 3-way switches, one on each side.

G. Lighting Panelboard – For generators larger than 200 kW or when indicated on the drawings, provide a factory installed 120/240 Volt, single-phase panelboard with a minimum main breaker rating of 60 Amps inside the generator enclosure. The panel shall be mounted in accordance with NEC working space requirements. All generator 120/240 Volt components shall be factory wired to the panelboard.

H. Receptacle – Provide one (1) 125V, 20A, Duplex GFI receptacle in a weatherproof FS box with a weatherproof cover mounted internally to the enclosure. The receptacle shall be mounted in accordance with NEC requirements. The circuit shall be wired locally when a single-phase panelboard is provided with the generator.

I. Contractor to coordinate with manufacturer on housing size prior to constructing concrete pad.

2.9 TESTING:

- A. Units shall be factory tested under design conditions. Purchaser, at his option, may witness test. Vendor shall give one (1) week notice before test is made.

2.10 FIELD TESTS:

- A. Perform field tests at the site after installation is complete and in the presence of the Owner's representative.

- B. Perform sequence start-up of plant and demonstrate compliance with specifications.
- C. Perform on site resistive load bank testing to the full capacity of the generator set for a minimum of two (2) continuous hours. Verify adequate generator cooling, fuel flow, metering, and operation. Contractor shall contact Engineer at least 48 hours prior to commencement of testing.

2.11 TRAINING:

- A. The equipment supplier shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. The training program shall be not less than 4 hours in duration and the class size shall be limited to 3 persons. Training date shall be coordinated with the facility owner.

2.12 SERVICE AND SUPPORT:

- A. The manufacturer of the generator set shall maintain service parts inventory at a central location which is accessible to the service location 24 hours per day, 365 days per year.
- B. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. Within 50 mile of the job site, the supplier shall maintain; a minimum of 6 factory trained and qualified field technicians; a proper supply of spare parts for the supplied equipment; a shop with overhaul capabilities; and be able to provide 24 hour, 7 day per week, 365 day per year field service capability.
- C. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

END OF SECTION