



No.JVM/DG SET/OT/03/2019-20

Date 22-08-2019

**INVITATION TO TENDER**

Principal, JVM , Shyamali, Ranchi invites open tenders for the subject given below , from reputed and similar work experience parties for the work to be carried out in JVM premises. (Total pages-17)

**WORK:- Supply ,installation & commissioning of 125 KVA DG Set JVM Shyamali Campus.**

The bidders will have to submit their quotations in sealed envelope separately as detailed below to The Principal, Jawahar Vidya Mandir, Shyamali, Ranchi-2:

**Part :A** for Techno Commercial bid and &

**Part: B** for Price bid

Both the envelopes shall be subscribed with name and reference number of this tender.

**Last date & time of submission of both parts A&B of bid is 01.00 PM on 07-09-2019**

**Pre bid meeting on 05-09-2019 at 1.00 PM**

**Terms & conditions are given below:**

- A.** All the Tenders shall be accompanied by EMD (Earnest money deposit) of Rs. 18000/- ( Rupees eighteen thousands only) payable to "Jawahar Vidya Mandir, Shyamali Ranchi " in the form of " Demand Draft" . Tenders received without EMD are liable to be rejected. EMD shall be refunded to successful bidder after execution of order and to unsuccessful bidder after finalization of order.
- B. Contract period:** One month from the date of issue of the work order.
- C. Payment:** The payment shall be made after completion of the work. Bill to be submitted by the Contractor, duly certified by the Engineer/ Supervisor Incharge.
- D. Security deposit:** 5% security deposit shall be submitted within one week after receipt of work order which will be refunded after maintenance period of six month.
- E.** Income tax deduction as per rule. Other taxes and duties shall be applicable as per statute.

Documents of GST Reg. no. & shall be mentioned in in tax invoice.

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Jawahar Vidya Mandir  
Shyamali, Ranchi



#### **F. ELIGIBILITY CRITERIA**

The bidders must satisfy all the conditions mentioned in GCC and SCC attached as a part of tender document.

Bidders must have carried out at least one similar work of supply & installation of DG set of minimum 100 KVA capacity. During last 3 years' successful installation & working certificate to be submitted.

#### **G. SPECIFICATION DESIGN BASIS FOR DIESEL GENERATING SET**

##### **1. SCOPE of Work:**

This specification covers the technical requirements for the supply, installation and commissioning of 125 KVA Diesel Generator.

##### **2. LOCATION & AMBIENT DESIGN TEMPERATURE:**

Generating set is to be installed at Jawahar Vidya Mandir, Shyamali Colony, Doranda, Ranchi 2, Jharkhand. The set should be suitable for operational at the following site conditions:

**Design ambient temperature: 50°C**

**Minimum ambient temperature: 0 °C**

##### **3. REQUIREMENT:**

The work of supply, installation, testing and commissioning of Diesel Generator set shall cover the following subject to requirements specified in the schedule.

- The DG set of capacity specified in the schedule shall be mounted on a common bed plate with all connected accessories.
- All piping works required as per the schedule for lubricating oil system, fuel system, engine cooling system and exhaust piping with insulation and cladding.
- Flexible connections if any in the above piping system.
- Starting equipment.
- Control cubicle and isolating facility as per schedule.
- Necessary set of vibration-isolation mountings as per schedule.
- All power and control cable works between control panel, alternator, and essential panel as per the schedule.
- Minor building work including cutting and making good, all clamps supports, grouting etc.
- Earthing, earth connection and loop earthing as per schedule.
- Any other work as specified in the schedule.

##### **4. DIESEL ENGINE:**

**4.1** The engine shall be of multi cylinders, vertical four stroke cycle, water cooled type with or without turbo charger, diesel operated and running at 1500 RPM and developing suitable BHP at site conditions for giving a continuous output as specified at the load terminals of alternator exclusive of the power requirements of the auxiliaries. The engine shall have 10% overload capacity for any one hour during 12 hours continuous run.

**4.2** The diesel engine capacity shall be suitably de-rated as per BS/IS-10000 to suit the climatic conditions stipulated under Clause 2 above.

**4.3** Capacity rating shall be at site conditions and exclusive of power requirements for auxiliaries that will come on the engine while operating.

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4.4 The engine should be complete with the following accessories and as per IS 1601 and IS 1002 amended up to date.

- Fly wheel dynamically balanced to suite flexible coupling.
- Necessary flexible coupling with guard between alternator and engine.
- Air cleaner.
- Corrosion inhibitor, if necessary.
- Radiator complete with hoses, fan, fan drive and guard.
- Daily fuel service tank as per manufacturers design.
- Fuel pump
- Necessary governor
- Starter motor as per manufacturers design and specifications.
- Set of starting batteries as per manufacturers design.
- Fuel oil filter.
- Necessary engine cooling system, oil lubricating system, fuel system.
- Turbo charger (exhaust gas driven) if any
- Instrument panel comprising of starting switch with key (Or push button arrangement), lub oil pressure gauge, water temperature gauge, battery charging ammeter, running hour meter with RPM indicator. (This may also be integrated with control panel)
- Necessary control push/pull for speed adjustment
- Lub oil filter
- Safety control against low lub. Oil pressure, high cooling water temperature and over speed.
- Common bed plate with suitable foundation bolts or suitable anti vibration mounting.
- Exhaust silencer, hospital type with necessary pipe work.

4.5 Cyclic variation of set shall be within the time limit specified in BSS 649 and IS1601/1960.

4.6 The scope of work shall include provision of lubricating oil circulation system for engine bearings.

4.7 Governor shall be centrifugal (mechanical) and shall be self-contained unit capable of monitoring speed.

4.8 The speed variation from NO load to FULL load shall not exceed 4% and at any constant load including NO load shall remain within a band of 1.5% of rated speed corresponding to clause A2 governing of BS 649.

4.9 The fuel system shall be gravity fed to engine driven fuel pump. The replacement element of fuel filter shall be suitably located to permit easy servicing.

4.10 The daily service fuel tank shall be built in type strictly as per the recommendation of the manufacturer.

4.11 Cooling system shall be of integral mounted radiator on common base plate with suitable vibration arrestor pads and brackets.

4.12 Starting system shall comprise of necessary set of batteries 12V DC, starter motor, axial type gear to match with the toothed ring on the fly wheel, protection system as per manufacturers design. Battery capacity shall be suitable for meeting the needs of the starting system as well as the requirements of control panel; indications and other auxiliaries. The scope shall cover all cabling, termination, initial charging etc.

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4.13 Silencer shall be hospital grade type with rain cap suitably optimised to meet stringent noise emission standards laid down by MOEF /CPCB.

4.14 Engine instrumentation shall be centralized on an instrumentation panel and resilient mounted on the engine.

4.15 Necessary engine protection devices for the following shall be provided.

- Low lubricating oil pressure.
- High/low cooling water temperature.
- Over speed shut down.
- Battery Over/under/weak volts
- Fail to crank/start
- Sensor failure
- Cranking lockout
- Low fuel oil

4.16 MS piping of adequate size shall be used for fuel oil piping and exhaust piping.

The pipe work shall be inclusive of all fittings and accessories such as valves, bends, reducers, elbows, flanges, flexible connections, necessary hardware etc. The installation shall cover clamps, supports, hangers, etc. as are necessary for completing the work. Welding, brazing will be permitted in the installation. However the work shall be sectionalized with flanged connections as are necessary for easy isolation. All MS pipe for water line and exhaust line work shall be class B type. The exhaust pipe shall be insulated with mineral wool and aluminium sheet cladding.

4.17 Engine and alternator shall be mounted on a common bed plate together with all auxiliaries. Fabricated bed plate will be acceptable. The bed plate shall also be suitable for installation on suitable anti vibration mounting system.

## 5. ALTERNATOR:

5.1 The alternator shall be of brushless design and rated for a continuous output as specified at 0.8Pf lag at 415V 3 Ph 50c/s suitable for 4 wire system exclusive of power requirement for auxiliaries. Windings are to be star connected and neutral shall be brought out through a separate terminal and will be solidly grounded. Speed of alternator shall match the engine for a direct drive.

5.2 The alternator shall be self-excited, self-regulated, and static excitation facility. The exciter unit shall be mounted on the control panel or on the alternator assembly. The rectifier shall be suitable for operation at high ambient temperature of the site.

5.3 The alternator shall be in accordance with the following standards as are applicable.

- IS 4722/BS 5000 – The electrical performance of rotating electrical machine.
- IS 4889/BS 269 – Rules for method of declaring efficiency of an electrical machine.

5.4 The performance of the alternator shall be as under:

- Voltage regulation from NO load to rated load shall be within a band of +/- 5% or rated voltage.
- The frequency regulation from NO load to FULL load shall be as defined by the engine governor.
- Voltage dip for any addition to load upto and including 90% load shall not exceed 23% of rated voltage and shall recover to and remain within the steady band in not more than 1.5 sec. Similarly, the frequency shall recover to the steady state band within 5 sec.
- The windings shall not develop hot spot exceeding safe limit due to an imbalance of 25% between any two phases from NO load to FULL load.

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5.5 Alternator enclosure shall be screen protected drip proof (SPDP) conforming to IP 23 as per IS.

5.6 The terminal boxes shall be suitable for necessary XLPE, 1.1kV grade of UG cable of required size detailed elsewhere. There shall be sufficient space for bifurcation inside the box. The box shall have removable gland plates. Suitable segregation shall be available for withstanding the mechanical and thermal stresses developed due to short circuit at the terminals.

5.7 Two numbers of earth terminals on opposite side with vibration proof connections, nonferrous hardware etc. with galvanized or plated and passivated washers of minimum 12mm dia shall be provided.

5.8 Voltage regulation of the alternator shall be automatic and compatible with excitation system described above.

5.9 The insulation of stator/rotor windings shall be Class-F or H or superior.

5.10 Where specified space heaters may be provided in the alternator to maintain the winding temperature such that it does not absorb moisture during long idle periods. The heater terminals shall be brought to a separate terminal box suitable for 30V AC supply and permanent caution notice "Isolate supply elsewhere before disconnection" be exhibited on the terminal cover.

#### **6. CONTROL PANEL:**

6.1 The control panel shall be fabricated out of sheet steel, totally enclosed, dust, and damp and vermin proof, free standing floor mounted and front operated type. It shall preferably be made into sections such that as far as feasible there is no mixing of control, power, DC and AC functions in the same section and they are sufficiently segregated excepting where their coming together on unit like relay contactor etc. is necessary. Sheet steel used for fabrication shall not be less than 2mm thick. Hinged double leaf doors shall be preferred for easy access to routine inspection from the rear etc. There is no objection to have single leaf hinged door in the front. All indication lamps instruments, meters, etc. shall be flush mounted in the front.

6.2 A frame earth bus of copper strip shall be run at the rear of the board for connecting all the sections and all section shall be suitable bounded to the earth bus. Earth terminals shall be provided at the end for connections to earth system. Earth terminal shall be vibration proof with all hardware of non-ferrous/galvanized/plated and passivated in case of ferrous hardware.

6.3 Removable gland plates, sectionalized for receiving various cables that are to enter on to the section and un-drilled or with suitable knockout shall be provided at the bottom of the panel sections. Where heavy cables are to be brought and terminated suitable clamps shall also be incorporated to relieve the stress on the glands due to the weight and bends of the cable covers.

6.4 Terminal blocks of robust type and generally not less than 15A capacity, 250V grade for DC and 660V grade for AC and rest of the junctions shall be employed in such a manner that they are freely accessible for maintenance. All control and small wiring from unit to unit inside the panel shall also be done with not less than 1.5 sq.mm copper conductor PVC insulated 660V grade cable. Suitable colour coding can be adopted. Wiring shall be neatly formed and run preferably function-wise and as far as feasible segregated voltage-wise. All ends shall be identified with ferrules at the ends.

6.5 Space heaters shall be controlled by a separate control switch and protective fuses.

6.6 All internal components shall be provided with suitable engraved identification labels. Labels shall be fixed on push buttons indication lamps etc.

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6.7 The entire panel shall be given primer coat after proper treatment and two coats of final paint of approved shade before assembly of various items.

## **7. SYSTEM OPERATION**

The control cubicle shall incorporate equipment and system to afford operational Requirements as under:

### **7.1 AUTO MODE (applicable with AMF panel)**

1. A line voltage monitor shall monitor supply voltage on each phase. When the main supply fails completely or falls below set value (variable between 80% and 95% of the normal value) on any phase, the monitor module shall initiate startup of diesel engine.

To avoid initiation due to momentary dips or system disturbance, a time delay adjustable between 0 to 5 sec. shall be incorporated in the startup initiation.

2. A three attempt starting facility shall be provided; 6 sec. ON 5 sec OFF-6 sec ON. If at the end of third attempt the engine has not already started and built up voltage the engine shall be locked out for start. A master timer shall be provided for the functions.

Suitable adjustable timers shall be incorporated which will make it feasible to vary independently ON OFF setting period from 1-10 sec. If the alternator does not build up voltage after the first and second start as may be prescribed further starting attempt will not be made and starting facility will be reset.

3. Once the engine has built up voltage the alternator contactor or circuit breaker shall close connecting load to the alternator. The load is now supplied by the alternator.

4. When the main supply is restored and is healthy as sensed by the line voltage monitor setting both for under voltage and unbalance after the quality is monitored by a suitable timer which can be set between 1minute and 10minutes, the load shall be transferred automatically to mains and alternator is shut down. Mains take over the supply to load.

5. The diesel alternator set reverts to stand by for next operation as per (1),(2),(3) above.

6. Alternator and main circuit breakers are invariably electrically interlocked such that unless one is OFF and the other cannot be made ON.

7. In case circuit breakers are employed for contactor duty and they have spring closing mechanism suitable motor operated spring closing mechanism with limit switches etc. otherwise suitable for operational modes shall be provided.

### **7.2 MANUAL MODE (Applicable with AMF panel)**

1. In a manual mode it shall be feasible to startup the generator set only by the operator pressing the start push button/starting key or switch.

2. Alternator contactor/circuit breakers close and trip operating shall be also through operator only by pressing the appropriate button on the panel.

3. Engine shut down otherwise due to faults, shall be manual by pressing a STOP button.

### **7.3 TEST MODE: (Applicable with AMF panel)**

1. Sequence 7.2 (1) and (2) shall be completed.

2. Engine shall build up voltage, but the set shall not take load by closing up alternator contactor/circuit breaker. When the load is on the main, monitoring performance for voltage/frequency etc. shall be feasible without supply to load.

3. If during test mode the power supply has failed, the load shall automatically get transferred to alternator.

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4. Bringing the mode selector to auto position shall shut down the set as per sequence 7.8.1.(4) provided main supply is ON. If the main supply is not available at the time the alternator shall take load as in (3) above.

**8 ENGINES SHUT DOWN & ALTERNATOR PROTECTION EQUIPMENTS:**

8.1 The following shut down and protection system shall be integrated in the control panel:

1. Engine shut down due to:

- Low lubricating oil pressure.
- High coolant (Water) temperature.
- Engine over speed.

2. Alternator protection (Trip)

- Over load trip in all three phases.
- Earth leakage trip
- Over load trip shall be adjustable between 80% and 120% while earth leakage trip shall be adjustable between 20% and 40%.
- Over/under voltage trip
- Over/under frequency
- Loss of AC sensing
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8.2 The above shut downs and trips shall have visual and audible alarms.

**9 MONITORING AND METERING FACILITIES**

- a) Combined digital meter with Ammeter, kWh meter, power factor meter and frequency meter for monitoring of mains and alternator supply (on load side)
- b) Visual monitoring lamp indicator for:
  - i. Load on set
  - ii. Load on Mains
  - iii. Set on test
  - iv. Engine shut down due to over speed
  - v. Engine shut down due to low lubricating oil pressure.
  - vi. Engine shut down due to high coolant (Water) temperature.
  - vii. Over load trip of alternator.
  - viii. Earth leakage trip of alternator.
  - ix. Engine lock out and failure to start.

All the indications (except i to iii) shall have an audio alarm and when energized shall be blinking and trigger the audio alarm until annunciated and accepted by the operator. When operator accepts the alarm, the hooter will be silenced and the fault indication will become steady until reset by operating the reset button.

- c) No. of starts meter in the panel
- d) 3 Phase indicating lamp for mains supply, DG ON, Load on DG and load on mains.
- e) RPM cum running hour meter.
- f) Oil pressure
- g) Engine Temperature
- h) Starting battery voltage
- i) Engine running hours

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**10 OPERATION DEVICES (Applicable with AMF panel)**

A set of operation devices described as under shall be incorporated in the front panel:

a) Master engine control switch:

This shall cut off in OFF POSITION DC CONTROL SUPPLY to the entire panel thus preventing startup of engine due to any cause under this status. However, battery charger, lamp test button, for testing the healthiness of indication lamps, DC voltmeter/ammeter etc. shall be operative. It shall be feasible to lock the switch in OFF position for maintenance and shut down purposes.

b) Operation selector/switch with OFF/auto/manual/test position.

c) Selector switches for all meters as specified.

d) A set of push buttons as specified.

**11 BATTERY CHARGER (Applicable with AMF panel):**

This shall be complete with boost/trickle selector, DC volt meter, DC ammeter and lamp indications for boost charge and float charge. The battery charger is to connected to the load side.

**12 TEST ON GENERATING SET:**

Test shall cover the following:

a) Routine tests as per standards at manufacturers works which may be inspected by the Engineer-in-Charge or authorized representative, if required.

b) Insulation resistance test.

c) Operation checks

d) Full load run test after installation at site for a period of at least 12 hours continuous run.

**13 EARTHING SYSTEM:**

Earth electrodes and earth leads as specified in the schedule together with necessary test links shall be provided conforming to CPWD specifications. Joints in the earth leads shall be with double bolts with washers and check nuts.

Earth resistance shall be measured and results shall be furnished.

**14 ACOUSTIC ENCLOSURES: (OPTIONAL)**

- The canopy should be sound proof, weather proof and environment friendly, conforming to latest environment (protection) act 1986 (29 of 1986) of ministry of Environment and forest notification No: dated 17th May 2002 and 12th July, 2004 and second amendment of 2002 and 2004 respectively. No set shall be accepted without the CPCB certificate of authorized agencies such as ARAI of Pune, NPL New Delhi, NSTL Visakhapatnam, FCRI Palghat, and NAL Bangalore.
- The canopy shall be in modular construction. The acoustic panels shall be fabricated in 1.6mm thick CRCA sheet. The finished sheet metal component shall undergo seven tank treatment process for degreasing, phosphatizing etc. for longer life and should be by poly polyester based coating inside and outside. The nuts, bolts and other hardware shall be zinc coated. The door shall be provided with high quality EPDM gaskets to avoid leakage of sound. The door handles and hinges shall be zinc plated and lockable type.
- The radiator fan of the water cooled engine shall be used for ventilation. A pusher fan, in addition to the radiator fan, if required shall also be provided.
- Adequate ventilation shall be provided to meet the air requirement for combustion and also to expel heat to maintain temperature inside the enclosure within 5°C above ambient at 10% over load with tripping arrangement.
- An arrangement for adequate illumination inside the enclosure shall be provided.

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- Separate door with locking arrangement for easy access to DG Set during operation and maintenance should be provided.
- Radiator bellows to be provided in case of water cooled engines.
- Fuel tank and control panel shall be incorporated inside the canopy.
- Suitable lifting arrangement shall be incorporated.
- Insulation on enclosure will be provided and fixed of mineral rock wool slabs of minimum 50mm thickness, covered with 0.6mm thick GI sheet having 3mm perforation fitted with strips of aluminium by hydraulic riveting to support the whole insulation rigidly. Specially designed sound attenuators shall be provided to control sound at air entry and exit points including louvers.
- Complete design, supply, installation and completion shall be under bidder scope.

**15. GENERAL:**

- The set shall have minimum vibration and noise under all conditions of load. The set shall be properly dynamically balanced. Anti-vibration mounting shall be provided for supporting the set. Control wiring shall be done with 2.5 Sq.mm multi strand PVC insulated copper conductor cable
- Earthing provision should be made for earthing all current carrying metal parts of the equipment. Earth lugs of suitable size shall be provided.
- All the exposed moving parts like coupling etc. shall be provided with suitable guards covering.
- A name plate showing rating, connection diagram should be provided on engine and alternator. All the important and major parts should bear their catalogue number make of the parts etc. All the control wiring shall be provided with letter number ferules at both ends.
- Three sets of manual giving the details about design, specifications, and special features of the equipment, schematic and wiring diagram, instructions regarding installation and maintenance etc. should be supplied. A laminated control wiring diagram should be pasted inside the control panel.
- Supplier shall also furnish copy of Conformity of Production (COP) for the DG set from an authorized agency.
- The whole installation system shall be guaranteed against any inherent defect of faulty workmanship and for its perfect functioning for a period of not less than one year from the date of commissioning of the system.
- Free services as per manufacturer's standard practice and norms will be provided free of cost.
- All work shall be executed as per CPWD General Specification for Electrical Works Part I (internal) - 2005, Part II (External)- 1994 and Part VII (DG SETS)-2006 and IE Rules.

**16. STATUTORY CLEARENCES: NA**

**17. INSPECTION, TESTING AND COMMISSIONING:**

- Copies of all documents of routine and type test certificate of the equipment, carried out at the manufacturer's premises shall be furnished.
- After completion of the installation work in all respect, the contractor shall offer the DG sets for testing.
- DG set will be tested on load of unity power factor for the rated kW rating. During testing the DG set shall be operated for a period of 12hours on the rated kW at DG set's kW rating including 1 hour on 10% over load after continuous run for the 12 hours. During testing all controls/operations safeties will be checked and proper record will be maintained. Any defects, abnormalities noticed during testing shall be rectified. The testing will be declared successful only when no abnormality/failure is noticed during the testing. The installation will be accepted only after successful completion of the testing.

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• **ACCEPTABLE MAKES**

1.	Engine	Cummins/Kirloskar/Greaves/ <b>Mahindra/ASHO K LEYLAND</b>
2.	Alternator	Stamford/Kirloskar Green/KEL/Crompton
3.	Relays	Alsthom/Siemens/Allen Bardly/PLA
4.	MCCB	Siemens/L&T/Legrand
5.	Contactos	Siemens/L&T/GE Power control
6.	CT	As per manufacturer
7.	MS pipe	Jindal/TATA/Zenith
8.	Ammeter/Voltmeter	AE/IMP/Universal/Reshabh/Kaycee
9.	Selector Switch	L&T / Kaycee / AE / IMP / Vaishno / Seizer / Rass control
10.	Indicating Lamps	Vaishno / Siemens / L&T / AE / IMP
11.	Control cables	Havell's/Finolex/Gloster/Universal/Nicco/CCI
12.	Digital/analog metering	Conzerv/L&T Rishab/Enercon/AE/IMP/Secure
13.	Lead Acid Battery. (Sealed Maintenance Free)	Exide / Standard Furukawa / AMCO / / Amara Raja.
14.	AVM Pads	As per manufacturer
15.	Power Cables	Fort Gloster / Finolex / Poly Cab / Havell's / Nicco
16.	Valves (Only ISI mark)	Kirloskar / Fountain / Trishul / Leader
17.	Contactors/Relays/Timer	L&T/Siemens/ABB/BCH/Control & switch gear/Schneider

**Note:** Any other materials used in the work and not mentioned in the list, shall be of reputed make and ISI approved.

**H. MINIMUM SCHEDULE OF QUANTITIES**

SI No.	Description	Quantity	Unit
1	<b>Sub Head "A" Equipment</b>		
1	Supply, installation, testing and commissioning of 125 KVA Silent type water cooled diesel driven generating set conforming to CPCB 2 norms comprising of radiator, 4 stroke multi cylinder engine of suitable BHP to deliver rated KVA at prevailing site conditions equipped with flywheel, hospital .type silencer, fuel governor, fuel pump, built in fuel tank, electric starting equipment with required nos of suitable AH sealed maintenance free batteries etc., directly coupled to 125 kVA 0.8PF, alternator suitable for 3 phase, 4 wire 50Hz AC supply	1	Set

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	system with the entire system mounted on common base frame etc. on an existing foundation, exhaust piping with thermal insulation, control wiring from Alternator to control panel, acoustic enclosure, etc. as specified and consisting of the followings and AMF panel as per specification given below etc. as required.		
	One number multi-cylinder, four stroke, liquid cooled, electric start, turbo charged type engine suitable for developing the required BHP at 1500 rpm, suitable for above output of alternator and conforming to BS 5514, BS 649, IS:10000, capable of taking 10% over loading for one hour after 12 hours of continuous operation complete with common base frame, Anti vibration mountings, radiator, starting equipment, batteries, hospital type silencer and other accessories etc. as required and as specified in the detailed specification enclosed.		
	1(b) Alternator		
	One number synchronous alternator rated at 125 kVA, 415volts at 1500 rpm, 3 phase, 50 Hz. AC supply with 0.8 lagging power factor. The alternator shall be having SPDP enclosure, brushless, continuous duty, self-excited and self-regulated through AVR conforming to IS : 4722/BS 2613 suitable for tropical conditions and with class F/H insulation.		
	1(c) Base Frame & Foundation:		
	Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer.		
	1(d) Fuel tank:		
	In built daily service fuel tank as per manufactures specification complete with all standard accessories and fuel piping between fuel tank and diesel engine, complete with valves, level indicator and accessories as required as per specification attached.		
	1(e) Exhaust system:		
	Dry exhaust manifold with hospital exhaust silencer and catalytic convertor		
	1(f) Starting System:		

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1(f) Starting System:		
12V/24V DC starting system comprising of starter motor, voltage regulator and arrangement for initial excitation, complete with required nos of suitable batteries as required and as per specification.		
1(g) Acoustic Enclosure: (OPTIONAL)		
Acoustic and weather proof enclosure with arrangement for fresh air intake for cooling of the engine and alternator, extraction, discharging hot air in to the atmosphere as per specification attached.		
1(h) AMF Panel:		
Compartmentalised floor mounting, out door type double door AMF control panel board totally enclosed dust and vermin proof, made out of 2mm thick sheet steel having concealed hinges, lockable doors, detachable gland plates of suitable size at the bottom for cable entry, and busbar chamber with copper bus bar of 300A capacity, powder coating the panel, supplying and fixing of the following and all other required accessories and components for the above DG set as per detailed technical specification, including copper wires for control wiring, connections and interlocking etc. complete as required.		
a) 200Amps. Four pole MCCB, Ics=50kA @ 415V or Ics=50kA @433Volts with rotary operating mechanism with phase barriers - 2 nos. (For mains and alternator)		
b) 255A, AC-I FP power contactor with add on block (L&T model MCX-34) or equivalent - 2 sets (For mains and alternator) with interlocking arrangement.		
Micro processor based automatic mains failure function unit for emergency and stand by power supply system having under voltage, over voltage and single phasing protection and other standard features - 1 no.		
d) Micro processor based IDMT relay for three phase over current + earth fault - 1 set.		
e) Energy analyser unit to indicate current, voltage, frequency, power factor and kWh		
(f) Phase indication lamps for DISCOM and Generator - 1 Set		

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	(g) Emergency trip switch, Auto/Manual/Off selector switch, trickle/boost charger switch and SMPS battery charger unit complete with transformer, rectifier, DC Voltmeter and ammeter, off and boost and current adjustment etc. - 1 Set		
	(h) Bakelite HRC fuses and control wiring for the entire system - 1 Set		
	(i) Indicating lamps for load on mains and load on set - 1 Set		
	(j) Fuse for instruments - 1 Set		
	(k) 25 x 5mm copper/aluminium/GI strip along the entire width and length of the board - 2 sets.		
2	(a) Supplying and fixing exhaust gas piping of suitable dia. Welded black MS 'B' class pipe conforming to IS:3589 cut to required length and installed with necessary bends, supports and clamps, anti vibration mountings, insulation of exhaust system with mineral wool/Rock wool 50mm thick, wire mesh and aluminium cladding etc. as required as per detailed specification attached.	12	Meter
	(b) Insulation of silencer with mineral wool/rock wool 50mm thick, wire mesh and aluminium cladding etc. as required.	1	job
3	Excavation for foundation in soft soil including dressing of sides and ramming of bottom, lift up to 1.5m including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres.	6	cum
4	Providing and laying in position cement concrete 1:3:6 (1cement: 2coarse sand: 6graded stone aggregate 40mm nominal size) in foundation of DG set including form work etc. as required.	1.00	cum
5	Providing and laying in position cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20mm nominal size) in foundation of DG set including form work & Reinforcement etc. as required.	6.75	cum
6	Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1cement: 2fine sand) including trenching (75cm deep) and refilling etc. as required. - 300mm dia.	8	Meter

*Drish*

*Sanjay*  
*22/08*  
*2019*



**JAWAHAR VIDYA MANDIR**  
**SHYAMALI, RANCHI – 834002**

AFF.NO.-3430004  
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**जवाहर विद्या मंदिर, श्यामली, राँची - 834002**

II	<b>Sub-head 'B' Cable &amp; laying and Junction Box</b>		
7	Supply of aluminium conductor, XLPE insulated, inner sheathed flat steel strip armoured and PVC sheathed overall underground power cable of 1.1 KV grade, conforming to IS, of following sizes as required.(Make: Finolex, Polycab, Havells, Nicco, Fort Gloster) -		
	I.(a) 3.5C x 240 Sq.mm Al, XPLE insulated armoured cable	50	Meter
	b) 3.5C X 120 Sq.mm Al, XLPE insulated armoured cable	200	Meter
	II. Junction box (suitable for 3.5C X 240 Sq.mm & 2 runs of 3.5C X 120Sq.mm) along with changeover switch of required ampere.	1	Set
8	Control wiring with suitable size multi pair copper conductor control cable from the alternator to the AMF panel in the existing pipe laid in floor/ground as required.	10	Meter
9	Laying of one number XLPE insulated, armoured and power cable of 1.1kV grade of size 240 sq.mm direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required.	50	Meter
10	Laying of one number XLPE insulated, armoured and power cable of 1.1kV grade of size 120 sq.mm direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required.	200	Meter
11	Supplying and making end termination with brass compression gland and aluminium lugs for following size of XLPE aluminium conductor cable of 1.1kV grade as required for above cables.	1	Lot
III	<b>Sub-head 'C' (Earthing)</b>		
12	Earthing with GI earth plate 600mm x 600mm x 6mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. (but without charcoal or coke and salt) as required.	2	Set
13	Earthing with copper earth plate 600mm x 600mm x 3mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. (But without charcoal or coke and salt) as required.	2	Set

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*Handwritten signature and date: 22/08/2019*





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14	Extra for using salt and charcoal for GI plate earth electrode as required.	4	set
15	Providing and fixing 25mm x 5mm copper strip in 40mm dia GI pipe from earth electrode as required.	20	Meter
16	Providing and fixing 25mm x 5mm GI strip in 40mm dia. GI pipe from earth electrode as required.	20	Meter
17	Providing and fixing 25mm x 5mm copper strip on surface or in recess for connection etc. as required.	10	Meter
18	Providing and fixing 25mm x 5mm GI strip on surface or recess for connection etc. as required.	10	Meter
19	Providing artificial load and carrying out test at site at rated kW for the 125 kVA DG set for a period of 12 hours continuous run including 10% overload for one hour after 12 hours of continuous operation. (The tenderer should provide POL required for running the gen set for the specified period, connections, reconnections for conducting the test including labour, transportation etc. as required.)	1	Job

**I. Completion Period:**

The entire supply and commissioning activity is to be completed within one month from the date of receipt of Work order.

**J. Guarantee Period**

The whole installation shall stand guarantee for a period of one year from the date of Successful commissioning. All defects correction & replacement of any part shall be free of cost to JVM, Shyamali during the guarantee period.

**K. Liquidate Damage:**

The job shall be completed in accordance with the schedule stipulated in work order . If the contractor fails to complete the work as per schedule, JVM, Shyamali shall recover the amount of LD @0.5% of work order price per week of delay subject to maximum of 5% of work order price excluding taxes/duties.

L. You are requested to visit the site before quoting your rate.

M. All the pages of GCC (enclosed with NIT) are to be signed and submitted along with bids.

N. Item 1(g) is optional .Bidder shall separately quote against this item.

Thanking you

Yours faithfully

*Sans*  
*22/08/2019*  
**(SAMARJIT JANA)**  
**PRINCIPAL**

*Principal*

Jawahar Vidya Mandir  
Shyamali, Ranchi

*Page*

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**General Condition of Contract (G.C.C.)**

1. Your scope of work shall include all workers, suppliers and services for completion of entire work as directed through site order.
2. The contractor shall have own site office, stores, godown as may required for carrying out the subject work.
3. Provision of all labours, skilled, semi skilled, less skilled as may be required to complete the work.
4. Providing adequate tools, instruments, tackles, scaffolding etc. for completion of entire work.
5. Procurement of all the materials, as may be required for carrying out the work.  
Abide by statutory regulations, labours rules, safety codes during execution of work.
6. Abiding by all statutory obligations including ESI, EPF etc. during execution of work and shall submit all evidence in this respect such as ESI, EPF certificates and minimum wage certificate along with each and every bill.
7. Contractor shall make arrangement at his own cost for drawing and distributing water and power from single point each where water and power will be provided by JVM free of cost.
8. Undertaking all works including repairs and renovation work for completion to the satisfaction of JVM.
9. Agency and/or the worker engaged by agency will not have any claim for payment employment in JVM. The age limit of worker shall be between 19 yrs. and 60 yrs.
10. Rate of wage shall not be less than the minimum wages plus prevailing percentage of EPF, FP, ESI, EDLI, Bonus etc. as required under the law.
11. Agency shall ensure fulfillment of all labour regulations/rules under the Labour Act and all other statutory requirement of Government of India and Government of Jharkhand.
12. Monthly bill based on actual deployment of worker shall be submitted by Agency statutory payment ) viz. EPF, FP, ESI, EDLI, bonus etc.) including taxes payable if any.
13. Unit rates of all the items shall remain firm, fixed and binding on the contractor during entire period of execution of work and shall not be subjected to any variation whatsoever on any account.
14. This being a unit rate contract, the payment shall however be released against actual quotations of work however be released against actual quantities of work executed duly certified by the JVM.
15. Unless other wise specified, measurement of work shall be carried out at site jointly by JVM & Contractor.
16. **Liquidated damages for non-fulfillment of completion schedule.** If the completion of work is delayed beyond the scheduled date for any reason other than due to force major condition or for those attributable to the contractor, then the contractor shall pay 0.5% per week of delay on total value of work order up to a maximum of 5% of the final contract price.
17. The contractor shall not sublet/sub contract the whole or any part of work failing which the contract may be terminated.
18. No completion certificate shall be issued or shall be work be considered to be complete until the contractor removes from the site all scaffolding, surplus materials, rubbish etc.





19. **Maintenance Guarantee Period (defect liability period):** The contractor guarantees that for a period of 12 (twelve) months commencing from the date of completion of contract. He shall undertake reconstruction rectification, replacement of all regular schedule work and any other work to make good the faulty work as stated under completion certificate for period of 06 (six) months from the date of issue of commissioning certificate.
20. The contractor shall have a valid labour license and shall also maintain al records/ register/return/cards under state contract labour (R&A) rules act such as :-
  - i) Register of workmen employed by contractor : Form - 9
  - ii) Employment card : Form – 10
  - iii) Muster roll : Form - 12
  - iv) Register of wages-cum-muster roll : Form - 13
  - v) Wage slip : Form – 15
  - vi) Register of over time : Form – 19
  - iii) Submission of Return in Form – 20
21. All materials supplied to the site shall be of good quality as per latest revision of CPWD specification. Any material not approved by the Engineer shall be removed from the site at his own cost by the Contractor.
22. The work carried at site as per latest edition of CPWD specification.
23. Further, JVM also reserves the right to cancel the tender without assigning any reasons for the same. In such event JVM shall return the Earnest money deposit.