

***TENDER  
FOR***

**SUPPLY INSTALLATION TESTING AND  
COMMISSIONING OF HT INSTALLATION  
TRANSFORMER, DG SET & ALLIED ELECTRICAL  
WORKS AT HLL CORPORATE OFFICE, POOJAPURA**

**PART-III  
PRICE BID**

**TENDER NO. HLL/ID / 15/15  
JULY 2015**



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## **1 COMMERCIAL CONDITIONS**

1.0.1 The tendered rate shall inter alia be deemed to include for the provision of all materials, process, operation and special requirements detailed in the particular specification irrespective of whether these are mentioned in the description of equipment schedule and Bill of quantities or not. It is an express condition of the contract that the tendered rates for various items in the Bill of Quantities shall be deemed to include for the full, entire and final condition of the contractor respective items of the works in accordance with the provision of the contract.

1.0.2 The tendered rate shall include for all taxes, duties, etc. as applicable and shall be quoted on the works contract basis for Supply Installation Testing and Commissioning of HT Installations, Transformer, DG Set & Allied Electrical Works at HLL Corporate office, Poojapura.

1.0.3 The tendered rate shall remain firm and free from variation due to rise in the cost of materials/equipment, labour or any other reasons whatsoever during the contract period and valid extension on the case may be.

1.0.4 The quantum of excise duty included in the tendered price, the rate at which they were assumed etc. shall be indicated in the tender.

### **1.1 UNIT RATES**

1.11 Only approved work will be measured on completion and priced as per rates quoted against the respective items.

### **1.2 BRIEF DESCRIPTION OF PRICING**

1.2.1. Unforeseen difficulties for which provision has not been made in the tender will in no way relieve the successful tenderer from the full execution of the work.

1.2.2 The price quoted shall be the final amount for this finished work.

### **1.3 INCOME TAX**

Any payment to the contractor as per contract, will be made after deducting income tax as per the rules and regulations.

### **1.4 SALES TAX AND EXCISE DUTY**

The tenderer shall clearly indicate sales tax, Excise and other duties as applicable in his offer for carrying out this work.

### **1.6. SUBMISSION OF BILL**

1.6.1. The contractor shall from time to time prepare and submit interim bills of the work executed and on completion of the contract, he shall prepare and submit the final bill. The measurements sheets in support of the interim and final bills shall be prepared by the contractor on the basis of measurements taken by him jointly with the project engineer and the said measurement sheets shall be submitted by him with the relevant bill.

### **1.7. EXTRA ITEMS**

The contractor is bound to carry out any items of work necessary for the completion of the job even though such items may not have been included in the schedule of probable quantities or rates, such items being necessary or essential for completing the job. Variation order in respect of such additional items and their quantities will be issued in writing by the employer.

1.7.1 All shavings, cuttings and other rubbish as it accumulates from time to time during the progress of work and on completion including that of the sub-contractors and special tradesman and all materials condemned by the project engineer shall be cleared and removed from the site by the contractor without any extra charge.

1.7.2 All measuring steel taps, scaffolding, ladders instruments and tools that may be required for taking measurements shall be supplied by the contractor.

## **1.8. OVER TIME WORK**

If the contractor is required to work night or on holidays in order to maintain the time schedule he shall take prior approval from the Engineer-in-charge. He should also provide and maintain at his own cost sufficient lights as may be necessary to enable the work to proceed satisfactorily during the night.

- 1.8.1. The contractor shall give full facilities to all other contractors working on site. He shall also arrange his programme of work so as not hinder the progress of other trades. The decision of the Engineer-in-charge on any point of dispute between the various parties shall be final and binding.
- 1.8.2. It is specifically pointed out that the contractor shall not be entitled to any compensation whatsoever on account of delay in procurement or supply of controlled materials and the rates quoted in the contract are fixed till the completion of the contract.
- 1.8.3. The contractor shall co-operate with other agencies appointed by the owners for the work to proceed smoothly with the least possible delay and to the satisfaction of the owners, architects and the consultants.
- 1.8.4. The owners shall provide a source for power supply at one convenient point at site. The contractor shall at his own cost install a separate meter at the said source and lay additional cables from the said source also at his own cost. For the electricity consumed by the contractor he shall pay the owner the actual cost at the rate charged by the local authority for power for constructional purposes. The contractor shall also obtain the necessary permit for utilizing power for constructional purposes.

## **2 SPECIAL CONDITIONS**

### **2.1. EXECUTION WORK**

2.1.1. The whole of the work as described in the contract (including bills of materials, specification and all drawings pertaining thereto) and as advised by the Engineer-in-charge from time is to be carried out and completed in all parts to the entire satisfaction of the Employer. Any minor details of construction which are obviously and fairly intended, or which may not have been definitely referred to in this contract, but which are usual construction practice and essential to the work, shall be included in this contract.

### **2.2. CERTIFICATE OF COMPLETION**

2.2.1 The contractor shall intimate to the Engineer-in-charge in writing as and when the works are completed and put into beneficial use in order to enable the consultants to check certify to the owners to take over the plants.

2.2.2 The work shall not be considered as completed and put into beneficial use until the consultants have certified in writing that the same has been completed and put into beneficial use.

2.2.3 The defects liability period of one year shall commence from date of such completion or any specific date mentioned therein.

### **2.3. OTHER CONDITIONS**

2.3.1 The contractor has to do all liasoning works and obtain statutory approval from Electricity board, Electrical inspectorate and any another body if required for the successful energisation of electrical supply. However, statutory fees if any will be paid by HLL. All necessary drawings and documents required for the same has to be prepared and submitted by the contractor with the concurrence and approval of the Engineer – in –charge.

**LIST OF APPROVED MAKES FOR ELECTRICAL WORKS**

<b>LIST OF APPROVED MAKES FOR MULTI STORIED BUILDING AT THE CAMPUS OF CORPORATE HEAD OFFICE AT HLL,POOJAPURA,</b>		
<b>SL NO</b>	<b>ITEM</b>	<b>MAKES</b>
<b>A. ELECTRICAL</b>		
1	HT CABLE	Universal, Gloster, Torrent, RPG
2	HT / LT CABLE TERMINATION / JOINT	Raychem, M-seal, Birla-3M
3	11 KV VCB PANEL	Schneider, Resitech, Intrans, Megawin
4	TRANSFORMER	Megawin, Intrans, Unipower
5	DIESEL ENGINE	Cummins, Kirloskar, Catterpillar
6	ALTERNATOR	Stamford, Kirloskar, BHEL
7	AIR CIRCUIT BREAKER	Legrand, Siemens, Schneider, ABB, GE
8	MOULDED CASE CIRCUIT BREAKER	Legrand, Siemens, Schneider, ABB, GE
9	CONTACTORS, SWITCH DISCONNECTOR UNIT, CHANGE OVER SWITCH	Siemens, L&T, Schneider, ABB, GE
10	INDICATION LAMP, SELECTOR SWITCH, PUSH BUTTON	Kaycee, Technic, Vaishno, L&T
11	VOLTMETER, AMMETER, MULTI-FUNCTION METER	AE, Schneider, L&T, Secure
12	RELAYS	Schneider, L&T, Siemens, ABB
13	CURRENT / POTENTIAL TRNSFORMER	Kappa, AE, Intrans, Resitech
14	XLPE/PVC LT CABLES	Universal, Gloster, Torrent, RPG
15	CABLE GLANDS & LUGS	Comet, Dowells, Hex
16	PVC CONDUITS AND ACCESSORIES	Avon Plast, Balco, Precision.
17	PVC WIRES - (COPPER)	Finolex, Panasonic, Lapp Kable.
18	MODULAR SWITCHES & SOCKETS	Legrand (Arteor), MK (Blenze), Anchor (Woods).
19	INDUSTRIAL PLUG & SOCKET	Legrand, Indoasian, Havells
20	MCB DISTRIBUTION BOARDS	Legrand, Havells, Indoasian (Gold plus)
21	MCB's, RCCB, ISOLATORS	Legrand, Indoasian, Havells

**The bidder should specify 100% service tax in their quoted price irrespective of whether any portion of the Service tax is directly payable by the contractor or to be remitted by the client. This total price will be taken for comparison and deciding the lowest bidder. However, due to the constitution of the bidder being proprietary or otherwise, if any portion of the service tax is to be borne by the HLL statutorily, the same shall be borne by the HLL. This shall be clearly indicated as given in the abstract as shown below.**

**BILL OF QUANTITIES**  
**ABSTRACT**

<b>SL. NO</b>	<b>ITEM</b>	<b>AMOUNT (Rs.)</b>
<b>1</b>	<b>Supply Installation Testing and Commissioning of HT Installations, Transformer, DG Set &amp; Allied Electrical Works at HLL Corporate office, Poojapura including all taxes &amp; duties except service tax.</b>	
<b>2</b>	<b>Service tax component to be paid by the bidder.</b>	
<b>3</b>	<b>Service tax component to be directly paid by the HLL in case the bidder is a Proprietary firm</b>	
	<b>Total Amount</b>	

	<b>S.NO.</b>	<b>DESCRIPTION</b>	<b>QTY</b>	<b>UNIT</b>	<b>Rate in words and figures</b>	<b>Amount in words and figures</b>
	<b>A</b>	<b>INDOOR HT PANEL</b>				
		Supply, installation, testing and commissioning of Indoor HT 3 panel unit, floor mounted, fabricated with 2mm thick CRCA sheet suitably reinforced, powder coated, with segregated HT & LT compartment consisting of :				
		<b>Incomer</b>				
		One no. 11 kV, 630A, TP, 350 MVA, VCB, with suitably interlocked earth switch, having horizontal draw out and isolation. The VCB shall be fitted with motorized spring mechanism for closing , ON, OFF LED /mechanical indication lamp, emergency trip, Microprocessor based Protection relays (3 OC & 1 SC), high speed tripping relay, trip circuit supervision relay, safety shutter etc. The breaker shall be complete with closing coil, tripping coil and shunt trip. Providing necessary power pack (in-built) also forms part of the scope. The panel shall be provided with the required no. of auxiliary contacts with 4NO+4NC spare contacts.				
		1set TOD meter with all necessary accessories as per the requirment of Electricity supply authority.				
		<b>Outgoing</b>				

		Two nos. 11 kV, 630A, TP, 350 MVA, Load Break Switch with earth switch. The panel shall be provided with ON, OFF LED / mechanical- indication lamp, emergency trip, safety shutter etc. The breaker shall be complete with shunt trip. The panel shall be provided with the required no. of auxiliary contacts with spare contacts.				
		Components in incomer and outgoing panels shall also include, but not limited to the following items.				
		1 no. Trip neutral close (T-N-C) switch for incomer.				
		2 set suitable rated HT HRC Fuse for outgoing				
		3 no. Analogue volt meter scaled 0-15KV with selector switch				
		2 no. Analogue ammeter scaled 0-50 A with selector switch for outgoing.				
		3 set On,Off, Trip indication lamp				
		1 set Trip healthy, spring charge indication lamp for incomer				
		1 set panel earth bus.				
		1 set Draw out type 3 limb, 11 kV/110/110V, 100VA, class 0.5, epoxy cast resin potential transformer with necessary HT & LT fuses for incomer & KSEB metering.				
		2 set Draw out type 3 limb, 11 kV/110V, 100VA, class 1, epoxy cast resin potential transformer with necessary HT & LT fuses.				
		1 set Epoxy resin cast CT with suitable ratio as per demand load, with 15VA, class 0.5 for KSEB metering & 15VA class 5P10 for protection				

		2 set Epoxy resin cast CT with suitable ratio as per demand load, with 15VA, class 1 for metering.				
		3 set Panel heater with a control switch and illumination lamp with door switch.				
		3 set Test terminal block.				
		1 set 800A, 18.34kA, TP copper bus having a current density of 1.2A per sqmm duly sleeved with all accessories and insulators complete as required.				
		1 set 8 window solid state alarm annunciator with test, acknowledge, rest push button with hooter.				
		Required Danger boards, signages, lettering etc.				
		The panel shall be subjected to all routine tests as per IS/IEC standards. Type test certificate of identical panel shall be submitted.				
		In addition to the above, 11kV HT panel shall be with all requirements as per the guidelines by Local E.B authorities and Electrical inspectorate.	<b>1</b>	<b>set</b>		
		<b>Total For HT Panel</b>				
<b>B</b>		<b>Transformer</b>				

	Supply, installation, testing and commissioning of Indoor Unitised substation comprising of 400 KVA, 11000 / 433 V, 3 phase AN cooled, vector group Dyn11, Dry type, class F insulated Cast Resin , copper wound transformer with off load tap changer having tapping range of $\pm 5\%$ in steps of 2.5%, provided with LV cable box suitable for terminating 3 runs of 3.5 x 300 Sq mm XLPE cable. The HV terminals of the Transformer connected to 11kV, 630A, 350 MVA Load Break Switch switch with HT fuse, resin cast CT/PT units, ammeter, voltmeter, epoxy encapsuled copper bus bar. 1 set of OC & EF relay for the protection of the transformer shall be provided. Earth switch shall be provided with front operated spring charged mechanism.				
	The HV cable box shall be suitable for terminating 11kV, 3 core 150 sq mm XLPE cable , along with all standard accessories as per IS 11171 and in conformity with all required standards . Neutral CT of <b>125/5A</b> , 5P10, 15VA shall be provided on the transformer neutral terminal. The The housing of the USS shall be made up of 2 mm thick CRCA sheet. Door interlock to prevent access to live terminal of HT breaker shall be provided. The enclosure shall be compartmentalised. The enclosure shall also house 1 no. emergency trip push button.	1	Nos		
	<b>Total for transformer</b>				
	<b>DIESEL GENERATOR</b>				

C-1	C-2	<p>Supply, Installation, Testing and Commissioning of 500 <b>KVA</b>, silent type, water cooled, radiator type, four stroke, electric start <b>D.G Set</b> with acoustic enclosure and standard control panel. The engine shall be capable of taking 10% overload for one hour after 12 hours of continuous operation. The DG shall be suitable for AMF operation. The alternator shall be brushless, self excited, self regulated, brushless, SPDP enclosure, class F/H insulation, suitable for continuous operation at 1500 rpm, generating 415 V +/- 5% at 0.8 p.f, 50Hz, 0.85 load factor, 3 phase, 4 wire system generally conforming to BS: 2613 &amp; IS: 4722. <b>(The control panel shall not be provided as the AMF Panel is nearby)</b></p>	1	Set		
		<p>Both Engine and Alternator shall be mounted on common channel iron base frame, and with standard accessories such as antivibration pad, lead acid batteries (as specified by engine manufacturer) and engine driven battery charger along with leads, battery stand, fuel piping from fuel tank to Engine, electronic governor, Residential silencer, suitable size cable termination box etc as required. Rate shall be inclusive of all lift, lead charges. The work should be as per Electrical Inspectorate / Pollution control board norms.</p>				

C-2		Supply & installation of exhaust gas piping of suitable diameter as per manufactures standard welded black MS, B class pipe confirming to IS:3589 cut to required lengths and installed with necessary bends, supports and clamps, anti- vibration mountings, insulation of exhaust system with mineral wool / Rockwool, 50mm thick wire mesh & aluminum cladding etc.	42	Mtr		
		<b>Total For DG set</b>				
<b>D</b>		<b>AMF PANEL</b>				
		Supply, Installation, Testing & Commissioning of AMF panel, cubicle type, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system with bus bars , including internal wiring with suitable size wires, rotary handle, spreaders, 3mm thick gland plate, hinged type door with neoprene gasket etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>INCOMER</b>				
		1 No. 630A, FP, 35kA, Electrically operated, motorised, microprocessor based MCCB with 3 OC, SC, EF release with shunt trip coil, neutral protection. For KSEB Transformer side				

		1No. 800A, FP, 35kA, Electrically operated, EDO, motorised, microprocessor based ACB with 3 OC, SC, EF release with shunt trip coil, neutral protection.For DG side				
		<b>BUSBARS</b>				
		1 Set of 800 Amp TPN busbars of high conductivity electrolytic quality Aluminium alloy.				
		1 Set of 25 x 3 mm copper busbars of high conductivity electrolytic quality shall be provided throught out the panel for its earthing.				
		<b>INSTRUMENTS</b>				
		2 No 3 phase Digital Multi function meter to read V, A, F Acc class 1.				
		2 Set of phase indicating lamps, LED type, RYB.				
		2 Set of ON, OFF, Trip indicating lamps, LED type.				
		2 Set of 2A 10kA C curve SP control MCB				
		1 Set of 600/5A, Class 1.0, 15VA, Cast Resin CT for metering.				
		1 Set of 800/5A, Class 1.0, 15VA, Cast Resin CT for metering.				
		1 Set microprocessor based AMF logic relay, with all protection features for the starting of the DG set automatically				
		1 set electrical interlock between the 2 incomers.				
		1 set auto/manual selector switch				
		The panel shall be with all required accessories & control wiring for AMF operation.				
		<b>OUTGOING</b>				

		a) 1 No, 400A 35kA 4P MCCB with 300A 4P AC3 contactor Provision in bus bar for connecting suitable sq mm Aluminium armoured cable				
		b 1 No. 630A, FP, 35kA,Fixed type with extended handle MCCB with Thermal Magnetic release, having adjustable OL & SC protection.Provision in bus bar for connecting suitable sq mm Aluminium armoured cable	1	Set		
		<b>Total AMF Panel</b>				
<b>E</b>		<b>AUTO TRANSFER SWITCH</b>				
		Supply, installation,testing & commissioning of 4 pole, 400A , 415 V, 3Phase 50Hz,35kA rated Auto transfer switch - shall also include, but not limited to the following specifications				
		The automatic transfer switches and accessories shall conform to the requirements of,IEEE Standard 446 - IEEE ,recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications				
		The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. The switch shall be positively locked and unaffected by momentary outages for maximum reliability and operating life,all main contacts shall be silver composition, blow-on construction for high withstand current capability and be protected by separate arcing contacts.				

		<p>A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.</p> <p>Neutral conductors shall be provided with fully-rated overlapping neutral transfer contacts. The neutrals of the normal and emergency power sources shall be connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which the transfer is being made. The panel's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, and inherent serial communications capability. A full duplex RS485 interface shall be installed in the ATS control panel to enable serial communications with remotely located annunciators and/or network supervisors. The serial communication interface shall be equal to ASCO Accessory 72A.</p>	1	Set		
		<b>Total Auto transfer switch</b>				
<b>F</b>		<b>L.T. PANELS</b>				

F-1		Supply, Installation, Testing & Commissioning of Main panel, cubicle type, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system with busbars extendable on both sides, including internal wiring with suitable size wires, extended rotary handle, spreaders, 3mm thick gland plate, hinged type door with neoprene gasket etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>INCOMER</b>				
		1 No. 630A, FP, 35kA, fixed type, microprocessor based MCCB with 3 OC, SC, EF release with shunt trip coil.				
		<b>BUSBARS</b>				
		1 Set of 800 Amp TPN busbars of high conductivity electrolytic quality Aluminium alloy.				
		1 Set of 25 x 3 mm copper busbars of high conductivity electrolytic quality shall be provided through out the panel for its earthing.				
		<b>INSTRUMENTS</b>				
		1 No 3 phase Digital Multi function meter to read V, A, F, kW, PF, kWh, Acc class 1 and with RS 232 communication port.				
		1 Set of phase indicating lamps, LED type, RYB.				
		1 Set of ON, OFF, Trip indicating lamps, LED type.				
		1 Set of 2A 10kA C curve SP control MCB				

		1 Set of 800/5A, Class 1.0, 15VA, Cast Resin CT for metering.				
		1 Set of 600/5A, Class 1.0, 15VA, Cast Resin CT for connection to APFC panel.				
		3 nos of Analogue Ammeter, Acc. Class 1				
		1 no. low set earth fault relay for connecting to the transformer neutral with 150/5A, class 5P10, 15VA, resin cast CT with necessary control cable.				
		<b>OUTGOING</b>				
		6 Nos. 400A, TPN, 25kA, MCCB with Thermal magnetic release, Ics=Icu, having adjustable over load & short circuit protection.				
		2 Nos. 250A, TPN, 25kA, MCCB with Thermal Magnetic release, Ics=Icu, having adjustable over load & short circuit protection.				
		8 Nos 3 phase 4 wire CT operated energy meter, 5-10A, Acc. Class 1.				
		6 Set of 400/5A, Class 1.0, 15VA, Cast Resin CT for metering.				
		2 Set of 250/5A, Class 1.0, 15VA, Cast Resin CT for metering.				
		Space provision for energy meter and CT shall be provided in the spare feeders.	1	Set		
		<b>CAPACITOR PANEL</b>				

F-2		Supply, Installation, Testing & Commissioning of 120 kVAR APFC panel, cubicle type, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b><u>Incomer</u></b>				
		1 No 250A, TPN, 35kA, MCCB with Thermal Magnetic release, having adjustable OL & SC protection.				
		<b><u>Busbar</u></b>				
		1 Set of 300 Amp TPN busbars of high conductivity electrolytic quality Aluminium alloy and suitable size earthing conductor through out the panel for its earthing.				
		Instruments				
		1 No 3 phase Digital Multi function meter to read V, A, F with Acc class 1.				
		1 Set of phase indicating lamps, LED type, RYB.				
		1 Set of 2A 10kA C curve SP control MCB				
		1 Set of 250/5A, Class 1.0, 5VA, Cast Resin CT for metering				
		1 no. 6 stage APFC relay				
		6 set On, Off push button				
		6 set On, Off LED type indication lamp				

		1 set Auto / manual selector switch.				
		Required Danger boards, signages, lettering etc.				
		Panel mounted cooling fan (2 nos) shall be provided for the capacitor cubicle with thermostat and control switch. Louvers shall be provided on the door of the capacitor cubicle for proper ventilation of capacitors.				
		Outgoing.				
		4 Nos. 63A, TPN, D curve, MCB				
		2 Nos. 40A, TPN, D curve, MCB				
		2 Nos. 10kVAR MPP heavy duty capacitor with capacitor duty contactor & 7% detuned harmonic filter.				
		3 Nos. 25kVAR MPP heavy duty capacitor with capacitor duty contactor & 7% detuned harmonic filter.				
		1 No. 25kVAR MPP heavy duty capacitor with 7% detuned harmonic filter directly connected.				
		The switching of capacitors shall take place at zero crossing level to reduce harmonics and improve capacitor life.	1	Set		
		<b>SUB - DISTRIBUTION PANELS</b>				

F-3		Supply, Installation, Testing & Commissioning of AC panel, cubicle type, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system including internal wiring with suitable size wires, extended rotary handle, spreaders, 3mm thick gland plate, hinged type door with neoprene gasket etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>INCOMER</b>				
		1 No 400A, TPN, SFU , having AC23A rating, front operated mechanism, positive isolation fuses, high clearance & creepage distance with phase barriers. Must be suitable for vertical & horizontal orientation and for aluminium termination. Provision for add on auxiliary contacts				
		<b>BUSBARS</b>				
		1 Set of 400 Amp TPN busbars of high conductivity electrolytic quality Aluminium alloy.				
		1 Set of 25 x 3 mm copper busbars of high conductivity electrolytic quality shall be provided through out the panel for its earthing.				
		<b>INSTRUMENTS</b>				
		1 No 3 phase Digital Multi function meter to read V, A, F, Acc class 1.				
		1 Set of phase indicating lamps, LED type, RYB.				

		1 Set of 2A 10kA C curve SP control MCB				
		1 Set of 400/5A, Class 1.0, 10VA, Cast Resin CT				
		<b>OUTGOING</b>				
		2 Nos. 125A, TPN, 16kA, MCCB with Thermal magnetic release, Ics=Icu, having adjustable over load & short circuit protection.				
		3 Nos. 100A, TPN, 16kA, MCCB with Thermal magnetic release, Ics=Icu, having adjustable over load & short circuit protection.	2	Set		
<b>F-4</b>		Supply, Installation, Testing & Commissioning of Utility panel, cubicle type, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system ,including internal wiring with suitable size wires, extended rotary handle, spreaders, 3mm thick gland plate, hinged type door with neoprene gasket etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>INCOMER</b>				
		1 No 400A, TPN, SFU , having AC23A rating,front operated mechanism,positive isolation fuses,high clearance & creepage distance with phase barriers. Must be suitable for vertical & horizontal orientation and for aluminium termination.Provision for add on auxiliary contacts				
		<b>BUSBARS</b>				

		1 Set of 400 Amp TPN busbars of high conductivity electrolytic quality Aluminium alloy.				
		1 Set of 25 x 3 mm copper busbars of high conductivity electrolytic quality shall be provided through out the panel for its earthing.				
		<b>INSTRUMENTS</b>				
		1 No 3 phase Digital Multi function meter to read V, A, F, Acc class 1.				
		1 Set of phase indicating lamps, LED type, RYB.				
		1 Set of 2A 10kA C curve SP control MCB				
		1 Set of 400/5A, Class 1.0, 10VA, Cast Resin CT				
		<b>OUTGOING</b>				
		3 Nos. 125A, TPN, 16kA, MCCB with Thermal magnetic release, Ics=Icu, having adjustable over load & short circuit protection.				
		3 Nos. 100A, TPN, 16kA, MCCB with Thermal magnetic release, Ics=Icu, having adjustable over load & short circuit protection.	1	Set		
		<b>Total LT Panels</b>				
<b>G</b>		<b>HT &amp; LT CABLE</b>				
G-1		Supply of 3C x 150 sqmm 11kV (E) grade XLPE insulated PVC sheathed compact circular armoured aluminium conductor HT power cable, insulation screened with extruded semi conducting compound in combination with copper tape suitable for 11kV earthed system conforming to relevant standard.	100	Mtr		

G-2		Supply of the following size 1.1kV grade XLPE insulated PVC sheathed, armoured Aluminium conductor power cable confirming to IS 7098 (part 1) ammended upto date.				
	1	3.5 C x 400 sq.mm	150	Mtr		
	2	3.5 C x 300 sq.mm	60	Mtr		
	3	3.5 C x 240 sq.mm	100	Mtr		
	4	3.5 C x 95 sq.mm	100	Mtr		
	5	3.5 C x 70 sq.mm	60	Mtr		
	6	3.5 C x 35 sq.mm	150	Mtr		
	7	3.5 C x 25 sq.mm	150	Mtr		
	8	4 x 16 sqmm	180	Mtr		
	9	4 x 10 Sq.mm	250	Mtr		
	10	4 x 6 sqmm	250	Mtr		
G-3		Supply of the following size 1.1kV grade XLPE insulated PVC sheathed, armoured Copper conductor power cable confirming to IS 1554 ammended upto date.				
	1	3 C x 4 Sqmm Cu cable	150	Mtr		
	2	3 C x 2.5 Sqmm Cu cable	120	Mtr		
	3	12 C x 1.5 Sqmm Cu cable	60	Mtr		
		<b>Total HT Cables</b>				
<b>H</b>		<b>HT Cable Laying &amp; Termination</b>				

H-1		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
	1	Above 120 sq. mm upto 400 sq mm	100	Mtr		
H-2		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/ HUME/ METAL pipe / Cable tray as required.				
	1	Above 120 sq. mm upto 400 sq mm	30	Mtr		
H-3		Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required :				
	1	150 sq. mm	4	Nos		
	2	185 sq. mm	1	Nos		
H-4		Disconnection of indoor cable end termination with heat shrinkable jointing kit with all accessories including lugs suitable for 185 sq mm size of 3 core, XLPE aluminium conductor cable of 11 KV grade	1	Nos		
H-5		Excavation and removing of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of 185 Sq mm size laid direct in ground as required & as per site condition	35	Metre		
		<b>Total for HT Cable Laying &amp; Termination</b>				
<b>I</b>		<b>LT cable Laying &amp; Termination</b>				

<b>I-1</b>		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
	1	Upto 35 sq. mm	150	Metre		
	2	Above 35 sq. mm and upto 95 sq. mm	20	Metre		
	3	Above 185 sq. mm and upto 400 sq. mm	150	Metre		
<b>I-2</b>		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
	1	Upto 35 sq. mm	60	Metre		
	2	Above 35 sq. mm and upto 95 sq. mm	20	Metre		
	3	Above 185 sq. mm and upto 400 sq. mm	50	Metre		
<b>I-3</b>		Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
	1	Upto 35 sq. mm (clamped with 1mm thick saddle)	250	Metre		
	2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	30	Metre		
	3	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	80	Metre		
<b>I-4</b>		Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.				
	1	Upto 35 sq. mm (clamped with 1mm thick saddle)	850	Metre		

	2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	90	Metre		
	3	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	90	Metre		
<b>I-5</b>		Supplying and making end termination with brass compression gland and aluminium / copper lugs including gland earthing for following size of PVC insulated and PVC sheathed / XLPE aluminium / copper conductor cable of 1.1 KV grade as required.				
	1	3.5 C x 400 sq.mm	14	Each		
	2	3.5 C x 300 sq.mm	4	Each		
	3	3.5 C x 240 sq.mm	10	Each		
	4	3.5 C x 95 sq.mm	8	Each		
	5	3.5 C x 70 sq.mm	6	Each		
	6	3.5 C x 35 sq.mm	12	Each		
	7	3.5 C x 25 sq.mm	10	Each		
	8	4 x 16 sqmm	14	Each		
	9	4 x 10 Sq.mm	20	Each		
	10	4 x 6 sqmm	20	Each		
	11	3 C x 4 Sqmm Cu cable	8	Each		
	12	3 C x 2.5 Sqmm Cu cable	6	Each		
	13	12 C x 1.5 Sqmm Cu cable	4	Each		
<b>I-6</b>		Supplying and making cable route marker with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size ) of size 60 cm X 60 cm at the bottom and 50 cm X 50 cm at the top with a thickness of 10cm including inscription duly engraved as required.	15	Each		

		<b>Total for LT Cable laying &amp; Termination</b>				
		<b>Cable trays</b>				
<b>J</b>		Supplying and installing following size of perforated GI cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders, fixed to wall, including bolts & nuts, horizontal & vertical bends, reducers, tees, cross members & all other accessories as required.				
	1	450 mm width x 62.5 mm depth x 2.0 mm thickness	60	Metre		
	2	300 mm width x 62.5 mm depth x 2.0 mm thickness	300	Metre		
	3	150 mm width x 50 mm depth x 1.6mm thickness	100	Metre		
		<b>Total for cable trays</b>				
<b>K</b>		Providing, laying and fixing following dia G.I. pipe (medium class) in ground complete with G.I. fittings including trenching (75 cm deep)and re-filling etc as required				
	1	50 mm dia	100	Metre		
	2	100 mm dia	100	Metre		
		<b>Total for GI Pipe</b>				
<b>L</b>		Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc as required.				
	1	150 mm dia	100	Metre		

	2	300 mm dia	100	Metre		
		<b>Total For RCC Pipe</b>				
<b>M</b>		<b>EARTHING &amp; LIGHTNING PROTECTION</b>				
	1	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, copper tube, having single prong at top, with 85 mm dia 3 mm thick copper base plate including holes etc. complete as required.	2	Each		
	3	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.(For horizontal run)	120	Metre		
	4	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.(For vertical run)	80	Metre		
	5	Jointing copper / G.I. tape (with another copper/ G I tape, base of the finial or any other metallic object) by riveting / nut bolting/ sweating and soldering etc as required.	20	Each		
	6	Providing and fixing copper tape 20 mm X 3 mm thick on recess or surface of wall for earthing complete as required.	100	Metre		
	7	Earthing with CI earth plate 1200 mm x 1200 mm x 12 mm thick including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal or coke and salt complete as required.	6	Set		

8	Earthing with GI earth pipe 4.5 m long, 40mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal or coke and salt complete as required.	12	Set		
9	Earthing with copper earth plate 600 mm x 600 mm x 3 mm thick including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc with charcoal or coke and salt complete as required.	4	Set		
10	Earthing with GI earth plate 600 mm x 600 mm x 6 mm thick including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal or coke and salt complete as required.	10	Set		
11	Supplying and laying 25 mm X 3 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	120	Metre		
12	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	30	Metre		

	13	Supplying and laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	250	Metre		
	14	Providing and fixing 25 mm x 5 mm Copper strip on surface or in recess for earth connections etc. as required.	100	Metre		
	15	Providing and fixing 25 mm x 5 mm GI strip on surface or in recess for earth connections etc. as required.	600	Metre		
	16	Supply and providing 8 SWG dia copper wire on surface or in recess for earth connection	200	Metre		
	17	Providing and fixing 8 SWG dia G.I. wire on surface or in recess for loop earthing as required.	250	Metre		
		<b>Total for Earthing &amp; Lighting Protection</b>				
<b>N</b>		<b>SAFETY</b>				
	1	Supply and fixing anodised aluminum glass framed shock treatment/ restoration charts written in Hindi and English duly framed and covered with 2.8mm glass as required.	3	Each		
	2	Supply & laying ISI marked following electrical grade chequered type rubber mat.				
	a	2m x 1m x 6 mm for 415V grade	20	Nos		
	b	2m x 1m x 12 mm for 11kV grade	6	Nos		
	3	Supply and providing First Aid Chart duly framed and placed in a conspicuous location for clear vision.	2	Each		

	4	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	10	Each		
	5	Providing and fixing H.T. danger notice plate of 250 mm X 200 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	4	Each		
	6	Supply and providing Electrical main single line Diagram duly framed and placed in a conspicuous location for clear vision.	1	Each		
	7	Supply and providing 15" long rubber hand gloves 15kV.	2	Pair		
		<b>Total For Safety</b>				
<b>N</b>		<b>MISCELLANEOUS</b>				
	1	Dismantling and re-installation in new location, the existing 125kVA DG set including its canopy and all accessories like control panel, exhaust pipe, fuel tank and its piping, power and control cables including termination, earth strip, earth pit etc. The testing and commissioning of the DG set has to be done and made operational to the existing system complete as required.	1	Set		

2	Supply & installation of exhaust gas piping of suitable diameter as per manufactures standard welded black MS, B class pipe confirming to IS:3589 cut to required lengths and installed with necessary bends, supports and clamps, anti- vibration mountings, insulation of exhaust system with mineral wool / Rockwool, 50mm thick wire mesh & aluminum cladding etc.	50	Metre		
3	Cladding of existing exhaust pipe with mineral wool / Rockwool, 50mm thick wire mesh & aluminum cladding etc.	50	Metre		
4	Dismantling the existing underground / surface mounted cables of following sizes and storing in the place as per the direction of Engineer-in-charge. The cables has to be dismantled without any damage complete as required.				
a	Upto 35sqmm	60	Metre		
b	Above 35sqmm to 95sqmm	90	Metre		
c	Above 95sqmm to 185sqmm	200	Metre		
5	Dismantling and re-installation in new location, the existing capacitor panel and replace 2 nos faulty 10kVAR capacitors with one new 20kVAR & add one new 10kVAR including contactor, testing and commssioning,and to be made operational to the existing system complete as required as per site condition.	1	Set		
6	Dismantling the existing isolator/SFU panel for 200kVA DG set including disconnection of cable termination and stacking the removed cables at convinient location at site as instructed by engineer incharge.	1	Set		

	7	Supply and providing 7 mm thick MS chequered plate, providing with MS frame -suitable size angle iron for fixing, providing lifting hooks, including painting with two coats of enamel paint and covering the trench etc complete as required for covering cable trench/cut-riser floors.	1222	Kg			
	8	Preparation, submission of complete set of drawings including final LT distribution , and applications for the installation and service connection to Electrical inspectorate, KSEB and obtaining Power allocation, sanction and energising of the installation, road cutting permission, including obtaining sanction from the authorities complete Including providing necessary assistance to the client for obtaining sanctions.(All the paid statutory fees will be reimbursed by the client on production of original receipt).	1	Job			
		<b>Total For Miscellaneous</b>					
		<b>GRAND TOTAL HT, TRANSFORMER, DG &amp; ALLIED ELECTRICAL WORKS</b>					