

**HIGH SIDE ELECTRICAL & ALLIED WORKS FOR TERNA SAHYADRI HOSPITAL****AT NERUL, NAVI MUMBAI****BILL OF QUANTITIES (BOQ) -ELECTRICAL****ANNEXURE-1**

<b>Sr.No</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QTY</b>	<b>RATE</b>	<b>AMOUNT</b>
				<b>INR</b>	<b>INR</b>
<b>PART I:HT SUBSTATION RELATED WORKS</b>					
1.0	<b>Supply ,Installation,Testing and Commissioning</b> of the following equipments as per the technical specifications and various codes to meet local as well as national standards:				
1.1	Providing and laying the following sizes of HT Cables to be laid in the manner specified all complete.				
1.1.1	Providing and laying 11 KV, 3 core x 300 sq.mm Aluminium contactor armoured XLPE(E), HT Cable laid in prepared trenches over cable trays and fixed using brackets, clamops, wire grips all complete. As per tender specification	Mtr	60		
1.1.2	Providing and fixing of 11KV H.T cable indoor type end termination with Heat Shrinkable Raychem cable joint kits suitable for 3 core x 300 sq.mm. XLPE(E), 11 KV Cable end air terminations, indoor on HT Switchgear, including terminal all complete. - 1 each on CT/PT Unit, Breaker, Incomer and Outgoing, transformer outgoing all complete.	No.	2		
1.2	Providing and laying the following sizes of LT Control Cables in the manner specified complete. And as per technical specifications .				
1.2.1	12 core x 2.5 sq.mm copper conductor, PVC armoured cable using brackets, clamps etc	Mtr	180		
1.2.2	10 core x 2.5 sq.mm copper conductor, PVC armoured cable using brackets, clamps etc	Mtr	70		
1.2.3	4 core x 2.5 sq.mm copper conductor, PVC armoured cable using brackets, clamps etc.	Mtr	100		
1.3	Providing and fixing the following cable end terminations using tinned copper lugs crimping type and compression glands all complete				
1.3.1	12 core x 2.5 sq.mm copper conductor, PVC armoured cable	No.	10		
1.3.2	10 core x 2.5 sq.mm copper conductor, PVC armoured cable using brackets, clamps etc	No.	10		
1.3.3	4 core x 2.5 sq.mm copper conductor, PVC armoured cable	No.	10		
1.4	Providing and fixing the following safety equipments, As per technical specification given in the tender document.				
1.4.1	Insulating Mats :				

	Supply, Transport, Insure, test and commissioning of the following equipments as per the technical specifications and various codes to meet local as well as Indian standards				
	Corrugated Rubber Matting spread in front and the rear of the HT switchgear and to extend at least 1.0 mtr beyond the HT switchgear and rated for 11 KV Class of Voltage with appropriate thickness as per IS-15652 standard. The rubber mat roll should be atleast 750 to 900 mm in width.	Sq.mtr	200		
1.5	Providing and fixing the following Human and equipment safety equipments in the HT switchgear Room as per relevant standards both local and Indian Standrads.				
1.5.1	<b>Supply and Installation of Safety and Display Charts Charts</b>				
a	<b>Display Charts</b> -These charts should indicate all details and emergency contacts as per statutory requirements viz. Hospital Telephone Number as well as all emergency services phone numbers.	No.	5		
b	<b>Safety Charts</b> -These charts should indicate basic treatment to human life in the event of an electric Shock. The procedure should clearly marked in local as well as two other languages one being English. It should confirm to IS -2551 of 1973.	No.	5		
	<b>11KV tested insulated handgloves</b>				
1.5.2	The Hand gloves should be rated for 11 KV Class and certified by relevant local as well as British codes.	Set	3		
	<b>Electric Enameld caution Board for 11 KV Class and 440 Volts class</b>				
1.5.3	These 11 KV and 440V Caution boards should be prominently displayed in the HT room/Electrical room/DG Room/HVAC Panel room/Meter room per floor and should be made of metallic or any other approved material under the code and should have a bright RED background with the Letters of the Voltage and caution embossed in raised printing	No.	25		
	<b>5 Kgs. Dry Co2 foam type fire extinguishers</b>				
1.5.4	The fire extinguisher should contain approved dry Chemical Powder meant for extinguishing Electric Fires. The Extinguisher should be equipped with a flexible metallic tube with a Funnel for directing the dry chemical Powder. The dry chemical powder should be as per the approved list of materail as per local codes and Indian Standards.	No.	10		
	<b>First-Aid Kit</b>				

1.5.5	The First Aid Kit box should be of the required colour and marked with a surgical plus sign. It should contain all such medicines and ointments and medical liquids to treat Human beings of burns, cuts, bleeding wounds, to give immediate releif. The medicines should be Doctor prescribed. The medical box should also contain gauges, cotton, tincture iodine, Ointments for burns and cuts, anti septic creams and or liquids and all such medicines required under various local and Indian standrads.	No.	2		
1.5.6	<b>MS Stand with 5 Nos. Sand buckets</b>	No.	3		
1.60	Making trenches in soft/hard soil of suitable width for laying HT cable and group of LT cables.The rate shall include excavation upto depth of 1000mm, preparation of sand bed,placing of bricks,backfilling,cable marking and providing tags etc. complete as per specifications and directions of the Engineer/Consultant in charge.The work should be carried out in co ordination with the Electrical contractor and Consultant.	Mtr	50		
1.70	Providing and laying under the ground by excavation of soil,in semi hard soil at a depth of 1 mtr and finishing the surface as per the original surface all complete.RCC pipes of NP2 class and having 300 mm dia in standard lengths along with ring couplers cemented for laying HT and LT cables.The work should be carried out in co ordination with the Electrical contractor and Consultant.	Mtr	50		
<b>TOTAL FOR PART I</b>					
<b>PART II:MAIN LOW TENSION PANEL &amp; POWER DISTRIBUTION BOARDS</b>					
2.0	<b>General Specification for Power Panels</b>				
	<b>Contractor should submit the fabrication drawing, single line diagram and control logic system to TPCT for approval before fabrication of all panels.</b>				
	<b>NOTE: THE PANELS SHALL BE DRAWOUT TYPE WERE EVER SPECIFIED IN THE LINE ITEM.</b>				

	<p>Design as per technical specifications and obtain approval of drawings, prior to manufacturing, manufacture, insure, pack with PVC sheets, transport to site, store, erect in proper position, testing and commissioning of Indoor Duty and having Minimum IP 54 Rating LT panel cubicle and extendible type front and back operated having Top/Bottom Bus-Bars and Top/bottom Cable/Bus Duct entry, &amp; fabricated using 14 gauge, CRCA sheet steel for main frame, door and partitions, dust and vermin proof lockable doors and carrying the control wiring using approved make FRLS colour coded Wires of minimum 2.5 sq.mm and using approved make push on terminals. <b>The panel shall be wall mounting/floor mounting type, all complete with interconnections by using electrolytic grade tinned copper Bus Bars of 99.95% purity and Aluminium busbars wherever specified as per the detailed SLD and specification. The bus bars should be colour coded heat shrinkable PVC sleeves. The neutral bus should be rated for full load.</b></p>				
	<p>The Panel shall be painted with Powder Coated granular finished painting with 7 tank painting process with shade No. RAL 7032 from inside and outside all complete as per drawings, technical specifications and final approval of Consultant/Client.</p>				
	<p><b>AIR CIRCUIT BREAKER.</b> TP&amp;N , Electrical Draw out type ,Micro processor based Air circuit braker with over-current, short circuit and earth fault releases and the RS 486 Communication Port and the Necessary Control Module with by default display of fault history. The Breaker shall be suitable for 65kA 415 Volts 50 Hz., AC supply</p>				
	<p><b>MCCB.</b> 125 A and above MCCB shall have Micro processor release with overload,short circuit,Earth fault and Neutral protection with fault rating of 50KA.Below 125 A MCCB shall have Thermo magnetic release with overcurrent and short circuit protection with fault rating of 30 KA.Three/Four Pole Moulded Case Circuit Breaker with built in over current and short circuit The MCCB shall be suitable for 415 Volts 50 Hz., AC supply and inbuilt metering upto 250Amps. The fault level of MCCB should be 50 KA for 1 Sec and the metering and the indication as shown in Single Line Diagram. All MCCB's should be 4 pole.</p>				

	<b>BUS BAR</b> Uniformly rated, continuous duty, 415 V AC, 3 Phase and 100% fully rated Neutral electrolytic grade 99.95% Purity tinned Copper/Aluminium Bus-bars with colour coded heat sink sleeves supported on SMC type grip supports. The Horizontal / Vertical sections of the busbars should all be uniformly rated for specified current rating. The neutral busbars should be full rated.				
	All panels shall be Cubicle type with front operated and cable end boxes at the rear complete factory wired and tested in Cubicle type design with powder coated and paint process as per technical specifications and the panel board fabricated as per technical specifications all complete and as per final direction and final approval of the Consultant/ Owners.				
<b>2.1</b>	<b>MAIN LT PANEL-DRAWOUT TYPE as per SLD</b> Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
<b>2.2</b>	<b>APFC PANEL (250 KVAR) as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.3</b>	<b>LIFT PANEL as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.4</b>	<b>D.G DISTRIBUTION PANEL-DRAWOUT TYPE as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.5</b>	<b>LIGHTING PANEL-01 -GROUND FLOOR-A WING-DRAWOUT TYPE as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.6</b>	<b>LIGHTING PANEL-02 -GROUND FLOOR-B WING-DRAWOUT TYPE as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.7</b>	<b>POWER PANEL-01-GROUND FLOOR-A WING-DRAWOUT TYPE as per sld Drg No:-Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.8</b>	<b>POWER PANEL-02-GROUND FLOOR-B WING-DRAWOUT TYPE as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.9</b>	<b>POWER PANEL-01-FIRST FLOOR -A WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		
<b>2.10</b>	<b>POWER PANEL-02-SECOND FLOOR -A WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1</b>	Job	1		

2.11	POWER PANEL-03-THIRD FLOOR -A WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.12	POWER PANEL-01-FIRST FLOOR -B WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.13	POWER PANEL-02-SECOND FLOOR -B WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.14	POWER PANEL-03-THIRD FLOOR -B WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.15	LIGHTING PANEL-01-FIRST FLOOR -A WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.16	LIGHTING PANEL-02-SECOND FLOOR -A WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.17	LIGHTING PANEL-03-SECOND FLOOR -A WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.18	LIGHTING PANEL-01-FIRST FLOOR -B WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.19	LIGHTING PANEL-02-SECOND FLOOR -B WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.20	LIGHTING PANEL-03-SECOND FLOOR -B WING as per sld Drg No:-TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.21	FIRE PUMP PANEL as per sld Drg No:-TPCT/2015- 16/ELEC/SLD/R1	Job	1		
2.22	APFC PANEL(550 KVAR) as per sld Drg No:- TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.23	HVAC PANEL-DRAWOUT TYPE as per sld Drg No:- TPCT/2015-16/ELEC/SLD/R1	Job	1		
2.24	1250Amps,4pole MANUAL CHANGEVER ISOLATOR PANEL @36KA as per SLD. Drg No:-TPCT/2015- 16/ELEC/SLD/R1	Job	1		
2.25	PLUMBING PANEL as per SLD. Drg No:-TPCT/2015- 16/ELEC/SLD/R1	Job	1		

<b>TOTAL OF PART-II</b>					
<b>PART III:CABLES &amp; CABLE TERMINATIONS, TRAYS</b>					
<b>3.0</b>					
3.1	Supply, handling, laying effecting proper connections testing and commissioning of following sizes of 1.1 KV grade XLPE insulated FRLS Aluminium /Copper conductor cables laid over MS supports cable racks or fixing on walls including clamping the cable to supports in an approved manner as required complete with Copper earthing as specified for continuous earthing along with cable . (Earthing will be measured separately and need not be quoted under this item). All complete as required and as per final instruction as given by Owners/Consultants. and as per Technical specifications.				
3.1.1	3.5 Core x 240 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	Mtr	4443		
3.1.2	3.5 Core x 185 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	Mtr	945		
3.1.3	3.5 Core x 150 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	Mtr	590		
3.1.4	3.5 Core x 120 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	Mtr	160		
3.1.5	3.5 Core x 95sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	Mtr	25		
3.1.6	3.5 Core x 70 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	Mtr	50		
3.1.7	3.5 Core x 50 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	Mtr	50		
3.1.8	3.5 Core x 35 sq.mm., XLPE Insulated Cu Conductor Armoured Cable	Mtr	1100		
3.1.9	3.5 Core x 25 sq.mm., XLPE Insulated Cu Conductor Armoured Cable	Mtr	30		
3.1.10	4 Core x 10 sq.mm., XLPE Insulated copper Conductor Armoured Cable	Mtr.	1865		
3.1.11	4 Core x 6 sq.mm., XLPE Insulated copper Conductor Armoured Cable	Mtr.	360		
3.1.12	4 Core x 4 sq.mm., XLPE Insulated copper Conductor Armoured Cable	Mtr.	145		
3.1.13	3 Core x 6 sq.mm., XLPE Insulated copper Conductor Armoured Cable	Mtr.	10		
3.1.14	3 Core x 4 sq.mm., XLPE Insulated copper Conductor Armoured Cable	Mtr.	10		

3.2	Supply and making <b>terminal joints</b> for the following sizes of 1.1KV grade XLPE Insulated armoured/Unarmoured Aluminium/Copper conductor cables including providing heavy duty tinned copper terminal lugs, crimping type, insulation tape, heavy duty single compression type brass glands effecting terminal connection to the equipment/Panel complete as required as per final direction and approval of the Owner/Consultant.				
3.2.1	3.5 Core x 240 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	140		
3.2.2	3.5 Core x 185 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	16		
3.2.3	3.5 Core x 150 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	30		
3.2.4	3.5 Core x 120 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	4		
3.2.5	3.5 Core x 95sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	2		
3.2.6	3.5 Core x 70 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	6		
3.2.7	3.5 Core x 50 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	6		
3.2.8	3.5 Core x 35 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	56		
3.2.9	3.5 Core x 25 sq.mm., XLPE Insulated Aluminium Conductor Armoured Cable	No.	6		
3.2.10	4 Core x 10 sq.mm., XLPE Insulated copper Conductor Armoured Cable	No.	90		
3.2.11	4 Core x 6 sq.mm., XLPE Insulated copper Conductor Armoured Cable	No.	22		
3.2.12	4 Core x 4 sq.mm., XLPE Insulated copper Conductor Armoured Cable	No.	8		
3.2.13	3 Core x 6 sq.mm., XLPE Insulated copper Conductor Armoured Cable	No.	4		
3.2.14	3 Core x 4 sq.mm., XLPE Insulated copper Conductor Armoured Cable	No.	4		
3.3	Supply,Installation,Testing and Commissioning of 600mm X 50 mm X 1.6 mm thick GI Perforated cable tray along with bends,drops,joints,angles wereever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr.	100		
3.4	Supply,Installation,Testing and Commissioning of 450mm X 50 mm X 1.6 mm thick GI Perforated cable tray along with bends,drops,joints,angles wereever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr.	100		



3.5	Supply,Installation,Testing and Commissioning of 300mm X 50 mm X 1.6 mm thick GI Perforated cable tray along with bends,drops,joints,angles wereever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr.	100		
3.6	Supply,Installation,Testing and Commissioning of 600mm X 50 mm X 1.6 mm thick GI Ladder type cable tray along with bends,drops,joints,angles wereever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr.	100		
3.7	Supply,Installation,Testing and Commissioning of 450mm X 50 mm X 1.6 mm thick GI Ladder type cable tray along with bends,drops,joints,angles wereever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr.	100		
3.8	Supply,Installation,Testing and Commissioning of 300mm X 50 mm X 1.6 mm thick GI Ladder type cable tray along with bends,drops,joints,angles wereever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr.	100		
3.9	Supply,Installation,Testing and Commissioning of 300mm X 50 mm X 1.6 mm thick GI perforated type cable tray along with GI cover and bends,drops,joints,angles were ever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr	100		
3.9	Supply,Installation,Testing and Commissioning of 150mm X 50 mm X 1.6 mm thick GI perforated type cable tray along with GI cover and bends,drops,joints,angles were ever required along with supports,anchor fasteners to support the tray all complete to suspend the tray properly.	Mtr	75		
<b>TOTAL OF PART - III</b>					
<b>PART IV: EARTHING AND EARTH STRIPS</b>					
4.1	Supply ,Installation,Testing and Commissioning of Chemical earthing consisting of Copper bonded earth rods made from low Carbon Steel of grade BS 970 or AISI 1018 with a high tensile strength of at least 600 N/mm <sup>2</sup> ; low carbon steel core molecularly bonded with 99.99% pure electrolytic copper, 17.2 mm dia, 3 m long 250 micron coating, as per UL specification, and Electroditte Backfill, minimum 50 kgs (25 kg to a bag) per earth pit. (ASHLOK Make or equivalent )	No.	25		

4.2	Providing and fixing in position the following sizes of earthing strips or wires including providing all fixing accessories and effecting proper connections as per the final direction and approval of Owner/Consultant.				
4.2.1	50 x 6 mm Tinned Copper FLAT	Mtr.	200		
4.2.2	50 x 3 mm Tinned Copper FLAT	Mtr.	150		
4.2.3	25 x 5 mm Tinned Copper FLAT	Mtr.	500		
4.2.4	8 SWG bare Cu earth wire.	Mtr.	1000		
4.2.5	10 SWG bare GI earth wire.	Mtr.	1000		
4.2.6	1C x 4 sqmm Cu flexible wire (green )	Mtr.	100		
4.2.7	Earth terminal for each floor comprising of an earth strip of 50 X 6 mm bare copper tape with lugged holes and all outgoing earthing connected to it.	No	10		
<b>TOTAL OF PART -IV</b>					
<b>PART V:LIGHTNING PROTECTION SYSTEM</b>					
5.0	SITC of the following Lightning protection system as per technical specifications.				
5.1	Air Terminal: Early Streamer Emmission Lightning Air Terminal - Configured as a Spheroid which is comprised of separate electrically isolated 4panels surrounding an Earthened Central Finial. The upper section of the central finial shall be rated to withstand 180KA. The Insulation material used to electrically isolate the panels shall be comprised of base polymer which provides high Ozone & UV resistance with a dielectric strength of 24-38KV/mm & ESE terminal shall withstand a minimum Switching Impulse Voltage of 500KV tested as per IEC Test Standard - IEC60-1:1989.The radius of protection should be 70 metres. Model: Prevelectron Level-1	No	1		

5.2	Supporting Mast: The mounting mast used to support the lightning air terminal shall either be a supporting mast or Free standing mast at a minimum height of 2 metres above to be area protected or as per required level of protection. The mounting pole and supports shall be securely fixed with S.S brackets and PVC coated guy wires where required to withstand maximum locally recorded wind velocity. Mounting Pole shall be non cossesive. The down conductor shall pass through the centre of the pole for the entire length of the pole. Model: Supporting G.I Guyed Mast 04Mtr with PVC coated Guying wire, SS Uclamps & SS Anchor fasners.	Set	1		
5.3	Downconductor : The downconductor shall consist of copper conductor of 70Sqmm cross section and having min 990Nos of copper strands. Copper Conductor should be insulated with min.2mm thick PVC insulation and it should be tested as per IS standard. S.S saddles should be used at every 0.5mtr run. Type: MAP 70Sq.mm Copper cable with SS saddles.	Mtr	200		
5.4	Counter : Lightning Strike recorder( 6 digits Display) of non-resettable type in an IP 67 enclosure with the minimum sensitivity of 1500 A & maximum capacity of 220 KA ( 8/20 microsec wave form) tested as per IEC 60-1:1989. Model: MAP-LSR	No	RO		
5.5	Earthing: Maintenance Free Earthing consist of 3mtr long & 5/8"dia copper bonded earth rod with Ground Resistance Lowering Compound and ground rod clamp for termination of downconductor. Type: 3Mtr M.F.E				
	250Micron Cooper Bonded Earth Rod 3Mtr long x 5/8" dia made up of high tensile low carbon steel with copper bonding of 99.9% electrolytic copper. Electrode bothe ends should be threaded and suitable for threaded Ground Rod Clamp .	Set	3		
5.6	Ground Resistance Lowering Compound (GRESLO-10kg Bag)	No	9		
<b>TOTAL OF PART V</b>					
<b>PART VI:AMF CUM SYNC PANEL</b>					

6.0	<b>SITC of the following AMF cum Sync Panel-DRAWOUT TYPE PANEL:</b>				
6.1	SITC of AMF cum synchronising panel as per functioning and requirement mentioned in the detailed specification. <b>The AMF cum Sync panel should operate in MANUAL mode, AUTO mode and TEST mode.</b>	No	1		
	Incomer 1: 630 Amps ,4P,EDO type microprocessor based ACB with overload, short circuit and earth fault protection at 50KA .				
	Incomer 2: 630 Amps, 4P, EDO type microprocessor based ACB with overload, short circuit and earth fault protection at 50KA .				
	Indications: Phase indications should be provided for both the incomers by using R,Y and B LED lamps protected by 6Amps SP MCB.				
	ON /OFF/ TRIP Indications to be provided by using Red/Green and Amber LED lamps protected by 6Amps SP MCB.				
	All the fault indications viz. low lube oil pressure/ water temperature/engine fail to start/ low High speed diesel level should be shown at the Incomer section of respective 320KVA DG incomers. The faults should appear on an Annunciator of appropriate windows installed at each incomer side.				
	Also, Hooters should be provided to make the faults audible and so that the respective faults can be attended.				
	Control System:				
	The control system consisting of relays to give digital and analogue signal from the AMF cum DG sync panel to the DG sets and vice versa. Appropriate cable harness has to be considered in the existing 2 Nos of DG sets as required.				
	Outgoings:				
	2 Nos of 1000Amps,4P, microprocessor based ACB with overload, short circuit and earth fault protection at 50KA .				
	Indications: The respective outgoings should have ON OFF and TRIP indications by means of RED/GREEN and AMBER LED lamps protected by 6Amps SP MCB.Also, the phases shall be indicated by means of RED/YELLOW/BLUE LED lamps protected by 6Amps SP MCB.				

	Metering: The respective outgoings should have Load managers connected to 3Nos of CT's of respective ampere ratings.				
	<b>Note: The functioning of the AMF cum DG sync panel should be as per the details and requirements mentioned in the technical specs.</b>				
<b>TOTAL OF PART VI</b>					
<b>PART VII: CIVIL WORKS AND MISCELLANEOUS ITEMS</b>					
7.1	<b>Removal Bricks wall</b>	SQM	50.00		
	Removal up to 300 mm thk Bricks with /R.C.C. Lintel / Slab, including all types of. Plasters, Thickness of substation any thickness. The rate for the same shall and any other finishes of any thickness upto original RCC with debris disposal as a BMC Approval Area.etc.				
7.2	<b>Brick work up to 300 MM THK</b>	SQM	90.00		
	Providing and laying Brick work with Fire Proof bricks in superstructure above plinth level in all shapes and sizes in Cement Mortar 1:4 (1 cement : 4 sand) including scaffolding, racking out joints and watering etc. Rate shall be applicable for all levels and heights all complete as per instructions of EIC / Architect.				
7.3	<b>Internal / External Plaster</b>	SQM	180.00		
	Providing internal cement plaster 12mm thick (average) for interiors in double coat in cement mortar 1:4 (by volume) without neeru finish to concrete or brick surfaces in all positions including scaffolding, curing, all complete as per directions of Architect.				
7.4	<b>D.G.Foundation (Size 10 x 4.5 X 0.750)</b>	CUM	34.00		
	Making PCC and concrete work for foundation of D.G. as per Foundation,with M.s.Frame road frame work ,including surface will be clean drawing received from Architect.(if existing surface will be solid)				
7.5	<b>TRENCHES aprox (max. Finish Size 1500 X 0.750 Width )</b>	RMT	75.00		

	Making Trenches Digging pit Made out of Bottom level 50mm P.C.C. with vertical both side 230 mm thk brick wall (With Inside Plaster). M.s.Heavy Grills With Support L Chanel C/C 7 miters Main hole inside plaster & Existing Surface New surface should be fill up in p.c.c.complected. Cable should be laid thru MS Sand Blasted Pipe of 450 mm dia having wall thickness of 6 mm.				
7.6	<b>M.S.Shed. Ht 6M</b>	SQM	90.00		
	Making & Fixing Shade shape & Size In M.s. I beam with ms frame work, PVC Nali with down take Pipe for Rain Water with bracketing, above coated sheet with screws nut bolt etc complete with Red Oxide and Painting (Oil Paint) for MS Structure.				
7.7	Supplying & fixing Bakelite sheet covering above cut out wall with necessary frame work etc complected.	SQM	10.00		
7.8	Making Trench in Existing Asphalt/ PCC Road for Earthing Cable/Stripts of size 150 X 450 mm width and making the road as per existing condition as Asphalt / PCC Road complete with providing & Fixing Rumbler Strips with reflectors	RMT	25.00		
7.9	Cut out for cable with proper finish.in plaster complete. (500 x500)	Nos	10.00		
7.10	Supplying & fixing night glow Radium labels for the electrical panels of appropriate size.	Job	1.00		
<b>TOTAL OF PART VII</b>					
<b>PART VIII:POINT WIRING, DISTRIBUTION BOARDS AND LIGHTING /SOCKETS</b>					
8	Supply installation testing and commissioning of the following Miniature Circuit Boards in MS enclosure of Industrial design with double door design-IP -43 Class. All the MCBs to be provided shall be 10 KA rating and with C Curve.				
<b>8.1</b>	<b>6 way ETPN DB-For DG shed</b>	No.	1		
	<b>Incomer :</b>				
	40 Amps , 4 Pole MCB complete and suitable for 500 Volts rating.				
	<b>Busbars.</b>				
	100 Amps rated , 415 Volts AC , 50 Hz. TP and N tinned Copper busbars.				
	<b>Outgoings</b>				
	3 Nos of 25A DP ELCB at 30mA				

	12 Nos of 10/16 Amps Single Phase Miniature Circuit breakers at 10 KA, C Curve All complete with inter wired with incomer all complete.				
<b>8.2</b>	Supply, installation, testing & commissioning of point wiring for lights / fans / plug points / bell point etc. in MMS PVC conduit of suitable diameter , surface or recessed mounted complete with junction box, joints, bends, switch box, cover plate etc. including 1.1kV grade 2 x 1.5 sq.mm.Copper multi-stranded PVC insulated FRLS wires alongwith 1 x 1.5 sq.mm. Copper multi-stranded PVC insulated FRLS wires as earth wire, along with 6A modular surface/ recessed mounted switch , ceiling rose, connectors switch boxes etc. The work shall be completed with all material, labour, chiselling, making good surface etc. in cordination with civil agency complying with IE rules, regulations, standards & local supply authority requirements. Make:Mylinec in Legrand or equivalent in other approved make.				
<b>a</b>	Primary point	Each	10.00		
<b>b</b>	Secondary point	Each	10.00		
<b>8.3</b>	Providing point wiring for following group light points using 2 x 2.5 sq.mm.PVC copper conductor FRLS wires in the existing G.I Conduits from MCB DB to upto fixtures by looping from one fitting to other fixture by using minimum 2.5 sq.mm.PVC green colour copper earth wire as required and as per final direction and approval of the Architect/ Consultant. (The cost of MCBs have been taken part of DB in the tender).				
<b>a</b>	A group of 2 points controlled by 1 No. 10 Amps., Single Pole MCB.	Set	30		
<b>b</b>	A group of 3 points controlled by 1 No. 10 Amps., Single Pole MCB.	Set	10		
<b>8.4</b>	Supplying, erecting , testing & commissioning independent surface or recessed mounting modular 6 / 16A switch & socket complete with switch box, internal wiring with required chiselling making good surface etc...in cordination with civil agency complying with IE rules, regulations, standards & local supply authority requirements. . Make:Mylinec in Legrand or equivalent in other approved make.	Each	5.00		

<b>8.5</b>	Supplying, erecting , testing & commissioning independent surface or recessed mounting modular 6 A switch & 5 pin socket complete with switch box, internal wiring with required chiselling making good surface etc...in cordination with civil agency complying with IE rules, regulations, standards & local supply authority requirements. . Make:Mylinec in Legrand or equivalent in other approved make.	Each	5.00		
<b>8.6</b>	Supplying, erecting mains & submains wiring between DB & switchboards of lights/fan,independent plug point etc or between DB and light points with 1.1kV grade 2 x 2.5 + 1 x 2.5 PE multi stranded Copper PVC insulated FRLS wires drawn in HMS PVC conduits conduits of required diameter concealed / surface mounted including required accessories, termination complete with chiselling making good surface etc...in cordination with civil agency complying with IE rules, regulations, standards & local supply authority requirements etc...	Rmt	50.00		
<b>8.7</b>	Supplying, Installation,Testing and Commissioning of 20 Amps, 4pole MCB at 10KA along with socket in weather proof Enclosure all complete with mounting accessories.	No	2		
<b>8.8</b>	Supply & installation of light fixtures, light fixtures fixed in the manner the Owner / Consultants instructions and as shown in the lighting layouts. Further the rates should include all hardware, down rods, suspension arrangements, chains, PVC covering tubes etc complete .The light fixture shall be complete with electronic Ballast.&Lamp. The Catalogue Numbers provided should be installed. If equivalent is to be provided then it should match the intent of the specifications and looks of the Light Fitures.AS per specification.				
	Supply and Installation of following lighting luminaries with all accessories and lamps.				
a	28 Watts LED surface mounted light of length 1200mm. Make: Abby lighting-Aqua 36	No	10		
b	3 watts LED exit light with inbuilt battery. Make:Bajaj 220208 BESL 03 LED SSD WBB Green or eq.	No	5		
c	Exhaust fans of 450 mm dia all complete with frame and accessories.	No	6		
<b>TOTAL OF PART VIII</b>					



**PART IX:HIRING OF DG SET AND SHUTDOWN ARRANGEMENTS**

9.1	Supplying, Installation, Testing and commissioning at site Hired DG sets of 2Nos of 1500KVA ratings(1 working and 1 standby) for a period of 30 days. The efficiency of the hired DG should be 70% to 80%.	Job	1		
	The cost should include the cost of lube oil and Cabling (without jointing)to the Dummy panel provided for shut down activity. Also, necessary arrangement to protect the caable laid should be done by the contractor so that any damage to the cable laid is prevented.				
	The initial filling of HSD fuel should be borne by the contractor.TPCT shall provide the requisite HSD fuel for the functioning of the DG sets later. An amount equal to the quantity of unutilised HSD fuel provided by TPCT left in the DG fuel tank shall be deducted by TPCT before making the final payment.				
	The cost should also include the cost of operator for all three shifts. The accomodation/ food for the operator should be taken care by the Contractor.				
9.2	SITC of the following below mentioned Dummy electrical panel -IP 55 class Outdoor type Panel to carry on the shut down activity. The specification of the Dummy panel is as mentioned below:	No	1		
	Incomer: 2000Amps Manual Changeover switch to take supply from the 2Nos of 1500KVA Hired DG.				
	2000Amps, 4pole SFU along with phase and On/Off indications and KWH meter.				
	Outgoings:				
	1 No of 100Amps ,4 pole SFU .				
	1 No of 125Amps ,4 pole SFU .				
	2 Nos of 200Amps ,4pole SFU.				
	3 No of 315Amps ,4pole SFU.				
	3 Nos of 400Amps ,4pole SFU.				
	3 Nos of 630Amps ,4pole SFU.				
	All outgoing should have phase and On/Off indications.				
	The panel should be taken back by the contractor after the shutdown activities are completed.				
9.3	SITC of the following below mentioned PVC flexible cable of the sizes mentioned below to carry out the shut down activity. The cables should be taken back by the contractor after the shut down activities are completed:				
9.3.1	3.5 Core x 240 sq.mm., Al Armoured XLPE Cable	Mtr	400		
9.3.2	3.5 Core x 185 sq.mm., Al Armoured XLPE Cable	Mtr	300		
9.3.3	3.5 Core x 150 sq.mm., Al Armoured XLPE Cable	Mtr	400		

9.3.4	3.5 Core x 120 sq.mm., Al Armoured XLPE Cable	Mtr	200		
9.3.5	3.5 Core x 95sq.mm., Al Armoured XLPE Cable	Mtr	300		
9.3.6	3.5 Core x 70sq.mm., Al Armoured XLPE Cable	Mtr	350		
9.3.7	3.5 Core x 50sq.mm., Al Armoured XLPE Cable	Mtr	200		
9.4	SITC of the following below terminations of the sizes mentioned below to carry out the shut down activity. The terminations should be taken back by the contractor after the shut down activities are completed:				
9.4.1	3.5 Core x 240 sq.mm., Al Armoured XLPE Cable	No	16		
9.4.2	3.5 Core x 185 sq.mm., Al Armoured XLPE Cable	No	12		
9.4.3	3.5 Core x 150 sq.mm., Al Armoured XLPE Cable	No	8		
9.4.4	3.5 Core x 120 sq.mm., Al Armoured XLPE Cable	No	10		
9.4.5	3.5 Core x 95sq.mm., Al Armoured XLPE Cable	No	8		
9.4.6	3.5 Core x 70sq.mm., Al Armoured XLPE Cable	No	8		
9.4.7	3.5 Core x 50sq.mm., Al Armoured XLPE Cable	No	10		
<b>TOTAL OF PART IX</b>					
<b>PART X:CO-ORDINATION WITH THE OTHER AGENCIES AND PROPER INSTALLATION OF DG AND TRAF0</b>					
10.1	Co-ordinating with the DG set vendor and getting the 1010 KVA Dg set properly installed at site all complete and testing, commissioning the same in the presence of EIC.	Job	1		
10.2	Co-ordinating with the Transformer vendor and getting the 2000KVA Trafnsformer properly installed at site all complete and testing, commissioning the same in the presence of EIC.	Job	1		
<b>TOTAL OF PART X</b>					
<b>PART XI:LIASONING WITH THE SUPPLY AUTHORITY,ELECTRICAL INSPECTOR &amp; OTHER AGENCIES.</b>					
11.1	Liasoning with the Supply authority ie MSEB to get sanction and release of additional electrical load from existing 1000KVA to 1250KVA .	Job	1		
11.2	Liasoning with the State Electrical Inspectorate office for getting approval of drawings, arranging for site visits and obtaining commissioning certificates for transformers and DG sets as required.	Job	1		
11.2	Liasoning with the Supply authority ie MSEB,PWD and CPCB to get the 3 Nos of DG set( existing 320KVA-2Nos and new 1010KVA-1No) installation approved in all respect from the respective authority.	Job	1		
<b>TOTAL OF PART XI</b>					

**PART XII:DISMANTLING.**

12.1	Dismantling of the existing electrical system consisting of cable trays, Electrical Panels viz. Main LT Panel, Emergency panel , capacitor banks located at the external Sub station, Main Normal Power panel located at A wing and B wing of Ground floor,Main Emergency Lighting panel located at A wing and B wing of Ground floor, Normal Floor Power panel located at A wing and B wing of 1st floor,2nd floor and 3rd floor along with Emergency Floor Lighting panel located at A wing and B wing of 1st floor,2nd floor and 3rd floor in a proper and planned manner . Also, the corresponding LT cabling (from 240sqmm to 4 sq mm size ) to these panels should be pulled out and dismantled in a proper manner. The dismantled electrical panels and cabling should be handed over to the custody of TPCT and should be be stored at a placed allotted by TPCT in a proper manner. The bidder should visit the site to understand the items to be dismantled and the site conditions before quoting this item.	Job	1		
<b>TOTAL OF PART XII</b>					
<b>GRAND TOTAL</b>					