

Extension - II

 आकाशवाणी	प्रसारभारती / PRASAR BHARATI भारतीयलोकसेवाप्रसारक/ INDIA'S PUBLIC SERVICE BROADCASTER अपरमहानिदेशक(अभि.)(द.क्षे) काकार्यालय/ O/O. ADDL. DIRECTOR GENERAL (E)(SZ) आकाशवाणीएवंदूरदर्शन / ALL INDIA RADIO & DOORDARSHAN स्वामीशिवानंदसाले, चेन्नई / SWAMY SIVANANDA SALAI, CHENNAI - 600 005.	 सत्यम् शिवम् सुन्दरम्
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F.No. J-16028(1)/11/2026-DD PROJ-ADG(E)-(SZ) E.340374

Dt: 20.07.2026

Sub: Extension for Date of submission of Budgetary quote for Design, Fabrication, Transportation to site, Assembly, inter-connections, Erection, Testing and Commissioning of Low Tension Panel, Laying of LT Cables and termination, Supply and providing copper plate earthing system for GDDRC, Hyderabad **from vendors / OEM - Reg**

Ref: F.No. J-16028(1)/11/2026-DD PROJ-ADG(E)-(SZ) E.340374, dt. 02.07.2026

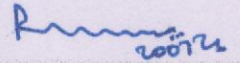
Sir/Madam,

With reference to File no referred above in reference, the date of submission of Budgetary quote for Design, Fabrication, Transportation to site, Assembly, inter-connections, Erection, Testing and Commissioning of Low Tension Panel, Laying of LT Cables and termination, Supply and providing copper plate earthing system for GDDRC, Hyderabad from Vendors/OEM **is extended upto 27.07.2026**

The budgetary quote for the above DSITC may kindly be provided by email to **tvproject_sz@yahoo.com** on or before **27.07.2026**.

Encl: Technical Specification for LT Panel.

भवदीय /Regards,



(पी.एन.एम. श्रीनिवास/ P.N.M. Srinivas)

ए डी ई - टी वी पी/ADE-TVP

कृतेअपरमहानिदेशक (प्र.सं.)(द.क्षे) / for ADG(BO)(SZ)

SPECIFICATION FOR DSITC OF 630 AMP/415V LT PANEL AT GDDRC HYDERABAD

SECTION I

GENERAL CONDITIONS

1.0	SCOPE :
	<i>This section covers design, fabrication, transportation to site, assembly, inter-connections, erection, testing and commissioning of Low Tension Panel at Geo Diversity Disaster Recovery Centre at Hyderabad as per the requirements given in Section II. The panels shall meet all other relevant statutory regulations of the State Electricity Board/Authority including that of CEA Clearance and local SPDCTL, Hyderabad.</i> <i>Supply and providing conventional type earthing system as per drawing, excavation and laying of 240Sq.mm 2 runs 4 core cable from Transformer LT side to LT Room and executing the cable terminations at both ends and testing the power supply LT panel system.</i>
2.0	GENERAL CONDITIONS OF CONTRACT:
2.1	<i>Payment terms, taxes and duties, insurance cover, validity, tender acceptance, initial inspection at manufacturer/tenderer's works, transportation /dispatch of materials, testing and commissioning of equipment after installation and final inspection at site, guarantee terms, delivery period (completion period for SITC), penalty for delay and other commercial terms would be applicable as per Doordarshan's terms and condition on the subject.</i>
2.2	<i>The offered Panel shall conform to the Technical Specifications as given in various sections of this specification. Should a tenderer desire to depart in any respect from the given specifications either on account of manufacturing practice or for any other reason, he must specifically bring out the modifications in a covering letter explaining in detail each and every departure he proposes to make. Unless otherwise stated, the equipment offered shall be deemed to satisfy these specifications.</i>
2.3	<i>The Panel shall be designed for efficient and trouble free service for long periods of continuous operations. The units shall be designed for easy maintenance, repairs/replacements and complete safety to operating personnel. All materials used in the construction shall be of high quality and conform to the relevant IS specifications.</i>
2.4	<i>The switchboard offered shall be capable of withstanding rigorous use and rough handling including during transportation</i>
2.5	<i>The tenderers are advised to visit the site before submitting their offers.</i>
3.0	COMPLETENESS OF CONTRACT
	<i>All sundry fittings, assemblies, accessories, hardware items, foundation bolts, nuts, terminal lugs for electrical connection and cable glands, which may not have been specifically mentioned or which the tenderer may not explicitly mention in his tender but are useful and necessary for proper assembly, installation and efficient working of the various components of the work, shall be deemed to be included in the contract and shall be provided by the contractor without any extra charges. Such items shall be deemed to be included within the rates quoted unless otherwise specifically indicated in the tender.</i>

4.0	TECHNICAL DOCUMENTATION (TO BE SUBMITTED ALONG WITH TENDER)
	<i>The tenderer must submit the following documents along with the tender:</i>
4.1	<i>A Clause-by-clause compliance statement for various technical specifications given in Section IV clearly bringing out deviation, if any.</i>
4.2	<i>Detailed printed literature of various components used in fabrication of Switch Board Panel.</i>
4.3	<i>Complete schedule of material</i>
4.4	<i>Exact dimension details & Mounting arrangement for various Panels & Distribution Boxes (DBs)</i>
4.5	<i>Proposed Time schedule for completion of SITC work.</i>
5.0	TECHNICAL DOCUMENTATION (TO BE SUBMITTED AFTER ACCEPTANCE OF TENDER)
5.1	<i>The successful tenderer shall submit the following within three weeks of acceptance of the tender for approval. Two sets will be returned after approval.</i>
5.2	<i>Six copies of the drawings showing the physical arrangement and dimensions, location of accessories, circuit identification markings, nameplate etc. conform to the IS specifications No 9815- 1981 amended up to date.</i>
6.0	TECHNICAL DOCUMENTATION (TO BE SUBMITTED AT TIME OF DELIVERY)
	<i>Following documents shall be supplied to the consignee along with equipment at the time of delivery:</i>
6.1	<i>Two copies of the book of instructions & drawings regarding installation, testing, operation and maintenance and servicing of the switchgear together with all the relevant data sheets, spare parts catalogue and workshop procedure for repairs, assemblies and adjustments. Operation of the Change Over shall be deemed to be included in the contract and be provided by the contractor without any extra charge.</i>
6.2	<i>Two copies of Factory test certificates showing the results of the tests actually carried out on the LT switch-gear</i>
6.3	<i>Two copies of Type Test certificate from an agency like CPRI etc. as stipulated by the Central Electricity Authority.</i>
6.4	<i>Two sets of finalized drawings showing dimensions and other fixtures of the LT Panel.</i>
7.0	INSPECTION
	<i>The successful tenderer will have to get the switch board inspected by a person authorized by ADG of concerned DD Zone at his (tenderer's) workshop/factory before dispatch.</i>

8.0	DELIVERY
	<i>The entire work of SITC including design shall be completed within a period of three months effective from the date of acceptance of the tender and shall be independent of any other factors.</i>
9.0	GUARANTEE
9.1	<i>The tenderer shall offer at least Three-year guarantee from the date of commissioning and satisfactory acceptance (handing over) of the installed switchboard panels (equipment/ components including associated wiring /cables) by the indenter.</i>
9.2	<i>All equipment/components and associated cables/wires that may fail during the guarantee period due to faulty design, manufacturing, assembly, or poor workmanship shall be replaced at site free of charge by the tenderer.</i>
9.3	<i>All repairs shall be done promptly within a reasonable period, say 48 hours, after the information is given on telephone or writing by the indenter/ consignee.</i>
10.0	ERECTION
10.1	<i>The tenderer/contractor is required to <u>design, supply, install, test and commission the LT Panel at site as a complete work-contract.</u> The contractor shall do all internal wiring of LT Panel including the supply of control cables. The tenderer shall terminate main incoming cables from the distribution transformer and essential supply from the diesel generator.</i>
10.2	<i>The tenderer shall also have to arrange transportation for inspection & certification for handing over the same to the Doordarshan.</i>
10.3	<i>All electrical works shall be carried out in accordance with various CPWD General Specifications for Electrical Works Part-I (Internal) 2005, Part-II (External) 1995, and Part-IV (Sub-stations) 2007 as amended from time to time and in accordance with Indian Electricity Rules, 1956 and Indian Electricity Act, 1910 amended up to date.</i>
10.4	<i>The tenderer shall be responsible for storage of all equipment and materials brought to site from time to time and their safe custody at site till the LT panels are handed over to the indenter/his representative</i>
10.5	<i>The tenderer shall indemnify and hold harmless the indenter against all claims in respect of injury to any person however arising out of erection of the equipment in course of such installation. The tenderer shall discharge all his obligations under the Indian Workmen's Compensation Act in so far as it affects workmen in his employ.</i>
10.6	<i>The tenderer and his employees will submit to the regulations in force for controlled entry into the premises where the said equipment is to be installed.</i>
10.7	<i>If the tenderer or his workmen or servants shall break, deface, injure or destroy any part of the building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cable, drains, electric or telephone posts or wires, trees, grass or grasslands in the premises on which the work or any part of it is being executed, the tenderer shall, upon receipt of a notice in writing on that behalf, make good at his own expense, or in default, the indenter may get the same rectified and deduct the expenses from any amount that may be then due or at any time thereafter may become due to the tenderer or from his security deposit.</i>

11.0	ESSENTIAL SPARES
	<i>Tenderer shall recommend essential spares required for smooth functioning of LT Panel after Guarantee period. The list should include the name & part No. of the parts / components with quantity. The tenderer/ manufacturer shall ensure availability of quoted materials for a period of 10 years from the date of supply.</i>
12.0	CEA Clearance
	<i>Necessary Documents, drawings, details for CEA approval to be provided by the tenderer and Necessary Co-ordination for all approvals.</i>
13.0	MANUALS
	<i>One set of manuals for operation, maintenance, servicing & Test Report from O.E.M. of all ACB, MCCBs, Change over Switch, APFC & SPDs shall be supplied. Guarantee/ warranty cards of the supplied unit should be supplied with the unit.</i>

SECTION-II

SCHEDULE OF REQUIREMENTS

DD requires the following equipment/ services as per technical specifications detailed under Section – I. The present requirement is for Doordarshan Geo Diversity Disaster Recovery Centre (GDDRC) at Chintalakunta, LB Nagar, Hyderabad.

The tenderer shall quote prices of each item separately in price bid with necessary break up details keeping in view the following.

i. Make and model of each item, to be indicated.

ii. Indenter reserves the right to choose & decide the quantity of equipment at the time of finalization of tender.

	ITEM	QUANTIT Y	Rate
1.0	Main LT Panel Consisting of		
1.1	415V, 3 Phase, 800A Main Copper Bus Bar 60 x 12 mm	1 set	
1.2	CT & PT (Ratio 200:5), 10VA	1 Set	
1.3	Indicating Lights (RYB)	2	
1.4	Multi Function Meter	1	
1.5	Push Button	1	
1.6	Phase sequence Meter	1	
1.7	Incoming ACB 630 A, 4Pole , (Drawout Type) Icu=Ics-55kA, Adjustable Overload, Short-circuit & Ground Fault Protection with Microprocessor Based Trip Unit.	2	
1.8	630A Change Over Switch (Normal Type) for ACB-1 & ACB-2	1	
1.9	MCCB , 4P – 400A, Icu>35kA, AO, FS)	10	
1.2	Onload Change Over Switch (Fixed Type) 400A	7	
1.21	MCCB 4P-200A, Icu>35kA, AO, FS)	10	
1.22	MCCB 4 P- 250A	1	
1.23	MCCB 4 P-100A	3	
1.24	APFC – 155 kVAR 1) 5 kVAR 2) 10 kVAR 3) 15 kVAR 4) 20 kVAR 5) 25 kVAR	5 Nos. 5 Nos. 1No. 1No. 1No.	
1.25	Surge Protection Device, 100kA	1	
1.26	Earth Leakage Relay	1	

1.2 7	Main LT Copper Bus Bar 800A -60 X 12 mm Non Essential Copper Busbar 600A, Essential Busbar-I 400A , Essential Busbar -II,400 A,415V, 3 Phase, 50mm X 12mm Copper Bus Bar Neutral BUSBAR- 50mm x 6mm Copper Bus Bar	As per drawing	
1.2 8	Supply and Providing Conventional type Copper Plate Earthing 2 Nos for LT Panel & dedicated earth 1 No. for SPD (All Earthing Material including copper plate, strip, fabrication & brazing charges to be provided by the tenderer) Copper Purity certificate 99.99% to be submitted from MSME or any Government Authorised Labs. Copper Plate: 600 x 600 x 3 mm Copper Strip : 50 x 3 mm GI Class B Pipe Laying and termination of copper strips at respective terminals. Rate per actuals at site.	3	1 Job
2	240Sqmm Cable Laying and Terminations Excavation of Cable trench, laying of 240 Sqmm,4 core, Armoured, XLPE Aluminium Cable two Nos as per the drawing from two 500 kVA Transformers to LT Panel Room Cable Trench Including 240 SQmm,4 core Cable Termination at both 500 kVA Transformers LT Side and two ACBs in the LT Panel.	125 Mtrs (Approx.)	
3	Installation, Testing & Commissioning of LT Panel at site.	1	

Accepted Makes of Materials

S. No.	Description of Items	Approved Makes
1.	LT Panel as per CPRI Standardpe	Schnieder/Siemens /ABB
2.	ACB	Schnieder/Siemens /ABB
3.	Changeover Switch	Schnieder/Siemens /ABB
4.	MCCB	Schnieder/Siemens /ABB
5.	Surge Protecting Device (SPD)	Schnieder/Siemens /ABB
6.	Indicator	Schnieder/Siemens /ABB
7.	Multi Function Digital meter, Phase Sequence Meter	Schnieder/Siemens /ABB
8.	Control wire	Havells, Finolex
9.	Copper wire FRLS	Havells, Finolex
10.	Digital VAF Meter	Schnieder/Siemens /ABB
11.	Protection Relays	Schnieder/Siemens /ABB

Note:

1. Electrical Panel and Switchgears shall be Same Make.

SECTION-III

S.NO	SPECIFICATIONS	TENDERER'S OFFER WITH EXCACT VALUE WHEREEVER REQUIRED
1.0	GENERAL	
1.1	All the materials to be used in the work shall conform to the following specifications. a. CPWD general specification for Switchboard Work. b. The materials should conform to IS Specifications and should be ISI marked.	
1.2	The tenderer shall use reputed & field proven makes of the materials in the work. The actual make offered by the tenderer is to be clearly mentioned in the tender. If more than one make are offered, then it will be open to the indenter to choose any one of the offered makes while placing work-contract.	
1.3	The L.T. Panel shall consist of the panels as per requirements given under 'Schedule of Requirements' and shown in the Power Supply schematic. It shall be suitable for working on voltage up to 500 volts, 3 phase, 50 Hz, 4 wire with earthed neutral supply system capable of functioning satisfactorily in temperatures of 45 degree C. General requirement shall be covered by IS-4237 as amended up to date.	
1.4	The LT Panel shall be indoor type, suitable for mounting on the trench /floor, compact, metal clad, totally enclosed and readily extendable on both sides, having in it all switches and accessories and completely factory pre-wired.	
1.5	The Enclosure shall provide a degree of protection covered by type IP-55 of IS-2147 amended to date.	
1.6	All the ACBs, MCCBs, Changeover Switch, SPD, indicating Lights, DBs shall be of single make.	
2.0	CONSTRUCTIONAL FEATURES	
2.1	The LT Panel shall be designed for mounting over 500 mm wide cable trench in the floor and will have 500 mm rear space to access. All cables will enter the LT Panel vertically from the trench below. Outlets from MCCBs that are above the bus bars shall be through reverse entry cable boxes. The LT Panel shall be provided with removable bottom plates fitted with cable glands of appropriate size for aluminium cables. Aluminium crimping type lugs shall be provided.	
2.2	The LT Panel shall be of single front construction and equipment shall be mounted only on the front. The depth of the LT Panel shall not exceed 1200 mm. The LT Panel shall have a uniform height and depth throughout its length.	
2.3	The LT Panel shall present a flush appearance and shall be made of not less than 2 mm thick (14 SWG) for load bearing members, 1.6 mm for doors both front and rear	

	<i>side of L.T. Panel of cold rolled M.S. sheet & and shall be free from rust, scales, grease and other foreign matters.</i>	
2.4	<i>For convenience of operation and ease of cable termination, there shall be adequate gap (about 1000 mm) between the floor level and the bottom most units. The maximum operating height shall not exceed 2000 mm.</i>	
2.5	<i>The framework shall be rigid and with modular arrangement. The framework shall house the MCCBs etc. in multi-tier formation. The equipment shall be mounted independent of the back plate and not on the rear surface of the housing.</i>	
2.6	<i>Suitable cable termination arrangement shall be provided for switching unit equipment with proper fastening arrangement to ensure vibration free operation.</i>	
2.7	<i>Each module shall be fitted with individual doors with concealed hinges. All doors shall be held securely against sponge rubber gaskets to make the equipment dust free and vermin proof and all the doors should terminate with Earthed to the panel with flexible Insulated copper conductor.</i>	
2.8	<i>The compartment doors shall be interlocked so that it shall not be possible to open the door with the switch in closed (ON) position. Provision may also be made for pad locking the switches in off position wherever required.</i>	
2.9	<i>All steelwork shall undergo a process of degreasing, pickling in acid, cold rinsing, phosphatising, passivating and then be sprayed with a high corrosion-resistant primer. The finishing treatment shall be by application of two coats of heat resistant synthetic Enamel of approved shade (generally Siemen's Grey) as per 63106 IS 5 stoving process will be preferred.</i>	
2.10	<i>A base channel, painted black shall be provided to prevent corrosion of sheet cubicles and to facilitate cleaning of floors.</i>	
3.0	BUS BARS	
3.1	<i>Single piece, air insulated bus-bars of hard drawn high conductivity electro type copper rated for the current indicated in the schedule of requirements and corrected for an ambient temperature of 50° C and conforming to Grade E91E of IS 5082 as amended to date shall be provided.</i>	
3.2	<i>The bus bar shall be capable of carrying the rated current at 415 Volts continuously. The bus bars shall be designed to withstand the temperature rise of 45° C above the ambient.</i>	
3.3	<i>Bus bars shall be supported on unbreakable, non-hygroscopic supports rigidly held to the framework of the chamber so as to withstand thermal and dynamic stresses during system short circuits/fault conditions. They may be insulated individually with an approved non-deteriorating insulating material such as empire tape or sleeved with heat-shrinking PVC sleeves to make it dust proof. Phase identification with colour tape also is to be</i>	

	<i>provided.</i>	
3.4	<i>The neutral bus bars should be insulated with provision for earthing at one point. Required clearances of bus bars shall be maintained. (Between phase-to-phase - at least 32 mm and between phase and neutral at least 36 mm.)</i>	
3.5	<i>The bus bars shall have a uniform section throughout the length of the switchboard. The cross section of the neutral bus bar shall be the same as that of phase bus bar of the capacities up to 800A. For higher capacities of bus bar, the neutral bus bar shall have a cross section of at least 50% of the phase bus bar.</i>	
3.6	<i>Red, Yellow & Blue indicating lights on the front panel shall be provided on the bus bar chamber to indicate the presence of phase voltages.</i>	
4.0	Air Circuit Breaker, 630A, 4 Pole Microprocessor Based (Drawout Type): 630A, Air Circuit Breaker is an essential, electrical switching and protection device designed to protect Heavy Duty and High Capacity Electrical distributions from Overload, Short Circuit and Earth fault current the breaker can safely Interrupt. Its operating voltage is 415V and breaking capacity ranges between 50kA to 65kA. Operating Mechanism is Manual and Motorized. For Manual Operation Charging handle and Auto operation motorised operation for remote switching spring charging. The Complete Drawout type ACB is mounted over the chassis assembly for easy roll or rack the breaker out for safer maintenance & service. Microprocessor based releases allows precise settings for over load (O/L), Short circuit (S/C) and earth fault protection. Protection Releases Microprocessor –based Communication – Capable release should consists of : • True RMS sensing • Offers comprehensive protection for overload, short-circuit, instantaneous, earth fault and neutral overload. • High resolution backlit LCD display • Intelligent Pre-trip alarm to prevent system shutdown • Password protected settings and commands • MODBUS RTU protocol with intrinsic RS 485 PORT • Led indication for POWER ON, different faults and Pre-trip alarm • 2 sets of storable protection settings. • Last 5 trips & 128 Event records with time & date stamping • 3 programmable contact-1 for micro controller failure, 2 for basic fault annunciation • 4 relay contact for indication of exceeding maximum demand, Pre-trip alarm and control on breaker (closing and opening) • Rating-plug for precise protection at lower load	

	currents • Auto-doubling features to prevent nuisance tripping • Selectable $I^2 t$ based current for short-time and earth fault zones. • Thermal reflectivity enables faster tripping on recurrent overloads • Inbuilt Zone Selective Interlocking • Provision for Self-diagnostic test • Conformance to EMI/EMC standards.	
5.0	MOULDED CASE CIRCUIT BREAKERS (MCCB) - Microprocessor Based, Fixed Type	
5.1	All the live parts of MCCBs shall be enclosed in insulated moulded housing. The operating mechanism should be quick make, quick-break. Three-phase MCCBs shall have a common operating handle for simultaneous operation and tripping of all three phases. It should be independent of manual operation and conform to relevant sections of IS-13947.	
5.2	The housing should be made of heat resistant and flame-retardant thermo-insulating material. The operating handle should clearly indicate ON, OFF and TRIP positions.	
5.3	Terminals shall be so designed such that it can accept links or cable lugs. Adequate separation between adjacent terminals with insulation barriers shall be provided.	
5.4	MCCB shall be provided with the following interlocking devices for interlocking the door of a switchboard: a) Door interlocking to prevent the door being opened when the breaker is in ON position. b) Defeat the interlocking device to open the door even if the breaker is in ON position.	
5.5	The MCCB should have inverse time-current tripping characteristics against overload and in against short circuits.	
5.6	The MCCB shall have silver layered contacts to reduce arcing time. It shall operate on the current limiting principle and time of interruption shall not exceed 5 milli-seconds. The operating handle should clearly indicate ON, OFF and TRIP positions.	
5.7	The MCCB shall be housed in a non-ignitable, high impact precision moulded reinforced plastic material to ensure high electrical and mechanical properties.	
5.8	The MCCB shall be fast acting and free from bouncing of contacts and should ensure long contact life and proper contact pressure.	
5.9	The MCCB shall be trip free and should conform to specification IS 8828 amended to date.	
	Protection Releases Microprocessor –based should consists of : • Overload Protection with inverse time delay • I^2t, I^4t, SI, LI-VI based over load curves	

	• <i>Short Circuit Protection with selectable time delay</i> • <i>Instantaneous protection with fine settings</i> • <i>Advanced current and voltage based protection function</i> • <i>Protection against current unbalance and single phasing</i> • <i>Comprehensive current, power and energy metering</i> • <i>Inbuilt Earth fault and Neutral overload protection</i> • <i>Provision of Thermal memory defeat</i> • <i>Panel mounted O-LED display</i> • <i>Communication through MODBUS RTU</i> • <i>Pre-trip alarms</i> • <i>True RMS sensing</i> • <i>Power on LED</i> • <i>"Push to Trip" button</i> • <i>Self powered</i>	
6.0	<i>SURGE PROTECTION DEVICES (SPD)</i>	
6.1	<i>The Surge Protection Devices shall be provided in the LT Panel as per Power Supply schematic (Annexure-3) Diagram - 1 to protect electrical/ electronic broadcasting equipment against various over voltage impulses due to lightning & switching surges in supply line & in the distribution system.</i>	
6.2	<i>The Surge Protection Devices (SPD) shall be fitted with necessary circuit breakers in order to isolate the protected equipment from the installation case SPD failure. SPD with integrated breaker shall also be acceptable.</i>	
6.3	<i>The SPD shall be installed in a separate metal enclosure with circuit breaker. The SPD shall be connected in the circuit with minimum possible length of wires of required size as prescribed by the manufacturer of SPD.</i>	
6.4	<i>The SPD shall be a microprocessor based device. SPD shall be modular in design so that it can be replaced in case of failure.</i>	
6.5	<i>In absence of surges in the power system, the SPD shall not have a significant effect on the operational characteristics of the system to which it is applied.</i>	
6.6	<i>During occurrence of surges in the power system, the SPD shall respond to surges by lowering its impedance thus diverting the surge current through it to limit the voltage to its protection level.</i>	
6.7	<i>The SPD should recover to its high impedance state after the surge is over and it should extinguish any possible flow of current.</i>	
6.8	<i>Installation of SPD shall be complied with TT & TN-S earthing system.</i>	
6.9	<i>Separate Earth shall be provided for SPD#1 as per Drawing 3 enclosed. Earth resistance shall be less than 1 Ω.</i>	

6.10	<i>The Technical specifications of SPD shall be as follows:-</i>			
	TECHNICAL SPECIFICATIONS	SPD		
6.10.1	<i>Location</i>	<i>Main LT Panel</i>		
6.10.2	<i>Surge Rating</i>	<i>100 KA</i>		
6.10.3	<i>Nominal Supply Voltage</i>	<i>400V,3 Phase,Star,50 Hz</i>		
6.10.4	<i>Continuous operating voltage</i>	<i>440V,AC</i>		
6.10.5	<i>Mode of Protection</i>	<i>3P+N</i>		
6.10.6	<i>Response Time</i>	<i>Less than 25ns</i>		
6.10.7	<i>Voltage Protection Ratio</i>	<i>1200V</i>		
6.10.8	<i>Operating Current</i>	<i>Less than 0.1mA</i>		
6.10.9	<i>Max.Discharge current I max,8/20us</i>	<i>> 100kA</i>		
6.10.10	<i>Voltage Protection Ratio (UL-3r Ed)</i>	<i>1200V</i>		
6.10.11	<i>Nominal Discharge Current(In) 8/20 us</i>	<i>10kA</i>		
6.10.12	<i>State Indicator</i>	<i>Yes</i>		
6.10.13	<i>Disconnecter</i>	<i>125A,MCCB, B or C curve</i>		
6.10.14	<i>Earthing system</i>	<i>TT system</i>		
6.10.15	<i>Temperature Range</i>	<i>Up to 80 deg centigrade</i>		
6.10.16	<i>Reference Standard</i>	<i>UL 1449 3 rd edition,IEC-61643-1</i>		
6.10.17	<i>Degree of protection</i>	<i>NEEMA 1</i>		
6.10.18	<i>Mounting Arrangement</i>	<i>Capable of mounting at Main LT Panel</i>		
7.0	CABLE CHAMBERS			
7.1	<i>The outgoing circuit breakers shall have facility for connection of cables as indicated in the schematic. The LT Panel shall include suitable cable glands, lugs, sealing compound and all accessories necessary for installation and putting into service.</i>			

7.2	For connection to the distribution board only PVC cable shall be used. All control wiring and the wiring for metering shall be done using HFFR copper conductors of minimum size 1.5. sq.mm. Wirings for CTs shall be 2.5 sq. mm. cu conductors. All control wirings shall be fitted with identification ferrule at each end. The wires shall be arranged and supported in such a manner that there shall be no strain on the terminations. Wirings for CTs shall be 2.5 sq. mm. cu conductors. All control wirings shall be fitted with identification ferrule at each end. The wires shall be arranged and supported in such a manner that there shall be no strain on the terminations.	
8.0	Indicating Instruments and Meters	
8.1	The Digital Multi-Functional meter has to display three phase current, phase to phase voltage, phase to neutral voltage, three phase power factor and frequency shall be displayed digitally with 3.5 Digital display. Meters shall be of 96 x 96 mm size. The meters shall meet the various IS specifications.	
8.2	The meters/instruments shall have Instrument transformers wherever needed.	
8.3	Current transformers shall conform to IS 2705 (Part III) as amended to date having rated burden of 10 VA and class I accuracy.	
8.5	Electromechanical Phase sequence meter shall be of size 96mmx96mm.	
9.0	Earthing Terminals	
9.1	Earth bars shall be of Copper, minimum size 50 mm x 5 mm. The terminals have to be provided on both ends (sides) of the board for connecting the board to external earth through 50 mm wide 3 mm thick copper Strip as per Indian Electricity Rules.	
10.0	Supply and Providing conventional type Copper plate outdoor earthing system for LT Panel (body Earth -2 Nos.) & SPD (Dedicated – 1No) including termination, interconnections, test links and all accessories as per the drawing 3 enclosed in for completion of the earthing. Earth resistance Value to be ensured below 1 Ohm by the Tenderer. (Copper Strips (50 x 3 mm), Copper Plate (600 x 600 x 3mm), GI Pipe with funnel (Class C) (3000mm x 40mm Dia) to be supplied by the Tenderer)	
11.0	Testing	
11.1	The routine tests on LT Panel shall be conducted in accordance with IS 8623 as amended to date and shall comprise:	
11.2	Inspection of the LT Panel including inspection of wiring and Electrical operational tests where necessary.	
11.3	Dielectric tests.	

11.4	Checking of protective measures and electric continuity of the protective Circuits.	
12.0	Miscellaneous	
12.1	The drawings enclosed and the schedule of requirements shall form part of these specifications for major items.	
12.2	Special tools for dismantling and testing circuit breakers if necessary shall be included in the supply of the LT Panel.	
12.3	The tendered cost shall include the cost of painting of entire exposed ironwork for the complete installation. All iron works barring the contact areas of moving parts shall be painted at the works before dispatch to the site with two coats of anticorrosive primer paint. Final finishing and painting shall invariably be done at site. After completing the installation and assembly a final coat of painting of approved colour shall again be given to the equipment.	
	<u>Note :</u> <u>Required Length of LT Cables 240 Sqmm, XLPE, 4 CORE , Armoured Cables will be Supplied by the Department.</u>	

SECTION – IV
BILL OF MATERIALS

	ITEM	QUANTITY
1.0	Main LT Panel Consisting of	
1.1	Incoming ACB 630A, 4Pole, Microprocessor Based (DRAWOUT) Type Icu=Ics-55kA, Adjustable Overload, Short-circuit & Ground Fault Protection with Microprocessor Based Trip Unit.	2 Nos.
1.2	415, 3 Phase, 800A Main Copper Bus bar 60 x 12 mm	1 Set
1.3	CT & PT (Ratio 200:5), 10VA	1 Set
1.4	Indicating Lights (RYB)	2
1.5	Multi-Function Meter	1
1.6	Push Button	1
1.7	Phase sequence Meter	1
1.8	Non-Essential Copper Busbar 600A, Essential Busbar-I 400A , Essential Busbar -II, 400 A, 415V, 3 Phase, 50mm X 12mm Copper Bus Bar Neutral BUSBAR- 50mm x 6mm Copper Bus Bar	As per drawing
1.9	630A Change Over Switch (Fixed Type), 4 pole, (Micro Processor Based)	1
1.2	MCCB 4P – 400A (Fixed Type) Icu>35kA, AO, FS)	10
1.21	MCCB 4P- 200A (Fixed Type) Icu>35kA, AO, FS)	10
1.22	MCCB 4P- 250A (Fixed Type) Micro Processor Based	1
1.23	MCCB 4P-100A (Fixed Type) Micro Processor Based	3
1.24	ON LOAD CHANGE OVER Switch (Fixed Type) 4 pole, 400 AMP (MCCB Type) Micro Processor Based	7
1.25	APFC – 155 kVAR 1) 5 kVAR 2) 10 kVAR 3) 15 kVAR 4) 20 kVAR 5) 25 kVAR	5 Nos. 5 Nos. 1No. 1No. 1No.
2.0	Surge Protection Device (100KA/630A) Micro Processor Based	1
3.0	Earth Leakage Relay	1
4.0	Supply and Providing Conventional type Copper Plate Earthing System as per the Earthing Drawing (2 Nos for LT Panel & 1 No. dedicated earth for SPD)Copper Materials to be supplied by the tenderer.	3 Nos. As per Earth drawing

	Copper Purity certificate 99.99% to be submitted from MSME or any Government Authorised Labs. (Copper Strips (50 x 3 mm), Copper Plate (600 x 600 x 3mm), GI Pipe with funnel (Class C) (3000mm x 40mm Dia) to be supplied by the Tenderer)	
5.0	Excavation, Routing of 50 x 3mm strips with suitable heavy duty sleeves from the earth pit to the LT Panel – 3 Nos and SPD and termination of copper strips as per SPDCTL Hyderabad norms. (Payment as per actuals)	10 Meters (Approx.)
6.0	Panel Installation, Testing & Commissioning at site.	1 Job
7.0	240Sqmm Cable Laying and Terminations Excavation of Cable trench, laying of 240 Sqmm,4 core, Armoured, XLPE Aluminium Cable two Nos as per the drawing from two 500 kVA Transformers to LT Panel Room Cable Trench Including 240 SQmm,4 core Cable Termination at both 500 kVA Transformers LT Side and two ACBs in the LT Panel. (Payment as per actuals)	125Mtr Approx.
	Special conditions : Bear all the charges for submission of drawings to Electricity dept. Vendor must coordinate with SPDCTL Hyderabad (SOUTHERN POWER DISTRIBUTION COMPANY OF TELANGANA LTD). for approval of installation, CT/PT ratios, and relay settings, inspection etc. Any deviations from this specification must be clearly listed in the bid. Bidders must submit short-circuit and ampacity calculations to confirm adequacy of cable sizing (240Sqmm).	
	Payment Terms: Payment shall be made as follows: 80% of the cost of materials/service/insurance/ Transportation and 100% GST charges in item No.1,2,3 under Section IV will be released upon supply of LT Panel units in good condition at site. The 100% payment in respect of remaining items and work balance 20% will be released after satisfactory completion of DSITC of LT Panel at Doordarshan Geo Diversity Disaster Recovery Centre, Chintalakunta, LB Nagar, Hyderabad.	

1.1. TECHNICAL PARAMETER:**1.1.1. AIR CIRCUIT BREAKER (ACB) (Drawout Type) 630A:
(Microprocessor Based)**

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Nos. of Poles	4	
B	Rated Operational Voltage	440V/50Hz	
C	Rated Current	630	
D	Breaking Capacity	100kA 445V AC	
E	Rated Insulation Voltage	1000V AC	
F	Rated short-time withstand current	100kA 1s	
G	Rated short-circuit making capacity	220kA	
H	Rated Impulse Withstand Voltage of Main Circuit	8kV	
I	Rated Impulse Withstand Voltage of Auxiliary Circuit	4kV	
J	Typical opening time	40 ms	
K	Typical Closing Time	60 ms	
L	Utilization Category	Category B	
M	Suitability for isolation	As per IEC Standard	
N	Type of Drawout	Electrical & Manual	
O	Electrical and Mechanical (Operating Cycle)	20,000 Cycles	
P	Protection Release Microprocessor based communication capable release.		
Q	Overload (Phase) Current Settings (A), $I_r = I_n \times$	0.4 to 1.0 I_n in steps of 0.05 I_n	
	Time Delay, T_r (sec) at $6 \times I_r$	0.5-1-2-4-6-12-18-24-30	
	Pre-trip Alarm Settings	0.5 to 0.95 I_r in steps of 0.05 I_r	
	Thermal Reflectivity	ON / OFF	
	Function	Enable / Disable	
ii	Neutral Fault Current Settings (A), $I_n = I_{rx}$	0.5-1.0	
	Time Delay (sec)	Same as 'Overload (Phase)	
iii	Short-Circuit Current Settings (A), $I_{sd} = I_n \times$	2 to 10 I_n in steps of 0.5 I_n	
	Time Delay, t_{sd} (msec) at $10 \times I_n$	20-100-200-300-400	
	Pre-trip Alarm Settings	0.5 to 0.95 I_s in steps of 0.05 I_s	

	I^2t	ON / OFF	
	Cold-load Pick-up	Enable / Disable	
	Cold-load Pick-up Delay	0.1 to 10 sec in steps of 0.1 sec	
iv	Instantaneous Function	Enable / Disable	
	Current Settings (A), $I_i = I_n \times$	2 to 16 I_n in steps of 0.1 I_n	
v	Earth Fault Function	Enable / Disable	
	Current Settings (A), $I_g = I_n \times$	0.1 to 0.6 in steps of 0.05 I_n for I^2t ON	
		0.1 to 0.6 in steps of 0.01 I_n for I^2t OFF	
	Time Delay (sec), t_g	100 to 400 msec in steps of 100 msec for I^2t ON	
		0.1 to 5 sec in steps of 100 msec for I^2t OFF	
	Pre-trip Alarm Settings	0.5 to 0.95 I_g in steps of 0.05 I_g	
	I^2t	ON / OFF	
	Cold-load Pick-up	Enable / Disable	

CHANGE OVER SWITCH (Fixed Type) (For ACB-1 & ACB-2) 630A: Microprocessor Based

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Nos. of Poles	4	
B	Rated Operational Voltage	440V/50Hz	
C	Rated Current	630	
D	Breaking Capacity	100kA 445V AC	
E	Rated Insulation Voltage	1000V AC	
F	Rated short-time withstand current	100kA 1s	
G	Rated short-circuit making capacity	220kA	
H	Operation Type	Normal	

MOULDED CASE CIRCUIT BREAKER (Fixed Type) 400A (Micro Processor Based):

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Nos. of Poles	4	
B	Rated Operational Voltage	440V/50Hz	
C	Rated Current	400A	
D	Breaking Time	800 ms	

<i>E</i>	<i>Earth Leakage Protection Class</i>	<i>Class A</i>	
<i>F</i>	<i>Earth Leakage Sensitivity</i>	<i>0.03s</i>	
<i>G</i>	<i>Overload Category</i>	<i>IV</i>	
<i>H</i>	<i>Impulse Withstand Voltage</i>	<i>8 kA</i>	
<i>I</i>	<i>Rated Insulation Voltage</i>	<i>800V</i>	
<i>J</i>	<i>Utilization Category</i>	<i>Category A</i>	
<i>K</i>	<i>Standard</i>	<i>Phase: ISS/IEC 60947-2, Neutral: EN60947-2</i>	
<i>L</i>	<i>Microprocessor based Protection release for MCCBs</i>		
<i>i</i>	Overload (Phase) <i>Current setting, I ($I = x I$)</i>	<i>40% to 100% I_n in steps of 1%</i>	
	<i>Time delay, t_r (Inverse)</i>	<i>0.5s to 30s in steps of 0.1s</i>	
	<i>Protection mode</i>	<i>ON / OFF</i>	
	<i>Preset trip alarm setting</i>	<i>50% to 90% I_r in steps of 1%</i>	
	<i>Thermal memory</i>	<i>Enable/Disable</i>	
<i>ii</i>	Overload (Neutral) <i>Current setting, I ($I = x I$)</i>	<i>50% to 150% I_r in steps of 1%</i>	
	<i>Time delay, t</i>	<i>0.2s / same as overload</i>	
	<i>Protection mode</i>	<i>ON / OFF</i>	
<i>iii</i>	Short Circuit <i>Current setting, I_s ($I = x I$)</i>	<i>1.5 to 8 I_r in steps of 0.1</i>	
	<i>Time delay, t</i>	<i>100ms, 200ms, 300ms, 400ms</i>	
	<i>Protection mode</i>	<i>ON / OFF</i>	
	<i>Preset trip alarm setting</i>	<i>50% to 90% I_s in steps of 1%</i>	
<i>iv</i>	Instantaneous <i>Current setting, I_i ($I_i = x I_n$)</i>	<i>1.5 to 8 I_n in steps of 0.1</i>	
	<i>Protection mode</i>	<i>ON / OFF</i>	
	<i>Preset trip alarm setting</i>	<i>50% to 90% I_i in steps of 1%</i>	
<i>v</i>	Earth Fault <i>Current setting, I_g ($I = x I$)</i>	<i>10% to 50% I_n in steps of 5%</i>	
	<i>Time delay, t</i>	<i>100ms to 500ms in steps of 50ms</i>	
	<i>Protection mode</i>	<i>ON / OFF</i>	

MOULDED CASE CIRCUIT BREAKER (Fixed Type) (Micro Processor Based) 250A:

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Nos. of Poles	4	
B	Rated Operational Voltage	440V/50Hz	
C	Rated Current	250A	
D	Breaking Time	800 ms	
E	Earth Leakage Protection Class	Class A	
F	Earth Leakage Sensitivity	0.03s	
G	Overload Category	IV	
H	Microprocessor based Protection release for MCCBs		
i	Overload (Phase) Current setting, I ($I = x I$)	40% to 100% I_n in steps of 1%	
	Time delay, t_r (Inverse)	0.5s to 30s in steps of 0.1s	
	Protection mode	ON / OFF	
	Preset trip alarm setting	50% to 90% I_r in steps of 1%	
	Thermal memory	Enable/Disable	
ii	Overload (Neutral) Current setting, I ($I = x I$)	50% to 150% I_r in steps of 1%	
	Time delay, t	0.2s / same as overload	
	Protection mode	ON / OFF	
iii	Short Circuit Current setting, I_s ($I = x I$)	1.5 to 8 I_r in steps of 0.1	
	Time delay, t	100ms, 200ms, 300ms, 400ms	
	Protection mode	ON / OFF	
	Preset trip alarm setting	50% to 90% I_s in steps of 1%	
iv	Instantaneous Current setting, I_i ($I_i = x I_n$)	1.5 to 8 I_n in steps of 0.1	
	Protection mode	ON / OFF	
	Preset trip alarm setting	50% to 90% I_i in steps of 1%	
v	Earth Fault Current setting, I_g ($I = x I$)	10% to 50% I_n in steps of 5%	
	Time delay, t	100ms to 500ms in steps of 50ms	
	Protection mode	ON / OFF	

MOULDED CASE CIRCUIT BREAKER (Fixed Type) 100A (Micro Processor Based):

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Nos. of Poles	4	
B	Rated Operational Voltage	440V/50Hz	
C	Rated Current	100A	
D	Breaking Time	800 ms	
E	Earth Leakage Protection Class	Class A	
F	Earth Leakage Sensitivity	0.03s	
G	Overload Category	IV	
H	Microprocessor based Protection release for MCCBs		
i	Overload (Phase) Current setting, I ($I = x I$)	40% to 100% I_n in steps of 1%	
	Time delay, t_r (Inverse)	0.5s to 30s in steps of 0.1s	
	Protection mode	ON / OFF	
	Preset trip alarm setting	50% to 90% I_r in steps of 1%	
	Thermal memory	Enable/Disable	
ii	Overload (Neutral) Current setting, I ($I = x I$)	50% to 150% I_r in steps of 1%	
	Time delay, t	0.2s / same as overload	
	Protection mode	ON / OFF	
iii	Short Circuit Current setting, I_s ($I = x I$)	1.5 to 8 I_r in steps of 0.1	
	Time delay, t	100ms, 200ms, 300ms, 400ms	
	Protection mode	ON / OFF	
	Preset trip alarm setting	50% to 90% I_s in steps of 1%	
iv	Instantaneous Current setting, I_i ($I_i = x I_n$)	1.5 to 8 I_n in steps of 0.1	
	Protection mode	ON / OFF	
	Preset trip alarm setting	50% to 90% I_i in steps of 1%	
v	Earth Fault Current setting, I_g ($I = x I$)	10% to 50% I_n in steps of 5%	
	Time delay, t	100ms to 500ms in steps of 50ms	
	Protection mode	ON / OFF	

ON-LOAD CHANGE OVER SWITCH (Fixed Type) 400A (MCCB TYPE):

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Nos. of Poles	4	
B	Rated Operational Voltage	440V/50Hz	
C	Rated Current	400A	
D	Breaking Capacity	50kA 445V AC	
E	Rated Insulation Voltage	750V AC	
F	Rated Impulse Withstand Voltage	8 kV	
G	Rated short-time withstand current	11.5kA 3s	

APFC :**Automatic Power Factor Controller (APFC) SIEMENS/HAVELLS/L&T**

Sl. No.	Item	DD's Requirement	Tenderer's Offer
a	Voltage input	230 V AC + - 15% 50 Hz + - 2.5 Hz	
b	Accuracy of display parameters	2% + / - 1digit	
c	Target PF setting	0.7 lag to 0.9 lead	
d	Safety lock-out time	30 sec +/- 10%	
e	Capacitor bank switching delay	adjustable from 1 sec to 240 sec	
f	Output contacts	8 Nos. (5A, 250 V AC) for capacitors	
g	Indicators	For all relays, alarm, Auto/manual, lead/lag	
h	Burden	Less than 0.5 VA at CT input	
i	Operating Temperature	0 to 60 degree centigrade	

Capacitors (APFC)

Sl. No	Item	DD's Requirement	Tenderer's Offer
(a)	Rated Voltage	690 V AC	
(b)	Connection	Delta	
(c)	Rated frequency	50 Hz	
(d)	Impregnation	Dry, inert gas	
(e)	Climatic	-40 to +55 Degree Centigrade	
(f)	Humidity	95%	
(g)	Degree of protection	IP 20	
(i)	Standard	IEC 60831-1/2	

Potential Transformer:

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Ratio	11000/110	
B	No. of phases	3	
C	Insulation level: (i) Primary (ii) Secondary Impulse with stand voltage	28 kV rms/ 1min 3 kV rms / 1min 75 kV peak	
D	Rated output	100VA	
E	Accuracy Class	0.5	
F	Type	Epoxy Cast resin	
G	Type of fuses provided	Primary- HT fuse	
H	Applicable standard	IS-3156(1992) amended to date	

Protection Relays:

Sl. No	Item	DD's Requirement	Tenderer's Offer
A	Type designation	IDMT	
B	Time of operation at Max. dial setting & 10 times the tap setting current	1.3 sec.	
C	Type of characteristic	IDMT – Standard Inverse	
D	Whether draw out	Yes	
E	Applicable Standard	IS-3231(1987) Amended to date	

1.1.2. Bus Bar:

Sl.No	Item	DD's Requirement	Tenderer's Offer
A	Main bus bar- a) Size b) Material c) Rated short time current for 3 seconds	50 mm x 12mm Copper 50 kA	
B	Interconnecting bus bar- a) Size b) Material c) Rated short time current for 3 seconds	50mm x 12 mm Copper 50 kA	
C	Applicable Standard	IS-375 amended to date	

Diagram -1

SINGLE LINE LT PANEL DIAGRAM OF GDDRC, HYDERABAD

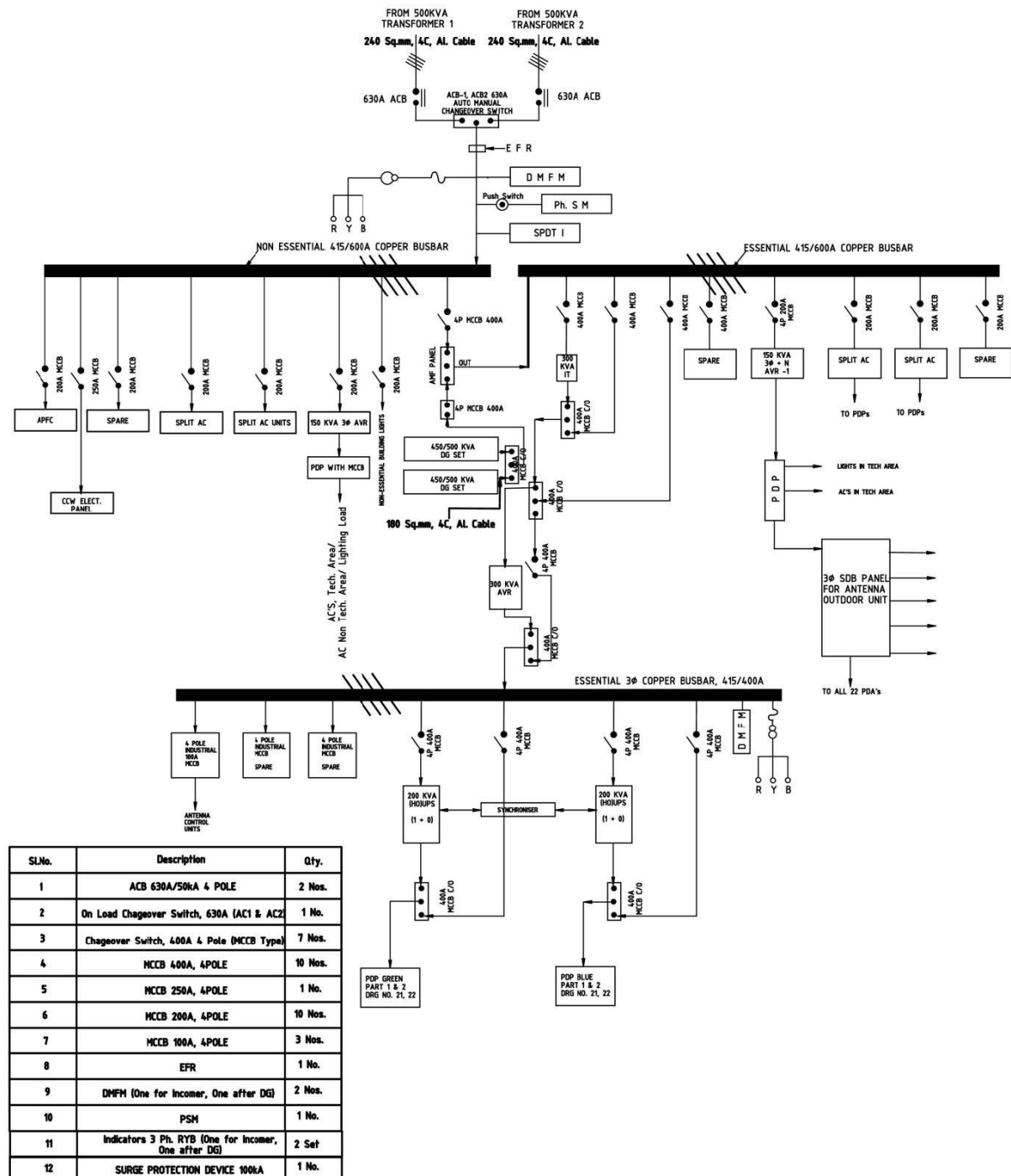


Diagram -2

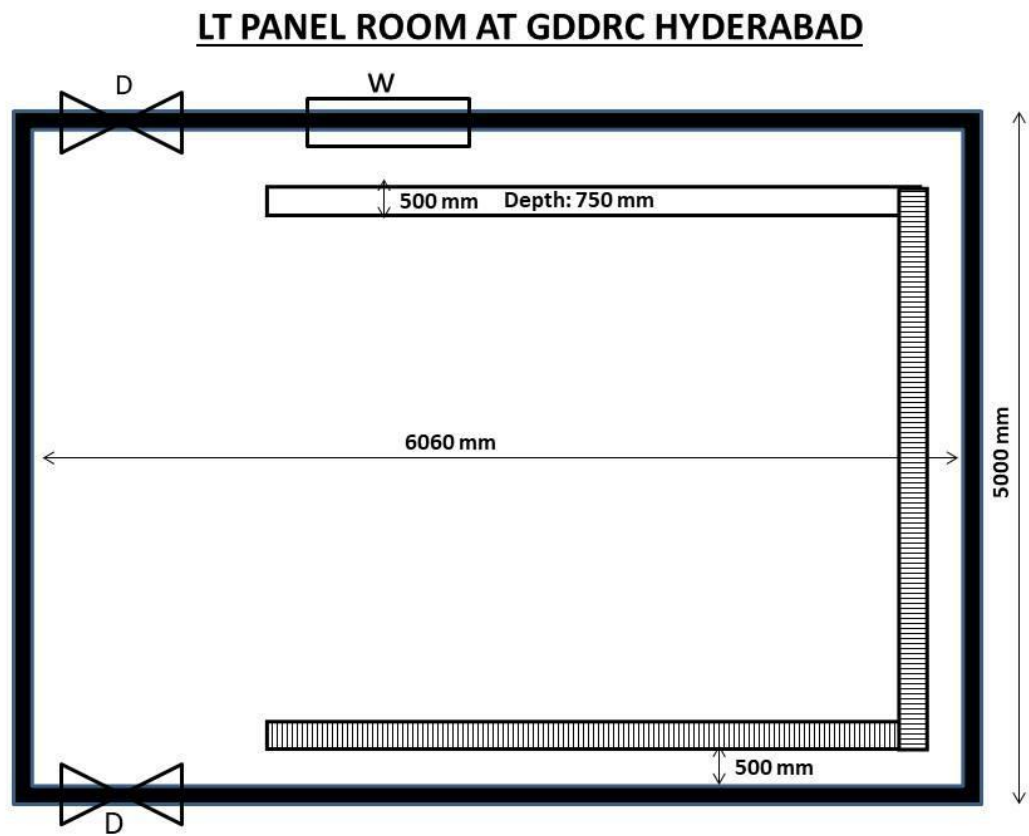


Diagram -3

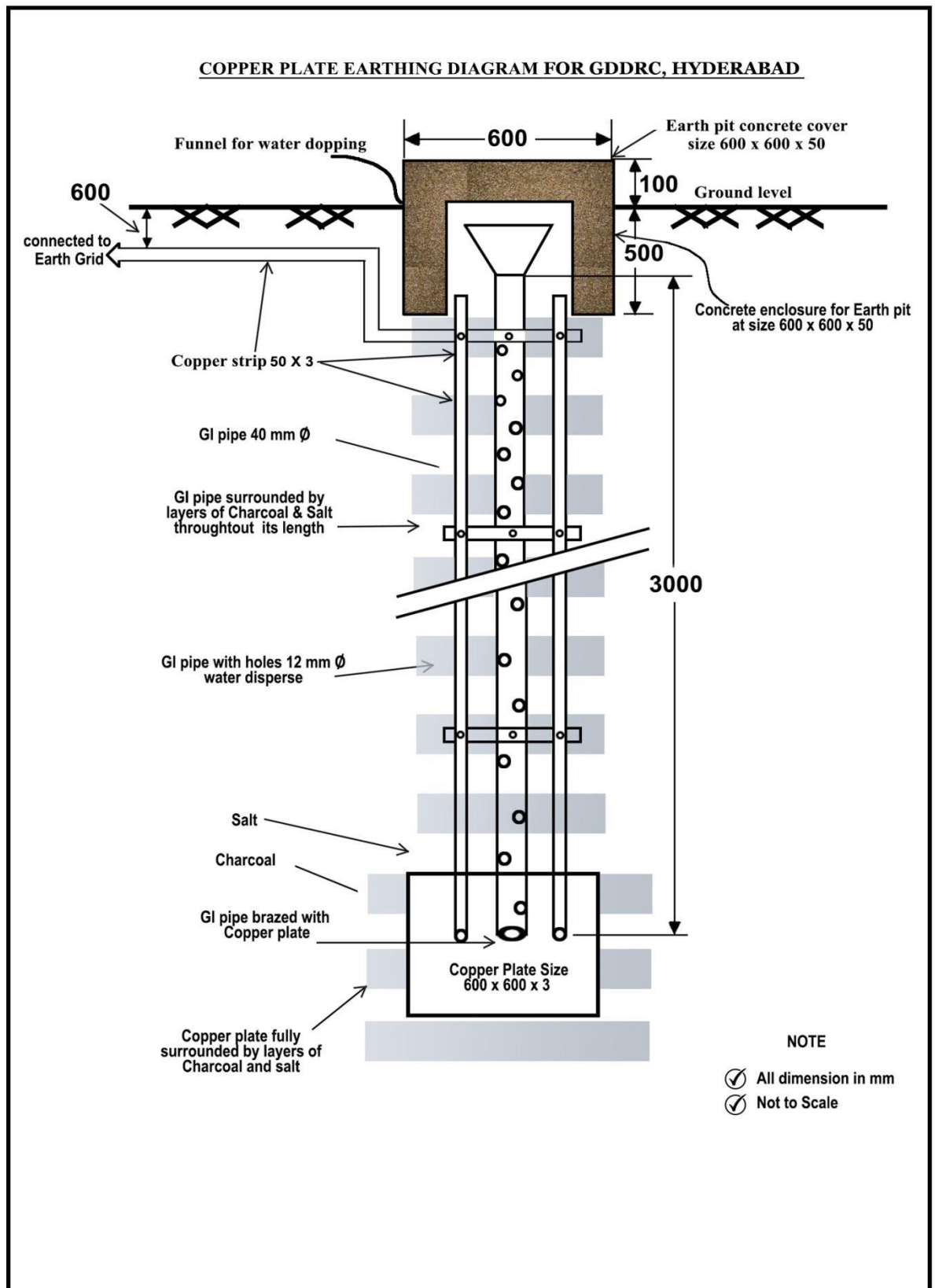


Diagram-4

