

**INTER UNIVERSITY ACCELERATOR CENTRE (IUAC) (AUTONOMOUS CENTRE OF  
UNIVERSITY GRANTS COMMISSION) NEW DELHI**

**NOTICE INVITING TENDER**

TENDER NO: IUAC/NIT/17/UGN/2016-17

|   |  |
|---|--|
| Name of Work  | : <b>SITC of LT Panels, Cables &amp; Terminations<br/>(Electrical Power &amp; Lighting works ) for BH-III</b>                          |
| Estimated Amount  | : Rs. 45 Lakhs   |
| Earnest Money   | : Rs. 90,000/- in the form of D. D.  |
| Tender Cost   | : Rs. 500/- in cash or D.D.  |
| Last Date and Time of Submission<br>of Tender                         | : 17/02/2017 at 3 p.m.   |
| Date & Time for opening of Tender<br>(Techno-commercial bid - Part-A) | : 17/02/2017 at 3.30 p.m.  |
| Date & time for opening of Price Bid<br>(Part-B).                     | : To be intimated later on to technically<br>qualified bidders.  |
| Address for submission of tender                                      | : Administrative Officer (S&P),<br>Inter University Accelerator Centre<br>Aruna Asaf Ali Marg<br>Post Box: 10 502<br>New Delhi-110067. |
| Place of opening of the Tender  | : Committee Room in above address.   |

Tender Documents can be purchased from Administrative Officer(S&P), at a cost of **Rs. 500/-**(Rupees five hundred only ) either in cash or Demand Draft. The tender documents can also be downloaded from IUAC web site “[www.iuac.res.in](http://www.iuac.res.in)”. Tender fee is payable even if tender documents downloaded.

For any clarifications / amendments / corrigenda etc. to NIT before the last date of submission of tender will only be available on our website “[www.iuac.res.in](http://www.iuac.res.in) and Bidders are requested to keep visiting the web site.

## GENERAL CONDITIONS OF TENDER:

1. **Submission of Tender:** Tenders should be submitted in sealed envelopes in two parts separately, i.e. "Techno-commercial bid" (Part-A) and "Price bid" (Part-B). Both the parts should be further sealed in an envelope super-scribing NIT No & name of work, due date for opening, bidders name & address. The tender duly filled in may be sent to above mentioned address either by post or hand delivered in the tender box kept in the area near west side entrance, after ensuring that due entries are made in the register kept at the counter. It should not be handed over to any employee of the Centre. No tender shall be accepted later than the time schedule specified above. Tender once submitted will remain with IUAC and never be returned to the bidders.
2. **Techno-commercial Bid (Part-A):** In this bid, the bidder should submit his company profile, history and structure of firm, name of directors/partners/proprietor with technical staff, list of plant, machinery & tools in his possession, copies of work orders successfully executed during the last 5 years, copy of Income tax clearance certificate for last two years. No deviations in respect of NIT conditions are acceptable. The following specific conditions are essential for technical qualification.
  - 1) Copies of work orders for “**electrical works including LT panels, cables, terminations etc**” successfully executed during the last 5 years for reputed Public Ltd. Companies, Public Sector and other Govt. Institutions in the following manner:
    - 1) Three similar works of value of Rs. 18.0 lakhs & above  
OR
    - 2) two similar works of value of Rs. 27.0 lakhs & above  
OR
    - 3) one similar work of value of Rs. 36.0 lakhs & above
  - ii) The tenderer must have a valid Electrical Contractor's License issued by any State / Union government. Copy of the license must be submitted.
  - iii) Earnest Money Deposit.
  - iv) Entire NIT (except Price bid) duly signed & stamped by the bidder.
  - v) Detailed technical specifications/ leaflets of the system offered.
  - vi) Satisfactory work completion certificate from at least one client with contract details. The work order and completion certificate should be for the same work
  - vii) The Centre reserves the right to either visit the works of the bidders and the similar site of installations of the bidders and carryout the verification of the works claimed to have been completed by them during last five years for qualification of their bids.
3. **Price Bid (Part-B) :** In this bid the bidder is required to quote his items rates/prices for the works mentioned in the scope of work & technical specifications. The rates/price should be inclusive of all material cost, labour, services, charges for the plant/machinery/tools & tackles required for completion of work, freight, insurance, Octroi, Govt. duties, taxes, levies up to IUAC site basis. No charges towards quantity variations, escalation, site difficulties, other hidden cost even though they may not have been explicitly mentioned in the scope and schedule of works shall be payable extra or separately. It is mandatory on bidder to quote all items rate as asked for in the **BOQ/ Schedule of Prices**. Failure to adhere to this condition will lead to rejection of tender. The bidders should quote unconditional rates, neatly written without any overwriting and duly signed & stamped by all pages.

4. **Earnest Money:** An earnest money of **Rs.90,000/-** has to be enclosed along with the Techno-commercial bid (Part-A). The EMD shall be only in the form of Bank Draft in favor of **Inter University Accelerator Centre**, payable at **New Delhi**. No Cheque/Cash shall be accepted as EMD. EMD of technically disqualified bidders will be returned within 15 days from the date of evaluation of the technical bids. The refund of EMD to all other bidders except the lowest bidder shall be made within 15 days from the date of opening of price bid. The refund of EMD of the successful bidder shall be made after completion of works and acceptance of system by IUAC upon his written request.
5. **Exemption from EMD:** Unit registered with National Small scale Industries Corporation (NSIC) are exempted from payment of Tender cost and EMD, subjected to:
  - The unit being registered with NSIC for the items tendered.
  - Self Attested copy of valid NSIC registration Certificate.
  - Photocopy of application for registration as NSIC or for renewal of NSIC will not be acceptable. Such offers will be treated as offers received without EMD.
6. **Validity of Tender:** Tender shall be valid for our acceptance without any change in rates and NIT conditions for a period of 90 days from the date of opening of price bid.
7. **Escalation:** No escalation over and above items rates quoted by the bidder shall be paid during the execution of contract.
8. **Performance Bank Guarantee:** The successful bidder has to submit a performance bank guarantee of an amount equal to 5% of total contract value within a period of 15 days from the date of issue of LOI/Purchase Order, failing which LOI/Purchase Order shall be deemed to be canceled and EMD of the bidder shall be forfeited. Validity of BG shall be entire contract period plus 3 months. In case of contract extension with or without LD the validity of BG shall also be extended. On successful taking over of the project by IUAC the performance bank guarantee shall be returned after submission of BG towards defect liability period as per the clause no-15 (iii).
9. **Completion time:** The time shall be the essence of this contract and entire work as detailed in schedule of rates is to be completed in all respect within a period of **90 days** from the date of submission of Performance Bank Guarantee (as per clause 8 above) by the Bidder. Any delay in completing the work for reasons attributable to the Contractor is liable for liquidated damages as per clause 19 of NIT. However under the force-majure conditions or delay due to reasons beyond control of the bidder, IUAC may grant suitable time extension for which the contractor has to request along with the justification/ reasons well in advance to the Director, IUAC for approval without any prejudice to price escalation. No time extension request shall be considered after the expiry of completion period of contract. The decision of the Director will be final and binding on the bidder/contractor.
10. **Scope of Work :** Detailed scope of work, terms and conditions, technical specifications, list of approved makes etc. are enclosed with this NIT as per Annexure- I, II, III & IV.
11. **Deviations :** No deviation from the stipulated commercial terms and conditions will be allowed. Tenders should be unconditional.
12. **Quantity variation in ordered and executed quantity of works:** IUAC reserves the right to decrease the quantity of all/any item as per site requirement. However any increase in quantity of any/all items as per site requirement up to 25% of ordered quantity the bidder has to execute the same without any change in prices.
13. **Site Conditions :** Bidder shall acquaint himself fully with the site conditions and the working environment of the IUAC before quoting his rates. No compensation on account of any site difficulties will be entertained at a later date after award of works.

14. **Correspondence :** All the correspondence in respect of tender/contractual obligation shall be made to A.O.(S&P), Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi-110067.
15. **Terms of Payment :** The payment shall be made on submission of the bills by the bidder and after due certification by the IUAC person responsible for supervision of the work in following manner:-
  - i) 60% Payment of will be released on delivery of items at our site on pro-rata basis.
  - ii) 30% Payment will be released after installation, testing and commissioning on pro-rata basis up to the satisfaction of IUAC Engineer.
  - iii) 10% of balance payment will be released after installation, testing and commissioning on furnishing of a bank guarantee of an amount equal to 10% of final bill value valid for entire defect liability period.
16. **Guarantee/Defect liability period :** The bidder should guarantee for the works/items executed/supplied by him from the manufacturing/engineering defects and bad material/workmanship for a period of **365 days** from the date of acceptance by IUAC. During this period if any replacement of items and/or repairs/rectification is needed, he shall make the same free of cost or else IUAC reserves the right to get the defects rectified at cost of contractor and same shall be recovered from the BG. Bank guarantee worth 10% of final bill value held with IUAC for the guarantee period will be released only after completion of guarantee period.
17. **Labour Laws :** The contractor will abide by all the rules and regulations related to labour laws, accident, Workman Compensation Act, workmen insurance, ESI, PF etc. This will be the sole responsibility of the contractor. IUAC will not be a party at any stage in any of the disputes relating to the above. In case any liability arises due to non-conformance by the contractor, under no circumstances IUAC will be liable for the same.
18. **Rules governing the Contractor's employees working in the IUAC Premises:** The contractor's employees working inside the IUAC campus will abide by the instructions which is furnished to them by Engineer in-charge from time to time. Any damage to the IUAC property due to mishandling, carelessness on the contractor's or his workmen's part will be recoverable from the contractor's bills.
19. **Liquidated damages:** In case the work is delayed beyond the specified completion period for reasons attributable to the contractor, deductions on account of Liquidated damages @ 0.5% per week will be made subject to a maximum of 5% of the total incomplete works / material. In such case incomplete work shall be worked out by deducting value of works actually executed to the working condition from total order value. However, in case the works are delayed beyond the scheduled completion/ contract period, IUAC reserves the right to get the work done by any other contractor at the risk and cost of the bidder and amount to this affect will be deductible from bidder's bills/dues with an additional amount @ 15% as departmental charges.
20. **Right of The Director IUAC: The Director, IUAC reserves the right to accept or reject any tender without assigning any reason and does not bind himself to accept the lowest tender.**
21. All the persons deployed by the contractor at IUAC site will have to carry valid gate passes, which will be issued after submission of their bio-data in desired format by the contractor. Any negligence/offence on their part will attract immediate removal of person(s) from site.
22. The contractor will provide for all necessary materials, tools equipments, measuring instruments and working consumables etc. needed for execution of the works. Safe custody of all such materials will be contractor's sole responsibility. No extra charges will be paid for the same.
23. Watch and ward of all material till the system is taken over by IUAC shall be the sole responsibility of the contractor and pilferage etc. shall be entirely to his account.

24. All the employees of the contractor working at our site will have to be covered under insurance against any personal accident and IUAC will not be liable for payment of any compensation on that account.
25. Suitable lighting arrangements will have to be arranged by the contractor at his own cost. However IUAC will provide the power/light points at nearest available point from the place of work.
26. The works shall be carried out as per the norms set by the manufacturer of respective equipment/material, specification and specific instructions as may be issued by the IUAC Engineer responsible for work from time to time.
27. During execution of work the contractor should follow all standard norms of safety measures/precautions to avoid accident/damages to persons, machines and buildings. On non-adherence of this clause, suitable fines as decided by the Director IUAC shall be imposed.
28. Manpower deployed by the contractor at our site for carrying out contracted works is strictly prohibited being associated with any other works in the campus.
29. No material belonging to the contractor whether consumable or non-consumable should be brought inside the IUAC campus without proper entry at the main gate nor any material should be taken out without proper gate pass issued by the Centre.
30. IUAC will provide free water and electricity during installation work at IUAC at one point. The contractor has to make his own arrangements for drawing power and water from that point as per his requirement.
31. Tenders once submitted will remain with the Centre and will never be returned to the bidders.
32. **Termination of Contract** : The Director, IUAC reserve the right to terminate the contract on account of poor workmen ship, failure to start the work within 30 days, non-compliance of set norms/ specifications for the works, delay in progress of work, violation of any contract provisions by the Contractor. The contract can also be terminated at the request of Contractor within 10 days from the date of LOI/ purchase order. In such case the EMD of the Contractor will be forfeited. If the contractor requests the termination of contract any time after submission of performance bank guarantee, the Performance Bank Guarantee shall be en-cashed along with forfeiture of EMD.
33. **Any dispute arising out of this contract will be subjected to jurisdiction of New Delhi/Delhi.**

Accepted

(Signature of bidder)

Note:- Entire NIT (except price bid) is to be attached with "Techno-commercial bid (Part-A)" duly signed & stamped by the bidder

**SCOPE OF WORK:**

**The scope of works under this tendered work shall be as follows.**

- 2.1. Design, manufacturing, testing, supply, transportation & unloading of electrical panels confirming to detailed specifications as per approved makes & Schedule of Rates.
- 2.2. Supply, unloading, storing, shifting, laying, testing & terminations of LT cables, cable trays etc confirming to detailed specifications as per approved makes & Schedule of Rates.
- 2.3. Supply and making of terminations confirming to the specifications as per Schedule of Rates.
- 2.4. Making and repairing of any hole in existing walls, floor etc. as required during installation of items.
- 2.5. Supply, laying and fixing of earth strips, wires etc. as required for proper installation as directed by engineer in-charge.
- 2.6. In addition to the above and as per the Schedule of Prices the bidder has to do all minor sundry works including supply and fixing of assemblies accessories, junction boxes, hardware items, foundation bolts, termination lugs for electrical connections as required and all other sundry items which are useful and necessary for proper assembly and efficient working of various components of the work whether or not such details are indicated in the schedule of prices. Nothing extra shall be paid on this account. Such works shall be deemed to have been included in the tender.
- 2.7. **Quantities:** The quantities mentioned in Schedule of Rates are tentative. The successful bidder has to take the measurements at site and get approval from the Engineer in-charge before supplying. Any quantity of material brought at site without taking measurement and approval shall not be paid even if it is mentioned in the Schedule of Rates.
- 2.8. **Drawings:** The successful bidder has to prepare GA, one-line diagram and control drawings with bill of material of items to be manufactured and submit to the engineer in-charge for approval. The work of manufacturing of panels can be taken up only after approval of drawings. After completion of works the bidder has to submit two copies of all as-built drawings and layout of cables as laid etc. as required by engineer in-charge.
- 2.9. **Inspection and Testing at the Manufacturer's works:** The successful bidder has to arrange for the detailed testing and verification of all the parameters at the manufacturer's works before the dispatch of the system. The manufacturer has to make all required arrangements for the same and give the inspection call at least 15 days in advance to IUAC. Any delay in completion time due to not providing advance time for inspection shall be treated as delay in completion time and the LD clause shall be imposed.

## **Annexure -II**

### **TECHNICAL DETAILS FOR THE PANELS**

#### **3.1. LT Distribution Panel -1:**

LT Distribution Panel -1 (RFQ-DTL) shall be rated for 415 volt 3 phase 4 wire system and shall comprise with two incomer of electrically operated fixed type Air circuit breakers and outgoing in following configuration.

**Incomers:** 2nos, 1250 Amps, 35 kA, 4 pole electrically operated fixed type ACB's with microprocessor release of O/L, S/C & E/F, door sealing frame and digital power monitor EM6400 or equivalent. Both incomers shall be electrically interlocked.

**Outgoing feeders:**

- 1) 630 Amps, 35 kA, 3 pole MCCB's with magneto-thermal release with electronic trip unit and extenders for ease of terminations and insulated phase barriers - 2 nos. with Digital VAF Meter with suitable CT's etc. as required.
- 2) 160 Amps, 35 kA, 3 pole MCCB's with magneto-thermal release with electronic trip unit and extenders for ease of terminations and insulated phase barriers– 9 Nos.

#### **3.2. LT Distribution Panel -2:**

LT Distribution Panel -2, shall be rated for 415 volt 3 phase 4 wire system and comprise with two incomer of electrically operated fixed type Air circuit breakers and outgoing in following configuration.

**Incomers:** 2nos, 630 Amps, 35 kA, 4 pole electrically operated fixed type ACB's with microprocessor release of O/L, S/C & E/F, door sealing frame and digital power monitor EM6400 or equivalent. Both incomers shall be electrically interlocked.

**Outgoing feeders:**

- i) 250 Amps, 35 kA, 3pole Handle operated fixed type MCCB with electronic trip unit and extenders for ease of terminations and insulated phase barriers - 3 nos.
- ii) 160 Amps, 35 kA, 3 pole Handle operated fixed type MCCB with electronic trip unit and extenders for ease of terminations and insulated phase barriers - 3 nos.

#### **3.3. LT Distribution Panel -3 :**

LT Distribution Panel -2, shall be rated for 415 volt 3 phase 4 wire system and comprise with two incomer of electrically operated fixed type Air circuit breakers and outgoing in following configuration.

**Incomers:** 2nos, 630 Amps, 35 kA, 4 pole electrically operated fixed type ACB's with microprocessor release of O/L, S/C & E/F, door sealing frame and digital power monitor EM6400 or equivalent. Both incomers shall be electrically interlocked.

**Outgoing feeders:**

- 1) 160 Amps, 35 kA, 3pole Handle operated fixed type MCCB with electronic trip unit and extenders for ease of terminations and insulated phase barriers - 3 nos.
- 2) 100 Amps, 25 kA, 3 pole MCCB with magneto-thermal release, fixed type MCCB with extenders for ease of terminations and insulated phase barriers.-12nos.
- 3) 63 Amps, 10 kA, 3 pole C –Series TP MCB - 36 nos.
- 4) 10 Amps, 10 kA, 1 pole C –Series MCB - 12 nos

#### **3.4. LT Distribution Panel -4 & 5 :**

LT Distribution Panel -3&4, shall be rated for 415 volt 3 phase 4 wire system and shall have following configuration.

**Incomer:** 250 Amps, 35 kA, 3 pole MCCB with magneto-thermal release, fixed type MCCB with copper extenders for ease of terminations and insulated phase barriers . Digital VAF Meter with suitable CT's on incomer as required. 3 Phase indicating lamps with protective MCB's. – 1No.

**Outgoing feeders:**

- 1) 100 Amps, 25 kA, 4 pole MCCB with magneto-thermal release, fixed type MCCB.-1no.
- 2) 63 Amps, 10 kA, 3 pole D –Series MCB - 16 nos.
- 3) 10 Amps, 10 kA, 1 pole C –Series MCB - 16 nos.

**NOTE: Due to space constraint physical dimensions of this panel has to be within 400mm X 1100 X 2200mm (WXLXH). However this is not final.** Final dimension of the panel will be approved by Engineer-in-charge of IUAC and shall be fabricated as approved based on the site condition.

- 3.5. **VTPN MCB Panel -1:** 12 way VTPN MCB DB panel shall be rated for 415 volt 3 phase 4 wire system and shall have following configuration.

**Incomer:** 160 Amps,25 kA, 4 pole MCCB with magneto-thermal release, fixed type MCCB with copper extenders for ease of terminations and insulated phase barriers and insulated copper bus bars.

**Outgoing feeders:**

- i) 63 Amps, 10 kA, 3 pole D –Series MCB - 8 nos.
- ii) 10 Amps, 10 kA, 1 pole C –Series MCB - 10 nos.

- 3.6. **VTPN MCB Panel -2:** 12 way VTPN MCB DB panel shall be rated for 415 volt 3 phase 4 wire system and shall have following configuration.

**Incomer:** 100 Amps,25 kA, 4 pole MCCB with magneto-thermal release, fixed type MCCB with copper extenders for ease of terminations and insulated phase barriers and insulated copper bus bars.

**Outgoing feeders:**

- i) 16-32Amps, 10 kA, TP C –Series MCB - 4 nos.
- ii) 16-32Amps, 10 kA, SP C –Series MCB - 24 nos.

- 3.7. **VTPN MCB Panel -3 :** 8 way VTPN MCB DB panel shall be rated for 415 volt 3 phase 4 wire system and shall have following configuration.

**Incomer:** 100 Amps,25 kA, 4 pole MCCB with magneto-thermal release, fixed type MCCB with copper extenders for ease of terminations and insulated phase barriers and insulated copper bus bars.

**Outgoing feeders:**

- 1) 16-32Amps, 10 kA, TP C –Series MCB - 2 nos.
- 2) 16-32Amps, 10 kA, SP C –Series MCB - 18 nos.

- 3.8. **OUTDOOR DISTRIBUTION PANEL :**

Outdoor Distribution Panel (football ground) shall be Outdoor type double door floor mounted IP-65 rated suitable for 415 volt 3 phase 4 wire system and shall have following configuration.

**Incomer:** 320 Amps, 35 kA, 4 pole On-line change over switch with busbar extenders for ease of terminations and insulated phase barriers. One incomer of this changeover switch should have energy



meter with kVAH and kWH both having suitable CT's as required. The outgoing of this switch should have digital VAF meter with CT's etc as required. Both incomer should have 3 Phase indicating lamps with protective MCB's.

**Outgoing feeders:**

- i) 250 Amps, 25 kA, 3 pole MCCB with magneto-thermal release -1 No.
- ii) 200 Amps, 25 kA, 3 pole MCCB with magneto-thermal release -3 Nos.
- iii) 63 Amps, 10 kA, 2 pole C –Series MCB - 4 nos.

- 3.9. **Outdoor Feeder Pillar-1:** Outdoor Feeder Pillar-1 shall be Outdoor, floor mounted double door type IP-65 rated suitable for 415 volt 3 phase 4 wire system and shall have following configuration.

**Incomer:** 250 Amps, 35 kA, 4 pole MCCB with busbar extenders for ease of terminations and insulated phase barriers.

**Outgoing feeders:** Only 250 A busbars of size 450 mm long horizontally mounted 4 nos for all 3 phases & neutral shall be provided

- 3.10. **Outdoor Feeder Pillar -2:** The feeder pillar shall be Outdoor, floor mounted double door type IP-65 rated suitable for 415 volt 3 phase 4 wire system and shall have following configuration.

**Incomer:** 160A, 25 kA, 3 pole MCCB

Outgoing feeders:

- i) 100 Amps, 25 kA, 3 pole MCCB-3 Nos.
- ii) 63 Amps, 10 kA, 2 pole C –Series MCB - 4 nos.
- iii) 32 Amps, 10 kA, 2 pole C –Series MCB - 4 nos.

## **Annexure-III**

### **DETAILED TECHNICAL SPECIFICATIONS**

#### **4.1. LT Panels:**

All the electrical panels shall be confirming to the following technical specifications.

**4.1.1. Codes & Standards:** The general construction of panels shall confirm to the requirements of the following codes/ specifications as applicable :IS: 8623/77, IS:4237, IS:2147, IS:3072, Installation of switchgear -IS:1248 & 2149,

The equipment shall also conform to Indian Electricity Rules as amended up to-date.

**4.1.2. Construction features:** The panels shall have the following features:-Cubicle type switchboard shall be fabricated out of sheet steel not less than 2.0 mm. thick MS sheet for load bearing and 1.6 mm thick MS sheet for non load bearing members. Wherever necessary, such sheet steel members shall be stiffened by angle iron framework. Each compartment shall have its own hinged door with concealed hinges. The door shall have square section neoprene gaskets fixed on the inner side. The LT panels shall be designed in such a way that all the incoming & outgoing cables shall be terminated in cable alleys only. Suitable bus-bar extenders shall be provided for the same. All panels shall have necessary earth busbar running across the panel having two points to connect the same with external earthing system at both sides. Gland plates shall be provided at top as well as bottom side of cable alley. Flexible earth connection with the body should be provided for each door.

**4.1.3. Bus bars:** Bus bars used in the panel shall be of Aluminum E91E grade (IS5052-1981) of adequate section suitable for 3 phase, 4 wire, 415 volt 50HZ AC supply and with short circuit current rating of 50 kA. The bus bar shall have uniform cross section through out the length. The bus bars shall be designed for carrying rated current continuously. The bus bars and links shall be designed for maximum temperature of 75 Deg C. the maximum current density of bus bars shall be 1.28 amps/ sq.mm. suitable de rating factors shall be applied to arrive at the correct cross section of the bus bars. Bus bars shall be supported on suitable non hygroscopic, non combustible material such as permali or Hylam at sufficiently close intervals to prevent bus bar sag. All bus bar joints shall be provided with high tensile steel bolts (Electro plated with suitable metal such as Nickel/cadmium), spring washers & nuts so as to ensure good contact. Alternatively, electroplated / tinned brass bolts shall be used. The joints shall be formed with fish plates on either side of bus bars to provide adequate contact area. Bus supports shall be provided on either side of joints (max unsupported distance from the joint shall not be more than 300 mm.) power shall be distributed to each circuit in each section by a set of vertical bus bars (phases + neutral). Individual module shall be connected from vertical connections through sleeved connections. Bus bars shall be insulated with heat shrinkable type PVC tapes with color coding (RYB-B). The bus bars and their supports shall be able to withstand thermal and dynamic stresses due to the system short circuits. The supplier shall furnish calculations along with his shop drawing establishing the adequacy of design of both for continuous duty and short circuits rating. Short circuit withstand capacity shall be one second.

**4.1.4. Surface Treatment & Painting:** All sheet metal accessories and components of panels shall be thoroughly cleaned, degreased, de-rusted and phosphorized in a 7 tank system before red oxide primer is applied. The panel shall be powder coated to the required finish & approved color. All holes for fixing the components shall be drilled before primer painting. Two coats of red lead anti-corrosive primer shall be given on all sides internal as well as external, before taking up powder coating process.

**4.1.5. Instruments :**All meters shall be confirming to IS 1248 and accuracy class –1.

**4.1.6. Indicating lamps:** On off and 3 phase indicator lamps shall be LED type indicating lamps suitable to work on 200-230V AC supply. Colored lamps shall be used for indicating correctly. All control circuits and lamps shall be connected through MCB's where phase indicator lamps are provided.

**4.1.7. Control wiring:** All control wiring, indication etc. shall be carried out using 650V grade 1.5 sqmm copper conductor cables PVC insulated conforming to IS 1554 Part-I. CT wiring shall be with 4/2.5 sqmm copper conductor with suitable CT shorting links. Wiring shall be suitably protected within the

switchboard. Runs of wires shall be neatly bunched and suitably supported and clamped. Means shall be provided for easy identification of the wires. Identification ferrules shall be used at both the ends of the conductors.

**4.1.8. Interconnection:** All the interconnections between the incoming, bus and the outgoing of 100A and above rating shall be done by the insulated bus links/strips of suitable sizes. The power inter connections shall be carried out by means of bolted connections with washers. The wiring shall be terminated by using crimping sockets. Wiring shall be laid out neatly in bunches which are firmly fastened to the steel members of the panel. All the potential circuits shall be protected by fuses mounted near the tap-off point from the main connections.

**4.1.9. Name Plate:** The panel as well as the feeder compartments door shall be provided with the name plates giving the feeder description as required.

**4.1.10. Installation at Site:** The panels shall be installed indoor or outdoor as provided in technical specifications. Suitable foundation as approved by engineer-in-charge shall be made for all indoor & outdoor panels for installation. Installation shall be done at location approved by the Engineer-in-Charge. Danger board shall be provided on each panel. All cables connections shall be made using appropriate accessories like crimping lugs, flat and spring washers, bolts and nuts etc., as suitable for the type of termination. In no case, any mechanical pull from cable connection shall be experienced at the terminations. After all cable terminations no openings or unplugged holes shall be allowed, which may allow ingress of dust, insect etc. All incoming and outgoing feeders shall be properly marked indicating the load connected, cable sizes and outgoing connection etc. Megger testing of all LT cables shall be done after laying before connecting & charging the cables.

**4.1.11. Testing:** The tests shall be conducted in the presence of IUAC Engineer.

- i. All the main & auxiliary bus connections shall be checked and tightened.
- ii. All the wiring terminations & bus bar joints shall be checked and tightened.
- iii. Wiring shall be checked for correctness as per the drawings.
- iv. All wiring shall be tested for insulation resistance by 1000 V megger & panels shall be hi-pot testing at 2.5 kV.
- v. Phase rotation tests shall be conducted.
- vi. Suitable injection tests shall be applied to all the measuring instruments to establish the correctness & accuracy of calibration and working order.
- vii. All relays and protective devices shall be tested for correctness of settings & operation by introducing a current generator & an ammeter in the circuit.

#### 4.2. MCCB's

- i. All the MCCB's shall be rated for at least 35 & 25 kA and from the approved makes.
- ii. Operating mechanism shall be Quick-make, quick-break, trip free.
- iii. This shall be independent of manual speed of operation.
- iv. Contacts shall not be 'teased' into position, nor can the breaker be held closed under fault conditions.
- v. Shall have Clear indication of ON, OFF and TRIP position.
- vi. All MCCB's shall be provided with operating handles to be fixed on the panel door.
- vii. Facility to 'push to trip' to verify healthiness of mechanism shall be in built.
- viii. All parts of circuit breaker shall be enclosed in heat resistance insulating material housing Silver alloy contacts should have long electrical life and there should be no arcing on the current carrying part of the contact
- ix. Terminals shall have large dimensions to accept links or cable lugs are separated by insulated barriers with adequate clearances

### 4.3. LT AIR CIRCUIT BREAKERS

Air circuit breakers shall conform to BS:3659 or IS:2516. in all respects. ACBs shall be suitable for operation on 415Volts, 50Hz, AC supply.

#### 1) RATINGS AND REQUIREMENTS: AIR CIRCUIT BREAKERS

Air circuit breakers shall be suitable for 1200 and 630 A continuous current rating, electrically operated, electrically charging with microprocessor release of O/L, S/C, E/F conforming to IS2516. The equipment shall comply to the following minimum specifications:-

|                                  |                                   |
|----------------------------------|-----------------------------------|
| Rated service voltage:           | 600 VAC                           |
| Rated insulation voltage:        | 1000 VAC                          |
| Rated impulse withstand voltage: | 12 kV                             |
| Continuous rated current:        | 630 A                             |
| Capacity of the neutral pole:    | 630 A                             |
| Short circuit breaking capacity: | 35 kA min                         |
| Short circuit making capacity:   | 35 kA min                         |
| Operating temperature:           | [°C] -25...+70                    |
| Frequency:                       | f [Hz] 50 - 60                    |
| Version:                         | Electrically operated fixed type. |
| Protection:                      | O/L, S/C & E/F                    |

- Necessary isolating plugs and sockets.
- Necessary independent manual spring closing mechanism with mechanical ON/OFF indicator as well as electrical ON/OFF indication to be provided at front panel.
- Necessary set of auxiliary switches and indication, metering requirements such as ON/OFF indication, selector switches fuses.
- ACB shall have motor operated charging system.
- Both incomer ACB's shall be electrically interlocked by providing suitable control circuits.

### 4.4. Compound Lighting Pole

Following shall be the specifications:

**Material :** B-class GI pipe

**Outer Diameter:** 58 mm

**Description of Pole:** The pole shall be 3000 mm high with MS base plate of 300X300X3 mm.

**Pole box:** Thermoplastic pole box of size 200X160X98 mm of Hensel make having suitable GI clamps with 4 Pheonix connectors of 25 sqmm size & 6 Amp SP MCB mounted on DIN rail.

**Installation:** Installation shall be done by digging 500 mm deep and providing cement concrete as per CPWD specifications.

### 4.5. LED Flood Light - 100 Watts

The LED flood light fixture shall be made out of die cast aluminum, suitable reflector for wide beam application covered with toughened glass. The flood light fittings shall be installed on 3 mtrs high poles by providing suitable painted MS angle frame made out of 35X35X5 mm angle welded to GI pole.

### 4.6. Post Top Lantern Fitting- 40 Watts

The LED post top lantern fitting shall be made out of die cast aluminum fitted with suitable reflector & poly carbonate cover.



# SPECIFICATIONS FOR LT CABLES, TRAYS & EARTHING

- 5.1. **LT. CABLES (XLPE):** All cables shall be suitably sized as per BOQ. Al. Conductor, armoured, XLPE insulated cables shall be rated for 1.1kV grade as per IS 7098 (part-1) 1998. C
- 5.2. **COPPER FLEXIBLE. CABLES :** Single core/ multicore copper flexible cables shall be conforming to IS 694: 1990 voltage grade up to 1100 volts shall be manufactured from bright-annealed 99.97% pure bare copper conductors. These cables shall have low conductor resistance. These wires shall be insulated with a special grade PVC compound formulated and manufactured and shall be impervious to water, oil, and grease, acids, etc. and are tough to protect from any mechanical abuses.
- 5.3. **WELDING CABLES WITH HOFR COVERING:** The Welding Cables shall be Double Insulated, Extra Flexible with HOFR Covering with sheathing of heat oil fire resistant. Shall be verified on various international parameters. Shall be Annealed Bare Copper conductor as per IS: 8130/1984, TRS / HD HOFR sheathed as per IS: 6380/84, **IEC 245-6,IEC-60228** and if applicable to IS: 9857/1990.
- 5.4. **END TERMINATIONS:** Cable end terminations shall be carried out by using chrome plated brass cable glands for Al. armoured cables. Brass glands shall be of COMET or eqvt. make for XLPE cables OR HENSEL/GP make thermoplastic glands as per BOQ and requirements of IUAC. Thimbles shall be of Copper and Aluminium material for copper cables and aluminium cables respectively.
- 5.5. **EARTHING:** All non current carrying metal parts of the electrical installation shall be earthed as per IS: 3043. All metal enclosures, cable armour, switch gears; meters etc. shall be bonded together by two separate and distinct conductors to earth electrodes/grid. Earthing shall also be in conformity with the provisions of rules 32,61,62,67 and 88 of IER 1956. The Backfill having not more than 0.20 Ohm/cm resistance, eco friendly, non degradable and non soluble. The earthing pit shall be designed and supplied with Poly-plastic Pit Cover non conductive, environment friendly.
- 5.6. **PERFORATED TYPE CABLE TRAY:** Perforated type of Cable tray with covers shall be made out of hot dipped G.I. Sheet of suitable sizes as mentioned in the schedule. All sections of the tray shall be made out of 2.0 mm thick G.I. sheet. Tray sections shall be joined by using proper coupler plates and G.I. nuts and bolts. All accessories like tray bends, tee's, reducers etc. shall be pre fabricated and galvanized.
- 5.7. **FABRICATED SUPPORTS:** The cable tray shall be mounted on proper supports made of angle iron of adequate section as per BOQ. Wherever structure is not available the support shall be fastened to the wall/roof/floor using anchor bolts of suitable sizes. All nuts, bolts, washers etc. used for fixing and joining of the cable tray with supports shall also be painted after erection. All welded supports shall be painted with 2 coats of enamel painting over 1 coat of primer after proper cleaning.

### LIST OF APPROVED MAKES

Following makes shall be acceptable under this Tender.

| Sl. No. | Item description                                     | Make  |
|---------|--|---|
| 1.      | LT Panels  | Siemens/Adlec/Antelec/ABB/Tricolite/ OR equivalent CPRI approved manufacturer |
| 2.      | LT Switchgear  | Siemens, ABB, Schneider, L&T  |
| 3.      | ACB/MCCB's/MCBs                                      | Siemens, ABB, Schneider, L&T  |
| 4.      | SFU  | Siemens, ABB, Schneider, L&T  |
| 5.      | LED lights   | Crompton/Philips  |
| 6.      | CT's   | Siemens / Areva / ABB/AE or Equivalent  |
| 7.      | Chemical/ GI earthing electrode & back fill compound | Planet/ Teksai/ JMV/ GPS/ JK or Equivalent                                    |
| 8.      | Measuring Instruments                                | Conzerv/ABB/ Merlin Gerin Schnieder or Equivalent                             |
| 9.      | Glands, Thimbles                                     | Dowells, Asian, 3M  |
| 10.     | XLPE cables, wires                                   | Fort Glostar / Universal / Finolex / Asian / Polycab/Havells                  |
| 11.     | HOFR insulated Welding cable                         | Miracle/Jainson/Unique/IGI /Universal / Finolex / Asian / Polycab/Havells     |
| 12.     | Indication lights                                    | BCH / L&T / Concord /Siemens, Technic/ Essen Deinki                           |
| 13.     | Selector switch                                      | L&T / Siemens/ Kaycee   |
| 14.     | Push button  | L&T / Siemens/ Kaycee   |
| 15.     | Terminals  | Phoenix or equivalent   |
| 16.     | Junction Box   | Hagger, Hensel  |

## SCHEDULE OF PRICES

| Sr. No. | Description of Items   | Aprx. Qty. | Unit Price (Rs) | Total (Rs) |
|---------|--|------------|-----------------|------------|
| 1.0.    | <i>Supply, installation, testing and commissioning of Electrical panel as per technical specifications annexure-III having and Al. bus bars, incomers &amp; outgoing switchgears as per Refer annexure-II.</i> |            |                 |            |
| 1.1.    | Supply, installation, testing and commissioning of <b>LT Distribution panel-1</b> Refer 3.1 annexure-II.   | 1 No.      |                 |            |
| 1.2.    | Supply, installation, testing and commissioning of <b>LT Distribution panel -2.</b> Refer 3.2 annexure-II.   | 1 No.      |                 |            |
| 1.3.    | Supply, installation, testing and commissioning of <b>LT Distribution panel -3.</b> Refer 3.3 annexure-II.   | 1 No.      |                 |            |
| 1.4.    | Supply, installation, testing and commissioning of <b>LT Distribution Panel -4 &amp; 5.</b> Refer 3.4 annexure-II.   | 2 Nos.     |                 |            |
| 1.5.    | Supply, installation, testing and commissioning of <b>VTPN MCB Panel-1</b> Refer 3.5 annexure-II.  | 1 No.      |                 |            |
| 1.6.    | Supply, installation, testing and commissioning of <b>VTPN MCB Panel-2</b> Refer 3.6 annexure-II.  | 1 No.      |                 |            |
| 1.7.    | Supply, installation, testing and commissioning of <b>VTPN MCB Panel-3</b> Refer 3.7 annexure-II.  | 1 No.      |                 |            |
| 1.8.    | Supply, installation, testing and commissioning of <b>OUTDOOR Distribution Panel.</b> Refer 3.8 annexure-II.   | 1 No.      |                 |            |
| 1.9.    | Supply, installation, testing and commissioning of <b>Outdoor Feeder Pillar-1</b> Refer 3.9 annexure-II.   | 1 No.      |                 |            |
| 1.10.   | Supply & installation of <b>outdoor feeder pillar-2</b> Refer 3.10 annexure-II.  | 1 No.      |                 |            |
| 2.0.    | <i>Supply, installation, testing and commissioning of LED light fittings as per technical specifications. Refer annexure-II.</i>   |            |                 |            |
| 2.1.    | Supply & installation of 40 watt <b>LED Post Top Lantern fitting LPTO-40-CDL or equivalent</b> on 3 mtrs high poles.   | 30 Nos.    |                 |            |
| 2.2.    | Supply & installation of 100 watt <b>LED Flood Light</b> on existing 3 mtrs high, 58mm dia poles including providing suitable frame made out of 35X35X5 mm MS angle on poles as required.                      | 3 Nos.     |                 |            |



|       |   |           |  |  |
|-------|---|-----------|--|--|
| 3.0.  | Supply and fixing of following LT Al./ Cu. Cables/ copper flexible cables/ UNINYVIN cables  |           |  |  |
| 3.1.  | Supply & laying of <b>aluminum cable</b> , 3.5 core 240 sq.mm armoured XLPE power cable in the existing cable trench as per specifications  | 200 mtrs  |  |  |
| 3.2.  | Supply & laying of <b>aluminum cable</b> , 3.5 core 120 sq.mm armoured XLPE power cable in the existing cable trench as per specifications  | 200mtrs   |  |  |
| 3.3.  | Supply & laying of <b>aluminum cable</b> , 4 core 50 sq.mm armoured XLPE power cable in the existing cable trench as per specifications   | 150 Mtrs. |  |  |
| 3.4.  | Supply & laying of <b>aluminum cable</b> , 4 core 25 sq.mm armoured XLPE power cable in the existing cable trench as per specifications   | 200 Mtrs. |  |  |
| 3.5.  | Supply & laying of <b>aluminum cable</b> , 3 core 6 sq.mm armoured XLPE power cable in the existing cable trench as per specifications  | 450 Mtrs. |  |  |
| 3.6.  | Supply and laying of <b>Copper Cable</b> , 120 sq.mm , Welding Cable, Double Insulated, Extra Flexible with HOFR Covering using Annealed Bare Copper conductor and as per the specifications. | 100mtrs   |  |  |
| 3.7.  | Supply and laying of 1.1 kv grade <b>Copper Cable</b> , 70 sq.mm (360/0.5) single core PVC insulated (unsheathed flexible cable )   | 500 Mtrs. |  |  |
| 3.8.  | Supply and laying of 1.1 kv grade <b>Copper Cable</b> , 4 core , 35 sq.mm (276/0.4) PVC insulated (unsheathed flexible cable ).   | 100 Mtrs. |  |  |
| 3.9.  | Supply of 1.1 kv grade <b>Copper Cable</b> , 4 core , 10 sq.mm (80/0.4) PVC insulated (unsheathed flexible cable ).   | 200 Mtrs  |  |  |
| 3.10. | Supply of 1.1 kv grade <b>Copper Cable</b> , 4 core , 6 sq.mm (84/0.3) PVC insulated (unsheathed flexible cable ).  | 200 Mtrs  |  |  |
| 3.11. | Supply of 1.1 kv grade <b>Copper Cable</b> , 4 core , 4 sq.mm (56/0.3) PVC insulated (unsheathed flexible cable ).  | 200 Mtrs  |  |  |
| 3.12. | Supply of 1.1 kv grade <b>Copper Cable</b> , 4 core , 1.5 sq.mm (22/0.3) PVC insulated (unsheathed flexible cable ).  | 200 Mtrs  |  |  |
| 3.13. | <b>Termination of 3.5 core 400 sq.mm</b> armoured Al. XLPE cable with brass cable glands and Al. thimbles including supply of gland and lugs.   | 1 No.     |  |  |
| 3.14. | <b>Termination of 3.5 core 240 sq.mm</b> armoured Al. XLPE cable with brass cable glands and Al. thimbles including supply of gland and lugs.   | 10Nos.    |  |  |

|       |   |           |  |  |
|-------|---|-----------|--|--|
| 3.15. | <b>Termination of 3.5 core 120 sq.mm</b> armoured Al. XLPE cable with brass cable glands and Al. thimbles including supply of gland and lugs.                                       | 2 Nos.    |  |  |
| 3.16. | <b>Termination of 4 core 50 sq.mm</b> armoured Al. XLPE cable with brass cable glands and Al. thimbles including supply of gland and lugs.  | 4NOS      |  |  |
| 3.17. | <b>Termination of 4 core 25 sq.mm</b> armoured Al. XLPE cable with brass cable glands and Al. thimbles including supply of gland and lugs.  | 10NOS     |  |  |
| 3.18. | <b>Termination of 3 core 6 sq.mm</b> armoured Al. XLPE cable with brass cable glands and Al. thimbles including supply of gland and lugs.   | 60 Nos.   |  |  |
| 3.19. | <b>Termination of 120 sq.mm single core</b> Copper, HOFR insulated welding cable with PG gland and copper lugs (bottle type) including supply of gland and lugs.                    | 10nos     |  |  |
| 3.20. | <b>Termination of 70sq.mm single core</b> PVC insulated copper cable (unsheathed flexible cable ) with PG gland and copper lugs including supply of gland and lugs.                 | 60nos     |  |  |
| 3.21. | <b>Termination of 35sq.mm single core</b> PVC insulated copper cable (unsheathed flexible cable ) with PG gland and copper lugs including supply of gland and lugs.                 | 12nos     |  |  |
| 3.22. | <b>Termination of Copper cable</b> , 4 core 35 sq.mm armoured XLPE power cable with brass cable glands and copper lugs including supply of gland and lugs.                          | 2nos      |  |  |
| 4.0   | <i>Supply of GI perforated cable tray /tee/bends with covers and coupler plates, nuts and bolts etc.as per specifications.</i>  |           |  |  |
| 4.1   | Supply of 450 mm wide, 2.0 mm thick mm GI perforated cable tray of minimum 75 mm depth with covers and coupler plates, nuts and bolts covers as per specifications.                 | 50 Mtrs.  |  |  |
| 4.2   | Supply of 450 mm wide, 2.0 mm thick mm GI perforated cable tray of minimum 75 mm depth <b>BEND</b> with covers and coupler plates, nuts and bolts as per specifications.            | 5nos      |  |  |
| 4.3   | Supply of 450 mm wide, 2.0 mm thick mm GI perforated cable tray of minimum 75 mm depth <b>TEE</b> with covers with covers and coupler plates, nuts and bolts as per specifications. | 5nos      |  |  |
| 4.4   | Erection of 450 mm wide, 2.0 mm thick mm GI perforated cable tray of minimum 75 mm depth GI perforated cable tray with covers as per specifications.                                | 100 Mtrs. |  |  |

|      |   |           |  |  |
|------|---|-----------|--|--|
| 4.5  | Erection of 450 mm wide, 2.0 mm thick mm GI perforated cable tray TEE/ BEND of minimum 75 mm depth GI perforated cable tray with covers as per specifications.  | 10Nos.    |  |  |
| 5.0  | <i>Miscellaneous items such as earthing, supports and earth excavations/ PANEL shiftings etc. as required.</i>  |           |  |  |
| 5.1  | Supply and fixing of 25X3 mm Copper earth strip.  | 200 kg    |  |  |
| 5.2  | Supply & laying of 8 SWG GI earth wire along with cables and tying the same with GI wire of adequate size.  | 160kg     |  |  |
| 5.3  | Supply of MS angle, C-channel/ pipe etc. as required for supports, frames etc.  | 1000 kg   |  |  |
| 5.4  | Fabrication and installation of supports from of MS angle, C-channel/ pipe and MS plates in C/L/U form of required arm length and including primer and two coats of enamel paint of approved shade etc. as required.                | 1000kg    |  |  |
| 5.5  | Installation of existing 3.5mtrs high MS C-channel post/pillar etc. as required.  | 5Nos      |  |  |
| 5.6  | Removal of existing LT panel of approximate size 2000X2000X450 mm including disconnecting of cables, cable tray, earthing etc and shifting the panel to desired location within the campus as instructed. (up to a lead of 200mtrs) | 2 Nos.    |  |  |
| 5.7  | Shifting & erection of LT panel of approximate size 2000X2200X600 mm on cable trench including providing MS angle supports as required. (up to a lead of 200mtrs)   | 1 No.     |  |  |
| 5.8  | Supply & erection of chemical earth pits (2 Nos) in rocky area by using 75X3000 mm GI earth electrode complete with back filling compound and 10 mtrs of 25X5 mm GI earth strip and as per specifications.                          | 2 set     |  |  |
| 5.9  | Supply & installation of 3 mtrs high <b>GI Compound Light Pole</b> with pole box, base plate complete as per specifications.  | 26 Nos.   |  |  |
| 5.10 | Removing of light fitting & cutting of 7.5 mtr high street light pole at 2.5 mtrs from ground level, providing suitable MS reducer (150 mm to 60 mm) by welding for installation of post top light fitting as required.             | 6 Nos.    |  |  |
| 5.11 | Removing of light fitting & cutting of 7.5 mtrs high street light pole at ground level and shifting the same to stores as required.   | 2 Nos.    |  |  |
| 5.12 | Digging of cable trench of size 300 mm wideX450 mm deep in the ground and back filling the same after cable laying including  | 400 Mtrs. |  |  |

|      |   |          |  |  |
|------|---|----------|--|--|
|      | supply & laying of 50 mm dia double wall corrugated PVC pipe as per CPWD specifications.  |          |  |  |
| 5.13 | Digging cable trench of size 300X450 mm by removing stone pitching including supply & laying of 50 mm dia double wall corrugated PVC pipe & restoring the same as required. | 40 Mtrs. |  |  |
| 5.14 | Digging & refilling of cable trench for laying of cables in ground including supply of sand & bricks etc as required as per CPWD specifications for LT cable laying.        | 300mtrs  |  |  |
| 5.15 | Supply & fixing of thermoplastic type cable junction box of size 300X600X170 mm with 4 nos. of open type terminals suitable for 3.5CX300 sqmm cable termination.            | 2 Nos.   |  |  |
| 5.16 | Supply and installing thermoplastic outdoor type box with 10 A DP MCB as required for control of LED flood lights.  | 2 Nos.   |  |  |
| 5.17 | Making rectangular hole in Brick wall of 9" thick of size 1mtrsX 0.5mtrs for entry of cable trays.  | 1 no.    |  |  |
| 5.18 | Making 4"-6" dia holes in concrete walls having 300mm thickness using DIAMOND CORE CUTTING MACHINE and clearing of dust using powerful vacuum suckers.                      | 8nos     |  |  |

Total Amount (Rs.)

Total Amount in words ( Rupees ..... )  
 .....

Signature & Seal of Bidder

**NOTE: Quoted rates above shall be inclusive of all applicable taxes & duties.**