

**TENDER DOCUMENTS
FOR
PROVISION OF ELECTRIC WORKS LIKE LT PANELS,
1100 VOLT GRADE XLPE SHEATHED ARMoured
CABLES AND OTHER ELECTRICAL ITEMS
FOR THREE PHASE SUPPLY TO HOSTELS OF
ARMY INSTITUTE OF LAW
SECTOR-68, MOHALI**

LAST DATE OF SUBMISSION OF TENDER: 30 APRIL 2023

TABLE OF CONTENTS

| S.No | Subject | Page No |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1 | Definition of Terms | 1 |
| 2 | Instructions to Tenderer's | 2-3 |
| 3 | Terms and conditions for Tenderer's for Technical bid | 3-4 |
| 4 | Articles of Agreement | 4-5 |
| 5 | Form of Tender | 5-6 |
| 6 | Check list of Documents for Technical Bid | 7 |
| 7 | Commercial Bid | 7 |
| 8 | Detailed Scope of Work | 7-11 |
| 9 | General Conditions of Contract a) Work order b) Modification and variation c) Materials and services d) Make of Material e) Authorities and laws f) Material and workmanship | 11-12 |
| 10 | Technical Specification | 12-13 |
| 11 | Supervision | 13 |
| 12 | Access to Work | 13 |
| 13 | Schedule of Quantities and Drawings a) Schedule of work b) Procurement of materials c) Sufficiency of schedule | 14 |
| 14 | Measurement & Bills | 14-15 |
| 15 | Removal of Material/Installations | 15 |
| 16 | Completion Certificate a) Commencement defect liability period b) Completion drawings & documents c) Defect liability period | 15-16 |
| 17 | Labour laws | 16 |
| 18 | General insurance | 16 |
| 19 | Date of commencement | 16 |
| 20 | Time extension | 16-17 |
| 21 | Termination of contract | 17 |
| 22 | Certification and payments | 17 |

| | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 23 | Arbitration | 17 |
| 24 | Technical Scrutiny of Final Bill | 18 |
| 25 | Co-ordination | 18 |
| 26 | Site Meeting | 18 |
| 27 | Prices | 18 |
| 28 | Extra Items | 18 |
| 29 | Payment Terms | 19 |
| 30 | Special Conditions of Contract <ul style="list-style-type: none"> • Storage and office shed • Electricity and water • Maintenance of site • Security rules • Display of drawing at site • Examination of drawings | 19-20 |
| 31 | Safety Regulations | 20 |
| 32 | Performance Test | 21 |
| 33 | Performance Guarantee | 21 |

1. **Definition of Terms.** 'Owner/Purchaser' shall mean the client on whose behalf this enquiry is issued and his authorized representative.

- 'Bidder' shall mean party who quotes against this enquiry.
- 'Contractor' shall mean the successful 'BIDDER' whose bid has been accepted by Owner and on whom Purchase/Work Order is placed.
- 'SITE' shall mean the actual place of work.
- 'SPECIFICATIONS' shall mean collectively all the terms and stipulations contained in these provisions of contract as general and special conditions, amendments, deletions, revisions as made in agreement or written agreements made pertaining or relevant to method or scope of work.
- 'Month' shall mean calendar month.
- 'Plant/Equipment' and 'Works' shall mean respectively the goods to be supplied and services to be provided by contractor.
- 'Contract/Work Order' shall mean the order specifying works and associated specifications to be executed by "Owner and Contractor".
- 'Contract Period' shall mean the period during which "Owner" and "Contractor" shall execute the entire contract as agreed.
- 'Guarantee Period' / "Defect Liability Period" shall mean period during which the plant / equipment and installations shall give same and trouble free performance as guaranteed by contractor.
- 'Engineer's Instructions' shall mean instruction oral or written, drawings, direction, explanations issued by Consultant / Engineer / Architects on behalf of the owner from time to time during period of contract. (All 'oral' instructions shall be authenticated by written instructions immediately.)
- 'Performance Tests' shall mean all tests to be carried out by contractor as per specifications prior to installation being taken over by Owner under guarantee.
- 'Commissioning' shall mean integrated activity of carrying out performance tests, initial and trial operations of system.
- 'Drawings' shall mean all drawings furnished by Engineer / Owner for basis of proposal or for carrying out works, from time to time; all drawing submitted by vendor provided such drawings are acceptable to Engineer/Owner.
- 'UR' means quote unit rate.

2. Instructions to Tenderer's.

- (a) The tender is to be filled properly and all relevant information asked for shall be provided in the given format.
- (b) Technical and Commercial bids are to be **submitted in separate envelopes** with **super scribed** as **Technical Bid or Commercial Bid** as the case may be.
- (c) Technical bid to include blank BOQ (without price schedule) attached in this document duly signed by the Vendor/Tenderer along with official stamp.
- (d) The tenderer's are required to furnish information about similar works handled, staff held and infrastructure etc in technical bid.
- (e) Commercial bid to include BOQ with price schedule duly filled and signed on each page, super scribing the envelope as commercial bid.
- (f) The schedule of rates technical bids and commercial bids to be submitted in two sets.
- (g) All section wise total amounts shall be written in words also.
- (h) EMD @2% of total cost to be deposited by the selected tenderer to AIL Mohali before commencement of work. EMD shall be in the form of Demand draft of Nationalized Bank and to be deposited under a covering letter to AIL, Mohali. The DD should be in favour of AIL Mohali, payable at Mohali.
- (i) The duly completed tender shall be submitted at Army Institute of Law in a sealed envelope on or before the time indicated.
- (j) Building drawings shall be available for reference & discussions with AIL office.
- (k) Time is essence of contract; hence contractor has to mobilize proper manpower & material in a short mobilization period to site. No extension will be given for completion period, without proper and genuine reasons.
- (l) All bidders should visit site prior to giving quotes to get acquainted with the site conditions. No demand shall later be entertained due to site conditions. Time for visit – 0900 hrs to 1600 hrs on working days upto 29 April 2023.

(m) The Principal AIL, reserves the right to accept or reject any or all the quotations without assigning any reasons.

(n) No cuttings/overwriting is permitted. Documents with cutting/overwriting will be held null and void.

(p) Tender will be required to acquaint himself/herself with the existing electrical set up at college before filing bid to clearly understand the scope of work. Tender or his/her representative can visit the college from Monday to Friday (except on gazetted holidays) between 9:00 AM to 4:00 PM for familiarization.

3. Terms and Conditions for Tenderer's for Technical Bid. Bidders who fulfil the following requirements shall only be eligible to apply:-

(a) Joint ventures are not accepted.

(b) The bidder should have satisfactorily completed similar works as mentioned below during the last two years ending last day of month previous to the one in which tenders are invited.

(i) Three similar works each costing not less than **30%** of the estimated cost put to tender (_____).

OR

(ii) Two similar works each costing not less than **40%** of the estimated cost put to tender (_____).

OR

(iii) One similar work each costing not less than **50%** of the estimated cost put to tender (_____).

“Similar work shall means Supplying & laying of 1100 volt grade or above XLPE insulated PVC sheathed aluminium conductor armoured cables as per specification in existing trenches, cable trays, ducts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning.

(c) Bidder should have average annual financial turnover (Gross) of Rs 50,00,000/- during the last three consecutive financial years ending 31st

March 2022. Balance sheets duly audited by the chartered accountant, year in which no turnover is shown would also be considered for working out the average.

(d) Bidder should not have incurred any loss (profit after tax should be positive) not in more than two years during available last five consecutive balance sheets, duly certified and audited by chartered accountant. **(The balance sheet in case of Pvt/public Ltd. Company means its stand alone financial statement and consolidate financial statement both).**

(e) The bidder's performance for qualifying works completed in the last seven years should be certified by an officer not below the rank of executive engineer or equivalent.

(f) The bidder to provide requirement of technical representative(s) and recovery rate as per format given below:-

| S. No | Minimum Qualification of technical representative | Discipline | Designation | Minimum experience | Number | Rate at which recovery shall be made from contractor in the event of non-deployment |
|-------|---------------------------------------------------|------------|------------------------------------|--------------------|--------|-------------------------------------------------------------------------------------|
| 1. | Graduate Engineer | Electrical | Principal technical representative | 5 years | 1 No. | Rs 15000/- per month |
| 2. | Diploma Engineer | Electrical | Technical representative | 5 years | 1No. | Rs 10000/- per month |

Note: All the documents' shall be duly attested & counter signed by the agencies.

4. Articles of Agreement. The vendor/ agency will be required to sign following agreement with the College after completion of Tender process.

Articles of Agreement -----made on the -----
----- day of ----- 2023 between: _____
(hereinafter called "The Owner") of the part and -----
----- of (or whose registered office is
situated at) -----
(herein after called "The contractor"). Whereas the owner is desirous of
awarding the External & Internal Work for -----
----- . Drawings and bill of quantities
showing and describing the work to be done prepared by under the direction
of AIL and whereas the Contractor has supplied the owner with a fully priced
copy of the said bills of quantities (which copy herein after referred to as "The
Contract bills") and whereas the said drawings (herein after referred to as "The
Contract drawings") and the contract bills have been signed by or on behalf of
the parties here to and where to and where as the Contractor has deposited
the sum of rupees -----
with the OWNER for the due performance of this agreement. Now it is hereby
agreed as follows:

For the consideration herein after mentioned the contractor will upon and
subject to the condition annexed, carry out and complete the work shown
upon the contract drawings and described by or referred to in the contract bills
and the said Conditions.

The owner will pay the contractor the sum of Rs. -----
----- (herein after referred to as "Contract sum")
or each other sum as shall become payable here under at the time and in the
manner specified in the said conditions.

5. Form of Tender (To be accompanied by DD for Rs.1000/-)

To,

The Principal
Army Institute of Law
Sector 68, Mohali
PIN - 160062

Dear Sir/Madam,

Having examined the drawings, specifications and schedule of quantities of work specified and having visited and examined the site of works for acquiring requisite information. I/We hereby offer to execute the works specified below in the specified time period at the rates quoted in the Schedule of prices attached in accordance with the drawings, designs, specifications, conditions of contract and in all other respects with such conditions as applicable. (Bidder should fill and duly **sign the form of tender his letter head**)

1. Description of Work:
2. Completion period: 90 days after acceptance of Contract Agreement.
3. Our Bankers are:
 - (a)
 - (b)
4. Names of Owner/Partner of Firm
 - (a)
 - (b)
 - (c)
5. Name of Partners/Director of Firm Authorized to Sign.
6. Name of Person having Power of Attorney to Sign the Contract.
7. Agency/ Company PAN No(specify)-
8. GST No-
9. Company/ Agency Complete Address, Contact No, Email ID and website details.
 - (a) Address (attach address proof)
 - (b) LandLine No
 - (c) Mob No
 - (d) Email Address
10. Two References (name and contact of person where the company/agency has accomplished their work.

| S.No | Name of Person | Designation | Installation/ Office | Contact Details |
|------|----------------|-------------|----------------------|-----------------|
| 1. | | | | |
| 2. | | | | |

11. DD No. _____, Drawn on _____ is attached.

PLACE:

DATE:

Signature & Seal of Contractor

6. Check List of Documents for Technical Bid.

- (a) Application having all detail of correspondence address.
- (b) Copy of GST certificate.
- (c) Copy of PF certificate.
- (d) Cancel cheques of banks.
- (e) HT electric licence issued by the State/Centre government.
- (f) Certificate of similar nature of works (as mentioned in tender documents)
- (g) Turnover certificate of previous three years up to 31-3-2022 (as mentioned in tender documents).

Note: The financial bid will be opened only in case of bidders whose technical bid has been evaluated successfully. If they do not full fill the criteria the bid shall not be entertained.

7. **Commercial Bid.** The commercial bid (BOQ) is attached as per **Appx 'A'**.

Important Note: All documents should be marked by the contractor on his company letter head with his signature and stamped with company stamp/seal or else the given documents will be rejected.

8. Detailed Scope of Work.

- (a) Supplying & laying of following 1100 volt grade XLPE insulated PVC sheathed aluminium conductor armoured cables as per specification in trenches, cable trays, ducts, clamped includes anchor fastners wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning.
- (b) Supply and making End terminations, with proper size double compression brass glands and suitable size lugs/ thimbles for the following LT cables.
- (c) Supply, installation, testing and commissioning of LT panel/electrical board outdoor cubical panel made out of 3 mm and 2 mm thick inner CRCA sheet duly Powder coated/painted, dust and vermin proof compartments for required swicgears, confirming IS- 8623, with gland

plates, suitable arrangement for earth connections, suitable size control wiring, consists of following switchgears complete as required.

(d) Supply, installation, testing and commissioning of LT panel/electrical board outdoor cubical panel made out of 3 mm thick and 2 mm thick inner CRCA sheet duly powder coated/painted, dust and vermin proof compartments for required switchgears, confirming IS- 8623, with gland plates, suitable arrangement for earth connections, suitable size control wiring , consists of following switchgears complete as required.

(e) SITC of 250 KVAR APFC panel made out of 3 mm thick outdoor and 2 mm thick inner CRCA sheet duly powder coated/ painted, suitable for outdoor installation, dust and vermin proof compartment for switchgears proper arrangement for earth connections, floor mounted, front operated with following switchgears complete as required.

- i) Incomer: 630A , 36KA, TP, MCCB with thermal and magnetic release -- 01 No.
- ii) 15 KVAR CAPACITOR BANK -04 NOS.
- iii) 20 KVAR CAPACITOR BANK -02 NOS.
- iv) 25 KVAR CAPACITOR BANK -06 NOS.
- v) 15 KVAR THYRISTOR BANK -04 NOS.
- vi) 20 KVAR THYRISTOR BANK -02 NOS.
- vii) 25 KVAR THYRISTOR BANK -06 NOS.

(f) Excavation of cable trenches of size 2 ft deep & 1.5 ft wide as per ground mentioned below:-

- i) Katccha ground
- ii) Pakka ground/ROAD

(g) Providing G.I Earthing with G.I Plate size 600x600x6 mm including excavation & refilling of earth pit and soil treatment with charcoal & salt , provision of watering arrangement and M.S. pit cover as required.

(h) Providing G.I Earthing with G.I Plate size 600x600x6 mm including excavation & refilling of earth pit and soil treatment with charcoal & salt, provision of watering arrangement and M.S. pit cover as required.

(j) Supply and fixing G.I. strip on surface or in ground for earth extension as reqd.

(k) Supply and fixing G.I strip on surface or in ground for earth extension as reqd.

(l) Providing of the Cable Tray for holding electrical wiring of building which insulated electrical cables used for Power Distribution, Control and Communication.

(m) **Scope Includes:-** PVC bedded aluminium stranded conductor served with inner sheathing of PVC tape armoured with galvanised steel wire or tape and over all PVC sheathed of size are as under:-

- (i) (aa) 3.5 core 630 sq. Mm
- (ab) 3.5 core 185 sq. Mm
- (ac) 3.5 core 150 sq. mm

- (ii) (aa) 3.5 core 120 sq. Mm
- (ab) 3.5 core 240 sq. Mm
- (ac) 4 core 16 sq. mm

(iii) Incomer: 200A , 25KA, 4P, MCCB with thermal and magnetic release -- 01 No.

Multifunction meter for VAF measurement with ct set-- 01 No.

Phase indicating lamps with protection MCBs. - 03 No.

Copper BUS-BAR: 300A - 04 No.

Outgoings:

aa) 40A 16 KA 4P, MCCB with T/m release - 08 Nos.

ab) Spare Space for MCCB: - 01 No.

(iv) Incomer: 160A, 25KA, 4P, MCCB with thermal and magnetic release -- 01 No.

Multifunction meter for VAF measurement with ct set-- 01 No.
Phase indicating lamps with protection MCBs. - 03 Nos.
Copper BUS-BAR: 250A – 04 Nos.

Outgoings:

aa) 40A 16 KA 4P, MCCB with T/m release -08Nos.
ab) Spare Space for MCCB: - 01 No.

(v) aa) Incomer: 630A, 36KA,TP, MCCB with thermal and magnetic release – 01 No.

Phase indicating lamps with protection MCBs. - 03 No.

12 step APFC digital relay

Copper BUS-BAR: 1000A TPN

Outgoings:

ab) 15 KVAR CAPACITOR BANK -04 NOS.

ac) 20 KVAR CAPACITOR BANK -02 NOS.

ad) 25 KVAR CAPACITOR BANK -06 NOS.

ae) 15 KVAR THYRISTOR BANK -04 NOS.

af) 20 KVAR THYRISTOR BANK -02 NOS.

ag) 25 KVAR THYRISTOR BANK -06 NOS.

(vi) Katccha ground

Pakka ground/Road

(n) **Post Completion and Handing over of Documents.** Contractor's scope of work also covers post completion and handing over of documents, which will cover the following:

(i) Installation & maintenance manuals of all equipment.

(ii) Test & warranty certificates of all bought out items.

(iii) Statutory documents required for record.

(iv) Testing & commissioning Documents in standard forms.

(v) Laminated LT distribution diagram and route of LT cable mounted on a board.

(vi) Earth resistance register duly signed by contractor and Project Monitoring Group.

9. General Conditions of Contract.

(a) **Work Order.**

(i) The work order conveys final agreement between owner and contractor on terms and conditions and is exclusive statement of terms of their agreement.

(ii) In case of discrepancy between general conditions and specifications, drawings furnished by owner, the latter shall take precedence.

(b) **Modification and Variation.** The order may be amended, modified or rescinded only in writing by both the parties and their duly authorized representatives pursuant to terms stated therein.

(c) **Materials and Services.**

(i) **Labour and Tools Tackles.**

(aa) The contractor shall provide at his cost, all necessary material, tools, tackles, skilled manpower for proper execution of works specified in the schedule of the quantities and as per drawings and specifications.

(ii) Any discrepancy in schedule of quantities and drawings shall be brought to notice of engineer/owner for decision, immediately.

(d) **Make of Material.**

(i) Contractor shall provide all material of specific or can't be specific makes accepted during discussion stage or from approved list of makes.

(ii) In case of any problem/ difficulties in procurement of such items, alternative makes will be approved on samples and specifications submitted by contractor.

(iii) Alternative material shall be procured only after written approval for makes.

(iv) Procurement and use of material of makes not in approved list shall be sole responsibility of the contractor. Contractor shall replace all such material at no additional cost within stipulated period.

(e) **Authorities and Laws.**

(i) Contractor shall confirm to all provisions of any law pertaining to works and to the regulations and by laws of related authorities and for water/electricity supply.

(ii) Contractor shall indemnify owner/Engineer from all conflicts arising out of provisions of regulations & laws.

(f) **Material and Workmanship.**

(i) All the materials to be supplied for execution of works shall be of first quality, new and strictly as per specifications.

(ii) In case employer procures such items and hands over the same for fixing to the contractor, the contractor will receive the goods, open the crates and report any discrepancies, store it in his custody until required, and install and commission it with necessary care and the best workmanship.

(iii) The contractor shall be responsible for any loss or damages once the materials are supplied to him in good order and condition.

(iv) All the installation rates are deemed to include handling, erection, fabrication services & erection hardware required for all items.

(v) All the works shall be executed with highest quality of workmanship and as directed by owner/engineer.

(vi) In case of mock-ups or approved samples, the quality of the same shall be adhered to for all works and any work quality & material below that standard will be rejected.

10. Technical Specifications.

(a) **General.** The entire electrical installation shall be carried out in accordance with latest Indian Electricity Code and relevant IS Standards up to date. The work shall also comply with all statutory regulations of

supply agencies, state inspection authorities and fire regulations.

(i) Definition of terms pertaining to all technical requirements as per IEC / IS shall apply.

(ii) All material, equipment, fittings used in the installation shall be of approved quality conforming to relevant IS specifications.

(iii) On completion of works contractor shall carry out all necessary tests including but not limited to pressure test, insulation resistance test.

(iv) Continuity of conductors and earth resistance and functional tests along with commissioning checks to the satisfaction of Consultant/ Engineer. Contractor shall employ services of specialist agency for testing of substation equipment, L.T. Cables & L.T. Joints, relays & for harmonic analysis.

(v) Contractor shall furnish necessary test certificates as required by authorities and consultant.

(vi) Installation of equipment shall include all necessary works and fixing accessories like hardware, clamps, round blocks supports boxes etc. required for completing installation satisfactorily.

(vii) Complete location/room wise technical and functional testing will be done for equipments & installation before handing over and a consolidated acceptance test report shall be prepared by contractor based on standard formats along with test certificates of bought out items, certificates of testing carried out at site. All equipment & installation test will be done jointly with representatives of client, consultant and signed jointly for the acceptance with remarks if any.

11. Supervision. A competent representative of contractor shall be available at work site for supervision of works and for co-coordinating, receiving instructions from owner/engineer during entire period of contract. The supervisory staff required shall depend on value & complexity of job.

12. Access to Work. Owner/ Engineer or their authorized representative shall have access to works being carried out at all reasonable times. No person, not authorized by owner/engineer except representatives of public authorities shall be allowed at work site at any time.

13. Schedule of Quantities and Drawings.

(a) **Schedule of Work.**

- (i) The schedule of quantities indicates nearest approximate quantities of the items works.
- (ii) There could be possibility of upward or downward variation of quantities due to site modifications.
- (iii) Any variation of quantities of the individual items as per schedule and overall cost variation of 25% shall be accepted by contractor without any financial implication.
- (iv) Contractor shall take exact measurements for items like cables, earth strips prior to bringing and cutting the same.
- (v) If variation is beyond above stipulated limits, such items shall be carried out after written mutual agreement. However, no excess payment claims for additional quantities shall be entertained if variation is established prior to deliveries of stipulated quantities.

(b) **Procurement of Materials.**

- (i) Contractor shall bring quantities of items like cables, earthing strips, etc. after specific measurement.
- (ii) Client will not take over excess quantities of any items unless it is specifically agreed.
- (iii) Contractor shall have to take back all such quantities without any financial burden on client.

(c) **Sufficiency of Schedule.** The contractor shall be deemed to have satisfied himself before tendering as to correctness and sufficiency of his tender for works and prices quoted therein which shall cover all obligations under contract for satisfactory completion of works, and stipulated performance of system/equipment in his preview.

14. Measurements and Bills. Measurements and billing shall be done by specific method detailed below: -

- (a) Owners representative/ Engineer shall check these measurements from time to time. Coordination for checking will be contractor's responsibility.

- (b) Contractor shall make bills based on checked measurements only.
- (c) Bills shall be made in standard and cumulative formats only. Non-cumulative bill will not be accepted.

15. Removal of Material/ Installations. The owner/engineer during the progress of work have power to order in writing removal from the works any material/installations which in their opinion are not as per specifications or instructions, and for carrying out rectification/rework within specified time and contractor shall carry out such removals/rework as per specification at his own cost. The owner/engineer can get such rectifications/rework done from other agencies at the cost of contractor, if the same are not carried out by them in the stipulated and agreed period.

16. Completion Certificate.

(a) **Commencement of Defect Liability Period.** The work shall be deemed to have been completed on written certificate by Engineer that they have been virtually completed. The "Defect Liability Period" shall commence from the date of such certificate.

(b) **Completion Drawings and Documents.**

(i) On completion of works, prior to getting completion certificate contractor shall prepare as built drawings in association and to satisfaction of consultant/Engineer giving all particulars.

- (aa) Exact dimensions and clearances.
- (ab) Switchgear ratings, ratings of equipment.
- (ac) Cable sizes, cable schedule.
- (ad) Earthing details.

(ii) Contractor shall submit the as-built drawing prints and one set of reproducible to the client.

(iii) Contractor shall also submit detail drawings, instruction & maintenance manuals & test certificates for all brought out items. Test certificates of all tests carried out at site shall also form part of this. One set of all handing over documents shall be given to Engineer/ Consultant.

(c) Defect liability Period.

(i) Any defects, faults, deterioration in performance of the material and installations which may appear, during the "Defect Liability Period" of twelve months or any period as agreed by both parties from virtual completion of contract shall be amended/made good by the contractor at his own cost within a reasonable time.

(ii) In case of default, owner may employ and pay other person to make good the defects and deduct the expenses from the dues payable to contractor on certification from engineer.

(iii) The defect liability period unless otherwise specifically agreed shall be twelve months.

17. Labour laws.

(i) Contractor shall have valid PF, ESI registration.

(ii) All laws related to Labour, PF, ESI, medical insurance etc. shall be adhered to by contractor.

(iii) No child Labour shall be employed by contractor.

18. General Insurance. Contractor shall provide necessary insurance cover for all equipment and material in his scope till the system is handed over. Necessary insurance cover shall also be provided for manpower employed on site. Contractor shall indemnify Owner/Engineer and their representatives employed and hold them harmless in case of any damages injuries/accidents and any claims arising out of them.

19. Date of Commencement. The date of commencement of work shall be accounted from the date of issue of LOI (letter of intent).

20. Time Extension. If in the opinion of owner/engineer the work is delayed by force majeure, by reasons beyond control of contractor, extension of time for carrying out the works can be sanctioned by owner/engineer on written request from contractor with due reasoning/ supporting evidence. Force majeure shall mean & include compliance with statutory laws & regulation, government order or change in orders, war & war like conditions, acts of civil & military authorities, fire, floods, earthquakes and other acts of God, sabotage,

revolt, strikes & lockout of more than 2 weeks. However, contractor and owner in such case should devise means of expediting the progress for performance as per contract.

21. Termination of Contract. Owner shall be entitled to terminate the contract in case contractor fails to fulfil one or more conditions of contract

- (a) Has abandoned the work.
- (b) Has failed to commence the work or has without any lawful excuse under contract conditions suspended work progress for more than one week or,
- (c) Has failed to proceed with the works and failed to make such due progress for timely completion of works or.
- (d) Has failed persistently to observe and perform works as per specifications and contract conditions.

22. Certification and Payments. The contractor shall be paid by owner from time to time under interim measurements certified by AIL on account of work executed in accordance with contract and to satisfaction of Engineer with certain retention till the work is completely executed. On virtual completion of the works, contractor shall be paid final installment retaining certain fixed percentage over a period known as "Defect Liability Period" as security. The final balance shall be payable to the contractor after expiry of "Defect Liability Period" and after such certificate is issued by engineer/consultant. Engineer/Consultant shall have power to withhold payment against work or part thereof not carried out to his satisfaction. The decisions, opinion and directions done only after the satisfaction of competent authority and certification in this regard kept on record. All other decisions, opinion, direction certificates etc. shall be subject to right of arbitration.

23. Arbitration. All the disputes of any kind in connection with contract shall be referred to engineer/consultant and settled in writing by him. If any party is dissatisfied with such decision taken only by the competent authority only. Both parties shall appoint Arbitrator/s and his/their decision shall be final and binding on both parties. Consultant/Engineer if necessary, will represent the client in case of arbitration.

24. Technical Scrutiny of Final Bill. The owner shall have right to get works and bills technically scrutinized at the time of payment of final bill. Owner shall be entitled to recover any money found to be over paid or over certified during such scrutiny.

25. Co-ordination. Contractor or his authorised representative shall be responsible for co-ordination with all other agencies working at site for smooth functioning and timely completion of works. The Contractor shall arrange his work program to suit the building progress and priorities given by Owner.

26. Site Meeting. Qualified/responsible representative shall attend necessary site meeting from contractor's side to take site instruction/decision in view of trouble shooting and progress review of works. Consultant/his representative shall attend the meetings as required. The Contractor shall arrange his work program to suit the building progress and priorities given by Owner/ Consultancy. Qualified/responsible representative shall attend necessary site meeting from contractor's side to take site instruction/decision in view of trouble shooting and progress review of works. Consultant/his representative shall attend the meetings as required.

27. Prices. The prices quoted in the schedule of works shall remain fixed during the period of contract. Bidder shall clear state taxes, statutory duties and levies which he is required to pay. The rates quoted by Bidder for the items in schedule of rates shall be inclusive of all taxes, duties etc. No separate amounts shall be payable to contractor on this account. Any upward statutory duty/ tax variation shall be payable on production of proof and necessary reduction shall be effected for downward variation.

28. Extra Items. Contractor may be required to carry out extra items due to site requirements or changes. All such items shall be carried out by contractor after written consent from client. Contractor shall submit a rate analysis of these items based on market rates. A margin of 15% shall be allowed over and above the expenses incurred. Escalation shall not be allowed on the extra items.

29. Payment Terms.

- (a) 80% of supply value against complete supply of material at site.
- (b) 10% of supply value & 75% of labour value on installation.
- (c) 10% of supply of installation on value against testing and Commissioning.

30. Special Conditions of Contract.

(a) **Storage and Office Shed.** The contractor has to prepare his own store and office shed. The owner at site will provide the suitable space. The contractor will be responsible for safety of his materials stored on site. The contractor shall make his own arrangements for housing of his staff. The Contractor will not be given space to put up Labour camp. Contractor shall make his own arrangement outside the premises without causing any hindrances to the Owner. The cost of putting up the labour camps will be borne by the Contractor. After completion of work the office & store shed shall be dismantled/ removed by the contractor at his own cost.

(b) **Electricity and Water.** AIL will provide any of these at one place. Contractor shall have to make his own arrangements for further use of the facility.

(c) **Maintenance of Site.** Contractor should keep the site, building office clean of during the period of contract and work will not be considered as complete till last particle of is disposed off to the satisfaction of the Engineer/owner.

(d) **Security Rules.** The contractor shall strictly follow all security rules of AIL particularly bearing upon the inward & outward movements of his trucks, people and equipment and shall also execute the work in such a manner so as to cause the minimum disturbance to the working of the owner.

(e) **Displays of Drawings at Site.** The drawings maintained on the site shall be carefully mounted on boards of appropriate size. They shall be protected from rain, ants or other insects.

(f) **Examinations of Drawings.** Contractor shall examine the relevant drawings, specifications of work which shall be available at the architect's/consultant's office. No claims shall be entertained for the assumptions made by tenderer, if any, Contractor shall not write any comments/conditions /figures or change the tender by writing on the same in any manner. The tender drawings are meant for guidance only.

31. Safety Regulations.

(a) Readily accessible **First Aid Kit** including adequate sterilized cotton and dressing shall be provided on site.

(b) All workmen working at heights shall be provided with **safety belts**.

(c) Workers engaged in welding and related works shall be provided with protective eye shields and gloves.

(d) The excavations, trenches etc. shall be provided with necessary **signals, barricades, obstacles** etc.

(e) All the electrical connections taken for construction purpose shall have earthing wires provided for equipment earthing.

(f) **Open/temporary jointing of the cables** shall be avoided and all connections shall be taken through proper sockets & plug tops, Insulated joints and switches etc.

(g) **Live wires** shall not be laid on ground/road or taken on surface without protective cover.

(h) All water sumps shall be underground or otherwise shall have covers. **All workmen and supervisors** shall be provided with **helmets/safety caps**.

(j) **All visitors/Engineers** shall also **wear helmets** when moving on sites. Safety apparatus like hand gloves of appropriate class shall be used for all testing commissioning activities. Proper care through danger notice boards, personal vigil shall be taken during such operation to avoid injury and damage.

(k) **Protective switchgear** shall also be used for **all temporary works**.

- 32. Performance Test.** It shall mean all tests to be carried out by contractor as per specifications prior to installation being taken over by Owner under guarantee.
- 33. Performance Guarantee.** It shall mean period during which the plant / equipment and installations shall give same and trouble free performance as guaranteed by contractor.

BOQ

Name of Work: Provision of Electrical work for Ph-2 of Hostels at AIL Mohali.

| S. No. | Description of work | Auth | Brief Specification | Unit | Qty | Rate | Amount | Remarks |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | 1 Supply and laying or fixing or passing through pipe 1100 volts grade heavy duty electric cable with XLPE insulated screened PVC bedded aluminium stranded conductor served with inner sheathing of PVC tape armoured with galvanised steel wire or tape and over all PVC sheathed of size 630 Sqmm x 3.5 core and making connection complete with suitable size lugs etc. Make : Polycab/ KEI/ Havells/ Plaza. | RM | 130 | | | |
| | | | 2 Supply and laying or fixing or passing through pipe 1100 volts grade heavy duty electric cable with XLPE insulated screened PVC bedded aluminium stranded conductor served with inner sheathing of PVC tape armoured with galvanised steel wire or tape and over all PVC sheathed of size 185 Sqmm x 3.5 core and making connection complete with suitable size lugs etc. Make : Polycab/ KEI/ Havells/ Plaza. | RM | 290 | | | |
| | | | 3 Supply and laying or fixing or passing through pipe 1100 volts grade heavy duty electric cable with XLPE insulated screened PVC bedded aluminium stranded conductor served with inner sheathing of PVC tape armoured with galvanised steel wire or tape and over all PVC sheathed of size 150 Sqmm x 3.5 core and making connection complete with suitable size lugs etc. Make : Polycab/ KEI/ Havells/ Plaza. | RM | 110 | | | |
| | | | 4 Supply and laying or fixing or passing through pipe 1100 volts grade heavy duty electric cable with XLPE insulated screened PVC bedded aluminium stranded conductor served with inner sheathing of PVC tape armoured with galvanised steel wire or tape and over all PVC sheathed of size 120 Sqmm x 3.5 core and making connection complete with suitable size lugs etc. Make : Polycab/ KEI/ Havells/ Plaza. | RM | 240 | | | |

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| | | | 5 | Supply and laying or fixing or passing through pipe 1100 volts grade heavy duty electric cable with XLPE insulated screened PVC bedded aluminium stranded conductor served with inner sheathing of PVC tape armoured with galvanised steel wire or tape and over all PVC sheathed of size 240 Sqmm x 3.5 core and making connection complete with suitable size lugs etc. Make : Polycab/ KEI/ Havells/ Plaza. | RM | 170 | | | |
| | | | 6 | Supply and laying or fixing or passing through pipe 1100 volts grade heavy duty electric cable with XLPE insulated screened PVC bedded aluminium stranded conductor served with inner sheathing of PVC tape armoured with galvanised steel wire or tape and over all PVC sheathed of size 16 Sqmm x 4 core and making connection complete with suitable size lugs etc. Make : Polycab/ KEI/ Havells/ Plaza/ Finolex. | RM | 2000 | | | |
| | | | 7 | Excavation in trenches for laying underground cables, poles and stays in any type of soil not exceeding 1.5m wide and not exceeding 1.5m deep and getting out. | Cum | 226.80 | | | |
| | | | 8 | Returning, filling in, including speading, levelling, watering and well ramming in layers not exceeding 25cms thick. | Cum | 42.98 | | | |
| | | | 9 | Removing surplus excavated material to a distance not exceeding 50m and depositing where directed at a level not exceeding 1.5m above the starting point. | Cum | 183.82 | | | |
| | | | 10 | Sand cushioning to under ground cable provided with a layer of 8cm deep before laying the cable and 15cm deep after laying and stretching the cable. | Cum | 124.20 | | | |
| | | | 11 | Brick covering with common burnt clay bricks old size laid as width equal to length of brick for protection to cables with well burnt sub class 'B' bricks laid dry flat all as directed. | Each | 19440 | | | |
| | | | 12 | Boring of holes under road payment, hard standing by trenchless technology using ultra sonic technique and necessary machine including HDPE pipe of 150 mm dia suitable for 0.4 mpa working pressure complete all as specified and directed. | RM | 20 | | | |

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| | | 13 | <p>Supply, install, testing and commissioning of factory made LT panel of suitable size, CPRI approved outdoor (tapped roof top) double door type for LT distribution floor mounted, totally enclosed cubical type modular compartment, dust and vermin proof with neoprene gasket fabricated out of CRCA sheet of thickness 3.00 mm for outer and 2.00 mm thick for inner compartment complete with bus bar chamber having openable front and rear shutters with suitable locking arrangements of shutters, duly powder coated. LT panel shall have angle iron frame 50x50x6 mm of 600 mm height to be embedded in PCC 1:2:4 not less than 300 mm complete including making connection of all incoming and outgoing cables with suitable size of lugs, glands etc and necessary earth work all as specified and directed with the following components:-</p> <p>(a) <u>Incoming</u> (i) MCCB with thermal and magnetic release adjustable type 200 Amps four pole, 415 volts, 50 Hz, rupturing capacity 25 KA and connection with proper size of thimbles complete - 01 Each</p> <p>(b) <u>Outgoing</u> (i) MCCB thermal and magnetic release adjustable type 40 Amps, four pole, 415 volts, 50 Hz, rupturing capacity 16 KA and connection with proper size of thimbles complete all as directed - 08 Each</p> <p>(c) Copper bus bar 04 Nos with heat shrinkable insulation mounted on porcelain insulators suitable for 300 Amps for phase and neutral.</p> <p>(d) Indicating LED lamps for all three phases with different colour RYB - 01 Set of three.</p> <p>(e) Digital Ammeter flush type with CT operated suitable for 0-300 Amps - 01 Nos.</p> <p>(f) Digital Voltmeter flush type of rating 0-500 volts with selector switch.</p> <p>(g) Suitable size cable gland for incoming and outgoing cables.</p> <p>Make of MCCB : ABB/ L&T/SIEMENS/Schneider/Legrand</p> | Each | 4 | | | |
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| | | | <p>14 Supply, install, testing and commissioning of factory made LT panel of suitable size, CPRI approved outdoor (tapped roof top) double door type for LT distribution floor mounted, totally enclosed cubical type modular compartment, dust and vermin proof with neoprene gasket fabricated out of CRCA sheet of thickness 3.00 mm for outer and 2.00 mm thick for inner compartment complete with bus bar chamber having openable front and rear shutters with suitable locking arrangements of shutters, duly powder coated. LT panel shall have angle iron frame 50x50x6 mm of 600 mm height to be embeded in PCC 1:2:4 not less than 300 mm complete including making connection of all incoming and outgoing cables with suitable size of lugs, glands etc and necessary earth work.all as specified and directed with the following components:-</p> <p>(a) <u>Incoming</u> (i) MCCB with thermal and magnetic release adjustable type 160 Amps four pole, 415 volts, 50 Hz, rupturing capacity 25 kA and connection with proper size of thimbles complete - 01 Each</p> <p>(b) <u>Outgoing</u> (i) MCCB thermal and magnetic release adjustable type 40 Amps, four pole, 415 volts, 50 Hz, rupturing capacity 16 KA and connection with proper size of thimbles complete all as directed - 08 Each</p> <p>(c) Copper bus bar 04 Nos with heat shrinkable insulation mounted on porcelain insulators suitable for 250 Amps for phase and neutral.</p> <p>(d) Indicating LED lamps for all three phases with different colour RYB - 01 Set of three</p> <p>(e) Digital Ammeter flush type with CT operated suitable for 0-250 Amps - 01 Nos</p> <p>(f) Digital Voltmeter flush type of rating 0-500 volts with selector switch.</p> <p>(g) Suitable size cable gland for incoming and outgoing cables.</p> <p>Make of MCCB : ABB/L&T/SIEMENS/Schneider/Legrand</p> | Each | 1 | | | |
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| | | 15 | <p>Supply, install, testing and commissioning of 250 KVAR automatic power factor improvement system of 3 phase 415 volts, 50 Hz floor mounted modular design structure non compartmentalised dust and vermin proof made out of 3.0 mm thick MS sheet and MS angle iron 40x40x6 mm frame duly powder coated front and back openable with locking arrangements to facilitate easy maintenance heavy cable entry gland provision hooks on top for mounting panel on platform complete capacitor and reactor filter assembly should be mounted on the rack through nut and bolts so that it can be taken out from the panel during the maintenance/ replacement necessary internal connection with proper copper wire rating and lugs proper control wiring with protection to relay, fans and thristor module comprises of following:-</p> <p><u>Panel make</u> : ABB/ GE/ APCOS/ NEPTUNE <u>Instrument</u> : 01 No digital VIF with inbuilt selector switch, set of CTs, protection of auxilary supply through MCB. <u>Indication</u> : Phase indication for RYB and bank on plus off display. <u>APFC Controller</u> : Controller should be of 12 stage advance with digital signal processor for fast thristor switching, dual PF mode, com. port-485 programmable discharge time, alarm option on over voltage, harmonics, display capacity, inductive normal position of the system, it should have clarify visible three window LED display to display each phase data in order to have complete system and network control, it should have seven input channels, 4 voltage and 3 main network current. It should be capable of recording KWH and calculating harmonics upto 19th level on all phase sensing current from three CTs for all three phase parameters. The system should be capable of measuring and display following parameters for each phase: Current, voltage, power factor, cos phie, active power, reactive power, apparant power, THD-01(%), THD-V(%), individual harmonics upto 19th, current and voltage harmonics upto 19th. Active energy (KWH) reactive energy (KVARH), equivalent 3 phase active power, equivalent 3 phase reactive power, equivalent 3 phase apparant power. <u>Make</u> : ABB/ L&T/ NEPTUNE-DUCATI</p> | Each | 1 | | | |
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| | | | <p>Axial flow fan with thermostat on the top with MCB protection. Bus bar 1000 Amp TPN copper bus bar. SMPS Power Supply : 24 volt, 9A SMPS power supply for TSM firing with protection on incoming and outgoing . <u>Incomer</u> : 630 Amps TP, MCCB, thermal magnetic, adjustable with O/L, S/C protection 100% Ics=Icu 36 kA Make: L&T/ GE/ Legrand/ ABB <u>Outgoing</u> (Bank protection): HRC fuse link with fuse base of suitable capacity complete in all respect Glass fuse link 2A with base for thyristor module protection. Make: Connectwell/ FTC/ Pheonix <u>THYRISTOR MODULE:</u> Electronic thyristor switching module (Not SSR- solid state relay) should be capable of voltage peak withstand capacity upto 2200 volts PIB. They should be installed in separate enclosure with heat sink, firing card and axial fan for its cooling operation. Bank -01 : 02 Nos of 15 KVAR Bank -02 : 02 Nos of 15 KVAR Bank -03 : 02 Nos of 20 KVAR Bank -04 : 02 Nos of 25 KVAR Bank -05 : 01 Nos of 25 KVAR Bank -06 : 01 Nos of 25 KVAR Bank -07 : 01 Nos of 25 KVAR Bank -08 : 01 Nos of 25 KVAR Make : L&T/ GE/ NEPTUNE/ EPCOS</p> <p><u>CAPACITOR :</u> Capacitor should be super heavy duty (MDXL) with 525 volts, 50 Hz capable of withstanding current upto 4xIn and temp with standing upto 70 deg C temp on its surface without any deterioration in its life span. Bank -01 : 02 Nos of 15 KVAR Bank -02 : 02 Nos of 15 KVAR Bank -03 : 02 Nos of 20 KVAR Bank -04 : 02 Nos of 25 KVAR Bank -05 : 01 Nos of 25 KVAR Bank -06 : 01 Nos of 25 KVAR Bank -07 : 01 Nos of 25 KVAR Bank -08 : 01 Nos of 25 KVAR Make : L&T/ GE/ NEPTUNE/ EPCOS</p> | | | | | |
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| | | | 16 | Earthing complete with galvanised steel earth plate electrode 600 mm X 600 mm X 6 mm thick burried directly to ground vertically to a depth not less than 2.25 mtr below normal ground level connected to GI strip of size 32x6 mm and earthing lead protected with 50 mm dia GI pipe light grade filling around with charcoal dust and salt including excavation, returning, filling of earth and disposal of surplus soil to a distance not exceeding 50 mtr and connected to GI strip b means of GI nuts, bolts and washers, strip connected to earth plate including champer PCC 1:3:6 type C1 using 20 mm graded stone aggregate in concrete pit precast RCC 50 mm thick reinforced with 6 mm bar lifting handle 02 Nos, funnel with wire mesh 20 mm dia GI pipe light grade watering pipe and frame work complete. (GI strip upto 7.5 m length is included in unit rate quoted by the contractor and beyond this length the same shall be measured and paid separately). | Each | 12 | | | |
| | | | 17 | Supply & fix GI strip 25mm x 3mm complete with saddles and fixing screws for fitting the strip. | RM | 150 | | | |
| | | | 18 | Supply & fix GI pipe light grade of size 100 mm dia complete laid in trenches or fixed to wall for protection of LT cable all as specified. | RM | 70 | | | |
| | | | 19 | Material and labour for PCC work 1:2:4 type B-1 using 20 mm graded stone aggregate foundation raised base complete all as specified. | Cum | 6 | | | |

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