

















## INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH(IISER) TIRUPATI

### SECTION I -NOTICE INVITING e-TENDERING

1. Indian Institute of Science Education and Research, Tirupati invites online percentage composite bids in open bid system from reputed construction agencies, found eligible as per the minimum requirements defined in clause 2 & 3 of NIT for the work mentioned below:

Name of work & Location : **Supply, Installation, Testing and Commissioning of Electrical System to receive and Distribute Power from HT line at IISER TIRUPATI Main Campus, Jangalapalli Village, Yerpadu Mandal, Tirupati.**

NIT NUMBER : IISERT/ENGG/Elec/01

Estimated cost : **Rs. 98, 72,534/-**

Period of completion : 2 months.

Cost of tender documents : Rs. 1000/- (One thousand only)  
(Non – refundable )

Last Dates & time to fill/upload the tender through e-tendering. : 03/02/2020 up to 03.00 PM

Pre bid meeting date &time : 22-01-2020 at 11:00 hours at the Office of Director, IISER Tirupati Transit Campus at Sree Rama Engineering College Building, Karakambadi Road, Mangalam (B.O), Tirupati - 517 507 +91 (0877) 2500 400

Time & date of opening of Technical bids : At 3:30 PM on 03-02-2020



2. The applicant should be from reputed, eligible and resourceful Contractors who are enlisted in appropriate class in Sub Station work or registered in any central/state govt. unit. (or) The firms which are specialized in Sub Station works up to a level of 33 KV.

a) Should have experience of having successfully completed works during the last seven years ending previous day of the last date of submission of tenders

(i) 3 similar works each costing not less than Rs. **40 Lakhs** or completed two similar works each costing not less than **Rs 60 Lakhs** or completed one similar work costing not less than **Rs 80 Lakhs**.

b) Components of work executed other than those included in definition of similar work shall be deducted while calculating cost of similar work. Bidder shall submit abstract of cost of work in support of this.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of receipt of applications for tender.

Similar work means: Sub Station works up to a level of 33 KV including supply, installation and commissioning of Transformers, Breakers, and Panels for distribution, external Electrical works of cabling, street lighting etc.

This should be certified by an officer not below the rank of Executive Engineer in Govt. Departments and Superintending Engineer/ Chief Project manager or Equivalent in other organizations.

c) Should have had average financial turnover (Gross) of at least **Rs 95 Lakhs** on Civil & Electrical construction work during the immediate last three consecutive years balance sheets duly audited by Chartered Accountant. Year in which no turnover is shown would also be considered for working out the average. No enhancement in the value of turnover for the past years shall be made for bringing them to current turnover level.

d) Should not have incurred any loss (profit after tax should be positive) during the immediate last two consecutive financial years ending 31<sup>st</sup> March, 2019, duly certified and audited by the Chartered Accountant.

e) Should have solvency of **Rs. 40 Lakhs** certified by a Scheduled Bank and obtained not earlier than three months before the date of submission of Bid.

f) Bidder should have sufficient number of Technical and administrative employees for proper execution of the contract. The bidder shall have to submit a list of these employee stating clearly how these would be involved in this work within 15 days of award of work.

### 3. CONTRACT ELIGIBILITY CRITERIA

Further, the contract eligibility includes the following.

- 3.1 Experience in similar type of completed works executed during the last 7 years details like monetary value, clients, proof of satisfactory completion.  
  
Similar work means: Sub Station works up to a level of 33 KV including supply, installation and commissioning of Transformers, Breakers, and Panels for distribution, external Electrical works of cabling, street lighting etc.  
  
The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7 % per annum, calculated from the date of completion to previous day of last date of submission of tender.
- 3.2 Enlistment/Registration, if any, in appropriate class of Electrical works for executing works upto 33 KV with departments (CPWD, State PWDs, MES, Railways, PSUs etc)/ Organizations, class / type of registration or previous pre- qualification(s) for similar projects.
- 3.3 Documentary evidence of adequate financial standing, Certified by Bankers, Audited Profit & Loss A/c and Balance Sheet, Annual turnover in **last three years**, access to adequate working capital.
- 3.4 Information regarding projects in hand, current orders, regarding litigation, exclusion/expulsion or black listing, if any.
- 3.5 Key personnel available and proposed to be engaged for management and supervision of the Project, their qualifications and experience.
- 3.6 Bidders not meeting the minimum eligibility criteria shall be summarily rejected.
- 3.7 Copy of the enlistment order and certificates of work experience and other required as specified in the bid documents shall be scanned and uploaded to the e-tendering website within period of bid submission.
- 3.8 Bidder should not have been blacklisted by any state/Central Departments/PSUs/Autonomous bodies during the last 7 years of its operations. Affidavit shall be made in current date after the date of invitation of the tender as per **Form F** and shall be furnished on a 'Non-Judicial' stamp paper worth Rs.100/-otherwise the tender shall be rejected.

- 4 The time allowed for carrying out the work will be **2 months** from the date of start as defined in schedule 'C' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the tender.
- 5 The bid document is Two stage two Envelope e-tendering system can be seen from the Central Public Procurement Portal ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)) & Institute website [www.iiserTirupati.ac.in](http://www.iiserTirupati.ac.in) The contents of Envelope I & Envelope II are specified in the NIT.
- 6 Submission of Technical Bid Documents**  
Information and instruction for bidder for e-tendering forming part of bid document uploaded on website. Last date and time of submission of technical bid, Tender fee and other documents as specified in the NIT.

**List of Document to be scanned and uploaded within the period of bid submission:**

- I. Transaction Receipt of online deposit of tender fee and EMD.
- II. Enlistment Order of the Contractor (Attested copy) if required.
- III. Certificates of work Experience certificates submitted shall clearly indicate the:
  - a) Type and nature of work
  - b) Completion cost
  - c) Time period, actual completion date.In case, if any of above details are not included in the work done certificates, then such bids will not be considered for opening.
- IV. Complete set of TDS certificate ( Form 16) shall be uploaded in case the similar work is executed from a private body which shall form basis for establishing the completion cost of work executed.
- V. Certificate of Registration for GST and acknowledgement of up to date filed return if required.
- VI. Scanned Copies of all eligibility documents required as per NIT **Annexure –I**

Tender documents should be submitted online complete in all respect along with requisite amount of tender fee (cost of bid document). Complete set of tender documents comprising Volume I, II, III and financial bids has been made available at e-tender portal <https://eprocure.gov.in/eprocure/app>  
[www.iiserTirupati.ac.in](http://www.iiserTirupati.ac.in)

- 7 Director, Indian Institute of Science Education & Research, Tirupati shall be the "Accepting Authority" hereinafter referred to as such for the purpose of this Contract.
- 8 Bids must be accompanied by tender fee and bid-security/EMD (Earnest Money Deposit) amount specified for the work in clause 10 payable at Tirupati and drawn in favour of The Director; IISER Tirupati Bid Security shall have to be valid for 90 days beyond the validity of the bid.
- 9 Tender fee shall be Rs. 1000/- (One thousand only) non-refundable fee required to be deposited in **IISER Tirupati Bank account** through net banking as detailed below failing which the bid will be declared non responsive.

**Name-IISER Tirupati**  
**Bank-State Bank of India**  
**Branch- Korlagunta Branch, Tirupati**  
**Current A/c No. 35029946671**  
**IFSC-SBIN0001901**

Scanned copy of the net banking transaction receipt towards payment of tender fee shall be uploaded on the e-tendering website within the period of bid submission failing which the bid will be declared non responsive.

**10 Bid Security/EMD,**

**10.1 Bid security/EMD amounting to Rs 1,97,450/- ( One Lakh Ninety seven Thousand Four hundred and Fifty only) in the following form before the date and time fixed for opening of bid failing which the bid will be declared non responsive.**

100% EMD amount can be deposited in **IISER Tirupati Bank account** through net banking as detailed below.

**Name-IISER Tirupati**  
**Bank-State Bank of India**  
**Branch- Korlagunta Branch, Tirupati**  
**Current A/c No. 35029946671**  
**IFSC-SBIN0001901**

**10.2 Bid Security/EMD of unsuccessful Bidders will be returned to them within 90 days from the date of acceptance of bid of the successful Bidder.**

**10.3 The Bid Security may be forfeited, if**

a) The Bidder withdraws / modifies his Bid or any item thereof after opening of bid.

b) The successful Bidder fails within the specified time limit to commence the work.

**10.4 Scanned copy of net banking transaction receipt and Bank Guarantee towards security/ EMD shall be uploaded to the e-tendering website within the Period of bid submission Failing which the bid will be declared non responsive.**

**11 A pre-bid meeting will be held on 22.01.2020 at 11 00 hours at the office of The Director, IISER Tirupati, to clarify the issues and to answer questions on any matter that may be raised at that stage as stated in Clause 12.**

## 12 Pre-bid meeting

- 12.1 The Bidder or his officially authorized representative is invited to attend a pre-bid meeting, which will take place as referred in clause 11 of NIT. Bidder/ bidder representative who wish to attend Pre-bid meeting should carry a valid identity proof certifying his designation with said firm.
- 12.2 The purpose of the meeting is to clarify issues and to answer questions on matters that may be raised at that stage.
- 12.3 The Bidder is requested to submit their questions/ queries/ clarifications in writing or by email/ fax to reach the IISER Tirupati before the meeting. Bidders can send Pre-bid queries on their letter head referring tender number by Speed post on above said address so as to reach IISER Tirupati or on **e-mail address** [pvnr Rao@iisertirupati.ac.in](mailto:pvnr Rao@iisertirupati.ac.in) **before 22.01.2020** up to 11 00 Hours.
- 12.4 Minutes of the meeting (MOM), including the text of the questions raised (without identifying the source of enquiry) and the responses given will be uploaded as corrigendum on website [www.iisertirupati.ac.in](http://www.iisertirupati.ac.in) and ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app))
- 13 Any modification of the bidding documents which may become necessary as a result of the pre-bid meeting shall be made by the IISER, Tirupati through pre bid MOM and this shall form part of bidding document.
- 14 IISER Tirupati reserves the right to reject any prospective applicant without assigning any Reason and to restrict the list of technically qualified bidders to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.

## 15 Site visit, availability of site and cost of bidding

- 15.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the IISER, Tirupati will in no case be responsible and liable for these costs.
- 15.2 The Bidder should inform the IISER in advance about the proposed site visit.
- 15.3 The Bidder, at his own responsibility and risk is encouraged to visit, inspect and survey the Site and its surroundings and satisfy himself before submitting his bid as to the form and nature of the Site, the means of access to the Site, the accommodation he may require, etc.
- 15.4 In general, Bidders shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A Bidder shall be deemed to have full knowledge of the Site, whether he inspects it or not and no extra claims due to any misunderstanding or otherwise shall be allowed.
- 15.5 The costs of visiting the Site shall be at the Bidders' own expense. Any report shared at the site, by the IISER is subject to verification by the contractor. Any deviations of information in the report and the actual site will not be the responsibility of the IISER.

15.6 The site for the work is available.

## **16 Content of Bidding Documents**

16.1 Submission of a bid by a Bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be executed and local conditions and other factors having a bearing on the execution of the works.

16.2 The Bidder shall submit the Bid, which satisfies each and every condition laid down in the bid documents, failing which, the bid is liable to be rejected.

16.3 Notice Inviting e-Tender shall form part of the Contract document.

16.3.1 The documents listed below comprises one set of bid document that are issued to Bidders:

### **PART – I**

#### **Technical Bid**

#### **Envelope –I**

#### **Volume I**

- a) Notice Inviting Tender (Including eligibility criteria)
- b) Tender Form and General Rules and Directions for the Guidance of the Contractor
- c) General Conditions of Contract and Schedules

#### **Volume II**

Scope and Technical Specifications of the work.

### **PART-II**

#### **Envelop II – (Financial bid)**

Financial bid Schedule of quantity (BOQ).

## **17 Amendment of Bid Documents**

17.1 Before the deadline for submission of bids, the IISER Tirupati may modify the bidding documents by issuing corrigendum.

17.2 Any corrigendum so issued shall be part of the bid documents as well as Contract document and shall be on uploaded website [URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app) and [www.iisertirupati.ac.in](http://www.iisertirupati.ac.in) Bidders should take note of the uploaded corrigendum and submit the tenders accordingly.

## **18 Bid Validity**

- 18.1 The bid submitted shall become invalid if:
- (i) The bidders is found ineligible.
  - (ii) The bidder does not deposit Online tender fee and EMD with IISER Tirupati before the date and time fixed for opening of the bids.
  - (iii) The bidders does not upload all the documents (including GST registration) as stipulated in the bid document.
  - (iv) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest tenderer in the office of tender opening authority.
- 18.2 The bids submitted shall remain valid for acceptance for a period of 90 days from the date of opening of the technical bids.

## **19 Technical bid Bid Opening**

- 19.1 Online bid documents submitted by intending bidders shall be opened only of those bidders, whose tender fee and EMD is deposited online with IISER Tirupati and scanned their scanned copies i/c tender documents scanned and uploaded are found in order.

## **20 Technical Evaluation of the bids**

- 20.1 The bidder qualifying initial criteria as set out in Para 2 & 3 and the details furnished by bidders in the Proforma 1 and **FORM A to Form H** enclosed as **Annexure-1** of Section II will be evaluated by the IISER Tirupati technical evaluation committee appointed by the competent authority.  
Performa's listed are elaborated below,
- I) Initial bidding capacity Performa I,
  - II) Financial Information **FORM "A"**
- a) Solvency certificates from a scheduled bank - **Form B**
  - b) Details of similar works -- **Form C**
  - c) Performance report of works referred to in **Form D**
  - d) Organization structure Personnel **Form E**
  - e) PROFORMA OF AFFIDAVIT FOR NON - BLACK LISTING- **Form F**

- f) The bidders qualifying the initial eligibility criteria as set out in clause no 2 & 3 above will be evaluated based on the information submitted by bidders as per clause no 20.1 after due verification and selection will be made by IISER, TIRUPATI on the basis of the strength of individual applicants. Main consideration will be the ability of the Principal Contractor to fulfill technical, financial, contractual and legal obligations. Special emphasis will be laid on competence to do good quality works within specified time schedule and in close co-ordination with other agencies over and above the rate structure of the items.
- g) IISER Tirupati reserves the right to waive off minor deviations in the eligibility, if the technical evaluation committee consider that they do not materially affect the capability of the bidder to perform the contract. IISER Tirupati decision in this regard shall be final and binding & conclusive.

## 20.2 TECHNICAL EVALUATION :

Evaluation of performance: Evaluation of the performance of the bidders for eligibility shall be done by the committee constituted by the Director, IISER Tirupati. All the eligible similar works executed and submitted by the bidders may be got inspected by a committee which may consists client or any other authority as decided by the competent authority. The evaluation shall be done based on this inspection, if inspection is carried out otherwise on the basis of the performance report given by the client department officer not below the rank of Executive Engineer.

20.3 Even though a bidder may satisfy the above requirements, he would be liable for dis-qualification if he has:

- (a) Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the pre-qualification document.
- (b) Records of poor performance such as abandoning work, not properly completing the contract, or financial failures / weaknesses etc.

## **PART II**

### **21 Financial /Price bid**

21.1 After technical evaluation of (part I) bids as per clause 2, 3 & 20 above only short listed agencies financial bids shall be opened at the notified date and time.

### **22. Clarification of Bids**

22.1 To assist in the examination and comparison of Bids, the IISER, Tirupati may, at its discretion, ask any Bidder for clarification of his Bid, including breakdown of unit rates. The request for clarification and the response shall be in writing or by email / fax, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the IISER, Tirupati in the evaluation of the bids.



- 22.2 No, Bidder shall contact the IISER, Tirupati on any matter relating to his bid from the time of the bid opening to the time the contract is awarded.
- 22.3 Any effort by the Bidder to influence the IISER's bid evaluation, bid comparison or contract award decisions, may result in the rejection of his bid.
23. Indian Institute of Science Education and Research Tirupati, does not bind itself to accept the lowest or any other bid, and reserves the right to reject any or all of the tenders received without assigning any reasons. Bids in which any of the prescribed conditions are not fulfilled or any conditions including that of the conditional rebate put forth by the bidder shall be summarily rejected.
- 24 If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer-in-charge or his representative's estimate of the cost of work to be executed under the contract, the IISER, Tirupati may require the Bidder to produce detailed rate analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those rates with the implementation/construction methods and schedule proposed.

## **25 Award Criteria**

- 25.1. IISER Tirupati reserves the right without being liable for any damages or obligation to inform the bidder to:
- a) amend the scope and value of the contract to the bidder
  - b) Reject any or all applications without assigning any reasons
- 25.2 IISER, Tirupati shall award the contract to the Bidder whose evaluated offer / bid has been determined to be the technically suitable and financially lowest and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to execute the contract satisfactorily. The Board of Governors of IISER reserves the right to accept or reject any application and to annul the pre-qualification process and reject all applications at any time, without thereby incurring any liability to the affected applicants or specifying the grounds for the Employer's action
- 26 Contractor whose tender is accepted will be required to furnish Performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in Schedule C. This guarantee shall be in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'C'. including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor and without prejudice to any other right or remedy. The Earnest Money deposited along with tender shall be returned after receiving the aforesaid performance guarantee. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee.

27

Disclosures

Any change in the constitution of the contractor's firm, where it is a partnership firm, as declared in the prequalification documents submitted by the bidders at the time of submission of pre-qualification documents, should be disclosed to the IISER, Tirupati, at any time between the submission of bids and the signing of the contract.

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**IISER Tirupati**

## II) INSTRUCTIONS TO THE TENDERERS/BIDDERS

### **Name of Work: Supply, Installation, Testing and Commissioning of Electrical System to receive and Distribute power from HT line at IISER TIRUPATI Main Campus, Jangalapalli Village, Yerpadu Mandal, Tirupati**

NIT No. : IISERT/ENGG/Elec/01

The Tenderer/bidder submitting the Tender should read the schedule of quantities, Specifications for the works and other terms and conditions given in the NIT and drawings. The following conditions, which shall form part of the Tender documents, are specially brought to the notice for compliance while filling the Tender:-

1. The Tenderer/bidder are advised to quote rates in words and figures for each item and work out the total amount in figures.
2. All taxes as applicable shall be borne by the contractor. The tenderer/bidder shall quote his rates in the BOQ for all items considering all such taxes. However, in respect of service tax, same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to him by the Engineer-in-Charge after satisfying that it has been actually and genuinely paid by the contractor. In case of LBT/Octroi IISER Tirupati will issue exemption certificate and bidder shall co-ordinate with the PMC for getting the goods exempted.
3. The tenderer/bidder are advised to inspect and examine the site, and its surroundings and satisfy themselves before submitting their Tender/bid. The tenderer/bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed.
4. Tenderers/bidders who propose any alteration in the work specified in the said form of invitation to Tender, or in the time allowed for carrying out the work, which contain any other condition (s) of any sort including conditional rebate will be summarily rejected. Rates of such Tenders/bids shall neither be read out, not entered in the Tender opening register at the time of opening of Tenders.
5. All the statutory recoveries shall be made from the running bills of the contractor like Security deposit, Income tax, Surcharge, Education cess, etc or any other statutory recovery as per Government of India norms at the prevailing rates and in the manner prescribed by Government of India.
6. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, between the rates, figures and words, the rates which correspond with the amount worked out by the contractor shall be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tallies, but the amount is not worked out correctly, the rates quoted by the contractor shall taken as correct and not the amount. In the event no rate has been

quoted for any item (s) leaving space both in figure(s) word(s) and amount blank in any item, it will be presumed that the contractor has included the cost of this/these item (s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.

7. All rates shall be quoted in the Schedule of Quantity available in Financial bid document. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs. Should be written before the figure of rupees and word 'P' after the decimal figures, e.g. 'Rs. 2.15 P' and in case of words, the word, Rupees, should precede and the word 'paisa' should be written at the end. Unless the rate is in whole rupees and followed by the word 'Only' it should invariably be up to two decimal places. While quoting the rate in schedule of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.
8. Rates should be quoted in Indian Rs. Only.
9. The bidders have already been declared technically qualified for the above work and need not to submit technical qualification documents unless there are changes during the course of time between the EOI and the present call of financial bids.

**LETTER OF TRANSMITTAL**

From

To

THE DIRECTOR,  
INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH (IISER)  
TIRUPATI

Sub: SUBMISSION OF TENDER DOCUMENTS FOR THE WORK OF NAME OF WORK: Supply, Installation, Testing and Commissioning of Electrical System to receive and Distribute power from HT line at IISER TIRUPATI Main Campus, Jangalapalli Village, Yerpada Mandal, Tirupati

**NIT NUMBER:** IISERT/ENGG/Elec/01

Sir,

Having examined the details given in press notification and the tender document for the above work, I/we hereby submit the tender documents and other relevant information.

1. I/We hereby certify that all the statements made and information supplied in the enclosed forms and accompanying statements are true and correct.
2. I/We have furnished all information and details necessary for eligibility criteria and have no further pertinent information to supply.
3. I/We submit the requisite certified solvency certificate and authorize the Director, IISER, Tirupati – 517 507 to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/We also authorize Project Engineer, Tirupati to approach individuals, employers, firms and corporation to verify our competence and general reputation.
4. I/We submit the following certificates in support of our suitability, technical know-how & capability for having successfully completed the following works

Name of Work:

Certificate from

- 1.
- 2.
- 3.

- 1.
- 2.
- 3.

Enclosures:

Seal of applicant

Date of submission

Signature(s) of applicant(s)

**Undertaking to sign the integrity Agreement**

To,

.....,  
.....,  
.....

**Sub: SUBMISSION OF TENDER DOCUMENTS FOR THE WORK OF “**

Name of work &Location

:

**Supply, Installation, Testing and  
Commissioning of Electrical System  
to receive and Distribute power from  
HT line at IISER TIRUPATI Main  
Campus, Jangalapalli Village, Yerpadu  
Mandal, Tirupati**

NIT NUMBER

:

IISERT/ENGG/Elec/01

Dear Sir,

It is here by declared that IISER is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the IISER.

Yours faithfully

Sd/-

Registrar

## Forwarding letter for Integrity Agreement

To

### **INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH (IISER) TIRUPATI**

Transit Campus at Sree Rama  
Engineering College Building,  
Karakambadi Road, Mangalam  
(B.O), Tirupati - 517 507

**Sub: SUBMISSION OF TENDER DOCUMENTS FOR THE WORK OF “**

**Name of work & Location:** Supply, Installation, Testing and Commissioning of  
Electrical System to receive and Distribute power from HT line at IISER TIRUPATI  
Main Campus, Jangalapalli Village, Yerpadu Mandal, Tirupati

NIT NUMBER:  
IISERT/ENGG/Elec/01

Dear Sir,

I/We acknowledge that IISER is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by IISER. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, IISER shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid in accordance with terms and conditions of the tender/bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

**To be signed by the bidder and the signatory competent / authorised to sign the relevant contract on behalf of IISER**

**INTEGRITY AGREEMENT**

This Integrity Agreement is made at ..... on this ..... day of 20.....

**BETWEEN**

IISER represented through its Registrar, (Hereinafter referred as the '**Principal/Owner**', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

**AND**

.....  
(Name and Address of the Individual/firm/Company)

through ..... (Hereinafter referred to as the (Details of duly authorized signatory)

**"Bidder/Contractor"** and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

**Preamble**

WHEREAS the Principal / Owner has floated the Tender (NIT No. ....) (hereinafter referred to as **"Tender/Bid"**) and intends to award, under laid down organizational procedure, contract for .....  
(Name of work)  
hereinafter referred to as the **"Contract"**.

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as **"Integrity Pact"** or **"Pact"**), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

**Article 1: Commitment of the Principal/Owner**

- 1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:



- (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
  - (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
  - (c) The Principal/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- 2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

## **Article 2: Commitment of the Bidder(s)/Contractor(s)**

- 1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of **fraud or corruption or Coercion or Collusion** of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
- 2) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
- a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
  - b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
  - c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

- d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
  - e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- 3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
  - 4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice **means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.**
  - 5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

### **Article 3: Consequences of Breach**

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

- 1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. **Such exclusion may be forever or for a limited period as decided by the Principal/Owner.**
- 2) **Forfeiture of EMD/Performance Guarantee/Security Deposit:** If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.

3) **Criminal Liability:** If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

**4) Article 4: Previous Transgression**

1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.

2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.

3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

**Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors**

1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/ sub- vendors.

2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.

3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

**Article 6- Duration of the Pact**

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority.

**Article 7- Other Provisions**

- 1) This Pact is subject to Indian Law, place of performance and jurisdiction is the **Headquarters of the** Principal/Owner, who has floated the Tender.
- 2) Changes and supplements need to be made in writing. Side agreements have not been made.
- 3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- 4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this **Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.**

**Article 8- LEGAL AND PRIOR RIGHTS**

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....  
 (For and on behalf of Principal/Owner)

.....  
 (For and on behalf of Bidder/Contractor)

WITNESSES:

1. ....  
 (signature, name and address)

2. ....  
 (signature, name and

address) Place:

Dated :

## ANNEXURE 1

### PERFORMA '1'

#### INFORMATION REGARDING INITIAL BIDDING CAPACITY

The information to be filled in by the Bidder in the following pages will be used for purposes of Pre- qualification as provided above.

**1. For Individual Bidders**

1.1 Constitution or legal status of Bidder (Attach

Copy) Place of registration:

Principal place of business:

(Power of attorney of signatory of Bid)

1.2 (A) Value of work Completed during the last five years (in Rs. Lakh)

<i>Particular</i>	<i>Year</i>	<i>Value</i>
Total value of Work Executed in the last three years**	2016-17	
	2017-18	
	2018-19	

\*\* Immediately preceding the financial year in which bids are received. Attach certificate from Chartered accountant.

(B) Existing commitments and on-going works: (format for **clause 3.7**)

<i>Descripti on Of work</i>	<i>Plac e &amp; stat e</i>	<i>Contra ct No.&amp; Date</i>	<i>Name &amp; Address of Client</i>	<i>Value of Contac t (Rs. Lacs)</i>	<i>Stipulate d period of completi on</i>	<i>Value of work remaining to be complete d</i>	<i>Anticipate d date of completi on (Rs.)</i>	<i>Remarks Information regarding the litigation if any</i>

**FORM 'A'**

**FINANCIAL INFORMATION**

- I. **Financial Analysis**-Details to be furnished duly supported by figures in balance sheet/profit & loss account for the last five years duly certified by the Chartered Accountant, as submitted by the applicant to the Income tax Department (Copies to be attached.)

**Years**

<b>Year</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
<b>Gross annual turn over</b>			
<b>Profit/ Loss</b>			

- II. **Financial arrangements** for carrying out the proposed work.
- III. **Solvency Certificate** from Bankers of the bidder in the prescribed Form "I".

Signature of Chartered Accountant with Seal    Signature of Bidder(s)

**Form B**

**FORM OF BANKERS' CERTIFICATE FROM A SCHEDULED BANK**

This is to certify that to the best of our knowledge and information that;

\_\_\_\_\_

(Name of the individual or the firm)

\_\_\_\_\_

(Name of the proprietor in case of a sole proprietorship concern or names of partners in case of partnership concern as per bank's record, be indicated)

\_\_\_\_\_

(Address of the customer as per bank record)

is a / are customer(s) of our bank, is/are respectable and can be treated as good for any engagement up to a limit of Rs. \_  
(Rupees \_\_\_\_\_ only)

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

**Signature of the Manager**

**Seal of**

**Bank Note** :This certificate should be issued on the letter head and addressed  
to the DIRECTOR , IISER Tirupati

**FORM 'C'**

**DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING  
THE LAST 7 (Seven) YEARS ENDING PREVIOUS DAY OF THE DATE OF  
SUBMISSION OF TENDER**

<b>S. No.</b>	<b>Name of work/project and location</b>	<b>Owner or Sponsoring organization</b>	<b>Cost of work in crores of Rupees</b>	<b>Date of commencement As per contract</b>	<b>Stipulated date of completion</b>	<b>Actual date of completion</b>	<b>Litigation/arbitration cases pending/in progress with details</b>	<b>Name and address/telephone number of officer to whom reference may</b>	<b>Remarks</b>
1	2	3	4	5	6	7	8	9	10

- Indicate gross amount claimed and amount awarded by the Arbitrator.

**SIGNATURE OF BIDDER(S)**



## FORM D

### PERFORMANCE REPORT OF WORKS REFERRED TO IN PROFORMA 'C'

1. Name of the work/ Project & Location.
2. Agreement No.
3. Estimated Cost
4. Tendered Cost
5. Date of Start
6. Date of completion
  - (a) Stipulated date of completion.
  - (b) Actual date of completion.
7. a) Whether case of levy of compensation for Delay has been decided or not ? Yes / No
  - d) If decided, amount of compensation levied for Delayed completion if any ?
8. Amount of reduced rate items, if any
9. Performance report
  - i) Quality of Work : Outstanding/Very Good / Good / Poor
  - ii) Financial soundness : Outstanding/Very Good / Good/ Poor
  - iii) Technical Proficiency : Outstanding/Very Good / Good / Poor
  - iv) Resourcefulness : Outstanding/Very Good / Good / Poor
  - v) General Behaviour : Outstanding/Very Good / Good / Poor

**DATED:**

**Executive Engineer or Equivalent**

## FORM 'E'

### STRUCTURE AND ORGANISATION

1. Name and address of the applicant
2. Telephone No./Telex No./Fax No.
3. Legal Status (attach copies of original Document defining the legal status)
  - (a) An Individual
  - (b) A proprietary Firm
  - (c) A Firm in partnership
  - (d) A limited Company or Corporation.
4. Particulars of registration with various Government bodies (Attach attested photo-copy)
  - a) Registration Number.
  - b) Organization / Place of registration
5. Names and Titles of Directors and officers with designation to be concerned with this work.
6. Designation of individuals authorized to act for the organization.
7. Has the bidder, or any constituent partner in case of partnership firm Limited Company/Joint Venture, ever been convicted by the court of law? ? If so, give the details.
8. In which field of Civil Engineering Construction, the bidder has specialization and interest ?
- 9 Any other information considered necessary but not included above.

**SIGNATURE OF BIDDER(S)**



- vii) *Site Engineers* shall mean the Project Manager, Assistant Engineer & Jr. Engineer (Civil / Electrical) appointed by Institute works department.

## 2. DUTIES & POWERS:

### 2.1 *Site Engineers*:

The duties of the Site Engineer(s) are to watch and supervise the works and the workmanship in connection with the works, and to test and examine any materials to be used. He shall have no authority to relieve the contractor of any of his duties or obligations under the contract, except as expressly provided here under, nor to order any work involving delay or any extra payment by the Institute and to make any variation in the works.

The Engineer-in-charge, from time to time in writing, delegates to the Site Engineer(s) any of the powers and authorities vested in them. Any written instruction or written approval given by the Site Engineer (s) to the contractor within the terms of such delegation (but not otherwise) shall bind the contractor and the Institute as though it had been given by the Engineer-in-charge provided always as follows :

- a) Failure of the Site Engineer (s) to disapprove any work or materials shall not prejudice the power of the Engineer in-charge to subsequently disapprove such work or materials and to order the pulling down, removal or breaking up thereof.
- b) If the contractor is dissatisfied by reason of any decision of the Site Engineer (s), he shall be entitled to refer the matter to the Engineer-in-charge, who shall thereupon confirm reverse or vary such decision.

## 3. ASSIGNMENT & SUBLETTING:

- 3.1 The contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under without the written consent of the Engineer in-charge. The whole of the works included in the contract shall be executed by the contractor except where otherwise provided in the contract. The contractor shall not sublet any part of the works without the written consent of the Engineer in-charge and such consent, if given, shall not relieve the contractor from any liability or obligation under the contract, and he shall be responsible for the acts, defaults and neglects of sub-vendors, his agents, servants or workmen, as if they were the acts, defaults or neglects of the contractor provided always that the provision of labour contracts on a piece work basis shall not be deemed to be a subletting under this clause. In case the bidder out source part of furniture through his authorised vendors then the quality and finish of the product has to be as per original company standard and it shall be the responsibility of the co. to carry out the quality check on the outsourced products.

## 4. SCOPE OF CONTRACT:

The contract comprises the supply, Installation, completion and Testing of the works and handing over to IISER, Tirupati, and the provision of all labour, materials, equipment and transportation, temporary works and everything, whether of a temporary or permanent nature required in and for such construction, completion so far as the necessity for providing the same is specified in or reasonably to be inferred from the contract. The contractor shall make his own arrangements for the safe storage of materials, accommodation for his staff etc. and no claim for the temporary accommodation from the contractor shall be entertained.

The contractor shall carry out and complete the said work in every respect in accordance with this contract and as per the directions and to the satisfaction of the Engineer in-charge. Issue of further drawings and / or written instructions, detailed directions and explanations which are hereinafter collectively referred to as instructions of the Engineer in-charge in regards to:

- a) The variation or modification of the design, quality or quantity of works or the addition or omission or substitution of any work.

- b) Any discrepancy in the Drawings or between the Schedule of Quantities and / or Drawings and / or specifications. The materials are to be supplied as per approved shop drawings. Any excess material brought to site shall be taken back by the agency and no claim for payment of the same shall be entertained by IISER.
- c) The removal from the site of any materials brought thereon by the contractor and the substitution of any other material thereof.
- d) The dismissal from the works of any persons employed thereupon.
- e) The opening up for inspection of any work covered up.
- f) The amending / making good of any defects.

The contractor shall forthwith comply with and duly execute any instructions of work comprised in such Engineer in-charge's instructions, provided always that the verbal instructions and explanations given to the contractor or his representative upon the works shall, if involving a variation, be confirmed in writing by the contractor within seven days and if not dissented in writing within a further seven days by the Engineer in-charge, such shall be deemed to be instructions of the Engineer in-charge within the scope of the contract.

5. **CONTRACT DOCUMENT:**

- 5.1 The several documents, forming the contract, are to be taken as mutually explanatory of one another and in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer-in-charge who shall thereupon issue to the contractor its interpretation directing in what manner the work is to be carried out. In case the contractor feels aggrieved by the interpretation of the Engineer-in-charge then the matter shall be referred to the Superintending Engineer and his decision shall be final, conclusive and binding on both parties to the contract.
- 5.2 The bidder shall be responsible for getting the drawings prepared from the consultant proposed by him if any & approved by the Institute. Delay in issue of drawings, if any shall not be considered for any purpose. The bidder alone shall be responsible for timely arrangement of required drawings and getting them approved from the Engineer-in-Charge.
- 5.3 The approved drawing shall remain in the custody of the Institute. However, two complete sets of drawings, specification and Bill of Quantities shall be furnished by the Engineer-in-charge to the contractor. One complete set shall be kept on the work site and the Engineer-in-charge and his representatives shall be, at all reasonable times, have access to the same. The contractor shall study the drawings thoroughly before the commencement of work. In case of any discrepancy, the contractor shall seek clarification before proceeding with the works. Figured dimensions are in all cases to be accepted in preference to the scaled sizes. Large-scale details shall take preference over small scale ones.

The Engineer-in-charge shall have full powers and authority to supply to the contractor from time to time during the progress of the work such drawings and instructions as shall be necessary for proper execution and the contractor shall carry out and be bound by the same.

- 5.4 **Commercial tax (GST) @ 2%** of the value of work done shall be recovered from the contractor's bill.
- 6. The contractor(s) shall give to the Municipality, police and other authorities all necessary notices etc. that may be required by law and obtain all requisite licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be levied on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night.
- 7 The Contractor(s) shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed. However if any change is required, the same shall be done with the approval of Engineer-in-Charge & no extra payment shall be made on this account.

- 8 Contractor(s) shall provide permanent bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of the work. All such reference points shall be in relation to the levels and locations, given in the Architectural and other related services drawings.
- 9 On completion of work, the Contractor(s) shall submit at his own cost four prints of "as built" drawings to the Engineer-in-Charge within 4 weeks of completion of the work failing which a recovery of Rs. 25,000/- for each item as listed below, to be made as reasonable compensation. These drawings shall have the following information.
- a. All drawings related to electrical installations and services if any.
10. The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed, so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.
11. The Architectural drawings given in the tender other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fixing involved unless and otherwise specifically mentioned. However, the work shall be executed in accordance with the drawings duly approved by the Engineer-in-Charge.
12. The contractor shall be fully responsible for the safe custody of materials brought by him at site / issued to him even though the materials may be under double lock and key system. The contractor has to make his own arrangement like shed enclosure etc. for keeping the material, providing security etc. The contractor shall be allowed to make temporary structures for stores, offices, sheds, labour huts etc. The contractor shall remove all the structures erected by him necessary for the execution of the work, after completion of the work and clean the site removing all structures and temporary hutments in all respect as per the direction of Engineer-in-charge.

#### **14 PROGRAMME CHART:**

14.1 The Contractor shall prepare an integrated programme chart for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, material, equipment and machinery required for the fulfillment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer-in-Charge within ten days of award of the contract failing which Rs.1000/- per day shall be recovered (nonrefundable) from the contractor till the date of actual submission.

14.2 If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above, the contractor shall produce a revised programme showing the modifications to the approved programme to ensure completion of the work. The modified schedule of programme shall be approved by the Engineer in charge.

14.2 The submission for approval by the Engineer-in-Charge of such programme or the furnishing of such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.

#### **15 PROGRESS REPORT:**

15.1 The contractor shall submit Weekly progress report of the work in computerized form. The progress report shall contain the following the information, apart from whatever else may be required as specified. Contractor shall give the Engineer-in-charge on 7<sup>th</sup> day of each week a progress report of work done during previous week failing which Rs.500/- per day shall be recovered (non refundable) from the contractor till the date of its actual submission.

15.2 Project information, giving the broad features of the contract.

15.3 Introduction, giving a brief scope of the work under the contract and the broad structural or other details.

**16 QUALITY ASSURANCE:**

**16.1** The contractor shall establish, document and maintain an effective quality assurance system as outlined in the specifications and various codes and standards.

**16.2** The bidder shall understand scope of the work, drawing, specifications and standards etc. attached with the tender or to be followed and shall seek clarification, if any before submission of the tender.

**16.3** The quality assurance system plans / procedures / method statement to be followed shall be furnished in the form of quality assurance manual. It should cover quality assurance, plan procedure, specifications, frequency of the inspection, testing, acceptance criteria, method of sampling, testing etc to be followed for quality and the details of the person responsible. It is obligatory on the bidder to obtain the approval of every quality assurance document with Engineer-in-charge before he starts using particular document for execution of work.

**16.4** If the contractor fails to deploy the quality assurance team, the necessary recovery shall be made from the contractor's bill as per the rates provided for in the Schedule – F (Clause 34(i)) of the agreement.

**17 TESTING OF MATERIALS**

17.1 All the required tests as per Technical Specification have to be got conducted at the risk & cost of the contractor, unless specifically mentioned otherwise.

17.2 All necessary tests as per the Contract/CPWD specifications/relevant BIS codes shall be carried out on all the materials whether ISI marked or otherwise. Wherever Contract /CPWD specifications/relevant BIS codes do not specify the frequency of tests, the same shall be carried out as per the directions of the Engineer-in-Charge. Nothing extra whatsoever shall be payable on this account.

**18 Testing at Manufacturer's Place**

18.1 All materials which are specified to be tested at the manufacturer's works shall satisfactorily pass the tests in presence of the authorized representative of Engineer-in-charge before being used in the work. In case all requisite testing facilities are not available at the manufacturer's premises, such testing shall be conducted at laboratory approved by the Engineer-in-charge. The charges for such testing shall be borne by the contractor.

18.2 Test certificates of the required test carried out at the manufacturer factory shall be submitted to the Engineer in charge from time to time.

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## **SECTION-II**

### **ITEM RATE TENDER & CONTRACT FOR WORKS**



SECTION- II

Tender Form

Item Rate Tender & Contract for Works

**Name of work: Supply, Installation, Testing and Commissioning of Electrical System to receive and Distribute power from HT line at IISER TIRUPATI Main Campus, Jangalapalli Village, Yerpadu Mandal, Tirupati**

NIT No. : IISERT/ENGG/Elec/01

- (a). Tender(s) to be submitted by (time) 3.00 PM on 27/01/2020 to Engineering In Charge, Indian Institute of Science Education and Research, Tirupati
  
- (b). Tender(s) to be opened in presence of tenderers who may be present at 3.30 hours on 27/01/2020 in the office of the Engineering In Charge, Indian Institute of Science Education and Research , Tirupati

**TENDER**

I/We have read and examined the notice Inviting Tender, Schedule, Specifications applicable, General Rules and Directions, Conditions of Contract, clauses of contract, special conditions, Schedule of Rate & other document and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the Director of Indian Institute of Science Education and Research Tirupati within the time specified in Schedule 5 (Five) months viz, schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to the Conditions of contract and with such materials as are provided for and in respects in accordance with such conditions so far as applicable.

We agree to keep the tender valid for (90) ninety days from the due date of its opening and not to make any modifications in its terms and conditions.

A sum of Rs (figure)------(in words) -----

-----

has been deposited in Deposit at call Receipt of a Schedule bank/demand draft of a scheduled bank/bank guarantee issued by a Schedule Bank as earnest money. If I/we, fail to furnished the prescribed performance guarantee within prescribed period, I/we agree that the said Director Of Indian Institute of Science Education and Research Tirupati (IISER-Tirupati) or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely, if i/we fail to commence work as specified, I/we agree that Director Of Indian Institute of Science Education and Research Tirupati (IISER-Tirupati) or his successors in office shell without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up

to maximum of the percentage mentioned in Schedule 'C' and those in excess of that limit at the rates to be determined in accordance with the provision containing in the clause 12.2 & 12.3 of the condition of contract.

Further, I/We agree that in case of forfeiture of earnest money or both earnest money & performance guarantee as aforesaid, I/We shall be debarred for the participation in the re-tendering process of the work.

I/We hereby declare that I/we shall treat the tender documents drawings and other records connected with the work as secret/ confidential documents and shall not communicate information / derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the state or IISER Tirupati.

Dated .....

Signature of Contractor  
Seal

Postal Address

Witness :

Address:

Occupation:

#### ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on the Director IISER, Tirupati for sum of Rs.....(Rupees.....).  
.....).

The letters referred to below shall form part of this contract Agreement:-

(a)

(b)

(c)

For & on behalf of the Director, IISER Tirupati

Signature.....

Dated.....

Designation.....

**SECTION – III**  
**GENERAL CONDITIONS OF CONTRACT**

**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH TIRUPATI**

**(i) General Rules & Directions**

1. All work proposed for execution by contract will be notified in a form of invitation to tender prominently displayed in public places and signed by the officer inviting tender or by publication in Newspapers as the case may be.  
This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the application, and the amount of the security deposit and performance guarantee to be deposited by successful tenderer and the percentage, if any, to be deducted from bills. Copies of specification, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office of officer inviting tender during office hours.
2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act' 1952.
3. Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.
4. Applicable for Item Rate Tender only  
Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes.(Applicable for Item Rate Tender only)

The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paise and considering more than fifty paise as rupee one.

In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more contractors is same, the such lowest contractors may be asked to submit sealed revised offer quoting rate of each item of the schedule of quantity for all sub sections/sub heads as the case may be, but the revised quoted rate of each item of schedule of quantity for all sub sections/sub heads should not be higher than their respective origin original rate quoted already at the time of submission of tender. The lowest tender shall be decided on the basis of revised offer.

If the revised retendered amount (worked out on the basis of quote rate of individual items) of two or more contractors received in revised offer is again found to be equal, then the lowest tenderer, among such contractors, shall be decided by draw of lots in the presence of Registrar IISER Tirupati, Engineer in charge lowest contractors those have quoted equal amount of their tenders.

In case of any such lowest contractor in his revised offer quotes rate of any item more than their respective original rate quoted already at the time of submission of tender, then such revised offer shall be treated invalid. Such case of revised offer of the lowest contractor or case of refusal to submit revised offer by the lowest contractor shall be treated as withdrawal of his tender before acceptance and 50% of his earnest money shall be forfeited.

In case all the lowest contractors those have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractors.

Contractor, whose earnest money is forfeited because of non-submission of revised offer, or quoting

higher revised rate(s) of any item(s) than their respective original rate quoted already at the time of submission of his bid shall not be allowed to participate in the re-tendering process of the work.

5. The officer inviting tender or his duly authorized representative will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule-I. The earnest money of all unsuccessful bidders shall thereupon be returned to the contractor remitting the same, without any interest.
6. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.
7. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgement of payment to the officer inviting tender and the contractors shall be responsible for ensuring that he procures a receipt signed by the officer inviting tender or a duly authorized cashier/accounts officer.
8. The memorandum of work tendered for and the schedule of materials to be supplied by the department and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.
9. The tenderers shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.
- 9A. Use of correcting fluid, anywhere in tender documents is not generally permitted. Such Tender is liable for rejection.
10. In the case of Item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below / above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount.  
In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this/these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.
- 10A In case of Percentage Rate Tenders only percentage quoted shall be considered. Any tender for Item containing item rates is liable to be rejected. Percentage quoted by the contractor in Rate percentage rate tender shall be accurately filled in figures and words, so that there is no Tender only discrepancy.
11. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.
12. All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs' should be written before the figure

of rupees and word 'P' after the decimal figures, e.g. Rs. 2.15 P and in case of words, the word 'Rupees' should precede and the word 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word 'only' it should invariably be up to two decimal places. While quoting the rate in schedule of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.

12A In Percentage Rate Tender, the tenderer shall quote percentage below /above (in figure as well as in words) at which he will be willing to execute the work. He shall also work out the total amount of his offer and same should be written in the figures as well as in Words in such a way that no interpolation is possible. In case of figures, the word 'Rs' should be written before the figure of rupees and word 'P' after the decimal figures e.g. 'Rs 2.15P' and in case of words, the word 'Rupees' should be precede and the word 'Paise' should be written at the end.

13. (i) The Contractor, whose tender is accepted, will be required to furnish performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in scheduled C. This guarantee shall be in the form of Deposit at call receipt of any scheduled bank/ banker's cheque of any scheduled bank/Demand draft of any scheduled bank /Pay order of any scheduled bank or Government Securities or Fixed Deposit Receipt or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form.

(ii) The Contractor, whose tender is accepted, will also be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 2.50 % of the tendered value of the work. The Security Deposit will be collected by deductions from the running bills of the contractor at the rates mentioned above and the earnest money deposited at the time of tenders, will be treated as a part of the Security Deposit. The security amount will also be accepted in the shape of Government Securities. Fixed Deposit Receipt and Guarantee Bonds of a Scheduled Bank or State Bank of India will also be accepted for this purpose provided confirmatory advice is enclosed.

14. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.

15. The contractor shall give a list of IISER employees, if any, related to him.

16. The tender for the work shall not be witnessed by a contractor or Contractors who himself/ themselves has/ have tendered or who may and has/ have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.

17. The contractor shall submit list of works which are in hand (progress) in the following form:

Name of work	Name of client & particulars of works being executed	Value of work In Rs.	Position of works in progress	Remarks

18. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Engineer in charge may at his discretion without prejudice to any other right or remedy available in law cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

## (ii) CONDITIONS OF CONTRACT

### **Definitions:**

- 1 The **contract** means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of the Director, Indian Institute Of Science Education and Research Tirupati and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.
- 2 In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them :-
  - i). The expression **works** or **work** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
  - ii). The **Site** shall mean the land/ or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
  - iii). The **Contractor** shall mean the individual, firm or company, whether incorporated or not, undertaking the works shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
  - iv). The **Director**, Indian Institute of Science Education and Research Tirupati means his successors also.
  - v). The **Engineer-in-Charge** means Engineer/Officer either from IISER, Tirupati or consultant notified by The Director (IISER, Tirupati) who shall supervise and be in-charge of work and who shall act on behalf of the Director, IISER for execution of contract.
  - vi). **IISER** means Indian Institute of Science Education and Research Tirupati, or his authorized representative.
  - vii). **Accepting Authority** shall mean the authority mentioned in Schedule 'C'.
  - viii). **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by IISER Tirupati of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to IISER-Tirupati's faulty design of works.
  - ix). **Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'C' to cover, all overheads and profits.
  - x). **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the CPWD Delhi schedule of rates mentioned in Schedule 'C' hereunder, with the amendments thereto issued up to the date of receipt of the tender.

- xi). **Department** means Indian Institute of Science Education and Research Tirupati. (IISER Tirupati)
- xii). **Specifications** means the specifications contained in tender documents, CPWD specifications 2009 Vol I & II with up to date correction slips, CPWD specifications for internal Electrical works – 2013, external electrical services- 2007, Indian standard specification, technical specifications as applicable.
- xiii). **Tendered Value** means the value of the entire work as stipulated in the letter of award.
- xiv) **Date of commencement of work: The date** of commencement of work shall be the date of start as specified in schedule “C” or the first date of handing over the site, whichever is later, in accordance with the phasing if any, as indicated in the tender documents.

Xv) Director IISER TIRUPATI , Registrar IISER Tirupati and Engineer In-charge shall bear all the decisionary and financial power of pertaining to Name of Work: : Supply, Installation, Testing and Commissioning of Electrical System to receive and Distribute power from HT line at IISER TIRUPATI Main Campus, Jangalapalli Village, Yerpadu Mandal, Tirupati

NIT No. : IISERT/ENGG/Elec/01

- 3 Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
- 4 Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
- 5 The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications. Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract
- 6 The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.
7. The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion of the works.
8. The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General conditions.
- 8.1. In the case of discrepancy between the schedules of quantities, the specifications and or the drawings, the following order of preference shall be observed.
  - (i) Description of schedule of Quantities
  - (ii) Technical specification and Special Condition, if any.
  - (iii) C.P.W.D. Specification



- (iv) Indian Standard Specifications of B.I.S.
- 8.2 If there are varying or conflicting provision made in any one document forming part of the contract, the Accepting Authority shall be deciding authority with regard to the intention of the documents and his decision shall be final and binding on the contractor.
- 8.3 Any error in the description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.
9. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority, shall within one month from the stipulated date of start of the work, sign the contract consisting of:-
- (i) The notice inviting tender, all the documents including drawings if any, forms the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
  - (ii) Standard Form Consisting of followings
    - (a) NIT, Work order
    - (b) Item rate tender form & Contract for worker.
    - (c) General Rules and Directions
    - (d) Condition of contracts
    - (e) Clauses of contracts, Safety code & Contractors labour regulations
    - (f) Proforma of agreement
    - (g) Proforma of Schedule A to C
    - (h) Special Condition of contracts
    - (i) Technical specifications
    - (j) All correspondence between the parties till award of contract
  - (iii) Till such time contract agreement is signed between the parties, all the documents mentioned Sr. 9 (i), 9 (ii)- (a to j) above shall be binding on the contractor.
  - (iv) No payment for the work done will be made unless contract is signed by the contractor.

**(iii) CLAUSES OF CONTRACT SAFETY CODE AND LABOUR REGULATIONS**

The Clauses of Contract, safety code to be followed and the labour regulations to be adhered to, are as per the **CPWD General Conditions of contract 2014** with corrections as applicable up to date. The clauses of contract as as given in the mentioned GCC 2 (iii), the safety code as given in the 2 (v) and labour regulations in 2 (vii). The schedules from A to C applicable in addition to the GCC are given in this tender document as proforma of Schedules.

In addition to all the safety code as mentioned above, the general safety rules as per the Indian Electricity Act are to be followed.

**(vii) Form of Performance Security (Guarantee)**

**Bank Guarantee Bond**

1. In consideration of the Director IISER Tirupati (hereinafter called "IISER- Tirupati") having offered to accept the terms and conditions of the proposed agreement between-----and-----  
----- (hereinafter called "the said Contractor(s)") for the work -----

------(hereinafter called “the said agreement”) having agreed to production of an irrevocable Bank Guarantee for Rs.----- ( Rupees -----only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

We ----- (hereinafter referred to as “the Bank”) hereby (indicate the name of the Bank) Undertake to pay to the IISER Tirupati an amount not exceeding Rs-----.(Rupees -----only) on demand by IISER Tirupati

2. We -----do hereby undertake to pay the amounts due and payable (indicate the name of the Bank) under this Guarantee without any demure, merely on demand from the IISER Tirupati stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs----- (Rupees-----only)
3. We, the said bank further undertake to pay the IISER Tirupati any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.

4. We, ----- further agree that the guarantee herein contained shall (indicate the name of the Bank) remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the IISER Tirupati under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge on behalf of the IISER Tirupati certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.
5. We, ----- further agree with the IISER Tirupati that the IISER Tirupati (indicate the name of the Bank) shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the IISER Tirupati against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the IISER Tirupati or any indulgence by the IISER Tirupati to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).
7. We, ----- lastly undertake not to revoke this guarantee except (indicate the name of the Bank) with the previous consent of the IISER Tirupati in writing.
8. This guarantee shall be valid up to-----unless extended on demand by the IISER Tirupati. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs----- (Rupees-----only) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the -----day of-----for----- (indicate the name of the Bank)

**(viii) Proforma of Agreement**

ARTICLE OF AGREEMENT is made at Tirupati on the ..... day of..... 2020 between Indian Institutes Of Science Education and Research Tirupati, (IISER Tirupati) (Herein after referred to as the employer which expression shall includes its successors and assigns where the context so admits) of the one part and -----

-----  
(Hereinafter referred to as the “contractor(s) which expression shall include his/their respective heirs, executors, administrators and assigns where the context so admits) of the other part.

WHEREAS the employer is desirous of getting the work.....done and caused drawings, schedule of quantities, terms and conditions and specification describing the work to be executed and completed maintained.(hereinafter called “the works”)and has accepted a tender of the CONTRACTOR for the execution, completion and guarantee of such works.

AND WHERE AS the contractor has deposited a Sum of Rs.-----

----- With employer as security for the due performance of this agreement as provided in the said Conditions.

NOW IT IS HEREBY agreed and declared by and between the parties as follows.

- (a) In consideration of the payments to be made to him as herein after provided the contractor shall upon and subject to the condition herein contained and the said conditions executed and complete the work shown upon the said drawings and such further detailed drawings which may be furnished to him and described in the said specifications and the said priced schedule of quantities within ----- from the date of order to commence the work.
- (b) The employer shall pay to the contractor such sum that shall become payable hereunder at the times and in the manner specified in the said conditions.
- (c) Time is essence of this agreement and the contractor agrees to pay compensation for delay as per Clause 2 of general Condition of Contract.
- (e) The documents mentioned below under (g) shall form the basis of this agreement and the decision Engineer or the Engineers in Charge, in reference to all matters of dispute as to material and workmanship shall be final and binding on both the parties.
- (f) The employer through the Engineer-in-Charge reserves to himself the right of altering the drawings and the adding to or omitting any items of works or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall not violate agreement.
- (g) This agreement comprises the work said above and the entire subsidiary work connected there with, even though work may not be shown on the drawings or described in the said specifications or the priced schedule of quantities.

This agreement contains the following documents in addition to pages of articles of agreement.

- (a) NIT/WORK ORDER
- (b) Item rate tender form & contract for works.
- (c) General Rules and Directions
- (d) Condition of contracts
- (e) Clauses of contracts
- (f) Safety code
- (g) Models rules for the protection of health, sanitary arrangements for workers employed by IISER Tirupati or its Contractors.

- (h) Contractors labour regulations
- (i) Proforma of agreement
- (j) Proforma of Schedule A to C
- (k) Special Condition of contracts
- (l) Technical specifications
- (m) Tenders drawings
- (n) Price Schedule/ Schedule of Quantities
- (o) All corresponds between the parties until award of contract.
- (p) Prequalification document

In witness whereof the parties hereto have their respective hands the day and the year herein above written.

Signed by for and on behalf of the employer.

Engineering In charge

Witness (1)-----

Witness (2) -----

Signed by the said contractor

Address----- Witness (1)-----

Countersigned Witness (2) -----

**(IX) PROFORMA BANK GUARANTEE IN LIEU OF BID SECURITY**

**(On Non Judicial Stamp paper to be stamped in accordance with stamp act, the stamp paper to be in name of Executing Bank)**

Ref.....

Date.....

Bank Guarantee No.....

To **INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH, TIRUPATI**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Dear Sir,

In accordance with your Notice Inviting Tender for \_\_\_\_\_ under your tender No \_\_\_\_\_ dated \_\_\_\_\_ M/s \_\_\_\_\_ (hereinafter called the Tenderer) with following directors on their Board of Directors /Partners of the firm.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 _____	4 _____
5 _____	6 _____
7 _____	8 _____
9 _____	10 _____

Wish to participate in the said tender for the following:

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

Whereas it is a condition in the tender documents that the tenderer has to deposit Bid Security with respect to the tender, with Indian Institute of Science Education & Research, Tirupati amounting to Rs..... or alternatively the tenderer is required to submit "Bank Guarantee" from a nationalised bank irrevocable and operative till 28 days after the validity of the offer. (i.e. 120 days from the date of opening of tender), for the like amount which amount is likely to be forfeited on the happening of contingencies mentioned in the tender documents. And whereas the tenderer desires to secure exemption from deposit of Bid Security and has offered to furnish a Bank Guarantee for a sum of Rs..... to the IISER, Tirupati for the purpose of securing exemption from the deposit of Bid Security.

1. NOW THEREFORE, we the ..... Bank, a body corporate constituted under the Banking Companies (Acquisition and Transfer of undertakings) Act 1969 and having a branch office at..... (hereinafter referred to as the Bank") do hereby undertake and agree to pay on demand in writing by the IISER, Tirupati the amount of Rs..... (Rupees.....) to the **Indian Institute of Science Education & Research, Tirupati** without any demur, reservation or recourse.
2. We, the aforesaid Bank, further agree that the IISER, Tirupati shall be the sole judge of and as to whether the tenderer has committed any breach or breaches of any of the terms and conditions of the tender and the extent of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the IISER, Tirupati on account thereof the extent of the bid security required to be deposited by the Tenderer in respect of the said Tender document and the decision of the IISER, P Tirupati that the Tenderer has committed such breach or breaches and as to the amount or amounts of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the IISER, Tirupati shall be final and binding on us.
3. We, the said Bank further agree that the Guarantee herein contained shall remain in full force and effect until it is released by the IISER, Tirupati and change in the constitution, liquidation or dissolution of the Tenderer shall not discharge our liability guaranteed herein.
4. It is further declared that it shall not be necessary for the IISER, Tirupati to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the IISER, Tirupati may have obtained or shall obtain from the Contractor at the time when proceedings are taken against the Bank for whatever amount may be outstanding or unrealized under the Guarantee.
5. The right of the IISER, Tirupati to recover the said amount of Rs..... (Rupees ..... ) from us in manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said

M/s..... (Tenderer) and/or that any dispute or disputes are pending before any authority, officer, tribunal or arbitrator(s) etc.

6. Notwithstanding anything stated above, our liability under this guarantee shall be restricted to Rs.....(Rupees.....) and our guarantee shall remain in force up to..... and unless a demand or claim under the guarantee is made on us in writing within three months after the aforesaid date i.e. on or before the ..... all your rights under the guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there under.

Date.....

place.....

(Signature)\_\_\_\_\_

(Printed Name)\_\_\_\_\_

(Designation)\_\_\_\_\_

(Bank's Common seal)\_\_\_\_\_

(Authorisation No.)\_\_\_\_\_

In the presence of:

Witness

1)\_\_\_\_\_

2)\_\_\_\_\_

Accepted

(Signature of the Officer)

For and on behalf of the

INDIAN INSTITUTE OF SCIENCE EDUCATION  
AND RESEARCH, TIRUPATI.

**APPENDIX (xv) -CLAUSE 25**

APPENDIX XV Notice for appointment of Arbitrator [Refer Clause 25]

To  
The Chairman  
Building and Works Committee  
IISER Tirupati.

Dear Sir,

In terms of clause 25 of the agreement, particulars of which are given below, I/we hereby give notice to you to appoint an arbitrator for settlement of disputes mentioned below:

1. Name of applicant
2. Whether applicant is Individual/Prop. Firm/Partnership Firm/Ltd. Co.
3. Full address of the applicant
4. Name of the work and contract number in which arbitration sought
5. Name of the Division which entered into contract
6. Contract amount in the work
7. Date of contract
8. Date of contract Date of initiation of work
9. Stipulated date of completion of work
10. Actual date of completion of work (if completed)
11. Total number of claims made
12. Total amount claimed
13. Date of intimation of final bill (if work is completed)
14. Date of payment of final bill (if work is completed)
15. Amount of final bill (if work is completed)
16. Date of request made to SE for decision
17. Date of receipt of SE's decision
18. Date of appeal to you
19. Date of receipt of your decision.

Specimen signatures of the applicant

(only the person/authority who signed the contract should sign)

I/We certify that the information given above is true to the best of my/our knowledge. I/We enclose following documents.

1. Statement of claims with amount of claims.
- 2.

Yours faithfully

Copy in duplicate to:  
Engineer in Charge.

**(v) PROFORMA OF SCHEDULES**

(Operative Schedules to be supplied to each intending tenderer)

**SCHEDULE 'A'**

Schedule of quantities

Enclosed

**SCHEDULE 'B'**

Schedule of materials to be issued to the contractor.

S.No	Description of item	Quantity	Rates in figures & words at which the material will be charged to the contractor	Place of issue
1	2	3	4	5
	NIL			

Tools and plants to be hired to the contractor

S.No	Description	Hire charges per day	Place of issue
1	2	3	4
	NIL		

Extra schedule for specific requirements/document for the work, if any. -- NIL—

**Reference to General Conditions of contract.-**

**NAME OF WORK:** Supply, Installation, Testing and Commissioning of Electrical System to receive and Distribute power from HT line at IISER TIRUPATI Main Campus, Jangalapalli Village, Yerpada Mandal, Tirupati

NIT NUMBER : IISERT/ENGG/Elec/01

Estimated cost put to tender : **Rs. 98.72 Lakhs**

(i) Earnest money : Rs 1,97,450/-  
(to be returned after receiving performance guarantee)

(ii) Performance Guarantee : 5% of tendered value.

(iii) Security Deposit : 2.5 % of tendered value.



## SCHEDULE 'C'

### GENERAL RULES & DIRECTIONS:

Officer inviting tender

DIRECTOR, IISER TIRUPATI

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3 : See below

### Definitions:

- 2(v) Engineer-in-Charge : Superintending Engineer , IISER Tirupati
- 2(viii) Accepting Authority : The Director, IISER, Tirupati
- 2(ix) Percentage on cost of materials and labour to cover all overheads and profits : 15%
- 2(x) Standard Schedule of rates : CPWD Delhi Schedule of Rates (E&M) 2018
- 2(viii) Department : Indian institute of Science Education & Research, IISER, Tirupati
- 2(ix) Standard contract Form : Item rate tender form & Contract of works

### Clause 1

- (i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance : 15days
- (ii) Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above : 15 days

### Clause 2

Authority for fixing compensation under clause 2. : The Director Indian institute of Science Education & Research, IISER Tirupati.

### Clause 2 A

Whether Clause 2A shall be applicable : Yes Applicable

### Clause 5

Number of days from the date of issue of letter of award works for reckoning date of start : 15 days

**Mile stone(s) as per table given below:-**

S.No	Description of Mile Stone (Physical)	Time allowed in days/months (From date of start)	Amount to be with-held in case of non-achievement of Milestone

**Authority to decide:**

- |       |   |  |
|-------|---|--|
| (i)   | Extension of time   | The Director Indian institute of Science Education & Research, IISER Tirupati. |
| (ii)  | Rescheduling of mile stones   | Engineer in charge   |
| (iii) | Shifting of date of start in case of delay in handing over of site: | Engineer in charge.  |

**Clause 6, 6 A**

Clause applicable – (6or 6A)	6A
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**Clause 7**

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment	Rs. 10.00 Lakhs
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**Clause 10**

List of testing equipment to be provided by the contractor at site lab.	To be arranged by the agency as per work requirement.
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**Clause 10 B**

Whether Clause 10 B shall be applicable	10B applicable
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**Clause 10 C**

Component of labour expressed as percent of value of work = Not Applicable

**Clause 10 CA**

**NOT Applicable**

Material covered	Nearest Materials (other than	Base price and its corresponding period of all the materials
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NIL

NIL

**CLAUSE 10 CC**

**NOT APPLICABLE**

Clause 10 CC to be applicable in contracts with stipulated period of completion exceeding the period shown in next column .....	12 months
---	-----------

Schedule of component of other Materials, Labour, POL etc. for price escalation.

Component of civil (except materials covered under Clause 10CA /Electrical Construction materials expressed as percent of total value of work	Xm -- 0 %
---	-----------

Component of Labour  
expressed as percent of total value of work. Y -- 0 %

Component of P.O.L-  
expressed as percent of total value of work. Z.....0..... %

Note :  $X_m \dots \%$  should be equal to  $(100) - (\text{materials covered under clause 10CA i.e. Cement, Steel and other material specified in clause 10CA} + \text{Component of Labour} + \text{Component of P.O.L})$ .

### Clause 11

Specifications to be followed for execution work

- 1) Technical specification given in Tender documents.
- 2) CPWD standard specification 2009 Volume I & II with up to date correction slips for civil works.
- 3) Indian Standard Specification
- 4) Manufactures specification
- 5) Engineer In charge decision.

### Clause 12

Type of work	Project and original work
12.2 & 12.3	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building Super structure work & other Associated Electro-mechanical works (±) 30 %
12.5	(i) Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (±) 100%

### Clause 16

Competent Authority for deciding reduced rates	The Director Indian institute of Science Education &. Research, IISER Tirupati
--	--

### Clause 18

List of mandatory machinery, tools & plants - NIL  
To be deployed by the contractor at site at his cost:

### Clause 25

Constitution of Dispute Redressal committee will be as constituted by Director, IISER Tirupati.

**Clause 34 (i)**

Requirement of Technical Representative(s) and recovery rate to be affected from Contractor bill for non-deployment of technical staff at site of work:

S.No	Technical Representative(s)	Qualification & Discipline of the Technical representative(s)	Minimum Experience of the Technical representative(s)	Minimum Numbers to be employed at site	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 34(i)	
					Figure	Words
1	Project Manager (Full duration of project)	BE Electrical	10 years	1	40000	Forty thousand only

Note:

(1) Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.

(2) Diploma holder with minimum 10 year relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

**VOLUME II**

**SCOPE OF WORK & TECHNICAL SPECIFICATIONS**

**1. SCOPE OF WORK:** Supply, Installation, Testing and Commissioning of Electrical Power Distribution System of IISER TIRUPATI with Double Pole Structure with required connections, 33kV/ 415V 630 KVA Oil type Transformer, HT VCB, LT Panel, street lighting, Connecting cables as required complete in all **respect including obtaining clearance from Electricity authorities for charging of the same** at IISER TIRUPATI Main Campus, Jangalapalli Village, Yerpadu Mandal , Tirupati.

The work shall be generally carried out in accordance with tender/bid specifications and the following specifications / rules.

- a) CPWD General Specifications for Electrical work Part I Internal – 2013, as amended upto date
- b) CPWD General Specifications for Electrical work Part II External 1994, as amended upto date
- c) CPWD General Specifications for Electrical work Part IV (Substation works) as amended upto date.
- d) The Indian Electricity Act, 2003, as amended upto date.
- e) Indian Electricity Rules 1956 amended upto date.

## **TECHNICAL SPECIFICATION**

### **TECHNICAL SPECIFICATIONS OF MV / LT PANELS**

#### **Scope**

This Section covers the detailed requirements of medium voltage switch Panel for 433V, 3 phase 50 Hz 4 wire system. All switchgears shall be fully rated at an ambient of 40° C.

#### **Type of Panel**

The medium voltage switch board panel shall comprise of anyone of the following types of switchgears or combination thereof as specified.

- a) Air Circuit breakers draw out
- b) type.
- c) Switch Disconnector Fuse Units fixed type, MCCBs of suitable Ics ratings. MCCBs shall invariably be Current Limiting type. Features like Double Break, Positive Isolation functions shall be preferred.

The Panel shall be indoor type having incoming sectionalization and outgoing switchgears as specified. The design shall be cubical type. The degree of enclosure protection shall be **IP 42** as per IS: 13947 (Part-I).

#### **M. V. Panel**

##### **General Construction**

The switchboard shall be floor mounted free standing totally enclosed and extensible type. The switch board shall be dust & vermin proof and shall be suitable for the climate conditions as specified. The design shall include all provisions for safety of operation and maintenance personnel. The general construction shall conform to IS: 8623/1993 for factory assembled switch board.

## **Cubical Type Panels**

Cubical type panels shall be fabricated out of sheet steel not less than 2.0 mm thick. Wherever necessary, such sheet steel members shall be stiffened by angle iron frame work. General construction shall employ the principle of compartmentalization and segregation for each circuit. Unless otherwise approved, incomer and bus section panels or sections shall be separate and independent and shall not be mixed with sections required for feeders. Each section of the rear accessible type panel shall have hinged access doors at the rear. Overall height of the panel shall not exceed 2.4 meters. Operating levers, handle etc. of highest unit shall not be higher than 1.7 meters.

Multi-tier mounting of feeder is permissible. The general arrangement for multi tier construction shall be such that the horizontal tiers formed present a pleasing and aesthetic look. The general arrangement shall be approved before fabrication. Cable entries for various feeders shall be either from top or bottom. Through cable alleys located in between two circuit sections, either in the rear or in the front of the panel. All cable terminations shall be through gland plates. There shall be separate gland plate for each cable entry so that there will not be dislocation of already wired circuits when new feeders are added. Cable entry plates shall therefore be sectionalized. The construction shall include necessary cable supports for clamping the cable in the cable alley or rear cable chamber.

Cubicle panels with more than 1000 Amps BUS shall be made of tested structural modular sections.

## **Bus Bar and Connections**

The bus bars shall be of Copper of high conductivity electrolytic quality and of adequate section. Current density shall not exceed 160 amps for Copper /sq. cm. The bus bar system may comprise of a system of main horizontal bus bars and ancillary vertical bus bars run in bus bar alleys on either side of which the circuit could be arranged with front access cable entries. In the case of rear access, horizontal bus system shall run suitably either at the top or bottom. All connections to individual circuits from the bus bar shall preferably be solid connections; however flexible connections shall also be permitted as per recommendations of the Panel Manufacturer. All bus bars and connections shall be suitably sleeved I insulated in approved manner.

### **Incomer / Termination**

Incomer termination shall be suitable for receiving bus trunking / underground cables. Cable terminations shall invariably be through terminal blocks (Polyamide or superior) or brought out solid terminals.

### **Instruments**

All voltmeters and ammeters shall be flush mounted of size minimum 96 mm conforming to class 1.5 of IS:1248 for accuracy. All voltmeters shall be protected with MCR

### **Indicating Lamps**

On all the incomers of M.V panels, ON/OFF indicating LED lamps shall be provided and shall be suitable for operation on AC supply. Phase indicating LED lamps shall be associated with necessary ON/OFF toggle switch.

### Small Wiring

All small wiring for Controls, Indication etc. shall be of with suitable FRLS/HFFR (halogen free fire retardant) copper conductor cables. Wiring shall be suitably protected within switch board. Runs of wires shall be neatly bunched, suitably supported and clamped. Means shall be provided for easy identifications of the wires. Where wires are drawn through steel conduits, the works shall conform to CPWD General Specifications for Electrical works (Part 1- Internal) - 2005 and IS: 732 as the case may be. Identification ferrules shall be used at both ends of the wires. All control wiring meant for external connections are to be brought out of terminal board.

## OPERATIONAL REQUIREMENTS

The indoor type MV panel shall conform to the following:

- a) The panel shall comprise of incomers, outgoing feeders and bus coupler as specified. The incomer shall be either a double break / contact repulsion MCCB or an Air Circuit Breaker. The bus coupler shall be either a circuit breaker or a double break / contact repulsion MCCB or switch disconnecter fuse unit as specified. The outgoing feeders shall be circuit breakers/MCCBs as specified.
- b) Bus bars for phase and neutral shall have a rating as per specifications.
- c) The entire switch panel shall be cubical type generally conforming to IS: 86231-1993 for factory assembled switch board.
- d) The incomer panel shall be suitable for receiving bus trunking or MV cable of size specified either from top or from bottom.
- e) All incoming AIRCIRCUIT BREAKER/MCCB shall have suitable adjustable tripping current and the time delay settings.
- f) The entire panel shall have a common earth bar of size as specified with two terminals for earth connections.

### Rating and Requirements

#### Air Circuit Breaker

All Air Circuit Breakers shall be 3/4 pole with minimum 50 KA breaking capacity (35 MV A at 433V) conforming to IS: 13947 (Part-II). Rated current shall be as per capacities specified. The equipment shall be complete with the following:

- a) Necessary circuit breaker carriage with 3 position (isolate, test, service) draw out mechanism.
- b) Necessary isolating plugs and sockets.
- c) Necessary mechanism interlock and automatic safe shutters gear with arrangement for pad locking.
- d) Necessary independent manual spring mechanism with mechanical On/Off indication as well as electrical On/Off indication.
- e) Necessary bus bars with bolted type neutral links.
- f) ACB shall be provided with microprocessor based releases having built in over load, short circuit & earth fault protection. Microprocessor release shall be EMI( electro magnetic induction)/EMC (electro magnetic compatible) certified.
- g) Necessary set of auxiliary switches.
- h) Necessary set of CTs with ratios as specified
- i) Necessary identification, metering requirements as specified i/c. ON/OFF indication lamps, selector switches, fuses, ammeter, voltmeter etc.



j) In case of 4 pole breaker neutral shall be fully rated with adjustable settings from 50% to 100% of In.

k) ACB terminals shall be suitable/suitably brought out for direct aluminum termination as per IS:13947 Part-II.

#### Switch Disconnector Fuse Units /MCCB:

Switch Disconnector Fuse Units: All SDF units for feeders or outgoing circuits shall be suitable for a Breaking capacity of 80 KA (57 MV A 433V) capacity at 433V 3 phase 50 Hz AC system conforming to IS: 4064. The number of units and rated current shall be as per detailed requirements specified. Switch Disconnector Fuse unit shall be double break front operated type. The units shall be complete with following:

- a) Necessary HRC cartridge fuses conforming to IS:9224 (part-II).
- b) Necessary operating mechanism quick break make type.
- c) Necessary set of CTs together with an ammeter and selector switch as specified.
- d) Necessary interconnections to bus bars.
- e) Necessary neutral link inside the SDF unit.
- f) All SDF units shall be AC23A utilization category.

MCCB : All MCCBs shall be current limiting type with features of load line reversibility and suitable for Horizontal / Vertical mounting without any derating. Beyond 300Amps capacity MCCBs shall have positive isolation and preferably double break I contact repulsion & double insulation features. The MCCBs shall invariably be used with terminal spreaders. For all MCCBs,  $I_{cs} = I_{cu}$ .

#### TESTS AT MANUFACTURERS WORK

All routine tests shall be carried out and test certificates produced to the department.

### **INSTALLATION, TESTING & COMMISSIONING**

The installation work shall cover assembly of various sections of the panels lining up, grouting the units etc. In the case of multiple panel switch boards after connecting up the bus bars etc., all joints shall be insulated with necessary insulation tape or approved insulation compound. A common earth bar as per section 7 of these specifications shall be run inside at the back of switch panel connecting all the sections for connection to frame earth system. All protection and other small wirings for indication etc. shall be completed before calibration and commissioning checks are commenced. All relays, meters etc. shall be mounted and connected with appropriate wiring.

Commissioning checks and tests shall include all wiring checks and checking up of connections. Relay adjustment/setting shall be done before commissioning in addition to routine Megger tests. Checks and tests shall include the following:

- a) Operation checks and lubrication of all moving parts.
- b) Interlock function checks.
- c) Continuity checks of wiring, fuses etc. as required.
- d) Insulation test: When measured with 500V Megger the insulation resistance shall not be less than 100 mega ohms.
- e) Trip tests and protection gear test.

## TECHNICAL SPECIFICATIONS OF TRANSFORMERS

The general specification for the Oil type transformer are as given in the CPWD general specifications for Electrical Works ( Sub Station works – part IV). The rating of the transformer is 630KVA 33 KV/ 415V , ONAN , With On load tap changer as given in the Schedule.

### DOUBLE POLE STRUCTURE ALONG WITH REQUIRED CONNECTIONS

Double-pole structure consisting of 11 mtr steel poles, cross-arms/ Channels, 33KV Isolator AB Switch, Lighting arrestors, HG Fuse, Disc insulators, pin insulators, Connectors, Earth-pits, Earth connections, 33 KV cable terminations as per the technical details furnished below.

**Double pole M. S. Structures:** Shall be R S joists heavy duty of size 200X200 mm, 11Mtrs. long conforming to IS: 2062 Gr. A. The planting of the ISHB shall be 1.8Mtrs length. GI Channel members 100 x 50X6 mm and required MS angles (shall be used for mounting of LA, AB switch & HG fuse set. Any Steel sections required to complete the work shall be in the scope of successful bidder. Structure shall be provided with two coats of primer and two coats of finishing paint.

The drawings are to be prepared by the successful bidder and the work shall be taken up based on approved drawing. GTP of bought out items shall be submitted for approval.

**AB switch:** 33KV 600 A AB Switch: The 33KV, 600Amp, Double break (maximum system voltage is 36KV) 3 pole AB Switch shall conform to IS: 9920 part I to IV (latest version) and IS: 9921 part I – IV (latest version).

#### For 33 KV 600A AB Switches:

1. Operating down pipe : 6.1 Mts, 32 NB Class-B GI Pipe
2. Connectors (Jumper plate) : LM –6 Alloy terminal connectors (75X12 mm) suitable for conductor.
3. Fixed Contact : 25X4 mm Copper Flat (HDE)
4. Moving Contact : 38 OD and 30 ID Copper Pipe (HDE)
5. Base Channel : 100X50 mm MS Channel of length 1065 mm
6. Provision for pad lacking in ON-OFF position shall be provided.
7. Three numbers Guides of MS Angle 50X50X6 mm for supporting the down Pipe, slotted holes are to be made to the angles for fixing the same to the pole.

#### Lightening arrestor:

Metal oxide, 30KV, 10KA, class-1, system voltage: 33KV, Station class Lightening Arresters, suitable for operation when installed outdoor and exposed to direct sun under the normal service conditions. The Lightening Arresters shall conform to IS 3070/1985 part-I (Latest version).

The necessary bolts, nuts and clamps etc. are to be supplied for mounting the lightning arrester on 100X50 M.S. Channel. The bolts, nuts and clamps etc. shall be suitably galvanized.

#### HG fuse set:

33 KV HG fuse set complete with Pin insulators, nuts, bolts, lugs and mounting base channel as per IS 9385 (latest edition).

**EARTHING:**

Four treated earth-pits shall be provided. These shall be with CI earth pipe, 2.75 mtrs long, 100 mm dia including accessories, masonry enclosure with cover plate, watering pipe etc., with charcoal, coke and salt as required.

Two separate earth connections each for LA and body shall be done with proper supports and spacers.

**Insulators:** 33KV, Polymer (B&S type, 70KN) disc insulators with metal parts and Polymer 33 KV pin/ support insulators with hardware & connectors shall be provided, as required.

**Foundation for poles:**

The poles shall be erected in excavated pits, with PCC, with coping, and back-filling and ramming as required. This shall be generally as per sketch enclosed.

**Fabrication:** The fabrications of structures shall be good quality. Special care shall be taken with regard to straightening, punching of holes and bending of structure members. There should not be any joints for structural supports, structural members and seating channels.

**Stay Sets:** Stay sets shall be provided, if required based on site conditions.

**Cable End Terminations:** Outdoor termination shall be provided 33 KV 3x120 sqmm cable for connection to the Double-pole structure, along with provision for bolting of the cable to the double-pole structure.

Indoor termination shall be provided on 33 KV 3x120 cable for connection to 33 KV HT VCB, along suitable glanding.

Suitable earth connections, as required, shall be provided at both ends.

**ERECTION OF STRUCTURES:**

The structures shall be erected on the foundation, after allowing the required curing time for the foundations. The members shall not be strained or bent during the course of erection. Care shall be taken to see that the jointing surfaces are clean and free from dirt or grit and fit properly. The structures shall be erected strictly in accordance with the approved drawings.

The bolts and nuts, spring washers and pack washers required for the work will be supplied by the contractor. After erection of structures the bolts shall be checked to ascertain that all nuts are fully tight. The contractor shall ensure that all the bolts are in position and fully tightened. All hardware used shall be corrosion proof.

The structure must be truly vertical after erection and no straining will be permitted to bring them to vertical position.

**TECHNICAL PARTICULARS of 33 KV VACUUM CIRCUIT BREAKER PANEL****GENERAL:**

Vacuum Circuit Breaker shall be incorporated in H.T. Panel wherever specified. VCB's shall conform to IEC 298 and 694 IS 3427, BS 5227 and VDE 0670, part 6 as well as the regulations mentioned therein. VCB's shall be suitable for operation on 33kV, 3 phase, 50Hz, AC supply.

**TYPE AND CONSTRUCTION:**

The metal clad panel shall be fully extensible and compartmentalized to give.

- i) Circuit Breaker Compartment
- ii) Busbar Compartment
- iii) CT and Cable Compartment

The compartments shall be safe to touch and compartments thus formed shall be dust proof & vermin proof. A separate metering chamber for fixing the necessary instrumentation metering and protective equipment shall be mounted on the top and bottom of the panel at the front.

The VCB shall consist of three air insulated poles incorporating mechanism of interrupters. The body of interrupters shall be made of nickel chromium steel supported on insulators made out of metalised aluminum oxide. The contacts shall be of chromium copper and butt shaped.

Vacuum circuit breaker shall be mounted on truck or a carriage mechanism. In case of truck mechanism, the breaker shall be on a trolley while in a carriage mechanism, shall be separate door and it shall be possible to perform all operations with front door closed. The draw out carriage shall have two positions for the circuit breaker viz isolated/test & service position. Bus bars shall be insulated type made of high conductivity copper (Copper conductivity should be greater than or equal to 95% in all cases) supported on cast epoxy monobloc designed to withstand full short circuit currents and shall be provided all along the length of the H.T. board.

Busbar compartment shall be provided at the rear. Electrolytic copper busbars shall be of rectangular cross section and insulated and covered with standard sleeve. Busbars shall be supported properly by cast epoxy resin insulators so as to withstand thermal and dynamic stresses during system short circuits. Busbars shall be provided with necessary color coding for phases indication. The busbars shall be designed to withstand a temperature rise of 60 deg. C above and ambient temperature of 45 deg. C.

All busbars and jumper connections shall be of electrolytic copper conforming to relevant IS standards. They shall be adequately supported on epoxy insulators to withstand electrical and mechanical stresses due to specified short circuit currents. Busbar cross section shall be uniform throughout the length of switch board.

Contact surface at all joints shall be properly cleaned and No-oxide grease applied to ensure an efficient and trouble free connections. All bolted joints shall have necessary washers for maintaining adequate contact pressure. All connection hardware shall have high corrosion resistance.

Busbar insulators shall be of track-resistance, high strength, and non- hygroscopic, non-combustible type & shall be suitable to withstand stresses due to over voltages and short circuit current. Busbar shall be supported on the insulator such that the conductor expansion and contraction are allowed without straining the insulators. The temperatures of the busbars and all other equipments, when carrying the rated of relevant Indian Standards, duly considering the specified ambient temperature.

### **EARTHING AND PROTECTIVE EARTHING**

Copper earthing bus shall be provided. It shall be bolted/ welded to the framework of each panel. The earth bus shall have sufficient cross time fault currents to earth without exceeding the allowable temperature rise. Suitable arrangement shall be provided at each end of the earth for bolting. Earthing conductors and earth bus shall run inside at the back of the panel for entire length. Facilities shall be provided for integral earthing of busbars & feeder circuit. Cost of this earthing rod is deemed to be included in the cost of VCBPanel.(50x6mm cu strip)

### **METERING AND PROTECTION**

The VCB Panel Board shall be provided with epoxy resin current transformers for metering and protection. The CT's shall conform in all respects to IS 2705. These shall have accuracy class of 1.0 for metering of 5P10 for protection. Potential transformers shall conform to specifications of IS: 3156. Ammeter and voltmeter to be installed on panel shall be of Digital type. All meters shall be tested for phase to phase isolation of 2000V for 1 minute, input overload withstanding of 1000V for 5 second, and shall be 96mm square pattern, flush mounting type with necessary selector switches. Necessary indicating lamps of low voltage type with built in resistors shall be provided (maximum wattage 2.5W).

## **OPERATING MECHANISM**

Vacuum Circuit Breaker shall be equipped with motorized spring charge. These operating mechanisms shall be of the stored energy type. In the closed state of the breaker, the energy stored in the springs shall be suitable for O-C-O duty.

### **Interlocking and Safety Arrangement**

Vacuum Circuit Breaker shall be provided with the following safety and interlocking arrangements:

- a. The draw out carriage cannot be moved from either test/disconnected to service position or vice versa, when the circuit breaker is 'On'.
- b. The circuit breaker cannot be switched 'ON' when the carriage is in any position between test & service position.
- c. The front door of the panel cannot be opened when the breaker is in service position or in an intermediated position.
- d. The low voltage plug & socket cannot be disconnected in any position except test/isolated position.
- e. The door cannot be closed unless the LV plug has been fitted.
- f. It shall be possible to mechanically close and trip the circuit breaker through push buttons with the circuit breaker in service position and the door closed.
- g. Individual explosion vents shall be provided for breaker, busbar, cable chambers on the top of the panel to let out the gases under pressure generated during an unlikely event of a fault inside the panel.
- h. Circuit Breaker & sheet metal enclosure shall be fully earthed.
- i. Self locking shutters shall be provided which close automatically and shall be interlocked with the movement of the draw out carriage mechanism.

**Rating:**

The rating of the vacuum circuit breaker shall be as per Bill of Quantity. The rated/breaking capacity of the breaker shall be at 33kV as per standards. The rated making capacity shall be as per the relevant standards.

**Accessories:**

Circuit Breakers shall be provided with the following accessories.

- i. Auxiliary Switch with minimum 4 NO+ 4 NC auxiliary contacts.
- ii. Tripping Coil
- iii. Mechanical Operation Counter
- iv. Spring Charging Handle

**Additional Accessories**

The loose items to be supplied with the 11kV VCB Panel Board shall comprise of the following:

- i. Instruction Book.
- ii. Maintenance Manual.
- iii. Reaching in/out handle.
- iv. Handle for spring charging mechanism.
- v. Foundation bolts.
- vi. Busbar Earthing & Circuit Earthing Trolley

**Mounting**

Vacuum Circuit Breakers shall be mounted as per manufacturer's standard practice.

**Auxiliary Supply**

- a. The tripping shall be at 24 Volt D.C. through a power pack unit.
- b. Space heater indication & other auxiliary supply requirement shall be at 230

V AC. Necessary termination arrangements complete with isolating switch, control fuse & link shall be provided at one place in the panel for receiving the purchaser's cable.

## **TESTS**

### **Factory Tests**

The circuit breakers/panel shall be subjected to routine tests at manufacturer's works in accordance with the details specified in the relevant IS specifications. NO panel/equipment will be accepted without factory acceptance test(FAT) These shall however necessarily comprise of the following.

- a. Power frequency voltage test on the main power circuit.
- b. Verification of the correct wiring/Functional Test.
- c. Dielectric test at 1.5kV on the control circuit. Apart from above, the vendor shall submit the routine test certificates for the following equipments:
  - i. Circuit Breakers
  - ii. Current Transformers
  - iii. Voltage Transformers

The vendor shall submit the type test certificate for following along with the offer.

- a. Temperature rise test.
- b. Impulse & power frequency voltage test
- c. Short time current test on circuit breaker.

### **Site Test**

#### **i. General**

- a. Verification for completion of equipment, physical damage/deformities.
- b. Alignment of panel, interconnection of busbars & tightness of bolts & connection etc.
- c. Interconnection of panel earth busbar with plant earthing grid.
- d. Inter panel wiring between transport sections.
- e. Cleanliness of insulators and general Cleanliness of panel to remove traces of dust, water etc.

#### **ii. Circuit Breaker & Panel**

- a. Check for free movement of circuit breaker, lubrication of moving part & other parts as per manufacturers manual.
- b. Manual/Electrical operations of the breaker and Functional test as per drawings.
- c. Meggar before the Hi Pot test.
- d. H.T. Test - Hi Pot test (Power frequency withstand test for one minute at 28kV RMS). At site Hi Pot test is carried out at 80% of 28kV RMS value.
- e. Meggar after the Hi Pot test.



- f. CT/PT ratio/polarity primary injection test.
- g. Secondary injection test on relays to practical characteristics.

## L.T. SWITCHGEARS

### TECHNICAL PARTICULARS of LT Panel with LT ACB

#### GENERAL

Air circuit breakers shall be incorporated in PCC Panels wherever specified. ACBs shall conform to IS 13947 (Part 2) & IEC 947 (2) in all respects. ACBs shall be suitable for operation on 415 volts, 3 phase, 50Hz, AC supply.

#### Technical Specifications:

The Air circuit breakers shall conform to the requirements of IS13947-2 and IEC 60947-2 & their latest amendments and should be type tested & certified for compliance to Indian standards from-CPRI/ERDA. Manufacturer shall submit test report for combined sequence tests from CPRI/ERDA. The breakers shall be suitable for isolation and should be clearly indicated on the front facia. The Air circuit breakers shall be suitable for following system conditions:

- i) The ACBs shall have  $I_{cs} = I_{cu} = I_{cw}$  for 1 sec for short circuit breaking capacity of not less than 50 KA rms at 415 Volts 50Hz ac.
- ii) Rated Operational Voltage (V) & Frequency : 415 Volts, 3 phase, 4wire 50 Hz.
- iii) Rated insulation voltage ( $U_i$ ): 1000 voltsAC
- iv) Ambient temperature: designed at 40 degree C ambient temperature. ACB shall be fully rated at inside panel temperature of 50 deg C.
- v) Rated impulse voltage 8 KV forMain circuit.
- vi) Utilization Category: B

All ACBs shall be of electrically operated and draw out type (EDO) unless otherwise stated. The circuit breakers shall be 3/4 pole (as specified in BOQ) with quick make/break, trip free operating mechanism.

All current carrying parts shall be silver plated and suitable arcing contacts with proper arc chutes shall be provided to protect the main contacts.

The ACBs shall be fitted with detachable arc chutes on each pole designed to permit rapid dispersion, cooling and extinction of the arc. It should be possible to remove arc chutes without using any tool & without removing the

breaker from the panel.

The ACBs shall have minimum mechanical life of 20000 operations for ratings up to 2500A & 5000 operations for higher ratings. It should be possible to extend electrical life of the ACB to mechanical life by replacing the arcing contacts at site.

It shall be possible to directly terminate Aluminum/copper links / bus bars as specified in IS13947-2. All 4 Pole ACBs should have fully neutral Pole.

Auxiliary switches directly operated by the breaker operating mechanism and having 4NO and 4NC contacts (or as required), shall be provided on each breaker. The auxiliary switch contacts shall have a minimum rated thermal current of 10 Amps at 230V ac.

All the ACB ratings shall have a uniform panel door cut-out, on left or right side of the panel for allowing maximum utilization of panel space. The ACB with Panel should meet IP53 protection on breaker front.

### **Cradle:**

The cradle shall be so designed and constructed as to permit smooth withdrawal and insertion of the breaker into it. Draw out ACBs shall have 4 distinct and separate positions wrt cradle i.e. Service Position, Test Position, Isolated Position and Maintenance. ACB should have facilities for carrying out maintenance without physically removing the breaker from panels.

For ease of maintenance, it should be possible to replace jaw contacts without disturbing the busbar links for draw-out type ACBs.

### **Protection Release**

The protection release of **Incomer level ACBs (except APFC Panels)** should have inbuilt adjustable protections against overload, short circuit, instantaneous and earth fault protection with adjustable time delay settings for all protections except instantaneous zone. The release should have separate indication by LEDs for Power ON, Overload, Short Circuit, Instantaneous and Earth Fault, Trip & Alarm. The release should provide following additional protection with necessary modules apart from basic protections:

- Undercurrent
- Current Unbalance
- Reverse power

- Under and over voltage
- Under and over frequency
- Phase sequence
- Maximum demand exceed

The parameterization should be possible through communication and menu. The release must provide a password protection to access the protection configurations. The release shall meet the EMI / EMC requirements.

The release should have high resolution LCD for comprehensive metering with the following parameters:

- Phase and Neutral currents (running, avg & max), percentage loading etc
- Phase voltages (P-P & P-N) (running, avg & max)
- Energy & power parameters (active, reactive and apparent)
- Maximum demand in KW
- Power Factor
- System Frequency
- Harmonic- Voltage & current

The release of **APFC Panels incomer ACB and Outgoing ACBs** shall be microprocessor based with following inbuilt protections and features :

- Protection against Overload, Short circuit, Instantaneous & Earth faults
- Short circuit & Earth fault protection zones shall have time based selectivity
- Self-diagnostic to indicate healthiness of microprocessor.
- Individual fault annunciation by LEDs without using external power supply
- On line change of settings shall be possible
- It should be possible to carry out On Line testing of release without tripping the ACB
- Switch selectable thermal memory to reduce thermal stresses
- The release shall trip the breaker directly
- Shall sense true RMS value of current
- The release shall be self powered and draw its power from the main breaker CTs and shall require no external power supply for its operation.
- The release shall meet the EMI / EMC requirements.

## **Safety Features:**

Draw out ACBs shall be provided with automatically operated safety shutters to prevent accidental contact with live contacts when breaker is withdrawn from the Cradle.

For Draw-out breakers, an arrangement shall be provided to prevent rating mismatch between breaker and cradle. It shall not be possible to interchange two circuit breakers of different thermal ratings.

Draw out breakers should not close unless in distinct Service/Test/Isolated positions.

Electrically operated ACBs shall be provided with mechanical anti-pumping.

Remote tripping device (Shunt release) should be able to trip the ACB, even at voltages as low as 10%.

The insulation material used shall conform to Glow wire test as per IEC60695.

It should be possible to access racking handle & carry out setting of the release from the front & without opening the cassette door.

## **TYPE AND CONSTRUCTION**

Air Circuit Breakers shall be of enclosed pattern, dead front type with 'trip free' operating mechanism. It shall have microprocessor based electronic release. Air Circuit Breakers shall be EDO type (Electrically drawout type unless otherwise specified) with horizontal drawout carriage. The ACBs shall be strong and robust in construction with suitable arrangements for anchoring when in fully engaged or fully drawn-out positions. The carriage or cradle on which the breakers are mounted shall be robust design made of fabricated steel, supported on rollers. Cradle shall also comprise of main and secondary separable contacts and all draw out mechanism in a completely fig welded assembly. There shall be no dependence upon the switchboard frame for any critical alignment. The withdrawal arrangement shall be such as to allow smooth and easy movement.

All the current carrying parts of the circuit breakers shall be silver plated, suitable arcing contacts shall be provided to protect the main contacts. The contacts shall be of spring loaded design. The sequence of operation of the contacts shall be such that arcing contacts 'make before' and break after' the main contacts. Arcing contacts shall be provided with efficient arc chutes on each pole and these shall be such suitable for being lifted out for inspection of main as well as arcing contacts. The contact tips and arc chutes shall be suitable for ready replacement. Self aligning isolating contacts shall be

provided. The design of the breaker shall be such that all the components are easily accessible to inspection, maintenance and replacement. Interphase barriers shall be provided to prevent flashover between phases.

## **OPERATING MECHANISM**

Air Circuit breaker shall be provided with a quick-make, trip free operating mechanism, the operating mechanism shall be 'strain-free' spring operated. The operating handle shall be in front of the panel type. The design shall be such that the circuit breaker compartment door need not be opened while moving the breaker from completely connected, through test, into the disconnected position. Electrical operated breakers shall have a motor wound spring charged closing mechanism. Breaker operation shall be independent of the motor, which shall be used solely for charging the closing spring. The operating mechanism shall be such that the breaker is at all times free to open immediately and the trip coil is energised. Mechanical operation indicator shall be provided to show open and closed position of breaker. Electrically operated breakers shall be additionally provided with mechanical indication to show charged and discharged condition of charging spring. 24 volt DC supply through battery backup for closing and opening for tripping circuit.

Means shall be provided for slow closing and opening of the breaker for maintenance purposes and for manual charging and closing of electrically operating breakers during emergencies.

## **INTERLOCKING AND SAFETY ARRANGEMENT**

Air Circuit Breakers shall be provided the following safety and interlocking arrangements:

- i. It shall not be possible for breaker to be withdrawn when in "ON" position.
- ii. It shall not be possible for the breaker to be switched on until it is either in fully inserted position or for testing purposes it is in fully isolated position.
- iii. The breaker shall be capable of being racked into 'testing' 'isolated' and 'maintenance' positions and kept locked in any of these positions.
- iv. A safety catch to ensure that the movement of the breaker, as it is withdrawn is checked before it is completely out of the cubicle.
- v. The operating mechanism shall provide for racking the breaker into connected, test and disconnected positions without operating compartment door. When cubicle door shall be open position, the breaker can be pulled out to a fourth position, maintenance, where free access shall be possible to all parts of the breaker.

## **RATING**

The rating of the circuit breaker shall be as per the Bill of Quantity Rated service breaking capacity (Ics) of the breakers shall be as per BOQ unless otherwise specified at 415 volts. The rated making capacity shall be as per the relevant standard.

## **ACCESSORIES**

The breaker shall be equipped with electronic microprocessor based release to provide over current & earth fault protection. The breaker shall be fitted with following accessories for control, signal and interlocking.

- i. Micro switches shall be mounted on the cradle of draw out breaker to indicate the position of the breaker on the cradle.
  - a. Kit for test/isolated indication.
  - b. Kit for service position indication.
  - c. Kit for shutter assembly.
- ii. Accessories for following interlocking schemes shall be provided.
  - d. Accessory kit for locking the breaker in isolated position. This kit is useful for interlocking scheme as well as keeping personnel and equipment safe.
  - e. Door interlock kit: Panel or cubicle door cannot be opened with the ACB in Test or Service position.
  - f. Lockable trip push button.

## **MOUNTING**

Circuit Breakers shall be mounted as per manufacturers' standard practice.

### **Protection against transients/surges**

Encapsulated Class B surge arrester for three phase four wire system with discharge impulse current(Iimp as per IEC61643-1 65KA (for 10/350µs) between phase to neutral & 100KA (for 10/350µs) between Neutral to earth. Maximum continuous operating voltage should be 500V for phase to phase & 320V for Phase to neutral. Response time (ta) should be less than 100ns for phase to neutral & Voltage protection level should be less than 1.3 KV.

## **TESTING**

Testing of each circuit breaker shall be carried out at the works(**factory site**) as per IS 2516 and the original test certificate shall be furnished in triplicate. The

tests shall incorporate at least the following.

- i. Impulse withstand test.
- ii. Power frequency withstand test.
- iii. Short circuit test.
- i v. Temperature - rise test under rated conditions.



## **MOULDED CASE CIRCUIT BREAKERS**

### **GENERAL**

Moulded Case Circuit Breaker shall be incorporated in the Main/Sub Distribution Boards wherever specified. MCCBs shall conform to IS 13947 (Part 2) & IEC 947 (2) in all respects. MCCBs shall be suitable either for single-phase AC 230 volts or three phase 415 volts. All MCCBs shall have microprocessor based over current and short circuit releases with adjustable current setting from  $0.4I_n$  to  $1.0I_n$ .

### **Technical Specifications**

The MCCB should be current limiting type with trip time of less than 10 milli sec under short circuit conditions. The MCCB should be either 3 or 4 poles as specified in BOQ.

MCCB shall comply with the requirements of the relevant standards IS13947 - Part 2 /IEC 60947-2 and should have test certificates for breaking capacities from independent test authorities CPRI / ERDA

MCCB shall comprise of Quick Make -break switching mechanism, arc extinguishing device and the tripping unit shall be contained in a compact, high strength, heat resistant, flame retardant, insulating moulded case with high withstand capability against thermal and mechanical stresses.

The breaking capacity of MCCB shall be as specified in BOQ. The rated service breaking capacity should be equal to rated ultimate breaking capacities ( $I_{cs}=I_{cu}$ ).

All MCCBs upto 100A ratings should be provided with Thermal Magnetic type release with adjustable Overload and fixed short circuit protections. MCCBs of ratings above 100A shall be provided with Microprocessor based having inbuilt adjustable protections against Over Load (L), Short Circuit (S) and Ground Faults (G) with time delay.

All MCCBs should be provided with the Rotary Operating Mechanism. The ROM should be with door interlock (with defeat feature) & padlock facility

MCCB should have Spreader links & Phase barriers as standard feature. Superior quality of engineering grade plastics confirming to glow wire Tests as Per IEC 60695-2-1 should be used for insulation purpose.

The handle position shall give positive indication of 'ON', 'OFF' or 'Tripped' thus qualifying to disconnection as per the IS/IEC indicating the true position of all the contacts.

### **CONSTRUCTIONS**

The MCCB's cover and case shall be made of high strength heat treatment and flame

retardant thermo-setting insulating material. Operating handle shall be quick make/quick break, trip-free type. The operating handle shall have suitable "ON", "OFF" "and" "tripped" indicators. Three phase MCCBs shall have common operating handle for simultaneous operation and tripping of all the three phases. MCCBS shall be provided with rotary handle.

Suitable extinguishing device shall be provided for each contact. Tripping unit shall be of thermal magnetic or static release type provided in each pole & connected by a common trip bar such that tripping of any pole operates all three poles to open simultaneously. MCCB shall be current limiting type.

Contact trips shall be made of suitable air resistant, silver alloy for long electrical life. Terminals shall be of liberal design with adequate clearance.

## **TESTING**

- a. Original test certificate of the MCCB as per Indian Standards (IS) 315-C-8370 shall be furnished.
- b. Pre-commissioning tests on the Main Distribution/Sub Distribution Board incorporating the MCCB shall be done as per standard.

## MEASURING INSTRUMENTS, METERING & PROTECTION

### GENERAL

Direct reading electrical instruments shall be in conformity with IS 1248. The accuracy of direct reading shall be 1.0 for voltmeter and 1.5 for ammeters or better. Other type of instruments shall have accuracy of 1.5 or better. The errors due to variations in temperature shall be limited to a minimum. The meter shall be suitable for continuous operation between -10 degree Centigrade to + 50 degree Centigrade. All meters shall be of flush mounting type of 96mm square or circular pattern. The meter shall be enclosed in a dust tight housing. The housing shall be of steel or phenolic mould. The design and manufacture of the meters shall ensure the prevention of fogging of instrument glass. Instruments meters shall be sealed in such a way that access to the measuring element and to the accessories within the case shall not be possible without removal of the seal. The meters shall be provided with white dials and black scale markings in case of analog meter, although in most of the cases **digital meter will be preferred.**

The pointer shall be black in colour and shall have zero position adjustment device which could be operated from outside. The direction of deflection shall be from left to right.

Suitable selector switches shall be provided for all ammeters and voltmeters intended to be used on three-phase supply.

*The specifications herein after laid down shall also cover all the meters, instrument and protective devices required for the electrical work. The ratings type and quantity of meters, instruments and protective devices shall be as per the Bill of quantities.*

### AMMETERS

Ammeters shall be moving iron or moving coil type. The moving part assembly shall be with jewel bearing. The jewel bearing shall be mounted on a spring to prevent damage to pivot due to vibrations and shocks, the ammeters shall be manufactured and calibrated as per the latest edition of IS:1248. Ammeters shall be instrument transformer operated, and shall be suitable for 5A secondary of instrument transformer. The scales shall be calibrated to indicate primary current, unless otherwise specified. The ammeters shall be capable of carrying sustained overloads during fault conditions without damage or loss of accuracy.

### VOLTMETERS

Voltmeter shall be of moving iron or moving coil type. The range for 415 volts, 3 phase voltmeters shall be 0 to 500 volts. Suitable selector switch shall be provided for each voltmeter to read voltage between any two lines of the system. The voltmeter shall be provided with protection fuse of suitable capacity.

## **CURRENT TRANSFORMERS**

Current transformers shall be in conformity with IS: 2705 (Part I, II & III) in all respects. All current transformers used for medium voltage applications shall be rated for 1kV. Current transformers shall have rated primary current, rated burden and class of accuracy as required. However, the rated acceptable minimum class of various applications shall be as given below:

Measuring : Class 0.5 to 1

Protection : Class 5P10.

Current transformers shall be capable of withstanding without damage, magnetic and thermal stresses due to short circuit fault of 50KA on medium voltage system. Terminals of the current transformers shall be marked permanently for easy identification of poles. Separate CT shall be provided for measuring instruments and protection relays. Each C.T. shall be provided with rating plate.

Current transformers shall be mounted such that they are easily accessible for inspection, maintenance and replacement. The wiring for CT's shall be copper conductor, PVC insulated wires with proper termination lugs and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

All Current Transformer shall be Cast resin type.

## **MISCELLANEOUS**

Control switches shall be of the heavy-duty rotary type with escutcheon plates clearly marked to show the operating position. They shall be semi-flush mounting with only the front plate and operating handle projecting.

Indicating lamps shall be of the filament type of low watt consumption, provided with series resistor where necessary, and with translucent lamp covers, bulbs & lenses shall be easily replaced from the front.

Push buttons shall be of the momentary contact, push to actuate type fitted with self- reset contacts & provided with integral escutcheon plates marked with its functions.

## **TECHNICAL PARTICULARS of LT CABLE**

### **GENERAL**

L.T. Cables shall be supplied, inspected, laid tested and commissioned in accordance with drawings, specifications, relevant Indian Standards specifications and cable manufacturer's instructions. The cable shall be delivered at site in original drums with manufacturer's name clearly written on the drums. The recommendations of the cable manufacturer with regard to jointing and sealing shall be strictly followed.

### **MATERIAL**

The L.T. power cable shall be XLPE insulated PVC sheathed type aluminium conductor armoured cable and L.T. control cable shall be PVC insulated PVC sheathed type copper conductor unarmoured cable conforming to IS: 1554: 1988 (Part-I) with up to date amendments.

### **INSTALLATION OF CABLES**

Cables shall be laid directly in ground, pipes, masonry ducts, on cable tray, surface of wall/ceiling etc. as indicated on drawings and/or as per the direction of IISER TIRUPATI Engineer. Cable laying shall be carried out as per CPWD specifications. **All cable trenches will be provided by IISER TIRUPATI.**

### **INSPECTION**

All cables shall be inspected at site and checked for any damage during transit.

### **JOINTS IN CABLES**

The Contractor shall take care to see that the cables received at site are apportioned to various locations in such a manner as to ensure maximum utilisation and avoiding of cable joints in all cases. This apportioning shall be got approved from Engineer-in-Charge before the cables are cut to lengths.

### **LAYING CABLES IN GROUND**

Cables shall be laid by skilled experienced workmen, using adequate rollers to minimize stretching of the cables. The cable drums shall be placed on jacks

before unwinding the cable. With great care it shall be unrolled on over wooden rollers placed in trenches at intervals not exceeding 2 metre. Cables shall be laid in the trench provided by IISER TIRUPATI for LT & HT cables.

The relative position of the cables, laid in the same trench shall preserve. At all changes in direction in horizontal and vertical planes, the cables shall be bent smooth with a radius of bent not less than 12 times the diameter of cables. Minimum 3 metre long loop shall be provided at both end of cable or as directed by engineer incharge.

Distinguishing marks should be made on the cable ends for identifications of phases. Insulation, tapes of appropriate voltage and in red, yellow and blue colours shall be wrapped just below the sockets for phase identifications.

Cable route marker shall be provided as per CPWD specifications. Cost of cable route markers is deemed to be included in the cost of cables/cable laying.

Care shall be taken to avoid crossing of cable.

### **CABLES TAGS**

Cable tags shall be made out of 2mm thick aluminium sheets, each tag 1 inch in dia with one hole of 2.5mm dia, 6mm below the periphery. Cable designations are to be punched with letter/number punches and the tags are to be tied inside the panels beyond the glanding as well as below the glands at cable entries. On straight lengths, tags shall be provided at every 5 metres or as directed by engineer incharge.

### **TESTING OF CABLES**

Prior to installation burying of cables, following tests shall be carried out. Insulation test between phases, phase & neutral, phase & earth for each length of cable.

- a. Before laying.
- b. After laying.
- c. After jointing if any.

Along with the test as prescribed in IS Code, cross sectional area shall also be checked. On completion of cable laying work, the following tests shall be conducted in the presence of the Engineer in Charge.

- a. Insulation Resistance Test (Sectional and overall).
- b. Continuity Resistance Test.



## **TECHNICAL PARTICULARS of EARTHING**

### **EARTHING AND PROTECTIVE EARTHING**

Copper earthing bus and connectors shall be provided. It shall be bolted/welded to the framework of each panel. The earth bus shall have sufficient cross time fault currents to earth without exceeding the allowable temperature rise. Suitable arrangement shall be provided at each end of the earth for bolting. Earthing conductors and earth bus shall run inside at the back of the panel for entire length. Facilities shall be provided for integral earthing of busbars & feeder circuit. Cost of this earthing bus and connectors is deemed to be included in the cost of all Panels/equipment.

All the non-current metal parts of electrical installation shall be earthed properly. All metal conduits trunking, switchgear, distribution boards, switch boxes, outlet boxes, and all other parts made of metal shall be bonded together and connected by means of specified earthing conductors to an efficient earthing system. Earthing work shall conform to CPWD General Specifications for Earthing work shall conform to Internal-1994 and Indian Electricity Rules 1956 amended up to date and in the regulations of the local Electricity Supply Authority.

### **EARTHING CONDUCTOR**

Earth continuity conductor along with submain wiring from Main/Sub Distribution boards to various distribution boards shall be of copper. Earth continuity conductor from distribution board onward up to outlet point shall also be of bare copper. Earth continuity conductor connecting Main & Sub Distribution boards to earth electrode shall be with copper strip with conductivity greater than 95 %.

#### **The grounding system shall incorporate individual components or a combination of the following:**

- Deep driven copper bonded steel core ground rod/ Copper Plate / Copper Rod as central injection point for flow of fault current which is securely connected to the lower end of the down conductor.
- The use of ground resistance improvement material shall be applied in order to reduce the resistivity levels of the grounding system and maintain a constant low resistivity. The grounding system shall be maintenance free.



## **SAFETY EQUIPMENTS**

### **DANGER NOTICES**

Danger notices shall be affixed permanently in a conspicuous position in Hindi or English with sign of skull and bones at every overhead lines, transformer, electrical equipments motors, etc.

### **FIRST AID BOX**

Standard first aid box with all standard contents shall be supplied.

### **FIRE BUCKETS**

The fire bucket unit shall consist of galvanised iron baskets, which shall be with round bottom, and of 13 liters capacity. They shall be filled with dry sand. Arrangement shall be made to hang them on GI pipe stand comprising of at least 2 vertical and one horizontal members of 50 mm GI pipe. The stands shall have hooks and locking chain arrangement. The buckets and stand shall be painted with epoxy red paint.

### **FIRE EXTINGUISHER**

Foam type Fire extinguishers of 9 Kg. capacity and Dry Chemical type Fire Extinguishers of 10 Kg capacity shall be of approved make. It shall be filled with carbon tetrachloride. It shall have horns. Extinguishers shall be fixed on walls/columns with necessary clamps made out of 50 mm x 6mm MS flat and coated bolts and nuts grouted in wall/column.

### **RUBBER MAT & Hand Gloves**

Corrugated rubber insulating matting shall be provided in front of all power & motor control centers, push button station and distribution board in the electrical rooms. The width of matting shall be one meter. It shall be as ISI mark.

Hand Gloves shall be of highly insulating material with ISI Mark and can be able to use for both L.T. & H.T

### **INSTRUCTION CHART**

Printed instruction chart both in English and Hindi and duly framed with front glass, prescribing treatment to be given to persons having Electric shock, shall be supplied.

## **GENERAL REQUIREMENTS FOR SUPPLY OF EQUIPMENT**

### **TESTING AND INSPECTION**

Failure on the part of the client to inspect or to reject after inspection any work, which later proves to be defective, shall not relieve the Contractor from warranties, commitments and obligations, which he undertakes under this contract. The Contractor is solely responsible for the accuracy, quality and completeness of his work and supply.

The client at his discretion shall order re-inspection of the whole / part of the material found faulty during inspection. The Contractor shall attend to all the comments noted by the client.

### **PACKING AND FORWARDING**

The Contractor shall include and provide for securely protecting and packing the equipment in accordance with the best established practices so as to protect the contents from damage during transit, storage, exposure to heat, moisture or rain.

Notwithstanding the above, the Contractor shall be entirely responsible for loss, damage or deterioration to the materials occasioned by faulty, defective or insecure packing.

The following marks in English block letters shall be clearly stenciled on the packages with good quality non-fading paint in characters sufficiently large as the size of the package will permit.

Each package shall have a detailed packing list quoting the detailed list of the contents packed within the package giving the part numbers with reference to the assembly drawings.

### LIST OF APPROVED MANUFACTURERS

S.No.	Item	Make
1.	33 KV VCB Panel Board	Crompton/Siemens /L&T /ABB/ Schneider/ Alsthom/ S&S Power/ Easun/Andrew Yule/Kirloskar
2.	Air Circuit Breakers	L&T /Siemens / ABB/Schneider/ Crompton/GE/HPL
3.	MCCB	L&T/ Siemens/ ABB/ Schneider/HPL
4.	MCB-DB's, MCB, ELCB	L&T/ Siemens/ Legrand/HPL
5.	RCCB/ MCB-Isolator etc.	Schneider /HPL
6.	Power Contactors	L&T/ Siemens/ Schneider/ ABB
7.	SDFU	L&T/ GE Power Controls/ Siemens/ Schneider/HPL
8.	Material used in LT Panel	Manufactured at the works of L&T, Siemens, ABB, Schneider/HPL
9.	Relay	Crompton / ASHIDA/ Alsthom/L&T /ABB/C&S
10.	Street Lights	Wipro/Bajaj/Crompton / havel's
12.	Digital meter	Schneider /Allen-bradley/Secure
16.	Battery	Relicell/Exide/Luminous
17.	33 KV XLPE Cable	polycab/ Universal/ NICCO/ CCI/Gloster/KEI
18.	L.T. Cables	Universal/CCI//Finolex/ Gloster/ KEI/polycab
20.	Modular Range of Switches/ sockets etc	Anchor- Roma/ North West/ Toyama/ Standard/ MDS-Mosaic/ Legrand/ Schneider/ L&T
23.	Earthing	LPI/ JMV/Ashlok/Bradley/Trinity touch
24.	Lightening arrester	LPI/JMV/Bradley/ Ashlok/Trinity touch
25.	Surge arrester	LPI/Bradley/JMV/Conzerve

**VOLUME III**

**FINANCIAL BID**













SI.No.	Description	Quantity	Unit	Rate	Amount
	5 Nos. 160A T P MCCB capacitor duty with 185A CPD contactors				
	1 Nos. 63A T P MCCB capacitor duty with 80A CPD contactors.				
	6 Nos. 32A T P MCCB capacitor duty with 40A CPD contactors.				
	discharge resistors etc.,				
	The capacitors shall be gas filled with detuned filters.				
	On/Off PB lamp with auto / manual selector switch.				
	The capacitor shall be provided with timers for each capacitor starters.				
	2 Nos. 50KVAR Capacitors.				
	3 Nos. 20KVAR Capacitors.				
	4 No. 10KVAR Capacitors.				
	2 No. 5KVAR Capacitors.				
	Note: Capacitor shall be connected with 150% rated Copper flexible wiring.				
	<u>Other components:</u>				
	Selector switch - Auto / Manual for Incomer.				
	Time delay contactors				
	Push button				
	Indicating lamps				
	MCBs				
	HRC fuses				
	Internal & control wiring - To be with ferrules				
	Fan (with thermostat) for cooling of panel alongwith suitable capacity MCB				
	Heat resistant type, 1100V grade single core copper flexible.	1	Set		
<b>2.3</b>	<b>Feeder Pillar Panel</b>				
	SUPPLY & INSTALLATION OF OUTDOOR FABRICATED PANEL STAND MOUNTED. WITH, 125A 4P MCCB -1 NOS- In-Coming , 63A 4P MCB-1NO.-Out-Going, 32A 4P MCB-4NO.-Out-Going, 25A SP MCB-4 NO.- Out-Going including all accessories as required.	2	Nos		
	<b>SUB HEAD III : (LT CABLES)</b>				
3.1	Supplying of XLPE insulated and PVC sheathed armoured aluminium power cable of 1.1 kV grade conforming to IS 7098(Part 1) ammended upto date of following sizes cable complete as required				
i)	4 core 10 Sqmm.	200	Metre		
ii)	4 core 16 Sqmm.	300	Metre		
iii)	3.5 Core 50 Sqmm.	400	Metre		
iv)	3.5 Core 120 Sqmm.	700	Metre		
v)	3.5 Core 240 Sqmm.	200	Metre		
3.2	Laying of one number XLPE insulated and PVC sheathed power cable 1.1kV grade direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required				
i)	Up to 35 sq.mm	275	Metre		
ii)	Above 35 Sq mm and upto 95 Sq mm	250	Metre		
iii)	Above 95 Sq mm and up to 185 Sq mm	250	Metre		
iv)	Above 185 Sq mm and up to 400 Sq mm	140	Metre		
3.3	Laying of one number XLPE insulated and PVC sheathed power cable 1.1kV grade direct in the existing RCC/ Hume/Stoneware/Metal pipe as required				
i)	Up to 35 sq.mm	75	Metre		
ii)	Above 35 Sq mm and upto 95 Sq mm	30	Metre		
iii)	Above 95 Sq mm and up to 185 Sq mm	50	Metre		

Sl.No.	Description	Quantity	Unit	Rate	Amount
iv)	Above 185 Sq mm and up to 400 Sq mm	25	Metre		
3.4	Laying of one number additional PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground in the same trench in one tier horizontal formation including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
i)	Up to 35 sq.mm	100	Metre		
ii)	Above 35 Sq mm and upto 95 Sq mm	120	Metre		
iii)	Above 95 Sq mm and up to 185 Sq mm	400	Metre		
iv)	Above 185 Sq mm and up to 400 Sq mm	35	Metre		
3.5	Supplying and making end termination with suitable size Aluminium lugs including double compression glands of following sizes of 1.1 kV grade multicore aluminium conductor XLPE insulated and PVC sheathed				
i)	4 Core 10 Sqmm	20	Each		
ii)	4 Core 16 Sqmm	14	Each		
iii)	3.5 Core 50 Sqmm.	14	Each		
iv)	3.5 Core 120 Sqmm.	10	Each		
v)	3.5 Core 240 Sqmm.	6	Each		
	<b>SUB HEAD IV : (EARTHPIITS)</b>				
4.1	Supply & fixings of standard Copper Plate Earth station, with 600X600X3mm thick copper plate & 20mm dia 2100mm long GI pipe including construction of brick pedestal, providing meshed funnel, CI cover and other civil Engineering works, spreading a homogeneous mixture of salt charcoal around the plate etc, completely as per IS 3043, 1987 or latest revision. (For Tx – Neutrals & DG-Neutrals)	6	Set		
4.2	Supply & fixing of standard C.I. Pipe Earth station, with 100mm dia. 2500mm long C.I. pipe including construction of brick pedestal, providing meshed funnel, CI cover and other civil Engineering works, spreading a homogeneous mixture of salt charcoal around the pipe etc, completely as per IS 3043, 1987 or latest revision. (Tx, DG sets, all Panels Body earthing & Fencing)	10	Set		
4.3	Supplying and laying 25mmX5mm GI strip at 0.5m below ground level as strip earth electrode, including soldering etc. as required.	150	Metre		
4.4	Supplying and laying 50mmX6mm GI strip at 0.5m below ground level as strip earth electrode, including soldering etc. as required.	50	Metre		
4.5	Supplying and laying 25mmX5mm Copper strip at 0.5m below ground level as strip earth electrode, including soldering etc. as required.	75	Metre		
4.6	Supplying and laying 50mmX6mm Copper strip at 0.5m below ground level as strip earth electrode, including soldering etc. as required.	50	Metre		
4.7	Providing & fixing 6 SWG G.I. wire on surface or in ground for loop earthing for street poles	400	Metre		

Sl.No.	Description	Qunatity	Unit	Rate	Amount
	<b>SUB HEAD V : (STREET LIGHTS)</b>				
5.1	Supply & fixing of of 6.0Mtr height Single arm GI Street light Pole. The pole shall be with base plate of 300mmX300mm 12mm thick with 1no 70W LED Light Fixture (IP 66) along with Junction box with 1no 6A SPMCB, Connectors and wiring upto terminal box from fitting with 1.1 KV grade PVC insulated multi strandred 3 x 2.5 Sq.mm multi strand copper conductor cable, and 2nos of 40mm Dia Class B GI Pipes for cable entry. The pole shall be erected on existing PCC/Grouting Base plate and Fixing bolts, nuts etc shall be included and complete as required.	35	Nos		
5.2	Supply & fixing of of 3.5 Mtr height Single arm GI Street light Pole. The pole shall be with base plate of 300mmX300mm 12mm thick with 1no 35 W LED Light Fixture (IP 66) along with Junction box with 1no 6A SPMCB, Connectors and wiring upto terminal box from fitting with 1.1 KV grade PVC insulated multi strandred 3 x 2.5 Sq.mm multi strand copper conductor cable, and 2nos of 40mm Dia Class B GI Pipes for cable entry. The pole shall be erected on existing PCC/Grouting Base plate and Fixing bolts, nuts etc shall be included and complete as required.	35	Nos		
	<b>SUB HEAD VI : (Misc. Civil Works)</b>				
6.1	Providing brick work (in width 225 mm or more) with F.P.S. bricks of class designation 7.5 in cement mortar 1:4 (1 cement :4 coarse sand) at all levels.	6	Cum		
6.2	Providing 15mm thick cement plaster of mix 1:4 (1 cement : 4 fine sand) at all levels.	20	Sqm		
6.3	Providing and laying in position cement concrete 1:3:6 (1cement : 2 coarse sand : 6 graded stone aggregate 20 mm nominal size) in foundation of pump, DG set etc including form work etc as required.	6	Cum		
Total Amount					