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**Name of Work:** *Replacement of old 2 MVA transformer (2 Nos.) with new 2.5 MVA transformer having academic building loads, installed at substation No.1 (under buy back of old transformers).*

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**NIT amounting to Rs. 73,70,674/- (Rupees Seventy Three Lacs Seventy Thousand Six Hundred Seventy Four Only) is approved.**




भारतीय प्रौद्योगिकी संस्थान, कानपुर  
संस्थान निर्माण विभाग, केंद्रीय कार्यालय

इ-निविदा सूचना संख्या - सं०नि०वि०/के०का०/2020/1135

दिनांक: 29-06-2020

अधीक्षण अभियंता, संस्थान निर्माण विभाग, संस्थान के संचालक मंडल की ओर से  
(1. निविदा संख्या: 33 / विद्युत्/2020. कार्य का नाम: सबस्टेशन सं 1 पर स्थित पुराने 2 एमवीए ट्रांसफार्मर  
(2 no's) को नए 2.5 एमवीए ट्रांसफॉर्मर के साथ बदलने का कार्य जो कि शैक्षणिक भवन के लिए है, (पुराने  
ट्रांसफार्मर को वापस खरीदने के तहत) अनुमानित लागत: रू० 73,70,674/- धरोहर राशि: रू० 1,47,413/-  
कार्य पूर्ण करने की अवधि: 05 माह, कार्य हेतु योग्य "A" क्वालिटी अनुमोदित गवर्नमेन्ट विद्युत् ठेकेदार जो  
कि सीपीडब्लूडी, बीएसएनएल, एमईएस, पीडब्लूडी, रेलवे, केंद्र/ राज्य सरकार के उपक्रम में उचित श्रेणी में  
पंजीकृत हो, से मद्दूर निविदाएं आमंत्रित की जाती हैं। निविदा सूचना [www.tenderhome.com](http://www.tenderhome.com) तथा  
[www.iitk.ac.in/iwd/tenderhall.htm](http://www.iitk.ac.in/iwd/tenderhall.htm) वेबसाइट पर उपलब्ध है तथा ऑनलाइन निविदाएं  
[www.eprocure.gov.in/eprocure/app](http://www.eprocure.gov.in/eprocure/app) वेबसाइट द्वारा ही डाली जा सकेंगी। ऑनलाइन निविदाएं 21.07.2020  
को 15:30 बजे तक प्राप्त की जाएगी। यदि इस निविदा सूचना के सम्बन्ध में कोई संशोधन सूचना जारी की  
जाएगी, तो केवल उपरोक्त वेबसाइट पर ही उपलब्ध होगा।

कृपया निम्न में प्रकाशित करें  
दैनिकजागरण: - कानपुर एवं लखनऊ संस्करण।

  
अधीक्षण अभियंता  
21/06/2020

**INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR E-TENDERING FORMING PART OF NIT AND TO BE POSTED ON WEBSITE**

The Superintending Engineer, IWD, I.I.T., Kanpur on behalf of Board of Governors of IIT Kanpur invites online Item rate tender from approved and eligible\* contractors for the following work(s):

S. No. 01	NIT No. 33 /Elect./2020/1135	Name of work and location	Estimated cost put to tender	Earnest Money (In favour of the " Director, IIT Kanpur")	Period of Completion	Last date & time of submission of tender	Period during which EMD, Cost of Tender Document, e-Tender Processing Fee and other Documents shall be submitted	Time & date of opening of tender
		Replacement of old 2 MVA transformer (2 Nos.) with new 2.5 MVA transformer having academic building loads, installed at substation No. 1. (under buy back of old transformers).	Rs. 73,70,674/-	1,47,413/-	05 Months	Upto 3:30 PM on 21.07.2020	After last date and time of submission of tender and upto 3:30 PM on 24.07.2020	At 3:30 PM on 29.07.2020

The registration of the contractors should be valid on the last date of submission of tenders.

1. The contractor should be registered in any of CPWD, BSNL, MES, PWD, Railways, Central PSUs/ State PSUs in the appropriate class.
2. Having satisfactorily completed 3 (three) similar works of value 40% or two similar works of value 50% or one similar work of value 80% of estimated cost during last seven years in the registered department are eligible to participate.
3. Having valid "A" class electrical licence.
4. Having GST, ESI & EPF registration No. of government authorities.
5. Having similar nature of works mean **"Installation of transformers capacity of 2.5 MVA in single work and the aggregate capacity of 5 MVA in two works for 3 works not less than 7.5 MVA with voltage level not less than 11 KV"**

6. Three similar completed work (at least one out of them should be in Central Govt. / State Govt. / Central autonomous bodies/ State autonomous bodies / Central PSUs and State PSUs).
7. Two similar completed work (at least one out of them should be in Central Govt. / State Govt. / Central autonomous bodies/ State autonomous bodies / Central PSUs and State PSUs).
8. One similar completed work (in Central Govt. / State Govt. / Central autonomous bodies/ State autonomous bodies / Central PSUs and State PSUs).
9. Details of average annual financial turn over on electrical works should be at least 100 % of the estimated cost during the last three consecutive financial year.
- 10. Having a bank solvency certificate not less of 40% of estimated cost.**
11. The work has to be complete within limited shut down period.

In case the last date of submission of tender is extended, the registered of contractor should be valid on the original date of submission of tenders.

1. The intending tenderer must read the terms and conditions of CPWD-6 for e-Tendering carefully. He should only submit his tender if he considers himself eligible and he is in possession of all the documents required.
2. Information and Instructions for tenderer posted on website shall form part of tender document.
3. The tender document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website [www.iitk.ac.in/iwd/tenderhall.htm](http://www.iitk.ac.in/iwd/tenderhall.htm), [www.tenderhome.com](http://www.tenderhome.com) and <https://eprocure.gov.in/eprocure/app> free of cost and shall be submitted on line on website <https://eprocure.gov.in/eprocure/app>.
4. The bids can only be submitted after filling all the details in new drop down menu of e tendering portal such as demand draft or pay order or bankers cheque or deposited call receipt or fixed deposited receipt and bank guarantee of any scheduled bank (bankers name, amount, number and date) towards cost of bid documents and EMD in favour of the Director IIT Kanpur and processing fee in favour of ITI Ltd, New Delhi and other documents as required.
5. The intending tenderer has to fill all the details such as Banker's name, Demand Draft/Fixed Deposit Receipt /Pay Order/ Banker's Cheque/Bank Guarantee number, amount and date.

The amount of EMD can be paid by multiple Demand Draft / Pay Order / Banker's Cheque / Deposit at call receipt / Fixed Deposit Receipts along with

multiple Bank Guarantee of any Scheduled Bank if EMD is also acceptable in the form of Bank Guarantee.

6. Those contractors not registered on the website mentioned above, are required to get registered beforehand. If needed they can be imparted training on online bidding process as per details available on the website.
7. The intending tenderer must have valid class-III digital signature to submit the tender.
8. On opening date, the contractor can login and see the tender opening process. After opening of tenders he will receive the competitor tender sheets.
9. Contractor can upload documents in the form of JPG format and PDF format.
10. Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures in yellow colour.

In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0".

Therefore, if any cell is left blank and no rate is quoted by the tenderer, rate of such item shall be treated as "0" (ZERO).

**List of Documents to be scanned and uploaded within the period of tender submission:**

- Copy of Registration with the Department.
- Required Experience -Completion certificates with Bill of quantity of similar works.
- The works certificates submitted by the bidder clearly indicate that:
- Similar work executed shall be "Installation of transformers capacity of 2.5 MVA in single work and the aggregate capacity of 5 MVA in two works for 3 works not less than 7.5 MVA with voltage level not less than 11 KV ".
- The completion certificate cost of the electrical work.
- Actual date of completion of the electrical work.
- Copy of EPF & ESI No.
- Copy of valid electrical license.
- Copy of GST Registration No.
- Details of turn over during the last three years.
- E.M.D. and Bank drafts of tender cost & processing fee.

## BID DOCUMENT

Online bids (Technical & Financial) from eligible bidders which are valid for a period of 90 days from the date of Technical/financial Bid opening (i.e. 29.07.2020) are invited for and on behalf of the Superintending Engineer, IWD, IIT, Kanpur for **Replacement of old 2 MVA transformer (2 Nos.) with new 2.5 MVA transformer having academic building loads, installed at substation No.1 (under buy back of old transformers).**

Notice Inviting Tender No.	33 /Elect/2020/1135 Dated: 29.06.2020
Name of Work	<b>Replacement of old 2 MVA transformer (2 Nos) with new 2.5 MVA transformer having academic building loads, installed at substation No. 1 (under buy back of old transformers).</b>
Estimated Cost	Rs. 73,70,674/-
Earnest Money	Rs. 1,47,413/-
<b>Date of Publishing</b>	<b>03.07.2020 (15:30 hrs)</b>
Clarification Start Date and Time	<b>03.07.2020 ( working days only)</b>
Clarification End Date and Time	<b>14.07.2020 ( working days only)</b>
Queries (if any)	No queries will be entertained after clarification end date and time
<b>Bid Submission Start Date</b>	<b>03.07.2020 (18:00 hrs)</b>
Last Date and time of uploading of Bids	<b>21.07.2020 (15:30 hrs)</b>
Last Date and time of <b>submitting</b> , EMD and other documents at IWD, IIT Kanpur	<b>24.07.2020 (15:30 hrs)</b>
Date and time of opening of Technical Bids	<b>24.07.2020 (16.00 hrs)</b>
Date and time of opening of Financial Bids	<b>29.07.2020 (15.30 hrs)</b> (Tentative)

Interested parties may view and download the tender document containing the detailed terms & conditions from the website <http://eprocure.gov.in/eprocure/app>

**(The bids have to be submitted online in electronic form on [www.eprocure.gov.in](http://www.eprocure.gov.in) only. No physical bids will be accepted.)**

## INSTRUCTION FOR ONLINE BID SUBMISSION

The bidders are required to submit soft copies of their bids electronically on the Central Public Procurement (CPP) Portal ie <http://eprocure.gov.in/eprocure/app>, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

### **REGISTRATION**

- (i) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>) by clicking on the link "Online Bidder Enrollment" option available on the home page. **Enrolment on the CPP Portal is free of charge.**
- (ii) During enrolment/ registration, the bidders should provide the correct/ true information including valid email-id & mobile no. All the correspondence shall be made directly with the contractors/ bidders through email-id provided.
- (iii) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- (iv) For e-tendering possession of valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) is mandatory which can be obtained from SIFY /nCode/eMudra or any Certifying Authority recognized by CCA India on eToken/ SmartCard.
- (v) Upon enrolment on CPP Portal for e-tendering, the bidders shall register their valid Digital Signature Certificate with their profile.
- (vi) Only one valid DSC should be registered by a bidder. Bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse and should ensure safety of the same.
- (vii) Bidders can then log into the site through the secured login by entering their userID/ password and the password of the DSC/ eToken.

### **SEARCHING FOR TENDER DOCUMENTS**

- 1) There are various search options built in the CPP Portal to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords, etc., to search for a tender published on the CPP Portal.



- 2) *Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective „My Tenders“ folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.*
- 3) *The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.*

#### **PREPARATION OF BIDS:**

- (i) *For preparation of bid Bidders shall search the tender from published tender list available on site and download the complete tender document and should take into account corrigendum if any published before submitting their bids.*

*After selecting the tender document same shall be moved to the „My favourite“ folder of bidders account from where bidder can view all the details of the tender document.*

- (ii) *Bidder shall go through the tender document carefully to understand the documents required to be submitted as part of the bid. Bidders shall note the number of covers in which the bid documents have to be submitted, the number of documents – including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.*
- (iii) *Any pre-bid clarifications if required, then same may be obtained online through the tender site, or through the contact details given in the tender document.*
- (iv) *Bidders should get ready in advance the bid documents in the required format (PDF/xls/rar/jpg formats) to be submitted as indicated in the tender document/schedule. **Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.***
- (v) *Bidders can update well in advance, the documents such as experience certificates, annual report, PAN, EPF & other details etc., under “My Space/ Other Important Document” option, which can be submitted as per tender requirements. This will facilitate the bid submission process faster by reducing upload time of bids.*

#### **SUBMISSION OF BIDS:**

- (i) *Bidder should log into the site well in advance for bid submission so that he/ she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay.*
- (ii) *Bidder should prepare the EMD as per the instructions specified in the NIT/ tender document. The details of the DD/BC/BG/ others physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.*

- (iii) While submitting the bids online, the bidder shall read the terms & conditions (of CPP portal) and accepts the same in order to proceed further to submit their bid.*
- (iv) Bidders shall select the payment option as offline to pay the EMD and enter details of the DD/BC/BG/others.*
- (v) Bidder shall digitally sign and upload the required bid documents one by one as indicated in the tender document.*
- (vi) Bidders shall note that the very act of using DSC for downloading the tender document and uploading their offers is deemed to be a confirmation that they have read all sections and pages of the tender document without any exception and have understood the complete tender document and are clear about the requirements of the tender document.*
- (vii) Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document. For the file size of less than 1 MB, the transaction uploading time will be very fast.*
- (viii) If price quotes are required in XLS format, utmost care shall be taken for uploading Schedule of quantities & Prices and any change/ modification of the price schedule shall render it unfit for bidding.*

*Bidders shall download the Schedule of Quantities & Prices i.e. Schedule-A, in XLS format and save it without changing the name of the file. Bidder shall quote their rate in figures in the appropriate cells, thereafter save and upload the file in financial bid cover (Price bid) only.*

*If the template of Schedule of Quantities & Prices file is found to be modified/corrupted in the eventuality by the bidder, the bid will be rejected and further dealt as per provision of clause no 23.0 of ITB including forfeiture of EMD.*

*The bidders are cautioned that uploading of financial bid elsewhere i.e. other than in cover 2 will result in rejection of the tender.*

- (ix) Bidders shall submit their bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.*
- (x) After the bid submission (i.e. after Clicking "Freeze Bid Submission" in the portal), the bidders shall take print out of system generated acknowledgement number and keep it as a record of evidence for online submission of bid, which will also act as an entry pass to participate in the bid opening.*

- (xi) Bidders should follow the server time being displayed on bidder's dashboard at the top of the tender site, which shall be considered valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system.*
- (xii) All the documents being submitted by the bidders would be encrypted using PKI (Public Key Infrastructure) encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology.*

**ASSISTANCE TO BIDDERS:**

- (i) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contract person indicated in the tender. The contact number for the helpdesk is 0512-2597401 between 10:30 hrs to 17:00 hrs.*
- (ii) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24X7 CPP Portal Helpdesk. The 24 x 7 Help Desk Number 0120-4200462, 0120-4001002 and 0120-4001005. The helpdesk email id is [support-eproc@nic.in](mailto:support-eproc@nic.in)*

## INSTRUCTION FOR e-PROCUREMENT

### 1. PREPARATION AND SUBMISSION OF BIDS :

- a. The detailed tender documents may be downloaded from <http://eprocure.gov.in/eprocure/app> till the last date of submission of tender. The Tender may be submitted online through CPP Portal <http://eprocure.gov.in/eprocure/app>
- b. The bidder should submit the bid online in two parts viz. Technical Bid and Financial Bid. Technical Bid should be upload online in cover- 1 and Financial Bid in ".Xls" should be upload online in cover-2

### 2. SUBMISSION OF THE BID : All interested eligible bidders are requested to submit their bids online on CPP Portal: <http://eprocure.gov.in/eprocure/app> as per the criteria given in this document:

- a. Technical Bid should be upload online in cover-1.
- b. Financial Bid should be upload online in cover-2

Both Technical and Financial Bid covers should be placed online on the CPP Portal (<http://eprocure.gov.in/eprocure/app>).

### 3. TECHNICAL BID: Signed and Scanned copies of the Technical bid documents as under must be submitted online on CPP Portal: <http://eprocure.gov.in/eprocure/app>.

**List of Documents to be scanned and uploaded (Under Cover-1) within the period of bid submission:-**

- Copy of Registration with the Department.
- Required Experience / completion certificates of similar nature of works alongwith BOQ.
- Registration Certificates of EPF & ESIC
- Scan copy of E.M.D. as to be submitted in hard copy.
- Scanned copy of Electrical Licence.
- Scanned copy of solvency certificate
- Scanned copy of financial turnover during last 3 years.
- Scanned copy of PAN and GST Registration No.
- The hardcopy of above required documents along with earnest money deposit receipt shall be submitted in the office of Superintending Engineer, Central Office, IWD within due date and time.

**Please note that no indication of the rates/amounts be made in any of the documents submitted with the TC-BID.**

#### 4. **Financial Bid**

- a. *The currency of all quoted rates shall be Indian Rupees. All payment shall be made in Indian Rupees.*
- b. *In preparing the financial bids, bidders are expected to take into account the requirements and conditions laid down in this Tender document. The financial bids should be uploaded online as per the specified “**.Xls**” format i.e. Price Bid in Excel sheet attached as „**.Xls**“ with the tender and based on the scope of work, service conditions and other terms of the Tender document. It should include all costs associated with the Terms of Reference/Scope of Work of the assignment.*
- c. *Being an individual work contract no other tax is payable other than GST. The GST shall be paid extra as applicable.*

#### 5. **Last Date for Submission of Tender:**

- a. *Online bids complete in all respects, must be submitted on or before the last date and time specified in the schedule of events.*
- b. *The IIT, Kanpur may, at its own discretion, alter/extend the last date for submission of tenders.*

#### 6. **Bid Validity**

- a. *All the Bids must be valid for a period of **90** days from the last date of submission of the tender for execution of Contract. However, the quoted rates should be valid for the initial/ extended period of the Contract from the effective date of the Contract. No request will be considered for price revision during the original Contract period.*
- b. *A bid valid for a shorter period shall be declared as non-responsive.*
- c. *In exceptional circumstances, prior to expiry of the original time limit, the IIT may request the bidders to extend the period of validity for a specified additional period beyond the original validity of **90** days. The request and the bidders' responses shall be made in writing. The bidders, not agreeing for such extensions will be allowed to withdraw their bids without forfeiture of their Bid Security.*

#### 7. **Modification / Substitution/ Withdrawal of bids:**

- a. *No Bid shall be modified, substituted or withdrawn by the Bidder after the Bid 's due Date.*
- b. *Any alteration/ modification in the Bid or additional information supplied subsequent to the Bid's due Date, unless the same has been expressly sought for by the Authority, shall be disregarded.*

#### 8. **Rejection of the Bid:** *The bid submitted shall become invalid if:-*

- a) *The tenderer is found ineligible.*
- b) *The tenderer does not upload all the documents as stipulated in the tender document.*
- c) *The hardcopy of above required documents along with earnest money deposit receipt shall be submitted in the office of Superintending Engineer, Central Office, IWD within due date and time.*
- d) *If any discrepancy is noticed between the documents as uploaded at the time of submission of tender and hard copies as submitted physically in the office of tender opening authority.*

## CPWD-6 FORM e-Tendering

The Superintending Engineer, IWD, I.I.T., Kanpur on behalf of Board of Governors of IIT Kanpur invites online item rate tenders from approved and eligible\* contractors for the works of:

***Replacement of old 2 MVA transformer (2 Nos.) with new 2.5 MVA transformer having academic building loads, installed at substation No.1 (under buy back of old transformers).***

- 1.1 The work is estimated to cost **Rs. 73,70,674/-** This estimate, however, is given merely as a rough guide.
- 1.2 The authority competent to approve NIT for the combined cost and belonging to the major discipline will consolidate NITs for calling the tenders. He will also nominate Division which will deal with all matters relating to the invitation of tenders.

### 2 Criteria of eligibility

- a. Eligible electrical contractor born on the approved list of CPWD, BSNL, MES, PWD, Central PSUs/ State PSUs in the appropriate class.
  - b. Having satisfactorily completed 3 (three) similar works of value 40% or two similar works of value 50% or one similar work of value 80% of estimated cost during last seven years in the registered department are eligible to participate.
  - c. Having valid „A“ class electrical licence.
  - d. Having ESI & EPF registration No. of government authorities.
  - e. Having similar nature of works mean **"Installation of transformers capacity of 2.5 MVA in single work and the aggregate capacity of 5 MVA in two works for 3 works not less than 7.5 MVA with voltage level not less than 11 KV"**.
  - f. Required Experience –Attached completion certificates with Bill of quantity of similar works.
  - g. Details of average annual financial turn over on electrical works should be at least 100% of the estimated cost during the last three consecutive financial year.
  - h. Having a bank solvency certificate not less of 40% of estimated cost.
3. Agreement shall be drawn with the successful tenderers on prescribed Form No. CPWD 7 (or other Standard Form as mentioned) which is available as a Govt. of India Publication and also available on website [www.iitk.ac.in](http://www.iitk.ac.in) Tenderers shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
  4. The time allowed for carrying out the work will be **05 Months** from the date of start as defined in schedule „F“ 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 documents.
  5. The site for the work is available.\*
  6. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website [www.iitk.ac.in/iwd/tenderhall.htm](http://www.iitk.ac.in/iwd/tenderhall.htm), <https://eprocure.gov.in/eprocure/app> and [www.tenderhome.com](http://www.tenderhome.com) free of cost and shall be submitted on line on website or <https://eprocure.gov.in/eprocure/app>.

Other necessary documents also can be seen in the office of the Superintending Engineer, IWD, IIT, Kanpur between hours of 10:00 AM to 5:00 PM from 03.07.2020 to 21.07.2020 every day except on Saturdays, Sundays and Public Holidays in free of cost.

7. After submission of the tender the contractor can re-submit revised tender any number of times but before last time and date of submission of tender as notified.
8. While submitting the revised tender, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of tender as notified.
9. Earnest Money can be paid in the form of Treasury Challan or Demand Draft or Pay order

or Banker`s Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of Director, IIT, Kanpur along with Bank Guarantee of any Scheduled Bank wherever applicable.

A part of earnest money is acceptable in the form of bank guarantee also. In such case, 50% of earnest money or Rs. 20 lac, whichever is less, will have to be deposited in shape prescribed above, and balance in shape of Bank Guarantee of any scheduled bank.

Treasury Challan or Demand Draft or Pay Order or Banker`s Cheque or Deposit at Call Receipt or FDR or Bank Guarantee against EMD, Cost of Tender Document and cost of tender processing fee shall be placed in single sealed envelope superscripted as "Earnest Money, Cost of Tender Document and cost tender processing fees with name of work and due date of opening of the tender also mentioned thereon.

Copy of Registration Order and certificate of work experience wherever applicable and other documents if required and specified in this bid document shall be scanned and uploaded to the e-Tendering website within the period of tender submission and certified copy of each shall be deposited in a separate envelop marked as "Other Documents"

Both the envelopes shall be placed in another envelope with due mention of Name of work, date & time of opening of tenders and to be submitted in the office of Superintending Engineer after last date & time of submission of tender and up to 03:30 PM on 21.07.2020.

Online tender documents submitted by intending tenderers shall be opened only of those tenderers, whose Earnest Money Deposit, Cost of Tender Document and e- Tender Processing Fee and other documents placed in the envelope are found in order.

The tender submitted shall be opened at 03:30 PM on 29.07.2020

10. The tender submitted shall become invalid and cost of tender & e-Tender processing fee shall not be refunded if:
  - (i) The tenderers is found ineligible.
  - (ii) The tenderers does not upload all the documents as stipulated in the tender document.
  - (iii) If any discrepancy is noticed between the documents as uploaded at the time of submission of tender and hard copies as submitted physically in the office of tender opening authority.
11. 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 Schedule F. This guarantee shall be 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 of any scheduled bank or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. **In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended**

**period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.**

12. Intending Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderers shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The tenderers shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderers 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 and local conditions and other factors having a bearing on the execution of the work.
13. The competent authority on behalf of the Board of Governors, IIT, Kanpur does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderers shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with tenderers is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable for rejection.
15. The competent authority on behalf of Board of Governors, IIT, Kanpur reserves to himself the right of accepting the whole or any part of the tender and the tenderers shall be bound to perform the same at the rate quoted.
16. The contractor shall not be permitted to tender for works in the IIT Kanpur responsible for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the IIT Kanpur. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
17. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractor's service.
18. The tender for the works shall remain open for acceptance for a period of **ninety (90) days** from the date of opening of tenders if any tenderer withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the tenderers shall not be allowed to participate in the retendering process of the work.



19. This Notice Inviting Tender shall form a part of the contract document. The successful tenderers/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
- a) The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming part of the tender as uploaded at the time of invitation of tender and the rates quoted online at the time of submission of tender and acceptance thereof together with any correspondence leading thereto.
  - b) Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as applicable.

20.1.1 The tender document will include following three components:

**Part A:-**

CPWD-6, CPWD-7 including schedule A to F for the major component of the work, Standard General Conditions of Contract for CPWD 2010 as amended/modified up to **21.07.2020**

**Part B:-**

General/specific conditions, specifications and schedule of quantities applicable to major component of the work.

**Part C:-**

Schedule A to F for minor component of the work. (SE/EE in charge of major component shall also be competent authority under clause 2 and clause 5 as mentioned in schedule A to F for major components), General/specific conditions, specifications and schedule of quantities applicable to minor component(s) of the work.

20.1.2 Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works. The Earnest Money will become part of the security deposit of the major components of work.

21. In case any discrepancy is noticed between the documents as uploaded at the time submission of bid on line and hard copies as submitted physically in then office of the superintending engineer, then the bid submitted shall become invalid and the institute shall, without prejudiced to any other right or remedy, be at the liberty to forfeit 50% of said EMD as affosaid. Further the bidder shall not be allowed to re-tendering process of the work

22. EPF & ESI paid to contractor worker shall be reimbursed actual basis.

**Superintending Engineer  
For & on behalf of the Board of Governors, IIT, Kanpur**

**ITEM RATE TENDER AND CONTRACT FOR WORK****(A) Tender for the work of:**

*Replacement of old 2 MVA transformer (2 Nos.) with new 2.5 MVA transformer having academic building loads, installed at substation No.1 (under buy back of old transformers).*

**TENDER**

I/We have read and examined the Notice Inviting tender, schedule, A,B,C,D,E&F. Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents 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 Board of Governors, IIT, Kanpur within the time specified in Schedule „F“, viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

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

A sum of Rs. **1,47,413/-** is hereby forwarded in Cash/Receipt Treasury Challan/Deposit at call Receipt of a Scheduled Bank/Fixed deposit receipt of scheduled bank/demand draft of a scheduled bank/bank guarantee issued by scheduled bank as earnest money. If I/we, fail to furnish the prescribed performance guarantee or fail to commence the work within prescribed period I/we agree that the said Board of Governors, IIT, Kanpur or his successors in office shall without prejudice to any other right or remedy be at liberty to forfeit the said earnest money absolutely. Further, if I/we fail of commence work as specified, I/we agree that Board of Governors, IIT, Kanpur or his successors in office shall 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 „F“ and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

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 participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/ have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for tendering in IIT, Kanpur in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

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 therefrom 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.

Dated \_\_\_\_\_ \*\* \_\_\_\_\_

Witness: \*\*  
Address: \*\*  
Occupation: \*\*

\*\*  
Signature of contractor  
Postal Address \*\*

# ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the Board of Governors, IIT, Kanpur for a sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_)

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

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_

For & on behalf of the Board of Governors, IIT,  
Kanpur

Dated \_\_\_\_\_

Signature \_\_\_\_\_  
Designation \_\_\_\_\_

**Operative schedules shall be supplied separately to each intending tenderer)**

**SCHEDULE 'A'**

Schedule of Quantities :

**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
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
----- <b>NIL</b> -----				

**SCHEDULE 'C'**

Schedule of Tools and Plants to be hired to the contractor

S. No.	Description	Hire charges per day	Place of issue
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
-----NIL-----			

**SCHEDULE 'D'**

Extra schedule for specific requirements/document for the work, if any: ***As attached in tender form.***

**SCHEDULE 'E'**

Schedule of component of other Materials, Labour, POL etc. for price escalation : **N.A.**

**SCHEDULE 'F'**

Reference to General Conditions of contract.

<b>Name of Work:</b>	<b><i>Replacement of old 2 MVA transformer (2 Nos) with new 2.5 MVA transformer having academic building loads installed at substation No.1 (under buy back of old transformers).</i></b>
<b>Estimated cost of the work:</b>	Electrical Items of Work   <b>Rs. 73,70,674/-</b>
<b>Earnest money</b>	<b>Rs. 1,47,413/-</b>
<b>Performance Guarantee</b>	5% of the tendered value of the work
<b>Security Deposit</b>	2.5% of the tendered value of the work

**General rules and direction :**

**Definitions:**

2(v)	<b>Engineer-in-Charge</b>	
	For Electrical items of work	<b>Executive Engineer, Institute Works Department IIT, Kanpur</b>
2(vi)	Accepting Authority	<b>Superintending Engineer, Institute Works Department IIT, Kanpur</b>
2(vii)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(viii)	<b>Standard Schedule of Rates:</b>	
	Electrical Items of Work:	D.S.R. 2018 with up to date correction slips
2(ix)	Department:	Central Public Works Department
2(x)	Standard CPWD contract Form:	GCC 2020, CPWD <b>form-7</b> as modified & corrected up to <b>21.07.2020</b> (Whether correction vide latest circulars are incorporated or not in this document).
<b>Clause 1</b>	i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance	15 Days
	ii) Maximum allowable extension beyond the period as provided in i) above	7 Days
<b>Clause 2</b>	Authority for fixing Compensation under Clause 2	<b>Superintending Engineer, Institute Works Department IIT, Kanpur. Or successor thereof</b>
<b>Clause 2 A</b>	Whether Clause 2A shall be applicable	No
<b>Clause 5</b>	i) Number of days from the date of issue of letter of acceptance for reckoning date of start	<b>22 Days</b>
	ii) Time allowed for execution of work	<b>05 (Five) Months</b>
<b>Authority to decide</b>	<b>Extension of time</b>	<b>Superintending Engineer, Institute Works Department IIT, Kanpur</b>
<b>Clause 6/ 6A</b>		<b>Only clause 6 applicable.</b>
<b>Clause 7</b>	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	<b>Not applicable</b>

<b>Clause 10A</b>	Material to be provided by the contractor.	<b>Applicable</b>
<b>Clause 10B (ii), (iii)</b>	Whether clause 10-B (ii) and 10-B (iii) shall be applicable.	<b>Not Applicable</b>
<b>Clause 10 C</b>	Component of labour expressed as percentage of value of work	<b>---</b>

<b>Clause 10 CA</b>	Materials covered under this clause.	Nearest material( <b>other than cement, reinforcement bars and structural steel</b> ) for which All India Whole sale price Index is to be followed.	Base price of all the materials covered under clause 10 CA
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	1. Cement (PPC)	<b>Nil</b>	<b>NIL</b>
	2. Steel	<b>Nil</b>	<b>Nil</b>
<b>Clause 10 CC</b>	Increase/Decrease in Price of materials/wages		<b>Not Applicable</b>

**Clause 11 Specification to be followed for execution of work:**

**For electrical works** **CPWD specifications 2013 internal and 1994 external electrical works**

For Civil items of work CPWD Specifications 2009 Vol. 1 and Vol. 2 with up to date correction slips.(Hereinafter called CPWD specifications also)

**Clause 12**

12.2 & 12.3	Deviation limit beyond which clause 12.2 & 12.3 shall apply for building work	<b>---</b>
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12.5	Deviation limit beyond which clause 12.2 & 12.3 shall apply for foundation work	<b>50%</b>
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**Clause 16 Competent Authority for Deciding reduced rates:**

For lift/ electrical/civil items of work **Superintending Engineer, Institute Works Department IIT, Kanpur**

**Clause 18** List of mandatory machinery, tools & plants to be deployed by the contractor at site. **Ladders, drill machine, crimping tools, chase cutting tools , cable jointing tools, blower**

**Clause 36 (i)** **Requirement of technical Representative(s)**

For supervision of civil as well as electrical items of work, technical representatives of the respective disciplines will be required to be deployed.

**Clause  
42**

- |     |   |   |
|-----|---|---|
| i)  | a) Schedule/ statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2018 printed by CPWD          | <b>D.S.R. 2018 (with up to date correction slips)</b> |
| ii) | <b>Variations permissible on theoretical quantities</b>   |   |
| a)  | Cement for works with estimated cost put to tender not more than Rs. 5 lakhs.<br>For works with estimated cost put to Tender is more than Rs. 5 lakhs | <b>3% plus/minus</b><br><b>2% plus/minus</b>          |
| b)  | Bitumen all works   | <b>2.5% plus only &amp; nil on minus side.</b>        |
| c)  | Steel reinforcement and structural steel Sections for diameter, section and category.   | <b>2% plus/minus.</b>                                 |
| d)  | All other materials   | <b>Nil</b>  |

**RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION**

SI No	Description of items	Rates in figures and words at which recovery shall be made from the contractor	
		Excess beyond permissible variation	Less use beyond the permissible variation
1.	Cement (PPC)	<b>N. A</b>	<b>NIL</b>
2.	Steel reinforcement (TMT Bars)		<b>NIL</b>



# SALIENT/MANDATORY REQUIREMENTS FOR THE TENDER

**Name of work: Replacement of old 2 MVA transformer (2 Nos.) with new 2.5 MVA transformers having academic building loads, installed at Substation No. 1 (under buy back old transformers).**

- 1 The tenderer is advised to read and examine the tender documents for the work and the set of drawings available with Engineer-in-charge. He should inspect and examine the site and its surroundings by himself before submitting his tender.
- 2 Separate schedule of quantity is included in this tender for electrical items of work. If the tenderer wants to offer any unconditional rebates on their rates, the same should also be offered in the respective components of civil and electrical schedule separately. The contractor shall quote the percentage rates in figures and words accurately so that there is no discrepancy in rates written in figures and words.
- 3 Time allowed for the execution of work is **05 (Five) months.**
- 4 The contractor(s) shall submit a detailed program of execution in accordance with the master programme/milestone within ten days from the date of issue of award letter.
- 5 Contractor has to arrange and install field laboratory during the currency of work and nothing extra will be paid on this account.
- 6 Quality of the project is of utmost importance. This shall be adhered to in accordance with the provisions of CPWD specifications and guidelines given in the relevant paras.
- 7 Contractor has to deploy required Plant and machinery on the project. In case the contractor fails to deploy the plant and machinery whenever required and as per the direction of the Engineer-in-charge, he (Engineer-in-charge) shall be at a liberty to get the same deployed at the risk and cost of the contractor.
- 8 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 Superintending Engineer/Executive Engineer may in 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.
- 9 Temporary Electric connection shall be issued as per request and the water charges shall be recovered as per rule.

# ***PART-B***

## **QUALITY ASSURANCE OF THE WORK**

1. The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted. He shall have to submit quality assurance programme within two weeks of the award of work. The quality assurance programme should include method statement for various items of work to be executed along with check lists to enforce quality control.
2. The contractor shall get the source of all other materials, not specified else where in the document, approved from the Engineer-in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/ make of various materials not specified in the agreement, to be used for the approval of the Engineer-in-Charge along with samples and once approved, he shall stick to it.

### **3. Other Laboratories :**

1. The contractor shall arrange carrying out of all tests required under the agreement through the laboratory as approved by the Engineer-in-Charge and shall bear all charges in connection therewith including fee for testing. The said cost of tests shall be borne by the contractor/department in the manner indicated below.
  - i) By the contractor, if the results show that the test does not conform to relevant CPWD Specifications / BIS code or specification mentioned else where in the documents
  - ii) By the department, if the results conforms to relevant CPWD Specifications / BIS code or specification mentioned else where in the documents.
2. If the tests, which were to be conducted in the site laboratory are conducted in other laboratories for what ever the reasons, the cost of such tests shall be borne by the contractor.

### **C) Sampling of Materials :**

1. Sample of building materials fittings and other articles required for execution of work shall be got approved from the Engineer-in-Charge. Articles manufactured by companies of repute and approved by the Engineer-in-Charge shall only be used. Articles bearing BIS certification mark shall be used in case the above are not available, the quality of samples brought by the contractor shall be judged by standards laid down in the relevant BIS specifications. All materials and articles brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-Charge which shall be preserved till the completion of the work.
2. The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-Charge.
3. BIS marked materials except otherwise specified shall be subjected to quality test at the discretion of the Engineer-in-Charge besides testing of other materials as per the specifications described for the item/materials. Wherever BIS marked materials are brought to the site of work, the contractor shall if required, by the Engineer-in-Charge furnish manufacturers test certificate or test certificate from approved testing laboratory to establish that the material produced by the contractor for incorporation in the work satisfies the provisions of BIS codes relevant to the material and/or the work done.
4. The contractor shall procure all the materials at least in advance so that there is sufficient time to testing and approving of the materials and clearance of the same before use in work.

5. All materials brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorised representative of the work on receipt of the same at site before use.
6. The contractor shall be fully responsible for the safe custody of the materials issued to him even if the materials are in double lock and key system.

## ADDITIONAL TERMS AND CONDITIONS

- 1 Unless otherwise provided in the Schedule of Quantities/Specifications, the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the work and nothing extra shall be payable to him on account of the same. Extra payment for centering/shuttering, if required to be done for heights greater than 3.5 m shall however be admissible at the rates arrived at in accordance with clause 12 of the agreement, if not already specified.
- 2 Other agencies doing works related with this project may also simultaneously execute their works and the contractor shall afford necessary facilities for the same. The contractor shall leave such necessary holes, openings etc. for laying/burying in the work, pipes cables, conduits, clamps, boxes and hooks for fan clamps etc. as may be required for the other agencies. Nothing extra over the Agreement rates shall be paid for doing these.
- 3 Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The contractor shall be bound to follow all such restrictions/instructions and nothing extra shall be payable on account of the same.
- 5.1 The contractor shall fully comply with all legal orders and directions of the Public or local authorities or municipality and abide by their rules and regulations and pay all fees and charges for which he may be liable in this regard. Nothing extra shall be paid/reimbursed for the same.
- 5.2 The building work shall be carried out in the manner complying in all respects with the requirements of the relevant bylaws and regulations of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-charge and nothing extra shall be paid on this account.
- 6 If as per local Municipal regulations, huts for labour are not to be erected at the site of work, the contractor shall be required to provide such accommodation at a place as is acceptable to the local body and nothing extra shall be paid on this account.
- 7 The structural and architectural drawings shall at all times be properly co-related before executing any work. However, in case of any discrepancy in the item given in the schedule of quantities appended with the tender and Architectural drawings relating to the relevant item, the former shall prevail unless otherwise given in writing by the Engineer-in-charge.
- 8.1 For the purpose of recording measurements and preparing running account bills, the abbreviated nomenclature indicated in the publications Abbreviated Nomenclature of Items of DSR 2016 shall be accepted. The abbreviated nomenclature shall be taken to cover all the materials and operations as per the complete nomenclature of the relevant items in the agreement and relevant specifications.
- 8.2 In case of items for which abbreviated nomenclature is not available in the aforesaid publication and also in case of extra and substituted items for which abbreviated nomenclature are not provided for in the agreement, full nomenclature of item shall be reproduced in the measurement books and bill forms for running account bills.
- 8.3 For the final bill, however, full nomenclature of all the items shall be adopted in preparing abstract in the measurement books and in the bill forms.
- 9 The contractor shall take instructions from the Engineer-in-charge for stacking of materials. No excavated earth or building materials etc. shall be stacked/collected in areas where other buildings, roads, services, compound walls etc. are to be constructed.
- 10 Any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been

arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.

- 11 It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.
- 12 In case the supply of timber/steel frames/shutters for doors, windows etc. is made by some other agency, the contractor shall make necessary arrangements for their safe custody on the direction of the Engineer-in-charge till the same are fixed in position by him & nothing extra shall be paid on this account.
- 13 The contractor shall maintain in perfect condition, all portions executed till completion of the entire work allotted to him. Where however phased delivery of work is contemplated these provisions shall apply separately to each phase.
- 14 The entire royalty at the prevalent rates shall have to be paid by the contractor on all the boulders, metals, shingle sand etc. collected by him for execution of the work, directly to the Revenue authority or authorized agents of the State Government concerned or the Central Government, as the case may be.
- 15.1 The contractor shall bear all incidental charges for cartage, storage and safe custody of materials issued by the departments and shall construct suitable godowns, yards at the site of work for storing all materials as to be safe against damage by sun, rain, dampness, fire, theft etc. at his own cost and also employ necessary watch and ward establishment for the purpose, at his own cost. Materials to be charged directly to work and stipulated for issue free of cost shall also be issued to the contractor as soon as those are received at site or at the stipulated place of issue. The provision of this para shall apply equally and fully to those as well.
- 15.2 All materials obtained from the Institute Works Department store or otherwise on receipt shall be got checked by the Engineer-in-charge of the work or his representations before use.
- 15.3 Registers for the materials to be issued by the department shall be maintained as required by the Engineer-in-charge and these shall be signed by the contractor or his authorized agent and representative of Engineer-in-charge on each day of transactions.

### *Special condition for Safety at the Work Site*

The contractor will identify one of the supervisors for taking care of implementation of Safety systems.

The Contractor should follow the following General Guidelines governing the safety rules as laid down under:

1. Smoking is strictly prohibited at workplace.
2. Nobody is allowed to work without wearing safety helmet. Chinstrap of safety helmet shall be always on. Drivers, helpers and operators are no exception.
3. No one is allowed to work at or more than three meters height without wearing safety belt and anchoring the lanyard of safety belt to firm support preferably at shoulder level.
4. No one is allowed to work without adequate foot protection.
5. Usage of eye protection equipment shall be ensured when workmen are engaged for grinding, chipping, welding and gas-cutting. For other jobs as and when site safety co-ordinator insists eye protection has to be provided.
6. All safety appliances like Safety shoes, Safety gloves, Safety helmet, Safety belt, Safety goggles etc. shall be arranged before starting the job.
7. All excavated pits shall be barricaded & barricading to be maintained till the backfilling is done. Safe approach to be ensured into every excavation.
8. Adequate illumination at workplace shall be ensured before starting the job at night.
9. All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded.
10. Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work platforms.
11. Material shall not be thrown from the height. If required, the area shall be barricaded and one person shall be posted outside the barricading for preventing the tre-passers from entering the area.
12. Other than electricians no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.
13. All electrical connections shall be made using 3 or 5 core cables, having a earth wire.
14. Inserting of bare wires for tapping the power from electrical sockets is completely prohibited.

15. A tools and tackles inspection register must be maintained and updated regularly.
16. Debris, scrap and other materials to be cleared from time to time from the workplace and at the time of closing of work everyday.
17. All the unsafe conditions, unsafe acts identified by contractors, reported by site supervisors and / or safety personnel to be corrected on priority basis.
18. No children shall be allowed to enter the workplace.
19. All the lifting tools and tackles shall be stored properly when not in use.
20. Clamps shall be used on Return cables to ensure proper earthing for welding works.
21. Return cables shall be used for earthing.
22. All the pressure gauges used in gas cutting apparatus shall be in good working condition.
23. Proper eye washing facilities shall be made in areas where chemicals are handled.
24. Connectors and hose clamps are used for making welding hose connections.
25. All underground cables for supplying construction power shall be routed using conduit pipes.
26. Spill trays shall be used to contain the oil spills while transferring / storing them.
27. Tapping of power by cutting electric cables in between must be avoided. Proper junction boxes must be used.

Superintending Engineer



## **SPECIAL TERMS & CONDITIONS**

1. *In the Contract (as hereinafter defined) the following definitions words and expressions shall have the meaning hereby assigned to them except where the context otherwise required.*

- i) *Institute shall mean the Indian Institute of Technology (IIT), Kanpur*
- ii) *The President shall mean the Board of Governor, IIT Kanpur.*
- iii) *The Engineers In-charge, who shall administer the work jointly, shall mean the Executive Engineer (Electrical) for electrical works.*
- iv) *Government or Govt. of India shall mean the Indian Institute of Technology represented by its Director.*
- v) *The term Director General of Works shall mean the Chairman, Building & Works Committee of the Institute.*
- vi) *Accepting authority shall mean the Director, IIT Kanpur or his authorized representative.*
- vii) *Superintending Engineer shall mean the Superintending Engineer of the Institute, who as overall In-charge and head of the Institute Works Department, shall direct the contract.*
- viii) *Site Engineers shall mean the Assistant Engineer & Jr. Engineer (Electrical) for Electrical & Air-conditioning works, appointed by the Institute Works Department.*

2. ***Duties & Powers :***

i) ***Site Engineers :***

*The duties of the Site Engineer(s) are to watch and supervise the works and the workmanship employed 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 nor, except as expressly provided here under, to order any work involving delay or any extra payment by the Institute, nor to make any variation in the works.*

*The Engineer-in-charge, from time to time in writing, delegate 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 / Architect 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 / Architect 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 / Architect, who shall thereupon confirm reverse or vary such decision.*

3. *The scope of contract comprises the construction, completion and maintenance of the works for (12) months after the completion and the provision of all labour, materials, construction of plant equipment and transpiration, temporary works and everything, whether of temporary or permanent nature required in and for such construction, completion and maintenance so far as the necessity for providing the same is specified in or reasonably be inferred from the contract. The contractors shall make his own arrangements for the store 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/Architect. 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/ Architect"s 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.*
- 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 engineers-in-charge 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 is not dissented in writing within a further seven days by the Engineer-In-Charge/Architect, such shall be deemed to be instructions of the Engineer-In-charge/Architect within the scope of the contract.*

#### 4. **Contract Document:**

4.1 *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 Institute then the matter shall be referred to the Superintending Engineer and his decision shall be final, conclusive and bind on both parties.*

4.2 *The drawings etc. shall remain in the custody of the Institute. Two complete sets of drawings, specification and bill of quantities shall be furnished by the Engineer-In-Charge to the contractor in such time which must not delay the progress of the construction and the Institute shall furnish copies of any additional drawings, which in their opinion may be necessary for the execution of any part of the work. 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 case to be accepted in preference to the scaled sizes. Large scale details shall taken preference over small scale one.*

*The contractor shall give adequate notice in writing to the Engineer-in-charge of any further drawings or specification that may be required for the execution of the works or otherwise under the contract.*

*The Engineer-in-charge shall have full powers and authority to supply 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.*

4.3 *The successful tenderer shall be required to enter into an agreement with the Institute. The Bill of Quantities & rates filled by the successful tenderer in, the General Condition of the Contract for CPWD works 2010, CPWD specifications for Civil, Electrical & Air-conditioning works, the special conditions, additional specifications, negotiation letter and the award letter etc. shall form part of the agreement to be signed by the successful tenderer. The cost of stamp paper and stamp duty, required for the agreement, shall be borne by the contractor.*

5. **Contract Agreement:**

*The contractor shall, when called upon to do so, enter into and execute a contract agreement in the form annexed as annexure 'A' with such modifications as may be necessary. The contract agreement, inclusive of its enclosures, shall remain in the custody of the Superintending Engineer, Institute Works Department, IIT Kanpur and the made available him as and when required contractor shall however be supplied, an attested copy there free of cost.*

6. *All tenders are required to deposit earnest money in the form of FDR/CDR in the only duly endorsed in favour of Director, IIT Kanpur. Earnest money should be enclosed in a separate sealed envelope and tender documents should be enclosed in a another envelope superscribed “ **EARNEST MONEY- NAME OF WORK “ ITEM RATE-TENDER-NAME OF WORK”** on the top of envelope. At the time of opening of tender earnest money envelope will be opened first and in case earnest money is not found in the requisite from or amount envelope containing item rate tender of the party concerned shall be opened and will be summarily rejected and documents submitted will be confiscated by the Institute.*

8. *Canvassing in connection with tenders is prohibited and the tenders, submitted by the tenderers who resort to canvassing, are liable for rejection.*

9. *Tenderers shall have to sign the attached declaration (Appendix B) and if the declaration is not found to represent a true statement of facts the contract is liable to be cancelled, earnest money forfeited and the contractor shall have no claim on the Institute.*

10. *Tenderes are not allow to make additions and alterations in the tender document. Any additions and alternations, if incorporated in the tender, shall be at the tender"s risk since the modified tender is liable for rejection.*

*Conditional tenders violative of the sprit and the scope or the terms & conditions of the tender, are liable to be rejected without assigning any reasons. Tenders with any form of rebate shall be rejected summarily.*

11. *Water and electricity required for electrical & air-conditioning works shall be supplied free of charge.*

12. *Stamps duty on the security money shall also be the born by contractor as per prevailing notification of U.P Govt.*

13. *Value Added Tax on work contract as per prevailing notification of U.P.Govt. shall be also be recovered from the contractor bill.*

13. *Income tax shall be deducted as per prevalent law.*

14. ***Conditions for Electrical and Air-conditioning Works:-***

14.1 All *chase cuttings in the wall, for recessed conduits & boxes and drilling the holes shall be done with power operated machines only. No chase shall be allowed to be cut manually with the use of hammer & chisel.*

14.2 All *cuttings in cement plaster and brick shall be made good by using cement mortar 1:3 (1 part cement, 3 part coarse sand)*

14.3 The *cut surfaces shall be repaired by an experienced mason only so as to match the repaired plaster with the original.*

14.4 All *such repaired surfaces shall be cured for 3 to 4 days to keep the surfaces wet, using water spray machine (hand/motor operated) and avoid unnecessary flooding of the area.*

15. ***Payment shall be regulated as under***

- a.) *75% of the tendered rate on receipt of materials at site.*
- b.) *15% of the tendered rate on installation and connection.*
- c.) *10% of the tendered rate on testing and commissioning.*

16. ***Drawings/Data required prior to commencement of electrical/air-conditioning works:-***

- 17.1 *The following drawings shall be provided by the Architect/Engineer-In-Charge of the work:-*

- 1. *Conduit layout for lights, fans, socket outlets, telephone outlets, network & fire alarm system and sub mains showing size of conduits, no. of wires and size of wires in each run, location and*

*size of accessories like junction boxes, ceiling boxes for hooks, draw boxes and switch boxes etc.*

2. *Cable routing drawings showing details of size, type and no. of cables and mode of installation.*
3. *Ducting /chilled water pipe line/drain pipe etc., drawing showing details of size, type and mode of installation.*

17.2 *Following drawings shall be furnished by the contractor for the approval of the Engineer-In-charge.*

- a. *G.A and schematic drawings of MV switchgear/distribution /Plant/AHU/ FCU/Fire Alarm panel showing material and size of sheet steel/bus bars / inter connections and make and ratings of switchgear i/c details of protection, metering, indicating and inter lock etc.*
- b. *Ducting /chilled water pipe line/drain pipe etc., drawing showing details of size, type and mode of installation.*

18. **Completion drawings:**

*On completion of works and before issuance of completion certificate, the contractor submit completion drawings in the form of three complete set of originals (reproducible)*

- i) *As built GA and schematic drawings of MV panels, distributions boards, fire alarm panels, Plant, AHU & FCU etc. showing material and size of sheet steel/bus bars/ connections and make and rating of switchgear i/c details of protection, meter indicating and interlocks etc.*
- ii) *Technical literature, test certificates and operation and maintenance manuals required.*

19. **Works Inspection and Testing of Equipment:**

a.) *Prior to dispatch of equipment the Institute reserves the right to inspect the same at the manufacturer's works and the contractor shall provide and secure every reasonable access and facility at the manufacturers works for inspection, for witness of all acceptance and routine tests as per relevant Indian Standards. Contractor shall give a reasonable notice of about 15 days for the purpose of test, and witness of all major equipments.*

b.) *Pre-commissioning test: All routine tests shall be carried out on the electrical & air-conditioning equipment. Protective & measuring devices should be checked for calibration of Plant AHU & FCU's should be checked for air quantities. All grills/diffusers should be checked for balanced air quantities.*

20. **Taxes & Duties:**

20.1 **Rates:** *The work shall be treated as on works contract basis and the rates tendered shall be for complete item of work and all charges for items contingent to the work, such as packing, forwarding, insurance, freight and delivery at site for the materials to be supplied by the contractor,*

watch and ward of all materials at the site, labour related expenses as per relevant labour laws, testing of materials/ samples etc excluding Goods and Service Tax (GST).

- 20.2 Being an indivisible works contract, no other tax is payable other than GST. The GST shall be as applicable to IIT Kanpur as per Government rules.
21. *The earnest money of the unsuccessful tenderers shall be refunded on written request, within 1(one) month of the award of work. The earnest money of the successful tenderer shall however be adjusted towards the security deposit.*
22. *The tender document & drawings in respect of the work can be seen in the o/o Executive Engineer (Electrical)*
23. *The tender document contains \_\_\_\_\_ pages. No page of the tender document shall be removed, mutilated, detached or cancelled.*
24. *Rates for finished works shall be given for each items separately, both in words & figures. In the event of non compliance the tender shall be deemed incomplete and liable for rejection.*
25. *All entries by the tenderer should be made in one ink and one hand writing only. Tenders should be filled in legible hand writing and should not contain erasures, corrections and overwriting as far as possible. However if it becomes necessary, each correction etc. should be properly attested under dated signature.*
26. *The work shall be executed on the basis of the following CPWD specifications:*
- i) Electrical Works :*
- *General specifications for Electrical Works Part-1 (Internal) 2013 with up to date corrections.*
  - *General specifications for electrical works (external) 1994 with upto date corrections.*
  - *General specifications for electrical works Part-VII (DG set) 2013 with upto date corrections.*
  - *General specifications for electrical works Part-IV Sub-station- 2013 with upto date corrections.*
  - *General specifications of HVAC works 2017 with upto date corrections.*
27. *For the purpose of clause 12 of the General conditions of contract the following schedule of rates shall be applicable.*
- i) Electrical Works: Based upon prevailing market rates.*
28. *The special conditions listed above shall take precedence over all above provisions of the contract. The General Condition of contract for CPWD works shall be generally followed including the clause 21 i.e. work shall not be sublet.*
29. *The contractor shall have to execute the work in such place and condition where other agencies will also be engaged for other works such as site grading, filling and leveling, interiors, landscape, and*

*electrical and mechanical engineering works, etc. No claim shall be entertained due to work being executed in the above circumstances.*

30. *No contractor, to whom the provisions of the BOCW Act apply, shall be allowed to commence work on the campus unless he has produced the „Registration Certificate“ issued by the office of Dy. CLC (Central)*
31. *The contractor shall engage only such workers who are registered as beneficiaries with U.P. BOCW Welfare Board and in case of engagement of new workers, he shall ensure the submission of applications for registration of such workmen within appropriate time.*
32. *a certificate for administrative convenience shall be obtained from the contractor covered under BOCW Act whether he has engaged 10 or more workmen while working in the Institute and only thereafter, Cess @1% from the bills raised by him shall be deducted at source for all running works. Cess, so deducted shall be deposited with the BOCW Welfare Board.*
33. *As per clause 36 (I) of GCC : It should be noted that license wire man shall only be allowed for the wiring work.*

## **GENERAL ELEECTRAL SPECIFICATION**

1.00.00 Cable Trays, Racks, perforated and associated Material

### **1.01.00 Cable Trays / Support**

1.01.01 All cable trays shall be ladder type and shall be supported and laid in accordance with The 'layout drawings'.

1.01.02 Cable trays shall be ladder type and dip galvanized after fabrication.

1.01.03 Cable tray supports shall be cantilever type for easy installation. All supports and hardware shall be hot dip galvanized.

1.01.04 Standard cable tray width shall be 600 mm. However reduced width of 300 mm shall be used in some place where specifically required.

1.01.05 Trays in general shall be supported at a distance of 1.5 m horizontal run.

1.01.06 All welds for cable trays shall have a minimum throat thickness of 60mm.

1.01.07 Jointing of cables trays shall be done by welding only.

1.01.08 Damaged galvanized surfaces shall be cleaned and coated with two (2) coats pf red oxide primer followed by two (2) coats of cold galvanized paint.

### **1.02.00 Earthing of cable Trays.**

1.02.01 Cable trays shall be electrically continuous and grounded. Earthing of cable trays shall be ensured by separate connection with the weld.

### **1.03.00 Cable Tray Installation**

1.03.01 All relevant layout drawings enclosed shall be followed except shaft obvious interference occurs. In such case the coating shall be damaged as directed and / approved by the owner.

Twenty (20%) spare space shall be provided in cable tray .

### **2.00.00 Cabling**

2.01.01 Adequate space will be provided to facilitate installation of cable system and to allow routine inspection and modification after installation.

2.01.02 Different voltage grade cable shall be laid in separate trays when the tray are run in tier formation. Generally power cable will be on bottom trays and control cables system with non-inflammable materials.

2.01.03 Cables for redundant equipment / system shall be run in separate trays.

2.01.04 All opening in the floor and wall for cable access shall be sealed after installation of the cable system with non-inflammable materials.



### **3.00.00 Grounding**

- 3.01.00 All grounding work shall be carried out as per guidelines specified in 'Grounding notes and details along with the typical grounding drawings enclosed with this specification.
- 3.02.00 All equipment under this package shall be directly connected to main grounding grid/ ground continuity conductor running along cable tray.
- 3.03.00 The riser shall be bolt connection at equipment end. In case the rise length is not adequate, separate equipment ground conductor shall be used which will be welded to the riser at one end and bolt connector to the equipment at other end.
- 3.04.00 All ground conductor shall be painted black after connection to guard against weathering and easy identification .

Equipment ground connection after checked and tested by the Authority shall be coated with anti-corrosive paint/ old compound.

- 3.05.00 All ground connection shall be made by electric arc welding unless otherwise specified.
- 3.06.00 Electrical equipment shall be provided with two separate and all sealed grounding pads, each complete with tapped hole galvanizing\_ spring washer for connection to main ground grid .

### **4.00.0 Tests**

- 4.01.0 Upon completion system and equipment shall be subjected to standard tests for checking the acceptability of the system with reference to relevant IS and IE rules.
- 4.02.0 Six (6) copies of Routine tests Certificate shall be submitted for approval prior to the dispatch of the concerned equipment from works.

## GROUNDING NOTES

1. Grounding work shall conform to the requirements of the following latest standard, statutory provision is amended upto date:

IS : 3043 – 1987 –Code of practice for earthing.  
Indian Electricity act, 1910  
Indian Electricity Rules – 1956

Contract Specifications  
Enclosed grounding drawings

2. The ground shall be connected with main grid available in the yard.
3. The earth pit shall be as per enclosed drawing and connected to the ground grid conductor.
4. Riser / pig tail from the ground grid conductor shall be as per typical details shown in the enclosed drawing .
5. All ground connection below the grade shall be made by Electric arc welding with low hydrogen content electrode Bonding of the conductor where necessary shall be done by gas heating.
6. The ground conductors shall be interconnected between them and top the main ground grids through risers.
7. All electrical equipments and associated non-current carrying metal works , supporting structures , building columns , fence , system neutrals lightening mast/ arrestors shall be connected to the ground grid system.
8. Two separate and distinct ground connections shall be provided for earthing of electrical equipment frame work in compliance with I.E. rules.
9. Misc. devices such as push button stations, lockout switches and cable end boxes etc. shall be grounded effectively whether specifically shown or not.
10. For ground connections, the conductor sizes shall be as listed below:

Equipment	G.I. Steel flats / wires
a. 33 / 11 KV equipments	2 No. 50 x 6mm
b. Structures, cable trays etc	2 No. 50 x 6mm
c. LT/HT panels	2 No. 50 x 6 mm

11. Ground conductor connection above the grade shall be generally made by electric arc welding.
12. Bolted connections shall be made only for grouting equipment devices and removable structures. The contact surface shall be thoroughly cleaned before connection to ensure good electrical contact.
13. A continuous 50x6mm GI flats ground c conductor shall be installed on one bank of vertical/horizontal trays and securely attached to such tray section, forming a solidly grounded trays system.

Before installing 50x6mm GI flats ground conductor along the cable tray run the cable trays welding joints in cable to ground tray supports shall be painted as specified.

14. Where two or more trays run together in one bank either vertically/ horizontally provide a continuous conductor on the top tray only on taps to each section of to other tray at 10M interval.
15. Earth pit shall be provided at connection
16. All welding joints in ground conductor above the ground shall be coated with two coats of cold galvanizing anti-rust paint after welding.
17. For typical detail of grounding refer drawing enclosed.

## SPECIFICATION FOR L.T TRANSFORMER E-01

### **1.00.00 DESIGN CRITERIA:-**

- 1.01.00 The transformer will be used to supply power to various equipment & accessories related to owner's facilities.
- 1.02.00 The transformer shall be capable of continuous operation at specified rating under following condition:
- |  |       |         |
|--|-------|---------|
| a) Voltage variation                     | ..... | +/- 10% |
| b) Frequency variation                   | ..... | +/- 5%  |
| c) Frequency variation<br>(Absolute sum) | ..... | 10%     |
- 1.03.00 The transformer shall be capable of withstanding the short circuit stress due to a terminal fault on one winding with full voltage maintained on the other winding for minimum period of three (3) seconds.
- 1.04.00 The transformer shall free from annoying hum or vibration. The design shall be such as not to cause any undesirable interference with radio or communication circuits.

### **2.00.00 SPECIFIC REQUIREMENTS:-**

#### **2.01.00 Tanks**

- 2.01.01 Tanks shall be of all welded construction & fabricated from good commercial grade low carbon steel of adequate thickness. All shall be double welded. All welding shall be stress relieved. Sheet steel minimum 2mm thick. The screen shall be perforated sheet steel type.
- 2.01.02 The tank wall shall be reinforced by stiffener to ensure rigidity so that it can withstand without any deformation (a) Mechanical shock during transportation. (b) Oil filling by vacuum to permit transportation of transformer within enclosure.
- 2.01.03 All removable covers shall be provided with weather proof, hot oil resistant, resilient gaskets. The design shall be such as to prevent any leakage of water into or oil from the tank.
- 2.01.04 Each Transformer tank shall be provided with one set of bi-directional rollers for rolling the transformer parallel to either center line.
- 2.01.05 Jacking pad, lifting eyes & pulling legs shall be provided to facilitate movement of the transformer. All heavy removal parts shall be provided with eye bolt for easy handling.
- 2.01.06 Manholes/ hand holes of sufficient size shall be provided for access to leads, windings, bottom terminals of bushings & taps.

#### **2.02.00 CORE & COILS:-**

- 2.02.01 The transformer shall be of core shell type. The core shall be built up with high grade, non-aging, low loss high permeability grain oriented cold-rolled silicon steel laminations specially suitable for core material. Material shall be prime core only documentary evidence should be got approved before delivery of transformer.
- 2.02.02 The coils shall be manufactured from electrolytes copper conductor & fully insulated for rated voltage.

- 2.02.03 The insulating material shall be of proven design. Such type of insulation shall be used so that the impulse & power frequency voltage stresses can be minimized.
- 2.02.04 The core & coil assembly shall be securely fixed in position so that no shifting or deformation occurs during movement of transformer or under short circuit stresses.
- 2.02.05 Coil assembly shall be suitably supported between adjacent section by insulating spacers & barriers. Bracing & other insulation used in assembly of the winding shall be arranged to ensure a free circulation of the coil & to reduce hot spot in the wind.
- 2.02.06 All leads from the windings to the terminal board & bushing shall be rigidly supported to prevent injury from vibration or short circuit stresses. Guide tube shall be used where practicable.

**2.03.00 TAPINGS:-**

- 2.03.01 Off circuit taps as specified shall provided on the high voltage winding i.e. variation +/- 7.5 % in the steps of 2.5%.
- 2.03.02 The transformer shall be capable of operation at its rated kVA on any tap provided the voltage does not vary by more than +/- 10% of the rated voltage corresponding to the tap.
- 2.03.03 The winding including the tapping arrangement shall be designed to maintain electromagnetic balance between HV & LV winding at all voltage ratios.

**2.04.00 OFF-CIRCUIT TAP CHANGER:-**

- 2.04.01 The off- circuit tap changing will be effected by a 3 phase gang-operated switch. Arrangement shall be such that switch can be operated at standing height from ground level.
- 2.04.02 The operating handle can be padlocked, at any tap position. The design shall be such that the lock can not be inserted unless the contacts are correctly engaged.
- 2.04.03 The mechanism shall be provided with a mechanical tap position indicator.
- 2.04.04 All contacts shall be silver plated & held in the position under strong contacts pressure to ensure low contact drop & avoid pitting.

**2.05.00 INSULATING OIL:-**

- 2..01 The transformer shall be filled with mineral insulating oil suitably inhibited to prevent slugging.
- 2..02 First filling of oil alongwith 10% excess shall be furnished for each transformer. Oil shall be supplied in non-returnable containers suitable for outdoor storage.
- 2..03 Oil preservation shall be by means of conservator tank complete with silica gel breather & oil seal.

**2.05.00 BUSHING:-**

- 2.05.01 Bushing shall be solid porcelain oil communicating type.
- 2.05.02 Bushing shall be provided with terminal connectors of approved type & size.
- 2..04 Bushing location shall provide adequate phase & ground clearances.

**1.01.00 TERMINAL ARRANGEMENTS:-**

- 2.06.01 L.T. Terminal for bus duct/cable connection shall be brought through insulating supports (FRLP or equal) with matching flange for bus duct/ cable connection. Supply & installation of bus duct/ cable has been covered under separate sub section of this package specification.
- 2.06.02 Details of bushing terminals & flange shall be furnished for co-ordination with bus duct.
- 2.06.03 H.T terminals for cable connection shall be brought out through side wall mounted bushings to a cable-end box with inspection cover.
- 2.06.04 Cable-end shall be self-supporting, weatherproof, air insulated type with sufficient space inside for termination and connection of cables from top.
- 2.06.05 In general, the arrangement shall be such as to permit removal of the transformer without dismantling the bus duct/ cable installation.
- 2.06.06 A separate L.V. neutral bushing shall be provided for connection to station ground mat (2x 50 x 6 GI flat).

**2.07.00 MARSHALLING BOX:-**

- 2.7.01 A sheet steel IP55 marshalling box shall be provided for each transformer. The box shall be located directly on the outside of transformer at suitable height & contain all auxiliary devices except those which must be located directly on the transformer.
- 2.7.02 All terminal blocks for owner's cable connection shall be located in this box. The terminal blocks shall be ELMEX 10 sqmm or approved equal.
- 2.7.03 The marshalling box shall be provided with removable cable gland plate for cable connections.

**2.08.00 WIRING:-**

- 2.8.01 All control, alarm & indication devices approved with the transformer shall be wired upto the terminal blocks.
- 2.8.02 Wiring shall be done with PVC armoured cable. Minimum wire size shall be 2.5 sqmm copper. Not more than two wires shall be connected to a terminal. 20% spare terminals shall be provided.
- 2.8.03 All devices & terminals blocks within the marshalling box shall be identified by symbols corresponding to those used in applicable schematic or wiring diagram.

**2.09.00 GROUNDING:-**

- 2.09.01 Two grounding pads, located on the opposite sides of tank, shall be provided for connection to station grounding grid.
- 2.09.02 Grounding pad shall have clean buffered surface with two tapped holes M10 GI bolts & spring washers for connection to 50 X 6 mm GI flat.
- 2.09.03 Ground terminals shall be also provided on marshalling box to ensure if effective earthing.

**2.10.00 AUXILIARY EQUIPMENT:-**

- 2.10.01 Neutral bushing current transformers shall be furnished where specified in the annexure.
- 2.10.02 The arrangement shall that the C.T. can be removed from the transformer without removing the tank cover.
- 2.10.03 C.T. secondary leads shall be wired upto the terminal blocks. The terminals for C.T. secondary leads shall have provision for shorting.

**2.11.00 PAINTING:-**

- 2.11.01 All steel surface shall be thoroughly cleaned by sand blasting or chemical agents, as required, to produce a smooth surface free of scales, grease & rust.
- 2.11.02 The steel surface after cleaning shall be given a coat of high quality red oxide or zinc chromate yellow primer followed by filler coats.
- 2.11.03 The internal surface in contact with insulating oil shall be painted with heat resistant insulating varnish which shall not react with & be soluble in the insulating liquid used.
- 2.11.04 The transformer shall be finished with two coat of synthetic enamel paint as per IS.
- 2.11.05 The paint shall be carefully selected to withstand tropical heat, rain etc. The paint shall not scale off or crinkle or be removed by abrasion due to normal handling.
- 2.11.06 Sufficient quantity of touch up paint shall be furnished for application after installation at site.
- 2.11.07 If it is considered necessary, the enclosure may be given a further coating at site by the owner. The bidder shall therefore indicate the type & quality of the paint with full specification for this purpose.

**2.12.00 DRAWING, DATA & MANUALS:-**

- 3.00.01 To be furnished for approval after award of work.
  - a) General arrangement drawing showing constructional features, space required in front for withdrawals, power & control cable entry points etc.
  - b) Details of materials with specifications.
  - c) Typical foundation plan & loading.
  - d) Typical breaker control schematic.
  - e) Matching flange & terminals for the bus termination.
  - f) Type test reports on circuit breaker.
  - g) Technical leaflets on
  - h) Circuit breaker
  - i) Instrument transformers
  - j) Relays, meters, switches etc.
  - k) Single line diagram
  - l) Control schematics
  - m) Wiring diagrams
- 2.12.02 Instruction manuals on transformer & its various fittings. The manual shall clearly indicate method of installation, check-ups & tests to be carried out before commissioning of the equipment.
- 2.12.03 The bidder may note that the drawings, data & manuals listed are minimum requirement only. The bidder shall ensure that all other necessary write ups, curves & information required to fully describe the equipment offered are submitted with his bid.

## **FITTINGS & ACCESSORIES**

Each transformer shall be equipped with fitting & accessories as listed below :

1. Oil conservator with filler cap drain plug and plain oil level gauge.
2. Silica gel breather with connecting pipe and oil seal.
3. Air release plugs.
4. Pressure release device. Explosion vent, if provided, should be double diaphragm type and with equalizing pipe.
5. 150mm dial magnetic oil level gauge with low level alarm contacted ( Two Sets)
6. 150mm dial oil temperature indicator with maximum reading pointer and electrically two sets of separate contacts for trip & alarm.
7. 150mm dia winding temperature indicator with maximum reading pointer & electrically separate two sets of contacts for trip & alarm.
8. Thermometer pockets.
9. Double float Bucholz relay with gas release cock, shut off valve on either side & separate two sets of contacts for trip & alarm.
10. Filter valve with threaded adopter (top & bottom).
11. Drain valve with threaded adopter.
12. Sampling valve.
13. Jacking pads, handling & lifting lugs.
14. Cover lifting eyes.
15. Bi-directional rollers & skids complete with clamping device with nuts & bolts for clamping the transformer on inverted channel.
16. Hand hole of sufficient size for access to interior of the tank.
17. Two grounding pads each complete with two (2) nos. tapped holes M-10 GI bolts & washer for transformer tank, cover & radiator tank.
18. Weatherproof marshalling box housing control equipment & terminal connections.
19. Rating & terminal making plates.
20. H.V. & L.V. cable box.
21. Termination arrangement of L.V. side including its neutral through non-segregated bus duct. The scope of transformer vendor will be upto matching flange of bus duct.
22. ONAN cooling system complete with isolation valves & all necessary accessories.
23. L.V. neutral bushing separately brought out for earthing of transformer neutral.
24. Copper flexible with lug duly installed for effective earthing of equipment components like radiator, top cover of tank etc.
25. Externally hand operated lockable off circuit tap changer.
26. 10% excess oil shall be furnished as per clause 2.05.02



### **AUXILIARY EQUIPMENT**

Transformer shall be provided with neutral bushing current transformers as indicated below:-

4000/5 A current transformer                      -1 No.  
10 VA  
Class 1.0

### **POWER TRANSFORMER**

Rated Output	-	2500 KVA
Type of cooling	-	ONAN
Rated voltage	-	HV-11000 Volts LV- 433 Volts
No. of phase	-	HT-3 phase LT-3 phase & N
Energy efficiency level	-	level-II (As per IS-1180 Part-I)
Vector group	-	Delta / Star Dyn 11
Frequency	-	50 Hz
Winding material	-	Copper
HT bushing	-	Provision for connection of 2x185 sq.mm 11 kV grade HT XLPE cable
LT bushing	-	Provision for bus duct.
Tap Changer	-	OFF load with pad locking provision

## **SPECIFICATION FOR LT BUS DUCT E-02**

### **1.00.00 Design Criteria**

- 1.01.00 The LT non phase segregated bus duct serve as a interconnection between the LT switchgear and outdoor LT transformer.
- 1.02.00 The LT bus ducts will be installed partially indoor and partially outdoor in a hot, humid and tropical atmosphere. All panels associated.
- 1.03.00 Bus duct associated equipment and wiring shall be provided with tropical finish to prevent fungus growth. All ventilation openings shall be screened and drains shall be filtered to prevent entrance of dust and insects.
- 1.04.00 For continuous operation at specified ratings, temperature rise of the bus duct and auxiliary equipment shall be limited to the site permissible values stipulated in relevant standards and / or this specification.
- 1.05.00 Bus duct and auxiliary equipment shall be capable of withstanding the mechanical forces and thermal stresses of the short circuit currents listed in the annexure without any damage or deterioration of material.
- 1.06.00 The bus ducts shall be self cooled and shall not be equipped with blower or any other type of forced ventilation.
- 1.07.00 Bus duct enclosure shall be of sheet steel.

### **2.00.00 Specific Requirements.**

#### **2.01.00 General**

- 2.00.01 The LT bus duct shall be non phase segregated enclosure type.
- 2.00.02 The layout of the bus ducts shall be generally in accordance with enclosed drawings. The details shown however are only typical. Bidder may propose changes to suit his particular design.
- 2.00.03 All parts and accessories shall have appropriate match mark and part numbers for easy identification and installation at site.

#### **2.02.00 Enclosure**

- 2.02.01 Phase shall be enclosed in weather proof, dust-tight, enclosure of sheet steel fabricated type conforming to degree of protection of IP 55.
- 2.02.02 Circumferential neoprene rubber gaskets shall be provided for dust tight joints with adjacent enclosure section.

- 2.02.03 The bus enclosure shall have extended bellows or equivalent means to allow for temperature changes and vibrations. Flexible joints shall be provided in enclosures at all points where the bus duct terminates at equipment to withstand vibration, expansion/ contraction and at suitable intervals in any straight run of the bus duct where expansion and contraction would otherwise result in stress in the supporting structures.
- 2.02.04 All outdoor bus enclosures shall be so designed & constructed as to prevent accumulation of rain water on top sheet. Similarly all gasketed flanged joints shall be suitably protected against direct splashing of rain water in case of outdoor runs.
- 2.02.05 Suitable inspection openings shall be provided for access to support insulators, bus joints, transformer terminals, switchgear terminals etc. All inspection openings shall have reliable sealing arrangement with neoprene gaskets.
- 2.02.06 Seal-off bushings complete with wall frame and support plates shall be provided where the bus duct penetrates the building wall. The seal is to prevent free exchange of air between indoor and outdoor portions of the bus duct.
- 2.02.07 Silica-gel breather shall be provided on both indoor and outdoor portions of the bus duct.
- 2.02.08 Filtered drains for drainage of condensate shall be provided at the lowest points and at such locations where accumulation of condensate can be expected.
- 2.02.09 Shipping length of the bus duct shall be not more than three (3) meters in length.

#### 2.03.00 Bus Conductor

- 2.03.01 The bus conductor shall be of high conductivity, aluminium alloy, supported on wet process porcelain insulators.
- 2.03.02 The bus conductor shall be designed for bolted connections throughout the run.
- 2.03.03 Flexible connections shall be provided between bus sections to allow for expansion and contraction of the conductor. Flexible connections shall also be provide at all equipment terminations.
- 2.03.04 All contact surfaces shall be silver plated to ensure an efficient and trouble-free connection. All connection hardware shall be non-magnetic and shall have high corrosion resistance.

#### 2.04.00 Disconnect Link

- 2.04.01 Removable bolted discount link shall be provided in the bus where shown on the drawing for the purpose of isolation.

- 2.04.02 Disconnect link shall consist of a removable section of conductor and shall be so constructed as to permit easy removal or reinsertion without alignment difficulties.
- 2.04.03 The bus on both sides of the link shall be rigidly supported so that the disconnect link is equal in mechanical strength to any other section of the bus.

A minimum clearance of 300mm (12”) shall be provided between the disconnected bus sections with the link removed.

#### **2.05.00 Insulators**

- 2.05.01 Bus support insulators shall be interchangeable, high creep, high strength, wet process, fine glazed porcelain. Alternatively good quality cast resin insulators.
- 2.05.02 Insulator shall be mounted in such a way so as to permit easy removal or replacement without disassembly of the bus. The insulator mounting plate shall be designed for cantilever loading to withstand the short circuit.
- 2.05.03 The conductor shall be fastened on the insulator through fixed and slip joints so as to allow conductor expansion or contraction without straining the insulator.
- 2.05.04 Space heater shall be provided preferably located near to each insulator to avoid moisture condensation within bus-duct. No and wattage rating of space heater shall be decided by the tenderer.

#### **2.06.00 Connections & Terminations**

- 2.06.01 All matching flanges, seal off bushings, gaskets, fittings, hardware and supports required for termination of the bus duct at the switchgears, transformers shall be furnished.
- 2.06.02 In this connection the contractor is required to coordinate through the engineer with the suppliers of the switchgear, transformers with regard to connection details, mechanical and thermal stresses.
- 2.06.03 Flexible connections both for conductor and enclosure shall be furnished.
  - a) At all equipment termination to provide for misalignment upto 25mm (1”) in all directions.
  - b) Between bus duct supported from building steel to prevent transmission of vibration.
- 2.06.04 The equipment terminal connections shall be readily accessible and shall provide sufficient air gap for safe isolation of equipment during testing.
- 2.06.05 If the material of bus conductor and that of the equipment terminal connectors are different then suitable bi-metallic connectors shall be furnished.

## **2.07.00 Grounding**

- 2.07.01 A separately run 50x6mm GI flat suitably clamped along the enclosure shall be used as the ground bus. All parts of the bus enclosure supporting structures and equipment frames shall be bonded to above ground bus.
- 2.07.02 Ground pad shall be bolted type to accommodate 50x6mm galvanized steel flats. Complete with suitable tapped holes, bolts and washers.

## **2.08.00 Supporting Structures**

- 2.08.01 All supporting structures required for hanging and/or supporting the complete bus duct shall be furnished. These include all members, indoor/outdoor posts, bolts, shims, base plate, beams, hangers, brackets, bracings and hardware.
- 2.08.02 All buses shall be adequately supported and braced to successfully withstand normal operation, vibration, thermal expansion, short circuit forces and all specified design loads.
- 2.08.03 Supports shall be designed to provide tolerance of  $\pm 12\text{mm}$  (1/2") in the horizontal and vertical directions.
- 2.08.04 All steel members shall be hot dip galvanized after fabrication. All hardware shall be of high strength steel with weather resistant finish.
- 2.08.05 Concrete foundation, building steel, concrete, inserts/plates will be provided by the owner.

The contractor shall co-ordinate with the owner for this purpose giving well in advance the details of his requirements so as to enable the owner to arrange for the same in time.

## **2.09.00 Wiring**

- 2.09.01 All wiring for space heaters shall be done with insulated stranded copper conductor of not less than 2.5 sqmm cross section. Each wire shall be identified at both ends with wire designation as per contractor's wiring diagram and shall be brought out to a terminal box outside the bus duct.
- 2.09.02 Terminal blocks shall be box-clamp type Elemex 10 sqmm with marking strips or approved equal.
- 2.09.03 At least 20% spare terminals shall be furnished in the terminal block.

## **2.10.00 Name Plate**

- 2.10.01 Suitable name plate shall be furnished with each piece of equipment.
- 2.10.02 Materials for name plate shall be plastic/lamicoid, 3mm thick, using white letters on black background.

## **2.11.00 Finish**

- 2.11.01 Except for supporting steel structures which shall be galvanized, all equipment shall be finished with a undercoat of high quality primer followed by two coats of synthetic enamel paints.
- 2.11.02 The interior surface finish shall be as per manufacturer's standard. The shade of exterior surface finish will be as per IS.
- 2.11.03 Pretreatment consisting of degreasing, derusting etc. shall be done on all fabricated parts before painting or galvanizing.
- 2.11.04 Paints shall be carefully selected to withstand heat and weather conditions. The paint shall not scale-off or crinkle or get removed by abrasion due to normal handling.
- 2.11.05 Sufficient quantities of all paints and preservatives required for touching up at sites shall be furnished.

## **SPECIFICATION FOR POWER AND CONTROL CABLES**

### **1.00.00 DESIGN CRITERIA**

- 1.01.00 The cable will be used for connection of power and control circuits of the owner's electrical system.
- 1.02.00 Cable will be either laid on ladder type trays or directly buried in ground.
- 1.03.00 For continuous operation at specified rating, maximum conductor temperature shall be limited to the permissible value as per relevant standard and/or this specification.
- 1.04.00 The insulation and sheath materials shall be resistant to oil, acid and alkali and shall be enough to withstand mechanical stresses during handling.
- 1.05.00 Armoring shall be single round wire of galvanized steel for multicore cables and aluminium for single core cable.
- 1.06.00 Core identification for multicore cable shall be provided by colour coding.

### **2.01.00 SPECIFIC REQUIREMENTS**

#### **2.02.00 L.V. Power cables**

1100 Volt grade, heavy duty armoured power cables with stranded aluminium conductors, XLPE insulation and extruded PVC overall sheath.

#### **2.03.00 Control Cables**

1100 Volt grade, 70°C rating, control cables with standard copper conductor, PVC insulation, round wire armour and extruded PVC overall sheath.

#### **2.03.00 Drum Length & Tolerance**

Each size of the control cable shall be supplied in one length.

#### **2.05.00 Cable Identification**

Cable identification shall be provided by embossing on the outer sheath the following :

- a. Manufacture's name or trade mark
- b. Voltage grade
- c. Year of manufacture
- d. Type of insulation e.g. PVC etc.

### **3.00.00 Joints and Termination**

Material of construction for joints / termination shall perfectly match with the dielectric chemical and physical characteristics of the associated cables. The material and design concept shall incorporate a high degree of operating compatibility between the cable and the joints. The protective outer covering (jacket) used on the joints / terminations shall have the same qualities as that of the cable oversheath in terms of ambient / operating temperature and fire retardant properties withstand capability and resistance of hazardous environment and corrosive elements.

#### **4.00.00 TESTS**

##### **4.01.00 Shop tests**

*The cables shall be subject to shop tests in accordance relevant standards to prove the design and general qualities of the cables as below:-*

4.01.01 Routine tests on each drum of cables

4.01.02 Acceptance tests on each drum s chosen at random for acceptance of the lot.

4.01.03 Type tests on each type of cable, inclusive of measurement of armour D.C resistance of power cables.

##### **4.02.00 Test witness**

Tests shall be performed in presence of engineer-in-charge if so desired by the Institute. The contractor shall give at least thirty (30) days advance notice of the date when the tests are to be carried out.

##### **4.03.00 Test Certificates**

4.03.01 Certified reports of all the tests carried out at the works shall be furnished in six (6) copies for approval of the owner

4.03.02 Test reports shall be completed with all details and shall also contain IS specified limit values, wherever applicable to facilities review.

4.03.03 The cable shall be dispatched from works only after receipt of owner's written approval of the test reports.

#### **5.00.00 SPECIAL TOOLS & TACKLES**

5.01.00 A set of special tools and tackles which are necessary or convenient for splicing, jointing and termination of different types of cables.

5.02.00 These special tools and tackles shall includes but not limited to:-

- |   |      |
|---|------|
| a. Splice-cum-insulation remover for control cable  | 1 No |
| b. Hand operated compression tools with a set of dies for different cable sizes           | 1 No |
| c. Hydraulically operated compression tools with a set of dies for different cable sizes. | 1 No |

5.03.00 The tools shall be shipped in separate containers, clearly marked with the service for which they are intended.

#### **6.00.00 SPARES**

The bidder shall submit a list of recommended spare parts for three (3) years satisfactory and trouble free operation, indicating the itemized price of each item of the spare.



**7.00.00 DRAWING, DATA & MANUALS**

7.01.00 Drawing data manuals shall be submitted and in quantities and procedures as specified in general conditions of contract and / or else where in this specification on approval & subsequent distribution after the issue of letter of intent.

7.02.00 To be submitted with the bid:

- a. Manufacture's catalogues giving cable construction details and characteristics.
- b. Cable current rating for different type of installation inclusive of operating factors for ambient temperature, grouping etc.
- c. Write-up on manufacture's recommended method of splicing, jointing, termination etc. of the cables.
- d. Type test report on H.V power cable.

7.03.00 To be furnished for Approval and distribution:

- a. Confirmed cable data.
- b. Shop test reports.

## **SPECIFICATION FOR ELECTRICAL ERECTION**

### **1.00.00 GENERAL**

- 1.01.00 The tenderer shall furnish & install all materials & equipment which are obviously a part of the completed installation but have not been specifically mentioned in this specification without any additional charge to the Authority.
- 1.02.00 All ladders, platforms, scaffolding, temporary supports, any other facility required for erection at site shall also be provided.
- 1.03.00 The tenderer shall at all times work in close coordination with Engineer-in-charge supervisory personnel & afford them every facility to become familiar with the erection & maintenance of the equipment.
- 1.04.00 The tenderer shall arrange his schedule of work & method of operation to minimize inconvenience to other contractors at the project site. In case of any difference between contractors. The decision of the Owner shall be final & binding on all parties concerned.
- 1.05.00 In case of any hold up due to fault of other contractors or for any other reason, the tenderer shall bring it to the notice of the engineering-in-charge in writing without any delay. Otherwise any delay in completion of his work will be accounted for.
- 1.06.00 In case of any contradiction/ confusion with any other section/ sub-section of this specification, the same shall be referred to the Engineer-in-charge in this respect shall be final & binding.

### **2.00.00 REGULATIONS**

The complete installation shall meet the requirements of the latest edition of the relevant Indian Standard & I.E. Rules.

### **3.00.00 DRAWINGS**

The tenderer shall inform himself fully with the relevant Electrical layout single line diagram & schematic drawings enclosed with the package specification.

The tenderer shall furnish all erection drawings, catalogue data sheets, etc as required to cover specific information for all items.

### **4.00.00 TRANSPORTATION**

The contractor shall be responsible for the transportation to the site of all equipment, materials & supplies to be provided by him according to terms of the contract. The contractor shall be responsible for arranging transportation as advised by Owner depending on requirement & to meet the completion schedule. In the event of the schedule requiring change in the mode of transportation the same shall be arranged by the contractor without any extra cost.

### **5.00.00 UNLOADING**

The contractor shall arrange to unload equipment received at site & also arrange to transport the material from the unloading point to site.

The contractor shall make all necessary arrangement for tools & tackles, men & machinery for unloading of equipment at site & its transportation to site or storage. It is clearly understood that demurrage, whereas & other expenses incurred by the contractor due to delayed clearance of the material or for any other reason, shall be to the contractor's account.

## **6.00.00 STORAGE AT SITE**

The contractor shall provide coverage of the equipment & material, security arrangement & all other facilities required for proper & safe storage till completion of the work.

## **7.00.00 PROTECTION OF WORK**

7.01.00 The contractor shall effectively protect his work at his own expense, equipment & material under his custody from theft, damage or tampering.

7.02.00 Finished work where required shall be suitably covered to keep it clean & free from defacement or injury.

7.03.000 For protection of his work contractor shall provide fencing & lighting arrangement connect up space heaters & provide heating arrangement as necessary or directed by Engineer-in-charge.

7.04.00 Contractor shall be responsible for any loss or damage to equipment & material until his work is fully & finally accepted.

## **8.00.00 OPENING OF CASE, CHECKING AND CLEANING OF PART**

8.01.00 All packing cases or package shall be opened in presence of Owner's representative.

8.02.00 All equipment, accessories & materials i.e. Switchgear, transformer, bus duct, power & control cables etc after receipt at site shall be jointly inspected & checked with packing list & identified with erection drawings.

8.03.00 All claims against loss or damage in transit shall be lodged by the contractor under intimation to Owner. The contractor shall be responsible for processing and settlement of claim including furnishing any information that may be required in this connection.

8.04.00 The contractor shall ensure that insurance formalities are observed & any loss of claim due to the fault of the contractor shall be to the contractor's account.

8.05.00 All parts shall be thoroughly cleaned all rust removed & surface polished as required.

8.06.00 Cleaned & polished parts shall be coated with anti-corrosive paints where necessary & stored with care, ready for erection.

## **9.00.00 TESTING EQUIPMENT**

The major testing equipment that are required to be arranged by the contractor are listed below :

### **a.) Insulation Tests :**

- i) Power operated Meggar - 1 kV & 2.5 kV grade
- ii) Hand operated Meggar - 500 Volt/ 1100 Volt grade
- b.) Hand driven earth Resistance Meggar, range 0-1/3/30 Ohms.
- c.) High potential testing set- roller mounted type
- d.) Tong testers of suitable ranges
- e.) Contact resistance measuring set for micro-ohms

- f.) Torque wrench of various sizes.
- g.) Multimeters, test lamp, field telephone with buzzer set, different gauges etc.

### **10.00.00 PAINTING**

After completion of the erection, all equipment & materials supplied under this specification shall be given necessary protective painting. The colour of the final coat shall be approved by the Owner.

### **11.00.00 ERECTION**

#### **11.01.00 Method & materials**

- 11.01.01 All work shall be installed in a first class, neat & workman like manner by mechanics skilled in the trade involve. All details on the installation shall be mechanically & electrically correct.
- 11.01.02 All materials shall be brand new & of best available quality without having imperfections & blemishes. Where two or more units of the same manufacture.
- 11.01.03 All conduits & equipment shall be installed in such a manner as to preserve access to any other equipment installed.

### **12.00.00 DETAILED REQUIREMENT OF INSTALLATION :**

- 12.01.01 All alignment, leveling, grouting, base channel fixing & anchoring adjustments shall be carried out in accordance with manufacturer's instructions and install necessary floor steel for supporting the panels.
- 12.01.02 All connections, in switchgear shall be completed, checked and adjusted to ensure safety & satisfactory operation of the equipment.
- 12.01.03 In some cases minor modifications may have to be carried out at site in the wiring & mounting of the equipment to meet the requirement of desired control scheme & the contractor shall have to do the same at no extra cost.

#### **12.02.00 Transformer**

- 12.02.01 The contractor shall place the transformer on its foundation, assemble parts, fabricate & erect & supporting structure for detachable type cable chamber.
- 12.02.02 H.V. test of transformer oil shall be carried out taking a sample from individual transformer. If the result is not in satisfaction of the purchaser , oil conditioning of that particular transformer shall have to be carried out.
- 12.03.00 L.T. Bus duct shall be erected duly supported on the soffit on the building by structural member supplied along with the bus duct. The bus duct will pass through separate wall between transformer & switchgear & will rest on two flanges one each at the switchgear & The transformer end. The grounding of the bus duct shall be carried as per the relevant stranded. The flanges supplied alongwith the bus duct shall be erected & terminals end equipment namely transformer & switchgear will be connected to the bus duct. The bus duct shall be erected in straight, vertical or horizontal formation as per the site requirement. The test like mili volt drop on the contacts, insulation resistance value & proper tightness shall be ensured by the contractor.
- 12.03.01 For draining out of oil a oil soak pit for transformer is to be erected of the suitable capacity.

#### **12.04.00 Miscellaneous items :**

- 12.04.01 The tenderer shall install miscellaneous minor items to complete the installation of equipment.
- 12.04.02 These equipment will be generally floor or wall mounted. The exact location will be as decided by the Owner at site or as shown in Final drawings.
- 12.04.03 All support & bracket needed for installation shall be fabricated & painted by the tenderer.
- 12.04.04 All welding, cutting, chipping & grouting as & when necessary shall be carried out by the contractor.

#### **12.05.00 Handling of cable drum and cable**

- 12.05.01 Rolling of drum shall be avoided as far practicable. For short distance, the drums may be rolled they are rolled slowly and in proper direction as marked on the drum. In absence of any identification, the drums may be rolled in the same direction as it was rolled during taking up the cable.
- 12.05.02 For unreeling the cable, the drum shall be mounted on jacks or on cable wheel. The spindle shall be strong enough to carry the weight without bending. The drum shall be rolled on the spindle slowly, so that cable should come out over the drum & not below the drum.
- 12.05.03 While laying cable, cable shall be used at an interval of 2 meters. The cable shall be pushed over the roller by a gang of people positioned in between rollers. The cable shall not be pulled from the end without laying intermediate pushing arrangement. Bending radius shall not be less than what is specified by manufacturer.

#### **12.06.00 Cable laying :**

Cables shall generally be installed in cable trays except for some short runs in buried formation or in conduit / pipe for protection or crossing. Multi core power cables laid on trays & riser shall be neatly dressed & clamped with fabricated 25 x 3 mm G.S. flat or cable tray at an interval of maximum 1 meter for vertical / inclined run & 1.50 meter for horizontal run. Control cables may be laid in single layer with touching formation. Power & control cables shall be claimed in separate group. Power & control cables shall not be laid in a common tray excepting in very special case where a gap of 150 mm shall be maintained between power & control cables.

- 12.06.01 H.T. & L.T. power cables shall be laid in cable tray in single layer & with spacing equal to the diameter of cable.
- 12.06.02 Control cables can be laid upto a maximum of three layers in each tray.
- 12.06.03 Both power & control cables shall be clamped to the tray rungs by means of clamp made up of 25 x 3 mm fabricated G.S. flat at an interval of 1500 mm for horizontal run & 1000 mm for vertical / inclined cable run.
- 12.06.04 The cable trays shall be run with a vertical spacing of 300 mm cable trenches. A minimum of 300 mm clearance shall be provided between the top of tray & beams, cold piping, 500 mm clearance for hot piping/ object to facilitate installation of cables in tray.
- 12.06.05 Adequate pull boxes shall be provided in conduit run to facilitate. Cable pulling in long runs & also to ensure that there will be no more than 270 degree bend between the pull points.

- 12.06.06 Cable tray shall be installed to accommodate cable manufacturer's recommended maximum pulling tension & minimum bending radius.
- 12.06.07 All openings in the floor & wall for cable access shall be sealed after installation of the cable system with non-inflammable materials.
- 12.06.08 All floor / wall openings for cable entry to the electrical equipment & accessories shall be sealed with non-inflammable material, after completion of cable installation. Thickness of such materials shall be equal to the thickness of floor / wall.

**12.07.00 Cables-power & control :**

- 12.07.01 The tenderer shall install & connect all power & control cable required for complete installation within his scope of work. Type & size of power & control cable shall be as specified & as supplied under a separate sub section for power & control cable.
- 12.07.02 In general all power & control cable shall be run in cable trays in cable trenches. Isolated runs of control cables shall be run in rigid conduit.
- 12.07.03 Jointing of power cable should be avoided as far as possible. However, if any splicing of control cable is required to carry out interlock it will be done in junction boxes not in the conduit or in the trays. Such junction boxes shall be in the scope of tenderer.
- 12.07.04 The contractor shall not install cables with different voltage grade in the same cable tray.
- 12.07.05 During cable installation care shall be taken so that the actual bending radius of each cable is not less than the one recommended by the cable manufacturer.
- 12.07.06 For cables buried directly underground there shall be as per CPWD norms for HT & LT cables, stone free sand cushion both above & below the cable run being held by brick protection after sand cushioning.
- 12.07.07 Cables shall be pulled into the trenches in strict accordance with the cable manufacture's instruction.
- 12.07.08 Tenderer shall furnish & install suitable solderless crimping type cable lugs at the termination of all wires & cables if not already furnished with the equipment.
- 12.07.09 All exposed conduits & armoured cables shall be tagged with the numbers that appear in the conduit & cable schedules as prepared by the tenderer. All conduits & armoured cables shall be tagged at their entrance and/ or exist from any piece of apparatus, junction box or pull box. Aluminium tags shall be used with the number engraved/ punched on the tag. Tag shall be suitable secured to the conduit or armoured cable.
- The cable tags shall also be provided at all bends and at interval of 30 M on straight run of cable in order to facilitate the identification.
- 12.07.00 Laying termination & connection of all control cables for interlock, protection, indication & annunciation.

The tenderer shall prepare cable schedule & interconnection diagram & submit the same for approval of the Authority. Cable laying shall be started with the approval cable schedule & interconnection diagrams. Separate cables for each type of following services/ functions as applicable shall be used & laid along the run for each feeder.

- a.) Power - designate as 'P'
- b.) Control protection interlock, metering, indication & annunciation designate as 'C'.

### **13.00.00 FIELD TESTING :**

13.01.00 Field Testing shall be required for all the equipment & accessories furnished, installed or connected by the tenderer to ensure proper installation, setting, connection & in accordance with the plans, specifications & manufacturer's recommendations.

Testing shall be conducted in presence of Owner's engineers with prior notice at least 2 weeks before commencement of any test.

13.02.00 Field testing work shall be done as per the latest edition of the relevant standards. All tests recommended by the equipment manufacturer shall be conducted. The tenderer shall submit the list of all field tests to be conducted for all equipment & accessories for review / approval by the Owner.

13.03.00 Testing shall include any additional tests suggested by the Owner that he deems necessary because of field conditions to determine that equipment, materials & system meet requirements of the specification.

13.04.00 The tenderer shall depute qualified personal to conduit all testing & shall provide all labour & testing equipment required for & incidental to testing.

13.05.00 The tenderer shall be responsible for any damage to equipment & material due to improper test procedure or test apparatus & shall replace or restore to original condition of any damaged equipment or material.

13.06.00 The tenderer shall maintain in quadruplicate a written record of all tests showing date, personal making the tests, equipment or material tested, test performed & result. Two copies of test records shall be given to the Authority.

### **14.00.00 COMMISSIONING :**

After the satisfactory test are performed the equipment & material shall be put on trial operation by the tenderer. After successful trial operation, the equipment shall be put on performance tests. Initially at no load condition & finally with different loading conditions.

## **SPECIFICATION FOR THE ELECTRICAL INSTALLATION WORK**

The following specifications will apply under all circumstances to the equipment to be installed against this contract and it is to be ensured that the contractor shall obtain for himself at his own expense and on his own responsibility all the information which may be necessary for purpose of making the tender and for entering into a contract keeping in view the specification and inspection of site etc.

The tendered rates shall include for the cost of material erection, connection, commissioning, labour, supervision, tools, transport all taxes, contingencies, breakage, wastage, sundries, scaffolding, maintenance of installations for defect liability period i.e. they should be for an item complete in all respects.

**The general specifications of electrical works for internal-2013 and general specifications for Sub-station works-2013 of CPWD shall be followed.**

**1. SITE CONDITIONS:** the equipment to be erected and commissioned should be suitable for the site conditions, it is estimated that the maximum temperature as site will be 50°C.

### **2. L.S.SPECIFICATIONS:**

The following Indians standard specifications will apply to the equipment and the contract unless specified otherwise.

a)	Transformer	IS 1180 & IS 2026-1977 & 1981
b)	Low tension air-circuit breakers and MCCB	IS 2516-1965
c)	Switch fuse unit on cubicle switch boards etc.	IS 4047-1967
d)	Switch fuse unit on industrial boards etc	IS 4064-1967
e)	Switch gear bus bars	IS 375-1963
f)	HRC fuse links	IS 2208-1962
g)	Distribution fuse boards	IS 2675-1966
h)	Degree of protection provided by enclosure For low voltage switchgear	IS 2147-1962
i)	PVC cables.	IS 1954-1962
j)	11,000 volt paper insulated lead sheathed cables	IS 692-1965
k)	Tubular fluorescent lamps for general lighting Service.	IS 2418-1965
l)	Tungsten filament lamps for general service.	IS 418-1963
m)	Ceiling fans	IS 374-1966
n)	Flood light	IS 1947-1961
o)	Well glass flame proof electric light fitting	IS 2206-1962 Part-I
p)	XLPE cables	IS 7098-Part-II
q)	Industrial light fittings with metal reflectors.	IS 1971-1961
r)	Water tight electric light fittings	IS 3533-1966
s)	Fittings for rigid steel conduits	IS 2667-1964
t)	Rigid steel conduits for electrical wiring	IS 1958-1964
u)	Accessories for rigid steel conduit for electrical Wiring.	IS 3873-1966
v)	Switch socket outlets.	IS 4615-1963
w)	Three pin pug and socket outlets`	IS 1233-1967
x)	Switches for domestic and similar purpose	IS 3858-1966
y)	AC electricity meters	IS 722-1977/1980+86



**CODE FOR PRACTIC**

Earthing	IS 3043-1966
Electrical wiring installations	IS 732-1963
Lighting protection	IS 2309-1969

### Approved Make List

S.No.	Items	Makes
1	MS Conduit (ISI marked)	BEC/AKG/NIC/Steel craft/ M-Key, SK (E.R.W)
2	PVC Conduit and accessories	Polycab/AKG/Asian
3	PVC/XLPE insulated aluminium/Copper conductor armoured/Unarmoured MV Cable upto 1100 V	Havells/Finolex/KEI/Grandlay/ Gloster
4	FRLS PVC insulated copper conductor stranded flexible wire i/c control cables	Havells/Finolex/KEI/Grandlay/RR Kabel/ Gloster
5	Cable Raceway floor/wall mounted and accessories	Schenider/Legrand/Cooper
6	Modular Switch & Socket	Legrand (Myrus)/M.K. (Element)/Schneider (Zencelo India)/Havells/ ABB
7	Metal clad Industrial Socket	Legrand/Siemens/Schneider/C&S/ABB
8	Cat-6 Cable	Beldon/Siemon/Legrand/Penduit (Pannet)
9	Cable Glands	Dowells/Commet/Gripwell/Raychem
10	Crimp Patch Cord	Beldon/Siemon/Legrand/Penuit (Pannet)
11	Protection Device (MCB/RCCB/DB/ELCB)	Siemens (Betagard),/Hager/Schneider / Legrand / C&S / ABB
12	MCCBs	Siemens (3VA)/L&T /Schneider/ Legrand / C&S / ABB
13	Power contactor	Siemens /L&T / Schneider / Legrand / ABB / C&S
14	Surge Protection Devices	Siemens/L&T/Schneider / Legrand
15	Panel Accessories	Siemens /L&T/Schneider / Legrand/Tecnic / ABB/ C&S/Neptune
16	Selector Switch	Salzer/Seimens /BCH/ Kacee
17	Auxiliary Relays	Siemens/L&T/Schneider/Legrand/ABB
18	LED/Metal Halide/Fluorescent Internal Lighting Fixture	Philips/ Vipro/Havells/Crompton/Decon
19	External Lighting Fixture	Philips/ Wipro/Havells/Crompton
20	Emergency Lighting/ Exit Sign boards	Philips/Havells/Lighting Technologies/Trilux/Prolite
21	Ceiling Fan (ISI marked & BEE rated 5 star)	Havells/Almonard/Orient/Usha/Bajaj
22	Paint	Nerolac/Asian/Berger
23	Advance Lighting Protection System (Early Streamer Emission Type)	LPI (Australia)-by allied power/SGI (Duval Messien/satellite (France)- by SGI/Bradlay (USA)- by JMV/Erico (USA)-by security shoppe/ABB
24	GI Pipe	Tata/Jindal/SAIL

25	Main LT Panels/ MCC Panel	(Main LT panel / MCC Panel board should be IEC 61439 part-1 and II manufacturer has to produces the relevant test certificate as per IEC code for the same failing which panel shall be rejected). Tricolite, Delhi /Siemens / Schneider/ Milestone/ Neptune
26	Air Circuit Breaker	Siemens / Schneider /L&T /Legrand/ C&S/ABB
27	Surge Voltage Protection	Siemens /Schneider/L&T/Legrand/ABB
28	Earth fault module	Siemens/Schneider/L&T/Legrand
29	Protection relays	Siemens/Areva/L&T/Legrand
30	C.Ts and PTs	Kappa/AE/Matrix
31	Digital Meters	Siemens (PAC)/ Schneider/ (conzerv) / Secure Enersol / L&T/ Neptune
32	Change Over Switch	L&T/Havells /Socomec/ABB/C&S
33	Indicating lamps	ESBEE/Schneider/Siemens/Vaishno/Neptune
34	Power capacitors	Epcos/ Neptune / Legrand /ABB/ L&T
35	Automatic Power factor correction relay/controller	Epcos/Siemens (PAC) /Schneider (Conzerv)/L&T/Neptune
36	Sealed Maintenance Free Batteries	Exide/Panasonic/Hitachi/Shinkobe
37	Battery charger	Caldyne/Chhabi Electricals/Statcon/Max Power
38	Cable Trays (Factory Fabricated/Overhead & Floor Raceways	Legrand/MEM/OBO/ Milestone/ Neptune
39	HDPE underground cable duct	Rex Polyextrusion/Tirpura/Plasomatics/Duraline
40	Insulation Mats	DL Miller & Co. Ltd.?Premier Polyfilm Ltd./RMG Polyvinyl India Ltd/Jyoti
41	Smoke/Heat detectors	Apollo/ System Sensor/ Agni
42	Manual Call point	PRD/System-Tek/ Simplex/ System Sensor/Agni
43	Response indicators	PRD/System-Tek/ Simplex/ System Sensor/Agni
44	Fire Exit Signs	System-Tek/ Simplex/ Agni
45	Fire Control Panel	System-Tek/ Morley /Agni
46	Speaker / Hooter	System-Tek/ Philips /Agni
47	Occupancy Sensors/ Movement Sensor	Legrand/ Philips/ Wipro
48	Flush type switch /socket	Anchor/ Kinjal/ SSK/ Havells Reo

49	Fuse switches unit / switch fuse unit /HRC fuse	L&T / Siemens/ Havells/ C&S
50	Exhaust fan	Almonard/ Alstom/ Crompton/ Havells
51	XLPE insulated HT cables	Gloster /KEI/Havells
52	Cable lug	Ascon (Heavy gauge) Jainson Dowells
53	Lamp Holder (Brass)	Kay/SSK/Kinjal
54	Telephone wires/Telephone Cable /jelly filled telephone cables	Finolex /Delton/Havell's /R.R. Kabel
55	Telephone tag blocks	Krone/ Pouyet
56	Telephone outlet	MK Electric /Legrand (Mosaic)/Crabtree (Piccadilly)
57	GI raceways	Milestone Engineering /Legrand/MDS/Neptune Systems Pvt. Ltd./MK
58	PVC raceways	Legrand/ MK
59	Electronic ballast	Philips /Wipro/Bajaj/Decon/Crompton/Havells
60	DLP plastic trunking	Legrand/MK
61	Geysers	Recold /Venus /Usha Lexus /Sphere hot
62	Tower Light	Ligman/Simes/Bega
63	HT/LT transformers	ABB/Schneider /CGL (Crompton Greaves Ltd.)
64	HT SF-6 circuit breakers/VCB	Siemens /ABB/CGL/Schneider
65	Programmable Logic Controller(PLC)	Siemens/Allen-Bradley/Schneider
66	Earthing (Chemical Earthing) Plate Earthing	JMV/As per CPWD Norms
67	Octagonal Pole	Bajaj / Crompton / Phillips
68	11 kV HT panel I/c relay	CGL/Schneider/ABB/ Siemens
69	Control Relay Panel	CGL/Schneider/ABB
70	Lightning Arrestor	ABB/Alltec/JMV
71	Temp. Gauge	Guru
72	Gate Valve	Leader/Sant
73	Electrical Backup	Spare hot/ Racold
74	PVC Tank	Syntex/ Polycon
75	Thermostat	ISI Marked

76	Flat Collector Plate	Solocrome/ Tata BP/ Racold
77	S.S Sheet	Jindal / National
78	HT/LT cable joints (Straight through/outdoor/indoor)	3M/ Denson/ M Seal/Raychem/ Cabseal
79	Alternator	STAMFORD/Crompton Greaves
80	DG Set	Sterling & Wilson /Caterpillar/Commins Power / eneration/ Kirlosker
81	Makes of accessories of HT / LT Panel / Transformers	As per standard practice of manufacturer.
82	Bus Trunking	C&S / L&T/ Schneider as per standard practice of OEM manufacturer / channel partner
83	HT Panel 11 KV	ABB/Schneider /CGL (Crompton Greaves Ltd.)
84	Bus Duct	Neptune/ Milestone/Tricolite

**TENDER ACCEPTANCE LETTER**  
**(To be given on Company Letter Head)**

**Date:**

To,

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**Sub: Acceptance of Terms & Conditions of Tender.**

**Tender Reference No:** \_\_\_\_\_

**Name of Tender / Work: -**

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**Dear Sir,**

**1. I / We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely:**

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**as per your advertisement, given in the above mentioned website(s).**

**2. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. \_\_\_\_\_ to \_\_\_\_\_ (including all documents like annexure(s), schedule(s), etc .,), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.**

**3. The corrigendum(s) issued from time to time by your department/ organisation too have also been taken into consideration, while submitting this acceptance letter.**

**4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.**

**5. I / We do hereby declare that our Firm has not been blacklisted/ debarred/ terminated/ banned by any Govt. Department/Public sector undertaking.**

**6. I / We certify that all information furnished by our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organisation shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.**

**Yours Faithfully,**  
**(Signature of the Bidder, with Official Seal)**