Name of work

Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works.

BID DOCUMENT

Executive Engineer,
IWD, IIT Kanpur
Indian Institute of Technology, Kanpur

Indian Institute of Technology Kanpur

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It is certified that this document contains 90 pages

Executive Engineer

1. Notice Inviting e-Tenders

The Executive Engineer, IWD, IIT Kanpur on behalf of Board of Governors of IIT Kanpur invites online percentage rate tender from enlisted contractors in CPWD and / or the eligible firms / agencies satisfying criteria mentioned in the document for the following electrical work in two bid system.

NIT No: 73/EE/Elect/2026-27

1	Name of work	:	**Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works.**
2	Estimated cost **(inclusive of GST)**	:	**Rs. 8,58,266/-**
3	Earnest Money Deposit (Rs.)	:	**Rs. 17,165/-** **(The Director, IIT `Kanpur)**
4	Duration of contract	:	**Two(02) months**
5	**Last Time & date of submission of bids (Up to)**	:	As per CPP portal data (https://eprocure.gov.in/eprocure/app)
6	**Opening of bids**	:	As per CPP portal data (https://eprocure.gov.in/eprocure/app)

The bid forms and other details may be downloaded from Central Public Procurement Portal (http://eprocure.gov.in/eprocure/app). Aspiring bidders who have not enrolled / registered in e- procurement should enroll / register themselves before participating through web site http://eprocure.gov.in/eprocure/app. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at "Instructions for online bid submission."

Bidders can access quotation / tender documents on the website (for searching in the NIC site), kindly go to quotation search option and type 'IIT'. Thereafter, click on "GO" button to view all IIT quotations. Select the appropriate quotation / tender and fill them with all relevant information and submit the completed Quotation / Tender document online on the website http://eprocure.gov.in/eprocure/app. as per the schedule given in the next page.

Note: No manual bids will be accepted. All bids (both Technical & Financial) should be submitted in the e-procurement portal.

Applicants are advised to keep visiting the above-mentioned websites from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updates thereof, if any. An incomplete application may be liable for rejection.

Executive Engineer

2. Information and Instructions for Bidders for E-Tendering

The Executive Engineer, IWD, IIT Kanpur on behalf of Board of Governors of IIT Kanpur invites online percentage rate tender from enlisted contractors in CPWD and / or the eligible firms / agencies satisfying criteria mentioned in the document for the following electrical work in two bid system.

1	Name of organization	:	Indian Institute of Technology, Kanpur
2	NIT No.	:	73/EE/Elect/2026-27
3	Location	:	Indian Institute of Technology, Kanpur
4	Tender / Quotation type (open / limited /EOI / Auction / Single	:	Open
5	Tender / Quotation category (services / works	:	Works
6	Type of Contract (work / supply / auction/ service / buy / empanelment / sell	:	Works
7	Form of contract (CPWD-7/8)	:	CPWD-7
8	Work Category (civil / electrical / fleet / management / computer system	:	Electrical
9	Is multi-currency allowed?	:	No
10	Date of publishing / issue / start	:	As per CPP portal
11	Document download start date	:	As per CPP portal
12	Document download end date	:	As per CPP portal
13	Date & time of pre-bid meeting	:	As per CPP portal
14	Venue of pre-bid meeting	:	As per CPP portal
15	Last date & time of uploading of bids	:	As per CPP portal
16	Date & time of opening of technical bids	:	As per CPP portal
17	Bid Validity Days	:	90 days after opening of technical bid
18	Earnest Money Deposit (EMD)	:	**Rs. 17,165/-** scanned copy as a proof of EMD deposition to be uploaded with e-Tendering website by the bidder within the period of bid submission. This should be in the form of a bank guarantee (including e-bank Guarantee) or Banker's Cheque or Demand Draft (DD) or Fixed

			Deposit receipt issued by Scheduled Commercial Bank or Nationalized Bank in favour of "The Director, IIT Kanpur" Payable at Kanpur shall be scanned and uploaded to the e-tendering website by the bidder within the period of bid submission. The hard copy of earnest despite receipt (EMD) shall be submitted in the office of Executive Engineer, Central Office IWD, IIT Kanpur (except in case of e-bank Guarantee) before the date and time of opening of technical bids as specified in the bid document.
20	No. of Bids / Covers (1 / 2 / 3 / 4)	:	2
21	Address for communication	:	Office of Executive Engineer, IWD, IIT Kanpur-208016 Contact no. 0512-259-7715
22	Email address	:	kesav@iitk.ac.in

The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.

1. Information and instructions for bidders posted on website shall form part of bid document.
2. The bid document consisting of drawings, specifications, schedule of quantities of items to be executed, schedule of stages for payment as applicable and the set of terms & conditions of the contract to be complied with and other necessary documents can be seen and downloaded free of cost from www.eprocure.gov.in
3. But the bid can only be submitted after deposition of proof of submission of EMD. (except in case of e-bank Guarantee).
4. Those contractors not registered on the website mentioned above, are required to get registered beforehand. Only e-bids shall be accepted in CPPP portal through e-tendering processes.
5. The intending bidder must have valid Class-III digital signature to submit the bid.
6. On opening date, the contractor can login and see the bid opening process. After opening of bids, he will receive the competitor bid sheets.
7. Contractor can upload documents in the form of JPG format and PDF format.
8. Contractor must ensure to quote rate of each item. The column meant

for quoting rate in figures appears in pink colour and the moment rate is entered, it turns sky blue.

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 bidder, rate of such item shall be treated as "0" (ZERO).

However, if a tenderer quotes nil rates against each item in item rate, the tender shall be treated as invalid and will not be considered as lowest tenderer.

9. The "Eligibility/technical Bid" shall be opened first on due date and time as per the evaluation scheme. The "Financial Bid" of bidders qualifying the technical bid shall be opened on a later date as to be announced in CPP portal.

10. The bidders are advised to visit the site before submission of bids to have more clarity about the site conditions and availability of space for execution of the work.

11. All modifications/addendums/corrigendum's issued regarding this bidding process shall be uploaded on website only.

12. The department reserves the right to reject any or all bids without assigning any reason thereof and may restrict the list of qualified bidders to any number deemed suitable by it, if too many bids are received satisfying the minimum laid down criteria.

13. The rates for all items of work, shall unless clearly specified otherwise, include cost of all operations and all inputs of labour, material, T&P, scaffolding, wastages, watch and ward, other inputs, all incidental charges, all other taxes (inclusive of GST), cess, duties, levies etc. required for execution of the work.

14. If claimed, The enlistment of the contractors should be valid on the last date of submission of bids. In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

15. The description of the work is as follows: "**Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works.**

16. The work is estimated to cost **Rs. 8,58,266/-**. However, this estimate given is mere approximation for guide.

17. Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD 7 which is available as a Govt. of India Publication and also available on website www.cpwd.gov.in. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

18. The site for the work will be handed over as per the special terms and conditions of the document.

19. An approval programme of completion submitted by the contractor after award of work based on the milestone given in the tender.

20. The bid document consisting of NIT, 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.eprocure.gov.in free of cost.

21. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.

22. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he/she need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

23. Earnest Money Deposit receipt scanned copy shall be uploaded to the e-Tendering website within period of submission (except in case of e-bank Guarantee).

24. Copy of documents as specified in the bid shall be scanned and uploaded to the e-tendering website within the period of bid submission.

25. The bid submitted shall be opened at as per the details provided in the CPP portal at IWD office. The date of opening of Financial Bid shall be informed through web site after the opening of financial bid

26. The bid submitted shall become invalid if:

    (i) The bidder is found ineligible.

    (ii) If the bidder does not deposit original EMD to the office of Executive Engineer, Electrical Division, IWD, IIT Kanpur within the due date of submission (except in case of e-bank Guarantee).

    (iii) The bidder does not upload scanned copies of all the documents stipulated in the bid document.

    (iv) If a tenderer quotes nil rates against each item in item rate tender (if applicable), the tender shall be treated as invalid and will not be considered as lowest tenderer.

27. 5% of tendered value PG shall be 5% of the Estimated cost put to tender (ECPT) or contract amount whichever is higher, valid up to stipulated date of completion and Six (6) months beyond that. a) A bid will be treated abnormally low if the quoted amount is lesser than 80% of estimated cost put to tender. b) Requirement of Additional proforma Guarantee (APG): In case of abnormally low bids as defined above, the bidder shall be required Additional Performance Guarantee (APG) in additional to the Standard

Performance Guarantee (PG). The amount of Additional Performance Guarantee (APG) shall be equivalent to the difference between the 80% amount of ECPT and quoted amount. (e.g. if ECPT is A and quoted amount is 0.7A then the amount of APG shall be 0.8A-0.7A). The Additional Performance Guarantee (APG) shall be in the prescribed format of Performance Guarantee and has to be submitted within the time frame prescribed for submission of Performance Guarantee. The other terms and conditions of release etc. Of APG shall be same as that of PG.

28. 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 contractor shall be suspended for two years and shall not be eligible to bid for IITK tenders from the date of issue of suspension order.

29. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of afore said provisions by the sub-contractors, if any engaged by the contractor for the said work and program chart (Time and Progress) within the period specified in Schedule 'F'.

30. Intending Bidders are advised to inspect and examine the sites and its surroundings and satisfy themselves before submitting their bids 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, making proper arrangements to the site for smooth operation, 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 bid. Bidder shall be deemed to have full knowledge of the sites whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidder 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 bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Institute and local conditions and other factors having a bearing on the execution of the work.

31. Intending Bidders are advised to get familiarized with the specifications /rules related (i.e., **Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works."** to the work as approved by the competent authority and various policies related to

C&D waste and other environmental guidelines of the institute pertaining to the. Bidder shall be deemed to have full knowledge of such rules and regulations whether he has read it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. In case of reduction of scope of work or no work is possible to carry out on account of such issues, no cost shall be payable to them. Submission of a bid by the bidder implies that he has read this notice and all other documents and has made himself aware of the Institute Regulations and other factors having a bearing on the execution of the work.

32. The competent authority on behalf of the Board of Governors does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without assigning any reason. Bids in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

33. Canvassing whether directly or indirectly, in connection with bids is strictly prohibited and the bids submitted by the bidders who resort to canvassing will be liable to rejection.

34. The competent authority on behalf of the Board of Governors reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.

35. The contractor shall not be permitted to bid for works in the Institute Works Department responsible for award and execution of contracts, in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive) in IWD. 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 Office of IWD/ Institute Works Department. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.

36. 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 services without the prior permission of the Government of India in writing. This contract is liable to be canceled 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 bid or engagement in the contractor's services.

37. The bids for the work shall remain open for acceptance for a period of Ninety (90) days from the date of opening of bids. If any bidder

withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Institute shall, without prejudice to any other right or remedy, be at liberty to suspend the bidder for one year.

38. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 7 days from the stipulated date of start of the work, will sign the contract.

39. The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto

40. Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as applicable.

41. The bid document will include the following components:

    (a) CPWD-7 and CPWD-6 including Schedule A to F for all the components of the work, Standard General Conditions of Contract for CPWD 2023 as amended/modified up to last date of submission of the bid.

    (b) General / specific conditions, specifications applicable to all components of the work.

42. The eligible bidders shall quote percentage rates after considering all the components ofthe work.

43. After acceptance of the bid by competent authority, the Executive Engineer, IWD shall issue letter of award on behalf of the Board of Governors to the contractor. After the work is awarded, the contractor will have to enter into one agreement with Executive Engineer, IWD. One such signed set of agreement shall be handed over to Engineer-In-Charge as applicable.

44. Entire work under the scope of bid shall be executed under one agreement.

45. The requirement of technical staff given in various specialized works is as per requirements given in clause 32 of NIT document. The actual deployment of these technical staff will be as per execution of work and direction of the Executive Engineer, IITK.

46. The bill for work components shall be facilitated by Engineer-in-Charge to the contractor.

47. The work shall be treated as complete when all the components of the

work are complete.

48. It will be obligatory on the part of bidder to sign the contract document for all components before the first payment is released.

49. In case of reduction in scope of work claim on account of reduction in value of work, loss of expected profit, consequential overheads etc. shall not be entertained.

50. A team of officers from Indian Institute of Technology Kanpur may visit the office/ site of work of bidders for establishing their credibility and verification of submitted documents

51. The mentioned work is urgent as requested by client/Institute and to be completed strictly in given time schedule as per special terms and conditions. The contractor has to deploy the labour and supervisory staff in shifts to meet the targeted completion date. The work may be executed in extended shifts or two shifts. The rates quoted by the contractor will be deemed to be inclusive of any extra expenditures on account of this reason. Nothing shall be paid on this account.

52. The competent authority on behalf of the Board of Governors reserves the right to terminate the contract if,

    a) Any violation of labour law has been observed.

    b) Any of the construction workers engaged in the works under this contract is found also engaged in Service Contracts of the Institute at the same time.

53. The competent authority on behalf of the Board of Governors reserves the right to disqualify an agency for

    (a) Non-compliance of Institute orders

    (b) Violation of Institute policies as established by the Competent Authority in the best interests of the Institute.

54. Payment shall be regulated as under:

    (a) 75% of the tendered value on receipt of all materials listed in BOQ at site be submitted to claim the payment)

    (b) 15% of the tendered value on installation and connection.

    (c) 10% of the tendered value on testing and commissioning

2.1 Instructions for Online BID Submission

This tender document has been published on the Central Public Procurement Portal (URL: http://eprocure.gov.in/eprocure/app). The bidders are required to submit softcopies of their bids electronically on the CPP portal, using valid Digital Signature Certificates (DSC). 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.

More information useful for submitting online bids on the CPP portal may be obtained at http://eprocure.gov.in/eprocure/app

2.2.1 Registration

1. Bidders are required to enroll on the e-procurement module of the Central Public Procurement portal (URL:http://eprocure.gov.in/eprocure/app) by clicking on the link, "click here to enroll". Enrolment on the CPP portal is free of charge.
2. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for the accounts.
3. Bidders are advised to register their valid e-mail address and mobile number as part of the registration process. These would be used for any communication from the CPPP portal.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (class 2 or class 3 certificates with signing key usage) issued by any certifying authority recognized by CCA India (e.g. Sify / TCS / nCode/ eMudhra etc.) with their profile.
5. Only one valid DSC should be registered by a bidder. Please note that bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
6. Bidder then logs in to the site through the secured log-in by entering their user ID Password and the password of the DSC / eToken.

2.2.2 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. The 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 other; in case they want to obtain any clarification/help from the Helpdesk.

2.2.3 Preparation of bids

1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2. Please go through the tender advertisement and the tender document carefully to under- stand the documents required to be submitted as part of the bids. Please note the number of covers in which the bid documents have to be submitted. Any deviations from these may lead to rejection of the bids.
3. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF formats. Bid documents may be scanned with 100 dpi with black &white option.
4. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g., PAN card copy, annual reports, auditor's certificates, etc.) has been provided to the bidders. Bidders can use "My Space" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

2.2.4 Submission of bids

1. 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 due to other issues.
2. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3. A standard BOQ Format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the white colored [unprotected] cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.
4. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
5. All the documents being submitted by the bidders would be encrypted using PKI 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. Data storage encryption of sensitive fields is done.

6. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
7. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date &time of submission of the bid with all other relevant details.
8. Add scanned PDF of all relevant documents in a single PDF file of compliance sheet.

2.2.5 Assistance to bidders

1. Any queries relating to tender document and the terms and conditions contained therein should be addressed to the tender inviting authority for a tender or the relevant contact person indicated in the tender.
2. Any queries relating to the process of online bid submission or queries relating to CPP portal in general may be directed to the 24 x 7 CPP Portal Help Desk.

2.2.6 General instruction to bidders

1. The tenders will be received online through portal https://eprocure.gov.in/eprocure/app. In the technical bids, the bidders are required to upload all the documents in PDF format.
2. Possession of a valid class II / III Digital Signature Certificate (DSC) in the form of smart card / e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through https://eprocure.gov.in/eprocure/app. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the websitehttps://eprocure.gov.in/eprocure/app under the link "Information about DSC".

   Tenderers are advised to follow the instructions provided in the "Instructions to the tenderer" for the e-submission of the bids online through the Central Public Procurement Portal for e-procurement athttps://eprocure.gov.in/eprocure/app.

Executive Engineer

2.3 List of documents to be scanned and uploaded within the period of bid submission

The following mandatory documents to be submitted with online bid submission:

The Online bids (complete in all respect) must be uploaded online in two Envelops as explained here: -

2.3.1 Envelope - 1: Technical Bid

The following mandatory documents to be provided as **a single PDF** file in the same sequence as listed for an eligible bid:

1. EMD scanned copy shall be submitted along with the technical bid**
2. GST Registration Certificate
3. Copy of EPF & ESI Registration
4. Copy of PAN card
5. Affidavit for not being blacklisted/debarred/restrained as per 5.1
6. Performance report of works executed as per 5.2 or Completion certificate issued by competent Authority.
7. Structure and Organization of the Agency as per 5.3
8. Declaration on Details of the Bidder(s) as per 5.4
9. Details of Similar Nature of Works Completed as per 5.5
10. Declaration about Site Inspection as per 5.6
11. Letter of Transmittal as per 5.7
12. Tender Certificate as per 5.8
13. Tender Acceptance Letter as per 5.9
14. CPWD-7 5.10
15. Financial Information as per 5.11
16. Bankers certificate as per 5.12 (minimum 40% of estimated cost put to tender) Or Net Worth Certificate (minimum 10% from certified Chartered Accountant with UDIN) as per 5.13
17. Scanned copy of "A" class electrical license.
18. Registration details with the Govt. Department (CPWD, BSNL, MES, State Govt. Bodies, State /Central PSUs, Central Govt. Bodies).

****The bidder must provide an Earnest Money Deposit (EMD) for the amount specified in the tender document. This should be in the form of a bank guarantee (including e-bank Guarantee) or Banker's Cheque or Demand Draft (DD) or Fixed Deposit receipt issued by Scheduled Commercial Bank or Nationalized Bank in favour of "The Director, IIT Kanpur" Payable at Kanpur shall be scanned and uploaded to the e-tendering website by the bidder within the period of bid submission. The hard copy of earnest despite receipt (EMD) shall be submitted in the office of Executive Engineer, IWD, IIT Kanpur (except in case of e-bank Guarantee) before the date and time of opening of technical bids as specified in the bid document.**

Due date for EMD hardcopy submission is 13.10.2026 @ 15.30Hrs

2.3.2 Envelope - 2: Financial Bid

Price bid should be submitted in BOQ format

1. Eligibility Criteria

3.1 Eligibility criteria for contractors

Contractors who fulfill the following criteria shall be eligible to apply.

Eligible Bidders
Eligible bidders should satisfy the following criteria for an eligible bid:

1. **Average annual financial turn over:**
   Average annual financial turnover of works should be at least 30% of the estimated cost of work put to tender during the last 5 consecutive financial years by the certified Chartered Accountant.

   Audited turnover statements to be furnished as proof of the same duly certified by chartered accountant along with Profit & Loss Statements.

2. Bankers Certificate- 40% of the estimated cost put to tender as per 5.12 Or

   Net-Worth certificate of minimum 10% of the estimated cost put to tender issued by certified chartered Accountant with UDIN as per 5.13

3. **Experience:**

   Firms/Contractors must have completed satisfactorily
   i) One similar work of 80% value of the estimated cost put to tender
   Or
   ii) Two similar work of 60% value of the estimated cost put to tender
   Or
   iii) Three similar work of 40% value of the estimated cost put to tender

Works completed during last 7 years ending last day of the month previous to the one which application are invited.

And

One completed work of similar nature costing not less than the amount equal to 40% of the estimated cost put to tender (either part of above or a separate one) with Central Government Department/ Central Autonomous Body/ Central Public Sector Undertaking/ State Government Department/ State Autonomous Body/ State Public Sector Undertaking.

4. **Definition of similar work:** Similar type of work means "**Internal / External electrical installation works."**

5. The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to the previous day of last date of submission of bids.

6. **Having valid "A" Class Electrical License**

Eligible bidders must also satisfy the following conditions and ensure submission of all documents mentioned in 2.3

1. **Legal:** Unregistered Partnership Firm and Joint Venture or Consortium are not eligible.

2. **Registration:** Bidder should be registered with the Income Tax Department (PAN), Employees Provident Fund (EPF) Organization, Employees State Insurance (ESI) Corporation & GST. Bidders are not eligible in absence of these documents.

3. Bid Evaluation and Award

The following process will be followed for the Technical and Financial Bids Evaluation:

4.1 Technical Bid Evaluation

- Technical bids received complete in all respects covering the entire scope of work, will only be opened
- The technical bid evaluation is done only for bidders who satisfy the minimum criteria by submitting documentary proof supporting eligibility criteria and the bids of agencies who have not submitted these documents are liable to be rejected without notice.

4.2 Financial Bid Evaluation

For financial bids, the following points shall be followed:

- After evaluation of Pre-Qualification/technical bid Documents, a list of short-listed agencies will be prepared.
- Thereafter the financial bids of only the qualified and technically acceptable bidders shall be opened at the notified time, date and place in the presence of the qualified bidders or their representatives, if present.
- The bid shall remain valid for Ninety (90) days from date of opening of eligibility bids/Technical bid.

NOTE

The institute reserves the right, without being liable for any damages or obligation to inform the bidder, to:

- Amend the scope and value of contract to the bidder.
- Reject any or all the applications without assigning any reason.

Any effort on the part of the bidder or his agent to exercise influence or to pressurize the employer would result in rejection of his bid. Canvassing of any kind is prohibited.

4.3 Selection Criteria :

Contract award shall be based on the lowest financial bid (L1) among all technically qualified bidders.

Notes:

1. In case of tie during evaluation, the highest audited average turnover of the last three (03) financial years as a criterion to award the contract to avoid ambiguity or conflict among the bidders.

5. Various Forms and Formats

5.1 Affidavit for not being blacklisted/debarred/restrained

Proforma for AFFIDAVIT for not being blacklisted/debarred/restrained

(AFFIDAVIT to be submitted on a 'Non-Judicial' stamp paper worth Rs.100/)
(Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)

I/we undertake and confirm that our firm/partnership firm has not been blacklisted and/or debarred/restrained by any Central Govt./ State Govt. Agency/ Autonomous body of the Central or State govt./ PSU etc. Further that, if such information comes to the notice of the Institute, then I/we shall be debarred for bidding in the Institute in future forever. Also, if such information comes to the notice of the Institute on any day before date of start of work, the competent authority shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

Signature of bidder

OR

(An authorized Officer of the firm with stamp)

Signature of Notary with Seal

5.2 Performance report on work executed

Proforma of Performance report on works referred to in Financial Information
(To be printed in Company's Letterhead)

(Scanned copy of the Performance Reports to be uploaded at the time of submission of bid)

1. Name of work/project & location:
2. Agreement no.:
3. Estimated cost:
4. Tendered cost:
5. Date of start:
6. Date of completion:
7. Stipulated date of completion:
8. Actual date of completion:
9. Amount of compensation levied for delayed completion, if any:
10. Amount of reduced rate items, if any:
11. Performance Report:
    (a) Quality of work: Outstanding / Very Good / Good /Poor
    (b) Technical Proficiency: Outstanding / Very Good / Good /Poor
    (c) Resourcefulness: Outstanding / Very Good / Good /Poor
    (d) General Behavior: Outstanding / Very Good / Good /Poor

Signature of Superintending Engineer or Equivalent

Dated:

5.3 Structure and Organization of the Agency

Proforma of providing Structure and Organization of the Bidding Agency
(To be printed in Company's Letterhead)

(Scanned copy of the Structure and Organization Document to be uploaded at the time of submission of bid)

1. Name & address of the bidder:
2. Telephone no./Telex no./Fax no.:
3. Email address for Communication:
4. Legal status of the bidder (attach copies of original document defining the legal status):
   (a) An Individual:
   (b) A proprietary firm:
   (c) A firm in partnership:
   (d) A limited company or Corporation:
5. Particulars of registration with various Government Bodies (attach attested photocopy)

   Organization / Place of registration No.

   1.
   2.
   3.
6. Names and titles of Directors & Officers with designation to be concerned with this work.
7. Designation of individuals authorized to act for the organization
8. Has the bidder, or any constituent partner in case of partnership firm, ever been convicted by the court of law? If so, give details.
9. Any other information considered necessary but not included above.

Signature of bidder

5.4 Declaration on Details of the Bidders

Proforma of Declaration on Details of the Bidders
(To be printed in Company's Letterhead)

(Scanned copy of the Performance Reports to be uploaded at the time of submission of bid)

DECLARATION

I/We,..... hereby declare that all the information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I/we have gone through the specification, conditions and stipulations in details and agree to comply with the requirements and intent of specification.

Particulars of the bidder as per following details:

1.	Name of the firm / organization	:	
2.	Type of the firm / organization: Public Ltd, / Private Ltd./ Registered firm	:	
3	Registered office	:	
4	Address of office	:	
5	Contract people	:	
6	Name & designation	:	
7	Land line & mobile no.	:	
8	Email	:	
9	PAN No.	:	
10	GST No.	:	
11	EPF Registration No.	:	
12	ESI Registration No.	:	
13	EMD/FDR/DD No. & Date	:	
14	Has the applicant ever been required to suspend any project for a period of more than six months continuously after Commencement of work?	:	If so, give the name of the project and reasons of suspension of project
15	Has the applicant ever been convicted by a court of law?	:	YES / NO, If yes give details of the case

16	Details of any litigation in which the applicant is / was involved.	:	
17	All forms submitted as desired in the bid	:	Yes / No
18	Undertaking regarding no subletting of work.	:	

We further declare that our organization has not been blacklisted /delisted or put to any holiday by any Institutional agency / Govt. Department / Public Sector Undertaking in the last three years.

Signature of Bidder(s) with seal

Dated:

5.5 Details of Similar Nature of Works Completed

Proforma for submission of Details of Eligible Similar Nature of Works Completed* during the Last Seven Years ending previous day of the last date of submission of tenders (Scanned copy of the Performance Reports to be uploaded)

The contractor needs to submit the supporting documents

Sr. No	Name of work / project and location	Owners or sponsoring organization	Const of work in crores of rupees	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation/ arbitration cases pending /in Progress with details*	Name and address / tele-phone number of officers to whom reference may be made	Whether the work was done on back to back basis Yes/No
1	2	3	4	5	6	7	8	9	10
1									

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

Signature of bidder with seal

Dated:

5.6 Declaration about Site Inspection

Declaration about Site Inspection

(By Bidder)

To

The Executive Engineer,

IWD, IIT,

Kanpur

Subject: Submission of Tender for the work of "Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works.

Dear Sir/Madam,

It is hereby declared that as per terms and conditions of this tender document, I/ We the bidder inspected and examined the subject site and its surrounding and satisfy myself / ourselves as to the nature of the ground and sub-soil (so far as is practicable), the forms and nature of the site./ ourselves before submitting the bid, the accommodation which may require and all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid have been obtained. I/We the bidder shall have full knowledge of the site and no extra charge consequent upon any misunderstanding or otherwise shall be claimed in later date. I /We bidder shall be responsible for arranging and maintaining at 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 bid by me/us implies that I / We have read this notice and all other contract documents and has made myself /ourselves aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.

Sincerely

(Duly authorized signatory of the Bidder)

5.7 Letter of Transmittal

To
The Executive Engineer,
IIT, Kanpur- 208016

Name of Work: Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works.

Dear Sir/Madam

Having examined details given in Notice and bid document for the above work, I/we hereby submit the relevant information.

5.7.1 I/We hereby certify that all the statements made and information supplied in the enclosed forms and accompanying statement are true and correct.

5.7.2 I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.

5.7.3 I/We also authorize the Executive Engineer, IWD, Indian Institute of Technology Kanpur or his representative(s) to approach individuals, employers, firms and corporation to verify our competence, work experience, and general reputation.

5.7.4 I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible completed works:

Sl. No.	Name of work	Amount	Certificate issued by
1			
2			

CERTIFICATE

It is certified that the information given in the enclosed eligibility bid are correct. It is also certified that I/We shall be liable to be debarred, disqualified/ cancelation of enlistment in case any information furnished by me/us found to be incorrect.

Signature(s) of Bidder with seal

Enclosures: Date:

5.8 Certificate for Tender

(To be given on Company Letter Head)

Dated:

To,
The Executive Engineer
IIT Kanpur-208016

Sub: Certificate of compliance as per Rule 144 (xi) GFR's 2017Tender Reference

No: .....

Name of Tender / Work:

.....

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all the requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

(Signature of the Bidder, with Official Seal)

5.9 Tender Acceptance Letter

(To be given on Company Letter Head)

Date: .....

To,
The Executive Engineer
IIT, Kanpur-208016

Sub: Certificate of compliance as per Rule 144 (xi) GFR's 2017
Tender Reference No:
.....
Name of Tender / Work:
.....
Dear Sir,

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

5.10 CPWD-7

CPWD-7

PERCENTAGE RATE TENDER & CONTRACT FOR WORKS

Tender for the "**:Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works.**

1. To be uploaded as per details uploaded in CPP portal at www.eprocure.gov.in
2. To be opened in the presence of tenderers who may be present at the time of opening in the Executive Engineer, IWD, IIT Kanpur.
3. The pre-qualification/Technical bid shall be opened first on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the technical bid shall be communicated to them at a later date.

TENDER

(To be signed in Company's Letterhead)

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, General Conditions of Contract (For construction works) 2023, 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 within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing 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 respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for Ninety (90) days from the due date of its opening and not to make any modification in its terms and conditions.
I/We have deposited EMD for the prescribed amount in the office of concerned Executive Engineer as per the bid document.

If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said Board of Governors or his successors, in office shall without prejudice to any other right or remedy, be at liberty to take action as per GCC 2023. Further, if I/We fail to commence work as specified,

I/We agree that Board of Governors or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clauses 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money or 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 Indian Institute of Technology Kanpur in future forever. Also, if such a violation comes to the notice of Indian Institute of Technology Kanpur before date of start of work, the Executive Engineer, IWD shall be free to forfeit the entire amount of 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 there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety & integrity of IIT Kanpur.

Signature(s) of Contractor(s) with seal

Dated:

Address

Occupation

5.11 Financial Information

Proforma for providing Financial Information
(Scanned copy of the completed information sheet to be uploaded at the time of submission of bid)

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

Financial Years	2020-21	2021-22	2022-23	2023-24	2024-25
Gross Annual turnover					
Profit/Loss					

Signature of Chartered Accountant with Seal

Signature of bidder

5.12 Banker's Certificate from a scheduled Bank

Proforma of Banker's Certificate from a Scheduled Bank

(To be printed in Bank's Letterhead)

(Scanned copy of the Certificate to be uploaded at the time of submission of bid)

This is to certify that to the best of our knowledge and information that M/s./Sh..... having marginally noted address, a customer of our bank are/is respectable and can be treated

as good for any engagement up to a limit of Rs ..... (Rupees .....). This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

.....

(Signature for the Bank)

NOTE:

1. Bankers certificates should be on letter head of the Bank, addressed to tendering authority.
2. In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

5.13 Net Worth Certificate by certified Chartered Accountant

Proforma of Net Worth Certificate by certified Chartered Accountant

(To be printed in Letterhead of Chartered Accountant)

(Scanned copy of the Certificate to be uploaded at the time of submission of bid)

This is to certify that as per the audited Balance Sheet and Profit & Loss statement of the account during the financial year ....., the net worth of M/s./Sh.....(Name & Registered Address of individual/firm/company) as on 31.3.2025 is Rs. .....(Rupees. .....) after considering all liabilities.. It is further certified that the net worth of the company has not eroded by more than 30% in the last three years ending on 31.3.2025.

.....
(Signature of the Chartered Accountant)

.....
(Name of the Chartered Accountant)

.....
(Membership No. of ICAI)

.....
(Date & Seal

6 Proforma of Schedules

Operative schedules shall be supplied separately to each intending tenderer

SCHEDULE "A"	Schedule of Qty	Uploaded separately

SCHEDULE 'B'

Schedule of materials to be issued to the contractor:

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

SCHEDULE 'C'

Schedule of Tools and Plants to be hired to the contractor

S. No.	Description	Hire charges per day	Place of issue
1	2	3	4
----------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.	
Name of Work:	**Construction of Makerspace building inside The Tine Tinkering Lab (Phase-2) SH: Electrical works.**	
Estimated cost of the work:	**Rs. 8,58,266/- (i/c GST)**	
Earnest money	**Rs. 17,165/-**	
Performance Guarantee	5% of tendered value PG shall be 5% of the Estimated cost put to tender (ECPT) or contract amount whichever is higher, valid up to stipulated date of completion and Six (6) months beyond that. a) A bid will be treated abnormally low if the quoted amount is lesser than 80% of estimated cost put to tender. b) Requirement of Additional proforma Guarantee (APG): In case of abnormally low bids as defined above, the bidder shall be required Additional Performance Guarantee (APG) in additional to the Standard Performance Guarantee (PG). The amount of Additional Performance Guarantee (APG) shall be equivalent to the difference between the 80% amount of ECPT and quoted amount. (e.g.	

	if ECPT is A and quoted amount is 0.7A then the amount of APG shall be 0.8A-0.7A). The Additional Performance Guarantee (APG) shall be in the prescribed format of Performance Guarantee and has to be submitted within the time frame prescribed for submission of Performance Guarantee. The other terms and conditions of release etc. Of APG shall be same as that of PG.
Security Deposit	2.5% of the tendered value of the work will be deducted from each bill. Same would be released after successful completion of One-year defect liability period and as per special conditions of the contract

General rules and direction:

Officer inviting tender	**Executive Engineer, IWD, IIT, Kanpur.**

Definitions:

2(v)	Engineer-in-charge	
	For Electrical works	**Executive Engineer, IWD, IIT Kanpur**
2(vi)	Accepting authority	**SE / EE, IIT Kanpur**
2(vii)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(viii)	**Standard Schedule of Rates:** Electrical Items of work	**Minimum central labour wage rates (central Govt. and Market rates for other items-if applicable)** DSR 2025 -GST with up to date correction Slips
2(ix)	Department	IWD, IIT Kanpur
2(x)	Standard CPWD contract Form:	GCC Maintenance 2023, CPWD **form-7** as modified & corrected up to date (Whether correction vide latest circulars are in corporate or not in this document).
Clause 1	i) Time allowed for submission of Performance Guarantee from the date of issue of	7 Days

	letter of acceptance ii) Maximum allowable extension with late fee @0.1% per day of performance guarantee amount beyond the period as provided in i) above	7 Days
Clause 1A	Applicable. The Defect liability period shall be One Year from the date of handing over of the assigned works to the user/Institute	
Clause 2	Authority for fixing Compensation under Clause 2	**Executive Engineer, IWD, IIT, Kanpur**
Clause 2A	Whether Clause 2A shall be applicable	Yes
Clause 5	i) Number of days from the date of issue of issue of letter of acceptance for reckoning date of start ii) Time allowed for execution of work	15 days 02 Months
i)	Number of days from the date of issue of letter of acceptance for reckoning date of start	**15 days**
ii)	**Mile stone**	Not applicable
Authority to decide	**Extension of time**	**Executive Engineer, IWD, IIT, Kanpur**
Clause 6A	Computerized Measurement of bills	**APPLICABLE**
Clause 7		**APPLICABLE**
Clause 10A	Material to be provided by the contractor	**APPLICABLE**
Clause 10B (ii), (iii)	Whether clause 10-B (ii) and 10-B (iii) shall be applicable.	**NOT APPLICABLE**
Clause 10 C	Component of labour expressed as percentage of	**NOT APPLICABLE**

	value of work	
Clause 10 CA		**NOT APPLICABLE**
Clause 10 CC	Increase/Decrease in Price of materials/wages	**NOT APPLICABLE**
Clause 11		CPWD Specifications of all Electrical items (CPWD 2023), with correction Slips/amendments/revisions issued up to the last date of receipt of tenders and as per NIT for E & M electrical Works.
Clause 12: Type of work		Original Work/minor maintenance work
Clause 12.2 & 12.3: Deviation limit beyond which clause 12.2 & 12.3 shall apply for Building works		Applicable
Clause 16 Competent Authority for deciding reduced rates: For Civil items and For Electrical items of work		As per table 7
Clause 17 - Defect liability period completion of contract whichever is later		One Year and those listed in Special Conditions of Contract
Clause 18 - List of mandatory machinery, tools & plants to be deployed by the contractor at site		As per the scope of work
Clause 32 - Requirement of Technical Representative(s)		As per table 9

If the Contractor commits default in commencing the execution of the work as aforesaid, the performance guarantee shall be forfeited.

Table 6 Major milestones of the project

Sl. No.	Description of Milestone (Physical)	Time allowed from date of start	Maximum duration of work	Amount to be withheld in case of non-achieve of the milestones (% of composite tendered amount)
1.	Not Applicable			

The detailed program chart approved by the engineer-in-charge shall indicate how the resources will be deployed by the contractor to maintain desired progress and for the completion of the work within the specified period. If the submitted program is approved, the milestone shall be redefined accordingly by the Executive Engineer, IWD Indian Institute of Technology Kanpur. The amount to be withheld in such a case, for non-achievement of milestone(s), shall remain unaltered i.e., 1% of tendered amount

Table 7 Authority to decide

1.	Extension of time (EOT)	**Executive Engineer, IWD, IIT, Kanpur**
2.	Rescheduling of milestones	**Not applicable**
3.	Shifting of start in case of delay in handing over of site.	**Executive Engineer, IWD, IIT, Kanpur**

Table 8: Materials for which all India Wholesale Price Index to be followed Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed)

Sl. No.	Material covered under this clause	Base Price of Materials, covered under clause 10 CA
1.	**Not applicable**	

Table 9: Requirement of Technical staff as per Clause 32

Sl. No.	Qualification	Number	Minimum Experience in years	Designation	Rate at which the recovery shall be made from the contractor in the event of not fulfilling provision of Clause 32

1.	Graduate / Diploma	1	5	Project / Planning / construction / billing Engineer (Electrical)	Rs. 25000/- (Rupees Twenty Five Thousand only) per month, per person
Note: Assistant Engineers retired from Government services who are holding Diploma will be treated at par with Graduate Engineers. Diploma holder with minimum 10 years relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineer.					
The details of appointed engineers/technical staffs have to be verified and approved by Engineer- in-charge					

7.1 Scope of work

7.1 Project Brief

The scope of work is to execute some minor electrical repair works of urgent nature within the cost and time limits as specified in Schedule F, Table 6. These works shall be carried out based on the pre-approved Quantity take off sheet in Institute formats by Executive Engineer through Engineer-in-Charge. It can also be used for any works of restoration because of a disaster in campus causing damage to institute infrastructure. This contract is also applicable for works related to emergency services/ works of institute importance/ works concerned to safety health and environment of campus community.

The contractor should always keep his establishment ready to commence the work as per the schedule of the contract. Work requests of urgent nature shall be started at the earliest after receiving orders from the Engineer in charge. But it should be documented with photo and video evidence for all hidden items. Submission of this evidence is mandatory for all works executed without a pre-approved quantity take off sheets.

The typical minor works taken up through these contracts within the buildings/ houses and their surroundings are as follows. But the list is not exhaustive. The agency must be prepared to take on any assigned works within the allotted time. A sample list is provided below:

1. Minor modification in electrical and civil components for setting up rooms/ common areas of the buildings/ houses/ quarters.
2. Earthing works.
3. Providing additional power points and network points in allotted spaces etc.
4. Replacement of defective cables, switch gears, light and electrical fittings, data points, fire alarm sensors or cables, LT cabling works etc.

Note: The scope of the works listed above is indicative only. The work must be done strictly as per the items decided for each individual work. This must be done as per item specifications listed in the BoQ and as per tender clauses.

7.2 Specifications for Electrical Works

1.7.1 Specifications Medium Voltage Switchgear

1. STANDARDS AND CODES

The following Indian Standard Specifications and Codes of Practice will apply to the equipment and the work covered by the scope of this contract. In addition the relevant clauses of the Indian Electricity Act 1910 and Indian Electricity Rules 1956 as amended upto date shall also apply. Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable.

BIS certified equipment shall be used as a part of the Contract in line with Government regulations. Necessary test certificates in support of the certification shall be submitted prior to supply of the equipment.

It is to be noted that updated and current Standards shall be applicable irrespective of those listed below.

Low voltage Switchgear and Control gear specifications IS 13947

: 1993 Part I – General

Part 2 – Circuit Breakers

Part 3 – Switch Fuse Units

Part 4 – Contactors and Motor Starters

Part 5 – Control Circuit Devices

Electrical Relays for power system protection IS 3231 : 1986

Low voltage Switchgear and Controlgear assemblies IS 8623 :

1993 Marking of Switchgear busbars IS 11353 : 1985

Degree of Protection of Enclosures for

low voltage switchgear IS 2147 : 1962

Code of Practice for selection, installation and maintenance

of Switchgear IS 10118 : 1982

2. SWITCH FUSE UNITS

2.1 Switch fuse units, incorporated in switchboards wherever required shall conform in all respects to IS 13947 : 1993. Switch fuse units shall be suitable for 415 Volts 3 Phase 50 HZ AC supply and shall be suitable for AC - 23 A duty.

Unit housing shall be of robust construction designed to with standard conditions. Sheet steel used shall be given rigorous rust proofing treatment before fabrication and

painting Units shall have double break per phase in order to isolate fuse links when the switch is in OFF position.

Operating mechanism of units shall be crisp and positive in action with quick- make and quick-break silver plated contacts. Operating handle shall be suitable for rotary operation unless otherwise specified. Position of handle such as ON and OFF shall be clearly indicated.

All live parts inside the switch fuse units shall be shrouded to prevent any accidental contact.

All the terminals shall be liberally designed. All units above 100 A shall be provided with integral cable sockets.

All switch units shall be provided with suitable interlocks such that the door of the switchboard panel shall not open unless the switch is in OFF position. Provision for padlocking the switch in OFF position shall also be provided.

Routine and type tests as per IS 13947 : 1993 shall be conducted at works and test certificates furnished.

3. MOULDED CASE CIRCUIT BREAKERS

i) Moulded case circuit breakers (MCCB) or fuse free breakers, incorporated in switchboards wherever required, shall conform to IS 13947 : 1993 in all respects. MCCBs shall be suitable either for single phase 240 Volts or 3 Phase 415 Volts AC 50 HZ supply.

ii) MCCB cover and case shall be made of high strength heat resisting and flame retard- ant thermosetting insulating material. Operating handle shall be quick make/break, trip - free type. Operating handle shall have suitable ON, OFF and TRIPPED indicators. Three phase MCCBs shall have a common handle for simultaneous operation and tripping of all the three phases. Suitable arc extinguishing device shall be provided for each contact. Tripping unit shall be of thermal/magnetic type provided on each pole and connected by a common tripe bar such that tripping of any one pole causes three poles to open simultaneously. Thermal/magnetic tripping device shall have IDMT characteristics for sustained over loads and short circuits.

iii) Contact trips shall be made of suitable arc resistant sintered alloy. Terminals shall be of liberal design with adequate clearances.

iv) MCCBs shall be provided with following accessories, if specified in drawings/schedule of quantities :

- Under voltage trip
- Shunt trip
- Alarm switch
- Auxiliary switch

v) MCCBs shall be provided with following interlocking devices for interlocking the door a switch board.

- Handle interlock to prevent unnecessary manipulations of the breaker.
- Door interlock to prevent door being opened when the breaker is in ON position
- Deinterlocking device to open the door even if the breaker is in ON position.

MCCBs shall have rupturing capacity as specified in drawings/schedule of quantities.

4. METERING, INSTRUMENTATION AND PROTECTION.

The switchboard shall have required current and potential transformers as per schedule of quantities for metering and protection. The transformers shall comply to relevant ISS and class of accuracy required for metering and protection. Separate sets of CTs shall be provided for metering and protection.

4.1 Current Transformers

C/Ts shall confirm to IS 2705 (part -I, II and III) in all respects. All C/Ts used for medium voltage application shall be rated for 1 kV. C/Ts shall have rated primary current, rated burden and class of accuracy as specified in schedule of quantities/drawings. Rated secondary current shall be 5A unless otherwise stated. Minimum acceptable class for measurement shall be class
0.5 to 1 and for protection class SP 10. C/Ts shall be capable of withstanding magnetic and thermal stresses due to short circuit faults of 31 MVA on medium voltage. Terminals of C/Ts shall be paired permanently for easy identification of poles. C/Ts shall be provided with earthing terminals for earthing chassis, frame work and fixed part of metal casing (if any). Each C/T shall be provided with rating plate indicating:

- Name and make
- Serial number
- Transformation ratio
- Rated burden
- Rated voltage
- Accuracy class

CTs shall be mounded such that they are easily accessible for inspection, maintenance and replacement. Wiring for CT shall be with copper conductor PVC insulated wires with proper termination works and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

4.2 Potential Transformer

PTs shall confirm to IS 3156 (Part-I,II and III) in all respects.

4.3 Measuring Instruments

Direct reading electrical instruments shall conform to IS 1248 or in all respects. Accuracy of direct reading shall be 1.0 of voltmeter and 1.5 for ammeters. Other instruments shall have accuracy of 1.5. Meters shall be suitable for continuous operation between -10° C and +50^{0}C. Meters shall be flush mounting and shall be enclosed in dust tight housing. The housing shall be of steel or phenolic mould. Design and manufacture of meters shall ensure prevention of fogging of instrument glass. Pointer shall be black in colour and shall have Zero position adjustment device operable from outside. Direction of deflection shall be from left to right. Suitable selector switches shall be provided for ammeters and volt meters used in three phase system. The rating type and quantity of meters, instruments and protective device shall be as per Schedule of Quantities /drawings

4.4 Ammeters

Ammeters shall be of moving iron type. Moving part assembly shall be with jewel bearings. Jewel bearings shall be mounted on a spring to prevent damage to pivot due to vibrations and shocks. Ammeters shall be manufacture and calibrated as per IS 1248

Ammeters shall normally be suitable for 5 A secondary of current transformers. Ammeters shall be capable of carrying substantial over loads during fault conditions.

4.5 Voltmeters

Voltmeters shall be moving iron type range of 3 phase 415 volt voltmeters shall be 0-500.
Volt meters shall be provided with protection fuse.

4.6 Watt meter

Wattmeter shall be of 3 phase electro dynamic type and shall be provided with a maximum demand indicator if required.

4.7 Power factor meters

3 phase power factor meters shall be of electro dynamic type with current and potential coils suitable for operation with current and potential transformers provided in the panel. Scale shall be calibrated for 50% lag - 100% - 50% readings. Phase angle accuracy shall be +4^{0}.

4.8 Energy and reactive power meters

Trivector meters shall be two element, integrating type, KWH, KVA, KVARH meters.

Meters shall confirm to IEC 170 in all respects. Energy meters, KVA, and KVARH meters shall be provided with integrating registers. The registers shall be able to record energy conception of 500 hours corresponding to maximum current at rated voltage and unity power factor. Meters shall be suitable for operation with current and potential transformers available in the panel.

4.9 Relays

Protection relays shall be provided with flag type indicators to indicate cause of tripping. Flag indicators shall remain in position till they are reset by hand reset. Relays shall be designed to make or break the normal circuit current with which they are associated. Relay contacts shall be of silver or platinum alloy and shall be designed to withstand repeated operation without damage. Relays shall be of draw out type to facilitate testing and maintenance. Draw out case shall be dust tight. Relays shall be capable of disconnecting faulty section of network without causing interruption to remaining sections. Analysis of setting shall be made considering relay errors, pickup and overshoot errors and shall be submitted to Engineer-in-Charge for approval.

4.10 Over current relays

Over current relays shall be induction type with inverse definite minimum time lag charac- teristics. Relays shall be provided with adjustable current and time settings. Setting for current shall be 50 to 200 % insteps of 25%. The IDMT relay shall have time lag (delay) of 0 to 3 seconds. The time setting multiplier shall be adjustable from 0.1 to unity. Over current relays shall be fitted with suitable tripping device with trip coil being suitable for operation on 5 Amps.

4.11 Earth fault relay

Same as over current relay excepting the current setting shall be 10% to 40% in steps of 10%.

4.12 Under voltage relay

Under voltage relays shall be of induction type and shall have inverse limit operation characteristics with pickup voltage range of 50 to 90% of the rated voltage.

4.13 Power factor correction capacitors

Power factor correction capacitors shall conform to IS 2834 in all respects. Approval of insurance association of India shall be obtain if called for. Capacitors shall be suitable for 3 phase 415 volts 50 HZ supply and shall be available in single and three phase units of 5,10,15,20,25

and 50 kVAR sizes as per requirements. Capacitor shall be usable for indoor use, permissible overloads being as below.

- Voltage overloads shall be 10% for continuous operation and 15% for six hours in a 24 hours cycle.
- Current overloads shall be 15 % for continuous operations and 50% for six hours

in a 24 hours cycle.

- Over load of 30% continuously and 45% for six hours in a 24 hours cycle.

Capacitors shall be hermetically sealed in sturdy corrosion proof sheet steel containers and impregnated with non-inflammable synthetic liquid. Every element of each capacitory unit shall be provided with its own built in silvered fuse. Capacitors shall have suitable discharge device to reduce the residual voltage from crest value of the rated voltage to 50 volts or less within one minute after capacitor is disconnected from the source of supply. The loss factor of capacitor shall not exceed 0.005 for capacitors with synthetic impregnates The capacitors shall withstand power frequency test voltage of 2500 volts AC for one minute. Insulation resistance between capacitors terminals and containers when a test voltage of 500 volts DC is applied shall not be less than 50 meg.ohms.

5. MEDIUM VOLTAGE SWITCH BOARDS

5.1 GENERAL

- All medium voltage switchboards shall be suitable for operation at three phase/three phase 4 wire, 415 volt, 50 Hz, neutral grounded at transformer system with a short circuit level withstand of 31 MVA at 415 volts or as per schedule of quantities.
- The Switch Boards shall comply with the latest edition with upto date amendments of relevant Indian Standards and Indian Electricity Rules and Regulations.

5.2 SWITCH BOARD CONFIGURATION

- The Switch Board shall be configured with Air Circuit Breakers, MCCB's, and other equipment as called for in the Schedule of Quantities.
- The MCCB's shall be arranged in multi-tier formation whereas the Air Circuit Breakers shall be arranged in Single or Double tier formation only to facilitate operation and maintenance.
- The Switch Boards shall be of adequate size with a provision of 25% spare space to accommodate possible future additional switch gear.

5.3 EQUIPMENT SPECIFICATIONS

All equipment used to configure the Switch Board shall comply to the relevant Standards and Codes of the Bureau of Indian Standards and to the detailed technical Specifications as included in this tender document.

5.4 CONSTRUCTIONAL FEATURES

- The Switch Boards shall be metal enclosed, sheet steel cubicle pattern, extensible, dead front, floor mounting type and suitable for indoor mounting.
- The Switch Boards shall be totally enclosed, completely dust and vermin proof. Synthetic rubber gaskets between all adjacent units and beneath all covers shall be provided to render the joints dust and vermin proof to provide a degree of

protection of IP 42. All doors and covers shall also be fully gasketed with synthetic rubber and shall be lockable.

- The Switch Board shall be fabricated with CRCA Sheet Steel of thickness not less than 2.0 mm and shall be folded and braced as necessary to provide a rigid support for all components. The doors and covers shall be constructed from CRCA sheet steel of thickness not less than 1.6 mm. Joints of any kind in sheet metal shall be seam welded and all welding slag ground off and welding pits wiped smooth with plumber metal.
- All panels and covers shall be properly fitted and square with the frame. The holes in the panel shall be correctly positioned.
- Fixing screws shall enter holes tapped into an adequate thickness of metal or provided with hank nuts. Self-threading screws shall not be used in the construction of the Switch Boards.

5.5 SWITCHBOARD DIMENSIONAL LIMITATIONS

- A base channel 75 mm x 5 mm thick shall be provided at the bottom.
- A minimum of 200 mm blank space between the floor of switch board and bottom most unit shall be provided.
- The overall height of the Switch Board shall be limited to 2300 mm
- The height of the operating handle, push buttons etc shall be restricted between 300 mm and 1800 mm from finished floor level.

5.6 SWITCH BOARD COMPARTMENTALIZATION

The Switch Board shall be divided into distinct separate compartments comprising

- A completely enclosed ventilated dust and vermin proof bus bar compartment for the horizontal and vertical busbars.
- Each circuit breaker, and MCCB shall be housed in separate compartments enclosed on all sides.
- Sheet steel hinged lockable doors for each separate compartment shall be provided and duly interlocked with the breaker/switch fuse unit in "on" and "off" position.
- For all Circuit Breakers separate and adequate compartments shall be provided for accom- modating instruments, indicating lamps, control contactors and control fuses etc. These shall be accessible for testing and maintenance without any danger of accidental contact with live parts of the circuit breaker, busbars and connections.
- A horizontal wire way with screwed cover shall be provided at the top to take interconnecting control wiring between vertical sections.
- Separate cable compartments running the height of the Switch Board in the case of front access Boards shall be provided for incoming and outgoing cables.

- Cable compartments shall be of adequate size for easy termination of all incoming and outgoing cables entering from bottom or top.
- Adequate and proper support shall be provided in cable compartments to support cables.

  Following minimum clearances to be maintained after taking into consideration connecting bolts, clamps etc.

  i) Between phases 32 mm

  ii) Between phases and neutral 26 mm

  iii) Between phases and earth 26 mm

  vi) Between neutral and earth 26 mm

5.7 SWITCH BOARD BUS BARS

- The Bus Bar and interconnections shall be of electrolytic Copper/Aluminium and of rectangular cross sections suitable for full load current for phase bus bars and half rated current for neutral bus bar. The maximum current density for copper shall be 1.2 amps per sq. mm. and for Aluminium shall be 0.8 amp per Sq. mm. and suitable to withstand the stresses of a 31 MVA fault level or at 415 volts for 1 second or as per schedule of quantities. .
- The bus bars and interconnections shall be insulated with insulation tape/ fiber glass.
- The bus bars shall be extensible on either side of the Switch Board.
- The bus bars shall be supported on non-breakable, non-hygroscopic insulated supports at regular intervals, to withstand the forces arising from a fault level of 31 MVA at 415 volts for 1 second.
- All bus bars shall be colour coded.
- All bus bar connections in Switch Boards shall be bolted with brass bolts, washers and nuts.

5.8 SWITCH BOARD INTERCONNECTIONS

- All connections between the bus bars/Breakers/ shall be through solid copper strips of adequate size to carry full rated current and PVC/fibre glass insulated.

5.9 DRAW-OUT FEATURES

Air Circuit Breakers shall be provided in fully drawout cubicles. These cubicles shall be such that drawout is possible without disconnection of the wires and cables. The power and control circuits shall have self aligning and self isolating contacts. The fixed and moving contacts shall be easily accessible for operation and maintenance. Mechanical interlocks shall be provided on the drawout cubicles to

ensure safety and compliance to relevant Standards. The MCCB's shall be provided in fixed type cubicles.

5.10 INSTRUMENT ACCOMMODATION

- Instruments and indicating lamps shall not be mounted on the Circuit Breaker Com- partment door for which a separate and adequate compartment shall be provided and the instrumentation shall be accessible for testing and maintenance without danger of accidental contact with live parts of the Switch Board.
- For MCCB's instruments and indicating lamps can be provided on the compartment doors.

5.11 The current transformers for metering and for protection shall be mounted on the solid copper/aluminium busbars with proper supports. WIRING

All wiring for relays and meters shall be with PVC insulated copper conductor wires. The wiring shall be coded and labelled with approved ferrules for identification. The minimum size of copper conductor control wires shall be 1.5 sq. mm.

5.12 CABLE TERMINATIONS

- The cable terminations of the Circuit Breakers shall be brought out to terminal cable sockets suitably located at the rear of the panel.
- The cable terminations for the MCCB's shall be brought out to the rear in the case of rear access switchboards or in the cable compartment in the case of front access Switch Boards.
- The Switch Boards shall be complete with gland plates

5.13. SPACE HEATERS

The Switch Board shall have in each panel thermostatically controlled space heaters with a controlling 15 amp 230 volt switch socket outlet to eliminate condensation

5.14 EARTHING

A main earth bar of G.I shall be provided throughout the full length of the Switch Board with a provision to make connections to earth stations on both sides.

5.15 SHEET STEEL TREATMENT AND PAINTING

- Sheet Steel materials used in the construction of these units should have undergone a rigorous rust proofing process comprising of alkaline degreasing, descaling in dilute sulphuric acid and a recognized phosphating process or by using sand blasting method. The steel work shall then receive two costs of oxide filler primer before final painting. Castings shall be scrupulously cleaned

and fettled before receiving a similar oxide primer coat.

- All sheet steel shall after metal treatment be spray or powder painted with two coats of shade 692 to IS 5 on the outside and white on the inside. Each coat of paint shall be properly stoved and the paint thickness shall be adequate.

5.16 NAME PLATES AND LABELS

Suitable engraved white on black name plates and identification labels of metal for all Switch Boards and Circuits shall be provided. These shall indicate the feeder number and feeder designation.

6. INSTALLATION

The foundations prepared as per the manufacturers drawings shall be levelled, checked for accuracy and the Switch Board installed. All bus bar connections shall be checked with a feeler gauge after installation. The able end boxes shall be sealed to prevent entry of moisture. The main earth bar shall be connected to the sub-station earths.

A 15 mm thick rubber matting of approved make on a 100 mm high timber platform shall be provided in front of and along the full length of the Switch Board. The width of the matting shall be 1000 mm. The rubber mat shall withstand 15 KV for 1 minute and leakage current shall not exceed 160 mA/sq. metre.

After installation the Switch Board shall be tested as required prior to commissioning.

7. OUTDOOR TYPE DISTRIBUTION FEEDER PILLARS

The feeder pillar shall be of the floor mounting type, totally enclosed, and weather proof, conforming to ISI IP 54 incorporating phenolic moulded fuse fittings with high rupturing capacity cartridge fuse links having a certified rupturing capacity of not less than 35 MVA at 433 volts. The feeder pillar shall be suitable for 440 volts 3 phase 4 wires, 50 cycles AC supply.

The cubicle should be fabricated out of heavy gauge sheet steel of thickness not less than 2 mm thick with suitable side frame and stiffeners. Hinged doors of not less than 1.6 mm thick should be provided at the front and rear of the cubicle to provide access for installation, operation, tests and inspection. The rear door is provided to facilitate cable termination and the front door for inspection of fuses, to switch 'ON' and 'OFF' the switch as and when required. All doors should be fitted with dust excluding neoprene gaskets. The doors should also be fitted with suitable locking arrangement with lock to prevent unauthorized opening. The cubicle should be designed for mounting over cement concrete plinths by the roadside, and should be of substantial construction capable of withstanding the vibrations normally experienced due to vehicular traffic. The top of the feeder pillar is of slanting construction in all directions to prevent any collection of water due to rain. A gland plate is provided at the bottom of the feeder pillar (removable) for mounting the cable glands. The feeder pillar shall be fitted on an angle iron pedestal at the bottom covered with sheet metal from all the four sides which facilitates cable bending etc specially with aluminium cables. Two lifting hooks shall be provided at the top. A door switch shall be provided in the feeder pillar so as to switch 'ON' and 'OFF' the lamp fixed in the brass batten holder below the top sheet of the pillar.

The sheet steel materials used in the construction of the cubicle should have undergone a rigorous rust proofing process comprising alkaline degreasing, descaling in dilute sulfuric acid solution and recognized phosphating process. After metal treatment, the interior of the cubicle should be painted with two coats of air-drying red lead primer followed by two coats of air drying anti-condensation paint. The exterior of the cubicle should be painted with two coats of staving red oxide primer followed by one coats of epoxy finishing paint. One final spray of epoxy paint shall be applied at the time of handing over the installation.

All the nuts, bolts shall be cadmium plated with spring washers. A minimum spacing from cable connection to the bottom of gland plate shall be 300mm.

The bus bars should be of electrical grade copper. They should be air insulated with adequate clearances between conductors and between conductors and earth. These should be colour coded to enable immediate identification of the phases and neutral. The current density for bus bars shall not be more than 1.0 amps per square mm. All bus bar joints and tapings should be of the clamped type as far as possible thereby avoiding drilling of holes on bus bars. The bus bars should be carried on supports made out of a suitable non-inflammable and non-hygroscopic material such as Hylam, Permali or Formics. Suitable insulating phase barriers should be provided to

prevent accidental short-circuits during operation.

The fuse base contacts should be of copper comprising one top contact for bolting to the bus bar, one bottom contact for terminating the incoming or outgoing cable and a cable lug. The bottom contacts should be so designed that the cable tail from the cable gland to the cable lug is vertical and does not foul with any live parts in its run. The spacing between the respective fuse bases should not be less than 40mm.

The fuse carriers should be fitted as standard to all fuses to minimize accidental contact with live metal during inspection or maintenance. The carriers should be phenolic moulded, designed to accommodate HRC fuse-links and should incorporate a wedge action device for tightening the fuse-link to the base contact. This wedge action should be operated externally by insulated thumb screws giving uniformly high pressure contact ad ensuring cool running under full load conditions, with positive location of the fuse-link tags on the base contact. The fuse-link shall not work loose due to vibration occurring from vehicular traffic.

A viewing aperture should be provided on the carrier to facilitate location of a 'blown' fuse. The fuse carriers should also be easily withdrawable in service. The design of the carrier should be such that carrier components do not carry any current and the contact is decidedly between fuse-link tag and base contact.

When incoming links are called for it should be possible to fit the carriers with solid links in lieu of fuses.

1.7.2 Specifications for LT Panel/ Switchgear

1. **CONSTRUCTION:-**

i) Switchgear enclosure shall conform to the degree of protection IP4x minimum thickness of sheet metal used shall be 2 mm.

ii) The switchgear shall comprise a continuous line up of single / Multi-tire cubicles. The installations of circuit breakers however shall be limited to the bottom two tires only.

iii) The design shall be of fully compartmentalized execution with metal/ insulating portions. Working height shall be limited between 750 mm to 1800 mm from the floor level.

iv) Each breaker shall be housed in a separate cubicle, complete with an individual front access door; each vertical section shall have a removable back cover. All doors & covers shall be gasketed.

v) Switchgear cubicle shall be so sized as to permit closing of the front access door when the breaker is pulled out to ISOLATED position.

vi) All switchgear, lamps & indicating instruments shall be flush mounted on the respective cubicle door whereas relays & other auxiliary devices of any may be mounted on a separate cubical.

2. BUS AND BUS TAPS

i) The main buses & connections shall be of high conductivity aluminium alloy, as per IS : 5082 sized for specification current rating with maximum temperature limited to 85 degree C (i.e., 35 degree C rise over 50 degree C ambient). Bus bars shall be designed for a maximum current density of 0.8A/ sq.mm.

ii) All bus connections shall have adequate contact pressure which should be ensure by means of two bolt connections with plain & spring washers locknuts. Bimetallic connections between dissimilar metals.

iii) Bus connections shall be fully insulated for working voltage with adequate phase / ground clearances.

- Insulating sleeves for bus bars & surrounds for joints shall be provided.
- Bus insulator shall be flame-retardant, track resistant type with high creep age surface.

iv) All buses & connections shall be supported & braced to with stand the stresses due to maximum short circuit current & also to take care of any thermal expansion.

v) Bus-bars shall be sleeved in colour coded manner for easy identification & so located that the sequence RYB shall be from left to right, top to bottom of front to rear, when viewed from the front of switchgear assembly.

vi) Bolted disconnected links shall be provided from all incoming & outgoing feeders for isolation of neutral, if necessary.

3. <u>CIRCUIT BREAKER</u>

i) Circuit breaker shall be three poles, single throw, air breaker type with stored energy, trip free mechanism & shunt trip. The circuit breaker of the outgoing feeder shall have an in built microprocessor base release, short circuit, over current & earth fault protection release.

ii) Circuit breakers shall be draw out type, having SERVICE, TEST & ISOLATED position with positive indication for each position along with in built relay unit.

iii) Circuit breaker of identical rating shall be physically & electrically interchangeable.

iv) Circuit breaker shall be motor wound spring charged mechanism, motor voltage should be 240 V AC. For motor wound mechanism, spring charging shall take place automatically after each breaker closing operation. One open close-open operation of the circuit breaker shall be possible after failure of power supply to the motor. Power supply for this motor shall be taken from the output of auto changeover.

v) Mechanical safety interlocking shall be provided to prevent the circuit breaker from being racked in or out of the service position when the breaker is closed.

vi) Automatic safety shutters shall be provided to fully cover the female primary disconnects when the breaker is withdrawn.

vii) Each breaker shall be provided with an emergency manual trip, mechanical ON-OFF indicator, an operation counter & mechanism charge/ discharge indicator.

viii) In additional to the auxiliary contacts required for normal breaker operation & indication, each breaker shall be provided with following for interlocking purpose:-

a) Position/ cell switch with 4 NO. + 4 NC contacts. These shall be available as spare for automation work.

Control Supply:- 230V AC for closing,

Tripping & indication lamps.

a. Auxiliary switch, with 6 NO+ NC contact, mounted on the stationary portion of the switchgear & operated mechanically by a sliding level from the breaker, in SERVICE position. These shall be available as spare for Automation work.

ix) Limit / auxiliary switches shall be convertible type, that is, suitable for changing NO contact to NC & Vice-Versa.

4. Moulded Case Circuit Breakers

i) Moulded case circuit breakers (MCCB) or fuse free breakers, incorporated in switchboards wherever required, shall conform to IS 13947 : 1993 in all respects. MCCBs shall be suitable either for single phase 240 Volts or 3 Phase 415 Volts AC 50 HZ supply.

MCCB cover and case shall be made of high strength heat resisting and flame retardant thermosetting insulating material. Operating handle shall be quick make/break, trip - free type. Operating handle shall have suitable ON, OFF and TRIPPED indicators. Three phase MCCBs shall have a common handle for simultaneous operation and tripping of all the three phases. Suitable arc extinguishing device shall be provided for each contact. Tripping unit shall be of microprocessor based electronic type provided on each pole and connected by a common tripe bar such that tripping of any one pole causes three poles to open simultaneously. Electronic tripping device shall have IDMT characteristics for sustained over loads and short circuits.

Contact trips shall be made of suitable arc resistant sintered alloy. Terminals shall be of liberal design with adequate clearances.

MCCBs shall be provided with following accessories, if specified in drawings/schedule of quantities:

- Shunt trip
- Alarm switch
- Auxiliary switch

MCCBs shall be provided with following interlocking devices for interlocking the door a switch board.

- Handle interlock to prevent unnecessary manipulations of the breaker.
- Door interlock to prevent door being opened when the breaker is in ON position
- De interlocking device to open the door even if the breaker is in ON

position. MCCBs shall have rupturing capacity as specified in

drawings/schedule of quantities.

i) MCCB shall be triple pole air break.

ii) The MCCB shall have a quick - make, quick - break mechanism operated by a suitable external rotary handle, complete with position indicator this handle shall have provision for pad locking in ON & OFF position.

iii) MCCB should have microprocessor base electronic release with over current, earth

fault & short circuit protection equivalent to L&T 'D' since with RC-10 release.

5. <u>CONTROL & INDICATION</u> :-

The circuit breaker shall be wired up wired up for both local & remote operation. A local- remote selector switch shall be provided for this purpose. Each breaking cubicle shall be equipped with following:-

i) One (1) Test- neutral - service selector switch stay put type with test/ service position pistol grip handle & key interlock for breaker marked 'E'.

ii) Two (2) heavy duty, oil tight push buttons for TRIP & CLOSE.

iii) Three (7) LED indicating lights on front of compartment:-

GREEN : Breaker open & spring charged

RED : Breaker close

AMBER : Trip / circuit healthy condition

WHITE : Control supply failure

Phase indication : One Red, One Blue & One Yellow

O & 1 NC should be provided for status monitoring of the remote / local position.

iv) Lamps shall be low watt, LED type lamp & lens shall be replaceable from the front.

v) The general scheme of connections for control, interlock & protection shall got

approved before fabrication of panel.

6. **FUSES :-**

i) Fuses shall be HRC, preferably link type with a minimum interrupting capacity equal to the short circuit current.

ii) Fuses shall be furnished complete with fuse base & fittings of such as to permit easy & safe replacement of fuse element. Visible indicated indication shall be provided on blowing of the fuse.

7. CURRENT TRANSFORMER :-

Current transformer shall be cast- resin type. All secondary connections shall be brought out to terminal blocks where or delta connection will be made.

i) Ratings :

- for incomers and bus coupler

1500-750/5+5 : 3 sets

- For out goings :

800-400/5+5 : 4 sets

600-300/5+5 : 4 sets

400-200/ 5+5 : 2 sets

ii) Accuracy class of the current transformers shall be :-

a. Class 5P10 for other relaying (protection).

b. Class 1.0, ISF < 5 for metering.

8. RELAYS :-

i) Relays shall be of draw out design with built in testing facilities. Small auxiliary relays may be in non-draw out execution.

ii) Relay shall be rated for operation on 5 Amp secondary current & 110 / 220 V secondary voltage; number & rating of relay contacts shall suit the job requirements.

iii) The contractor shall furnish, install & co-ordinate all relays to suit the requirements of protection & interlock & as broadly indicated in the annexure & drawings.

9. METERS (digital display):-

i) Indicating instruments shall be switch board type & accuracy class of 2% .

ii) All Digital Watt-hour meter shall be provided, alternatively, they may have test block to facilitate testing of meter without disturbing C.T. or V.T. secondary

connections.

iii) Each breaker shall be with volt meter, amp meter with selector switches & KWH meters. Only outgoing feeders will be relaxed from voltmeters.

10. SECONDARY WIRING :-

i. The switchgear shall be fully wired at the factory to ensure proper functioning of control, protection, & interlocking schemes.

ii. Fuses & links shall be provided to permit individual circuit isolation from bus wires without disturbing other circuits. All spare contacts of relays, switches & other devices shall be wired upto terminal blocks.

iii. Wiring shall be done with FRLS PVC flexible, 650V grade, PVC insulated switchboard wires with solid copper conductors of 2.5 sq.mm for voltage circuits along with numbered ferrules.

iv. Each wire shall be identified, at both ends, with permanent markers bearing wire numbers as per contractors wiring diagrams.

v. Wire terminations shall be made with crimping type connectors with insulating sleeves. Wire shall not be spliced between terminals.

11 TERMINAL BLOCKS

i) Terminal blocks shall be 660V grade box clamp type with marking strips, similar to ELMEX 10 sq.mm of equal. Terminals for C.T. secondary leads shall have provision for shorting.

ii) Not more than two wires shall be connected to any terminals equal in number to 20% active terminals shall be furnished.

iii) Terminal blocks shall be located to allow easy access. Wiring shall be so arranged that individual wires of an external cable can be connected to consecutive terminals.

12 CABLE TERMINATION :-

i) Switchgear shall be designed for cable entry from the bottom. Sufficient space shall be provided for each of termination & connection. All provision & accessories shall be furnished for termination & connection of cables, including removable gland plates, cable supports, crimp type tinned copper/ aluminum lugs, brass compression gland with tapered washer (power cable only) & terminal block.

ii) Gland plate shall be minimum 4 mm thick.

13 BUS DUCT CONNECTION: -

i) Bus duct connections, where specified shall be furnished along with transportation of panel. Bus duct connections shall be generally from the top.

ii) All connecting bus work shall have the same continuous rating as associated

switchgear bus & shall be fully braced for the listed short circuit current.

iii) All provision such as matching flange & other accessories shall be furnished for connection to bus duct if any, being supplied by this purpose will be furnished by contractor.

14 GROUND BUS :-

i) A ground bus, rated to carry maximum fault current, shall external full length of the switchgear.

ii) The ground bus shall be provided with two bolt drilling with GI bolts & nuts at each to receive 50 x 6mm GI flat.

iii) Each stationary unit shall be connected directly to the ground bus. The frame of each circuit breaker & draw out VT unit shall be grounded through heavy multiple contacts at all times except when the primary disconnecting devices are separated by a safe distance.

iv) Whenever the schematic diagrams indicate a definite ground at the switchgear, a single wire for each circuit thus grounded shall be run independently to the ground bus & connected thereto.

v) C.T. & V.T. secondary neutrals shall be earthed through removable links so removed without disturbing others.

15 NAME PLATES :-

i) Nameplates of approved design shall be furnished at each cubicle & at each instrument & device mounted on or inside the cubicle.

ii) The material shall be lamicoid or approved equal, 3mm thick with white letter on block background.

iii) The name plate shall be held self-tapping screws. Nameplate size shall be minimum 20 x 75 mm for instrument device & 40 x 150mm for panels.

iv) Caution notice suitable metal plate shall be affixed at the back of each vertical panel.

16. **SPACE HEATERS PLUG SOCKETS:-**

i) Each vertical section shall be provided with thermostat-controlled space heater & 5A, 3 pin plug socket.

ii) Cubical heater, plug-socket circuit shall have individual switch fuse units.

17. **A.C. / D.C. POWER SUPPLY:-**

i) The following power supplied will be made available to the switchgear:

240 A.C. Supply: Two Feeders From these two single-phase feeders a reliable 240V, 1 Ph. AC bus shall be obtained using auto changeover scheme. The necessary equipment's for this scheme should be indicated.

The DC supply required for control purposes is to be obtained in each module through a rectifier arrangement, which will convert the 250V AC supply to 110V DC. The equipment necessary for this rectification, including protective relaying as per the approved drawing are also to be included.

ii) Isolating switch fuse units shall be provided at each switchgear for the incoming supplies, 2-pole, single throw for A.C. & 2-pole, double throw for D.C. Bus-wires of adequate capacity shall be provided to distribute the incoming supplies to different cubicles. Isolating switch- fuse units shall be provided at each cubicle for AC/DC supplies.

iii) AC load shall be so distributed as to present a balance loading on three-phase supply system.

18. PAINTING :-

i) All surfaces shall be sand blasted, pickled & grounded as required to produce a smooth, clean surface free of scale, grease & rust.

ii) After cleaning, the surface shall be given a phosphate coating followed by 2 coats of high quality prime & stove after each coat.

iii) The switchgear shall be finished in light gray (IS shade # 631) with two coats of synthetic enamel paint.

iv) Sufficient quantity of touch- up paint shall be furnished for application at site.

19. SPECIAL TOOLS & TACKLES :-

i) A set of special tools & tackle (manual charging handle & operating handle trolley for lifting outside breaker for maintenance) which are necessary or convenient for erection, commissioning, maintenance & overhauling of the equipment shall be supplied.

ii) The tools shall be shipped in separate containers (Tool Box) clearly marked with the name of the equipment for which they are intended.

1 SPARES:-

i) The bidder shall submit list of recommended spare parts for three (3) years satisfactory & trouble free operation indicating the itemized price of each item of the spares (if applicable).

20. **DRAWINGS, DATA & MANUALS :-**

i) 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 flanges & terminals for the bus termination.

f. Type test reports on circuit breaker.

g. Technical leaflet on

h. Circuit breaker

i. Instrument transformer

j. Relays, meters, switches etc.

k. Single line diagram

l. Control schematic

m. Wiring diagram

21. Instruction manuals of switchgear & individual equipment:-

The manual shall clearly indicate the installation method, checkup & tests to be carried out before commissioning of the equipment.

22. The bidder may note that the drawings, data & manuals listed here in are minimum requirements only the bidder shall ensure that the other necessary write-ups, curves & information required to fully describe the equipment are submitted with his bid.

CIRCUIT BREAKER

Make - As per approved make.

Type - Microprocessor release

air circuit breaker

Rated voltage - 415 Volts

Rated frequency - 50 Hz

Rated current - **1600/(Icu=Icf=1sec 50 kA) 800A(Icu=Icf=1sec 50 kA)**

No. of pole - 3

Aux. Voltage for trip/close coil - 110 V DC

Motor for spring charging Voltage- 240 V AC

Protection unit - Equivalent to SR-18G with

fault indication & thermal masonry.

Interlocking arrangement electrically & mechanically with bus coupler & incomer.

PROTECTION (FOR LT SUPPLY 415V PANEL)

The minimum protections to provide for different type of circuit are listed below:-

INCOMING FEEDER:-

2 over current +E/F relay microprocessor based along with the element of instantaneous o/c & E/F protection.

BUS COUPLER:-

3 O/C relay microprocessor based

All inverse time O/C relay shall be 3 sec. Version.

All definite time O/C relay shall have adjustable time range of 0-6 Sec.

Apart from protection relays each breaker shall be provided with auxi. Contact multiplier relay, anti-pumping relay, trip supervision relay, lockout relay test terminal block. These relay shall be hand reset.

1.7.3 Specifications for LT Bus Duct

1. **Design Criteria**

- The LT non phase segregated bus duct serves as an interconnection between the LT switchgear and outdoor LT transformer.
- The LT bus ducts will be installed partially indoor and partially outdoor in a hot, humid and tropical atmosphere. All panels associated.
- 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.
- 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.
- 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.
- The bus ducts shall be self-cooled and shall not be equipped with blower or any other type of forced ventilation.
- Bus duct enclosure shall be of sheet steel.

1. Specific Requirements.

- **General**
- The LT bus duct shall be non-phase segregated enclosure type.
- 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.

- All parts and accessories shall have appropriate match mark and part numbers for easy identification and installation at site.

1. **Enclosure**

- Phase shall be enclosed in weather proof, dust-tight, enclosure of sheet steel fabricated type conforming to degree of protection of IP 55.
- Circumferential neoprene rubber gaskets shall be provided for dust tight joints with adjacent enclosure section.
- 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/ construction 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.
- All outdoor bus enclosures shall be so designed & constructed as to prevent accumulation of rain water on top sheet. Similarly all gasketted flanged joints shall be suitably protected against direct splashing of rain water in case of outdoor runs.
- 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.
- 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.
- Silica-gel breather shall be provided on both indoor and outdoor portions of the bus duct.
- Filtered drains for drainage of condensate shall be provided at the lowest points and at such locations where accumulation of condensate can be expected.
- Shipping length of the bus duct shall be not more than three (3) meters in length.

4. Bus Conductor

- The bus conductor shall be of high conductivity, aluminium allow, supported on wet process porcelain insulators.
- The bus conductor shall be designed for bolted connections throughout the run.
- 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.
- 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.

5. Disconnect Link

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

6. Insulators

- Bus support insulators shall be interchangeable, high creep, high strength, wet process, fine glazed porcelain. Alternatively good quality cast resin insulators.
- 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.
- 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.
- 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.

7. Connections & Terminations

- 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.
- In this connection the contractor is required to coordinate through the Engineer in Charge with the suppliers of the switchgear, transformers with regard to connection details, mechanical and thermal stresses.
- Flexible connections both for conductor and enclosure shall be furnished.
- At all equipment termination to provide for misalignment upto 25mm (1″) in all directions.

8. Between bus duct supported from building steel to prevent transmission of vibration.

- The equipment terminal connections shall be readily accessible and shall provide sufficient air gap for safe isolation of equipment during testing.
- If the material of bus conductor and that of the equipment terminal connectors are different then suitable bi-metallic connectors shall be furnished.

9. Grounding

- 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.
- Ground pad shall be bolted type to accommodate 50x6mm galvanized steel flats. Complete with suitable tapped holes, bolts and washers.

10. Supporting Structures

- 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.
- All buses shall be adequately supported and braced to successfully withstand normal operation, vibration, thermal expansion, short circuit forces and all specified design loads.
- Supports shall be designed to provide tolerance of plus/minus 12mm (1/2") in the horizontal and vertical directions.
- All steel members shall be hot dip galvanized after fabrication. All hardware shall be of high strength steel with weather resistant finish.
- 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.

11. Wiring

- 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.
- Terminal blocks shall be box-clamp type Elemex 10 sq.mm with marking strips or approved equal.
- At least 20% spare terminals shall be furnished in the terminal block.

12. Name Plate

- **S**uitable name plate shall be furnished with each piece of equipment.

- Materials for name plate shall be plastic/lamicoid, 3mm thick, using white letters on black background.

13. Finish

- Except for supporting steel structures which shall be galvanized, all equipment shall be finished with an undercoat of high quality primer followed by two coats of synthetic enamel paints.
- The interior surface finish shall be as per manufacturer's standard. The shade of exterior surface finish will be battle ship gray shade 632 as per IS-5.
- Pre-treatment consisting of degreasing, derusting etc. shall be done on all fabricated parts before painting or galvanizing.
- 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.
- Sufficient quantities of all paints and preservatives required for touching up at sites shall be furnished.

14. Handling of cable drum and cable:

- 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.
- For unreeling the cable, the drum shall be mounted on jacks or on cable well. 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.
- While laying cable, cable shall be used at and 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 no be less than what is specified by manufacturer.

15. 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 cable 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 be no be laid in a common tray excepting in very special case where a gap of 150 mm shall be maintained between power & control cables.

- H.T & L.T power cables shall be laid in cable trays in single layer & with spacing equal to the diameter of cable.
- Control cable can be laid upto a maximum of three layers in each tray.
- Both power & control cables shall be clamped to the trays rungs by means of clamp made up to 25 x 3 mm fabricated G.S flat at an interval of 1500 mm for horizontal run & 1000 mm for vertical / inclined cable run.
- 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.
- 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.
- Cable tray shall be installed to accommodate cable manufacture's recommended maximum pulling tension & minimum bending radius.
- All opening in the floor & wall for cable access shall be sealed after installation of the cable system with non-inflammable materials.
- All floor/ wall 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.

16. Cable power & control:

- The tender shall install & connect all power & control cable required for complete installa- tion with in his scope of work. Type and size of power& control cable shall be as specified & as supplied under a separate sub section for power and control cable.
- In general all power and control cable shall be run in cable trays in cable trenches. Isolated runs of control cables shall be run in rigid conduit.
- Jointing of power cable should be avoided as per as possible. However, if any splicing of control cable is required to carry out interlock it will be done junction boxes not in the conduit or in the trays. Such junction boxes shall be in scope of tenderer.
- The contractor shall not installs cables with different voltage in the same cable tray.
- During cable installation care shall be taken so that actually binding radius of each cable is not less than the one recommended by the cable manufacturer.
- For cable buried directly underground their shall be a stone free sand cushion both above and below the cable run being held by brick wall support on two (2) sides. The excavated portion above the top sand cushion shall be covered by concrete precast slab supported on the side walls & finally filled up with

standard back fill.

- Cables shall be pulled into the trenches in strict accordance with the cable manufacture's instruction.
- Tender shall furnish & install suitable solder less crimping type cable lugs at the termination of all wires & cables if not already furnished with the equipment.
- All exposed conduits & armoured cables shall be tagged with numbers that appear in the conduit & cable schedules as prepared by the tenderer. All conduits & armoured cable shall be tagged at their entrance and / or exist from any piece of apparatus, junction box or pull box. Aluminum tags shall be used with the number engraved / punched on the tag. Tag shall 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.
- Laying termination & connection of all control cables for interlock, protection, indication & annunciation.

The tender 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 feeders.

a) Power - designate as 'P'

b) Control protection interlock, meeting, indication & annunciation designate as "C".

17. Filed Testing:

- Filed 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, specification and manufacturer's recommendations.
- Testing shall be conducted in presence of Owner's Engineer (i.e., Engineer in Charge) with prior notice at least 2 weeks before commencement of any test.
- Filed 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 filed tests to be conducted for all equipment & accessories for review/ approval by the owner.
- Testing shall include any additional tests suggested by the owner that the deems necessary

because of filed condition to determine that equipment, materials & system meet requirements of the specification.

- The tender shall depute qualified personal to conduit all testing & shall provide all labour and testing equipment required for & incidental to testing.
- The tender shall be responsible for any damage to equipment & material due to improper test procedure or test apparatus & shall replace to original condition of any damaged equipment or material.
- The tender shall maintain in quadruplicate a written record of all tests showing date, personal making the tests, equipment or material tested performed & result. Two copies of test records shall be given to the authority.

18. Commissioning:

After the satisfactory test is 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

1.8 Figure 2: Modified provisions in CPWD works manual 2019 regarding testing charges to be borne by contractor

7.3 List of Approved Makes for Electrical Works

S.No.	Items	Makes
1	*MS Conduit (ISI marked)with heavy duty accessories*	*BEC/AKG/ RM CON /Steel Krafts*
2	*PVC/ XLPE insulated aluminium / copper conductor armoured unarmoured MV cables upto 1100 V(ISI Marked)*	*Havells / Finolex/ KEI/ Grandlay/ Polycab/Gloster*
3	*FRLS PVC insulated copper conductor stranded flexible wire i/c control cables(ISI Marked)*	*Havells/Finolex/KEI/ Grandlay/Polycab/Gloster*
4	*Cable Raceway floor/wall mounted and accessories*	*Legrand / MK (Honeywell) / OBO/Excel*
5	*Cable Tray & Accessories*	*Venus / MEM / BEC / RM CON/ Indeana/Excel*
6	*Modular Switch & Socket & Accessories*	*Legrand(Myrus)/Schneider (Zencelo) / legrand (Arteor)/ ABB(millenium)*
7	*Metal clad Industrial Socket outlet and sheet steel Enclosure for MCCB/ MCB*	*Legrand/Siemens/Schneider/Hager*
8	*Cable Glands*	*Dowells/Commet/Gripwell/Raychem*
9	*Lugs and end termination*	*Dowells/Commet/Braco*
10	*Change over switch*	*L&T / Socomac / ABB / Schneider*
11	*Distribution Boards*	*Siemens (Betagard), / Hager / Schneider (Acti9) / Legrand (Ekinox3/ L&T (Exora / ABB (Elegence)*
12	*Protection Device (MCB/RCCB/RCBO/ELCB)*	*Siemens (5SL), Hager / Schneider (Acti9) / Legrand (DX 3) / ABB (S200M) / L&T/C&S*
13	*Current transformer / potential transformer*	*AEL / Gilbert & Maxwell / Pragati / Precise / L&T/ Kappa*
14	*Indicating Lamps LED type, Push Button*	*Siemens / L&T / Schneider / Legrand*
15	*Electronic Digital Meters*	*Schneider (conzerv) / L&T / Secure / Siemens / ABB / Legrand*
16	*MCCBs*	*Siemens (3VL) / L&T (D sine) / Schneider (CVS) / Legrand (DPX3) ABB (T max)/ C&S*
17	*Power Contactor*	*L&T (MNX)/ Schneider (Tesys) / Legrand (CTX3) ABB (Ax)*
18	*Surge Protection Devices*	*Siemens/L&T/Schneider / Legrand/ OBO*
19	*Selector Switch*	*Salzer/Seimens /BCH/ Kaycee / L&T*
20	*Auxiliary Relays*	*Siemens/L&T/Schneider/Legrand/ABB*
21	*LED Lighting Fixture*	*Philips/ Wipro/Havells/Crompton*

22	Emergency Lighting/ Exit Sign boards	Bajaj / Prolite / Glo-Line
23	Ceiling Fan, Fresh Air Fan, Exhaust Fan	Havells/Cromption/ Usha / Orient/ Atomberg
24	Paint	Nerolac/Asian/Berger/ICI
25	Lighting Protech System	OBO/ Cape Electric/ Infinite / APS/ Jeff Techno/ Axis
26	G.I Pipe	Tata, Jindal-Hissar, Prakash Surya
27	Rubber Mat (ISI Marked)	Jyoti / Deep Jyoti/ Premier
28	Fire Extinguisher	Minimax/ Life Guard / Cease Fire / Newage
29	CU/ GI Strip & GI wire for earthing	Jeff Techno/ Axis / OBO
30	MS Conduit (ISI marked)	BEC/AKG/NIC/ Steel craft/ M-Key, SK (E.R.W)
31	PVC Conduit and accessories	Polycab/ AKG / Asian
32	1.1 KV aluminium armoured XLPE insulated and PVC sheathed cable (LT cable)	Havells /KEI/ Finolex/ Grandlay/ Gloster
34	Metal Clad Industrial Socket	Legrand / Siemens/Schneider/ C&S/ ABB
35	Cat-6 cable	Beldon/Siemon/Legrand/Penduit (Pannet)
36	Crimp Patch Cord	Beldon/Siemon/Legrand/Penuit (Pannet)
37	Panel Accessories	Siemens/ L&T/ Schneider / Legrand / Tecnic/ ABB/ C&S/ Neptune
38	LED/ Metal Halide / Fluorescent Internal & External Lighting Fixtures	Philips/ Wipro/Havells/Crompton
39	BLDC Fans	Havells / Orient/ Usha/ Atomberg
40	Ceiling Fan (ISI marked & BEE rated 5 star)	Havells /Orient/ Usha/Bajaj
41	Advance lighting protections 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
42	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). L&T /Siemens / Schneider/ ABB/ Legrand / L&T or their authorized

		channel partners for IEC 61439 compliant panels
43	*Air Circuit Breaker*	*Siemens / Schneider/ L&T/ Legrand/ C&S/ ABB*
44	*Surge Voltage Protection*	*Siemens/L&T/Schneider / ABB*
45	*Earth fault module*	*Siemens/Schneider/L&T/Legrand*
46	*Protection relays*	*Siemens/ Areva/ L&T/ Legrand*
47	*C.Ts and PTs*	*Kappa / AE/ Matrix*
48	*Digital Meters*	*Siemens (PAC)/ Schneider/ (conzerv) / Secure Enersol / L&T/ Neptune*
49	*Indicating lamps*	*ESBEE/Schneider/Siemens/Vaishno/Neptune*
50	*Power capacitors*	*Epcos/ Neptune / Legrand /ABB/ L&T*
51	*Automatic Power factor correction relay/controller*	*Epcos/Siemens (PAC) /Schneider (Conzerv)/L&T/Neptune*
52	*Sealed Maintenance Free Batteries*	*Exide/Panasonic/Amara Raja/HBL*
53	*Battery charger*	*Caldyne/Chhabi Electricals/Statcon/Max Power*
54	*Cable Trays (Factory Fabricated/ Overhead & Floor Raceways*	*Legrand/MEM/OBO/ Milestone/ Neptune*
55	*HDPE underground cable duct*	*Rex Polyextrusion/ Tirpura/ Plasomatics/ Duraline*
56	*Insulation Mats*	*DL Miller & Co. Ltd.?Premier Polyfilm Ltd./RMG Polyvinyl India Ltd/Jyoti*
57	*Smoke/Heat detectors*	*Apollo/ System Sensor/ Agni*
58	*Manual Call point*	*PRD/System-Tek/ Simplex/ System Sensor/ Agni*
59	*Response indicators*	*PRD/System-Tek/ Simplex/ System Sensor /Agni*
60	*Fire Exit Signs*	*System-Tek/ Simplex/ Agni*
61	*Fire Control Panel*	*System-Tek/ Morley /Agni*
62	*Speaker / Hooter*	*System-Tek/ Philips /Agni*
63	*Occupancy Sensors/ Movement Sensor*	*Legrand/ Philips/ Wipro*
64	*Flush type switch /socket*	*Anchor/ Kinjal/ SSK/ Havells Reo*
65	*Fuse switches unit / switch fuse unit /HRC fuse*	*L&T / Siemens/ Havells/ C&S*
66	*Exhaust fan*	*Almonard/ Alstom/ Crompton/ Havells*
67	*XLPE insulated HT cables*	*KEI/Havells/Polycab/Gloster/ Grandlay*
68	*Cable lug*	*Ascon (Heavy gauge) Jainson Dowells*

69	*Telephone wires/Telephone Cable / jelly filled telephone cables*	*Finolex /Delton/Havell's*
70	*Telephone tag blocks*	*Krone/ Pouyet*
71	*Telephone outlet*	*MK Electric /Legrand (Mosaic)/Crabtree (Piccadilly)*
72	*GI raceways*	*Milestone Engineering /Legrand/ MDS/ Neptune Systems Pvt. Ltd./MK*
73	*PVC raceways*	*Legrand/ MK*
74	*Electronic ballast*	*Philips / Wipro/ Bajaj/ Decon/Crompton/Havells*
75 *76*	*DLP plastic trunking* *Geysers*	*Legrand/MK* *Recold /Venus /Usha Lexus /Sphere hot*
77	*Tower Light*	*Ligman/Simes/Bega*
78	*HT/LT transformers* *HT SF-6 circuit breakers / VCB*	*ABB/Schneider /CGL (Crompton Greaves Ltd.)* *Siemens/ ABB/ CGL / Schneider*
80	*Programmable Logic Controller (PLC)*	*Siemens /Allen-Bradley/ Schneider*
81	*Earthing (Chemical Earthing Plate Earthing*	*JMV/ As per CPWD Norms*
82	*Octagonal Pole*	*Bajaj / Crompton / Phillips*
83	*11 kV HT panel Incoming relay*	*CGL/Schneider/ABB/ Siemens*
84	*Control Relay Panel*	*CGL/Schneider/ABB*
85	*Lightning Arrestor*	*ABB/Alltec/JMV*
86	*Temp. Gauge*	*Guru*
87	*Gate Valve*	*Leader/Sant*
88	*Electrical Backup*	*Spare hot/ Racold*
89	*PVC Tank*	*Syntex/ Polycon*
90	*Thermostat*	*ISI Marked*
91	*Flat Collector Plate*	*Solocrome/ Tata BP/ Racold*
92	*S.S Sheet*	*Jindal / National*
93	*HT/LT cable joints (Straight through/outdoor/indoor)*	*3M/ Denson/ M Seal/Raychem/ Cabseal*
94	*Alternator*	*STAMFORD/Crompton Greaves/Kirlosker/Leroy Somer*

8 Terms Conditions of Contract

8.1 Terms Conditions for the minor works under the contract

1. The contract will be used only to execute original works/ minor works/ repair works of urgent nature. It can also be used for any works of restoration as a result of a disaster in campus causing damage to institute infrastructure/ works related to emergency services/ works of institute importance/ works concerned to safety health and environment of campus community. The works undertaken through such contracts are categorized as time bound and should be executed as per Table 6.
2. The contractor should always keep his establishment ready to commence the work immediately after the issue of the work of any amount. The schedule for the issued works under the contract should be at per Table 6. Work requests of urgent nature shall be started at the earliest after receiving orders from the engineer-in-charge but it should be documented with photo and video evidence for all hidden items. Submission of this evidence is mandatory for all works executed without a pre-approved quantity take off sheets.
3. During the execution, the noise creation should be minimized to the extent possible and the works may be carried at odd hours and more than one shift as per requirement.
4. The performance of the instruments or tools to be used should be checked precise before using them on site.
5. The contractor and his/her personnel has to build a well-coordinated system with the users regarding execution of the works.

8.2 Timely Completion

1. All work components must be started simultaneously and has to be delivered together or early within the given time schedule.
2. The contractor has to deploy the labor and supervisory staff in shifts to meet the targeted completion date. The work may be executed in extended shifts or two shifts.
3. Number of days from the date of issue of letter of acceptance for reckoning date of start shall be as per Schedule. If the Contractor commits default in commencing the execution of the work as aforesaid, the performance guarantee shall be forfeited.
4. The contractor shall procure the required materials in advance so that there is sufficient time for testing of the materials and approval of the same before use in the work, as required.

8.3 Rates

1. Unless otherwise provided in the schedule of quantities of the work the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building (inclusive of GST) and nothing extra shall be payable to him on this account.
2. The rates for all items of work shall, unless clearly specified otherwise, include cost of all labours, materials and other inputs involved in the execution of the item irrespective of whether they have been specifically mentioned in the tender document or not.
3. In case the same item (s) appear more than once in the schedule of work / BOQ under the same sub head or among the different subhead of works, the lowest rate quoted for that item (s) shall be considered for the particular item(s) wherever appeared in any part of BOQ / Schedule of works for the purpose of tender evaluation although web generated e-price bid may incorporate different quoted rate for same item(s) as per the quoting pattern of the tenderer. The tendered amount thus worked out shall be final &shall be binding on the contractor.
4. No double scaffolding is payable in single story houses including parapet wall. In multistor- ied houses the payment of double scaffolding shall be made after 3.5 meter from plinth protected level. The necessary deductions for single scaffolding be made from the items. Contractors are advised to visit the site & quote the rates accordingly.
5. The rates quoted by the contractor will be deemed to be inclusive of any extra expenditure of this reason. The contractor has to increase the manpower or other tools etc. to do the work as per the quantum of work provided to him at his own expenses. Nothing shall be paid on this account.
6. The contractor shall provide at his own cost suitable weighing, surveying and leveling and measuring arrangements as may be necessary at site for checking. All such equipment shall be got calibrated in advance from laboratory, approved by the Engineer-in-Charge. Nothing extra shall be payable on this account.
7. Other agencies may also simultaneously execute and install the works and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings, trenches etc. as may be required for such related works (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be available as specified elsewhere in the contract) and the contractor shall fix the same at the time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.
8. All material shall only be brought at site as per program finalized with the Engineer-in- Charge. Any pre-delivery of the material not required for

immediate consumption shall not be accepted and thus not paid for.

9. MCCB's, switches, sockets, wires, cable, light fixtures, earthings and other electrical items covered under the contract should conform to approved manufacturers specifications, where CPWD Specifications are not applicable. The contractor should get the materials (fixtures/fittings) tested from approved labs wherever required at his own cost.

10. The contractor shall be responsible for the watch and ward / guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the client department. No extra payment shall be made on this account.

11. The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, preparatory works, working during monsoon, working at all depths, height, lead, lift and location etc until / unless specified otherwise and any other incidental works required to complete this work. Nothing extra shall be payable on this account.

8.4 Quality and Workmanship

1. The contractor shall be entirely responsible and answerable for all the works done by him regarding quality, adherence to the laid down specifications, terms and conditions, warranty/guarantee etc. and he shall be liable to bear any compensation that may be levied by the department under any of the clauses of the agreement.

2. The materials having ISI mark shall have precedence over the one conforming to IS Specifications.

3. The proposed buildings are Institute housing and quality of work is paramount importance. Contractor shall have to engage well experienced skilled labour and deploy modern T&P and other equipment to execute the work.

4. Samples of all materials and fittings to be used in the work in respect of brand manufacturer and quality shall be approved from the Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work.

5. All materials used in the work shall be new and of good quality, conforming to the relevant specifications as per good engineering practice. All the materials proposed to be used in the work should be approved from Engineer in Charge before use in work.

6. Articles bearing BIS certifications mark shall only be used unless no manufacturer has got BIS/ISI mark for the particular material. Any material/fitting whose

sample has not been approved in advance and any other unapproved material brought by the contractor shall be immediately removed as soon as directed. Where the make of any particular material is not specified in the Contract document, the material shall be supplied as per makes desired by the engineer-in-charge.

7. It will be the responsibility of the contractor / bidder to ensure use of genuine materials in the work. The department reserves the right to get (any / all materials / components) inspected by the manufacturer or their authorized representatives at any stage of the execution of work. If any of the materials, supplied and used in work is found spurious at any stage, then the department reserves the right to ask the contractor to replace it by genuine one and make suitable recovery till it is done, even if any payment against that material is already made.

8. The contactor should get the make/TDS documents approved before procuring any material at site. The TDS/Make once approved shall not be changed without any valid recorded reasons. No material to be brought and used at site without the prior knowledge & approval of Engineer-in-Charge.

9. The department may ask for any valid document like manufacturer's test certificate, document for purchase of the material, document for import/shipment of imported materials etc. as deemed fit by the engineer-in- charge to ascertain genuinely of material supplied by/used in the work by the contractor. The contractor shall remain bound to submit all

   such documents to the department failing which payment may not be made or if already paid may be recovered/ withheld from subsequent running account payment.

10. All equipment and their components, and all the materials to be used in the work shall be suitable for the environmental conditions at the location of the work.

11. 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.

12. The contractor shall get the source of all other materials, not specified elsewhere 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.

13. Other Laboratories: 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.

    (a) By the contractor, if the results show that the test does not conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

    (b) By the department, if the results conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

    If the tests, which were to be conducted in the site laboratory, are conducted in other laboratories for whatever the reasons, the cost of such tests shall be borne by the contractor.

14. Sample of 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.

15. 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.

16. 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.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.

17. All materials brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.

18. 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.

8.5 Natural calamity

No payment will be made to the contractor for any damage caused by rain, snow fall, floods, dampness, fire, sun or any other natural cause whatsoever during the execution of work. The damage to the work due to above reason, if any, shall have to be made good by the contractor at his own cost and no claim on this account shall be entertained.

8.6 Safety and Security

1. The contractor has to follow all safety norms as laid down in National Building Code of India. All the workers shall be equipped with the required safety gadgets while working at site such as ISI marked helmets, Shoes and safety belts, gumboots, gloves etc.The contractor, the authorized representative(s), workmen etc., shall strictly observe orders pertaining to fire precautions prevailing in the area.
2. The contractor shall be fully responsible for the safe custody of materials brought by him/ issued to him even though the materials may be under double lock key system.
3. Contractor will arrange proper metal ladders, M.S. double scaffolding (for working, painting, etc. at higher levels) at his own cost and will take all safety measures like double harness safety belt, mechanized electrically operated platform etc. If it is observed that work is proceeding without adequate safety precautions, work may be stopped by Engineer-in- charge and in such cases, contractor will be solely responsible for delay and its consequences thereof.
4. The contractor shall be responsible for the watch and ward/guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.
5. The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night speed limit boards red flags, red lights and providing barriers. He shall be responsible for all dangers and incidents caused to existing / new work due to negligence on his part. No hindrances shall be caused to traffic during the execution of the work.
6. It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.
7. The Institute shall not have any responsibility or liability in case of any accident injury to the personnel to the contractor at work site or to the general public at the work site due to mishandling equipment by the personnel of the contractor or any other similar reason. The responsibilities and liabilities for such accidents and

incidents shall be borne by the contractor.

8.7 Approach to Site

1. The tenderer shall see the approaches to the site. In case any approach from main road is required at site or existing approach is to be improved and maintained for cartage of materials by the contractor, the same shall be provided, improved and maintained by the contractor at his own cost.
2. Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at his own cost.

8.8 Acts and Laws

1. The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by Collector / MC etc. and any other statutory bodies shall be adhered to, by the contractor, during the execution of work.
2. The Contractor shall also adhere to all traffic restrictions notified by the local authorities.
3. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges, as applicable) payable to such authorities for carrying out the work, shall be borne by the Contractor.
4. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the Institute and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself/herself or by his/her employees or his/her authorized representatives. Nothing extra shall be payable on these accounts.
5. The fee payable to statutory authorities for obtaining the various permanent service shall be borne by the Institute.

8.9 Labour and Laws

1. The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc. under various labour laws and other regulations applicable to the works, at his site office.
2. Huts for labour are not permitted within the premises of the Institute. No extra cost shall be payable even if the contractor provides such accommodation at a place as is acceptable to the local body.

8.10 Nondisclosure Agreement

1. The Agency shall take all precautions not to disclose, divulge and/or disseminate to any third party any confidential information, proprietary information on the Institute business or security arrangements (including but not limited to the Assignment instructions, Schedules and other subsequent Arrangements) and/or business of the Institute. The obligation is not limited to any Scope and the Agency shall be held responsible in case of beach of the confidentiality of Institute's information.
2. If the Agency receives enquiries from Press/Media/Radio/Television or other bodies/persons, the same shall be referred by the Agency to Institute immediately on receipt of such queries.

8.11 Indemnification:

1. The agency shall be directly responsible to indemnify the Institute against all charges, dues, claims, etc. arising out of the disputes relating to the dues and employment of the personnel deployed and further for any claim/compensation against all damages and accidents caused due to negligence on the part of the agents, employees and other personnel of the agency.
2. That the contractor shall keep the IITK indemnified against all claims whatsoever in respect of the employees deployed by the contractor. In case any employee of the contractor so deployed enters in dispute of any nature whatsoever, it will be the primarily responsibility of the contractor to contest the same. In case IITK is made party and is supposed to contest the case, IITK will be reimbursed for the actual expenses incurred towards Counsel Fee and other expenses which shall be paid in advance by the Contractor to IITK on demand. Further, the contractor shall ensure that no financial or Any other liability comes on IITK in this respect of any nature whatsoever and shall keep IITK indemnified in this respect.

8.12 Force Majeure:

If at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract is prevented or delayed by reasons of any war, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosion, epidemics quarantine restriction, strikes, lockouts or acts of god (hereinafter referred to as events) provided notice of happenings of any such event, is served by party seeking concession to the other as soon as practicable, but within 21 days from the date of occurrence and termination thereof. Provided the Party satisfies Institute adequately of the measures taken by it. Neither party shall, by reason of such event, be entitled to terminate this contract, nor shall either party have any claim for damages against the' other in respect of such non-performance or delay in performance. Further, the services under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist and the decision of Institute as to whether the services have to resume or not shall be final and conclusive, provided

further, that if the performance in whole or in part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 60 days, Institute may at his option, terminate the contract.

8.13 Dispute resolution

1. The institute reserves the right to amend rules whenever and wherever considered necessary and appropriate. The same shall be intimated to the agency in due course.
2. Any dispute arising out of and in relation to this agreement shall be referred to the arbitration by sole arbitrator to be appointed by Director of the Institute. The arbitration would be conducted and governed by and under the provisions of Arbitration Act, 1996 and its amendments. Any legal dispute will be subject to jurisdiction of Kanpur Courts only and no other court shall have the jurisdiction.
3. Any dispute arising out of and in relation to this agreement shall be referred to the arbitration by sole arbitrator to be appointed by Director of the Institute. The arbitration would be conducted and governed by and under the provisions of Arbitration Act, 1996. Any legal dispute will be subject to jurisdiction of Kanpur Courts only and no other court shall have the jurisdiction.

8.14 Arbitration

1. Except as otherwise provided anywhere in this Agreement, if any dispute, difference, the question of disagreement or matter, whatsoever, arises between the parties, as to the meaning, operation or effect of the Agreement or out of or relating to the Agreement or breach thereof, the same shall be referred to a Sole Arbitrator, to be appointment by the Director of the Institute at the time of the dispute.
2. If the Arbitrator, to whom the matter is originally referred, dies or refuses to act or resigns for any reasons from the position of arbitration, it shall be lawful for the Director of the Institute to appoint another person to act as Arbitrator in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by its predecessor, provided both the parties consent to this effect, failing which, the arbitrator shall be entitled to proceed on the matter de- novo.
3. It is a term of the Agreement that the party invoking the arbitration shall specify all disputes to be referred to arbitration at the time of invocation of arbitration under the clause.
4. It is a term of the contract that the cost of arbitration shall be borne by the parties themselves.
5. The place of the arbitration shall be Kanpur Nagar, Uttar Pradesh, India.
6. Subject as aforesaid, the provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications, amendments or re-enactment thereof and rules made

thereunder and for the time being in force, shall apply to the arbitration proceeding under this clause.

7. Except as otherwise provided anywhere in this Agreement, the Arbitration proceedings shall be conducted in English and the Agreement shall be constructed, interpreted and governed by the law of India, for the time being in force.

8.15 Jurisdiction of Courts

The court(s) at Kanpur Nagar, Uttar Pradesh, shall have the exclusive jurisdiction to try any as all the disputes(s) between the parties arising out this Agreement.

8.16 E&M Works

1. In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

(a) Schedule of quantities

(b) Technical specifications of the NIT

(c) Approved Drawing (If any)

(d) CPWD General specification Part – I (Internal) 2014, BIS Codes amended up to date, practices

(e) CPWD General Specifications for Electrical Works–Part-II(External), 2014 amended up to date.

(f) Relevant IS or other international code in case IS code is not available.

(g) Indian Electricity Act 2003 and Indian Electricity Rules 1956 amended up to date.

(h) Local Fire Regulations applicable at the place of installation. Relevant and applicable foreign standards and specifications amended up to date.

(i) Any other relevant act or rules and local by-laws.

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

3. Smoking is strictly prohibited at workplace.

4. Nobody is allowed to work without wearing safety helmet. Chinstrap of safety helmet shall be always on. Drivers, helpers and operators are no exception.

5. 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.

6. No one is allowed to work without adequate foot protection.

7. 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-coordinator insists eye protection has to be provided.

8. All safety appliances like Safety shoes, Safety gloves, Safety helmet, Safety belt, Safety goggles etc. shall be arranged before starting the job. .

9. All excavated pits shall be barricaded & barricading to be maintained till the backfilling is done. Safe approach to be ensured into every excavation.

10. Adequate illumination at workplace shall be ensured before starting the job at night.

11. All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded.

12. Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work platforms.
13. 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 trespassers from entering the area.
14. Other than electricians no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.
15. All electrical connections shall be made using 3 or 5 core cables, having a earth wire.
16. Inserting of bare wires for tapping the power from electrical sockets is completely prohibited.
17. A tools and tackles inspection register must be maintained and updated regularly.
18. Debris, scrap and other materials to be cleared from time to time from the workplace and at the time of closing of work every day.
19. All the unsafe conditions, unsafe acts identified by contractors, reported by site supervisors and / or safety personnel to be corrected on priority basis.
20. No children shall be allowed to enter the workplace.
21. All the lifting tools and tackles shall be stored properly when not in use.
22. Clamps shall be used on Return cables to ensure proper earthling for welding works.
23. Return cables shall be used for earthling.
24. All the pressure gauges used in gas cutting apparatus shall be in good working condition.
25. Proper eye washing facilities shall be made in areas where chemicals are handled.
26. Connectors and hose clamps are used for making welding hose connections.
27. All underground cables for supplying construction power shall be routed using conduit pipes.
28. Spill trays shall be used to contain the oil spills while transferring / storing them.
29. Tapping of power by cutting electric cables in between must be avoided. Proper junction boxes must be used.
30. All the E&M works shall be carried out as per direction and to the satisfaction of the Engineer-in-charge.
31. If the specifications for any item or its component are not available in the CPWD specifications cited above, relevant BIS specification as amended up to date shall be followed, whether or not the specific reference of a particular BIS specification has been made in this specification/ tender document.

32. Wherever any reference to any Indian Standard specification occurs in the document relating to this contract the same shall be inclusive of all amendments issued there to or revisions thereof, if any, up to the date of opening of tenders.

33. All materials should conform to relevant BIS specifications wherever the same exists in absence of stipulation in this tender document.

34. Where manufacturers furnish specific instructions / recommendations relating to the ma- terials used in this job and/or their installation, covering points not specifically mentioned in these documents, these instructions shall be followed in all cases and shall be deemed to be included in the schedule of work whether they have been specifically mentioned or not. 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.

35. All cuttings in cement plaster and brick shall be made good by using cement mortar 1:3 (1 part cement, 3-part coarse sand) The cut surfaces shall be repaired by an experienced mason only so as to match the repaired plaster with the original. 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.

36. The structural and architectural drawings shall at all times be properly co-related before executing any work.

37. For the purpose of recording measurements and preparing running account bills, the abbreviated nomenclature indicated in the publications Abbreviated Nomenclature of Items of DSR 2025 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. 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. For the final bill, however, full nomenclature of all the items shall be adopted in preparing abstract in the electronic measurement books and in the bill forms.

38. The following drawings must be submitted to Executive Engineer seven days of award of work.

(a) G.A and schematic drawings of MV switchgear/distribution /conduit layout/wiring drawing, 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) 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 boxed etc.

(c) Cable routing drawings showing details of size, type and no. of cables and mode of installation.

39. 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).

(a) As built GA and schematic drawings of MV panels, distributions boards, wiring, cable laying with sizes, earthling details, fire alarm panels, 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.

(b) Technical literature, test certificates and operation and maintenance manuals required

40. Works Inspection and Testing of Equipment: 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 equipment's.

41. Pre-commissioning test: All routine tests shall be carried out on the electrical equipment. Protective & measuring devices should be checked for calibration of MCCB's/MCB's, panel & cable meggaring, earthing measurements etc.

केन्द्रीय लोक निर्माण विभाग

कार्यालय ज्ञापन

No. DG/MAN/410

ISSUED BY AUTHORITY OF DIRECTOR GENERAL, CPWD

NIRMAN BHAWAN, NEW DELHI DATED: 22.10.2021

Subject: Addition of new Para 4.10.2 in CPWD Works Manual 2019 regarding testing charges to be borne by contractor.

It has been noticed that following provisions are sometimes being made in the NITs / Agreements by the NIT approving authorities:

"The cost of test shall be borne by contractor/ department in the manner as below:

i. By the contractor, if the result shows that material does not conform to the relevant codes/ specification.

ii. By the department, if the results show that the material conforms to relevant codes/ specification."

It has been decided by the competent authority that testing charges shall be borne by the contractor in all cases. Accordingly following new para is added in CPWD Works Manual -2019.

Existing Provision	Modified Provision
4.10 Preparation of NIT	**4.10 Preparation of NIT**
4.10.2 No Provision	**4.10.2 Testing charges to be borne by contractor** **Following provision shall be incorporated by the NIT approving authority in the NIT:** **All expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor. The NIT shall have list of approved laboratories for testing as approved by ADG / SDG.**

This issues with the approval of competent authority.

(वी.पी. साहू) 22.10.2021

अधीक्षण अभियंता(सी.एंड एम.)

Issued from file No. CSQ/CM/16(1)/2021 e-file 9116587

प्रतिलिपि: सभी केलोनिवि तथा लोनिवि दिल्ली के अधिकारियों को आवश्यक सूचना एवं कार्यवाही हेतु।(केलोनिवि वेबसाईट के माध्यम से).