

# NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI – 15

Web : [www.nitt.edu](http://www.nitt.edu)

Phone : 0431 –250 3840

**ESTATE MAINTENANCE DEPARTMENT/ELECTRICAL**



## TENDER DOCUMENT (TECHNICAL BID)

**Name of work** : **Supply, Installation, Testing and commissioning of 500kVA transformer 11kV/433V to OPAL hostel.**

**Value of Work** : **₹ 17,65,929/-**

**Tender Enquiry No** : **23/18-19**

**Period of Contract** : **120 days.**

**Tender Enquiry No** : **[EMD/EE/AE\(E\)/tender notice//Enq.No:23/18-19](#)**

NATIONAL INSTITUTE OF TECHNOLOGY  
TIRUCHIRAPALLI -620 015.  
**ESTATE MAINTENANCE DEPARTMENT/ELECTRICAL**

**NOTICE INVITING TENDER**

1. **Name of Work** : Supply, Installation, Testing and commissioning of 500kVA transformer 11kV/433V to OPAL hostel.
2. **Estimated Cost** : ₹ 17,65,926/-
3. **Earnest Money Deposit** : ₹ 35,319/-
4. **Completion time** : 120 days (from the date of commencement of work which will be reckoned from the date of agreement with the contractor)
5. **Cost of tender document** : Nil
6. **Last Date & Time for submission of tenders:** : 11.01.2019 & 3.00 P.M
7. (a) **Date & Time of Tender opening (Technical Bid)** : 11.01.2019 & 3.30 P.M  
(b) **Opening of Price bid intimation** : **only qualified bids after evaluation with intimation.**
8. **Maintenance period and Handing over** : 1 year from the date of actual completion of entire work and handing over to National Institute of Technology.
9. **Address for Submission of tender** : The Director, National Institute of Technology, Tiruchirappalli-620 015.

Tender document contains 39 pages including Price bid.

**Name of the Agency Submitting the tender** : .....

.....

.....

**Check list to evaluate the capability of the tenderer qualifying for price bid opening.**

Sl. No	Item/ Requirement from the Bidder	Bidders Response should be definite, complete and legible. Use separate sheet wherever necessary.
1	Particulars of remittance of EMD: Specify (a) DD Number (b) Amount (c) Name of Issuing Banker <b>Note: Bids without EMD will be rejected summarily</b>	
2	<b>Name and Complete Postal address of the Applicant or Bidder Firm/ Company with phone/ Fax/ Mobile number</b>	
3	Legal status / Constitution of the Bidder : (a) Sole Proprietor (b) Partnership (c) Private Limited Company (d) Public Limited Company (e) others <b>Please attach self-attested documentary proof</b>	
4	<b>Details of License type obtained from the Licensing Authority (Attach Self-attested Copy) Tick Whichever applicable</b>  EA <input type="checkbox"/> ESA <input type="checkbox"/>	License no :  Issue date :  Valid up to:
5	Nature of the Business of the Bidder	
6	Year of Commencement of Business	
7	Location of the Registered / Main Office	
8	(a) Name, (b) address ,(c) designation, (d) phone & cell number and (e) E mail ID of the CONTACT PERSON of the applicant/ bidder	
9	Name and address of your banker	
10	Copy of Income Tax Permanent Account Number (PAN Number) <b>(Please Attach self-attested copy)</b>	
11	Annual Turnover during the Last three financial years 2014-15, 2015-16 & 2016-17 <b>(Profit and Loss Account and Balance sheet duly audited and certified by a Chartered Accountant and Income Tax Return Acknowledgement i.e., ITR for the last three years may be attached)</b>	
12	Details of Manpower available with the bidder	<b>Use separate sheet to furnish the list</b>

<b>13</b>	Details of Equipment/ Tools/ Tackles available with bidder	<b>Use separate sheet to furnish the list</b>
<b>14</b>	Have you registered Under Employees Provident Fund (EPF) and Miscellaneous Provisions Act? If so, enclose copy of the registration certificate. Also provide a copy of the latest remittance, if any, made by your firm towards EPF.	
<b>15</b>	Have you registered under Employees State Insurance Corporation Act (ESI) Act? If so, enclose copy of the registration certificate. Also provide a copy of latest remittance made by your successful bidder/ firm/ company	
<b>16</b>	GST Registration Number, ( <b>Self-attested copy to be attached</b> )	
<b>17</b>	Details of similar 11kV/433V transformer installation works executed or being executed along with address of the service receiver with contact number, value of the work. <b>Enclose a copy of the work order along with performance certification.</b>	<b>Use separate sheet to furnish complete details in Appendix-B format.</b>

- ✓ I / we hereby certify that all the statements made and information supplied in the enclosed forms and accompanying statements are true and correct.
- ✓ I / we have furnished all information and details necessary for deciding our eligibility to be qualified for taking part in the tendering process for the work. We have no further information to supply.
- ✓ I/We also authorize the Director, NIT Tiruchirappalli or his representative to approach individuals, firms and corporations to verify our competence and general reputation.

**Authorized signatory of Bidder with Seal**

Name.....

Designation.....

**ESTATE MAINTENANCE DEPARTMENT/ELECTRICAL**

**INSTRUCTION TO TENDERERS**

1. Average Annual financial turnover during the last **3 years**, ending 31<sup>st</sup> March of the previous financial year, should be at least **30% of the estimated cost**.
2. Experience of having successfully completed similar works during last 7 years ending last day of month previous to the one in which applications are invited should be either of the following: -
  - a. **Three similar completed works costing not less than the amount equal to 40% of the estimated cost. or**
  - b. **Two similar completed works costing not less than the amount equal to 50% of the estimated cost. or**
  - c. **One similar completed work costing not less than the amount equal to 80% of the estimated cost.**
3. Definition of “similar work”.  
Similar work means execution of HT/LT Panel/ 11kV/433V Transformer installation work in educational institution/Private/Public sector.  
  
In addition to above, the criteria regarding satisfactory performance of works, personnel, establishment, plant, equipment etc. may be incorporated according to the requirement of the Project.
4. The bidder should possess a valid Electrical Contractor’s license grade **EA or higher grade license** issued by Tamilnadu Electrical Licensing board. If he possesses any other license issued by other State Governments, the same has to be endorsed by Tamilnadu Electrical Licensing Board.
5. The tender value includes cost of Electricals and civil materials and all other related material required for completion of the work.
6. Time is the essence of the contract. Being a time bound project, the contractor should make all efforts to complete the work in time.
7. Even though the overall completion period is indicated as **120 days**, the work shall be completed progressively and handed over as per agreed split up schedule if any.
8. The tenderers are advised to visit the site and get themselves acquainted with the site conditions before submitting the offer.
9. Tender quantity is only approximate and liable for variation without entitling the tenderer to any compensation, till the total value of contract vary by more than 30% (thirty percentage).
10. Quoted rate shall remain valid for a period of 120 days from the date of tender opening for the release of work order and will be firm throughout the contract period of **120 days** or till completion of work, once awarded and no cost escalation is allowed on any account.

11. The item rate offered is for finished item of works and shall provide for the complete cost towards fuel, tools, tackles, plant & machinery, temporary works, labour, materials, levies, taxes, transport, lay-out, repairs, rectifications, maintenance till handing over, supervision, labour colonies, establishment, services, roads, revenue expenses, overheads, profits & all other incidentals etc., complete. Rate quoted shall include all royalties, terminal taxes, Octroi duties, Central or Provincial Excise Tax, Sales Tax and any other taxes leviable under the State or Central Government rules. NITT will not entertain any claim whatever in this respect. **The applicable GST can be reimbursed by NITT along with the running / final bill on production of documentary evidence by the agency for having paid the GST to the authorities concerned.**
12. Some changes are likely in the quantities furnished as well as in the layout, design and specifications of the work. The rates quoted shall be deemed to be inclusive of all such contingencies
13. **Liquidated damage :** Liquidated damage due to delay in completion of works shall be levied .In case of delay in completion of works beyond the contract period as stated in the work order penalty @ 0.5% of the total value of contacts /week and subject to maximum of 5%, of the total value of the contract will be levied.
14. The work shall be carried out as per drawings released then and there, Electricity act 2003 and its amendments BIS/CPWD specifications, standard code of practice and as per the instructions of Engineer-in-charge. The brief description of items of work is given in the bill of quantities. **Tenderer has to quote rates both in figures and in words for all the items given in the Bill of Quantities provided in the Price Bid.**
15. For any item of work not covered in Bill of Quantities, the rate will be arrived at based on the procedure given in CPWD manual.
16. Since the responsibility for the quality, workmanship and accuracy of any work being carried out under this contract lies with the contractor, the contractor should ensure that no work is done without the presence of contractor's representative at the work spot, whose strength depends on the value of contract awarded. The contract should arrange for surveying construction site at his own cost.
17. The decision of Engineer-in-charge shall be final and binding on the contractor regarding clarification of items in this tender schedule.
18. The works contract to be entered into with the successful tenderer will be governed by the CPWD Works Manual in force.
19. The contractor shall strictly adhere to various labour laws in force.
20. To safeguard the persons working at height in roof, wall etc., sufficient number of Industrial Safety nets shall be provided at tenderer's cost in appropriate level and locations. The working hand including Supervisors, Engineers should wear the personal protective items and safety measures such as helmets, safety belts, shoes, etc., before entering into working place.

21. The tenderer has to deploy adequate labour of required categories such as Electrician, Wireman, Foreman, Supervisor, Technically experienced, etc. so as to execute the works simultaneously in all areas of work.
22. Expertise labour and work experienced persons only to be engaged for specialized items of work like laying of cables ,erection of transformer, DGs, HT & LT panels, cable terminations and cable joint kit etc.
23. The contractor shall follow norms of NITT security system for movement of men & materials within the campus.
24. All the works shall be executed as per the standard specifications as provided in CPWD / BIS/Electricity act 2003 and its amendment.
25. All the materials to be used in the work and the nature of work shall conform to the respective CPWD & BIS and National Building Organization, Standard Specifications forming part of "DELHI STANDARD SCHEDULE OF RATES" specifications and shall be got approved by the Engineer-in-charge before actual incorporation in the work.
26. All materials brought by the Contractor for incorporation in the work shall be got inspected and approved by the Engineer-in-charge before they are incorporated in the work and submitted with bills.
27. All safety measures are to be followed during execution of work, particularly during blasting and only licensed blaster should be engaged for this purpose. Sufficient care shall be taken by the contractor during excavation to avoid damages to the buried pipe lines, cables and other infrastructure if any etc. Controlled blasting including muffling can be carried out with prior permission from safety department. Damages caused if any shall be rectified at contractor's risk and cost.
28. The contractor should extend fullest co-operation with the third party agencies engaged, if any by NITT, to adhere the Quality Control Procedures ensuring quality.
29. The contractor should extend full co-operation to the other contractors who may be doing other works in the same areas to enable them to execute their portions of work without any delay or difficulty.
30. Tenderers are requested to furnish the duly filled in payment format attached as separate sheet along with a cancelled cheque leaf to accept Electronic fund transfer / R T G S transfer for any payment from NITT, Trichy.
31. No advance / mobilization advance will be given.
32. LD/penalty clause applicable as per CPWD works manual in force.
33. NITT reserves its right to reject a tender due to unsatisfactory past performance in the execution of a contract awarded against a different Tender.
34. The tenderer has to ensure payment of Minimum Wages as per Central rules and Minimum Wages as applicable under law from time to time.

35. Also the labourers shall be paid a minimum bonus which shall be 8.33% as per the payment of Bonus Act 1965 for the total wages paid.
36. The Contractor shall have to remit EPF & ESI contributions at the rates applicable under law to the authorities concerned for the total wages paid / abide by BOCW Act / Coverage in Group Insurance Scheme / All Risk Policy.
37. Rate for each item should be quoted in FIGURES and in WORDS. In case of any difference in the rates quoted in figures and in words, the lower of the two rates will be taken as the tendered rate. Unit rate quoted shall be the basis for arriving the total value of the tender. The total amount for every item shall be arrived by multiplying the unit rate with the quantity indicated for that item. In case of any arithmetic deviation is noticed in the total amount, the same will be corrected and evaluated by taking unit rate as basis and multiplying with the quantity indicated.
38. Tenders received after the due date and time of opening, will not be accepted.
39. The contractor's responsibility under this contract shall commence from the date of receipt of the LOI by the tenderer. The scheduled period of completion for this work is as mentioned in page No. 01, and the Contractor will have to plan his work accordingly.
40. Generally, the maintenance period for any work under NITT will be SIX (6)MONTHS from the date of completion
41. All the documents shall be duly signed with seal in all pages and placed in a common sealed cover duly superscripting the **Name of Work, Tender reference & Date of opening** and submitted.
42. Tenderer should furnish the RATE in the enclosed tender "Price Bid" and shall be duly signed with seal in all pages and placed in a separate sealed cover duly superscripting the cover "PRICE BID".
43. The Separate cover for the Demand Draft towards Document cost shall be placed in a separate cover duly superscripting the cover "EMD Bid"
44. The complete tender document consisting Technical qualification details but excluding price bid shall be placed in a separate cover duly superscripting the cover "Technical Bid". Tender without EMD or document cost will be rejected.
45. Totally there will be 3 Separate sealed covers. One cover containing Document cost, EMD and another cover containing the tender documents containing Technical Qualifications and the other containing the "Price Bid" both the contents duly signed with seal in all pages.
46. The above 3 Covers shall be placed in a Common Sealed Cover and submitted before the said due date as given above superscripting the tender No. & Date and Due Date.
47. Any deviation to this tender terms & condition and schedules of this tender will cause total rejection of the offer submitted
48. Incomplete offers will become liable for rejection.

49. Tender addressed to **The Director, NIT, Tiruchirappalli-620 015** will be received up to 15.00 Hrs **at the office of the Registrar** as per the schedule of tender notice and will be opened at 15.30 Hrs in the presence of those who may choose to attend the tender opening.

50. Tender submitted by post should be sent superscripting “**Register Post with Acknowledgement Due**”. These should be posted with due allowance for any postal delay. Tender received after due date and time of opening tenders, will be rejected and NIT, Trichy will not be responsible for any postal delay or tender may be put into tender box.

**51. Earnest Money Deposit:**

Earnest Money is to be paid by each tenderer to ensure that the tenderer does not refuse to execute the work after it is awarded to him. Shall also be furnished in the form of **Demand Draft** in favor of The Director, NIT Tiruchirappalli. EMD in any other form will not be accepted. The rate of earnest money deposit shall be as under:

Works costing upto Rs. 1 lakh 1% of the Estimated cost put to tender

Works costing more than Rs.1 lakh 2% of the Estimated cost put to tender

EMD by the Tenderer will be forfeited if,

EMD of the successful and unsuccessful contractor shall be refunded immediately after finalization of the contractor. EMD shall not carry any interest.

**51. Performance guarantee**

(1) The successful tenderer, hereafter referred to as the contractor, shall deposit an amount equal to 5% of the tendered and accepted value of the work (without limit) as performance guarantee in the forms of:

**Banker’s Cheque/Demand Draft/A Scheduled Bank**

(2) The time allowed for submission of the performance guarantee by the contractor shall be decided by the NIT approving authority for a period ranging from 4 to 15 days of issue of the letter of acceptance, depending upon the magnitude and/or urgency of the work. A sample copy of the letter of acceptance to the contractor for submission of the performance guarantee is given in Annexure-I.

- a) After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates.
- b) The tenderer does not commence the work within the period as per LOI / Contract. In case the LOI / contract is silent in this regard then within 15 days after award of contract.
- c) EMD given by all unsuccessful tenderers shall be refunded normally within fifteen days of acceptance of award of work by the successful tenderer.
- d) EMD shall not carry any interest.
- e) Security Deposit on estimate cost/Tender Value

**52. Security deposit**

(1) The security deposit shall be collected by deductions from the running bill of the contractors at the rate of 2.5% of the gross amount of the bill shall be deducted from each running bill as well as final bill of the contractor.

(2) The security deposit shall be refunded to the contractor after successful completion of maintenance period of six months. The refund of security deposit and performance guarantee will not carry any interest.

53. National Institute of Technology will not be bound by any power of attorney granted by the tenderer or by changes in the composition of firm made subsequent to the execution of the contract. They may however recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contract concerned.
54. If the tenderer deliberately gives wrong information in his tender or creates conditions favourable for the acceptance of his tender, NITT reserves the right to reject such tender at any stage.
- The expenses for completing and stamping the agreement shall be paid by the contractor.
55. Tenderers shall not increase their quoted rate in case NITT, negotiates for reduction of rate. Such negotiation shall not amount to cancellation or withdrawal of the original offer and the rate originally quoted shall be binding on the tenderers for a period of three months from the date of opening of tenders.
56. Canvassing in any form in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection
57. All entries in the tender documents should be in one ink. Erasers and over writings are not permitted. All cancellations and insertions should be duly attested by the tenderer concerned.
58. TENDERERS should fill in all the required particulars in the blank spaces provided for this purpose in the tender documents and also sign each and every page of Tender Documents including the drawings attached there to, before submitting their tender.
59. Conditional and Un witnessed tenders, tender containing absurd rates and amounts tenders which are incomplete or otherwise considered defective and tenders not in accordance with the tender conditions laid down by the Accepting Officer are liable to be rejected.
60. Tenders not submitted on the prescribed form are liable to be rejected.
61. This tender notice shall be deemed to form an integral part of the contract to be entered into for this work.
62. The tenderers are advised to go through the condition stipulated in Tender document & code of conduct for 'Safety of Contract Labourer' in details. Any violation thereof will invite punitive action being taken against them. While quoting the rate all the above factors are to be taken into account.
63. **Agency registered with NSIC/MSME is exempted from payment of tender document cost & Earnest Money Deposit but required to attach the attested copy of registration indicating the company name, address, registration number, validity & product for which registered in the technical bid,. Any deviation in the certificate on product or validity or name of the company tendering, will attract rejection resulting non-opening of respective price bid.**
64. **Payment Terms :** Payments will be made in 45 days after satisfactory completion of service if the documents are in order .

## **67. Compensation for Delay:**

If the contractor fails to maintain the required progress or to complete the work and clear the site on or before the contracted or extended period of completion, he shall, without prejudice to any other right or remedy of the NITT on account of such breach, pay as agreed compensation an amount calculated as stipulated below or such smaller amount as may be fixed by the NITT on the contract value of the work for every week that the progress remains below or that the work remains incomplete. This will also apply to items or group of items for which separate period of completion has been specified.

For this purpose the term 'Contract Value' shall be the value at contract rates of the work as ordered and the compensation for delay is by way of recovery at 1 percent of contract value per week of delay provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the contract value or of the contract value of the item or group of items of work for which a separate period of completion is given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the NITT.

## **68. Arbitration :**

Except where otherwise provided for in the contract all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions hereinbefore mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the work or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the sole arbitration of the Director of NITT and if Director is unable or unwilling to act, to the sole arbitration of some other person appointed by the Director, willing to act as such arbitrator. The cases referred to arbitration shall be other than those for which the decision of the Estate Officer / Engineer-in-charge is expressed in the contract to be final and conclusive. There will be no objection if the arbitrator so appointed is an employee of NITT and that he had to deal with the matters to which the contract relates and that in the course of his duties as such he had expressed views on all or any of the matters in dispute or difference.

The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason, Director as aforesaid at the time of such transfer, vacation of office or inability to act, shall appoint another person to act as arbitrator in accordance with the terms of the contract. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor. Subject as aforesaid the provision of the Arbitration & Reconciliation Act, 1996 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

It is a term of the contract that the party involving arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute.

The arbitrator(s) may from time to time with consent of the parties enlarge the time for making and publishing the award.

The work under the Contract shall, if reasonably possible, continue, during the arbitration proceedings and no payment due or payable, to the Contractor shall be withheld on account of such proceeding.

The Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the Parties fixing the date of first hearings. The arbitrator shall give a separate award in respect of each dispute or difference referred to him. The venue of arbitration shall be such place as may be fixed by the Arbitrator in his sole discretion. The award of the arbitrator shall be final, conclusive and binding on all parties to this contract.

In the event of disputes or differences arising between one public sector enterprise and a Govt. Department or between two public sector enterprises the above stipulations shall not apply or its amendments for arbitration shall be applicable.

**69. Force Majeure clause:** If at any time during the continuance of this contract the performance in whole or in part by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine, restrictions or acts of GOD (hereinafter referred to as events) then provided notice of happening of any such events is given by either party to other within twenty one days from the date of occurrence thereof neither party shall reason of such events be entitled to terminate this contract nor shall either party have any such non-performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by reason or any such event claims for extension of time shall be granted for period considered reasonable by NITT subject to prompt notification by the tenderer to NITT of the particulars of the events and supply to the NITT if required of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed to be a waiver of time in respect of remaining deliveries.

The correspondence exchanged against the tender from both tenderer and NITT through email are considered as valid document legally though it is not signed. It is treated as valid confirmations made on behalf of the respective company and very much comes under the legal ambit of the business transaction and hence it is binding on both the parties to the business.

Any transaction pertaining to the tender from both the parties of business done round the clock irrespective of the office or business hours of the companies, are valid legally and binding on both the parties. This applies to the extent only in such cases where deadline time for transaction is not specifically declared by either or both the parties to the business.

In case Letter of Intent (LOI) is issued through email, the PC generated time and date of mail shall be construed as the official time and date of release of LOI. In as much as this date is within the last date of validity given by the tenderer the LOI is said to have been issued within the validity period and shall be binding on both the parties to the business.

Tenderers participating in the tender should declare in their technical bid that whether they have been black-listed / kept on hold for a specified period / given Business holiday for a specified period by any Public sector undertaking or Government departments. The reasons for such action with details and the current status of such hold shall be clearly furnished to NITT. If no such details are mentioned in the offer then it will be construed that the subject tenderer is not under any such hold. But at a later date if it comes to the notice of NITT about any such hold under enforcement on the subject tenderer, NITT will have every right to reject the offer of such vendors at any point of time and also under any stage of the finalization of the subject tender irrespective of the status of the subject tenderer in that tender. Such tenderers will not be permitted to participate in the further tender proceedings and will be communicated suitably. They will not be also considered for any ongoing tenders even if participated till the hold is officially lifted and confirmed in writing.

70. **Undertaking regarding EPF provision :** "I.....  
 .....Son of.....  
 .....Resident of..... hereby give an undertaking that  
 \* I/We have employed only ..... persons in our establishment and hence the EPF and Miscellaneous provisions Act, 1952 is not applicable to my /our establishment.  
 \* I/ We have registered as per the EPF and Miscellaneous provisions Act, 1952 and our registration no is ..... We undertake to keep it valid during the currency of contract.  
 In case at any stage, it is found that the information given by me is false / incorrect, NIT shall have the absolute right to take any action as deemed fit/without any prior intimation to me".  
 \* strike out whichever is not applicable.

## **GENERAL CONDITIONS OF CONTRACT**

1. No night work will be permitted without the written permission of the Engineer – in – charge.
2. Items of work other than those mentioned in the Bill of Quantities (Tender Schedule) attached hereto will be carried out at the rates to be fixed by this organization as per relevant clauses of CPWD Works Manual.
3. Permission for erection of temporary work sheds etc., at site will have to be obtained from NITT in writing in advance.
4. The works contract to be entered into with the successful tenderer will be governed by the CPWD works Manual 2012 or the latest in force.
5. The successful tenderer / Contractor shall observe all safety regulations and take necessary safety precaution as called for and Safety Precautions enclosed herewith.
6. In all matters of dispute, the decision of the Director, National Institute of Technology, Tiruchirappalli -620 015. Shall be final and binding on the tenderer / contractor.
7. Some changes are likely in the quantities furnished as well as in the layout, design and specifications of the work. The rate quoted shall be deemed to be inclusive of all such contingencies.
8. All the materials to be used in the work and nature of work shall conform to respective CPWD, BIS and National Buildings Organisation Standard Specifications and shall be got approved by the Engineer – in – charge before actual incorporation in the work.
9. All materials brought by the Contractor for incorporation in the work shall be got inspected and approved by the Engineer-in-charge before they are incorporated in the work
10. Engineer in charge / Civil or his duly authorized representative shall have all reasonable times access to Contractor’s premises of work and shall have the power at all the reasonable times to inspect and test any portion of the work or examine the materials and workmanship

**CONTRACTOR**

13

**ACCEPTING OFFICER**

of the structures during their manufacture and test. The contractor shall give due notice in writing to the Inspecting Engineer of NITT when the materials supplied to be incorporated in the work are ready for Inspection and test. No material shall be incorporated in the work until the inspecting Engineer certified in writing that such materials have been inspected and approved by him or else the rejected material should be removed from site immediately.

11. The Contractor shall closely scrutinize all the drawings issued in connection with the work by this organization and bring to the notice of the Engineer-in-charge if any discrepancies, omissions in the drawings before undertaking the actual work pertaining thereto.
12. The contractor should submit in advance every fortnight a detailed programme of work to be undertaken from time to time strictly in conformities with the “Time and Progress Chart” covering the entire constructed work and reschedule them wherever necessary during the progress of the work so as to achieve the target set.
13. The contractor should extend full co-operation to the other contractors who may be doing other works in the same areas to enable them to execute their portions of work without any delay or difficulty.

## **GENERAL SAFETY PRECAUTIONS TO BE FOLLOWED AT WORK SITE DURING EXECUTION**

The following safety measures should be strictly adhered to, during execution of works at sites.

1. Providing the working platform with toe board and handrail for continuous working at heights.
2. Providing safety belt and life line at all times for men working at heights.
3. Providing dust or fume respirator in places where dust and fume concentration exists.
4. Providing goggles and welding screens.
5. Providing acid and alkali proof rubber gloves for handling acid and alkali and chemical which are corrosive.
6. Providing rubber gloves for working on electrical works.
7. Ensuring proper lashing of the components while being transported in vehicles.
8. The vehicles must have side supports or have body to support the materials conveyed.
9. The materials should not be allowed to extend or overflow the sides of the vehicles.
10. Materials should not be allowed to overhang from the rear edge of the body of the vehicle.
11. Driver of the vehicle must possess license.
12. Vehicle must not be overloaded prescribed limits.
13. Red flags and lights for parts projecting from the body of vehicle must be provided.
14. The speed restrictions within the Institute must be strictly adhered to.
15. The gas cylinders must be always handled on trolleys or kept tied down not in use. They should never be rolled as Roller for conveying.

16. Cylinders should not be used without regulators.
17. All excavations must be barricaded and red lamps must be provided.
18. All electrical connections must be properly earthed.
19. Providing helmet, safety belt, etc., for high level work and sufficient number of Industrial Safety nets at appropriate level to safeguard the persons working at high level particularly in roofing etc.,
20. All personal protective equipment conform with standard specification and Contractor including their sub-contractors, agents and labour engaged on the work are required to scrupulously adhere to the safety regulations, safety precautions and measures. Any violation thereof will invite punitive action being taken against them. Also contractors with frequent violations of safety regulations will not be entrusted with further work in this organization.

## **SAFETY PRECAUTIONS TO BE OBSERVED WHILE TRANSPORTING MATERIALS**

### **I. VEHICLE**

1. Vehicles carrying material should have proper registration documents and must be produced on demand by our Security Staff.
2. The light on right side, i.e., over the driver's cabin shall be in working condition.
3. Both the head lights as well as park lamps must be in working conditions.

### **II. MOVEMENT OF VEHICLE**

1. The vehicle should not travel at more than 20 km.ph in our premises.
2. The Driver of the vehicle must possess heavy duty license and produce on demand by the Security Staff.
3. Vehicles carrying inflammable liquids in the tank containers should have grounding chain or the tank should be coated with insulating material also to avoid Static Electricity.
4. In road junctions, speed breakers and railway crossing, the speed should be lowered and vehicle should proceed cautiously.
5. The driving should 'KEEP TO THE LEFT' at all places.
6. The vehicle should not be parked in road which could obstruct the vehicular traffic.
7. No person other than driver should be allowed to sit or stand on the prime mover or trailer.
8. The vehicle should pass only through the approved routes. Short cuts should be forbidden.

9. There must be a safe distance behind another moving truck.
10. The driver should avoid making quick starts, jerky stops or quick turns at excessive speed.

## **TERMS AND CONDITIONS REGARDING COMPLIANCE WITH VARIOUS LABOUR LAWS BY THE CONTRACTORS FOR NITT**

1. The Contractor shall not employ in connection with the work any person who has not completed 18 years of age.
2. The Contractor shall in respect of labour employed by him either directly or through subcontractors, comply with or cause to be complied with the following statutory provisions and rules and in regard to all matters provided therein.
  - a) The Contract Labour (Regulation & Abolition) Act 1970
  - b) The Minimum Wages Act 1948 and related Central Rules.
  - c) The Payment of Wages Act 1936 and related Central Rules.
  - d) The Employee's Provident Fund & Miscellaneous Provisions Act 1952.
  - e) The Employees State Insurance Act 1948.
  - f) The Workmen Compensation Act 1923.
  - g) The Industrial Disputes Act 1947.
  - h) The payment of bonus act 1965And any other law or modifications to the above or to the Rules made thereunder from time to time.
3. The Contractor employing 20 or more workmen is required to obtain license from the authorities (The Deputy Chief Inspector of Factories / Assistant Commissioner of Labour as the case may be). The license shall be amended and / or renewed wherever, there is an increase in the workmen employed by him or in the event of contract being extended or renewed. The Contractor shall inform the license number to the NITT Management before taking up the work.
4. The Contractor (Licensed or unlicensed) shall promptly furnish every information and document required by NITT authorities for the purpose of fulfilling their obligations as Principal Employer and shall render all necessary assistance for the same.

## **WAGES**

5. The Contractor shall pay wages to the workmen employed by him at the rate which shall not be less than the minimum wages applicable under Law from time to time.
6. The Contractor shall fix wage periods in respect of which wages shall be payable. No wage period shall exceed one month.

7. The Contractor shall ensure payment of wages to the contract labour employed by him within three days from the end of wage period in case the wage period is one week or a fortnight and in all other cases before 7<sup>th</sup> day of the following month.
8. All Payment of wages shall be made on working days at the work site and during the working time and on date notified in advance. In case the work is completed before the expiry of the wage period final payment shall be made within 48 hours of the last working day.
9. Where the employment of any worker is terminated by or on behalf of the Contractor, the wages earned by him shall be paid before the expiry of the second working day from the day on which his employment is terminated.
10. Wages due to every worker shall be paid to him direct or to the person authorized by him in this behalf. All wages shall be paid in current coin or currency in both.

#### **REGISTERS & RECORDS: -**

11. The Contractor shall maintain all registers and records in the proper manner and as required by the regulations of the various authorities concerned and indemnify the Employer from the consequences due to any inaccurate or faulty documentation on the part of the Contractor.

#### **POST TECHNICAL AUDIT OF WORK AND BILLS:-**

12. NITT reserves the right to carry out the post-payment Audit and technical examination of the work and final bill including all supporting vouchers, abstracts etc., and enforce recovery of any sum becoming due as a result thereof in the manner provided in the presiding sub-paragraphs. Such recovery shall be enforced any time even after passing the final bill.

#### **SUBMISSION OF BILLS BY CONTRACTOR: -**

13. a) The contractor has to submit the bill in their Invoice form with GST No, Invoice Serial No and other details as per Annexure-2 in the Tender document.

b) The Contractor at the end of each month shall submit a bill in triplicate, if required, detailing the various items of work done during the month supported by the requisitions issued from time to time. The Contractor shall, once in every month, submit to the EO / EMD separately details of his claims for the work done by him up to and including the previous month which are not covered by his contract agreement in any of the following respects:

- a) Deviation from the items provided in the contract documents.
- b) Extra items / new items of work.

- c) Items in-respect of which rates have not been settled. He should in addition furnish a clear certificate to the effect that the claims submitted by him as aforesaid cover all his claims and that no further claims shall be raised by him in respect of the work done upto and including the period under report.

**PAYMENT OF BILLS:-**

14. All payments to be made to the Contractor, under this contract shall be by NEFT or RTGS within a reasonable time, after the certification of bills by the execution department.

**RECOVERY FROM CONTRACTOR:-**

15. Whenever under the contract, any sum of money, shall be recoverable from or payable by the Contractors, the same may be deducted from or any sum then due or which at any time thereafter may become due to Contractor under the contract or under any other contract with NITT or from his Security Deposit or he shall pay the claim on demand.

**CANCELLATION OF CONTRACT FOR CORRUPT ACTS:-**

16. NITT, whose decision shall be final and conclusive, shall without prejudice to any other right or remedy which shall have accrued shall accrue thereafter to NITT cancel the contract in any of the following cases and the Contractor shall be liable to make payment to NITT for any loss or damage resulting from any such cancellation to the same extent as provided in the case of cancellation for default,

If the Contractor shall:-

- a) Offer or give or agree to give to any person in NITT service any gift or consideration of any kind, as an inducement or reward for doing or for bearing to do or for having done or for borne to do any act, in relation to the obtaining or execution of this or any other contract for NITT service,

OR

- b) Enter in to a contract with NITT in connection with which commission has been paid or agreed to be paid by him or with his knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed in writing to NITT.

OR

- c) Obtain a contract with NITT as a result of ring tendering or by non-bonafide methods of competitive tendering, without first disclosing the fact in writing to NITT.

**CANCELLATION OF CONTRACT FOR INSOLVENCY ASSIGNMENT OF TRANSFER OR SUB-LETTING OF CONTRACT:-**

17. NITT, without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter to NITT shall cancel the contract in any of the following cases:

If the Contractor,

- (a) Being an individual or if a firm any partner thereof shall at any time be adjudged bankrupt or have a receiving order for administration of his estate, made against him or shall take any proceedings for liquidation or composition under any bankruptcy Act or assignment of his effects of composition or arrangement for the benefit of his creditors or purport to do so, or if any application made under any

Bankruptcy Act for the time being in force for the sequestration of his estate or if a trust deed be granted by him on behalf of his creditors

OR

- (b) Being a Company, shall pass a resolution or the Court shall make an order for the liquidation of its affairs, or a receiver or Manager on-behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or Manager,

OR

- (c) Assigns, Transfers, Sub-lets or attempts to assign, transfer or sub-let any portion of the work without the prior written approval of the NITT.
- (d) Whenever NITT exercise the authority to cancel the contract under this conditions, NITT may have the work done by any means at the Contractor's risks and expenses provided always that in the event of the cost of the work so done (as certified by Engineer in charge which is final and conclusive) being less than the contract cost, the advantage shall accrue to the NITT and if the cost exceeds the money due to Contractor under the contract, the Contractor shall either pay the excess amount ordered by Estate Maintenance Dept. or the same shall be recovered from the Contractor by other means.
- (e) In case the NITT carries-out the work under the provisions of this condition the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plants and/or labour provided by the NITT with an addition of such percentage to cover superintendence and establishment charges as may be decided by Estate Maintenance Dept., whose decision shall be final and conclusive.

**CANCELLATION OF CONTRACT IN PART OF FULL FOR CONTRACATOR'S DEFAULT:**

18. If the Contractor:

- (a) makes default in carrying out the work as directed and continues in that state after a reasonable notice from Engineer in charge or his authorised representative
- (b) fails to comply with any of the Terms and Conditions of the contract or after reasonable notice in writing with orders properly issued thereunder
- (c) NITT, may without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter to NITT, CANCEL the contract as whole or in part thereof or only such work order or items of work in default from the contract. Whenever NITT exercise the authority to cancel the contract

as whole or part under this condition NITT may complete the work at the contractor's risk and cost (as certified by Engineer in charge, which is final and conclusive) being less than the contract cost, the advantage shall accrue to the NITT. If the cost exceeds the moneys due to the Contractor under this contract the Contractor shall either pay the excess amount ordered by Estate Maintenance Dept. or the same shall be recovered from the Contractor by other means. In case the NITT carries out the work or any part thereof under the provisions of the conditions the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plant and/or labour provided by the NITT with an addition of such percentage to cover the superintendence and establishment charges as may be decided by the Engineer in charge, whose decision shall be final and conclusive.

#### **TERMINATION OF CONTRACT ON DEATH OF CONTRACTOR. :-**

19. Without prejudice to any of the rights or remedies under this contract, if the Contractor dies, or if the firm is dissolved or the company is liquidated, NITT shall have the option of terminating the contract without compensation to the Contractor.

#### **SPECIAL POWER TO TERMINATION:-**

20. If at any time after the award of contract, NITT shall for any reason whatsoever not require whole or any part of the work to be carried out the Engineer in charge shall give notice in writing of the fact to the Contractor who shall have no claim to any payment of compensation or otherwise howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the fore-closing of the work.

#### **LABOUR:-**

21. The Contractor shall remain liable for the payment of all wages or other moneys to his work-people or employees under the payment of Wages Act 1936, Employees Liability Act. 1938, Workmen's Compensation Act 1923 or any other Act or enactment, relating thereto and rules framed, thereunder from time to time.

#### **PRECAUTIONS AGAINST RISK:-**

22. The Contractor shall be responsible for providing at his own expense for all precautions to prevent loss or damage from any and all risks and to minimize the amount of any such loss or damage and for the necessary steps to be taken for the said purpose.

#### **23. Rate for additional item / substituted item:**

This will be as per the rate analysis based on the market rate for material and labour prevailing at the time of execution at place of work as ascertained by Engineer in charge raised to the overall tender percentage at which the work was awarded to cover overheads / establishment/ profit.

#### **24. Corrigendum / Amendment:**

It is tenderer's responsibility to watch for any corrigendum or amendment till the opening of a particular tender that will be posted only at NITT web site.

## **TECHNICAL SPECIFICATION**

### **1. Scope :**

- The equipment to be supplied under this specification is – 500 KVA, 11/0.433 KV outdoor, ONAN DYnII distribution transformer – 1 no.

### **2. Standard:**

- Transformers covered by this specification shall, unless otherwise specified be built to conform to the latest Indian Electricity Rules, wherever applicable and the requirements of latest issue of ISS: 1180 Level II and ISS 2026, CBIP Standards and other ISS (All as per latest issues).
- In the event of a conflict between the above standards and the stipulation laid down in the specification the later shall govern.

### **3. Rating and General Data:**

- Type: Core form, three phase oil immersed step down two winding distribution transformers.
- Rating: 500 KVA
- Number of Phase: Three.
- Frequency: Transformer shall be suitable for continuous operation with a frequency variation of: 3% from normal 50 Hz without exceeding the specified temperature rise.
- Type of cooling: ONAN
- Voltage Ratio:11/0.433 KV
- Vector Group Reference:DYn11

### **4. Connection:**

- The primary (HV) winding shall be connected in delta and the secondary (LV) winding star with vector group Dyn11. The neutral of the secondary (LV) winding shall be brought out to a separate insulated terminal. The size (Cross Section) of the neutral connection conductors and jumpers must be of same size as that of the phase connection conductors and jumpers and shall be properly supported and insulated.

## **5. Temperature Rise:**

- For winding 50°C (measured by resistance) and for top oil - 40°C (Measured by thermometer) when tested in accordance with IS: 2026/1977.

## **6. Terminal Arrangement:**

- H.V. - Bare outdoor bushings
- L.V. – Cable box suitable for connection of 3 nos. 300 sq.mm 3.5 C cables.

## **7. Tap changing Switch:**

- Off circuit tap changing switch shall be provided having the range of +5% to -10% in steps of 2.5 where switch position No.1 shall correspond to the maximum plus tapping. The tap position No. should be of increasing order at clock-wise direction, the top marking should be of engraved in nature. Provision shall be made for locking the tap switch handle at each position. The locking arrangement shall be such that padlock cannot be inserted unless required contacts corresponding to the tap position are correctly connected with full contact pressure. Mechanical backstops should be provided at the limiting tap position. The tap changing shall be effected by an external three-phase gang operated switch. The Operation shaft shall be brought out of the tank provided with a hand wheel so that it can be operated at standing height from ground level and shall be easily accessible. The tap changer handle should be fitted on the side wall of the transformer.
- The supplier must provide all information to establish the quality, make and type of tap changers to be used in the transformer with sectional drawings showing the size, arrangement and functioning of the contacts and tap switch. The sample of the tap switch used for different sizes of transformers and voltage grades shall have to be approved before using them in transformers, if called for.

## **8. Leads:**

- All leads of the windings, connection of the windings or their wires to one another, to terminal bushings or to a tap changer shall be properly insulated and covered with insulation sleeves. The soldering materials shall have higher melting temperature above 300°C and preferably above 400°C for better thermal endurance and mechanical strength. The tenderer shall specifically mention the method and materials to be used by them for lead connections.

## **9. Conductors: Copper.**

## **10. Tank:**

- Tank wall must be fabricated from tested quality of mild steel sheets of thickness minimum 4 mm. Top and bottom plate of the tank must be of minimum 5 mm. thick. It should be shaped so as to make welding to a minimum. All welding shall be done electrically and relieved of welding stresses. All seams shall be double welded (both outside & inside of tank) for absolute oil tightness. The tank wall shall be formed by stiffeners of structural steel for general rigidity and to dampen transformer noise. It shall also withstand partial vacuum as per latest CBIP manual against standard atmospheric pressure. Maximum Tolerance on the negative side of the steel sheets shall be 0.15 mm. Tank design shall be such that the core and coil assembly can be tanked or detanked freely and easily without dismantling LV bushing etc. The top cover plate should be slightly sloped towards HV side for non-accumulation of rain water / transformer oil.
- Inside wall of the tank and the M.S. Channel shall be painted with varnish or with hot oil resistance paint.
- The tank cover shall be bolted on to flanged rim of the tank with a weather proof, hot oil resistant, resilient gasket in between for oil tightness. If the gasket is compressible, metallic strips shall be provided to prevent over compression of the gasket. Access and inspection holes blanked with oil tight gasket sealed cover plate shall be provided for working on the connection of the lead of windings, the bottom terminals of bushings and the off load tap switch. Bushing turrets, cover of access holes, covers for pockets of thermometers and other devices shall be designed to prevent any ingress of rain water into the tank and the tank cover as a whole shall shed off all rain

water. All the gaskets including Gasket used between tap cover and tank flange shall be of neoprene rubberised cork sheet RC 70-C and shall be provided with watertight compound between the tank flange of the gasket. Top cover gasket & HV bushing gasket should be of minimum 6 mm thick. The gaskets should be of either Grind beck / Gujarat cork / Bharat corrob / Talbros / Cortica /any reputed make.

- The conservator shall be provided with oil level indicator, drain plug & oil filling hole with cover. Conservator pipe shall be welded on the top cover and should be projected at least 20 mm inside the bottom of conservator so as to create a sump for collection of impurities. The minimum oil level should be above the top of the HV bushing.
- The conservator oil level indicating portion (which contains oil) should be painted in White colour. The indicating portion of the glass should be of minimum 15mm width. The glass should be of transparent & non-sticky type so that the oil level can be easily seen from a distance of 8 meters.
- Inspection cover has to be provided on the top cover. The inspection cover shall be suitably elevated from the level of the top cover to prevent ingress of water into the tank. Air release plug has to be provided on inspection cover.

#### **11. Core:**

- The magnetic core shall be build of very low loss cold rolled grain oriented steel.
- The materials used for insulating the sheets shall have high interlamination resistance and rust inhibiting property. It shall not be deteriorated by from hottest operating temperature and clamped pressure of the core of disintegrates due to mechanical modes of core vibration. It shall not have the least tendency to absorb moisture or to react with the dissolved particles in the insulating oil thus accelerating sludge formation.
- The assembled core shall be securely clamped in the lines and in the uniform pressures so as to minimize the noise from the core. The tie rod & core bolt should be made of MS Bright rods having dia not be less than 16 mm.
- The core clamping frame shall be provided with lifting eyes for the purposes of tanking and untanking the active part of the transformers. The whole core shall be electrically connected by copper strip of adequate section to the core frame at two points for being eventually earthed through the tank to drain offelectrostatic potential that may be build up.

- The supporting frame work of the cores shall be so designed so as to avoid the presence of pockets which would prevent complete emptying of the tank through the drain valve or cause trapping of air during filling.
- Adequate provision shall be made to prevent movement of the core and winding relative to the tank during transport installation or while in service.
- The cores shall conform to:
  - IS: 3024 = 1965 Electrical sheet steel. &
  - IS: 649= 1983 method of test of steel sheet.
- Flux density at normal voltage & frequency shall not be more than 1.65 tesla. All the cores should be annealed rust free, of same grade & same thickness.
- Cores of *M3jM4* or better grade should be used. Suppliers should give the manufacturer's test certificate, Purchase Order copy, received challans j bill copy of core supplier at the time of inspection call definitely.
- Over flux in the core shall be limited to 12.5% to ensure that in the event of over voltage to the extent of 12.5%, the core does not get saturated.

## 12. WINDING:

- Transformer shall be provided with the requisite number of windings and shall be designed to withstand the electromechanical stress exerted under short circuit conditions as per ISS: 2026: 1977.
- Class "A" insulation shall be used. Wooden supports, if used, shall be well seasoned and compatible with hot transformer oil.
- The insulation level of the windings shall be as follows:

Voltage	Impulse Voltage (KV peak)	Short duration power frequency voltage (KV)
433	-----	3
11000	75	28

- The winding shall be so designed to reduce to a minimum the out of balance forces in the transformer at all voltage ratios.
- The winding shall also be designed such that all coils assemblies of identical voltage rating shall be interchangeable and repairing of the winding can be made readily without special equipments.
- Conformation to IS standards relating to conductors and insulation.

The following Indian standards specification shall govern the quality of conductor, covering insulation such as enamel, paper and insulating boards.

- (1) IS: 2067 - 1975: Wrought Aluminium Wire for electrical purposes.
- (2) IS: 4800 - 1968: Enameled round winding wire.
- (3) IS L 7404 (Pt- I & II) 1974: For paper covered copper conductor (round and rectangle)
- (4) IS: 1397 - 1967: Kraft paper
- (5) IS: 335 - 1983: New Insulating Oil.
- (6) IS: 1576 -1967
  - IEC: B-2.1}
  - IEC: B - 3.1}                      Solid press Board for electrical
  - IEC: B - 4.3}                      purposes.

**13. BUSHING:**

The bushings shall conform to IS: 2099 - 1962 (Latest): Bushing for alternating voltages above 1000 volts. The dimensions of bushings shall conform to IS: 3347.

The clearance in air between live and conductive parts and live conductive part to earthed structures shall be as follows:

**Clearance**

Nominal system voltage KV rms.	Test Voltage Impulse KVR	Phase to earth (mm)	Phase to earth (mm)	Arcing Horn Gap.
0.433	-	85	40	-
11	75	280	140	85

**14. Cooling Arrangement:**

- The transformer shall be suitable for loading of 100% continuous maximum rating with 'ON' cooling without exceeding the thermal limit.
- The transformer shall be fitted with cooling tubes bent and welded to tank or radiators consisting of a series of separate circular or ERW Elliptical tubes of Sec-57, or a pressed steel plate assembly

formed into Elliptical oil channels, welded at their top and bottom to the tank. In case of Pressed Steel Radiator no joints in between the radiator fins connecting pipe assembly is accepted.

- The radiator tubes shall be seamless, made of CRCA sheet having a maximum wall thickness of 1.5mm and a clean bright internal surface free from rust. They shall be suitably branched to protect them from mechanical shocks normally met in transportation and to damp the modes of vibration transmitted by the active part of the transformer in service.
- The manufacturer will have to provide wall surface area of tank & radiator cooling tubes separately as part of the guaranteed technical particulars. They have to give the oil temperature rise calculation with radiator size & pieces provided along with the cooling chart of the radiator of the same manufacturer are to be used.

## **15. Painting**

- The surface to be painted shall be made free from all rust and mill scale or foreign adhering mater of grease and all external rough surface cavities by shot blasting or other approved method.
- All steel surfaces in contact with insulating oil as far as accessible shall be painted with heat resistant, oil insulable, insulating varnish or paint.
- All steel surfaces exposed to weather shall be given a primary coat of Zinc chromate and two coats of dark admiralty gray paints.
- All paints shall be carefully selected to withstand tropical heat and extrimitics of weather. The paint shall not scale off or wrinkle or be removed by abrasion due to normal handling.
- All nuts and bolts used in the transformer for external fittings shall be galvanized or zinc passivated.
- All nuts and bolts used in the transformer for internal fittings i.e. in oil shall be painted.

## **16. Inspection:**

- After completion of work, completion plans have to be submitted by the Contractor as per CPWD specifications. In addition to this the contractor shall also prepare and submit necessary drawings, test certificates, other documents etc. for submission to the Central Electricity Authority or any other Electrical Inspector as the case may be for obtaining approval for energizing the installation. It shall

be the responsibility of the Contractor to liaison with/coordinate with such inspecting authority for obtaining the approval for the installation. Nothing extra shall be payable to the Contractor on this account. ~~However the Department shall reimburse any fees paid to the Inspecting authority on this account.~~

- The transformer may be stage inspected at the factory of the manufacturer. The manufacturer shall intimate in advance in writing to the purchaser about the stages of manufacture & subsequent readiness of the transformers to enable him to carry out stage inspection, final inspection and testing of the finished transformers.
- The stage inspection will be carried out at the discretion of the purchaser during the process of manufacturing of the transformers. The manufacturer need not stop the process of production because of programme of stage inspection of the Purchaser. While offering for final inspection the following point should invariably be taken care of:
  1. Nameplates should be welded / reveted on the tanks of the transformer. SL No. of the transformer should be welded to the main tank wall before inspection.
  2. The bolts connecting the top cover of the transformer with the tank at the two opposite corners are to be provided with holes at their lower portions which would go beyond nuts so that the transformers may be sealed by inserting sealing wire in these holes.
- The purchaser has got the right to have further tests carried out at any place including the testing at supplier's end, which may include cut-open test, winding resistance test, etc.
- **Contract Drawings:**

The General outline drawing giving details of dimensions and fittings should be submitted for the transformer.
- **Overload Capacity:** Each transformer shall be capable of carrying sustained overload as stated in ISS.
- **Transformer Oil:**

The oil shall be as specified in IS: 335-1993 and it shall be free from moisture and have uniform quality throughout. It shall be capable of withstanding BDV of 60KV at 2.5 mm gap moisture contain 5ppm. The transformer oil used should be new transformer oil of Apar/Savita/Raj or any reputed brand. Reclamation oil should not be used.

## **17. FITTINGS AND ACCESSORIES:**

1. Two earthing terminals of M12 size.
2. Oil level gauge indicating three positions of oil marked as follows

- i. Minimum at- 5°C
  - ii. Normal at- 30°C
  - iii. Maximum at- 95°C
- 3. Lifting lugs
- 4. Rating, diagram and terminal marking plate of AL etched.
- 5. Transparent type silicagel breather with aluminium end cover & oil cup.
- 6. Drain cum sampling valve
- 7. Filter valve
- 8. Platform mounting arrangement
- 9. HV bushing with arcing homo
- 10. LV cable box
- 11. Bi-metallic connector for both HV & LV
- 12. Filling hole having P-1 1/4" thread on conservator.
- 13. Thermometer pocket as per ISS.
- 14. Air release plug.
- 15. Conservator with fittings.
- 16. Off circuit tap switch
- 17. Cast iron roller
- 18. Explosion vents with air release plug
- 19. Inspection cover with air release plug
- 20. Stem type oil temperature indicator
- 21. SL No. of the transformer welded on the tank

### **SPECIAL CONDITIONS**

- 1.1. The work shall be generally carried out as per tender specifications and in accordance with the following:
  - CPWD General Specifications for Electrical works Part I Internal - 2005, as amended upto date.
  - CPWD General Specifications for Electrical works Part II External - 1994, as amended upto date.
  - CPWD General Specifications for Electrical works Part IV Sub-station- 2007, as amended upto date.
  - The Electricity Act 2003.
  - National Electrical Code.
- 1.2. The contractor shall carry out the work as per relevant Indian Electricity Rules 1956, amended up to date.

### 1.3. Completion of work:

1.3.1. The Engineer –in –Charge or his authorized representative shall carry out the final inspection of the installation. The contractor shall demonstrate trouble free functioning of the Installations. The system shall be put to beneficial use for 15 days before finally taking over by the department.

1.3.2. Documents to be furnished on completion of Installation:

Three sets of the following documents shall be furnished by the contractor on completion of the work.

- Installation drawing giving complete details of transformer.
- Wiring diagrams with all components.
- Manufacturer’s technical catalogues of all equipment and accessories.
- Maintenance manuals.

1.4 Inspection :

a) The major equipment like HT panel, RMU, Metering Kiosk and HT cable shall be inspected and tests witnessed at the factory by the Engineer-in-Charge or his authorized representative for whom advance intimation shall have to be given by the contractor for arranging the inspection.

b) After completion of work, completion plans have to be submitted by the Contractor as per CPWD specifications. In addition to this the contractor shall also prepare and submit necessary drawings, test certificates, other documents etc. for submission to the **Central Electricity Authority or any other Electrical Inspector** as the case may be for obtaining approval for energizing the installation. It shall be the responsibility of the Contractor to liaison with/coordinate with such inspecting authority for obtaining the approval for the installation. Nothing extra shall be payable to the Contractor on this account. However the Department shall reimburse any fees paid to the Inspecting authority on this account.

1.5 **Defect Liability Period:** All the equipment’s shall be guaranteed for a period of 24 months from the date of completion. Any defective materials and equipment shall be replaced free of cost at the direction of Engineer-in-Charge.

# NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI – 15

Web : [www.nitt.edu](http://www.nitt.edu)

Phone : 0431 –250 3840

**ESTATE MAINTENANCE DEPARTMENT/ELECTRICAL**



## TENDER DOCUMENT (PRICE BID)

Name of work : **Supply, Installation, Testing and commissioning of 500kVA transformer 11kV/433V to OPAL hostel.**

Value of Work : **₹ 17,65,929/-**

Tender Enquiry No : **23/18-19**

Period of Contract : **120 days.**

Tender Enquiry No : **[EMD/EE/AE\(E\)/tender notice//Enq.No:23/18-19](#)**

**SCHEDULE 'A'**  
**LIST OF WORKS AND PRICES**

**NAME OF WORK:**

DETAILS & QUANTITIES of each item of work shown in the BILL OF QUANTITIES are only approximate. They are given as a guide for the purpose of tendering only and are liable to variation and alteration of the Competent Authority. The work under each item as executed shall be measured and priced at the corresponding rate quoted by the contractor in the BILL OF QUANTITIES

Sl.No.	Description of work / supplied	Total amount of work (in figures and words) Rs. Ps.	Period of contract
1.	-----	----- Lakhs (Rupees ----- Lakh and -- ----- only)	----- MONTHS

**BILL OF QUANTITIES**

Sl. No.	Appx. Qty.	Description of work	TNBP No.	Rate (Both in Unit fig & Words)	Amount Rs. Ps.
---------	------------	---------------------	----------	---------------------------------	-------------------

AS PER SEPARATE SHEETS ATTACHED CONTAINING 2 PAGES

FROM SERIAL No. 25 to 27

Contract Agreement No.....

**TENDER**

To

The Director,  
National Institute of Technology  
TIRUCHIRAPPALLI –620 015.

I / We hereby offer to carry out the work of

I / We hereby carefully perused the following documents connected with the above noted work and agree to abide by the same.

- 1.Specifications (General & Particular )
- 2.Drawings
- 3.Schedule ‘A’,
- 4.Bill of Quantities
- 5.CPWD works Manual in force.

I / We forward herewith the sum of Rs.....as Earnest Money, which shall be refunded should this tender be rejected. I / We further agree to deposit such sum which along with the sum of Rs.....mentioned above shall make up 50% of the fully Security Deposit for this work as provided for under conditions of the NATIONAL INSTITUTE OF TECHNOLOGY General Conditions of Contract.

I / We further agree to execute all the work referred to in the said documents upon the terms & conditions contained or referred therein and as detailed in Schedule ‘A’ and Bill of Quantities thereto and to carry out such deviations as may be ordered, vide conditions of the NITT upto a maximum of 30% of the tendered amount of Rs.....

I / We further agree to refer all disputes, as required to the sole arbitration of an Officer, to be appointed by the Director, NITT., in his sole discretion whose decision shall be final and binding.

**WITNESS**

Signature of the Contractor

Date :

1. ....

2. ....



## SCHEDULE OF WORK

State Tamilnadu  
Branch Electrical

Division EMD  
Sub-Division EMC

Name of Work : Supply, Installation, Testing and commissioning of 500kVA transformer 11kV/433V to OPAL hostel.

ITEM No	SUB-HEADS AND ITEM OF WORK	QUANTITY	UNIT	RATE (Rs)	RATE (In Words)	AMOUNT(Rs)
1	EARTHING					
1.1	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	4	Set			
1.2	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	25	Metre			
1.3	Supplying and laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)	45	Metre			
1.4	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	20	Metre			
	Sub-Total					
2	MV CABLE LAYING					
2.1	Laying and fixing of one number PVC insulated and PVC sheathed/ XLPE power cable of 1.1 KV grade of following size on wall surface as required.					
2.1.1	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	20	Metre			
2.2	Supply and laying of following size Double walled Corrugated High Density Polyethylene pipe having corrugation on the outer wall and plain surface inner wall conforming to IS 14930 part- I and part -II complete with necessary HDPE fitting for protection and laying of 1.1 KV grade underground cable directly in ground at a depth 75cm including excavation and refilling the trench etc. as required.					
2.2.1	Size: 120mm/103.5mm (OD/ID)	80	mtrs			

ITEM No	SUB-HEADS AND ITEM OF WORK	QUANTITY	UNIT	RATE (Rs)	RATE (In Words)	AMOUNT(Rs)
	Sub-Total					
3	HT CABLE LAYING					
3.1	Laying of one number additional PVC insulated and PVC sheathed/ XLPE power cable of 11 KV grade of following size direct in ground in the same trench in one tier horizontal formation including excavation, sand cushioning, protective covering and refilling the trench etc. as required.					
3.1.1	Above 120 sq. mm and upto 400 sq. mm	20	Metre			
	Sub-Total					
4	MV CABLE JOINTING & END TERMINATION					
4.1	Supplying and making outdoor end termination with cast resin compound including aluminium lugs and other jointing materials for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.					
4.1.1	3½ X 240 sq. mm	10	Each			
	Sub-Total					
5	HV CABLE JOINTING & END TERMINATION					
5.1	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required.					
5.1.1	240 sq. mm	2	Each			
	Sub-Total					
6	SUB-STATION EQUIPMENT'S AND ERECTION WORKS					

ITEM No	SUB-HEADS AND ITEM OF WORK	QUANTITY	UNIT	RATE (Rs)	RATE (In Words)	AMOUNT(Rs)
6.1	<p>a. Supply and Installation, testing and commissioning of following 11KV/433V 3 phase, 50 cycles, ONAN type cooled core type transformer double copper wound for voltage ratio between phases at no load as specifies below and arranged for <math>\square</math>/Y connection as per Vector Group Ref. DYn 11 with the natural bought out on star side on the existing plinth as per site condition including plinth re-arrangement.</p> <p>b. The Transformer shall be contained in mild steel radiator cooled tank and shall in general confirm IS: 2026/1977. The temperature rise as measured in oil by thermometer shall not exceed 50deg.cel.max. and of winding by measurement of resistance shall be 55 deg.cel.max. over an ambient of 50 deg.cel.max.</p> <p>c. Tapings will be on HV windings to obtain HV variation to maintain consistent LT voltage as mentioned below. The tapings will be controlled by OFF CIRCUIT TAP SWITCH shall be finished with standard ENAMEL PAINT of a shade corresponding to No. 632 of IS:5/1978. Transformer should be supplied with the first fill of transformer oil as per IS: 335/1983. Tapping range: +5% To -10% in 2.5 steps of through an OFF CIRCUIT TAP SWITCH</p> <p>d. Fitting and Accessories : Rating and diagram plate, Earthing terminals – 2 nos, Lifting lugs, OT/WT chamber, Air release hole with plug, Oil filling hole with plug on conservator, Dehydrating Breather, Oil level indicator (plain), Ext. operated OFF CIRCUIT TAP SWITCH, Drain cum bottom filter valve with plug, Oil conservator with drain plug, Filter valve with plug – 1No. (Top), Jacking lugs, Inspection cover, Pressure relief valve, Under base skids with flat treaded rollers, Radiators: L.V. ADDITIONAL NEUTRAL – 1 No. solid porcelain Outdoor bushing without cable socket, H.V. Terminals – Suitable for Bushing, L.V. Terminals - Suitable for Cable Box, Additional accessories: Oil Temperature Indicator. Including Drawing charges, Completion certificate, inspection and Safety certificate. Make: Kirloskar/Siemens/Indo tech.</p>					
6.1.1	SITC of 500kVA Transformer, 11kV/433V as per IS 1180, oil filled copper wound with OFF CIRCUIT TAP SWICH. Tapping +5% to -10% in 2.5 steps. Conforming IS 1180, HV: Cable Box and LV: Cable box with OT/WT Chamber	1	each			
	Sub-Total					
7	Supplying of Cables.					

ITEM No	SUB-HEADS AND ITEM OF WORK	QUANTITY	UNIT	RATE (Rs)	RATE (In Words)	AMOUNT(Rs)
7.1	Supplying of following size ISI marked PVC insulated and PVC sheathed aluminium grade with armoured as required.(Make:Finolex,Gloster,Polycab and Havells with 18 months warranty from the date of supply)					
7.1.1	3½ X 240 Sq mm	105	Metre			
	Sub-Total					
	Total					