

SUPPLY OF 2000KVA &1750 KVA TRAFO AT TERNA PUBLIC CHARITABLE TRUST, NERUL

TERNA PUBLIC CHARITABLE TRUST

NAVI MUMBAI -400706

TENDER DOCUMENT

FOR

SUPPLY OF 11/0.415 KV, 1750KVA & 2000KVA DRY TYPE TRANSFORMER

AT

TERNA PUBLIC CHARITABLE TRUST

PLOT N0.12, SECTOR 22, OPP NERUL RAILWAY STATION,

PHASE-2, NERUL WEST, NAVI MUMBAI,

MAHARASHTRA -400706

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Notice Inviting Tender

Terna Public Charitable Trust invites tenders for **Supply of 11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformer in Terna Public Charitable Trust Premise at Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai- 400706** from the original equipment manufacturers of Transformers i.e. Telawne, Kirloskar, Crompton Greaves make.

Accordingly, the tenderers are requested to submit their lowest quotation in the attached Tender Document comprising of Tender Document – Part I (Technical Bid) and Tender Document – Part II (Price Bid) duly filled in and signed on each page. Every page of the Tender Document shall be duly filled, signed and submitted.

The address of CEO is: **Terna Public Charitable Trust, Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai- 400706 (Tel No. +91 22 6157 8300)** and the tender document can be downloaded from the website < www.terna.org/tender.htm >.

The Technical Bid along with requisite DD towards Earnest Money Deposit (EMD) and Price Bid shall be submitted in two separate sealed envelopes superscribing “**Supply of 11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformer in Terna Public Charitable Trust Premises at Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai- 400706.– Part I (Technical Bid)**” and “**Supply of 11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformer in Terna Public Charitable Trust Premises at Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai- 400706.– Part II (Price Bid)**” respectively. Both the sealed envelopes should be sent in a common envelope superscribing “Tender Document for **Supply of 11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformer in Terna Public Charitable Trust Premises at Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai- 400706 – Part I and II**” and shall be sent at the above mentioned address of the office of the CEO so as to reach us on or before **03:00 PM of 15th Jan., 2016**. Late tenders will not be accepted and are liable to be rejected.

The above quotation will be subject to various terms and conditions given in the Tender Document. The tenderers are requested to visit the site to acquaint with site conditions and type of supply involved.

The pre-bid meeting will be held at **12:00 noon of 8th Jan., 2016** in the office of the CEO, TERNA PUBLIC CHARITABLE TRUST at the above said address in Mumbai with all the tenderers in order to get acquainted with the nature of supply and related issues. Tenderers/ their representatives are requested to be present during the pre-bid meeting. The Tenderers are requested to mail the queries two days prior to the pre-bid meeting. The pre-bid queries should be mailed to Shree. Santosh Deodhar (email ID: santoshdeodhar@ternatrust.org) and Shree. Ashok Mate (email ID: ternainfra@gmail.com). Any change in the Tender Document pursuant to the pre-bid meeting will be communicated to all the tenderers and all such correspondence in this regard will form part of the Tender Document.

No extra sheet or extra conditions should be attached with the Tender Document. **Conditional tenders will be summarily rejected and the tender may not be considered for evaluation.** Any doubt or clarification may be clarified from the officer-in-charge during pre-bid meeting before submitting the Tender Document.

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The validity of tender will be 180 days from the date of opening of the Price Bid.

Please note that Terna Public Charitable Trust reserves the right to reject any or all the tenders without assigning any reason thereof.

Signature :
Name of the Tenderer :
Date / Place :
Seal :

Tender Summary

Sr. No.	Particulars	Details
1	Nature of Supply	Supply of 11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformer in Terna Public Charitable Trust Premises at Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai-400706
2	Site of Supply	Terna Public Charitable Trust Premises at Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai-400706
3	Stipulated dates	
	Date and time of Pre-Bid	12:00 Noon of 8 th Jan., 2016
	Last date and time of submission of Tender Document	3:00 PM of 15 th Jan., 2016
	Opening of Tender	4:00 PM of 15 th Jan., 2016
	Validity of Tender	180 days from the date of opening of Price Bid
4	Time period of Delivery	Within 75 days from the date of receipt of purchase order
5	Earnest Money Deposit (EMD)	Demand draft for an amount equivalent to 1.5 % of the quoted tender amount drawn in favour of 'Terna Public Charitable Trust' payable at Mumbai.
6	Refund of EMD	(i) <u>To unsuccessful tenderer</u> : After award and acceptance of work by successful tenderer. (ii) <u>To successful tenderer</u> : After satisfactory completion of Commissioning work.
7	Defect Liability Period	1 year from the Date of Commissioning Work
8	Performance Guarantee	(i) Bank Guarantee for an amount @5% of purchase order value valid till the completion of DLP of 1 year issued by a Nationalized Bank as per the attached format in Annexure –I should be deposited as Performance Guarantee and has to be submitted by the successful tenderer before making the 1 st payment. (ii) Performance Guarantee will be released to the party after successful completion of DLP of 1 year.
9	Liquidated Damage	@ 0.25% of the value of purchase order per week subject to a maximum of 5%
10	Payment Terms	(i) 30% Advance against Techno commercial Order and separate Bank Guarantee of

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		<p>Nationalized Bank equivalent to Advance Amount as per the attached format in Annexure –II should be deposited as against 30% advance payment.</p> <p>(ii) 40 % of the certified value against Receipt of Supply of material.</p> <p>(iii) 15% of the certified value against successful installation, testing.</p> <p>(iv) 10% of the certified value against successful commissioning and handover.</p> <p>(v) 5% Retention Money, which will be paid after One Year of successful commissioning and Handover.</p> <p>The payments shall be released after recommendations of the Consultant & Client.</p>
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Signature :

Name of the Tenderer :

Date / Place :

Seal :

Form of Quotation

**The CEO,
Terna Public Charitable Trust,
Plot No.12, Sector-22,
Opposite Nerul Railway Station,
Phase.2, Nerul-West,
Navi Mumbai 400 076**

Dear Sir,

Sub:- Supply of 11 / 0.415 KV, 1750 KVA and 2000 KVA Dry Type Transformer in Terna Public Charitable Trust at Plot No.12, Sector -22, Opposite Nerul Railway Station, Phase-2, Nerul-West, Navi Mumbai.

We have examined the terms and conditions for the Tender Document-Part I (Technical Bid). We have also visited the sites where above work has to be carried out and acquainted ourselves with the nature of work involved. We have also got all clarifications in respect of the work during the pre-bid meeting. We hereby offer our quotations as specified in the Tender Document-Part II (Price Bid).

We have fully understood all the conditions made for the captioned work and have taken into account all the conditions while quoting the rates in the Tender Document-Part II (Price Bid). The bill of quantities in Price Bid has been read in conjunction with all the terms and conditions of Technical Bid.

A Demand Draft No._____ dated _____ drawn on _____ for an amount of **Rs._____/- (Rs. _____ only)** @ 1.5 % of quoted amount is enclosed herewith towards Earnest Money Deposit for the captioned work.

We are also aware that Trust reserves the right to reject any or all the quotations without assigning any reason whatsoever. As required by you, I/We am/are returning herewith Tender Document (Technical and Price Bid) duly signed by me/us at each page as a token of our acceptance of the provisions of the Tender Document.

In the event of this tender being accepted, I/we agree to undertake the work as specified in tender.

Signature :
Name of the Tenderer :
Date :
Place :
Seal :

General Terms and Conditions

1. The tenderer shall quote for only approved brands as specified in the Tender Document (i.e. Telawne, Kirloskar, Crompton Greaves only).
2. One tenderer shall quote for only one approved brand, in case of submission of more than one tender all the tenders of the particular agency shall be rejected.
3. The pre-bid meeting will be held on the stipulated date in the office of the Manager at the above said address in Mumbai with all the tenderers in order to get acquainted with the nature of works and related issues. Any change in the Tender Document pursuant to the pre-bid meeting will be communicated to all the tenderers and all such correspondence in this regard will form part of the Tender Document.
4. The tenderers are advised to enclose photocopies of all relevant documents duly signed on each page as mentioned in the list of testimonials and other required documents wherever required.
5. The tenderers are required to submit their full details along with requisite testimonials as mentioned in the tender. Incomplete Tender Document - Part I (Technical Bid) or Tender submitted without proper proofs for establishing their credentials may not be considered for Price Bid.
6. Each page of the Tender Document (Part –I and Part – II) shall be duly signed. The Tender Documents shall be signed by person / persons on behalf of the organization having necessary authorization / Power of Attorney to do so.
7. Tender Documents received after due date and time or incomplete in any respect are liable to be rejected.
8. Tender Document Part –I (Technical Bid) will be duly scrutinized before opening of the Price Bid. Terna Public Charitable Trust reserves the right to seek additional information or evidence thereof to substantiate any required parameters.
9. The desired technical specification has been mentioned in the Technical Specification Chart. Tenderers are required to mention the respective parameters of their offered model against each item.
10. In case of any changes after the scrutiny, the tenderers may be allowed to submit revised Tender Document Part –II (Price Bid).
11. Tender Document Part –II (Price Bid) of those tenderers who do not qualify the Technical Bid will not be opened.
12. The rates quoted in the Tender Document Part –II (Price Bid) should be inclusive of all taxes such as VAT, Service Tax, Octroi, other Central or State Govt. taxes, transportation, conveyance, labour charges and considering all other provisions as mentioned in the Tender Document.
13. The rates quoted by the tenderers will be valid for a period of 180 **days from the date of opening of Tender Document Part –II (Price Bid)**.
14. No costs incurred by the tenderer in applying, in providing necessary clarifications or attending discussion, conferences or site visits will be reimbursed by the Terna Public Charitable Trust.

- 15.If the tender is submitted by a partnership firm, a certified copy of the partnership deed, current address of the firm and the full names and current addresses of all the partners of the firm shall also accompany the Tender Document.
- 16.If the tender is submitted by a limited company it shall be signed by a duly authorized person holding the power of attorney for signing the Tender Document in which case certified copies of the power of attorney and the certification of incorporation, Memorandum of Articles of Association shall accompany the Tender Document.
- 17.If information and details furnished by tenderers are found to be false at any time in future the security deposit will be forfeited and suitable action may be initiated as per the extant legal provisions.
- 18.Terna Public Charitable Trust reserves the right to increase / decrease the quantity of materials as per requirement of the TERNA PUBLIC CHARITABLE TRUST for which the contractor will be paid as per the approved rate in the Bill of Quantities of the Tender Document Part –II (Price Bid) on pro rata basis.
- 19.Terna Public Charitable Trust also reserves the right to delete any of the items mentioned in the Bill of Quantities.
- 20.Terna Public Charitable Trust reserves the right to reject any or all the tenders without assigning any reason thereof.

Signature :
Name of the Tenderer :
Date /place :
Seal :

Other Terms and Conditions

1. The scope of work involves **Supply of 11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformer** in Terna Public Charitable Trust premises at plot No-12, Sector 22, Opposite Nerul railway Station, Phase-2, Nerul-West, Navi Mumbai-400076 by the successful tenderer.
2. The system to be supplied shall be brand new models and **any old or refurbished brands will not be accepted in any case.**
3. The loaders, unloaders, packers, transportation etc. would be sole responsibility of the OEM and Terna Public Charitable Trust wouldn't provide any labour/manpower for the same.
4. The procedure adopted for completion of work should be strictly as per manufacturer's recommendation.
5. Service support and spares availability for minimum of 10 years to be guaranteed by the supplier for the offered product. A confirmation letter duly signed by appropriate authorities must be enclosed with the offer.
6. Pre-dispatch inspection of Transformer set units shall be carried out by Terna Public Charitable Trust authorities / Consultant along with Third party at manufacturers site to confirm offered specifications.
7. In case of any defect or non functioning of the system shall be attended by the supplier within **8 hours of lodging the complaint.**
8. The successful tenderer will provide training to the staff members/ operators after commissioning at site by their trained engineers.
9. Date of completion of work:

Date of completion will be reckoned from the date of satisfactory commissioning and hand over of the system to Terna Public Charitable Trust.

10. Liquidated Damage:

The liquidated damage against supply of items will be charged @ **0.25% of the purchase order value per week subject to a maximum of 5 % of the purchase order value.**

11. Earnest Money Deposit (EMD):

Demand draft for the prescribed amount drawn in favour of 'Terna Public Charitable Trust' payable at Mumbai should be deposited along with Technical Bid as EMD.

The EMD deposited by the tenderers will be refunded as per the details given below:

- I. To unsuccessful tenderer: After award and acceptance of work by successful tenderer.
- II. To successful tenderer: After satisfactory completion of work.

12. Defect Liability Period (DLP):

The Defect Liability Period shall be one year from successful commissioning and hand over of the system to Terna Public Charitable Trust.

Any manufacturing defect, malfunctioning or breakdown of the system shall be covered under defect liability period. The terms and conditions are as given below:

- (i) Defects in any part of the system supplied by the tenderer at any stage during the defect liability during normal operations shall be covered under defect liability and has to be rectified by the successful tenderer at their cost. Terna Public Charitable Trust's observation regarding the performance of system will be final and binding.
- (ii) The complaint will be generally lodged on the contact telephone nos./ fax/ e-mail/ letters etc. as furnished by the tenderer during tendering process or any subsequent updates.
- (iii) In case of any defect in the normal functioning of the tenderer would attend it within **8 hours of lodging the complaint.**
- (iv) All the defective parts would be repaired/ replaced by the tenderer during the DLP within **48 hours of lodging the complaint.**
- (v) In case of non availability of spares or failure of attending the complaints within the stipulated time frame and resolving the complaints i.e. Other Terms and Conditions, the DLP will be increased for the period equal to the period of downtime. If the complaint is not resolved in complete for more than 15 days from the date of lodging the complaint or recurring failures for more than three occasions, Terna Public Charitable Trust may at its discretion invoke the Bank Guarantee. Terna Public Charitable Trust's decision in this regard will be final and binding on the successful tenderer.

13. Performance Guarantee:

- a. The Bank Guarantee for an amount @ 5% of the purchase order value valid till the defect liability period of 1 year issued by a Nationalized Bank as per the attached format should be deposited as Performance Guarantee and has to be submitted by the successful tenderer before making the 1st payment.
- b. Performance Guarantee will be released to the party after successful completion of DLP of 1 year.

14. Payment Terms:

The payment will be made to the successful tenderer after submission of original bill along with requisite delivery challans etc. The certification of rates would be strictly as per approved rates as per Tender Document Part –II (Price Bid), which is inclusive of all taxes such as VAT, Service Tax, Octroi, other Central or State Govt. taxes, loading/unloading, transportation or labour charges, local concerns, etc. Terna Public Charitable Trust will not pay any amount over and above the approved rates.

Payment will be released to the successful tenderer as per the details given below:

- I 30% Advance against Techno commercial Order and separate Bank Guarantee of Nationalized Bank equivalent to Advance Amount.
- II 40 % of the certified value against Receipt of Supply of material.
- III 15% of the certified value against successful installation, testing.
- IV 10% of the certified value against successful commissioning and handover to Terna Public Charitable Trust
- V 5% Retention Money, which will be paid after One Year of successful commissioning and Handover

The payments shall be released after recommendations of the Architect / Consultant.

15. TDS as applicable would be deducted at source for which the tenderer would be issued necessary TDS certificate.

Signature :
Name of the Tenderer :
Date / Place :
Seal :

ANNEXURE- I

PERFORMANCE GUARANTEE

In consideration of Terna Public Charitable Trust (hereinafter referred to as " Trust ") having offered to accept the terms and conditions of the proposed agreement between the Trust and(hereinafter referred to as "said Contractor") for the work

(Hereinafter referred to as "said agreement") having agreed to production of irrevocable Bank Guarantee for Rs.(Rupeesonly) as security / guarantee from the said contractor for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We(hereinafter referred to as "the Bank") hereby
(Indicate the name of the Bank)
undertake to pay to the Trust an amount not exceeding Rs.....
(Rupees.....only) on demand by the Trust.

2. We, the Bank do hereby under take to pay to the Trust on demand the amount due and payable under this Guarantee without any demure and merely on demand by the Trust stating that the amount claimed is due from the said contractor. Any such demand made to the Bank shall be conclusive as regard to the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.(Rupees.only)

3. We, the bank further undertake to pay to the Trust any money so demanded notwithstanding any dispute raised by the contractor in any suit or proceeding pending before any court or Tribunal relating thereto, and our liability under this guarantee being absolute and unequivocal.

4. The payment so made by us under this guarantee shall be a valid discharge of our liability for payment therein under and the said contractor shall have no claim against us for making such payment.

5. We, the Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Trust under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Authorised Officer on behalf of the Trust certifies in writing that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly the guarantee will be discharged.

6. We, the Bank further agree with the Trust that the Trust shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance of the said contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Trust against the said contractor and to forebear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor or for any forbearance, act or omission on the part of the Trust or any indulgence by the Trust to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the said contractor.

8. We, the bank lastly undertake not to revoke this Guarantee except with the previous consent of the Trust.

9. This guarantee shall be valid up tounless extended on demand by Trust. Notwithstanding anything mentioned above, our liabilities against this guarantee is restricted to Rs./-(Rupeesonly) and unless a claim in writing is lodged with us within nine months of the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

10. Notwithstanding anything contained herein :-

a. Our liability under this Bank Guarantee shall not exceed Rs. (Rupees Only).

b. This Bank Guarantee shall be valid upto

c) We are liable to pay the Guarantee amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before All the rights of the beneficiary under the said Guarantee shall be forfeited and Guarantee shall be released and discharged from all liabilities thereafter.

The Bank has under its constitution, power to give this Guarantee in your favour made under our Memorandum and Articles of Association and Mr/Mrs.....who signed it on behalf of the Bank has the authority to do so.

Dated this theday of for (indicate the name of bank)

ANNEXURE- II

ADVANCE GUARANTEE

In consideration of Terna Public Charitable Trust (hereinafter referred to as " Trust ") having offered to accept the terms and conditions of the proposed agreement between the Trust and(hereinafter referred to as "said Contractor") for the work

(Hereinafter referred to as "said agreement") having agreed to production of irrevocable Bank Guarantee for Rs.(Rupeesonly) (An amount equal to 30% advance received from the Trust) as security / advance guarantee from the said contractor for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We(hereinafter referred to as "the Bank") hereby
(Indicate the name of the Bank)

undertake to pay to the Trust an amount not exceeding Rs.....
(Rupees.....only) on demand by the Trust.

2. We, the Bank do hereby under take to pay to the Trust on demand the amount due and payable under this Guarantee without any demure and merely on demand by the Trust stating that the amount claimed is due from the said contractor. Any such demand made to the Bank shall be conclusive as regard to the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.(Rupees.only)

3. We, the bank further undertake to pay to the Trust any money so demanded notwithstanding any dispute raised by the contractor in any suit or proceeding pending before any court or Tribunal relating thereto, and our liability under this guarantee being absolute and unequivocal.

4. The payment so made by us under this guarantee shall be a valid discharge of our liability for payment therein under and the said contractor shall have no claim against us for making such payment.

5. We, the Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Trust under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Authorized Officer on behalf of the Trust certifies in writing that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly the guarantee will be discharged.

6. We, the Bank further agree with the Trust that the Trust shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance of the said contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Trust against the said contractor and to forebear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor or for any forbearance, act or omission on the part of the Trust or any indulgence by the Trust to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the said contractor.

8. We, the bank lastly undertake not to revoke this Guarantee except with the previous consent of the Trust.

9. This guarantee shall be valid up tounless extended on demand by Trust. Notwithstanding anything mentioned above, our liabilities against this guarantee is restricted to Rs./-(Rupeesonly) and unless a claim in writing is lodged with us within nine months of the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

10. Notwithstanding anything contained herein :-

a. Our liability under this Bank Guarantee shall not exceed Rs. (Rupees Only).

b. This Bank Guarantee shall be valid upto

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c) We are liable to pay the Guarantee amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before All the rights of the beneficiary under the said Guarantee shall be forfeited and Guarantee shall be released and discharged from all liabilities thereafter.

The Bank has under its constitution, power to give this Guarantee in your favour made under our Memorandum and Articles of Association and Mr/Mrs.....who signed it on behalf of the Bank has the authority to do so.

Dated this theday of for (indicate the name of bank)

Tenderer Details

1	Name of the Tenderer	
2	Tenderer Type (OEM/ Authorized dealer)	
3	Name of the Brand of 11/0.415KV, 1750KVA and 2000KVA Dry type transformer .	
4	Type of Organisation (Whether Proprietorship, Partnership, PSU etc.)	
5	Name of the Proprietor/ Partners/ Directors in the Organisation	
6	Address of the Registered Office	
	Telephone/ Mobile/ Fax Nos. of the Registered Office	
	E-Mail ID	
	Name of the Authorized Contact Person with Contact Details	
7	Address of the Office in Mumbai, if any	
	Telephone/ Mobile/ Fax Nos. of the Office in Mumbai	
	E-Mail ID	
	Name of the Authorized Contact Person with Contact Details	

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8	Name and address of the Bankers	
9	Indicate, if involved in any litigation or any civil suits pending in any of the supply/ service executed. Give Details.	
10	Company Registration No.	
11	Sales Tax Registration No.	
12	Service Tax Registration No., if any	
13	PAN No.	
14	Other details, if any	

Signature :
Name of the Tenderer :
Date / Place :
Seal :

PROJECT DESCRIPTION AND SCOPE OF WORK

□ **Scope of Work:-**

The scope of work includes **Supply of 11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformer**. The detailed scope of work and explanatory notes given below are added to assist the Transformer vendor to understand the project. The detailed scope is as described in the Bill of Quantities and Specifications. The scope of the Transformer vendor includes the Supply and Testing at factory of Transformer set. However, the Transformer vendor should provide Supervision to the main Electrical Contractor on TERNA PUBLIC CHARITABLE TRUST during on site testing, pre-commissioning & Commissioning of **11/0.415 KV, 1750 KVA and 2000KVA Dry Type Transformers** for **TERNA PUBLIC CHARITABLE TRUST, NERUL, NAVI MUMBAI**

□ **Site Conditions:-**

The project site is located at **Nerul, Navi Mumbai** in the state of Maharashtra. The vendor should visit the site and obtain information regarding the proposed location of the Transformer to be commissioned and make a note of all the site constraints.

□ **Approval of Drawings & Schedules:-**

All fabrication drawings for Acoustic enclosure, Manual Panel, foundation details, control wiring, Manual panel functional details shall be prepared and submitted by the Transformer vendor at no extra cost within the time stipulated by the Consultants and in the manner so required by him. The vendor shall proceed with the work only after approval of the same by Terna Public Charitable Trust/ Consultant. Such drawings shall be coordinated with all disciplines of work. The vendor shall also get all the approvals from Government bodies, Director of explosives (if required) Pollution Control, Electrical Inspector, Supply Authority etc. free of cost and within the expiry of the contract.

□ **Bill of quantity(BoQ) and Specifications:-**

The Specifications and Bill of Quantity shall be considered as part of this contract and any work or material shown on schedule and not called for in the specifications or vice versa, shall be executed as if specifically called for in both.

□ **Shop Drawings:-**

The vendor shall prepare and submit the Consultants for his approval detailed Shop drawings of Transformers, detail control wiring ,foundation details and GA drawing and any other equipment to be fabricated by Contractor within 7 days of signing of the Contract.

□ **ADDRESS OF LOCATION:-**

**Terna Public Charitable Trust,
Plot No.12, Sector 22,Opposite Nerul railway Station,
Phase 2, Nerul West, Navi Mumbai,
Maharashtra-400706**

Ph: 022-61115452

Ph: 022-61578300

TIME SCHEDULE

TIME SCHEDULE

DESCRIPTION OF WORK:

SUPPLY, TESTING AT FACTORY & SUPERVISION OF ONSITE PRE-COMMISSIONING, TESTING & COMMISSIONING OF 11/0.415 KV, 1750 KVA and 2000KVA DRY TYPE TRANSFORMER AT TERNA PUBLIC CHARITABLE TRUST.

LOCATION :	NERUL, NAVI MUMBAI
DELIVERY PERIOD:	2.5 (TWO & HALF) MONTHS FROM DATE OF ISSUE OF FOI/LOI/PO WHICHEVER IS EARLIER

NOTE:

- 1) Time for delivery of Transformer shall be reckoned from the date of issue of Fax/ Letter of Intent/Purchase Order by Terna Public Charitable Trust.
- 2) Time for delivery shall include the time required for Drawing/ Quality Assurance Plan(QAP) submission, Drawing/ QAP approval, manufacturing, Inspection, dispatch clearance, Packing & Forwarding, Transportation and receipt of the material at the site as per requirements of Contract Document and instructions of Clients Engineer-in-Charge and Consultant.
- 3) Supply of the Transformer only comes under the LD clause while Supervision & Commissioning does't come under this clause.

SCHEDULE OF QUANTITIES

SCHEDULE OF QUANTITIES

BILL OF QUANTITIES (ELECTRICAL - 11/0.415 KV,1750KVA and 2000 KVA DRY TYPE TRAFO)					
Sr.No	Item Description	Qty	Unit	Rate (INR)	Amount (INR)
1	H.T WORKS				
1.1.1	Design, Supply and Supervision during Installation, Testing and Commissioning of 11/0.415 KV , 2000 KVA Dry Type Cast resin ,(ONAN) Distribution Transformer having HV-11KV tap range from +5% to -15% , Vector group-DYN11, HV-Delta and LV-Star connected, frequency at 50 Hz having cast resin coated copper windings, class F insulation with ON LOAD tap changer to provide +5 to - 15% in steps of 1.25% along with remote tap changer to be installed at the existing Electrical panel room. The metering shall be provided for HV-for power(KVA, KW and input current), LV-for power (KVA, KW, V ,I and pf) along with Winding Temperature Indicator meter. The transformer supplies should be IP21 for Indoor application. There should be proper cable box arrangement made for both HT and LV cable termination. The transformer should be powder coated with Siemens gray color. The following protection should be considered: a. WTC tripping, b.On Load Tap Changing tripping in case of over voltage, c. Transformer should have overload, short circuit, ground and inrush current trippings. The transformer manufacturer shall arrange for the site visits of at least 3 persons to the factory to witness all the requisite tests on trafo. The manufacturer should also submit the test certificates. The cost of transformer should be inclusive of a warranty of minimum one year.	1	No		

SUPPLY OF 2000KVA &1750 KVA TRAFO AT TERNA PUBLIC CHARITABLE TRUST, NERUL

1.1.2	Design, Supply and Supervision during Installation, Testing and Commissioning of 11/0.415 KV , 1750 KVA Dry Type Cast resin,(ONAN) Distribution Transformer having HV-11KV tap range from +5% to -15% , Vector group-DYN11, HV-Delta and LV-Star connected, frequency at 50 Hz having cast resin coated copper windings, class F insulation with ON LOAD tap changer to provide +5 to - 15% in steps of 1.25% along with remote tap changer to be installed at the existing Electrical panel room. The metering shall be provided for HV-for power(KVA, KW and input current), LV-for power (KVA, KW, V ,I and pf) along with Winding Temperatures Indicator meter. The transformer supplies should be IP21 for Indoor application. There should be proper cable box arrangement made for both HT and LV cable termination. The transformer should be powder coated with Siemens gray color. The following protection should be considered: a. WTC tripping, b.On Load Tap Changing tripping in case of over voltage, c. Transformer should have overload, short circuit, ground and inrush current trippings. The transformer manufacturer shall arrange for the site visits of at least 3 persons to the factory to witness all the requisite tests on trafo. The manufacturer should also submit the test certificates. The cost of transformer should be inclusive of a warranty of minimum one year.	1	No		
1.2	Third Party Inspection:				
	Third Party Inspection of the transformer by Electrical Research Development Authority, ERDA. The manufacturer should co-ordinate the inspection which will be carried out in the presence of the Client, Consultant and the Third party inspection authority.	1	Job		
1.3	Less: Buy back of 1 No of 11/0.415 KV, 630 KVA Dry type transformer currently installed at site and is in working condition. MAKE: Crompton Greaves, YEAR OF MFG: 2004	1	No		
1.4	Annual Maintenance Contract:				
a	AMC cost for 1st year after expiry of warranty period:	1	Job		
b	AMC cost for 2nd year after expiry of warranty period:	1	Job		
c	AMC cost for 3rd year after expiry of warranty period:	1	Job		
d	AMC cost for 4th year after expiry of warranty period:	1	Job		
e	AMC cost for 5th year after expiry of warranty period:	1	Job		
			GRAND TOTAL		

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS FOR 1 NO OF 2000 KVA and 1750KVA 11/0.415 KV STEP DOWN DRY TYPE TRANSFORMERS WITH OLTC, RTCC & AVR .

1.1 Scope

This section covers the detailed requirements regarding Design, Manufacturing, Delivery and Supervision at site the Following 11/0.415 K.V. Step down Dry Type Transformers with OLTC, RTCC & AVR suitable for Indoor use as described in the Tender Documents. The prospective bidders should visit the site and understand the site feasibility before quoting for the transformer mentioned below.

2000 KVA and 1750KVA 11/0.415 KV Dry Type Transformers With OLTC, RTCC and AVR-01 No.

1.2 General Construction

1.2.1 The Transformer shall comply with the following Indian Standards as amended upto date:

- (1) IS 2026 – Part relevant to dry type power transformer
- (2) IS 1886 - Installation and Maintenance of Transformers.
- (3) IS 2099 - Bushings.
- (4) IS 2705 - Current Transformers.
- (5) IS 6600 - Guide for loading of Dry Type Transformers.
- (6) IS 11171-1985- Dry Type Transformers.
- (7) IEC – 726 Dry Type Transformers

1.2.2 Cores

Cores shall be built from cold rolled grain oriented (CRGO) silicone steel laminations. The core laminations shall be insulated from each other by a suitable high temperature resistant, oil proof, adherent coating materials. Core clamps and clamping bolts shall be heavily insulated from the core laminations. The insulation of core bolt shall be minimum of class 'H'. The bottom and top frames shall be connected with the tie rods to make a complete structure rigid for carrying the weight of core-coil assembly without unduly stressing the laminations or windings. Lifting eyes shall be provided on the frame for removal of core assembly. Completed core shall be flash tested for insulation with 2500 volts between the core and each of the clamps or core bolts (core being connected to earth). Corona losses shall be reduced by using MITRED Joints, staggered in alternate layers. Core surface to be treated with a resin coating to protect it from atmosphere pollutants.

All the core frames shall be bonded together with two metallic strips and connected to the enclosure for earthing, to ensure earth return and operation of protective gear in the event of a fault. Lifting eyes (or any other provision) for lifting the core from the enclosure and OLTC shall be provided.

1.2.2.1 Core Coil Assembly

Impregnated and cured windings shall be assembled on the core limbs. Pressure blocks of non-combustible porcelain insulators shall be provided at top & bottom of coils to keep the windings under pressed condition and to withstand Dynamic short circuit forces. Tapping for each phase shall be brought out on a separate terminal where a selectable link is provided or to the OLTC gear.

1.2.3 Winding and Insulation

Copper conductors shall be used for H.V. and L.V. windings. Super enameled/fiber glass insulated wires shall be used for H.V. windings. Hard fiber reinforced plastic resin cylinders shall be used for H.V. winding. Disc type H.V. Winding shall be provided with ceramic dovetail spacers. These spacers shall be locked to FRP Profile runners.

L.V. Winding shall be spiral Type in multi layers. Separated by a dielectric formed by FRP Profile.

Air circulation ducts shall be provided between H.V. and L.V. Windings.

1.2.4 Impregnation/Cast Resin

The H.V. & L.V. Windings of a phase shall be preheated in an oven to remove the moisture. Resin Impregnation shall be done under high vacuum in an impregnation plant comprising of:

- (i) Impregnation Chamber
- (ii) Resin Storage Tank.

The Impregnation shall be carried out by an automatic and programmable Controller. The impregnated coils shall be cured in an oven.

The H.V. and L.V. Windings shall be preheated to remove the moisture and the coils shall be treated with cast resin under vacuum to remove air spaces.

Enclosure

M.S. Enclosure shall be provided for core & coils assembly and OLTC to protect Mechanical Danger. The enclosure shall be suitable for IP 33 for indoor use and IP 45 for out door use.

1.3 General Requirements

The transformer shall be indoor type as specified. Unless otherwise specified the transformer in addition shall have thermal and dynamic ability to withstand external short circuit.

1.4 The transformer shall be suitable for continues full load rating irrespective of the winding tap position.

1.5 Temperature Rise

The reference ambient temperature assumed for the purpose of this specification are as follows :-

- (a) Maximum ambient air temperature 50 degree C.
- (b) Maximum daily average ambient air temperature 42 degree C.
- (c) Maximum yearly weighted average ambient temperature 32 degree C.
- (d) Minimum ambient air temperature (-) 5 degree C.

The temperature rise at the above conditions and at an altitude not exceeding 1000 meters shall be as follows:

Temperature rise in winding above ambient shall be maximum 90degree C.

1.6 Tap Changing Device

Tap changing device shall be provided on H.V. side, On Load Tap Changing (OLTC) device with Remote Tap Changing Control panel (RTCC) and Automatic Voltage Regulator (AVR) shall be provided. Automatic Tap changing arrangement shall be provided with AVR etc. with provision for manual tap changing arrangement. Tap changing arrangement shall be suitable to correct the voltage variation upto -15% and + 5% in steps of 1.5%. The tap changing shall be automatic and correction speed shall be fast. Remote and local operation of tap changer shall be provided with motor and manual operation with push buttons. Whenever supply fails, the tap changer shall come to normal position automatically and then it will correct the voltage as required when the supply resumes.

Remote Tap Changing Control Panel (RTCC)

RTCC panel shall be fabricated from 2 mm thick sheet steel and painted for housing all the control gears including Automatic Voltage Regulator, all control wiring shall be brought to a terminal block for connecting controls and power cables. Provide over voltage relay and under voltage relay for tripping the transformer H.T. Circuit Breaker as well as M.V. Panel.

The remote tap changer panel shall have the following provisions:

- i. Normally it will correct the voltage as required.
- ii. When H.V. supply fails, the tap changer shall come to normal position automatically, then it will correct the voltage as required when the supply resumes

1.7 **Voltage Ratio**

Unless otherwise specified, the transformer shall be suitable for a voltage ratio of 11 KV/415 V on no load.

1.8 **Vector Group**

In case of step down transformers, the winding connection shall conform to vector group Dyn 11 unless otherwise specified.

1.9 **Cooling**

Unless otherwise specified, the transformer shall be natural air-cooled type (AN).

1.10 **Accessories**

The transformer shall be a single unit with termination in cable end box suitable for 3C x 300 sq. mm XLPE cable on HV side. The MV side shall be suitable to receive 5 runs of 3.5C X 240 sqmm Al armoured cables with proper supports etc. and inter-connections suitable for full load current of the transformer.

1.11 **Fittings**

The Dry Type Transformers shall have the following fittings:

1. Base Channels skid type suitable for mounting on floor and Plinth.
2. Winding Temperature Indicator with Alarm and Trip contacts (on all three windings). An alarm should occur when the winding temperature reaches 75 deg C so that preventive measures can be initiated.
3. Earth Terminals
4. Lifting Hooks.
5. On load tap changing on H.T. Side.
6. Diagram and Rating Plates.
7. Paint Shade RAL 7032 SIEMENS GREY
(632 of IS-5 OR 631 of IS-5 can also be specified)
8. Suitable Enclosure
9. Limit switch for interlocking access to tapping
10. Additional neutral terminal separately brought out on a bushing for earthing the neutral of Transformer on M.V. Side.
11. Marshalling box for Transformer controls.
12. Necessary hardware, clamps, lugs, glands etc. for termination of H.V. Cable and suitable box for bus duct on M.V. Side.

1.12 **Rating and Diagram Plates**

The following name plates shall be fixed to Transformer in a visible position.

- (a) A rating plate of weather proof material bearing the data specified in the appropriate clauses IS : 11171-1985.
- (b) A diagram plate showing the internal connections and also the voltage vector relationship of the several windings in accordance with IS : 11171-1985 and a plan view of the transformer giving the correct physical relationship of the terminals for Transformer.

1.13 **Guarantee Technical Data**

Guaranteed technical particulars shall be supplied as per vide Schedule 'A'. No positive Tolerance will be accepted for no load and full load losses.

1.14 **Tests**

1.14.1 **Tests at Works**

1.1 **Tests and Test Reports**

The transformer shall be completely assembled and all type and routine tests as specified in IS: 2026 shall be conducted at factory in order to determine whether the materials and performance comply with the order and to provide the necessary operating data. If the type tests on similar capacity transformers are already conducted, a copy of the same shall be furnished by the agency before placement of order.

The following tests shall be conducted during manufacture in addition to other tests by the manufacturer and price for the same shall be included in quoted price only:

- a. Vacuum withstand strength of tank
- b. Test for oil tightness
- c. Material tests on core, conductor and insulating materials, indicating instruments, bushels relay and other associated equipment.
- d. All tank, single welds, radiators, valves and other parts necessary for complete transformer shall be tested for leaks and strength, by applying to the completed tank to withstand a pressure equal to twice the normal head of oil or normal pressure plus 0.35Kg/sq.cm; whichever is lower and measured at the base of the tank. This pressure shall be maintained for a period of 12 hours for oil and 1 hour for air, during which time no leakage shall occur. If leaks occur, the test shall be conducted after all leaks have been stopped.

All double welds shall be tested for leaks with dry nitrogen at not less than 7 kg/sq.cm.

1.1.1 **Routine Tests**

After completion of the manufacture, the following tests shall be conducted on each transformer as per applicable standards.

- a. Measurement of voltage ratio for all taps.
- b. Check test for Polarity, vector relationship and terminal markings.

- c. Measurement of no-load loss and excitation current at rated frequency and rated voltages.
- d. Measurement of load losses at rated load current at 75°C.
- e. Measurement of impedance voltage between each pair of windings at test bed temperature at rated current and calculation of impedance at 75°C.
- f. Measurement of cold resistance of winding at test bed temperature & at 75°C.
- g. Measurement of Insulation resistance between windings and windings to earth at room temperature.
- h. High voltage tests:
 - i. Separate source A.C voltage withstand test. The leakage currents shall be recorded in the test certificate.
 - j. Induced power frequency over voltage withstand test. The values of the exciting voltage, current and frequency shall be recorded in the test certificate.
- k. Calculation of regulation at rated load and at unity P.F, 0.85 and 0.8 lagging P.F.
- l. Determination of efficiency at full, three quarters, half and quarter loads at unity P.F.
- m. Zero sequence impedance tests for transformer.
- n. Tan delta test.
- o. Short circuit impedance test.
- p. Magnetic balance test.
- q. Measuring winding resistance at all top positions.

1.1.2 Heat Run Test

The manufacturer shall perform heat run test on one transformers selected by the employer / engineer. The hot spot temperature shall be set after the heat run test. The necessary costs incurred for the test shall be borne by the contractor.

1.2 Drawings & Manual

4 copies of the following drawings shall be submitted immediately after receipt of letter of intent & before placement of order.

- a. A general outline and transport dimensions, net and transport weights, height of crane hook for lifting core and bushings etc.
- b. Drawings for bushings, coolers etc.
- c. Terminal arrangement.
- d. Arrangement of cable boxes.
- e. Drawing necessary to demonstrate, compliance with the critical dimensional requirements for fitting into restricted space.
- f. As built drawings in three sets & in CD/DVD form along with operation should be submitted after commissioning.
- g. Installation, operation & maintenance manual of transformer with all associated equipments etc. should be submitted after commissioning. The manual shall clearly indicate the installation method, checkups & tests to be arrange before & after commissioning.

Copies of the certificates for type test for short circuit shall be supplied to the Owner.

1.3 WARRANTY:

The transformer should be offered a warranty for 12 months after successful commissioning of the transformer.

1.4 ANNUAL MAINTENANCE CONTRACT:

The offer shall include an AMC for a period of 5 years after the warranty period expires. The AMC cost shall include maintenance of transformer at least once in 6 months.

1.5 THIRD PARTY INSPECTION:

The manufacturer should offer the Transformer for third party inspection to be carried out by Electrical Research Development Authority, ERDA at the manufacture's premises.

**SCHEDULE 'A'
DATA SHEET**

SCHEDULE OF TECHNICAL PARTICULARS FOR DRY TYPE TRANSFORMER

2000kVA, 11kV / 0.433kV Transformer

(i)	Type	Out door / Step Down (11kV to 433 V) Three phase unit, ONAN
(ii)	No. of windings	Two
(iii)	No. of Phases	3 phase
(iv)	System frequency	50 Hz (\pm 5%)
(v)	kVA rating	2000 KVA
(vi)	Voltage rating (KV)	
	Low Voltage Winding	0.415 KV
	High Voltage Winding	11 kV
(vii)	Tap changing	ON load tap changing
(viii)	TAPPINGS	
	Tapping on windings	HV
	Tapping range	+5% to -15% in steps of 1.25%
	Tapping step	16 equal steps
(ix)	Winding connections for three phases	
	HV winding	Delta
	LV winding	Star
	Neutral	Solidly earthed
(x)	Vector Group	Dyn11
(xi)	Terminals	
	L.V. Terminals	Suitable for cables
	H.V. Terminals:	Suitable for cables
(xii)	Type of Insulation	
	High Voltage Winding	Fully insulated
	Low Voltage Winding	Fully insulated
(xiii)	Type of cooling	ONAN
(xiv)	Impedance Voltage at normal tap	6.25 %
(xv)	Insulating Medium	Air
(xvi)	Permissible voltage variation	+ 5% to -15%

S.No. Particulars	Guaranteed Data
(A) TRANSFORMER	
(1) Specification to which it conforms 1985	- 11171-
(2) Type and make wound (copper) Natural air cooled.	- Double
(3) Core type or shell type type	- Core
(4) Output in KVA (continuously rated) KVA	- 2000
(5) Frequency – 50 Cycles per second	
(6) Voltage between phases (HV on no load) on each tap position	-
(7) Voltage between phase (MV on no load) on each tap position Volts	- 415
(8) Impedance at normal voltage ratio at 75 degree C subject to I.S. tolerance	- 6.25%
(9) No load losses (W) Watts	- 3800
(10) Full load losses at 75 deg C (W) Watts	- 16500
(11) Regulation at unit P.F. at 75 degree C.	-
(12) Regulation at 0.8 P.F. at 75 degree C.	-
(13) Reactance at normal voltage and ratio.	-
(14) Resistance at H.V. windings at 75 degree C. ohms	-
(15) Resistance at M.V. windings at 75 degree C. Milli ohms	-
(16) Efficiency at unity Power factor and at 0.8 P.F.	
(a) Full Load	-
(b) 75% Load	-
(c) 50% Load	-

(17) OVER-LOAD : The transformers are capable of carrying overload as follows :

Percentage Load	When starting Cold (in hrs)	After running continuously in hrs
(a) 25%		-
(b) 50%		-
(c) 75%		-
(d) 100%		-
(18) Type of enclosure Conventional		-
(19) Width of air duct between core and Winding		- mm
(20) Type of insulation		
(a) H.V Copper winding Conductors Resin/Resin Impregnated Class 'F' Insulation		- Cast
(b) M.V. Copper winding Conductors/strips Resin/Resin Impregnated Class 'F' Insulation		- Cast

S.No. Particulars	Guaranteed Data
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(21) APPROXIMATE WEIGHT

(a) Core lamination	-	Kg.
(b) Copper	-	Kg.
(c) Insulation Materials	-	Kg.
(d) Enclosure & fittings	-	Kg.
(e) Total weight including complete transformer with fittings.		
-		Kg

22) OLTC

- (1) Specification to which it conforms
- (2) Type and make
- (3) Number of steps
- (4) Frequency
- (5) Voltage between steps on H.V. Side.
- (6) Resistance at H.V. windings tap connections.
- (7) Type and Voltage of operating motor.
- (8) Manual Operation
- (9) Diagram plate
- (10) Tap position Indicator
- (11) Terminal Block for Control cable & power supply.
- (12) Type of insulation
- (a) H.V Conductors lead from winding to OLTC.

(23) **APPROXIMATE WEIGHT**

- (a) OLTC and accessories.
- (b) Total weight including complete OLTC with fittings.
- (C) RTCC & AVR
 - Type and make of RTCC
 - Type and make of AVR
 - Details of components used in RTCC

(24) Flux density to be considered for design (Max.) for core of Transformer - 1.4 WB/Sqm.

(25) Dimension of the Transformer – Width X Depth X Height

SCHEDULE 'A'
DATA SHEET

SCHEDULE OF TECHNICAL PARTICULARS FOR DRY TYPE TRANSFORMER

1750kVA, 11kV / 0.433kV Transformer

(i)	Type	Out door / Step Down (11kV to 433 V) Three phase unit, ONAN
(ii)	No. of windings	Two
(iii)	No. of Phases	3 phase
(iv)	System frequency	50 Hz ($\pm 5\%$)
(v)	kVA rating	1750 KVA
(vi)	Voltage rating (KV)	
	Low Voltage Winding	0.415 KV
	High Voltage Winding	11 kV
(vii)	Tap changing	ON load tap changing
(viii)	TAPPINGS	
	Tapping on windings	HV
	Tapping range	+5% to -15% in steps of 1.25%
	Tapping step	16 equal steps
(ix)	Winding connections for three phases	
	HV winding	Delta
	LV winding	Star
	Neutral	Solidly earthed
(x)	Vector Group	Dyn11
(xi)	Terminals	
	L.V. Terminals	Suitable for cables
	H.V. Terminals:	Suitable for cables
(xii)	Type of Insulation	
	High Voltage Winding	Fully insulated
	Low Voltage Winding	Fully insulated
(xiii)	Type of cooling	ONAN
(xiv)	Impedance Voltage at normal tap	6.25 %
(xv)	Insulating Medium	Air
(xvi)	Permissible voltage variation	+ 5% to -15%

S.No. Particulars	Guaranteed Data
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(A) TRANSFORMER

(1) Specification to which it conforms 1985	- 11171-
(2) Type and make wound (copper) Natural air cooled.	- Double
(3) Core type or shell type type	- Core
(4) Output in KVA (continuously rated) KVA	- 2000
(5) Frequency – 50 Cycles per second	
(6) Voltage between phases (HV on no load) on each tap position	-
(7) Voltage between phase (MV on no load) on each tap position	- 415 Volts
(8) Impedance at normal voltage ratio at 75 degree C subject to I.S. tolerance	- 6.25%
(9) No load losses (W) Watts	- 3500
(10) Full load losses at 75 deg C (W) Watts	- 14500
(11) Regulation at unit P.F. at 75 degree C.	-
(12) Regulation at 0.8 P.F. at 75 degree C.	-
(13) Reactance at normal voltage and ratio.	-
(14) Resistance at H.V. windings at 75 degree C. ohms	-
(15) Resistance at M.V. windings at 75 degree C. Milli ohms	-
(16) Efficiency at unity Power factor and at 0.8 P.F.	
(a) Full Load	-
(b) 75% Load	-
(c) 50% Load	-

(17) OVER-LOAD : The transformers are capable of carrying overload as follows :

Percentage Load	When starting Cold (in hrs)	After running continuously in hrs
(a) 25%		-
(b) 50%		-
(c) 75%		-
(d) 100%		-
(18) Type of enclosure Conventional		-
(19) Width of air duct between core and Winding		- mm
(20) Type of insulation		
(a) H.V Copper winding Conductors Resin/Resin Impregnated Class 'F' Insulation		- Cast
(b) M.V. Copper winding Conductors/strips Resin/Resin Impregnated Class 'F' Insulation		- Cast

S.No. Particulars	Guaranteed Data
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(21) APPROXIMATE WEIGHT

(a) Core lamination	-	Kg.
(b) Copper	-	Kg.
(c) Insulation Materials	-	Kg.
(d) Enclosure & fittings	-	Kg.
(e) Total weight including complete transformer with fittings.		
-		Kg

22) OLTC

- (1) Specification to which it conforms
- (2) Type and make
- (3) Number of steps
- (4) Frequency
- (5) Voltage between steps on H.V. Side.
- (6) Resistance at H.V. windings tap connections.
- (7) Type and Voltage of operating motor.
- (8) Manual Operation
- (9) Diagram plate
- (10) Tap position Indicator
- (11) Terminal Block for Control cable & power supply.
- (12) Type of insulation
- (a) H.V Conductors lead from winding to OLTC.

(23) **APPROXIMATE WEIGHT**

- (a) OLTC and accessories.
- (b) Total weight including complete OLTC with fittings.
- (C) RTCC & AVR
 - Type and make of RTCC
 - Type and make of AVR
 - Details of components used in RTCC

(24) Flux density to be considered for design (Max.) for core of Transformer - 1.4 WB/Sqm.

(25) Dimension of the Transformer – Width X Depth X Height

THIRD PARTY INSPECTION

THIRD PARTY INSPECTION

□ **SCOPE**

Third Party Inspection of the transformer by Electrical Research Development Authority, ERDA. The manufacturer should co-ordinate the inspection which will be carried out in the presence of the Client, Consultant and the Third party inspection authority.

**LIST OF APPROVED BRANDS/MAKES OF EQUIPMENTS
REQUIRED UNDER THIS TENDER**

The following are the list of approved brands/makes of equipments required under this tender. Please note that wherever there is a multiple choice of brands/makes approved, any one make as nominated by the Owners/Consultants will have to be supplied by the Vendor without any extra cost to the owners. No deviation in this will be accepted by the owners.

Sr. No.	Description	Approved Makes	Makes/Brands being offered by the Contractor.
1.	11/0.415 V Dry Type Transformer	TELAWNE KIRLOSKAR CROMPTON GREAVES	

QUALITY ASSURANCE PLAN

SUPPLY OF 2000KVA &1750 KVA TRAFO AT TERNA PUBLIC CHARITABLE TRUST, NERUL

- 1.1] QA PLAN
- 1.2] ITP
- 1.3] DRAWING SCHEDULE
- 1.4] PROGRESS REPORT AND SCHEDULE
- 1.5] WAIVER AND DEVIATION
- 1.6] PROCUREMENT OF BOUGHT OUT MATERIALS
- 1.7] CALIBRATION RECORDS
- 1.8] INSPECTION TEST STATUS
- 1.9] QUALITY RECORDS
- 1.10] IDENTIFICATION AND TRACEABILITY
- 1.11] VENDOR DOCUMENT FOR REVIEW AND RECORDS
- 1.12] DOCUMENTS UNDER REVIEW CATEGORY.
- 1.13] FINAL DOCUMENTS

QUALITY ASSURANCE PLAN AND INSPECTION & TESTING PLAN REQUIREMENTS

1.1] QA PLAN

Vendor during bidding stage shall submit his quality assurance plans (QAP) consisting of relevant procedures covering various activities like design and engineering, material procurement , manufacture inspection and testing, documentation, dispatch to site , erection and commissioning wherever applicable and maintenance of quality records in the post order stage. The vendor shall submit the QAP to the site engineer for approval within 2 weeks from the date of receipt of LOI/ PO whichever is earlier. The QAP shall be approved by the authorized representative of TPI agency and then to TERNA PUBLIC CHARITABLE TRUST /Consultant after the approval of TPI agency.

1.2] ITP

Vendor shall submit inspection and test plan for approval within 2 weeks of loi/po and before commencement of manufacture to the site engineer as well as to the third party inspection agency (TPIA) that the vendor wishes to appoint for carrying out inspection and testing. This document should clearly specify the name, designation of the person concerned (with telephone/mobile no and email) and communication address of the TPI.

1.3] DRAWING SCHEDULE

Vendor shall submit a total index of drawings and documents required for approval/review/records along with the scheduled date of submission of each drawing/document within 2 weeks from date of issue of LOI/ PO whichever is earlier.

1.4] Progress report and schedule

Vendor shall submit monthly progress report and update procurement engineering and manufacturing schedule every month starting from 2 weeks from date of issue of foi/po whichever is earlier.

1.5] Waiver and deviation

Vendor shall strictly comply with the PO stipulations and no deviations shall be permitted.

1.6] Procurement of bought out materials

All critical materials such as casting, forging, fitting, pressure holding parts electrical and instrument accessories etc. Shall be purchased by the vendor from sub- vendors having BVQI, IRS, LLOYD"s, CEIL or DNV approval. Vendor shall submit a list of bought out materials for TERNA PUBLIC CHARITABLE TRUST/Consultant approval within 2 weeks from the date of issue of FOI/PO whichever is earlier.

1.7] Calibration records

Vendor shall use only calibrated measuring and test instruments and maintain calibration records. Vendor shall furnish records of calibration of measuring and test instruments including recalibration records to third party inspection agency on demand.

1.8] Inspection test status

Inspection and test status of products shall be identified by using markings. Authorized stamps, tags, route cards, inspection cards etc. During the course of manufacture to clearly indicate acceptance/ rejection of tests/stages of inspection performed during its manufacturing cycle. The identification of test status shall be maintained and records submitted as and when demanded by TERNA PUBLIC CHARITABLE TRUST/Consultant/TPI Agency.

1.9] Quality Records

Vendor shall maintain quality records as per his procedures. Inspection reports & test records copies shall be furnished to TERNA PUBLIC CHARITABLE TRUST/Consultant/ TPI Agency.

1.10] Identification And Traceability

Vendor shall establish and maintain a standard written procedure for identifying the products from applicable drawing specifications or other documents during all stages of production delivery. A copy of this standard procedure shall be made available TERNA PUBLIC CHARITABLE TRUST/Consultant/TPI Agency. The vendor shall ensure that each product which is going in the process of fabrication / manufacture / construction / erection has proper identification throughout the process including the final output.

1.11] Vendor Document For Review And Records

General

- 1] All documents shall be in English language and SI system of units.
- 2] Review of the vendor drawing by third party inspection agency / TERNA PUBLIC CHARITABLE TRUST/Consultant would be only to review the compatibility with basic design and concepts and in no way absolve the vendor of his responsibility to comply with PO requirements, applicable codes, specifications and statutory rules/regulations.
- 3] Submission of documents for review/records shall commence within 2 weeks from the date of issue of FOI/PO.
- 4] The vendor shall submit all drawings and documents in three copies as stipulated in the vendor data requirement along with documents index. The documents shall also be submitted in soft copies to expedite the process of approval/review.

Vendor shall ensure that each drawing shall contain the following information:

Po no name of equipment, tag no., name of project, client, drawing/ document title, drawing no., revision and date.

The drawing document shall be checked approved and duly signed stamped by the vendor revisions and date.

1.12] Documents under review category.

Following review codes shall be used for review of vendor documents / drawings.

AFI : Approved for inspection

AFM : Approved for manufacturing / fabrication as per comments

Vendor shall resubmit the same after incorporating the comments before carrying out final inspection by TPI Agency and dispatch.

Not approved: Resubmission required in cases of major non- conformities with respect to PO specifications.

1.13] Final documents

Final drawings/documents consisting of technical data manual as a compilation of as-built certified drawing and manufacturing data and test records duly certified by TERNA PUBLIC

SUPPLY OF 2000KVA &1750 KVA TRAFO AT TERNA PUBLIC CHARITABLE TRUST, NERUL

CHARITABLE TRUST/ TPI Agency should be submitted in three sets along with soft copy of the same.

Maintenance instructions of the material/equipments (wherever applicable) shall also be submitted in three sets and in soft format.