

SUPPLY OF 1010 KVA DG SET AT TERNA PUBLIC CHARITABLE TRUST, NERUL

TERNA PUBLIC CHARITABLE TRUST

NAVI MUMBAI -40070

TENDER DOCUMENT

FOR

SUPPLY OF 1010 KVA DG SET

AT

TERNA PUBLIC CHARITABLE TRUST

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

PHASE-2, NERUL WEST, NAVI MUMBAI,

MAHARASHTRA -400706

SUPPLY OF 1010 KVA DG SET AT TERNA PUBLIC CHARITABLE TRUST, NERUL

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Notice Inviting Tender

Terna Public Charitable Trust invites tenders for **Supply of 1010 KVA DG set with Manual Control Panel in Terna Public Charitable Trust Premises at Plot No.12, Sector 22, Opposite Nerul railway station, Phase 2, Nerul-West, Navi Mumbai- 400706** from the original equipment manufacturers of Diesel Generating Set i.e. Powerica, Kirloskar, Mahindra 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 1010KVA DG set along with Manual Control Panel 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 1010 KVA DG set along with Manual Control panel 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 1010KVA DG set along with Manual Control Panel 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 22nd 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 14th 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.

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

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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 1010KVA DG set along with Manual Control Panel 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 14 th Jan., 2016
	Last date and time of submission of Tender Document	3:00 PM of 22 nd Jan., 2016
	Opening of Tender	4:00 PM of 22 nd Jan., 2016
	Validity of Tender	180 days from the date of opening of Price Bid
4	Time period of work completion	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 work.
7	Defect Liability Period	1 year from the Date of Receipt of Supply
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%

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10	Payment Terms	<p>(i) 30% Advance against Techno commercial Order and separate Bank Guarantee of 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 1010KAV DG set along with Manual Control Panel in Terna Public Charitable Trust premises 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. Powerica, Kirloskar, Mahindra 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.

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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 1010KVA DG set along with Manual Control Panel 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.

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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.

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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

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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)

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.

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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

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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)

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Tenderer Details

1	Name of the Tenderer	
2	Tenderer Type (OEM/ Authorized dealer)	
3	Name of the Brand of 1010KVA DG set along with Manual Control Panel	
4	Type of Organization (Whether Proprietorship, Partnership, PSU etc.)	
5	Name of the Proprietor/ Partners/ Directors in the Organization	
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 1010KVA DG set in acoustic enclosure along with Manual Panel. The detailed scope of work and explanatory notes given below are added to assist the DG vendor to understand the project. The detailed scope is as described in the Bill of Quantities and Specifications. The scope of the DG vendor includes the Supply and Testing at factory of DG set. However, the DG vendor should provide Supervision to the main Electrical Contractor on board during on site testing, pre-commissioning & Commissioning of **1 No. 1010 KVA Diesel Generating Set** along with Acoustic Enclosure and Manual Panel 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 DG set 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 DG 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 Sahyadri Speciality Terna Public Charitable Trust(TSSH)/ Consultant. Such drawings shall be coordinated with all disciplines of work. The vendor shall also get all the approvals from Government bodies, Pollution Control, Director of Explosive, 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 Manual Panel, detail control wiring ,foundation details and Acoustic enclosure 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 1 No. 1010 KVA DG SETS 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 DG set along with Manual Control Panel 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 DG set and Manual Control Panel only comes under the LD clause while Supervision & Commissioning doesn't come under this clause.

SCHEDULE OF QUANTITIES

SCHEDULE OF QUANTITIES

BILL OF QUANTITIES (1010 KVA DG SET)					
Sr.No	Item Description	Qty	Unit	Rate (INR)	Amount (INR)
1	DG SET-1010 KVA WITH MANUAL CONTROL PANEL				
1.1	Supply of factory assembled Diesel Generator set of 1010 KVA, 808KW, 50Hz, 1180 BHP 0.8PF, 1500RPM with acoustic enclosure as per CPCB norms consisting of the following:- a) 6 cylinder 4 stroke , turbocharged Diesel engine with electric starting equipments, batteries with leads etc., complete with accessories as detailed in technical specifications. b) Common bed with anti-vibration mounting as required. c) Alternator of suitable capacity suitably coupled to the engine as per detailed technical specification. d) Piping and pumping work required for 990 litres fuel system including all accessories. The Manual control panel should be a part of the 1010KVA DG set. The detailed requirement is mentioned in the technical specs. The cost should include warranty for a period of 12 months. Charges towards obtaining of Central Electricity Authority /Pollution control board approval for running the DG set should be included in the rate quoted.	1	Job		
1.2	Service charges towards providing guidance to the Electrical contractor for installation, testing on site and commissioning of DG set with acoustic enclosure including supply and fixing of friction pads, positioning and initial filling of lube oil diesel testing the DG set on load capacity.	1	Job		
1.3	<u>Third Party Inspection:</u> Third Party Inspection of the DG set by approved agencies mentioned in the tender. The OEM 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		
1.4	Annual Maintenance Charges:				
	First year after the initial warranty of 12 months.	1	Job		
	Second year after first year of AMC.	1	Job		
	Third year after second year of AMC.	1	Job		
	GRAND TOTAL				

TECHNICAL SPECIFICATIONS

1.0 D.G SET- 1010KVA IN ACCOUSTIC ENCLOSURE ALONG WITH MANUAL CONTROL PANEL

1.1 Scope

This specification covers the requirements of design, manufacture, assembly, testing, packing and supply of following DG Set. The installation, testing and commissioning on site shall be carried out by the Principal Electrical contractor. The DG set vendor should make available his technical team at site to guide the entire installation, testing and commissioning process to be carried out by the Electrical contractor.

1No. 1010KVA, 430V D.G. Set (Outdoor) with base frame, battery & battery charger & fuel tank.

D.G control panels with required switchgear & protection. Generator control unit (GCU) shall be included in panel to provide control for manual operation.

Acoustics enclosure to restrict the vibration level to 70db at 1mtr distance from the DG set.

HSD day tank of minimum 990 liters capacity for 1010KVA DG set.

Flue gas ducting with silencer in IS 2002, 6mm thick. (Or A106 Gr. B., Sch 40) SS 304 bellow, lightly resin branded mineral wool, 100mm thick with 22g Aluminium cladding and exhaust stack. Length and the diameter of the exhaust stack shall be as per local regulations.

The length of the chimney should be derived as mentioned below:

(a) For DG set up to 500KVA :-

$$H = h + 0.2 \times \text{sq rt}(KVA)$$

Where H = height of exhaust stack

h = height of building

(b) For DG set above 500KVA :-

$$H = h + 6\text{mtr}$$

Where H = height of exhaust stack

h = height of building

All statutory approvals such as local supply co. and pollution control board NOC and approval of electrical inspector for installation drawings and installation work from Electricity Department, Pollution Control Board etc.

Earthing grid for DG and panel, earth pits in not in scope scope of contract.

All civil work, power cabling etc. shall not be in scope of contract.

All piping / hose between Day tank and DG set is in the scope of contract.

AVM pads (gel filled) for engine and alternator frame mounting is in the scope of contract.

1.2 Site Conditions

	Ambient Temperature	45°C
	Relative Humidity	90%
	Altitude above MSL	Not more than 1000 mtrs. from MSL
	Atmosphere	Industrial / Polluted

1.3 Electrical System

	Nominal Voltage	430 V \pm 10%
	Frequency	50 Hz. \pm 3%
	No. of Phases	3 Phase, 4 wire

1.4 Standards

The diesel engine, the alternator and accessories shall comply with the latest editions of the relevant Standards & codes as below but not limited to the following.

1	Diesel engine	ISO 3046/1/DIN 6271/BS-5514/BS-649.
2	Alternator	BS 2613/IS 4722
3	Control Panel	IS 4237

1.5 Generating Set

1	Quantity	1 No each.
2	Rating	1010 KVA at 0.8 P.F. at 45°C
3	Voltage	430 Volts/3 phase/4 Wire
4	Frequency	50 Hz.
5	Duty	24 Hours, Continuous

1.6 Diesel Engine

	Rating	1010 KVA generator as indicated above to run continuously with 10% overload capacity for one hour in any 12 hours.
	Speed	1500 rpm
	Type of Governor	Electronic
	Fuel	High Speed Diesel
	Starting	Battery operated Electric Starter.
	Type of Cooling	Radiator-cooled
	Lubrication	Force-feed for main bearings & by splash for camshaft and other parts.

Note:

- a. Vendor to include running cost and maintenance cost (for period upto handing over).
- b. First time change of air filter, lube oil filter, fuel filter, lube oil, fuel oil to be done by Vendor.

1.7 Diesel Engine Accessories

1.	Flywheel & flywheel housing	To be Provided
2.	Engine speed Governor Electronic	To be Provided
3.	Manual speed adjusting device	To be Provided
4.	Air filter & air intake manifold	To be Provided
5.	Turbocharger & after cooler / intercooler	To be Provided
6.	Torsional Vibration Damper	To be Provided
7.	Crankcase breather	To be Provided
8.	24V solenoid for Engine shutdown	To be Provided

Note:

1. MS day tank of 990 liters capacity for 1010KVA DG set, fabricated out of IS 2062, 3mm thick for each DG set shall be included in scope of work.
2. Level gauge shall be of borosilicate glass (3/4" OD) and MS channel protected.
3. Piping shall be IS 1239 'C' class and isolation ball valves shall be provided at inlet (50 NB) outlet (40 NB), drain (40 NB) and level gauge isolation valves (25 NB).
4. This tank shall be floor / wall ceiling mounted outdoor type with adequate mounting brackets.

1.8 Starting System

- a. Starter motor 24V DC
- b. Starter gear ring fitter on the flywheel
- c. 4 x 12V sealed Lead Acid batteries of suitable AH capacity & battery cable with interconnections / air bottle (vendor to specify)
- d. Static Battery charger for above battery shall be float cum boost type.
- e. Electrically operated lubrication pump to lubricate the engine while standstill.

1.9 Cooling System

1. Radiator cooled.

1.10 Lubrication System

1.	Forced feed lubrication with gear pump	To be Provided
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2.	Lube oil pump	To be Provided
3.	Lube oil filter	To be Provided
4.	Lube oil cooler	To be Provided
5.	Lube oil pipes on the engine	To be Provided
6.	Lube oil centrifuge	To be Provided

1.11 Fuel System

1.	Fuel injection pumps	To be Provided
2.	Feed pump for fuel injection pump	To be Provided
3.	Fuel filter and pre filter	To be Provided
4.	Fuel injection pipes	To be Provided

1.12 Exhaust System

1. Exhaust manifold, insulated for surface protection.
2. Residential heavy-duty silencer (vendor to specify noise levels guaranteed).
3. Exhaust gas turbocharger with after cooler.
4. Flexible pipe for silencers.
5. Exhaust pipe line shall be extended over top of the building as per rules of pollution control board.
6. The exhaust stack should be installed with appropriate filter and rain cap.

1.13 Monitoring Instruments for the Engine Safety

1. High water temperature gauge
2. Low lube oil pressure switch
3. Over speed detector
4. Diesel level detector

1.14 Static Instrument panel

Static Instrument panel consisting of indication for following

1. Lubricating oil temp
2. Lubricating oil pressure
3. Digital RPM, Digital hour (integrated)
4. Cooling water temperature
5. Engine start switch
6. Engine shutdown switch
7. Any other (contractor to specify)

1.15 Alternator

1.	Rated Voltage	430V, 3phase, 4 wire, 50 Hz
2.	Rating	1010KVA
3.	% Voltage regulation (From no load to full load)	+/- 0.5%
4.	Type of Excitation	Self excited brushless type excitor with automatic voltage regulator.
5.	AVR	Electronic
6.	Power factor at full load	0.8 Lag.
7.	Insulation (for Armature and Field Windings)	Class H
8.	No. of bearings	Two
9.	Enclosure	IP-23
10.	Accessories	a) Neutral terminal in cable box with neutral bushing brought out for connecting 2 nos. 50 x 6mm Copper Earth strips. The cable box shall be suitable for termination of cable from main PCC to alternator. b) Earthing Lugs – 2 nos. c) Lifting eyes.
11.	Overload Capacity	1) 10% overload capacity for 1 hr in 12 hours & 50% overload capacity for 15 seconds during starting or as per your standard. 2) Vendor to specify short - time overload capacity to provide starting current for large motors.
12.	Max. Voltage dip during starting	Less than 15% of 415V.
13.	Starting of large Motor	Vendor to specify largest size of Induction motor which can be started with star delta starter, when the generator is loaded up to 50%
14.	Temperature Scanner	Temperature scanner with provision to set alarm & trip temp Shall be provided in the control panel. Temperature sensors 2Nos.per phase winding & 1No. each for bearing to be provided. In the alternator associated wiring to be included.
15.	Cable adaptor box.	Suitable to terminate panel cable as per requirement.

1.16 Coupling

Engine & alternator are coupled together using a flexible rubber coupling & guard.

1.17 Base Frame

Engine & alternator are mounted on steady, fabricated, welded construction, channel base frame, foundation bolts and templates shall be supplied along with the engine.

1.18 Batteries, Battery Leads & Battery Charger

The scope covers the supplying, erecting, commissioning of required nos. & voltage of partial recombination type Nickel-Cadmium alkaline batteries to cater for the electrical starting of the engine along with the battery leads, with battery charger during idle time. Provide automatic charging of batteries during idle condition of the DG set with manual switch off facility. These batteries, battery leads & battery Charger shall be considered in the contractor's scope.

1.19 Labels

Labels shall be on anodized aluminum, with white engraving on black background. They shall be properly secured with fasteners.

1.20 Annunciator

A solid state multi-window annunciator shall be provided on the panel board with engraved inscriptions on acrylic sheets and with visible & audible alarms for fault.

Indications like:

1. Alternator over load
2. Reverse Power
3. Earth Fault
4. High water temperature
5. Low lube oil pressure
6. Over speed
7. Set fails to start and 2 spare annunciator windows.

1.21 Storing

The panels shall be stored in well ventilated dry places. Suitable polyethylene covers shall be provided for necessary protection against moisture.

1.22 Labels

Labels shall be on anodized aluminum, with white engraving on black background. They shall be properly secured with fasteners.

1.23 Control Panel for 1010KVA DG Set

1.23.1 General

The Control Panel should be a part of the 1010KVA DG set and should be in the enclosure itself. The control panel should be powder coated manufactured with 14/16 gauge CRCA sheet. The DG set manufacturer has to submit the detail layout plan of DG set & Control Panel before fabrication of panels.

The Control panel should consist of the following:

1. ACB of suitable rating with overload and short circuit protection.
2. Voltmeter and Ammeter with selector switch.
3. KW/PF meters.
4. Frequency meter.
5. KWh meter.
6. Indicating lamps for "Load ON" and "DG set running".
7. CT's
8. Aluminium bus bars of suitable capacity with incoming and outgoing terminations.
9. Instrument fuses duly wired and ferruled.
10. Audio/Visual announcement for faults.
11. Battery charger.

1.23.2 Mode of operation of Manual Control Panel

□ **Manual Mode of Operation:-**

- In this mode, the DG Set control selector switch on the AMF Panel shall be kept on "Manual" position. The Diesel Generator can then be manually started by pressing the engine "Start" push button on the AMF panel. After the DG Set comes to rated speed and the alternator voltage and frequency attain the rated value (as monitored by the DG supply monitor on AMF panel), it shall permit manual closing of the alternator circuit breaker. The DG set shall be now ready to take the load.

□ **Test Mode of Operation:-**

- In this mode of operation, when the DG set control selector switch on the AMF panel is transferred to "TEST" position, control circuitry shall be so wired that it shall sense a condition of "No Mains Supply"; (even when mains supply is healthy) and then follow a sequence of automatic starting of DG set except without closing of the breaker.
- When DG set control selector switch is kept in "OFF" position, the engine control circuit shall be ineffective.
- The DG set shall be provided with three attempt starting facility and in case the Diesel Engine fails to start and reach its rated speed within 30 seconds, it shall be disconnected and locked out immediately. Annunciation with alarm shall be provided on the DG control panel when engine fails to start after three attempts to start.

1.24 Test & Test Certificates

Shop test certificates for Engine and Generator to be furnished, (4 copies). Routine test witnessing for 4 hrs. will be borne by OEM at the manufacturers place.

Output of the DG set will be tested and proved by running the set continuously at a stretch for 3 hours at 100% load and then for 1 hour at 110% load during routine test witnessing at manufacturers place and again tested satisfactorily at site.

Site test including load test (12 hrs.) voltage regulation test & governor response to be carried out. Fuel consumption, lube oil consumption, other consumables and noise levels to be checked at site & confirmed to be within the guaranteed figures.

Routine tests shall be conducted on each power control panel in accordance with CI 81,2.2 of IS 8623 and shall comprise:

- i) Inspections of the power and control circuits including inspection of wiring and electrical operational tests where necessary.
- ii) Dielectric tests.
- ii) Checking of protective measures and electrical continuity of the protective circuits.

1.25 Guarantee

The DG set and panel with spares shall be guaranteed for trouble free operation for a period of 12 months from the date of handing over.

Any defect due to faulty material shall be rectified free of cost to the entire satisfaction of the purchaser.

Performance Guarantee runs shall be conducted after one-month continuous trouble free operation.

All guarantees from equipment supplied will be vested in the client.

The following items of performance shall be guaranteed by the vendor in respect of diesel generator set, the auxiliaries, as well as any ingress of water in weather proof acoustic enclosure shall be repaired/ replaced on site without any charges when operating under the specified site conditions and when using the specified fuel.

- Net electrical output at generator terminals.
- Fuel oil consumption at ½, ¾ and full load.
- Lube oil consumption at full load.
- Generator efficiency at ½, ¾, and full load.
- 10% overload for 1 hour without overheating or showing signs of undue stresses on engine & alternator. Alternator should have 50% over load capacity for 15 seconds during starting.
- Governor response, over speed trip and over speed capacity.
- Voltage regulator response.

1.26 Testing and Commissioning

Manufacturer shall carry out the supervision of installation, testing and commissioning of the D.G. set and Manual Control panel supplied by him. Safe and good engineering practise should be adopted by the OEM to guide the Electrical contractor to successfully commission the DG set at site to the satisfaction of the Consultant and the Client.

1.27 Civil Works

All civil works such as foundations for D.G. set, cable trenches, pipe trenches etc. will be provided by the Principal Electrical contractor. However contractor shall furnish necessary foundation details, weights of equipment, cable / pipe trench / rack details, cable requirement, etc. to the Consultant/Electrical Engineer in charge for approval before commencement of work.

1.28 Information, Data Drawings

Contractor shall submit the following drawings / manuals for approval of client/Architect/Consultant /Electrical Contractor's Engineer In-charge/ local supply company.

SUPPLY OF 1010 KVA DG SET AT TERNA PUBLIC CHARITABLE TRUST, NERUL

1. General arrangement drawings showing plan, elevation of the D.G. set and its accessories including control panels, alternator, terminal box etc. complete with overall dimensions, foundation plans, weight, detail of acoustic enclosure etc.
2. General arrangement drawing of the control panel and battery charger along with foundations plans, overall dimensions, front view etc.
3. Fuel oil tank drawing along with mounting arrangement.
4. Schematic wiring diagram for the control panel and battery charger along with complete bill of materials (make, range, rating, size, accuracy class etc.) and control cable requirements.
5. Erection, testing and commissioning, operation and maintenance instruction manuals along with test certificates, spare parts list (for 2 years trouble free operation) shall be furnished.

Data Sheet for 1010KVA DG Set

Sr. No.	Description	To be filled in by contractor
1.	Diesel Engine	
a)	Make	**
b)	Model no.	**
c)	Bore / Stroke / Mean piston speed /No. of cylinders	**
d)	Fuel Consumption in Gm/BHP/hr. & liters/hr	
i.	At 100% load in gm/BHP/hr.	**
ii.	At 75% load in gm/BHP/hr.	**
iii.	At 50% load in gm/BHP/hr.	**
iv.	At 100% load in ltrs./ hr.	**
v.	At 75% load in ltrs./ hr.	**
vi.	At 50% load in ltrs./ hr.	**
e)	Lube Oil Consumption (liters/hr.)	**
f)	Frequency of lube oil replacement	**
g)	Coolant conditioner consumption	**
h)	Frequency of corrosion resistor replacement	**
i)	Power availability at Generator terminals (units/liter of HSD)	**
j)	Specific gravity & calorific value of HSD considered for Fuel	**
k)	Type of AMF controller and Technical details.	**
l)	Cooling Water requirement:	
i.	Inlet temperature	**
ii.	Outlet temperature °C	**
iii.	Water flow required in Ltr/min	**
iv.	Heat load Ton	**
v.	Ventilation requirement (water)	**
2.	Alternator	
a)	Make	**
b)	Model	**
c)	Enclosure Air cooled IP protection class	**
d)	Insulation class F/F	**
e)	Temperature sensor for bearings	**
f)	Temperature sensor for windings	**
g)	Anti-condensation standstill heaters – Voltage: 220V AC	**
h)	Tropical/Humidity Protection	**

SUPPLY OF 1010 KVA DG SET AT TERNA PUBLIC CHARITABLE TRUST, NERUL

Sr. No.	Description	To be filled in by contractor
i)	Voltage regulator	**
3.	Protection Relays	**
4.	Acoustic Enclosure	
a)	Weatherproof, metallic, sound attenuated	**
b)	Noise level to be maintained at a level of less than 72 dB.	**
c)	Self supporting structure	**
d)	Normal regular conversation possible at a distance of 1.0 mtr. from the enclosure	**
e)	Residential silencer with suitable lagging	**
f)	Warranty offered for weather proof enclosure	**
g)	Overall Dimension layout with clearances with respect to DG set shall be provided	**
5.	Battery & Battery Chargers	
a)	Battery	
i.	Make	**
ii.	Type	**
iii.	Voltage	**
b)	Battery Charger	
i.	AH capacity	**
6.	Maintenance	
a)	Spares/consumables list for one year trouble free operation after warranty period.	**
b)	Maintenance schedule incorporating normal/major maintenance & shut down requirements.	**

Note: ** Data to be filled by contractor.

THIRD PARTY INSPECTION

THIRD PARTY INSPECTION

□ **SCOPE**

The third party inspection shall be conducted for the following major components

The Diesel Engine shall be Load tested and fuel consumption tested at the engine manufacturer's works. Refer standard specification clause no: 4.1.3 of standard specification for diesel Engines.

The Alternator shall be subjected to all tests at Alternator manufacturer's shop as defined in the data sheet and technical specification.

The control panels shall be tested at Panel manufacturer's works.

The QAP & ITP shall be submitted by the vendor for approval of Terna Public Charitable Trust/Consultant before carrying out TPI

- The approved agencies for inspection are as follows.

Lloyds

EIL

Rites

DNV

Bureau VERITAS

SGS

The item rate quoted for the DG SETS shall include the charges for carrying out third party inspection.

The power required to carryout requisite inspection, coordination with third party agency etc,, necessary charges for third party agency shall have to be borne by the vendor. QAP shall have to be submitted by the vendor well in advance for Terna Public Charitable Trust/Consultant approval. Inspection shall be carried out only after the QAP is approved.

□ **Brief Description Of The Scope**

The following scope lays down minimum requirements but not limited to the same and shall be read in conjunction with Data sheets/Technical specification and all other requirements as laid out in the tender documents. The vendor shall arrange to carryout all other tests not spelt out in the below scope but necessary for successful performance of the DG set"s.

● **Scope Of Inspection:**

Routine tests as per IS: 1600 & 1601, BS 5514 & IS 4722 shall be carried out by vendor on bare engine and alternator in presence of Third Party inspection Agency (TPIA).

Third party Inspection agency shall give a certificate to the effect that entire DG set along with accessories conform to the specifications given in the purchase order.

Following test shall be carried out on Diesel Engine & Alternative & certificate to be submitted to Third Party for review and endorsement.

Routine test for Engine as per BS - 5514 / IS- 1600 and 1601, like fuel consumption test etc. Maximum duration of test is 8 hours.

Routine test for alternator as per IS: 4722 or other applicable I.S. Like insulation resistance test, high voltage test, etc.

The relevant visual Inspection for Acoustic Enclosure to be done as follows:

- a) The acoustic enclosure shall be designed for easy access to serviceable parts.
- b) Modular construction for easy assembling and dismantling.
- c) Fabricated out of CRCA sheet steel of **14 gauge**. Base Frame shall be made out of ISMC of suitable sections or made out of sheet steel of 5mm minimum thickness. Base frame & main body sheet steel thickness as per CPCB approved design shall also be acceptable. CPCB approved drawing in this regards is to be submitted to the owner during the drawing approval stage.
- d) The hardware shall be of high tensile grade i.e. bolts of 10.9/8.8 grade. Hardware shall be passivated.

SUPPLY OF 1010 KVA DG SET AT TERNA PUBLIC CHARITABLE TRUST, NERUL

- e) Sound proofing of enclosure shall be done with quality rock wool/mineral wool, conforming to IS-8183, of suitable density.
- f) The rock wool /Glass wool shall further be covered with fibre glass cloth/fibre tissue paper fire resistive and perforated powder coated sheet of 0.6 mm thickness.
- g) Residential silencer is to be provided with the DG to control the exhaust noise.
- h) Interconnection between silencer and engine shall be through stainless steel flexible hose/pipe.
- i) Attenuators shall be provided to control sound at air entry & exit in the enclosure.
- j) Battery shall be accommodated in a separate tray in the Enclosure.
- k) The doors shall be gasketed with high quality EPDM gaskets to avoid leakage of sound.
- l) The door handles shall be lockable type.
- m) The sheet metal components shall be hot dip seven tanks pre-treated.
- n) The enclosure shall be P.P. based powder coated (inside as well as outside) in colour RAL 7032/7035.
- o) Base frame shall be epoxy coated when fabricated.
- p) Emergency Stop Push Button shall be provided outside the enclosure
- q) The Enclosure shall have on its body a 63A TPN five pin metal clad socket & plug for termination of three phase supply at a single point, for the AC load of lube priming pump, battery chargers for Control panel & DG starting battery banks, internal illumination of the Enclosure, etc. The power supply inside the Enclosure shall be distributed by providing a Distribution board & interconnecting cables by the Vendor
- r) The maximum noise level shall not exceed 75 db (A) at 1 mtr from the enclosure surface

SUPPLY OF 1010 KVA DG SET AT TERNA PUBLIC CHARITABLE TRUST, NERUL

s) There shall be provision for drain plugs for draining lube oil / diesel.

Vendor shall perform the following tests on DG set at work shop and Third party inspection agency will witness the tests.

1. Starting

2. Governor operation

3. Voltage Regulator response

4. Load Run

5. No load - 5 min.

25% load - 15 min.

50 % load - 30 min.

75 % load - 30 min

100% load - 60 min

110% load - 60 min.

□ **TESTING & INSPECTION MANUAL CONTROL PANEL:**

The panel boards shall be factory tested/inspected before finishing and dispatch.

The following tests shall be carried out:

□ **INSULATION RESISTANCE TEST**

Panel boards shall be meggered phase to phase and phase to neutral, using a 1000 V meggar with all switchgear in closed position. The meggered value should not be less than 2.5 mega ohms between phase and 1.5 mega ohms between phase & neutral & earth.

□ **HIGH VOLTAGE TEST**

The test shall be carried out by applying 2.5 KV for one minute between Air, three phase & earth. Between phase and the board shall withstand the same.

Panel boards shall be meggered phase to phase end.

Test reports shall be submitted to Third party inspection agency for endorsement.

**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.	Low Tension, 415 Volts AC Air Circuit Breaker, 3/4 Pole 50 Hz. 50 KA-STR.	SCHNEIDER-MASTERPACT SIEMENS-3WL	L & T-U-POWER- SR71
2.	Low Tension, Molded Case Circuit Breaker, 415 Volts AC, 3 Phase 50 Hz., 50 KA/35 KA-STR. Ics=Icu & Microprocessor	SCHNIDER-COMPACT SIEMENS-SENTRON-3VL	L & T – D SINE
3.	LED Type Indicating Lamps with Color LED.	SCHNIDER/L & T/ SIEMENS	
4.	Selector Switches for Ammeter/Voltmeter.	SCHNIDER/L & T SIEMENS	
5.	Meters, Analog type. for Ammeters, Voltmeters, PF meters, Frequency Meters.	IMP/ RISHABH	
6.	Energy Meters.	SECURE/ L & T/CONZERV	
7.	Relays.	SCHNIDER ABB/SIEMENS	
8.	FRLS Panel wires, in color in 660/1100 Volts grade. (Unilay Construction)	LAPP/ R.R. KABEL POLYCAB	
9.	Lugs, Crimping type, tinned copper heavy duty only.	JAINSON LAPP	

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Sr. No.	Description	Approved Makes	Makes/Brands being offered by the Contractor.
10.	Push Button Stations type, in different colour codes.	SCHNIDER/ L & T /SIEMENS/	
11.	Terminal Blocks, Clip on type.	WAGO/ LAPP	
12.	MS fabricated Panels	AS APPROVED BY CONSULTANTS.	
13.	Starters/Contactor/ Timers.	TELEMECANIQUE / L & T SIEMENS / ABB	
14.	Miniature Circuit Breaker of 10 KA Breaking Capacity and Boards.	SCHNIDER/ LEGRAND L & T/ABB	
15.	CTs - 660 Volts grade ABS CASINGS	RECO/KAPPA INDCOIL	
16.	Load Managers.	CONZERV / L & T / ENERCON	
17.	HRC Control fuses with bakelite/type Moulded fuse holders.	ABB/BUSSMAN SIEMENS/L & T	
18.	Push Button Stations type, in different colour codes.	TECHNIK/MOELLER/ SIEMENS/ VAISHNAV	
19.	Terminal Blocks, Clipon type.	ELMEX/WAGO CONNECTWELL	
20.	DG SET- ENGINE	POWERICA/KIRLOSKAR/ MAHINDRA	
22.	BATTERIES	EXIDE / CUMMINS	
23.	Any other Item.	SAMPLE FOR APPROVAL OF THE CONSULTANTS	

QUALITY ASSURANCE PLAN

SUPPLY OF 1010 KVA DG SET 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 to 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 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.