

Tender Details		07-12-2023 05:12:47
Tender Code	EE/ICH/CAPACITOR/T-18/2023-24	
Tender Type	Works Tender	
Type Of Bid	Two Bid	
Description	Tender for providing & fixing of substation capacitors and related equipments in Substations under Ichalkaranji Division.	
Estimated Cost (In Lakhs)	10	
Basis of prices	NA	
Tender Validity	NA	
Delivery Requirement (In Months)	NA	
Tender on rate contract basis	NO	
Tender Fee (In INR)	1000	
GST In INR (@18% on Tender Fee: SAC No.	180	
Total Tender Fee Amount including GST in INR.	1180	
Contact	Vasanti S Bharate , 7875932070 ,eeichalkaranji2013@gmail.com	
Pre-Qualifying Req	As per tender conditions	
Budget Type	Revenue	
Scheme Code	NA	
Scheme Name	NA	
Department	Distribution Department	
Office Type	DIVISION	
Location Type	Ichalkaranji Division	
Designation	Additional Executive Engineer(Distribution)	
Pre-Bid Meeting Address	Executive Engineer Maharashtra State Electricity Distribution Co. Ltd. Division Office, Ichalkaranji “Vidyut Bhavan”, Station Road. Ichalkaranji.	
Bid Opening Address	Executive Engineer Maharashtra State Electricity Distribution Co. Ltd. Division Office, Ichalkaranji “Vidyut Bhavan”, Station Road. Ichalkaranji.	
Version No	1	
Call for Deviation	NO	
Is Annexure C1 Applicable	NA	
Is Manufacturer Applicable	NO	
Is Trader Applicable	NO	
Minimum % of Offered Quantity	NA	
Is Power Supplier Applicable	NO	
Tender Sale Start Date	08-12-2023 11:00	

Tender Sale End Date	18-12-2023 23:50
Bid Start Date	08-12-2023 11:05
Bid End Date	18-12-2023 23:55
Pre-Bid Meeting Date	12-12-2023 11:00
Techno-Commercial Bid opening on	19-12-2023 11:00
Price Bid opening on	Will be declared later
Annexure C1 Opening Date	NA
Winner Selection Date	Will be declared later
Can Bidder Opt EMD Exemption	N



**Maharashtra State Electricity Distribution Company Limited
Division Office, Ichalkaranji.**

**Tender for providing & fixing of substation capacitors and
related equipments in Substations under Ichalkaranji
Division.**

Tender No. EE/ICH/CAPACITOR/T-18/2023-24

**VOLUME-1
TECHNICAL BID**



Executing Agency

**Executive Engineer
Maharashtra State Electricity Distribution Co. Ltd.
Division Office, Ichalkaranji
“Vidyut Bhavan”, Station Road.
Ichalkaranji.**

SEAL & SIGNATURE OF THE TENDERER

Providing & fixing of substation capacitors

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Note: This tender document contains 48 pages of Volume-I (including cover page) and 3 pages of Volume-II. Tenderers are requested to ascertain that all pages are downloaded.

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Providing & fixing of substation capacitors

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TENDER DETAILS

Tender No.	EE/ICH/CAPACITOR/T-18/2023-24
Name of the Tender	Tender for Providing & fixing of substation capacitors and related equipments in Substations under Ichalkaranji Division.
Estimated Cost of work	Rs.10.00 Lacs
Tender Fee	Rs.1000+18% GST=Rs. 1180/-
E.M.D. to be paid	Rs.10,000/- (1% of Estimate Cost)
Tender sale on E-tender website start date and Tender sale on E-tender website end date	08.12.2023(11:00 Hrs) and 18.12.2023(23:55 hrs) respectively
Date and place of Pre-Bid meeting	12.12.2023 Ichalkaranji Division 11.00am
Date of Submission/upload of Tender on website	On or before 18.12.2023 up to 23:55 Hrs.
Last date to pay E.M.D. amount online	18.12.2023
Date of Opening of Technical Bid	19.12.2023 at 11.00 Hrs.(if possible)
Date of Opening of Price Bid	Will be declared later
Total No. of pages	48 (Volume-I) + 3 (Volume-II)
Executing office	The Executive Engineer, MSEDCL, Division Office, Station road, Ichalkaranji.
Address	Vidyut Bhavan, Station road, Ichalkaranji.
Phone Nos.	7875932070
E-mail	eeichalkaranji2013@gmail.com
Website	www.mahadiscom.in
To be Filled by the tenderer	
Name and Address Of Bidder	M/s
Name of the Proprietor/Authorized Person	
License number of bidder to provide out sourced man power	
Telephone No.	
Fax No.	
Mobile No.	
E-mail	

**DETAILS OF THE TENDERER
(TO BE FILLED IN BY THE TENDERER)**

Name & Address of the Tenderer:

ERP Vendor Code:

Mobile No. :

Phone No. :

E-mail :

Fax No. :

Address of the Factory Unit :

Address of the Office :

Contact Person and Mobile No :

E.M.D. Paid Rs. _____/- vide M.R. No. _____ Date :

Bank Details for payment transaction through RTGS :

Signature of Tenderer

Seal of the Company

SEAL & SIGNATURE OF THE TENDERER

Volume I**TENDER NOTICE****ई-निविदा सूचना**

कार्यकारी अभियंता इचलकरंजी द्वारा खालील कामाची ई-निविदा काढणेत येत आहे :

इचलकरंजी विभागात असणाऱ्या उपकेंद्रासाठी कॅपेसिटर व संबंधित उपकरणे पुरविणे आणि बसवून देणेचे काम. निविदा क्र. टी-१८ निविदा रक्कम रु. १० लाख, निविदा फी रु. ११८०/-, ई.एम.डी. रु. १००००/-.

सविस्तर ई-निविदा <http://works.mahadiscom.in/eTender/etender> या संकेत स्थळावर दि. १८.१२.२०२३ वेळ २३:५५ पर्यंत उपलब्ध आहे.

□

पी.आर.ओ. क्र. १७७/२३-२४

कार्यकारी अभियंता,
इचलकरंजी

SEAL & SIGNATURE OF THE TENDERER**Providing & fixing of substation capacitors****- 5 -**

SECTION - 1

INSTRUCTIONS TO BIDDERS

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Providing & fixing of substation capacitors

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SECTION 1 INSTRUCTIONS TO BIDDERS

A. GENERAL

1.0 Scope of Bid

- 1.1 The Executing Agency, (also referred to as “the Employer” in these documents) invites sealed bids from eligible bidders for providing & replacement of Physical Protection to Pole Mounted Dist. Transformers faulty 11KkV & 33kV CT of Metering Cubicles / Overhead units / Kiosk of HT consumers under Ichalkaranji Division as per specification given in **Annexure G**.
- 1.2 The scope of work under this Bid is design, engineering (wherever applicable), manufacture, inspection & testing before dispatch, Providing & replacement of faulty 11KV & 33KV CTs (Dry Type Cycloaliphatic Resin Cast) for substations under Ichalkaranji division as per specification given in **Annexure G**.
- 1.3 The works are to be carried out at various sites under **Ichalkaranji Division** under Kolhapur Circle in the State of Maharashtra.

All bids shall be prepared and submitted strictly in accordance with these instructions.
- 1.4 The successful bidder will have to complete the works till completion of order value as per requirement and directives from concerned EEs or his representative.
- 1.5 Bid not covering entire scope of the project will be treated as incomplete and hence, is liable to be rejected.

2.0 Qualification of the Bidder

This invitation for Bid is open to eligible bidders.

2.1 Qualifying Requirements

- 2.1.1 The bidder shall furnish, as a part of his bid, an EMD equivalent to 1% of the estimated tender value online or in the form of Demand Draft/Pay order or Bank Guarantee in the Proforma (**Section-5 Sample Form 'B'**). The Demand draft should be drawn on any Nationalized/ Scheduled Bank in favor of “Maharashtra State Electricity Distribution Company Limited” payable at Kolhapur and Upload Payment Receipt. (**Note :- SSI Certificate will not be considered for EMD exemption for works contracts**)
- 2.1.2 **Tender Form Fee to be paid online only** (Upload Payment Receipt).
- 2.1.3 Valid Electrical contractor's license issued by Govt. of Maharashtra under the act.
- 2.1.4 The bidder should be registered with MSEDCL.
- 2.1.5 Material supplied should be of ISI MARK and approved GTP.
- 2.1.6 Registration with PAN card

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Providing & fixing of substation capacitors

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- 2.1.7 Registration for GSTIN.
- 2.1.8 In case of JV, any partner or both the partners together shall satisfy the experience. (Bidder should note that actual value of works executed during any three financial years mentioned herein shall only be considered). The JV agreement should be registered with Notary / applicable legal statute.
- 2.1.9 **GENERAL CERTIFICATE OF EXPERIENCE ISSUED BY OFFICER NOT BELOW THE RANK OF EXECUTIVE ENGINEER ALONG WITH ORDER COPIES.**
Bidder should have executed Work Orders for the similar type of work in any sector during any 3 financial years of
- A single order of at least 20% of the tender value, or
 - Two orders together at least 25% of tender value cost, or
 - Three orders together at least 30% of the tender value
- Note: Work in hand or Work Order Copies will not be considered as Experience.
- 2.1.10 Valid Copy of ITR for last three Financial year i.e. 20-21, 21-22 and 22-23.
- 2.1.11 Average Annual turnover certificate from Chartered Accountant for last three years Should be 30% of tender value.
- 2.1.12 **NET WORTH CERTIFICATE FROM CA SHOULD BE ATTACHED:- POSITIVE NET WORTH FOR YEAR 22-23 SHOULD BE CERTIFIED BY CA.**
- 2.1.13 **Certificate of Registration of manufacturing** unit under Factories Act / Shop Act Registration.
- 2.1.14 If the unit is SSI, valid SSI registration Certificate including the item (material) of the Bid.
- 2.1.15 Registration certificates under PF and labour laws as may be applicable as per relevant acts.
- 2.1.16. **Specific Work Experience:** Bidder should have similar nature of work experience at least 15% of total physical parameter involve under the tender and such experience should have been within preceding three years. In case of JV, any partner or both the partners together shall satisfy the experience.

3.0 Cost of Bidding

The bidder shall bear all costs associated with the preparation and submission of his bid and the Employer will in no case be responsible or liable for those costs.

4.0 Site Visit

- 4.1 Information about works given in bidding documents is purely tentative one and may change during actual execution as per site requirements. The bidder is advised to visit and examine the sites of Works at his own cost and their surroundings and obtain for himself, at his own risk & cost, all information that may be necessary for preparing the bid and entering into a contract for the Works. The sites selected may vary due to the encumbrance at present installation. The changes/variations of any of proposed sites would not confer right for the extra additional claims.
- 4.2 The Employer will not entertain any claim at any stage from the bidder on the plea of having him not acquainted sufficiently to the site conditions.

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B. BIDDING DOCUMENTS

5.0 Content of Bidding Documents

- 5.1 The set of bidding documents comprises the documents mentioned below and any Addenda issued in accordance with Clause 9:

VOLUME 1

- Section 1: Instructions to Bidder
- Section 2: Conditions of Contract.
- Section 3: Special terms and conditions.
- Section 4: Sample Formats
- Annexure- F: Check list Qualification Information
- Annexure- G: Technical Specifications

VOLUME II

Price bid

- 5.2 The bid should be submitted online only.
- 5.3 The Bidder is expected to examine all instructions, terms and conditions, forms and specifications in bidding document and fully inform himself as to all the conditions and matters which may in any way affect the works or the cost thereof.
- 5.4 Failure to furnish all information required in the bid document or submission of a bid not substantially responsive to the bidding document in any respect will be at the bidder's risk and may result in the rejection of his bid.

6.0 Clarification of Bidding Documents

- 6.1 A prospective bidder requiring any clarification of the bidding documents may notify the Employer in writing or by cable (hereinafter, "cable" includes telex and Tele-Fax) at the Employer's address indicated in the Invitation for Bid. However, request for such clarification must reach the employer at least 3 days prior to the submission of the bid.
- 6.2 The Employer will respond to any such request for clarification and may forward such clarification to all the purchasers of the bid, if employer finds it necessary to do so without identifying its source.
- 6.3 Request for clarification or any delay in complying with such request by the Employer, shall not in any way affect the obligation on the part of the bidder to send the complete bid by the deadline indicated.

7.0 Amendment of Bidding Documents

- 7.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addenda.
- 7.2 Any addendum thus issued shall form part of the bidding documents and shall be displayed on website. Prospective bidders are requested to visit our website before submission of bids.

C. PREPARATION OF BIDS

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8.0 Language of Bid

All documents relating to the bid shall be in the English language only.

9.0 Documents Comprising the Bid

Volume-I (Technical Bid) shall comprise scanned documents mentioned in clause No. 2.1.1 to 2.1.9 above. (Complete tender document i.e. Vol-I need not to be uploaded). Volume-II (Price Bid) shall comprise only price schedule.

10.0 Bid Prices

- 10.1 Unless stated otherwise in the bidding documents, the Contract shall be for the project defined as "the Works", as described in Sub-Clause 1.19 of Section 2 of this Volume I.
- 10.2 The bidder shall quote the price only on F.O.R. destination exclusive of GST, but inclusive of octroi/LBT, risk in transit and freight prepaid along under each column as provided in Annexure-E. In case of any deviation in the manner of quoting prices as stated above, the tender shall be rejected even though the offer of the Tenderer is found to be lowest. The Purchaser is registered dealer under GSTIN.
- 10.3 Items not indicated in the annexure but are required as part of equipment / work shall also be deemed to have been covered by the rates and prices in the activity schedule.
- 10.4 The bid price shall include the cost of charges for obtaining any permit or license.
- 10.5 Rate should be exclusive of GST and shall be paid as applicable at the time of passing of bills.
- 10.6 Payment for newly introduced taxes and statutory variations:
 - 10.6.1 100% payment towards newly introduced taxes, duties and statutory variations, subsequent to the date of submission of the bid, by the Central or the State Government shall be reimbursed to the contractor only against due documentary proof.
 - 10.6.2 However, in case of reduction/abolition of any taxes, duties, levies, cess, etc. by the Central or State Government during the currency of contract, the benefit of the same shall be passed on to the employer.
- 10.7 As regards Indian Income Tax, surcharge on Income Tax and any other Corporate Tax, the Employer shall not bear any tax liability whatsoever irrespective of the mode of contracting. The bidder shall be liable and responsible for payment of such taxes, if attracted under the provisions of Indian law. However IT deductions at source as per Income Tax rules will be made.
- 10.8 TDS towards all the applicable taxes shall be deducted, from the payment of contract value as per the rate applicable.
- 10.9 Relevant provisions under Indian laws / Acts for P.F., Labour Contract, and any other Law/ Act as may be applicable to the works under this contract will be applicable though not mentioned specifically in above list.
- 10.10 The contract is to be treated as a non-divisible contract, which includes all applicable taxes, duties, etc as indicated above and no concessional forms such as 'C' will be issued to the contractor.

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10.11 The Bid price quoted by the Bidder shall be firm.

11.0 Price Variation Clause

Not applicable to this contract.

12.0 Currencies of Bid and Payment

The price for tender shall be quoted by the Bidder entirely in Indian Rupees only.

13.0 Bid Validity

Bids shall remain valid for a period of 120 days after the deadline for bid submission specified in Clause 17.1.

14.0 EMD

14.1 The bidder shall furnish, as a part of his bid, an EMD equivalent to 1% of the estimated tender value in the form of Demand Draft/Pay order or Bank Guarantee. The Demand draft should be drawn on any Nationalised/ Scheduled Bank having branch at Pune in favour of "Maharashtra State Electricity Distribution Company Limited" payable at Kolhapur.

Any bid not accompanied by an original Bid Form and adequate EMD with correct bid reference in original shall be rejected by the Employer. The bid shall also be rejected if the bidder does not comply with the provisions of clause 15.1.

14.2 The EMD of unsuccessful bidders will be refunded immediately as soon as the contract is finalized.

14.3 The EMD of the successful bidder will be discharged when the bidder has signed the Agreement and furnished the required performance security.

14.4 The EMD will be forfeited in case of any of the following:-

- a) If the bidder withdraws his bid during the period of bid validity;
- b) If the bidder does not accept the correction of his bid price pursuant to Clause no. 24.2;
- c) If the successful bidder fails within the specified time limit to-
 - i) Sign the Contract Agreement;
 - ii) Furnish the required performance security;

15.0 Alternative Proposals by Bidders

Bidders shall submit offers, which comply with the requirements of the bidding documents, including the basic technical design as indicated in the specifications. **Alternative proposals shall not be considered.**

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16.0 Signing of Bid

- 16.1 The bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the bidder. The person(s) signing the bid shall initial all pages of the bid where entries and amendments have been made.
- 16.2 The bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the bidder, in which case the person(s) signing the bid shall initial such corrections.

D. SUBMISSION OF BIDS**17.0 Submission of Bids.**

- 17.1 This is two bid tender. i.e. Technical Bid and Price Bid. Bidder should online submit/upload Technical Bid and Price Bids separately.
- 17.2 Complete Technical Bid should not be uploaded on website. Only required documents/ attested copies of certificates should be uploaded.
- 17.3 **Deadline for Submission of Bids**
- 17.4 Bid must be submitted online/uploaded not later than **23:55 hours on date:- 18.12.2023**
- 17.5 The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 8. The Employer also reserves the right to extend the bid submission date without assigning any reason. In such case(s) all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

18.0 Late Bids

Any bid received by the Employer after the deadline prescribed in Clause 17.4 shall not be accepted. MSEDCL shall not be responsible for any delay in uploading/ online submission due to problem in server, Internet etc. Bidders are therefore requested to online submit/upload tenders in advance to avoid hurry at last moments.

19.0 Modification and Withdrawal of Bids.

The bidder may modify or withdraw his bid online before the deadline prescribed in Clause 19.

E. BID OPENING AND EVALUATION**20.0 Bid Opening**

- 20.1 If possible, the Employer will online open the Technical Bid, including its modifications made pursuant to Clause 19 on the due date and time for opening of Technical Bid.

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- 20.2 Bidders may also see the process of online opening of the bids if they desire.
- 20.3 The Employer will examine the document under Technical Bid of the bid in accordance with the requirements of the bid document. If any of the documents under Technical Bid is found to be not complying with the requirement of the bid document, the bid will be considered as non-responsive & Price Bid of the corresponding bid will not be opened for further evaluation.
- 20.4 The responsive bidders of the Price Bid shall be opened. Date for opening of Price Bid will be informed to the bidders by e-mail.

21.0 Process to be Confidential

Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful bidder has been announced. Any effort by a bidder to influence the Employer's processing of bids or award decisions shall result in the rejection of his bid.

22.0 Clarification of Bids.

To assist in the examination, evaluation and comparison of bids the Employer may, at his discretion, ask any bidder for clarification of his bid, including breakdown of the prices. The request for clarification and the response shall be in writing or by cable, but no change in price or substance of the bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids.

23.0 Examination of Bids and Determination of Substantial Responsiveness.

- 23.1 Prior to the detailed evaluation of bids, the Employer will determine whether each bid (a) Meets the eligibility criteria (b) has been properly signed; (c) is accompanied by the required securities; (d) is substantially responsive to the requirements of the bidding documents; and (e) provides any clarification and/or substantiation that the Employer may require.
- 23.2 A substantially responsive bid is one, which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality of performance of the Works; (b) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the bidder's obligations under the Contract' or (c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.
- 23.3 If a bid is not substantially responsive, it will be rejected by the Employer and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

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24.0 Correction of Errors

- 24.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. The Employer will correct errors as follows: where there is a discrepancy between the amounts in figures and in words, the amount whichever is lower shall govern.
- 24.2 The amount stated in the Form of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and shall be considered as binding upon the bidder. If the bidder does not accept the corrected amount of bid, his bid shall be rejected and the EMD will be forfeited in accordance with Sub-clause 14.4.

25.0 Prohibition for Post tender Correspondence.

- 25.1 The Bidder should note that no correspondence shall be entertained or considered after the due date and time of submission of tender unless otherwise sought by the Employer.
- 25.2 The bids shall be deemed to be under consideration immediately after those are opened and until such time official intimation of award / rejection is made by the Employer to the bidders. While the bids are under consideration, bidders and/or their representatives or other interested parties are advised to refrain from contacting by any means, the Employer and / or his employees / representatives on matters related to the bid under consideration. The Employer if necessary shall obtain clarifications on the bid by requesting for such information from any or all bidders in writing as may be necessary.

F. AWARD OF CONTRACT**26.0 Award Criteria**

Subject to Clause 29, the Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents and who has offered the Lowest Evaluated Bid Price, provided that such bidder has been determined a) to be eligible in accordance with provisions of Clause 2,

27.0 Employer's right to accept or reject, any or All Bid(s)

- 27.1 Notwithstanding Clause 28, the Employer reserves the right to accept or reject any or all bid(s), and to cancel the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders on the grounds for the Employer's action.
- 27.2 The Employer does not bind himself to accept the lowest or any bid, neither will any reason be assigned for the rejection or part of bid. It is also not binding on the Employer to disclose any analysis report on bids.

28.0 Notification of Award

- 28.1 Prior to the expiration of bid validity prescribed by the Employer, the Employer will notify the successful bidder by cable confirmed by registered letter that his bid has been accepted. This letter would be as per the format "D". This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") shall name the

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Sum which the Employer will pay the Contractor in consideration of the execution, completion and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price"). Such letter of Acceptance will be deemed to have been accepted if not otherwise specifically acknowledged by the Contractor within 7 days from date of receipt.

- 28.2 The notification of the award will constitute the formation of the Contract subject only to the furnishing of a performance security in accordance with the provisions of Clause 29 and signing of agreement.
- 28.3 Upon furnishing by the successful bidder of a performance security, the Employer will promptly notify the other bidders that their bids have been unsuccessful.

29.0 Performance Security

- 29.1 Within 7 calendar days of receipt of the Letter of Award from the Employer, the successful bidder shall furnish to the Employer a performance security as per Form C in the form of a Demand Draft or by cash for an amount equivalent to Ten percent (10 %) of the Contract Price. In case of joint venture, the Lead Partner shall furnish performance security deposit for an amount equivalent to 7.5% of the Contract price and the performance security deposit for the remaining amount of 2.5% of the Contract price shall be furnished by the joint partner.
- 29.2 The performance security is to be provided by the successful bidder by cash or in the form a Demand Draft issued by a Nationalized/Scheduled bank having branch in Kolhapur.
- 29.3 Failure of the successful bidder to comply with the requirements of Sub-Clause 31.1 & 31.2 shall constitute sufficient grounds for cancellation of the award and forfeiture of the EMD.

30.0 Contract Agreement

In the event of acceptance of particular bid for award of Contract, such successful bidder has to execute Contract Agreement as per attached Form E within 7 days.

31.0 Time: The Essence of Contract

- 31.1 The time stipulated in the contract for the completion of works shall be deemed to be the essence of the contract. The Contractor shall so organize his resources and perform his work as to complete it not later than the date agreed to.
- 31.2 This work should be started by the contractor from intimation by the AEE(O) /concerned SDO or his representative.

32.0 Inspection of Materials/Equipments

The equipments / materials to be supplied under this contract of ISI mark only. Before using the material, it should be got approved from the concerned SDO or his representative.

33.0 Other Important General Terms

- 33.1 The contract shall be considered as having come in to force from the date of Letter of Award by the Employer.

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33.2 Patent Rights and Royalties:

Royalties and fees for patents covering materials, articles, apparatus, devices, equipments, software and processes used in the works shall be deemed to have been included in the contract price. The Contractor shall satisfy all demands that may be made at any time for such Royalties or fees and he alone shall be liable for any damages or claims for patent infringements and shall keep the Employer indemnified in that regard.

- 33.3** The Contractor shall be responsible towards the work being undertaken by the sub-Contractors with regards to meeting the requirements as specified by the employer in the contract document.

33.4 Workmanship and Materials:

The Plant and/or the work shall be manufactured, constructed, provided, put in possession. Carried out and maintained in all respects with workmanship and material of the best and most substantial and approved qualities to the entire satisfaction of Engineer (The definition of Engineer is as provided under clause 1.11 of the Terms of Contract), who may reject any plant, apparatus, material or workmanship which shall in his opinion be defective in quality and such rejection shall be final and binding on the Contractor. The Contractor shall at his own expense provide all materials, labour, haulage, tools, tackles, apparatus and all things necessary to execute and complete the work and the plant in the manner aforesaid.

- 33.4.1** The materials used shall be of high grade, free from defects and recent manufacture and unused. The materials shall conform to the relevant standard specifications.

34.0 Bankruptcy

If the Contractor shall become bankrupt or insolvent, or have a receiving order made against him, or compound with his creditors, or being a company or corporation commence to be wound up, not being a member's voluntary winding up for the purpose of amalgamation or reconstruction, or carry on its business under a receiver for the benefit of its creditors or any of them, the Employer shall be at liberty (a) to terminate the contract forthwith by notice in writing to the Contractor or to the receiver or liquidator or to any person in whom the contract may become vested or (b) to give such receiver, liquidator or other person the option of carrying out the contract subject to his providing a guarantee for the due and faithful performance of the contract up to amount agreed.

35.0 Notices

- 35.1** Any notice to be given to the Contractor under the terms of the contract shall be served by sending the same by registered post or leaving the same at the Contractor's principal place of business (or in the event of Contractor being a company to or at its registered office.)
- 35.2** Any notice to be given to the Employer under the terms of the Contract shall be served by sending the same by registered post at the Employer's address.

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36.0 Details : Confidential

The Contractor shall treat the contract and everything contained therein as private and confidential. In particular, the Contractor shall not publish any information, drawings or photograph concerning the works and shall not use the sites for the purpose of advertising except with written consent of the employer and subject to terms and conditions as he may prescribe.

37.0 Other Instructions

The contractor would have to provide all the documents like guarantee certificates etc. along with the equipment supplied and erected by him to the employer at the time of handing over the site.

38.0 Check List

The bidder shall give a checklist of documents/schedules enclosed with his Bid in the covering pages(s) as per Annexure F for respective parts for quick check of the enclosures. A complete checklist shall be enclosed with each copy of the bid documents. It shall be construed that the Bidder shall comply completely with all the other requirements of the specification.

39.0 Jurisdiction

39.1 Any disputes or differences arising under, out of or in connection with this tender or contract if not concluded shall be subject to exclusive jurisdiction of courts in Ichalkaranji of Maharashtra State.

39.2 The Indian Laws shall govern the contract.

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SECTION - 2

CONDITIONS OF CONTRACT

SEAL & SIGNATURE OF THE TENDERER

Providing & fixing of substation capacitors

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SECTION 2

CONDITIONS OF CONTRACT

A. GENERAL

1.0 Definitions

- 1.1 **Acceptance date** is the date when the Employer accepts the bid of the successful bidder by issuing a Letter of Acceptance.
- 1.2 **The Completion Date** is the date on which the Contractor shall complete and commission whole of the Works, duly notified by the Chief Engineer or any other person duly Authorised by him, that the Employer can put to use the works. The Completion Date is specified in the Contract Data. Only the Employer may revise the Completion Date by issuing, in writing, an extension of time.
- 1.3 **The Contract** is the contract between the Employer and the Contractor, the terms and conditions of which have been incorporated in the agreement to be executed between the two parties.
- 1.4 **The Contract Data** defines the documents and other information, which comprise the Contract.
- 1.5 **The Contractor** is the bidder whose bid to carry out the Works has been accepted by the Employer and includes his legal heirs, successors, assignees.
- 1.6 **The Contractor's Bid** is the complete bidding document submitted by the Contractor to the Employer.
- 1.7 **The Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the contract.
- 1.8 **Days** are calendar days & **Months** are calendar months as per English Calender.
- 1.9 **Defect** is any part of the Works not completed in accordance with the Contract & material specifications. Also it shall include any works, or part thereof going faulty during Defect Liability Period.
- 1.10 **The Employer** is the Executive Engineer, Ichalkaranji Division, Maharashtra State Electricity Distribution Company Ltd (MSEDCL), Ichalkaranji who will have the necessary authority to get the project executed and be responsible to handle all affairs of the project including award of contract to the Contractor and include any person(s) authorized for the purpose by the Executive Engineer, Ichalkaranji, Maharashtra State Electricity Distribution Company Ltd. (MSEDCL), Ichalkaranji.
- 1.11 **The Engineer** is the person of the organization named in the Contract Data or any other competent person authorized by the Employer and notified to the Contractor, for effective implementation of the project.

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- 1.12 **Site In charge / in charge** is a person authorized by the Employer for the purpose of supervision and implementation of contract terms for the works covered under the contract.
- 1.13 **Construction Equipment** is the Contractor's machinery and vehicles brought temporarily to the site to complete the Works.
- 1.14 **Plant** is any integral part of "the Works" which is to have a civil, mechanical, electrical, electronic or chemical function.
- 1.15 **The Site(s)** is/are the area (s) defined as such in the Contract Data for execution of works & includes contractor's site store.
- 1.16 **The start Date** is the date of execution of Contract Agreement. It does not necessarily coincide with any of the Site Possession Dates.
- 1.17 **Specifications** mean and include collectively all the terms and stipulations contained in the bid document including the conditions of contract, Technical Provisions and Annexure thereto and list of correction and amendments.
- 1.18 A **Variation** is a modified instruction given by the Employer, which varies "The Works".
- 1.19 **The Works** means contract for providing & replacement of Physical Protection to Pole Mounted Dist. Transformers under Pune Rural Circle.
- 1.20 **Defect Liability Period** means the period, which begins at the completion, final acceptance, and handing over of the "**Works**" or its Sub-items & extends upto 1 year thereafter.
- 1.21 **Defect Correction Period** means the period, which begins after receipt of Notice of Defect & extends up to 60 days thereafter.
- 1.22 **Defect Notice Period** means the period after observation of "Defect" within which the Employer should notify the Bidder about the "Defect". This notifying of defect shall be normally immediate.

2.0 Interpretation

In interpreting these Conditions of Contract, singular also means plural, male also means female, and vices versa. Headings and cross-references between clauses have no significance. Words have their normal meaning under the language of the Contract unless specifically defined.

3.0 Language and law.

The language of the Contract shall be English. The law governing the Contract shall be the Indian Laws as stated in the Contract Data.

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4.0 Decisions

The Employer shall decide contractual matters between the Employer and the Contractor fairly and impartially. The decision of the Employer will be final, Conclusive and binding on both parties to the agreement for contract.

5.0 Delegation

The Employer may delegate any of his duties and responsibilities to other people by notifying the Contractor and may even cancel/withdraw any such delegation by notifying to the Contractor.

6.0 Communications

Communications between parties that are referred to in the conditions are effective, only When they are in writing.

7.0 Assignment and Subletting of Contract

- 7.1 The Contractor shall not assign the Contract or any part thereof or any benefit or Interest therein or there under without the prior written consent of the Employer.
- 7.2 The Contractor shall not sublet any part of the works without prior written consent of The Employer.
- 7.3 Such consent, if given, shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any subcontractor, his agents, servants or workmen as fully as if those were the acts, defaults and neglects of the Contractor, his agents, servants or workmen.
- 7.4 The engineer shall have the right to obtain from the Contractor any agreement in writing entered into by the Contractor with any of his sub-Contractors or any purchase orders placed for supplies and services in respect of the works included in the Contract provided that the Contractor shall not be bound to disclose the sub Contract value. The Contractor shall supply the engineer with full technical and commercial details of orders placed on his sub-Contractors. The technical specification of all the items ordered on sub-Contractor shall be subject to the Approval of engineer.

8.0 Co-ordination with Other Contractors

The Contractor is to co-operate and share the Site with public authorities, utilities, and the Employer.

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9.0 Personnel

- 9.1 The Contractor may employ either the key personnel named in the Schedule of Key Personnel to carry out the functions stated in the Schedule or other personnel approved by the Employer. The Employer will approve proposed replacement key personnel only if their qualifications, abilities and relevant experience are equal or better than those of the personnel listed in the Schedule, without affecting the Contract Price.
- 9.2 If the Employer asks the Contractor to remove a person who is a member of Contractor staff or work force and states the reasons, the Contractor shall ensure that the person leaves the Site immediately and in any case within seven days and such person will have no further connection with the work in the Contract.

10.0 Power, Water and Communication

The Contractor shall make his own arrangements for power, water, telephone and other facilities necessary for undertaking the works mentioned under the contract at his own cost.

11.0 Surplus Material

On completion of the work, all such material lying at the site, if any, that remained unutilized shall be removed by the contractor at his own expenses the site cleaned as per requirement of MSEDCL.

12.0 First Aid in all aspects will be look out of the contractor.**13.0 Contractor's Risks**

All risks of loss or damage to physical property and of personal injury and death, which arise during and in consequence of the performance of the Contract, are the responsibility of the Contractor.

14.0 Force Majeure

Force majeure is herein defined as any cause, which is beyond the control of the Contractor or MSEDCL as the case may be, which they could not foreseen or with a reasonable amount of diligence could not have foreseen and which substantially affects the performance of the contract, which includes the following:

- Natural Calamity including but not limited to flood, drought, earthquake, epidemics, volcanic activities, typhoon or cyclone, hurricane and nuclear disaster;
- The Contractor or the MSEDCL shall not be liable for delay in performing their respective obligations resulting from any force majeure cause as referred to and/or defined above; the date of completion shall be extended by a reasonable time even though such cause may occur after the Contractors performance of his obligations has been delayed for other causes.

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15.0 Insurance

- 15.1 The following insurance cover is to be provided by the Contractor in the joint names of the Employer and the Contractor for the period from the Start Date to the end of the Defects Notice Period or of the last Defects Correction Period whichever is the later.
- a) Full cover against damage to other people's property caused by the Contractor's acts or omissions.
 - b) Covered against death or injury caused by the Contractor's acts or omissions as per laws applicable in India to
 - (i) Anyone authorized to be on the Site.
 - (ii) Third parties who are not authorized on the Site.
 - c) Full cover against theft and damages to the Works and materials during storage and construction.
 - d) Contractor shall pursue the matters related to insurance claims in association with the Employer.
 - e) Policies and certificates for insurance are to be produced by the Contractor to the Employer for approval before the Start Date given in the Contract document and subsequently as the Employer may require.
 - f) Alterations to the terms of insurance may be made either with the approval of the Employer or as a result of general changes imposed by the Insurance Company with which the insurance policy is affected.
- 15.2 Both parties shall comply with the conditions of the Insurance policies.
- 15.3 The Contractor at his cost shall arrange, secure and maintain comprehensive insurance as may be necessary and for all such amounts to protect his interests and the interest of the Employer, against all risks. Any loss or damage to the equipment, during supply, handling, transporting, storage and erection, till such time the plant is commissioned by the Contractor and accepted by the Employer shall be to the account of the Contractor. The Contractor shall be responsible for lodging of all claims and make good for the damage or loss by way of repairs and/or replacement of the portion of the works damaged or lost. The transfer of title shall not in any way relieve the Contractor of the above responsibilities during the period of the Contract.
- 15.4 As per Govt. of Maharashtra Resolution No. Vimas-1011/Prakra 15/Vima Prashasan Dated:-29-04-2011, the Contractor shall obtain the Contractor's all risk (CAR) Insurance Policy or Transit cum erection (TCE) or Erection all risk (EAR) Insurance in respect of contract work from the Insurance Company approved by Director of Insurance, Govt. of Maharashtra, Graha Nirman Bhavan (MHADA), 264, First Floor, Opp. Kalanagari, Bandra (East), Mumbai, under direct method or from the insurance company approved by the Director of Insurance on Co-Insurance cum servicing basis under indirect method. For your information, Name, address and contact nos. of the Insurance Company in Kolhapur is given below.

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National Insurance Co. Ltd., Red Cross House, 205/B, E Ward, Cosmos Commercial Complex, New Shahupuri, Kolhapur, Maharashtra 416001.
Phone: 0231- 2652586(O)

15.5 INDEMNIFICATION OF EMPLOYER

15.5.1 The Contractor shall insure all his personnel, tools and plants, etc. and shall also take a third party liability cover to indemnify the Employer of all liabilities which may come up due to any act or omission on the part of Contractor and cause harm/damage to other Contractor/ representatives of Employer or all or anybody rendering service to the Employer or is connected with Employer's work in any manner whatsoever.

15.5.2 The Contractor shall necessarily indemnify the Employer in all these respects and the indemnification and insurance policy shall be to the approval of Engineer.

15.6 WORKMEN'S COMPENSATION INSURANCE

This insurance shall protect the Contractor against all claims applicable under the workmen's compensation Act 1948 or any amendment thereof. This policy shall also cover the Contractor against claims for injury, disability, disease or death of his or his sub-Contractor's employees, which for any reason are not covered under the workmen's compensation Act 1948. The liabilities shall not be less than workmen's Compensation as per statutory provisions.

15.7 COMPREHENSIVE AUTOMOBILE INSURANCE

This insurance shall in such a form to protect the Contractor against all claims for injuries, disability, diseases and death of members of public including the Employer's men and damage to the property of others arising from the use of motor vehicle during, on or off the site operations, irrespective of the Ownership of such vehicles.

15.8 COMPREHENSIVE GENERAL LIABILITY INSURANCE

15.8.1 This insurance shall protect the Contractor against all claims arising from injuries, disabilities, disease or death of members of public or damage to property of others, due to any act or omission on the part of the Contractor, his agents, his employees, his representatives and sub-Contractors or from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the Contractor for defending litigations, whether criminal, civil or both.

15.8.2 The hazards to be covered will pertain to all the areas and works which the Contractor, his sub-Contractors, his agents and his employees have to perform pursuant to the Contract.

15.8.3 The above are only illustrative list of insurance covers normally required and it will be the responsibility of the Contractor to maintain all necessary insurance coverage to the extent both in time and amount to take care of all his liabilities either direct or indirect.

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16.0 Queries about the Contract Data

The Employer shall give instructions clarifying queries about the Contract Data.

17.0 Contractor to Construct the Works.

- 17.1 The Contractor is responsible for supply, transport, construct, install, testing and commissioning and hand over the works in accordance with the relevant Specifications and Drawings.
- 17.2 All the works should be carried out in conformity with the provisions under IE Rules 1956 and Electricity Rules, 2005.
- 17.3 The Bidder shall be responsible for coordinating and liaising with the various offices i.e. Electrical Inspector Office, Municipal Offices, and any other Department, consumer or a group of consumers etc., needed for timely completion of the work. Any amount towards the legitimate fees like Electrical Inspector Charges shall be initially paid by the contractor and the same will be reimbursement to him in the running bill payment on submission of documentary evidence.

18.0 Quantity Variation

The employer reserves the right to vary the quantities of items or group of items ordered, as may be necessary, during the execution of contract without change in unit price or other terms and conditions. The variation in contract price due to this change in quantity shall be limited to increase or decrease by up to 5% (Five percent) of the original contract price. In case unit prices are not available, the prices for the items added or deleted shall be mutually agreed upon.

19.0 Deduction from total contract price

- 19.1 The employer shall claim all costs, damages or expenses that the owner may have paid, for which under the contract the contractor is liable. The employer to the contractor shall bill all such claims regularly as and when they fall due. Such bills shall be supported by appropriate documents or explanations, to enable the contractor to properly identify such claims. Such claims shall be paid by the contractor within 15 (fifteen) days of the receipt of the corresponding bills and if not paid by the contractor within the said period, the employer may then deduct the amount from any monies due or becoming due by him to the contractor under his contract or any other contract. The amounts may be recovered by the action of law or otherwise, if the contractor fails to satisfy the employer of such claims.

20.0 The Works to be completed by the Completion Date

The Contractor shall begin the Works on the Start Date and is to carry out the Works in accordance with the program submitted by him, as updated with the approval of the Employer, and complete them by the Completion Date.

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21.0 Safety**21.1 Works and Safety Regulations:**

21.1.1 The Contractor shall ensure the safety of all the workmen, materials and equipment either belonging to him or belonging to others working at site. Contractor is expected to observe all the safety rules and regulations enacted as per laws applicable.

21.1.2 The Contractor shall arrange for such safety devices as are necessary for such type of work and carry out requisite tests of handling equipment, lifting tools, tackles etc as per standards and practices.

21.2 Electrical Safety Regulations:

21.2.1 No work shall be carried out on any live equipment on any site. The Engineer must make equipment safe and permit to work is to be issued before any work is carried out.

22.0 Security

The Contractor shall have total responsibility for all equipment and materials in his custody stored, loose, semi-assembled and/or erected by him at site. The Contractor shall make suitable security arrangements to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss. All materials of the Contractor shall enter and leave the work site only with the written permission of the engineer in the prescribed manner. It shall be the responsibility of the Contractor to arrange for security till the works are finally taken over by the Engineer.

23.0 Discoveries

Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the State. The Contractor is to notify the Employer of such discoveries and carry out the Employer's instructions for dealing with them.

24.0 Instructions.

The Contractor shall carry out all instructions of the Employer, which are in conformity with the law of the country.

25.0 Arbitration**25.1 The matters to be determined by the EXecutive Engineer (E.E.):-**

All disputes and differences of any kind whatsoever arising out of or in connection with the contract, whether during the progress of the work or after its completion and whether before or after the determination of the contract, shall be referred by the contractor to the E.E. and the E.E. shall (within 120 days) after receipt of the Contractor's representation makes and notifies decisions of all matters referred to by the contractor in writing.

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- (i) **Demand for Arbitration:** In the event of any dispute or difference between the parties hereto as to the construction or operation of this contract, or the respective rights and liabilities of the parties on any matter in question, the dispute or difference on any account or as to the withholding by MSEDCL of any certificate to which the contractor may claim to be entitled to, or if the C.E. fails to make a decision within 120 days then and in any such case the contractor after 120 days but within 180 days of his presenting his final claim on disputed matters, shall demand in writing that the dispute or difference to be referred to arbitration. Such a demand shall be made to the Executive Director concerned.
- (ii) The demand for arbitration shall specify the matters, which are in question, or subject of the dispute or difference as also the amount of claim item-wise. Only such dispute(s) or difference(s) in respect of which the demand has been made, together with counter claims or set off shall be referred to arbitration and other matters shall not be included in the reference.
- (a) The arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for arbitration is received by the MSEDCL.
- (b) The claimant shall submit his claim stating the facts supporting the claims along with all relevant documents and the relief or remedy sought against each claim within a period of 30 days from the date of appointment of the Arbitral Tribunal.
- (c) The MSEDCL shall submit its defense statement and counter claim(s), if any, within a period of 60 days of receipt of copy of claims from the Tribunal thereafter unless otherwise extension has been granted by the Tribunal.
- (iii) No new claim shall be added during the proceedings by either party. However a party may amend or supplement the original claim or defence thereof during the course of arbitration proceedings subject to acceptance by Tribunal having due regard to the delay in making it.
- (iv) If the contractor(s) does/do not prefer his/their specific and final claims in writing, within a period of 90 days of receiving the intimation from the MSEDCL, that the final bill is ready for payment, he/they will be deemed to have waived his/their claim(s) and the MSEDCL shall be discharged and released of all liabilities under the contract in respect of these claims.

25.2 **Obligation during pendency of Arbitration:**

Work under the contract shall, unless otherwise directed by the Engineer, continue during the arbitration proceedings, and no payment due or payable by the MSEDCL shall be withheld on account of such proceedings, provided, however, it shall be open for Arbitral Tribunal to consider and decide whether or not such work should be continued during arbitration proceedings.

- (i) In cases where the total value of all claims in question added together does not exceed `1,00,00,00/- (Rupees Ten Lakh) the Arbitral Tribunal shall consist of a Sole Arbitrator who shall be either the E.E. of the MSEDCL or

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serving or retired officer of the MSEDCL/Government not below the grade of E.E. or equivalent nominated by the Managing Director of the MSEDCL in that behalf. The Sole Arbitrator shall be appointed within 60 days from the day when a written and valid demand for arbitration is received by the MSEDCL.

- (ii) In cases the value of the claim exceeds `1,00,00,00/- (Rupees Ten Lakh) as above, the Arbitral Tribunal shall consist of panel of 3 serving or retired officers of MSEDCL/Govt. not below the grade of Executive Engineer/Dy. Manager (F&A) as the Arbitrators. For this purpose, the MSEDCL will send a panel of more than 3 names of arbitrators of one or more department of the MSEDCL/Govt. to the contractor who will be asked to suggest to the Managing Director at least 2 names for appointment as contractor's nominee. The Managing Director shall appoint at least one of them as the contractor's nominee and will also appoint the remaining arbitrators either from the panel or from outside the panel, duly indicating the presiding arbitrator from amongst the three (3) arbitrators so appointed. While nominating arbitrators, it will be necessary to ensure that one of them is or has worked in Accounts department.
- (iii) If one or more arbitrators appointed as above refuses to act as arbitrator, withdraws from his office as arbitrator or vacates his/their office/offices or is/are unable or unwilling to perform his functions as arbitrator for any reason whatsoever or dies or in the opinion of the Managing Director fails to act without undue delay, the Managing Director shall appoint new arbitrators to act in his/their place in the same manner in which the earlier arbitrator/s had been appointed. Such reconstituted Tribunal may, as its discretion proceed with the reference from the stage at which it was left by the previous arbitrator(s).
- (iv) The Tribunal shall have powers to call for such evidence by way of affidavits or otherwise as the Arbitral Tribunal shall think proper, and it shall be the duty of the parties hereto to do or cause to be done all such things as may be necessary to enable the Arbitral Tribunal to make the award without any delay.
- (v) While appointing arbitrator(s) as above, due care shall be taken that he/they is/are not the one/those who had an opportunity to deal with the matters to which the contract relates or who in the course of his/their duties as MSEDCL's servant(s) expressed views on all or any of the matters under dispute or differences. The proceedings or the Arbitral Tribunal or the award made by such Tribunal will, however, not be invalid merely for the reason that one or more arbitrator had, in the course of his service, opportunity to deal with the matters to which the contract relates or who in the course of his/their duties expressed views on all or any of the matters under dispute.
- (vi) Arbitral award shall state item-wise, the sum and reasons upon which it is based.
- (vii) A party may apply for corrections of any computational errors, any typographical or clerical errors or any other error of similar nature occurring

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In the award and interpretation of specific point of award to tribunal within 30 days of receipt of the award.

- (viii) A party may apply to Tribunal within 30 days of receipt of award to make an additional award as to claims presented in the arbitral proceedings, but omitted from the arbitral award.
- (ix) In case of the Tribunal, comprising of three members any ruling or award shall be made by a majority of Members of Tribunal. In the absence of such a majority, the views of the Presiding Arbitrator shall prevail.
- (x) Where the arbitral award is for payment of money, no interest shall be payable on whole or any part of the money for any period till the date on which the award is made.
- (xi) The cost of the arbitration shall be borne equally by the respective parties. The cost shall inter-alia include fees of the arbitrators as per the rates fixed by the MSEDCL from time to time. Provided that the fees payable per arbitrator for claims up to 'Ten lakh shall not exceed' 2000/- per sitting subject to a maximum of '25,000/-' and the fees payable per arbitrator for claims over 'One Crore, shall not exceed' 2000/- per sitting subject to a maximum of '50,000/-'. Provided further that the arbitrators who are in service of Govt./MSEDCL shall draw fees at half of the rates mentioned above.
- (xii) MSEDCL shall maintain a list of arbitrators. The Managing Director shall have full powers to delete or add the name of the arbitrators in the list or to make amendments to the said list as per his discretion.
- (xiii) The arbitral proceedings should be completed and the award be finalized within one year from the date of appointment of arbitrators.
- (xiv) The decision of the sole arbitrator or arbitral tribunal as the case may be, shall be final and binding on the parties.

25.3 Disputes

Any disputes or differences arising under, out of or in connection with this tender or contract if not concluded shall be subject to exclusive jurisdiction of courts in Kolhapur District of Maharashtra State. The Indian Laws shall govern the contract.

26.0 Guarantee

- 26.1 The Contractor shall guarantee that the equipments/materials will be new and in accordance with the contract documents and will be free from defects in material and workmanship for a period of 1 year from the date of commissioning. Any defects developed due to defective materials and/or workmanship during testing and commissioning of the equipments or during the guarantee period of 1 year from the date of final acceptance of works by the employer shall be rectified or made good by the Contractor at his own cost. The contractor's liability shall be limited to repair/replacement of any defective part in the equipment of his own manufacture or those of his sub Contractor or those procured by him or his sub-contractor and arising from faulty design, materials and / or workmanship. All costs for the repair

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and / or replacement of defective parts such as dismantling, re-erection, supply, transportation, etc shall be to the account of contractor.

- 26.2 No repairs or replacement shall normally be carried out by the Engineer when the installation/works is under supervision of Contractor's supervisor. In the event of an emergency, where, in the judgment of Engineer, delay would cause serious loss or damage, repairs or adjustment may be made by the Engineer or a third party chosen by the Engineer without advance notice to the contractor and the cost of such work shall be paid by the contractor. In the event of such action taken by the Engineer, the Contractor will be notified promptly and he shall assist wherever possible in making the necessary corrections. This shall not relieve the Contractor's liability under the terms and conditions of the contract.
- 26.3 If it becomes necessary for the Contractor to replace or renew any defective portion of the installation/works under this clause, the provision of this clause shall apply to the portion of the plant so replaced or renewed until the expiry of 1 year from the date of such replacement or renewal and/or until the expiry of 1 year from the date of commissioning of the installation/ works and final acceptance by the employer, whichever is later.
- 26.4 The acceptance of the works by the Engineer shall in no way relieve the Contractor of his obligation under this clause.
- 26.5 If at any time during the guarantee period, it shall appear to the Engineer that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of inferior quality or that any materials or articles provided by him for the execution of the work unsound or of a quality inferior to that contracted for or are otherwise not in accordance with the contract, it shall be lawful for the Engineer, notwithstanding the fact that the work or materials or articles complained of may have been inadvertently passed, certified and paid for the Contractor shall be found forthwith to rectify, to remove and reconstruct the work so specified in whole or in part, as the case may require, if so required to remove the materials or articles so specified and provided other proper and suitable materials or articles at his own charge and cost.
- 26.6 In the event of Contractor failing to remove the defect within time specified by the Engineer, the Employer may proceed to undertake the removal of such defect at the Contractor's Cost and Risk, without prejudice to any other rights and recover the same from performance Bank Guarantee / other dues.
- 26.7 The Contractor shall promptly provide adequate staff at sites during guarantee period to attend to defects, if any. If it is not attended, then the loss arising will be recovered from the Contractor.

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27.0 Uncorrected Defects after Completion Date

- 27.1 After Completion date, the Employer may arrange for third party to correct a Defect if the Contractor has not corrected it within the Defects Correction period.
- 27.2 The Employer shall give the Contractor at least 7 days notice of his intention to use a third party to correct a Defect. If the Contractor does not correct the Defect himself within this notice period, the Employer may have the Defect corrected by the third party. The cost of the Correction will be to the contractors account & it will be deducted from the balance payment due to the Contractor. In addition to the above, MSEDCL may initiate any action against the contractor as deemed suitable.
- 27.3 Employer will carry out such work in the event of emergency and situation so demands and will inform to Contractor accordingly and will recover/deduct cost of such work done.

D. COST CONTROL**28.0 Payment Terms**

- 28.1 All payment due to the Contractor shall be paid only through RTGS by the concerned Superintending Engineer of the Circle.
- 28.2 The employer shall make progressive payments as and when they are due as per the payment schedule. The invoices along with the documents listed in the relevant clauses of terms of payment shall be submitted by the contractor to the concerned SDO through Section Officer and the same shall be verified by concerned Executive Engineer and payments shall be released by concerned Superintending Engineer of the Circle.
- 28.3 **Advance Payment**
Not applicable to this contract.
- 28.4 **Running Bill Payment**
- 28.4.1 The Contractor shall present every month his Invoice duly quoted GST, PAN Registration No. on the bill for items supplied installed/ tested/ commissioned. After verification by the concerned S.D.O. & EE, all items having financial value shall be entered and certified in Employers Measurement book. Running Bill payment of the Installation & commissioning charges shall be made for the items supplied, installed, tested & completed after making adjustment for incomplete work(s) will be arranged.
- 28.4.2 The contractor shall provide following documents to claim the payments.
- Invoice (For Equipment and completed Work) : 3 Copies;
 - Satisfactory work completion certificate from concerned Section Officer: 3 Copies;
 - Copy of Challan duly signed by the contractor and the Engineer-in-charge.

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- 28.5 The measurement entered in "Measurement Books" and bills prepared shall be signed and dated by both the contracting parties.
- 28.6 Passing of measurement as per bills does not amount to acceptance of the completion of the work mentioned. Any left out work has to be completed if pointed out at a later date by the Engineer.
- 28.7 The Contractor shall be directly responsible for payment of wages to his workmen.
- 28.8 It has to be noted that all the interim and final payments to the contractors would be made after necessary certification by the concerned EE.

29.0 Liquidated Damages

- 29.1 If the Contractor fails to complete all the works within the time frame stipulated as completion period or within extension of time granted by the Employer, the Employer shall levy liquidated damages for breach of contract without prejudice to any other rights and /or remedies provided in the contract.
- 29.2 The liquidated damages shall be levied @ 1 % (one percent) per day of delay or part thereof subject to maximum 10 (Ten) % of the delayed work price. In case of such maximum delay, the contract may be terminated by the Employer and the balance work shall be got completed by the Employer at the risk and cost of the Contractor.
- 29.3 For the purpose of levy of the Liquidated damages, the works would be considered as completed only on successful installation and commissioning of the same. For the purpose of computation of the Liquidated Damages, the total cost of the works including the material component and the corresponding erection and commissioning charges for the said works would be considered together.
- 29.4 The deduction of any sum under the provision of this clause shall not relieve the contractor from his obligation to complete the work or from his other obligations under the contract.

30.0 Security Deposit:

- 30.1 Within 7 calendar days of receipt of the Letter of award from the Employer, the successful bidder shall pay Security Deposit by cash, Demand Draft or Bank Guarantee for an amount equivalent to Ten percent (10 %) of the Contract Price.
- 30.2 Failure of the successful bidder to comply with the requirements of Sub- Clause 30.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the EMD.
- 30.3 The Security Deposit is to cover additionally the following guarantee to the Employer:-

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“The Contractor guarantees that the equipment installed by him shall be free from all defects in materials/workmanship and shall, upon written notice from the Employer, fully remedy free of expenses to the Employer such defects that are attributable to the Contractor within the period of guarantee specified in the relevant clause of the Contract.”

- 30.4 The Security Deposit is intended to secure the performance of the entire Contract. However, it is not to be construed as limiting the damages stipulated in other clauses of the Contract.
- 30.5 The Security Deposit will be released by the Employer after satisfactory completion of the order.
- 30.6 The Employer is to notify the Contractor of any claim made against the Security Deposit.
- 30.7 The Employer may adjust Security Deposit against the any claim of MSEDCL.
- 30.8 The Employer is not liable to pay any interest or compensation to the Contractor for retaining the Security Deposit after the end of the guarantee period.
- 30.9 Termination of contract due to contractor's default mentioned in this agreement or variation in the scope of work shall not entitle the Contractor to reduce the value of the performance guarantee nor the time thereof. The performance guarantee shall be valid for the full value and for the full period of Contract including guaranty period.
- 30.10 The Security Deposit will be forfeited in case of following:
1. If, Contractor does not commence the work.
 2. If the Contractor does not follow the stipulated Time schedule.
 3. If the contract is terminated due to the reasons attributable to the Contractor.
 4. If the contractor does any act resulting in holding up of the project without reasonable cause.

31.0 Cost of Repairs:

Loss or damage to the Works or materials to be incorporated in the Works between the Start Date and the end of the final Defects Correction periods is to the Contractor's Account.

32.0 Termination

- 32.1 The Employer may terminate the Contract by giving 7 (seven) days prior written notice to the Contractor in case of happening of or continuing of the following events:
- a) The financing of the project is stopped by financiers due to any reasons thereof.

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- b) On review of performance of the Contractor by the Employer, the Employer is not satisfied with the performance of the Contractor.
- 32.2 The Employer may upon written notice of Contractor's default, terminate the contract in the circumstance detailed hereunder.
- 32.3 If, in the opinion of the Employer, the Contractor fails to make completion of works within the time specified in the contract agreement or within the extended period granted by the Employer.
- 32.4 If, in the opinion of the Employer, the Contractor fails to comply with any of the other provision of the contract including technical requirement, statutory provisions etc.
- 32.5 In the event the Employer terminates the contract in whole or in part as provided above, the Employer reserves the right to get the work executed as deemed by the Employer to be similar to the one contracted for, upon such terms and in such manner as the Employer may deem proper and the Contractor shall be liable to the Employer for any additional cost for execution and completion of such works.
- 32.6 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure and leave the Site after handing over of the site to the Employer as soon as reasonably possible.

33.0 Payment upon Termination

- 33.1 If the Contract is terminated because of a breach of Contract by the Contractor, the Employer is to issue a certificate for the value of the work done and material ordered less payments received up to the date of the issue of the certificate and less the percentage of the value of the work not completed. Liquidated Damages do not apply and Employer has a right to claim for loss and damages in respect of any delay incurred arising from the Breach. If the total amount due to the Employer exceeds any payment due to the Contractor the difference shall be a debt payable to the Employer.
- 33.2 If the Contract is terminated at the Employer's convenience or because of breach of Contract by the Employer, the Employer is to issue a certificate for the value of the work done, materials ordered, the reasonable cost of removal of equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate.

34.0 Property

All materials on the Site, Plant, and Equipment owned by the Contractor, Temporary Works and Works are deemed to be the property of the Employer and are at his disposal if the Contract is terminated because of a breach of Contract by the Contractor.

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SECTION-3**GENERAL SCOPE OF WORK AND SPECIAL TERMS & CONDITIONS**

- 1) The scope of work under this tender is design, engineering (wherever applicable), manufacture, inspection & testing before dispatch, Providing & fixing of substation capacitors and related equipments , for substations under Division Office, Ichalkaranji as per specification given in **Annexure E**.
- 2) The concerned Engineer-In-Charge should take clear '**Line Permit**' on the distribution Transformer where the work is being undertaken.
- 3) The contractor should ensure that electric supply is made '**DEAD**' before starting the work of providing & replacement of fixing of substation capacitors and related equipments , PTs of Metering Cubicles / Overhead units / Kiosk of HT consumers and should take every care to avoid accident. MSEDCL will not be responsible for any type of accident (electrical or mechanical) if so occurred to his workmen during the contract period.
- 4) During work, the contractor will have to provide necessary arrangement for fencing, caution board, red lamps, sign board as '**DANGER**' whenever & wherever required. In case of violation of any Traffic rules, penalty charged by Road Traffic Department of PMC/PCMC or Police Authority will have to be paid by the contractor.
- 5) The contractor should not leave the site/spot unless the work is satisfactory completed and line is charged/power supply is restored.
- 6) After completion of the work in satisfactory manner, the contractor should submit a bill in triplicate duly quoted with PAN, GST Registration No. on the bill to concerned Section Officer within 3 days from the work done.
- 7) Upon receipt of bill from the contractor, the Section Officer should certify the bill as per order terms and conditions within 3 days and submit it to Sub-Divisional Officer.
- 8) Sub-Divisional Officer will forward the bill to Division Office for passing and payment within 3 days after making necessary entry in ERP system.
- 9) Payment will be made by concerned The Suptd. Engineer of the Circle after deducting Income Tax, Liquidated damages for late work done, security deposit and other statutory deductions, loss to MSEDCL if any.
- 10) A separate register should be maintained at Division level having details of work done.
- 11) Account of expenditure incurred against this order shall be maintained at Dn. level.
- 12) Rate accepted in this contract are valid for a period of one year or till order amount is completed which is earlier. However, the employer reserves the right to terminate the contract at any stage by giving 7 days notice.

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ADDENDUM TO SPECIAL TERMS AND CONDITIONS FOR THIS CONTRACT

- 1) Quality of material should be good and **ISI** make.
- 2) Material should be guaranteed for one year from the date of replacement.
- 3) The contractor/his supervisor along with his staff/workers and required material, T&P should attend the location given by MSEDCL Engineer/staff to him.
- 4) If the contractor does not attend the work, but makes obstruction/objection to do the work by other contractor, on the plea that, this division is allotted to them, such cases will be reported to police authorities for obstructions while performing Govt. duty.
- 5) In case of not attending the work for 3 occasions during contract period, the contract awarded will be terminated.
- 6) The contractor should give at least 1 contact numbers of his authorized persons, proprietors, supervisors to whom MSEDCL person should contact. All the mobile phone of contractor/his persons should **always** be in '**ON**' position. Reasons such as-battery discharged, out of order, not reachable and switched off will not be entertained in any case.
- 7) Phone/mobile nos. shall be available for 24 hrs.
- 8) Efforts shall be made so that the electric supply will be resumed at the earliest.
- 9) Contractor should submit bills timely to Sub-Dn., Dn., for necessary entry in ERP system, effecting payment etc. Concerned S.O./S.D.O./E.E. should timely take action for further processing of bill but within 7 days.
- 10) Monthly statement of the work done during the month should be given to Circle Office.
- 11) Proposals for extension order should be sent to this office in time. (After completion of 70% of the order value) along with the statement of work done, consent of the contractor and recommendations of the EE.
- 12) These instructions will be in addition to General Scope of Work and Special Terms and Conditions.
- 13) The capacitors to be provided on site are to be tested and approved by The Executive Engineer, MSEDCL, Testing Division, Kolhapur before installation may be noted.

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SECTION - 4

SAMPLE FORMATS

SEAL & SIGNATURE OF THE TENDERER

Providing & fixing of substation capacitors

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SAMPLE FORM – A**(On Bidder's Letterhead)
Bid Form**

TENDER NO. EE/ICH/CAPACITOR/T-18/2023-24

Contract for work of providing & fixing of substation capacitors and related equipments , for substations under Ichalkaranji Division

To

**The Superintending Engineer,
MSEDCL, Kolhapur Circle, Kolhapur.**

Sir,

I/We the undersigned have carefully examined and understood the bid documents. I/We hereby agree for work of work of providing & fixing of substation capacitors and related equipments , for substations under Ichalkaranji Division defined in the bid document and hand over the completed works as described above in accordance with the conditions of the contract and other prices identified in the Contract Data accompanying the bid.

This bid and your written acceptance shall be the basis for Contract Agreement. I/We understand that you are not bound to accept the lowest or any bid you receive or assign any reason thereof for the rejection.

I/We further agree to sign an agreement to abide by the General Conditions of Contract and carry out all works according to specific clauses.

I/We, agree to keep this Bid open for acceptance for 60 days from the date of opening thereof and also agree not to make any modification in its terms and conditions on my/our own accord.

Signed this day _____ of _____ 2023

Yours faithfully,

Signature of the Authorized Signatory

Name of the Authorized Signatory:

Designation _____ :

Name & Address of the company:

Date _____

Seal of the Company

Witness:

1). Name _____ :

Signature: _____

Address: _____

2). Name _____ :

Signature: _____

Address: _____

(To be filled in by the Bidder, together with his particulars and date of submission at the bottom of the Form of Bid.)

SEAL & SIGNATURE OF THE TENDERER

Providing & fixing of substation capacitors

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SAMPLE FORM – B**FORM OF BID SECURITY (BANK GUARANTEE)**

WHEREAS, _____ [Name of Bidder] (hereinafter called “the Bidder”) has Submitted his bid dated _____, 2023, for work of providing & fixing of substation capacitors and related equipments, for substations under Ichalkaranji Division **Tender No. EE/ICH/CAPACITOR/T-18/2023-24** (hereinafter called “the Bid”).

KNOW ALL PEOPLE by these presents that We _____ [Name of Bank] of [Name of Country] _____ having our registered office at _____ (hereinafter called “the Bank”) are bound unto the Maharashtra State Electricity Distribution Company Limited, Represented by The **Executive Engineer, (Ichalkaranji Division)**, Maharashtra State Electricity Distribution Co. Ltd., Vidyut Bhavan, 1st Floor, Tarabai Park, Kolhapur 416 003 India (hereinafter called the **Employer**) in the sum of _____ (Rupees _____ only) for which payment well and truly to be made to the said Employer. The Bank binds himself, its successors _____ [Address of branch office at Kolhapur, Maharashtra],

SEALED with the Common Seal of the said Bank this _____ day of _____, 2023

THE CONDITIONS of this obligation are if the bidder:

- (1) withdraws his Bid during the period of Bid validity specified in the Form of Bid; or
- (2) refuses to accept the correction of errors in his Bid; or
- (3) is determined at any time prior to award of contract to have engaged in corrupt or fraudulent practices in competing for the contract; or
- (4) having been notified of the acceptance of his Bid by the Employer during the period of Bid validity:
 - (a) fails or refuses to execute the Form of Contract Agreement in accordance with the Instructions to Bidders, if required; or
 - (b) fails or refuses to furnish the Security deposit, in accordance with the Instructions to Bidders;

We undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate his demand, provided that in its demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or all of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date **90 days** after the deadline for submission of bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE _____

Signature of Bank's authorized officer

SEAL _____

Seal & Signature of Bank's second authorized officer

SEAL & SIGNATURE OF THE TENDERER

SAMPLE FORM – C**FORM OF SECURITY DEPOSIT
(BANK GUARANTEE)**

To,
The Executive Engineer (Ichalkaranji Division)
 Maharashtra State Electricity Distribution Co. Ltd.
 'Vidyut Bhavan' Station Road, Ichalkaranji

WHEREAS *[name and address of Contractor]* (hereinafter called "the **Contractor**") has undertaken, in pursuance of Contract No. EE/ICH/LoA/____ Dated:-__-__-2023 **Tender No. EE/ICH/CAPACITOR/T-18/2023-24 for works under** to undertake the work for providing & fixing of substation capacitors and related equipments, for substations under Ichalkaranji Division (hereinafter called "the **Contract**");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of ` _____ *[amount of Guarantee]*1 _____ *[in words]*, and we undertake to pay you, through our branch office at _____ *[Address of branch office at Kolhapur, Maharashtra]*, upon your first written demand and without civil or argument, any sum or sums within the limits of ` _____ *[amount of Guarantee]* as

Aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date of **completion of the defects liability period, with a claim period of further six months.**

Yours truly,

Signature and seal of the Guarantor:

Name of Bank/Financial Institution:

Address:

Date:

SEAL & SIGNATURE OF THE TENDERER

SAMPLE FORM -D**LETTER OF ACCEPTANCE
By Regd Post A/D**

Contract No.-----

Date

To: _____ (Name and address of the Contractor)

Dear Sirs,

This is to notify you that your bid dated _____ for turnkey execution of "the Works" providing & fixing of substation capacitors and related equipments , for substations under Ichalkaranji division (amount in figures and words), as corrected and modified in accordance with the instructions to Bidders is hereby accepted by us.

You are advised to submit performance security within 7 days and sign a contract agreement within 7 days from the date of this letter.

You are hereby instructed to proceed with preparation for the said Works in accordance with the Contract documents as listed in the Contract Data attached hereto

Yours faithfully,

Signature

Name

Title

Employer

(Signature, name and title of signatory Authorised to sign on behalf of the Employer)

Copy to:

1. The Sr Manager (F&A), MSEDCL, Kolhapur Circle

SEAL & SIGNATURE OF THE TENDERER**Providing & fixing of substation capacitors****-41-**

SAMPLE FORM - E**FORM OF CONTRACT AGREEMENT**

This agreement made this ____ day of _____ 2023-24, between the Maharashtra State Electricity Distribution Company Limited, represented by the Executive Engineer (Ichalkaranji division), Maharashtra State Electricity Distribution Company Limited, Vidyut Bhavan, Station road, Ichalkaranji Maharashtra (India) (hereinafter called "the Employer") of the one part and _____ of _____ (hereinafter called "the Contractor") of the other part.

Whereas the Employer desires that the works for providing & replacement of faulty 11kV, 33kV CTs for substations under Ichalkaranji division **EE/ICH/CAPACITOR/T-18/2023-24** should be executed by the contractor and has accepted a Bid by the contractor for the execution of such works and the remedying of any defects therein.

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meaning as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
 2. The following documents shall be deemed to form and read and constructed as part of this Agreement.
 - (a) The Letter of Award no. _____ dated _____
 - (b) The Bid dated _____
 - (c) The Conditions of Contract (Part I and II)
 - (d) The Completed Schedules, and
 - (e) The Contractor's Proposal.
 3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned. The Contractor hereby covenants with the Employer to execute and complete the works. Remedy any defects therein and maintain the completed Facilities in conformity in all respects with the provisions of the Contract.
 4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the works, the remedying of defects therein and guarantee of the completed Facilities, the amount of [*insert the Contract Price*] or such other Sum as may become payable under the provisions of the Contract at the times and the manner prescribed by the Contract.
- In Witness** whereof the parties hereto have caused this Agreement to be executed the day and year first before written in accordance with their respective laws.

Authority signature of Contractor

Authority signature of Employer

SEAL

SEAL

In the presence of:

In the presence of:

Name _____

Name _____

Signature _____

Signature _____

Address _____

Address _____

SEAL & SIGNATURE OF THE TENDERER

Providing & fixing of substation capacitors

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SAMPLE FORM - F**Check list Qualification Information**

(Tenderer is specifically requested to check the list before submitting the tender)

Sr. No.	Particulars	Comments of the Tenderer
1	Purchase of Tender: Please quote Money Receipt No. & Date against which Tender is purchased	
2	Earnest Money Deposit: E.M.D. paid vide Money Receipt No. & Date (if by DD)	
3	SSI Registration: Whether registered as SSI Unit. If yes, quote Registration No. (Please enclose a copy of SSI Registration including the material (item) of the Bid offer)	
4	Type of Concern: Whether the unit is proprietary /Partnership /Private Ltd. or Limited Company.	
5	Past Performance: Whether you have executed orders of similar nature (Please attach Experience certificate along with copy of orders executed)	
6	Shop Registration No. and validity	
7	GST Registration No.	
8	PAN No.	
9	Validity of offer: Offer is valid for 90 days.	
10	Positive Net worth equivalent to tender value	
11	Certificate of Registration of manufacturing unit under Factories Act / Shop Act / Registration for trading.	
12	ISI MARK material to be provided	
13	The bidder should have minimum experience of works to amount equivalent to at least 20% of the bid value or two orders of 25% of bid value or 3 orders of 30% of bid value.	
14	Last 3 years Balance sheets & Income Tax Returns for FY 2020-21, 2021-22, 2022-23.	
15	Avg Annual Turn-Over of last three financial years: Should be 30% of tender value Please enclose copy of the Balance Sheet and Profit and Loss Statement duly attested by the CA for last 3 years.	

SEAL & SIGNATURE OF THE TENDERER

Declaration

The following declaration as to the eligibility of goods to be covered under the contract signed and dated by Contractor shall be attached to the bid.

"I, the undersigned hereby declare that, the major goods to be supplied are manufactured by (Name of the eligible source company (manufacturer)) & are confirming to the Technical Specifications of this Bid.

I, the undersigned hereby certify that (name of the Contractor)) has been incorporated and registered in (name of the eligible source state), has the required facilities for producing or providing the goods and services in (name of eligible source) and actually conducts its business there".

I, further hereby agree to carry out the work for work of providing & fixing of substation capacitors and related equipments , for substations under Ichalkaranji Division, on the lowest acceptable rate quoted by any other tenderer if contract is awarded to me.

Signature

Name & designation

Date:

Name of Co.

Place:

Address

SEAL & SIGNATURE OF THE TENDERER

Providing & fixing of substation capacitors

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**MAHARASHTRA STATE ELECTRICITY DIST. CO. LTD.
ICHALKARANJI DIVISION**

ANNEXURE 'G' TECHNICAL

Technical Specifications of work of providing & fixing of substation capacitors and related equipments , for substations under Ichalkaranji Division . Attached document:

TECHNICAL SPECIFICATIONS:-

- 1) For Capacitors as published on MSEDCL website with ref no CE/T-QC/MSC-II/11kV Fixed Capacitor Bank, Date: 12.02.2021

Copies of the technical specification are attached with the tender for ready reference may be noted please.

SEAL & SIGNATURE OF THE TENDERER

Providing & fixing of substation capacitors**-45-**



**Maharashtra State Electricity Distribution Company Limited
Division Office, Ichalkaranji
Tender for providing & fixing of substation capacitors
and related equipments in Substations under
Ichalkaranji Division.**

Tender No. EE/ICH/CAPACITOR/T-18/2023-24

VOLUME-2

PRICEBID



Executing Agency
Executive Engineer
Maharashtra State Electricity Distribution Co. Ltd.
Division Office, Ichalkaranji
“Vidyut Bhavan”, Station road,
Ichalkaranji.

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providing & fixing of substation capacitors

ANNEXURE 'I'

PRICE BID

(RATES TO BE QUOTED BY AGENCY & SUBMITTED ONLINE IN PRICE BID PART ONLY)

Tender No. EE/ICH/CAPACITOR/T-18/2023-24

Providing & fixing of substation capacitors and related equipments in Substations under Ichalkaranji Division.

33/11 KV Awade Mala S/Stn. & 33/11 KV Chandur S/Stn

The material should be as per specification given in Tech Specification of MSEDCL :- **CE/T-QC/MS-C-II/11kV Fixed Capacitor Bank, Date: 12.02.2021- attached with tender documents**

Sr. No.	Description	Qty Nos	Price per unit with prov. & fixing rate in Rs.
1	2.4 MVAR, 3 Ph, 11 KV HT Capacitor Bank	2 Sets	
2	Series Reactors -	2 Sets (6 Nos)	
3	11 KV Single Phase, Out Door NCT	2 Nos.	
4	11 KV CT 400-200/5-5 Outdoor	6 Nos.	
5	11 KV LA (Station Type)	6 Nos.	
9	Earthing Sets H.T. (L.S.)	20 Nos.	
10	11 KV Single Phase, Out Door RVT	2 Nos.	
11	Phase Displacement Relay	2 Nos	
12	O/C under voltage Relay	2 Nos	
13	Master trip relay	2 Nos	
11	2.5 sqmm X 4 Core Copper Armed	500 Mtr	
12	2.5 sqmm X 2 Core Copper Armed	280 Mtr	
13	2.5 sqmm X 12 Core Copper Armed	940 Mtr	

Above quantity may vary as per actual requirement. Wherever required existing healthy equipments of MSEDCL should be used. Vendor should be approved vendor of MSEDCL.

- 1) I/We ready to execute the work matching with the lowest acceptable rate (L-1) if _____ contract _____ is awarded to me. (In such case at the discretion of the MSEDCL, 70% contract value will be awarded to L-1 bidder and up to 30% to L-2 bidder matching rate with L-1 bidder) YES/NO _____

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SEAL & SIGNATURE OF THE TENDERER

Providing & providing & fixing of substation capacitors

I have read and understood all Terms & Conditions & these conditions are binding on me.

NOTE:-1)

The above rates are inclusive of Transportation with loading & unloading of material by contractor from his stores to work site & Viceversa.

- 2) The arrangement of cranes if necessary for unloading or loading of material should be made by the contractor; no extra charges will be paid by the MSEDCCL.
- 3) The contractor will have to obtain all statutory permissions such as way leave & road permissions from the local authorities if required.
- 4) The rates quoted by the contractor should include all local & general taxes duty etc. No extra charges will be paid. No accident/incident charges will be paid by MSEDCCL.

Sign & Seal of Tenderer



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR
ARRANGEMENT AND ASSOCIATED EQUIPMENTS

MATERIAL SPECIFICATION CELL

TECHNICAL SPECIFICATION
OF
11KV 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE
STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS
IN
33KV SUB-STATIONS



**TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR
ARRANGEMENT AND ASSOCIATED EQUIPMENTS**

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TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

1.0 SCOPE:

- 1.1 This specification covers design & supply of 1.2/2.4/3.0 MVAR capacitor bank along with all required equipments to be installed in 33kV sub stations. The capacitor bank shall consist of capacitor bank, circuit breaker, Series Reactor, control & relay panel, isolators, LAs, CTs and NCT, conductor, all type of necessary connectors along with suitable mounting structure. All these equipment shall have suitable terminal/equipment connectors as detailed under clause No.11.2 of the specification.
- 1.2 The equipments to be supplied against this specification are required for vital installations where continuity of service is very important. The design, materials and manufacture of the equipment shall, therefore, be of the highest order to ensure continuous and trouble-free service over the years.
- 1.3 The equipment offered shall be complete with all parts necessary for their effective and trouble-free operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated in the commercial order or not.
- 1.4 Configuration: The major equipments involved for each mechanically switched shunt capacitor bank are as follows.
- 1.5

Sr. No.	Particulars	Qty. Reqd.
1.	11 kV ,1.2/2.4 /3.0 MVAR capacitor bank	1Set.
2.	11 kV Circuit Breaker	1No.
3.	11 kV Isolator with earth blade	1No.
4.	11 kV lightning Arrestors	3No.
5.	11 kV Current Transformer	3No.
6.	11 kV Neutral current transformer	1No.
7.	11 kV Single phase Current Limiting Reactors	6No.
8.	Control & Protection Equipment.	1Set.

It is not the intent to specify herein complete details of design and construction. The equipment offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements. The dimensional drawings attached with this specification and the notes thereto are generally of illustrative nature. In actual practice, notwithstanding any anomalies, discrepancies, omissions, in-completeness, etc. in these specifications and attached



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drawings, the design and constructional aspects, including materials and dimensions, will be subject to good engineering practice in conformity with the required quality of the product, and to such tolerances, allowances and requirements for clearances etc. as are necessary by virtue of various stipulations in that respect in the relevant Indian Standards, IEC standards, I.E. Rules, I.E. Act and other statutory provisions.

- 1.6 The Tenderer/supplier shall bind himself to abide by these considerations to the entire satisfaction of the purchaser and will be required to adjust such details at no extra cost to the purchaser over and above the tendered rates and prices.
- 1.7 The tenderer shall furnish in his offer a list of recommended spares with unit rates for each set of equipment that may be necessary for satisfactory operation and maintenance of circuit breaker and Isolators for a period of 10 years. The purchaser reserves right of selection of items and quantities of these spares to be ordered. The cost of such spares shall not be considered for tender evaluation.
- 1.8 The tenderer shall submit a list and unit rates of all the special tools, equipment and instruments required for erection, testing, commissioning and maintenance of the equipment. The purchaser shall decide the quantity of tools to be ordered. Prices of these tools shall not be considered for tender evaluation. However, the list of necessary tools/equipment which will be supplied free of cost with each CB may be furnished separately.

The equipment/material offered shall be entirely satisfactory for operation under the conditions indicated below:-

2.0 SERVICE CONDITIONS:

Sr. No.	Particulars	Specified value
1	Maximum Ambient Temperature (Degree C)	50
2	Minimum Ambient Temperature (Degree C)	3.5
3	Relative Humidity (%)	10 to 100
4	Maximum annual rain fall (mm)	1450
5	Maximum wind pressure (Kg/m sq)	150
6	Maximum wind velocity	45
7	Isoceraunic level (days/year)	50
8	Maximum altitude above mean sea level meter	1000
9	Seismic level (Horizontal acceleration)	0.3g
10	Moderately hot and humid tropical climate conducive to rust and fungus growth	



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3.0 OPERATING CONDITIONS:

Sr. No.	Particulars	Specified value
1	Nominal system voltage	11kV
2	Highest system voltage	12 kV
3	Frequency	50Hz \pm 3%
4	Number of Phases	3
5	Neutral Earthing	Solidly grounded
6	Fault level (minimum)	12.5 kA for 3 sec.
7	Auxiliary AC supply	240 Volts \pm 10%
8	Auxiliary DC supply	30 Volts +10% – 15%

4.0 STANDARDS:

Unless otherwise specified elsewhere in the specifications equipments shall confirm to the latest revisions of all relevant standards available at the time of placement of the order. The standards are listed in Annexure 'I'.

In the event of offered equipment conforming to Standards other than the above, the salient points of comparison between the Standard(s) adopted and the relevant IS/IEC shall be indicated in the technical offer to bring out clearly how the chosen standard is equal to or better than the ones stipulated in this specification. Copies of the Standard(s) adopted shall be furnished.

5.0 PRINCIPAL TECHNICAL PARAMETERS:

Principal technical parameters of various equipments shall meet the requirements listed in Annexure II (A to H)

6.0 GENERAL TECHNICAL REQUIREMENTS:

- 6.1 The capacitor bank and all other equipments other than the indoor control panel shall be suitable for being installed outdoors & would be located at switchyards of various substations.
- 6.2 The equipment shall remain functional during and subsequent to the application of seismic loading. The exact value of seismic level (Horizontal acceleration) and maximum wind pressure may be considered as 0.3 g and 150 kg per sq. meter respectively.
- 6.3 The shunt capacitor should be designed for satisfactory operation even with presence of harmonics in the system. Suitable devices of required ratings should be included in the scope of supply. The general arrangement drawing alongwith the detailed layout plan of the capacitor bank shall be submitted for necessary approval.
- 6.4 Each bank shall be of 1.2/2.4/3.0 MVAR rating at 11kV and shall be double star connected bank with neutral point connected through NCT.



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If there are more than one capacitor banks in the sub-station, damping reactors of 0.2% rating should be used on the neutral side of the capacitor bank. The inductance value will control amplitude and frequency of the inrush current at back to back switching. Peak capacitor inrush current shall be less than 100 times rated current of the capacitor and less than the breaker making current.

6.5 The protective scheme shall be by a current relay arranged as follows:

- i) If the failure of one or more elements cause an over voltage of less than 10% tolerable on the other remaining healthy units, then the unbalance current shall cause in the first step to sound an alarm. But if more than the above numbers of elements fail causing the voltage rise of more than 10% on the other healthy units or the over voltage on the remaining healthy elements exceeds 65% then the unbalance current shall cause to trip and isolate the capacitor bank instantaneously in the second step.
- ii) The per phase and individual star group rating shall be built up if required by series- parallel combination of individual units so as to achieve the desired bank rating.
- iii) Internal fuses shall comply with IS- 12672 and shall be provided for the several individual elements within each unit.
- iv) Although the tolerances in the output rating of each individual unit shall be as per IS- 13925 (Part I) 2012, yet it shall be ensured that in a completely assembled bank, the departures from the nominal rating and with in the specified tolerance values shall not cause nuisance alarm or tripping since such alarm or tripping shall be to meet only with the protective requirements specified in(iii).
- v) Individual units shall be designed to meet the requirements of the permissible overloads & with internal discharge devices as specified in IS- 13925 (Part I) 2012.
- vi) Internal fuses for individual elements within unit shall be as per the manufacturer's design and shall be ensured for adequacy such as to withstand normal switching inrush transient currents, discharge current when the bank is switched off. Fuses shall be capable of disconnecting a faulty unit or element over a wide range of unit terminal voltages from 70 to 150 %. In case all the elements in the same row are fused out in cascade in an internal fuse unit then the fuse element blown out shall be capable of successful disconnection, with a voltage of not less than 100% rated voltage appearing across its terminals. The unit shall withstand this voltage successfully and continuously. An internal element/elements fuse blowing out shall not cause, case rupture of the container of the unit.



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- vi) The individual capacitor units shall be of ungrounded type with two bushings and fully insulated for rack potential. The capacitance shall be built up with high grade, all polypropylene dielectric film and aluminum foil. The polypropylene film shall cover the aluminum foil smoothly evenly and without any locked air pockets or voids. The containers shall be of CRCA sheet with minimum thickness 2mm duly welded and hermitically sealed. All welded joints shall be finished smoothly. The interior of the capacitor shall be degreased and derusted and shall not be painted. The insulating liquid shall be such that it shall remain chemically inert to the dielectric film. Aluminum foil shall not chemically degrade itself while in service.
- viii] Guaranteed failure rate i.e. no. of units failing per year) should not be more than 0.5% per annum during warranty period. In case the failure rate exceed 0.5% per annum, then the supplier will have to give as free replacement two capacitor units for each failed unit in excess to the above guaranteed figure.
- ix) The raw material used for capacitor manufacturing i.e. PP film, non PCB non toxic oil & aluminium foil shall be of best quality obtainable in international market. Thickness of PP film (both sides hazy) shall be indicated in the technical particulars by weight method. No. of layers of dielectric shall not be less than three. Low loss capacitors shall be preferred. Offers with less than three layers of dielectric will not be considered. List of sources of raw material shall be enclosed along with the offer.
- x) The capacitor elements shall be thoroughly dried & impregnated with an impregnant which had been completely refined & degasified so as not to have any gas or impurities which may cause deterioration of the dielectric.
The impregnant used shall have low viscosity & high chemical stability.
The impregnant should be non-PCB (NPCB)

6.6 Clearances and spacing as indicated below shall be provided.

a)	Phase to phase (Electrical) clearance for Breaker poles (minimum)	280 mm
b)	Phase to phase (Electrical) clearance for C.T.s & P.T.s (minimum)	370 mm
c)	Phase to earth clearance (H.T. Terminal to nearest grounded metal part)	370 mm
d)	Height of 11 kV terminals from ground level (min)	3100 mm
e)	Spacing between isolator poles (Centre to Centre) (fixed)	1000 mm



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f)	Height of lowest part of support insulator from ground level (minimum)	2800 mm
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Tenderers shall confirm in their technical offer that all clearances and spacing as stated above will invariably be provided. Offers without such confirmation are liable to be rejected.

7.0 CAPACITOR BANK

7.1 The capacitors shall be arranged in double star. Neutral Current transformer provided shall detect any unbalance due to Capacitor unit failure. Neutral Current transformer shall be provided between two Star points of the bank. Star point shall be ungrounded.

Capacitor unit should be made up of all polypropylene film dielectric with NON PCB impregnant liquid and provide with internal fuse element. The containers shall be made from CRCA sheet of thickness not less than 2mm.(14 SWG). The Capacitor unit should be arranged in open galvanized steel rack with copper tinned conductors for their inter connections and aluminium bus bar for interconnections between capacitor bank, L.A., series reactor and neutral current transformer.

7.2 The container shall be hermetically sealed by controlled arc welding/tig welding process. The metal flanges of the bushing should be soldered /welded to the container and covered with epoxy compound providing a strong hermetical seal to the container. Suitable mounting brackets, as required by the purchaser shall be welded to the container. The minimum creepage distance of the bushing shall be 375mm. The container of each capacitor unit shall be provided with suitable earthing terminal clearly marked.

7.3 The capacitor bank shall be designed, manufactured and tested as per IS-13925 (Part-I) 2012. The shunt Capacitor bank would be out door type & would be located at switchyards of various substations. Unless otherwise specified, the capacitors shall be suitable for upper limit of temperature category 50° C as per IS-13925.

7.4 The standard rated output of a switched capacitor bank shall be 1.2/2.4/ 3.0 Mvar as specified at 11kV rated voltage. The bank shall comprise of single phase units of 242 KVAR each rated for 7.3kV phase to earth voltage connected in double star with neutrals interconnected through NCT. The maximum permissible overloads with regard to voltage, current and reactive output shall conform to IS: 13925 (part I) 2012 with latest amendments.

7.5 The power loss in capacitors shall not exceed 0.2 Watt/kVAR. Suitable discharge device shall be connected across the capacitor units in accordance with the provision of IS: 13925 (part I) 2012 with latest



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amendments. The discharge device shall reduce the residual voltage from the cross value of the rated voltage to 75V or less within 10 minutes after the capacitor is disconnected from the source of supply.

- 7.6 Better configuration with appropriate capacity of cell units may also be acceptable subject to approval of the Chief Engineer (Testing) prior to tender finalization.
- 7.7 The outside of the container should have smooth and tidy look and should be coated with weather-proof and corrosion-resistant paint of white or light gray shade. The container/enclosure shall be painted with light gray colour, shade 631 as per IS:5.
- 7.8 The capacitor shall be provided with a rating plate and terminal markings as stipulated in IS:13925.
- 7.9 Other details of capacitor bank shall be as per Annexure II 'A' of Guaranteed Technical Parameters attached.
- 7.10 Mounting structure:
 - 7.10.1 The mounting racks shall be fabricated from suitable steel sections and shall be duly hot dip galvanized as per applicable IS. Mounting racks along with support insulators shall be suitable for mounting on elevating structure.
 - 7.10.2 The racks shall be complete with insulators, bolts & nuts, foundation bolts and other hardware, etc. for assembly into complete bank. Interconnecting materials and suitable bimetallic terminal connectors for connection with other equipments shall also be provided.
 - 7.10.3 The height of the racks of capacitor bank shall be such that for making electrical connection with the other equipments, proper electrical clearance is maintained.
 - 7.10.4 The hot dip galvanized elevating structure shall be provided of capacitor bank & isolator. Provision for mounting of LA, SR & NCT shall be made on the capacitor bank elevating & mounting structure.
- 7.11 Protection:
 - 7.11.1 Fuses:
 - i) The fuses shall withstand repeated application of transient conditions associated with normal duty of capacitor unit.
 - ii) Fuses shall be capable of limiting arc energy within the case of faulty capacitor to such small proportions that the danger of case rupture is eliminated.
 - iii) It shall have adequate rupturing capacity for the fault levels at the terminals of the capacitor.



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- iv) It shall have adequate thermal capacity to cater for increased heating which may occur due to harmonics.
- v) It shall have an ampere rating which will provide proper co-ordination between its total clearing time current curve and capacitor unit's case rupturing capacity.

7.11.2 The capacitor banks shall be provided with the following other protections:

- (a) Over current and earth fault protection to cover bus faults between the capacitor banks and its controlling circuit breaker.
- (b) Over voltage protection.
- (c) Unbalance protection.
- (d) No volt protection.
- (e) Leading Power factor Protection.

Requirement of each of the above protection are described below:-

a) Over-current & Earth fault protection:

Combination of two IDMT relays having 50-200% settings and one EIF relay of IDMT characteristic with 20-80% setting shall be used with suitable current transformer.

b) Over-voltage Protection:

Over-voltage shall have an inverse time characteristics and shall be energized through VT connected to the main bus bars on the source side of the circuit breaker controlling the capacitor banks. Relay shall have variable settings from 100% to 130% in steps of at least 1% to 2%.

c) Unbalance Protection:

Unbalance protection shall be provided with current operated relay with separate one no. NCT for each group of 5 MVAR.

The relays used shall be provided with a time delay device to prevent operation under transients and to allow individual fuses to isolate the faulty units. Inverse time delay relay may be used.

d) No volt Protection:

Under voltage protection shall be provided to disconnect the bank under low voltage conditions. A time delay relay must be provided with adjustable setting of 0 to 10 minutes to provide a time lag before which the bank shall not be again switched on (to avoid closing of the circuit breaker on a trapped charge).

7.11.3 The under-voltage protection shall not operate in the event of fault on 11 KV lines which may dip the bus bar voltage to 50%. There should be provision for adjustments in settings of voltage and time to



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coordinate the 11 KV line protections with the under-voltage protection to avoid malfunctioning of under-voltage relay under line fault conditions.

7.11.4 The power factor meter should be provided.

7.12 Associated Equipments:

The associated equipments as mentioned in clause 1.4 above of this Tech. Specification having detailed specification described herein after shall be supplied along with the capacitor banks. The hot dip galvanized elevating structure shall be provided of capacitor bank & isolator. The general arrangement of equipments is shown in the single line diagram appended with this specification.

8.0 11KV VACUUM CIRCUIT BREAKER:

Technical specifications of Circuit Breaker used for switching on & off of the Capacitor bank shall be as follows.

The 11KV circuit breakers offered shall be three phase, out door type, 3-pole gang operated, Vacuum circuit breakers having 800 Amps continuous current rating & short circuit rating of 25 KA for 3 sec. Circuit breaker shall be suitable for switching IN and OUT capacitor bank with out restrike. Circuit breaker shall have operating duty cycle of O-0.3 sec-CO- 3min-CO as per IEC 60056/IS-13118. Circuit breaker shall conform to IEC 60056/IS-13118 amended up to date.

8.1 Breaker Contacts

8.1.1 Main contacts shall have ample area and contact pressure for carrying continuous rated and short time current without excessive temperature rise, which may cause pitting or welding.

8.2 The inside operating rod or insulated fiber glass connecting rods wherever used shall be sturdy and shall not break during the entire life period of the breaker. The insulated rod shall have anti tracking quality towards electrical stresses.

8.3 Operating mechanism

8.3.1 Operating mechanism and control circuitry shall be housed in suitable metallic enclosure. It shall be painted white on the interior and Dark Admiralty Grey to shade no 632 of IS-5 on exterior surface. The enclosures shall be dust, moisture and vermin proof, to provide a Degree of protection to IP 55 in accordance with IS: 13947. Control cubicle for local operation of the breaker shall be mounted at a convenient height to enable easy operation from ground level. It shall have backwards slanting hood of 2 mm thick (14 SWG) sheet for protection against rain water. It shall accommodate the following items:



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Sr. No.	Item	Quantity Required
1.0	Mechanical ON & OFF knobs.	1 No.
2.0	Electrical ON/OFF push buttons	1 No. each
3.0	Mechanical ON/OFF indicator.	1 No. each
4.0	Electrical ON/OFF indicator	1 NO. each
5.0	Mechanical spring charged indicator.	1 No.
6.0	Electrical spring charge indicator	1 No.
7.0	Auxiliary A.C./D.C. supply indication	1 No. each
8.0	Conveniently located manual emergency trip	1 No.
9.0	Auxiliary switches as specified else where in this specification	1 set
10.0	Control cable termination connector blocks with stud type brass terminals of min 4 mm dia	1 set
11.0	One power plug along with control switch (240V,10A).	1 set
12.0	Space heater along with ON/OFF switch and thermostat	1 set
13.0	Cubical illumination lamp with switch.	1 set
14.0	Mechanical Operation counter to register the number of breaker operations.	1 No.
15.0	Local/Remote switch	1 No.

8.4 Auxiliary Switches:

- 8.4.1 Each operating mechanism of the circuit breaker shall be provided with adequate number of Cam/Snap type auxiliary switches of normally open and normally closed contacts for the control and operation of the equipment with continuous current rating of 10 Amp. The Breaking capacity of the contacts shall be minimum 2 A with circuit time constant less than 20 milli seconds at the rated D.C. voltage. Normal position of auxiliary switches refers to contact position when circuit breaker is open.
- 8.4.2 All spare auxiliary contacts of the circuit breakers shall be wired up and brought to the terminal block. Minimum 4 N/O+ 4 N/C contacts shall be available on each breaker for this purpose. Auxiliary contact multiplier, if any used, shall be connected to the DC supply only.
- 8.4.3 Insulation level of auxiliary contacts shall be 630 volts, 2.5 kV for 1min.
- 8.4.4 In case the control cubicle mounting height is more, there shall be provision of suitable folding type ladder attached to the breaker support structure, by means of which it will be possible to reach the control cubicle/operating mechanism box conveniently. Further, electrical ON/OFF push buttons/switch shall be accessible from the ground.



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- 8.4.5 The circuit breaker shall be provided with motor operated spring charged closing. Spring charging motor shall be suitable for 240V, 50 Hz, single phase AC. Spring release coil for closing shall be suitable for 30V DC. Provision shall be available for charging the springs manually as well, and to close CB mechanically.
- 8.4.6 Tripping of the circuit breakers shall be through "Shunt trip" coils rated for 30V DC operation. It shall be possible to trip the breaker manually in case of necessity.
- 8.4.7 In each circuit breaker, one potential free contact of the limit switch of spring charging motor shall be provided for remote indication of spring charged. This contact shall be wired up and brought to the terminal block.
- 8.4.8 Electrical antipumping device shall be provided for breaker.
- 8.4.9 The breaker shall be provided with CT mounting Bracket.
- 8.4.10 Requisites number of suitable and matching bimetallic terminal connectors shall also be supplied along with the breaker.
Other details of 11KV circuit breaker shall be as per Annexure II 'B' of Guaranteed Technical Parameters attached.

9.0 11KV CURRENT TRANSFORMERS:

- 9.1 All 11kV current transformers including neutral current transformers shall be single phase outdoor, oil cooled or dry type units. Oil cooled current Transformers shall be of dead tank design with the insulator housing of porcelain material. CTs shall be hermetically sealed conforming to IS-16227. CTs shall be of suitable ratio with ratio changing arrangement on primary side. The mounting arrangement of current Transformers shall have four holes equispaced at 350 ± 5 mm. distance suitable for 16mm. stud/foundation bolt.
 - 9.1.1 In case of dry type current Transformers tenderer shall give full technical and constructional details, without which offered Instrument Transformer shall not be technically acceptable.
 - 9.1.2 CTs shall have short time rating of 25 KA for 3 second. The primary and secondary windings of CTs shall be of copper.
 - 9.1.3 In case all three CTs are mounted on the same structure, clearances as specified elsewhere in the specification shall be maintained.
 - 9.1.4 CTs shall be only of reputed make approved by the Board. Performance certificates and type test certificates for CTs shall be furnished along with the technical offer.
- 9.2 The metal tank shall be fabricated from M. S. Sheet of minimum 3.15 mm thick. The metal tanks shall be coated with at least two coats of



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zinc rich epoxy paint. In case of oil cooled its inside all sides of tank shall be painted with oil resistant white enamel paint. All the ferrous hardware, exposed to atmosphere, shall be hot dip galvanized. All other fixing nuts, bolts, washers in the electric current path shall be made out of stainless steel.

- 9.3 Nuts and bolts or screws used for fixation of the interfacing porcelain bushings for taking out terminals shall be provided on flanges cemented to the bushings and not on the porcelain. If gasketed joints are used, nitrile /butyl rubber gaskets shall be used. The gasket shall be fitted in properly machined groove with adequate space for accommodating the gasket under compression.
- 9.4 Oil cooled Instrument Transformers.
 - 9.4.1 The Instrument transformer shall be provided with prismatic type oil level indicator at suitable location so that the oil level is clearly visible with naked eye to an observer standing at ground level.
 - 9.4.2 The unit shall be filled with oil under vacuum after processing to eliminate air and moisture from the winding and shall be hermetically sealed.
 - 9.4.3 Oil filling and/or oil sampling cocks if provided to facilitate factory processing shall be properly sealed before dispatch of the instrument transformers. It is preferable to provide leakage proof threaded plugs / caps instead of cocks for oil filling & sampling outlets.
 - 9.4.4 The porcelain housing for instrument transformer shall be of single piece construction without any joint or construction. The housing shall be made of homogeneous vitreous porcelain of high mechanical and dielectric strength. Glazing of porcelain shall be of uniform brown or dark brown colour. With a smooth surface to shade away rainwater or condensed water particles. The profile of porcelain shall be aerodynamic type conform to IEC 815 / IS 2099.
 - 9.4.5 Out door type bushing shall have a creepage distance of 25 mm/kV. The bushing housing shall have a rated voltage not less than 12 kV at rated current of 2000 amps. Vertical clearance of porcelain housing shall be at least 370mm.
- 9.5 Dry type Instrument transformers.
 - 9.5.1 The Instrument Transformers shall be so constructed as to ensure that the dry insulation media (resin, epoxy or any other polymer used) does not absorb moisture or develops cracks or breaks in to pieces during its life span when installed in outdoor. The media shall also have anti-tracking properties against electrical stresses.
 - 9.5.2 The HV/LV windings shall be made of HCE grade copper and cast under high vacuum using pure liquid epoxy resin or nyloner system to achieve



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void less embedment of windings. Use of mica and fiberglass insulation shall be avoided.

- 9.5.3 The material used for encapsulation shall be finely and scientifically graded well bounded polymer resin resin with good electrical, mechanical weathering properties.
- 9.5.4 The insulation coordination between phase to earth shall be in accordance with IS 2165 (Part I).
- 9.5.5 Enamel, if used for conductor insulation, shall be either polyvinyl acetate type or amide type and shall meet the requirements of IS 4800. Polyester enamel shall not be used. Double cotton cover, if used, shall be suitably covered to ensure that it does not come in contact with oil.
- 9.5.6 The dimensions of the terminal box and its openings shall be adequate to enable easy access and working space with use of normal tools.
- 9.5.7 Correct polarity shall be invariably marked on each primary and secondary terminal. Facility shall be provided for short circuiting and grounding of the C.T. secondary terminals inside the terminal box.
- 9.5.8 The instrument security factor of metering core shall be low enough but not greater than 5. This shall be demonstrated on all the ratios of the metering core, in accordance with procedure specified in IEC 185 or IS 16227.

9.6 Primary Winding

- 9.6.1 Primary winding shall be hair pin type or wound type made out of high conductivity copper, Conductors used for the primary winding shall be rigid. Unavoidable joints in the primary winding shall be welded type preferably lap type. The details of such welded joints shall be indicated in the drawings submitted with the offer. For primary winding current densities shall not exceed the limit of 1.6 Amp/sq mm for normal current.

9.6.2 Secondary Windings

Suitably insulated copper wire of electrolytic grade shall be used for secondary windings. Type of insulation used shall be described in the offer. For multi ratio C.T. design, the multi ratio shall be achieved by reconnection of the secondary windings/tapping.

9.7 Primary Terminals

- 9.7.1 The primary terminals shall be of stud type of size of 30mm dia x 80mm length for all CTs. The primary terminals shall be of heavily tinned electrolytic copper of 99.9% conductivity. The minimum thickness of tinning shall be 15microns.

9.8 Secondary Terminals

- 9.8.1 Secondary terminal studs shall be provided with at least three nuts and



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two plain and two spring washers for fixing the leads. The studs, nuts and washers shall be of brass, duly nickel plated. The minimum out side diameter of the studs shall be 6mm. The length of atleast 15mm shall be available on the studs for inserting the leads. The space clearance between adjacent nuts when fitted shall be at least 10 mm from the outside circum dia. of the nuts.

- 9.8.2 The instrument transformer shall be provided with non-corrosive, legible name and rating plates, with the information specified in relevant standards, duly engraved/punched on it.

Details of 11kV current transformers shall be as per Annexure II 'C' of Guaranteed Technical Parameters attached.

10.0 NEUTRAL CURRENT TRANSFORMERS:

Neutral Current Transformer shall be single phase, outdoor; oil immersed dead tank type or dry type. The ratio of the neutral current transformer shall be compatible with unbalance calculations of the capacitor bank & it shall be selected on the basis of the unbalance current flowing through neutral of capacitor bank during the failure of elements in one capacitor unit (at alarm stage & trip stage).

Details of 11 KV NCT shall be as per Annexure II 'D' of Guaranteed Technical Parameters attached.

11.0 SUPPORT STRUCTURES & EQUIPMENT FRAME:

- 11.1 Equipment frame, support structure, angles, channels etc. meant for the outdoor switch gear and other equipment viz. CTs, NCT, Isolators etc. shall all be hot dip galvanized. All the ferrous metal parts shall be hot dip galvanized smoothly as per IS 3638 (as amended up to date), IS or any other equivalent authoritative standard. The material shall be galvanized only after shop operations upon it have been completed. The metal parts before galvanization should be thoroughly cleaned of any paint, grease, rust, scales or alkalis or any foreign deposits which are likely to come in the way of galvanization process. The metal parts coating shall withstand minimum four one minute dips in copper sulphate solution as per IEC-168. Fasteners (nut-bolts) shall be of non-magnetic stainless steel. No spring washer shall be used, instead one check nut of suitable size shall be provided with each bolt.

- 11.1.1 Support structure shall be supplied for each of the outdoor equipment and shall be suitable to maintain the clearances and spacing stipulated for various equipments. Current transformers may be mounted on the same structure as that of the circuit breaker provided the requisite electrical and mechanical clearances are properly maintained. Typical bay arrangements indicating sectional clearances are shown in the enclosed drawings.

- 11.1.2 The main structure shall be fabricated out of hot dip galvanized angle of minimum 75 x 75 x 6 mm or equivalent strength.



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11.1.3 Successful tenderers shall clearly indicate on the relevant G.A. drawings the total dead weight coming on each support structure. Impact load, if any, shall also be stated on relevant drawing. These details are required for designing suitable foundations for the support structure for CBs, Isolators, etc.

11.2 Equipment terminal connectors(HV)

11.2.1 Tenderers shall include in their scope suitable connectors for each outdoor equipment. In the case of equipment with copper terminals, the terminal connectors shall be made of electrolytic grade copper, and shall be suitable for crimping type connection. Material required for inter connection between various bay equipment in between the two isolators of each bay shall be included in the tenderer's scope of supply. Details of the inter connector and the material used for the terminals/jumpers shall be furnished in the offer. In order to fix the jumperlength, size etc. standard layout drawing is enclosed. Successful tenderer shall have to adopt MSEDCL's standard foundation plan.

11.2.2 Take-off terminals of both the isolators of each bay and for Cu-Al bimetallic connections shall be of electrolytic grade aluminium and suitable for crimping ACSR jumper along with suitable bimetallic plate of minimum 2 mm thickness. These connectors shall be suitable for 200 mm sq. ACSR conductor. All nut-bolts used in the connectors shall be of non-magnetic stainless steel. In place of spring washers, check nut of suitable size shall be provided.

11.3 Earthing

Metal tanks of the instrument transformers and all other equipment, C & R panels, mechanism boxes, structures etc. shall be provided with two separate earthing terminals of size 16 mm dia. X 30 mm length H.D.G., with one plane washer and one nut, for connection to station earth-mat.

11.4 Lifting arrangement

Instrument transformers and switchgear equipment shall be provided with suitable lifting arrangement to lift the entire unit. Lifting arrangement (lifting eye) shall be positioned in such a way so as to avoid any damage to the porcelain housing, primary terminals or the tanks during the process of lifting for installation/transport. The general arrangement drawing shall show clearly the lifting arrangements provided such as lifting eye, guide etc.



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11.5 Painting

- 11.5.1 All sheet metal parts (panel, mechanism box, metal housing. Instrument transformer etc.) for outdoor installation shall be designed and fabricated with special care to avoid rust/fungus formation and corrosion. All metal parts shall preferably be hot dip galvanized. If this is not possible due to practical difficulties, cold galvanizing or epoxy coating shall be provided for all sheet metal parts, used for outdoor installation. Sheet steel shall be treated as per the 7 tank process. In case tank process for treating the sheet metal is not possible, alternate process adopted shall be clearly explained in the technical offer which shall be got approved by the MSEDCL. Dark Admiral Grey shade as per colour shade no. 632 of IS-5 shall be used for epoxy coating.
- 11.5.2 The sheet metal works, after final painting shall present an esthetically pleasing appearance, free of any dent or uneven surface.

11.6 Labels

- 11.6.1 All front mounted as well as externally mounted items including fuses shall be provided with individual identification labels. Labels shall be mounted directly below the respective equipment and shall clearly indicate the equipment designation. Labeling shall be on aluminum anodized plates of 1 mm thickness. The letters are to be properly engraved.
- 11.6.2 All the equipment and their parts shall be provided with suitable labels or identification and ease of operation and maintenance.

12.0 11KV SERIES REACTORS:

Suitable 0.2% current limiting reactors shall be provided on the neutral side of the Capacitor bank in rural areas having low THD level. However 6% series reactor shall be provided on the line side of the Capacitor bank to be provided in Urban areas where THD level is more. The inductance value will control the amplitude and frequency for the inrush current. Peak inrush current shall be less than 100 times rated current of the capacitor bank and less than the breaker making current.

i) The series reactors shall be out door type, single phase, air cored, air cooled, Dry type with Aluminum winding. The normal current rating of the reactor shall be 130% of rated continuous current of the capacitor bank. The Voltage rating of the series reactor's base insulators shall be nominal system voltage of 11KV.

ii) The provision for mounting of reactor is to be made on capacitor bank structure.

iii) The reactor shall be free from annoying hum or vibration. The design shall be such as not to cause any undesirable interference with



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radio or communication circuits. All routine tests shall be carried out as per IS- 5553 or equivalent international standard.

iv) The complete assembly of the Capacitor bank shall be on a mild steel galvanized steel structure.

v) Other details Of 11kV series reactor shall be as per Annexure II'E' of Guaranteed Technical Parameters attached.

13.0 11KV LIGHTENING ARRESTORS:

13.1 11KV Lightning arrestors shall be of station class, heavy duty, Metal oxide gapless type 9kV, 10KA conforming to IS-3070/1993/IEC-60099-4 with pressure relief device and shall be suitable for handling higher Capacitor energy discharge. Lightning arrestor shall perform the following operations.

13.2 The Lightning Arresters shall confirm in all respects to high standards or engineering design, workmanship.

13.3 The LA shall be provided with pressure relief device.

13.4 Each individual unit of Lightning Arresters shall be hermetically sealed and fully protected against ingress of moisture. The supplier shall furnished sectional view showing details of sealing employed and sectional view of pressure relief device employed with the offer.

13.5 The creepage distance of Arrester shall be more than 300mm.

13.6 All ferrous parts exposed to atmosphere shall be hot dip galvanised as per IS 2629 as amended from time to time.

13.7 The grounding terminal shall be suitable for accommodating purchaser's grounding connection to steel earthmat.

13.8 The lightning Arrester shall confirm to type tests in accordance with IS-IEC-60099-4.

13.9 All acceptance and routine test as stipulated in the relevant standards shall be carried out on each unit by the bidder and in presence of purchaser's representative during inspection of desired so.

13.10 Each Lightning Arrester shall be provided with galvanised mounting steel structure with foundation bolts template.

13.11 Porcelain/ Polymer Rubber Housing shall be free from lamination cavities or other flaws affecting the mechanical and electrical strengths.

13.12 Porcelain/ Polymer Rubber Housing shall be thoroughly vitrified and non-porous.

Other details shall be as per Annexure II 'F' of Guaranteed Technical Parameters attached.



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14.0 11KV ISOLATORS:

14.1 11KV isolators shall be three phase, out door type, with double break central pole rotating arrangement with 800A continuous current rating. Earthing blades shall be capable to discharge the trapped charge of the line. Isolator main switch shall be required to make or break the line charging current when no significant change in voltage occurs across the isolating distance on account of make or break. Other details shall be as per Guaranteed Technical Parameters attached. Isolators shall conform to IS/IEC-62271-102 amended up to date. All isolators shall have a short time rating of 25 KA for 3 second. The contacts and blades of the isolators shall be of electrolytic grade copper. The fasteners (nut-bolts) used for current carrying parts shall be of nonmagnetic stainless steel. Spacing between phases for all isolators shall be of 1000mm. Further the current density for copper current carrying parts shall not be more than 1.6 Amp /mm. sq in solid conductor and 2 Amp/sq. mm. in hollow tubes.

14.1.1 Isolators shall have built-in mechanical inter lock between the main and earth blades so that the closing of the main blade is not possible without opening the earth blade and closing of the earth blade will not be possible without opening the main blade.

14.1.2 All the fixed contacts shall be provided with a sheet metal rain hood. This shall be fabricated out of at least 2 mm thick Galvanized iron sheet metal and shall be designed such that it will in no case shall obstruct or restrict the movement of moving contracts (blades) and arcing horns, if provided.

14.2 Operating mechanism:

Manual operating mechanism gang operated through Hand operated lever shall be provided for main switch and earth switch separately. The operating mechanism shall provide quick, simple and effective operation. The design shall be such that one man shall be able to operate the isolator without undue effort. The operating mechanism shall be suitable to hold the main switch or earth switch in closed or opened position to prevent operation by gravity, wind, short circuit, seismic acceleration, vibration, shock, accidental touching etc.

14.3 Padlocking device:

The isolator and earthing switch shall be provided with padlocking device to permit locking of the isolator and earthing switch in both fully open and fully closed positions.

14.4 Earthing:

Flexible branded copper connections shall be provided between rotating earth blades and the frame which shall have a cross section of at least 50 sq mm and shall be tinned or suitably treated against



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oxidation.

The frame of each disconnect and earthing switch shall be provided with two reliable earthing terminals for connection to the purchaser's earthing conductor/flat so also clamping screw suitable for carrying specified short time current. Flexible ground connectors shall be provided for connecting operating handle to the earthing flat. The diameter of clamping screw shall be at least 12 mm. The connecting point shall be marked with earth symbol.

14.5 Moving blades:

Contact surface of moving blades and associated connectors/contacts and terminal pads shall be heavily silver plated to at least 15 microns thick. The surface shall be wiped during closing and opening operations to remove any film, oxide coating etc. Wiping action shall not cause scouring or abrasion of surfaces.

Material of Earthing blades & contacts shall be the same as those of the main moving blades and contacts respectively. Cross-sectional area of the Earthing blades and contacts shall not be less than 50% of corresponding area of main moving blades and contacts.

14.6 Bearings:

All the friction locations and rotating parts shall be provided with two nos. of bearings of at least 25 mm ID. 50 mm clear spacing between the bearings shall be provided. The housing for bearings shall be made of gravity dia cast metal with smooth surface and suitably machined for seating the bearings. The bearings bushes, joints, springs etc. shall be so designed that no lubrication shall be required during the service.

14.7 Tandem pipe:

Tandem pipe shall be of at least 25 mm NB, at least 2200 mm long and class B Mild steel galvanized. One single tandem pipe shall be used for phase coupling of double break isolators. Base plate of rotating insulators for connection of tandem pipe shall be made out of one piece of at least 6 mm thick M.S. plate. Bolt and shackle device shall be used to connect tandem pipe to the base plate. Whenever unavoidable sliding clamps are to be used, these clamps shall be made out of at least 6 mm thick M.S. flat with four nos. of nuts and bolts. A grub screw shall be provided for securing connection on tandem pipes.

14.8 Down pipe:

50 mm ID class B Mild steel galvanized single piece pipe shall be provided for operating disconnects. The pipe shall be terminated into a suitable swivel type joint between the tandem pipe driving mechanism and the operating mechanism if required to take care of marginal angular misalignment at site.



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14.9 Insulators:

- 14.9.1 All outdoor type Porcelain insulators shall have a creepage distance of 25mm/kV (i.e. 300mm). The insulators shall be of outdoor post type conforming to IEC 60168 . All insulators shall have a rated voltage not less than 12 kV and rated current of 2000Amps.
- 14.9.2 Post type insulators with 57 mm PCD shall only be provided. Pin type or polycone insulator shall not be acceptable.
- 14.9.3 The insulators shall be provided with a completely galvanized steel base designed for mounting on the support. The base and mounting arrangement shall be such that the insulator shall be rigid and self standing. Cap provided on top of the insulator shall be of high grade cast iron/malleable steel casting or aluminum alloy. It shall be machine faced and hot dip galvanized in case of first two options. The cap shall have four nos. of tapped holes with PCD same of that of insulator base. The holes shall be suitable for bolts with threads having anticorrosive protection. The effective depth of threads shall be adequate.
- 14.9.4 The insulator shall be made of homogeneous and vitreous porcelain of high mechanical and dielectric strength. It shall have sufficient mechanical strength to sustain electrical and mechanical loading on account of wind load, short circuit stresses etc. Glazing of the porcelain shall be of uniform brown or dark brown colour with a smooth surface arranged to shed away rain water. The porcelain shall be free from lamination and other flaws or imperfections that might affect the mechanical or dielectric quality. It shall be thoroughly vitrified, tough and impervious to moisture.
- 14.9.5 The porcelain and metal parts shall be assembled in such a manner and with such material that any thermal differential expansion between the metal and porcelain through the range of temperature specified in this specification shall not loosen the parts or create undue internal stresses which may affect the mechanical or electrical strength or rigidity. The assembly shall not have excessive concentration of electrical stresses in any section or across leakage surfaces. The cement used shall not give rise to chemical reaction with metal fittings. The insulator shall be suitable for water washing by rain or artificial means in service condition.
- 14.9.6 The insulator unit shall be assembled in a suitable jig to ensure correct positioning of the top and bottom metal fittings relative to one another. The faces of the metal fittings shall be parallel and at right angle to the axis of the insulator and corresponding holes in the top and bottom metal fittings shall be in a vertical plane containing the axis of the insulator.



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14.9.7 It shall be the sole responsibility of the supplier to carry out thorough inspection and quality checks on the insulators at the insulator supplier's works, before offering the insulators for purchaser's inspection.

Other details shall be as per Annexure II 'G' of Guaranteed Technical Parameters attached.

15.0 CONTROL AND PROTECTION EQUIPMENTS:

15.1 Constructional details:

15.1.1 Capacitor bank should be provided with a separate indoor type Control & Relay panel. It shall be painted white on the interior and Dark Admiral Grey to shade No.632 of IS-5 on the exterior surface.

15.1.2 Control and relay panel detailed in this section is required for indoor installation for controlling switching ON & OFF operations of the 11 kV Capacitor bank.

15.1.3 Panel shall be made of rigid welded structural frames enclosed completely with smooth finished sheet steel of thickness not less than 2 mm. There shall be sufficient reinforcement to provide level surfaces, resistance to vibration and rigidity during transport and installation. Panel shall be completely metal enclosed and shall provide a minimum degree of protection to IP 34 in accordance with IS:13947.

15.1.4 The doors shall be provided with 3-point locks operated by suitable handle. Bottom plates of the panels shall be fitted with removable brass cable glands to allow cable entries from the bottom. Terminal Connectors and Test terminal blocks for cables shall be fixed at an elevated height of at least 200 mm above the bottom plate. Adequate quantity of cable glands of suitable size shall be provided.

15.1.5 Design, materials selection and workmanship shall be such as to result in a neat appearance both inside and outside, with no welds, rivets or bolt heads apparent from outside. Steel sheets shall be suitably treated to achieve neat appearance and long life.

15.1.6 Each panel shall be provided with cubicle illumination lamp in shrouded holder, controlled by door operated switch. Space heater of 80 W rating along with control switch shall be provided inside each panel. Cubicle lamp and space heater shall be suitable to work on 240 V AC supply. In each panel, one 3-pin 10 Amp industrial type power plug along with control switch shall be provided for extending 240 V AC supply.



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- 15.1.7 Each panel shall be provided with one earth bus of size 25x3mm.(minimum). The earth bus shall be of tinned/nickel plated copper. All metallic cases of relays, meters, instruments etc. shall be connected to this bus independently for their effective earthing.
- 15.1.8 Other details of Control and relay panel shall be as per Annexure II 'H' of Guaranteed Technical Parameters attached.
- 15.2 Protective Relays:
 - 15.2.1 For the capacitor bank, one non-directional IDMTL triple pole relay having O/C elements on R and B poles and E/F element on middle pole may be provided for this purpose. All these relays shall be of 3 seconds IDMTL characteristics, the O/C elements having current setting variable from 50% to 200% of CT secondary ratings, and the E/F elements having current setting variable from 20% to 40%. Static/Numerical type IDMTL O/C & E/F relays shall be self powered (i.e. suitable for operation without external D.C. supply) or D.C. operated flag-coil type or mechanical flag type.
 - 15.2.2 Separate Static/Numerical type over voltage and under voltage relays shall be provided with adjustable timer.
 - 15.2.3 Static/Numerical type Neutral unbalance current sensing Relay with adjustable time setting shall also be provided.
 - 15.2.4 Static/Numerical type Trip circuit supervision relay shall be provided for circuit breaker. Trip circuit supervision scheme shall be such that testing of trip circuit healthiness is possible irrespective of whether the C. B. is in the closed or open position.
 - 15.2.5 Separate auxiliary relay shall be provided for alarm & tripping circuits.
 - 15.2.6 Static/Numerical type High speed relay for tripping HV breaker & suitable time delay relays shall be provided.
 - 15.2.7 Lead power factor relay which should be microprocessor based intelligent auto control unit and user friendly setting. Whenever LV loads are running at leading PF, the regulator/relay shall give alarm and as well as trip command to breaker so that bank can not be permitted to switch on. At lead PF the bank should be off / cut off through relay.
 - 15.2.8 In case Static/Numerical/microprocessor based relays are offered these shall be suitable for the station auxiliary supply (30V D.C.) and shall have facility of a test push button to test the relay functioning.
 - 15.2.9 All other relays shall be suitable for flush mounting, with only the flanges projecting on the front and connections at the back. Relays shall have dust-tight covers removable from the front. Protective relays



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shall have built-in test terminals.

15.2.10 One more switch shall be provided to select Service, Test and Off positions.

15.2.11 The relays shall be mounted on the control and relay panel. The relay should be as per DIN Standard and suitable for panel mounting. The relay should be supplied ready to mount with the necessary terminal block provided on the relay. Connecting terminals should be suitable to take 2.5sq. mm cable. The entire electronic component used should have high reliability and should be of defense/industrial grade conforming to latest IS.

15.3 Wiring and control wiring terminals:-

15.3.1 All wiring shall be carried out with 1100 volts grade single core, multi strand, flexible tinned copper wires with PVC insulation. The conductor size shall 2.5 sq mm (minimum) for circuits. Wiring trough may be used for routing the cables. Wire numberings and colour code for wiring shall be as per IS: 5578 & IS: 11353. The wiring diagram for various schematics shall be made on thick and durable white paper in permanent black ink and same should be encased in plastic cover, thermally sealed. It should be kept visibly in a pocket of size 350 x 400 mm of MS sheet of 1 mm thickness, on the interior surface of the door of C & R Panel.

15.3.2 Terminal blocks shall be of clip-on design made out of non-crackable insulating material of 1100 V grade. All terminals shall be stud type, with all current carrying and live parts made of tinned/nickel plated brass. The studs shall be of min 4 mm dia. brass. The washers, nuts, etc. used for terminal connectors shall also be of tinned/nickel plated brass.

15.3.3 The terminal connector/blocks shall be similar to ELMEX type CAT-44. Non- disconnecting type terminal connectors with automatic shorting of C.T. secondary terminals shall be provided in CT secondary circuit. All other terminal connectors shall be disconnecting type. At least 20% spare terminals shall be provided. All terminals shall be provided with ferrules indelibly marked or numbered and identification shall correspond to the designations on the relevant wiring diagrams. The terminals shall be rated for adequate capacity which shall not be less than 10 Amps.

15.3.4 All fuses used shall be of HRC type. The fuse base and carrier shall be plug-in type molded case kit Kat of bakelite/DMC. All current carrying and live parts shall be of tinned/ nickel plated copper. No



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fuse shall be provided on DC negatives and AC neutrals. Tinned copper links shall, however, be provided on DC negatives and AC neutrals.

15.3.5 Test terminal blocks used in metering circuit shall be suitable for 3 phase 8 wire type connections (2 watt meter method) with 3 no LCDs glowing on face plate to indicate 3 phase potential available to the energy meter.

15.4 Necessary protections as per clause 6.5 of this specification shall be provided. Control and relay panel shall be provided with Relays, ammeter, KV meter, MVAR meter, Power factor meter, Annunciator & other accessories as mentioned bellow.

Indoor type Control and relay panel shall have remote control of the shunt Capacitor bank.

Following main components shall be provided on C & R panel.

Sr. No.	Particulars	Qty
	<u>Protective Relays</u>	
1.	2 O/C + 1 E/F IDMT protection relay	1no.
2.	Unbalanced protection (Neutral current sensing) relay	1no.
3.	Over Voltage protection relay	1no.
4.	Under Voltage protection relay	1no.
5.	Trip circuit supervision relay	1no.
6.	Static type High speed relay	1no.
7.	Static type time delay relay	1no.
8.	Lead power factor relay	1 no.
	<u>Measuring Instruments</u>	
9.	96 X 96 mm Digital Ammeter with 4 position selector switch.	1no
10.	<u>96 X 96 mm Digital KV meter with 7 position selector switch</u>	1no
11.	Digital MVAR meter	1no
12.	Digital Power factor meter	1no
13.	12 window static Annunciator	1no
	<u>Other accessories</u>	
14.	Neon type indicating lamps for CB ON, CB OFF,	12nos
	Isolator 1 ON, Isolator 1 OFF, Isolator 2 ON, Isolator 2 OFF, Trip ckt. Healthy, Auto trip, D. C. Supply Healthy, R,Y,B Indication	
15.	Mimic Diagram	
16.	Push Buttons for Accept, Reset, Lamp test, & Sound cancel	4nos



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17.	Semaphore indicator 1no.for circuit breaker & 2nos.for Isolators.	
18.	12 way control switch for circuit breaker & for two Isolators only if motorized.	
19.	Hooter	1no.
20.	Panel Heater	1no
21.	Panel illumination Lamp with door switch	1set
22.	Power Plug point	1no

16.0 TESTS:

16.1 Type Tests:

16.1.1 The equipments offered in the tender should have been successfully type tested for the tests indicated in the enclosed Annexure III in line with the relevant standard and technical specification. The bidder shall be required to submit complete set of the type test reports along with the offer.

16.2 Acceptance Tests:

The inspecting officer will carry out the acceptance tests on the equipments as specified in the relevant standard with latest amendments and technical specifications.

16.3 Routine Tests:

All the equipment offered shall be subjected to the routine tests at the manufacturer's works as specified in the relevant standards.

16.4 Type Test Reports:

The tenderer shall furnish detailed type test reports of the offered Capacitor Banks for the tests as per relevant IS mentioned in this specification. All these Type Tests shall be carried out at laboratories that are accredited by the National Accreditation Board of Testing and Calibration Laboratories (NABL) of Government of India. These tests should have been carried out within the years as per CEA guidelines prior to the date of opening of the tender i.e. the validity of Type Test reports will be considered as per CEA guidelines.

The detailed type test reports alongwith the relevant oscillograms/ certified drawings,etc. are to be submitted in sealed cover along with the offer.

The purchaser reserve the right to demand repetition of some or all the Type Tests in presence of purchaser's representative at purchaser's cost. For this purpose, the tenderer shall quote unit rates



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for carrying out each Type Test. However, such unit rates will not be considered for evaluation of the offer. In case the unit fails in the type tests, the complete supply shall be rejected.

The successful tenderer shall take approval of type tests from C.E. (Testing), M.S.E.D.C.L. Prakashgad, Bandra, Mumbai, prior to commencement of supply.

16.5 Documentation:

- 16.5.1 After issue of letter of acceptance, the successful tenderers shall submit 3 identical sets of complete drawings along with detailed bill of materials for approval, to the Chief Engineer, (Testing) 5th floor, Prakashgad, MSEDCL, Bandra(E), Mumbai-400051. If any modifications are required on these, the same will be conveyed to the supplier who shall modify the drawings accordingly and furnish final drawings for approval. In no case delivery extension will be granted for any delay in drawing approval.
- 16.5.2 The manufacturing of the equipment shall be strictly in accordance with the approved drawings and no deviation will be permitted without the written approval of the Distribution department. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the supplier's risk.
- 16.5.3 After approval of the drawings and bills of materials, the suppliers shall submit detailed packing lists for approval. After approval, copies of these packing lists shall be forwarded to the respective consignees. Copies of packing lists shall also be submitted to the Chief Accounts Officer (SB), MSEDCL, Prakashgad, Bandra (East) along with the bills for payment.
- 16.5.4 Before dispatch of equipment to various consignees, the suppliers shall furnish sets of final drawings, including bills of materials and wiring schedules and also sets of technical literature and commissioning manuals. These shall be in five sets and shall be furnished to the Testing department, Bandra (E) positively before the dispatch of equipment. All drawings shall preferably be of A3 size. No drawing of width more than 35 cm will be acceptable. One set each of the final drawings; bill of materials, wiring schedules and commissioning manuals shall invariably be forwarded to the consignee along with the each set of capacitor bank consignment and shall be listed out in the packing list, when submitted for approval.



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16.5.5 In case the supplier fails to furnish contractual drawings and manuals even at the time of supply of equipment, the date of furnishing of drawings/manuals will be considered as the date of supply of equipment for the purpose of computing penalties for late delivery.

16.5.6 List of drawings to be submitted along with the offer are asunder:

- a) General arrangement drawing for capacitor bay & capacitor units.
- b) General arrangement drawing for circuit breaker.
- c) General arrangement drawing for series reactor.
- d) General arrangement drawing for Isolator (i) with earth blade and (ii) without earth blade.
- e) General arrangement drawing of current transformers.
- f) General arrangement drawing of Neutral current transformer.
- g) General arrangement drawing for control and relay panels.

Bill of material for complete Capacitor Bank and associated equipments such as, circuit breaker, CTs, NCT, Isolators, Reactors, Terminal connectors etc.

16.6 Successful tenderer shall furnish all above drawings and following additional drawings for approval.

16.6.1 Support structure for circuit breaker, Isolators, CTs, capacitor bank, series Reactors & NCT.

16.6.2 Common Foundation Plan and design details/data of foundations for incoming bus & outgoing section.

16.6.3 Detailed drawing for T-Connector, terminal connector and other connector.

16.6.4 Schematic diagram of power control & protection circuit for capacitor bank.

16.6.5 Schematic diagram and sequence diagram of circuit breaker.

16.6.6 Detailed drawings for every equipment showing Assembly, important cross sections, drawings of relevant parts, joints, gaskets, name plates and other informative drawings etc.

The drawings, technical literature and manuals submitted by the tenderer along with his offer shall be treated as purely and generally informative in nature and unless the details incorporated in them are clearly and specifically brought out in the various Schedules for Guaranteed Technical Particulars and Schedules of Deviations, the same shall not be binding upon the purchaser (a) for evaluation of the offer and (b) for the order, if placed.



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17.0 ERECTION & COMMISSIONING

The bidder should quote separately for the following works of erection & commissioning of the complete capacitor bank

- 17.1.1 Civil foundations for various equipment including capacitor Bank and associated equipments. The foundations will be casted in plain cement concrete in ratio 1:2:4.
- 17.1.2 Providing of earth mat & earthing of equipments etc. wherever required,
- 17.1.3 Required cabling works including materials as per the detailed approved drawings.
- 17.1.4 ACSR conductor of requisite length shall be supplied by the bidder/contractor for interconnecting the equipments.

18.0 Earthing System

The scope for installation of earthing system associated with the sub station shall include:-

- a. Supply of required materials for installation of earthing system including transporting the materials to the location of installation.
- b. Welding/brazing/bolting of joints as required and treating joints with appropriate paint as specified. Such connections should be bolted tightly using spring & ring washers for proper contact pressure.
- c. Installation of earthing conductor for the main earthing mat/Grid, MS Flat of size 50 x 6 mm or equivalent. These shall be buried in ground at a depth of 500 mm. The work shall include excavation and backfilling, laying the conductor, brazing the joints and providing the risers, wherever necessary.
- d. Installation of earth riser (MS Flat of size 50 x 6 mm), connection leads to the equipments and risers on steel structures wall etc. The position clearing and clamping at regular intervals, welding/brazing of riser/leads as required to the main earth grid and providing bolting joints at the equipment earthing terminals. All welded and brazed joints of riser conductor shall be coated with bituminous paint.
- e. Installation of earthing electrodes (earthing pipe) comprising of 40 mm dia GI Pipe of 3 Meter Length:



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- f. After completion of installation of capacitor bank the shut down for charging of capacitor bank will be arranged by MSEDCL. For this, the supplier has to intimate MSEDCL in writing about readiness of the capacitor bank. The 11 KV supply extension from existing bus to the incoming isolator of capacitor bank installation shall be within the scope of MSEDCL. However, the required clamps & conductor is to be arranged by the supplier. If extension of bus / extension of bay is required the same will be arranged by MSEDCL.
- g. As all the capacitor banks are going to be installed in the existing sub station, there is no separate electrical inspectorate approval is required. However, if it is required the same will be arranged by MSEDCL.
- h. At the existing 33/11 KV sub stations wherever space is a constraint or sufficient space is not available for installation of capacitor bank, bidder has to provide supporting PI structures along with PI for maintaining the clearances & adequate supports. Bidder has to include the cost of the same in the quoted prices of capacitor wherever required.

The scope of work shall include installation of these GI pipes in earth and earth pits, providing connection to the main earthing grid, excavation and back filling of earthing pits with all materials as required, placing the rod in position, and connecting to main earth grid conductors.

18.1 DETAILS OF EARTHING SYSTEM

Sr. No.	Item	Size	Material
1.	Main earthing conductor	50 x 6 mm Flats or equivalent as per the site requirement	M. S.
2.	Earthing for equipments, structures	50 x 6 mm Flats or equivalent as per the site requirement	M. S.
3.	Earthing electrodes	4 mm thick, 40 mm dia, 3000 mm long GI Pipe.	Galvanized. 1 No. to be used in one earth pit
4.	Earth pit (arrangement)	300 mm x 300 mm x 3000 mm.	Earthing electrodes interconnected to each other as per standard practice



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

18.2 Detailed Specification for installation of Earthing System

- a) The bidder shall install earthing material required for the system and individual equipment earthing. All work such as cutting, bending, supporting, soldering, coating, drilling, brazing, clamping, bolting and connecting into structures, pipes, equipment frames terminals, rails or other devices shall be in the bidder's scope of work. The bidder shall also carry out the excavation and trenching work involved. The bidder shall also back-fill and reinstates the trenches after installation of earthing conductors.
- b) Metallic frames of all electrical equipments shall be earthed by two separate and distinct connections with earthing system.
- c) Neutral connection shall never be used for the equipments earthing.
- d) An earthing pad shall be provided under each operating handle of the isolator. Operating handles of the isolator and supporting structure shall be bonded together by a flexible copper braided conductor (of appropriate rating in consultation with purchaser) connection and connected to the earthing grid of appropriate rating.
- e) A separate earth electrode pit shall be provided adjacent to structures supporting lightning arrester. Earth connections shall be as short and as straight as practicable.
- f) On completion of the installation, continuity of all conductors and efficiency of all bonds and joint shall be tested. The earth resistance shall be tested in the presence of the Purchaser's representative. All equipments necessary for the test shall be arranged by the bidder.
- g) The welding equipments and consumable items such as welding rods required for installation of the earthing system shall be arranged by the bidder.
- h) The earthing installation for the complete 11 KV capacitor installations as described above shall finally be connected to the main earth mat of the sub station existing earthing system by the bidder. The connections to main earthing system will have to be done at minimum of three points between the earthing system of Capacitor installation and main earth mat of existing substations.

For earthing system of the installation all associated civil works as described above shall be within the scope of bidder.



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

19.0 Control Cables:

- a) The copper control cable shall be of 1.1 KV grade L. T. cable with stranded untinned copper conductor, PVC insulated (Type A), colour coded up to 5 cores, & by number coded above 5 cores, laid up with fillers and/or binder tape where necessary, provided with extruded PVC inner sheath, single galvanized round steel wire armoured and provided with PVC outer-sheath. Both outer & inner sheaths shall be of type ST-1 as per IS: 5831-1984 and cable shall be conforming to IS: 1554(Part-1) -1988(amended up to date) & bearing ISI mark.
- b) The aluminum control cable shall be of 1.1 KV grade L. T. cable with stranded H2/H4 grade aluminum conductor, PVC insulated (Type A), colour coded, laid up with fillers and/or binder tape where necessary, provided with extruded PVC inner sheath, single galvanized round steel wire armoured and provided with PVC outer- sheath. Both outer & inner sheaths shall be of type ST-1 as per IS: 5831-1984 and cable shall be conforming to IS: 1554(Part-1) - 1988(amended up to date) & bearing ISI mark.
- c) The cable shall be designed to withstand mechanical, electrical and thermal stresses developed under the steady state and transient operating conditions. The bidder should assess the quantity of cable required for individual site.
- d) The bidder shall supply, install, test and commission the cables in accordance with the cable schedules approved by the purchaser. Cables shall be laid in accordance with the cable schedules approved by the purchaser. Cables shall be laid in existing cable trench wherever available. If the trench is not available the cable may be laid through PVC pipes of suitable size at a depth of 500 mm. The bidder's scope of work includes supply, unloading, laying, fixing, jointing, bending and termination of cables. The bidder shall also supply necessary materials for jointing and termination of cables.
- e) Identification tags shall be attached to each cable with non-corrosive wire. (Wire must be of non-ferrous materials).
- f) Sharp bending and kinking of cables shall be avoided.
- g) When cables are laid in the proximity of communication cable, required horizontal and vertical separation shall be maintained.
- h) No Jointing of cables shall be done.
- i) Special tools, clips and saddles, glands, seals, PVC sealing compound, locknut etc, for the connection and termination of cables shall be



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

arranged by the bidder.

j) As a standard practice following are the sizes of Cables used for capacitor bank installation:

- a) 2 core X 2.5 sq.mm copper
- b) 4 core X 2.5 sq.mm copper
- c) 19 core X 2.5 sq.mm copper
- d) 2 core X 4 sq.mm aluminum
- e) 4 core X 4 sq.mm aluminum

20.0 FITTINGS AND ACCESSORIES :

Any fitting or accessories which might not have been mentioned in the specifications but which are usual or are necessary in the equipment of similar nature, are to be provided by the contractor without extra cost. All equipments must be complete in all details whether mentioned in the specifications or not.

21.0 Indicative drawings for general arrangement & foundation details are attached herewith.



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

ANNEXURE 'I'

STANDARDS TO BE ADOPTED FOR CAPICATOR BANK.

Sr. No.	Indian Standard	Title	International Standard
1	IS:13925 part 1.2012	Shunt capacitors for AC Power systems having a rated voltage above 1000V	-
2	IS:12672	Internal Fuses for Shunt capacitors	-
3	IS:2099	Bushings for voltage above 1000V	IEC:60137
4	IS:5553	Reactors	IEC:60289
5.	IS:13118	High Voltage AC Circuit Breakers	IEC:60056
6.	-	AC Disconnectors (Isolators) & earthing switches	IS/IEC 62271-102/IEC:60129
7.	-	High Voltage Switches	IEC 62271-103/IEC:60265
8.	IS:16227	High Voltage Current Transformers	IEC:60185
9.	IS:16227	High Voltage Potential Transformers	IEC:60186
10.	-	Tests on post insulators for system with nominal voltage higher than 1000V	IEC:60168
11.	IS:2071	High Voltage tests	IEC:60060
12.	-	RIV measurements	IEC Recommendations CISPR
13.	IS:2609	Partial Discharge measurements	IEC:60270
14.	IS:3716	Insulation co-ordination & Application Guide.	IEC:71
15.	IS:1554	Low Voltage Cables	IEC:245,228,229, 189,204.
16.	IS:3070	Metal Oxide Surge Arrestors	IEC 60099-4
17.	IS:3231	Electrical Relays	IEC:255
18.	IS:11353	Control circuit wiring & Panels.	-
19.	-	Hot Dip Galvanizing	ISO 1459 & ISO 1461
20.	-	Clearances in Air as per IE Rules	-



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure-II 'A'

Schedule of Guaranteed Technical Particulars of Shunt Capacitor Bank

Sr. No	Particulars	Technical Requirement for			Offered
		1.2MVAR Cap.Bank	2.4 MVAR Cap.Bank	3.0 MVAR Cap.Bank	
1.	Type, Manufacturers Name & Address				
2.	Rated Voltage KV	12.65	12.65	12.65	
3.	Service Voltage KV	11	11	11	
4.	Rated Frequency Hz	50	50	50	
5.	MVAR of the Cap. Bank at rated voltage & Frequency	1.452	2.904	3.630	
6.	MVAR of the Cap. Bank at service voltage & Frequency	1.2	2.4	3.0	
7.	Temperature Rise (over an ambient of 40° C of the Cap. unit)	As per IS-13925, Part I 2012			
8.	Capacitance of the bank per phase in micro farads	28.88	57.76	43.31 & 28.88	
9.	Rated line current Amps	66.26	132.53	99.40 & 66.27	
10.	Maximum permissible continuous over load current Amps	As per IS-13925, Part I 2012			
11.	Capacitor losses for individual units Watts/KVAR	0.2	0.2	0.2	
12.	No. of Cap. units per Capacitor Bank	6	12	15(star group of 9 & 6 units)	
13.	Capacitor unit rating Kv	7.3	7.3	7.3	
14.	Capacitor unit rating kVAR	242	242	242	
15.	Max. capacitor inrush surge with the proposed reactor Amps	Less than 100 times the rated current.			
16.	Discharge time with internal discharge device	With in 600 Secs.	With in 600 Secs.	With in 600 Secs.	
17.	Min. elect. Clearances in the bank between phase to phase & live parts to earth in mm	As per Electricity Act 2003 & as per Indian Standards			



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Sr. No.	Particulars	Technical Requirement for			Offered
		1.2 MVAR Cap.Bank	2.4MVAR Cap.Bank	3.0MVAR Cap.Bank	
18.	Maximum permissible over voltage & duration corresponding to the same in % for 1Hr./2Hr./4Hr./ continuous	As per IS-13925, Part I 2012			
19.	Overall dimensions of the Capacitor Bank				
20.	Layout & dimensions drawings (to be attached separately)				
21.	Maximum over voltage the Unit Capacitor is capable of withstanding continuously in % rated KV	As per IS-13925, Part I 2012			
22.	Insulator strength of bushings & Cap. units	28kV(rms) 75kV(Pk)	28kV(rms) 75kV(Pk)	28kV(rms) 75kV(Pk)	
23.	Power frequency Test Voltage KV (rms)	28	28	28	
24.	Impulse Test Voltage KV (Peak)	75	75	75	
25.	Bushing's minimum Creepage	25mm/KV	25mm/KV	25mm/KV	
26.	No. of Capacitor elements per unit Capacitor with No. of series/parallel elements(Sketch enclosed)				
27.	Mode of internal connection of the Capacitor elements (Sketch enclosed)				
28.	Voltage across each element in unit at rated voltage				
29.	Percentage Loss of Capacitance at which an internally fused Capacitor unit is considered useless.	As per IS-13925, Part I 2012			
30.	Type of dielectric Material used.	All Polypropylene film			
31.	Thickness in mm of insulation system/ dielectric				
32.	Watt loss of paper/film at various dielectric temperatures (enclosed)				



**TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR
ARRANGEMENT AND ASSOCIATED EQUIPMENTS**

33.	Max. Stress on the dielectric in volts/micron.				
34.	Type test reports on cap. units				



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure- II 'B'

Schedule of Guaranteed Technical Particulars of Circuit Breaker

Sr. No	Particulars	Technical Requirement for			Offered
		1.2 MVAR Cap. Bank.	2.4 MVAR Cap. Bank	3.0 MVAR Cap. Bank	
1.	Make				
2.	Type	Outdoor, vacuum, gang operated			
3.	Reference Standard	IS:2516/ IEC:60056			
4.	Nominal system voltage	11 kV			
5.	Highest system voltage	12 kV			
6.	Rated current	800A			
7.	Single capacitor bank breaking current	200A			
8.	Short time rating of circuit breaker	25 kA for 3 secs			
9.	Short circuit breaking current	25 kA			
10.	No. of poles	3			
11.	Frequency	50 Hz			
12.	Basic insulation level	28 kV/75 kV peak			
13.	Rated short circuit making current	62.5 KA peak			
14.	Operation duty	O - 0.3 sec – CO – 3 min - CO			
15.	First pole to clear factor	1.5			
16.	Control Circuit Voltage	30 V DC			
17.	Max. Total break time at 100% rated interrupting breaking capacity	40-60 ms			
18.	Maximum Closing Time	100 ms			
19.	1.2/50 micro second impulse withstand voltage	75 kVp			
20.	One minute power frequency withstand voltage	28kV			
21.	Creepage distance of support insulators	Min. 300mm			
22.	Details of operating mechanism along with the details of spring charging mechanism/motor etc.				



**TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR
ARRANGEMENT AND ASSOCIATED EQUIPMENTS**

23.	Clearances provided in air in mm between a. Phases b. Live part to livepart c. Live part toEarth d. Live part toground e. Lowest part of support insulator toground		
24.	Whether all other details of Circuit Breaker are as per the specifications & relevant IS		



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure- II 'C'

Schedule of Guaranteed Technical Particulars of Current Transformers

Sr. No	Particulars	Technical Requirement for			Offered
		1.2 MVar Cap.Bank	2.4 MVar Cap.Bank	3.0 MVar Cap.Bank	
1.	<u>Current Transformer</u>				
1.	Make				
2.	Type	Outdoor, oil immersed/Dry Type, dead tank			
3.	Reference Standard	IS-16227			
4.	Rated voltage	11 kV			
5.	Rated Frequency	50 Hz			
6.	Rated primary current	200-100 or 300-150A			
7.	Rated secondary current	5 A			
8.	Ratio	200-100/5-5A or 300-150/5-5A			
9.	No. of cores	2			
10.	Rated output of each core	15 VA-15 VA			
11.	Class of accuracy	Prot-5P10, Met-Class 0.5			
12.	Over current factor	25 kA for 3 Secs.			
13.	Power frequency withstand voltage	28 kV(rms)			
14.	Impulse withstand test voltage	75 kV(peak)			



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure- II 'D'

Schedule of Guaranteed Technical Particulars of Neutral Current Transformer

Sr. No.	Particulars	Technical Requirement for			Offered
		1.2 MVAR Cap.Bank	2.4MVAR Cap.Bank	3.0 MVAR	
	Neutral Current Transformer				
01	Make				
02	Type	Outdoor, Oil cooled / Dry Type (Polycrate / Epoxy)			
03	Reference Standard	IS- 16227			
04	Rated voltage	11 kV			
05	Rated Frequency	50 Hz			
06	Ratio	5/5A as per the requirement			
07	No. of Cores	1			
08	Rated output of each core	15 VA			
09	Class of accuracy	Prot-5P10, Met-Class 0.5			
10	Power frequency withstand	28 kV (rms)			
11	Impulse withstand test voltage	75 kV (peak)			
12	Over current factor	25 kA for 3 Secs.			
13	Instrument security factor	Not more than 5			



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure- II 'E'

Schedule of Guaranteed Technical Particulars of Series Reactors

Sr. No	Particulars	Technical Requirement for			Offered
		1.2 MVAR Cap. Bank.	2.4 MVAR Cap.Bank	3.0 MVAR Cap.Bank	
1.	<u>Make</u>				
2.	Type	Outdoor, Single phase, air cooled, air cored, Dry type, aluminum wound, Non magnetically shielded			
3.	Reference Standard	IS-5553 part-III/1990			
4.	% Impedance	6% or 0.2% of corresponding Cap Impedance.			
5.	System Voltage, Frequency, & number of phases	12KV, 50Hz, 3 phase			
6.	Basic insulation level	28 kV/75 kV peak			
7.	Type of cooling	AN			
8.	Overall dimensions Length in mm Width in mm <u>Height in mm</u>				
9.	Over current factor	16.67 times for 2 Secs. & 130% of rated current for continuous operation			
		For 6% Reactor			
10.	Rated continuous through put KVAR	15.44 X 6	30.88 X 6	77.2 X 3 or 46.32 X 3 & 30.88 X 3	
11.	Rated current Amps / phase	34.63	69.27	-	
12.	Impedance Ohms/Phase				
13.	Load losses in KW for 3 phases				
		For 0.2% Reactor			
14.	Rated continuous through put KVAR	0.48 X 6	0.97 X 6	1.452 X 3 or 0.97 X 3	
15.	Rated current Amps / phase	33.13	66.27	99.40 & 66.27	
16.	Impedance Ohms/Phase				
17.	Load losses in KW for 3 phases				



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure- II 'F'

Schedule of Guaranteed Technical Particulars of Lightning Arrestors

Sr. No	Particulars	Technical Requirement for			Offered
		1.2 MVAR Cap. Bank.	2.4 MVAR Cap. Bank	3.0 MVAR Cap. Bank	
1.	Make				
2.	Type	Outdoor type, Station Class, Metal Oxide, Gapless, Single unit			
3.	Reference Standard	IS:3070 (Part-1) /1985 IS:3070 (Part-3) /1993			
4.	Rated voltage kV	9			
	Rated Frequency	50 Hz			
5.	Max. Continuous Operating Voltage (M.C.O.V) in KV rms	8			
6.	Nominal Discharge Current corresponding to 8/20 micro seconds	10 KA			
7.	Type of mounting	Pedestal type			
8.	Connection clearance a) between phase to earth b) between phase to phase	230mm. 340mm.			
9.	Long duration discharge class	III			
10.	Max. Radio Interference voltage when energized at M.C.O.V. (micro-volts)	PD less than 50 pC			
11.	Requirement for pressure relief test min. prospective symmetrical fault current (KA rms)	Class-A			
12.	Minimum Creepage Distance of arrestor housing (mm)	340			
13.	Terminal connectors	Suitable for ACSR Panther Conductor			
15.	Protective characteristics of Arrestors	As per IEC 60099-4			



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure-II 'G'

Schedule of Guaranteed Technical Particulars of Isolators

Sr. No	Particulars	Technical Requirement for			Offered
		1.2 MVAR Cap. Bank.	2.4 MVAR Cap. Bank	3.0 MVAR Cap. Bank	
1.	<u>Make</u>				
2.	Type	Outdoor type, Center rotating, Double break, 3 Pole Gang operated, With earth blade & without earth blade			
3.	Reference Standard	IS/IEC 62271-102			
4.	Rated voltage kV	12			
5.	Frequency Hz	50			
6.	Continuous current rating	800 Amps			
7.	Rated short time current rating for 3 sec	25 KA(rms) 62.5 KA (peak)			
8.	Maximum temperature rise over specified ambient temperature of 40° C	With in permissible limit as per IS/IEC 62271-102			
9.	1.2/50 micro second full wave positive and negative impulse withstand voltage a) To earth & between poles KV(peak) b) Across the isolating distance for main blades KV(peak)	75 95			
10.	One minute Power Frequency withstand voltage a) To earth & between poles KV(rms) b) Across the isolating distance for main blades KV (rms)	28 38			
11.	Type of main contacts	High pressure Banking type			
12.	Type of arcing contacts	Make before and break after			
13.	Material of contacts a) Arcing b) Main c) contacts	G.I. HDEC Pipe silver plated			



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

14.	Clearance a) between poles (mm) b) between live parts & earth (mm) c) between live parts when switch is open i) On the same pole (mm) ii) Between adjacent poles (mm)		
15.	Type of interlocks a) Mechanical interlock b) Electrical interlock	between Main switch & Earth/ switch between Isolator & circuit breaker	
16.	Type of operating mechanism	Manual	
17.	Total weight in kg.	400 kg approximately	



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure-II 'H'

Schedule of Guaranteed Technical Particulars of Control and Relay Panel

Sr. No.	Particulars	Technical Requirement for			Offered
		1.2 MVAR Cap.Bank	2.4 MVAR Cap.Bank	3.0 MVAR Cap.Bank	
1.	Cubicle Simplex type				
2.	Mimic Diagram				
3.	12 window static Annunciator with relays etc.	Reputed make			
4.	Accept, Reset, Lamp test, & Sound cancel Push Buttons (4nos.)	Reputed make			
5.	96 X 96 mm Digital Ammeter with selector switch.	Reputed make			
6.	96 X 96 mm Digital Voltmeter with selector switch	Reputed make			
7.	Digital MVAR meter	Reputed make			
8.	Digital Power factor meter	Reputed make			
9.	12 way control switch for circuit breaker	Reputed make			
10.	Numeric type 2 O/C + 1 E/F IDMT relay	Reputed make			
11.	Numeric type Over Voltage Relay	Reputed make			
12.	Numeric type Under Voltage Relay	Reputed make			
13.	Numeric type Unbalanced protection (Neutral current sensing) relay	Reputed make			
14.	Static type Trip circuit supervision relay	Reputed make			
15.	Static type High speed relay	Reputed make			
16.	Static type time delay relay	Reputed make			
17.	DC control ON/OFF switch.	Reputed make			
18.	Neon type indicating lamps for breaker & Isolator status (12nos.)	Reputed make			
19.	Semaphore indicator for circuit breaker & Isolator (3nos.)	Reputed make			



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Sr. No	Particulars	Technical Requirement	Offered
20.	Timer for breaker closing Interlock	Reputed make	
21.	Test terminal block	Reputed make	
22.	Lead Power factor relay	Reputed make	
23.	Set of fuses for control circuits	Reputed make	
24.	Illumination lamp with door limit switch	Reputed make	
25.	Space heater & toggle switch	Reputed make	
26.	3 Pin plug & socket	Reputed make	
27.	Earth Bus 25 X 6 mm	Reputed make	
28.	Set of disconnecting type terminal block	Reputed make	
29.	Set of non disconnecting type terminal block	Reputed make	
30.	Bell & Hooter for annunciation trip & non-trip alarm	Reputed make	



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Annexure III

List of Type Test Reports to be enclosed with the offer

(Ref.Cl.No.22.2.1)

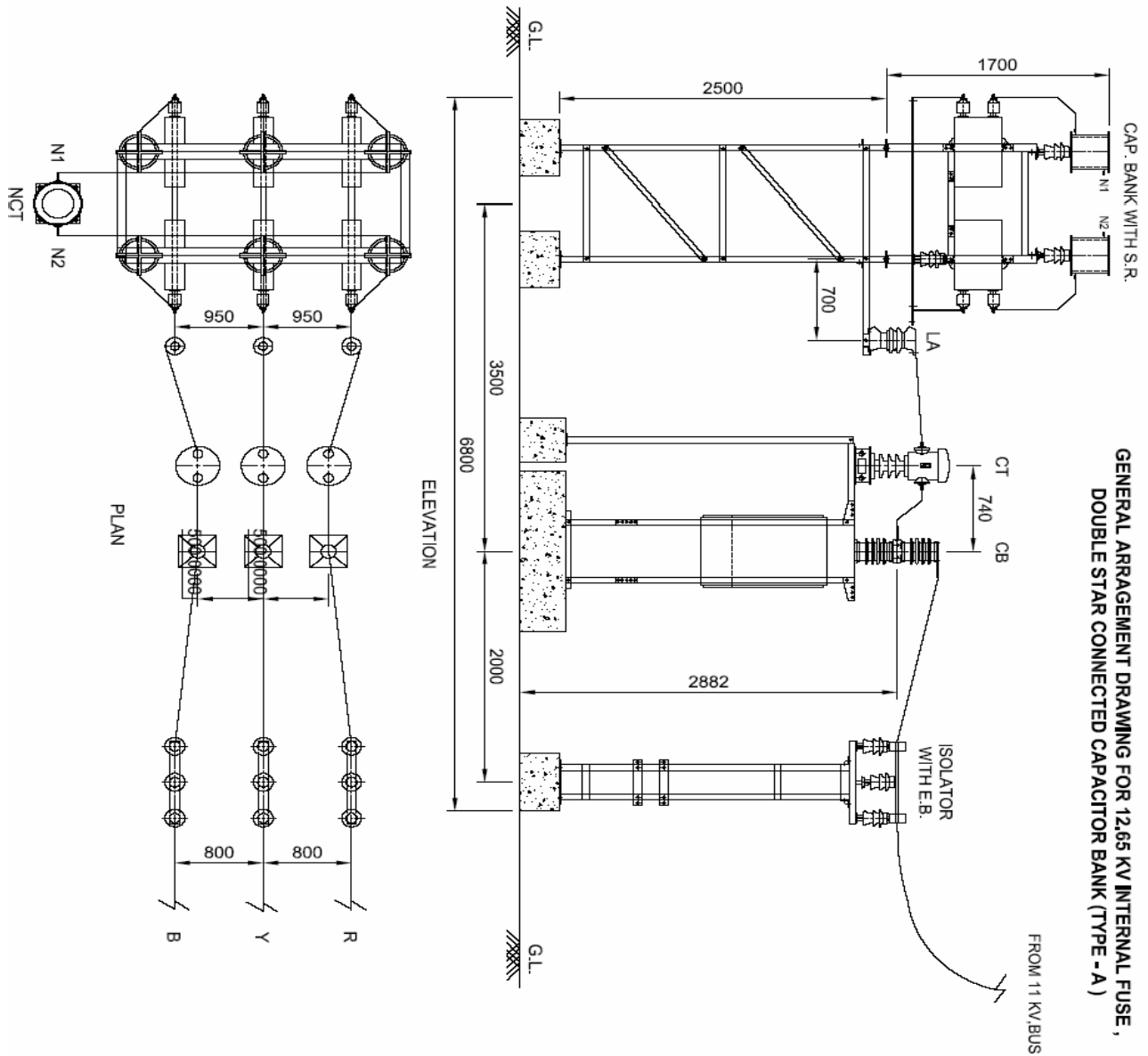
<u>CAPACITOR BANK: IS 13925(Part-I): 2012</u>	
Sr.No	Description of Type Test
1.	Thermal stability test
2.	Measurement of tangent of the loss angle (tan delta) of the capacitor at elevated temperature
3.	Ac voltage test between terminals and container
4.	Lightning impulse Voltage test between terminals and containers
5.	Short circuit discharge test
6.	Endurance Testing as per IS 13925 : Part 2 : 2002
<u>Circuit Breaker: IS: 13118/IEC-60056</u>	
1.	Lightning Impulse Voltage withstand Test
2.	Power Frequency Voltage Withstand Test a) Dry b) Wet
3.	Temperature Rise Test of main circuit
4.	Measurement of resistance of main circuit
5.	Short Time Withstand Current and Peak Withstand Current Test
6.	Mechanical Operation Test
7.	Short Circuit Making and Breaking current Tests a) No load operation before and after test b) Basic test duties no. 1 to5 c) Single Phase Short circuit test d) Condition of breaker after short circuit test
<u>Current Transformers IS 16227</u>	
1.	Short Time Current Test
2.	Impulse Voltage withstand Test on primary Terminals
3.	Temperature Rise Test
4.	Tests for accuracy
5.	Wet Test for outdoor type Transformer



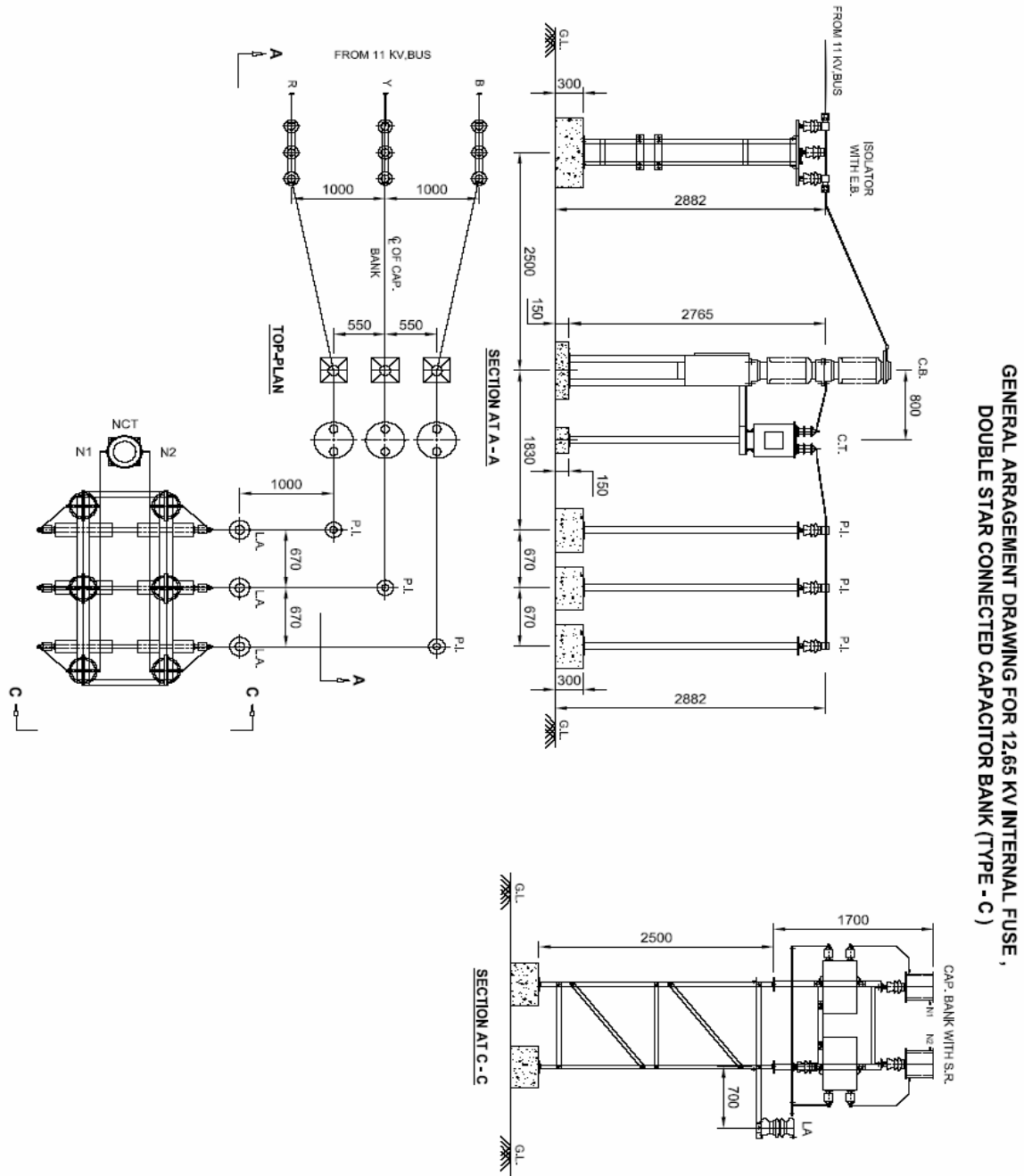
TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS

Sr.No	Description of Type Test
Series Reactors IS: IS-5553	
1.	Measurement of winding resistance
2.	Measurement of Insulation resistance
3.	Measurement of impedance of continuous current (if applicable)
4.	Measurement of Loss (if applicable)
5.	Separate-source voltage withstand test
6.	Induced over voltage withstand test
7.	Temperature-rise test at rated continuous current
8.	Lightning Impulse test
Lightning Arrestors: IS-3070(Part-3):1993/IEC 60099-4	
1.	Insulation withstand test on arrester housing
2.	Residual voltage test
3.	Long duration current impulse withstand Test
4.	Operating duty test
5.	Pressure relief test
6.	Tests of arrester disconnecter
7.	Artificial pollution test on porcelain housed arrestors
8.	Temperature cycle test on hollow porcelain housings
9.	Porosity test
10.	Galvanizing test on exposed ferrous metal parts
Isolators (with and without E.B.) IS/IEC 62271-102	
1.	Lightning Impulse Voltage withstand Test
2.	Power Frequency Voltage Withstand Test a) Dry b) Wet
3.	Temperature Rise Test
4.	Short Time Withstand Current and Peak Withstand Current Test
5.	Mechanical Endurance Test
Control & Relay Panel	
1	Degree of protection test
2	Induce over voltage test

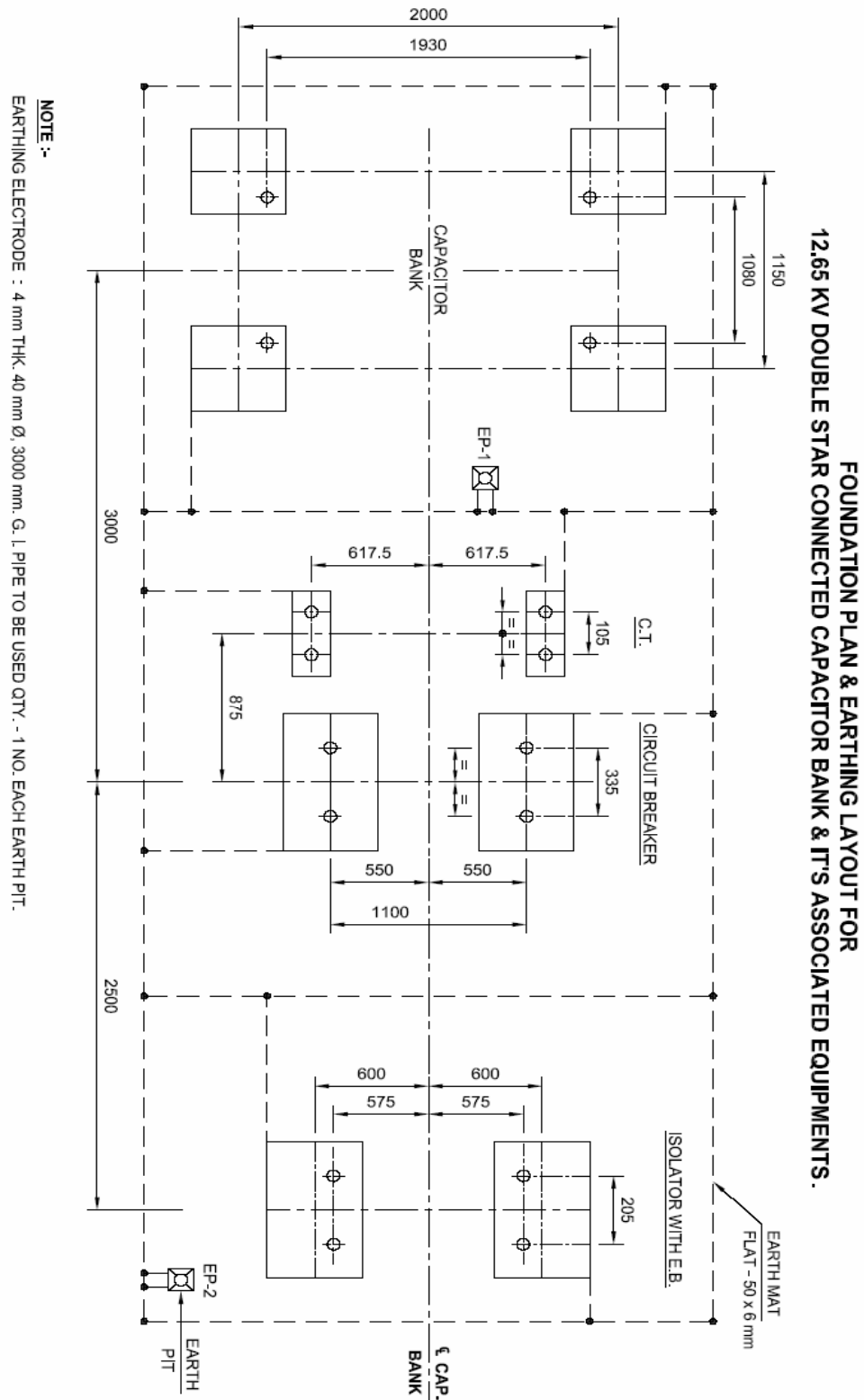
TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS



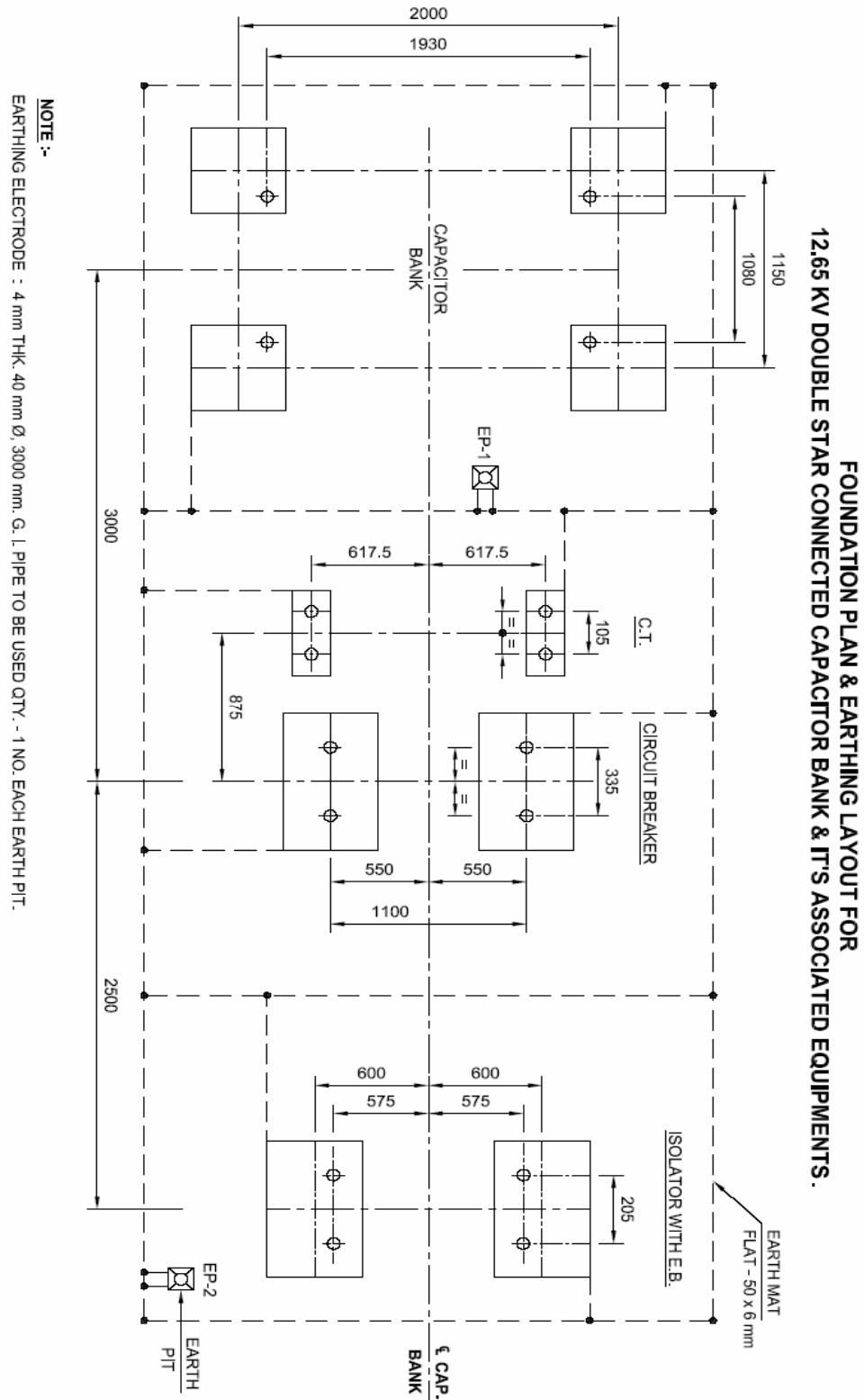
TECHNICAL SPECIFICATION OF 11KV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS



TECHNICAL SPECIFICATION OF 11kV, 1.2/2.4/3.0 MVAR CAPACITOR BANK WITH DOUBLE STAR ARRANGEMENT AND ASSOCIATED EQUIPMENTS



LIST OF SERVICES

SR. NO.	SERVICE NAME	ACTIVITY NUMBER	UOM	SAC CODE	REQ. QTY	VERSION	MATERIAL TYPE
1	Online capacitor repairing	PM.HTLC11.2 51	Number	995461	1		null

Required Documents (To be uploaded online)				
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Sr. No.	NAME	SECTION	ITEM	DESCRIPTION
1	Price Bid Document	Price Section	Online capacitor repairing	As per Tender Terms & Conditions
2	Technical Documents	Technical Section	Online capacitor repairing	As per Tender Terms & Conditions
3	Commercial Documents	Commercial Section		As per Tender Terms & Conditions