



**LOCAL HEAD OFFICE KOLKATA,  
SAMBRIDDHI BHAWAN, 1, STRAND ROAD,  
KOLKATA- 700001**

**SBI INVITE TENDERS**  
**For**

**HIGH TENSION ELECTRICAL WORKS AT SBI EMPLOYEE'S RESIDENTIAL COMPLEX, MICHAEL FARADAY ROAD, DURGAPUR**

The Bank's Empanelled Contractors under the following category **only** are eligible to apply –ELECTRICAL WORKS – Category ED (SBI/LHO/KOLKATA/2022)

**Last Date & Time for submission of e-Tender: 15.04.2023 till 2:00 PM**  
**Opening of e-Tender Technical bid: 3:00 PM on 15.04.2023**

Tender Submitted By:

**Name of Contractor:** .....

**Address:** .....

**GSTIN:** ..... **Date:** .....

**Note:**

1. The bidders should possess valid Digital Signature Certificate (DSC) to participate in the e-Tendering.
2. The successful bidder shall have to ensure, without any extra cost, meticulous compliance of protocols laid down by the Govt. with regard to COVID-19 during execution at site.

Signature of Bidder with seal

**STATE BANK OF INDIA  
PREMISES & ESTATE DEPARTMENT  
LOCAL HEAD OFFICE, KOLKATA  
SAMRIDDI BHAVAN, BLOCK B, 9<sup>TH</sup> FLOOR,  
1, STRAND ROAD, KOLKATA – 700 001, WEST BENGAL.**

**e-TENDER NOTICE**

Tender No.: **KOL-KK-2023-04-01** .Date: **05.04.2023**

SBI invites online tenders in two bid system from empanelled contractors for *Electrical Works* under **Category ED** (work value from 03 Lakh up to 10 Lakh) and above through online e-Tendering System Portal <https://www.tenderwizard.com/SBIETENDER>. Details of the e-Tender are as under:

1.	Name of the Work	:	HIGH TENSION ELECTRICAL WORKS AT STATE BANK OF INDIA EMPLOYEE'S RESIDENTIAL COMPLEX, MICHAEL FARADAY ROAD, DURGAPUR
2.	Estimated Cost	:	<b>Rs. 8,82,410.00 (Rupees Eight Lakh Eighty-two thousand Four Hundred Ten only)</b> This amount is exclusive of applicable Goods & Services Tax (GST), which shall be paid extra as applicable from time to time on the final certified bill.
3.	Time Allowed for Completion	:	<b>31 days</b> (including Sundays and Holidays) from the Date of Issue of the Work Order or the Site Handover Date, whichever is later.
4.	Validity of Tenders	:	<b>120 days</b> from the date of opening of tenders
5.	Earnest Money Deposit (EMD)	:	NIL Copy of Special term deposit submitted to Bank for empanelment is to be submitted in soft copy & scan copy is to be uploaded in the e-tender portal.  <b>Bidders are requested to submit technical bid as well as price bid in online mode only. No hard copy is required to be submitted physically during tender submission.</b>
6.	Pre-bid Meeting	:	No
7.	Initial Security Deposit (ISD)	:	2% of accepted Contract Price including EMD
8.	Total Security Deposit (TSD) in the form of Retention Money (RM)	:	5% of the Final Certified Bill Value including ISD <b>Note: Condition for submission of TSD may be changed in due course of time. Percentage of TSD may be changed in due course.</b>

9.	Availability of Tender Documents	:	Tender documents are to be downloaded from the Bank's website ( <a href="http://www.sbi.co.in">www.sbi.co.in</a> ) or SBI e-Tender Portal <a href="https://www.tenderwizard.com/SBIETENDER">https://www.tenderwizard.com/SBIETENDER</a>
10.	Tender Documents Downloading	:	(a) <b>Start Date:</b> From 1:00 PM on 05.04.2023 (b) <b>End Date:</b> Up to 2:00 PM on 15.04.2023
11.	Last Date and Time of Submission of Technical & Price Bids	:	<b>Up to 2:00 PM on 15.04.2023</b>
12.	Date and Time of Opening of the Technical bid	:	<b>15.04.2023 at 3:00 PM</b> In case the tender opening date is declared as holiday / lock-down, the tender will be opened in the next working day at the same time.
13	Date & Time of e-reverse auction	:	<b>NA</b>
14	For any details, please contact	:	The Asst. General Manager (P&E) State Bank of India Local Head Office, Kolkata, Samriddhi Bhavan, Block B, 9th Floor, 1, Strand Road, Kolkata - 700 001. Mobile No.: +919674710034 Mail ID: agmpre.lhokol@sbi.co.in
15	Project Architect	:	<b>NA</b>
16	For e-Tender related queries	:	<u>Service provider:</u> M/s. Antares Systems Limited, Registered Office: #24, Sudha Complex, 3 <sup>rd</sup> Stage, 4 <sup>th</sup> Block, Bangalore - 560079, Karnataka. Ph.: 080-49352000 / 40482000 Fax: 080-49352034 Help Desk: 9073677150 / 9073677151 / 9073677152 / 033 4604 6611  <u>Contact Persons:</u> (On working days 9 AM to 6 PM) 1. Mr.Kushal Bose Mobile No.: +91 7686913157 e-Mail: <a href="mailto:kushal.b@antaressystems.com">kushal.b@antaressystems.com</a> <b>2. Mr. Subrata Sheet</b> Mobile No.: +91 9674758723 e-Mail: <a href="mailto:subrata.s@antaressystems.com">subrata.s@antaressystems.com</a>

17	Liquidated Damages (LD)	:	0.5% the Contract Price per week of delay, subject to the maximum of 5% of the final Work Value or work order value whichever higher
18	Defects Liability Period	:	12 Months from the date of Virtual Completion of work
19	Value of Interim Certificate	:	No advance on materials / plant / machinery or mobilization advance shall be paid under any circumstances.
20	Deduction of Income Tax and GST		<p>A) TDS on Income Tax / GST will be deducted at source as per Govt. Guidelines.</p> <p>B) The contractor should comply with the following;</p> <p>i. Contractor should have GST Registration Number</p> <p>ii. Invoice should specifically / separately disclose the amount of GST levied at applicable rate as per GST provision</p> <p>iii. Contractor should timely file his GST return in accordance with GST provisions to enable the Bank to claim the credit of GST paid to the contractor.</p>
21	Corrigendum		Corrigenda, if any, is to be followed as published in <a href="http://www.tenderwizard.in/SBIETENDER">www.tenderwizard.in/SBIETENDER</a> portal only.
22	Documents Required to be submitted with Technical Bid at SBI Circle Office.	:	<p>1. EMD in original if applicable</p> <p>2. <b>Process Compliance Statement</b> as per <i>Annexure X</i> of NIT</p> <p>3. Page No. 1-5 of NIT (<i>Filled up &amp; signed by the Contractor</i>)</p> <p>4. <b>Electrical supervisory License for HT works</b></p>
23.	Any additional Information		The estimated rates as per the Break-up of Quantities (BOQ) uploaded in this tender are inclusive of materials, labour, wages, fixtures, transportation, installation, all taxes & charges, cost of the insurances as specified in the tender, cost towards testing of materials supplied, wastages, Octroi, machinery, temporary works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work. However, GST on work contract will be extra as applicable.

**CAUTION NOTE:** Please note that the contractor quoting abnormally low / erratic rates will be asked to submit rate analysis or Additional performance guarantee (APG) or both in the form of Bank Guarantee or D.D issued by any scheduled Bank as per draft supplied by the Bank, within a period of one week before award the work. The amount of said Bank Guarantee shall be equal to the **difference** between **92.5 % of estimated cost of project** and **tender amount quoted by the contractor**. This Bank Guarantee/D.D will be treated as an additional security deposit for due fulfilment of contract and will be retained by the SBI for entire completion period of the project. The contractor shall undertake not to cancel/withdraw the said Bank Guarantee/DD. In case contractor fails to undertake the job within stipulated time or leave the same incomplete or carryout substandard job, the bank will be at liberty to forfeit the said initial security deposit and additional security deposit by invoking the Bank Guarantee/en-cashing the DD.

**And**

**if the rate analysis submitted by the vendor found to be non-satisfactory & rates are non-reasonable** then the **vendor shall be debarred from participating in any further E-tendering process (for next 6 months) to be conducted by establishments under SBI LHO Kolkata.**

**Note:** Please note, if any vendor is not participating in the tendering process consecutively four times , then we will presume that the vendor is not interested in the Bank's job & **will be delisted from the list of empanelled vendors** for all categories.

Sd/-  
The Asst. General Manager (P&E)  
State Bank of India  
Local Head Office, Kolkata,

IMPORTANT NOTES

- (a) All contractors who are empanelled with SBI Kolkata Circle in the specific category only are eligible for the above-mentioned work.
- (b) Any abnormal increase from the quoted price / cost will not be accepted.
- (c) The Bank reserves the right to reject any or all the tenders without assigning any reason whatsoever.
- (d) Sealed Tenders are invited from the Bank's Empanelled Contractors in Category ED & Above (work value above 03 Lakh and up to Rs 10 Lakh for Electrical Works & above) only in **one part, i.e., Part - I {Technical Bid (1-5 pages) + EMD + HT SUPERVISORY LICENCE}, to be submitted online only** and (Online Price Bid) separately Electronically Sealed Price Bid is to be submitted online through the following portal: [www.tenderwizard.in/SBIETENDER](http://www.tenderwizard.in/SBIETENDER)

**\*\* Price Bid shall not be accepted offline.**

**Price Bid can be submitted through online mode only**

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Part - I (Technical Bid + "EMD"): Technical Bid will be available online for downloading of documents in the portal as stated above and is to be submitted online only along with the requisite "EMD" to the address as mentioned earlier.

and

Online Price Bid: This shall contain the Electronic format of Price Bid. No condition / stipulation in this part other than unconditional general rebate shall be accepted. The contractors can view the Tender Opening Details through their respective log-in IDs on the above- mentioned e-Tendering Portal (Website).

- (e) The Bidder is expected to examine all instructions, forms, terms and specifications in the bid documents. Failure to furnish all information required as per the Bid Documents or submission of bids not substantially responsive to the Bid Documents in every respect will be at the bidder's risk and shall result in rejection of the bid.
- (f) In case the date of opening of tenders is declared as a holiday / lock-down, the tenders will be opened on the next working day at the same time. Again, **corrigenda**, if any, are to be followed from <https://www.tenderwizard.com/SBIETENDER>.
- (g) No conditions other than mentioned in the tender will be considered, and if given they will have to be withdrawn before opening of the Price Bid.
- (h) Tenders received without "EMD" shall be summarily rejected, and such tenders shall not be allowed to participate in the online price bidding process.
- (i) SBI has the right to accept / reject any / all tenders without assigning any reasons and no correspondence shall be entertained in this regard.
- (j) Rates furnished in the Online Price Bid are inclusive of all costs, carriage, allowances, taxes & levies, etc., but excludes GST. However, GST will be paid extra by the Bank on production of GST Registration document and on claim as per prevailing rate.

- (k) The intending bidders are to quote their offers item wise in all the items of price bid. If vendor fails to quote their price in any of the items of price bid, the price quoted by the vendor will be assumed as "Zero". Vendor will be bound to execute the work of the item & the work value of that item will be zero.
- (l) Contractors shall provide all labour and materials, tool and tackles including necessary scaffolding for proper execution of the work including curing etc.
- (m) 3% of the value of the executed work will be retained as Security Deposit and will be refunded on satisfactory completion of free maintenance period, i.e., 12 (twelve) months from the date of completion of work. No interest shall be payable.
- (n) Rates quoted shall be inclusive of providing necessary arrangements for satisfactory protection of furniture / flooring / electrical fittings / Bank's any other property during execution of the work.
- (o) Rates shall be inclusive of cost for disposing debris and any other unserviceable materials as per direction and inconformity with the Local or any other authority (s) rules.
- (p) Rates shall be inclusive of cleaning of floors, making good to damaged floor, ceiling, walls, etc., after completion of work.
- (q) In case of any poor quality of work or substandard materials used for the purpose, shall be replaced as per instructions without any extra cost.
- (r) e-Reverse auction will be conducted in this tender and K-factor will be applied on the rates of L1 bidder in auction process.  $K\text{-factor} = (\text{amount quoted in reverse auction} / \text{Amount quoted in online price Bid})$ . K factor will be applicable on all item rates quoted by the L1 vendor in online price bid after finalization e-reverse auction for getting the final rates and work value.

**Notes:-**

- ❑ Conditional tenders shall be summarily rejected.
- ❑ SBI reserve their rights to accept or reject any or all the tenders, either in part or whole without assigning any reason(s) for doing so and no claim / correspondence shall be entertained in this regard.
- ❑ Quantities are tentative and can increase or decrease the quantities of any item and contractor have to execute the same at the quoted rates.
- ❑ The application forms must be submitted in a prescribed format as laid down in the enclosed Annexures. Soft Copy of the Technical bid should be submitted as Technical bid (online) super scribed with the legend

**HIGH TENSION ELECTRICAL WORKS AT STATE BANK OF INDIA EMPLOYEE'S RESIDENTIAL COMPLEX, MICHAEL FARADAY ROAD, DURGAPUR**

**To:**

Assistant General Manager  
(P&E), State Bank of India, Local  
Head Office, Samridhi Bhavan,  
Block "B", 9<sup>th</sup> Floor ,

Tender No.: **KOL-KK-2023-04-01**

Category -ED

1, Stand Road, Kolkata - 700 001.

The Price bid should be submitted in online mode only as prescribed format given in our Service Provider's portal [www.tenderwizard.in/SBIETENDER](http://www.tenderwizard.in/SBIETENDER).

Yours Faithfully,

Sd/-

Assistant General Manager (P&E)  
SBI, P&E Deptt., Engg. Section, LHO Kolkata.



**Terms & Conditions of e-Tendering**

State Bank of India shall finalize the Tender through e-Tendering mode, for which M/s. Antares Systems Limited have been engaged. Please go through the guidelines given below and submit your acceptance to the same along with your Commercial Bid:

1. e-Tendering shall be conducted by SBI through M/s. Antares Systems Limited on pre-specified date. While the Contractors shall be quoting from their own offices / place of their choice, Internet Connectivity and other paraphernalia requirements shall have to be ensured by the Contractors themselves. In the event of failure of the Internet Connectivity due to any reason whatsoever, it is the Bidders' responsibility only.

In order to ward-off such contingent situation, Bidders are requested to make all the necessary arrangements / alternatives such as back-up power supply whatever required, so that they are able to circumvent such situation and still be able to participate in the e-Tendering successfully. Failure of power at the premises of Contractors during the e-Tendering cannot be the cause for not participating in the e-Tendering. On account of this, the time for the e-Tendering cannot be extended and SBI is not responsible for such eventualities.

2. M/s. Antares Systems Limited shall arrange to provide adequate training to the Bidders and their nominated person (s) without any cost to them. They shall also explain the former all the rules related to the e-Tendering. The Bidders are required to give their compliance on it before start of the Bid Process.
3. **BIDDING CURRENCY AND UNIT OF MEASUREMENT:** Bidding will be conducted in Percentage-rate Tendering Process, the final amount will be in Indian Currency (INR) and Unit of Measurement will be displayed item-wise in online e-Tendering.
4. **BID PRICE:** The Bidder has to quote only in terms of ITEM RATE Basis.
5. **VALIDITY OF BIDS:** The quoted Bid Price shall be firm for a period specified in the tender document and shall not be subjected to any change whatsoever.

**Procedure of e-Tendering**Online Tendering:

- (a) The soft copy of the Technical as well as Price Bid is available on the Bank's website during the period specified in the NIT.
- (b) Online e-Tendering is open to the empaneled bidders in the respective category.

The Price Bid shall be made available online by the Service Provider wherein **the Contractors will be required to fill-in their offers only in terms of Item Rate.** "Incomplete Tender" shall be liable for rejection.

- (c) The Contractors are advised not to wait till the last minute to submit their online item-wise quote in the price bid to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.

1. **LOG-IN NAME & PASSWORD:** Each Bidder is assigned a Unique Username & Password by M/s. Antares Systems Limited. All bids made from the Login ID given to the bidder will be deemed to have been made by the Bidder.
2. **BIDS PLACED BY BIDDER:** Bids will be taken as an offer to execute the work as specified. Bids once made, cannot be cancelled / withdrawn and the Bidder shall be bound to execute the work at the quoted bid rate. In case the L-1 Bidder backs out or fail to complete the work as per the rate offered, SBI shall at liberty to take action as deemed necessary including de-paneling such contractors and forfeiting their EMD.
3. At the end of the e-Tendering, SBI will decide upon the successful bidder. The decision of SBI on Award of Contract shall be final and binding on all the Bidders.
4. SBI shall be at liberty to cancel the e-Tendering process / tender at any time, before ordering, without assigning any reason whatsoever.
5. SBI shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause.
6. Other terms and conditions shall be as per the Techno-Commercial Bids and other correspondences till date.
7. **OTHER TERMS & CONDITIONS:**
  - The Bidders shall not involve themselves or any of their representatives in Price Manipulation of any kind, directly or indirectly, by communicating with other suppliers / bidders.
  - The Bidder shall not divulge either his Bids or any other exclusive details of SBI to any other party.

- The decision of SBI on Award of Contract shall be final and binding on all the Bidders.
- SBI reserve their rights to extend, re-schedule or cancel any e-Tendering within its sole discretion.
- SBI or its authorized service provider shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause.
- SBI or its authorized service provider is not responsible for any damages, including damages that result from their works, but are not limited to negligence.

SBI or its authorized service provider will not be held responsible for consequential damages, including but not limited to systems problems, inability to use the system, loss of electronic information, etc.

**N.B.:** All the Bidders are required to submit the Process Compliance Statement (Annexure – I), duly signed, to the Service Provider.

All the bidders are requested to ensure that they have a valid Digital Signature Certificate (DSC) well in advance to participate in the online event.

**PREAMBLE TO BILL OF QUANTITIES & RATES**

Bidders are advised to quote their rates after due consideration of the following pertinent points:

1. Actual site conditions including working time that would be available to them as per standing rules
2. Material access regulations of the building including permission of use of lifts and stairways etc.
3. Temporary storage provision of disposable materials arising out of the work.
4. Security measures and permissions required to be observed and obtained in consultation with the representatives of the landlords and act strictly according to the same.
5. Traffic regulations of the City Police in order to organize trouble free access of materials
6. The work must be executed in close and effective co-ordination with other executing agencies who shall be working simultaneously
7. Any other governing issue or issues likely to have impact on the productions rate and cost of work
8. **TAXES AND DUTIES:** The tenderer must include in their tender prices quoted for all duties, royalties, cess, excise, sales tax, work contract tax or any other taxes such as Income Tax deducted to vendor or local charges, as applicable etc. No extra claim on this account will in any case be entertained. However, GST as per act will be paid on production of GST Registration Certificate and on claim.
9. **GOVERNMENT AND LOCAL RULES:** The Contractor shall conform to the provisions of all local Bylaws and Act relating to the work and to the Regulations, etc., of the Government and Local Authorities (at the State / UT as the case may be) and of any Bank with whose system the premises is proposed to be connected. The Contractor shall give all notices required by the said Act, Rules, Regulations and By-laws etc. and pay all fees payable to such authority / authorities for execution of the work involved. The cost, if any shall be deemed to have been included in his quoted rates, taking into account all liabilities for licenses, fees for footpath encroachment and restorations, statutory Clearance etc. and shall defend all actions arising from such claims or liabilities.

**PROCESS COMPLIANCE STATEMENT (Annexure X)**

*(The bidders are required to print this on their company's letter head and sign, stamp and submit with technical Bid)*

To,

M/s. Antares Systems Limited,

Registered Office: #24, Sudha Complex,

3<sup>rd</sup> Stage, 4<sup>th</sup> Block, Bangalore – 560079, Karnataka.

e-Mail: [kushal.b@antaressystems.com](mailto:kushal.b@antaressystems.com), [subrata.s@antaressystems.com](mailto:subrata.s@antaressystems.com),

**AGREEMENT TO THE PROCESS RELATED TERMS AND CONDITIONS**

**FOR THE ONLINE e-TENDERING FOR THE WORK**

**Tender ID: KOL-KK-2023-03-04 dated 05.04.2023**

Dear Sir,

This has reference to the Terms & Conditions for the e-Tendering mentioned in the Tender Document.

This letter is to confirm that:

- 1) The undersigned is authorized representative of the company.
- 2) We have studied the Commercial Terms and the Business Rules governing the e-Tendering as mentioned in NIT / RFP / GCC of SBI as well as this document and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the e-Tendering Tool and have understood the functionality of the same thoroughly.
- 4) We confirm that SBI and M/s. Antares Systems Limited shall not be liable and responsible in any manner whatsoever for my / our failure to access and bid on the e-Tendering Platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC or any other unforeseen circumstances, etc., before or during the e-Tendering event.
- 5) We confirm that we have a valid Digital Signature Certificate (DSC) issued by a valid Certifying Authority.
- 6) We hereby confirm that we will honor the bids placed by us during the e-Tendering process.

With regards,

Date:

Signature with company seal Name:

Company / Organization:

Designation within Company / Organization:

Address of Company / Organization:

e-Mail ID:

Phone No.:

ARTICLES OF AGREEMENT

**ARTICLES OF AGREEMENT made the \_\_\_\_\_ day of \_\_\_\_\_ 2022  
between \_\_\_\_\_**

\_\_\_\_\_

of \_\_\_\_\_

(hereinafter called the "Employer") of the one part and \_\_\_\_\_  
of \_\_\_\_\_ (hereinafter called "The Contractor") of the other part, where as  
the Employer is desirous of getting the work of  
" \_\_\_\_\_ " executed and has caused drawings,  
conditions of contract, specifications and schedule of quantities etc., describing the works prepared by  
Bank.

AND WHEREAS the SAID DRAWINGS numbered as per list attached inclusive of and the conditions of contract, specifications and schedule of quantities etc., have been signed by or on behalf of the parties hereto.

AND WHEREAS THE CONTRACTOR has agreed to execute upon and subject to the conditions set forth in the Schedule hereto (hereinafter referred to as "Said Conditions") the works shown upon the said drawings and described in the same specifications and included in the said schedule of quantities for such sum as may be ascertained to be payable in terms of the Bills of Quantities, and which sum is estimated to be Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) (hereinafter referred to as "Said Contract Amount").

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said sum to be paid at the times and in the manner set forth in the said conditions, the contractor shall upon and subject to the said conditions, execute and complete the work shown in the said drawings and described in the said specifications.
2. The Employer shall pay the contractor the said sum or such sums as shall become payable hereunder at the times and in the manner specified in the said conditions.
3. The term "Architect" in the said conditions shall mean the said **Bank**, or in the event of their ceasing to be the Architect for the purpose of this contract, such other person as shall be nominated for that purpose by the Employer, not being a person to whom the contractor shall object for reasons considered to be sufficient by the Arbitrator mentioned in the said conditions provided always that no persons subsequently appointed to be the Architect under this contract shall be entitled to disregard or over-rule any previous decision or approval or direction given or expressed by the Architect for the time being.
4. Tender documents containing work order Notice to the Contractor, Conditions of Contract, Appendix thereto, Special Conditions of Contract, Specifications and Schedule of Quantities with the rates entered therein, shall be read and studied as forming part of this agreement and the parties hereto shall respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their part respectively in such conditions contained.

5. The contract is neither a fixed lumpsum contract or a piece work contract, but is a contract to carry out work in respect of the entire works to be paid for according to actual measured quantities, including variations from BOQ at the rates contained in the Schedule of rates and Probable bill of quantities or as provided in the said conditions.
6. The Employer through the Architect, reserves to himself the right of altering the drawings and natures of the work, of adding/substitution to or omitting any items of work or having portions of the same carried out through alternate agencies without prejudice to this contract.
7. Time shall be considered a the essence of this agreement and the contractor hereby agrees to commence the work soon after the site is handed over to him but within 180 days reckoned from the date of issue of work order to execute the work, as provided for in the said conditions and complete the entire work in **31 days** subject to nevertheless to the provisions for extension of time.
8. This agreement and contract shall be deemed to have been made in Kolkata and any questions or dispute rising out of or in any way connected with this Agreement and Contract shall be deemed to have arisen in Kolkata and only the courts in Kolkata shall have jurisdiction to determine the same. The limitation period will be 90 days from the date of dispute having arisen.

AS WITNESS our hand this \_\_\_\_\_ day of \_\_\_\_\_ 2022

Signed by the said in the presence of:

WITNESS : SIGNATURE

NAME :

ADDRESS :

EMPLOYER

WITNESS : SIGNATURE

NAME :

ADDRESS :

APPENDIX TO GENERAL CONDITIONS OF CONTRACT

1. Earnest Money Deposit (EMD) : **Rs. NIL**
2. Initial Security Deposit (ISD) : 2% of contract value including EMD.
3. Period of completion : 31 days
4. Defects Liability period : 12 months after completion as recorded in the completion certificate.
5. Agreed Liquidated Damages : ½% of contract amount per week of delay subjected to a maximum of 5% of contract value.
6. Period of final measurement : One month after completion as recorded in the completion certificate.
7. Minimum value of work to be Executed for issue of interim Certificates for making payment : Min. Rs. 10.00 Lakhs subjected to work volume
- 8.a) Retention money from each bill : 10% of gross value of each interim bill, subject to 8(b) below.
- b) Total retention money including Earnest money and initial security Deposit : 5% of the contract value.
9. Release of Security deposit after Virtual completion. : 50% of the total security to be released along with final certificate of payment, but only after removing all his materials, equipment, labour, huts/force, temporary sheds/stores, all his installations, machinery etc., from the site. Balance payment to be released on submission of Bank Guarantee on any Scheduled Bank, Other than SBI, and its associated banks in the prescribed manner and valid till the completion of defects liability period of 12 months plus 3 months.
10. Period for honouring certificate : 30 working days from date of Architects certificate of payment for interim bills and 45 working days for final certificate.

WITNESS :

DATE : SIGNATURE OF THE CONTRACTOR WITH DATE



**SPECIAL CONDITIONS OF CONTRACTOR**

1. Contractor shall not be entitled to any compensation for any loss suffered by him on account of delays in commencing or executing the work, what ever the cause of the delays may be, including delays arising out of modifications to the work entrusted to him or in any subcontract connected there with or delays in awarding contracts for other trades of the project or in commencement or completion of such works in obtaining water and power connections for construction purpose or for any other reason what so ever and the Employer shall not be liable for any claim in respect thereof. The Employer does not accept liabilities for any sum besides the tender amount, subject to such variations as are provided for herein.
2. The successful tenderer is bound to carry out any items of work necessary for completion of the job if such instructions in respect of such additional items and their quantities will be issued in writing by the Architects with the prior consent in writing of the Employer.
3. The contractor must bear in mind that the work shall be carried out strictly in accordance with specifications made by the Architects.
4. The rates quoted in tender shall also include electric consumption charges for power. If no power is available at site the contractor shall have to make his own arrangement to obtain power connection and maintain at his expense an efficient service of electric light and power and shall pay for the electricity consumed. The Employer shall give all possible assistance to the contractor to obtain the requisite permission from the various authorities, but the responsibility for obtaining the same shall be that of contractor.
5. Contractor shall strictly comply with the provisions of safety code in addition to all local rules and regulations.
6. The contractor shall be responsible for the observance of all rules and regulations framed by the government under the contract labour act. The Employer shall be entitled to deduct all losses, damages that he might suffer on account of non-observance of these rules by the contractor, from the amount payable to the contractor.
7. Time shall be considered the essence of this contract. The entire work must be completed within 60 DAYS from the commencement of the work. If the completion of the work is delayed beyond 1 month, a penalty at the rate of ½ % per week over the contract value will be imposed subjected to a maximum of 5%.  
  
If the work is delayed beyond 30 days after the date of completion, the remaining work will be carried out through other agencies at the risk and cost of the contractors under the contract with prevailing market rates.
8. The successful tenderer shall submit the phased programme of execution of different items of work within 2 days after receipt of acceptance letter.
9. Payment will be made subjected to a minimum of Rs. 10,00,000/- (Rupees Ten Lakhs Only) and will be made within a period of four weeks after the bill is submitted to the Employer's Office with Architects/Engineer's Certificate.
10. Before filling in the tender the contractor will check all the drawings and schedule of quantities and will get an immediate clarification from SBI / Architects on item not clearly understood. No claims for any loss or compensation will be entertained on this account.

11. All the work shall be carried out as per detail drawings and specifications or as directed by SBI / Architects.
12. The rates quoted in the tender shall be for the finished items of work They shall include all the charges labour, materials, transportation of material equipment, double scaffolding water and electric charges, tool and plants, marking out and cleaning of site, to do all things necessary to provide complete finished item for work consistent with the specifications attached to this tender document. The rates shall be inclusive of octroi duty, excise duty, packing and forwarding, loading or unloading or any other duties or fees levied by any government, public or local bodies. The rates shall be firm and shall not be subject to exchange variations, labour conditions or any other conditions whatsoever.
13. The calculations made by the tenderer should be based upon the probable quantities of the several items of work which are furnished for the tenderer's convenience in the schedule of quantities ,but it must be clearly understood that the contract is not a lumpsum contract , that neither the probable quantities nor the value of individual items nor the aggregate value of the entire tender will form part of the contract and that SBI / Architects do not in any way assure the tenderer or guarantee that the work would correspond there to.
14. Adequate engineering and technical staff to be appointed at site. ELECTRICAL contractor should inform of their number and qualification. An Approval of SBI / Architects should be taken prior to appointing such technical staff on site.
15. The contractor shall keep the tender submitted by him open for acceptance for a minimum period of three months from the date of it's submission. When once the tender is accepted the rates quoted by the successful tenderer shall be firm and the variation in rates of any one or all the items on any account shall not be allowed during the entire duration of the contract
16. During the execution of work, contractor must check the work with his drawings. The contractor shall be responsible for all the errors in this connection and shall have to rectify all the defects at his own cost, failing which the client reserves the right to get the same rectified at the risk and cost of contractor.
17. No claim for extra item or deviation from specification shall be entertained unless the same is pointed out and accepted as such before the work is taken in hand or within 15 days of work by the successful tenderer.
18. The contractor shall comply with all bye- laws and tax regulations (including GST) of local and other statutory authorities having jurisdiction over the works and shall be responsible for the payment of all the fees and other charges and for giving and receiving of all necessary notices drawings and test certificates.
19. The successful tenders shall properly safeguard against damage or injury to the public and to any property or thing and shall alone be responsible for any such damage and injury to any person or persons or thing arising in connection with it's execution of work .The successful tenderer shall protect and hold harmless the SBI against any or all claims for any such injury or damage.
20. The work in every respect during the progress and till final acceptance by the SBI, including raw materials delivered at the site to be incorporated or used in ELECTRICAL work by the successful tenderer will be at his own risk . Any loss or damage to any such material or work shall immediately be replaced by the successful tenderer at his own expense.
21. The SBI shall have the right to direct the contractor to purchase and use the materials from any source for proper execution of work.

22. The employer / SBI / Architects or their authorized representatives shall have full power for inspecting the contractor's works or at any place from which the material is obtained. Acceptances of any such materials shall no way relieve the contractor of his responsibility for meeting the requirements and /or analysis not called for in the specifications shall be borne by the SBI in case the material or work is found defective or of inferior quality .tests and /or analysis shall be done in the laboratory approved by the client and the contractor shall permit SBI and or the client's or their authorized representative to be present during any of the tests and /or analysis.

23. **INSURANCE**

The contractor shall indemnify SBI up to CAR Policy (Contractor's All Risk Policy) against all claim which may be made against SBI by any member of the public or the third party in respect of anything which may arise in consequence thereof and shall at his own expense arrange to effect and maintain up to one month after the virtual completion from an office approved by SBI a policy of insurance in the joint names and deposit such policy or policies with SBI from time to time during the currency of this contract. The contractor shall also indemnify SBI against all claims which may be made upon the SBI under the workman's compensation act or any other statute in force during the currency of this contract or at common law in respect of any employee of the contractor or any sub contractor and shall at his own expenses effect and maintain upto one month after virtual completion of the contract from an office approved by SBI a policy or policies of insurance in the joint names of SBI and the contractor as aforesaid .The contractor shall be responsible for any other thing which may exclude from the insurance policies above referred to and also for any other damage to any property arising out of and incidental to the negligent or defective carrying out of this contract.

He shall also indemnify SBI in respect of any costs, charges or expenses arising out of any claim or proceedings and also in respect of any award of compensation or damage arising therefrom. SBI shall be at liberty and is hereby empowered to deduct the amount of any damages, compensation caused, charges and expenses arising or occurring from or in respect of any such claims or damages from any sum or sums due or to become due to the contractor.

24. **WORKMAN AT SITE :**

The contractors workpeople shall not be allowed to live on the site at any time throughout the contract nor to trespass beyond the limits of the site. The contractor will be held responsible for any acts of trespass by his workpeople.

25. **DIMENSIONS :**

Figures dimensions are to be taken in preference to scaled dimensions in all cases. Before commencing any work the contractor shall verify all measurements. If any discrepancies are found they shall immediately be brought to the notice of the Architects.

26. **DISCREPANCIES**

All the items shown on the drawings or specifications are taken to be included in both. Any discrepancies, which occur in either the drawings or specifications, shall immediately be brought to the attention of the Architects.

27. **CUTTING AND MAKING GOOD**

Where it is found necessary to interfere with finished work in order to execute this contract, the contractor will be required to do all necessary work at his expenses. Only approved hangers and bolts or other metal fixing devices shall be used to secure frames panels and other units in position. Wooden plugs will not be permitted .Holes shall be formed with electric

drills whenever possible. Structural members shall not be cut or drilled without prior consent of the client.

28. MAINTENANCE AND GUARANTEE

The whole of the work to be performed under this contract shall be completed to the satisfaction of the Architects / Bank.

The contractor without additional charge to SBI renew or replaces any works which prove faulty from workmanship or materials and fully maintain the whole installations for a period of 6 months after the commencement of defects liability period of the main contract and a sum of 5% of the contract amount shall be retained by SBI for his period.

29. PREVENTION OF SPOIL DUMPING

The contractor shall take all reasonable steps to prevent spoil, rubbish, debris surplus materials etc., arising from a work being dumped on an area other than a recognized or approved tipping area and the Contractor will be held responsible for and shall indemnify SBI against any claim or loss arising therefrom.

30. LEAVE PERFECT :

The Contractor shall remove all rubbish and superfluous material from the site of the works with all reasonable speed from time to time and at completion. On no account shall W.C' S or the SBI's receptacles to be used for this purpose.

The client reserves its right to clear contractors uncleared debris at contractors own cost without any reasons & not more than one notice will be given for this.

31. SETTLEMENT OF DISPUTES AND ARBITRATION:

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship of materials used on the work or as to any other question, claim, right matter or thing whatsoever in any way arising out of our relating to the contract, designs, drawings, specifications, estimates, instructions orders or these conditions or otherwise concerning the work or the execution or failure to execute the same whether arising during the progress of work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

- (a) If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Architect or in case the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the contractor shall forthwith give notice in writing of his claim, or dispute to The Asst. General Manager, Premises & Estate Department, LHO Kolkata, 9<sup>th</sup> floor, Block-B, Samriddhi Bhavan, 1, Strand Road Kolkata- 700001 within 30 days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the contractor shall not be entitled to raise any claim nor shall the bank be in any way liable in respect of any claim by the contractor unless notice of such claim have been given by the Contractor The Asst. General Manager, Premises & Estate Department, LHO Kolkata, 9<sup>th</sup> floor, Block-B, Samriddhi Bhavan, 1, Strand Road Kolkata-700001 in the manner and within the time as aforesaid. The contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to The Asst. General Manager, Premises & Estate Department, LHO Kolkata, 9<sup>th</sup> floor, Block-B, Samriddhi

Bhavan, 1, Strand Road Kolkata- 700001 in writing in the manner and within the time aforesaid.

- (b) The Asst. General Manager, Premises & Estate Department, LHO Kolkata, 9<sup>th</sup> floor, Block-B, Samriddhi Bhavan, 1, Strand Road Kolkata- 700001 shall give his decision in writing on the claims notified by the contractor. The contractor may within 30 days of the receipt of the decision of The Asst. General Manager, Premises & Estate Department, LHO Kolkata, 9<sup>th</sup> floor, Block-B, Samriddhi Bhavan, 1, Strand Road Kolkata- 700001 submit his claims to the conciliating authority namely the Circle Development Officer, State Bank of India, Local Head Office, Kolkata for conciliation along with all details and copies of correspondence exchanged between him and The Asst. General Manager, Premises & Estate Department, LHO Kolkata, 9<sup>th</sup> floor, Block-B, Samriddhi Bhavan, 1, Strand Road Kolkata- 700001.
- (c) If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned Chief General Manager of the Bank for appointment of an arbitrator to adjudicate the notified claims failing which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.
- (d) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes of differences arising out of the notified claims of the contractor as aforesaid and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the Chief General Manager. It will also be no objection to any such appointment that the Arbitrator so appointed is a Bank Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as Bank Officer. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said Chief General Manager. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.

It is also a term of this contract that no person other than a person appointed by such Chief General Manager as aforesaid should act arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any statutory modification or re-enactment thereof and the rules mad there under.

Its is also a term of the contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties. However, no fees will be payable to the arbitrator if he is a Bank Officer.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their settlement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parities. The cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof, shall be paid and fix or settle the amount of costs to be so paid.

## 32. TERMINATION OF CONTRACT BY EMPLOYER:

If the contractor (being an individual or a firm) commit any “ Act of Insolvency “, or shall be adjudged as insolvent, or shall make an assignment or composition of the greater part in number of amount of his creditors, or shall enter into a Deed of Assignment with his creditors, or (being an incorporated Company) shall have an order made against him or pass an effective Resolution for winding up either compulsorily, or Subject to the supervision of the court or voluntarily, or if the official Assignee of the contractor shall repudiate the Contract, or if the Official Assignee or the Liquidator in any such winding up shall be unable, within seven days after notice to them requiring him to do so, to show to the reasonable satisfaction of the Architect that he is able to carry out and fulfil the Contract and if required by the Architect to give a security there for, or if the contractor shall suffer any payment under this contract to be attached by or on behalf of any of creditors of the Contractor, if the Contractor shall assign or sublet the contract without the consent in writing of the Architect/ Bank first obtained, or if the contractor shall charge or encumber this Contract for any payments due or which may become due to the Contractor thereunder, or if the Architect/ Bank shall certify in writing to the SBI that in his opinion the Contractor:

- (a) Has abandoned the Contract, or
- (b) Has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the work for fourteen days after receiving from the Architect written notice to proceed, or
- (c) Has failed to proceed with the work with such due diligence and failed to make such due progress as would enable the works to complete within time agreed upon or
- (d) Has failed to remove materials from site or to pull down and replace works within seven days after receiving from Architect written notice that the said materials or work where condemned and rejected by the Architect under these conditions or
- (e) Has neglected or failed persistently to observe and perform all or any of the acts, matters or things required by this Contract to be observed and performed by the Contractor for seven days after written notice shall have been given to the Contractor requiring the contractor to observe or perform the same, or
- (f) Has to the detriment of good workmanship or in defiance of the Architects instructions to the Contrary, submit any part of the contract or has used in the permanent works important materials which are substandard and not as per specification fraudulently making the Architect / SBI to believe that it is the specified material.

Then and in any of the said caused the SBI with the written consent of the Architect may, notwithstanding any previous waiver, after giving seven days’ notice in writing to the Contractor, determine the contract, but without thereby affecting the powers of the Architect or the obligations and liabilities of the Contractor, the whole of which shall continue to be in force as fully as if the contract has not been so determined and as if the works subsequently executed and being executed by or on behalf of the contractor. And further, SBI with the consent of the Architect by his agents or servants may enter upon and take possession of the works and all plant, tools, scaffoldings, shed, machines, steam and other power utensils and materials lying upon premises or the adjoining lands or roads, and use the same as his own property or may employ the same by means of his own servants and workman in carrying on and completing of the works or by employing any other Contractor or any other person or persons to complete the works and the Contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other Contractor or other person or persons employed for completing and finishing or using the materials and plant for the works, when the work shall be completed, or as soon thereafter as convenient, the Architect shall give a notice in writing to the Contractor, to remove his surplus material and plant and should the Contractor fail to do so within a period of fourteen days after receipt thereof by him, the SBI may sell the same by public auction and shall give credit to the Contractor for the amount so realized. The Architects shall thereafter shall assertion and certify in writing under his hand what (if anything) shall be due or payable to or by the SBI, for the value of the said plant and

materials so taken possession of by SBI, and the expense or loss which the SBI shall have been put to in getting the works to be so completed, and the amount, if any owing to the Contractor and the amount which shall be so certified shall, thereupon, be paid by SBI to the Contractor or by the Contractor to SBI as the case may be, and the certificate of the Architect shall be final and conclusive between the parties.

33. The mode of measurements shall be as per IS: 1200.
34. The contractor should co-ordinate with other agencies viz., INTERIOR, HVAC (Air-Conditioning), Civil, LAN cabling etc.,
35. CONTRACTOR SHOULD WORK AT ODD HOURS, ON HOLIDAYS TO KEEP UP TIME SCHEDULE.
36. The Contractor shall not be eligible for any material advance.
37. **Contacto**r must obtain relevant permissions from Discom/Municipality/State Electricity Authority and other stakeholders for successful execution and commissioning of the project.

**SPECIAL CONDITIONS AND SAFETY CONDITIONS**

The contractor is hereby advised to read the following conditions carefully before quoting rates and to be strictly adhered during execution of work.

**SPECIAL INSTRUCTIONS**

- a) Contractor shall submit copies of all statutory compliance certificates such as ESIC, PF, Contract labour registration, shop & establishment and or any other local authority registration as applicable.
- b) All workmen, engineers, supervisors shall be converted as per ESIC, PF & minimum wages act.
- c) All workmen, engineers, supervisors shall undergo pre-employment medical check up through company recognized medical officer and submit copies of test report.

Contractor to provide proof of monthly remittances with regard to the workmen deployed at the site.

Contractor is responsible to ensure that his workmen are confined to their work area and comply with all safety, security and administrative instructions given by the site engineer.

Contractor shall provide identification badges to all his people.

On completion of day's work, the entire area shall be kept clean and neat. All debris, surplus material etc., shall be removed immediately from the site.

Any such standard material used during execution will be rejected and fully deducted from the bills.

The contractor has to carry out the work in coordination with the other appointed agencies. The contractor should study the situation at site and organize the work accordingly. Whenever work needs to be done in coordination with other agencies, the contractor shall work out the actual time required to complete his part of the job in respects and inform the company.

Revision of rates is not allowed and will be not paid for any reason due to unexpected increase in the cost of the materials or delay in completing the works etc.,  
No labour hutment is allowed inside the premises.

The areas is in "No smoking Zone" therefore smoking is strictly prohibited.

All workmen, Mistry, supervisor and Engineers wearing shoes and safety helmets are only allowed to enter the gate.

Every day contractor / his supervisor should take necessary " Work permit " from the company engineer before starting the job.

Workers are not allowed to sleep during night and cook food inside the premises.

Work to be carried out only under supervision of the qualified engineer.

Contractor should strictly following safety guidelines.

Contractor should use only metal angle/pipe scaffolding. Wooden scaffolding is not allowed.

All contractor's people need to undergo induction/safety training and formal interview by company selection committee.

Contractor shall submit a copy of competency certificates like wiremen license, supervisor's license, IBR welder license etc., issued by competent authority before starting the work.

Contractor shall maintain daily master roll book for his people at site. Based on that, ESIC & PF contribution to be made.



## COMPANY SAFETY GUIDE LINES

### WORKING BELOW GROUND LEVEL:

Check that there are no underground cables/ water/sewage lines prior to start of work area. If found inform site in-charge. Disconnect power supply to any cables found in work areas with permission.

For pits deeper than 3 feet workmen should be provided with lifelines. Ladders should be provided for quick escape from the pit. Provide firmly supported side shuttering or shoring to prevent accidental collapse of earth into pits; cordon off the area around the pit to prevent accidental falls. (cordon must be at least 3 feet beyond the pit edge) excavated earth from the pit must be stacked only beyond the cordon.

Refill the pit promptly on completion.

Incase pits need to be left open for any reason, ensure proper covers over the pits.

### WORKING AT HEIGHTS:

All personnel working at heights beyond 1.8M should wear safety belts.

Ensure that safety belts are tied security to anchors while working at heights.

Ensure that rigging is well anchored to solid supports prior to erecting items like trusses at a height.

Ensure that debris is cleared on a daily basis from work spots.

Ensure that a nylon safety net is securely fitted under the trusses to provide safety against accidental falls to personnel (who will need to have safety belts securely fastened) working on the t6russes and roofing. Alternatively well-supported platforms with protected railings should be used a height suitable for personnel to work while standing.

Ensure that roof top ladders are used while laying and working on the roof.

Ensure that ladders used for climbing to heights are firmly secured against slippage.

All scaffolding should be in steel frames.

Scaffolding should be provided with 3 feet wide working platforms. The platforms should be provided with protective railings.

### WORKING WITH ELECTRICITY

Ensure proper earthing of all electrical machines used.

The L-1 contractor should be having Liaison with the supply authorities and other Government bodies for getting the approvals at his own cost. No extra cost payable to the contractor

Ensure that all connections are taken throughout earth leakage's circuit breakers. Providing ELCB on the main distribution board prevents accidental shocks.

Ensure that welders always used suitable welding goggles and gloves while welding.

Ensure availability of 2 CO2 type fire extinguishers at any easily accessible location at site for fire fighting

Provide a paid of fire buckets filled with dry sand for fire fighting at site.

As far as possible DC generators sets shall be used instead of AC transformer sets.

Contractor shall get his welding sets certified by inspector of electrical department.

The welding transformer shall be fed through an armored cable.

All connections from main to individual M/C (such as cutter, planer, compressor etc) to be taken through shielded cable and 3-pin plug only.

The potable machines should be of fully insulated or plastic body. No metal body is allowed.

During welding the earthling to be provided directly to the member to be welded throughout cable only not using any reinforcement rod/angles.

#### PERSONAL PROTECTIVE GEAR

Following is a list of itmes to be provided to workmen by the contractor as and when required the items must be ISI certified.

Safety shoes

Hard hats

Safety belts

Goggles

Gloves

Safety nets

Roof top ladders

GENERAL

#### BREAKING WORKS:

Workmen engaged in breaking stones/chipping of concrete should wear safety goggles.

#### **OTHER CONDITIONS:**

#### **CONTENTS:**

##### **A) SPECIAL CONDITIONS**

##### **B) TECHNICAL SPECIFICATIONS**

*Chapter 1 POWER TRANSFORMERS*

*Chapter 2 Circuit Breaker*

*Chapter 3 POWER CONTROL CENTERS*

*Chapter 4 LAYING OF CABLES*

*Chapter 5 EARTHING*

*Chapter 6 STANDARD DRAWINGS*

*GI PIPE EARTH STATION*

**COPPER PLATE EARTH STATION**

##### **C) RECOMMENDED MAKES OF MATERIAL**

##### **D) SCHEDULE OF QUANTITIES**

**SPECIAL CONDITIONS****1. General:**

1.1 These special conditions shall be read in conjunction with the description of the item of work in the Bill(s) of Quantities, the particular Specifications, Local Statutory Regulations, Indian Standards Specifications/Codes and the drawings. All the above quoted documents, shall be considered supplementary to each other. However, in the case of conflict amongst the various provisions the owner's and the consultants opinion will be final and shall be adopted.

1.2 The tenderer is advised to inspect the site to ascertain the nature of site, access thereto, local facilities for procurement of materials and working labour rates prevalent in the area, in fact all matters affecting his prices and execution of the work. The tenderer shall be deemed to have full knowledge of the site and drawings whether or not he actually inspects them.

**2. Rates**

2.1 The rates quoted shall be deemed to allow for all minor extras and constructional details which are not specifically shown on drawings or given on the specifications but are essential in the opinion of the Engineer-in-charge to the execution of works to conform to good workmanship and sound engineering practice. The Consultant/SBI reserves the right to make any minor changes during the execution without any extra payment.

2.2 The Consultants/SBI decision to clarify any item under minor changes, minor extras and constructional details shall be final, conclusive and binding on the Contractor.

2.3 The rates quoted by the Contractor shall be net so as to include all requirements described in the contract agreement and no claim whatsoever due to fluctuations in the price of material and labour will be entertained.

2.4 The rates quoted by the Contractor shall include for supplying materials and labour necessary for completing the work in the best and most workmanship like manner to the satisfaction of the Consultant/SBI and which in the opinion of the Consultant cannot be made better, and for maintaining the same. The rates shall be complete in all respects also including cost of materials, erection, fabrication, labour, supervision, tools and plant, transport, sales and other taxes, royalties, duties and materials, contingencies, breakage, wastage, sundries, scaffoldings, etc., on the basis of works contract. The rates quoted shall include all transport, insurance, octroi, or any other levies applicable under the statute.

**3.0 Materials:**

3.1 The Contractor shall ensure to the satisfaction of the Consultant/SBI that the materials are packed in original sealed containers/packing bearing manufacturer's markings and brands etc., except where the gross quantity required is a fraction of the smallest packings. Materials not complying with this requirement shall be rejected.

**3.2 Testing of Materials:**

a) When required by the Consultant / SBI, the Contractor shall provide all facilities at site or at manufacturer's works or in an approved laboratory for testing the materials and/or workmanship. All the expenditure in respect of this shall be borne by the Contractor unless specified otherwise in the Contract. The Contractor shall, when required to do so by the Consultant shall submit at his own cost, manufacturer's certificate of tests, proof sheets, mill sheets etc., showing that the materials have been tested in accordance with requirements of these specifications. The samples for Tests shall be selected by SBI / Consultant.

**4.0 Rectification of Defects:**

4.1 Any defect in the work done or materials used in the works pointed out by the Consultant / SBI shall be rectified within a week or such extended time as may be allowed in this failing which the said defect shall be got rectified by the Consultant at the risk and cost of the Contractors.

#### **5.0 Conduit and Cables Layout :**

5.1 Prior to the pulling of wires, the Contractor shall verify the conduits laid at site by Civil Contractors and satisfy themselves about the adequacy of the same. The contractors shall prepare Wiring layout along with Conduit layout and submit for approval. Prior to laying of the cables, the Contractor shall submit to the Consultant /SBI detailed layout plans of the cable net work and get the same approved. The layout plans shall contain particulars regarding size and routes of the cables. The Cables shall be procured only after approval of Layout Drawings.

#### **6.0 Regulations & Standards :**

6.1 The installation shall conform in all respects to Indian Standard Code of Practice for Electrical Wiring Installation IS:732 and IS:2274. It shall also be in conformity with the current Indian Electricity Rules and Regulations and requirements of the local Electric Supply Authority in so far as these become applicable to the installation. Wherever this specification calls for higher standard of material and/or workmanship than those required by any of the above regulations then this specification shall take precedence over the said regulations and standards.

#### **7.0 Shop Drawings :**

7.1 The Contractor shall prepare and submit to the Consultant / SBI for the approval of detailed fabrication drawings for Main LT Panels/SwitchGears/Rising Mains special boxes and Distribution Board, switch board, special any other equipment to be fabricated by Contractor within 7 days of signing of the contract.

#### **8.0 Completion Drawings :**

8.1 At the completion of the work and before issuance of certificate of virtual completion the contractor shall submit to the consultant / SBI layout drawings drawn at approved scale indicating the complete wiring system "As Installed". These drawings shall in particular, give the following information.

- (a) Run and size of conduits, inspection, junction and pull boxes.
- (b) Location and rating of sockets and switches, controlling the light and power outlets.
- (c) Number and size of conductors in each circuit.
- (d) Location and details of distribution boards, mains, switches, switchgear and other particulars.
- (e) A complete wiring diagram, as installed and schematic drawings showing all connections in the complete electrical system.
- (f) Location of telephone outlets, T.V. Music & Fire Alarm outlet boxes, junctions boxes, sizes of various conduits.
- (g) Locations of all earthing stations, routs and size of all earthing conductors, manholes etc.
- (h) Layout and particulars of all cables.

#### **9.0 Manufacturer's Instructions:**

9.1 Where manufacturers have furnished specific instructions, rating to the materials used in this job, covering points not specifically mentioned in the documents, these instructions shall be followed in all cases.

#### **10.0 Completion Certificate :**

10.1 On completion of the Electrical Installation a certificate shall be furnished by the Contractor counter signed by a licensed supervisor, under whose direct supervision the installation was carried out.

This certificate shall be in the prescribed form as required by the local supply authority. The Contractor shall be responsible for getting the drawings and Electrical Installation inspected and approved by the local Authority concerned.

#### **11.0 Qualified Competent Supervision :**

11.1 The Contractor shall employ competent fully licensed, qualified full time Engineer to direct the work of Electrical installation in accordance with drawings and specifications. The Engineer shall be available at all times on the site to receive instructions from Consultant in the day to day activities, through out the duration of the contract. The foremen shall co-relate the progress of the work in conjunction with all relevant requirements of the supply authorities.

#### **12. Approval from SEB/ Electrical Inspectorate :**

The Contractor shall prepare and submit all the relevant drawings as per the Requirement of WB TRANSCO/ Electrical Inspectorate and obtain the Approvals from CEIG,CEA, Kolkata. No incidental expenses will be paid towards the same. Only statutory fees if any will be paid by SBI.

**NOTE: The contractor shall arrange for the witnessing of the tests made at the factory as part of his scope only for client & consultants representatives which shall be included. Hence separate charges shall not be paid towards the same.**

**TECHNICAL SPECIFICATIONS  
CHAPTER 1****POWER/DISTRIBUTION TRANSFORMER****1.0 General****1.1 Scope**

The transformer shall be manufactured to the relevant IS 1180 (part-1)2014 specifications.

Scope covers manufacturing, supply, storage, installation, testing and commissioning of power transformers and associated equipment of required ratings.

**1.2. Codes and Standards**

The design, material, construction, manufacture, inspection, testing and performance of oil type power transformer (ONAN) shall comply with all currently applicable standards, regulations and safety codes in the locality where the equipment shall be installed. The equipment shall also conform to the latest applicable standards and codes of practice.

In case of conflict between the applicable standards and this specification, this specification shall govern.

The transformer shall generally conform to IS 2026, IEC 60076, IEC: 62271-202 etc.  
If there will be any other standard mandated by the Statutory Authority

**1.3 Rating**

The Transformer shall be continuously rated for a full load. Temperature rise not exceeding 55 deg.C by resistance method.

**1.4 Equipment**

Each Oil type transformer shall be fitted with all standard and special accessories and shall include but not limited to the following:

1. Primary side cable box with detachable gland plate to suit the number and size of the XLPE armoured cables specified and with intermediate disconnecting chamber.
2. HV Epoxy bushings
3. LV Bus-duct flange (relative orientation of primary and secondary side terminals shall be 180 degrees to each other)
4. Lifting lugs for core and coil assembly
5. Lifting device for Transformer
6. Under-carriage haulage with holes
7. Flat bi-directional rollers with locking arrangement
8. Marshalling box
9. Winding temperature Indicator with alarm and trip contact.
10. Oil temperature indicator
11. Earthing Terminals with lugs
12. Rating and diagram Plate
13. LV Neutral CT with secondary terminal box in marshalling box
14. Maintenance Instructions Manual

**1.5 Tap Changing Arrangement**

The transformer shall be provided with a off Load Tap Changing Gear, covering a total tapping range as mentioned in Data Sheet in steps of 2.5% to accommodate for a corresponding HV voltage variation so as to ensure a constant no load secondary voltage of 433V.

The On Load Tap Changing equipment shall be complete with:

- a. On Load Tap Changing Gear, mounted on to the transformer tank.
- b. Indoor type Remote Tap Changing Control Cubicle (RTCC) panel, fitted with Electronic Automatic Voltage Regulating Relay (AVR)

The On Load Tap Changing equipment shall be suitable for the following tap-change operations:

- a. Local Manual tap change operation, with cranking handle
- b. Local electrical tap change operation, with raise and lower switches or push buttons on the OLTC panel.
- c. Remote electrical, non-automatic independent / Group simultaneous tap change operation, with raise and lower switches or push buttons on RTCC Panel.
- d. Remote electrical, automatic tap change operation, with AVR. A PT of suitable ratio shall be provided on the LV side as a feedback signal to the AVR to effect automatic changeover without additional cost to the Employer.

#### **1.6 HV Terminal arrangement**

Terminal Box shall be provided suitable to receive 3C X 95 Sqmm A2xFY Cables

#### **1.7 LV Terminal arrangement**

A four pole cable box shall be provided suitable to receive 2-Runs x 3.5C x 300 Sqmm or bare flanges and a three pole plus neutral (TPN) Bus Duct.

If additional neutrals are required, these shall be brought out through an Outdoor Bare Bushing.

Care shall be taken in the installation of cable sockets and lugs.

The number of runs of cable, type and size shall be as per the Data Sheet.

#### **1.8 General Constructional Features**

All the materials used shall be of the best quality and of class most suitable for working under the conditions specified to withstand the variations of temperature and atmospheric conditions without distortion, deterioration or undue stresses in any part.

Pipes and pipe-fittings, screws, studs, nuts and bolts used for external connections shall be as per the relevant standards. Steel bolts and nuts exposed to the atmosphere shall be galvanized.

**All bolts and nuts shall be in metric sizes.**

Rating and terminal marking plates indelibly marked shall be provided. All label plates shall be of galvanized material.

All internal connections and fastenings shall be capable of operating under overload condition.

### **1.9 Painting**

The interior of the transformer tank and other chambers and internal structural steel work shall be cleaned of scale and dust by sand-blasting. These surfaces shall be painted with heat resistant and insulating varnish.

Exposed surfaces of the transformer shall be painted with weather proof paint of specified shade 631 of IS5 or any other required shade.

### **1.10 Design Features**

The transformer shall:

- 11.0 be capable of delivering the rated current at a voltage equal to 110% of the rated voltage without exceeding the limiting temperature rise.
- 12.0 be capable of operation continuously, in accordance with the applicable standard loading guide at its rated kVA and at any of the specified voltage ratios.
- 13.0 be complete with cable boxes designed and constructed to withstand without damage, the effects of external short circuits as per the specified Standards. Account shall be taken of the different forms of system faults that can arise in service such as line to earth faults and line to line faults associated with the relevant system and transformer earthing conditions.
- 14.0 The dynamic ability to withstand short circuit shall be demonstrated by tests or by reference to tests on identical transformers.
- 15.0 All rated parameters such as voltage ratios, impedance, regulation, load losses, and no load losses subject to the suppliers' guarantees shall be within the tolerances given in the applicable Standards.
- 16.0 The transformer windings shall be designed for Basic Impulse insulation Level not lower than those specified in IS:11171
- 17.0 The Dry type Transformers shall be provided with suitable protective sheet steel housing with easily removable sections/doors, having minimum IP20 degree of protection for the enclosure. The housing shall have ventilation louvers provided with punched steel plate and shall be supplied with suitable lifting lugs.

### **1.11 Tests**

The tests listed below shall be carried out on the transformer and shall be deemed to be included in the Contractor's scope.

- a. Routine tests as per IS.
- b. 2kV withstand test for all wiring circuits.
- c. Dimensional Check
- i) Visual
- g. Vector group

### **1.12 Data Sheet**



Rating	500 KVA
Installation	Sub- Station suitable
Type	Two Windings Oil type (ONAN)
Phase	3 Phase
Primary Voltage	11000V
Secondary Voltage	433 V
Tap changeover	Off Circuit Tap Changer
BIS Efficiency Level	Level 1 (as per latest BIS Specification 2022)
Tapping on windings HV/LV	HV winding
OFF load tap changer	-10% to + 5%, in steps of 2.5%
Winding connection	
H.V	Delta
L.V	Star Grounded
Winding material	Copper
Insulation Level (kV/Kvp)	28/75
Class of Insulation	Class A (Minimum)
Vector Group	Dyn 11
Percentage Impedance	As per IS
Fault Level HV system	350 MVA
Transformer Neutral	Effectively earthed through an additional bushing on LV side
Transformer Terminations:	
Primary side	XLPE 11kV Cable Termination
Secondary side	To suit Aluminum conductor Armored cable

### **1.13 Installation of Transformer**

Transformer shall be installed and commissioned as per the requirements of IS 1886 and IS 10028.2 (latest edition) and as per regulations of local authorities.

### **1.14. Handling**

Transformer and all its accessories shall be handled carefully in its upright position as indicated on the packing case. Lifting lugs and jacking pads shall be used for lifting of the transformer. While using jacking pads utmost care shall be taken in proper application of jacks.

Where transformer is dragged or pulled on sleeper or rollers the traction eyes provided at the bottom frame shall be used with suitable wire ropes and shackles.

### **1.15 Storage**

Transformer shall be stored under shelter in a place free from fire and explosion hazards.

### **1.16 Cabling and Earthing**

Cables shall be terminated at cable boxes only after IR values are measured and found to be in order. Cable termination shall be carried out with utmost care and H.T. cable box shall be filled with compound after jointing and termination. The neutral of the transformer shall be connected to two separate and distinct earth stations through a double run of copper flats of suitable size. The body of the transformer shall also be provided with effective earthing as per the drawings and specifications.

### **1.17 Pre-commissioning Tests**

The Consultant / Client shall witness the pre-commissioning tests and the erection of the transformer. (i) Insulation resistance Test (ii) BDV test of Transformer Oil (iii) Winding resistance Test (iv) Vector Group test (v) Polarity Test (vi) Testing of all relays and tripping circuit. Arrangement of all the necessary testing kit required will be under vendor's scope vendor

The Consultant / Client will perform a general inspection of bolts, nuts and checking of all accessories.

### **1.18 Mounting and Erection**

The transformer shall be lifted by lugs or shackles or by any other suitable means (such as dragging on rollers) and mounted on the rails which are embedded in concrete prepared for the purpose. Care shall be taken to see that the transformer is not tilted during lifting and erection of the transformer. The rollers shall be checked to prevent movement of the transformer after being positioned on the rails. Adequate and necessary clearance from walls, and other equipment, shall be provided as indicated in the drawing and as per regulation of local inspection authorities. After positioning of the transformer stoppers are to be welded to the rails so that transformer is finally fixed at its place.

All the accessories and parts shall be mounted on the transformer. Tighten all bolts and nuts.

Phasing out tests shall be performed with 415 Volts applied to HV windings and voltage across LV winding checked.

Measurement of neutral and body earth resistance shall be performed using an earth testing megger. The values shall not exceed 1 to 2 Ohms respectively.

The transformer shall be charged only after the above tests are conducted and approval of local authorities is obtained. The earthing of neutral and body of the transformer shall be done as per I.E. regulations and the requirements and of local authorities.

However, general mode of earthing arrangement is indicated on the drawings. The Contractor shall supply all the material and labour for erection and commissioning of the transformer.

### **1.19 Warranty and Maintenance**

The installation shall be guaranteed against faulty workmanship for **minimum of one year from the date of practical completion**. All faulty workmanship shall be replaced and restored to full operation at no cost to the Employer within the guarantee period.

Manufacturer's guarantees and warranties shall be obtained as agreed. The warranty period shall be for eighteen months commencing from the date of installation or twelve months from the date of practical completion, whichever is the first to occur.

**CHAPTER 2****I SUBSTATION EQUIPMENT :****1. Air-Break GO-DO Switch with Fuse:**

- 1.1 Quantity : 1no Outdoor & 1no part of the Sub-Station (as per Schedule) DP Mounted
- 1.2 Installation : 1no Outdoor & 1no Sub-Station suitable
- 1.3 Nominal system voltage : 11 KV, 3 phase
- 1.4 Highest system voltage : 12 KV, 3 phase
- 1.5 System frequency : 50 Hz +/- 5%
- 1.6 Details of neutral earthing : Solidly earthed
- 1.7 Rated current : 200A
- 1.8 Rated insulation level : 12 KV
- 1.9 Rated symmetrical short circuit breaking capacity : 350 MVA for 11KV
- 1.10 Operating duty : As per IS:2516 (part 1 sec.3) or latest revision.  
The breaker is not intended for rapid auto- reclosing.
- 1.11 Type of breaker : Air-Break GO Switch
- 1.12 Closing mechanism : Manual Gang Operated
- 1.13 Tripping mechanism : Manual Gang-operated
- 1.14 Fittings : Necessary accessories, insulators bushings etc.
- 1.16 Mechanical & Electrical : Nil

**2. Current Transformers**

- 2.1 Quantity : 1no
- 2.2 Type : Indoor epoxy resin cast type suitable for effectively earthed system.
- 2.3 Rated voltage : 11 KV, 3 phase
- 2.4 Rated primary current : As given in the Schedule
- 2.5 Rated secondary current : 5 Amp.

- 2.6 No. of secondary : Two - 1 for metering; 1 for Protection
- 2.7 Rated burden : 15 VA for each winding
- 2.8 Insulation level : 75KV
- 2.9 Short time current : 18.1KA min.for 1 second rating
- 2.10 Class of accuracy : 0.5 – Metering 5 p - Protection
- 2.11 Reference standard : IS 2705

## 2A. Potential Transformers

- 2A.1 Quantity : As per schedule
- 2A.2 Type : Indoor, epoxy resin cast.
- 2A.3 Rated Primary voltage : 11/ SQRT3 KV
- 2A.4 Rated secondary voltage : 110/ SQRT3 V
- 2A.5 No. of windings : One
- 2A.6 Accuracy class : 0.5
- 2A.7 Rated burden : 100 VA for main winding
- 2A.8 Impulse withstand : 28 KV rms (induced voltage)  
75 KV peak for 11KV
- 2A.9 Reference standard : IS: 3156

## 3. Relays

3.1 The following shall be provided on the panel.

A) Metering :

i/ 1 No. Ammeter, Digital type, suitable for operation from 5Amp. CT secondary, 96 mm sq. flush mounting. Selector switch shall be provided with each ammeter. **(For all Breakers)**

ii/ 11KV Digital load manager with RS485 protocol, class 0.5 Accuracy (Make similar to ENERCON) with Modbus connectivity

iii) 1 No. Voltmeter, Digital type, along with PT of 11000/110V Selector switch shall be provided with each Voltmeter.

iv) Digital PF Meter

B) Protections

i/ 1 No. - Three Element IDMTL Over-current cum Earth Fault Relay (EEMake CDG 31) Horizontal version in flush pattern, drawout cases. **( For all Breakers)**

ii/ Master trip relay type VAJH13 of EE make. **( For all Breakers)**

C) Auxiliary relays(VAX 31)

i/ Suitable relays of EE for tripping with "Auto trip" indicating lamp.

ii/ Indicating lamps for ON-OFF position of the circuit breaker.

iii/ Breaker spring charged

iv)/ R , Y , B Indications

v)/ Trip Circuit Healthy

vi)/ Buchholtz,s Alarm & Trip, Oil Temperature Alarm & Winding Temperature Alarm

4.Fault Annunciation (12 Windows for Transformer Breakers & 4 windows for Incomer Breaker & Outdoor Breakers)

Suitable scheme shall be provided for annunciating trip & non-trip faults with separate annunciators and lamps with necessary relays and push buttons for accept & reset. High speed trip relay type VAJH13 of EE shall be used for tripping circuit breaker. The general Specifications of the Annunciator are given below.

i) Face : Translucent Glass / Plastic Window with Engraving

ii)Operation :

a) On Occurrence of Fault : Audible Hooter and flashing of Indication lamp.

b) Acknowledge Button Pressed : Audible hooter and flashing of Indication lamp shall stop. Indication lamp shall become steady.

c) Reset Button Pressed : If Fault is removed then Indication lamp shall go off

d) Test Button Pressed : All lamps shall Glow.

iii) Monitoring : Power supply to Annunciator shall be monitored.

iv) Indications : The Indications shall be provided for following  
 Incomer VCB : Breaker On/ Breaker Off/ O.C Trip/ E/F Trip  
 Outgoing VCB: Breaker On/ Breaker Off/ O.C Trip/ E/F Trip,  
 Buchholtz's alarm & Trip, Winding Temp alarm & Trip

## II. INSPECTION AND TESTING SCHEDULE AT MANUFACTURE'S WORKS

The supplier shall offer the above equipment for following inspections / Tests which may be witnessed by the purchaser / purchasers representatives. The supplier shall be responsible for providing instruments of correct range and accuracy that may be required for carrying out these tests. All tests shall be carried out as per relevant Indian standard specifications or other approved International standard specifications.

## 1. **CIRCUIT BREAKER**

### 01 Visual Inspection

- a) Layout of component dimensions bus bar mounting arrangements and bill of materials as per the approved drawings.
- b) Checking tightness of joints, phase markings, electrical clearance etc.
- c) Routing of control wiring and power cables, their termination etc.
- d) Verification of test certificates for bought out components.
- e) General workmanship, finish, interchangeability, compartmentalization, identification, tags etc.
- f) Check of earth arrangements, provision of shutters and mechanical interlock arrangement.
- g) Verification of Conformity to Engineering Standards

### 02 Routine Tests

- a) Measurement of resistance of main circuit.
- b) Operation tests including measurement of closing & opening time on oscilloscope.
- c) One minute power frequency voltage dry withstand test on circuit breaker.
- d) One minute power frequency voltage dry withstand tests on auxiliary circuits.

Routine tests mentioned above shall be carried out as per IS:2516 (part -II / sec.2) latest revision.

## 2. **CURRENT TRANSFORMER**

### 01 Visual Inspection

- a) Dimensional check and general arrangement.

b) Terminal marking.

c) Name plate details.

#### 02 Routine Tests

a) Determination of error according to the requirements of appropriate accuracy class.

b) Verifications of terminal markings and polarity.

c) High voltage power frequency test on primary and secondary windings.

Routine tests shall be carried out as per IS:2705 (part-I) - latest revision.

### 3. **RELAYS**

#### 01 Visual Inspection

- For layout components, bus mounting, compartmentalization etc. as approved drawings.
- For checking of dimensions, electrical clearances, phase marking, tightness of joints etc. p73
- General workmanship, finish identification labels, routing and termination of control and power wires / cables etc.
- Verification of test certificates for bought out components.

#### 02 Running Tests

- High voltage power frequency withstand test
- Insulation resistance test
- Functional test including simulation test on relay.

#### III) Manuals & Guarantee Cards :

The successful Contractor shall submit all the Operation and Maintenance Manuals for all Major equipment (in 3 Sets)



**CHAPER 3****POWER CONTROL CENTRES****1.0 Scope :**

This specification is to cover the requirement of design, supply, installation, testing and commissioning of LT power control centres / main switch boards with all components, Instruments, fittings and accessories for efficient operation without any trouble.

**2.0 Standards :**

The PCC specified herein, unless otherwise stated shall conform to the relevant and latest revisions of Indian standards and Indian Electricity Rules.

**3.0 Design and construction :**

3.1 Design requirements : The power control centres shall be suitable for operation on 440volt, 3 phase,4wire 50HZ system to withstand a short circuit level of 50 KA RMS symmetrical.

The PCC shall be designed for operation in high ambient temperature upto 45 degrees centigrade and high humidity upto 95% and tropical atmospheric conditions. Means shall be provided to facilitate ease of inspection, Maintenance and Servicing.

**3.2 Constructional requirements :**

The power control centre shall be of

- i) Metal clad, cubicle, indoor, free standing type suitable for Mounting on Built up Trenches with U Channels of adequate size.
- ii) Made up of the requisite vertical sections, which when coupled together shall form continuous dead front switch board.
- iii) Dust and damp protected, the degree of protection shall be better than IP - 54 as specified in IS-2147.
- iv) Readily extendable on both sides by the addition of vertical sections after removal of the end covers.
- v) Single front construction with the circuit breaker feeder and switch fuse feeders suitable for operation from the front of the panel.

The PCC shall have the feeder ratings as per the schematic diagrams enclosed with the schedule and constructed only of materials capable of withstanding the mechanical, electrical and thermal stresses as well as the effects of humidity, which are likely to be encountered in normal service.

3.3 Vertical Sections :Each vertical section shall comprise a front framed structure rolled folded sheet steel channel section of minimum 2 mm thickness rigidly bolted together. This structure shall house the components contributing the major weight of the equipment such as circuit breaker, switch fuse units, main horizontal busbars, vertical risers and other front mounted accessories. The structure shall be mounted on a rigid base frame of folded sheet steel of minimum of 2.5 mm thickness and 100mm height. The design shall ensure Structural stability during Transit and also during Operation after Commissioning Suitable cable chamber housing the cable end connections and power / control cable terminations shall be provided. The design shall ensure generous availability of space for ease of installation and maintenance of cabling and adequate safety for working in one vertical section without coming into accidental contact with live parts in the adjacent section.

A cover plate at the top of the vertical section shall be provided with necessary ventilating arrangements. Any aperture for ventilation shall be covered with a perforated sheet having less than 1 mm diameter perforations to prevent entry of vermin.

#### 3.4 Sheet Steel Cubicle :

3.4.1 The sheet steel cubicle shall be designed in fully segregated multitier formation. Each cubicle shall have hinged front access door with easy operating fasteners. All the doors and covers shall be heavily gasketed to make the compartment dust tight. Each cubicle shall have a covering at the bottom to make a dust and vermin proof construction. Door hinges shall be of concealed type.

The cubicle shall be of minimum 2 mm thick sheet steel. Sheet steel shrouds and partitions shall be of minimum 1.6 mm thickness. All sheet steel work forming the exterior of switch boards shall be smoothly finished, leveled and free from flaws. The corners shall be rounded. The minimum Thickness of Gland plates shall be 3mm.

3.4.2 The apparatus and circuits in the power control centers shall be so arranged as to facilitate their operation and maintenance at the same time to ensure the necessary degree of safety. Apparatus forming part of the control centers shall have the following minimum clearance.

- i) between phases - 25 mm,
- ii) between phase and neutral - 25 mm,
- iii) between phases and earth - 25 mm,
- iv) Between neutral and earth - 19 mm,

When, for any reason, the above clearances are not available suitable insulation shall be provided. Clearance shall be maintained during normal service conditions. Creepage distances shall comply with those specified in relevant standards.

3.4.3 All insulating materials used in the construction of the equipment shall be non hygroscopic duly treated to withstand the effect of high humidity, high temperature and tropical ambient service conditions.

3.4.4 Functional units such as circuit breakers and fuse switches shall be arranged in multitier formation, except that not more than One air circuit breaker housed in a single vertical section.

3.4.5 Metallic/insulated barriers shall be provided within vertical sections and between adjacent sections to ensure prevention of accidental contact with :

- i) Main busbars and vertical risers during operation, inspection or maintenance of functional units and front connected accessories.
- ii) Cable terminations of one functional unit, when working on those of adjacent unit/units.

3.4.6. All doors / covers providing access to live power equipment / circuits shall be provided with tool operated fasteners to prevent unauthorized access.

3.4.7 Provisions shall be made for permanently earthing the frames and other metal parts of the switchgear by two independent connections.

#### 3.5 Metal treatment and finish :

All steel works used in the construction of the switch boards shall have undergone a suitable rigorous metal treatment process so as to remove oxide scales and rust formation and to facilitate a

durable coating of the paint on the metal surfaces and also to prevent the spreading of rust, in the event of the paint film being mechanically damaged.

Two coats of Anti Corrosive primer followed by a finishing coat of Epoxy spray power coating of the shade 631 of IS : 5 (i.e. Siemens grey) shall be given. The total thickness of paint shall not be less than 25 micron.

### 3.6 Bus Bars :

3.6.1 The busbars shall be housed in non-segregated sheet steel compartments in the cubicle at convenient locations with provision for access to the buses from the front of the panel. The busbar shall be suitably braced with DMC/SMC supports to provide a through fault withstand capacity of 50 KA RMS symmetrical for one second and a peak short circuit withstand capacity 150 KA minimum. The neutral as well as the earth bus shall be capable of withstanding the above fault level.

3.6.3 Large clearance and creeping distance shall be provided on the busbar system to minimize the possibility of a fault.

3.6.4 High tension bolts, nuts and spring washers shall be provided at all busbar joints.

3.6.5 The continuous rating of the busbar shall be 125% of the rated current. Maximum temperature of the bus and the connections shall not exceed 85 degrees centigrade. The busbars shall be of liberal design for the required current rating i.e. 0.8Amp/sq.mm.

The main phase busbars shall have continuous current rating throughout the length of each power control centre and the neutral busbars shall have continuous rating of at least 50% of phase busbars.

3.6.6 Connections from the main busbars to functional circuits shall be arranged and supported so as to withstand without any damage or deformation, the thermal and dynamic stresses due to short circuit currents.

All busbars and tapings shall be provided with color coded sleeves for phase identification.

All joints/tapping points of the buses shall be suitably shrouded to prevent accidental contact.

### 4.0 Circuit Breakers :

#### 4.1 General :

4.1.1 Circuit breakers shall be of triple pole / four pole, air break, MCCB with rotary handle, as given in the schedule of work and comply with the requirements of relevant IS with latest amendments and shall have the following :

i) A short circuit breaking capacity of not less than 50 kA RMS at 415 volts, 50 Hz AC.

ii) A short circuit making capacity of 105 KA.

iii) Electrical overload performance at 6 times the rated current, 100% of the rated voltage as recovery voltage at 0.5 power factor.

v) Dielectric test of 2.5 KV applied for one minute on main circuits.

4.1.2 The Molded case circuit breakers shall be fitted with necessary bus spreader on each pole designed to permit proper connection. Interphase barriers shall be provided to prevent flash over between phases.

4.1.3 Arcing contacts shall be of hard wearing material copper tungsten or silver tungsten and shall be easily replaceable. Main contacts shall be of silver plated copper of high pressure type and generous cross section.

#### 4.2 Operating Mechanism :

The operating mechanism shall be of robust design, with minimum number of linkages to ensure maximum reliability. Manually operated circuit breakers shall be provided with spring operated closing mechanism which are independent of speed of manual operation. Electrically shall be independent of the motor which shall be used slowly for charging the closing spring.

The operating mechanism shall be such that the breaker is at all times free to open immediately when the trip coil is energized.

Mechanical operation indicators shall be provided to show open and close positions of the breaker. Electrically operated breakers shall be additionally provided with mechanical indications to show charged and discharged conditions of the charging spring.

Means shall be provided for slow closing and opening of the breaker for maintenance purposes, and for manual changing and closing of electrically operated breakers during emergencies,

#### 4.3 Protection :

Provisions shall be available for fitting a minimum of five trip devices - three over current, as shunt trip and an under voltage release or two over current and earth fault release, a shunt trip and one under voltage release. The breakers shall be of the shunt or series trip type as specified in the schedule.

#### 4.4 Housing of Circuit Breaker :

Circuit breakers shall be individually housed in sheet metal castle provided with hinged doors. The breaker along with its operating mechanism shall be mounted on a robust carriage moving on guide rollers with in the castle. Isolating contacts for both power and control circuits shall be of robust design and fully self aligning. The assembly shall be designed to allow smooth and easy movement of the breakers within its castle.

#### 4.5 Interlocking :

4.5.1. The moving portion of the circuit breaker shall be interlocked so that :

i) It shall not be possible either to isolate it from the connected position, or to plug it in from the Isolated position with the breaker closed.

iii) It shall not be possible to open the hinged door of the castle unless the breaker is in off position.

iv) Inadvertent rotation of the rotary handle of MCCB too far beyond the supporters is prevented by the suitable stops.

4.5.2 Provisions shall be available for the padlocking of the circuit breaker access flame in any of the positions.

4.5.3 Automatically operated safety shutters shall be provided to screen the fixed isolating contacts when the breaker is drawn out from the castle.

4.5.4 The moving portion of the circuit breaker shall be provided with a heavy duty, self aligning earth contact, which shall make before and break after the main isolating contacts during insertion into with drawl from the service position of the breaker. Even in the isolated position positive earthing contact should exist.

4.5.5 Auxiliary switches directly operated by the breaker operating mechanism and having 4 'NO' and 4 'NC' contacts, shall be provided on each breaker. The auxiliary switch contacts shall have a minimum rated thermal current of 10 amps.

## 5.0 **Switch Fuse Units :**

### 5.1 General :

The switch fuse units shall be of the load break, heavy duty, cubicle type conforming to the requirements IS and of AC 23 duty.

The switch fuse units shall be capable of withstanding the thermal and electromagnetic stresses caused by short circuits for the time of operation of the associated fuse links.

The switch fuse units shall be double break and have quick make break mechanism, designed to ensure positive operation.

All switch fuse contacts shall be silver plated at the current transfer surfaces.

The unit shall be provided with a front operating handle. The ON and OFF positions of the switch handle shall be clearly marked.

### 5.2 Interlocks and Safety :

Interlocks shall be provided so as to prevent opening of the unit door when the switch is in the ON position and also to prevent closing of the switch with the door not properly secured. It should however be possible for a competent person to operate the switch shall be suitable for locking with switch in the OFF position by means of a padlock.

The interior arrangement of the switch fuse unit shall be such that all 'Live' parts are shrouded.

### 5.3 HRC Fuses :

The switch fuse units shall be fitted with High rupturing capacity cartridge fuse links with ISI marking for a rupturing capacity of not less than 80 KA at 415 volts. The fuse links shall be mounted in a drawout carriage, thus ensuring positive isolation of contacts during fuse replacements.

## 6.0 **Current Transformers.**

Current transformers shall comply with the requirements of relevant latest amendment IS. They shall have ratios, outputs and accuracy as specified in the schedule.

## 7.0 **Indicating / Integrating Meters :**

All indicating instruments shall be of flush mounted industrial pattern conforming to the relevant latest amended IS. The instrument shall have non reflecting bazels, clearly, divided and indelibly marked scales, and shall be provided with zero adjusting devices in the front. Integrating instruments shall be of flush mounted switch board pattern complying with the requirements of relevant latest IS.

**8.0 Relays** :Circuit breakers shall be provided with integrally mounted relays as specified in the schedule.

The relay shall have a set of three phase characteristics, which shall be adjustable over a wide range, to provide discrimination between a multiplicity of devices. The relay shall be able to provide over current and earth fault protection. Also UV and Shunt trip Relays are to be provided.

**9.0 Control switches/Selector switches** :Control switches/Selector switches shall be of the heavy duty rotary type, with plates clearly marked to show the operating position. They shall be of semi-flush mounted type with only the front plate and the operating handle projected.

Circuit breakers control switches shall be of the spring return to neutral type.

#### **10.0 Indicating lamps and push buttons :**

Indicating lamps shall be of the LED type of low watt consumption, provided with series resistors where necessary and with translucent lamp covers. Bulbs and lenses shall be easily replaceable from the front.

Push buttons shall be of the momentary contact, push to actuate type fitted with self-reset contacts and provided with plates marked with its junctions.

#### **11.0 Cable terminations :**

Cable entries and terminals shall be provided in the switch board to suit the number, type and size of aluminum conductor power cables and copper conductor control cables as indicated in the schematic diagram.

Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided, with the position of cable glands and terminals such that cables can be easily and safely terminated.

Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

Cable riser shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

Cable sockets shall be of copper and of the crimping type/soldering as required.

**12.0 Control wiring** :All control wiring shall be carried out with 1100/650 V grade single core Copper cable conforming to relevant IS having stranded copper conductors of minimum 2.5 sq.mm. section for CT Wiring and 1.5sq.mm for Control/indicating Instruments.

Wiring shall be neatly bunched, adequately supported and properly routed to allow easy access and maintenance.

Wires shall be identified by numbered ferrules at each end. The ferrules shall be of the ring type of non-deteriorating material. They shall be firmly located on each wire so as to prevent free movement.

All control circuit fuses shall be mounted in front of the panel and shall be easily accessible.

#### **13.0 Terminal blocks and lables :**

Terminal block shall be of 500 volts grade of the stud type. Insulating barriers shall be provided between adjacent terminals.

Terminal block shall have minimum current rating of 10 amps and shall be shrouded.

Provisions shall be made for label inscriptions.

Labels shall be made of anodized aluminum, with white engraving on black background. They shall be properly secured with fasteners. Danger plate of size and descriptions as recommended in the relevant IS shall be provided on the PCC.

#### 14.0 Tests :

i) The power control centre shall be completely assembled, wired, adjusted and tested for operation under simulated conditions to ensure correctness of wiring and interlocking and proper functioning of all components.

ii) Each power control centre and components shall be subjected to standard routine tests as per applicable clauses of relevant standards.

iii) All current carrying parts and wiring of power control centre shall be subjected to power frequency voltage withstand test.

15.0 **Drawings** :After the award of the contract the contractors shall submit three copies of the Sunstation drawings for approval of the Department. The detailed drawing should contain follows:

i) Outline dimensional drawing of the PCC showing the general arrangement indicating the following :

- a) Busbar clearances;
- b) power and control cable entry points;
- c) Configuration of busbars;
- d) Details of support insulations and spacings;
- e) Outgoing power cable termination arrangements.

ii) Single line diagram of power control centre showing Protection, Metering etc.

iii) Cubicle wiring diagram.

iv) List of Firements with Ratings & makes / Models

#### 16.0 Installation Testing and commissioning :

The power control centre shall be installed over the cable trench/cable pit using suitable size of MS channel including grouting of the channel with necessary bolts and nuts. Proper earthing of PCC shall be done using two independent copper/GI strip of sizes as indicated in the schedule. The channel shall be painted with one coat of red oxide primer and two coats of anticorrosive enamel paint of proper shade as directed by the Engineer-in-charge.

The pre-commissioning tests as required shall be done and the PCC shall be commissioned.

## **CHAPTER 4 LAYING OF CABLES**

### **1.0 Scope :**

This specification is intended to cover the requirements of installation and energizing of PVC/XLPE/PILCDSTA power cables including jointing of cables.

### **2.0 Standards :**

The power cable and its fixing accessories shall comply with the latest relevant Indian Standards and National Electrical Code.

### **3.0 Laying of Cables :**

#### **3.1 General :**

3.1.1 Before the commencement of cable laying, it shall be ensured by the Engineer-in-Charge that only ISI marked cables are used. It shall be the responsibility of the contractor to check the soundness and correctness of the size of the cable while taking delivery of the cable from stores. Any defect noticed shall be brought to the notice of the issuing authorities immediately. If any defects is noticed after the cable is laid or during the process of laying, it shall be brought to the notice of the Engineer-in-Charge and upon his satisfaction, that the cable is not damaged due to bad handling, it will be the entire responsibility of the contractor to retrieve the cable already laid and return the defective cable to store and take fresh length of the cable from the store and relay the same.

3.1.2 The material such as bricks, sand, cable route markers, RCC slab of best quality as approved by the Engineer-in-Charge only shall be used for cable laying works.

3.1.3 The contractor shall provide all the necessary labour, tools, plants and other requisites at his own cost for carrying out pumping of water and removing of water from trenches, if any, where required.

3.1.4 Installation shall be carried out in a neat, workman like manner by skilled, experienced and competent workman in accordance with standard practices.

3.1.5 While laying the cable care shall be taken to avoid formation of kinks and also damage to the cable. In the case of cable bends, it shall not have bent radius lesser than 20 times the overall diameter of the cable.

3.1.6 A cable loop of about five meters length and as directed by the Engineer-in-Charge / SBI shall be provided at the following locations.

- a) Near the termination points
- b) Near to the straight through joint

3.1.7 The method of cable laying and routing of cables, shall in every case be as directed by the Engineer-in-Charge / consultant / SBI. Total length of buried cable must be protected by Hume pipe.

3.1.8 Whenever cable passes through hume pipes/GI pipes embedded across the wall in a building, both the ends of the pipe shall be suitably sealed.

3.1.9 Identification tags indicating the size of the cable and feeder designation shall be securely attached at both ends of the cable. Such tags shall also be attached to the cable at intervals of 50 Mtrs. The materials of the tag shall be of either 12 SWG GI sheet. In case of plastic, the details have to be engraved and incase of GI sheet, the details should be punched. Cable route markers shall be provided at the intervals of 200 M with a minimum of one number route marker. The details of the



route makers shall be as per the drawing. At the locations of straight through joints, necessary joint-markers shall be provided.

3.1.10 When cable runs vertically, it shall be clamped on mild steel flats or angle iron fixed on walls and are spaced at such intervals as to prevent buckling of the cables. All steel work shall be painted with a coat of red oxide and thereafter finished with suitable anticorrosive paints.

### **3.2 Cable laid in ground :**

3.2.1. All MV cables (up to 1.1 KV) shall be laid at a minimum depth of 0.75 M & HT cables (1.1 KV to 11 KV) shall be laid at a depth of 1.0 M when laid in ground. When cable pass through roads, nallahs etc. they must be protected by either hume pipe or GI pipe of suitable dimensions.

3.2.2. Excavations of trenches shall be carried out as indicated in the drawing. The width of the trench at the bottom shall be 0.4 M for one cable. In case the total number of cables laid in trenches is more than one, then the width shall be such that the spacing between the cables is maintained as shown in the drawing. Before the cable is laid in the trench the bottom of the trench shall be cleared from stones and other sharp materials and filled with sand layers of 75 mm, as shown in the drawing.

3.2.3. While removing the cable from the drum, it shall be ensured that the cable drum is supported on suitable jacks and the drum is rotated to unwind the cable from the drum. The cable should never be pulled while unwinding from the drum. It shall be ensured that the cables are run over the wooden rollers placed in the trench at intervals not exceeding 2 M.

3.2.4. After placing the cables in the trench shall be filled in layers ensuring that each layer is well rammed by spraying water and consolidated. The extra earth shall be removed from the place of trench and deposited at a place as directed by the Engineer-in-Charge/consultant / SBI.

3.2.5. The HT cables shall be provided with RCC slabs (marked HT cable) on top as protection.

3.2.6. Complete length of HT cable buried should be protected by Hume pipe of adequate size.

### **3.3 Cables laid in built up trench :**

3.3.1. Before the commencement of cable laying the cable trench shall be drained properly. Cable shall be laid as explained in item 3.2. Cable shall be properly clamped to the cable supports, which are provided in the cable trench. The method of clamping shall suit the size of the cable and the cable supports, which are provided in the cable trench. The method of clamping shall suit the size of the cable and the cable supports, as directed by the Engineer-in-Charge / SBI.

Care shall be taken while removing and replacing the trench cover slab. It is the responsibility of the contractor to make good any damaged trench covers.

### **3.4. Cable terminations and straight through joints :**

3.4.1. All cable jointing materials such as straight through joint boxes, cable compound, cable lugs, insulation tapes etc. shall be of best quality and as approved by the Engineer-in-Charge / SBI.

3.4.2. Cable glands for strip / armoured cables shall include a suitable armour clamp for receiving and securely attaching the armouring of the cable in a manner such that no movement of the armour occurs when the assembly is subjected to tension forces.

The cable gland shall not impose on the armouring, a bending radius not less than the diameter of the cable. The clamping ring shall be solid and of adequate strength.

Provision shall be made for attachment of an external earthing bond between the metallic covering of the cable and the metallic structure of the apparatus to which the cable box is attached.

### **3.5 Sealing boxes :**

3.5.1 A sealing box, irrespective of the class of insulation of the cable for which it is intended, shall be so designed that it may be filled with compound after connecting the cable specially in flame proof/hazardous areas.

3.5.2 All parts and connection for attaching the armouring, wiping or clamping the metallic sheath in a sealing box, shall be easily accessible. This may be achieved by splitting the box or by providing a suitable cover or other such means.

3.5.3 The joints in the box shall prevent leakage of the compound.

3.5.4 Provision shall be made to ensure that the cores of the cable are efficiently sealed to prevent moisture penetrating along the strands or the cable conductors.

3.5.5 The sealing box shall be provided with compound filling orifices with suitable covers or plugs of size that will permit easy pouring of the compound.

In all cases where screwed plugs are used, one or more air vents shall be provided to ensure complete expulsion of air and total filling of the box with compound.3.5.6 The box shall be of sufficient length to allow for manipulation of the insulated cover without damage to them or to the insulation.

3.5.7 A sealing box intended to be attached directly to the apparatus shall be designed such that the box together with the connected cable may be detached from the apparatus without disturbing the sealing compound.

3.5.8 Cable sealing and dividing boxes intended for use in the flame proof areas shall comply additionally with the relevant requirements of IS:2148-1968.

### **4.0 Testing**

Once cable is laid, following tests shall be conducted in the presence of Engineer-in-Charge, before energizing the cable:

- i) Insulation resistance test (Sectional and Overall).
- ii) Sheathing continuity test.
- iii) Continuity and conductor resistance test.
- iv) Earth test.
- v) High voltage test.

Tests conducted shall be as per Indian Standards and National Electrical Code.

**CHAPTER 5****EARTHING****1.0 SCOPE:**

This specification is intended to cover the requirements of supply, installation, testing and commissioning of

- a) Pipe earthing
- b) Plate earthing
- c) Strip earthing

**2.0 STANDARDS:**

Earthing installations shall conform to the Indian Electricity Rules - 1956, as amended from time to time and IS 3043-1989 "code of practice for earthing", with latest amendments.

**3.0 Earth electrode arrangement :****3.1 Pipe electrode :**

3.1.1 Electrode shall be made of CI pipe having a clean surface and not covered with paint, enamel or poorly conducting material. Galvanized pipe shall not be smaller than 100 mm ID. Earthing with pipe electrode shall be done as per the details indicated in IS : 3043/87 .

3.1.2 Electrodes shall be embedded below permanent moisture level.

3.1.3 The length of pipe electrodes shall not be less than 3.0m. if rock is encountered, pipes shall be driven to a depth of not less than 3.0 m with suitable inclination. Pipe shall be in one piece and deeply driven.

3.1.4 To reduce the depth of burial of an electrode without increasing the resistance, a number of rods or pipes may have to be connected together in parallel. The distance between two electrodes in such a case shall not be less than twice the length of the electrode. The earthing lead shall be connected by means of a through bolt, nuts and washers and cable socket.

**3.2 Plate electrode :**

For plate electrodes, minimum dimensions of the electrode shall be as under.

3.2.1 GI plate electrode : 600 x 600 x 6 mm thick.

3.2.2 Copper plate electrode : 600 x 600 x 3.15 mm thick

3.2.3 The electrode shall be buried in ground, with its faces vertical and top not less than 3.0 M from the surface of the ground.

3.2.4 Earthing using plate electrode shall be done as per details, indicated in drawing.

3.2.5 Plate electrodes shall have a galvanized iron water pipe, buried vertically and adjacent to the electrode. One end of pipe shall be atleast 5 cm above the surface of the ground and need not be more than 10 cm. The internal diameter of the pipe shall be atleast 19 mm. The length of pipe under the earth's surface shall be such that it shall be able to reach the center of the plate. The earthing lead shall be securely bolted the plate with two bolts, nuts, check nuts and washers.

**3.3. Strip or conductor electrodes :**

3.3.1. Strip electrode shall not be smaller than 25 x 1.6 mm, if of copper and 25 x 3 mm, if of galvanized iron and steel. If round conductors are used as earth electrodes, their cross sectional area shall not be smaller than 3 sq.mm , if of copper and 6 sq.mm. if galvanized iron and steel.

3.3.2. Conductor shall be buried in trenches not less than 0.5 m deep.

#### 4.0 General :

i) All materials used for connecting the earth lead with electrode shall be of GI in case of GI pipe and GI plate electrodes, and of tinned brass in case of copper plate electrode. The earthing lead shall be securely connected at the other end to the main board.

ii) The earthing lead from electrode onwards shall be suitably protected against mechanical injury by routing the earth wire / strip through a suitable size of GI pipe.

iii) All medium voltage equipments shall be earthed by two separate and distinct connections with the earth. In the case of high and extra high voltages, the neutral points shall be earthed by not less than two separate and distinct connections with the earth, each having its own electrode at the generating station or substation.

iv) All materials, fittings etc. used in earthing shall conform to Indian standard specifications wherever they exist. In the case of materials for which Indian standard specifications do not exist, such materials shall be approved by the Engineer-in-Charge.

v) The earth electrode shall be kept free from paint, enamel and grease.

vi) It shall be ensured that similar materials for respective earth electrodes and earth conductors are used.

vii) Earth electrode shall not be installed in proximity to a metal fence.

viii) Copper/GI strip shall be connected to the respective earth electrodes, either by brazing or welding respectively. The Copper/GI strip shall be jointed only either by brazing or by riveting at the end of over lapping portions. The over lap shall not be less than 50 mm.

ix) Earthing clamps used for supporting earth strips shall be made of such materials so as to avoid bimetallic action between strip and clamps.

#### 5.0 Testing :

The earth resistance of each electrode shall be measured by using a reliable and calibrated earth megger and the value shall be as per IS/IE rules .

**LIST OF I.S.CODES FOR INTERNAL ELECTRIFICATION INSTALLATIONS****B.**

1.	EXTERNAL ELECTRIFICATION wiring installation (system voltage not exceeding 650V)	IS 732 – 1989
2.	Graphical symbols used in Electro-technology art-XI-Electrical Installation buildings	IS 2032-1969
3.	Fire safety of buildings (General) Electrical Installation	IS 1646-1961
4.	3 pin plugs and sockets	IS 1293
5.	Earthing.	IS 3043-1966
6.	Rigid steel conduits for electrical wiring	IS 9537-PII-1989
7.	Fittings for electrical wiring	IS 2667-1964
8.	Flexible steel conduits electrical wiring	IS 3430-1966
9.	Accessories for rigid steel conduit insulated cables	IS 3837-1966
10.	General and safety requirements for electric lighting fittings	IS 1913-1969
11.	Protecting of buildings and allied structures against lightning	IS 2309-1967
12.	Busbar ratings	IS 8084-1976
13.	On load change over switches	IS 4064-1978

**Details of Insurance Policies**

Type of Policies	Name of Insurance	Amount (Rs.)	Policy No.	Validity
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CAR Policy including  
3<sup>rd</sup> Party Liability

Workmen's Compensation

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Remarks :

1. This is only on-account payment and is not to be interpreted either as approval of work materials brought or affixed at site or for that matter approval of any sort
2. The quantum of work done and materials delivered at site have been certified by .....
3. Should you wish to audit such work, kindly contract the undersigned and oblige.

Architects

**PROFORMA OF HINDRANCE REGISTER**

Name of Work : Date of start of work :

Name of Contractor : Period of completion:

Agreement No. : Date of completion :

Sl. No.	Nature of hindrance	Date of occurrence of hindrance	Date of which hindrance was removed	Period or hindrance	Signature SE/PE	Remarks
1	2	3	4	5	6	7

SE = Site Engineer

PE = Project Engineer

Place : \_\_\_\_\_

Date : \_\_\_\_\_

**PROFORMA OF REGISTER OF MATERIAL AT SITE ACCOUNT**

Name of Work : Name of Article :

Name of Contractor : Estimated Requirement :

Agreement No. : Issue Rate :

Sl. No.	Date of Receipt	Received from / issued to (with)	Receipt	Issue	Balance	Initials of Contractor	Initials of Bank's / Architect's Representative	Remarks



**PROFORMA FOR APPLICATION BY CONTRACTOR FOR EXTENSION OF TIME**

1. Name of the Contractor
2. Name of the works as given in the Agreement
3. Agreement WO
4. Tender Amount
5. Date of Commencement of Work
6. Period allowed for completion as per agreement
7. Date of completion as per agreement
8. Period for which extension of time has been given  

<u>Date</u>	<u>Month</u>	<u>Year</u>
-------------	--------------	-------------
- (a) 1st extension vide Bank's Letter No.
- (b) 2nd extension vide Bank's Letter No.
- (c) 3rd extension vide Bank's Letter No.
9. Reasons for which extensions have been previously given ( copies of the previous applications should be attached )
10. Period for which extension is applied for and the reasons thereof including hindrances time for extra work assigned , if any etc.

Signature of Contractor

## **TECHNICAL SPECIFICATION**

### **Electrical work terms & conditions**

1. All PVC insulated and armoured cables used shall conform to ISI 554/64 and of 650/1100V grade. Test certificates of cables issued by manufacturers are to be furnished after installation on demand.
2. Minimum bending radius of PVC/XLPE armoured cables shall be 12 times the diameter of cable.
3. Contractor would be required to furnish after completion, two sets of detailed drawings.
4. Work must be completed within **31 days** from the date of receipt of work order.
5. The work must be guaranteed for a period of 12 months for its satisfactory performance from the date of completion and all defects cropping up within this period must be rectified at contractor's cost immediately.
6. Caution boards as per statutory requirements must be displayed wherever required.
7. All material, fittings and appliances used in electrical installation shall conform to the latest relevant Indian Standard specifications, wherever they exist. A list of approved material is annexed and other materials not covered will have to be got approved by the Engineer-in-charge, prior to actual use.
8. Contractor is required to ensure that no damage is caused to Bank's property during execution of the job and should make good damages, if any, at their own cost.
9. Contractor must keep the E-I-C informed about the progress of work at suitable intervals, as desired by the Bank/E-I-C.
10. Standard deductions will be made from bills as per Bank's rules.
11. EMD submitted in the form of DD/Banker's Cheque. Security deposit of 5% of the total value inclusive of EMD would be retained by the Bank as security deposit for a period of 6 months from the date of completion. Bank shall not provide any mobilization advance.
12. Work has to be carried on without disturbing normal banking operations.
13. Rates shall be quoted in both figures and words. Quotation shall be submitted in duplicate and in the prescribed schedule. Rate quoted in original quotation will be considered.

14. Rates quoted shall be inclusive of all taxes, levies, duties, transportation cost etc. However, service tax as per service tax Act will be payable extra on the actual basis by SBI only on basis of proof of payment along with the submission of invoice.
15. Contractors shall provide all labour and materials including necessary scaffolding for proper execution of the work.
16. Bank shall have the right to change the quantities as per on spot requirements. Bank also have right to reserve to cancel at any/all quotations/tenders without any cause.
17. Contractors should submit the Test Certificate form at the time of submission of final bill
18. Necessary blanking plates are to be provided wherever required.
19. For earthing IS 3043 for conduit to be used in wiring shall confirm IS 9537 (Part-II)1981 or latest in all respect.
20. Contractor should be advised to depute their representative to the Branch from take-on date to the following day of branch going live at their own cost.
21. All the materials which shall be used in the work shall be as per specification and must be from the list of approved materials as mentioned in the specification. Samples of the materials proposed to be used shall be submitted for approval and nothing shall be used which are not approved.
22. Contractor should note that all wiring, DB, Starter etc. below false ceiling in System Room should be concealed unless otherwise specified.
23. On demand lowest bidder must produce rate analysis of all the quotation items within 2/3 days from opening of the quotations.
24. **It is obligatory under Indian Electricity Rules that electrical installations work shall be executed under qualified Electrical Supervisor holding a valid Electrical Supervisor's Certificate of competency guaranteed by the State License Board**
25. The contractor has to obtain labor license and abide by Rules and Regulations of contract labor (Regulation and abolition Act., 1970 and central rule 1971 as also relevant latest amendments hereto..)
26. Evidence vouchers from manufacturers/authorized agent showing use of proper materials should be furnished as and when required.
27. Quantities are approximate, and the work will be paid on the measurement basis as per ISI code of measurement.
28. The contractor must be registered with service tax act and furnish a copy of registration documents.
29. Test report of supply authority has to filled in, if required

30. CONDITIONALTENDERS OR INCOMPLETE TENDERS ARE LIABLE FOR REJECTION.

31. State Bank of India reserves the right to accept or reject any or all quotations/Tenders without assigning any reason thereof. Bank's decision as regards eligibility shall be final and binding.

32. Each page of the tender shall be signed by the authorized person and **cutting or overwriting shall be duly attested by him.**

33. No extra payment will be made for the work carried during the nights or holidays.

34. The tenderers shall quote their rates for individual items both in words and figures; in case of discrepancy between the rate quoted in words and figures, the unit rate quoted in words shall prevail. If no rate is quoted for a particular item, the tender will be liable for rejection.

The amount of each item shall be calculated and the **requisite total to be given on each page.** In case of discrepancy the total amount calculated from multiplication of unit rate and quantity, the unit rate quoted will govern and the amount will be corrected.

**Contractor signature with Date & Stamp**

### **LIST OF MATERIALS OF APPROVED MAKES/BRAND**

The contractor shall use materials in their works subject to inspection prior to despatch, by Owner or his authorised representative of any materials, as deemed necessary in accordance with the following list. All materials not otherwise specified shall be in accordance with the latest Indian Standard Specification, where such exists and subject to prior approval of Owner/Architect. The contractor shall be bound to offer sample of materials, which are claimed to be conforming to IS Specifications, for testing at an approved Test Laboratory as and when directed by Owner/Architect.

Contractor shall purchase all materials from the makers or their authorized stockists only. Necessary documentary evidence must be produced to the Owner or their authorised representative on demand. **Contractor shall be bound to supply items of any make of the items as per the choice of the Owner/Architect.**

**1.:**

Sl.No.	Description	Make
1.	L T Switch Board Panel	: Locally fabricated with all components from SIEMENS/L&T/GE/ABB/Schneider
2.	CFS/Switch Fuse with HRC fuses	: L&T/SIEMENS/GE/ABB/Schneider
3.	Changeover switch	: HPL / HAVELLS /L & T / ABB/ Schneider
4.	MCCB and Accessories	: Legrand/Hager/Schneider/L&T
5.	MCCB/MCB Distribution Board	: Legrand /Hager /Schneider/Havells stadx/L&T
6.	RCBO, MCB & MCB Isolator	: Legrand /Hager/ Schneider/Havells stadx/L&T
7.	Current Transformers	: AE/KAPPA/SEGC/L & T
8.	KWH Meter :	GE /IMP /ABB /LANDIS GYR /JAIPUR/L&T

9.	Ammeter & Volt Meter (Analog)	:	AE/IMP/MECO/ENERCON/L & T
10.	Selector Switch for Volt-meter/Ammeter	:	Kaycee/L & T/Siemens
11.	Contactors and Timer (Modular Type)	:	Legrand / SIEMENS/L&T
12.	PVC Terminals	:	ESSEN/ELMEX/L&T
13	1.1 KV grade PVC/XLPE aluminium/copper conductor cable (armoured/unarmoured)	:	GLOSTER / UNIVERSAL / POLYCAB / NICCO / HAVELL'S/BONTON

14			
14.	1100V grade PVC insulated and sheathed and PVC insulated copper conductor wire/flexible wire	:	RR-KABEL / FINOLEX/ V-GAURD/ POLYCAB/ HAVELL'S / Gloster/ KEI/BONTON
15.	Telephone Wire	:	RR-KABEL / DELTON / POLYCAB/BONTON
16.	Cable Lug	:	Dowells, Comet, Cosmos, Dowell's (Biller India) Hax Brass (Copper Alloy India)
17.	Cable Gland	:	Dowells/Power Engg/Comt
18.	Steel Conduit (ISI marked) Black enamelled/galvanised	:	BEC/NIC/AKG
19.	PVC Conduits (MMS)/Channels and accessories	:	BEC/Plastran/Precision/Polycab/Harsh/AKG/ Plasma/Astral
20.	G I Pipe	:	TATA/ITC/BST/Jindal
21.	Ceiling Rose (3 Plate)	:	Anchor/Precision/SSK/Rider
22.	15 Amp/5 Amp Piano Key type switch and flushed type plug socket and mounting accessories	:	Anchor/SSK/PRECISION
23.	20A, 2 Pin and scrapping earth type switch socket and plug socket	:	Legrand/MK/Havell's/ABB/L & T/Schneider
24.	Holder	:	Kay/MMP/EPP/Anchor/Precision/SSK
25.	Modular Type Switch/Socket/ M.S box/plate	:	Legrand myrius /Hager-insysta /North-west Nowa /Crabtree-Athena/MK wraparound
26.	RJ-11 Socket Outlet (Modular)	:	Legrand myrius /Hager-insysta /North-west Nowa /Crabtree-Athena/anchor woods
27.	Indication Lamp (LED Type)	:	Legrand/L&T/Siemens
28.	Buzzer/Call Bell	:	Bajaj/Anchor
29.	Light Fittings	:	Philips//Wipro/Havells/Crompton/Jaquar
30.	Fans	:	ORIENT/ Crompton/ HAVELLS/Bajaj (Heavy duty and high speed

31.	Earthing Enhancement Material	Ashlock, Galaxy, Indelec, Forend
32.	Lightning Protection System	APS, Hakel, LPI
33.	Cable Trays (Factory Fabricated) / Raceways/floor box	OBO Bettermann, Legrand, MK – Raceways, Fraser Techno Circuit Limited
34.	Lighting & Surge Voltage Protection	Indelec, OBO Bettermann, Schneider Electric, ASCO Hager, L&T
35.	Insulators	ABI/MIL/IEC/Yamuna/Incap/Reputed ISI marked

2.:

<b>STATE BANK OF INDIA</b>	
<b>LIST OF APPROVED MANUFACTURERS OF MATERIALS TO BE USED IN THE ELECTRICAL WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY THE CONSULTANT/ ENGINEER</b>	
<b>S.No</b>	<b>Material Name</b>
1	<b>Transformers/ PTs-</b> Voltamp/ ABB/ Schneider/ CG/ Kirloskar/RTS Power/PCN/Essenar
2	<b>VCBs/ RMUs – L&amp;T, ABB, SEIMENS, C&amp;S</b>
3	<b>Copper Conductor wires :</b> Poly Cab/ Finolex /Havells/RR Cable
4	<b>MCBs /MCB Distribution boards(Powder coated Only) :</b> ABB/Siemens/ Legrand / Schneider /L&T/ Havells
5	<b>MCCBs/Switchgear :</b> L&T/ ABB/Schneider/ Legrand/ Siemens
6	<b>Underground Cables :</b> Poly Cab/ Finolex /Havells/Gloster/National
7	<b>Cable Glands :</b> HMI /Comet/ Cosmos/Dowells (Biller India)/ Hax Brass
8	<b>Capacitor Bank :</b> Epcos /Neptune/ Tibcon/L & T/Schneider
9	<b>Cable Lugs :</b> Dowell's / 3D/Jainson
10	<b>MV Panels (PCCs) :</b> Manufacturers with CPRI Test Certificate.
11	<b>Measuring Instruments :</b> Conzerv/ CMS/ El measure/IME/ L&T/ Nippen/ Schneider Electric
12	<b>Selector Switches:</b> Vaishno / Salzer / Kaycee
13	<b>Indication Lamps LED :</b> Schneider / Vaishno / Binay
14	<b>Resin cast CTs :</b> AE / Kappa/kalpa
15	<b>HT Jointing Kit:</b> Raychem, 3M, Densons
	<b>Note: All Items Materials Used on site shall be ISI Mark only &amp; Materials will be selected by bank only</b>

Contractor signature with Date &amp; Stamp

<b>STATE BANK OF INDIA</b>					
<b>PREMISES AND ESTATE DEPARTMENT</b>					
<b>LOCAL HEAD OFFICE, KOLKATA</b>					
<b>HT ELECTRICAL WORKS AT STATE BANK EMPLOYEE'S RESIDENCE AT MICHAEL FARADAY COMPLEX, DURGAPUR</b>					
S. No.	Particulars	Unit	Qty	Rate	Amount
	Supply, Transportation, Installation, Testing & commissioning of 1*500 kVA 11/.433 kV Plinth/foundation mounted substation with 11kV HT DP structure. Pole structure shall be assembled with 200A, AB Switch, 400A Horn Gap fuse, Lightning Arrestor, Disc insulator, Pin insulator, jumper etc. necessary accessories such as clamps, nuts, bolts, as per site requirement to draw incoming 11kV supply. Civil works for excavation of pits (1.5 m deep) with 600 mm coping above ground. Filling 1:3:5 Concrete mix and painting the poles with 2 coats of red-oxide primer and aluminum paint (or as per Electrical Supply Authority rules)				
1	150*150 mm RS Joist 11 mtr (34.6 kg/mtr)	kg	152 2		
2	MS channel 100*50*6 mm, 2.8 Mtr (9.8 kg/mtr)	kg	100		
3	MS channel 75*40*6 mm, 2.8 Mtr (6.8 kg/mtr)	kg	120		
4	Cantilever for supporting A.B. Switch 75*40*6 mm MS angle 1 Mtr. (6.8 kg/mtr)	kg	28		
5	Cantilever for supporting HG Fuse 50*50*6 mm MS angle 1 Mtr. (4.5 kg/mtr)	kg	28		
6	Cantilever for supporting HG Fuse 50*50*6 mm MS angle 2 Mtr. (4.5 kg/mtr)	kg	40		
7	11kV 200A 3-Pole Air-Break Gang Operated switch (Complete set)	Set	2		
8	11kV 100A 3-Pole HG Fuse (Complete set)	Set	2		
9	12 kV, 10kA Polymer Lightning Arrestor suitable for MS channel/angle mounting along with complete accessories	No.s	6		
10	11kV Pin insulator along with all necessary accessories	No.s	12		
11	11kV disc insulator along with all necessary accessories	No.s	3		
12	Ht stay complete set with insulator, clamp and wire etc	No.s	4		
13	supply and fixing of Caution Board - 11KV and 433 V in trilingual mode	Nos.	10		
14	supply and laying of ACSR DOG conductor	Mtr.	20		
15	Supply and fixing of Aluminium Binding wire	Kg	5		
16	Supply and fixing of Aluminium tape	Kg	1		
17	supply and fixing of Jumpering arrangement required for necessary interconnection	mtr.	30		



18	Supply & Installation of Ring type Cast Resin Current Transformer: Low Voltage (System voltage 433V) Ratio-600/5A, 50 VA, Accuracy class-1, as per IS 2705:Part-I & II	No.s	3		
19	Supply & Installation of compact LT CT meter panel with Tri-vector 3-Phase Energy meter along with cable terminal blocks (For CT & PT) with CT shorting provisions. Lockable from outside.	No.s	1		
20	Supply of 11 KV (UE) Grade XLPE Aluminium Armoured 95 Sq.mm. 3 C UG Cable.	Mtr.	110		
21	Laying of 1R*3C*95 Sqmm cable as per IS standard The cable to be laid at a depth of 1000 mm though underground covered with sand cushioning and protective layer RCC/Metal pipe/Full hume pipe/Bricks	Mtr.	90		
22	supply and fixing of Heat Shrinkable OUT/IN Door type End Termination KIT, ISI marked, For 11KV XLPE 3X 95 Sqmm	Nos.	4		
23	supply and laying of GI pipe 150 mm Dia for cables crossing road etc. at a depth of 1500 mm. The pipe should be laid by making hole by appropriate boring machine	Mtr.	20		
24	supply and laying of Heavy gauge GI pipe 6" Dia for cables riser near pole, VCB and Transformer with necessary clamping arrangements	Mtr.	10		
25	High Voltage Pressure Testing of H.T Equipment, like Transformer , H.T Cable, H.T Switch and Submission of test Report to the office of chief Electrical Inspector/Discom for obtaining approval for commissioning of the system.	Job	1		
26	Providing G.I earth station, with 50mm dia, 3000mm long galvanized iron pipe including construction of brick pedestal providing meshed funnel, CI cover and other Civil works, spreading a homogenous mixture of salt charcoal around the pipe etc., Completely as per IS 3043,1987 or latest revision (LT panels- 2nos, DP Structure- 2nos, Lightning Protection- 2nos,).	Nos.	6		
27	Supply and uniformly laying sand and 40mm size gravels in the substation area with bed depth of 100-150 mm	cubic ft	150		
28	Supply and fixing of HT cable route marker made up of 10 mm MS Rod and 2.0mm thick sheet duly painted and written in bold letters and arrow mark	Nos.	5		
29	Obtaining permission from SAIL (DSP)Electricity Department, Water Department, Sewage Department and other concerned authority regarding HIGH TENSION ELECTRICAL WORKS, excavation etc. And timely repair of damage to SBI/Durgapur Steel Plant/ Municipality water supply line, Sewage line, Telephone line etc. as required during execution of HT works.	Ls	1		
30	Civil works including wall cutting, chiseling and mending all the damages during execution	Ls	1		
<b>TOTAL (Excluding GST)</b>					₹

