TENDER ID	HYD201906148
DATE	28-06-2019

SBI INFRA MANAGEMENT SOLUTIONS PVT LTD
(WHOLLY OWNED SUBSIDIARY OF SBI)

INVITES TENDERS ON BEHALF OF SBI LHO, HYDERABAD.

IN A SINGLE BID THROUGH E-TENDERING PROCESS.

Contractors who are on the panel of SBI, Hyderabad Circle, (LHO) for electrical works in the appropriate category are only eligible. (Contractors should submit proof of the same)

FOR

PROPOSED ELECTRICAL WORKS FOR STATE BANK OF INDIA,

NAGARJUNA COLONY BRANCH, UNDER RBO DILSUKHNAGAR.

Note: Firm should possess valid digital signature for this e-tender.

The Vice president,
SBI Infra Management Solutions Pvt. Ltd.
Ground Floor, Adj Commercial Branch, SBI LHO campus,
Bank Street, Koti,
Hyderabad – 500 095
Phone:040-23466310/46

NOTICE INVITINGTENDER. (NIT)

1.	Name of the Work	**Proposed Electrical works of Nagarjuna Colony Branch, RBO Dilsukhnagar.**
2.	Eligibility of the contractor	Electrical contractors empanelled with SBI, LHO, Hyderabad for appropriate category.
3.	Estimated cost of work:	**Rs.12,33,180.00 plus GST as applicable**
4.	Earnest Money Deposit. (EMD)	**Rs. 13,000/-** all Drafts/BCs shall be in favour of "SBIIMS, Hyderabad". Payable at Hyderabad.
5.	Tender Cost	Rs.3,000/- to be paid through State Bank Collect ONLY as detailed under; 1) login https://www.onlinesbi.com 2) Select SB Collect from Top Menu, click the check box and "Proceed" 3) Select "All India" in "State of Corporate/Institution" & Select "Commercial Services" in "Type of Corporate/Institution" then "Go" 4) Select " SBI Infra Management Solutions pvt. Ltd" in Commercial Services Name and "Submit" 5) Select "Tender Application Fee" in "Payment Category" and enter the "Tender ID" exactly as given in first page top of this tender(characters in uppercase only). 6) Fill up all fields such as email, GST No., Mobile No, Vendor/Firm Name etc and make payment. 7) Enclose payment receipt having unique reference No. along with EMD.
6.	Time of Completion:	**45 DAYS.**
7.	Date of download of tender documents from Bank's web site http://www.sbi.co.in under " procurement news ".	**From 29.06.2019 to 09.07.2019**
8.	Last date and time for submission of online e-tender. at **https://etender.sbi**	**Date: 09.07.2019 by 3.00 P.M.**
9.	Date and Time of opening of e-Tenders: (Technical Bid and Price Bid)	**Date: 09.07.2019 at 3.10 P. M. (IST).**
10.	Address of opening of tender	Vice President, SBI Infra Management Solutions Pvt. Ltd., Office, Ground floor, Adj to commercial branch, SBI LHO campusg, Bank Street, Kothi, Hyderabad – 500 095. Technical Bid of those firms / contractors who do not submit EMD shall be rejected. Those who are submiited one time EMD need not to submit EMD again Representatives of Bidder may be present during opening of Bids. However Bids would be opened even in the absence of any or all the bidder's representatives.
11.	EMD & Tender cost to be submitted at:	EMD should be submitted physically at above mentioned address before due date. Contact:. Vice President / Vice President. 040-23466346. vg.reddy@sbi.co.in.
12.	Bidder Contact Details.	Bidder to provide following information. 1) Name of Company. 2)Contact Person. 2) Mailing address with Pin Code. 4)Telephone number and Fax number. 5)Mobile Number and E-MAIL.
13.	Agency for arranging online bidding.	e-Procurement technologies Limited, Ahmedabad. Email id:- sujith@eptl.in, jaymeet.rathod@eptl.in, pratik.parekh@eptl.in, dharam@eptl.inPrimary Contact No:- 079-

		61200579/580/566/596/576/569/567, 9374519754 Alternate Contact No.:- Mr. Yashrajsinh Rathod:- 079/68136815, yashrajsinh@auctiontiger.net
14.	Initial Security Deposit	2% including EMD. in favor of AGM, Internal Audit Department, Hyderabad. Payable at Hyderabad.
15.	Defects Liability Period	12 Months (Twelve months)
16.	Total Security Deposit	5 % of contract value including initial security deposit.
17.	Liquidated Damages	0.50% per week subject to max 5%of the value of work
18.	Validity	90 days
19.	Payment terms	F1st and final

The SBIIMS reserves the right to accept or reject any or all the tenders without assigning any reason whatsoever.

INSTRUCTIONS TO CONTRACTORS.

1. This tender is for the " ELECTRICAL Works at as specified in NIT. It is a Single Bid containing Technical and Price Bid.

In their own interest the contractors are advised to use their own specific seals and desist from using currency coins for the purpose. Tenders with incomplete or broken seals are liable to be rejected, the matter solely resting at the discretion of the EMPLOYER / ARCHITECTS. If a Contractor does not quote for one or more items, the Tender will be considered as incomplete and will be rejected.

2. Clients/Architects reserve to itself the right to accept or reject any tender without assigning any reason for doing so and does not bind itself to accept the lowest or any other tender.

3. General Specifications are for guidance only. The latest ISI codes and Specifications and mode of measurements will be referred to during execution.

4. The term "THE ARCHITECTS" in the said conditions shall mean

5. Employer or Client shall mean Vice President, State Bank of India Infra Management Solutions Pvt. Ltd.,

6. Tenders are to be uploaded directly to M/S e-procurement Technologies Limited. E-mail: yashrajsinh@auctiotiger.net.

INDEX

1. TENDER FORM

PROJECT: PROPOSED ELECTRICAL WORKSFOR STATE BANK OF INDIA, HYDERABAD.
REF : ELECTRICAL WORKS
LOCATION: AS SPECIFIED IN THE NIT

Dear Sirs,

I/We the undersigned have carefully gone through and clearly understood after visiting the site and the Tender drawings and tender documents comprising of the tender form, Notice to contractors, and conditions for building contract, Special Conditions, Specifications and Schedule of Probable quantities and Draft Agreement prepared by SBIIMS**.**

I/We do hereby undertake to execute and complete the whole or part of the work (as desired by you) at the respective rates which/I/We have quoted for the respective items of the Probable Bill of Quantities and at which rate the items specified amount as specified in NIT

I/We are depositing as Earnest Money, as specifiedin NIT, along with this tender for due execution of the work at my/our tendered rates together with any variations which shall be adjusted by the Architects at prices based on our tendered rates. I/We shall deposit further sum equivalent to 2% of tender amount, less EMD paid in the event of my/our tender being accepted, towards initial security deposit.

In the event of this Tender being accepted I/We agree to enter into an agreement as and when required and execute the contract according to your form of Agreement, within 15 days of receipt of work order, in default thereof, I/We do hereby bind my-self/ourselves to forfeit the aforesaid initial security deposit.

I/We further agree to complete the work covered in the said schedule of quantities within 12months from the 15th day reckoned from the date of issue of the work order to commence the work or on which contractor is instructed to take possession of the site, whichever is later.

I/We agree not to employ Sub-contractors other than those that may be specifically approved by your Architects/SBIIMS for this contract work.

I/We agree to and to get the work, workers, employees (of contractor, Architect & Employer) engaged on the work at site and all materials at site for execution of the work shall be insured comprehensive insurance including fire/accidents/ rain/ floods/riots/CAR policy (contractor's all risk insurance policy) and the insurance shall cover the period from date of start of work to date of actual completion of work plus 3 months. In case part work is taken over by the Employer before final completion of the whole work, such parts may not be covered by the insurance from the date of taking over that part of work by the Employer. Draft Insurance deed will be got vetted by the Architect, before obtaining the same. All the rates quoted by me/ us are inclusive of the same in full and nothing extra shall be claimed anytime on account of any of these.

I/We agree to pay Income tax, to be deducted at source, at the rate prevailing from time to time on the Gross value of the work done, and the rates quoted by me/we are inclusive of same.

Yours faithfully,

Contractor's Signature

Address: Date:

_____

_____

_____

_____

2. NOTICE TO CONTRACTOR

ADDRESS:

_____

_____

_____

PROJECT: PROPOSED ELECTRICAL WORKS FOR STATE BANK OF INDIA, HYDERABAD.
REF : ELECTRICAL WORKS
LOCATION: AS SPECIFIED IN THE NIT

Dear Sirs,

1. On behalf of our clients, **M/s SBIIMS Hyderabad**, we have pleasure in inviting you to tender for the aforesaid work.

2. ***The scope of work broadly as given below is for Proposed ELECTRICALs for SBI, HYDERABAD, LOCATION AS SPECIFIED IN THE NIT.***

3. **Tender Documents should be filled and uploaded on the site of** M/S e-procurement Technologies Limited. E-mail: **yashrajsinh@auctiotiger.net**

4. The tenderer must obtain for himself, on his own responsibility and at his own expenses, all the information which may be necessary for the purpose of filling this tender and for entering into a contract for the execution of the same and must examine the drawings and inspect the site of the work and acquaint himself with all local conditions and matters pertaining thereto.

5. Each of the tender documents page is required to be signed by the person or persons submitting the tender in token of his/their having acquainted himself/themselves with the General conditions etc., as laid down. Any tender with any of the documents not so signed will be rejected.

6. The tender documents must be filled in English and all the entries must be made by hand and written in ink. If any of the documents are missing or un-signed, the tender shall be considered invalid.

7. Each and every one of all erasures and additions/alterations made, while filling the tender, must be attested by initials of the tenderer. Over-writing of figures must be attested by initials of the tenderer. Overwriting of figures is not permitted. Failure to comply with either of these conditions will render the tender void. After submission of the tender no advice or any change in rate or conditions will be entertained. All the rates should be quoted both in figures and words. In-case of any discrepancy in rates quoted in words/figures and the amounts, the rate quoted in words shall be taken as final and binding.

8. The tender shall be valid for a period of 90 days from the date of opening.

9 TOTAL SECURITY DEPOSIT : shall comprise of:

a. Earnest Money deposit
b. Initial Security deposit
c. Retention money

9.1 The intending tenderer shall deposit with **SBIIMS HYDERABAD ,** by Demand Draft as specified in NIT as the Earnest Money, as a guarantee of good faith, which amount shall be forfeited as liquidated damages, in the event of any evasive/direct refusal or delay in starting the work and or signing the contract. The deposit of the unsuccessful tenderers will be returned, without interest, immediately after a decision is taken regarding the award of the contract. The Earnest money of the successful tenderer will be adjusted towards Security Deposit. A tender not accompanied by Earnest money deposit will not be considered.

9.2 The successful tenderer will have to pay further sum equivalent to 2% of his contract value, less EMD already paid, as initial Security Deposit (ISD) by means of a D.D./Banker's cheque in favour of SBIIMS HYDERABAD within 14 days from the date of issue of work order to commence work. The EMD and Security deposit thus paid shall be held by the State Bank of India as Security deposit, for due execution and fulfillment of the contract, till the completion of the work and defect liability period in all respects and shall not bear any interest.

9.3 Together with the money paid under clause 11.1 & 11.2 above, further retention of 10% of the value of the work done will be deducted from every running bill, till total retention, including EMD and initial SD paid earlier, comes to 5% of the contract value, and same shall be held by the Bank as Total Security Deposit. On the Architect's certifying the completion of work, 50% of the total security deposit shall be released to the contractor along with the final certificate of payment, and the balance amount will be retained in the manner stated elsewhere for a further period of twelve months after the completion date recorded in completion certificate, issued by the Architects and agreed to by the Bank. Also refer condition 23(ii) on Page 7 of Volume 1.

10. Within one month of the receipt of intimation from the Architects of the acceptance of his/their tender, the successful tenderer shall be bound to sign an agreement, on a stamp paper in accordance with the Draft Agreement and conditions of contract attached herewith, but the work order or the written acceptance of a tender by the Employer will constitute a binding agreement between the Employer and the person tendering whether such formal contract is or not signed by the contractor.

11. All compensation or other sums of money payable by the contractors to the clients, under the terms of this contract, may be deducted from the Security Deposit or from any sum that may be or may become due to the contractor on any account whatsoever, and in the event of the Security deposit being reduced by reasons of any such deductions, the contractor shall within 15 days of being asked to do so make good in cash or cheque, any sum which have been deducted from his security deposit.

12. The rates quoted by the Contractor shall include all eventualities, such as heavy rain, sudden floods, accidents, fire, riots etc., which may cause damage to the executed work or which may totally wash out the work. Until the completion certificate is issued to the Contractors,

neither the Architect nor the clients will be responsible for such damage or wash out of the construction work.

13. Time is the essence of the contract. The work should be completed **AS SPECIFIED IN NIT** from the date of commencement. The date of commencement shall be within ONE day after confirmation.

    a) The day two weeks from the date of issue of work order.

Or

    b) The day on which the contractor receives the possession of the site which ever is later.

Or

    c) The contractor is asked in writing to take over the possession of the site.

    The successful contractor will have to give a CPM/PERT chart of various activities of work to be done so that the work gets completed within the stipulated time. The chart shall be submitted within 15 days from the date of acceptance of the tender.

14. If the contractor fails to complete the work by the Scheduled date of completion or within any sanctioned extended time, he will have to pay liquidated damages at the rate of ½% of contract amount for each week of delay the work remains incomplete beyond the completion(Original/extended date), subject to maximum of 5% of the contract value (without extra items) as per clause 31 of the General conditions of contract.

15. The quantities contained in the Schedule are only indicative. The work as actually carried out and done will be measured up from time to time, for which payment will be made subject to the terms and conditions of contract.

16. The unit prices shall be deemed to be fixed prices. In case of extra items, a record of labour charges paid shall be maintained and shall be presented every month for extra/substituted items regularly to the Architects for checking. The settlement will be made based on figures arrived at jointly and taking into account unit prices of items of work mentioned in the contract assigned to the successful tenderers. In case, of extra items, where similar or comparable items are quoted in the tender, extra rates shall invariably be based on those tender rates to the extent reasonable.

17. Our clients, SBIIMS, do not bind themselves to accept the lowest or any tender and reserve to themselves the right to accept or reject any or all tenders, either in whole or in part, without assigning any reason whatsoever for doing so.

18. No employee of the bank or SBIIMS is allowed to work as a contractor for a period of two years of his retirement from bank service, without the previous permission of the bank or SBIIMS. This contract is liable to be cancelled, if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the bank or SBIIMS as aforesaid before submission of the tender or engagement in the contractor's service.

19. The tenderer, apart from being a competent contractor must associate himself with agencies of the appropriate class who are eligible to tender for (1) Electrical (2) Airconditioning works (3) Fire fighting systems & (4) Interiors (fixed furniture), as the case maybe.

20. Release of security deposit:

    i) 50% of the total security deposit will be released along with the final certificate of payments as stipulated under para 9 on page 12 of Volume I, Appendix to General Conditions of contract,

    ii) Balance 50% of Retention money will also be released as noted under(i) above, subject to submission of a Bank Guarantee, to the satisfaction of SBI for an equivalent amount. This Bank Guarantee shall be valid upto completion of defects/removal liability period plus 3 months.

3. ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT made the _____ day of _____ 2019
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 **SBIIMS, Hyderabad.**

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 SBIIMS, 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 15 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**15 days** subject to nevertheless to the provisions for extension of time.

8. This agreement and contract shall be deemed to have been made in Hyderabad 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 Hyderabad and only the courts in Hyderabad 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 _____ 2019

Signed by the said in the presence of:

WITNESS : SIGNATURE

NAME :

ADDRESS : EMPLOYER

WITNESS : SIGNATURE

NAME :

ADDRESS :

4. APPENDIX TO GENERAL CONDITIONS OF CONTRACT

1.	Earnest Money Deposit (EMD)	:	AS SPECIFIED IN NIT
2.	Initial Security Deposit (ISD)	:	2% of contract value includingEMD.
3.	Period of completion	:	AS SPECIFIED IN NIT
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	:	Three months after completion as recorded in the completion certificate.
7.	Minimum value of work to be Executed for issue of interim Certificates for making payment	:	First & Final
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	:	15 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

5. INDEX TO GENERAL CONDITIONS OF CONTRACT

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 45 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 First & Final and will be made within a period of TWO weeks after the bill is submitted to the Employer's Office with Architects 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 SBIIMS / 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 SBIIMS / 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 SBIIMS / 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 SBIIMS / 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 andtax 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 SBIIMS 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 SBIIMS, 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 SBIIMS 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 / SBIIMS / 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 SBIIMS 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 SBIIMS 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 SBIIMS up to CAR Policy (Contractor's All Risk Policy) against all claim which may be made against SBIIMS 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 SBIIMS a policy of insurance in the joint names and deposit such policy or policies with SBIIMS from time to time during the currency of this contract. The contractor shall also indemnifySBIIMS against all claims which may be made upon the SBIIMS 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 SBIIMS a policy or policies of insurance in the joint names of SBIIMS 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 SBIIMS 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. SBIIMS 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 SBIIMS 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 SBIIMS 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 SBIIMS 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 SBIIMS's receptacles to be used for this purpose.

The client reserves its right to clear contractors un cleared 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 Vice President,** SBI Infra Management Solutions Pvt. Ltd., Circle Office, Ground Floor, State Bank of India, **Adj to commercial branch, SBI LHO CAMPUS, Bank Street, Kothi,** HYDERABAD – 500 095and endorse a copy of the same to the Architect, 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 Vice President,** SBI Infra Management Solutions Pvt. Ltd., Circle Office, Ground Floor, Adj to Commercial branch, State Bank of India, **LHO Campus, Bank Street, Kothi,** HYDERABAD – 500 095in 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 Vice President,** SBI Infra Management Solutions Pvt. Ltd., Circle Office, Ground Floor, Adj to Commercial Branch, State Bank of India, **LHO Campus, Bank Street, Kothi,** HYDERABAD – 500 095in writing in the manner and within the time aforesaid.

(b) **The Vice President,** SBI Infra Management Solutions Pvt. Ltd., Circle Office, Ground Floor,Adj to Commercial Branch, State Bank of India, **LHO campus, Bank Street, Kothi,** HYDERABAD – 500 095shall 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 Vice President,** SBI Infra Management Solutions Pvt. Ltd., Circle Office, Ground Floor, Adj Commercial Branch,State Bank of India, **LHO campus, Bank Street, Kothi,** HYDERABAD – 500 095submit his claims to the conciliating authority namely the Circle Development Officer, State Bank of India, Local Head Office, Hyderabad for conciliation along with all details and copies of correspondence exchanged between him and **The Vice President,** SBI Infra Management Solutions Pvt. Ltd., Circle Office, Ground Floor, Adj to commercial Branch, State Bank of India, **LHO campus0, Bank Street, Kothi,** HYDERABAD – 500 095.

(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 alongwith 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 thereunder.

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 fulfill 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 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 shall certify in writing to the SBIIMS 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 completed 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 / SBIIMS to believe that it is the specified material.

Then and in any of the said caused the SBIIMS 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, SBIIMS 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 SBIIMS 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 SBIIMS, for the value of the said plant and materials so taken possession of by SBIIMS, and the expense or loss which the SBIIMS 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 SBIIMS to the Contractor or by the Contractor to SBIIMS 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.

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 under go 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, Mastri, 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 good 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 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.

Ensure that all connection s 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 laddes
GENERAL

BREAKING WORKS:

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

OTHER CONDITIONS:

CONTENTS:

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 confirm to good workmanship and sound engineering practice. The Consultant/SBIIMS reserves the right to make any minor changes during the execution without any extra payment.

2.2 The Consultants/SBIIMS 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/SBIIMS 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/SBIIMS 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 / SBIIMS, 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 SBIIMS/ 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 / SBIIMSshall 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 /SBIIMSdetailed 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 / SBIIMSfor 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/SBIIMS 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 AP TRANSCO/ Electrical Inspectorate and obtain the Approvals from CEIG,CEA, Hyderabad. No incidental expenses will be paid towards the same. Only statutory fees if any will be paid by SBIIMS.

TECHNICAL SPECIFICATIONS
CHAPTER 1
INTERNAL ELECTRIFICATION

1.0 Scope :

This specification is intended to cover the requirements of supply, installation, testing and commissioning of electrical wiring installation and other accessories required for its satisfactory operation. This covers the essential requirements or precautions regarding wiring installations for ensuring satisfactory and reliable service.

2.0 Standards :

The Electrical wiring installations and other accessories shall comply with latest IS : 732 - 1989 and National Electrical code - 1985.

3. Construction

Wall mounted switch boards shall be installed such that the bottom is at a minimum height of 1.35 m above finished floor level wherever applicable, as indicated in the drawing.

Equipment which is on the front of a switch board shall be so arranged that inadvertent personnel contact with live parts is unlikely during the manipulation of switches, changing of fuses or similar operation.

In every case in which switches and fuses are fitted on the same pole, these fuses, shall be so arranged that the fuses are not live when their respective switches are in 'OFF' position.

No fuses other than fuses in instrument circuit shall be fixed on the back or behind a switch board panel or frame.

4. Capacity of circuit :

Lighting Circuits shall not have more than a total of ten points of fans, 5A socket outlets and light points and its total load shall not exceed 800 watts. Lights, fans, and 5A socket outlets can be wired on a single common circuit. If fan circuit is drawn separately, circuit shall not be used more than eight points and load shall not exceed more than 800 watts. In the circuit, the neutral and earth wires can be looped up to 10points. From distribution boards Neutral & Earth wires shall be run for every circuit.

The power circuits shall not have more than two outlets per circuit if load to be fed by each outlet is less than 1KW, and if load is more than 2KW, each outlet shall be connected to a separate circuit.

Switches : All switches shall be placed in the live conductor of the circuit and no single pole switch or fuse shall be inserted in the earth or earthed neutral conductor of the circuits. Single pole switches (other than for multiple control) carrying not more than 15amperes may be of the piano flush type and the switch shall be 'ON' When the knob is down.

Lamp holders : Lamp holders for use on brackets and the like shall have not less than 1.3 cm nipple and all those for use with flexible pendant shall be provided with cord grips. All lamp holders shall be provided with shade carriers. Where centre contact Edison screw lamp holders are used, the outer or screw contact shall be connected to the 'middle wire' or the neutral or to the earthed conductor of the circuit.

Lamps : All incandescent lamps, unless otherwise specified shall be hung at a height of not less than 2.5 m above the finished floor level.

Ceiling rose : a) A ceiling rose or any other similar attachment shall not be used on circuit, the voltage of which normally exceeds 250 volts.

A ceiling rose shall not embody fuse terminals as an integral part of it.

Every socket outlet shall be controlled by a switch. The switch controlling the socket shall be on the 'live' side of side line.5 Amps and 15 Amps socket-outlet shall normally be fixed at any convenient place 60 cm above the floor level or near such level as indicated in drawing. 15 Amps socket outlets in kitchen shall be fixed at convenient place 23cm above the working platform. In a room containing a fixed bath or shower, there shall be no socket outlet and there shall be no provision for connecting a portable appliance.

5 Recessed MS conduit wiring system

a) Making of chase : The chase in the wall shall neatly be made and shall be of suitable dimension to permit the conduit to be fixed in the manner desired by the Engineer-in-charge. In the case of buildings under construction, chases shall be provided in the wall, ceiling, etc. at the time of their construction and shall be filled up neatly after erection of conduit and brought to the original finish of the wall.

b) Fixing of conduit in chase : The conduit shall be fixed by means of staples or by means of saddles not more than 600 mm apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing-in of conductors. All the threaded joints of rigid steel conduits shall be treated with approved preservative compound to ensure protection against rust.

c) Inspection boxes : To permit periodical inspection and to facilitate replacement of wires, suitable inspection boxes shall be provided at convenient locations. They shall be mounted in flush with the wall. The minimum size of inspection boxes shall be 75 x 75 mm. Suitable ventilating holes shall be provided in the inspection box covers.

d) Types of accessories to be used : All outlets, such as switches and sockets, may be either of flush mounting type or of surface mounting type.

The switches and other outlets shall be mounted on such boxes. The metal box shall be efficiently earthed with the earth continuity wire run along the conduit.

When crossing through expansion joints in buildings, the conduit sections across the joint may be through flexible copper bellows of the same size as PVC conduit. The Number of wires that can be drawn through a conduit shall be strictly as per IS 732 and as mentioned in Drawings.

6. MS Conduits :

MS conduit shall be black enameled and of thickness not less than 16SWG and of size minimum 19 mm dia. The Conduit shall conform to IS 9537/ Part II

Bunching of cables : Separate conduits shall be used for bunching of conductors of AC supply and DC supply for lighting and small power outlet circuits.

All outlets of conduit systems shall be properly drained and ventilated, but in such a manner so as to prevent the entry of insects etc. as far as possible.

Bends in conduit : Wherever necessary, bends or diversions may be achieved by bending the conduits or by employing normal bends, inspection bends, inspection boxes, elbows or similar fittings.

In case of plain conduit, heat may be used to soften the conduit for bending and forming joints. Positioning of conduit in close proximity to hot surfaces should be avoided.

7. TESTING OF WIRING:

The following tests shall be carried out on all types of wiring on completion of the work and before energizing the installation :

i) Insulation resistance test,

ii) Electrical continuity test,

iii) Earth continuity test,

iv) Earth electrode resistance test,

v) Switch polarity test.

i) Insulation Resistance test :
The insulation resistance shall be measured by using 500 v megger between the following points.

Phase and neutral conductor with all fuses in position and all switches in closed condition and main switch in OFF position with lamps and other devices removed.

Between earth and whole system of conductors with all fuses in place, all switches closed and all lamps in position.

Between all conductors connected to one phase of the supply of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one megaohm.

The insulation resistance in megaohm as obtained by each of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one megaohm.

(ii) Electrical continuity test :

Each and every circuit shall be tested for electrical continuity by using a multimeter.

(iii) Earth continuity test :

The earth continuity conductor including metal conduit shall be tested for electrical continuity and the resistance of the same along with the earthing lead measured from the connection with the earth electrode to any point in the earth continuity conductor in the complete installation shall not exceed one ohm.

iv) Earth electrode resistance test :

The earth electrode resistance shall be tested as specified in section

(v).Switch polarity test :

Test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout and such conductor shall be marked for connection to the phase conductor.

8 Distribution Boards :

All the distribution boards shall be with MCBs as described in the respective schedule.

The distribution boards shall be controlled by a switch fuse, miniature circuit beaker or an isolator as described in the respective schedule. Each outgoing circuit shall be provided either with MCB or a fuse on the phase. The neutral shall be connected to a common link and be capable of being disconnected individually for testing purposes.

The distribution boards shall be located as indicated in the respective electrical working drawings and as directed by Engineer - in - charge. The distribution boards shall be fixed on wall in the niche provided and marked with the details of circuits, source of supply, size of incoming wires Etc.,

All marking shall be clear and legible.

The total load of the consuming devices shall be evenly distributed between the number of ways of distribution board.

The consuming devices circuit shall be connected to distribution board in proper sequence, so as to avoid unnecessary crossing of wires.

Cables shall be connected to a terminal only by crimped lugs.

Cables shall be rigidly fixed in such a manner that a clearance of at least 2.5cm is maintained between conductors of opposite polarity or phase and between the conductors and any material other than insulating material.

The incoming and outgoing cables shall be neatly bunched.

9. MOUNTING HEIGHTS :

The Mounting heights of various fixtures shall be as specified in the Drawings.

CHAPER 2

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 beaker 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 beakers and fuse switches shall be arranged in multitier formation, except that not more than One air circuit braker 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 fastners 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, horizontal draw out /Fixed type, 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) A short time withstand capacity of 150 KA for one second.

iv) 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 circuit breakers shall be fitted with detachable arc chutes on each pole designed to permit rapid dispersion, cooling and extinction of the arc. 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.

The breaker shall have three distinct positions within the castle as follows :
i) ` Service' position : With main and auxiliary contacts connected.

ii) `Test' position : with power contacts fully disconnected and control circuit contacts connected.

iii) `Isolated' position : with both power and control circuit contacts fully disconnected.

It shall be possible to achieve any of the above positions with the castle doors closed. Mechanical position indicators shall be provided for the three positions of the breakers.

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.

ii) The circuit breaker can be closed only when it is in one of the three positions or when it is fully out of the castle.

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

iv) Inadvertent with drawl of the circuit breaker 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 three 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 reflectingbazels, 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 lable inscriptions.

Lables 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 D**rawings :**After the award of the contract the contractors shall submit three copies of the following drawings for approval of the Department.

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-i-charge.

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

CHAPTER 3
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 / SBIIMSshall 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 / SBIIMS.

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 / SBIIMS.

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

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 / SBIIMS.

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 / SBIIMS.

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 4
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 2.5 m. if rock is encountered, pipes shall be driven to a depth of not less than 2.5 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 2.5 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

LIST OF APPROVED MANUFACTURERS / NATURAL SOURCES OF MATERIALS TO BE USED IN THE ELECTRICAL WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY THE SBIIMS.

LIST OF APPROVED MANUFACTURERS OF MATERIALS TO BE USED IN THE ELECTRICAL WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY THE CONSULTANT/ ENGINEER		
Sl No	**Item name**	**Makes**
1	MV Panels (PCCs)	Manufacturers with CPRI Test Certificate.
2	Rising Mains	Tricolite / L&T / Zeta / C & S/Legrand India
3	DISTRIBUTION BOARDS	ABB/Siemens/ Legrand / Schneider /L&T/ Havells
4	METAL CLAD SOCKETS	Legrand /L&T /ABB/SIEMENS/ Schneider
5	AIR CIRCUIT BREAKERS	Siemens/ L&T/Schneider/ABB
6	MCCB/MCB	ABB/Siemens/ Legrand / Schneider /L&T/ Havells
7	CONTACTORS(POWER/ AUX)	SCHNEIDER/L&T/ ABB/SIEMENS
8	Protection Relays	L&T/Areva/ABB/Siemens
9	Fuse Disconnector Switch/ SFU/Fuse	L&T/Siemens/ABB
10	CABLES	Havells/ polycab/ Finolex/Universal
11	COPPER CONDUCTOR WIRES	Havells/ polycab/ Finolex/Universal
12	CABLE LUGS	Dowells / Jainsons/3D
13	CABLE GLANDS	HMI /Comet/ Cosmos/Dowells (Biller India)/ Hax Brass
14	PVC conduits, Casing , Capping & Accessories (ISI MEDIMUM)	Precision / Sudhakar/ Avon plast/ FINOLEX
15	Steel Conduit	BEC / AKG / PRECISION / ATUL
16	M.S. Cable Tray	Stelco / Steelways / Slotco / Pilco / Patny
17	SWITCH & SOCKET/ STEP TYPE REGULATOR	Legrand –Mosaic / MK-wrap around/ Anchor -Woods / SchneiderClipsal/Crabtree (Havell's) /PANASONIC/PHILIPS
18	Capacitor Bank	Epcos /Neptune/ Tibcon
19	Measuring Instruments (VOLT METER, AMMETER, FREQUENCY METER, PF, LOAD MANAGER,KWH, ETC)	Conzerv/ CMS/ El measure/IME/ L&T/ Nippen/ Schneider Electric/Enercon / AE / IMP/BHEL / SIMCO / India Meter/HPL
20	Selector Switches:	Vaishno / Salzer / Kaycee
21	Indication Lamps LED	L &T/ Siemens/Technique/ ESBEE/Schneider / Vaishno / Binay
22	Resign cast CTs	KALPA/KAPPA/ Automatic Electric
23	CT SHORT CIRCUITING TERMINALS	ELMEX or equivalent
24	Telephone Wires	Lapp / Delton / Polycab/ Finolex/ SKYTONE/ HAVELLS
25	LAN Cables	D LINK, Finolex, Ploycab, Legrand/SKYTONE/ HAVELLS
26	Light Fixtures (LED)	Philips / Havells/ CG
27	LED COVE/ROPE Lighting Strip	Philips / GE/ Havells/ CG/ Wipro/Jaguar
28	Ceiling Fans, Wall mounted fans & Exhaust Fans	Havells/Bajaj/ CG/Orient/ USHA/ Almonard
29	UPS	Schneider/ Numeric/ APC
30	BATTERY	EXIDE/ PANASONIC / AMARON QUANTA
31	Poles	Reputed (As per IS and subject to approval from Bank
32	Pipes	Jindal Hissar / Tata / BST
33	Occupancy sensors	Schneider/ Legrand/ Phiips/ Havells

34	GI pipes / MS pipe	Jindal / GST / Tata / Zenith
35	HOOTER	VPRO or equivalent
36	GSS sheet	Jindal / Sail / Tata/ Equivalent
37	Grilles/ Fire dampers/Diffusers/ VCD	Caryaire/Premier/ Dynacraft / Ravistar/ Equivalent
38	Expanded Polystyrene	Thermolloyd/ Beardsell/ Astha polymer/ Equivalent
39	GI sheet	Jindal / Sail / Tata/ Equivalent
40	Valves	Advance/C&R/ Audco/ Leader/ Equivalent
41	Strainer	Sant/ DS engineering/ Equivalent
42	3/2Way mixing valves	3/2Way mixing valves
43	LAN SWITCHES/ I/O PORTS	Kramer/Extron/Crestron/ CISCO
44	CAT 6 / LAN cables/ OFC	DLink/DigiLink/Aten
45	AV Audio Rack Floor Mounted	VALRACK/NETRACK/EMERSON
46	EPABX SYSTEM - PC BASED OPERATOR CONSOLE	SIEMENS / MATRIX / PANASONIC / NEC UNIVERGE
47	ANALOG PHONE	SIEMENS/ PANASONIC/ NORTEL / BEETEL
48	BATTERIES	EXIDE/ PANASONIC / AMARON QUANTA
49	MDF/IDF, TAG BLOCKs	KRONE or equivalent
	Note:All Items Materials Used on site shall be ISI Mark only	
Important: Please Tick (/) the make of materials considered in the Tender. Any other material not specified above should be used after approval of the same by the consultant/SBIIMS.		

NOTE : **The contractor shall use only above mentioned material or equivalent make to be approved by the Consultant. All other materials shall confirm to the specifications laid down. The tenderer shall take this into account while tendering rates / prices. The Consultant / SBIIMS has got every right to select any of the above Makes for the Project. However the samples of every material including all fixing accessories shall be got approved by SBIIMS / Consultant before Execution.**

ALL MAKE SHALL BE CONFIRMING TO BIS ONLY.

PRICE BID:

SCHEDULE OF QUANTITIES AND DETAILED SPECIFICATIONS: ELECTRICAL

S.No.	Description	Qty	Units	Rate	Amount
1	Design, Fabrication, Testing and Commissioning of floor mounted **Main Panel** with as per given specification an following switchgears. The panel will be manufactured/ Fabricated in accordence with IS specifications using good quality 14/16SWG CRCA sheets, dust and vermine proof Aluminium busbar of suitable size rated to the I/C switch gear heat srinkable colour code sleeves and busbar supports and assembly.	1	No		
	INCOMER				
	a) 100A, FP, 25KA MCCB - 1No				
	b) Phase Indicating lamps LED type with fuse control - 1Set				
	c) On, off, trip, indication lamps - 2Set				
	d)0 to 100A Ampere meter with selector switch with 3nos of 100A/5A, CL-1, 15VA CT's with tape wound - 1job				
	e)0 to 500V voltage meter with selector switch - 1job				
	f)Load Manager – 1No				
	OUT GOINGS				
	a) 100A 4P, MANUAL CHANGEOVER – 1No				
	b) 100A, TPN, MCCB - 2 No's				
	c) 63A, TPN, MCB - 3 No's				
	d) 40A, TPN, MCB – 5 No's				
	e) 32A, TPN, MCB – 1 No				
	f) 40A, DP, MCB – 2 No's				
	g) 25A, DP, MCB – 8 No's				
	h) 63A, FP, MCCB with TVSS - 1 No				
	i) 40A,TP, MCB with 2Nos of 5KVAR AUTOMATIC CAPACITOR BANK - 1 No				
	BUS BAR 40mm X 6mm				
2	Supply, erection, testing and commissioning of Double Door type MCB Distribution Boards, wall mounted (either surface / recess mounted). The erection rate shall include fixing of DB on a M.S frame, Providing 32mm dia. PVC pipe for cable incoming and all other fixing accessories and necessary civil works as required.				
a	4 Way, TPN MCB DB (Metal door)with 63A, 4P, MCB -1 No as incomer and 6-32 A (10KA) SP MCBs -12 Nos as	1	no		

	outgoings. For Power DB & UDB				
b	4 Way, TPN MCB DB (Metal door)with 40A, 4P, ELCB -1 No as incomer and 6-32 A (10KA) SP MCBs -12 Nos as outgoings. For Lighting DB	2	no		
c	4 Way, TPN MCB DB (Metal door)with 63A, 4P, MCB -1 No as incomer and 6-32 A (10KA) SP MCBs -12Nos as outgoings. For AC-DB	2	no		
d	Supply of 8 Way SPN DB with IP 43 Protection as per IS:13032 and suitable for 6Nos S.P out goings and for 1 No 40A DP Incommer etc complete For UPS DB	1	no		
e	4 Way, VTPN TPN MCB DB (Metal door)with 63A, TPN, MCB -1 No as incomer and 63 A (10KA) TP MCBs -4Nos as outgoings. UDB	1	no		
3	**CABLES**				
i)	**SUBMAINS**				
a	Supply and laying following size 1.1KV grade PVC insulated armoured aluminium/Cu. FRLS conductor under ground cable on the surface of wall, above false ceiling along with 2runs of 12swg GI wire with all installation materials.The cable shall conform to IS 1554 Part- I.scope also includes termination of the cable as required with suitable glands and lugs				
	1)3.5 core x 35sqmm Aluminium Cable for MAIN PANEL	80	mtr		
	2)4 core x 10sqmm Copper Cable for ACDB/PDB & AC O/D UNITS	60	mtr		
	3)4 core x 6sqmm Copper Cable for LDB & AC O/D UNITS	120	mtr		
	4)3 core x 6sqmm Copper Cable for UPS & UPS DB	30	mtr		
	5)3 core x 4sqmm Copper Cable for SPLIT AC	200	mtr		
	6)4 core x 4sqmm Copper Cable for 3 Ph Cassete AC	150	mtr		
b	Providing end terminations for following size cables including supply of Compression type cable gland, lugs, insulation tape and identification tags complete with end termination and earthing of gland.				
	1)3.5 core x 35sqmm Aluminium Cable for MAIN PANEL	4	Nos		
	2)4 core x 10sqmm Copper Cable for ACDB/PDB & AC O/D UNITS	6	Nos		
	3)4 core x 6sqmm Copper Cable for LDB & AC O/D UNITS	6	Nos		
	4)3 core x 6sqmm Copper Cable for UPS & UPS DB	4	Nos		
	5)3 core x 4sqmm Copper Cable for SPLIT AC	6	Nos		
	6)4 core x 4sqmm Copper Cable for 3 Ph Cassete AC	4	Nos		
ii)	**POINT WIRING - LIGHTS & CEILING FANS**				

a	Point wiring with 1.5sqmm FRLS 650V grade multistranded PVC insulated copper wire in 2mm thick 25mm dia PVC pipe for lights, fans including supply & fixing of 5 amp modular switch in concealed MS switch box,front plate, 3 plate ceiling rose, and concealed circuit wiring with 3 Nos (P,N,E) 2.5sqmm **(DB's to switchboards & switch board to switch boards loopings)** and all interconnections as required.	20	pts		
b	Same as above but for secondary points looped from the above	35	pts		
c	Same as point wiring but for the call bell points for the cabins including supply of call bell as required	2	pts		
d	Supply and fixing of 1nos. 6A sockets fixed the switch board with 1 no 6A switch including all interconnections as required for raw power (New Sockets) In Public area	8	no		
iii)	**POINT WIRING- WALL MOUNTING FANS :**				
	Wiring for the **wall mounting fans** from the nearest switch board with 1.5sqmm FRLS 650V grade multistranded PVC insulated copper wire in 20mm dia 2mm thick PVC pipe and all interconnections as required including the supply and fixing of 6A modular socket 3" below the false ceiling and 6A switch in the switchboard as required.	19	nos		
iv)	**WIRING FOR AIRCONDITIONERS :**				
	Wiring with 1100V grade PVC insulated Copper conductor multistrand wires along with one run of 2.5mm FRLS copper earth wire run in suitable size 2 mm thick 25mm dia PVC conduit run concealed on wall/ Ceiling etc as required for Single phase 2.0/1.5/1.0 TR High Wall Spli ACs as under :				
a	Supply and Fixing of 25 A DP MCB fixed on a suitable module metal box including all interconnections as required. (for Single Phase AC units)				
i)	For 25A DP for 1.0 & 1.5 wall split AC's (wiring with 2runs of 4.0 sq.mm FRLS and 1 run of 2.5sqmm FRLS 1100 V grade PVC insulated multi strand copper conductor wires conforming to IS 694 (with latest amendments) in suitable size	10	nos		
ii)	For 32A TP REAR SOCKET for 2TR -2 Nos Cassette 3 phase Acs (with latest amendments) in suitable size	2	nos		
v)	40A DP MCB with enclouser for UPS Output	2	nos		
4	**SOCKETS - RAW :**				
a	**RAW Socket - 1 x 6A**				

i)	Supply and fixing of 1nos. 6A sockets fixed Above the table with 1 no 6A switch fixed above the table on 3 module metal box and white front plate (Modular type)with 2runs of 2.5 sq.mm FRLS and 1 run of 1.5sqmm FRLS 1100 V grade PVC insulated multi strand copper conductor wires conforming to IS 694 (with latest amendments) in 25mm dia PVC conduit of 2mm thick concealed in wall/floor and supply of all fixing materials and accessories,interconnections complete as required for the raw power primary sockets (DB to work stations Primary point)	4	no		
ii)	Supply and fixing of 2nos. 6A sockets fixed Above the table with 1 no 16A switch fixed above the table on 5 module metal box and white front plate (Modular type)with 2runs of 2.5 sq.mm FRLS and 1 run of 1.5sqmm FRLS 1100 V grade PVC insulated multi strand copper conductor wires conforming to IS 694 (with latest amendments) in 25mm dia PVC conduit of 2mm thick concealed in wall/floor and supply of all fixing materials and accessories,interconnections complete as required for the raw power primary sockets (DB to work stations Primary point)	3	no		
iii)	same as above but looped from nearest Raw Power point (Primary point to Secondary point)	12	no		
iv)	Supply and fixing of 16A/6A 5 Pin sockets 1 no 16A switch on 5 module metal box and white front plate (Modular type)with 2runs of 4 sq.mm FRLS and 1 run of 2.5sqmm FRLS 1100 V grade PVC insulated multi strand copper conductor wires conforming to IS 694 (with latest amendments) in 25mm dia PVC conduit of 2mm thick concealed in wall/floor and supply of all fixing materials and accessories,interconnections complete as required for the raw power primary sockets (DB to Soccket)	11	no		
	SOCKETS - UPS:				
b	**UPS Socket - 4 x 6A**				

i)	Supply and fixing of 4nos. 6A sockets with 1 no 16A switch fixed on a suitable module metal box and white front plate (Modular type) including all interconnections as required(switch shall be fixed above the table with suitable modular front plate /box and sockets shall be fixed below the counters) with 3runs of 2.5 sq.mm FRLS grade 1100 V PVC insulated multi strand copper conductor wires conforming to IS 694 (with latest amendments) in suitable size PVC conduit of 2mm thick concealed in the above ducts in the floor and supply of all fixing materials and accessories,interconnections complete as required for the UPS power sockets. (DB to work stations Primary point)	8	no		
ii)	same as above but looped from nearest UPS Power point (Primary point to Secondary point)	4	no		
iii)	Supply and fixing of 16A/6A 5 Pin sockets 1 no 16A switch on 5 module metal box and white front plate (Modular type)with 2runs of 4 sq.mm FRLS and 1 run of 2.5sqmm FRLS 1100 V grade PVC insulated multi strand copper conductor wires conforming to IS 694 (with latest amendments) in 25mm dia PVC conduit of 2mm thick concealed in wall/floor and supply of all fixing materials and accessories,interconnections complete as required for the raw power primary sockets (DB to Soccket)	5	no		
5	**TELEPHONE & DATA :**				
a	Supply and fixing of RJ 11 Telephone socket with 2 Pair (0.5mm) Telephone Cable From Each Table to Krone Box, this include suitable Surface/concealed box and all required materials this Includes Wiring. Supply and fixing of Suitable PVC Conduits and Cable Numbers to provided.	12	nos.		
b	Supplying and fixing a 20 pair krone connector in a suitable box as required. AGM antiroom and Mintanance room	1	nos.		
c	Supply and Laying of 4Pair, UTP(Unshielded Twisted Pair) cat6 Lan Cable with Information outlet and Suitable 2mm Thick PVC Pipe Laying Below Flooring/Wall/Slab etc MS Junction Boxes to All Tables, Including all Related Civil Works etc All Cable Numbers to be Provided at both ends	26	nos.		
d	supply & fixing of 7 feet feet Patch Cords.	100	nos.		
e	supply & fixing of 3 feet Patch Cords.	100	nos.		
f	**Supply & Fixing** of 24 Port Jack Panel & switch	1	nos.		
g	**Supply & Fixing** of 12U Rack with Accessories	1	nos.		

6	**PA & MUSIC SYSTEM**				
a	S & I of point wiring for music - cum PA system comprising of 2x 1.0 sqmm stranded, copper conductor, flexible PVC insulated and PVC Sheathed wire pulled through 20 mm dia PVC heavy gauge conduits and looped from one speaker to other and to the volume control and control switch wherever applicable and finally terminated at Tag Block.	15	Pts.		
b	S & I of Philips / Bosch/Ahuja make music 6W (101.6mm Diameter) speaker flush mounted on the false ceiling with proper clamping arrangement	15	Nos.		
c	S & I of volume control - cum - ON - OFF switch flush mounted on wall along with other electrical switches .The size and plate of the regulating knob should match with other switches nearby (MK make)	2	Nos.		
d	S & I of 100 Watts BOSCH/Ahuja make Central Music System Amplifier and MP3/CD/USB Player with FM facility of make Samsung/Onida/LG	2	SET		
7	**<u>SUPPLY AND INSTALLATION OF LIGHTING FIXTURES</u>**				
	Supply & Installation of following type Fluorescent / Compact fluorescent / Incandescent light fixtures. The fixtures shall be installed including supply and wiring between Ceiling rose to fixture with supply and laying of 3core 1.5Sq.mm copper flexible cable and fixing of Lamp with all required accessories, support chains & interconnections etc.				
a	Supply & Installation of **18W Led down light fixture. (Havells:- ENDURANEODLR15WLED840S or Equl)** including cost and conveyance of all materials, taxes and all labor charges etc., complete.	53	Nos		
b	Supply & Installation of 36W 2' X 2' LedLight fixtures **(CROMPTON MAKE - SIGNATURE SERIES STELLUX-H Or Equl)** including cost and conveyance of all materials, taxes and all labor charges etc., complete.	10	Nos		
c	Supply & Installation of 1X25W 4FT Wide T5 FIXTURE LED Light including cost and conveyance of all materials, taxes and all labor charges etc., complete.	5	Nos		
d	Supply & Installation of 1X25W 2FT Wide T5 FIXTURE LED Light including cost and conveyance of all materials, taxes and all labor charges etc., complete.	0	Nos		
e	Supply,Fixing of 5W/MTR LED Strip Light including driver cost and conveyance of all materials, Labour Charges etc.complete. MAKE: Phillips/ GE / Crompton / Havells /JAQUAR.	4	ROLL		

f	**Ceiling Mounting Fans**				
	Supply and fixing of 50W hi speed Crompton Greves Rivera model with 120W step type regulator (or) equivalent 48" inches ceiling fan (Including 2F lenth down road and Hooks) of approved makewith all connections and anchor fasteners ,fan hooks, down rods etc as required	2	Nos		
g	**Wall Mounting Fans**				
	Supply and Fixing of wall mounted fans of approved make 400mm Hi flow model.	19	Nos		
h	**Exhaust Fans**				
	Supply & Installation of fresh air exhaust fan 50W of light duty 300mm size (12"), Metallic body plastic blades, wire mesh, bird louvers etc. including cost and conveyance of all materials, taxes and all labor charges etc., complete for eraction	2	Nos		
8	**EARTHING**				
a	Providing standard copper plate earth station ,with 600x600x3.15mm thick copper plate, 40mm dia, 2.5 mtr GI pipe with 25X3 copper strips runs on both sides up to top of the earth pit including excavation and construction of brick pedestal providing meshed funnel, CI cover and other Civil works, spreading a homogeneous mixture of salt, charcoal around the plate etc completely as per IS 3043,1987 or latest revision	2	nos		
b	Providing G.I earth station, with 40mm dia, 2500mm 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.	2	nos		
c	Supply & Laying of 100mmX 25mmX 5mm Copper strip with supporting insulator and holes	1	nos		
d	Supply and laying of 8SWG CU Wire in 20mm dia rigid pvc conduit for ups DB earthing from the existing earth pits in PVC conduit of suitable size.	150	mtr		
e	Supply and laying of 8SWG GI Wire in 20mm dia rigid pvc conduit for Raw power & Lighting DB earthing from the existing earth pits as required in PVC conduit of suitable size.	200	mtr		
9	SUBSTATION ACCESSORIES				
	Safety Accessories: Supply and fixing of following fixing accessories. All accessories shall bear ISI certification mark				

a	11KV Rubber mats of size 2000X600mm long 12mm thick	1	Each		
b	4.5KG CO2 type fire extinguishers	2	Each		
c	Shock treatment charts (English, Telugu & Hindi languages- Laminated)	1	Each		
d	Danger Boards (English, Telugu & Hindi languages)	1	Each		
e	Laminated SLD in suitable A2 color	1	Each		
f	First Aid kit with complete set of medicines	1	Each		
10	Preparation & submission of As built drawings/documents along with necessary handing over documents, as required in the form of the Soft & hard copy sets.	1	LS		
11	WEATHER PROOF ENCLOSURES WITH SUITABLE ELCBS FOR VRF/VRV O/D UNITS				
	Supply and fixing of factory made following ratings ELCBs with 300mA sensitivity powder coated Enclosures along with suitable supports, interconnections including all fixing accessories complete as required.				
a	32A, FP ELCB with 300mA sensitivity	1	Nos		
b	40A, FP ELCB with 300mA sensitivity	3	Nos		
c	63A, FP ELCB with 300mA sensitivity	1	Nos		
12	Supply, Fixing of MS slotted Angle iron supports from Roof for Heavy gauge MS conduits above False ceiling with 2coats of red oxide paint and 2 coats of synthetic enamel paint including supply and providing of 10mm dia Anchor fasteners & studs at every 1mtr interval.	0.40	Ton		
13	Supply and Fixing of modular type TV. Socket outlet with anodized GI box and front plate complete as required.	1	Nos		
14	Supply and Laying of RG 11 Coaxial TV cable in PVC Conduits	50	Mtr		
15	Supply and Laying of RG 6 Co.axial TV cable in PVC Conduits	75	Mtr		
16	Supply and Fixing of 4way TV Splitter in a MS powder coated enclosure	1	Nos		
17	Supply and laying of 1.6mm Thick Aluminum Floor Raceways of the following sizes in the floor including cutting/chipping of the existing floor with cutting machines etc wherever required and making the finishing to normal good level as required (Power / Data / Voice)				
a	25x25mm 1.6mm thick Aluminium Box Section as Raceway	150	Mtr		

b	50x25mm 1.6mm thick Aluminium Box Section as Raceway	25	Mtr		
c	80x44mm 1.6mm thick Aluminium Box Section as Raceway	10	Mtr		
d	100x44mm 1.6mm thick Aluminium Box Section as Raceway	5	Mtr		
18	Supply and fixing of Junction boxes made out of 2mm thick MS sheet including powder coating as required fixed in floor. The box shall be provided with removable type 3mm thick powder coated cover.				
a	125X125X50mm deep junction boxes	25	Each		
b	300X300X50mm deep junction boxes	2	Each		
19	Cutting & chipping of the floor to lay the floor raceways / conduits. The cutting shall be made with the cutting machines and the debris shall be shift outside the premises. The floor shall be made good to normal after laying the raceways /conduits. (as directed by the site engineer).	.50	Cu. Mt		
20	Supply and fixing of following size GI perforated cable tray made out of 2mm thick galvanized sheet and the tray covered with 2mm thick cover including GI / MS supports for fixing the tray, anchor fasteners etc., complete as required. (for Power / Data & Voice Cables)				
a	500mm wide	5	Mtr		
b	300mm wide	30	Mtr		
c	150mm wide	75	Mtr		
21	**LAN CABLE/ RJ 45 SOCKETS**				
1	Supply and laying of following size heavy guage FRLS PVC Conduits concealed in wall/ ceiling/ floor/ column including supply and drawing of 12SWG GI wire as fish wire for laying of LAN cables at a later stage and supply of all fixing materials complete as required.				
a	20mm	75	Mtr		
b	25mm	200	Mtr		
c	32mm	100	Mtr		
d	20mm dia Flexible Conduit	20	Mtr		
e	25mm dia Flexible Conduit	50	Mtr		
f	32mm dia Flexible Conduit	25	Mtr		

22	Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess etc. as required, 1 or 2 Module (75mmX75mm) including all accessories.(NOTE: Color of the front plate shall be as finalized by the architects).	26	Nos		
23	Supply, fixing, testing and commissioning of LAN outlet (RJ45) with anodised GI box/with suitable front plate and plu in type socket (NOTE: Color of the front plate shall be as finalized by the clients/architects/consultants)).	26	Nos		
24	Supplying and drawing of UTP 4 pair **CAT 6 LAN** Cable in the existing surface/ recessed Steel/ PVC conduit as required (NOTE: Make as finalized by the clients/architects/consultants).	1040	Mtr		
	GRAND TOTAL				
26	BUY BACK (amount to be paid to the Bank)				
	Removing of existing electrical fixtures viz., Light fixtures, fans, exhaust fans, all distribution boards, sockets, switches, wiring, conduits, Lan, telephone sockets and wiring. All distribuiton boards etc., complete and carting away non servicable material and disposing of all debris to contractor's dump yard or approved land fill as directed etc., complete. All servicable items are to be handed over to SBI and to be carted to their stack yard as per directions etc., complete.	(-1)	LS		
	TOTAL				

Note: Applicable GST on quoted amount will be paid extra.