INDIAN BANK,
CORPORATE OFFICE, ESTATE DEPARTMENT
No. 254 - 260, Avvai Shanmugam Salai,
Royapettah, Chennai - 600 014.
Ph: 044-28134401/4308,
Email: hoestate@indianbank.co.in

TECHNICAL BID
(PART – 1)

Tender document for Electrical works for Proposed DAMC,Indian Bank Building, 1st floor, Chetpet, Chennai-600010

ISSUED TO

M/s._____

This document contains Part- 1(Technical) From 01 to 91 pages

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TENDER DOCUMENT

Name of work: Indian Bank, Corporate Office, Chennai invites sealed quotes for Electrical works for Proposed DAMC,Indian Bank Building, 1st floor, Chetpet, Chennai-600010

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NOTICE INVITING TENDER

Sealed tenders are invited for Electrical works for Proposed for DAMC,Indian Bank Building, 1st floor, Chetpet, Chennai-600010

Indian Bank invites sealed tenders in 2- bid system [Technical (Part-1) and Financial bid (Part-2)] from the Contractors for their proposed Electrical works for Proposed DAMC,Indian Bank Building, 1st floor, Chetpet, Chennai-600010

Tenders should be accompanied by an Earnest Money Deposit for an amount of Rs.20,000/- (Rupees Twenty Thousand only) in the form of D.D favouring " Indian Bank , Corporate Office, Expenditure Department, Chennai-14"/ Bank guarantee from any scheduled Bank in favor of Indian Bank, Corporate Office, Chennai-14 shall be enclosed along with Technical Bid Documents. Tender cost of Rs 2000/- (Rupees Two Thousand Only) in the form of DD in favor of "Indian Bank, Corporate Office, Expenditure Department" should be submitted along with the Technical Bid (Cover-1). Tenders submitted without EMD and Tender Cost will be rejected.

The tenders in DUPLICATE along with enclosures should be submitted in two separate Sealed covers each with the superscription giving the Name of the work. The EMD in the above form and the technical & price bid shall be enclosed in a cover superscripted with the name of the work and wording 'EMD + Technical bid '(cover 1). The Price bid consisting of the Bill of Quantity shall be enclosed in another cover super scribed with the name of the work and the working 'Price Bid' (Cover 2). Both the covers 1 & 2 may be inserted in a third cover super scribed with the name of the work (cover 3).

Sealed tenders in the prescribed format shall be deposited in the tender box kept at the Corporate Office, Indian Bank, 254-260, Avvai Shanmugham Salai, Royapettah, Chennai- 600 014 on or before the stipulated date and time of submission of the tender, after noting down in the register meant for this in the Expenditure department. The Price Bid not submitted in the prescribed format will be summarily rejected.

At the time fixed for opening of the tender, the cover 3 shall be opened and then cover Containing the EMD and Technical bid will be opened. If the EMD submitted is in the Acceptable form, then the Technical bid will be evaluated, if not the tender will be rejected. The tender cost of Rs 2000/- (Rupees One Thousand Only) in the form of a demand draft in favor of Indian Bank Corporate Office, Expenditure Department shall also be enclosed in cover-1.

Salient Features of the works:

Name of Work	Electrical works
Estimated Cost of total Work	**Rs.10.0 Lakhs** (Rupees Ten Lakhs Only)
Tender Fee	Rs 1000/- **DD in favor of "Indian Bank, Chennai"**
Earnest Money Deposit (EMD)	Rs. 20,000/- (Rupees Twenty Thousand Only) Refundable; **DD in favor of "Indian Bank, Chennai"**
Initial Security Deposit (S.D)	2% of the total contract value (shall be submitted within 7 days of receiving Work Order)
Retention Amount (RMD)	5% of the each Bill Amount
Total Security Deposit (SD)	7% of the total contract price [Initial S.D (2%) + RMD (5%)
Defects Liability Period (DLP)	**12** Months from the date of virtual completion
Date of Commencement	**14 days** from the date of issue of Work Order/letter of intent or Date of which the site is handed over whichever is later
Date of Completion	**30 days** from the Date of issue of Work Order/letter of intent or Date of which the site is handed over whichever is

	later.
Liquidated Damages for Delay	1% per week of the Contract Value for intermediate and final deadlines subject to maximum total of 10% of final Contract value
Minimum Value of work for the issue of Interim Certificates	Rs.7.0 lakhs/- (Rupees Seven Lakhs Only)
Period of honoring certificate for interim payment against each running bill by Employer	**15 days** from the date of receipt of Bill payment recommendations from Engineer-Incharge / Consultant.
Period of honoring Final Certificate	Six weeks from the date of receipt of Bill payment recommendations from Engineer-Incharge / Consultant.
Start of Issue of Tender	**23-08 - 2022**
Last date and Time of Submission of tenders	**29 - 08- 2022** on or before 3:00 PM
Opening of Techno-commercial Bid	4:00 PM on **29 -08 - 2022**

Eligibility Criteria

1) The Tenderers shall be themselves licensed electrical contractors who have executed the Electrical works at Government, Public Sector Undertakings / PSBs and reputed business organizations. The Tenderer should have after sales service unit at Chennai for the period of last three years ending 31.03.2022. The contact details should be given.
2) The Tenderer should be in business of similar nature for the past 7 years and their annual turnover should be minimum of Rs 40 Lakhs (Rupees Twenty Five Lakhs Only) each for the last 3 years (Year ending 31.03.2021). They should be profit making for the last 3 years. The Tenderer should completely fill the format given below and submit along with the technical bid:

Year	Turnover (Rs)	Total Sales (Rs)	Net Profit (Rs) (as per P&L Statement)
2017-18			
2018-19			
2019-20			
2020-21			

3) The Tenderer **should enclose copies of their audited balance sheets** with Profit and Loss statement for the last 3 years. If the balance sheet of 2020-2021 is not available, then balance sheet of 2017-2018 may be submitted. All the balance sheet should include P&L statements also.
4) The Tenderer should posses valid EA/ESB Licence issued by Tamil Nadu State Electrical Licensing Board, Chennai – 600 032.
5) The Tenderer should have executed Electrical works of
(a) Three works each costing not less than the amount equal to 40% of the estimated cost i.e Rs 4.0 lakhs (or)
(b) Two works each costing not less than the amount equal to 50% of the estimated cost i.e Rs 5.0 lakhs (or)
(c) One work costing not less than the amount equal to 80% of the estimated cost i.e Rs 8.0 lakhs under single agreement during the last 5 years ending with 31.03.2021.
The Tenderer shall produce copies of Work orders and Completion Certificates for the work claimed under eligibility criteria as a proof of having completed the job in the following format.

Sl.No	Name of the Work Executed	Bank/Owner / Client / Customer	Work Order Reference	Year of Execution	Date of Completion / (enclose completion certificate)	Work order amount (Rs)	Final Bill value of the work (Rs)
01							
02							
…							

Similar nature means but not limited to the following:

i. Electrical panel fabrication / modification etc.,
ii. Electrical Wiring Services.
iii. Residential Electrical wiring works.
iv. Electrical Control Panel Service.
v. Electrical Laying / Cable Jointing.
vi. Electrical Substation Installation Services.
vii. Electrical Instrumentation Service.
viii. Electrical Breakdown Works.
ix. Interior Electrical Services.

Note: The bank is not bound to accept the lowest tender & reserves the right to accept or reject any or all the tenders without assigning any reasons whatsoever.

GENERAL RULES & CONDITIONS FOR THE GUIDANCE OF TENDERERS

1. Sealed tenders Techno-commercial bid (Part-1&2) are invited Electrical works for Proposed DAMC,Indian Bank Building, 1st floor, Chetpet, Chennai-600010

2. Tenders Techno-commercial bid (Part-1&2), which should always be placed in a sealed cover, with the name of project written on the envelope i.e. superscripted with "Indian Bank, Corporate Office, Chennai invites sealed quotes for Electrical works for Proposed for DAMC,Indian Bank Building, 1st floor, Chetpet, Chennai-600010. Sealed tenders in the prescribed format shall be deposited in the tender box kept at the Corporate Office, Indian Bank, 254-260, Avvai Shanmugham Salai, Royapettah, Chennai- 600 014 on or before the stipulated date and time of submission of the tender, after noting down in the register meant for this in the Expenditure department. ***The Tender / Price Bid not submitted in the prescribed format will be summarily rejected. No correspondence will be entertained in this regard.***

3. The time allowed for commencing the work is **Fourteen days** (14 days) from the date of written orders to commence work or handing over the site whichever is late.

4. The contractors should quote in figures as well in words the rates and amount tendered by them. The amount for each item should be worked out and the requisite totals to be given.

5. When a contractor signs a tender in any Indian languages the percentage above or below and the tendered amount in the same language. In case of illiterate contractors the rates or the amounts tendered should be attested by a witness and his / their KYC documents to be furnished.

6. Tenders should be accompanied by Earnest Money Deposit (Refundable), amounting to **Rs. 20,000/- (Rupees Twenty Thousand Only)** and **Tender cost (Non-Refundable) of Rs 1000/- (Rupees One Thousand Only)** in the form of Bank's demand draft in favour of "INDIAN BANK,CHENNAI" for , furnishing & Electrical works. ***Tenders submitted without EMD and Tender Cost will be rejected.***

7. The EMD of the contractor, whose tender is accepted, shall be forfeited in full, in case he does not remit the Initial Security Deposit within the stipulated period or start the wok by the stipulated date mentioned in the award letter.

8. The acceptance of the tender will rest with "INDIAN BANK" which does not bind itself to accept the lowest tender, and or reserves to itself the authority to reject any or all of the

tenders received without the assignment of a reason. All tenders in which any of the prescribed conditions are not fulfilled or, are incomplete in any respect are liable to be rejected.

INDIAN BANK reserves the right to accept the tender in full or in part and the tenderer shall have no claim in future for revision of rates or other conditions if his tender is accepted in parts.

9. Canvassing in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable for rejection.

10. All rates shall be quoted on the proper form of the tender alone. The tenderers shall take care to price his tender rationally. Extreme under pricing or overpricing in item-rates, total amount will be considered adversely in the assessment of tenders. The tenderer shall on demand submit analysis of rates of some items of work if so required by the Employer.

11. An item rate tender containing percentage below / above will be summarily rejected.

12. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Employer / Engineer-Incharge shall be communicated to the Employer.

13. Special care should be taken to write the rates in figures as well as words and the amounts in figure only; in such a way that interpolation is not possible. The total amount should be written both in figures and in words. 'P' after the decimal figures e.g. Rs.7.55"p" and in case of words the word "Rupees" should precede and the word paise should be written at the end, unless the rate is in whole rupees and followed by the words "only". It should be invariably be up to two decimal places. While quoting the rate in schedule of quantities, the word "only" should be written closely following the amount and it should not be written in the next line.

14. INDIAN BANK does not bind itself to accept the lowest or any tender and reserves to itself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same as the rate quoted.

15. The tenderers shall separately specify at the end of the tender the % and value of SGST and CGST as applicable. As on date 9 % CGST and 9% SGST IS APPLICABLE FOR WORKS CONTRACT which is subject to existing Government norms. Regarding tax part, the tax rate at the time of billing shall rule over and above all documentations. Valid documents shall be produced if tendered/ asked for at the time before payment.

16. TDS for income tax is as applicable and shall be included in the quoted rates. The comparison for the least bidder shall be made with the basic price of items of work excluding "Goods and Service Tax" part.

17. INDIAN BANK will not entertain any other claim whatsoever in this respect.

18. The tender for the works shall remain open for acceptance for a period of **60 Days** from the date of opening of tenders. If any tenderer withdraws his tender before the aforesaid period, the bank shall be at liberty to forfeit Earnest Money Deposit paid along with the tender and no further claim in this regard will be entertained.

19. The tender for the work shall not be witnessed by a contractor or contractors who himself / themselves has / have tendered or to whom may and / have tendered for the same work. Failure to observe these conditions would render tenders of the contractors tendering as well as witnessing the tender liable to be summarily rejected. It will be obligatory on the part of

the tenderer to tender and sign the tender documents for all the component parts and that, after the work is awarded, he will have to enter into an agreement for each component with the competent authority of INDIAN BANK.

20. The tenderer, apart from being a competent contractor must associate himself with agencies of the appropriate class who are eligible to tender for (a) electrical work (b) Air-conditioning (c) Sanitary and Water supply installations (d) Horticulture (e) Fire fighting and / or any other related work. Any clarifications on the design and drawings may be sought from office **of The Assistant General Manager (P&E), 254-260, Avvai Shanmugam Salai, Royapettah, Chennai 600 014 or contact through email id: hoestate@indianbank.co.in.**

21. If the contractor or his representatives are found to be absent from the site for more than 3 days the contract is deemed to be terminated by him without any prior notice.

22. The tenderers are advised to inspect the site before quoting for the job. The site will be available for inspection on all working days between **10:00 AM & 5:00 pm between 23/08/2022 to 29/08/2022.** Hence, the tenderers are advised to inspect the site in this regard before quoting for the job.

23. The Employer is not liable for the cost incurred in the inspection and preparation of tender and submission / participation and also not liable for any other cost what so ever may be.

24. Tenders can be submitted in person or through post / courier so as to reach on or before the due date and time. Bank will not be responsible for any postal delays or any other reason for not submitting the bid in the specified time and resulting in disqualification / rejection of any bid and no claim whatsoever will be entertained in this regard.

25. During evaluation of the bids, the Bank may, at its discretion, seek clarification from the Bidder/s. The request for clarification and the response shall be in writing.

26. **"The bank is not bound to accept the lowest tender & reserves the right to accept or reject any or all the tenders without assigning any reasons whatsoever"**

इंडियन बैंक / INDIAN BANK
म.का. / C.O.
परिसर, व्यय एवं संपदा विभाग
Premises, Expenditure & Estate Dept.
रायपेट्टा, चैन्नै / Royapettah, Chennai-14

Signature of the competent authority

SPECIAL CONDITIONS OF CONTRACT

1. Scope of Work:

The scope of work for the purpose of this tender constitutes Indian Bank, Corporate Office; Chennai invites sealed quotes for Electrical works for proposed DAMC, Indian Bank Building, 1st Floor, Chetpet, Chennai 600010

2. Price Basis:

a. The unit rates mentioned in schedule of rates shall remain firm and shall not be subjected to any escalation throughout the currency of the contract.

b. The quoted rates shall be inclusive of supply of all materials required for completing the item works.

c. Payment shall be made on the actual quantum of work executed, duly certified by Engineer-Incharge / Consultant.

d. The rates quoted shall be based on laws, levies, taxes and duties applicable on the date of LOI. Any statutory variations thereto and / or new levies due to an act or enactment, after the date, shall be to the employer's account against documentary evidence within the contractual completion date. Any such variation/imposition of new taxes and levies beyond the contractual completion date shall be to the contractor's account.

e. Contractor shall satisfy himself on the applicability of various taxes, duties, levies etc. as applicable for such work and quoted prices shall be inclusive of all such liabilities. Employer / Consultant shall not be liable to any liability of the Contractor on this account. Contractor shall periodically produce documentary proof for having fulfilled the above obligations in time, including proof of payment, proof of filing of returns, etc. failing which Employer / Consultant reserve the right to take appropriate action at the cost and consequence of the Contractor.

f. Income Tax, at applicable rates, shall be deducted from the Contractor's Bills, as per Income Tax Act and TDS Certificate issued thereof.

3. Terms of Payment:

Progress Payment:

a. One interim bill shall be allowed subject to minimum value for interim certificate as stated in these documents.

b. The bills in proper forms must be duly accompanied by detailed measurements in support of the quantities or work done and must show deductions for all previous payments, retention money etc.

c. The Employer / Engineer-Incharge / Consultants will entertain for a minimum gross amount of **Rs.7.0 Lakhs (Rupees Seven Lakhs Only).**

d. Employer may withhold payment on account of any defect/deficiency in the work already executed and payment released, based on subsequently discovered evidence, failure to make payments to Sub-Contractors, damage caused by the Contractor to

Employer's property, properties of other agencies within the premises, unfulfilled statutory obligations, etc.

4. **Effective date, Time schedule and Liquidated damages for delay:**

a. The date of Letter of Intent issued by Indian Bank shall be deemed as the "Effective Date" of contract.

b. The entire work covered under the contract shall be completed in all respects within **30 days** from the Effective Date.

c. Time is the essence of this project and hence completion schedule of **30 days** should be strictly adhered to.

d. However, at the option of the EMPLOYER, such delayed completion may be accepted subject to levy of liquidated damages @ 1.00% of the final contract value per week of delay or part thereof, subject to a maximum of 10.00% of the final contract value.

e. The effective date shall be reckoned from **14 days** from the date of issue of Work Order/letter of intent or date of which the site is handed over whichever is later.

5. **Measurement:**

The Quantities set out in the schedule of items and rates are estimated quantities of work. The final quantities of work executed by the Contractor in fulfillment of his obligations under the contract shall be jointly measured by the Contractor and the Engineer-Incharge / Consultants. The Engineer-Incharge / Consultants will be final authority for the measurement relating to bills.

6. **Responsibility:**

Bank / Engineer-Incharge / Consultant reserve the right to inspect the execution of work at the Contractor's Works as per the technical specifications and the equipment shall be dispatched only after receipt of a Release Order issued by the Engineer-Incharge / Consultant.

Unless otherwise specified in the contract / Work order / Purchase Order, the completion of work shall not be deemed to have been achieved until all the works required to be carried out under the contract have been completed to the entire satisfaction of the Bank / Engineer-Incharge / Consultant, in all respects and virtual Completion Certificate is issued.

It is the responsibility of the contractor to obtain all statutory approval from the Electrical Inspector/ government departments etc. and hand them over to the Bank through the Consultant.

7. **Progress Report:**

The Contractor shall submit to the Employer / Consultant once in two weeks progress report for the previous period showing up-to-date cumulative progress and progress during the preceding period alone on all progress items of each section or portion of the works in the proforma prescribed by the Employer / Consultant.

8. **Contractor's Engineer:**

The Contractor shall keep qualified and experienced Engineer(s) for full time during execution of work for entire Contract period.

9. **Equipment:**

The Contractor shall make his own arrangement to procure all constructional plant and equipment for his work. He shall also submit with the tender, the type and number of different equipments with their capacities in good working conditions, which he will use on the site to ensure smooth completion of the work in specified time. All materials, construction plant and equipment etc., once brought by the CONTRACTOR on the site are not to be removed from there without the written approval from the Bank / Engineer-Incharge / Consultant.

10. **Extra Items:**

Extra items, if any, shall be paid on the basis of analysis of rate of cost of materials and labour produced by CONTRACTOR, and the item-rates agreed upon with the Engineer-Incharge / Consultant.

The execution of extra item is compulsory in order to complete the project work. In case the Contractor fails to execute extra item, Bank / Engineer-Incharge / Consultant will have the right to execute these items through other agency / agencies at the risk and cost of the Contractor.

While arriving at the agreed rate of extra items, the Plant & Machinery / Overheads / profit shall be considered to the tune of 15% of cost of materials and labour.

Bank / Engineer-Incharge / Consultant reserve the right to verify the price of material through market survey.

11. **Guarantees / Liabilities:**

The Works / Installation including all components and accessories **shall be guaranteed for a period of 12 months from the date of Virtual Completion of the same against defective material** (including Manufacturer's guarantee for equipments etc.), shortfall in performance and faulty workmanship. The contractor shall immediately make free replacement of any of the parts or components that might go out of order within this period and Bank / Engineer-Incharge / Consultant's decision in this regard will be final and binding on the contractor.
The work shall be carried out in a workmanlike manner.

12. **Shut down work:**

The work has also to be carried out on bank holidays. Since there is need to take shut down of 415V electrical system for working inside the panels. At least one week before notice to be given for arranging such electrical shut downs which will not affect the power supply to continuously energized equipments like UPS units, air conditioning units in server room, UPS room etc.

13. **INSURANCE**

Contractor shall obtain and maintain any and all necessary insurance cover for the entire work, which may be required under any law or regulations applicable, including but not limited to the following:

a. Contractor's All Risk Policy, for Contractor's Scope of Work.
b. All materials and Contractor's own machinery, equipment, tools & tackles, vehicles, etc.
c. Third Party liability.
d. Workmen Compensation
e. ESIC
f. Employer's Liability

The quoted price shall be inclusive of all costs for such insurance coverage including transit insurance and till it is handed over to the employer after its full completion. In all such policies, Employer shall be made 'Co-insured'. Also other Contractors, working at the Site, are covered under the policy.

14. Termination:

i. Bank reserves the right to down size the project or add some works in the project to suit the completion or cancel the entire project or in part depending on their administrative reasons. In such case the value of works done upto that stage will be measured and paid at the tender rates.

ii. Bank also reserves the right to terminate the contract after giving a notice of 30 days to the contractor in case the contractor could not produce good / considerable progress in work execution within the contract period or in the extended period.

15. GENERAL

These Special Conditions of Contract (SCC) shall be read in conjunction with the terms and conditions stipulated in the General Conditions of Contract (GCC). However, if there is any contradiction between the terms and conditions mentioned in this SCC and those in the GCC, stipulations of SCC shall prevail to that extent.

इंडियन बैंक / INDIAN BANK
प.का. / C.O.
परिसर, व्यय एवं संपदा विभाग
Premises, Expenditure & Estate Dept.
रायपेट्टा, चेन्नै / Royapettah, Chennai-14

GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual item in the schedule of quantities and in the specifications and conditions laid down in after and in the drawings, the work shall be carried out as per standard specifications and under the direction of Employer/Engineer-Incharge.

1. INTERPRETATION

In constructing these conditions, the specifications, the schedule of quantities, tender and agreement, the following words shall have the meaning here in assigned to them except where the subject or context otherwise requires.

Employer: The term Employer shall denote INDIAN BANK, Corporate Office, 254-260, Avvai Shanmugam Salai, Royapettah, Chennai – 14, for or any of its employee's representatives authorized on their behalf.

Engineer-Incharge: The term Engineer-Incharge shall mean - ENGINEER or in the event of his/their ceasing to be the Engineer-Incharge for the purpose of this contract such other person/s as the employer shall nominate for the purpose.

Contractor: The term contractor shall mean _____ and includes his/their heirs, legal representative, assigns and successors.

Site: The site shall mean the site where the works are to be executed as shown within boundary in red border on the site plan including any building and erections thereon allotted by the employer for the contractor use. The site here mentioned is at the Indian Bank, Corporate Office, Chennai invites sealed quotes for Electrical works for proposed DAMC, Indian Bank Building, 1st Floor, Chetpet, Chennai 600010.

Site engineer: The site engineer shall be appointed by the employer. The employer may also determine the number of site engineers and the supporting staff at site office to assist them and also whether the site engineer shall be temporary or permanent as far as possible, the site engineer should assume charge of his post before the contractor reports on site of work. When more than one site engineer is appointed, one of them shall be designated as senior site engineer by the premises department and the other site engineer shall be reporting to the senior site engineer.

Drawings: The work is to be carried out in accordance with drawings, Specifications, the schedule of quantities and any further drawings which may be supplied or any other instruction, which may be given by the employer during the execution of the work. All drawings relating to work given to the contractor together with a copy of schedule of quantities are to be kept at site and the employer/ Engineer-Incharge shall be given access to such drawings or schedule of quantities whenever necessary.

In case of any detailed drawings are necessary the contractor shall prepare such detailed drawings and /or dimensional sketches there for and have it confirmed by the employer/Engineer-Incharge prior to taking up such work.

The contractor shall ask in writing all clarifications on matters occurring anywhere in drawings, specifications and of quantities or for additional instructions at least 10 days ahead from the time when it is required for implementation so that the employer may be able to give decision thereon.

"The works" shall mean the work to be executed or done under this contract

"Act of insolvency" shall mean any act as such as defined by the Presidency Towns Insolvency Act or in Provincial insolvency Act or any amending statutes.

"The schedule of Quantities" shall mean the schedule of quantities as specified (forming part of this contract) duly priced with the accepted quoted rates of the contractor.

2. SCOPE

The work consists of construction of employer's (details of work) in accordance with the **"drawings" and the "schedule of quantities".** It includes furnishing all materials, labour, tools and equipment and management necessary for and incidental to the construction and completion of the work, during its progress and upon completion, shall conform to the lines elevations and grades as shown on the drawings furnished by the employer/Engineer-Incharge. Should any detail essential for efficient completion of the work be omitted from the drawings and specifications it shall be the responsibility of the contractor to inform the employer /Engineer-Incharge detail with employer/Engineer-Incharge concurrence, so that upon completion of the proposed work the same will be acceptable and ready for use.

Employer/Engineer-Incharge may in their absolute discretion issue further drawings and or written instructions, details, and explanations, which are, hereafter collectively referred to as "the Employer's/Engineer-Incharge Instructions" in regard to:

a. The variation or modification of the design quality or quantity of works or the addition or omission or substitution of any work.

b. Any discrepancy in the drawings or between the schedule of quantities and / or drawings and / or specification.

c. The removal from site of any defective material brought thereon by the contractor and the substitution of any other material thereof.

d. The demolition, removal and /or re-execution of any work executed by the contractor.

e. The dismissal from the work of any persons employed thereupon.

f. The opening up for inspection of any work covered up.

g. The rectification and making good any defects under clauses herein after mentioned and those arising during the maintenance period (retention period).

The contractor shall forthwith comply with and duly execute any work comprised in such employer's / Engineer-Incharge instruction, provided always that verbal instructions, directions and explanations given to the contractor or his representative upon the works by the Employer/Engineer-Incharge shall if involving a variation be confirmed in writing to the contractors within seven days. No works for which rates are not specifically mentioned in the priced schedule of quantities shall be taken upon without written permission of the Employer/Engineer-Incharge. Rates of items not mentioned in the price schedule of quantities shall be fixed by the employer in consultation with the Engineer-Incharge as provided in clause "variation".

Regarding all factory made products for which BIS (Bureau of Indian Standards) marked products are available, only products bearing BIS marking shall be used in the work.

3. TENDERER SHALL VISIT THE SITE

Intending tenderer shall visit the site and make themselves thoroughly acquainted with the local site condition, nature and requirements of the works, facilities of transport condition, effective labour and materials, access and storage for materials and removal of rubbish, traffic regulations, NOC required if any from any authorities / societies etc.,. The tenderer shall provide in their tender for cost of carriage, freight and other charges as also for any special difficulties including police restriction for transport etc., for proper execution of work as indicated in the drawings. The successful tenderer will not be entitled to any claim of commencement of work or which in the opinion of employer/Engineer-Incharge might be deemed to have reasonably been inferred to so exist before commencement of work.

4. TENDERS

The entire set of tender papers issued to the tenderers should be submitted fully priced and also signed on the last page together with initials on every page. Initial/ signature will indicate the acceptance of the tender papers by the tenderer.

The schedule of quantities shall be filled as follows:

I. The rate columns to be legibly filled in ink both in figures and English words. **Any rates / filled in pencil or any other mode shall make the tender as "In-eligible" and will be rejected.**

II. Amount column to be filled in for each item and the amount for each sub head as detailed in schedule of quantities.

III. All corrections are to be initiated.

IV. The rate column for alternative items shall be filled up.

V. The amount column for alternative items for which the quantities are to be mentioned shall not to be filled up.

VI .In case of any errors, the rates given in the tender marked 'original' shall be taken as correct rates.

No notifications, writings or corrections can be made in the tender papers by the tenderer, but may at his option offer his comments or modifications in a separate sheet of paper attached to the original tender papers. The employer reserves the right to reject the lowest or any tender and also to discharge any or all of the tenders for each section or to split up and distribute any item of work to any specialist firm or firms, without assigning any reason.

The tenderers should note that the tender is strictly on the item rate basis and their attention is drawn to the fact that the rates for each and every item should be correct, workable and self-supporting. If called upon by the Employers/ Engineer-Incharge detailed analysis of any or all the rates shall be submitted. The Employer/Engineer-Incharge shall not be bound to recognize the contractor's analysis.

The works will be paid for as: "measured work" on the basis of actual work done and not as "lump sum" contract unless otherwise specified.

All items of work described in the schedule of quantities are to be deemed and paid as per complete works in all respect and details including preparatory and finishing works

involved, directly, related to and reasonably detectable from the drawings, specifications and schedule of quantities and no further extra charges will be allowed in this connection. In the case of lump sum charges in the tendering respect of any item of works, the payments of such items of work will be made for the actual work done on the basis of lump sum charges as will be assessed to be payable by the Employer/Engineer-Incharge.

The employer has the power to add to, omit from any work as shown in drawings or described In the specifications or include in the schedule of quantities and intimate the same in writing, but no addition, omission or variation shall be made by the contractor without authorization from the Employer. No variation shall vitiate the contract.

5. AGREEMENT:

The successful contractor may be required to sign an agreement as may be drawn up to suit local conditions and shall pay for all stamps and legal expenses, incidental thereto.

6. TAXES AND DUTIES:

The tenderers shall separately specify at the end of the tender the % and value of SGST and CGST as applicable.

As on date 9 % CGST and 9% SGST IS APPLICABLE FOR WORKS CONTRACT. Regarding tax part, the tax rate at the time of billing shall rule over and above all documentations. Valid documents shall be produced if tendered/ asked for at the time before payment. TDS for income tax is as applicable and shall be included in the quoted rates. The comparison for the least bidder shall be made with the basic price of items of work excluding "Goods and Service Tax" part.

7. PROVISIONAL SUMS:

All provisional sums described in the schedule of quantities as P.S. shall be exclusively allotted to the purchase of materials and not for any handling and fixing to be done by the contractor. Such costs of handling and fixing with profit (including transport charges if required) shall be separately included in the contract price as described in the schedule of quantities. The disposal of amounts covered under this head will be absolutely at the discretion of the employer.

Contractor is to make payments for these materials to the suppliers on certificate or order issued by the Employer/Engineer-Incharge and realizes them through his bill from the Employer.

8. QUANTITY OF WORK TO BE EXECUTED:

The quantities shown in the schedule of quantities are intended to cover the entire work indicated in the drawings / tender but the Employer reserves the right to delete any item from the scope of work, execute only a part or the whole or any excess thereof without assigning any reason there for.

9. OTHER PERSONS ENGAGED BY THE EMPLOYERS:

The employer reserves the right to execute any part of the work included in this contract or any work, which is not included in these contract by other agency or persons and contractor shall allow all reasonable facilities and use of his scaffolding for the execution of such work. The main contractor shall extend all cooperation in this regard.

10. EARNEST MONEY AND SECURITY DEPOSIT:

The tenderer will have to deposit an amount of **Rs. 20,000/- (Rupees Twenty Thousand Only)** for **Electrical works**, in the form of bank draft in favour of **"Indian Bank, Chennai"** at the time of submission of tender as an earnest money deposit. The Employer is not liable to pay any interest on the EMD. The Earnest Money of the unsuccessful tenderers will be refunded without any interest soon after the decision to award the work is taken or after the expiry of the validity period of the tender.

The successful tenderer to whom the contract is awarded will have to deposit as initial security deposit a further sum to make up 2% of the value accepted tender including the earnest money. On acceptance of the DD or Bank Guarantee by the Employer, the Earnest Money Deposit shall be refunded to the Contractor.

The initial security deposit will have to be made within **7 days** from the date of **issue of work order**, failing which the employer at his discretion may revoke the letter of acceptance and forfeit the EMD furnished along with the tender. The initial security deposit will be refunded after satisfaction and completion of work (as certified by the Engineer-Incharge).

Apart from the initial security deposit made as above, retention money shall be deducted from progressive running bill @ 5 % of the gross value of each running bill. This, together with the initial S.D. of the 2% referred to above, will constitute the total Security Deposit and on virtual completion of work the employer shall refund 50% of the total Security Deposit. The remaining 50% will be refunded after completion of the **Defect Liability Period of 12 months,** provided he has satisfactorily carried out all the work and attended to all the defects in accordance with the conditions of the contract. No interest is allowed on retention money.

11. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY:

The contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, schedule of drawings, schedule of quantities and specifications taken together whether the same may or may not be particularly shown described therein provided that the same can reasonably be inferred there from. The contractor shall provide himself for ground and fresh water for carrying out of the works at his own cost. The employer shall on no account be responsible for the expenses incurred by the contractor for hired ground or fresh water obtained from elsewhere.

The rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplation of the contract, and beyond the unit price, no extra payment, will be allowed for incidental or contingent work. Labour and / or materials inclusive of all taxes and duties whatsoever except for specific items, if any stipulated in the tender documents.

The contractor shall supply, fix and maintain at his own cost, for the execution of any work, all tools, tackles, machineries and equipments and all the necessary Centreing, scaffolding, staging, planking, timbering, strutting, shoring, pumping, fencing, boarding, watching and lighting by night as well as by day required not only for the proper execution and protection of the said work but also for the protection of the public and safety of any adjacent roads, streets, walls, houses, buildings, all other erections, matters and things and the contractor shall take down and remove any or all such Centreing, scaffolding, staging, planking, timbering, strutting, shoring, etc., as occasion shall be required or when ordered so to do, and shall fully reinstate and make good all matters and things disturbed during the execution of works to the satisfaction of the employer / Engineer-Incharge. The contractor shall also provide such temporary road on the site as may be necessary for the proper performance of the contract and for his own convenience but not otherwise. Upon completion, such roads

shall be broken up and levelled where so required by the drawings unless the employer shall otherwise direct.

The contractor shall at times give access to workers employed by the employer or any employed on the buildings and to provide them with water and lighting and leave or make any holes, grooves etc., in any work. Where directed by the employer as may be required to enable such workman to lay or fix pipes, electrical wiring, special fittings etc. the quoted rates of the tenderers shall accordingly include all these above mentioned contingent works.

12. TIME OF COMPLETION/EXTENSION OF TIME & PROGRESS CHART

1. **Time of completion:** The entire work is to be completed in all respect within the **stipulated period of 30 days.** The work shall deem to be commenced within **14 days from the date of acceptance letter or date of handing over of site**, whichever is later. Time is the essence of contract and shall be strictly observed by the contractor. The work shall not be considered as complete until the Employer/ Engineer-Incharge have certified in writing that this has been complete and the defects liability period shall commence from the date of such certificate.

2. **Extension of time:** If in the opinion of the Employer/ Engineer-Incharge the works be delayed (a) by reason of any exceptionally inclement weather or (b) by reason of instructions from the employer in consequence of proceedings taken or threatened by or disputes, with adjoining or neighbouring employers or (c) by the works, or delay of other contractors nominated by the employer and not referred to in the specification or (d) by the reason of authorized extra and additions or (e) by reason or any combination or works men or strikes or lock-out affecting any of the building trade or (f) from other causes which the employer may consider are beyond the control of the contractor, the employer at the completion of the time allowed for the contract shall make fair and reasonable extension of time for completion in respect therefore. In the event of the employer failing to give possession of the site upon the day specified above, the time of completion shall be extended suitably.

   In case of such strikes or lockouts as are referred to above, the contractor shall, immediately give the employer, written notice thereof. Nevertheless he shall use his best endeavours to prevent delay, and shall do all that may be reasonably required, to the satisfaction of the employer for any extension of time for completion hereunder (which shall be final and binding on the contractor) shall be promulgated at the conclusion of such strike or lock-out and the employer shall then, in the event of an extension being, granted, determine, and declare the final completion date. The provision in clause 13 with respect to payments of liquidated damages shall be construed as if the extended date fixed by the employer were substituted for and the damages shall be deducted accordingly

3. **Progress of work:** During the period of construction the contractor shall maintain proportionate progress on the basis of programme chart submitted by the contractor immediately before commencement of work and agreed to by the employer/Engineer-Incharge. Contractor should also include planning for procurement of scarce material well in advance and reflect the same in the programme chart so that there is no delay in completion of the project.

13. LIQUIDATED DAMAGES

Should the work be not completed to the satisfaction of the employer/Engineer-Incharge within the stipulated period, the contractor shall be bound to pay to the employer a sum calculated as given below by way of liquidated damages and not as penalty during which the work remains un commenced or unfinished after the expiry of the completion date.

a. For contracts having time for completion **upto 6 months** and less 1% of the estimated amount shown in the tender per week subject to a ceiling of 10% of the accepted contracted sum.

b. For contracts having time for completion exceeding 6 months & less than 2 years 0.50% of the estimated amount in the tender per week subject to ceiling of 7.5% of the accepted contracted sum.

14. NOTICE AND PATENTS OF APPROPRIATE AUTHORITY AND OWNERS

The contractor shall confirm to the provisions of any acts of the legislature relating to the work, and to the regulations and Bye laws of any authorities and/or any water, lighting and other companies, and/or authorities with whose systems the structures were proposed to have connection and shall before main and variation from the drawings or specification that may be associated to so confirm give the employer/Engineer-Incharge written notices specifying the variations proposed to be made and the reasons for making them and apply for instruction thereon. The employer/Engineer-Incharge on receipt of such intimation shall be giving a decision within a reasonable time.

The contractor shall arrange to give all notices required for by the said Acts. Regulations or Byelaws to be given to any authority and to pay such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipt with the employer.

The contractor shall indemnify the employer against all claims in respect of patent rights, royalties, damages to building, roads or members of public in course of execution of work and shall defend all actions arising from such claims and shall keep the employer saved harmless and indemnified in all respects from such actions, costs and expenses.

15. ACCESS

Any authorized representative of the employer shall at all reasonable times have free access to the workshop, factories or other place where materials are being prepared or constructed for the works and also to any place where the materials are lying or from where that are being obtained, and the contractor shall give every facility to the bank or their representative everything necessary for inspection and examination and test of the materials and workmanship. Except the representative of the employer no person shall be allowed at any time without the written permission of the employer.

16. MATERIALS, WORKMANSHIP, SAMPLE, TESTING OF MATERIALS

All the works specified and provided for in the specification or which may be required to be done in manner with materials of the best and approved quality of the respective kinds in accordance with the particulars contained in and implied by the specifications as any from their entire satisfaction. If required by the employer/Engineer-Incharge during the execution of the work, and to their entire satisfaction. If required by the employer/Engineer-Incharge the contractor shall carry out tests on materials and workmanship in approved materials testing laboratories or as prescribed by the employer/Engineer-Incharge at his own cost to prove that the materials etc. under test conform to the relevant B.I.S or as specified in specifications. The necessary charges for preparation of mould (in case of concrete cube) transporting, testing etc, shall have to be borne by the contractor. No extra payments on this account should in any case be entertained.

best of their kind available and the contractor/s must be entirely responsible for the proper and efficient carrying out of work. The work must be done in the best workmanlike manner. Samples of all materials to be used would be submitted to the employer/Engineer-Incharge when so directed by the employer/Engineer-Incharge and written approval from employer/Engineer-Incharge must be obtained prior to placement of order.

During the inclement weather contractor shall suspend concreting and plastering for such time as the employer / Engineer-Incharge may direct and shall protect from injury all work when in course of execution. Any damage (during constructions) to any part of the work for any reasons due to rain, storm, or neglect of contractor shall be rectified by the contractor in an approved manner at no extra cost.

Should the work be suspended by reason of rain, strike, lock-outs or any other cause the contractor shall take all precautions necessary for the protection of work and at his own expenses and shall make good any damage arising from, any of these causes.

The contractor shall cover up and protect from damage from any cause, all new work and supply, temporary/doors, protection to windows and any other requisite protection for execution of the work whether by himself or special tradesmen or sub contractor and any damage caused must be made good by the contractor at his own expense.

17. REMOVAL OF IMPROPER WORK

The employer shall during the progress of the work have power to order in writing from time to time the removal from the work within such reasonable time or time as they be specified in order of any materials which in the opinion of the employer/Engineer-Incharge are not in accordance with specification or instructions. The substitution or proper re-execution of any work executed with materials or workmanship not in accordance with the drawings and specification or instructions, in case the contract or refuses to comply and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereon or incidental thereto as certified by the employer/Engineer-Incharge shall be borne by the contractor or may be deducted from any money that may become due to the contractor. No certificate which may be given by the Engineer-Incharge shall relieve contractor from his liability in respect of unsound work or bad materials.

18. SITE ENGINEER

The term "site engineer" shall mean person appointed and paid by the employer to superintend the work. The contractor shall afford the site engineer every facility and assistance for examining the works and materials and for checking and measuring work and materials. The site engineer shall have no power to revoke, alter, enlarge or relax any requirements of the contractor or to sanction any day work, addition, alterations, deviations or omissions or any extra work whatsoever except in so far such authority may be specifically conferred by a written order of employer/Engineer-Incharge.

The site engineer shall have power to give notice to the contractor or to his foreman for non-approval of any work or materials and such work shall be suspended or the use of such materials shall be discontinued until the decision of the employers is obtained. The work will from time to time examined by the engineer from the premises department of the employer and by the Engineer-Incharge. But such examinations shall not in any way exonerate the contractor from the obligation to remedy any defects which may be found to exist at any stage of the work or after the same is complete subject to the limitations of this clause, the contractor shall take instructions only from the Engineer-Incharge/employer.

19. CONTRACTOR'S EMPLOYEES

The contractor shall employ technically qualified and competent supervisor for the work who shall be available (by turn) throughout the working hours to receive and comply with instructions of employer/Engineer-Incharge. The contractor shall engage at least one experienced engineer as site-in-charge for execution of the work. The contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job efficiency.

The contractor shall employ labourers on the work as far as possible.

No labourer below the age of sixteen years and who is not an Indian national shall be employed on the work.

Any labourer supplied by the contractor to be engaged on the work on day-work basis either wholly or partly under the direct order or control of the employer or his representative shall be deemed to be a person employed by the contractor.

The contractor shall comply with the provision of all labour legislation including the requirements of:

a. The payment or wages act
b. Employer's liability act
c. Workmen's compensation act
d. Contract labour (Regulation & Abolition) Act, 1970 and Central Rules 1971.
e. Apprentices act 1961.
f. Any other act or enactment relating thereto and rules framed there under from time to time.

The contractor shall keep the employer saved harmless and indemnified against claims if any of the workmen and all costs and expenses as may be incurred by the employer in connections with any claim that may be made by any workmen.

The contractor shall comply at his own cost with order of requirement of any health officer of the state or any local authority or of the employer regarding the maintenance of proper environmental sanitation of the area where the contractors' labourers are housed or accommodated for the prevention of small pox, cholera, plague, typhoid, malaria and other contagious diseases. The contractor shall provide, maintain and keep in good sanitary condition adequate sanitary accommodation and provide facilities for pure drinking water at all times for the use of men engaged on the works and shall remove and clear away the same on completion of the works. Adequate precautions shall be taken by the contractor to prevent nuisance of any kind on the works or the lands adjoining the same. The contractor shall arrange to provide first aid treatment to the labourers engaged on the works. He shall within 24 hours of the occurrence of any accident at or about the site or in connection of execution of the works, report such accident to the Employer and also to the Competent Authority where such report is required by the law.

20. DISENGAGEMENT / DISENGAGE OF WORKMEN

The contractor shall on the request of the employer immediately disengagement / disengage from works any person employed thereon by him without any prior notice, who any in the opinion of employer be unsuitable or incompetent or who may misconduct himself. Such discharges shall not be the basis of any claim for compensation damages against the employer or any of their officer or employee.

21. DAMAGE TO PERSONS AND PROPERTY INSURANCE ETC.

i. The contractor shall be responsible for any injury to the work or workmen to persons, animals or things and for all damages to the structural and/or decorative part of property which may arise from the operations of neglect to himself or of any sub-contractor or of any of his or sub-contractor's employees, whether such injury or damages arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this contract. The cause shall be held to include inter-alia, streets, footpath or ways as well as damages caused to the buildings and the works forming the subject of this contract by rain, wind or other inclemency of the weather. The contractor shall indemnify the employer and hold harmless in respect of all and any expenses arising from any such injury or damages to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage to persons or property as aforesaid under any acts of compensation or damage consequent upon such claim.

ii. **The employer shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs charges and expenses arising or accruing from or in respect of any such claim or damage from any sums due or to become due to the contractor.**

22. INSURANCE

a. Unless otherwise instructed the contractor shall insure the works and keep them insured until the virtual completion of contract against any loss or damages by fire and/or earthquake flood. The insurance must be placed with a company approved by the employer, in the joint names of the employer and the contractor for such amount and for any further sum if called to do by the employer, the premium, of such further sum being allowed to the contractor as an authorized extra.

b. **The contractor shall deposit the policy and receipt for premiums paid with the employer within 7 days from the date of issue of work order unless otherwise instructed.** In default of the contractor insuring as provided above, the employer on his behalf may so insure and may deduct the premiums paid from any bills, which may become due to the contractor. The contractor shall as soon as the claim under the policy is settled or the work reinstated by the insurance company should they elect to do so, proceed with due diligence with the completion of the works in the same manner as though the fire has not occurred and in all respects under the conditions of the contract. The contractor in case of rebinding or reinstatement after fire shall be entitled to extension of time for completion as the employer may deem fit.

c. From commencement to completion of works, the Contractor shall take full responsibility for the care of the work and for taking precautions to prevent loss or damage to the work to the maximum extent possible and shall be liable for any damage or loss that may arise to the works or any part thereof from any cause whatsoever including causes of fire, lightning, explosion, earthquake, storm, hurricane, floods, inundation, subsidence, landslides, rock slides, riots (excluding Electrical war, rebellion, revolution and insurrection) or any latent defect or damage and shall at his own cost repair and make good the same so that at all times the work shall be in good order and condition and in conformity in every respect with the requirements of the Contract.

d. For the purpose of this condition this expression "from commencement to completion of works" shall mean the period starting with the date of issue of Work Order or date of handing over of site whichever is later and ending with issue of Virtual Completion Certificate.

e. Without limiting the obligations and responsibilities under this condition, the Contractor shall insure and keep insured the works from commencement to completion, as aforesaid, for the full contract value including Price Variation Adjustment if any against the risk of loss or damage from any cause whatsoever including the causes enumerated in the foregoing Clause (a). In the event of there being a variation in the nature and extent of the works, the Contractor shall from time to time increase or decrease the value of the insurance correspondingly. All the premia for the insurance shall be borne and paid by the Contractor.

f. The said insurance shall also provide cover for the removal of debris of the lost or damaged works. The said insurance shall be in the joint names of the Employer and the Contractor, Employer's name being mentioned first in the policies and the Contractor shall deposit with the Employer the said policy or Policies within 15 days from issue of Work Order. All money payable by the insurer under such Policy/Policies shall be recovered by the Employer only and may be paid to the Contractor or any other agency of Employer's choice in installments for the purpose of rebuilding or replacing or repairing the works and/or goods destroyed or damaged as the case may be.

g. The Contractor shall at all times indemnify and keep indemnified the Employer against all losses, claims, damages or compensation including under the provisions of the payment of the Wages Act 1936, Minimum Wages Act 1948, Employer's Liability Act 1938,Workman's Compensation Act 1923,the Maternity Benefit Act 1961,the Bombay Shops and Establishments Act 1947, Industrial Disputes Act 1947, and Contract Labour (Regulation and Abolition)Act 1970 and Employees State Insurance Act 1948, Motor Vehicles Act 1988 or any modifications thereof or under any other law relating thereto and rules made thereunder from time to time or as a consequence of any accident or injury to any workman or other person in or about the work whether in the employment of the Employer or Contractor or not, and also against all costs, charges and expenses of any suit, action or proceedings whatsoever out of such accident or injury or combination of any such claims.

h. Before commencing the work, the Contractor shall without limiting his obligations and responsibilities under this condition, insure against any loss of life or injury to any personnel in the employment of Contractor. For this purpose, insurance shall be taken by the Contractor. Such insurance shall be taken to include both employees/workmen covered by the Workman's Compensation Act 1923, as well those employees/workmen not covered by the said Act. Separate insurance policies may be taken for employees/ workmen covered by Workman's Compensation Act 1923, and employees / workmen not covered by the said Act. All the premia shall be paid by the Contractor. Policy/Policies taken under this para for the personnel in employment with the Contractor may be in their Employer's names of the Contractor. In the event of any loss or injury to personnel in employment with the Contractor, the Employer and Contractor shall recover directly from the Insurance Company and ensure that payment of the same is made to the affected parties including the Employer. The policy in original shall be deposited with the Employer.

i. The Contractor shall at all times indemnify and keep indemnified the Employer against all losses and claims for injuries or damage to any person or any property whatsoever which may arise out of or in consequence of the construction and maintenance of the work and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto. Before commencing the execution of the works, the Contractor shall without in any way limiting his obligations and liabilities under this condition, insure at his cost and

expense against any damage or loss or injury which may be caused to any person or property including the employees and directors of the Employer / Electrical Consultant and their property by or in the course of the execution of the works. Such insurance to be known as the Third Party Insurance shall be in a sum of Rs 5.0 Lakhs (Rupees Five Lakhs Only). The Insurance policy to be so obtained by the Contractor shall be deposited by the Contractor with the Employer within fifteen days of its issue by the Insurer.

j. The Contractor shall provide the Employer with documentary evidence from time to time, that he has taken all the insurance policies mentioned in the foregoing paragraphs and renewed them if required and that he has paid the necessary premia for keeping the policies valid till the works are completed and handed over to Employer.

k. The Contractor shall ensure that similar insurance policies are taken out by his sub Contractors or nominated Contractors, if any. The Contractor shall be responsible to the Employer or to any other person for any claim or loss resulting from the failure of the Sub-contractors or nominated Sub-Contractors to obtain such insurance policy. While taking the insurance policies, Contractor should indicate clearly to the insurance companies that policies issued shall cover their Sub-Contractors and nominated Sub-Contractors also.

l. If the Contractor and/or his sub-Contractor or nominated Sub Contractor, if any, shall fail to effect and keep in force the insurance referred to above or any other insurance which he / they may be required to effect under the terms of the Contract, then in any such case, the Employer may, without being bound to effect and keep in force any such insurance policy pay such premium or premia, as may be necessary for that purpose from time to time and deduct the amount so paid by the Employer from any money due or becoming due to the Contractor or recover the same as a debt due from the Contractor.

m. All insurance to be effected by the Contractor, and/or his sub-Contractors, or nominated sub-Contractors, if any, shall be taken only with an Insurance Company approved by the Employer.

n. Without prejudice to any of its obligations and responsibilities under this condition, the Contractor shall, within 30 days from the date of the Work Order and thereafter at the end of each quarter submit a report to the Employer in Proforma 'C' annexed hereto the detailed information on the Insurance Policies as prescribed in the said proforma together with relevant documentary evidence.

o. No work shall be commenced by the Contractor unless and until he has obtained the insurance or insurances required to be obtained by him under or by the foregoing clauses and no work shall be carried out or continued by the Contractor unless and until such insurance is current and valid at that time. All the receipts in original along with two photo copies thereof, for the payment of the premia shall be furnished by the Contractor to the Employer. The original receipts will be returned to the Contractor after verification. The Employer reserves the right for payment for works done subject to fulfillment of this condition and shall instruct the Engineer-Incharge accordingly.

p. In the event of any claim for insurance becoming due on account of any eventuality covered by the respective insurance policy/policies, the Contractor shall reinstate the installation, replace the materials or equipments or pay compensations to the affected personnel/Employees without waiting for settlement of the claim from insurance company.

q. If the Contractor shall not perform and observe any of the duties and obligations devolving upon him hereunder, and such omission or breach by the Contractor shall involve the Employer in any liability tortuous or otherwise and/or loss or damage, the Employer shall be entitled to the restitution of such loss or damage and shall be entitled to recover the amount of restitution from any moneys due to the Contractor from the Employer under this Contract or any other Contract.

23. ACCOUNTS RECEIPTS AND VOUCHERS

The contractor shall, upon the request of the employer/Engineer-Incharge furnish them all the invoices, accounts, receipts and other vouchers that they may require in connection with the works under this contract. If contractor shall use materials less than what he is required under the contract, the values of the difference in the quantity of the materials he was required to use and that he actually used shall be deducted from his dues. The decision of employer shall be final and binding on the contractor as to the amount of materials the contractor is required to use for any work under this contract.

Before taking any measurement of any work, the site engineer or subordinate deputed by him shall give reasonable notice to be contractor. If the contractor fails to attend at the measurements after such notice or fails to countersign or to record the difference within a week from the date of measurement in the manner required by the site engineer than in any such event the measurement after such notice taken by the site engineer or by subordinate deputed by him as the case may be is final and binding on the contractor and contractor shall have no right to dispute the same.

24. PAYMENTS

All bills shall be prepared by the contractor in the form prescribed by the employer/Engineer-Incharge. **One interim bills shall be prepared subject to minimum value for interim certificate as stated in these documents.** The bills in proper forms must be duly accompanied by detailed measurements in support of the quantities or work done and must show deductions for all previous payments, retention money etc.

The employer/Engineer-Incharge shall issue a certificate after due scrutiny of the contractor's bill stating the amount due to the contractor from the employer and the contractor shall be entitled to payment thereof, within the period of honouring certificates named in these documents.

The amount stated in an interim certificate shall be the total values of work properly executed as per tender up to the date of the bill less the amount to be retained by the employer as retention money vide **clause 10** of these conditions, recovery of TDS and less installments previously paid under these conditions, provided the certificate shall only include the value of said materials and goods as from such time as they are reasonably, properly and not prematurely brought and placed adjacent to the work and then only if adequately protected against weather or other casualties.

The employer will deduct retention money as described in clause 10 of these conditions. The refund of retention money will be made as specified in the said clause.

If the employer has supplied materials or goods to the contractor, the cost of any such materials or goods will be progressively deducted from the amount due to the contractor, in accordance. All the interim payment shall be regarded as payments for work actually done and completed, and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the contract, or any part thereof in any respect or the according of any claim, nor shall, it

determine or affect in anyway the power of the employer under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise or in any other way affect the contract. The final bill shall be submitted by the contractor within one week of the date fixed for completion of the work or of the date of certificate of completion furnished by the site engineer. All final payments shall be made within 3 months.

25. FINAL PAYMENTS

The final bill shall be accompanied by a certificate of completion from the Engineer-Incharge. Payments of final bill shall be made after deduction of retention money as specified in **clause 10** of these conditions, which sums shall be refunded after completion of defects liability period after receiving the Engineer-Incharge's certificate that the contractor has rectified all defects to the satisfaction of employer. The acceptance of payment of the final bill by the contractor would indicate that he will have no further claim in respect of the work executed.

26. VARIATION / DEVIATION

The price of all such additional items/non-tendered items will be worked out on the basis of rates quoted for similar items in the contract wherever existing or on engineering rate analysis based on prevalent fair price of labour, material and other components as required.

27. SUBSTITUTION

Should the contractor desire to substitute any materials and workmanship, he/they must obtain the designated in this specification indefinitely by such terms as "Equals" or "Other approved" etc. specific approval of the employer/Engineer-Incharge has to be obtained in writing.

28. PREPARATION OF BUILDING WORKS FOR OCCUPATION AND USE ON COMPLETION

The whole of the work will thoroughly be inspected by the contractor, deficiencies and defects put right. On completion of such inspection the contractor shall inform the employer/Engineer-Incharge that he has completed the work and it is ready for inspection.

On completion the contractor shall clean all windows and doors including the clearing and oiling if necessary, of all hardware, inside and outside, all floors, staircases, any every part of the building. He will leave and clean and ready for immediate occupation and to the satisfaction of the employer.

29. CLEARING SITE ON COMPLETION

On the completion of the works the contractor shall clear away and remove from the site all construction plans, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a workman like condition to the satisfaction of the Employer / Engineer-Incharge.

30. DEFECTS AFTER COMPLETION

The contractor shall make good at his own cost and to the satisfaction of employer all defects, shrinkage, settlements or other faults which may appear within 12 months after completion of work. In default the employer may employ a person and amend and make good such damage, losses and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages, loss and expenses shall be recoverable from him by the employer or may be deducted from the contractor, deduct from any money due to

the contractor a sum equivalent to the cost of amending such work and in the event of the amount retained being insufficient, recover that balance from the contractor from amount retained under **clause No. 10** together with any expenses the employer may have incurred in connection there with.

31. ESCALATION

The rate quoted shall be firm throughout the tenure of the contract (including extension of time, if any, granted) and will not be subject to any fluctuation due to increase in cost of materials, labour, taxes, etc. unless specifically provided in these documents.

32. IDLE LABOUR

Whatever the reason may be no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would not be entertained under any circumstance.

33. SUSPENSION

If the contractor except on account of any legal restraint upon the employer preventing the continuance of the work or in the opinion of the employer shall or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default, the employer shall have the power to give notice in writing to the contractor requiring the work be proceeded within a reasonable manner and with reasonable dispatch, such notice purport to be notice under this clause.

After such notice shall have been given, the contractor shall not be at liberty to remove from the site of the works or from any contiguous thereto any plant or materials to subsist from the date of such notice being given until the notice shall have been compiled with. If the contractor fails to start the work within seven days after such notice has been given to proceed with the works as there in prescribed the employer may proceed as provided in clause 34 (Termination of contract by employer).

34. TERMINATION OF CONTRACT BY EMPLOYER

If the Contractor being an individual or a firm, commits any "Act of insolvency" or shall be adjudged as Insolvent or being an incorporated Company shall have an order for compulsory winding up or applies for voluntary winding up or subject to the supervision of the Court and of the Official Assignee or the Liquidator in such acts of Insolvency or winding up shall be unable within seven days after notice to him requiring him to do so, to show to the reasonable satisfaction of the employer/Engineer-Incharge that he is able to carry out and fulfill the Contract, and to give security therefore, if so required by the employer/Engineer-Incharge.

or if the Contractor (whether an individual; firm or incorporated Company) shall suffer execution to be issued, or shall suffer any payment under this Contract, to be attached by or on behalf of any of the creditors of the Contractor,

or shall charge or encumber this Contract or any payments due or which might become due to the Contractor there under,

or shall assign or sub-let the Contract without obtaining the prior consent in writing of the Employer or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor,

or if in the opinion of the Employer the contractor,

(i) has abandoned the Contract, or

(ii) has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for seven days after receiving from the employer / Engineer-Incharge written notice to proceed, or

(iii) has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or

(iv) has failed to remove materials from the site or to pull down and replace work for seven days after receiving from the employer / Engineer-Incharge written notice that the said materials or work were condemned and rejected by the employer/Engineer-Incharge under these conditions, or

(v) has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this Contract to be observed and performed by the Contractor, or

(vi) has to the detriment of good workmanship or in defiance of the employer / Engineer-Incharge instructions to the contrary sublet any part of the Contract.

then in any of the said cases the Employer 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 Employer or the obligations and liabilities of the Contractor, the whole of which shall continue in force as fully as if Contract had not been so determined and as if the works subsequently executed had been executed by or on behalf of the Contractor (without thereby creating any trust in favour of contractor). Further, the Employer, may enter upon and take possession of the work and all plant, tools, scaffoldings, sheds, machinery, steam and other power, utensils and materials lying upon the premises or the adjoining lands or roads and seal the same as his own property or may employ the same by means of his own servants and workmen carrying on and completing the works or by employing any other contractors or other persons to complete the works, and the Contractor shall not in any way interrupt or do any act, matter or things 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 works shall be completed or as soon thereafter as convenient, the Employer / Engineer-Incharge shall give a notice in writing to the Contractor to remove his surplus materials and plant, and should the Contractor fail to do so within a period of 14 days after receipt thereof by him the Employer shall sell the same by public auction, and shall give credit to the Contractor for the amount realized after deducting there from the costs of removal and sales by the Employer for the values of the said plant and material so taken possession of by the Employer and the expense or loss which the Employer shall have been put to in procuring the works to be completed and the amount, if any, owing to the Contractor and the amount which shall be so payable shall thereupon be paid by the Employer to the Contractor, or, by the Contractor to the Employer, as the case may be, On termination of the Contract, the Contractor shall forthwith remove himself and his workmen from the works site.

35. ARBITRATION

All disputes or differences of any kind whatsoever which shall at any time arise between the parties hereto touching or concerning the works or the execution or maintenance thereof of this contract of the rights touching or concerning the works or the execution of maintenance thereof of this contract of the construction remaining operation or effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during or after determination foreclosure or breach of the contract (other than those in respect of which the decision of any person is by the contract expressed to be final and binding) shall after written notice by either party to the contract to the other of them and to the Employer hereinafter mentioned be referred for adjudication to a sole Arbitrator to be appointed as hereinafter provided.

For the purpose of appointing the sole Arbitrator referred to above, the Employer will send within thirty days of receipt of the notice to the contractor a panel of three names of persons who shall be presently unconnected with the organization for which the work is executed.

The contractor shall on receipt of the names as aforesaid select any one of the person(s) name to be appointed as a sole Arbitrator and communicate his name to the Employer within thirty days of receipt of the names. The Employer shall thereupon without any delay appoint the said person as the sole arbitrator. If the contractor fails to communicate such selection as provided above within the period specified the competent authority shall make the selection and appoint the selected person as the sole Arbitrator.

If the Employer fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the Employer a panel of three names of persons who shall all be unconnected with either party. The Employer shall on receipt of the names as aforesaid select any one persons name and appoint him as the sole arbitrator. If the employer fails to select the person and appoint him as the Sole Arbitrator within thirty days of receipt of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from the panel as the sole arbitrator and communicate his name to the Employer.

If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment of vacates his office due to any reason whatsoever another sole Arbitrator shall be appointed as aforesaid.

The work under the contract shall, however, continue during the arbitration proceedings and no payment due to or payable to the contractor shall be withheld on account of such proceedings.

The arbitrator shall be deemed to have entered on the reference on the date he issued notice to both the parties fixing the date of the first hearing.

The arbitrator shall give a separate award in respect of each dispute or difference referred to him. The arbitrator shall decide each dispute in accordance with the terms of the contract and give a reasoned award. The venue of arbitration shall be in **Chennai**.

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 parties. The cost of the reference and of the award including the fees, if any, of the arbitrator who may direct to and by whom and in what manner, such costs or any part thereof shall be paid and may fix of settle and amount of costs to be so paid.

The award of the arbitrator shall be final and binding on both the parties.

Subject to aforesaid the provisions of the Arbitration Act 1992 or any statutory modification or re-enactment thereof and the rules made there under, and for the time being in force, shall apply to the arbitration proceeding under this clause.

The Employer and the contractor hereby also agree that arbitration under clause shall be condition precedent to any right to action under the contract with regard to the matters hereby expressly agreed to be so referred to arbitration.

Submitting to arbitration may be considered as an additional remedy and it does not preclude the parties to seek redressal / other legal course.

36. CERTIFICATE OF VIRTUAL COMPLETION OF WORKS:

The Contractor shall report in writing to the Engineer-Incharge / Employer, in the form of a Certificate as per Proforma 'C' annexed hereto as and when the works are completed in all respects. The Engineer-Incharge / Consultant / Employer shall after the verification of the works and in consultation with Engineer-Incharge / Consultant issue to the Contractor a certificate to be called "Virtual Completion Certificate", a copy whereof shall be submitted to the Employer to enable him to take possession of the completed works. The Defects Liability period shall commence only from the date of issue of such certificate.

DECLARATION

I / We hereby declare that I / We read and understood the above terms and conditions and that we shall abide by them if the work is awarded to us.

Contractor's Signature with Seal

ADDITIONAL CONDITIONS OF CONTRACT (ACC)

1. COMPLETION SCHEDULE

The contractor will be required to work according to a programme given to them by the consulting Engineer-Incharge, based on the priorities of the employers. The contractor will be required to prepare bar charts on the basis of the programme given to them and get these approved by employer/Engineer-Incharge. **The overall completion programme of the work will be 30 days.**

2. WATER AND ELECTRICAL ENERGY

The contractor has to make his own arrangements for water, storage and distribution for the work.

Electricity will be supplied by the bank at one point for the work on chargeable basis.

3. OTHER RULES AND REGULATIONS

a. All E.S.I formalities or prescriptions under Workmen Compensation Act will be adhered to by the contractor. He will have to observe the regulations prescribed under the contracts Labour-Regulations & Abolition Act, 1970 and rules formed there under.

b. The contractor shall not employ any labour below the age of 18 years and shall pay his labourers not less than the wages paid for similar work or the fair wage. Fair wage means wage whether for time or piece work as defined in the minimum wages act.

PREAMBLE TO SCHEDULE OF QUANTITIES

1. Tender shall be on the basis of items rates which shall include the cost of materials, labour, all taxes, duties, and all other appurtenant services required for the complete installation, testing and commissioning in accordance with relevant drawings and meeting the requirements of the specifications and relevant I.S. specification including the fees for inspection together with the liabilities and obligations as detailed in the general conditions of contract.

2. Prices shall remain firm and free from variation due to rise and fall in the cost of materials and labour or any other price variation whatsoever whether during the stipulated period of execution or during extended period of completion if any, expect direct statutory, increases by the Act of Govt. or Local bodies.

3. Item rates shall remain valid for any variations in the estimated quantities given in the schedule of quantities.

4. In order to facilitate the technical scrutiny of various quotations, the tenderer must supply with their quotations, the tenderer must supply with their quotations detailed technical particulars, make catalogues and erection drawings for various items under different parts specified in the schedule of quantities.

5. The drawings and specifications lay down minimum standards for equipment and workmanship. Deviations, if any, shall be clearly set down. In the absence of any deviations, it will be deemed that the tenderer is fully satisfied with the intents or the specifications and drawings and their compliance with the statutory and fire insurance provision including local codes. Where the drawings and specifications conflict the more stringent shall apply.

6. All installations shall be tested as specified and a test certificate in the prescribed form required by the authorities shall be furnished.

7. The entire installation shall be guaranteed against any defective materials of workmanship for a period of **12 months** from the date of installation as certified by the Engineer-Incharge and taken over by the employer. During the guarantee period, all defects shall be rectified by the contractor, free of cost.

8. Water and power required for works may be made available at site. Use of electrical power will be on chargeable basis. If the water available at site is unsuitable for construction purpose, the contractors will make their own arrangements for water.

9. The tenderers must acquaint themselves of the site conditions and take note of all factors while quoting the rates, as no extra will be allowed on any ground.

10. The employer shall pay the contractor such sums as shall become payable hereunder at the times and in the manner specified in the said conditions.

11. The term "Consulting Engineer-Incharge / Consultant / Engineer-Incharge" in the conditions shall mean the said '- ENGINEER-INCHARGE', or in the event of their death or ceasing to be the consulting Engineer-Incharge for that 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 in sufficient by the Employer. Provided always that no persons subsequently appointed to be consulting

Engineer-Incharge under this contract shall be entitled to disregard or over rule any decision or approval or direction or expressed in writing by the consulting Engineer-Incharge for the time being.

12. The plan, agreement and documents mentioned shall form the basis of this contract and the decision of the said Consulting Engineers/Engineer-Incharge for the time being as mentioned in the conditions of contract in reference to all matters of dispute as to the materials, workmanship or account and as to the intended interpretation of the clauses of the agreement of any other document attached hereto shall be final and binding on both parties and may be made a Rule of Court.

13. The said contract comprises the works mentioned in the BOQ (Bill of Quantities) and all subsidiary works **(if any)** connected therewith within the same site as may be ordered to be done from time to time by the said Employer through the consulting Engineer-Incharge for the time being, even though such works may not be shown on the drawings or described in the said specifications or the priced schedule of quantities.

14. The employer reserves to himself the right of altering the drawings and nature of the work and of adding to or omitting any items of work or of having portions of the same carried out without prejudice to this contract.

15. The said conditions shall be read construed as forming part of this agreement, and the parties hereto will respectively, abide by and submit themselves to the conditions and stipulations and perform the agreements on their parts respectively in such conditions contained.

16. Further, letters exchanged between the employer and the contractor after the receipt of this contract as cited shall form an integral part of this contract.

17. The successful tenderer shall supply completion drawings of the entire installations as executed at site drawn to scale approved by the employer / Engineer-Incharge after the completion of the work. But before completion certificate is given by the employer / Engineer-Incharge upon receipt of the completion drawings, as built drawings of the work only, the final bill will be released.

18. The materials of the first preference shall be used by the contractor may exclude himself of not doing so only if the required range as per tender specifications is not manufactured, by the particular manufacture. The evidence of such case shall be supported by a letter from the respective manufacturer. Samples of all fittings and accessories shall be approved by the employer/Engineer-Incharge prior to their installations.

ARTICLES OF AGREEMENT

This agreement is made at Chennai on this day of _____ Two Thousand Eighteen, INDIAN BANK, a body Corporate constituted under the Banking Companies (Acquisition and Transfer of Undertakings) Act 1970 having Corporate Office, 254-260, Avvai Shanmugam Salai, Royapettah, Chennai 600 014, (herein after referred to as "The Employer", which expression shall unless excluded repugnant to the context be deemed to include its successors and assigns) of the one part

AND M/s_____ having its Registered office at.....
..... and Regional Office at ..... Chennai.
(hereinafter referred to as the "Contractor") which expression shall include its successors, legal representatives and assigns of the second part.

WHEREAS Employer intends / desirous of doing Electrical works for proposed DAMC, Indian Bank Building, 1st Floor, Chetpet, Chennai 600010 and has drawings and specifications, schedule of quantities describing the work

WHEREAS the Employer has caused drawings and tender documents to be prepared by his Engineer-Incharge (hereinafter referred to as "Engineer-Incharge").

AND whereas the Employer has called for tenders for the above work as per Employer's NIT dated ----------and whereas the tender dt. ---------- submitted by the contractor has been accepted for such sum as may be ascertained to be payable in terms of the Bill of Quantities and which sum is estimated to be Rs. ... . (Rupees .....) hereinafter referred to as the said "Contract Sum".

AND whereas the Contractor has agreed to execute the work as per drawings, specifications, conditions of contract of the tender and work Order for the Employer's project of'.

AND whereas parties herein desirous of reducing the agreed terms into writing as under:

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:-

1) In consideration of the said Contract Sum to be paid at the times and in the manner set forth in the said Conditions the Contractor shall carry out and complete all the Electrical Works as per terms and conditions herein contained and according to the general rules & conditions of the contract, notice inviting tender, special conditions of contract, general scope of work, technical specifications, schedule of rates and instructions to be given by Engineer-Incharge / Employer and to the entire satisfaction of the Employer.

Further, the contractor hereby agrees and undertakes to execute and complete the said works shown in the said drawings and such further detailed drawings as may be furnished to it by the Employer and described in the said specifications and the said schedule of quantities upon and subject to the said conditions.

The said tender and allied documents, drawings, specification, priced schedule of quantities, agreement and documents above mentioned shall form the basis part and parcel of this

contract and the decision of the Employer as mentioned in the condition of contract with reference to all matters of disputes as to materials, workmanship of account and as to the interpretation of the clauses of this agreement or the said conditions shall be final and binding on both the parties.

The contract herein contained comprises of the said work above mentioned and all subsidiary works connected therewith in the same site as may be ordered to be done from time to time by the Employer even though such works may not be shown in the said drawings or described in the said specifications or the schedule of quantities. The contractor hereby agrees and undertakes to do and perform all such works in a thorough and workman like manner, with best materials and within the time limit herein mentioned.

The Employer reserves to himself the right to alter the drawings and nature of the work and of adding or omitting any item of work or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall be carried out without prejudice to this contract.

The said conditions shall be read and construed as forming part of this agreement and the parties hereto will respectively abide by and submit themselves to the conditions and stipulations and perform the agreements on their parts respectively as such conditions contained.

It will be the entire responsibility of the contractor to procure all materials required for the said works.

2) **Contract Price, Taxes and Payment Terms:**

Total contract price is Rs..... which is inclusive of cost of materials, equipment, installation charges and tools and tackles required for execution of the job. Above price is inclusive of all taxes / GST & duties including excise duty, sales tax, works contract tax, income tax, octroi etc. in respect of this contract. No claim in this respect will be entertained. Sales tax on works contract & Income tax on payments shall be levied as per prevailing rules and will be deducted and deposited by Employer in accordance with the sales tax law of the state and the provisions of tax deductions at source under Income Tax Act 1961.

However, interim payment will be made as per the site measurements on Item Rate basis and certification of the Consultant and the Employer shall for such works pay to the contractor such sums as shall become payable at time, in the manner specified in the said conditions.

3) **Completion Period:**

Time is the essence of the Contract. The work is to be completed in all respects within **30 days** from the date of receipt of the Work Order /letter of intent by the Contractor or handing over of site whichever is later. If the Contractor fails to complete the job within the agreed time period the Contractor will have to bear liquidated damages as per the relevant clause mentioned in the Tender Documents.

The contractor shall complete the said work as specified above from the date of commencement of work as per work order for the work and will remove from the site all plants, scaffoldings, materials in use, rubbish and leave the work site clean within the said period.

4) **Earnest Money:**

The Contractor has deposited Demand Draft / Bank Guarantee for an amount of **Rs. 20,000/- (Rupees Twenty Thousand Only)** as Earnest Money.

5) **Inspection of Site:**

The Contractor has inspected the site before submitting his tender and has satisfied himself as to the nature of the work to be executed on the site. Any difficulties which the Contractor may come across in the course of the work shall in no way entitle the contractor to claim or receive extra payment unless the Employer is of the opinion that such difficulties could not have been foreseen and the Employer consents in writing. The site will be handed over to the contractor as per the terms of tender and in no case the contractor can claim for non suitability of site condition for extension of time unless employer opinions the other way.

6) **Supply of Material and Labour:**

The Contractor shall arrange all labour, materials, equipments, tools, tackles and everything necessary for the completion of the work as per the terms of tender and specification / BOQ etc.,. The Contractor will assume all responsibility for the safety, protection and accounting of all material and equipment and the work during construction. All materials used by the Contractor shall be of the best quality conforming to the required specification mentioned in the tender document and will be subject to the approval of the Engineer-Incharge / Employer. All such materials not approved by Engineer-Incharge / Employer shall be removed at once by the Contractor at his own expense. The Contractor shall also at his own expense arrange for carrying out any test of materials which the Engineer-Incharge / Employer may from time to time require or if so desired by the employer.

7) **Defective Work / Materials:**

If any part of the work done by the Contractor is found defective in workmanship or if bad or inferior materials have been used the Contractor shall at his own risk and cost demolish all such defective work and rebuild the same and / or replace the bad or inferior materials used within a time frame mentioned to the satisfaction of the 'Engineer-Incharge / Employer'. The decision of the Employer / Electrical Consultant in this regard shall be final and binding on the Contractor. In case of default of the contractor to remove the defective work and rebuild the same or replace bad or inferior materials as directed by the Employer, the Employer shall be entitled to employ anyone else to carry out the same at risk and cost of the Contractor and recover all expenses incurred in this regard from the contractor.

The contractor should not damage the any existing water proofing done on the roof. They should discuss about the work they are going to carry out with Engineer-Incharge / Employer before they take up the work. In case of any damage done to the water proofing and detect leakage due to the same, the contractor will be made responsible to rectify the same at their cost to the full satisfaction of the bank.

8) **Inspection of Work:**

During progress of the work the site engineer of the Employer and Engineer-Incharge / Employer shall be entitled at all times to have access to and inspect the work. If the work is inspected by the any Government/ Bank's authorized persons, the contractor will fully co-operate and extend all help to meet the observations.

9) **Supervision:**

The Contractor shall provide one or more competent and technically qualified engineers duly and fully authorized to act on his behalf in all matters relating to the works to be carried out under or any other matter concerning this agreement and who shall at all times be

present at the works while any work is in progress as per directions, explanations & instructions of Engineer-Incharge / Employer.

10) **Compliance with Statutory Regulations & Work Rules:**

The Contractor shall be responsible for complying with the applicable laws / bye laws / Regulations in force from time to time and shall have to bear all statuary liabilities to the workers / personnel engaged for the job. Nothing will be paid extra in this regard. If any amount is paid by the Employer in this regard the same amount shall be deducted from the Contractor's dues. The Contractor shall have to arrange insurance cover for the workers / personnel engaged by him for the job. This clause should be read in conjunction with clause mentioned in tender document, **clause no: 13 of special conditions of contract and clause no: 22, of General condition of contract**

11) **Determination of Contract:**

In the event of Contractor failing to keep / adhere to agreed schedule of work, or in the event of the Contractor failing to comply with the provisions of this contract by default and / or negligence and / or suspension of work or in the event of Contractor failing to complete the work within the stipulated period, the Employer may terminate this Agreement forthwith and employ, at the Contractor's risk and cost, another contractor or sufficient number of workmen to complete the work.

12) **Force Majeure:**

In case any Force Majeure condition herein mentioned occurs and continues for a period exceeding 15 days the parties here to undertake to sit together and devise ways for expeditious and proper performance of the obligations of the parties under this order.
This clause will be operative only if the work is delayed by

a) Acts of God

b) Earthquake or floods or similar natural calamities.

c) Serious loss or damage by fire or lightning.

13) **Arbitration:**

"In the event of any dispute or difference relating to interpretation and application of provisions of the contract and all disputes/claims whatsoever which shall either during the continuance of the contract or afterwards either between the parties to the contract or the respective representatives touching the construction/application of any provision/clause mentioned in the contract or any account or liability between the parties to the contract or as to any act or deed or omission of any party to the contract, in any way relating to these presents, shall be first at the discretion of the Bank attempted to be resolved in good faith by mutual discussion within 30 days of the dispute or question being raised failing which the same shall be settled by arbitration in accordance with provisions of Indian arbitration and Conciliation act 1996.

The Parties concerned shall designate an arbitrator on mutual consent/consensus. In the event of no consensus being arrived, an Arbitral Tribunal shall be constituted comprising three Arbitrators, each party appointing one arbitrator and a third arbitrator to be appointed by the two arbitrators so appointed by the parties. The venue of the arbitration shall be exclusively at Chennai and any award passed by arbitrator or the arbitral Tribunal shall be final, conclusive and binding upon the parties and shall be deemed to have been made between parties themselves. The parties to the dispute shall share equally the cost of arbitration as intimated by the arbitrator".

All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen in Chennai and only courts in Chennai shall have jurisdiction to determine the same.

Submitting to arbitration may be considered as an additional remedy and it does not preclude the Parties to seek redressal/other legal recourse.

14) **Engineer-Incharge / Consultant:**

The term Engineer-Incharge / Consultant in the said conditions shall mean the said ENGINEER-INCHARGE, Chennai or in the event of it being ordered to be wound up or in ceasing to be the Engineer-Incharge / Consultant 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 Employer mentioned in the said Conditions provided always that no person subsequently appointed to be Engineer-Incharge / Consultant under this Engineer-Incharge / Consultant shall be entitled to disregard or overrule any provision, decision or approval or direction given or expressed by the Consultants for the time being.

15) The several parts of this contract have been read and fully understood by us.

16) Following shall be deemed to form and be read and construted as part of this agreement viz

a) The Bid No / date.
b) The award letter No / date.
c) References as mentioned in the award letter
d) All the correspondences till award of contract

IN WITNESS whereof the said contracting parties have set their hands and seals on the day and year first hereinabove witness.

Witness Address — Employer

Witness Address — Contractor

GENERAL SPECIFICATIONS REQUIREMENTS

All works should confirm to standard laid down by the Bureau of Indian Standards (BIS) Latest Edition.

Wherever detailed specifications are not given, the works shall be carried out as per CPWD specifications with latest additions and corrections.

1. SPECIFICATIONS – GENERAL REQUIREMENTS

1A. List of tender drawings is given elsewhere in the tender documents. These drawings are meant for tenders and construction also. These drawings may be revised and fresh revised copies issued to the contractor from time to time for adoption in work to suit the final designs and the physical conditions encouraged during the progress of work.

1B. Figured dimensions on drawings shall only be followed and drawings to large scale shall take precedence over these to smaller scale.

1C. Information noted on the drawings pertaining to the materials and workmanship, if contrary to that given in the specifications, shall have precedence.

1D. The contractor shall prepare, at his own cost, detailed shop drawings and shall obtain the approval of the Engineer-Incharge/Employer before adoption.

2.

2A. The specification is intended for general description of quality and workmanship of materials and finished work. They are not intended to cover minute details. The work shall be executed in accordance with sound engineering and other professional practice.

2B. Where reference is made to any standard specification of Bureau of Indian Standards or any other similar body, the information and provisions of the latest revised edition of the specification on the date of submission of such standard specifications are in conflict with the provisions standard in these specifications the latter provisions shall have precedence.

2C. All materials shall be quality manufactured by renewed concerns conforming to Indian Standards or equivalent and shall have "BIS" mark as far as possible unless otherwise approved by the Engineer-Incharge / Employer. The contractor shall get all materials approved by the Engineer-Incharge / Employer prior to procurement and use.

3. MEASUREMENTS AND PAYMENTS

3A. The quantities stated in the bills of Quantities are tentative. The contractor shall be paid at the quoted rate and on the basis of actual measured dimensions of the finished work, limited however by those dimensions shown in the drawings, or as directed by the Engineer-Incharge / Employer.

3B. Measurement of work shall be generally in accordance with **IS: 1200** "Method of Measurement of Building and Electrical Engineering Work" except where the stipulations of the tender are contradictory.

4. LAYOUTS AND SURVEYS.

The contractor shall be responsible for the true and proper setting out of works, for the correctness of position, levels, dimensions and alignment of all parts of the works and for the provisions of all necessary instruments, appliances and labour in connection there with. If at dimensions or alignments of any part of works, the contractor, on being required to do so, shall at his expenses rectify such errors, checking of any setting out or of any line or level by the Engineer-

Incharge/Employer shall not in any way relieve the contractor of his responsibility for the corrections thereof.

4. CONSTRUCTION SCHEDULE AND TIME OF COMPLETION

5A. A bar chart shall be submitted by the contractor detailing out the complete construction activities for each work within 7 days of start of work at site. This chart shall be reviewed by the Engineer-Incharge/Employer and alterations, if any, shall be made by the contractor. This chart will form the basis or reappraisal to evaluate the progress of work at site.

5B. The drawings shall be issued to the contractor at least one week in advance before commencement of work.

5C. No extension of time shall be granted on the plea of drawings not having been received in time provided the above time schedule is adhered to.

5. CO-OPERATION WITH OTHER AGENCIES

6A. During the course of implementation of this contract, several other agencies and contractors shall be working at site simultaneously. In order to effect proper co-ordination and avoid delays, it shall be the responsibility of the contractor of this tender to give adequate notice and exact dates of work proposed to be executed by him which requires the placement and fixation of embedment etc., by the other agencies. The safety and prevention from damage activities would remain with the contractor. In the event of damage or loss, caused, indirectly or directly by the contractor or his labour, he will be responsible to make good the same as advised/instructed by the Engineer-Incharge/Employer.

6. DELIVERY OF WORKS

Every portion of the work shall be kept clear of accumulation from time to time and delivered up clean and free from all defects of every kind at the conclusion of work.

7. RELATION TO OTHER DOCUMENTS

8A. The technical specifications are intended for general description of items listed in the bill of quantities. All works specified or implied in the technical specification form a part of the items in the bill of quantities. Similarly, all indications in drawings and general description of works, whether specified or implied, form a part of the items in bills of quantities.

8B. The quoted rates in the bills of quantities shall be assumed to include all the specified and implied works of the technical specifications, drawings and general description of works even when not specifically mentioned in the bills of quantities.

8. LIFTS AND LEADS

9A. The rates quoted for all items of work shall include all lifts and leads where applicable.

9B. All debris and waste materials shall be disposed away from the site to a far off place as directed.

GENERAL ELECTRICAL SPECIFICATION REQUIREMENTS

1. GENERAL:

Withstanding the definition of wiring in I.E.E. regulations, or elsewhere, wiring shall so far this contract is concerned, include all work items / accessories in the complete wiring circuit from tapping the point in the sub main or distribution board to the following:

The switch /ceiling rose or connector / socket outlet / bell push / bookplate / call bells, buzzers.

i) The following shall be deemed to be included in the point wiring:

1. Circuit wiring from the relevant distribution board.
2. Switch and ceiling rose / connector
3. Wire as required up to lamp holder in the case of wall brackets, bulk circles and all other fittings, fan regulators and looping inside switch boards.
4. Bushed PYC conduit of suitable size where cables pass through walls and ceiling below ceiling level to 1.5M above upper floor level.
5. Earth wire from 3 pin socket to the respective distribution board.
6. Continuous run of earth wire on complete lighting, fan wiring, to respective distribution board.
7. All wood or metal boards and boxes, sunk or surface type including those required for mounting fan regulators and switches (excluding those under distribution boards and main control switches)
8. Round blocks for housing connectors / ceiling rose.
9. All fixing accessories such as clips, nails, screws, or rawl plugs, wooden plugs etc., as required.

ii). SIZES OF WIRES:

All wires shall be PYC insulated single core copper stranded conductor as specified and shall be 250 / 1100 V grade. The smallest conductors for lighting and circuits shall be 1.5 Sq. mm. and 2.5 Sq. mm. of copper respectively using the following colour codes as per standard practices.

Phase - 1	Phase - 2	Phase - 3	Neutral	Earth
R	Y	B	N	
Red	Yellow	Blue	Black	Green.

iii). FITTINGS WIRES:

The use of fittings wires shall be restricted to the internal wiring of light fittings. The sub circuit leads shall terminate in ceiling roses or connectors from which they will be carried into the fittings.

iv). Connections to the switches, sockets etc., wherever possible shall be through crimped pin type plugs.

(v). FLEXIBLE CORDS:

For sort connections to appliances, fans and pendants shall be 250 / 440 V grade (3 or 4 core) with tinned copper wires, insulated, twisted and sheathed with strengthening cord The colour of sheath shall be to Engineer-Incharge's approval.

2. WIRING IN CONDUITS: [FOR EXTERNAL WORK UNDER SUSPENDED CONDITIONS ONLY]

2.1. CONDUITS

a) Rigid steel conduits shall be of heavy gauge welded black enamelled of 16 SWG sheet up to 40mm dia. and 16SWG sheet above 40mm dia. with threaded / screwed type accessories and when laid shall free from edges and burrs.
b) All rigid non-metallic conduits shall confirm to IS 2509 / 1973 & IS 9537 (part3) / 1983 either threaded or plain type and shall be used with corresponding accessories.

2.2. SIZES:

Shall be selected in accordance with IS codes depending upon the size and number sizes to be drawn, the minimum dia. being 19mm / 20mm.

2.3. JOINTS IN CONDUITS:

Conduit pipe shall be joined by means of screwed couplers and screwed accessories only. In long straight runs of conduit inspection type of couplers (for surface conduits) or running threads with couplers and jam nuts with bared threaded portion suitably protected by anti-corrosive paint shall be provided. Threading shall in all cases be sufficiently long enough [from 11mm to 27mm] long to accommodate pipes to full threaded portions of couplers or accessories. Cut ends of conduits pipes shall have no sharp edges nor any buffers left, to avoid damage to the insulations of conductors while pulling them through such pipes and all such ends shall be neatly protected by approved bushes of proper size, of P.V.C. or of well seasoned TW, painted or of porcelain, bakelite or rubber.

2.4. PVC CONDUIT CONNECTIONS: [ALL OTHER CONCEALED WORKS ARE WITH PVC CONDUITS]

PVC conduits shall be joined by means of screwed or plain couplers depending on whether the conduits are screwed or plain. Where there are long runs of straight conduit, inspection boxes shall be provided at intervals as approved by the Engineer-Incharge. The threads of pipe and sockets shall be free from grease and oil and shall be thoroughly cleaned before making the screwed / plain joints. Proper jointing materials as recommended by manufacturers of these conduits shall be used for jointing of PVC pipes. Use PVC couplers and connectors for PVC pipe connections and terminations in boxes. All the joints shall be watertight.

Junction boxes and running joints shall be provided at suitable places to allow for subsequent extensions if any, without undue dismantling of conduit system. Diagonal run of conduits shall be avoided as far as possible. Junction between conduit and adaptable boxes, back outlet boxes, switch boxes and the like must be provided with entry spouts and smooth PYC bushes. Joints between conduits and iron clad distribution boards and control gear shall be effected by means of conduit couplers into each of which will be coupled smooth PYC bush from the inside of box or case. Conduit system shall be erect and straight as far as possible. Traps where water may accumulate from condensation are to be avoided, and where unavoidable suitable provision for draining the water shall be made. All jointing methods shall be subject to the approval of Engineer-Incharge.

Separate conduits shall be provided for the following system.

1. 15 Amps Power outlets for air conditioning, heaters, refrigerators and such appliances
2. 5 Amps outlets and lighting system
3. Fire alarm system / Telephone system
4. Equipment wiring

2.5. BENDS IN CONDUIT:

Wherever necessary, bends or diversions may be achieved by means of bends / or circular inspection boxes with adequate and suitable inlet and outlet screwed joints. In case of recessed system, each junction box shall be properly secured and flush with the finished wall surface, so that the conductors inside the conduits are easily accessible. No bends shall have reading less than 2 1/2 times the outside diameter of the conduit. Heat may be used to soften the PYC the conduit for bending. Caution should be exercised in using the PVC conduits in location where ambient temperature is 50 Celsius or above. Use of PVC conduit in places where ambient temperature is 60 Celsius or above is prohibited.

PVC conduits shall not be used in outdoor exposed system. G.I. pipe conduits shall be used for outdoor system.

2.6. FIXING OF CONDUITS:

Conduits and junction boxes shall be kept in position while the walls, slabs and floors are under construction/ renovation and proper hold-fasts shall be provided. Conduits shall be so arranged as to facilitate easy drawing of wires though them. Adequate junction boxes of approved shape and size shall be provided. Where conduits cross expansion joints in the building, adequate devices shall be used to take care of any relative movement. All conduits shall be installed in such a manner that no damage occurs due to other pipe net works. A conduit shall not come in contact with any wooden members unless otherwise specified. Conduit stubs in floors / slabs shall be kept as short as possible above the finished floor level in order to avoid any damage on them. After conduits, junction boxes, outlet boxes, and switch boxes are installed in position, their outlets shall be properly plugged or covered so that water, mortar, insects or any other foreign matter does not enter into the conduit system.

Exposed conduits shall be fixed by means of space bar saddle at intervals not more than 1000mm in normal and 500mm from both sides of fitting or accessories. The saddles shall be of 3 mm X 19 mm galvanized mild steel flat, properly treated with primer and painted, securely fixed to support by means of nuts and bolts and brass machined screws as required. Conduits shall be laid in a neat and organized manner as directed and approved by the Engineer-Incharge.

Conduit runs shall be planned so as not to conflict with any other service pipes lines / ducts.

Where exposed conduits are suspended from the structure they shall be clamped firmly and rigidly to the hangers of design to be approved by the Engineer-Incharge. Where hangers are to be anchored to reinforced concrete members, appropriate inserts and necessary devices for their fixing shall be left in position at the time of concreting. Making holes or openings in the concrete will generally not be allowed. In case of unavoidable situations prior permission of the Engineer-Incharge shall be obtained.

Conduits in chases shall be avoided. Where unavoidable, conduits shall be fixed in chases by means of staples not more than 600 mm apart and the chase filled with cement mortar 1:4. Cutting of horizontal chases in walls is prohibited.

2.7. PROTECTION:

To minimize condensation or sweating inside the conduit pipes, all outlets of conduits system shall be adequately ventilated as directed and approved by Engineer-Incharge. All screwed and socketed connections shall be adequately made fully water tight by the use of proper jointing materials i.e. 'Tropolin' for PVC conduit and white lead for metal conduit.

2.8. OUTLETS:

All outlets for fittings, switches etc., shall be boxes of suitable metal of 'surface or flush' mounting type. Wall thickness shall not be less than of 16g covered with a sheet 1/8" (3mm) thick perfect or 3mm thick decorative laminated hylam as may be specified, in front giving minimum clear depth of 75mm. All MS boxes, irrespective of sizes, shall have a fully threaded stud welded inside, for earth termination.

2.9. CONDUCTORS:

All Conductors used in conduit wiring shall unless otherwise specified be stranded. No single core cable of nominal cross-sectional area greater than 16 sq. mm. shall be enclosed alone in a conduit and used for alternating current.

2.10. INSPECTION BOXES:

Suitable inspection boxes, with ventilating holes in the covers shall be provided in a conduit wiring, at spacing not more than 12 meters apart or two solid 90 degree bends or equal to permit periodical inspection and facilitating removal of wires if necessary.

2.11. ERECTION AND EARTHING OF CONDUIT:

The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth confirming to the requirements specified under section 12 (below). Earthing by means of special approved type earthing clamps efficiently fastened to conduit pipe in a workman like manner for perfect continuity between each wire. And conduits crossing gas or water pipes, and others, which are liable to mechanical damage, they shall be adequately protected.

2.12. GUIDE WIRE:

Suitable fish or pull wire shall be drawn in all conduit before they are embedded. Steel conduits, even if galvanized, run in under-floor screed shall be painted with a heavy coat of emulsified bitumen.

3.0. WIRING IN CONCEALED CONDUIT

3.1. Conduits buried in concrete in structure shall be put in position and securely fastened to the reinforcement and the system got approved by the Engineer-Incharge / Structural Consultant before the concrete is poured. Proper care shall be taken to ensure that the conduits are neither dislocated nor chocked at the time of pouring concrete. Suitable fish or pull wire shall be drawn in all conduits before they are embedded.

3.2. MAKING OF CHASE:

The Chase in the wall is neatly made and be of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of building under renovation, chase shall be provided in the wall, ceiling, etc., at the time of renovation and shall be filled up neatly after erection of conduit and brought to the original finish of the wall, ceiling etc.

3.3. The conduit pipe shall be fixed by means of staples or saddles not more than 500mm apart. Fixing of standard bends or elbow shall be avoided as far practicable and all curves maintained by bending the conduit pipe itself with radius long enough to permit easy drawing in of conductors. All threaded joints of conduit shall be treated with approved preservative compound to secure protection against rust.

3.4. INSPECTION BOXES:

Suitable inspection boxes shall be provided as at 9.2 (Flush mounted).

3.5. TYPES OF ACCESSORIES TO BE USED:

All outlets such as switches, wall sockets, etc. may be either flush or of surface mounting type.

3.6. The outlets box shall be same as in Clause 9.2 ante and shall be mounted with the wall. The metal box shall be efficiently earthed with conduit by the stud vide 9.2.

4.0. WIRING IN SURFACE CONDUITS:

4.1. Conduit pipes shall be fixed on the approved heavy gauge metal saddles, Properly secured to walls or ceilings through suitable teakwood plugs (or other approved varieties) with round or cheese circle screws for rust proof material, at intervals of not more than 500 mm on straight runs, with saddles not more than 300 mm on either side of couplers or bends or similar fittings, from such fittings. The conduits shall be run neatly parallel or at right angles to walls and painted in different colours to distinguish light, power and telephone lines. Inspection boxes shall be provided as at.

6.0. ARMOURED AND UN-ARMOURED PVC CABLE ON SURFACE:

a) This system of wiring is suitable for providing sub-mains for low / medium voltage installation. All such cables used shall confirm to the relevant I.S. Specification.

b) FIXING ON WALL / CEILING:

PVC insulated, steel tape or wire armoured and PYC-sheathed cable on walls, ceiling etc., shall be run on proper wooden / MS cleats with GI saddles placed at such distance apart as to neatly and adequately support the cable all along the run. The wooden cleats shall be secured on the wall / ceiling by flat circle screws to rawl / Phil plugs.

c) PASSING THROUGH WALL:

A teakwood box or extending through the whole thickness of the wall shall be buried in the wall and the cable shall be carried so as to allow 12mm clear space on the three sides of the cable or the cable shall carried in an approved bush of well seasoned teakwood duly painted, or other approved material. The cable shall in no case be buried directly in masonry or plaster.

d) LAYING:

The cables shall be uncoiled from the drum and laid in straight length so as to avoid sharp bends,

turns or twists on the conductor. The cables should be laid along wall / ceiling in the best workman like manner, so as to give a neat appearance. Excessive sharp bends to the cable shall be avoided.

e) STRIPPING OF OUTER COVERING:

While cutting and stripping the outer covering of the cables, care shall be taken to see that the sharp edge of cutting instrument does not damage the PYC insulation of the conductors. The insulation shall be stripped off near the connection terminals as far as possible taking care again to see that the conductor is not damaged.

f) END TERMINATION:

The connecting terminals of the armoured and Un-armoured cable shall be terminated on the iron clad main switch / distribution board etc., by using proper size brass / alloy supporting glands. In case of armoured cables, the armoured cables shall be supported into the gland and connected to the earth as per standard / conventional practice. Terminations at both ends shall be made with cable lugs.

7.0. EARTHING:

a) Except for equipment provided with double insulation, all non-current carrying metal parts of electrical installations are to be earthed properly. All metal conduits, cable sheaths, switchgear, distribution fuse boards, etc., shall be bonded together and connected to an efficient earth electrode.

Medium Voltage energy consuming plant and equipment shall have two separate and distinct connections to the earth.

In the case of MV /L T panels, 2 nos. of earth bus bars of copper or aluminium of suitable section shall be run on the back side of the panel and earth bus bars and the individual switches shall be interconnected by means of copper or 01 wire of suitable gauge as specified.

b) EARTHING CONDUCTOR:

Earthing conductor shall be of higher conductivity copper or Al or any other suitable approved material to give equivalent conductivity and shall not less than half the largest current carrying conductor or 14 SWO (7 / 00.029) but subject to an upper limit of 65 sq.mm. For equipment exceeding 750 KVA the size shall be as per IS.1886-1961.

c) INSTALLATION:

The buried earthing leads will be protected from mechanical injury by 12mm Al pipe recessed in wall and floor where considered necessary and 'carried up to the earth electrode. It shall be fixed over its entire length with clamps, saddles, staples, etc. The earthing lead shall be securely bolted and soldered to the electrode with bolts and washer of the base metal. The earthing lead shall be securely connected at the other end to the main board and all its mountings and looped to all other iron clad switches and distribution boards.

d) ELECTRODE:

The construction of earth electrode shall be in accordance with relevant IS code. The electrode shall be surrounded by alternate layers of charcoal or coke and salt. Watering arrangement with 40mm GI pipe and funnel shall be provided, the latter being housed in chamber of inner size 450 mm X 450 mm. The resistance of earth electrode shall not exceed 1 Ohms; that of each continuity path from any point with electrode shall not exceed 1 0hm and that of earthing connection 0.1 Ohm.

8.0. UNDERGROUND CABLES:

a) HIGH / MEDIUM / LOW TENSION:

Cables should be double tape / wire armoured over lead covering and XLPE as specified in the schedule of work. All joints of cables should be in joint boxes and filling in of the compound shall be done as per IS specifications using best quality of materials. In case of the PYC insulted armoured cables, joining will be done with approved quick setting epoxy compound with suitable jointing kit. The jointing work should be carried out by a competent authorized cable jointer.

b) TRENCH:

All underground cables shall be laid in suitable trenches which shall not be less than 450mm wide and 750 mm below ground level in the case M.V. and L.T. And 1200 mm below ground level in the case of H.T. Wherever necessary suitable propping and shoring shall be done to avoid caving in of the adjoining walls. Where the cables cross other services lines such as water / sewer lines or drains through walls into buildings, adequate protection should be made to prevent accidental exposure and / or damage to the cables.

c) SPACING BETWEEN CABLES:

Where more than one cable is laid in the same trench the actual space between the cables should be normally be 250 mm apart leaving a clear distance of 150 mm from the cable and the trench walls.

d) LAYING OF CABLES:

Before the cables are laid, a 75mm layer of sand base is to be provided for cushioning. The cables after being uncoiled from the rollers, and before laid into a trench, should be drawn in straight length. After the cable is laid a 230mm wide duct is to be formed with two well burnt brick laid on the edge one on either side of the cable and bridged by a well burnt brick laid flat on the top supporting bricks on edge, with sand filled in and around the cable. The trench is then filled with excavated earth, laid in layers, watered and consolidated, the surplus earth being disposed off.

Cable markers with 3mm thick plates of suitable size, with 40mm X 40mm X 6mm supporting vertical MS angle iron welded to plate duly painted in two coats, for protection against corrosion, or with 50mm thick RCC slab of suitable size, making done with details of cables and depths at which cables are laid, duly painted on them, shall be provided at ground level after being suitably embedded in cement concrete (I :3:6) blocks of 200mm X 200mm X 200mm and spaced at distances of about 30 mts. Centre to centre and in every change in direction.

When more than one cable is to be laid, the width of the trench will be suitably increased and cables laid side by side confirming to specifications as above. In such case there shall be a separate brick duct for every cable. In case the cables cannot be laid side by side at one level they may be laid in tier formation in same trench. In this case, after the first 75mm of sand cushioning, the first tier of cable is laid and sand filled in the trench for full width to form a bed of 230 mm above this tier. After this, second cable is laid and the process repeated the top most tier being at least 450 mm below the ground level. The top cable shall be suitable covered with bricks as detailed for the single tier above. When laying with cables, care should be taken to see that the paper insulated cables are bent, straightened slowly, sharp radius being avoided. The minimum safe bending radius for single core cable is 20 diameters, and for multi core cables 10 diameters. and for armoured cable 12 diameters, the diameter being the overall diameter of the cable. Where the cables are required to cross the roads water / sewer lines etc., they should normally be taken through pipe sleeves at least

100mm in diameter, which may either of stoneware, steel or spun reinforced concrete. For more than one cable the diameter should not be less than 150 mm. Steel pipe shall be used where it is not possible to obtain sufficient depth to withstand impact from traffic.

e) Rate for cables shall include costs for all operations described above unless otherwise separately provided for elsewhere.

f) CABLE INSIDE BUILDING:

Cable laid inside the building should be properly protected and be carried either in ducts with suitable covers of slabs or chequered plates or fixed to walls by clamps, brackets or cable trays.

g) TESTING OF CABLES:

High voltage tests should be undertaken to ensure that no damage has occurred during the laying operation and that the joints are in order. Cable of 1.1 K V suitable for low and medium voltage should withstand for 15 minutes, 3,000 volts Direct Current applied between the conductor and sheath. In the absence of high pressure testing equipment it is sufficient to test for 1 minute with 1000 volts. If the test results are to be found not satisfactory, the Contractor shall arrange for having this set right at his cost, including removal of rejected materials, relaying etc.

9.0. RECEPTION AND DISTRIBUTION OF MAIN SUPPLY:

9.1. SWITCH CONTROL AT POINT OF COMMENCEMENT OF SUPPLY:

9.1.1. There shall be a circuit breaker or a linked switch on each live conductor of the supply of mains at the point of entry. The wiring through the installation shall be such that there is no breakage in the neutral wire in the form of a switch or fuse unit. The neutral shall also be distinctly marked as provided in the Indian Electricity Rules 1956.

9.1.2. The main switch gears shall be easily accessible and shall be situated as near as practicable to the termination of service line.

9.1.3. On the main switch gear, where the conductors include an earthed conductor of two wire system or an earthed conductor of two wire system or an earthed neutral conductor of a multi-wire system or a conductor which is to be connected there to an indication of a permanent nature shall be provided to identify the earthed neutral conductor in accordance with the Indian Electricity Rules 1956.

9.2.1. LOCATION:

a) Open type switch boards shall placed only in dry situations and in well ventilated rooms and they shall not be placed in the vicinity of storage batteries and exposure to chemical fumes.

b) In a damp situation, or where inflammable or explosive, dust, vapour, or gas, is to likely to be present the switch boards shall be totally enclosed or made flame proof as may be necessary in the particular circumstances.

c) A switch board shall be installed so that its bottom is 1250mm above a floor, unless the front of the switch board is located in a position to which only authorized persons have access.

d) Switch boards shall not be erected above gas stoves or sinks or within 2500mm of any washing unit in the washing rooms of laundries, or in bathrooms, lavatories, or kitchen or toilets.

e) Switch boards if unavoidably fixed in places likely to be exposed to weather, water or

abnormally moist atmosphere, outer casing shall be provided with glands or bushings or adapters to receive screwed conduits according to the manner in which cables are run.

9.2.2. MOUNTING:

Iron / metal clad switch gear shall be preferably be mounted on any of the following boards:

a) HINGED TYPE METAL BOARDS:

For small switchboards for mounting iron / metal clad switch / gear metal board shall be used. Metal board shall consist of a box made of metal sheet of less than of 16g. thickness and shall be provided with a hinged cover to enable the board to be swung open for the examination of the wiring at the back. The joints shall be welded. The boards shall be securely fixed to the wall by means of rag bolts and shall be provided with locking arrangements and earthing stud. Al wires passing through the metal board shall be properly bussed. Alternatively, metals boards may be made of suitable size or channel iron frame work suitably mounted on front with 3mm thick MS plates and on back with 1.588 mm MS sheet. In the case of PVC sheathed system of wiring, the top and bottom members may be replaced by 25.4mm teakwood batten. Except for the above change all other details shall be applicable for the alternative also. Besides, the front sheet shall be provided with suitable hinges.

There shall be a clear distance of 31.75 mm between the front sheet shall be provided with suitable hinges.
A teakwood board of thickness not less than 6 mm will be provided at the back, if so specified.

b) FIXED-TYPE METAL BOARDS:

These shall consist of angle or channel iron frame fixed on the wall or on the floor. There shall be clear distance of 1000mm in front of the switchboard. A working distance of 1000 mm behind the switchboard is preferable. If there is any attachment of bare connections at the back of the switchboard, Rule 51 (1) c of Indian Electricity Rules, 1956 shall apply. The detailed dimensions and design of metal boards and angle iron frame work for switch gears, including the position of the various mountings, which shall be symmetrically and neatly arranged for arriving at the overall dimensions shall be prepared and submitted before hand and shall have been prior approval of the Engineer-Incharge.

9.2.3. Where so specified in the schedule of quantities or elsewhere switch boards shall be recessed into the wall with front fitted with hinged panel of 16 guage M.S. Sheet or 3mm thick decorative laminated Hylam Sheet in M.S. angle iron frame with locking arrangement, the outer surface of the doors being flush with the walls. Ample room shall be provided at the back for connection and at the front between the switchgear mountings and the door. Steel work shall be painted one coat with synthetic enamel paint of approved make and colour over an anti-corrosive primer.

9.2.4. ARRANGEMENT OF APPARATUS / MOUNTINGS:

a) Equipment which is on the front of a switch Board shall be arranged that an inadvertent personal contact with live parts is unlikely during tier manipulation of switches, changing of fuses or like operations.

b) No apparatus shall be project beyond any edge of the panel. No fuse body shall be mounted within 25mm of any edge of the panel and no holes other than the holes by means of which the panel is fixed shall be drilled closer than 12mm from any edge of the panel.

c) Various live parts, unless they are effectively screened by substantial barrier of non-

hygroscopic non-inflammable insulating materials shall so spaced that an arc cannot be developed and maintained between such parts and earth.

d) The arrangement of the apparatus shall be such that they shall be readily accessible and their connections to all instruments and apparatus shall be easily traceable.

e) In every case in which switches and fuses are fitted on the same pole, the fuses shall be so arranged that they cannot be live when their respective switches are in ' off ' position.

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

9.2.5. MARKING OF APPARATUS

a) When a board is connected to voltage higher than 250v all the terminals or leads of the apparatus mounted on it shall be marked in the following colours to indicate the different poles or phases to which the apparatus or its different terminals may have been connected.

Three Phases	-	Red, Blue and Yellow
I Neutral	-	Black

b) Where four wire three phase wiring is done, the neutral shall preferably be in one colour and each of the other three wires in another colour.

c) Where a board has more than one switch, each switch shall be marked to indicate which section of the installation it controls. The main switch shall be marked as such and when there is more than one main switch in the building, each switch shall be marked to indicate which section of the installation it controls.

d) All marking required under this clause shall be clear and permanent.

9.3. MAIN AND BRANCH DISTRIBUTION BOARDS:

9.3.1. Unless otherwise specified main and distribution fuse boards shall be iron clad / metal clad type or any type so described in these specifications, subject to approval of the Engineer-Incharge.

9.3.2. Main distribution boards shall be provided with a switch or any circuit breaker on each pole of each circuit, a fuse or a phase or a live conductor and a link on neutral or earth conductor of each circuit. The switches shall always be linked.

9.3.3. Branch distribution boards shall be provided with a fuse or a circuit breaker on the live conductor of each circuit an earthed neutral conductor shall be connected to a common link and capable of being disconnected individually for testing purposes. A spare circuit of the same capacity shall be provided on each branch distribution board. Lights and fans may be wired on a common circuit. As regards power sub-circuits the outlets shall be provided according to the load design of these circuits, but in no case there shall be more than two outlets on each circuit. Where there are special requirements like air-conditioning such outlets should be wired on separate circuits with a control such IC switch / miniature circuit breaker.

9.4. CIRCUIT LIMITATIONS:

Sub-circuits shall not have more than a total of ten points of lights, fan and socket outlets or a load of 800 watts, whichever is less. If a separate fan circuit is adopted the number of fans in a circuit shall not be more than ten.

9.5. INSTALLATION OF DISTRIBUTION BOARDS:

a) The distribution boards shall be located as near as possible to the Centre of the load they are intended to control.

b) These switches (as per clause 9.2) shall be fixed on a suitable stanchion or wall and shall be accessible for replacement of fuses.

c) These shall be of either iron / metal-clad type or all insulated type. But if exposed to weather or damp situations, they shall be of the waterproof type and if installed where they are exposed to explosives, dust, vapour or gas, they shall be of the flame proof type.

d) Where two or more distribution fuses, boards feeding low pressure circuits are fed from supply at medium voltage these distribution boards shall be:
   1) Fixed not less than 2000 mm apart or

   2) Arranged so that two cannot be opened at the same time viz. they are interlocked and the metal case is marked "Danger - 440 Volts" or

   3) Installed in a room or enclosure accessible to only authorized persons.

e) All distribution boards shall be marked "Lighting" or "power" as the case maybe and also marked with pressure and number of phases of supply. Each shall be provided with circuit list, giving details of circuit which it controls, and the current rating of the circuit and size of the fuse element.

9.6. WIRING OF DISTRIBUTION BOARDS:

a) In wiring a branch distribution board, the total load or the consuming devices shall be divided as far as possible evenly between the number of ways in the board leaving the spare circuit for future extension.

b) All connections between pieces of apparatus or between apparatus and terminals on board shall be neatly arranged in a definite sequence following the arrangement on the apparatus mounted thereon, avoiding unnecessary crossing.

c) Cables shall be connected to terminals only by soldered lugs / crimped lugs unless the terminals are of such form that they can be securely clamped without cutting cable strands.

d) All bare conductors shall be rigidly fixed in a such manner that a clearance of at least 25 mm is maintained between the conductors and any terminal other than the insulating material.

e) In a hinged board, the incoming and outgoing cables shall be neatly bunched and shall be fixed in such a way that the door shall be capable of swinging through an angle of not less than 90 degrees.

f) If required [in the schedule of quantities], a pilot lamp shall be fixed and connected through an independent single pole switch and fuse to the bus bars of the board.

g) All main and branch distribution boards shall be provided with earth bus bars as described in clause 12 ante.

10. PASSING THOUGH WALLS / CEILINGS:

When the conductors pass though walls / ceilings, anyone of the following methods shall be employed. Care shall be taken to see that wires pass freely through protective pipe or box and that wire pass though in a straight line without any twist or cross in wires, on either end of such holes.

a) A teakwood box extending through the whole thickness of the wall shall be buried in the wall and casings or conductors shall be carried so as to allow 12mm air space on three sides of the casing or conductor.

b) The conductor shall be carried in an approved heavy gauge solid drawn or lap welded conduit or in 2m thick PYC pipe of such size that it permits easy drawing in. The ends of conduits shall be neatly bushed with PYC, wood, or other approved materials. Where a wall tube passes outside a building exposed to weather, the outer end shall be bell mouthed and turned downwards and properly bushed on open end.

c) Where conductors pass from floor to another through ceiling, they shall be protected in the manner specified in (b) above, from 25 mm below the ceiling level and up to a height of 1500 mm above floor level. (Without any extra charges).

11. FIXING TO WALLS AND CEILINGS:

a) Plugging of walls or ceiling shall be done efficiently and neatly, using approved types of fiber fixing plugs with the right sizes and types of tool in workman like manner. Where this cannot be done, wooden plugs as described below can be used with special permission of the Engineer-Incharge.

b) Plug for ordinary walls or ceilings shall be well seasoned teak or other approved hardwood not less than 50mm long by 25 mm square on the inner end and 20 mm square on outer end. They shall be cemented into walls within 6 mm of the surface with plaster or lime punning. Where wiring to irregular coursing or other reasons the plugging of walls or ceiling with wood plugs present difficulties, the wood encasing, wooden batten, metal conductor or cleat (as case may be) shall be attached to the wall or ceiling in a suitable manner to be approved by the Engineer-Incharge.

In the case of new buildings, teakwood plugs shall be fixed in the walls, before first coat of white washing is given.

12. BRANCH SWITCHES:

Where the supply is derived from a three wire or four wire source and the distribution is done on the two wire system all branch switches shall be placed in the outer or live conductor of the circuit and no single pole switch or fuse shall be inserted in the middle wire, earthed or earthed neutral conductor of the circuit. Single pole switches carrying not more then 15 amperes may be of the tumbler type or as specified.

13. FITTINGS AND ACCESSORIES:

All materials used in the construction of fittings shall be of such quality, design and construction that will provided adequate protection in normal use, against mechanical and electrical failure and exposure, to the risk of injury or electric shock and shall withstand the effects of exposure to atmosphere.

14. ATTACHMENT OF FITTINGS AND ACCESSORIES:

14.1 In other than conduit wiring, all ceiling roses, sockets, outlets, switches, regulators, brackets, pendants, and accessories attached to the wall or ceiling shall be mounted on substantial blocks of well seasoned teakwood, or hard wood of approved quality twice varnished both inside and outside

including backside after all fixing holes are made in them. Blocks shall be used for attaching fittings and accessories to their blocks.

14.2. Groups of accessories and regulators shall be mounted on well seasoned and properly secured teakwood boards of suitable sizes to a accommodate that required number of fittings. The board shall be well varnished with pure shellac on all sides, both inside and outside and the cover shall be 3mm thick decorative laminated Hylam of approved make as may be specified. The board shall be divided into sections, one for the switches which shall be flush mounted and other for the regulators, fixed with suitable washers and round circle iron screws. In the case of surface type wiring, switches may be surface mounted or flush mounted as specified on double teakwood boxes with hinge cover, or covered with 3mm thick laminates hylam sheet, as specified.

14.3. PROTECTION OF CONDUIT AGAINST RUST:

The outer surfaces of the conduit surfaces of the conduit pipes including all bends, unions, tees, junction boxes, etc., forming part of the conduit system shall be adequately protected against rust, particularly when such system is exposed to weather. In all cases no bare threaded portion of conduit pipe shall be allowed unless such bare threaded is treated with anti-corrosive preservative or covered with approved plastic compound.

14.4. PROTECTION AGAINST DAMPNESS:

In order to minimize the condensation or sweating inside the tube, all outlets of the conduit system shall be properly drained and ventilated, but in such manner as to prevent the entry of insects as far as possible.

All necessary bends in the system including diversion shall be done by bending pipes or by inserting suitable solid or inspection type normal bends or similar fittings, or fixing M.S. inspection boxes which ever more suitable. Inspection conduit fittings shall be avoided as far as possible on conduit system exposed to weather. Wherever necessary, solid type fittings shall be used. No length of conduit shall have more than two equivalent 90 degrees bends from outlets to outlets the bends at the outlets not being counted.

SCHEDULE OF RATES

1. The schedule of rates should be read in conjunction with all the other sections like drawings, specifications etc.

2. The quantities shown against the items of work are only approximate and may vary to any extent. No extra whatsoever shall be entertained.

3. The rates inserted in the bills of quantities are to be for the full inclusive of value of the work described under the several items, including all costs and expenses which may be required in and for the construction and full protection of the work described, together with all risks, liabilities and obligations set forth or implied in the documents on which the tender is based. The quoted rates shall be for all heights, lifts and leads unless otherwise mentioned specifically in the description of item.

4. General direction and description of work and materials given elsewhere in the contractor documents are not necessarily repeated in the Bill(s) of quantities. Reference to be made to the other documents for the full information / details.

5. The contractor shall be deemed to have visited the site before quoting for the tender and to have examined for himself the conditions under which the work will be carried out including local conditions under which the work will be carried out including local

conditions affecting labour and to have studied the items of the bills of quantities, the drawings and specification, relating to them and to have satisfied himself that the rates quoted by him provide for all minor accessories and contingent works or services as necessary for the works described even though there are not specifically defined.

6. Tenderer is advised to read items of works carefully and quote the rates accordingly. However, if he quotes different rates for the same items of work under different schedules of items, the lowest rates quoted shall be made applicable to all the Bills of quantities and the contract sum corrected accordingly.

7. Where an item of work not mentioned in a particular bill of quantities, is required to be executed and where the rate for such an item of work is quoted under a different bill of quantities forming a part of this contract, then the contractor being called upon shall execute the work and shall be paid at the rate so quoted. Nothing extra over shall be payable on this account.

8. The drawing(s) attached with this tender document are for the purpose of tender only, giving the tenderer a general idea of the nature and the extent of works to be executed.

9. The rates quoted by the tenderer shall be deemed to be for the execution of the works in accordance with the "Electrical Drawings" (to be supplied to the contractor).

10. The rates quoted by the tenderer shall include all labour, tools and plants, materials inclusive of all, transport, loading, unloading charges, all levies, all taxes, excise duties, etc. at the time of quoting their rates. The quoted rates shall remain firm throughout the contract period. No escalation on prices of labour and materials shall be entertained.

PARTICULAR SPECIFICATION FOR ELECTRICAL WORKS

1. LABELS AND DIAGRAM PLATE

Every incoming or outgoing switch mounted on the Panel / DB shall be provided with individual label identifying its designation and feeder number. Also all the Panels / DBs shall be provided with a non-rusting label on the front, engraved with its designation as per the Electrical Schematic Diagram. Inside the Panel / DB a circuit diagram shall be pasted on the back of the door for quick reference.

2. LT BOARD

The boards shall be made with pressed CRCA Sheet steel of 1.6mm. Thickness and should be of free standing design. - Degree of protection shall conform to IP 50 of IS 2147. - The minimum and maximum heights shall be 450 mm. and 1950 mm. respectively from floor level. - All fuse switches shall be of double break design and utilisation category shall be AC 23 duty except for Lighting Boards (AC 22). - HRC Fuse links of 80 KA minimum rupturing capacity shall be used.

Proper door interlocks shall be provided such that unless the Fuse Switch/ Isolator is in OFF Position, the door cannot be opened and vice versa.

The Busbar compartment shall be separate and shall be accessible from the front.

The maximum current density of Aluminum busbars shall be 0.8 A per Sq.mm. - They shall be liberally sized for the specified current ratings (both short circuit and continuous currents) maximum temperature of the bus and bar connection shall be limited to 80 ^{o}C.

The metering equipments shall not be mounted on the busbar compartment cover.

All bus works shall be braced to withstand stresses due to short circuit current and without damage.

Appropriate colour code shall be used to identify the various phases busbars and the neutral as per relevant Indian Standard using heat shrinkable sleeves.

The boards shall be easily extendable on both sides.

The design shall be compartmentalised.

All cables shall be entering the boards only from the top or bottom.

All Aluminum bus bars should confirm to E 91 E grade as per IS 5082.

The distribution boards shall be fabricated in such way that it shall be totally enclosed, dust and vermin proof, dead front, with hinged door type of bolted / welded construction suitable for wall mounting.

Each DB shall have individual hinged / bolted gasket doors with cam lock. Removable conduit entry plates shall be provided at top and bottom of the DB to facilitate drilling the conduit holes at site to suit individual requirements or knockout shall be provided.

Protective insulated cover plate shall be provided inside the panel to shroud all the live parts. Only the operating handle of the switch and the operating knobs of the miniature circuit breakers shall be projecting outside the cover plate. The unused outgoing gap of DB shall be suitably shrouded to avoid accidental contact. Each phase or way shall also be suitably shrouded with DMC / SMC. The

boards shall be factory wired and assembled. Circuit identification cables shall be provided on the cover.

All lighting / power distribution boards shall be provided with double door arrangements with phase segregation type.

All components in the distribution boards shall be same make.

The busbars shall be air insulated and made of high conductivity high strength copper busbars liberally sized with high safety factor for the required rating (both short circuit and continuous currents). The neutral busbar shall have adequate number of terminals for all outgoing single phase circuits. A copper earth bus of suitable size shall be provided in each DB for earthing of the power, lighting circuits and earthing of DB.

3. PAINTING

All metal surfaces shall be thoroughly cleaned and degreased to remove all mill scale, rust, greased and dirt. Fabricated structures shall be pickled and then rinsed to remove any trace of acid. The under surface shall be prepared by applying two coats of red oxide. The under surface shall be made free from all imperfections before undertaking the finishing coat.

After preparation of the under surface, the switchboard shall be of powder coated spray painted with two coats of final paint. Colour shade of final paint shall be as per SHADE RAL 7032 (SIEMENS GREY COLOR) .

All unpainted steel parts shall be cadmium painted or suitably treated to prevent rust formation. If these parts are moving elements, then they shall be greased.

4. SWITCHES

All switches shall be load break heavy duty air break type provided with quick make/ break manual operating mechanism. The operating handle shall be mounted in the door of the compartment having the switch.

Switches shall be designed to carry the rated current continuously without overheating.

Barriers shall be provided to prevent inter phase arcing and live terminals shall be shrouded to avoid accidental contact.

5. FUSES

Fuses shall be non deteriorating HRC Cartridge link type, Diazed Fuses are not acceptable.

The fuses shall be pressure fitted type and shall preferably have ribs on the contact blades to ensure good line contact.

It shall be possible to handle fuses during off load conditions with full voltage available on the terminals. Wherever required fuse pullers shall be provided. The fuse bases shall be so located in the modules to permit insertion of fuse pullers and removal of fuse links without any problems.

6. MCCB

MCCBs should comply with IEC 947 Part 2.

The MCCB shall be suitable for universal mounting (i.e) the Load / Line must be interchangeable.

The MCCB shall be suitable for operating Voltage of 415 V minimum and an Insulation Voltage of 600 V.

7. PROTECTION

The Thermal setting shall be continuously adjustable from 63% to 100% of its normal current.

The magnet setting shall be continuously adjustable from 500% to 1000% of its normal current.

Trip reset should be available Manual / Automatic.

8. MCB/MCB DB's

All the MCB Distribution Boards shall be fabricated out of 16 G thick sheet steel and shall be of the totally enclosed dust proof type suitable for wall mounting.

The DB shall have welded back and sides and gasketted fully hinged front door. Detachable gland plates shall be provided at the top and bottom with suitable gaskets for cable entry.

The enclosure shall undergo suitable pretreatment followed powder coated of RAL 6032 (SIEMENS GREY COLOR).

8.1. The MCB Distribution Boards shall have the following:

Incoming MCB required rating in an independent compartment. The incoming terminals shall be fully shrouded.

Three phase compartments, each housing MCB's connected to one phase of the power supply system. Each of the sections shall have a 4P MCB on the incoming and SP MCB's for Lighting/ Power. In each section a separate neutral bus and independent earth bus shall be provided.

8.2. MINIATURE CIRCUIT BREAKERS

The MCB's shall be of current limiting type and shall comply to IS 8829 – 1996 / IEC 898-1995. The power loss per pole shall be in accordance with IS 8828 – 1996 and shall be furnished by the Manufacturers. The MCBs shall have inverse – time tripping characteristics against over loads and instantaneous trip against short circuits. The MCBs shall be of fault current limiting type also. The MCBs shall be slip on type to the busbar. The ON and OFF machines of the switch handle shall be clearly marked. The MCBs shall be suitable for operating in ambient of 45°C without de-rating. The incoming and outgoing of the MCBs shall be accessible only after opening the front door of the DB. The MCBs shall be suitable for 415V, 3 phase, 4 wire, 50HZ system with the fault level of 9KA RMS symmetrical. The terminals of MCB knobs shall be suitable for use with eye lugs. The 4 pole, 3 pole and 2 pole MCB knobs shall be trunked with adequate strength tandem pin.

8.3. EARTH LEAKAGE CIRCUIT BREAKERS

Incomer of the DB shall be provided with current operated Earth leakage circuit breakers with a sensitivity of 30mA or higher. The ELCB shall have trip free mechanism and shall operate even on neutral failure.

The ELCB shall be provided with a test push button to stimulate leakage and test the ELCB. The ELCB shall operate and switch off the circuit within 30 milliseconds in case of a fault.

The enclosures of the ELCB shall be moulded from high quality insulating materials, which shall be fire retardant, anti-tracking, non-hygroscopic, impact resistant and shall withstand high temperatures.

All cable entries shall be from the bottom or top. The bus bar shall be of Tinned Copper having continuous current ratings equal to that of the incoming switch.

The busbars shall be designed to withstand a fault level of not less than 31 MVA for one second / as per the system requirement.

The MCB's shall have a lockable switching lever.

The minimum electrical endurance shall be 20,000 operations-.

The housing of the MCB shall be mounted self-extinguishing thermoset plastic material.

The short circuit current shall be brought to zero within 4 to 5 milli seconds from the time they are established.

All MCBs shall have a minimum short circuit capacity of 10 KA Rms.

Undrilled gland plates shall be provided both at the top and bottom. The degree of protection shall confirm to IP 50.

Phase separation barriers shall be provided

8.4. GROUNDING

The DBs shall be provided with two nos brass earthing stud terminals with suitable nuts, washers etc for connection to earth bus outside the DB.

8.5. PAINTING

Care shall be taken in workmanship and selection of materials to prevent the occurrence of any form of damage or corrosion due to damp or highly humid conditions.

The DB shall be prepared, primed, filled and painted to the highest standards.

All items shall be cleaned and deburred after fabrication and welding is complete. External surfaces shall be filled and rubbed down as necessary to obtain a perfectly flat smooth surface free from blemishes and imperfections and the whole shall be powder coated with epoxy paint and the shade shall be indicated later.

8.6. TESTS

All necessary routine shall be performed on the equipment to demonstrate satisfactory performance to owner / consultant at works without any extra cost. Equipment shall not be dispatched without obtaining approval of test certificates for type, routine and acceptance tests (whichever applicable).

9. LT CABLES LAYING OF CABLES METHOD OF LAYING CABLES

In the Plant Buildings, Switch/Control rooms etc., power and control cables shall generally be taken exposed on brackets, cable racks/trays/hooks unless otherwise specified laid in concrete trenches or along building and technological structures.

Power and control cables installed along buildings and technological structures, ceiling, walls etc. which are required to be protected against mechanical damage.

Extra length of cables shall be provided wherever possible for any future contingency to the extent of 10% of the length of any section.

The cables laid fully burried in ground or partly in trench and partly in ground shall be armoured type. Cables are laid fully in rack/tray/hook or laid in G.I. pipes, shall be also armoured type.

The installation work shall be carried out in a neat workman like manner by skilled, experienced and competent workmen particularly with experience in jointing termination of aluminium / copper conductor cables.

Cables runs shall be uniformly spaced properly supported and protected in an approved manner. All bends in runs shall be well defined and made with due consideration to avoid sharp bending and linking of the cable. The minimum bending radius of cables shall not be less than twelve times the overall diameter.

Cable installation shall be property co-ordinated at site with the routing of other services, utilities and the cable routings with a view to avoid interference with any part of the building, structure, equipment, utilities and services.

Entry of cables directly burried in ground or from underground trenches, to the buildings shall be through GI pipe sleeves. Necessary precautions shall be taken to make entry point fully watertight by properly sealing the pipe sleeves with epoxy resin (rubberised compound).

All cables shall be provided with identification tags indicating the cable numbers in accordance with the cable/circuit schedule. Tags shall be fixed at both the ends of cable at joints and at 20 m. Spacing for straight runs. When a cable passes through a wall tags shall be of durable fibre of aluminum sheet with the numbers punched on them, and securely attached to the cables with non-corrosive wire. For single core cables wire shall be non-ferrous material.

All cables shall be tested for proper insulation prior to laying. The cable drums shall be transported on wheels to the place of work. The cables shall be laidout in proper direction as indicated on the drum using cable drunk stands. In case of higher size cables, the laid out cables shall run over rollers placed at close intervals and finally transferred carefully on to the trenches and racks. Care shall be taken so that links and twists or any mechanical damage does not occur in cables. Only approved cable pulling grips or other devices shall be used.

Adequate length of cables shall be pulled inside the switchboards, control panels, terminal boxes etc. so as to permit neat termination of each core/conduct. Control cables cores entering switchboard or control panels shall be neatly bunched and strapped with PVC perforated tapes and suitable supported to keep it in position at the terminal block. All spare crores shall be neatly dressed and suitably taped at both ends.

Power cable terminations shall be carried out in such a manner to avoid strain on the terminals by providing suitable clamp near the terminals.

All power cable terminations shall be by means of crimping type cable lugs. Control cables shall be terminated by crimping or directly clamped in the terminal blocks by screws.

No jointing shall normally be made at any intermediate point in through runs of cables unless the length of the run is more than the length of the standard drum supplied by cable manufacturers. In such cases when jointing is unavoidable, the same shall be made by means of standard cable jointing boxes/kits.

All cables entry openings in the equipment shall be sealed and made proof against entry of creeping reptiles.

10. LAYING OF CABLES ON RACKS/TRAYS/BRACKETS/HOOKS

All power cables in trenches and on structures shall be laid on racks and shall be clamped by means of single or multiple galvanised MS saddles. The saddles shall be placed at an interval of 1000 mm. in both horizontal and vertical straight runs, at each bend and turnings from horizontal to vertical direction and vice versa.

Multi-core control cables shall be laid touching each other on trays and wherever required may be taken in two layers. Ladder type cable racks shall be selected from three sizes viz. 300 mm., 450mm. and 600 mm. Ladder. type trays shall be painted after fabrication.

Vertical spacing between cable racks/trays shall be 250 mm.

Power cables of different voltage grades shall be laid in separate racks / brackets / hooks. Control cables as well as signal and communication cables shall be laid in a separate trays. However, in cases where smaller size power cables (below 16 sq.mm) of fewer numbers cables provided suitable vertical barriers are installed between them.

Order of laying of various cables in racks/trays brackets/hooks shall be such that control cables are located at the bottom-most tier and 1100 V grade cables at top tier. In case of duplicate feeders of same consumer, these shall be laid in two separate racks/brackets.

Where there is possibility of mechanical damage cable rack / trays shall be adequate protected by sheet steel covers. For future installation of cables, provision shall be made to keep 20% space as spare on each tray/rack/bracket.

11. LAYING OF CABLES BURIED UNDERGROUND

Power and control cables laid directly buried in ground shall be laid generally conforming to the requirements of code of practice IS : 1255 in so far as it is applicable. Generally cables shall be taken at a depth of 750 mm. from finished ground level and shall be provided at least 150 mm. sand cushioning both at top and bottom and precast reinforced concrete protective covers or bricks.

For laying 1100V grade power cables in horizontal axial spacing shall be 75 mm. Control cables shall be laid touching each other without any horizontal spacing. However, the distance of the control cable from the nearest power cables shall be 150 mm. Power and control cables may be laid in a common trench, but power cables for each voltage grade cables may be laid in a common trench, but power cables for each voltage grade and the control cables shall be separately in groups. Generally, cables shall be laid in one layer. In general, communication shall not be taken in a common trench. In case the same is required to be taken along with power cables, the minimum axial spacing between two cables shall be 350 mm where a brick separator shall be provided between the two cables and without brick separation the spacing shall be 500 mm.

Precast concrete protective cover shall be placed centrally along the cables. The concrete slab shall be of RCC type as per appendix C of IS : 1225 of length having suitable provision for dove tailing with the adjacent slab. The length of the slab shall be 750 mm the width however shall vary depending on the number of cables in the trench as well as axial spacing. The minimum width of slab shall not be less than 200 mm.

After laying of cables the trench shall be back filled with good excavated soil and well rammed in successive layers not less than 300 mm. depth. The excavation of trenches shall be kept as straight as possible. The width of trench shall be in accordance with the number of cables to be laid out in no

case shall be less than 400 mm. The minimum clearance between trench edge and cable shall not be less than 100 mm.

Where cables required to cross roads, railway tracks and surface drains they shall be taken through reinforced concrete spun pipes at a minimum depth for 1000mm.

For crossing water, oil, gas or sewage pipes etc. cables shall be taken above the pipes where minimum 500 mm. clearance is available from top of pipes. Where 500 mm. clearance is not available the cables shall cross pipes through RC pipes at a minimum depth of 750 mm. from finished ground level keeping the distance between the utility pipes and pipe carrying cables 250 mm. minimum.

In each cable run some extra length shall be kept at a suitable point to enable one or two straight through joints to be made in case the cable develops fault at a later date. Also when group of cables are laid together the cable length shall be adjusted to stagger the straight through joints.

Direct burial underground cable shall be generally laid in the utility alley along the roads and cable routing shall follow the road layout. However, in special cases to keep the cable lengths minimum the cables may be laid by the shortest route and the same shall be taken through RC pipe.

While laying cables parallel to buildings, utility pipelines, drainage, sewerage etc., the minimum clearance shall not be less than 1000 mm.

12. CABLE TERMINATION AND JOINTING

Termination and jointing of aluminium conductor power cables shall be by means of compression method using compression type of aluminium lugs. Copper conductor control cables shall be terminated directly into screwed type terminals provided in the equipment. Wherever control cables are to be terminated by means of terminal lugs, the same shall be tinned copper compression type.

13. CONDUIT & WIRING

13.1. GENERAL REQUIRMENT OF WIRING SYSTEM

13.1.a. System of Wiring

The system of wiring shall consist of FRLS insulated copper conductor wires in Heavy gauge rigid MS conduits for concealed installation and metal conduits for surface installations as called for.

Prior to laying and fixing of conduits, the Contractor shall carefully examine the drawings indicating the layout, satisfy himself about the sufficiency of number and size of conduits, locating of junction boxes, size and location of switch boxes and other relevant details. Any discrepancy found in the drawings shall be brought to the notice of the Consultant/employer. Any modifications suggested by the Contractor shall be got approved by the consultants before the actual laying of conduits is commenced.

Generally concealed electrical wiring installation shall be in PVC conduits and surface wiring in MS conduits.

13.1.b. Mains and Sub-Mains

Mains and sub-mains cable or wires where called for shall be of the rated capacity and approved make. Every main and sub-main wire shall be drawn into an independent adequate size conduit. An independent earth wire of the proper rating shall be provided for each sub main, two earth wires of proper rating shall be provided for every single phase sub main. For every 3-phase sub main, two earth wires of proper rating shall be provided along with the sub main. The earth wires shall be

fixed to conduits by means of clips at not less than 1000 mm distance. For mains and sub-mains extra lengths of cable shall be provided to facilitate easy connections and maintenance.

13.1.c. Circuit main for light circuit

Circuit main/ sub circuit main is inclusive in the point wiring (ie. wiring from mcb's in DB to First Switch Box/Switch Box to Switch Box looping) and however wherever called for separately in the BOQ alone shall be measured in length from the Distribution Board/Panel Board up to the first switch box on that circuit only; from Switch Box to Light Point for single control Light point and for group control Light Point all the points connected to a single switch will be termed as group light point.

Point wiring and circuit wiring should be done in independent conduits and should not be taken through one conduit.

Fan regulator box, fans, light fittings, calling bells are to be properly earthed. In respect of 5 Amps conventional plug point, the third pin should be earthed with 2.5 Sq.mm green FRLS insulated copper wire.

All flush type switches and accessories will be used with 3-mm thick hylam sheet in MS box.

For the purpose of determining the load per circuit. The following electric rating of points shall be assumed.

Light point	:	60 watts
Conventional plug point (Plug point in light switch box or independent)	:	100 watts
Fan points	:	60 watts
Exhaust fan points	:	40 watts or as specified

Lights, fans and 5 A points shall be wired on a common circuit. Each circuit shall not have more than a total of ten points of lights, fans and 5 A socket outlets or a load of 800 watts whichever is less. The ceiling fan point shall be complete with special outlet box including fixing and connection of regulator. Supply and fixing of 5A switch for each ceiling fan is included in scope of Contractor.

13.1.d. For 15A Power Plug Points

In one circuit, there shall not be more than two 15A power plug points and 2 x 4 Sq.mm copper conductor wires shall connect circuit.

One flush type plug socket outlet and switch shall be fixed for each power point on 3mm thick hylam sheet cover or modular type . Plug socket can be standard type or 15/5 A universal type. The circuit main would commence from DB and end up to the switch box. Looping of circuit would be done to second 15A power point from first 15A power point and shall be counted as power point wiring.

Each circuit would have its own 2.5 Sq.mm green FRLS insulated copper wire from DB to switch box and would be connected to third pin of socket outlet.

Electrical load for each 15A power point would be considered as 1000 watts.

13.1.e. General Wiring

All wires shall have been manufactured in accordance with the latest IS Specification (IS 694 - Part II).

All wires shall be FRLS insulated, copper conductors of 1100V grade. Cross section of the conductor shall be as per the specification mentioned in schedule of quantities.

Minimum cross section of conductor for electrical wiring shall be 1.5 mm square.

For single phase wiring, the colour of the insulation of phase conductors shall be Red/Yellow/Blue and black for neutral. The colour coding adopted should be uniform for the en tire Project.

Earthing is to be done by Green FRLS insulated copper conductor. For three phase the insulation of phase conductors shall be Red/Yellow/Blue, as per relevant phase and Black for neutral.

Earth wire shall always be of copper conductor FRLS insulated and colour of insulation shall be Green.

Whenever wires are being terminated in a Distribution Board/Switch Box/Plug point/Outlet Box etc., a minimum of 200 mm long extra wire should be provided in the form of a loop for further maintenance use.

For each lot of wires, the Contractor shall submit all relevant test certificates issued by the Manufacturer stating its origin, date of manufacture, constitution and standards to which it complies. All wires and cables shall bear the manufacturer's label and shall be brought to site in original packing.

Only Authorized/certified wiremen and cable jointers shall be employed to do the cable jointing work.

Wires shall not be jointed inside the conduit or pull boxes. Where unavoidable, joints shall be made through approved mechanical connectors with prior permission of Engineer-Incharge / Employer.

Control switches shall be connected in the phase conductors only; and shall be 'ON' when knob is down. Switches shall be fixed in galvanized steel boxes. Plated screws shall be used.

Power wiring shall be distinctly separate from lighting wiring.

Each circuit phase wire from the distribution boards should be followed with a separate neutral wire of the same size as that of the circuit wire.

Wires originating from two different phases shall not run in the same conduit.

13.1.f. **CIRCUIT WIRING / Group Wiring**

The following specification is applicable only when three or more lights (or) more than 500 watts of lighting load is controlled by one MCB/ Switch.

Lights would be controlled by rated capacity MCB/switch and connected by wire size, as specified in schedule of quantities. However, it shall not be less than 5A and 2.5 sqmm respectively.

MCB/Switch for these lights should be installed in a suitable MS box with hylam/Front Plat / Modular type as per OEM.

Total electric load is to be controlled from each of the single Phase MCB DB shall not exceed 3000 watts or six groups of lights or as specified in the approved drawings. Circuits with earthing for this Group Lighting Board would always be from DB of size as specified in schedule of quantities.

"Group lights" points would commence from DB including circuits, surface/concealed conduit system, necessary wiring, MS switch box, M.C.B, hylam sheet cover and outlet box up to last light of the group.

Lights, 5A sockets, Ceiling fans and Ex-haust fans may be wired on a common circuit. Such circuit shall have 10 points of light, ceiling and ex-haust fan and socket outlets or a load of 800 watts, whichever is less. A switch board might have more than two circuits but should be of same phases.

All outlets connected on a lighting circuit shall be measured under point wiring. It shall Include wiring from switch point of the circuit up to light, fan, socket outlet via switches, regulators, controls etc., as called for. Generally, the following accessories shall be included.

The following shall be deemed to be included in the point wiring:-

a) Switches and Manufacturing mounting box.
b) Ceiling rose or terminal connector as required
c) Bushed conduit, G.I.Sleeves where cables or pipes passes through wall etc.
d) Earth wire from three pin socket outlet point/fan regulator to common earth including earth dolley except the earth wire from the first tapping point of live wire to the final distribution board.
e) All fixing accessories such as clips, rails screws, rawl plugs, wooden plugs etc. as required.
f) Connections to ceiling rose, connector socket outlet, lamp holder,switch and fan regulator etc.
g) Looping the same switch board interconnections between points on the same circuit.
h) Providing fish wire in conduits while recessed circuiting work undertaken.

i) The Chases in the wall shall be neatly made and in ample dimensions to permit the conduit to the fixed in the manner desired.
j) Any special or suitable round block for neatly housing the connector and covering the fan hook in case of fan point.
k) Bushed conduit, MS.Sleeves where cables or pipes passes through wall etc.
l) Earth wire from three pin socket outlet point/fan regulator to common earth including earth dolly.
m) All wood or metal blocks, boards and boxes sunk of surface type, including those required for mounting fan regulator but excluding those under the main distribution switchgear.
n) All fixing accessories such as clips, rails screws, rawl plugs, wooden plugs etc. as required.
o) Connections to ceiling rose, connector socket outlet, lamp holder, switch and fan regulator etc.
p) Looping the same switch board interconnections between points on the same circuit.
q) Providing fish wire in conduits while recessed circuiting work is undertaken.
r) In case of buildings under construction, conduits shall be burried in the wall before plastering. These shall be grouted and covered with cement and mortar, neatly finished at the plane of the un-plastered brick work and stretched for providing key to the plaster and cured. Under no circumstances, finished plastered surfaces shall be allowed to be chased for the conduit work. Before taking up chasing of the wall, the routes shall be marked and got approved by Engineer-Incharge / Consultant. In case of exposed brick / rubble masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work.

13.1.g. Drawing Conductors

The drawing and jointing of MS insulated copper/aluminium conductor wire and cables shall be executed with due regard to the following precautions. While drawing wires through conduits, care shall be taken to avoid scratches, etc., Care shall also be taken to ensure that the insulation is not peeled off either in portions or as a whole; and the conductor is not broken anywhere. There shall be no sharp bends that may lead to the breakage of the conductor.

FRLS Insulated copper conductor wire ends shall be soldered (at least 20 mm length) before inserting into the switch for termination and Conductors having nominal cross sectional areas exceeding 10 Sq.mm shall always be provided with cable sockets/lug of same material as that of conductor.

Strands of wires shall not be cut for connecting terminals. The terminals shall have sufficient cross sectional area to take all strands and shall be soldered. Connecting brass screws shall have flat ends. All looped joints shall be soldered and connected through block/connectors. The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less.

At all bolted terminals, brass flat washer of large area and approved steel spring shall be used. Brass nuts and bolts shall be used for all connections.

For all internal wiring, FRLS insulated wires of 1100 volts grade shall be used.

The sub-circuit wiring for point shall be carried out in loop system and no joints shall be allowed in the length of the conductors. If the use of joint connections are unavoidable due to any specific reason, prior permission, in writing, shall be obtained from the Engineer-Incharge / Employer. No wire shall be drawn into any conduit, until all work of any nature, that may cause injury to wire, is completed. Care shall be taken in pulling the wires so that no damage occurs to the insulation of wire. Before the wires are drawn into the conduits, the conduits shall be thoroughly cleaned of moisture, dust, dirt or any other construction debris, by forcing compressed air through the conduits. All sub-circuit wiring for light points shall be with 2.5 Sq.mm FRLS insulated copper conductor.

All Light, Fan, Sockets, fittings must be earthed.

Point wiring rate should include circuit mains wiring cost also.

Separate neutral must be taken for each circuit.

The physical and electrical continuity shall be maintained throughout the conduit systems.

Only 14 SWG thick PVC conduits shall be used as required in Bill of Quantities or Schedule of works.

Only concealed type of fan hooks shall be used on all possible locations.

Wires of any two branch circuits connected to different phases must be drawn in separate conduits.

Receptacles, control switches, fan regulators, MCB DBs, junction boxes for concealed wiring system shall be flush mounted in wall / ceiling / partitions as required.

50 mm. dia and height MS inspection boxes of 14 SWG Thick having smooth external finish shall be provided to facilitate removal and replacement of wires wherever required.

Strands of wires shall not be cut for connecting terminals. The terminals shall have sufficient cross sectional area to take all strands. At all bolted terminals, flat washers of large area and approved steel shall be used.

13.1.h. **COLOUR CODING OF WIRES**

Colour coding of wire shall be carried out as detailed below:

PHASES	RED
	YELLOW
	BLUE
NEUTRAL	BLACK (OR) GREY
EARTH	GREEN

Colour code shall be maintained for the entire wiring installation as red, yellow, blue for three phases, black for neutral.

The minimum diameter of the conduits shall be 25 mm only.

The following sizes or higher of PVC insulated multi stranded copper conductor wires shall general be followed throughout:

From the final switch to individual outlets (Phase, Neutral and Earth)	:	1.5 sq.mm.
From Distribution Boards to First Switch Board and subsequent	:	1.5 sq.m.m
All 15A socket (Only Phase & Neutral)	:	4.0 Sq.mm.
Earth wire throughout for Lighting	:	1.5 Sq.mm.

Conduits for power and lighting shall be separate and shall not be mixed.

All Control switches (5 AMPS & 15 AMPS Capacity) used in point wiring, whether surface mounted or concealed type shall conform to IS 3854 and carry ISI Mark distinctly.

All switches and socket outlets shall be mounted in a suitable sized MS Box with ample space for connection and disconnection of wires.

All socket outlets shall invariably have their third earth pin connected to main grounding /earthing grid.

13.2. MS Conduits

Conduits and accessories shall conform to IS: 9537-Latest and the specifications given below. MS conduits shall be of black, round, heavy gauge Milled Steel (MS). The internal surface of the conduit shall be smooth. All flexible conduits shall be of steel. Only approved quality as recommended by the consultant and factory made bends/accessories shall be used.

Conduits and Accessories shall conform to IS: 9537 (Latest) and tender specifications. The steel conduits shall be solid drawn, mild steel, 16 gauge, heavy duty electrical welded, thread type, having perfect circular tubing with tight fitting joints and shall be capable of being cleaned easily. The conduit shall be protected from rust by one coat of paint applied inside and outside in its manufactured form.

Minimum Conduit Dia (OD) For Electrical Wiring Shall Be 25.0 mm.
Minimum Conduit Dia (OD) For Telephones and Audio/Video shall be 19.0 mm

Joints between conduits and accessories shall be securely made, to ensure earth continuity.

Where called for, buried wiring passing underground, shall run in galvanized steel conduit.

The conduits shall be delivered to the site of construction in original bundles and each length of conduit shall bear the label of the manufacturer. This shall be approved by respective Engineer-Incharge / Engineer-in-charge.

The number of 650/1100 volts grade insulated copper conductor wires that may be drawn in the conduits of various sizes are given below. The space occupied by the wires shall not exceed 60% of the conduit Internal Area and 40% of conduit space should be left free.

Maximum permissible number of 650/1100 volt grade insulated wires that may be drawn into rigid non-metallic or MS conduits are given below:

Sl. No.	Size of Wire (in Sq.mm)	Maximum Number of wires within conduit of size				
		19mm	25mm	32mm	38mm	51mm
1	1.5	-	6	10	14	-
2	2.5	-	5	10	14	-
3	4.0	3	5	10	14	-
4	6.0	2	5	8	11	-
5	10.0	-	4	7	9	-
6	16.0	-	2	4	5	12
7	25.0	-	-	2	2	6
8	35.0	-	-	2	5	-

13.2.a. INSTALLATION OF CONDUITS

13.2.a.i. Concealed Conduit System

Unless otherwise specified all wiring shall be in heavy gauge rigid PVC conduit embedded in wall, or ceiling and Surface type MS conduiting above false ceiling. The size of the conduit shall be selected in conformity with relevant IS code and as specified in the above table. Factory made conduit bends and accessories shall be used. MS conduit shall be jointed using solvent cement as recommended by the conduit supplier. The conduit in ceiling slab shall be straight as far as possible. Before the conduits are laid in the ceiling, the position of the outlet points, controls, junction boxes shall be set out clearly as per the dimensions and to minimize off-sets and bends. Conduits in ceiling shall be bonded to the reinforcement rods with GI bonding wire to secure them in position. MS light outlet/pull boxes shall be provided as required. The conduit in ceiling slab shall be laid above the first layer of reinforcement rods to avoid cracks in the ceiling surface.

Conduits concealed in the wall shall be secured rigidly by means of steel hooks/staples at minimum 750 mm intervals. Before conduit is concealed in the walls, all chases, grooves shall be neatly made to proper required dimensions to accommodate number of conduits.

The chased portion of the walls for electrical works shall be plastered by electrical Contractor to bring it to the finished wall surface. The outlet boxes, control switches, and inspection and draw boxes shall be fixed as and when conduits are being fixed.

The recessing of conduits in walls shall be so arranged as to allow at least 12 mm plaster cover on the same. Where conduit passes through expansion joints in the building, adequate expansion fitting or other approved devices shall be used to take care of the relative movement of expansion joints.

All grooves, chases etc., shall be refilled with cement mortar and finished up to wall surface before plastering of walls is taken up by the general civil Contractor. Whenever the conduits terminate into Control Boxes, distribution boards etc., conduits shall be rigidly connected to the boxes/boards with check nuts on either side of the entry to ensure electrical continuity. All opening of conduits, junction boxes shall be properly plugged with MS stoppers or any other suitable materials, so that water, mortar, vermin or any other foreign materials do not enter into the conduit system. All conduit ends terminating into an outlet shall be provided with bushes of MS or rubber after the conduit ends are properly filed to remove burrs and sharp edges. Necessary GI pull wires shall be inserted into the conduit for drawing wires. The Insulated Earth wires shall be run in each conduit originating from the panel board up to the Light, Socket and Switch boxes. If the Electrical Contractor forgets to install any conduit/boxes etc., before the plastering/painting work is done by other agencies, he may be permitted to install the same with prior permission of Engineer-Incharge / Employer and the expenses towards redoing the wall, floor, ceiling etc., shall be borne by the Electrical Contractor.

13.2.a.ii. Open/Surface Conduit System

Conduits on surface of treated walls/RCC slabs shall be avoided as far possible. In case it is not avoidable, prior approval in writing shall be obtained from Employer/Consultant on the exact route. Heavy gauge GI saddles shall fix conduit. Distance between two consecutive saddles shall not exceed 900 mm. No wooden gutties for fixing saddles/clamps shall be used. Use of Rawl plug/steel fastener with hard setting/scaling compound is recommended. Conduits shall be run in square and by metrical lines. Wherever couplers, bends, or similar fittings are used, saddles shall be provided at either side at a distance of 300 mm from the Centre of such fittings. Conduits shall be joined by means of screwed couplers and screwed accessories only. In long distance straight runs of conduit, inspection type couplers/junction boxes shall be provided.

Threading shall be long enough to accommodate pipe to the full threaded portion of the Couplers and accessories. Cut ends of conduits shall have neither sharp edges nor any burrs left, to avoid damage to insulation's of wires.

Using pipe-bending machine shall do bends in conduit runs. Sharp bends shall be accomplished by introducing solid bends, inspection bends or cast iron/ MS inspection boxes. Radius of solid bends shall not be less than 75mm. Not more than 90-degree bend shall be used in a conduit run from outlet to outlet.

All conduits opening shall be properly plugged with MS stoppers/bushes. Conduits shall be adequately protected against rust by applying two coats of approved synthetic enamel paint after the installation is completed and should be certified by the Engineer-Incharge / Employer.

Wherever conduits terminate into control boxes, outlet boxes, distribution boards etc., it shall be rigidly connected to the box with check nuts on either side of the entry.

In the floors, conduiting below the flooring should be avoided. Wherever it is unavoidable, GI pipe should be used with prior approval of Employer/Engineer-Incharge.

The entire conduit system shall be bonded to the earth.

14. ALL STRAIGHT JOINTS THROUGH INSULATED TUBE LUGS – CRIMPED

Only certified wiremen and cable jointers shall be employed to do jointing work. All wires and cables shall bear the manufacturer's label and shall be brought to site in original packing. For all internal wiring, PVC Insulated wires of 650 V grade shall be carried out in loop system and no joints shall be allowed in the length of the conductors. If the use of joints/connections are unavoidable due to any reason prior permission, in writing shall be obtained from the Consultants / Employer. No

wire shall be drawn into any conduit, until all work of any nature, that may cause injury to wire is completed. Care shall be taken in pulling the wires into the conduits. The conduits shall be thoroughly cleaned of moisture, dust, dirt or any obstruction by forcing compressed air through the conduits. The minimum size of PVC Insulated copper conductor wires for all sub-circuit wiring for light points shall be 1.5 Sq.mm.

15. LOAD BALANCING

Balancing of circuits in three phases installation shall be planned before the commencement of wiring and shall be adhered to.

16. SWITCHES AND ACCESSORIES

All switches shall be placed in the live conductor of the circuit and no single pole of fuse shall be inserted in the earthed neutral conductor of the circuit.

Single pole switches (other than for multiple control) carrying not more than 15Amps may be of the piano key type/moulded plat type and the switch shall be `ON' when the knob is down.

The switch box shall be placed in the live conductor of the circuit and no single pole of fuse shall be inserted in the earthed neutral conductor of the circuit.

Single pole switches (other than for multiple control) carrying not more than 15 Amps may be of the piano key type/moulded plat type and the switch shall be `ON' when the knob is down.

The switch box shall be made of metal on all sides, except on the front. In the cases of cast iron boxes wall thickness shall be at least 3mm. and in case of welded mild steel sheet boxes the wall thickness shall not less than 18 gauge for boxes upto a size 20 cms x 30 cm. above this size 16 gauge MS boxes shall be used. Except where otherwise stated 3mm. thick phenolic laminated sheets shall be fixed on the front with aluminum alloy/ brass/cadmium plated iron screws as approved by Engineer-Incharge/Engineer - incharge.

To facilitate drawing of wires in the conduit, GI Fish wire of 16 SWG shall be provided while laying recessed conduit. Point wiring shall include all works necessary to complete wiring of a switch circuit of any length from the tapping point on the distribution circuit to the following (via the switch).

a) Ceiling rose or contractor (in the case of ceiling / exhaust fan points) b) Back plate (in case of fluorescent fitting with down rods etc).
b) Socket outlet (in the case of socket outlet points)
c) Lamp holder (in case of wall brackets, bulk head and similar fittings).
d) All civil works like chipping, making good the damages, drilling holes in walls etc., are to be done by the contractor only.

16.1. LENGTH PER POINT

The term "Length per point" in point wiring in the case of the fan and light points shall mean the distance between the switch and ceiling rose, connector or back plate, lamp holder depending upon the fitting, measured along the run of wiring irrespective of the number of wires in the run. In the case of socket outlet points, the length shall mean the distance between the socket outlet and the tapping point of live wire on the nearest switch board.

16.2. MEASUREMENT OF POINT WIRING

Points on the basis of length per point inclusive of circuit mains shall be classified as under:
a) Average point : Length per point not exceeding 10 M.

b) Special point for socket outlet points : Length per point exceeding 10 M Light, Fan and 5A

The rate for average point shall be on a per point basis.

For special points, the extra length of wiring over and above the length of Meters specified shall be measured and paid for.

In case of points with more than on light point controlled by the same switch, they shall be measured on a set basis (i.e.) Two lights controlled by one switch shall be considered a set and so on. The distance between the first point and subsequent point shall not be more than 5 mts. In case of more than two lights controlled by one switch only the average distance between light points shall be considered.

The minimum size of pipe shall be 25mm. dia only. The wall thickness shall 2mm only. The chases in the wall shall be neatly made and in ample dimensions to permit the conduit to be fixed in the manner desired. In case of buildings under construction, conduits shall be burried in the wall before plastering. These shall be grouted and covered with cement and mortar, neatly finished at the plane of the unplastered brick work and scratched for providing key to the plaster and cured. Under no circumstances finished plastered surfaces shall be allowed to be chased for the conduit work. Before taking up chasing of the wall the routes shall be marked and got approved by Engineer-Incharge / Engineer-incharge. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work.

16.3 Switch Outlet and Junction Boxes

All concealed outlet boxes for switches, sockets and other receptacles shall be rust proof and shall be of thick Galvanized steel (GI) boxes having smooth external and internal surfaces.

All outlet boxes for receiving plug sockets and switches shall be of standard factory make and of approved size, and shape. All boxes shall have adequate number of knock out holes of required diameter and earthing terminal screws. Outlet boxes shall have a minimum depth of 65 mm.

All 5/15 amps switches shall be enclosed type flush mounted for 240 volts AC. The box in which the switches are fixed shall have an adjustable plate cover. Ample space at the back and sides shall be provided for accommodating wires. Switch, controlling the light point shall be connected to the phase wire of the circuit. The Switch plate shall be white plastic or any other approved type and it should match the interior design.

16.4. Light Outlet Boxes

The Light Outlet Boxes for concealed installation shall be round in shape and shall be made of MS knock out holes/projections to connect MS pipes. Light outlet boxes for surface installation shall be of MS (painted).

16.5. Inspection Boxes

Rust proof inspection boxes of 2 mm thick mild steel having smooth external and internal finish shall be provided to facilitate removal and replacement of wires, where required.

16.6. Fan Outlet

For fixing of ceiling fans, circular outlet boxes made of 16 SWG steel sheet, 100 mm diameter, complete with fan hook fabricated art of 12 mm dia mild steel rod.

16.7. Wall Socket Outlets

Following types of socket outlet shall generally be used for interiors:

All sockets shall be of shutter type. 5A 3 Pin Switched Socket outlet in guest rooms, Toilet, office area, lobby, restaurant etc., 5A 3 Pin un-switched socket outlet for TV supply with Independent 5A SP Control switch near the bedside.

15/5A 3 pin switched socket with Indicator for power points.

15A, 5 pin domestic plug point for using mixie, microwave oven etc., should be provided. Guest rooms kitchen, main kitchen and split AC units, etc., shall only be operated by metal clad industrial type socket and plug with suitable rating of MCBs of any one of the following combinations as per design and rating of the equipment's used. In pantry area, where the domestic appliances are used, flush type switches and sockets can be fixed.

16 Amps SP Industrial type socket controlled by 16 Amps SP MCB mounted on a fabricated MS box with cover plate.

20 Amps SP Industrial type socket controlled by 20 Amps SP MCB mounted on a fabricated MS box with cover plate.

32 Amps S.P/T.P 230V/415V, Industrial type socket controlled by 32 Amps S.P/T.P. MCB mounted in a fabricated MS box with cover plate.

No electrical cable/temporary cabling shall be allowed at floor level for connecting any equipment on any account.

17. EARTHING

The method adopted for system as well as equipment earthing shall be in accordance with the code of practice for earthing IS:3043-1966 /1987 (latest) and shall also comply with the relevant clauses of Indian Electricity Rules.

All non-current carrying metallic parts of various electrical equipment as well as cable armouring metallic conduit/GI pipe system, cable racks/ trays brackets, supporting structures etc. shall be effectively earthed. Earthing of medium and high voltage equipment shall be done by means of two separate earth conductors connected either directly to earth electrodes or to an earthing ring irrespective of use of armoured cable or metallic conduit/GI pipe.

The total earth resistance at any point of the earthing system for sub-station and main building shall not be more than 1 Mega ohms. However, for other areas, shall not exceed 5 Mega ohms.

Interconnections with electrodes shall be done with 16 mm^2. PVC Insulated armoured copper cable with crimped sockets at a depth of 600mm. and shall be provided.

G.I Earth Pipe 40mm internal dia, 3mm pipe thickness and 2.5 meters long of standard quality class-B and as per IS-1239 (Part-I) 1990 with ISI marking.

G.I. Earth Pipe shall be accompanied with the tender while submitting the tender for which samples are not received along with tender are liable for rejection. G.I Earth Pipe 40mm internal

dia, 3mm pipe thickness and 2.5 meters long of standard quality class-B and as per IS-1239 (Part-I) 1990 with ISI marking

G.I Earth Pipe 40mm internal dia, 3mm pipe thickness (No minus tolerance allowed) and 2.5 meters long of standard quality class-B. The pipe should be provided with 10mm holes in diagonally opposite directions throughout the length of the pipe at 150mm intervals Centre to Centre. At one end, cast iron cone of 50mm length shall be welded. The other end 40x3 mm G.I Flat is to be welded neatly and the welding portion only to be painted to prevent rusting 4 Nos. holes suitable for 12mm bolts shall be drilled in the flat at equal distances and 4 Nos. G.I bolts and nuts of size 50x12mm with 2 Nos. spring washers for each bolt shall be supplied with each pipe. G.I pipe shall conforming to Class-B and as per IS-1239 as per drawing enclosed (Part-I) 1990 with ISI marking.

For earthing Installation, excavation of size shall be of 1 meter diameter and 3 meter length shall be excavated after depth of 3 meter the size of excavation shall be 900X300X900mm depth. Plate / Pipe Electrode shall be in vertical position. GI/PVC pipe for Watering shall be used of 40mm Diameter, length of 3 meter (contain hole of 10mm Diameter in Zigzag manner starting from 15cm away from bottom to 2 meter height). At bottom 150mm layer of Salt and charcoal power shall be installed than Plate shall be installed.Alternate layer of 150mm of Salt and charcoal power shall be used up to 2.5 meter. Min 120kg of charcoal power and 120kg of salt shall be used for each earthing pit. The plate \ pipe electrode, as far as practicable, shall be buried below permanent moisture level but in no case not less than 2.5 M below finished ground level.

Plate Earthing Electrode shall be of sizes, for copper shall be
600 x 600 x 3.1mm and For Hot dip GI shall be 600 x 600 x 6.3mm.

18. CLEARANCE AND SAFETY

For all switch boards, control panels, power control centres, a clear front space of not less than 1000 mm. shall be provided in front of the equipment. In case, where the equipment is provided with drawout unit, a minimum clearance of 2,000 mm shall be provided.

For all electrical equipment a minimum clearance headroom of 500mm shall be provided.

All motors located away from the feeding and control panels and for which control desk of posts are not within visible location, shall be provided with readily accessible and easily operated, locally mounted lockable type `stop' pushbuttons in the control circuits.

All electrical equipment operating on 415 V or higher voltage shall be provided with caution notice boards of approved type and shall be affixed permanently in a conspicuous position.

Where a group of equipment is located within a switch / control room or within a fenced area, the notice board shall be fixed at the entrance. Where a group of equipment is located within a switch / control room or within a fenced area, the notice boards of approved type and shall be fixed at the entrance.

All moving parts of the equipment which are exposed and liable to cause hazard to the operating and maintenance personnel shall be suitably protected by metallic guards.

In front of the entire (all) switch boards rubber mats shall be provided for personnel safety.

Open type control panel or open type busbars shall not be installed inside the plant/ building.

19. TESTING AND COMMISSIONING

The inspection and testing shall be carried out in accordance with Indian Electricity Rules 1956 and IS 732 (PART – 3) Inspection and Testing of Installation by the Contractor in the presence of Engineer-Incharge / Engineer in charge / representative. In the event of defects being found, these shall be rectified as soon as practicable and the installation re-tested free of cost. Some of the Test and Inspections to be carried out are:-

a) General inspection of complete installation with respect to conformity with Indian Standards and Indian Electricity Rules.

b) General workmanship (Earthing, cables, bolt, connections etc).

c) Testing of Insulation Resistance of all cables and wires.

d) Testing of Earth continuity path

e) Testing of Polarity of Single Pole switches.

f) Lighting circuits to be tested for resistance to earth in the following ' manner:-
- All switches 'ON' with consuming devices in circuit
- All switches 'ON' with consuming devices removed the IR values between poles and E
- All switches 'ON' with consuming devices in position the IR between poles and E

g) Testing the earth resistance of earth pits and full earthing grid as a whole.

h) Test specified by manufacturer's for particular equipment.

i) Check for 'DANGER BOARD' sign wherever required and shall be supplied and erected at free of cost.

All Panels and DBs shall be subjected to High Voltage Test (2500 Volts for one minute) and Megger Test and Test Report shall be submitted by the Contractor before dispatch of the panel (wherever applicable if required).

20. Energy Meter:

The energy meter shall be of 3 Ø 4 wire 415V AC 3 x (20A-100A) whole current Electronic **Energy Meter (shall be approved by Engineer-Incharge)**. The Meter to be supplied must be tested from any of the NABL/ BIS Accredited Testing-Calibration Laboratories. The Energy meter shall be installed at the separate housing within an enclosure. The CTs shall be copper wound resin cast bus bar mounting type. The same will have communication port RS-232 or higher.

21. SAFETY

The Contractor shall maintain in a readily accessible place first aid appliances including adequate supply of sterilised dressings and cotton wool.

An injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalisation.

No portable single ladder shall be over 8 metres in length. The width between the side rails shall not be less than 30 cm. Clear and the distance between two adjacent rungs shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding the ladder.

Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable ending or railing whose minimum height shall be one metre.

Workers employed on mixing and handling material such as asphalt, cement, mortar shall be provided with protective footwear and rubber hand gloves.

Hoisting machine and tackle used in the works, including their attachments, anchorage and supports shall be in perfect condition.

The Engineer-Incharge / Employer reserves the right to instruct the Contractors to take additional safety precautions if found necessary. All workers shall be provided with helmet, Safety Shoes and Safety belts.

SAFETY CODE

FIRST AID

1. At every work place, there shall be maintained in readily accessible place first aid appliance including supply of sterilized dressings and sterilized cotton wool. The appliance shall be kept in good condition, and in large work place, they shall be placed in charge of a reasonable person who shall be readily available during working hours.

2. At large work places, where hospital facilities are not available within easy distance of the works, first aid posts shall be established and be run by a trained compounder.

3. In every work place, there shall be provided and maintained at suitable places, easily accessible to labour sufficient cold water fit for drinking.

SCAFFOLDS

1. Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except in the case of short duration work which can be done safely from ladders. When a ladder is used, it shall be of rigid construction made either of good quality wood or steel. The steps shall have a minimum width of 450 mm and a maximum rise of 300 mm. Suitable hand holds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than ¼ to 1 (1/4 horizontal and 1 vertical).

2. Scaffolding or staging more than 4 m. above the ground floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly bolded, braced or otherwise secured, at least 1 m. above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

3. Working platforms, gangways and stairways shall be so constructed that they do not sag unduly or unequally and if the height of the platform, gangway or stairway is more than 4 m. above ground level or floor lever, they shall be closely boarded and shall have adequate width and be suitably fenced as described in (2) above.

4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 m.

   Wherever there are open excavations in ground, they shall be fenced off by suitable railing and danger signals to be installed at night so as to prevent persons slipping into the excavations.

5. Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m. in length while the width between side rails in rung ladder shall in no case, be less than 290 mm. for ladder up to and including 3 m. in length. For longer ladders this width shall be increased at least 20 mm for each additional meter of length.

6. A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the Engineer obtained prior to construction.

OTHER SAFETY MEASURES

7. All personnel of the contractor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all metal workers shall be provided with safety gloves. Persons employed on metal cutting and grinding shall wear safety glasses.

8. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

EXCAVATION & TRENCHING

9. All trenches, 1.25 m. or more in depth shall at all times be supplied with at least one ladder for each 30 m. in length or fraction thereof. The ladder shall be extended from bottoms of the trench to at least 1 m. above the surface of the ground. Sides of trenches which are 1.5 m. or more in depth shall be stepped back to give suitable slope or securely held by timber bracing so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

10. The contractor shall take all measures on the site of the work to protect the public from accidents and shall be solely bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any persons for injury sustained owing to neglect of the above precautions and to pay any such persons or which may with the consent of the contractor, be paid to compromise any claim by any such person. No future claim shall be entertained / made against the bank in this regard.

DEMOLITION

11. Before any demolition work is commenced and also during the process of the work:

    a. All roads and open areas adjacent to the work site shall either be closed or suitably protected.

    b. No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.

    c. All practical pre-cautions steps shall be taken to prevent danger to persons employed from the risk fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

PERSONAL SAFETY / PROTECTIVE EQUIPMENTS

12. All necessary personal safety equipment as considered adequate by the Engineer should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned.

    a. Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

b. Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles.

c. Those engaged in welding works shall be provided with welder's protective eyesight lids.

d. Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

e. When workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public.

f. The contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead or any toxic material in any form. Wherever men above the age of 18 are employed on the work of such painting, the following precautions should be taken:

i. No paint containing lead or lead products shall be used except in the form of paste or readymade paint. Paints like vinyl and epoxies having toxic fumes should be applied after following all precautions laid down by manufacturers.

ii. Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.

iii. Overalls shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.

13. When the work is done near any public place where there is risk of drowning all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompts rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

HOISTING MACHINES

14. Use of hoisting machines and tackle including their attachments anchorage and supports shall confirm to the following standards or conditions:

a. These shall be of good mechanical constructions sound material and adequate strength and free from patent defect and shall be kept in good repair and in good working condition.

b. Every rope used in hoisting or lowering materials of as means of suspension shall be of durable quality and adequate strength and free from patent defects.

c. Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years shall be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

d. In case of every hoisting machine and of every chain ring hook, shackle shovel and pulley block used in hoisting or as means of suspension the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose or testing.

e. In case of departmental machines, the safe working load shall be notified by the Engineer. As regards contractor's machines, the contractors shall notify the safe working load of the machine to the Engineer whenever he brings any machinery to site of work and get it verified by the Engineer concerned.

15. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with such means as will reduce to the minimum of the risk or any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energised, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary, should be provided. The workers should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

16. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use.

17. Adequate washing facilities should be provided at or near places of work.

18. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

19. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer, Engineers of the Department or their representatives.

20. The contractor is solely responsible for the safety and security of the workmen engaged by him or his subcontractors in this project.

21. Notwithstanding the above clause from (1) to (21), there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

****

APPENDIX – I

PROFORMA 'A'
(See Clause 22(h) of General Conditions)

CONTRACTOR'S LIABILITY AND INSURANCE SUMMARY

Name & Number of Insurance Policy with description	Value of Insurance	Validity Period	Loss or damage to work (covered under Policy) or any part thereof and all materials at site from any cause whatsoever
1.	2.	3.	4.
a) b) c)			

Damage, loss or injury to any property of the Employer's or Consultant's or his agent's and servant's	Claims under the Workman compensation Act 1923, the Minimum Wages Act 1948 & Contract labour (Regulation and Abolition) Act 1970	Remarks
5.	6.	7.
a) b) c)		

NB: Details of further policies taken if any and the loss or damage if any under that policy may please be indicated separately at appropriate places.

Signature of Contractor

Address:

Witness:

APPENDIX - II

PROFORMA 'B1'

MEASUREMENT SHEET

Running Bill No. _____
Name of the Work _____
Name of the Contractor _____

Sr. No.	Item	Qty. as per contract	Unit	No. / Length	Qty. of Present Bill

NOTE: Quantity of Present Bill shall be carried forward to Interim Bill.

PROFORMA 'B2'
INTERIM BILL

Interim Bill No. _____

Name of the Work _____

Name of the Contractor _____

S. No.	Item	Unit	Qty. as per Contract	Qty. upto previous bill	Qty. of present bill	Total Qty.	Unit Rate	Gross Amount

Total cumulative Gross Amount of Bill Rs. _____.

Gross Amt. of the present Bill = Gross Amt. of bill – Gross Amt. upto previous bill

APPENDIX - III

PROFORMA 'C'

REPORT OF VIRTUAL COMPLETION

(See Clause 36 of General Conditions)

Draft of letter to be written by the Contractor to the consultant in connection with the Virtual Completion Certificate as per Clause No. 29 of General Conditions of Contract.

Having executed the work in terms of the Contract, we hereby certify and affirm that we have virtually completed the contracted works.

We hereby certify that the work has been executed wholly to our satisfaction and with the materials and workmanship in accordance with the contract.

We do certify further that we have executed the work in accordance with the applicable laws and without any transgression of such laws.

APPENDIX - IV

BIDDER DETAILS (TO BE FILLED BY THE BIDDER)

Sl.No	Particulars	
1.	Name of firm / company /Individual	
2.	Address	
	Registered Office	
	Administrative Office	
3.	Telephone Nos. Including Mobile	
4.	Email address	
5.	Constitution of the firm / company /Individual (Please enclose relevant documents like copy of partnership deed, Memorandum/articles of association etc.)	
6.	Year of Establishment	
7.	Name of Partners/Associates	
8.	**Registration with Authorities**	
	PAN	
	GST	
	H T or LT Electrical License no and validity of the same (if any)	
9.	Has the bidder or any constituent partner in case of partnership firm / Company, ever been debarred/black listed for tendering in any organization at any time? If so, give details	
10.	Banker's Name	
11.	Field of Core Competence (Mention the fields on preference basis)	
12.	Any Pending or past litigation (within 3 years)? If yes, please explain with present status ending 31.03.2021	
13.	**LOCAL OFFICE AT CHENNAI Contact person name and complete postal address, contact number / email id**	

Note: Please enclose separate sheets, photographs, documents etc wherever required.

DECLARATION:

1. All the information furnished by me / us here is correct to the best of my/our knowledge and belief.
2. I / we have no objection if enquiries are made about the work listed by me / us in the accompanying sheets / annexures.

Place: **SIGNATURE OF AUTHORIZED PERSON**

NAME & DESIGNATION

Date :

APPENDIX V

PROFORMA OF APPLICATION FOR EXTENSION OF TIME PERIOD		
1	Name of the Contractor	
2	Name of the work as given in the Agreement	
3	Agreement No	
4	Estimated tender amount	
5	Date of Commencement of work as per Agreement	
6	Period allowed for completion of work as per Agreement	
7	Date of completion stipulated in Agreement	
8	Period for which extension of time has been given previously	
a	1st extension vide Engineer-Incharge/Bank letter	
	No Dated Month	Days
b	2nd Extension vide Engineer-Incharge/Bank letter	
	No Dated Month	Days
	3rd Extension vide Engineer-Incharge/Bank letter	
	No Dated Month	Days
	4th Extension vide Engineer-Incharge/Bank letter	
	No Dated Month	Days
	Total extension previously given	
9	Reasons for which extensions have been previously give (copies of the Previous applications should be attached)	
10	Period for which extension is applied for	
11	Hindrances on account of which extension is applied for with dates on which hindrances occurred and the period for which these are likely to last	
	a Serial No	
	b Nature of hindrance	
	c Date of Occurrence	
	d Period for which it is likely to last	
	e Period for which extension required	
	for this particular hindrance	
	f Overlapping period of any with reference	

PROFORMA OF APPLICATION FOR EXTENSION OF TIME PERIOD		
	to item (e) above	
	g Net extension applied for	
	h Remarks, if any	
12	Extension of time required for extra work	
13	Details of work and the amount involved	
	a Total value of extra work	
	b Proportionate period of extension of time on estimated amount put to tender	
14	Total Extension of time required for 11 & 12	
	Submitted to the Engineer-Incharge / Bank	
	Signature of Contractor	

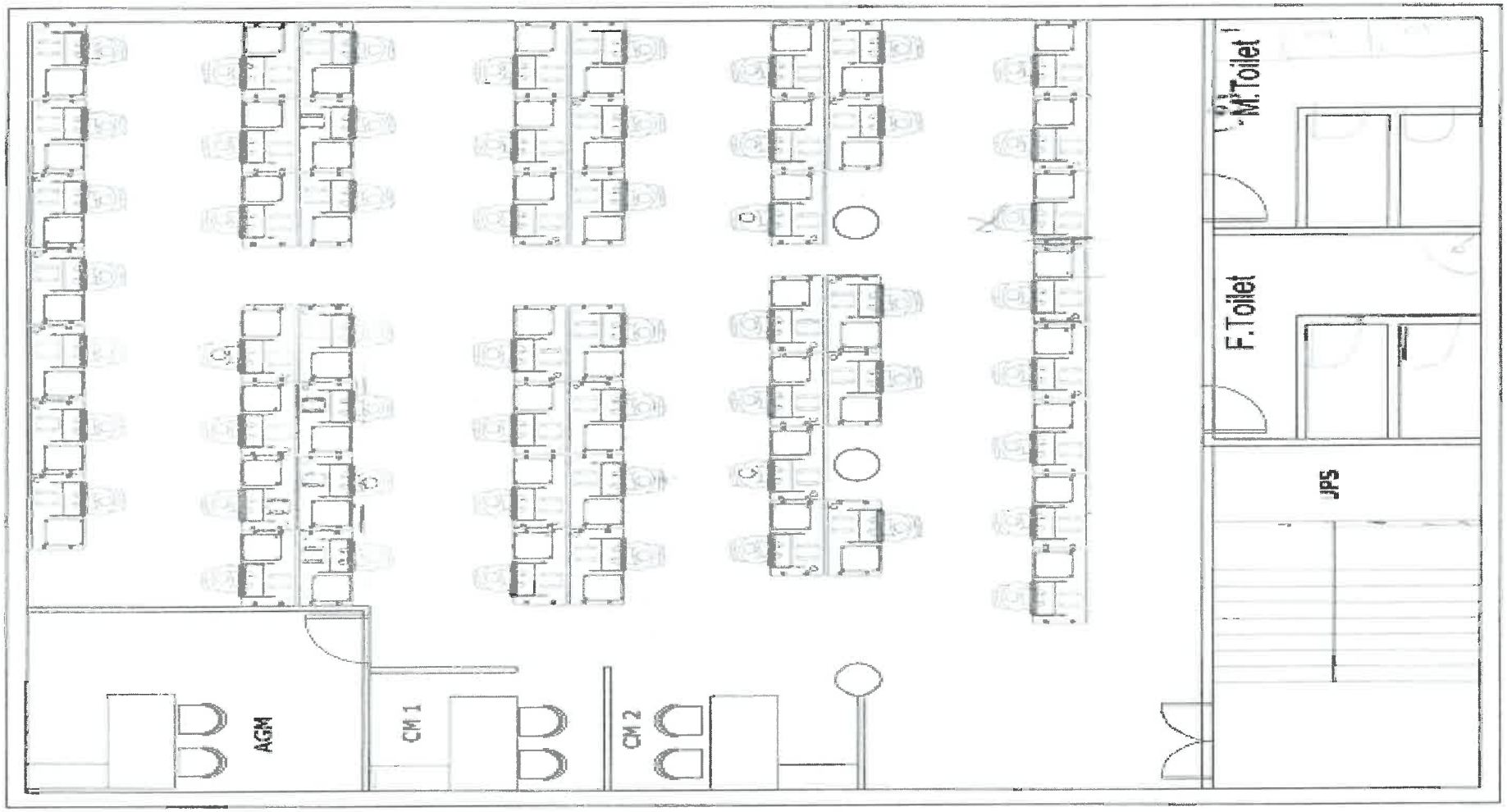
LIST OF PREFERRED MAKES FOR ELECTRICAL WORKS

Sl.No	Description	MAKES
1	Cable Glands single / Double compression with earthing	COMET / Dowell /Cosmos / Comet
2	LUGS & THIMBLES	Dowells / Jainsaon / Praca (double comp. type Glands) / Comet
3	1.1 kV LT Power & Control Cables	Finolex / Polycab / KEI
4	Insulating Mats	ISI Marked (As recommended by Engineer-Incharge)
5	Pre Fabricated Cable Tray	OBO Bettermann / Slotco or equivalent
6	Protection & Other Relays	AREVA/L&T / SIEMENS
7	Earthing pipes	Jindal / Tata / Sail
8	Air Circuit Breaker	L&T(Upower) / Siemens(Sentron) / C&S (equivalent of U Power)
9	Moulded Case Circuit Breakers	L&T(D-Sign) / Siemens (sentron) / Legrend / C&S
10	Fuse Disconnector Switch / Switch Fuse Units / HRC Fuses	L&T / Siemens / GE Power
11	Ammeter, Voltmeter, KWH,PF, Frequency meter / Digital Meters, Multifunction Meter	L&T / AE / Conserve
12	Selector Switch, Push Button / Indication lamps	Kay CEE/L&T/GE Power Control
13	LED Indication Lamps	AE/EASUN/Kay cee
14	Ct'S	AE/ Kappa/ Kaycee / L&T/ kaycee / Universal / MECO /Gilbert & Maxwell
15	Starters / Contactors / Timers	L&T / GE Power / Siemens
16	MCB	Legrand / Schneider / L&T / C&S
17	PLC	ABB / ROCKWELL
18	UPS	Emerson/APC/NUMERIC/EATON
19	Ant vibration mounts	Dunlop-S Class
20	Battery	Exide/ HBL / Luminous
21	Electrical Light Fittings	Philips / HPL /Bajaj/GE / Wipro
22	Fans-Ceiling / Wall mount	Orient / Crompton Greaves/ Usha / Polar (Model to be appd. By the Engineer-Incharge)

Sl.No	Description	MAKES
23	Exhaust Fan	Almonard/ Crompton
24	Geysers	Racold/Jaguar-aero smith/Venus / Bajaj
25	Prefabricated Panels	L&T, Hager, Legrand
26	Cable Management System	MK/Legrand / Schenieder
27	CAT Cable / Wires& Fiber Optic Cable	Amp/D-Link / Molex/ Krone /Sisco
28	Telephone cables	Polycab / KEI / Finolex
29	Speaker wires	Polycab / KEI / Finolex
30	ACDB	Local fabrication approved by Engineer-In-charge
31	Energy Meter	L&T / HPL / Secure / Schneider
32	Surge Protection	OBO Betterman/ Legrand / ABB
33	Switches & Sockets	Honeywell/MK - Blenze Plus or Legrand - Myrius
34	GI Sheets	TATA / JIDAL/ SAIL
35	Insulation acoustic	ARMAFLEX/BIRSAL/SUPREME
36	C-PVC/U-PVC Pipes	Astral /supreme / Avonplast / MODI
37	Controllers, controls & Sensors	Honeywell / Schneider/ Siemens
38	MS Structure/Beam/Gurdar/Channel	SAIL/TATA/JINDAL/ESSAR
39	FIRE Sealant	Promat, Hilti, Brila-3M
40	MS Conduit(ISI marked)	AKG(ISI marked), BEC(ISI marked), Gupta
41	Heavy Duty Accessories for MS Conduit	Sharma Sales Corporation / super Sales Corporation
42	Selector Switch, Toggle Switch	Salzer(L&T), Kaycee / Siemens
43	LT Jointing kit/Termination	Raychem / Safe kit/ Mahindra M- Seal / Denson
44	Main & Change over switch	L & T/ HPL / SIEMENS
45	Pre Fabricated Distribution Boards	MDS Legrand/ L & T / Hager
46	Metal clad sockets	MDS Legrand/ L & T / Hager
47	LAN switches/ jacks	D-Link / MK

DRAWINGS

LAYOUT FOR TENDER PURPOSE ONLY



No. of Workstation : 55
No. of CMs Cubicle : 02
No. of AGM Room : 01
Total : 59

Proposed Floor plan for DAMC
1st Floor, Chetput, Chennai

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INDIAN BANK,
CORPORATE OFFICE, ESTATE DEPARTMENT
No. 254 - 260, Avvai Shanmugam Salai,
Royapettah, Chennai - 600 014.
Ph: 044-28134401/4308
Email: hoestate@indianbank.co.in

PRICE BID
(PART – 2)

Tender document for Electrical works for Proposed for DAMC, Indian Bank Building, 1st floor, Chetpet, Chennai-600010

ISSUED TO

M/s._____

इंडियन बैंक / INDIAN BANK
कॉ.का. / C.O.
परिसर, व्यय एवं संपदा विभाग
Premises, Expenditure & Estate Dept.
रायपेट्टा, चेन्नै / Royapettah, Chennai-14.

This document contains 13 pages

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S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
A	**MV PANEL with UG CABLES**							
1	Supply and fixing of 160A TPN 25KA MCCB With extended rotary handle and spreader terminals housed in existing enclosure in EB metering panel(L&T d sine) The cost including 4runs 16sqmm copper wire with sockets crimping meter to MCCB.	Nos	1					
2	**MV PANEL:** Supply, Testing at factory, loading, unloading Erection and Commissioning of cubical Type indoor, fully compartmentalized wall mounting Main Power Panel made of 16 SWG MS sheet steel provided with Copper Busbars of 160A capacity mounted on SMC busbars supports including interconnections, & Double Earthing. The board shall be powder coated with Siemens gray paint. The panel length, height, depth etc to match with site condition and all accessories as required as per the site condition INCOMER: **1no.160A 4 pole 25KA MCCB** OUTGOINGS: **2 nos. 100A 25KA MCCB. (AC DB & UPS input DB)** With extended rotary handle and spreader terminals. **3 nos. 63A 25KA MCCB. (LDB, RAW power DB & 1no Spare)** With extended rotary handle and spreader terminals. RYB Indicating lamps Control MCBs BUS BAR 4 Runs of 25mm x 6mm Copper Bus Bar Earthing 25mm x 3mm Copper Bar INTER CONNECTION: 100A MCCB to bus bar 20mm x 6mm Copper flat 4runs 63A MCCB to bus bar20mm x 3mm Copper flat 4runs 160 A MCCB to bus bar 25mm x 6mm Copper flat 4runs	Nos	1					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
3	Supply and laying of 3.5core 70Sq mm XLPE armored Aluminium conductor cable 1.1 KV grade laid in wall/ ceiling /Duct with suitable clamping From Ground floor EB room to 1st floor MV panel.	Mts	25					
B	**AC SYSTEM - DISTRIBUTION BOARD & WIRING FOR Cassette AC SYSTEM**							
4	**DISTRIBUTION BOARD FOR AC SYSTEM:** Supply and installation, testing and commissioning of factory fabricated 4 way vertical D.B with 100 A, 4 pole, 10ka MCB as incomer and Outgoing of 25A/20 A, single pole MCB 12 nos. The work shall also include for cutting chase wall and finally finishing the surface & matching the same with the existing surface.	Nos	1					
5	Supply and laying of 3.5core 35 Sq mm XLPE armored Aluminium conductor cable 1.1 KV grade laid in wall/ ceiling /Duct with suitable clamping From MV panel to AC DB	Mts	30					
6	Supplying, laying, connecting& commissioning 2 runs of 4.0sq.mm. **PVC insulated FRLS Wire in recessed PVC conduit**, (one each for phase and neutral) with 1 run of 2.5 sq.mm. **PVC insulated FRLS wire in recessed PVC conduit**, wires for continuous earthing in PVC conduits concealed in ceiling / wall / floor conduits with necessary clamps, screw, etc for VDB to AC Indoor or outdoor	Mts	300.00					
7	Supply and fixing of modular type 25amps Socket controlled by 25amps single pole Mini MCB housed in metal/ PVC box with require all accessories.	Nos	10					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
C	**UPS DISTRIBUTION BOARD & WIRING**							
8	**INPUT DB** Supply and installation, testing and commissioning of factory fabricated 4 way vertical double door D.B with following 100 A, 4 pole, MCB as incomer. 63A 3 pole MCBs -2nos 40A 3 pole MCBs -2nos as outgoing .	Nos	1					
9	Supply and laying of 4core 35Sq mm XLPE armored Aluminium conductor cable 1.1 KV grade laid in wall/ ceiling with suitable clamping (For UPS DB incoming)	Mts	30					
10	Supply and laying of 4runs 16sq mm and 2runs 4sqmm copper wire in PVC conduit with all accessories for UPS input and output Drop wires and UPS room to UPS Sub DB input	Mts	40					
11	**OUTPUT DB** Supply and installation, testing and commissioning of factory fabricated 8 way vertical double door D.B with following 63 A, 4 pole, MCB as incomer. 16A SINGLE pole MCBs -15nos 10A Single pole MCBs -9nos as outgoing .	Nos	1					
12	Distribution board: Supply and Installation of 8 way SPND.B (IP43) comprising of	Nos	1					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
	63amps 4pole MCB type change over switch - 01No, Cost includes cutting, plastering and concealed in the wall							
13	Supplying, laying, connecting& commissioning 2 runs of 2.5sq.mm. PVC insulated FRLS Wire in recessed PVC conduit, (one each for phrase and neutral) with 1 run of 1.5 sq.mm. PVC insulated FRLS Wire in recessed PVC conduit,for continuous earthing in PVC conduits concealed in ceiling / wall / floor conduits with necessary clamps, screw, etc for UPS sockets	Mts	600					
	UPS SOCKETS							
14	supply, fixing and connecting of 3nos 6A socket controlled by 2nos 6A switch housed in a 8 module PVC/Metal base box covered with suitable module base and cover plate . for UPS sockets. The cost Include concealed in Partition / wall with necessary accessories	Nos	65					
D	**RAW POWER :**							
15	**Distribution boar**d: Supply and Installation of 6 way TPNDB (IP43) compressing of Incomer 63A 4P MCB - 01No,With 63A 4P30ma RCCB - 01No Out Going –. 16/10A SP MCB 18 Nos for RAW power DB Cost includes cutting, plastering and concealed in the wall	Nos	1					
16	Supplying, laying, connecting& commissioning 2 runs of 2.5sq.mm. PVC insulated FRLS Wire in recessed PVC conduit, (one each for phrase and neutral) with 1 run of 1.5 sq.mm. PVC insulated FRLS Wire in recessed PVC conduit, for continuous earthing in PVC conduits concealed in ceiling / wall / floor conduits with necessary clamps, screw, etc for RAW sockets	Mts	400					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
17	**SOCKETS**							
a	supply, fixing and connecting of 1no 16A socket controlled by 1no 16A switch housed in a 4 module PVC/Metal base box covered with suitable module base and cover plate . for RAW sockets. The cost Include concealed in Partition / wall with necessary accessories	Nos	6					
b	supply, fixing and connecting of 2nos 6A socket controlled by 2nos 6A switch housed in a 6 module PVC/Metal base box covered with suitable module base and cover plate . for UPS sockets. The cost Include concealed in Partition / wall with necessary accessories	Nos	65					
c	supply, fixing and connecting of 1no 6A socket controlled by 1no 6A switch housed in a 3 module PVC/Metal base box covered with suitable module base and cover plate . for UPS sockets. The cost Include concealed in Partition / wall with necessary accessories	Nos	15					
E	**LIGHTING**							
18	Distribution board Supply and Installation of 6 way TPND.B (IP43) comprising of **Incomer** 63A 4P MCB - 01No, With 63A 4P30ma RCCB - 01No **Out Going –** b. 16/10A SP MCB 18 Nos for LIGHTING DB Cost includes cutting, plastering and concealed in the wall	Nos	1					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
19	Supply and laying of 4core 25 Sq mm XLPE armored Aluminium conductor cable 1.1 KV grade laid in wall / false ceiling with suitable clamps for LDB & RAW power DB incomings	Mts	40					
20	Wiring for light point/fan point/exhaust fan point/call bell point with two runs1.5 sqmm PVC insulated FRLS wire in recessed PVC conduit, with modular type premium switch, suitable size G.I box and earthing the point with 1.5 sqmm PVC insulated FRLS)copper conductor single core cable,ceiling hose with all required nuts,screws and all accessories accessories							
A	One Light Controlled By One Switch	Nos	40					
B	Two Light Controlled By One Switch	Nos	20					
C	Three Light Controlled By One Switch	Nos	5					
D	Four Light Controlled By One Switch	Nos	5					
G	Exhaust fan point	Nos	3					
H	6A socket with Switch (Board Socket)	Nos	10					
I	Wall mount fan points near 6A Socket near Fan	Nos	15					
21	Supplying, laying, connecting& commissioning 2 runs of 1.5sq.mm. PVC insulated FRLS wire in recessed PVC conduit,(one each for phase and neutral) with 1 run of 1.5 sq.mm. PVC insulated FRLS wire in recessed PVC conduit,for continuous earthing in PVC conduits concealed in ceiling / wall / floor conduits with necessary clamps, screw, etc for Emergency LIGHTING switch board circuits (UPS LIGHTS)	Mts	200					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
22	Supplying, laying, connecting& commissioning 2 runs of 2.5sq.mm. PVC insulated FRLS wire in recessed PVCconduit,(one each for phase and neutral) with 1 run of 1.5 sq.mm. PVC insulated FRLS wire in recessed PVC conduit,for continuous earthing in PVC conduits concealed in ceiling / wall / floor conduits with necessary clamps, screw, etc for LIGHTING switch board circuits	Mts	300					
F	**LTUG cable Terminations**							
23	Supply and termination of the above cables with single compression type cable glands aluminium sockets for aluminium conductor /copper sockets for copper conductor ,insulation tape , anti corrosive paste etc.							
a	3.5core x70 sq mm	Nos	2					
b	3.5core x35 sq mm	Nos	4					
c	4 core x 25 sq mm	Nos	4					
G	**EARTH ELECTRODE**							
24	Providing earth electrode as per IS-3043 with 2mts long 40mm dia GI pipe with Funnel on Top with holes drilled for tapping connection. The rate including making 300mm diameter pit using Auger method after Excavation pit filled up to surface with alternate layer of salt/charcoal mixture. A brick work masonry shall be constructed of size 450x450x300mm with CI (simco make) cover (General Earthing). NOTE: The job includes submitting test report of resistance of the new earth pit.	Nos	1					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
25	Providing earth electrode all as per IS-3043 with 600x600x3mm copper plate fitted with 2nos 25mmx3mm copper flat and riveted to the plate.A link should be provided at the top with holes drilled for tapping for connections using brass bolt nut washer etc Rate should include 2mts long 40mm dia GI pipe Heavy with Funnel on Top with holes drilled for tapping connection. The rate including Excavation pit and filled up to surface with alternate layer of salt/charcoal mixture. A brick work masonry shall be constructed of size 450x450x300mm with CI cover (SIMCO make) (UPS Earthing) NOTE: The job includes submitting test report of resistance of the new earth pit. **NOTE:** The job includes submitting test report of resistance of the new earth bit.	Nos	1					
26	Supply and laying of 10sq mm copper wire in 20mm PVC conduit with all accessories from earth pit to UPS room Earth link.	Mts	100					
27	Supply and laying of 8SWG copper wire from G.floor to 1st floor MV panel	Mts	50					
28	Supply and laying of 10SWG copper wire for body earth LDB &UPS input, RAW power DB	Mts	200					
H	**LIGHT FITTINGS**							
29	Supply andInstallation of 2X2 LED (30 watts - 36 watts), Lumens ≥ 3600 Lumens, 6500K, Full Glow to be fixed in the false ceiling with guide wires,screws and all necessary accessories etc.	Nos	40					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
30	Supply and Installation of LED Round /Down Lighter , Lighting Fixture 15W or Lesser , 6500k, Lumens ≥ 1500Lumen (Recess mounted) with all necessary accessories required for the job	Nos	40					
31	Fixing of PHILIPS LED fitting6500k, 20/10/5W with necessary accessories required for the job.	Nos	15					
32	Supply and fixing of 300mm Exhaust fan	Nos	3					
33	Supply and Fixing of Hi Speed 1200 mm Sweep Celing Fan with down rod , Fan Hook (Anchor Fastner Type) and required accessories etc. (Crompton)	Nos	1					
34	Supply and fixing of wall mounted fans of approved make to be fixed in wall or partition with all necessary fixing accessories, arrangements and etc. Cost include all hardwares, screws, clamps and etc. Fan make & model to be approved by bank engineer/architect. (Make of wall mounted fan- Crompton Creaves.)	Nos	15					
J	**Telephone & Data conduit**							
35	Supply and installation of 25mm PVC conduit to be laid on floor, wall, partition from main HUB to workstations (Cost includes cutting, plastering and concealed in the wall)	Mts	400					
36	Supply and installation of 20mm PVC conduit to be laid on floor, wall, partition from main Krone to workstations/tables (Cost includes cutting, plastering and concealed in the wall and all accessories)	Mts	200					

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)
37	Supply and installation of 32mm PVC conduit to be laid on floor, wall, partition. (Cost includes cutting, plastering and concealed in the wall)	Mts	50					
K	**Floor Junction Boxs:**							
39	Supply, erection, testing & commissioning of floor junction boxes with top cover fabricated out of hot dip Galvanised Sheet for bottom with four sides entry of Pipes and Top cover made of Stainlesssteel plate of 14 SWG paper coated mirror finish for junction boxes.							
a	150 x 150 x 50 mm x2 mm thick	Nos	10					
b	300 x 300 x 50 mmx2 mm thick	Nos	10					
L	**MISCELLENOUS**							
40	EB approval charges for Enhancement of sanction Load in existing meter (statutory payment for EB will be reimbursed / paid against production of original receipts)	nos	1					
41	Supply of Electrical insulating Safety mat 2mts x1mts x 2mm at front of the LT panels	nos	2					
				Total Supply		**Total Installation**		
	SUBTOTAL (A)							
	GST (B)							
	GRAND TOTAL (C) = (A)+(B)							

S.No	Description of work	Unit	Quantity	Supply		Installation		Total Amoun
				Rate (in Rs)	Amount (in Rs)	Rate (in Rs)	Amount (in Rs)	(in Rs)

Total Amount in words inclusive of GST

(Rupees.....

..... Only)

Date:

Authorized Signature with Seal