UNION BANK OF INDIA
REGIONAL OFFICE
MAHABUBNAGAR
TELANGANA

TENDER SCHEDULE FOR ELECTRICAL WORKS
CONFERENCE ROOM
REGIONAL OFFICE - MAHABUBNAGAR

FOR BANK'S EMPANELLED CONTRACTOR
UNDER TELANGANA REGION
ONLY NEED TO APPLY

CONSULTANTS:

AKRITI ARCHITECTURE
Architecture, Interior Design, HVAC, LAN, ME&P
BHARANI COLONY, SAINIKPURI,
SECUNDERABAD -500094
PH: 040-40168004
E-mail : akritihyd@gmail.com

Last date for submission of Sealed Tenders: Before 3.00 PM on 29/ 07 /2022
Opening of Sealed Tenders: at 3.30 PM on 29/ 07 /2022

Issued to: ----------

NOTICE INVITING TENDER (NIT)

Sealed Tenders on item rate basis are invited from eligible contractors having sound, technical and financial capacity to do **ELECTRICAL, LAN, AUDIO VIDEO SOLUTIONS, AIR CONDITIONING WORKS** for **UNION BANK OF INDIA – CONFERENCE ROOM AT REGIONAL OFFICE MAHABUBNAGAR.**

1	Name of the work	**ELECTRICAL, LAN, AUDIO VIDEO SOLUTIONS, AIR CONDITIONING WORKS** for **UNION BANK OF INDIA – CONFERENCE ROOM AT REGIONAL OFFICE MAHABUBNAGAR.**
2	Cost of application/tender document.	Rs 500/- (non refundable) by DD/CASH.
3	Date and Time where tender forms are available.	From **22/07/2022** To **29/07/2022** up to 3 P.M at the following address: The Regional Head,UNION BANK OF INDIA, Regional Office, Mahabubnagar. D.NO.8-3-40, GL TOWERS, VENKATESHWARA COLONY, NEAR BUS STOP, METTUGADDA, MAHABUBNAGAR, TELANGANA-509001. PH.NO.08542 – 270355/272525
4	Time and last date of submission of Tender	**Up to 3.00PM on 29/ 07/2022**
5	Place, Address for submission of tender.	The Regional Head, UNION BANK OF INDIA, Regional Office, Mahabubnagar. D.NO.8-3-40, GL TOWERS, VENKATESHWARA COLONY, NEAR BUS STOP, METTUGADDA, MAHABUBNAGAR, TELANGANA-509001.
6	Date, Time and Place of opening of tenders	**On 29 / 07 /2022 at 3:30 PM;** Place & contact person: The Dy General Manager THE UNION BANK OF INDIA, Regional Office, Mahabubnagar.
7	Quantum of Earnest Money Deposit (EMD) .	Earnest Money Deposit amounting to **Rs.8900/-(Rupees Eight Thousand Nine Hundred Only)** in the form of Demand Draft/ Pay Order Drawn in favour of **UNION BANK OF INDIA,** REGIONAL OFFICE, MAHABUBNAGAR, payable at Mahabubnagar.

8	Initial Security Deposit	**2 % of the contract value including EMD.**
9	Retention money to be deducted from the bills.	**8% against each bill subject to maximum of 10 % of contract value including ISD/EMD.**
10	Terms of payment of Bills, if any (specify the minimum value of work for payment of running account bills)	SINGLE BILL UP TO Rs 5.00 LAKHS.
11	Liquidated Damages (Penalty clause)	In case of delay a penalty @ the rate of 1% of the value of the work per week subject to a maximum of 10% (as per the value of work) would be strictly imposed.
12	Stipulated time for completion of the work/supply.	**25 DAYS.**
13	Estimated value of tender/project	8,88,000/- (excluding GST)
14	Validity period of the tender.	Four (4) Months.
15	Taxes	Rates quoted should include all Taxes, Octroi, other charges like Transportation, lifting etc. However TDS will be deducted at source as applicable.
16	GST	Tenderer shall quote rates exclusive of GST. Bank shall pay GST as applicable to the Contractor along with their bills.
17	Electronic Payment	Details such as name, name of the bank, name of the branch, account number, IFSC code no. etc to be furnished to make Electronic payments.
18	Defects Liability Period	12 months
19	Tender forms can be downloaded from our Union Bank of India Website.	http://www.unionbankofindia.co.in - Tenders - View Tender http://eprocure.gov.in

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 reason whatsoever.

Tenders submitted without EMD and without application fee will be rejected. In case bidders are registered with NSIC or MSME certificate, they are eligible for waiver of Tender Fee and EMD. However, they need to provide valid NSIC or MSME certificate clearly mentioning that they are registered with NSIC/MSME under single point registration scheme.

THE TENDERS SHOULD BE IN A SEALED COVER WITH THE NAME OF THE WORK AND THE BRANCH CLEARLY WRITTEN ON THE SEALED COVERS.

REGIONAL HEAD
(REGIONAL OFFICE – MAHABUBNAGAR)

Terms And Conditions:

1. The work has to be carried out/ executed in day and night without causing any inconvenience.

2. The contractors should quote in figures as well as in the words the rates, and amount tenders by them. The amount for each item should be worked out and the requisite totals given. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates, figures and words. However, if a discrepancy is found the rates, which correspond with the amount worked out by the contractor shall be taken as correct. If the contractor does not work out the amount of an item or it does not correspondent with the rate written either in figure or in words then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally but the amount is not worked out correctly the rates quoted by the contractor will be taken as correct and not the amount.

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

4. The acceptance of a tender will rest with the Competent Authority, who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all of the tenders received, without assigning any reasons. All tenders in which any of the prescribed conditions are not fulfilled, or are incomplete in any respect are liable to be rejected.

5. All compensation or other sums of money payable by the Contractor to Clients under the terms of this contract may be deducted from the security deposit, or from any sum that may be or may become due to the Contractor on any account whatsoever and in the event of the Security Deposit being reduced by reasons of any such deductions, the Contractor shall within 10 days of being asked to do make good by cheque any sum which have been deducted from his security deposit.

6. Tender containing any condition leading to unknown/indefinite liability, are liable to be summarily rejected. If at all any rebate(s) is/are to be offered the tenderer shall first quote his rates strictly on the terms and conditions stipulated in tender document and then show separately rebate(s) offered specifying the conditions for such rebate(s). Failure to follow this procedure will render the tender liable to summarily rejection.

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

8. The tenderer should quote their (own) rates for undertaking the work.

9. Tenderers must include in their tender prices quoted for all duties, royalties, cost, sales tax, work contract tax, service tax, Labour Cess or any levies, taxes etc. GST will be paid extra as applicable.

10. Income Tax plus surcharge as applicable as per Government Rules, will be deducted.

11. Retention amount equivalent to 8% of the gross value of work done, subject to a ceiling as detailed in below, will be deducted from each running account bill and will be returned to the contractor, without any accrued interest, after one year from the date of virtual completion of the work.

12. The total security deposit on the contact, including Earnest Money Deposit, will be calculated as 10% on the value of the Contract.

13. 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 date mentioned in the award letter.

14. The work so completed will be under a Defect Liability Period of 12 months from the date of virtual completion.

15. Time is the essence of the contract. The work should be completed in **30 Days (Thirty Days)** from the date of the work order issued to the contractor, failing which, penalty will be strictly imposed.

16. Tenders for works shall remain open for acceptance for a period of 120 days from the date of opening of tenders. If the tenderer withdraws his tender before the expiry of the said period or makes any modifications in terms and condition of the tender which are not acceptable to the Bank, then the bank without prejudice to any other right or remedy is at liberty to forfeit the earnest money.

17. 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 in the bank.

18. The tenderer, apart from being a competent contractor must co-ordinate himself with the all agencies appointed by the bank.

19. The tenderer should visit the site to ascertain the working conditions and local authority regulations/restrictions if any and other information required for the proper execution of the work.

20. The quantities of various items given in the schedule of quantities are approximate. The quantities of work may vary at time of allotment / execution of work. Bank reserves the right to omit / delete any item(s) of work from the schedule at the time of allotment / before. Contractor will be paid for the actual work done at the site duly verified by the the Architect.

21. In case of extra items, a record of labour charges paid shall be maintained and shall be presented regularly to the Employer's for checking. The settlement will be made based on figures arrived at jointly and taking unit price given in the contract assigned to the successful Tenderer. In case of extra items where similar or comparable items are quoted in the tender, extra rates shall be based on tender rates.

22. The work has to be started **Immediately** from the date of receipt of work order. In case of work not being started within this stipulated period, the bank reserves the right to cancel the work order duly forfeiting the Earnest deposit.

23. No employee of the Bank is allowed to work as a contractor for a period of 2 years of his/her retirement from Bank Services without previous permission of the Bank. This contract is liable to be cancelled, if either the contractor or any of his employees is any time to be such a person who had not obtained the permission of Bank as aforesaid before submission of the tender or engagement in the contractor's service.

24. No advance will be granted for the works proposed.

25. The unit price shall be deemed to be fixed price.

26. Sealed tenders are to be addressed and sent to:

The Regional Head,
UNION BANK OF INDIA, Regional Office, Mahabubnagar.
D.NO.8-3-40, GL TOWERS, VENKATESHWARA COLONY, NEAR BUS STOP,
METTUGADDA, MAHABUBNAGAR, TELANGANA-509001.
PH.NO.08542 – 270355/272525

Signed and delivered for and on behalf of The Contractor _____by

Shri_____his Duly authorized official.

ADDITIONAL CONDITIONS OF CONTRACT

Tender shall sign wherever provided for. The tenders not so signed shall be rejected. The tenders shall be submitted in on or before the due date.

No tenders shall be accepted unless the full amount of the earnest money deposit is paid at the time of submission of the tender. No exemption will be entertained.

Fluctuations in the prices of any materials or equipment or labour etc., shall not be taken into account either for compensation for damages for extras.

Watch and ward in respect of all plants, machinery and materials at site for use in works shall be the contractor's sole responsibility.

The contractor shall have to make his own arrangements to house his labour and staff and for their services.

All instructions regarding the execution of works shall be received from the Architects/Bank only. Any other instructions issued directly to the contractor by anyone else shall not be binding on the employer.

During execution of works the contractor must check his work with the drawings. The contractor shall be responsible for all the errors in this connection and will have to rectify all defects at his own cost, failing which the employer reserves all right to get the same rectified at the risk and cost of the contractor.

The contractor entrusted with the work shall in indemnify the Bank and the Architects against theft, mishaps in construction and injury to workmen, damage to persons, property etc., He shall make well the damage at his own expense.

The Bank through the Architects shall have the power to omit or cancel any item of work without assigning any reason whatsoever and no claim for compensation for damage will be entertained for such omissions and cancellations.

The contractor shall maintain satisfactory progress of work as well as maintain a desired workmanship. If in the opinion of the Architects the progress is unsatisfactory and/or the workmanship is unsatisfactory, the architects shall advise the bank to take possession of the work with 7 days notice to that effect.

The Employer shall then complete the entire work and rectify all the defects at the contractor's cost and consequences.

In case the Bank/Architects are not satisfied with the quality of materials used by the contractor they reserve the right to direct the contractor to procure such supplies from agencies they deem fit.

The contractor shall submit the bills for payment along with the detail statement showing the actual works carried out under different circles of items.

The contractor shall clear of works as per instruction of the Bank/Architects. The site of works shall be cleared of all men, materials, etc., belonging to the contractor. The site shall be delivered in a broom clean and neat condition immediately after the job is completed. In case of failure by

the contractor, the employer shall have the right to get the site cleared at the risk and cost of the contractor.

The contractor shall not without the written consent of the Bank/Architects assign the agreement or sublet any portion of words.

The quoted rates shall be all inclusive and cover the cost of all materials, freight, all types of taxes, duties, royalties, erection, construction, overhead, profit and any other expenditure incurred for completion of work as per drawings and specifications.

Wherever required, the Bank/Architect shall instruct erecting items sample, or mock-up as the case may be, and upon approval of the same, the items shall be fabricated and completed by the contractor(with or without modifications as the Bank/Architects shall instruct).

The final bill from the contractor shall not be entertained under any circumstances without full completion of all the items of works. Any work found defective wrongly carried out, and instructed by the Bank/Architect to be rectified or replaced shall be rectified or replaced prior to submission of final bill. It is to be expressly noted that no final bill will be held valid in the event of non-rectification of the defective or wrongly carried out items and the completion date shall not on this account be extended. Defects liability period will be effective from the day of satisfactory completion of all the items of works, as may be certified by the Architect.

In the event of the work being executed on holidays/beyond the Bank normal office working hours which might be required for the completion of the work within the stipulated time, the utmost care to be taken for not to disturb to normal working of Branch prior permission shall be obtained in the event of any night work is to be carried out.

While executing the work, considerable amount of shifting and re-shifting of several furniture items are likely to be involved. It is also likely that some of the items might be required to temporarily shift elsewhere in the premises on any other floors. Theses shall be done by the Contractor, and no payment against these works shall be separately paid for by the Bank. As the work is to be carried out and completed in the working Bank, the contractor shall be responsible for maintaining the premises in clean condition every morning for the normal functioning of the Bank.

The contractor shall acquaint himself with the site conditions, local traffic regulations, local authority regulations availability of materials, labour, tax, structure, etc., and quote rates accordingly. No extra charges/increases in rates shall be allowed on any of these or any other accounts.

The contractor shall have a component supervisor on the site at all the times. The contractor and/or his authorized representatives will attend all the meetings, whenever called for and the decisions taken in meeting will be binding on the contractor.

The contractor shall extend all necessary help to the agencies help to the agencies of associated works like Interior, A.C, Electrical works, Intercom works, Computer wiring works, fire detection works and works to be carried out by landlords agencies in such a manner that they can carry out their works smoothly and whole finished work must appear absolutely integrated. Nothing extra shall be paid on this account whatsoever. Figured dimensions are in all cases to be followed and in no case should they be scaled. Large scale details take precedence over small-scale drawings. In case of any ambiguity, conflict of interpretation shall prevail; the Bank/Architects decisions in this regard shall be final and binding.

The contractor shall be given a single electrical connection at the work site. Electrical charges for consumption by the contractors will be charged separately by the Bank.

The contractor shall be bound to carry out any extra items of work, whenever possible the rate for extra item shall be derived from the rate already quoted, otherwise the rate shall be worked out at cost of material + labour + 15% overhead wastage and profit.

The contractor shall submit his running bills for payment concerning work executed or materials delivered on the site, or work executed at his workshop which will be certified by the Architect for payment within 10 days from the date of submission of bill.

The architect will not certify any application for payment if there are:

a. Defective items of work still uncorrected.
b. Any claims or liens filed against the contractor for failure to pay for materials, labour or sub-contractors amount due; or reasonable evidence that includes probable filing of such claims
c. Damage to another contractor.
d. A reasonable doubt that the contractor can be completed for the balance then unpaid.

When the works are completed in all respects, the Contractor shall intimate in writing to the Architects and bank to enable to take possession of the same. The works shall not be considered virtually complete until the Bank/Architect have jointly inspected the works and certified in writing that this has been completed.

Contractor’s Seal and Signature.

GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual items in the schedule of quantities in the specifications, conditions laid down hereinafter and in the Drawings, the work shall be carried out as per standard specifications and under the direction of Bank/Architects.

INTERPRETATION:

In constructing these conditions, the specifications, the schedule of quantities, tender and Agreement, the following words shall have the meaning herein assigned to them except where the subject or context otherwise requires:

a. **Employer:** The term employer shall denote **UNION BANK OF INDIA, Its Regional Office Mahabubnagar, TS** and any of its employees representatives authorized on their behalf.

b. **Architects:** The term Architects shall mean **M/s** AKRITI ARCHITECTURE, HYDERABAD **Or** in the event of his/her ceasing to be the Architects for the purpose of this contract such other persons/as the Employer shall nominate for the purpose.

c. **Contractor:** The term contractor shall mean ……. (Name and address of the contractor) and his/hers legal representatives, assign and successors.

Site: The site shall mean the site where the works are to be executed. The site is in **UNION BANK OF INDIA, CONFERENCE ROOM 2ND FLOOR – REGIONAL OFFICE – MAHABUBNAGAR.**

d. **Site Engineer:** The site engineer shall be appointed by the Bank/Architect. The bank 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 change of his post before the contractor reports on site of work. Where more than one site engineer appointed, one of them shall be designated as senior engineer by the Premises Department and the other Site Engineer shall be reporting to the Senior Engineer.

e. 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 instructions, 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/Architects shall be given access to such drawing and/or dimensional sketches therefore and have it confirmed by the Employer/Architects prior to taking up such work. The contractor shall ask in writing for all clarifications on matter occurring anywhere in drawings, specifications and schedule of quantities or to additional instructions at least 3 days ahead from the time when it is requires for implementation so that the Employer may be able to give decision thereon.

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

g. "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 statues.

h. "The schedule of Quantities" shall mean the schedule of quantities as specified and forming part of this contract.

i. "Priced Schedule of Quantities" shall mean the schedule of quantities duly price with the accepted quoted rates of the contractors.

2. SCOPE:

The work consists of construction of Employer's Interior/Civil and Electrical works in accordance with the "drawings" and "Schedule of Quantities" It includes furnishing all materials, labour, tools and equipment and management necessary for and incidental to the completion of the work. 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/Architects and to furnish and install such detail with Employer's/Architects concurrence, so that upon completion of the proposed work the same will be acceptable and ready for use.

Employer/Architects may in their absolute discretion issue further drawings and/or written instructions, details, directions and explanations, which are hereafter collectively referred to as "The Employer's/Architect's 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 the 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/s.
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 of any defects under clauses hereinafter mentioned and those arising during the maintenance period (retention period).

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

Regarding all factory made products for which ISI marked products are variable, only products bearing ISI marking shall be used in the work.

3. TENDERER SHALL VISIT THE SITE:

Intending tendered shall visit the site and make himself 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. The tenderer shall provide in their tender cost of carriage, freight and other charges as also for any special difficulties and including police restriction for transport etc., for proper execution of work as indicated in the drawing. The successful tenderer will not be entitled to any claim of compensation for difficulties faced or losses incurred an account of any site condition which existed before the commencement of the work or which in the opinion of the Employer/Architects might be deemed to have reasonably been inferred to be so existing before commencement of work.

4. TENDERS:

The entire set of tender paper issued to the tenderer should be submitted fully priced and also signed on the last page together within initials on every page. Initial/Signature will indicate the acceptance of the tender papers by the tenderer he schedule of quantities shall be filled in as follows:

(i) The 'Rate' column to be legibly filled in ink in both English figures and English words.
(ii) Amount column to be filled in for each item and the amount for each circle as detailed in the "Schedule of Quantities".
(iii) All corrections are to be initialed.
(iv) The 'Rate Column' for alternative items of which the quantities are not mentioned shall not be filled up.
(v) In case of any errors/omissions in the quoted rates, the rates given in the tender marked 'Original shall be taken as correct rates.

No modifications, 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 Bank 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 tender should note that tender is strictly on the item rate basis and their attention is drawn to the fact that the rate for each and every item should be correct, workable and self-supporting. If called upon by the Employer/Architects detailed analysis of any or any or all the rates shall be submitted. The Employer/Architects shall not the bound to recognize the contractor's analysis.

The work will be paid for the "measured work" on the basis of actual work done and not as "Lump sum" contract.

All items of work described in the schedule of quantities are to be deemed and paid as complete works in all respects 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 any case of lump-sum charges in the tender in respect of any item of works, the payment 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/Architects.

The employer has power to add to, omit from any work as shown in drawings or described in specifications or included in 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.

The tenderer shall note that his tender shall remain open for consideration for a period of 90 calendar days from the date of opening of the tender.

5. AGREEMENT:

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

6. PERMITS AND LICENSES:

Permits and licenses for release of materials which are under Government control will be arranged by the contractor. The employer will render necessary assistance, sign any form or applications that may be necessary. The basic price of controlled materials for the purpose of valuing the tender is to be considered as stipulated below. This will also be the basis of adjustment in settling the contractor's bills.

It may be clearly understood that no compensation or additional charges can be claimed by the contractor for non receipt of any controlled materials in due time on this account or according to his own requirements.

The contractor will, however, be eligible to a proportionate extension of time on this account which in the opinion of the Bank/Architects is reasonable. The contractor shall at his own cost arrange for storage shed adequate for taking delivery and storing of the quantity of controlled materials released by the authorities or supplied by the Bank. The costs of storing, transporting etc., of all materials including those under government control are to be included by the tenderer in his quoted rates.

The Bank/Architects shall be indemnified against all government or legal actions for theft and any other controlled materials in the custody of the contractor.

7. GOVERNMENT AND LOCAL RULES:

The contractor shall confirm to the provision of all local Bye-laws and Acts relating to the work and to the Regulations etc., of the government and local authorities and of any company with whose system the structure is proposed to be connected. The contractor shall give all notices required by said Act, Rules, Regulations and Bye-laws etc., and pay all fees payable to such authority/authorities for execution of the work involved. The cost, if any, shall be deemed to have been included in his quoted rates, taking into account all liabilities for licenses, fees for footpath encroachment and restorations etc., and shall indemnify the Employer against such liabilities and shall defend all actions arising such claims or liabilities.

8. TAXES AND DUTIES:

Tenderers must include in their tender prices quoted for all duties, royalties, cost, sales tax, work contract tax, service tax, Labour Cess or any levies, taxes etc. GST will be paid extra as applicable.

9. PROVISIONAL SUMS (PS):

All provisional sums described in the schedule of quantities as PS shall be exclusively 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 the amounts covered under this circle will be absolutely at the discretion of the Bank. Contractor is to make payments for these materials to the suppliers on certificate or order issued by the Bank/Architects and realizes them through his bills from the Bank.

10. QUANTITY OF WORK TO BE EXECUTED:

The quantities shown in the schedule of quantities are intended to cover the entire new structure indicated in the drawings but the bank reserves the right to execute only a part or the whole or any excess thereof without assigning any reason therefore.

11. OTHER PERSONS ENGAGED BY THE EMPLOYER:

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

12. EARNEST MONEY DEPOSIT:

The tendered will have to deposit an amount as specified in tender notice in the form of Bank Draft drawn in favour of **The UNION BANK OF INDIA – REGIONAL OFFICE MAHABUBNAGAR** at the time of submission of tender as an Earnest Money. The employer is not liable to pay any interest on the Earnest Money of the unsuccessful tenderer 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.

13. INITIAL SECURITY DEPOSIT:

The successful tendered to whom the contract is awarded will have to deposit as initial security deposit a further sum to make up 2% of the value of the accepted tender including the Earnest Money. The initial Security Deposit will have to be made within fourteen (14) days from the date of acceptance of tender, failing which the Employer at his discretion may revoke the letter of acceptance and forfeit the Earnest Money deposit furnished along with the tender. The initial Security Deposit shall be refunded to the contractor without accrued interest within fourteen days after the issue of certificate virtual completion.

14. RETENTION MONEY:

Apart from the initial security made as above, retention money shall be deducted from progressive running bills @ 8%of the gross value of each running bill.
The retention amount will be refunded to the contractor 14(fourteen) days after the end of defects liability period of One year provided he has satisfactorily carried out all the work and attended to all defects in accordance with the conditions of the contract. No interest is allowed on retention money.

15. 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 quantities and specifications taken together whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred there from and if the contractor finds any discrepancies therein he shall immediately and in writing refer the same to the Bank/Architects whose decision shall be final and binding.

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 at all times gives access to workers employed by the Bank or any employed on the buildings and to provide such parties with proper sufficient and if required special scaffolding, hoists and ladders and 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 workmen to lay or fix pipes, electrical wiring, special fittings etc., The quoted rates of the tenderer shall accordingly include all these above mentioned contingent works.

16. TIME OF COMPLETION EXTENSION OF TIME AND PROGRESS CHART:

a. **Time of Completion:** The entire work is to be completed in all respects within the stipulated period. The work shall deem to be commences within seven days from the date of acceptance letter or date of handing over of site, whichever is earlier. Time is essence of the contract and shall be strictly observed by the contractor.

   The work shall not be considered as complete until the Bank/Architects have certified in writing that this has been completed and the Defects Liability Period small commence from the date of such certificate.

b. **Extension of Time:** If in the opinion of the Bank/Architects the works be delayed

(i) By reason of any exceptionally inclement weather, or

(ii) By reason of instructions from the Bank consequence of proceedings taken or threatened by or disputed, with adjoining or neighboring owners or

(iii) By the works, or delay, of other contractors or tradesmen engaged or nominated by the Employer and not referred to in the specification or

(iv) By reason of authorized extra and additions or

(v) By reason of any combination of workmen or strikes or lock-out affecting any of the building trades or

(vi) From other causes which the Bank may consider are beyond the control of the contractor, the bank at the completion of the time allowed for the contract shall make fair and reasonable extension of time for completion in respect there for. In the event of the Bank 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 lock-outs, as are referred to above, the contractor shall, immediately give the bank, written notice thereof. Nevertheless, the contractor shall use his best endeavors to prevent delay, and shall do all that may be reasonably required, to the satisfaction of the employer to proceed with the works and on his doing so that it will be ground of consideration by the employer for and extension of time as above provided. The decision of the employer as to the period to be allowed for an extension of time for completion hereunder (which decision shall be final and binding on the contractor) shall be promulgated at the consideration of such strike or lock-out and the employer shall then, in the event of and extension being granted, determine and declare the final completion date.

Progress of Work: During the period of construction the contractor shall maintain proportionate progress on the basis of program chart submitted by the contractor immediately before commencement of work and agreed to by the Employer/Architects. Contractor should also include planning for procurement of scare material well in advance and reflect the same in the program chart so that there is no delay in completion of the project.

17. LIQUIDATED DAMAGES:

Should the work be not completed to the satisfaction of the Employer/Architect within stipulated period the contractor should 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 uncommenced or unfinished after the expiry of the completion date.

a. For contracts having time for completion 6 months and less	1% of the estimated amount shown in the tender per week subjected to 10% of the accepted contracted sum.
b. For contracts having time for completion exceeding 6 months but not exceeding 24 months.	0.5% of the estimated amount shown in the tender per week subjected to 7.5% of the accepted contracted sum.
c. For contracts having time for completion exceeding 24 months.	0.25% of the estimated amount shown in the tender per week subjected to 5% of the accepted contracted sum

18. TOOLS, STORAGE OF MATERIALS, PROTECTIVE WORKS AND SITE OFFICE REQUIREMENTS:

The contractor shall provide, fix up and maintain in an approved position proper office accommodation for the contractor's representative and staff which offices shall be open at all reasonable hours to receive instruction notices or communications and clear away on completion of the works and make good all distributed work.

All drawings maintained on the site are to be carefully mounted on boards of appropriate size and covered with a coat a approved varnish. They are to be protected from ravages of termites, ants and other insects.

The contractor shall provide at his own cost all artificial light required for the work and to enable other contractors and sub-contractors to complete the work within the specified time.

The contractor shall provide a suitable temporary hut for the watchmen and clear away the same when no longer required and to provide all necessary attendance, lights, etc., required.

The contractor shall arrange for temporary latrines for the use of workers and field staff and keep the same in clean and sanitary condition to the satisfaction of the public Health Authorities and small cause such latrines and soil to be cleared away whenever necessary and shall make good all the works disturbed by these conveniences.

Every precautions shall be taken by the contractor to prevent the breeding of mosquitoes on the works during the constructions, and all receptacles, cisterns, water tanks, etc., used for the storage of water must be suitable protected against breeding of mosquitoes. The contractor shall indemnify the employer against any breach of rules in respect of anti-malarial measures.

The contractor shall not fix or place any placards or advertisement of any description or permit the same to be fixed or placed in or upon any boarding gantry, building structure other than those approved by the Employer.

Protective Measures: The contractor from the time of being placed in possession of the site must make suitable arrangements for watching, lighting and protecting the work, the site and surrounding property by day, by night, on Sundays and other holidays.

Tools: The contractor should cover in his rates for making provisions for all reasonable facilities for the use of his scaffolding, tools etc., by sub contractors for their work.

19. 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 making any variations from the drawings or specification that may be associated to so conform, give the Employer/Architects written notices specifying the variations proposed to be made and the reasons for making them and apply for instruction thereon. The Employer/Architects on receipt of such intimation shall give a decision within a reasonable time.

The contractor/s shall arrange to give all notices required for by the said Acts, Regulations or Bye-Laws to be given to any authority, and to pay to such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the Employer.

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

20. CLEARING SITE AND SETTING OUT WORKS:

The site shown on the plan shall be cleared of all obstructions. If at any time, any error shall appear during the progress of any part of the work, the contractor shall at his own expenses rectify such error if called upon to the satisfaction of the Employer. The contractor shall further set out the works to the alternative positions at the site until on is finally approved and the rates quoted in his tender should include for this and no extra on this account will be entertained.

21. MATERIALS, WORKMANSHIP, SAMPLES, TESTING OF MATERIALS:

All the works specified and provided for in the specifications or which may be required to be done in order to perform and complete any part thereof shall be executed in the best and most workman like 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 and as represented by the drawings or according to such other additional particulars, and instructions as may from time to time be given by the Employer/Architects during the execution of the work, and to his entire satisfaction.

If required by the Employer/Architects the contractor shall have to carry out tests on materials and workmanship in approved materials testing laboratories or as prescribed by the Employer/Architects at his own cost to prove that the materials etc., under test conform to the relevant I.S Standards or as specified in the specifications. The necessary charges for preparation of transporting, testing, etc. shall have to be borne by the contractor. No extra payment on this account should in any case be entertained.

All the materials stores and equipment required for the full performance of the work under the contract must be provided through normal channel and must include charge for import duties, sales tax, octroi and other charges and must be the best of their kind available and the contractor/s must be entirely responsible for the proper and efficient carrying out of the work. The work must be done in the best workmanlike manner. Samples of all materials to be used must be submitted to

the Employer/Architects when so directed by the Engineer/Architects and written approval from Employer/Architects must be obtained prior to placement of order.

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 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 all temporary/doors, protection to windows and any other requisite protection for the extension of the work whether by himself or special tradesmen or subcontractor and any damage caused must be made good by the contractor at his own expenses.

22. 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 times as may be specified in the order of any materials which in the opinion of the Employer/Architects are not in accordance with specifications or instructions, the substitution or proper re-execution of any work executed with materials or workmanship not in accordance with the drawings and specifications or instructions. In case the contractor refuses to comply with the order the employer shall have the power to employ and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereto as certified by the Employer/Architects shall be bornes by the contractor or may be deducted from any money due to or that may become due to the contractor. No certificate which may be given by the Architects shall relieve the contractor from his liability in respect of unsound work or bed materials.

23. SITE ENGINEER:

The term 'Site Engineer' shall mean the 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, additions, alterations, deviations or omission any extra work whatever, except in so far as such authority may be specifically conferred by a written order of the Employer.

The site engineer shall have power to give notice to the contractor or to his foreman, of 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 Employer is obtained. The work will from time to time be examined by the Architects, Engineer from the premises department of the Employer and the Site Engineer. But such examination shall not in any way exonerate the contractor from the obligation to remedy any defects which may be found to exist ay any stage of the work or after the same is complete. Subject to the limitation of this clause the contractor shall take instructions only from the Architects/Engineer.

24. CONRACTOR'S EMPLOYEES:

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

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

No labour below the age of 16 years and who is not an Indian National shall be employed on the work.

Any labourer applied 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 of Wages Act
b. Employer's Liability Act
c. Workman Compensation Act
d. Contract Labour (Regulation & Abolition) Act, 1970 & 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 connection with any claim that may be made by any workmen.

The contractor shall arrange to provide first aid treatment to the labourers engaged on the works. He shall within 24 hours of occurance of any accident at or about the site or in connection with execution of the works, report such accident to the Employer and also to the competent authority where such report is required by law.

25. DISMISSAL OF WORKMEN:

The contractor shall on the request of the Employer immediately dismiss from works any person employed thereon by him, who may in the opinion of the Employer be unsuitable or incompetent or who may misconduct himself. Such discharge shall not be basis of any claim for compensation or damages against the Employer or any of the officer or employee.

26. ASSIGNMENT:

The whole of the works included in the contract shall be executed by the contractor and the contractor shall not directly or indirectly transfer, assign or undesert the contract or any part, share or interest therein nor, shall take a new partner, without written consent of the Employer and no subletting shall relieve the contractor from the full and entire responsibility of the contract or from active superintendence of the work during their progress.

27. DAMAGE TO PERSONS AND PROPERTY INSURANCE ETC.,

The contractor shall be responsible for all 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 or neglect of himself or of any sub-contractor or of any of his or a sub-contractor's employees, whether such injury or damage arise from carelessness, accident or any other cause whatsoever in any way connected with carrying out of this contract. The clause shall be held to include inter-alia, any damage to building whether immediately adjacent or

otherwise, and any damage to roads, streets, foot paths 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 under any acts of compensation or damage consequent upon such claim.

The contractor shall reinstate all damage of every sort mentioned in this clause, so as to deliver the whole of the contract works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damages to the damages to the property or third parties.

The contractor shall affect the insurance necessary and indemnify the Employer entirely from all responsibility in this respect. The insurance must be place with a company approved by the Employer and must be effected jointly in the name of the contractor and the employer and the policy lodged with the later. The scope of insurance is to include damage or loss to the contract itself till this is made over in a complete state. Insurance is compulsory and must be affected from the very initial stage. The contractor shall also be responsible for anything which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this contract.

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 damages from any sums due or to become due to the contractor.

28. INSURANCE:

Unless otherwise instructed the contractor shall insure the works and keep them insure until the virtual completion of the contractor against less or damage by fire and/or earth quake, 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 so by the employer, the premium of such further sum being allowed to the contractor as an authorized extra.

The contractor shall deposit the policy and receipt for premium paid with the Employer within 21 (twenty one) 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 money due, or 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.

29. ACCOUNTS RECEIPTS AND VOUCHERS:

The contractor shall upon the request of the employer furnish them with all invoices, receipts, accounts and other vouchers that may require in connection with the work under this contract. If the contractor shall use materials less than what he is required under the contract, the value of the work 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 the 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 a subordinate deputed by him shall give reasonable notice to the contractor. If the contractor fails to attend at the measurements after such notice or fails to counter sign or to record the difference within a week from the date of measurement in the manner required by the site engineer then in any such event the measurements taken by the site engineer or by the subordinate deputed by him as the case maybe is final and binding on the contractor and the contractor shall have no right to dispute the same.

30. PAYMENTS:

All bills shall be prepared by the contractor in the form prescribed by the Employer/Architects. Normally one interim bill shall be prepared each month 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 of work done and must show deductions for all previous payments, retention money, etc.,

The Employer/Architects 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 honoring certificates named in these documents.

The amount stated in an interim certificate shall be the total value of work properly executed and 75% of invoiced value of material brought of site for permanent incorporation into the work up to the date of the bill less the amount to be retained by the Employer as retention money vide clause 12 of these conditions, provided that such certificate shall only include the value of said material and good as and from such time as they are reasonably, properly and not prematurely brought to or places adjacent to the work and then only if adequately protected against weather or other causalities.

The employer will deduct retention money as described in clause 12 of these conditions. The refund of retention money will be made as specified in the same clause.

If the Employer has supplied any 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 with the quantities consumed in the work.

All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed, and shall not preclude the requiring of bad, unsound, and imperfect or unskilled work to be removed and taken away and reconstructed, or reelected or be considered as an admission of the due performance of the contract, or any part thereof in any respect or the accruing of any claim, nor shall, it conclude 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 vary or affect the contract. The final bill shall be submitted by the contractor within one month of the date fixed for completion of the work or of the date of certificate of completion furnished by the Site Engineer and payment shall be made within three months.

31. FINAL PAYMENT:

The final bill shall be accompanied by a certificate of completion from the Employer/Architects. Payments of final bill shall be made after deduction of Retention Money as specified in clause 14 of these conditions, which sum shall be refunded after the completion of the

Defects Liability Period of Twelve (12) months after receiving the Employer's/Architects certificate that the contractor has rectified all defects to the satisfaction of the Employer/Architects. 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.

32. VARIATION/DEVIATION:

The price of all such additional items/non-tendered items will be worked out on the basis of rate quoted for similar items in the contract whether existing or on engineering rate analysis based on prevalent fair price of labour, material and other components as required. The tender rates, shall hold good for any increase or decrease in the tendered quantities up to variation of 10%., For variation beyond +/- 10%, the rate for the respective item may be reviewed on mutually agreed terms.

33. SUBSTITUTION:

Should the contractor desire to substitute any materials and workmanship, he/they must obtain the approval of the Employer/Architects in writing for any such substitution well in advance. Materials designated in this specification indefinitely by such term as "Equal" or "Other approved" etc., specific approval of the Employer/Architects has been obtained in writing.

34. PREPARATION OF WORKS FOR OCCUPATION & USE ON COMPLETION:

The whole of the work will be thoroughly inspected by the contractor and deficiencies and defects put right. On completion of such inspection the contractor shall inform the Employer that he has completed the work and it is ready for inspection. On completion the contractor shall clean all windows and doors including the cleaning and oiling if necessary, of all hardware, inside and outside, all floor, staircases, and part of the building. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the bank.

35. CLEARING SITE ON COMPLETION:

On completion of the works the contractor shall clear away and remove from the site all 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/Architects.

36. DEFECTS AFTER COMPLETION:

The contractor shall make good at his own cost and to the satisfaction of the Employer all defects, shrinkage, settlements or other faults which may appear within 12 months after completion of the work. In default the Employer may employ and pay other persons to amend and make good such damages, 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 by the employer, in lieu of such amending and making good by 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 the amount retained under clause No. 12 together with any expenses the Employer may have incurred in connection therewith.

37. CONCEALED WORK:

The contractor shall give due notice to the Employer/Architects whenever any work is to be buried in the earth, concrete or in the bodies of walls or otherwise becoming inaccessible later on, in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall, at the opinion of the Employer/Architect be either opened up for measurement at the contractor's expense or no payment may be made for such materials. Should any dispute to differences arise after the execution of any work as to measurements etc., or other matters which cannot be conveniently tested or checked, the notes of the Employer/Architects shall be accepted as correct and binding on the contractor.

38. ESCALATION:

The rate 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, sales tax, octroi, etc., unless specifically provided in these documents.

39. IDLE LABOUR:

Whatever the reasons may be no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entertained under any circumstances.

40. 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 neglect 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 a notice under this clause.

After such notice shall have been given the contractor shall not be at liberty to remover from the site of the works of from any ground contiguous thereto any plant of materials to subsist from the date of such notice being given until the fall for 7 (seven) days after such notice has been given to proceed with the works as therein prescribed, the Employer may proceed as provided in the following.

41. TERMINATION OF CONTRACT BY EMPLOYER:

If the contractor being a company go into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjudicated insolvent or shall make and assignment or a composition for the benefit of the greater part, in number of amount of his creditors or shall enter into a Deed or arrangement with his creditors, or if the Official Assignce in insolvency, or the Receiver of the contractor in insolvency, shall repudiate the contract, or if a receiver of the contractor's firm appointed by the court, shall be unable within fourteen days after notice to him requiring him to do so, to show to the reasonable satisfaction of the employer that he is able to carry out an fulfill the contract, and if so required by the employer to give reasonable security there for, or if the contractor shall suffer execution to be issued, or shall suffer any payment under this contract to be attached by or on behalf of and of the creditors of the contractor, or shall assign, charge or encumber this contract or any payments due or which may become due to the contractor, there under, or shall neglect or fail to observe and perform all or any of the acts matters of things by this contract, to be observed and performed by the contractor within three clear days after the notice shall have been given to the contractor in manner hereinafter mentioned requiring the contractor to observe or perform the same or shall use improper materials or workmanship in carrying on the works, or shall in the opinion of the employer not exercise such due diligence and make such due progress as would enable the work to be completed within due time agreed upon and shall fail to proceed to the satisfaction of the employer after three clear days notice requiring the contractor so to do shall have been given to

the contractor as hereinafter mentioned, or shall abandon the contract, then and in any of the said cases, the bank may not withstanding previous waiver determine the contract by a notice in writing to the effect as hereinafter mentioned, but without thereby effecting the powers of the employer of the obligations and liabilities of the contractor the whole of which shall continue in force as fully as if the 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 the contractor) further the employer or his agent, or servants, may enter upon and take possession of the work and all plants, tools, scaffolding, sheds, machinery, steam and other power, utensils and materials lying upon premises or the adjoining lands or roads and sell the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other contractors or other persons or person 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 contractors or other persons or person employed from completing and furnishing or using the materials and plants for the works when the works shall be completed, or as soon thereafter as conveniently may be, the employer shall give notice in writing to the contractor to remove his surplus materials and plants and should the contractor for the amount so realized. Any expenses or losses incurred by the employer in getting the works carried out by other contractors shall be adjusted against the amount payable to the contractor by way of selling his tools and plants or due on account of work carried out by the contractor prior to engaging other contractors or against the Security Deposit.

42. ARBITRATION:

All disputes or differences of any kind whatsoever whish 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 execution or maintenance thereof of this contract of the construction remaining operation or effect thereof or to the rights or liabilities of the parties to arising out of or in relation thereto whether during or after determination foreclosure of branch 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 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 persons 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 Arbitrator so appointed is unable or unwilling to act or resign his appoint or 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 such place as may be fixed by the Arbitrator in his sole discretion.

The fees, if any, of the Arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the 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 1940 or any statutory modification or reenactment thereof and the rules made there under and for the time being in for, shall apply to the arbitration proceeding under this clause.

The Employer and the contractor hereby also agree that arbitrator 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.

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

43. SAFETY CODE:

Personal Safety Equipment's:

All necessary personal safety equipments 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 steps to ensure proper use of equipments by those concerned. The contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting the following precautions should be taken:

First Aid:

a. At every work place, there shall be maintained in readily accessible place first aid appliance including and adequate supply of sterilized dressings and sterilized cotton wool. The appliance shall be kept in good order and in large work place they shall be places under the charge of a responsible person who shall be readily available during working hours.

b. 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.

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

Contractor's Seal and Signature.

SPECIFICATION AND WORKMANSHIP

GENERAL SPECIFICATIONS:

1. GENERAL:

These specifications are for work to be done, if item to be supplied and materials to be used in the works as shown and defined on the drawings and described herein, to the satisfaction of the Bank/Architect.

The workmanship is to be the best possible and of a high standard. The contractor shall take all steps immediately to make up deficiency if any noticed by the Bank/Architects. Use must be made up of special tradesmen in all aspects of the work and allowances must be made in the rates for the same.

The materials is to be the best possible and of a high standard. The contractor shall take all steps immediately to make up deficiency if any noticed by the Bank/Architects. Use must be made up of special tradesmen in all aspects of the work and allowances must be made in the rates for the same.

The materials to be provided by the contractor shall be accordance with the samples already got approved from the Bank/Architect by the contractor and in conformity with specifications and approved list of manufactures and brand. The contractor shall produce all invoices, vouchers or receipts for any material if called upon to do so by the Bank/Architect.

Samples of all materials are to be submitted to the Bank/Architects for their approval before the contractor's orders or deliver the material to the site. Samples together with their packings are to be provided free of charge by the contractor and should any materials be rejected they will be removed from the site at the contractor expense. All samples will be retained by the Bank/Architects for comparison with materials which will be delivered at site. Also the contractor will be required to submit specimen finished of colors, fabrics, etc., for the approval of the Bank/Architects before proceeding with the works.

The contractor shall be responsible for providing and maintaining temporary coverages required for the protection of finished work. He is also to clean out all word shavings, cuts ends and other waste from all pats of the works before covering or infilling are constructed.

Contractor shall maintain uniform quality and consistency in workmanship throughout the execution of the work.

ARTICLES OF AGREEMENT

Articles of Agreement made at **MAHABUBNAGAR** this day of _____ between **THE UNION BANK OF INDIA, REGIONAL OFFICE, MAHABUBNAGAR, TS...** (Hereinafter referred to as "The Employer" which expression shall unless excluded or repugnant to the context be deemed to include its successors and assigns) of the one part, and M/s _____ carrying on business at _____ (hereinafter referred to as the "Contractor" which expression shall unless excluded or repugnant to the context be deemed to include their heirs, executors, administrators, representatives and assigns) of the other part.

WHEREAS

The Employer is desirous of carrying out the **ELECTRICAL,LAN,AUDIO VIDEO AND AIR CONDITIONING WORKS** for The **UNION BANK OF INDIA, CONFERENCE ROOM AT RO MAHABUBNAGAR.** and has drawings and specifications, schedule of quantities describing the work to be done, have been prepared by the Consultant **M/s** AKRITI ARCHITECTURE , HYDERABAD , under the direction of the Employer. The Employer is desirous of completing the said work strictly and according to the said drawings and specifications.

1. The contractors in their tender dated _____ and negotiations through letter on _____ have agreed to execute the said works as per said drawings specification and schedule of quantities, rates and subject to the conditions set forth in the special conditions of contracts (all of which are collectively hereinafter referred to as "the said conditions"). The special conditions and condition of contract have been persued, examined and accepted by the contractor. Total tender value is accepted as Rs. _____ (Rupees _____ _____only).
2. The contractor has deposited Rs. _____ (Rupees _____ only) with the Employer Security Deposit for performance of this agreement.

NOW IT IS HEREBY MUTUAL AGREED AND DECLARED BETWEEN THE PARTIES HERETO AS FOLLOWS:

1. 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 specification and the said schedule of quantities upon and subject to the said conditions.
2. The Employer shall for such interior works, pay to the contractor such sums as shall become payable at time, in the manner specified in the said conditions.
3. The said tender and allied documents, drawings, specification, prices schedule of quantities, agreement and documents above mentioned, shall from the basis of this contract and the decision of the Employer as mentioned in the condition of contract with reference to the clauses of this agreement or the said conditions shall be final and binding on both the parties.
4. The contract herein contained, comprises of the said work above mentioned and all subsidiary works connected therewith in the same site 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 though and work man like manner. With best materials and within the time limit herein mentioned.
5. The employer reserved to himself the right after 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 and such alterations or variations shall be carried out without prejudice to this contract.
6. The said conditions shall be read and constructed as forming part of this agreement and 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.

7. It will be the entire responsibility of the contractor to procure all materials required for the said works.
8. The contractor shall complete the said work within **25 DAYS** 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.
9. All disputes arising out of or in anyway connected with this agreement shall be deemed to have arisen in Hyderabad and only in courts in Hyderabad shall have jurisdiction to determine the same.
10. The several parts of this contract have been read and fully understood by us.
11. The work-order issued to the contractor shall be treated as part of this agreement.

In witness where of the parties hereto have set their respective hands on the day month and year above written.

Signed and Delivered by

The Bank

In the presence of Witness

Signed and Delivered by

The Contractor

In the presence of Witness

TECHNICAL SPECIFICATION
ELECTRICAL WORK

GENERAL SPECIFICATION FOR MEDIUM VOLTAGE POWER AND LIGHTING DISTRIBUTION BOARDS AND MISCELLANEOUS ELECTRICAL EQUIPMENT.

This Specification generally described medium voltage power and lighting distribution boards and other miscellaneous electrical equipment such as Isolators, Switches, Socket outlets etc to be used for power wiring and lighting installations.

The equipment covered by this specification is as follows:

415/240 V Power distribution boards
415/240 V Switch fuse lighting distribution board.
415/240 V miniature circuit breakers (MCB) lighting distribution boards
415/240 V metal clad Isolating switches
240 V Switch socket outlet

1. SYSTEM VOLTAGES

For power wiring and lighting installation, electrical power will be available at 415/240 V 3phase 4 wire 50HZ maximum voltage variation may be expected as +/-3%.

2. POWER DISTRIBUTION BOARDS

The power distribution boards are generally intended for distribution of power to various consumers in the office and shall be suitable for 415V 3 phase or 3phase and neutral 50HZ system. The distribution boards shall be either cubicle type or pedestal mounting type as specified.

a) Cubicle type boards

Cubicle type power distribution boards shall be factory assembled and wired conforming to IS: 4237 & IS: 8623. The boards shall be of Industrial, Floor mounted, totally enclosed cubicle type with multi-tier compartmental arrangement housing open execution type incoming isolating switches and requisite number of outgoing switch fuse/fuse switch units. Alternatively moulded case circuit breaker (MCCB) unit may be provided in incoming and outgoing circuits as specified. The degree of protection provided by the enclosure shall be in accordance with IS 2147 and conforming to IP50 or IP54 as called for in the Technical specification. The unit shall be of pressed sheet steel having minimum thickness of 2mm with rubber gasket at all joints and openings including doors. All bolted joints shall be provided with toothed/spring washers to ensure good earth continuity. It shall have a series of cubicles of uniform height placed

side by side with front access for operation as well as cabling. The maximum operating height of the switches on the panel shall not exceed 1900mm and minimum operating height shall not be less than 400mm. The board shall be supplied along with base frame made of minimum 50mmx25mm Ms Channels.

The incoming and outgoing switches are MCCBs shall be arranged in tier formation to accommodate each unit in a separate compartment with gasketed hinged door. The door of individual compartment shall be interlocked in such a way that it can't be opened when the MCCB in the ON position. The "ON" and "OFF" positions of the switch handle shall be distinctly indicated. Modular construction shall be adopted to cater for different sizes of MCCBs. The switch board shall be of easily extensible type. Each PDB shall be provided with one 100 A and one 63 A TPN spare switch fuse/fuse switch unit or two numbers 100A TP MCCB.

In case of switch fuse distribution boards, the switches shall be of load break AC 23 category conforming to IS: 4064 (part-1) having fully shrouded contacts. The isolator for the switch fuse units shall be on the bus bar side and fuse on the load side. Rotary type switches may be used for rating up to 63A. The switch fuse units shall be provided with non-deteriorating type HRC fuse links having rupturing capacity not less than 46 KA conforming to IS: 2208.

In case of MCCB distribution boards, the MCCBs shall have all live parts totally enclosed in heat resistant moulded insulated housing have terminals accessible for external connections, but well shrouded against accident contacts. The units shall be generally designed, manufactured and tested according to IEC: 157-7 and shall be of manually operated type with quick make, quick break trip – free mechanism. The MCCBs shall be provided with direct acting adjustable thermal overload and magnetic short-circuit releases having breaking capacity not less than the short-circuit fault level at the bus bars of the distribution boards or as specified. The MCCB shall be selected from four frame sizes viz., 100,250,400 and 600A.

Separate bus bar compartment provided on the top and/or sides bolted cover. The bus bars shall be so arranged that they are easily accessible from the front of the cubicle. The main bus bars shall have continuous current rating as specified but in no case less than the current rating of incoming isolator. However, neutral bus bars shall have half the full load rating of the phase bus bars. The bus bars shall be of electrical purity aluminum or aluminum alloy conforming to IS: 5082. The bus bar sizes shall be so selected that the temperature rise over 45oC ambient does not exceed 45oC as measured by thermometer. The bus bars shall be properly supported with high quality non- hygroscopes insulating material having good electrical and mechanical properties suitable for the applicable voltage grade and of adequate mechanical strength so as to withstand without damage effects of maximum available short-circuit current. Moulded bus bar supports made of glass reinforced thermo-setting plastic materials will be preferred. Bus bar supports shall have adequate creepage distance and anti tracking provision. The PDBs shall be selected from three

categories having bus bar suitably designed to withstand a through-fault current of 10KA, 25KA and 40KA. The selection shall be based on the available short circuit current at point where PDB is proposed to be used in the system. The bus bars shall be properly spaced to facilitate taking vertical connections to individual units. Tapping to the individual units from the bus bar shall be by mean of taped bus bars. Arrangement and marking of the bus bars and main connections shall be as per IS: 375. The Connection between bus bar and other connection made of different metal as well as their connections with the terminals of the equipment shall be made in such a way, as to prevent corrosion and local heating.

Generally incoming and larger outgoing units will be located at the bottom-most tier and cables shall be directly terminated to the equipment terminals. For terminating multiple cable directly to the equipment terminals, extension pieces as required shall be provided. Outgoing power cables from the upper compartments shall be brought out to the terminal blocks located in the vertical cable compartments. Liberal space shall be provided in the cable compartments as well as in the bottom most tiers to facilitate termination of cables. Cable compartment shall be provided with bolted cover plates. Detachable cable gland plates shall be provided both at the top and bottom of cable compartments as well as the bottom most compartments. Provision shall be made in all cable compartments for clamping cables so as to facilitate cable termination to individual units.

Wherever specified, AC magnetic contractor shall be incorporated in the incoming and outgoing feeders of the board for remote switching. The contractor shall be housed in the same compartment of incoming/outgoing switches on MCCBs. The contractor shall be of study construction with double break silver tipped contacts conforming to IS: 2956 and shall be of AC3 utilization category.

For termination of power cable in equipment terminals/terminal blocks, compression type cable lugs suitable for aluminum conductor cables shall be provided. Die-cast aluminum alloy or brass cable glands suitable for PVC insulated, PVC sheathed armoured/ unarmoured cables shall be provided in the cable compartments.

The PDB having two incoming switches/MCCBs shall have bus-section isolating switch/MCCB key interlocked with the incoming switches/MCCBs in such a manner that bus section switch/MCCB can be closed only when one of the incoming switches is open. Incoming and bus-section switches/MCCBs shall be housed in separate compartment.

The PDB shall have an indicating voltmeter selector switch connected to incoming feeder with easily accessible voltmeter fuses. Ammeters with selector switches shall be provided in each incoming feeder. These instruments shall be flush type located on the front door of the compartments.

Suitably engraved identification labels and inscription plates shall be provided for each circuit as well as for the boards.

One continuous earth bus shall be provided in the bottom part of PDB along the full length of the board with two bolted type earthing terminals to comply with the requirements of Indian Electricity Rules. Proper danger plates shall also be provided on each board.

Pedestal mounting type switch-fuse distribution board.

The pedestal mounting type distribution board shall be supported on pedestals made of steel sections and shall be of industrial metal clad dust-proof, totally enclosed design having specified number and sizes of fuse-switch or switch fuse units arranged on top and bottom of bus bar chamber.

The height of the stands shall be such as to permit proper termination of cables for the switches mounted above the bus-chamber and the same time keep the switches operating handles, both below and above the bus-chamber at convenient heights.

The supporting arrangement and other constructional and design features of the bus bars shall be similar to that described.

Switch fuse units shall be of load-break type as specified above and shall be mounted on the bus bar chambers by means of flanged throat arrangement. Wherever called for, suitably key interlocking shall be provided between two incoming or two incoming and bus-section switches. All switches mounted on the top of the bus bar chamber shall be provided with detachable type reverse entry adapter boxes. Wherever required switch mounted at the bottom of the bus bar chamber shall also is provided with suitable adapter box to facilitate termination of cables.
Cable lugs and cable glands shall be as specified earlier.

Identification labels and inscription plates etc shall as specified earlier.

Earthing arrangement and danger plates shall be as specified earlier.

For terminating multiple cables directly to the equipment terminal extension pieces as required shall be provided to permit connection and disconnection of each individual cable without disturbing other cables.

3. Switch fuse lighting distribution boards:

The Switch fuse lighting distribution boards shall be either enclosed cubicle or pedestal mounting type as specified suitable for 415/240V, 3-phase and neutral system.

4. Cubicle type boards

The constructional and design feature of the distribution boards shall be similar to that described above for cubicle type power distribution boards except that the switches shall be of AC 22 or above category conforming to IS:4064(part).

5. Pedestal mounting type switches Lighting distribution boards.

The constructional and design features of the distribution boards shall be similar to that described above for pedestal mounting type Switch fuse power distribution board except that the switches shall be of AC 22 or above category conforming to IS:4064(part).

6. Miniature circuit-breaker lighting distribution boards.

The lighting distribution boards with miniature circuit breakers (MCB) shall be suitable for 415/250V, 3-Phase and neutral or 240V single – phase and neutral system.

The lighting distribution board shall generally comprise incoming isolating switch or MCB isolator, requisite number of outgoing miniature circuit – breakers and adequately rated bus bars.

The boards shall be of industrial, totally enclosed dust-proof, wall mounted, sheet cubicle design. The boards shall have welded back and sides gasketed hinged door at the front with door handle having suitable locking device. Detachable cover plates shall be provided at the top and bottom with suitable gaskets for cables entry. For boards with incoming isolating switch, the access to the Operating handle shall be from the front of the cubicle without opening the front door. Operating knobs of both incoming MCB isolators and outgoing MCB shall be accessible only after opening the front door of the cubicle. Protective insulated cover plate with shall be provided inside the cubicle to shroud all the live parts with only the operating knobs of the MCBs protruding outside the cover plate. As far as possible the board shall also be dust-proof in door-open position, adequate space shall be provided within the board to facilitate termination of incoming and outgoing cables. The board shall be factory wired and assembled. Where specifically called for, the boards shall be of special weatherproof design suitable for outdoor installation.

The incoming isolating switch shall be similar to that specified above except that the switches shall be of AC 22 or above category conforming to IS: 4064 (part-1).

The miniature circuit-breaking shall be heat resistant plastic moulded type generally designed manufactured and tested as per IS: 8828 – 1978. Unless specified otherwise all MCBs shall be provided with quick break trip free mechanism and direct acting thermal overload and short-circuit trip elements. The short-circuit breaking capacity of the MCBs shall not be less than 9,000 A at 0.8 power factor. The MCBs shall be suitable for operation in an ambient of 45oC without excessive derating. Single – phase MCBs, which are not provided with built – in phase barriers, and mounted adjacent to each other and connected to different phases, shall be provided with adequate insulated phase barriers. The type, arrangement and other design and constructional shall be as in item above.

For direct entry of cables, cable gland suitable for PVC insulated, PVC sheathed armoured / unarmoured aluminum conductor cables shall be provided. For cable entry through conduits detachable top and bottom plates shall provided. Cable terminals shall be suitable for aluminum conductor cables and so arranged to enable connecting and disconnecting of each circuit without disturbing any other circuits. Compression type aluminum cable lugs shall

also be provided. To facilitate termination of cables in the incoming MCB isolators and above 30 A outgoing MCBs suitable terminal connectors shall be provided. Wherever called for terminal blocks of adequate capacity/sizes shall be incorporated for the incoming/outgoing cables.
Identification labels and inscription plates etc shall be as specified above. Earthing arrangement and danger plates shall be as specified above.

7. 240V SWITCH SOCKET OUTLET

Socket outlet for 240 V supply shall be of 3-pin (two-pole and one earth) non-reversible, metal-clad, dust-proof, industrial type suitable for horizontal insertion type. 240V socket outlet shall be controlled by rotary type switch / MCB mounted on the socket outlet box. Operating handle of the rotary switch shall be fixed in such a manner that it will not be possible either to insert or to withdraw the plug without switching off the supply. All socket outlets shall be supplied with heavy-duty type plug and cap with chain. The isolating switches shall be of category AC 22 or above conforming to IS: 4064 (part-1). Manually operated industrial type. The isolator shall be housed in dust and vermin-proof sheet steel enclosure suitable for terminating aluminum conductor cables either directly or through conduits and shall be provided with compression type lugs. The isolator handle shall be interlocked with the door.
Inscription plate shall be provided indicating the voltage rating for the switch socket outlet.

8. LIGHT FITTING AND ACCESSORIES

General

All light fittings and accessories shall be manufactured from best quality materials the light fittings and accessories shall be designed, manufactured and tested in accordance with the following Indian Standards in so far as they are applicable.

a) IS: 1913 (part –1)-1978-General and safety requirements for luminaires. Tubular fluorescent lamps.
b) IS: 2418 (part 1 & 2)-1977-specification for tabular fluorescent lamps for general lighting service.
c) IS: 418-1963- Tungsten filament general service electric lamps.
d) IS: 1534 (part 1) – 1960 – Ballast for fluorescent lamps for switch starts circuits.
e) IS: 1569 – 1976 – Capacitors for use in tubular fluorescent lamps, high pressure mercury and low pressure sodium vapour discharge lamp circuits.
f) IS: 2215 – 1968 – Starters for fluorescent lamps.
g) IS: 3323 – 1965 – Bi pin lamp holders for tubular fluorescent lamps.
h) Fluorescent fittings:

Fluorescent fitting shall be supplied complete with copper wound ballast, Starter, bi-pin spring loaded holder & power factor improvement capacitor suitable for switch start fluorescent tube lamp and shall be fully wired.
The fluorescent light fittings shall be specified below:

i. Industrial trough type fluorescent fittings suitable for twin 40 W, single 40 W fluorescent lamp, having vitreous enamelled heavy gauge sheet steel reflector, finished and grey stove enamelled channel similar to Philips type no. TKC -–24, Crompton type No. IVE, Bajaj type no. BJIV, K-lite No.KL – B or equivalent.

ii. Industrial trough type fluorescent fitting as specified above but with stove enamelled heavy gauge sheet steel reflector similar to Philips type No.TKC – 22, GEC type No.FH – 23, Crompton type No.ISE, Bajaj type No.BJIE, K-Lite type No.KL – IS or equivalent.

iii. Decorative recess mounting type Mirror optic wide spread fitting suitable for false ceiling with electro chemically brightened and anodised aluminum reflector assembly suitable for 2Nos 36W or 1 No 36W fluorescent tube but without tube, duly wired with electronic ballast, rotor type bi pin holder similar to Philips type No.TBS 518, Crompton CRFG, K-Lite type No.KL – RMWST or equivalent.

iv. LAMPS

All lamps shall be of high lumen output and with long life. The successful tenderer will have to give guarantee for the lamp performance.

Incandescent Lamp

All general service incandescent lamps shall be gas filled, clear finish and where ever possible, should be of coiled coil type. Incandescent lamp cap shall be of BT.

Fluorescent Lamp

All fluorescent lamps shall be of day light type (unless otherwise specified) and shall be suitable for switch – start with bi – pin type cap.

v. Ballast

The ballast shall be well tried out design to give trouble free operations, with long life having provisions for suitable tappings in steps. The ballast must be able to dissipate sufficiently the heat developed in the windings and therefore provisions for good heat conduction from the coil to the case of the ballast shall be made. The ballast shall be of polyester filled copper wound having minimum power loss and the temperature rise shall be within Permissible limits and in conformity with IS: 6616 – 1972.

vi. Electronic Ballast

The Ballast shall be well tried out design to give trouble free operations with long Life conform to BIS specifications, tested at ERTL Kolkata or CFRI, Bangalore. The Ballast loss should be less than 2 W and efficacy of more than 6.5 Lumen / Watt. Operating voltage range between 100 and 250 V A.C.

vii. Capacitor

Capacitor shall consist of element wound from layers of high purity aluminum foils and loss capacitor paper contained in aluminum cylindrical can. The capacitor shall be vacuum dried under high vacuum and impregnated. The can shall be hermitically sealed and shoulder lug terminal provided over porcelain insulators. The capacitor shall conform to IS: 1569 – 1976.

viii. Lamp holder

The lamp holders shall have well spring contacts engaging positively with the pins of the lamp and preventing the lamp from extinguished due to vibration. The

holders shall be such that the lamps can be removed easily whenever required for cleaning or for replacement purposes.
For fluorescent lamp, bi-pin lamp holders shall be provided. The starter holders shall be well tried out design and robust construction with provisions for easy insertion and removal of the starter ensuring correct starter contacts by means of strong spring action for incandescent lamps.

a) CABLE LAYING

Cable shall be laid in cable trenches/trays already provided by the premises owner. Any trenches and trays required shall be brought to the notice and necessary routing approvals and shall be taken before the cables are laid.
Bending of cables shall be laid in accordance with the manufacture's recommendation of cable bends.
Extra length of cable shall be provided on both ends for future maintenance works.
The cables should be supported and clamped at regular intervals.
All cables shall comply with IS 1554 (part 1) 1976, for 650/6180V.

1. CABLE TERMINATION

All cable ends are terminated with single compression cable glands with suitable size lugs crimped. All lugs shall be of copper / Aluminum as required.

2. CONDUITS

All conduits used shall be rigid PVC with 1.5mm thickness PVC and shall be of reputed grade quality. All conduits laid shall be clamped at regular intervals. Separate conduits shall be laid for UPS lighting, UPS Sockets and general wiring. Any joints in the wiring shall be jointed properly in the junction box with proper insulation type etc.

If rigid PVC conduit is not accessible for installation due to short bends etc, Flexible PVC conduit shall be used for that particular length.

3. WIRES

All conductors are drawn from electrolytic grade copper bunched and Insulated with PVC compound, which is resistant to moisture, oil, alkalis and grease, PVC insulation, shall have high insulation resistance value. The colour for PVC insulation for different phases, Red, Yellow, and Blue and for Neutral, Black and for Earth, Green is mandatory.

4. SWITCHES & SOCKETS

All switches and sockets shall be of modular plate switches.
All UPS connected switches and sockets shall be of different coloured front plates and uniform in all the areas. General power connected switches and sockets front plates shall be of white colour only. All sockets shall have shutters.

All plastics should be fire retardant and self-extinguishing

All conduits shall be of silver plated conduits.

GENERAL SPECIFICATIONS FOR ELECTRICAL WORKS

1.0 GENERAL SPECIFICATIONS AND INSTRUCTIONS – ELECTRICAL

I.E. RULE 1956: the installation shall generally be carried out in conformity with Indian electricity rule 1956 as amended from time to time and national electrical code which contains specific regulations to be adhered to in the supply and use of electrical energy in the interest of safety.

PRESURE AND FREQUENCY OF SUPPLY: all current consuming devices shall be suitable for the pressure and frequency of supply stated in the special conditions of contract.

SYSTEM OF WIRING: the wiring shall be carried out on such a system as may be specified in the conditions of contract. Power wiring shall be kept separate and distinct from lighting wiring. All conductors shall be run as far as possible along the walls and ceiling, so as to be easily accessible for inspection. The balancing of circuits in three phase system shall be arranged before hand by the engineer.

CONDUCTORS: The material and size of the conductors shall comply with the bureau of the Indian standards and as per the provision of I.E. rules, 1956. all cables shall have the maker's name and identifications printed on the insulated surface. In case of dispute regarding make it is the responsibility of the contractor to prove that the material is original of the company.

MATERIALS: All materials, fittings, equipment and their accessories, appliances, etc, used in an electrical insulation shall confirm the bureau of India standard specification wherever they exist. Incase the Indian standard does not exist, the materials and other items shall be those approved by the competent authority. A list of approved materials for use in the electrical works is enclosed.

TESTS TO BE COMPLIED WITH: Before the installation is permanently put in to service the following test shall be complied with.

INSULATION RESISTANCE:

a) The insulation resistance shall be measured by applying between earth and the whole system of conductors or any section there of with all fuses in place and all switches on a direct current pressure of not less than twice the working pressure shall be deemed to be that which is maintained between the phase conductors and the neutral.

b) The insulation resistance of an installation measured as in above shall not be less than 1 mega ohm.

Lighting circuits shall be tested with all lamps in place except in the case of earthed concealed wiring system. Heating and power circuits may be tested, if desired with the heating and power appliances disconnected from the supply.

EARTH RESISTANCE: It is recommended that the value of any earth system shall not be more than 1 ohm unless other wise specified. Care should be taken select a material which is resistant to corrosion in the soil in which, it will be used. The electrode shall be kept free from paint, enamel and grease. The size of the earth continuity conductor should not be less than 14 S.W.G.(2.8.94sqm). earth resistively test shall be carried out in accordance with Indian standard code of practice for earthing.

FANS AND REGULATORS: All ceilings fans shall be wired to a ceiling rose and suspended from hook or shackle and insulated from the same. All joints in the suspension rod shall be screws and all joints or bolts in connection shall be additionally secured by means of split pins.

CONDIUT SYSTEM OF WIRING: The conduit shall be electrically continuous front distribution board to out let boxes of lighting switches and other appliances. The lengths of conduits shall be joined by means of screws sockets. Threads shall be free from grease or oil and no material of this nature shall be allowed to come in contact with the conductors. The whole system of the conduits shall be electrically continuous throughout and shall be permanently and efficiently connected to the earthing system.

EXCAVATION AND BACKFILL: All excavation and backfill including tempering, shorting and strutting required from the installation of the cable shall be carried out by the contractor in the accordance with the drawing and requirements laid down else where. Trenches will be filled in layer not exceeding 150mm. Each layer shall be properly rammed and consolidated before laying the next layer. The contractor shall restore all surface, road ways, side walks, curbs, wall or other worked out by excavation to their original condition, satisfactory to the departmental officers.

Prior to burying of cables, following tests shall carried out

Insulation test between phases, phase and earth for each length of cable before and after jointing. On completion of cable laying work, the following test shall be conducted in the presence of the departmental engineer.

(i) Insulation resistance test
(ii) Continuity test and
(iii) Earth test

MEDIUM VOLTAGE AND LOW VOLTAGE SWITCH GEAR PANEL BOARD:

The main panel board shall be floor mounted and totally enclosed. The design shall include all provisions for safety of operating and maintenance personal. The general construction shall confirm to appropriate Indian standard specifications. Cubical type switch board shall be fabricated out of sheet steel not less than 2.00mm thick. Such sheet steel member shall be stiffened by angle iron frame work. Unless other wise approved, incomer bus section panel or sections shall be separate and independent.

The general arrangement for multiplier construction shall be such that the horizontal bar framed present a pleasant and authentic look. The general arrangement shall be got approved before fabrication. All cable entries shall be through gland plates. Cable entry plates shall be sectionalized. The construction shall include necessary cable supports for crimping the cable allay or rear cable chamber. incomer termination shall be suitable for receiving busbar trunking. Busbar shall be firmly fixed on support constructed from a suitable inculting material which confirms to relevant Indian standards. The support shall be sufficiently robust to effectively with stand electromechanical stresses produced in the event of short circuit. The minimum clearance to be maintained for open and closed indoor air insulated busbars/ electrically iron exposed and working at system voltage up to 600volts shall be as follows:

BETWEEN	MAINCLERANCE
Phase to earth	26mm
Phase to phase	32mm

DISTRIBUTION:

Distribution boards shall be assembled, aligned and installed as per installation manual of the switch board supplier and relevant Indian standard specifications. Phase sequence for each incomer shall be tested and connections adjusted accordingly. A mechanical endurance test shall be carried out by closing and opening of the circuit breaker.

COMPLETION DRAWINGS:

At the completion of the work and before issuance of virtual completion contractor shall submit to the departmental officer five sets of layout drawings drawn at approved scale indicating the complete wiring system "as installed".

The drawings shall in particular give the following information.

- Run and size of conduits, inspection and junction boxes.
- Number and size of conductors in each circuit
- Location and rating of sockets and switches controlling the light and power out lets.
- Location and details of distribution boards, main switches and others particulars.
- A complete wiring diagram as installed and schematic diagram showing all connections in the complete electrical system.
- Instructions, maintenance and operation manuals if any for the equipments.
- Contractor should obtain necessary approval, from electrical inspectorate submitting necessary drawings test certificates etc.

1.1 SPECIAL CONDITIONS FOR THE ELECTRICAL WORKS (GENERAL)

The work shall be carried out strictly in conformity with (1) code of practice for electrical wiring and fittings in Govt. buildings (2) the Indian standard specification (3) the departmental specification, if the work carried out does not comply with the code of practice and departmental specifications and if the workmanship is unsatisfactory it will

be binding the contractor to redo the job without any extra cost and pay penalty as decided by the department. The work should be carried out under the direct supervision of persons holding a certificate of competency for the type of work involved.

After completion of work a plan of building should be prepared indicating the location of various main and sub-boards and all the fitting together with a circuit diagram duly numbered (in the diagram). The final bill will not be paid till the above and the diagram submitted and approved after verification.

The contractor will be responsible for any defects noticed for either improper work man ship or defective materials supplied by him for one calendar year from the date of final completion of work.

Lugs should be provided for all earth connections.

The contractor himself should arrange for the transportation of men and material to their work spot.

All civil works and patch works indicated for providing electrical installations should be well finished to the satisfaction of the civil authorities. A certificate from them should be obtained to the effect that the civil and patch work done is to the satisfaction civil authorities. It will be the responsibility of the electrical contractor to obtain such certificate from the civil engineer. Unless such certificate is produced this office will have right to with held the bill.

Concerting to the pole and providing independent earthing should be done in presence of departmental staff.

The distribution board with switch controls shall be separate in each floor for normal supply and essential supply.

The lighting circuits shall be provided with separate conductor to enable to connect the normal lighting and essential lighting with linking to any of the above system to ensure to switch over to essential supply in the order to have minimum to avoid inconvenience to the staff working.

The control for the luminary to be provided in the hall for both to be connected to the normal supply and essential supply shall be separate and away from the each system.

For the points to be connected to essential supply a separate conduit system is to be laid as enumerated in the above conditions includes circuit a main of any system.The location for the D.B's and switch controls for essential supply will be decided during the course of execution where the circuit conduit way have to be terminated.

Ceiling fans and other fittings will be supplied departmentally free of cost at divisional stores. And contractor has to make his own arrangements to transport the same to sit and fix in position.

1.2 LIST OF INDIAN STANDARDS FOR ELECTRICAL WORKS

Relevant Indian standards for the various materials to be used in electrical works as per specification:

Sl.No.		Description	IS.No. and as amended from time to time
A) LIST OF INDIAN STANDARDS			
I	**CABLES**		
	1	PVC insulated cables for working Voltage upto and including 1100 V	IS 694:1990
	2	PVC Insulated (heavy duty) electrical cables	IS 1554:1988
	3	11 KV XLPE cables	I S 7089-part-II
	4	Recommended current ratings for cables	IS 3961-1967
	5	PVC insulations and sheath of electric cables	IS 5831:1984
	6	Conductors for insulated electric cables & flexible cords (superceding IS 1753: 1967)	IS 8130:1984
II	**CONDUITS & ACCESSORIES AND JUNCTION BOXES**		
	1	Flexible PVC conduits for electrical wiring	IS 3480:1966
	2	Conduits for electrical installation: Part 1 General requirements	IS 9537-PI-1981
	3	Conduits for electrical installation: Part 2 PVC conduits	IS 9537-PII-1989
	4	Accessories for PVC conduits for electrical wiring	IS 3837-1976
	5	Adopters for PVCconduits	IS 4649:1968
III	**DOMESTIC SWITCHES SOCKETS**		
		Plugs and socket outlets (250V; 16A) : Specifications	IS 1293:2005
		Ceiling Roses – Specification	IS 371:1999

Sl.No.		Description	IS.No. and as amended from time to time
		Switches for domestic and similar purposes	IS 3854:1997
IV	**ELECTRICAL INSTALLATION**		
		code of practice for electrical wiring installation	IS 732:1989
		code of practice for earthing	IS 3043:1987
		Recommendations on safety procedures and practices in electrical work	IS 5216:1982
		Code of practice for Selection, installation and maintenance of fuses (Voltages not exceeding 650 V)	IS 3106-1996
		code for practice for interior illumination Part2	IS 3646:1966
		code of practice for lighting of public thoroughfares	IS 1944:1970
		Installation and maintenance of paper insulated power cables	IS 1155-1967
		Code of practice for use of structural steel in General building construction	IS:800
		Methods of testing uniformity of coating on zinc coated articles	IS:2633
		Code of practice for phosphate iron and steel	IS:6005
V	**LT PANEL BOARDS / LIGHTING PANELS**		
		Enclosed distribution fuse board and cutouts for voltage not exceeding 1000 V AC / 1200 V DC	IS 2675-1983
		Specifications for Low voltage switchgear and control gear for voltages not exceeding 1000 V. Part-1 General Rules (supercedes IS 4237 & IS 2147) Part-2 Circuit Breakers (supercedes IS 2516) Part-3 Switches, disconnectors (supercedes IS 4064) Part-4 Contractors, starters (supercedes IS 2959)	IS 13947:1993
		Part-5 Control circuit devises & switching elements (supercedes IS 6875 switches/ push button)	IS 13947:2004
		Code of practice for climate for climate proofing of electrical equipment	IS 3202:1965
		Electrical accessories- Circuit breaker for over current protection for house hold & similar installations (Miniature Air-bread circuit breakers for voltage not exceeding 1000V)	IS 8828:1996

Sl.No.		Description	IS.No. and as amended from time to time
		Current transformers	IS 2705:1992
		Low voltage fuses (upto 1000V) Supercedes IS 2208 & IS 9224	IS 13703:1993
		Wrought aluminium and aluminium alloy bars, rods, tubes and sections for electrical purposes	IS 5082: 1998
		Specifications for low voltage switch gear and control gear assemblies (i.e. Factory build assemblies of switchgear and control gear for voltages up to 1000 V)	IS 8623:1993
		Electrical measuring Instruments (Direct acting indicating analog instruments) & accessories	IS 1248:2003
		Danger notice plates	IS 2551:1982
		Guide for Marking insulated conductors (supercedes IS 375)	IS 5578-1984
		Guide for uniform system of marking & identification of conductors and apparatus terminals	IS 11353:1985
		Electrical relays for power systems protections	IS 3231:1986
		Voltage Transformers (part 1 to part 4)	IS 3156:1992
		Electricity meters induction type (for alternating current)	IS 722:1986
		Inter connecting Bus-bars for Voltage above 1KV	IS 8084-1976
VI	**LIGHTNING**		
		Code of practice for the Protection of buildings and allied structures against lightning	S 2309-1989
VII	**FIRE SAFETY**		
		Code of practice for Fire safety of buildings (General) Electrical Installation	IS 1646-1997
VIII	**LIGHTING FIXTURES AND ACCESSORIES**		
		General and safety requirements for electric Lighting fittings	IS 1913-1969
		Interior Illumination	IS 3636-1966
		tubular florescent lamps	IS: 2418:1977
		Bal lazes for use in florocent lighting fittings (part 1)	IS: 1534
		bi-pin lamp holders for tubular florocent lamps	IS: 3323
		capacitors for use in florocent lighting fittings	IS: 1569

Sl.No.		Description	IS.No. and as amended from time to time
		starters for florocent lamps	IS: 1522
		holders for starters for tubular florocent lamps	IS: 3324:1982
		specifications for decorative lighting out fits	IS: 5077
		high-pressure mercury vapour lamps	IS: 2183
		GLS lamps	IS: 416
		Bayonet lamp holders	IS 1258:2005
		dust proof electric lighting fittings	IS :4012
		dust tight electric lighting fittings	IS:4013
		specification for floodlights	IS: 1947
		Lighting public thorough fares	IS 1944-1970
		Luminaries for street lighting	IS 2149-1970
		Water tight electric lighting fittings	IS 3553-1966
		Waterproof electric lighting fitting	IS 3528-1966
		industrial lighting fittings	IS: 1777
		industrial lighting fitting with plastic reflectors	IS:3287
IX		**CEILING FANS**	
		Electrical ceiling type fans & regulators	IS 374-1979
X		**TRANSFORMERS**	IS 2026-1962
		Installation and commissioning of transformers	IS 1886-1967
XI		Onload **change over** switches	IS 4064-1978
		Tubular steel poles for overhead power lines	IS 2713:1980
		Mild Steel wire for General Engineering purpose	IS 280:2006

Standards for Electrical Equipment

1.3.1 Unless other wise stipulated in this specification, all equipment or material covered under this specifications shall be designed, manufactured and tested in accordance with the latest standards of Indian Standard's specifications.

1.3.2 All equipment shall conform to latest Indian electricity Rules, Indian electricity act and Indian Insurance rules as regard safety, earthing and other essential provisions specified in for installation and operation of electrical equipments.

1.3.2 Extreme care shall be taken to make enclosures for switch gears proof against rodents, lizards and other creeping vermin.

1.3.3. Continuity of power supply is to be given maximum consideration and the design of the equipment shall be such as to simplify inspection maintenance and testing at site. The design shall include all reasonable precautions and provisions for safety of operating personnel and maintenance personnel.

2.0 WIRING INSTALATION SCOPE

The scope under this section covers wiring installation comprising of

a) Lighting/Fan/Exhaust Fan/Circuit bell points.
b) Power circuits and Air Condition circuits.
c) Circuit wiring.

RECESSED CONDUIT WIRING SYSTEM WITH RIGID STEELCONDUIT

a) **Type and size of conduit:** All rigid non-metallic conduits shall conform to accepted standards and shall be used to corresponding accessories. Conduits shall provide adequate mechanical protection for the enclosed cables and the interior of the conduit shall be free from obstructions. No non-metallic conduit less than 20 mm in dia shall be used.

The number of insulated cables that can be drawn into rigid non-metallic conduits are given in the following table:

Size of table		SIZE OF CONDUITS, MM													
Normal cross Sectional area mm2	No, &nd diameter of wires Mm	16		20		25		32		40		50		63	
		Number of Cables, Max													
		S	B	S	B	S	B	S	B	S	B	S	B	S	B
1.0	1/1.12*	5	4	7	5	13	10	20	14	-	-	-	-	-	-
1.5	1/1.40	4	3	7	5	12	10	20	14	-	-	-	-	-	-
2.5	1/1.80 3/1.06	3	2	0	5	10	8	18	12	-	-	-	-	-	-
4.0	1/ 2.24 7/0.35	3	2	4	3	7	8	12	10	-	-	-	-	-	-

6.0	1/ 2.80 7/1.06*	2	-	3	2	6	5	10	3	-	-	-	-	-	-
10.0	11/3.55+ 7/1.40*	- -	2 -	- 2	5 -	4 4	3 3	7 6	- 5	- 8	- -	- -	- -	- -	- -
16.0	7/1.70	-	-	-	-	2	-	4	3	7	6	-	-	-	-
25.0	7/2.24	-	-	-	-	-	-	3	2	5	4	8	6	9	7
35.0	7/2.50	-	-	-	-	-	-	2	-	4	3	7	5	8	6
50.0	7/3.00+ 19/1.80	-	-	-	-	-	-	-	-	2	-	5	4	6	5

"*" for copper conductors only.

"+" for aluminum conductors only.

MS Conduits: Conduit pipe shall be finished with stove enamel surface. all conduit accessories shall be treaded type only and under no circumstances pin grip type or clamp type accessories be used. No steel conduits less than 16mm diameter shall be used. The number of insulated conductors that can be drawn into rigid steel conduits are given in the table.

b) **Bunching of cables:** Unless otherwise specified, insulated conductors of AC supply shall be bunched in separate conduits. For lighting and small power outlet circuits, phase segregation in separate conduits is recommended.

c) **Conduit Joints:** Conduits (metallic) shall be joined by means of screwed couplers and screwed accessories only. In long distance straight runs of conduit, inspection type boxes at reasonable intervals shall be provided. Cut ends of conduit pipes shall have no sharp edges nor any burrs left to avoid damage to the insulation of conductors while pulling them through such conduits.

d) Inspection type conduit fittings such as inspection boxes, deep boxes, bends, elbows and tees shall be so installed that they remain accessible for such purposes as withdrawal of existing cables or installation of additional cables.

e) Metallic switch board boxes shall be fabricated from **1.6mm** thick sheet metal of 16 gauge GI sheet and wooden switch board boxes shall be of Teakwood. The switch boards should be flush mounting type. The MS switch boards should be painted with two coats of red oxide and two coats of synthetic enamel paint of approved grade and make before fixing in position.

The switch boxes should be covered with **3mm** thick Decolum Hylum cover.

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

g) The conduits shall be fixed in chases by means of staples or saddles not more than **60 cms** apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing in of conductors. All threaded joints of rigid steel conduit shall be treated with some approved preservative compound to secure protection against rust.

h) Suitable inspection boxes shall be provided to permit periodical inspection and to facilitate removal of wires if necessary. Minimum size of inspection boxes shall be **75** x **75 mm**.

i) The M.S. switch board boxes, junction boxes etc., should be efficiently earthed with conduit by a suitable means of earth attachment.

j) When crossing through expansion joints in Buildings, the conduit section across the joint may be through flexible conduits of same size as the rigid conduit.

k) **Wires:** Wires shall comply with the following features.

- Annealed copper conductor, multi strand, PVC insulated, **1100** volts grade cables.
- The following colour coding shall be followed :-

Phase	-R	-	Red
Phase	-Y	-	Yellow
Phase	-B	-	Blue
Neutral		-	Black
Earth		-	Green

l) On each (lighting/Ceiling Fan/Exhaust Fan) circuit not more than 6 points or **800-1000** watts load should be connected. Example:- If on one of the switch boards there are only **4** switches to control **4** lights, other switch board another **3** switches to control lights etc, then for arriving at the circuit length, the shortest distance from circuit breaker in the MCB distribution board to the nearest switch board shall be considered. Inter connections between such switch boards shall be allowed by providing same wires as are used for light points and no measurement in circuit wiring is allowed for such inter connections. A separate conduit pipe has to be provided for running circuit mains and the conduits for light points shall never be used for the same.

For **5** Amps **3** pin on separate board the circuit measurement to first nearest **5** Amps **3** pin socket is considered. No measurement will be separately considered for looping of switch boards in circuit wiring.

m) The mounting height of switch boards (bottom of MS Box) shall be **4'6"** from finished floor level.

The **5** Amps/**15** Amps **3** pin sockets with shutter protection shall be at 1 mtr. Level (or skirting level).

Wiring for power circuits i.e., **15** Amps **3** pin and AC points shall be provided in separate conduit pipes.

n) Neat holes shall be punched on MS Switch Board Boxes for conduit pipe entries. Rough, burred holes with chisel shall be avoided. Conduit pipes to be fixed to MS Switch Board Boxes, MCB Distribution Boards etc., by providing (double chack)check nut arrangement. Before drawing of PVC insulated cables inside the conduits, ebonite/ nylon bushes to be provided at conduit ends in order to avoid damage to cables during drawing.

o) **3mm** thick Hylum / Decolum covers provided on Switch Boards should be fixed to switch boards by providing brass coated screws and plated cup washers.

p) Any loose holes on Switch Board boxes and Distribution Boards shall be properly closed, so as to prevent entry of lizards etc.

q) Whenever cables of size 2.5 sq.mm /**6.0** Sq.m and above are connected inside switch, socket or MCB, metallic plug point etc, proper type and size of lugs to be crimped to cable leads before making the permanent connection in switches etc.

r) Telephone/intercom cables shall not be laid in the same conduit where electric lighting/power cables are drawn. Separate conduit pipes to be used for drawing of telephone/intercom cables.

s) Loose joints with PVC insulation shall be avoided. Wherever possible joints of cables shall be avoided. If found necessary proper type and size of connectors shall be used.

t) The drop of voltage between the main switch/distant. Terminals and the farthest current consuming apparatus shall not exceed **2%** with all devices switched on.

Testing

The entire installation shall be tested for

a) Insulation Resistance

b) Earth continuity

c) Polarity of single pole switches

Tests shall be conducted in the presence of Site Engineer. Test results to be tabulated and submitted to the site engineer.

3.0 MCB DISTRIBUTION BOARDS, MCB'S AND ELCB'S

Scope

The scope under this section covers installation comprising.

a) Low voltage distribution boards

Details

a) The Distribution Boards shall have vermin, dust, rust proof painting done by powder coating process.

b) The cables entering the D. Board should be properly bunched and dressed before making connection in MCB's.

c) Cable glands shall be provided wherever armoured cables are connected to switches.

d) Cable leads shall be provided with proper type and size of lugs crimped to eads before making permanent connection inside MCB's, RCCB's etc.

e) Permanent circuit identification shall be provided on the distribution boards.

f) The mounting height of MCB distribution boards etc., (bottom line) shall be **6'-6"** from finished floor level.

4. CABLES

4.1 Scope: The scope under this section covers Power cables

4.2 Standards

A	Specification for conductors for insulated electric cables	IS:**8130** -
B	Specification for Armoured/ unarmoured power cables	IS:**1554**-Part I
C	Recommended current ratings for cables	IS:**3961** -
D	Specifications for PVC insulation and sheathing of electric cables	IS:**5831-1984**

4.3 General requirements for cables

a) Cables should be stranded aluminium conductors for **6mm** and above.

b) L.V. cables shall be **1100** Volts grade.

c) Cables shall have colour coded insulation.

d) PVC inner and outer sheathing shall be applied by extrusion.

e) Steel armouring between inner and outer sheathing.

f) The PVC insulation and sheathing shall confirm to IS:**5831-1984.**

g) The armouring for cables up to **16mm²** shall be of round steel wire and that above **16mm²** shall be of galvanized steel strings.

4.4 Laying of Cables

a) Cables if laid underground shall be at a depth of not less than **60** Cms., in a trench. Sand filling shall be provided at the bottom of trench before laying the cable. Bricks shall be provided on either side of the laid cable. Sand filling shall be done to cover the cable laid. Bricks shall be provided on the top. Earth filling shall be done.

   M.S. cable identification tags, route indicators embedded in C.C. are to be provided at every 8 meters length of cable laid.

b) Hume pipe, trenches/tunnels with proper pre-cast slabs to withstand wear and tear of vehicular traffic shall be provided at road crossings.

c) Cables if laid in the air shall be laid on cable trays and shall be properly clamped to the trays by plated MS. saddles at proper intervals. Cables shall be properly dressed before fixing on the cable trays.

d) Extra cable loops of minimum **500 mm** shall be provided at each end of cables laid.

e) Cables shall be bent to a radius of **20** times the diameter of the cable with a minimum of **10** times diameter at restricted space.

f) Control/Telephone cables shall be laid away from power cables on separate cable trays.

4.5 Testing:

Manufacturers test report shall be submitted for tests on cables in accordance with Indian standards specifications.

Cables shall be tested after installation before commissioning by using 1000 Volts Megger and the following readings shall be obtained and tabulated.

- Continuity on all conductors
- Insulation Resistance a) between conductors
  b) all conductors and ground

The tests shall be conducted in the presence of Site Engineer and results submitted.

5 CABLE TRAYS, RACE WAYS AND ACCESSORIES:

5.1 Scope

The scope covers MS Race ways/cable trays accessories.

5.2 Standards : (IS. specifications shall be adhered to)

5.3 Specifications

Material: Hot rolled plain sheets of tested quality "O" grade as per IS **1079.**
Thickness of material: **2.0 mm**
Cable loading on tray: **50** Kg/MTR
Span between cable tray supports: **1.5** meters to **2.0** Mtrs.
Surface finish: Hot dip galvanising iron as per IS **2629,** minimum **70** microns thickness

Length of cable trays: **2.5** Meters
Width of Cable trays: (outside to outside width to be taken)

a) Ladder type - Bolted/welded construction 150/**300** mm/450mm/ (depending on number of cables to be laid)

b) Perforated cable trays (Same as above)

5.4 Sizes of Cable Trays:

a) Ladder type - Bolted/welded construction Side rail

* Flange width **15** mm
* Depth **75** mm
* Two coupler holes of **10**mm diameter required on each side of side rail
* Rungs
* Channel section: **20** x **40** x **20** mm
* Slot size on rungs: **20** x **10** mm (oblong holes)
* Interval between rungs not more than **250m**m

b) Perforated type construction

* Flange width : **30**mm
* Slot size : **20** x **10** mm (oblong)

5.5 Sizes of Coupler Plates:

a) Ladder type - Bolted/welded construction
Size: **90** x **45** mm
Thickness of material: **2/2.5** mm
Slot size: **20** x **10**mm oblong holes - Two numbers
Round holes **10**mm diameter Two numbers
Finish: Hot dip galvanised as per IS:**2629**

b) Perforated type construction:
Size: **210**mm x **25**mm
Thickness of material: **3**mm
Slot size: Oblong holes **20** x **10** mm - **2** numbers
Round holes **10**mm diameter - Two numbers
Finish: Hot dip galvanised as per IS:**2629**

5.6 Hardware for coupler plate: (Electro galvanised)

a) Hexagonal Head Bolts - **4** Nos.
b) Plain washers **- 8** Nos.
c) Hexagonal nuts - **4** Nos.
Number of coupler plates per cable tray - Two numbers.

5.7 Cable tray Accessories:

Material: Hot rolled plain sheets of tested quality "O" grade as per IS: **1079**

Finish: Hot dip galvanised as per IS:**2629**

Minimum bending Radius - **450**mm

Tees, Horizontal/vertical elbows, cross and reducers for both ladder type - welded/bolted and perforated construction shall be as per standard manufacturers drawings.

5.8 Erection

Cable trays shall be erected on walls, trenches (if necessary) by **drilling holes in the wall by power drilling machine**. Cable Tray shall be fixed to wall by providing proper size Anchor expandable type bolt and nut arrangement.

Proper type of cable tray accessories shall be selected depending on the site condition.

5.9 Scope

The scope covers MS POWDER COTED Race ways, race way accessories.

5.10 Standards : (IS. specifications shall be adhered to)

5.11 Specifications

Material: Hot rolled plain sheets of tested quality "O" grade as per IS **1079** with powder coated.
Thickness of material: **2.0 mm**
Surface finish: Hot dip galvanizing iron as per IS **2629,** minimum **70** microns thickness with gray color powder coating

Length of race way: **2.5** Meters
Width of Cable trays: (outside to outside width to be taken)

a) Race way - Bolted/welded construction 60x40/150x40/**300** x40mm/450mm/600mm (depending on number of cables to be laid)

5.12 Sizes of race way:

* Depth **40** mm
* Two coupler holes of **10**mm diameter required on each side of side rail
* Rungs

5.13 Sizes of junction boxes:

Bolted/welded construction
Size: **100x50x100x100x50x200**
Thickness of material: **2.5** mm
Finish: Hot dip galvanised as per IS:**2629** with POWDER COATED

b) JUNCTION BOX COVERS:
MATIRIAL: **SS PLATES**
Thickness of material: **3**mm

6.0 CABLE TERMINATION:

Cable gland body shall be made of brass castings and machined to final size. The general construction of the glands should be as per standard manufacturer's drawings. It mainly consists

a) Compression Nut - Brass - 1 No.
b) Gland body with Hexagonal head - Brass - 1 No.
c) Rubber Ring - Rubber - 1 No.
d) Brass washers - Brass - 3 Nos.
e) Check nuts - Brass - 1 No.

Metal parts of the gland shall be free from blow holes and surface shall be machined smoothly.

All edges shall be debarred and then nickel plated wherever necessary. The cable glands shall be of single compression type.

6.2 HT CABLE TERMINATION KIT

11KV cable and termination kits shall be suitable for XLPE insulated armoured cable. Cable end termination shall be of heat shrinkable nonflammable type suitable for indoor/outdoor applications.

The termination shall be of non-tracking and weather resistant type having stress control sleeve and copper braided for earthing.

The out-door termination shall have rain sheds while indoor termination shall be provided with terminal bolts.

The termination kits shall be complete with all accessories and consumables.

6.3 L.T.CABLE TERMINATION ACCESSORIES

Termination of 1.1KV grade power and control cables shall be carried out with single compression SIBG type brass cable glands and crimping type tinned copper lugs. The type of lug shall suit the terminals provided.

7.0 L.T. PANEL BOARDS

7.1 Scope

The Scope covers the requirement of designs, construction, assembly, testing, Supply and installation of Panel Boards.

7.2 Standards:

IS:13947 - Specification for low-voltage switch gear and control gear

Part -1 General rules (supercedes IS 4237 & IS 2147)

Part -2 Circuit breaker (supercedes IS 2516)

Part-3 Switches, disconnectors (supercedes IS 4064)

Part-4 Contractors, motor-starters (Supercedes IS 2959)

Part-5 Control circuit devises & switching elements (supercedes IS 6875)

IS:13703 - Low Voltage fuses (supercedes IS:**9224 & IS 2208)**

IS:**2705** - Current Transformers

IS:**1248** – Indicating Instruments

IS 5578 - Guide for Marking insulated conductors (superceding IS 375)

IS 11353 - Guide for uniform system of marking & identification of conductors and apparatus terminals

IS:**3156** - Voltage Transformers

IS:**3231** - Relays

IS:**722** - Integrating Information

IS:**8623** - Factory Built Assemblies of switch gear and control gear.

7.3 CONSTRUCTION:

The panel board shall be:

i) of the metal enclosed, indoor, floor mounted, free standing type.

ii) be made up of the requisite vertical sections, which, when coupled together shall form continuous dead front switchboards.

iii) provide dust and damp protection, the degree of protection being no less than IP, **51** to IS. **2147**.

iv) be readily extensible on both sides by the addition of vertical sections after removal of the end covers.

7.3.1 The panel boards shall be constructed only of materials capable of withstanding the mechanical, electrical and thermal stresses, as well as the effects of humidity, which are likely to be encountered in normal service.

7.3.2 Each vertical section shall comprise:

i) A front framed structure of rolled/folded sheet steel channel section, of minimum **2** mm thickness, rigidly bolted together. This structure shall house the components contributing on the major weight of the equipment, such as circuit breaker fuse switch units, main horizontal busbars, vertical risers and other front mounted accessories.

The structure shall be mounted on a rigid base frame of folded sheet steel of minimum **2mm** thickness and **100mm** height. The design shall ensure that the weight of the components is adequately supported without deformation or loss of alignment during transit or during operation.

ii) A cable chamber housing the cable and connections, and power/control cable terminations. The design shall ensure generous availability of space for ease of installation and maintenance of cabling, and adequate safety for working in one vertical section without coming into accidental contact with live parts in an adjacent section.

iii) Front and rear doors fitted with dust excluding neoprene gaskets with fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors, generous overlap shall be assured between sheet steel surface with closely spaced fasteners to prelude the entry of dust.

7.3.3 The height of the panel should not be more than **2400** mm. The total depth of the panel should be adequate to cater for proper cabling space.

7.3.4 Doors and covers shall be minimum 2.0/ **1.5**mm thick sheet steel. Sheet steel shrouds and partitions shall be of minimum **1.5**mm thickness. All sheet steel work forming the exterior of switch boards shall be smoothly finished, levelled and free from flaws. The corners should be rounded.

7.3.5 The apparatus and circuits in the panel boards shall be so arranged as to facilitate their operation and maintenance and at the same time to ensure the necessary degree of safety.

7.3.6 Apparatus forming part of the panel boards shall have the following minimum clearances:

i) Between phases - **25** mm

ii) Between phases and earth - **25** mm

iii) Between phases and earth - **25** mm

iv) Between neutral and earth - **19** mm

When, for any reason, the above clearances are not available, suitable insulation shall be provided. Clearances shall be maintained during normal service conditions.

Creepage distances shall comply to those specified in relevant standards.

7.3.7 All insulating material used in the construction of the equipment shall be of non-hygroscopic material, duly treated to withstand the effects of high humidity, high temperature tropical ambient service conditions.

7.3.8 Functional units such as circuit breakers and fuse switches shall be arranged in multi-tier formation, except that not more than two air circuit breakers shall be housed in a single vertical section.

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

i) Main busbars and vertical risers during operation, inspection or maintenance of functional units and front mounted accessories.

ii) Cable terminations of one functional unit, when working on those of adjacent unit/units.

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

7.3.11 Provision shall be made for permanently earthing the frames and other metal parts of the switch gears by two independent connections.

7.4 METAL TREATMENT AND FINISH:

7.4.1 All steelwork used in the construction of the switchboards, should have undergone a rigorous metal treatment process as follows: (Seven tank process.)

i) Effective cleaning by hot alkaline degreasing solution followed by cold water rinsing to remove traces of alkaline solution.

ii) Pickling in dilute sulphuric acid to remove oxide scales and rust formation, if any, followed by cold water rinsing to remove traces of acidic solution.

iii) A recognised phosphating process to facilitate durable coating of the paint on the metal surface and also to prevent the spread of rusting in the event of the paint film being mechanically damaged. This again, shall be followed by hot water rinsing to remove traces of phosphate solution.

iv) Passivating in de-oxalite solution to retain and augment the effects of phosphating.

v) Drying with compressed air in a dust free atmosphere.

vi) Primer coating with two coats of a highly corrosion resistant primer, applied wet on wet & stove dried under strictly controlled conditions of temperature and time.

vii) A finishing coat of stoving synthetic enamel paint to the specified shade of IS.**5.** The total thickness of paint should not be less than **15** to **20** microns.

7.5 BUS BARS:

7.5.1 The busbars shall be air insulated and made of high conductivity, high strength aluminium alloy complying with the requirements of grade E91 of IS 5082.

7.5.2 The busbars shall be suitably braced with non-hygroscopic SMC supports to provide as through fault withstand capacity of **50** KA RMS symmetrical for one second and a peak short circuit withstand of **105** KA minimum. The neutral as well as the earth bar should also be capable of withstanding the above fault level. Ridges shall be provided on the SMC supports to prevent trackling between adjacent bus bars.

7.5.3 Large clearances and creepage distance shall be provided on the busbars system to minimise the possibility of a fault.

7.5.4 High tensile bolts and spring washers shall be provided at all busbar joints.

7.5.5 The cross sections of the busbars risers for various ratings shall have been decided on the basis of temperature raise tests carried out under conditions closely similar to actual service conditions. For a total operating temperature of **110** deg. C. at an ambient of **40** deg. at the standard current ratings and corresponding cross sections of the main busbars should be such that the bus bar shall carry **1** Amp. per Sq.mm.

7.5.6 The main phase busbars shall have continuous current rating throughout the length and the neutral busbars shall have a continuous rating of atleast 50% of the phase busbars.

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

7.5.8 Busbars shall be colour coded for easy identification of individual phases and neutral.

7.5.9 The busbars shall be suitably supported with epoxy resin mould insulators.

Earthing bus bar connections etc. should be to IS standards with 25 x 6mm GI earth bar and Two terminals, externally accessible.

7.5.10 Microprocessor based electrical energy analyzer

The instrument shall be able to offer readings of electrical parameters like voltage, current, KWhr, KVARH, power factor, frequency, maximum demand harmonics etc. through microprocessor based energy analyzer. The instrument shall also provide prior alarm / trip signal incase the maximum demand increases or there is low power factor in the circuit. The analyzer shall also be provided with RS 485 serial output port which can be interfaced with personnel computer. The instrument shall be provided with suitable clipon type of current transformers standards. The analyzer shall correspond to international standards EN 55081 - 4

Technical Specifications:

Voltmeter input	Range from 1 volt to 500 V R.M.S Max. non destructive input 675 V R.M.S
Ammeter input	Range from 20Milli. Amps R.M.S. maximum 5A R.M.S
Power supply	Voltage - alternating - 230 V. R.M.S at 50 Hzs. With tolerance direct current 24 or 28 V D.C.
Instrument input power	3 V A
Working Temperature	0 to 45 ^{o} C
Relative humidity	50 % at 40^{o} C
Approved makes:	"DIRIS" system of "SOCOMEC" or Neptuhe DUCATI or ENERCON

7.5.11 Automatic power factor correction panel shall comprise of

1) Automatic power factor control relay
2) Capacitor bank
3) Contactors

1. **Automatic power factor correction relay**:

The above relay shall be of 6 steps having LED display with CT operated microprocessor control having provision for measurement of KW, KVAR, load current , voltage. The relay shall also be provided with over voltages and temperatures etc.

2. **Capacitor Bank**:

The capacitor bank shall be of mixed dielectric type having long life, modular in design. The capacitor shall be provided with in rush current coil for protection against current surges.

3. **Contactors:**

The contactors shall have suitable built-in résistance to switch 3 phase capacitor banks. The contactors shall eliminate additional inductances in the switching circuits. The contactors shall be designed to work at temperature less than 70 ^{0} C ambient. The contactor shall operate at 50 HZs and 230 V .

Details of capacitor bank contactors and protection fuses

Size of Capacitor	Contactor rating	AUXILLARY CONTACT ARRANGEMENT		Protection MCB Size
KVAR	AMPS	NOR-OPEN	NOR-CLOSE	AMPS
5	25	**1**	**1**	32
10	25	1	1	32
15	32	1	1	32
20	45	1	1	63
20	45	1	1	63
20	45	1	1	63

The micro processor based power factor correction relay, the capacitor bank, contactors and protection fuses shall be housed in floor mounted dust, rust and vermin proof , free standing panel. Fabricated from 2mm thick CRCA sheets. The panel shall have 20 x 3mm GI earth strip. The panel shall be provided with ambient temperature controlled thermostat with exhaust fan arrangement. The panel shall be painted by seven tank and powder coating process with paint of approved shade. The panel shall have the following.

Incomer - MCCB - 1 No

Bus Bars- Aluminium bus bars ---A / phase rating - 1 Set

Current transformer - ---/5 A ratio class I accuracy 15 Volt Amp 1 Set

.Control transformer- to convert 3 phase to single phase - 1 Set

Automatic power factor corrections relay, capacitors banks,
Capacitor duty contactors and protection fuses as per above
Detailed specifications - 1 Set

Push button stations for manual ON/OFF off individual Capacitors bank - 1 Set

Auto / manual selector switch for bypassing the APFC relay And operate the panel manually - 1 Set

Indicating lamps for indication of 3 phases and manual Operation of capacitor bank - 1 Set

Copper control cables of suitable size for inter connections - 1 Set

7.6 Tests:

The panel Board shall be inspected as per relevant standards in presence of the Site Engineer and shall include.

a) High voltage test

b) Insulation test

c) Constructional and safety features

7.7 Name Plates:

Main name plates shall be fixed at the top centre. Name plate giving feeder detail shall be provided and are to be fixed by screws.

8.0 Earth Electrodes:

8.1 Scope:

The scope included both pipe earth electrodes and plate earth electrodes.,

8.2 Standards:

IS: 3043 - Code of practice for earthing.

Construction:

Pipe Earth Electrode: GI pipe shall not be less than 38mm dia meter and 3.5m long. It shall be buried vertically into the earth pit with the top not less than 1.25m below ground level. The GI pipe should be "B" class type.

8.3 Plate Earth Electrode:

Plate shall be 600 x 600 x 3.15mm copper buried in the earth with faces vertical and top shall not be less than 1.5m below ground level.

The electrode shall be surmounted by alternate layers of charcoal or coke and salt or gypsum or bentonite. The electrode should have watering arrangement with 20mm "B" class GI pipe fixed to copper plate and with a funnel with mesh cover at the throat shall be provided. The funnel has to be housed with masonry chamber or inner size 300 x 300mm with CI hinged cover. Lockable type with CI frame embedded in

masonry to be provided on the top. The whole earthing electrode should be as per IS:3043-1966 or latest revision.

8.4 General:

All exposed metal parts such as DBs and enclosures, metal clad switch enclosures, lamp brackets, MS switch boxes etc., shall be properly earthed , by connecting them to the earth electrode, by means of single cored copper wire, GI / copper bare wire or flat of approved size, in order to pass the fault current, safely, to earth in case of leakage earth the apparatus or in the system.

DBs should have 2 x 10 SWG copper wire. Loop earthing of main DBs etc, is with two 25 x 3mm GI tapes.

Light / fan point earthing is by 3 / 20 insulated copper cable run inside the conduit (Green colour).

Earth tape bus for machinery where required, should be run on the nearest wall, in duplicate. Adequate holes should be drilled to take the twin connections to each mortar / machine / board.

8.4.1 Tests:

The resistance of earth electrode shall be less than 5 Ohms.

8.5 Electricity Regulations

The installation shall generally comply with the stipulation of I.E. Act 1910 & I.E. Rules 1956 as amended from the time to time (i.e.) Regulations and supplementary regulations of Electricity Board.

8.5.2 SPECIFICATION FOR ELECTRICAL EQUIPMENT

All equipment and materials shall confirm to relevant IS specifications. Where specifications do not exist or the materials specified by the Consultant do not comply with the IS specification, the same shall be procured with prior approval of the Consultant/client.

8.5.3 11KV 400A GROUP OPERATED DISCONNECTING SWITCH

11KV Group Operated Disconnector shall be horizontal mounting, with Titling vertical disconnecting type switch suitable to operate on a system voltage of 11KV.

The constructional features of the GOS shall be as follows:

a. The GOS shall be a triple pole unit with a continuos current carrying capacity of 200A.

b. GOS shall incorporate spring loaded high pressure, high thermal capacity silver plated contacts.

c. The blades shall be hard drawn electrolytic grade copper or gunmetal of appropriate cross section duly silver-plated.

d. The GOS shall incorporate metal arcing horns. The arcing horns shall close

before the main contacts and open after the main contacts.

e. It shall be possible to adjust the alignment and travel of contacts at site without requiring precision tools and other gadgets.

f. All steel parts shall be hot dip galvanised.

g. The phase inter connecting rod shall have a minimum length of 2 meters and the operating rod connecting the GOS and the operating handle shall be of 5 Mtr. length. It shall be possible to adjust the lengths at site to suit mounting height.

h. The GOS shall be of 9-insulator type. The insulators shall be of glazed porcelain.

9.0 EXTERNAL ELECTRIFICATIONS WORKS

9.1 Underground Cables:

i) Medium and low pressure:

Cables should be double steel tape armoured over lead covering and paper insulated or PVC insulated as specified in the schedule of work. All repair joints of cables should be in joint boxes and filling in of the compound shall be done as per IS specifications using best quality materials. All accessories and other materials should conform to I.S. Specification. The jointing work should be carried out by a competent authorized cable jointer. The cables shall be 1100 V grade.

ii) Trench:

Trenches shall not be less than 45 cm wide and 60cm below ground level. Wherever necessary, suitable propping and storing may be done to avoid caving in of the adjoining trench walls. Where the cables cross other services lines adequate protection should be taken to prevent accidental exposure and/or damage to the cables.

iii) Spacing between cables:

Where more than one cable is laid in the same trench the actual space between the cables should normally be 23 cm apart leaving a clear distance of 15cm from the cable and the trench walls.

iv) Laying of cables:

Before the cables are laid, a layer of 3" sand base is to be provided for purposes of cushioning. The cables after being uncoiled and laid into the trench from the rollers should be drawn in straight length. After the cable is laid, it is to be covered with another layer of sand of about 15cm in depth, and the top surface is to be suitably levelled to received the cable covers which may be of second class bricks or tiles and laid in such manner as to overlap the cables on either sides by at least 5cm. Cable markers of aluminium or G.I. shall be provided at concrete blocks of 3/20cm x 20cm x 5cm and spaced at distance of about 30cm from center to center and at every change in direction. Cables may also be laid in tier formation in the same trench in this case also

after the 1st 3 inches of sand cushion, the first tier of cable is laid and sand filled in the trench to form a bed of 23cm above this tier. After this the second cable is laid and the process repeated, the top most tier being at least 45cm below the Ground level. The top cable shall be suitably covered with bricks or tiles. When laying cables, care should be taken to see that the paper insulated cables are bent/straightened slowly, sharp radii being avoided. The minimum safe bending radius for single core cables is 20 diameters and for multicore cables 10 dia meters and for armoured cables 12 diameters, the diameter being the overall diameter of the cable. Where the cables are required to cross roads they should be normally taken through sleeve pipes at least 10cm in diameter which may be either stone ware, steel or spun reinforced concrete. For more than one cable the diameter should not be less than 15cm. Steel pipes shall be used where it is not possible to obtain sufficient depth to withstand impact from traffic.

v) Cable inside building:

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

vi) Hume Pipes

Wherever cables crossing roads, passages Hume pipes of suitable diameter shall be provided across the road including Civil works of digging, laying of Hume pipes upto a depth of 1 metre and refilling the trench. This shall be properly laid to cover the entire road so as to protect the cables against damage of passing Heavy Vehicles.

vii) Testing the 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. Cables of 1.1 KV suitable for low and medium voltage should with stand for 15 minutes, 300 volts D.C. current applied between the conductors and between each conductor and sheath. In absence of high pressure testing equipment it is sufficient to test for 1 minute with 1000 volts. If the test results are found to be not satisfactory the contractors shall arrange to replace without any extra cost including removal of rejected materials, Re-laying etc.

viii) Cable laying & termination shall confirm to IS 1255

ix) Earthing of cables and cable glands shall confirm to IS 3043

x) The cable length given in bill of quantities are approximate and the contractor has to measure exact length of cables to be laid before commencement of work in presence of engineer in charge and give the sizes and quantities required to the engineer in charge to take further action by the engineer in charge. The measurements after laying cables are also to be taken jointly by contractor.

9.2 Over head lines

This specification of over head line covers installation, testing and commissioning of over head lines distribution lines upto including 11 KV lines, service connections and street lighting works.

1) **Materials** : Supports for over head lines and for street lights shall be any of the following types or as specified by Engineer in charge and shall be of adequate strength confirming in all respects to Rule 76 of Indian electricity rules.

Steel tubular poles: This shall conform IS 2713-1964. This shall be seamless/sawaged and welded type as specified and shall be in time stepped sections. Unless other wire specified $1/6^{th}$ from the base length of the pole plus 15cm be coated with black bitumen paint both internally and externally. The remaining portion of the pole shall be painted with one coat of red oxide on its external surface. The pole shall be complete with cap and base plate.

Steel poles (RSJ Joists): These shall be 1 section steel rolled poles confirming to IS standards and Medium weight. The height of the pole shall not be less than 9mts and the pole shall be fixed below ground level not less than 1.5 mts.. The size of overhead line steel RS Joist pole shall be concreted in 1:3:6 cement concrete and painted as per steel tubular poles given above.

Prestressed Cement Concrete Poles (PSCC): PSCC poles shall be of 8.0 Mts./ 9.0 Mts. Height and shall confirm to standards of APTRANSCo. / APDISCo.

'D' Iron Clamps: Where so specified in the contract conductors shall be spaced vertically supported on shackle which are attached to the pole by means of 'D'shaped clamps made of M.S. flats of size not less than 50x6mm and galvanized set the dimensions of 'D' shall be such as to hold 75 mm high and 90 mm dia (minimum size) shackle insulators. The 'D' iron clamp shall be compete with pole clamp with necessary bolts nuts and washers and bolts holes. Clamps shall also provided for pin insulators as in case of vertical formation.

G.I. Strap : Where 'D' iron clamps are not specified, a pair of strap plates of galvanized iron of size 40mm x 3mm and length of 23cms shall be used with shackle insulators. The pole clamp shall be treated with one coat of red oxide primer before erection and finished with two coats of approved paint after erection along with other hardware as specified. The nuts, bolts, for pole clamp shall be of G.I./Cadmium passicated/ galvanized.

Stay/Strut Set : A stay set shall consist of stay rod, anchor plate, bow tightener or turn buckle, thimble, stay wire, and strain insulator. The stay rod shall be with stay grip in case of turn buckle is used instead of bow tightener. The stay wire shall be either 7/4.00mm dia or 7.3.15mm dia. G.I. as specified in the contract confirming to IS 2141 – 1968 grade. The anchor plate shall be of M.S. galvanized and not less than 30cms x 30cms x 6.4mm thick and size of stay rod shall be not less than 1.8 m (6 feet) long and 19mm dia.

Insulator: Porcelain insulator shall conform to IS 1445 –1966 suitable for over head lines for power lines below 1000 V and IS 731-1971 for overhead power lines greater than 1000V. This shall be vitreous throughout and non absorbent. The exposed surface shall be glazed. Insulator shall have adequate mechanical strength high degree of resistance to electrical puncture and resistance to climatic and atmospheric attack. The insulator shall be of the following types as specified.

a) Pin and shackle insulators for L.T. and MV lines.

b) Pin and disc type for HV lines.

The minimum size of shackle insulators shall be 65mm dia 100mm high. The pin insulators shall be suitable for 12mm cordeam thread and shall be complete with GI. Pin, nuts, and washers.

Binding Materials: Binding of conductors with the insulators shall be done with 12 SWG soft/ aluminum conductor.

Guard wire: Guard wire shall be G.I. It shall have minimum breaking strength of 635 kg in accordance with Rule 38 of I.E. Rule. It shall also be sufficient current carrying capacity to ensure rendering of guard line.

Earth wire: The size of the continuous earth wire shall not be less than SSWG.G.I.

Section Stay: A stay shall be provided at all angle or terminal poles. The stay rod with the anchor plate shall be embedded in cement concrete 1:3:6(1 Cement:3 coarse:6 graded stone) and not less than 0.28 cum content in such away to prevent uprooting of the stay rod. The stay wire shall also be connected and bounded properly to the continuous earth wire. Double stays shall be provided at the all dead ends of the pole.

Jumpers: While stringing conductors as sufficient length be kept at shackle termination for making jumpers.

Guarding: All road crossing, crossings, of overhead lines, and between HV & LV lines carried on the same support guard shall be provided. The guard wires shall be bonded to earth wire Cage guard shall be provided for distribution lines of vertical configuration.

9.3 Lightening Arrestors

Lightening arrestors shall confirm to IS 3070 - 1965 part I and IS - 3070 - 1966 part-II as applicable. The lightening arrestors system shall confirm to Rule 92 of IE Rule.

9.4 Service Connection by Underground Cables:

The service cables from an overhead distribution live shall be fixed to the support with 2 No’s of clamp of M.S. flat size 50mm x 6mm. This shall be protected upto a height of 3m from ground level by a G.I. pipe of adequate size clamped to the support with 2 No’s of flats of size 50mm x 6mm. The cable shall be laid through pipes while crossing roads, pavements, masonry etc.

9.5 ACSR Conductors

Conductors shall be of the following types.

Aluminium conductor steel reinforced (ACSR) This shall comply with the requirements of I.S. 398 - 1961.

The physical and electrical properties of the above conductors shall be in accordance with the specifications as per IS. These conductors shall have a breaking strength of not less than 350kg.

Necessary precautions during storage and handling shall be taken to avoid damage to the conductors.

9.6 Transformers

The transformers required are intended for use in distribution of power and lighting. The 11 KV / 433 volts Transformer required for feeding lighting, pumps, Air conditioning, lifts etc.
The transformers shall be distribution type out door used complete with oil filled H.T brushing, L.T. cable end box receive suitable size confirming to IS2026
The transformers shall be designed and manufactured and tested as per IS 2026.
The transformers winding shall be of copper/aluminium winding as specified.
The transformer shall be adequately designed and effectively cooled to ensure its working on full load conditions continuously under short time over load conditions.
The design of core should ensure stability and reduce to a minimum the transformer excitation current and eddy current losses.

The core shall be provided with lugs suitable for lifting the complete core and coil assembly of the transformer.
The transformer coils shall be made of high conductivity copper and insulated with paper of dielectric strength and allow ageing characteristics. The Insulation of the coils shall be treated with suitable insulating material like varnish is to develop full electrical strength of the windings.
The tap changing arrangement shall be provided on the H.T side. The tap changer shall be ON / OFF load type. The tap changing switch shall be mechanically coupled to the external operating handle and the operating handle shall be carried through on oil tight gland on the tank side. A register plate clearly indicating the tapping in use shall be fixed to the external operating mechanism and provision shall be made for securing and padlocking the switch in any of the working position and to ensure that contacts are fully engaged before the transformer is energised. The range of ON / OFF Load tap change shall be $\pm$2 ½ % to $\pm$ 5%.

i) Bushing
The Bushing Insulators of the transformers shall be of sufficient creepage length and shall be unaffected by atmospheric conditions due to weather, fumes, alkalies at site.

ii) Insulating oil
Sufficient oil shall be supplied for first filling. The oil shall comply in all respects with pro IS.335.

All accessories like drain valve, oil filling valve, filter valve, oil sampling valve, pressure relief device, oil level indicator, indicating thermometer (dial type) earthing terminal, bi-directional rollers . Exhaust vent, eye bolts, lugs, Diagram and rating plate.

10.0 Testing

All panel boards, switch boards, transformers, over head lines, cables, switches, main switch boards, shall be properly tested with meggar, test lamps for voltage, Insulation, and values shall be submitted to site electrical Engineer before commissioning pressure test of approximate standard shall be carried out on equipment, on overhead lines, cable panel boards etc.

The H.T. side of transformers shall be tested with 1000V meggar and L.T. side of equipment, overhead lines, cables with 500V meggar. The earth pits shall be tested with earth meggar. All results shall be carried out at site in presence of electrical Engineer and report shall be submitted to him in triplicate and also to the consultant.

All test certificates Transformers, main panel boards, main switch boards, cables, overhead lines, sub distribution boards shall be supplied in triplicate to the site electrical Engineer as well as to consultant. All meters shall be properly working without damages/strucking.

11.0 GATE LIGHT POLES

The galvanized octagonal poles for 250W/150W/70W HPSV GATE light and construction conforming to IS:2713.

The general arrangement of the poles and the foundation shall be as shown in the drawings. The poles shall be of requisite length having tubes of progressively reducing dimensions at the top.

12.0 Commissioning

All the equipment, transformers, cables, panel boards, overhead lines can be commissioned only after the pressure/meggar tests are found satisfactory. The equipment, cables, overhead lines, panel boards, transformer etc shall be energised in presence of Engineer and consultant after satisfactory presence/meggar tests.

MATERIALS TO BE USED IN THE ELECTRICAL WORKS SUBJECT TO THE

APPROVAL OF SAMPLES BY THE CONSULTANT.

S.N.	MATERIAL NAME.	BRAND / MANUFACTURER.
1	PVC RIGID PIPE	KALINGA/SUPER
2	PVC ROLL PIPE	SUPER DAIDA
3	WIRES AND CABLES	FINOLEX FRLS
4	SWITCH AND SOCKETS MODULAR	ANCHOR ROMA
5	LIGHT FITTINGS	PHILIPS / WIPRO
6	DB & MCB	MDS LEGRAND
7	AC SOCKETS, PLUG SOCKET	MDS LEGRAND
8	TELEPHONE SOCKET	ANCHOR ROMA
9	DATA, VOICE CABLE CAT 6	D-LINK
10	LUGS	DOWELLS
11	TERMINALS	ESSEN/ELMEX
12	BURGULAR ALARM	GODREJ/GLOBE DETECTIVE
13	E-CAT6 PATCH PANNEL	D-LINK
14	FAN (WALL/CEILING/EXHAUST)	ORIENT / CROMTOM / HAVELLS
15	TELEPHONE CABLE	D LINK CAT 5
16	AUDIO VIDEO	AS PER SPECIFICATION BRAND MENTIONED
17	AIR CONDITIONING	AS PER SPECIFICATION BRAND MENTIONED

NOTE : **The contractor shall use only above mentioned material or equivalent make to be approved by the Consultant. All other materials shall confirm to the specifications laid down. The tenderer shall take this into account while tendering rates / prices.**

DECLARATION

I/We have inspected the site of works and have made me / us fully acquainted with the local conditions in and around the sites of works. I/We hereby declare that I/We have gone through the conditions laid down in the Notice Inviting Tender, Conditions of Contract, Technical Specifications and understood the same and on the basis of the same I/We quoted our rates in the Schedule of Quantities attached with the tender documents.

I/We shall also uniformly maintain such progress as may be directed by the Employer / Architect to ensure completion of same within the target date as mentioned in the tender document.

Witness:

_____

Signature of Tender

Address_____

_____

_____

Date: _____

SUMMARY
FOR UNION BANK OF INDIA
CONFERENCE ROOM
REGIONAL OFFICE MAHABUBNAGAR

ELECTRICAL,LAN,
AUDIO VIDEO AND AIR CONDITIONING WORKS: RS…….

TOTAL: RS…….

TAX GST: Tenderer shall quote rates exclusive of GST, GST as applicable, will be paid to the contractor along with their bills.

NAME OF THE CONTRACTOR
& ADDRESS: -

DATE: - SIGNATURE OF THE CONTRACTOR

DATE: - SIGNATURE OF THE CONSULTANT

DATE: - AUTHORISED SIGNATURE OF BANK

SCHEDULE OF QUANTITIES FOR ELECTRICAL WORKS					
UNION BANK OF INDIA - CONFERENCE ROOM - RO MAHABUBNAGAR					
	ELECTRICAL,LAN,AUDIO VIDEO AND AIR CONDITIONING WORKS				
SL. NO	**ITEM/DESCRIPTION**	QTY	UNIT	RATE (RS.)	AMOUNT (RS.)
1	**ELECTRICAL**				
	POINT WIRING.				
	Supply & Installation of concealed point wiring using 600v grade 2.5 sqmm copper conductor PVC insulated wires (with proper R,Y,B color code) pulled through haevy gauge PVC conduits laid concealed over false ceiling or in wall chases including circuit wires from the relevant DB and also including 1.5 Sq.mm Green Colour Copper earth wire and provision of grid plate type (ROMA) switches and sockets as approved by Bank / Architect. Each circuit feeding not more than 8 points / 800 W as per the following configuration.				
	Lighting point complete with modular type switch, plate, M.S. conceal box.				
1.1	Point - 1 Light point control by 01 switch.	20	Nos		
1.2	Point - 2 Light point control by 01 switch.	15	Nos		
1.3	6 amps dependent sockets on switch board	4	Nos		

1.4	Wall bracket and Ceiling fan point as above complete with modular type switch,plate & M.S. conceal with modular type switch,plate & M.S. conceal plate & conceal box at fan end.box. Including one 2pin plug socket from one circuite.	10	Nos		
1.5	Call bell point same as as bove complete with modular type push switch,plate & M.S. conceal box with buzzer type bell.	1	No.		
1.6	Supply Laying of Circuite line2x2.5mmsq +1x 1mmsq PVC insulated copper wire form MCB DB to lighting SB & Raw power plug point (6Amps)rest are same as item no.1.3 light board or 6 amps plug connected	100	Mts		
1.7	Supply Fixing & connection of modular type 6 amps Plug switch complete with Ms box Socket to fixed under table & switch above table.	8	No.		
1.8	- Do - but 16 Amps 6pin socket with 16amps switch for raw power point. (01 Nos plug connected from one circuite.)	2	No.		
2	**TELEPHONE WIRING.**				
2.1	Supply laying & connection of same as iem no.1 but with 2 pair 0.51mmsq tinned CU.conductor through PVC regid ISI mark pipe from telephone point to Korne DB complete with RJ - 11 telephone socket modular type in MS conceal box.	4	No.		
2.2	Do - 20 pair .51mmsq copper conductor telephone cable in 20mm dia PVC pipe	25	Mts		

2.3	Supply fixing & connection of 20 pair KRONE connector DB complete with PVC moulded Telephone DB box with locking system.	1	Set		
3	**SUPPLY FIXING & CONNECTION WITH ALL ATTACHMENTS**				
	LIGHT FITTINGS / FANS :				
	WIPRO/PHILIPS LED MAKE				
3.1	LED PANEL FULL DIFFUSER-35W LED.	20	Nos		
3.2	LED DOWN -15W LED.	30	Nos.		
	CROMPTON/ORIENT MAKE				
3.3	Wall Mounted Fan	10	Nos.		
4	**UPS WIRING :**				
4.1	Supply fixing & connection of UPS circuite line with 2x2.5+1x1.5mmsq through regid PVC conduite 20mmdia 1.6 mm wall tickness, with ISI mark, to lay from UPS MCB DB to plug point board.rest same as item no.1 Two nos point to be connected from One circuite .	150	Mts		
4.2	Suppy fixing of 2x6Amps 5 pin socket + 1x16 Amps 6 pin socket in single board (under table) + 1x16 A switch in another board above table as per direction.	10	Set		
4.3	- Do - but 3x6/16, 6pin socket with switch to provide near HUB rack, are to be connected from UPS power.	2	Set		

4.4	Supply, laying and connection of incoming UPS power from main panel's DB to UPS incoming power control switch and from UPS output to UPS output switch, and UPS output switch to UPS incoming DB wiring same as item no 1, only wire size 2 x 10sqmm + 1 bare 12 SWG soft drawn copper earth is to be binded outside with wire drawn 19mm MS pipe 16 SWG with ISI Mark for running earth from lighting DB to UPS DB switch and from UPS output to UPS	25	Mts		
4.5	Supply installation of UPS incomming 20Amps industrial socket with 32 Amps SP MCB MDS make.FOR 2 NOS.UPS.	6	Nos		
4.6	Supply installation and termination of UPS outgoing power distribution system with 10+2Way SPN DB comprising10x6Amps SP MCB & 32 Amps DP MCB as main.	2	nos		
5	**LAYING OF CABLE :**				
5.1	Supply laying fixing main power PVC insulated,PVC sheated Alu.Conductor, 1100 v. grade armoured cable complete with 02 nos 8 SWG bear GI.wire as running earth.				
5.2	with 50mmsq 3.5 core from Meter room to Main Panel.	20	Mts.		
5.3	with 35mmsq 3.5 core from Main Panel to LDB.	10	Mts.		
5.4	End termination of 70,50,35mmsq 3.5 Core armoured cable,complete with brass cable gland , Alu. Lug, PVC tape.	6	End		
6	**MAIN ELECTRICAL VTPN DB.**				

6.1	Supply & Installation 8 way VTPN L/P D.B. with internal MCB connecting bars and wire complete with in 'M.S. box.Including Neutral Bar.	1	Set		
	Incomer.				
	125 AMPS MCCB 1 No.				
	Outgoing				
	2 Nos.63A TPN MCB				
	2 Nos 32A TPN MCB				
	12 Nos 32A SPN MCB				
	Sepatare distribution to be connected through main to be located at suitable place.				
6.2	Suply and installation of 6 way, TP&N 'MCB type Distribution Board(double door) flush mounted on wall, sheet metal fabricated, powder coated, having dust-proof and vermin 'proof, gasketed and hinged door with all internals such as DIN rails, neutral-link, interconnected wiring, complete with earthing legs, housing following switch gears (Double door HORIZONTAL DB)	1	Set		
	Incomer.				
	1 no., 63A, TPN, MCB				
	Outgoing				
	18 nos, 16/20/25A, SP, MCB				
7	**EARTHING STATION : FOR UPS**				

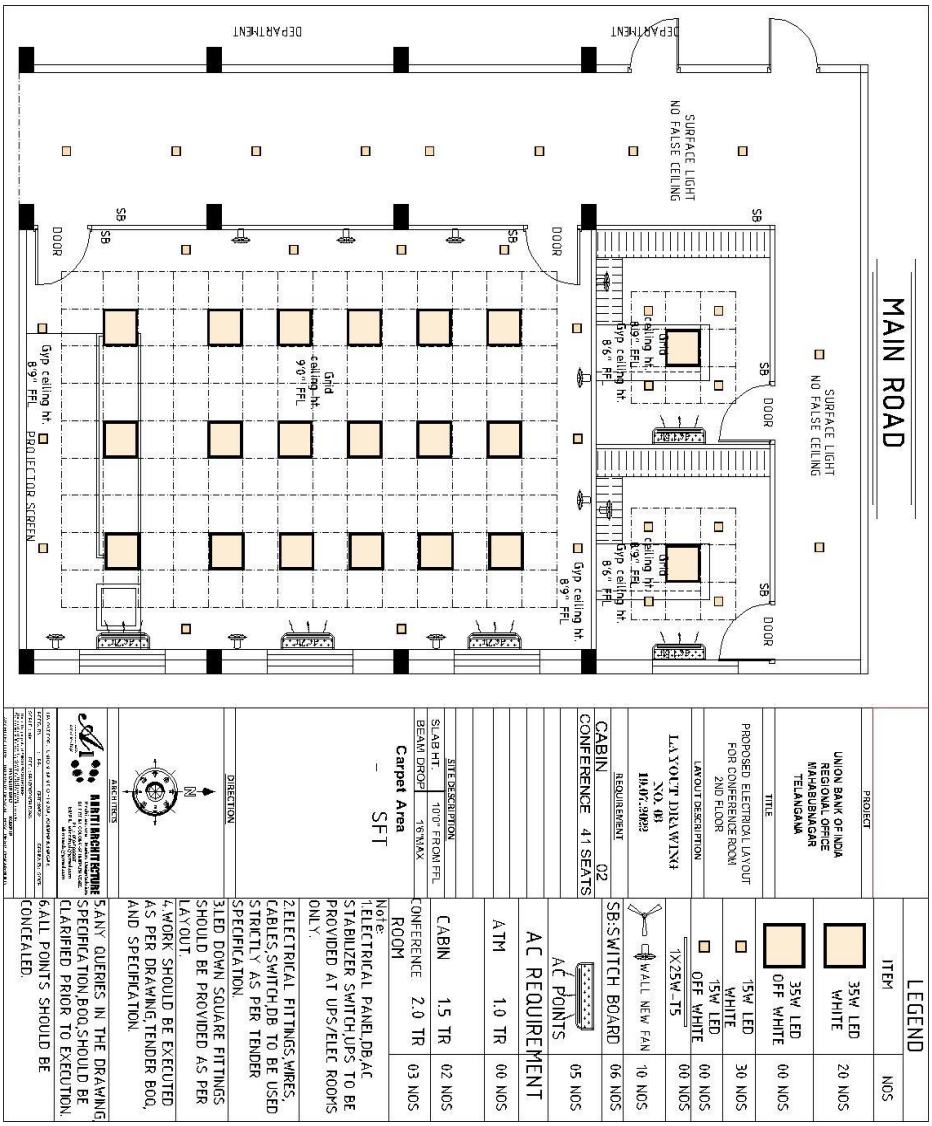
7.1	Earthing installation as per I.E. rule conforming to IS 3043-1987 or its latest amendent by making earth station with 600x600x3mm(mini-mun) thick copper plate electrode to be installed such that is top edge shall be at a minimum depth of 3.3mts below ground level after preparation of ground with charcoal, sand ,& salt, connecting the 25x3mm thick copper lead in strip (upto 10 mts length) by bolting and brazing to the copper plate complete with Brass bolt of suitable length double nuts & washer including supply & fixing of 50mm dia 2.3Mts long partly perforated G.I. Pipe with funnel for watering arragment.N.B :- The Copper plate to be buried under 3.3Mts depth from ground level, including C.I. Pit 300x300mm with necessary brick wall (For UPS earthing).	1	SET		
7.2	SpikeEarthing with G.I. Electode 3mts. Longx50mm dia (Class - B) including accessories and providing masonary enclosure with cover 300x300mm plate having locking arrangement and watering funnel Etc. with charcoal, sand & salt at alternate layer as required for electrical panal earthing.(For main electrical panel earthing.)	1	SET		
7.3	Supply laying 2x8SWG copper bear wire from earth spike to main panal.(Electrolite wire)	35	Mts		
7.4	Do but with 1x16mmsq insulated copper wire from earth spike to UPS earth bus bar through PVC regid 20mmdia ISI mark.	35	Mts		
8	**A/C. electrification :-**				

8.1	Supply laying & connection of A/C. line for 1.5 /2 TR A/C. window / splite with 2x4 + 1x2.5 mmsq throughRegid PVC conduite rest same item no 1.	150	Mts		
8.2	Supply and fixing of A/C. MCB Industrial Socket complete with 20 amps .(MDS)	5	Nos		
9	**Out door type glow sgn board**				
	wiring :-				
10	**LAN**				
1	UTP E-CAT-6 Cable make D-Link	300	Rmt		
2	24PORT 10/100Mbps Switch D- link	1	No		
3	24 Port Jack Panel Make:-D-Link	1	No.		
4	19" Rack 9U with Glass Door , Locking system Make: APW	1	No.		
5	Information outlet dual port with face plate and back box	8	Nos		
6	Mounting cord 7' 0"make D-Link	16	Nos		
7	Mounting cord 3' 0"make D-Link	16	Nos		
8	Supply and Laying 1"/2" pvc conduit pipes in partitions,wall consealed etc….	100	Mtr		
11	**AUDIO VIDEO WORKS FOR CONFERENCE ROOM**				
11.1	**PROJECTION SYSTEM**				

1	5000 ANSI Lumens Projector. Make - Epson/Panasonic - Model - PT - VZ580	1	Nos		
2	Ceiling mount kit for above projector. Make- Custom.	1	Nos		
3	Grandview 110 inches 16:10 manual projection screen.Make - Liberty,Model - Grandview	1	Nos		
11.2	**AUDIO SYSTEM**				
1	Conference system delegate unit - Ahuja/CWS8200D	4	Nos		
2	Carrier Frequency 2.4 GHz (2400-2483MHZ) Adaftive Digital FHSS Technology.Ahuja/CY/S8300R	1	Nos		
3	Special high gain wall mounting antenna CSA-20.Mount it on a suitable microphone stand or hang it on a wall.Ahuja/CS/A20	1	Nos		
4	Gooseneck Microphone Ahuja/GN/45	4	Nos		
5	Handheld Microphone complete set Wireless Make Ahuja.	2	Nos		
6	Wireless router Ahuja/CA/8	1	Nos		
7	Ceiling Speaker with an elegant,aesthetically pleasing rimless design.Ahuja/CS/X6101T	6	Nos		
8	120 WATTS with built in digital player medium wattage PA mixer amplifier .Ahuja/SSB/120	1	Nos		

9	Speaker cable,HDMI Cables and connectors - Lot NT/Logic.	1	Lot		
10	Installation and Commissioning charges of above job.	1	Job		
12	**AIR CONDITIONING MAKE - VOLTAS / BLUE STAR /CARRIER INVERTER MODEL**				
	CONFERENCE ROOM 2.0TR X 3 NOS				
	CABIN 1.5TR X 2 NOS				
1	**AC HIGHSIDE WORKS**				
	Supply, installation ,testing and comissioning of the following capacity BEE Lebeled 3 star rated Hi-Wall multisplit/Single units with one no.indoor unit and one no.outdoor unit with rotary compressors,copper piping,DX Cooling coil,condenser fans,vibration pads,condenser				
1.1	**2.0 ton high wall split** unit with inverter model BEE Lebeled 3 star rated with codless remote for Banking area ,Machine total including installetion Kit upto 3 mtrs copper piping. Excluding taxes.	3	Set		

1.2	**1.5 ton high wall split** unit with inverter model BEE Lebeled 3 star rated with codless remote for Banking area ,Machine total including installetion Kit upto 3 mtrs copper piping. Excluding Taxes.	2	Set		
2	**AC LOWSIDE WORKS**				
2.1	Installatton : Erection, testing and commissioning of High wall mounted Split Air Conditioner 1.5/2tr complete unit with associated civil work (chipping and plastering) for run copper and drain pipe.	5	Set		
2.2	Supply , erection , testing and commissioning of MS structure for condensing support for wall mounted Split Air Conditioner.	5	Set		
2.3	Provide Additional Copper Piping as per standard specification of 2tr and 1.5 tr cassatte /Wall mounted split units.	15	Mtr		
2.4	Provide Additional Drain Piping as per standard specification for Wall mounted split units.	15	Mtr		
	TOTAL ELECTRICAL,LAN,AUDIO VIDEO AND AIR CONDITIONING WORKS				


MAIN ROAD
DEPARTMENT
DEPARTMENT
SURFACE LIGHT
NO FALSE CEILING
SURFACE LIGHT
NO FALSE CEILING
SB
DOOR
Gyp ceiling ht. 8'9" FFL
Grid ceiling ht. 9'0" FFL
PROJECTOR SCREEN
Gyp ceiling ht. 8'6" FFL
Grid ceiling ht. 8'9" FFL
PROJECT
UNION BANK OF INDIA
REGIONAL OFFICE
MAHABUBNAGAR
TELANGANA
TITLE
PROPOSED ELECTRICAL LAYOUT
FOR CONFERENCE ROOM
2ND FLOOR
LAYOUT DESCRIPTION
LAYOUT DRAWING
NO. 01
10.07.2023
REQUIREMENT
CABIN
CONFERENCE 41 SEATS 02
SITE DESCRIPTION
SLAB HT. 10'0" FROM FFL
BEAM DROP 1'6"MAX
Carpet Area
–
SFT
DIRECTION
N
ARCHITECTS
MARUTI ARCHITECTURE
LEGEND
ITEM
NOS
35W LED WHITE
20 NOS
35W LED OFF WHITE
00 NOS
15W LED WHITE
30 NOS
15W LED OFF WHITE
00 NOS
1X25W-T5
00 NOS
WALL NEW FAN
10 NOS
SB:SWITCH BOARD
06 NOS
AC POINTS
05 NOS
AC REQUIREMENT
ATM 1.0 TR 00 NOS
CABIN 1.5 TR 02 NOS
CONFERENCE ROOM 2.0 TR 03 NOS
Note:
1.ELECTRICAL PANEL,DB,AC STABILIZER SWITCH,UPS TO BE PROVIDED AT UPS/ELEC ROOMS ONLY.
2.ELECTRICAL FITTINGS,WIRES, CABLES,SWITCH,DB TO BE USED STRICTLY AS PER TENDER SPECIFICATION.
3.LED DOWN SQUARE FITTINGS SHOULD BE PROVIDED AS PER LAYOUT.
4.WORK SHOULD BE EXECUTED AS PER DRAWING,TENDER BOQ, AND SPECIFICATION.
5.ANY QUERIES IN THE DRAWING SPECIFICATION,BOQ,SHOULD BE CLARIFIED PRIOR TO EXECUTION.
6.ALL POINTS SHOULD BE CONCEALED.