

PROPOSED ELECTRICAL INCLUDING LAN WORKS

UNION BANK OF INDIA, ANNAVARAM BRANCH

KAKINADA REGION



UNION BANK OF INDIA  
Regional Office (Kakinada)  
D.No.13-1-61/61,  
2<sup>ND</sup> FLOOR, KATYAYANI COMPLEX,  
MAIN ROAD,  
KAKINADA - 533 001.

ARCHITECT :

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(A Government of India Undertaking)

**UNION BANK OF INDIA**  
Regional Office (Kakinada)  
D.No.13-1-61/61,  
2<sup>ND</sup> FLOOR, KATYAYANI COMPLEX,  
MAIN ROAD,  
KAKINADA - 533 001.

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**Subject:** Electrical works including LAN works and Air-conditioning Works

**DATE OF ISSUE:** 05.05.2022 TO 11.05.2022

**TENDER SUBMISSION ON:** On or Before 11.05.2022 UPTO 15.30 HOURS.

**TENDER OPENING:** 11.05.2022 at 1600 Hrs

(TENDERS WILL BE OPENED IN PRESENCE OF CONTRACTING AGENCIES OR THEIR AUTHORISED REPRESENTATIVES)

**PLACE OF TENDER COLLECTION / SUBMISSION:**

**UNION BANK OF INDIA**  
Regional Office (Kakinada)  
D.No.13-1-61/61,  
2<sup>ND</sup> FLOOR, KATYAYANI COMPLEX,  
MAIN ROAD,  
KAKINADA - 533 001.

**TENDER ISSUED TO:** M/S\_\_\_\_\_

**Regional Office, Kakinada**

II<sup>nd</sup> Floor, Katayayani complex, Main Road, Kakinada- 533001

Tel. No.0884-2366123, 2366126, E-mail - [rcc.kakinada@unionbankofindia.com](mailto:rcc.kakinada@unionbankofindia.com)

Ref.No.RO: SSD:: 02 /2022-23

Date: 05.05.2022

**SUB: INVITES TENDERS FOR FURNISHING & ELECTRICAL WORKS AT "ANNAVARAM BRANCH"**

**[To publish on bank's website & Govt. NIT Portal]**

UNION BANK OF INDIA invites sealed tenders from the empanelled contractors of KAKINADA Region on item rate/percentage over estimated cost basis for the Interior Furnishing & Electrical works at the ANNAVARAM BRANCH. The Details of tender are as under:

01	Name of the works	Interior Furnishing & Electrical works at UNION BANK OF INDIA, ANNAVARAM, KAKINADA District, Andhra Pradesh.		
02	Estimation cost for carry out the works			
	Nature of work	Amount	Nature of work	Amount
	Interior Furnishing Work		Electrical works	
	Total		Total	
	Total estimation cost for Interior Furnishing & Electrical works at ANNAVARAM BRANCH & ATM			Bidder estimate as per Architect drawing
02	Time allowed for completion	30 DAYS		
03	Earnest Money Deposit	Interior Furnishing	@2% of as per	
		Electrical Work	Estimation	
04	Security Deposit	10% on the first Rs.1,00,000/- cost of works & 7.50% on the remaining amount.		
05	Cost of tender document	Rs.500.00 for each tender [Non Refundable] In favour of Union Bank of India by way of DD payable at KAKINADA		
06	Issue of Tenders	FROM 05.05.2022 TO 11.05.2022		
07	Last date & time of submission of tenders	11.05.2022 3.30 PM		
08	Date & time of opening of tenders	11.05.2022 4.00 PM		
09	Address at which the tender are to be submitted & opened	Regional Head, UNION BANK OF INDIA, Regional Office, II <sup>nd</sup> Floor, KATYAYANI COMPLEX, Main Road, KAKINADA - 533001.		
10	Place of opening of tenders	Same as above		
11	Defect Liability Period	1 year from the date of completion		
12	Validity of offer	3 (Three) months		
13	Liquidated Damages	0.5% of the Tender value per week subject to maximum of 5% of the accepted tender amount.		
14	Tender forms can be downloaded from our Union Bank website:-	http://www.unionbankofindia.co.in/ ⇒ Tenders ⇒ View Tender & http://govttenders.nic.in		

In case of date of opening of tenders is declared as a holiday, the tenders will be opened on the next working day at the same time.

UNION BANK OF INDIA reserves the right to accept/reject any/all tenders without assigning any reasons.

**CHIEF MANAGER [P&D]**

**DY.REGIONAL HEAD**

**REGIONAL HEAD**

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## NOTICE FOR INVITING TENDER

To,

M/s. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Dear Sir,

SUB:- TENDER FOR ELECTRICAL WORKS INCULDING LAN WORKS OF UNION BANK OF INDIA, ANNAVARAM BRANCH AND ATM, KAKINADA REGION(EAST GODAVARI DIST).

Sealed tenders on item rate basis are invited from Electrical and Air conditioning Contractors on behalf of Union Bank of India, Regional Office, Kakinada at d.no.13-1-61, 2<sup>nd</sup> Floor, Katyayani Complex, Main Road, Kakinada - 533001 .as per following details:

The contractor shall visit the site at their own expenses, to inspect the site. He should confirm that he has got all the information necessary to carry out the work as per the tender document.

Name of the work : Electrical work for the proposed Electrical and Lan Works works for Union Bank of India, ANNAVARAM.

Earnest Money Deposit : @2% as per your estimations by Demand draft / Pay Order drawn from any scheduled commercial bank in favour of Union Bank of India payable at Kakinada.

Period of Completion 30 Days

Validity of Tender : 120 days

Date of Issue of Tender : From 05.05.2022 to 11.05.2022 during Office hours

Last date of submission of : Up to 15.30 Hrs. on 11.05.2022 .

Tender

Date & Time of opening the : 16.00 Hrs. on 11.05.2022 .

Tender

2) The tender shall be duly filled in and submitted to, Ass. General Manager, Union Bank of India, Regional Office, Kakinada at d.no.13-1-61, 2<sup>nd</sup> Floor, Katyayani Complex, Main Road, Kakinada - 533001 before 1530 Hrs 11.05.2022.

3) The item rates under the contract include for full, final & entire completion of all works in all respects described in contract & as shown in drawings forming part of the contract. Contractor must quote item rates for all the items of work. Tenders will be opened in the presence of contracting agencies or their authorized representatives.

4) The tenders shall be submitted in a sealed envelope. The envelope shall be marked as Technical Bid, shall contain Volume- 1 of the tender, EMD & Cost of tender Form in the form of Demand Draft / Pay Order.

5) The Envelope of the contractors who have complied with the required EMD will be opened on the due date & time of opening.

6) Tenders are to be submitted in a sealed envelope cover super scribed "Tender for Electrical works and Air Conditioning Works for the proposed Regional Office, KAKINADA.

7) The tenderer must use only the tender forms issued for the purpose to fill in the rates intimation of tender quoted by letter, telegram / telex will not be acceptable.

8) Tenderers are advised not to make any alternation / modification in the tender documents, item of work or in any respect whatsoever. Violation of this requirement will make the Tender Liable for rejection.

9) In case of postal delivery, the tenderer has to ensure that tender is reached before the due date and time. The bank will not be responsible for damage in the transit and delay of receipt to tender, if any or sent by a special messenger. Tender received late shall be rejected.

10) Every page of the tender documents should be signed by the person or persons submitting the tender in token of his / their having acquainted himself / themselves with the General and Special Conditions of Contract, Specifications etc., as laid down. Any tender with any of the documents not so signed will be subjected to rejection.

11) No consideration will be given to a tender received after the time stipulated above and no extension will be allowed for submission of the tender. The Union Bank of India shall not be bound to accept the lowest tender and reserves the right to accept or reject any or all the tenders without assigning any reason whatsoever.

12) This notice inviting tenders, the conditions of tender and the duly completed form of tender etc. will form part of the Agreement to be executed by the successful tenderer with the bank.

The following document forming a part of tender are enclosed herewith

1. Notice Inviting Tender
2. Form of Tender for Works
3. Conditions of the Tender
4. Form of Agreement
5. General Conditions of the Contract
6. Abstract of General conditions of the Contract
7. List of Approved Manufacturers for Materials
8. Safety Code
9. Special Instructions & Conditions
10. Declaration
11. Bill of Qualities

This tender notice shall form part of the contract and non-submission of tender in the above manner will render your offer liable for rejection.

FOR UNION BANK OF INDIA

ASST. GENERAL MANAGER

## FORM OF TENDER FOR WORKS

To:

The Asst. General Manager  
Union Bank of India  
REGIONAL OFFICE,  
D.No.13,1,61/61, 2<sup>nd</sup> Floor,  
Katyayani Complex, Main Road,  
KAKINADA- 533 001.

Dear Sir,

Having duly examined the tender documents including the drawings, specifications, designs, schedule of quantities relating to the works specified in the underwritten memorandum and having visited the site of the said work having acquired all the requisite information relating there to as affecting this tender, I/We hereby offer to execute the works specified in the underwritten memorandum within the time specified therein at the rates specified in the schedule of quantities and in accordance, in all respects with the specifications, designs, drawings and instructions in writing referred to in the conditions of the tender, the Articles of Agreement, special conditions, the schedule of quantities, and conditions of the contract and with such conditions of the contract and with such materials as are specified, by and in all other respects in accordance with such conditions in the schedule of quantities and conditions of contract so far as applicable.

Should this tender be accepted, in whole or in part, I/We hereby agree (i) to abide by and fulfill all the terms and provisions of the said conditions of the contract annexed hereto and the conditions to tender so far as applicable or in default thereof to forfeit and pay to Union Bank of India the sums of money mentioned in the said conditions.

A sum of **RS.** @2% as per your estimations by Demand draft / Pay Order drawn from any scheduled commercial bank in favour of Union Bank of India payable at Kakinada in the form of a DD drawn on a scheduled Bank in favor of Union Bank of India at the time of submission of the tender as Earnest Money Deposit is hereby forwarded as Earnest Money Deposit.

I / We agree (i) that should I/We fail deliver or commence the installation work specified in the above mentioned memorandum Bank shall without prejudice to any other right or remedy be at the liberty Bank towards security deposit mentioned in the above memorandum, (ii) to execute all the works referred to in the tender document upon the terms and conditions contained or referred to therein and to carry out authorized variations as directed by the Consultants/Bank and as per said conditions of the contract.

Our Bankers are:

- 1.
- 2.

The name of the proprietor/Partners/Directors of our firm are:

- 1.
- 2.
- 3.
- 4.

Signature of the tenderer with seal

Date the ..... Day of ..... 2020

## THE CONDITIONS OF TENDER

1. The tender form must be filled in English and all entries must be made by hand and written in ink.
2. Each and every page of the tender document must be signed by the owner of the firm or the power of attorney holder.
3. The tenders must be submitted in the prescribed format only. The tenders must quote the rates in the Schedule of Quantities, rates and amount. The rates should be written both in words and figures without any erasures and alterations. However if errors are made, the wrong figures or words must be neatly scored out under full signature of the tenderer and the correct figures and words neatly rewritten. Over writing is not permitted.
4. Errors in the schedule of quantities rates and amount shall be dealt with the following manner:
  - a) In the event of discrepancy between the rates quoted in words and the rates in figures, the Co-efficient of the total amount by the quantity shall be taken into consideration, provided the tender is not rejected.
  - b) In the event of an error occurring in the amount column as a result of wrong multiplication and extension of unit rate and quantities, the unit rate shall be regarded as firm and the amount shall be amended accordingly.
  - c) All the errors in totaling in the amount column and in carrying forward, the totals shall be corrected.
5. The quantities indicated in the schedule of quantities are only probable quantities and are liable to alteration by omission, reduction or addition. Payment shall be made on the basis of actual quantities of work done at the accepted rates.
6. No alterations which are made by the tenderer in the drawings, specifications or in probable quantities accompanying the tender will be recognized and, if such alterations are made the tender is likely to be invalidated. Remarks and explanations should be given in a separate cover along with EMD and will become binding only if specially accepted in writing by Bank at the time of acceptance of the tender.
7. The tenderer must obtain for himself on his own responsibility and at his own expenses all the information necessary for the purpose of filling this tender and to enter into a contract with Bank, he must examine the drawings, specifications conditions et., and must inspect the site of work and must acquaint himself with all local conditions and matters pertaining thereto.
8. The tenderer shall also bear all expenses in connection with the preparation and submission of this tender.
9. **EARNEST MONEY DEPOSIT (EMD):** The tenderer shall deposit an amount of @2% as per your estimations by Demand draft / Pay Order drawn from any scheduled commercial bank in favour of Union Bank of India payable at Kakinada in the form of a DD drawn on a scheduled Bank in favor of Union Bank of India at the time of submission of the tender as Earnest Money Deposit. Bank is not liable to pay any interest on Earnest Money. Bids/tenders without EMD shall be summarily rejected otherwise exempted under various guidelines of Central Government/Bank.

The EMD for unsuccessful tenderers shall be refunded to them without any interest after the decision to award the work is taken. The EMD of the successful tenders shall be retained as part of Security Deposit and for the due fulfillment of the contract.

### 10. SECURITY DEPOSIT (SD):

Apart from Earnest Money Deposit made as above, Security Deposit shall be deducted from running/progressive bill/s of the Contractor @ 8% of the gross value of the each bill until the total Security Deposit including EMD equals to:

- (a) 10% on the first Rs. 1,00,000/- of the cost of work
- (b) 7.5% on the next amount upto Rs. 2 crores cost of work.
- (c) Total Security Deposit EMD(2%) plus retention money 8% of the bill amount subjected to maximum Security Deposit. Security Deposit shall not bear any interest.

50% of the retention money will be refunded after 14 days after completion of the work and on issue of virtual completion certificate by the Architect



11. COMPLETION PERIOD:

The time is the essence of Contract. The entire work shall be completed by the Contractor within 45 days after the day the tender is accepted by Bank. The work is of urgent nature and the completion time schedule should be strictly adhered to by the Contractor.

12. The tenders submitted shall remain valid for acceptance for a period of 30 days from the date of their opening. Should any tenderer withdraw his tender before the expiry of the said period or makes any modification to his tender, his EMD will be forfeited and the tender declared invalid.

13. Bank does not bind itself to accept the lowest tender and reserves to himself the right to reject any or all of the tenders received without assigning of reasons thereof.

14. The tenderer whose tender is accepted shall execute a formal agreement with Bank in accordance with this draft agreement which will include the notice inviting tender, these conditions, other papers herein, special conditions, drawings and specifications etc., but his liability, under the contract shall commence from the date of the written acceptance of his tender whether the formal agreement is drawn or not.

The Contractor shall bear all expenses in connection with the execution of the said agreement including fees for stamps and registration of documents as required.

15. The compensation or other sums of money payable by the contractor to the Bank under the terms of contract maybe deducted from his EMD/SD if the amount permits and the contractor shall, unless such deposit has become otherwise payable, within ten days after such deduction make good in cash the amount so deducted.

16. The work shall be carried out under the directions and supervision of and subject to the approval in all respects by the Consultants / Bank.

17. On acceptance of tender the contractor shall, in writing, and at once inform Bank and the Consultants the names of his accredited representatives who will be responsible to take instructions from the Consultants/Bank.

18. The work or any part of it shall but be transferred assigned or subcontracted without the consent of Bank.

19. The contractor shall be required to co-operate and work in accordance with and afford reasonable facilities for such other agencies / Specialists as may be employed by the Consultants / Bank on other works / sub-works in connection with the work.

20. The contractor shall insure the work and keep it insured until one month after the date of taking over the works by Bank or otherwise as per the terms of the contract, against loss or damage by fire and other usual risks other than the risks accepted in the terms of the contract with an approved insurance company such as GIC.

21. The contractor is required to comply with all Acts of Govt. relating to Labor and the rules and regulation made there under from time to time and submit at the proper times all particulars and statements required to be furnished to the labor or any other statutory authorities.

22. For all the items of work executed by him, the contractor shall supply, at his own expenses, to the Consultants, copies of post card size photographs in triplicate each of the work, taken from two approved portions of each item of work at intervals of not more than one month during the progress of the work and also at every important stage of the work or as directed by the Consultants/Bank.

23. In carrying out the work the contractor shall comply with the provisions of the safety code, annexed to these papers.

## ARTICLE OF AGREEMENT

Articles of agreement made this the ..... day of ..... 2022 Between ..... UNION  
BANK OF INDIA, having it's registered office at

-----  
----- herein after called "The Employer" of the one part;

AND

M/s. ....having its registered office

at -----

-----  
(herein after "The Contractor" of the other part.)

Whereas the employer is desirous of getting the Electrical and Lan Works for UNION BANK OF INDIA, Regional Office, Kakinada Executed as schedule to this agreement and has annexed drawings, bills of quantities and specifications describing the work to be done as prepared by Er. Badam sundara Rao, M/s SUNDAR ASSOCIATES, Kakinada – 533001. Cell:09848160357. (herein after called THE CONSULTANTS and whereas the said drawing as per Schedule-2 inclusive, the bills of quantities marked "BOQ" and the specifications etc., have been signed by or on behalf of the parties hereto; and whereas the contractor has agreed to execute the work subject to the conditions set forth is Schedule-3 hereto attached (herein after to as "The Condition"), the work shown upon the said drawings and described in the said specifications and included in the said bills of quantities for the sum of Rupees.....

### NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the sum of Rs. .... To be paid at the time and in the manner set forth in the said conditions, the contractor will, upon and subject to the said conditions execute and complete the works shown upon the said drawings and described in the said specifications and bills of quantities.
2. The employer will pay to the contractor the said sum of Rs..... or such other sum as shall become payable hereunder at the times and in the manner specified in the said conditions.
3. The terms "The Consultants" in the said conditions shall mean Er. Badam Sundara Rao, or in the event of their ceasing to be the Consultants for the purposes of this contract, such other persons as shall be nominated for that purpose by the employer, not being a person to whom the contractor shall object for reasons considered to be sufficient by the Arbitrator mentioned in the said conditions. Provided always that no person subsequently appointed to be the Consultants under the contract shall be entitled to disregard or overrule any decision or approval or direction given or expressed by the Consultants for the time being.
4. The said conditions, specifications and priced bills of quantities shall be read and construed as forming part of this agreement, and the parties hereto will respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their parts respectively in such conditions, specifications and priced bills of quantities contained.

As witness our hand the day and year first above written signed by the said EMPLOYER.

In the presence of witnesses:

Name :

Name:

Occupation:

Occupation:

Address:

Address:

Signed by the said Contractor(s) :

In the presence of Witnesses:

Name :

Name :

Occupation :

Occupation:

Address :

Address:

## GENERAL CONDITIONS OF CONTRACT

Subject: Electrical works and Lan Works for Renovation of Union Bank of India, ANNAVARAM Branch(East Godavari).

### *General Instructions to Contractor*

Inspection of sites: The contractor shall visit and examine the site and satisfy as to the nature and correct dimensions of work and facilities for obtaining material and shall obtain generally his own information on all matters affecting the execution of work. No extra charge made in consequence of any misunderstanding or incorrect information on any of these points on the ground of insufficient description will be allowed. All expenses incurred by the contractors in connection with obtaining information for submitting this tender including his visit to site and efforts in compiling the tender shall be borne by the tenderer and no claims for reimbursement thereof shall be entertained.

Safety Regulations: The contractor shall take all the necessary precautions while working and to safeguard adjacent property, Bank's property, Bank's employees, and traffic persons

Compliance to local laws: The contractor shall conform to the provisions of any Act of the Legislature relating to the work and to the Regulation of Bye Laws of any authority. He shall also obtain the permission of the Municipality or any other Authorities if required under the existing rules.

Site cleaning: All the rates quoted are inclusive of removal of rubbish / debris collected during the progress of work, rejected material and clearance of site before and after the work is completed. Not more than one truck load shall be stored that to for not more than 3 days. The contractor shall arrange to remove the same immediately. If the contractor is failing to remove the same and the expenses shall be recovered from the contractor and he will not dispute for the expenses so incurred.

Vouchers / bills: Contractor shall upon the request of the Bank furnish bills, invoices, accounts, receipts and other vouchers for all materials brought on site to prove that the material purchased are as mentioned in the specification.

Contractor's responsibility: The work will from time to time be examined by Bank's Architect / Engineer, but such examination shall not in any way exonerate the contractor from the obligation to remedying any defects which may be observed at any stage of the work or after the same is completed.

Dismissal from work: The contractor shall upon the written request of the Bank's Architect / Engineer immediately dismiss from the work any person employed by him thereon, who may in the opinion of the authority be incompetent or misconduct himself and such person shall not be again employed on the work, without the permission of the bank.

Order of work, etc.: Bank reserves the right to fix the order in which the various items of work involved are to be executed. However, the contractor shall be responsible for the completion of the entire job within the item limit specified failing which liquidated damages as mentioned in clause No.49 shall be recovered from the contractor.

Commencement of work: The work must be started within 7 days upon accepting the work order and the programme for carrying out the various jobs shall be drawn out in consultation with the Bank's Architect / Engineer. Adequate labour force shall be provided to complete the work within the specified period. Proper security aspects should be taken care of by adequate vigilance in view of the importance of the building. Default in compliance with the programmes so finalised shall entail operation of liquidated damages as stated.

**Subletting the work:** The contractor shall not directly or indirectly sublet the work to other party without written permission from the bank.

**Quantities of works are provisional:** The quantities mentioned in schedule are provisional and likely to increase / decrease to any extent or may be omitted thus altering the aggregate value of the contract. No claim for loss of profit / business shall be entertained on this account

**Distribution of work:** The Bank reserve the right to distribute the work for which quotation have been called, among more than one parties, if found necessary. No claim in this respect shall be considered and the contractor agrees to cooperate with other agencies appointed by the bank.

**Third party damage:** The contractor shall be responsible for all injury to persons, animals, building, building structure, any damage to road, streets, footpaths and shall rectify it at its own cost.

**Insurance cover:** All the workers of the contractor as well as his sub-contractor must be properly covered by an Insurance Policy under Workman's Compensation Act and Fatal Accidents Act. The contractor at his own expenses arrange to effect and maintain until the virtual completion of the contract, insurance policy in the joint name of the Bank and the contractor against this risk to be retained by the Bank until the virtual completion of the work, and indemnify the Bank from all the liabilities arising out of such events. In case of delay, contractor shall arrange to extend insurance policy till work is completed.

**Delay & Extension of time:** All the work should be completed within the specified period in the tender. If the work is delayed due to the reasons beyond the control of the contractor, he should applying to the Bank explaining, therein the reasons for such delays, immediately and if in the opinion of Bank's authorities the delay is justified, the contractor shall be granted extension in time limit.

**Certificate of virtual completion:** As soon as the work is completed, the contractor shall inform in writing such completion to the Bank's Architect / Engineer who will inspect the work and if satisfied will issue the certificate that the work has been virtually completed and the defects liability period shall commence from the date of such certificate.

**Defect liability period:** The defects or other faults which may appear during the defect liability period which is 12 months after the virtual completion of the work, arising in the opinion of the bank due to inferior quality of material or bad workmanship not in accordance with the contract, contractor shall make good at his own cost within a reasonable time. In case of default, Bank may employ and pay other agencies to amend and make good such defects and all expenses / damages / losses shall be recoverable by Bank or may be deducted from any money due to the contractor

**Arrangement of work:** The contractor shall organise the work in such a way that the office users or the nearby public area put to no hardships and the working of the office is not affected. The contractor shall take adequate care during the progress of work to protect the office property like stationery, furniture, etc. In case of any damage, the same shall be made good by the contractor. Contractor is agreed to work after office hours for which no extra cost shall be considered.

**Stacking of material:** The contractor is not to stack any of his material recklessly so as to endanger the safety of the building and cause any nuisance to the occupants and the public.

**Extra charges:** It must be clearly understood that all the conditions of contracts are intended to be strictly enforced and that no extra charges in respect of extra work will be allowed unless they are

clearly outside the spirit and meaning of the condition and unless such work shall have been ordered in writing.

**Protection of material and work:** The contractor shall be responsible for storing and watching his own material and protecting the work at his own cost. The contractor and his worker will be allowed to use lift after office hours. However, no paint drums or heavy bag of cement / paint will be allowed to be taken into the lift. Any damage / spoiling of lift / floor / dado caused during such act will have to be made good by the contractor at his own expenditure.

**Water supply:** The contractor shall make his own arrangement for water required for the work. in case the water is available and supplied by the Bank, the charges for the same shall be recovered at the rate of 1% of value of the work executed. In case water supplied by the Bank, the contractor shall make his own arrangement for the storage, pipeline from point of take off to the required location.

**Electric supply:** Electricity will be supplied by the Bank, the contractor shall make his own arrangement for providing points, wires lines, extension board wherever it is required in the premises, in and out.

**Approval of samples:** The contractor shall furnish well in time before work commence at his own cost, colour samples, samples of material or workmanship that may be called by Bank's Architect / Engineer for approval. Rates quoted shall cover for such preliminary work.

**Workmanship:** The work involved calls for a high standard of workmanship combined with speed. All the glass panes, door handles / hinges, electric fitting, fans, furniture records, floors etc. are to be thoroughly cleaned after work is completed. Any damage to the flooring, tiles, dado, panelling or any other part of the building, etc. shall be made good at the cost of the contractor to the entire satisfaction of the Bank. Contractor shall make all arrangements for shifting of furniture / records and keeping the same in its original position after he finishes the work on daily basis. The contractor at his own cost shall provide brown paper, polythene, tarpaulin etc. for protecting furniture / fixtures, paneling, electrical, fittings, records, etc.

**Interpretation of documents / drawing:** Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design drawings and instructions herein before mentioned and as to the quality of workmanship or materials used for the work or as to any other question, claim, right, matter or thing whatsoever, in any way arising out of or relating to the contract, designs, drawings specifications, estimates, instructions, orders or these conditions or otherwise concerning the works, or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the competent authority of the Bank whose decision shall be final and binding on the contractor.

**Use of scaffolding:** The contractor shall allow the use of scaffolding erected by them to any other agency employed by the Bank during the contract period without any payment.

**Provisional Item:** If ordered by the Bank, contractor shall be required to carry out provisional items at the same conditions and rates as applicable for this contract.

**Measurements of all concealed items:** Measurements of all concealed items of work and extra item if any, shall be got recorded by the Bank's Architect / Engineer before they are checked up.

Measurements: All measurement tapes shall be of steel and all scaffolding and ladders that may be required for taking measurements shall be supplied by the contractor.

Cleaning during the work: The rates quoted shall include cleaning of ceiling roses, electric switches, boards, window panes etc. after the repairing leaving the site neat and tidy from time to time.

Complying I.S. specification: Unless otherwise mentioned in the contract, the latest Indian Standard Code for material specifications, method of work, mode of measurements shall be followed. The payment shall be made on the basis of actual measurement of work done to be submitted along with bill

Rate to include: The rates quoted by the contractor shall cover for work at any height in the premises for all finished items under this contract. The rate quoted shall be inclusive of all material cost, wastage, labour, loading, profit, taxes if any, scaffolding, transport, supervision, spot light arrangement and any other means to complete the job. Octroi, sales-tax, works contract tax or any other taxes present or future to be included in the rates so quoted. If there is a change in the tax structure / duties as per State / Central Govt. order after opening of tender, the Bank shall reimburse difference in tax as per actual.

Price Fluctuation: The rates quoted by the contractor shall be firm throughout the currency of contract (including extension of time if any granted) and will not be subject to any fluctuation due to variation in the cost of material or labour

The successful tenderer if called upon to do so, shall obtain a letter from the approved trade manufacturer whose product is used, if found necessary by the Bank confirming that the manufacturer shall provide all the technical assistance and supervision during the execution of the work at all such places as directed and the contractor shall bear the expenses, if any, for such supervision and technical assistance supplied by the trade manufacturer.

Testing of materials: If at any point of time during the work, if Bank authorities desire to carry out the tests of certain materials, the contractor shall arrange for the same and submit the test report without any extra cost to the Bank.

The contractor shall note that they should bring to the notice of the Architect / Engineer any breakage in glass window before starting work. However, if any glass window is found to be broken during the repairing work, the same shall be replaced by the contractor at his own cost.

Conditional tenders: Conditional tenders are liable to be rejected.

Rates of non-tendered items: The successful tenderer is bound to carry out any item of work necessary for the completion of the job even though such items are not included in schedule of quantities.

Abandonment of work: If in any case the work required to be abandoned, the contractor shall not be entitled for any claims and he will be paid as per the actual work done till that period.

The Bank reserves the right to accept / reject the lower or any or all tenders in part or in whole without assigning a reason therefor.

Decision of the Bank shall be final and binding on any matter connected with the work. The matter of any dispute shall be decided after mutual discussions based on the terms and conditions of this

contract. However, if the matter cannot be resolved then the same shall be referred to the respected, qualified person in the field agreed to both the parties and his opinion shall be binding on both the parties. However, this is precourse to any legal action in this regard.

**Payments:** The contractor shall be paid by the Bank from time to time under interim payment on account of works executed and when the value of work equal to the approximate value named in the Appendix as 'Value of work for Interim Certificate' has been executed in accordance with this contract.

When the work has been virtually completed and Bank's Architects / Engineer has certified in writing that the work has been completed on the basis of detailed measurements and has made a final scrutiny and that there is no dispute items, rates, ad quantities, the contractor shall be entitled to the payment of the final bill in accordance with the final certificate which will be honored within the period specified in the Appendix as period of honouring final certificate.

The contractor shall be paid by the Bank within the period named in Appendix (period of honouring certificate) after such certificate has been delivered to the employer by the Bank's Architect / Engineer. Bank's Architect / Engineer has power to withhold any certificate in the work or any part thereof are not carried out to his satisfaction or the contractor fails to show the desired progress or fails to follow the instructions given or in case of breach of this contract.

For water proofing works on traces, bathroom, WC, Chajja, work has to be executed through the agency specialized in waterproofing. Contractor will have to submit a guarantee of 10 years on stamp papers as per the format to be prescribed by the Bank.

**Earnest Money Deposit** of successful tenderer shall be treated as security deposit. The contractor should pay this amount to the Bank by DD or PO at the time of submission of tender. This amount shall be retained by the Bank till the work is virtually completed and all amounts relating thereto settled. Second part of security deposit shall be built through the retentions from interim and final bills of the contractor and the amount of retention shall be as stated in the Appendix.

When the certificate of the virtual completion is issued to the contractor the security deposit in the form of EMD and 50% of retention money shall be refunded, provided that the contractor has fulfilled all the conditions of contract and further provided that the employer has no claim for forfeiture of part or whole of the said deposit. The balance 50% of the retention money built up through retention from interim and final bills will be returned to the contractor after the expiry of defect liability period, subject to deductions for any appropriations thereof required to be made by the Bank as per conditions of the contract. The contractor should note that no interest will be allowed on his security deposit.

The contractor is requested to sign each page of the quotation and put rubber stamp, seal below his signature and seal the quotation in an envelope.

**Liquidated damages:** If the contractor fails to maintain the required progress or to complete the work and clear the site or before the contract or extended date period of completion, he shall without prejudice to any other right, pay as agreed compensation amount of 1 % of contract amount per week of delay subject to maximum of 10 % of contract amount as liquidated damages.

**Records & measurements:** Measurements shall be taken jointly by Bank's Architect / Engineer and contractor and shall without extra charges provide assistance with appliance, labour and other things



necessary for the work and measurements will be signed and dated by both the parties on completion of measurements.

**Safety measures:** The contractor at his own cost shall provide tarpaulins on the external side of the building at the time of breaking plaster etc. to safeguard adjacent property, Bank's property, employees, traffic, etc. The contractor shall follow all the safety measures while carrying out the work. Employer that is Bank shall not be liable for any compensation due to accident, any mishap or negligence.

If there is delay in commencement of work for any reason, the employer that is Bank shall not be liable for any compensation.

If at any point of time during the progress, it is observed that the contractor is not progressing the work with due diligence, care and lagging much behind the schedule or fails to gear up the work despite instructions from Bank's Architects, the employer (Bank) reserves the right to terminate the contract with 7 days notice. In such case, the contractor shall be liable to pay the employer any extra cost involved for the completion of the said work and will not obstruct any way in completing the work through other agency. After completion of entire work the contractor shall be paid for the actual work executed by him at the quoted rates after deducting any claims, damages. In case of such termination the security deposit held by the Bank will be forfeited

Although the number of coats of paints / polishing / white washing are specified the contractor will have to additional coats if the surface is not to the satisfaction of the Bank's Architect / Engineer and there shall be no extra payment on account of such coats

**First Aid:** The contractor shall be responsible for all first aid and he shall keep the site fully equipped to meet such emergency.

**Supervision:** The contractor is required to have on site during all working hours a competent supervisor (acceptable to Bank) who will be responsible for the conduct of worker and who has authority to receive and act on such instructions issued by the Architect / Engineer of Bank.

All work shall be carried out in a workman-like manner to the entire satisfaction of the Architect / Engineers.

Contractor shall follow all rules / regulations in force and should possess the license for employing labour and also follow all safety measures, labour bye law and shall be responsible for any lapse.

**Transfer of Tender Documents:** Transfer of tender documents purchased by one intending tenderer to another is not permissible.

**Safety:** The contractor shall carry out the entire work in a workman like manner having full regard for the safety of the men working at site. All safe practices shall be strictly adhered to by the workmen of the contractor like wearing helmets, safety belts when working at heights, gloves when handling sharp objects and reinforcement, eye shields during welding, safety shoes, etc. The contractor shall protect sides of openings in floor slabs, edges of slabs, stairs, stairwells etc. with barricades, warning signs / lights and educate all his workmen regarding following safe working practices. He shall provide first aid boxes at site.

In spite of following safe methods, in case of any unfortunate accident, the contractor shall indemnify the employer against any expenses or claims towards treatment or compensation.

**A Daily Diary Register:** A daily diary register (with cement and steel stock statement) will be kept

in the Engineer's Office or the site office. The contractor or his representative will furnish every day at 9.00 hrs. details of work for the day proceeding and the diary will be written up every day and jointly signed by the Engineer and the Contractor or their representatives in token of its correctness.

Nuisance: The contractor shall not any time do cause or permit anyone to do or cause any nuisance on the site or do anything which shall cause unnecessary disturbance of inconvenience to the Employer or to the owners, tenants or occupiers of other properties near the site and to the public generally.

Rights, remedies and powers:

l) Termination of contract due to contractor's default. If the contractor:

- a. Abandon the contract.
- b. At any time defaults in proceedings with the works with due diligence and continues to do so after a notice in writing of seven days from the Engineer or Project Architect or Employer, or
- c. Commits default in complying with any of the terms and conditions of the contract and does not remedy it within 7 days after a notice in writing is given to him in that behalf of the Engineer or Project Architect or Employer.
- d. Persistently disregards the instructions of the Engineer, Project Architect or contravenes any provision of the contract, or
- e. Fails to remove materials from the site or to pull down and replace work after receiving from the Engineer, Project Architect notice to the effect that the said materials or works have been rejected.
- f. Fails to complete the works or items of work on or before the stipulated date (s) of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer, or Project Architect of Employer, or
- g. Offer or gives or agrees to give to any person in the Employer's service or to any other person on this behalf, any gift or consideration of any kind as an inducement or reward for doing or forbearing to do so for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for the Employer, or
- i. Shall obtain a contract with the Employer as a result of ring tendering or other non-bonafide methods of competitive tendency, or
- j. Being an individual, or if a firm, any partner thereof, shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or support so to do, or any application be made under any Insolvency Act for the time being in force for the sequestration of his estates or if a trust deed be executed by him for benefit of his creditors, or

- k. Being a company, shall pass a resolution or the court shall make an order for the liquidation of its affairs, or a appointed or circumstances shall arise which entitle the court or debenture holders to appoint a receiver or manager, or
  - l. Shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days, or
  - m. Assigns, transfers, sublets (engagement of labour on a piece work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be sub-letting) or attempts to assign, transfer or sub-let the entire works, or any portion thereof without the prior written approval of the employer.
- I) The Bank may, without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter as the Employer by written notice determine the contract either as a whole or in part.
  - II) Upon such determination of the contract in whole or in part, the security deposit with the Employer in respect of the contract shall stand forfeited to the Employer without in any way effecting the rights of the Employer.
  - III) Rights of the employer after determination of the contract due to contractor's default.  
  
The Engineer shall on such determination have powers to:
    - a. Take possession of the site and any materials equipment, plant, implements stores etc. thereon, and / or
    - b. Carry out the incomplete work by any means at the risk and cost of the contractor.
- IV) On determination of the contract in full or in part, the Engineer shall determine what amount, if any, is recoverable from the contractor for completion of the works or part of the works or in case the works or part of the works is not to be completed, the loss or damage suffered by the Employer. In determining the amount, credit shall be given to the contractor for the value of the work executed by him upto the time of cancellation or the value of contractor's materials to be present so as to record the measurements in his presence. If the contractor fails to be present in response to the notice, the recording of measurements shall be proceeded with ex-parte and the measurements as recorded shall be binding the contractor.
  - V) The Bank shall have the right to use contractor's plant, machinery and materials on the balance work but shall not in any way be responsible for any damage or loss of the same and the contractor shall not be entitled to any compensation thereof.

### ABSTRACT TO GENERAL CONDITIONS OF CONTRACT

Subject: Electrical works and Lan Works, Union Bank of India, ANNAVARAM Branch(East Godavari Dist).

1. Defect liability period : 12 months from the date of virtual completion of work.
2. Date of commencement : 7 days after the contract is accepted by the contractor
3. Date of completion : 30 days.
4. Liquidated damages : 1% of contract amount per week / day of delay subject to maximum of 10% of contract amount for the works of less than 6 month completion period.
5. Period of honoring final certificate : 30 days
6. Value of work for interim certificate : Rs. 1.00 lakhs
7. Period of honouring certificate : 15 days
8. Retention money : 10% of the bill value will be deducted as retention subject to maximum security deposit, inclusive of EMD. 50% of the retention money so held shall be refunded after virtual completion and balance 50% after defects liability period after 12 months of full & final completion of job.
9. Earnest Money to be submitted : **Rs. .** in the form of a DD drawn on a scheduled Bank in favor of Union Bank of India at the time of submission of the tender as Earnest Money Deposit is hereby forwarded as Earnest Money Deposit.

LIST OF APPROVED MANUFACTURERS / SUPPLIERS OF MATERIALS

MATERIALS	APPROVED MANUFACTURERS /SUPPLIERS
S & F / Light fixtures / Patti	Philips / Osram / Crompton Greaves
1x PL 18 w	Philips / Osram / Crompton Greaves
Switch, sockets, conceal box, plate/ Change over switch	North West/ Hager / MDS / Crabtree / Anchor Roma (woods)
MCCB	L&T / Siemens
Busbar / TPN LDB, TPN MCB / DP MCB / SPN UPDB / MCB & DB/ELCB/RCCB	MDS Leagrand / Siemens / Merlin Gerin / L&T
LT Cable / Telephone cable	Dowells / Braco / Delton / Polycab
Light / circuit wiring / Cable ISI / PVC insulated wire ISI	Polycab / Finolex / Bonton / R.R. Kable / Khaitan / L&T
Floor conduits MMS Grade / PVC conduits & accessories	Precision / Wimco / X-press
Music cum Public address system	Bosch / Sony
Low tension switch fuse unit with HRC fuse	L&T
Timer	Leagrand
Gland Flang type	Braco
Lugs / Woodenscrew	Dowell's / Braco / Nettlefold
Telephone tag block	Krone
Wall / Ceiling / Exhaust fans	Crompton / Usha /Orient
CAT – 6 Cable / CAT-6 I/O	D-link

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

Abbreviations:

R.M.T	:	Running Meter
Sq.Mt.	:	Square Meter
Sq. Ft.	:	Square Foot
Cu. Mt.	:	Cubic Meter
T.W.	:	Teak Wood
Q.R.O.	:	Quote Rate Only
C / C	:	Centre to Centre
M.T.	:	Metric Ton
C.P.	:	Chrome Plated
NO.	:	Numbers
MM	:	Millimeter

1. All dimensions are in M.K.S. unless otherwise stated.
2. The quoted rate shall be all inclusive and cover the cost of material including wastage, freight, all types of taxes, duties, royalties, erection, construction, testing of materials if required samples brought for approval, tools and tackles, plant and equipments, supervision, overheads, profit and any other expenditure incurred for completion of work as per drawings, specifications and to the full satisfaction of BANK / Architect.
3. The rates quoted shall be valid for working at all heights, depths and on all floor levels. No extra payment shall be made for scaffolding, staging, ladders etc for transportation of men and materials at higher or lower levels.
4. The item rate specifications are indicative. the contractor will have to carry out the work in accordance with the drawings, technical specifications and / or other conditions laid down in tender document and to the full satisfaction of BANK / Architect.
5. Quantities mentioned against respective items are approximate and can vary to any extent. Payment shall be made on actually executed quantities.
6. No claims shall be entertained in case of increase / decrease quantities of any item and also to add / delete any item in totality. BANK / Architect reserve the right of operating any item for any work.
7. After completion of work the site shall be handed over absolutely clean, after ensuring that all floors, walls etc are spotlessly clean.
8. Rates of all items shall remain constant irrespective of floor level and no extra charges shall be paid for handling and stacking of materials, removing debris etc from the site.
9. Unless other wise noted, the method of measurement will be as per I.S. 1200.
10. BANK / Architect reserve the right of operating all ' Quote Rate only ' items.
11. Wherever contractor proposes to use ' equivalent ' makes (i.e. other than specified) he shall obtain BANK's prior approval. BANK may ask Architect before giving approval to the same. Any additional cost and time lost due to this will be on Contractor's account and no claims will be entertained.
12. The rate of partition, paneling shall include necessary additional framework supports that may be required to suit site conditions or stability of the item. Decision of Architect in regards to the need for such additional supports shall be final.
13. All wooden frame work/ member size mentioned as out of, shall be full size with maximum planning tolerance of 3 mm both ways.
14. After completion of work the site shall be handed over absolutely clean, after ensuring that all laminates, floors walls etc are spotlessly clean.

### SAFETY CODE

1. The contractor shall maintain in a readily accessible place "FIRST AID APPLIANCES" including adequate supply of sterilized dressings and cotton wool.
2. The injured person shall be taken to Public Hospital without loss of time, in case where the injury necessitates hospitalization.
3. Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from ground.
4. No portable single ladder shall be over 9 meters in length. The width between the side rails shall not be less than 30cm. (clear) and the distance between two adjacent rungs not more than 30 cms. When a Ladder is used an extra helper shall be engaged for holding the ladder.
5. Every opening in the floor of building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing, the minimum height of which shall be one meter.
6. No floor, roof or any other part of the structure shall be so loaded with materials as to render it unsafe.
7. workers shall be provided with protective glasses, footwear, headwear, and rubber hand gloves whenever required.
8. Those engaged in welding works shall be provided with welder's protective eye and gloves.
9. I) No paint containing lead or lead products shall be used except in the form of paste or ready-made paint.  
ii) Suitable face masks should be supplied for use by the workers when the paint is applied in the form of spray or a surface having lead paint if dry rubbed and scraped.
10. Overalls shall be supplied by the contractor to the painter and adequate facilities shall be provided to enable the working painters to wash themselves during the period of cessation of work.
11. Hoisting machines and tackle used in the works including their attachments, anchorage and supports shall be maintained in perfect conditions.
12. Ropes used in hoisting or lowering material or as a means of suspension shall be of durable quality and of adequate strength and free from defects.

OTHER CONDITIONS:

CONTENTS:

- A) SPECIAL CONDITIONS
- B) TECHNICAL SPECIFICATIONS
  - Chapter 1 INTERNAL ELECTRIFICATION
  - Chapter 2 POWER CONTROL CENTERS
  - Chapter 3 LAYING OF CABLES
  - Chapter 4 EARTHING
  - Chapter 5 STANDARD DRAWINGS
    - GI PIPE EARTH STATION
    - COPPER PLATE EARTH STATION
- C) RECOMMENDED MAKES OF MATERIAL
- D) SCHEDULE OF QUANTITIES

SPECIAL CONDITIONS

1. General:

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

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

2. Rates

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

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

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

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



### 3.0 Materials:

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

### 3.2 Testing of Materials:

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

### 4.0 Rectification of Defects:

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

### 5.0 Conduit and Cables Layout :

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

### 6.0 Regulations & Standards :

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

### 7.0 Shop Drawings :

7.1 The Contractor shall prepare and submit to the Consultant for the approval of detailed fabrication drawings for Main LT Panels/SwitchGears/Rising Mains special boxes and Distribution Board, switch board, special any other equipment to be fabricated by Contractor within 60 days of signing of the contract.

### 8.0 Completion Drawings :

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

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

#### 9.0 Manufacturer's Instructions:

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

#### 10.0 Completion Certificate:

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

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

#### 11.0 Qualified Competent Supervision:

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

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

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

TECHNICAL SPECIFICATIONS  
CHAPTER 1  
INTERNAL ELECTRIFICATION

1.0 Scope:

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

2.0 Standards:

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

3. Construction

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

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

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

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

4. Capacity of circuit :

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

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

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

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

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

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

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

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

## 5 Recessed MS conduit wiring system

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

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

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

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

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

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

## 6. MS Conduits :

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

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

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

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

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

## 7. TESTING OF WIRING:

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

- i) Insulation resistance test,
  - ii) Electrical continuity test,
  - iii) Earth continuity test,
  - iv) Earth electrode resistance test,
  - v) Switch polarity test.
- i) Insulation Resistance test :

The insulation resistance shall be measured by using 500 v megger between the following points.

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

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

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

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

(ii) Electrical continuity test :

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

(iii) Earth continuity test :

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

iv) Earth electrode resistance test :

The earth electrode resistance shall be tested as specified in section

(v).Switch polarity test :

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

## 8 Distribution Boards :

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

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

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

All marking shall be clear and legible.

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

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

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

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

The incoming and outgoing cables shall be neatly bunched.

## 9. MOUNTING HEIGHTS :

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

## CHAPTER 2 POWER CONTROL CENTRES

### 1.0 Scope :

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

### 2.0 Standards :

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

### 3.0 Design and construction :

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

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

### 3.2 Constructional requirements:

The power control centre shall be of

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

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

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

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

### 3.4 Sheet Steel Cubicle :

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

The cubicle shall be of minimum 2 mm thick sheet steel. Sheet steel shrouds and partitions shall be of

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

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

Apparatus forming part of the control centers shall have the following minimum clearance.

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

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

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

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

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

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

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

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

3.5 Metal treatment and finish :

All steel works used in the construction of the switch boards shall have undergone a suitable rigorous metal treatment process so as to remove oxide scales and rust formation and to facilitate a durable coating of the paint on the metal surfaces and also to prevent the spreading of rust, in the event of the paint film being mechanically damaged.

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

3.6 Bus Bars :

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

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

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

3.6.5 The continuous rating of the busbar shall be 125% of the rated current. Maximum temperature of the bus and the connections shall not exceed 85 degrees centigrade. The busbars shall be of liberal design for the

required current rating i.e. 0.8Amp/sq.mm.

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

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

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

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

#### 4.0 Circuit Breakers :

##### 4.1 General :

4.1.1 Circuit breakers shall be of triple pole / four pole, air break, horizontal draw out /Fixed type, as given in the schedule of work and comply with the requirements of relevant IS with latest amendments and shall have the following :

- i) A short circuit breaking capacity of not less than 50 KA RMS at 415 volts, 50 Hz AC.
- ii) A short circuit making capacity of 105 KA.
- iii) A short time withstand capacity of 150 KA for one second.
- iv) Electrical overload performance at 6 times the rated current, 100% of the rated voltage as recovery voltage at 0.5 power factor.
- v) Dielectric test of 2.5 KV applied for one minute on main circuits.

4.1.2 The circuit breakers shall be fitted with detachable arc chutes on each pole designed to permit rapid dispersion, cooling and extinction of the arc. Interphase barriers shall be provided to prevent flash over between phases.

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

##### 4.2 Operating Mechanism :

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

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

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

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

##### 4.3 Protection :

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

##### 4.4 Housing of Circuit Breaker :

Circuit breakers shall be individually housed in sheet metal castle provided with hinged doors. The breaker



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

The breaker shall have three distinct positions within the castle as follows :

- i) 'Service' position : With main and auxiliary contacts connected.
- ii) 'Test' position : with power contacts fully disconnected and control circuit contacts connected.
- iii) 'Isolated' position : with both power and control circuit contacts fully disconnected.

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

#### 4.5 Interlocking :

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

- i) It shall not be possible either to isolate it from the connected position, or to plug it in from the Isolated position with the breaker closed.
- ii) The circuit breaker can be closed only when it is in one of the three positions or when it is fully out of the castle.
- iii) It shall not be possible to open the hinged door of the castle unless the breaker is drawn to the isolated position.
- iv) Inadvertent withdrawal of the circuit breaker too far beyond the supporters is prevented by the suitable stops.

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

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

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

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

#### 5.0 Switch Fuse Units :

##### 5.1 General :

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

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

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

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

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

##### 5.2 Interlocks and Safety :

Interlocks shall be provided so as to prevent opening of the unit door when the switch is in the ON position and

also to prevent closing of the switch with the door not properly secured. It should however be possible for a competent person to operate the switch shall be suitable for locking with switch in the OFF position by means of a padlock.

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

### 5.3 HRC Fuses :

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

### 6.0 Current Transformers.

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

### 7.0 Indicating / Integrating Meters :

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

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

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

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

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

### 10.0 Indicating lamps and push buttons :

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

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

### 11.0 Cable terminations :

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

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

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

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

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

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

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

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

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

### 13.0 Terminal blocks and lables :

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

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

Provisions shall be made for lable inscriptions.

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

### 14.0 Tests :

- i) The power control centre shall be completely assembled, wired, adjusted and tested for operation under simulated conditions to ensure correctness of wiring and interlocking and proper functioning of all components.
- ii) Each power control centre and components shall be subjected to standard routine tests as per applicable clauses of relevant standards.
- iii) All current carrying parts and wiring of power control centre shall be subjected to power frequency voltage withstand test.

15.0 Drawings: After the award of the contract the contractors shall submit three copies of the following drawings for approval of the Department.

- i) Outline dimensional drawing of the PCC showing the general arrangement indicating the following :
  - a) Busbar clearances;
  - b) power and control cable entry points;
  - c) Configuration of busbars;
  - d) Details of support insulations and spacings;
  - e) Outgoing power cable termination arrangements.
- ii) Single line diagram of power control centre showing Protection, Metering etc.
- iii) Cubicle wiring diagram.
- iv) List of Firements with Ratings & makes / Models

### 16.0 Installation Testing and commissioning :

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

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

## CHAPTER 3 LAYING OF CABLES

### 1.0 Scope :

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

### 2.0 Standards :

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

### 3.0 Laying of Cables :

#### 3.1 General :

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

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

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

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

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

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

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

3.1.7 The method of cable laying and routing of cables, shall in every case be as directed by the Engineer-in-Charge / consultant.

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

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

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

### 3.2 Cable laid in ground :

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

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

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

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

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

### 3.3 Cables laid in built up trench :

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

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

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

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

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

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

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

### 3.5 Sealing boxes :

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

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

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

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

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

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

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

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

#### 4.0 Testing

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

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

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

## CHAPTER 4 EARTHING

### 1.0 SCOPE:

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

a) Pipe earthing

b) Plate earthing

c) Strip earthing

### 2.0 STANDARDS:

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

### 3.0 Earth electrode arrangement :

#### 3.1 Pipe electrode :

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

3.1.2 Electrodes shall be embedded below permanent moisture level.

3.1.3 The length of pipe electrodes shall not be less than 2.5 m. if rock is encountered, pipes shall be driven to a depth of not less than 2.5 m with suitable inclination. Pipe shall be in one piece and deeply driven.

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

### 3.2 Plate electrode :

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

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

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

3.2.3 The electrode shall be buried in ground, with its faces vertical and top not less than 2.5 M from the surface of the ground.

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

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

### 3.3. Strip or conductor electrodes :

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

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

### 4.0 General :

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

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

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

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

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

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

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

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

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

#### 5.0 Testing :

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

DATE:

SIGNATURE OF THE CONTRACTOR



### DECLARATION

I/We have inspected the site of works and have made me / we 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.

\_\_\_\_\_

Signature of Tender

Address\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date\_\_\_\_\_

**UNION BANK OF INDIA**  
**REGIONAL OFFICE, KAKINADA**  
**SPECIFICATION FOR UNION BANK OF INDIA**  
**ANNAVARAM BRANCH**

S.No.	Particulars	UNIT	QTY	RATE	PER	AMOUNT
	<b>ELECTRICALS</b>					
	<b>POINT WIRING</b>					
1	Supply, laying, Connection & testing of light, fan point, wiring by 2 X 1.5mmsq (2X3/0029) + 1 X 1mmsq PVC insulated copper flexiable wire maintaining the colour code as per direction in PVC conduite of 20mm with ISI mark 1.5mm thickness to conceal in wall partition mending good the damage, complete with PVC circular box, bend to be done as per drawaing including 3 point ceiling rows wherever required GI saddle to be used for fixing, metal flexiable/PVC flexiable pipe may use if requied in partition wall. All PVC pipes should be with ISI mark. No joints will be allowed inside pipe, light, fan & plug point complete with modular type switch plate & MS box. Including the main circuite line 2 X 2.5mmsq + 1 X 1.5mmsq earth PVC insulated Cu. Wire, maintaining the coloud code. Circuiteline for lighting switch board, 6Amps plug board are to be drawn from lighting DB to Lighting board & plug board, 6/16 Amps plug point line are to be draw from power DB Amps plug to be & to 6/16 plug point board. 3 Nos lighting board, 03 Nos, 6Amps connected from one circuite & one 02 Nos. 6/16 plug to be connected from on circuite.					
A	Lighting point complete with modular type switch, plate, M.S.Conceal box.					
	Point – 1 Light point control by 01 switch	NOS	40			
	Point – 2 Light point control by 01 switch	NOS	8			
	6 amps dependent sockets on switch board	NOS	4			
B	wall bracket and ceiling fan point as above complete with modular type switch, plat & M.S. conceal with modular type switch, plate & M.S. conceal plat & conceal box at fan end box. Including one 2 pin plug socked from one circuite	NOS	18			
C	Call bell point same as above complete with modular type push switch, plate & M.S.Conceal box with buzzer type bell.	NOS	1			
2	Supply Laying of Circuite line 2 X 205mmsq + 1 X 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 6amps plug connected	Mtr	260			
A	Supply Fixing & Connection of modular 6 amps plug switch complete with MS box socket to fixed under table & switch above table	NOS	4			
B	-Do-but 16 Amps 6 pin socket with 16 amps switch for raw power point. (01 Nos plug connected from on circuite)	NOS	4			
3	<b>TELEPHONE WIRING.</b>					
	Supply laying & connection of same as item no.1 but with 2 pair 0.51mmsq tinned CU conductor through PVC rigid ISI mark pipe from telephone point to Korne DB Complete with RJ – 11 telephone socket modular type in MS conceal box.	NOS	10			
A	Do – 10 pair.51mmsq copper condutor telephone cable in 20mm dia PVC pipe	Mtr	20			
B	Supply fixing & connection of 20 pair KRONE connector DB complete with PVC moulded Telephone DB box with locking system.	SET	1			
4	<b>SUPPLY FIXING &amp; CONNECTION LIGHT FITTINGS/FANS:</b>					
A	10W LED PANEL LIGHTS (WIPRO, PHILIPS, CROMPTION, SYSCA)	NOS	18			

B	SUPPLY AND FIXING OF 600 X 600 GG MODULAR POP OR SURFACE MOUNTED 40W LED LIGHTS(WIPRO, PHILIPS, CROMPTON, RC 375 Model)	NOS	20			
C	PHILIPS MAKE Miroalta 1 X 40 watt TLD.	NOS	10			
D	Supply and Fixing of Crompton Ceiling Fans	NOS	18			
E	supply and fixing of fan electronic regulators	NOS	18			
F	Exhauster Fans	NOS	3			
5	<b>UPS WIRING:</b>					
	Supply fixing & connection of UPS circuit line with 2 x 2.5 = 1 x 1.5 mm sq through regid PVC conduit 20mm dia 1.6mm wall thickness, 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 circuit	Mtr	290			
A	Supply fixing of 3 x 6 Amps 5 pin socket = 1 x 16 Amps 6 pin socket in single board (under table ) = 1 x 16 A switch in another board above table as per direction	SET	16			
B	-Do- but 3 x 6/16, 6 pin socket with switch to provide near HUB rack, are to be connected from UPS power	SET	1			
C	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 UPSDB switch and from UPS output to UPS	Mtr	30			
D	Supply installation of UPS incoming 20 Amps industrial socket with 32 Amps SP MCB MIDS make	NOS	4			
E	Supply installation of termination of UPS outgoing power distribution system with 10+2 way SPNDB comprising 10 x 6 Amps SP MCB & 32 Amps DP MCB as main	NOS	2			
6	<b>LAYING OF CABLE:</b>					
A	Supply laying fixing main power with 50mm sq 3.5 core PVC insulated, PVC sheated Alu. Conductor, 1100 v grade armoured cable complete with 02 nos. 8 SWG bear GI. Wire as running earth.	Mtr	35			
B	End termination of 50mmsq 3.0 core armoured cable, complete with brass cable gland, Alu. Lug, PVC tape.	END	1			
7	<b>MAIN ELECTRICAL</b>					
	Supply, fabrication, assembling, internal connection, testing, commissioning & connecting with incoming, outgoing power cables & lines as required to complete the job of cubicle type electrical panel made from 14 SWG CRCA Sheet with proper earthing termination (Nut, Bolt & washer) 2 Nos. outside of Panel. Painting: Powder Coating Electrical Gray / Siemens gray to be done. One 6"x4" enamel type 440 volts danger Board to be fixed up on Main Panel Bus Bar cover. Components are as follows. All MCCB & MCB knobs should be visual. Panel Board (Modular Type) with suitable Bus Bars 1 No. Incomer MCCB 125A Rating 1 No. Change Over Switch 125A Rating 1 No. 63A TP MCBs for A.C Units 2 Nos. 32A SP MCBs for Lighting & Fans 1 Nos. 32A TP MCBs for Lighting & Fans 1Nos. 32A TP MCBs for 2Nos of 5KVA UPS Units 3 Nos. Indicating Lamps (R+Y+B) with Toggle Switches 3Nos. Ammeter 0-150A, CTR: 150/5A 1No. CTs: 150/5A 3 Nos. Volt Meter 0-500V 1No. CT: 75/5A (for APFC Panel PF Meter) 1No.	SET	1			
7A	Supply and fixing of lighting DB 3 phase 6 way Double Door DB-1NO INCOMING 40 A.TPN MCB- 1 NO OUTGOING 10 A.MCB-16 NO	SET	1			
7B	Supply and fixing of A.C.D.B-3 phase 4 way Double Door DB-1 INCOMING 63A TPN-1 OUTGOING 20a.mcb-10 NO'S	SET	1			

	A.P.F.C Panel for 26 KVAR Capacitors (Cubicle type, Wall Mounting type)					
	A.P.F.C Panel for 26 KVAR Capacitors (Cubicle type, Wall Mounting type) Supply, fabrication, assembling, internal connection, testing, & Commissioning of Automatic Power Factor Control Panel (A.P.F.0 Panel) housed in Powder Coated 14 SWG CRCA Sheet with 3 Indicators for Incoming supply + 8 Stage APFC Relay + Required Contactors + Power & Control MCBs On Indicators + individual Push Buttons for ON/OFF Operation + Auto/Manual Switches + CTs + Ammeter with Selector Switch + Volt Meter with Selector Switch + Capacitors as per the following arrangement complete. Panel Board (Modular Type) with suitable Bus Bars 1 No. APFC Relay 8 Stage 1 No. 10KVAR Capacitor with Suitable MCB, Contactor etc. 1Nos 5KVAR Capacitor with Suitable MCB, Contactor etc. 3Nos. 3KVAR Capacitor with Suitable MCB, Contactor etc. 1 No. 2KVAR Capacitor with Suitable MCB, Contactor etc. 1No. Indicating Lamps (R+Y+B) with Toggle Switches 3Nos. Ammeter 0-50A, CTR: 50/5A, with Ammeter Selector Switch 1 No. CTS: 50/5A 3Nos. Volt Meter 0-500V with Voltage Selector Switch Power Factor Meter 1 No. (Sensing from Main Panel Incomer CT) 1No.	SET	1			
8A	EARTHING STATION	SET	2			
	Supply of GLORES™ Maintenance Free Earthing systems consists of 1 i) Earth Electrode of Copper bonded high tensile low carbon steel rod of 3.0 meter long & minimum 17.2 mm dia with copper bonding thickness of min 250 micron and UL Listed - 1 No. Sets 1 ii) GLORES™ Earth Enhancement compound supplied in sealed bags of min 10 Kgs - 3 Nos. iii) U-bolt Rod clamp - Type "E" - 1 No.					
B	Spike Earthing with G.I. electrode 3mts long x 50mm dia (Class-B) including accessories and providing masonry enclosure with cover 300 x 300mm plate having locking arrangement and watering funnel etc., with charcoal, sand & salt at alternate layer as required for electrical panel earthing ( for main electrical panel earthing)	NOS	1			
C	Supply laying 2 x 8 SWG copper bare wire from earth spike to main panel (electrolyte wire)	Mtr	30			
D	Do but with 1 x 16 mm sq insulated copper wire from earth spike to UPS earth bus bar through PVC rigid 20mm dia ISI mark	Mtr	30			
9	A/C ELECTRIFICATION					
	Supply laying & connection of A/C line for 1.5/2 TR A/C Window/Split with 2 x 4 + 2.5 mm sq through Rigid PVC conduit rest same item no.1	Mtr	250			
A						
B	Supply and fixing of 20A A/C. Metal Box with 20A MCB	NOS	9			
10	OUT DOOR TYPE GLOW SIGN BOARD –Wiring					
A	Supply laying of main line with 2 x 2.5 + 1x1.5mmsq. through MS conduit from main panel to glow sign board	Mtr	18			
B	Supply installation of 16amps DP MCB at main entrance glow sign board timer 24 hrs in original housing	SET	1			
11	Supplying of 100 Amps TPN HRC type SFU at SEB for main incoming on MS angle frame & 02 nos cable end box including connection.	nos	1			
12	GEN SET WIRING:					
A	Supply laying fixing main power with 3.5 core 50 sq.mm PVC insulated, PVC sheathed Alu conductor, 1100 v grade armoured cable complete with 02 nos 8 SWG bare GI. Wire as running earth.	Mtr	38			
B	End termination of 3.5 core 50 sq.mm armoured cable, complete with brass cable gland, Alu. Lug, PVC type	END	1			
Total						

Add for Miscellaneous Works	
Total	
Say	

#### LAN WORKS

S.No	Particular	Qty	Per	Rate	Amount
1	Supplying and Fixing of CAT 6 UPTCable (23AWG) 2 Run	350	Mtr		
2	Supplying and Fixing of CAT 6 UPTCable (23AWG) Information Outlet + Dual face Plate + Box	16	NOS		
3	Supply & Fixing of 12U rack(Dealing from netrack)	1	NO		
4	Supply & Fixing of 24 Port Dealing Jack Panel	1	NO		
5	Supply & Fixing of 2m Patch Card	16	NO		
6	Supply & Fixing of 1m Patch Card	16	NO		
	Total				
	Add for miscellaneous work				
	GRAND TOTAL				
(RUPEES SEVENTY THOUSAND ONLY)					

ABSTRACT					
		Cost of Electrical Works			
		Cost of LAN Works			
		TOTAL			



