

**ELECTRICAL INSTALLATION WORK OF
BANK OF INDIA, SHIVAJI PARK BRANCH
INDRAVADAN CO-OP.HSG.SOC.LTD., BAI
PADMABAL THAKKAR MARG, MAHIM,
MUMBAI - 400 016**

FOR

BANK OF INDIA

**TENDER DOCUMENT (for empanelled
contractor only)
FOR ELECTRICAL WORK**

PART I

**TECHNICAL SPECIFICATIONS, SPECIAL CONDITIONS
OF CONTRACT**

ARCHITECTS

**KOTHARI ASSOCIATES PRIVATE.LIMITED.
Kartar Bhavan, 3rd floor,121 Shahid Bhagat Singh Road,
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e-mail: kotharibom@vsnl.net**

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OP.HSG.SOC.LTD., BAI PADMABAL THAKKAR MARG, MAHIM,
MUMBAI - 400 016**

Ref:

dated:

LETTER OF INVITATION OF TENDER

To,

Dear Sir,

Sub: Tender for Electrical installation work of Shivaji Park Branch at Indravadan Co-op.Hsg.Soc.Ltd., Bai Padmabal Thakkar Marg, Mahim, Mumbai

We as client "Bank of India, Mumbai" invite you to tender for the above work.

The tender copies can be purchased from BANK OF INDIA, on following address onwards on payment of Rs.500-(Rupees five hundred only)(non refundable) from the office of Chief Manager, Bank of India, address mentioned below on any working day during working hours between 11.00 a.m. to 3.00 p.m.

Your tender accompanied with a Bank Draft of Rs.5000/- (Rupees Five Thousand only) as earnest money, duly filled in, signed and sealed shall be submitted in two separate sealed envelopes as described in Instruction to tenderer clause 30 on page no.7 hereafter latest by 30.03.2010 up to 2.00 P.M. at the following address:

**Asstt. General Manager
Bank of India, Mumbai South Zone
A&S Department
Bank of India Building,
70-80 Mahatma Gandhi Road, Fort,
MUMBAI : 400 001**

Please note that the Bank through the Architects, reserve the right to accept or reject any or all the tenders without assigning any reason whatsoever.

Yours faithfully,

BANK OF INDIA

- 7.5 Insurance Clause 24.
- 7.6 Terms of payment:
1. The payment shall be made against one interim bill and final bill.
 2. 8% retention money from each bill.
- 7.7 Period of honouring final bill 30 days from the date of receipt of final bill.
- 7.8 Retention after virtual completion. The 50% of the total sum of retention amount shall be released after virtual completion of the work and remaining 50% shall be refunded after successful completion of defect liability period provided the contractor has satisfactorily carried out all the work and attended to all defects in accordance with the condition of the contract. No interest is allowed on retention money.
- 7.9 Earnest money deposit Rs.5000/-
- 7.10 Initial Security deposit with the owner 2% including EMD
- 8) We understand that you are not bound to accept the lowest or any tender you may receive.

DATED DAY OF March 2010
 Signature in the capacity of
 duly authorized to sign tenders for and on behalf of

(IN BLOCK CAPITALS)

WITNESS:
 SIGNATURE _____ ADDRESS OF _____
 NAME _____ TENDERER _____
 OCCUPATION _____

2. INSTRUCTIONS TO TENDERERS

1. Before tendering the Tenderer shall visit the site and also carefully examine the conditions of contract, special condition, technical specification (including drawings and other specifications referred to therein), the schedules and the bill of quantities and if there should be or appear to be any ambiguity in or discrepancy between any of these documents or between figured and measured dimensions upon the drawings, he should immediately refer the matter to the Engineer for clarifications.
2. Timely completion of the works is the greatest essence of this contract and the period specified for the completion of works from the date of letter of intent must be adhered to as indicated. Any deviation proposed shall be clearly mentioned. Commitment on early completion of work will be given due weight age while deciding on the tender.
3. The Tenderer shall complete the annexed form of tender and fill in the rates and amounts in the bill of quantities. He shall sign and date the tender documents in the spaces provided for the purpose. The Tenderer shall initial each page of the bill of quantities.
4. The Tender shall be signed by person or persons so authorized by the Tenderer with signature duly witnessed. In the case of a corporation, the tender shall be signed by the officers so authorized by the corporation with its seal duly affixed. In case of consortium, the tender shall be signed by the officers so authorized by each corporate member of the consortium and the tender shall be affixed with corporation seals of each member of the consortium.
5. The Tender shall contain an address for serving notice required to be served to the Tenderer in connection with the Tender.
6. The Tender form and the documents attached to it shall not be detached one from the other, and no alternation or multination (other than filling in all the blank spaces) shall be made in any of the documents attached documents shall be pointed out in the covering letter otherwise it shall not be entertained.
7. The rates quoted by the Tenderer shall not be subject to any adjustment with variations in wage rates, taxes, VAT, prices of material or any other costs except where specific provisions have been made in documents.
8. The Tenders shall accompany the following information, schedules and drawings :
 - a) A construction program showing the Tenderer's proposed sequence of operations together with the estimated time for each activity, including preparation of drawings if any, construction/manufacture, delivery, erection and commissioning etc.

- b) The Tenderer's proposals for supervising the work, including the numbers and experience of the various grades of supervisory personnel/officers for each month of construction period.
 - c) Schedule of labour requirements showing the total estimated labour force, for each month of construction period.
 - d) Schedule of monthly electrical power consumption including peak power requirement where applicable.
 - e) Schedule of proposed sub-contractor/associates.
9. The Employer reserve the right to adjust arithmetical or other errors in the tender in accordance with the following general rules. In the event of discrepancy between words and figures quoted, the description in words shall prevail. Similarly in the event of an error in the amount column arising as a result of wrong extension, the unit or item rates shall be regarded as firm and extensions amended accordingly.
10. This is an item rate measurement contract based on priced Bill of Quantities. The item rates shall be valid during the complete performance of the Contract (including Maintenance period). The Tenderers shall note that the prices and rates inserted in the Bill of Quantities are to be the full inclusive value of the works described under each item including all costs and expenses which may be required in and for the Installation of the works described whether specifically mentioned or not, together with all general risks liabilities and obligations set forth or implied in the documents, on which the tender is based. The employers will not be responsible for or pay for expenses or losses which may be incurred by any tenderer in the preparation and submission of the Tender, or in any activity connected therewith. As soon as the successful tenderer is advised of the award of the contract to incur by him shall be deemed to be covered by the prices quoted in his tender.
11. The Tender shall be accompanied by Earnest Money as per Tender Notice. This Earnest Money as per Tender Notice. This Earnest Money shall be refunded to the unsuccessful Tenders. In case the Tenderer does not accept the offer, Earnest Money deposit shall stand forfeited.
12. Any Tenderer who may be in doubt as to the meaning of any part of the tender documents shall at once notify the Employer/Consulting Engineer requesting written explanation or clarification thereof. Such explanations or clarification to the tender document shall be issued as formal addenda by Consulting Engineer to each tenderer who has purchased the Tender documents and such addenda shall become part of the Tender document and the incorporated and returned with it.
13. The Tender shall remain 30 days submission stipulated in the tender notice. Any Tenderer with drawing or amending his tender within this period shall forfeit his earnest money to the employer.
14. The employer reserves the right to reject any or all tender or accept the lowest or any other tender without assigning any reason therefore.

15. Tenderer shall require to furnish Electrical Contractor License Number and Name of the Supervisor holding license in Maharashtra.
16. Tenderer shall require to furnish list of staff, tools and tackles along with offer in duplicate.
17. Tenderer shall submit a list of similar job carried out in part and list of job in hand with value and owner's permission.
18. All Tender documents, drawing shall be returned by contractor along with the quotation.
19. The necessary formalities as required by statutory local bodies in execution of the electrical work, necessary approval of electrical installation from the Electrical Inspector and other relevant authority, submission of test report and commissioning them to be included in the electrical contractor's scope of work. All fees required to be paid to the authority in this connection shall be paid by the owner. The rate and prices quoted by the contractor shall be deemed to have allowed for all such associated work and activities briefly described in the foregoing paragraphs and no additional cost on change whatsoever shall be payable to the Contractor.
20. Necessary space for temporary store arrangement to be provided by owner. However, lockable room to be made by the Electrical Contractor.
21. Power at one point will be provided and made available by owner.
22. No space/room etc will be given by owner for staff of Electrical contractor.
23. Necessary bricks, sand, cement, welding electrodes, testing meters, tools and tackles required to carry out job shall be arranged by Electrical Contractor.
24. The Drawings attached with the tender and forming part of this contract are subject to additions and alterations to suit the requirements of the work for which no extra claims shall be entertained.
25. The Specifications forming part of this contract have been drawn up with all possible care and intended to cover, the supply of all the materials, tools, plants and equipments, labour and the executing of all works necessary to complete the entire work in all respects under this contract. In case there are any details of construction or materials which have not been referred to in the specifications of items schedule of quantities or the drawings but which are usual or essential in the true completion of the purpose of the work, the same shall be deemed to have been included in the price quoted by the tenderer. Wherever specifications are not stipulated the work shall be as per latest ISI specifications and/or as directed by the engineer following good engineering practice.
26. The Tenderer shall not be allowed to modify or withdraw his Tender for 30 days from the date of submission of the Tender.

- 27 The Owner / Consultants do not bind themselves to accept the lowest Tender and reserve the right to reject any or all Tenders without assigning any reason what so ever.
- 28 Time is the essence of the contract. The entire work shall be completed simultaneously along with the completion of civil works progressively but not later than 45 days in phased manner.
- 29 Items of work and quantities indicated in schedule of quantities are only approximate and for the rough guidance of the tenderers and are subject to variation to any extent (without limit) during actual execution of work
30. The sealed tender shall be submitted in 2 nos. sealed envelope under the heading as follows:
Part I - Technical bid (Technical specifications, special conditions, conditions of contract) along with Earnest Money Demand Draft.

Part II - Commercial bid (Bill of quantities)

3. SCOPE OF WORK

The Tender bids are invited from Licensed Electrical Contractor for carrying out Electrical installation work of Shivaji Park Branch at Indravadan Co-op.Hsg.Soc.Ltd., Bai Padmabal Thakkar Marg, Mahim, Mumbai .

The scope of work is elaborated in the drawings and specifications including the bill of quantities. The loading, unloading, insurance, storage of material supplied and installation with commissioning is within the scope of work.

The contractor shall also carry out the necessary liaison with the power supply authorities for providing electrical supply to new proposed office. The lighting, power wiring, Telephone, data cables for computers etc. shall be carried out as indicated on drawing and as required at site. He shall also obtain the necessary approval and do the liaison with other approving bodies like the Electrical Inspectorate, and co-ordination with other working agencies such as A.C. contractor, Interior contractor, false ceiling etc.

4. CONDITIONS OF ELECTRICAL INSTALLATION WORK

1. All work shall be executed in accordance with the Indian Electricity Rules, I.E.E. and Regulations for Electrical equipment of Building, fire insurance requirements, factory act and any other regulation in force.
2. The contractor shall depute at site a qualified and competent Engineers and Supervisor for the job.
3. Any adjustment necessary during stages of erection shall be carried out without any additional charges to the purchaser.
4. Any additional item of work over and above those scheduled in the order are to be carried out at the same basic rates as quoted in the order for the same type of work.
5. The employer will have the liberty to carry out any item of work departmentally or through any other agency and no compensation or damage will be payable on account of this.
6. No extension of time to complete the work will be made except when the work is delayed by :
 - i. Force major.
 - ii. Reasons of fire, earthquake, civil strike, lock out or strikes affecting any of the trades employed upon the work.
7. The Contractor will be required to submit interim and final bills in quadruplicate duly supported by the measurement as to quantities and will be paid by the employer from time to time as per certificate issued by the site engineers. The employer will have power and authority to review and revise any certificate issued by them if it is subsequently found that mistake have been committed.
8. The employer may intimate from time to time that they require the work to be measured and the contractor shall immediately attend or send a qualified agent to assist in the taking of these measurements. This measurement will be taken as correct measurements of work.
9. Before final payment is made, the employer may require the contractor to furnish satisfactory proof that there are no outstanding debits or liens in connection with the contract.
10. The contractor shall be totally responsible for the entire erection of the equipment mentioned in scheduled of this order including additions, if any to the satisfaction of the employer.
11. The contractor will supply all the normal consumable materials such as Rawl plugs, Phil plug, welding Electrodes, Kerosene, Petrol, Insulation Tapes, Soldering Plugs, cotton waste, cleats, wires for portable tools, lights, plugs, etc., and such other materials as contractor might need to execute handling and erection.

12. The contractor will be responsible for the supply of necessary erection and testing equipment tools, tackles, cranes winches, welding machines, welding sets, drilling machines, grinders, conduit bending machines, conduit threading equipments, brazing equipments, scaffoldings, cleaning equipment, etc. The contractor will give a list of all erection and testing equipments, tools and tackles which in his opinion, he will be bringing to the plant site for erection and installation. The contractor should not depend on the employer in the matter supply of erection and testing equipment, tools and tackles.
13. After completion of erection of the plant the contractor's testing and commissioning staff shall carry out the necessary (H.V. Test Megger Test and continuity tests) tests and starting up of the plant with employer's operation and maintenance staff under direct supervision and guidance.
14. Testing and commissioning charges are included in labour charges and it is the responsibility of the contractor to test and commission his part of work at the time of handing over the site to the employer.
15. The contractor shall clear the site of work of all workers, materials, sheds, etc belonging to the contractor and deliver the site in a clean and leveled condition as required by the employer within a period of one week after the work is completed. In case of failure by the contractor the employer shall clear the site at the cost and risk of the contractor.
16. Contractor shall have the electrical contractor license to carry out electrical installation work in the state. He should issue the necessary test certificates for the installation work carried out by him and the contractor shall arrange to approve the electrical drawings and the installation by the electrical inspector. Necessary testing fees of electrical inspector will be paid by the employer against the cash receipt memo.
17. Progress and Times of completion:
 - a) The work shall be commenced within stipulated time.
 - b) The contractor shall confirm to the time schedule for completion of work as specified by the owner. i.e. within 50 days from the date of work order
18. Penalty Clause:

If the contractor fails to deliver, install and commission the item mention above within the stipulated time, he shall be liable to pay penalty to the owner at the rate of 5 % per week subject to maximum of 5% penalty of the total value of this contract. The penalty will be imposed on contractor only when the contractor fails to complete work that should have been done in normal course by him.
19. Variation in quantities:

The rates mentioned in the schedule of quantities are binding to the contractor irrespective of any variation in quantities.

20. Temporary Workshops, Stores etc.:

The contractor shall provide during the progress of the works provide, erect and maintain at his own expenses all necessary temporary workshops, stores, offices, etc as required for the proper and efficient execution of the works. The planning, setting and erection of these buildings shall be to the approval of the Engineer-in-charge and they shall be maintained at all times be kept tidy and in a clean and sanitary conditions to the entire satisfaction of the Engineer-in-charge and at the contractor's expense.

21. The contractor will take back all surplus materials, which are not required, at the end of the job. Supply and installation for cables will be paid on actual length of the cable laid.

22. Contractor shall have to work in close co-ordination with other agencies and Engineers-in-charge of the job, after obtaining necessary work permit.

23. Terms of payment:

As mentioned in the clause No. 7.6 of the Tender Form,

24 Fire Insurance

The Contractor shall on signing the Contract insure the works for the total contract sum and keep them insured until the virtual completion of the contract against loss or damage by fire and earthquake in an office to be approved by the Architects in joint names of the owner and contractor. Such policy shall cover the property of the Employer. The contractor shall deposit the policy, in original, and receipt for premium with Employer within twenty-one days from the date of signing the contract unless otherwise instructed by the Architects. In default of the contractor insuring, as provided above, the owner may so insure and may deduct the premiums paid from any moneys due, or which may be come due to the contractor. The contractor shall, as soon as the claim under the Policy is settled, work reinstated by the Insurance Office should they elect to do so, proceed with all due diligence the completion of the work in the same manner as though the fire had not occurred and in all respects under the same conditions of contract. The contractor in case of rebuilding or reinstatement after fire shall be entitled to such extension of time for completion, as the Architects may deem fit.

5. SPECIAL CONDITIONS OF CONTRACT

1. The contractor will depute a Licensed Supervisor to supervise the work and the same shall be done in good workmanship manner as per India Electricity Act. , Indian Electricity Rules, Standards IS and other Codes, as mentioned, Tariff Advisory Committee Regulation, Fire insurance Department Code, Local Supply Authorities Regulation with latest amendments.

In case of contradiction, the contractor should take the approval of the Client / Consultants before execution.

2. On award of the contract the successful bidder has to give a List of Technical Persons, he will be deputed on the Job Site and the Technical Man co-ordination at his office.
3. The successful bidder has to immediately submit a bar chart showing the detailed time period for Supply, Erection and Commissioning of Equipments. This bar chart should have the Completion dates as per requirements.
4. The Contractor should depute adequate number of skilled and unskilled Laborers. In case found necessary the Contractor must supplement the work force to adhere to the completion schedule.
5. The contractor should keep at site a set of tools required for this job including drill machine, welding set, crimping machine, scaffolding, ladders etc.
6. The Contractor has to submit for every material supplied by him, either a manufacturer's technical product literature, or a Drawing prepared by him for fabricated items of a sample of the material for small accessories etc. The sample submitted will be kept with the Consultant/Client till the completion of the Job.

Only on approval of the sample Drawing or Product Literature, should the Contractor dispatch material to site. A written Approval from the Consultant/Client is essential before dispatch of material.

7. The Contractor shall carry out the entire Installation, Testing and Commissioning as per the relevant Codes mentioned in Point No. 1 above. The necessary test for equipment Manufacturer at the works will also be necessary and the necessary final test will be carried out in the presence of Consultants/Client and the Test Results have to be approved by the Client/Consultant.
8. In case the Test Results are not proper, the contractor has to do the necessary rectification to obtain proper result at no extra cost to the client.

All material used against this contract shall be new, of first class quality, reputed take free from imperfections and selected for long life and minimum maintenance.

9. Five Copies of Test Certificates of the Test shall be submitted to the Client/Consultant within week's time of test.

10. Quantities are indicative and Actual Quantities have to be worked out by the Contractor and accordingly rate submitted.
11. Equipment Locations in Tender Drawing are tentative and exact locations will be shown at site.
12. Contractor has to make his own arrangement for proper storage of materials, tools tackles at site. In case of improper means for storage, loading/ unloading, erection, the contractor should immediately rectify when pointed out by the client / consultants at no extra cost to the client.
13. The contractor should submit proper Erection Drawings wherever necessary and asked for by the client / consultant.
14. The Contractor should follow all safety codes for the safety of his men, materials and other personals involved on this work site. He should take adequate care to avoid damage to other agencies working and clients property, and all workmen shall be insured under workman's Compensation Act in force.
15. The Contractor will have to co-ordinate with other agencies working at the site for day to day work. He shall co-ordinate with Civil Contractor and others at site.
16. The Contractor will be responsible for the Liaison with Authority / Approving Bodies. The scope will include preparation of necessary drawings and submission to authorities Inspectorate including Test Certificates. The necessary follow-up with relevant Authorities till the installation is approved and commissioned is ice charges, meter rent and deposit if any, in this regards shall be borne by the client.
17. The general conditions of contract are surpassed by special conditions wherever there is contradiction in Interpretation of contracts.
18. Contractor shall provide all insurance for men, material including Contractors all risk Policy and Third Party Insurance Risk for damage to the client's property.
19. The Contractor shall abide by all the rules stipulated by Labour Laws and maintain all such registers as are necessary and should produce for inspection when called for.
20. Contractor shall indemnify the Client against any claims, Liability etc., regarding any accident, ESIS, Provident Fund, Sub-Contract Payments etc., as required by the Law.
21. Limited open space will be provided as available at Site or adjacent to Site to stock materials.
22. Contractor shall submit his cost competitive offer based on these terms and conditions and other term and conditions in the Tender.
23. Site clearance on completion of work shall be carried by the Contractor. The entire site is to be cleaned of all waste to the satisfaction of Clients/Consultants.

24. Electricity and water will be supplied free of cost at one point in the building. All further extensions have to be arranged by the Contractor. In case of any misuse of water and power supply by the Contractor, the same will be stopped to the Contractor and he has to make his independent arrangement.
25. In case the material specifications are altered and the client supplies the material the Contractor shall install the same. The installation rates shall be derived from Tender Rates.
26. The Tender Specification and Drawings are the copy right of the Consultants. Tenderers are not permitted to copy/reproduce the same in part or whole for any other works.
27. Contractor's labourers shall not be allowed to stay at site.
28. Settlement of Dispute, Arbitration.
 - i) Any other decision, opinion, direction, certificate or valuation of the Architects not relating to any of the accepted matters or any refusal of the Architects to give any of the same, and all disputes and differences of any kind arising out of or in connection with the contract or the carrying out of the works (Whether during the progress of the works or after their completion and whether before or after the determination, abandonment, or breach of the Contract) shall be referred to a single Arbitrator in case the parties can agree upon one or in case of disagreement as to the appointment of a single Arbitrator shall be referred to two Arbitrators. The appointment of Arbitrator shall be sole responsibility of the President of the Indian Institute of Materials Management and same shall be deemed to be a submission to arbitration in accordance with the provisions of the Indian Arbitration Act, 1940 as per the amendment 1986, or any statutory modification thereof for the time being in force.

Provided always that the Employer shall not withhold the payment of an interim certificate nor the contractor in any way delay the carrying out of the works by reasons of any such matter, question or dispute to be referred to arbitration but shall proceed with the work with all due diligence and shall until the decision of the Arbitrator or Arbitrators or the Umpire abide by the decision of the Architects or the Corporation as the case may be, and no Award of the Arbitrator or the Arbitrators or the Umpire shall relieve the contractor of his obligations to adhere strictly to the Architects' instructions with regard to the actual carrying out of the works. The Arbitrators at their first sitting shall nominate an Umpire to whom the dispute would be referred to in case of disagreement between them. The Umpire, on reference to him by the Arbitrator, will give his Award without the necessity of taking fresh evidence of the parties unless he considers it necessary to examine any additional evidence. The decision of the Umpire shall be final and binding on the parties

- i. It is a term of the contract that the party invoking the arbitration shall specify the dispute or disputes to be referred to the arbitration under this clause together with the amount or amounts claimed in respect of each such dispute, make any demand for arbitration in respect of any claims in writing within 90 days of receiving the intimation from the Employer that final bill is ready for payment, the claim of contractor(s) will be deemed to have been waived and absolutely barred and the Employer will be discharged and released of all liabilities under the contract in respect of these claims.
- ii. The decision of the Architects regarding the quantum of reduction as well as justification thereof in respect of rates for sub-standard work which may be decided to be accepted will be final and would not be open to arbitration.

In all cases of disputes referred to arbitration, the Arbitrator/Arbitrators shall state the decision in writing and will give reasoned award for each item of dispute referred thereto.

CONTRACTOR

6. TECHNICAL SPECIFICATIONS

A. LIGHT AND POWER WIRING.

1. PVC CONDUIT:

PVC Conduit shall be Heavy duty all accessories/fittings including ordinary and inspection fees, bushing, reducers, junction boxes, terminal boxes, saddles etc.

The PVC Conduit shall run along walls, ceiling, in accordance with Conduit layout drawings.

All burs shall smoothen and cleaned. The conduit shall be of minimum of 25mm dia. and no bending accessories shall be used. The conduit shall be bending for required location with the help of spring bending and **not with hot bending methods.**

The number of wires through the given section of PVC conduit shall be as per IS specification.

When two length of PVC conduit are joined together through the coupling, running threads equal to the full length of the coupling shall be provided on any one length.

All the supporting holes are to be drilled by electric drill machine.

2. WIRING METHODS & PVC WIRES:

The wire pulling shall be in accordance with standard practices. All the wires in a particular section shall be bunched together and pulled at a time.

The wires used shall be colour coded with Red wires for R phase, Yellow wire for Y phase, Blue wire for B phase and Black wire for neutral.

All the wires shall be purchased directly from the manufacturers and approved by the Consultant.

All the wire shall be insulated with adequate thickness of extruded PVC insulation.

All wires shall be of 1100V grade conforming to IS 694 with latest amendment.

All the wire ends shall be ferruled with colour codes and numbers.

All the circuits shall be identified at both ends of the circuit.

A maximum of 3 lights to be switched on one switch of **6A**.

3. EARTH CONDUCTOR:

The Earth Conductor flat shall be connected with brass nuts and bolts with washers. The contractor shall not keep contact/ joints loose. The conductor shall be clamped on spacers at regular intervals of 400 mm. In the Ground the conductor shall be at a depth of 600 mm. from Ground surface. All the back filling and other civil work be done by the electrical contractor. The suitable tapping for the Board/Socket earthing shall be taken from 25 mm. x 6.15 mm. G.I. flat.

4. EARTH PITS :

The earth pits are to be made as per IS 3043 by excavating to a depth of 3 mtrs. **G.I.** 600 x 600 x 3.15mm plate shall be buried to a depth of 3 mtrs. with alternate layers of salt and charcoal. The pipe shall have funnel at the top for watering. The cast iron cover shall be of heavy duty to be provided on the chamber at the top. Two Nos. 25 x 6.15mm **G.I.** flat shall be connected at the two points on the pipe with brass nut and bolts and washers.

All other details shall be as mentioned in I.S. The pit shall be tested on completion. The earth resistance value shall be measured with an earth megger and shall confirm to IS regulation i.e., less than 1 - 2 ohms.

5. POWER CABLES :

- 5.1 All the power cables used in this job shall be conforming to I.S. 1554, with PVC insulation, PVC sheathed, 1100 V grade steel armored with standard copper conductor, PVC insulation etc.
- 5.2 The cable supplied shall be of reputed make having ISI mark.
- 5.3 No cables joints are allowed, unless it is absolutely essential and will be carried out only on client/consultant's written approval.
- 5.4 All the cables distributed within the site shall be laid under ground.
- 5.5 The Cable shall be tied with Nylon ties at regular interval of 1 meter for horizontal length. In case of vertical run cable shall be tied at every 500 mm, with metallic cable ties. at the cable bend ties shall be provided at 150 mm. Interval from the center of bending radius to avoid any sharp bends.
- 5.6 The cable to be laid in the Ground shall be laid at 750 mm. depth from ground level width of the trench will be approved by client/consultant depending upon No. of cables to be laid.
- 5.7 Bricks are to be laid on the cables and then the back filling with screened soil.
- 5.8 Trench excavation, supply of sand bricks, back filling and reinstatement is within the scope of electrical contractor's work.

- 5.9 Spacers, Saddles for clamping of cables shall be of G.I
- 5.10 Cable lugs of COPPER are to be provided with individual cable at both ends
- 5.11 For cables laid in the ground cable markers are to be provided on the cable route at every bend and at every 15 meters for straight run.
- 5.12 Cables supplied, laid and installed will be paid on per meter basis. The exact cable run will be measured on site from terminal lug to terminal lug at the other end.
- 5.13 Cable pulling shall be carried in approved manner by using Rollers, corner rollers, hydraulic jacks for lifting of cable drums etc.
- 5.14 The cable bends shall not exceed the limits specified in Indian Standard for various sizes and sections.
- 5.15 The cable crossing through floors, walls etc. should be through G.I. pipe and sealed with fire barrier material and bushes.
- 5.16 Where group of H.V., L.V. control and telephone cables are to be laid along the same route, suitable barriers to segregate them physically shall be employed.
- 5.17 The Communication cable shall be at least 600 mm. from power cable.
- 5.18 Where cable crosses roads, pavements etc. they shall be laid in R.C.C. Hume Pipe buried not less than 1 meter depth.
- 5.19 Cables laid, installed within Building crossing Air conditioning duct, C.W. pipe, H.W. pipe, drainage and any other services, a minimum clearance of 300 mm. is to be observed.

6. TERMINATIONS :

- 6.1 PVC insulated steel armored, 1100 V grade, cables are to be terminated with the help of Compression Type glands, for large size cables flange type glands (Brass), for 2.5 mm cables. crimping type copper lugs are to be used for end terminations. All standard practices to be followed and anti corrosive inhibiting, flux is to be used. Brass nut bolts with plain and spring washers are to be used.
- 6.2 The Crimping machine shall be of hydraulic or otherwise. The same should be approved by the client/consultant before the work commencement.
- 6.3 Any accessories other than above such as cable and box jumpers etc. for cable terminations should be included in the scope of termination of cables.
- 6.4 Cress - Crossing of individual cores while connecting the respective phase terminal shall be avoided.

- 6.5 Spliced ends of cable should be immediately crimped with lugs. Base conductor should not be left open to atmosphere.
- 6.6 All the strands of a conductor must be fitted in the lugs and no cutting of strands will be allowed under any circumstances.

7. DISTRIBUTION BOARD

- 7.1 The Distribution board Drawing and Circuitry shall be got approved before fabrication and it shall be as specified.
- 7.2 The Board shall made up of 14 swg M.S. sheet. The board shall be suitable for wall/recessing mounting. It shall be totally enclosed, dust proof and vermin proof. The fabrication shall be as per relevant IS specifications for degree of protection provided by enclosure for low voltage switchgear-IP 54. The equipment such as MCB, ELCB, insulators, Bus bars shall be as per relevant IS specifications with latest amendments.
- 7.3 The sheet steel shall be smoothly finished, leveled and free from flows. All doors, removable covers shall be gasketed all round the perimeter.
- 7.4 The service voltage is 440 volts and Bus bars will be **electrolytic copper**. The copper Bus bars shall be tinned throughout the length.
- 7.5 The door interlock shall be provided so that it shall not be possible to open the door with breaker in close position.
- 7.6 The enough space shall be provided for termination. The minimum two earth terminals shall be provided for each D.B. The board shall be factory wired with proper refilling.
- 7.7 Adequate shrouds shall be provided for avoiding accidental contact with line terminals, Bus bars etc.
- 7.8 The conduits knock out shall be provided for conduit entry.
- 7.9 The guaranteed technical particulars shall be provided for MCB and ELCB etc.
- 7.10 The engraved black anodized labels shall be provided on all incoming and outgoings.
- 7.11 All steel works shall undergo a process of degreasing, pickling in acid bath, phosphating etc.
- 7.12 The painting shall be by two coats of primer and two coats of final finish paint, both applied with spray, the colour shall be light battle ship gray.
- 7.13 The distribution board shall have hinged door.
- 7.14 The Bus bars supports shall be non hygroscopic, anti tracking material.

8. 15 A SWITCH SOCKET:

- 8.1 Scope shall include supply and installation of 2 x 4 Sq.mm copper wire PVC insulated, 1100 V grade in PVC conduit with 1 x 2.5 Sq.mm PVC insulation 1100V grade as earth wire.
- 8.2 The wire shall be laid in conduit from the power distribution board to the individual socket. Two sockets can be looped on one **circuit**. The wires shall be connected to the MCB in the distribution board.
- 8.3 The box for the 15 Amp switch socket outlet shall be of M.S. and sizes of the box shall be matching with cover plate of 15 amp switch socket of specified/approved make.

8.a 5 AMPS, SWITCH, SOCKET OUTLET POINT WIRING:

- 8a.1 The point wiring for 5 Amps switch sockets outlet including running of 2 x 2.5 Sq.mm Copper Conductor, PVC insulated, 1100 V grade wires in PVC conduit with 2.5 Sq.mm wire as earth (Green) from the lighting distribution board. The each circuit shall provide with maximum 6no. Sockets in **radial circuit**
- 8a.2 It shall be of approved make conforming to latest IS standards. The Three pin socket shall be provided with shutter to prevent accidental contact with live parts. The box for socket outlet shall be suitable for concealed mounting and should be supplied by the manufacturer with the switch and socket unit.

9. LIGHT & EXHAUST FAN POINT WIRING :

- 9.1 The bidders are advised to study the Electrical layout and single line diagram.
- 9.2 The point wiring includes the supply of all materials, accessories and labour.
- 9.3 The point wiring includes sub main wiring from DB to switch board, however the switch board with switches and further wiring from switch boards to individual light point including ceiling rose shall be part of light point and as discussed in Bill of Quantities.
- 9.4 The point wiring shall be with 3 x 2.5 Sq.mm. copper conductor, PVC insulated 1100 V grade wire in PVC conduit. The wires to be run from the switch board to the Individual point.

10. POINT WIRING FOR CEILING FANS. :

- 10.1 The ceiling fan point wiring (Single Phase) shall be similar to light point wiring. However, provision electronic Type Regulator connection's and space on the switch board be provided.

10.2 All the fans shall be provided with individual control. All the ceiling fan point shall be provided **with stainless steel fan hook.**

11. POINT WIRING FOR CALL BELL:

The Point wiring to include supply and installation of concealed box outside the main door. The musical bell is to be provided and connection in the passage as shown in the drawings.

The supply to the bell push and to the bell shall be with 2 x 1.5 Sq.mm PVC copper 1100V grade wires through PVC Conduit.

12. FANS :

12.a. CEILING FANS :

12a.1 Ceiling fans are to be provided.

12a.2 Ceiling fans shall be supplied with down rod. The exact length of down rod shall suite site conditions.

12a.3 Ceiling fans shall be of 1400mm. size of brown/colour/white as approved by architect /Client.

12.b. EXHAUST FANS:

12b.1 The Exhaust fan to be supplied and Installed it shall be of approved make and size, and pertaining to relevant IS.

12b.2 Exhaust fans shall be suitable for 230 V supply.

12b.3 an opening for fixing of an Exhaust fan shall be provided by others. However, balance minor civil works shall be done by the Electrical Contractor.

12b.4 Minor civil works for fixing of fan shall be in the scope of the Electrical contractor.

13. THE SWITCH FUSE UNIT. (LOCAL ISOLATOR) :

The individual lift machine room, Pump room and such power installation will be provide power supply of 440V by the contractor by provision of adequate capacity SFU and suitable supports, brackets etc. The SFU capacity rating will be as indicated in the respective SLD.

14. TESTING & INSPECTION:

1. The Contractor shall carry out stage wise inspection and testing of each location and complete installation of BANK in presence of Client/Consultant.
2. The record of inspection at various stages must be kept by the contractor and the copies of inspection sheets must be submitted to the client in triplicate.
3. The Testing of each flat must be carried out in presence of Client/Consultant. The test result record for each flat must be maintained and copies of test result must be submitted to the client consultant in triplicate.
4. The following tests must be conducted for Building installation.
 - 4.1. Megger test for insulations resistance.
 - 4.2. Earth test for system earthing.
 - 4.3. Polarity test for each switch socket outlet.
 - 4.4. Functional test for each switch, fixtures, appliances etc. supplied by the contractor as well as client.
5. Any other tests not recommended above but required for fulfilling statutory requirements of C.P.W.D. specifications, local authority, etc shall be carried out by the contractor.
6. All the test carried out shall confirm to Indian standard specifications.

15. CODE OF INSTALLATION:

The Proper tools, necessary for installation like drilling machine, megger, crimping tool etc. shall be used. Making holes for fixing shall be done by an electric drilling machine only. The proper dia must be used for conduits bends etc.

The adequate care shall be taken before concreting so that cement slurry does not block conduit, junction boxes etc. Equipment location in the drawing are diagrammatic, the exact detailing have to be marked on site.

B. TELEPHONE WIRING

B-1 TELEPHONE SYSTEM:

The provision of Telephone system as explained in the drawing shall be provided, with adequate size of PVC Conduit 25mm dia. and as approved by local MTNL authority. The Junction Box shall be also provided as per MTNL practice. The wiring from individual Telephone point from location to Main distribution frame (MDF) to be carried out by 3pair/ 6 core lucent make wire. The MDF will be located in the office area on the ground floor as indicated in the respective layout Drawing.

B-2 TELEPHONE SOCKET OUTLET:

Telephone socket shall be with PVC box with cover of approved make.

C. LIGHT FIXTURES & LAMPS

LIGHT FIXTURES/ LUMINAIRES:

- 1) All lights fitting including Lamps and Tubes.
- 2) The luminaires are to be as per the makes and catalogue nos. indicated.
- 3) Installation of light fittings shall include making of connections and proper suspensions support and mounting.
- 4) For suspended Fluorescent light fitting suitable length of conduit ball and socket an junction box are to be provided.
- 5) Fittings mounting on soffit without suspensions are to be mounted on wooden round box.
- 6) The design, manufacture and performance of Luminaire shall comply to all applicable statutory, regulations and safety codes.
- 7) The luminaires shall be designed for minimum glare of continues operation without reduction of lamp life or without detereation of material and internal wiring.

- 8) The fitting shall be designed for low temperature rise and it should be complete with copper chokes, starter, reflector etc.
- 9) The power factor improvement capacitor shall be incorporated.
- 10) Each luminaires shall have terminal for loop in loopout and tee of connection. All internal wiring shall be flexible copper suitable to withstand high temperature.
- 11) The luminaires shall be provided with earthing terminal conduit layout etc.
- 12) The reflectors/lovers/ diffuser of fitting should be easy to clean without removal of light fitting.
- 13) The ballast shall be designed to have low power loss and shall be mounted using anti vibration fittings. The ballast should be totally enclosed. The ballast should be copper wound.
- 14) The starter of be safety typed shall be replaceable without use of any tool.
- 15) The starter shall be brass contact.
- 16) The luminaires with diffuser shall be acrylic, non-yellowing, non-aging type. Fluorescent tubes shall be of day light colour type and shall be suitable for use in any position.

D. COMPUTER NETWORK SYSTEM / DATA / VOICE CABLING

The workstation and certain vital location in the Banks will have to be provided with computer workstation. The locations of each workstation will be provided as indicated on Layout drawings. The contractor will have to lay data cables within PVC conduit, ceiling conduits and flexible conduits for LAN connections. The data cables shall be CAT 5 and will be approved by the Software Consultant of the Client. The each location of the Computer point will be provided with suitable Hardware, concealed type box, plugging jacks (information panel). The other end of the data cables shall be suitably connected and terminated its server room. The connection of the same cables will be terminated within the hub panel or patch panel in coordination with Software and Hardware Consultant for the computer system. The Electrical Contractor is advised to engaged reputed subcontractor with experience in the installation of computer network and co-ordinate with computer agency to undertake total commissioning of computer system

APPENDIX HEREINBEFORE REFERRED TO

1. **Date of commencement** : 7th day from the date of issue of work order.
2. Date of completion : 60 days from the date of Commencement
3. Insurance : Clause 24
4. Liquidated damage : 1% of the contract sum per week of delay subject to max.of 5% of final contract sum..
5. Period of honouring Final Bill receipt of bill : 30 days from the date of
6. Terms of payment : 1.The payment shall be made against one interim bill and final bill.
2.10% retention money from each bill limited to 5% of contract amount
- 7 a) Earnest Money Deposit : Rs 5000/-
- b) Retention after virtual completion:
The 50% of the total sum of retention amount shall be released after virtual completion of the work and remaining 50% shall be refunded after successful completion of defect liability period provided the contractor has satisfactorily carried out all the work and attended to all defects in accordance with the condition of the contract. No interest is allowed on retention money.
- 7.. Defects Liability period : 12 months from the date of virtual commencement.

CONTRACTOR

LIST OF APPROVED MAKES/MANUFACTURERS

SR. NO	MATERIALS	MANUFACTURER/SUPPLIERS
1	M.C.B./E.L.C.B./D.B.	DATAR / HAVELLS./ MDS/ GE / HENSEL
2	PVC CONDUIT	PRECISION / ASIAN / PREMIUM
3	PVC WIRING.	FINOLEX / POLYCAB / RAJNIGANDHA
4	HRC FUSES.	L&T / GE / SIEMENS.
5	POWER CABLES.	FINOLEX / POLYCAB / FINOLEX
6	CABLE GLANDS & LUGS	COMMET / JENSON / SIEMENS.
7	SWITCHES & SOCKETS	LEGRAND, GRAPTREE , ANCHOR, MK OR AS APPROVED BY THE ARCHITECT.
8	TELEPHONE CABLES	DELTON / DE-LINK / ITI
9	LIGHT FIXTURE	As supplied by the Client and approved by the Architect. PHILIPS , CROMPTON, WIPRO AND GE
10	CEILING FANS	CROMPTON / USHA / BAJAJ.
11	EXHAUST FANS	BAJAJ / GEC-ALSTHOM.
12	CALL BELL & INDICATOR	As per approved sample by the Architect.

All the above-approved material will be supplied by the contractor at site, in case material is not available as per the specifications then the contractor should get material approved before supplied to the site.

