

 <p>बैंक ऑफ महाराष्ट्र Bank of Maharashtra भारत सरकार का उद्यम एक परिवार एक बैंक</p>	<p>पुणेपूर्वांचलकार्यालय, पुणे PUNE EAST ZONAL OFFICE, PUNE 568, केसरीवाड़ा, दूसरीमंज़िल, नारायणपेठ, पुणे- 411030 568, Kesariwada, 2nd Floor, Narayanpeth, Pune-411030 टेली./TELE: 020-24459184/24514007 ई-मेल/E-mail: gad_per@mahabank.co.in</p> <p>प्रधानकार्यालय: लोकमंगल, 1501, शिवाजीनगर, पुणे-5 Head Office: LOKMANGAL, 1501, SHIVAJINAGAR, PUNE-5</p>	 <p>एक कदम स्वच्छता की ओर 'स्वच्छता अभियान' की सफलता हेतु हम प्रतिबद्ध हैं</p>
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TENDER DOCUMENT

VOLUME I - TECHNICAL BID

PROJECT: - PROPOSED ELECTRICAL WORK OF ZONAL OFFICE OF PUNE EAST ZONE FOR BANK OF MAHARASHTRA.

SITE : - BANK'S OWN PREMISES AT HADAPSAR I.E., HADAPSAR, PUNE

Architect : Narendra Sardeshpande & Associates

43, "Shreekul", Ground Floor, United Western Housing Society, Near Tathawade Garden, Karvenagar, Pune-411 052, Tel No.(020)-2545 4297, E-mail : nsapune1@gmail.com

A. NOTICE INVITING TENDER

Sealed tenders on item rate basis are hereby invited from **the eligible contractors only** to execute the **ELECTRICAL WORKS** for **ZONAL OFFICE OF PUNE EAST ZONE, BANK OF MAHARASHTRA AT HADAPSAR I.E., PUNE**

1. Tender copies can be downloaded from Bank's website or collect from Architect's office between 10 AM to 2 PM and 2.30 PM to 5.30 PM **from 12th March 2019 to 27th March 2019**. Any query in respect of tender will be clarified in the Architect's office at above place; with prior appointment.
2. The late tenders shall be rejected including postal / courier delays.
3. Tender Specifications dully filled-in, signed and sealed should be addressed & submitted to: **our office at Bank of Maharashtra, Pune East Zone, 568 - Kesari Wada, Narayan Peth, Pune.**
4. Sealed tenders will be accepted **on or before 27th March 2019 upto 5.30 PM** at Bank of Maharashtra, **Pune East Zone, 568 - Kesari Wada, Narayan Peth, Pune.**

Opening Date of Technical Bid- 28.03.2019

Opening of Price Bid- 02.04.2019

5. The **BANK OF MAHARASHTRA**, Pune reserves the right to reject or accept any one or all tenders without assigning any reasons whatsoever.
6. E.M.D. will be accepted only in the form of DD drawn on Nationalized bank & shall be submitted in separate envelope as per directions.
7. Tender Fees of **Rs.1,500.00 (Non-Refundable)** should be paid in the form of DD in favour of the Architect – **NARENDRA SARDESHPANDE & ASSOCIATES** at the time of submission of Tender Documents.
8. The Earnest Money Deposit will be forfeited in the event of any evasion, refusal or delay on the part of the bidder to sign and execute the Contract on acceptance of his tender. The Earnest Money Deposit will be refunded to the bidders whose tenders are not accepted.

NOTES:-

1. The Owner reserves the right to reject the lowest or any tender without assigning any reason for the same.
2. All the rates quoted in the tender shall be inclusive of all taxes (except GST), levies, duties, transportation charges, wastage, Octroi, LBT etc; and shall remain firm till the completion of Work. No escalation of prices will be payable for what-so-ever reasons.
3. The bidder whose tender has been accepted shall within Five days of the intimation of acceptance of tender, submit the stamp paper of required value to the Architect for entering into agreement. Bidder's failure to comply with these conditions within the time, shall give right to the Employer to revoke acceptance of the tender and forfeit his earnest money without any further notice to the bidder.

4. The decision of the Employer will be given within 8 Days from the date of receiving the tenders within which period the terms of the tender will be binding on the bidder. The earnest money will be returned to the unsuccessful bidder within a reasonably short period. If the bidder, after intimation to him, fails to collect his earnest money deposit within three years of date of intimation, the amount will be automatically forfeited.
5. No additions or alterations shall be made in the Drawings, the Specifications, Schedule of Quantities, the conditions of contract and the tender by the bidder and, if made, such tender is liable to be rejected. In case of the successful tender, any such additions and alterations made by the bidder will be treated as null and void. If the bidder wants to put any condition, he must mention them on a separate letter attached on the top of the tender form.
6. The tenders shall be valid for a period not less than 90 days after the date of opening of the Price Bid.
7. This tender Notice shall form part of the Contract.
8. **The tender to be submitted, as two envelopes duly sealed and super scribed as-**

ENVELOPE NO. 1 – Technical Bid (Volume I)

It should contain following:-

- a. Notice Inviting tender.
- b. EMD
- c. Form of Tender
- d. Articles of Agreement
- e. General conditions of Contract.
- f. Special conditions of Contract.
- g. Pro-forma for various applications.
- h. General Specifications
- i. Technical Specifications
- j. Technical qualification & organization details of bidder.(Pre-qualification Bid)

ENVELOPE NO. 2 – Price Bid (Volume II)

It should contain following:-

- a. Priced Bill of Quantities only.

PROCEDURE FOR SUBMITTING TENDERS: -

1. All drawings & tender papers should be duly signed.
2. Both the envelopes should be super scribed with envelope no., type of bid & subject with site name.
3. If the contents in Envelope 2 (technical bid) are found ok & satisfactory then only Envelope 1 (Price bid) will be open.

Thanking you,

Yours truly,

Dy. Zonal Head – Pune East Zone

B. APPENDIX: TIME SCHEDULE

1	Period of Completion	: 45 (Forty Five) DAYS INCLUDING HOLIDAYS, SUNDAYS
2	Defects Liability Period (DLP)	: 12 (Twelve) months from the date of Completion of work
3	Date of Commencement	: As per the work order
4	Liquidated Damages for Delay	: As per the work order
5	Period of final measurement	: 30(Thirty) days.
6	Value of work for Interim Certificate	: Minimum of Rs. 10.00 (ten) lakhs
7	Period of honoring interim Certificate	: Total 15 working days. 7 working days for Architect to certify and another 7 working days for Bank to make payment.
8	Period of honouring Final Certificate	: 30(Thirty) working Days.
9	Retention Money	: 8% of Interim Bill amount subject to the ceiling of the total security deposit
10	Total Security Deposit (Maximum)	: 5% of total tender amount
11	Initial Security Deposit including EMD	: 2% of Contract sum
12	Earnest Money	: Rs. 30,000.00
13	Tender validity period	90 days

SIGNATURE OF THE CONTRACTOR.

C. INSTRUCTIONS FOR BIDDER

1. The details of work to be carried out and its scope are given in the specifications and Bill of Quantities in these documents, which also indicate a brief description of the project where work is to be executed. The bidders are advised to study the same carefully before tendering and they shall be deemed to have fully acquainted themselves with the same.
2. The bidders in their own interest, are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders in respect of the site conditions including but not restricting to the following which may influence or affect the work or cost thereof under the contract.
 - a. Site conditions including access to the site, existing and required roads and other means of transport/communication for use by him in connection with the work.
 - b. Requirement and availability of land and other facilities for his enabling works, stores and workshops etc.
 - c. Ground conditions including those bearing upon transportation, disposal, handling and storage of material required for the work or obtained there from.
 - d. Source and extend of availability of suitable materials including water etc. and labour (skilled and unskilled), required for work and Laws & Regulations governing their use and employment.
 - e. Geological, meteorological, topographical and other general figures of the site and its surroundings as are pertaining to and needed for the performance of the work.
 - f. The limit and extent of surface and sub surface water to be encountered during the performance of the work, the requirement of drainage and pumping.
 - g. The type of equipment and facilities needed preliminary for and in the performance of the work, and for successful completion of work.
 - h. All other information pertaining to and needed for the work including information as to the risks, contingencies and other circumstances which may influence or affect the work or the cost thereof under this contract.
3. The bidders should note the information, if any, regards to the site and local conditions, as contained in these tender documents has been given merely to assist the Bidders and is not warranted to be complete.
4. The Bidders should note and bear in mind that the BANK shall bear no responsibility for the lack of acquaintance of the site and other conditions or any information relating thereto, on their part. The consequences of the lack of any knowledge, as aforesaid, on the part of the bidders shall be at their risk and cost and no charges or claims whatsoever consequent upon the lack of any information, knowledge or understanding shall be entertained or payable by the Bank.

5. Immediately on receipt of the Tender Documents from the Bank, but at least three days prior to the date fixed for opening of envelope no.1 of tender, the Bidder may submit in writing any tender enquiry on matters where clarifications or additional information is desired. If considered appropriate, the Bank reserves the right to issue addendum(s) / amendment(s) to any condition/ specifications/schedules of all bidders before the date of submission. Tenders submitted by the tender shall be deemed to cover the effect of such addendum(s)/ amendment(s) issued and such addendum(s)/ amendment(s) duly signed by the Bidders shall be submitted along with the tenders.
6. The Tender should be submitted in the prescribed form and the same should be signed as laid down here under:
 - a. If the Tender is submitted by an individual, it shall be signed by the Proprietor with his full name and full name of his firm with its current business address.
 - b. If the Tender is submitted by proprietary firm, it shall be signed by the proprietor with his full name and full name of his firm with its current business address.
 - c. If the Tender is submitted by a firm in partnership, it shall be signed for and on behalf of the firm by all the partners of the firm about their full names and current business address, or by a partner holding the power of attorney by the firm for signing the tender, in which case, a certified copy of the partnership deed and current business address of all the partners of the firm shall also accompany the tender.
 - d. All witnesses and sureties (if any) shall be person of status and their full names, occupations and address shall be stated below their signature. All signatures affixed on each page in the tender will be dated.
7. The Earnest Money deposit without any interest will be returned to the unsuccessful bidders only after Validity period / award of work.
8. The Bidders should quote for all the items of work as given in Bill of Quantities. The rates shall be written both in words and in figures. Bidder shall also show cost of each item in total of each sub head and the grand total of the whole contract. Corrections, if any shall be made by crossing out initialing dating and rewriting.
9. The acceptance of a tender will rest with the Bank, which does not bind itself to accept the lowest tender, and reserves to itself the authority to reject any or all of the tenders received without the assignments of any reasons. All tenders in which any of the prescribed conditions are not fulfilled or are incomplete, in any respect are liable to be rejected.
10. All item rates shall be quoted on the proper form of the tender alone.
11. An item rate tender containing percentage "below / above will be summarily rejected. However where a bidder voluntary offers a rebate for payment without a stipulated

period, this may be considered.

12. On acceptance of tender the name of the accredited representative (s) of the Contractor who would be responsible for taking instructions from the Employer / Architect shall be communicated to the Employer / Architect.
13. Special care shall be taken to write the rates in figures as well as in words, and the amounts in figures only, in such a way that misinterpretation is not possible. The total amount should be written both in figures and in words. In case of figures, the words 'Rs' should be written before the figure of rupees and words 'P' after the decimal figures e.g. Rs. 2.15 P and in case of words, the word Rupees should be precede and the word 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the words 'only' it should invariably be up to two decimal places. While quoting the rates in the bill of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.
14. The Bank does not bind itself to accept the lowest tender but it may accept any tender and reserves to itself the right of accepting the whole or any part of tender and the bidder shall be bound to perform the same at the rates quoted.
15. The Bank also reserves the right to accept the tender in full or in parts and that the tender shall have no claim for revision of rates or other conditions if the tender is accepted in parts.
16. The tender for work shall remain open for acceptance for a period of 90 days from the date of opening of Envelope no. 2 of the tenders. If any, bidder withdraws his tender before the said period, then the Bank shall be at liberty to forfeit his Earnest Money Deposit. The Earnest Money Deposit of the bidder whose tender is accepted shall be forfeited in full in case he does not start the work by the stipulated date mentioned in the award letter.
17. It will be obligatory on the part of the bidder to tender and sign the tender documents for all the component parts and that after the work is awarded, he will have to enter into an agreement for each component with the competent authority of Employer.
18. The "Notice Inviting Tender" and this "Instructions for Bidders" shall form part of the Tender Documents.

D. FORMS OF TENDER

(Blanks must be filled in by the bidder)

To,
**The Dy. Zonal Head,
PUNE EAST ZONE,
Bank of Maharashtra,
568 - Kesari Wada, Narayan Peth, Pune**

Respected sir,

With reference to the tender invited by M/S. **NARENDRA SARDESHPANDE AND ASSOCIATES** on behalf of you for the **Proposed Electrical Work of Zonal Office of PUNE EAST ZONE, Bank of Maharashtra at HADAPSAR I.E., PUNE**

I/We do hereby offer to execute the work under the Contract at the respective **item rate basis** mentioned in the schedule of quantities.

I/We have examined and studied carefully the site of the proposed works, all the Drawings, Schedule of Quantities, Specifications and conditions of contract and I/We agree to comply whole of work within respective time limits mentioned in the tender; from the date of getting the intimation from you that our tender has been accepted and upon receiving the possession of the site.

I/We further undertake that on failure subject to the conditions of contract relating to extension of time; I/We shall pay damages to the Employer the sum named in Appendix to the condition of the Contractor/Supplier as Liquidated damages for the period during which the Work shall remain incomplete.

I/We have deposited as earnest money an amount of Rs. **(Rs. 30,000.00)** _____ by D.D. No. _____ on _____ bank in your favour (to be handed over along with tender documents), which amount is not to bear any interest and I/We do hereby agree that this sum shall be forfeited, in the event of accepting my/our tender & I/We fail to start the work under the Contract & execute the Contract documents when call upon to do so.

I/We do agree to pay 5% of the total value of the work done as security amount.

I/We do agree that my/our tender shall stand disqualified in the event of –

- a. Failure to submit the tender in specified time and date.
- b. Any page of this tender is found missing.
- c. Any page of this tender form is not signed by us in token of acceptance.
- d. The rates and/or amounts in the Schedule of Quantities are not filled in figures as well as in words in English and all erasures are not counter signed.

I/We have read the notes attached herewith and do agree to the same.

Thanking you,

Yours truly,

Signature & Seal of the Contractor

E. ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT made on the _____
Between _____ (hereinafter referred to
“**the Contractor**”) of the one part And **The Dy. Zonal Head, PUNE EAST ZONE, Bank of Maharashtra** hereinafter referred to as “**the Employer**” (which term shall mean and include its successors in interest and permitted assignees) of the other part; WHEREAS the Drawings and specifications and the Priced Schedule of Quantities have been signed by or on behalf of the parties hereto and WHEREAS the Contractor has agreed to execute upon and subject to the conditions set forth herein (herein after referred to as “**the said conditions**”) the work shown upon “**the said Drawings**” and described in “**the said Specifications**” and “**the said Priced Schedule of Quantities**” at rates mentioned in the Priced Schedule of Quantities (herein after referred to as “**Contract rates**”) and WHEREAS the Contractor has deposited Rs. _____ (Rs. _____ only.) as Security Deposit for the due performance of the agreement.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the payments to be made to the Contractor as hereinafter provided he shall upon and subject to the said Conditions execute and complete the works shown upon the said Drawings and such further detailed drawings as may be furnished to him by the said Architects and described in said Specification and the said Priced Schedule of Quantities.
2. The Employer shall pay the Contractor such sum as shall become payable hereunder at Contract rates in the manner specified in the said conditions.
3. The within plans, agreement and documents above mentioned shall form the basis of this contract, which for the time being as mentioned in the conditions of contract in reference to all matters of dispute as to the material workmanship or account and as to the intended interpretation of Clause of this Agreement or any other documents attached hereto shall be final and binding on both parties and may be made a Rule of Court.
4. The said Contract comprises the building/buildings/roads/drawings work mentioned hereinbefore and all subsidiary work connected therewith within the same site as may be ordered to be done from time to time by the said Architects or the Employer even

though such works may not be shown on the Drawings or described in the said Specifications of the Priced Schedule of Quantities.

5. The Employer reserves to himself the right of altering the Drawings and nature of the Work and of adding to or omitting any items of work or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall be carried out without prejudice to this contract.
6. The said conditions shall be read and constructed as forming part of this Agreement and the parties hereon will respectively abide by and submit themselves to the condition and stipulations and performs the agreement as their parts respectively.
7. All disputes arising out of or in any way connected with this Agreement shall be deemed to have arisen in Pune and only the Courts in Pune shall have jurisdiction to determine the same.
8. The term or "The Architect" in the said conditions shall mean **M/S. NARENDRA SARDESHPANDE AND ASSOCIATES – 43,"Shreekul", Flat No. 2, Ground Floor, United Western Housing Society, Near Tathawade Garden, Karvenagar, Pune- 411 052**, or in the event of their death ceasing to be the Architect for the purpose of this contract, such other person as the Employer shall nominate for that purpose, not being a person to whom the Contractor shall object for reasons considered to be sufficient by an Arbitrator appointed in accordance with the said conditions. Provided always that no person subsequently appointed to be the Architect under this contract shall be entitled to disregard or over rule any certificates or opinion or decision or approval or instruction given or expressed by or the Architect for time being.
9. The term "Consultants" refers M/s. NARENDRA SARDESHPANDE & ASSOCIATES", Pune or in the event of their ceasing to be the consultants for this project, such other person or persons as by be appointed by the Architect with approval of the Employer.
10. The contract is based on Item Rate Basis.
11. The time shall be considered as the essence of this contract and the Contractor hereby agrees to commence the work soon after the site is handed over to him or from next day after the date of normal Work Order as provided for into the said conditions whichever is later & to complete the entire work within **FORTY FIVE DAYS** subject nevertheless to the provisions for extension of time.

12. All payments by the Employer under this contract will be made only at PUNE as per the Architect's certificate AND the Client's certificate.

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

Witness our hands this day of , 2019.

Signed by the said presence of

Employer.

Contractor.

F. GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual Items in the schedule of quantities and in the specification and under the direction of employer/Architect.

1. INTERPRETATION

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

2. CLIENT/EMPLOYER

The term Client/Employer shall denote **PUNE EAST ZONE, Bank of Maharashtra, 568 - Kesari Wada, Narayan Peth, Pune - 411 030** and any of its employee’s representative authorized on their behalf.

3. ARCHITECTS

The term Architects shall denote **NARENDRA SARDESHPANDE & ASSOCIATES** whose office is situated at **43, “SHREEKUL”, Flat No. 2, Ground Floor, United Western Housing Society, Near Tathawade Garden, Karvenagar, Pune – 411 052.** Or in the event of his/their ceasing to be the Architect for the purpose of this Contract such person as the employer shall nominate for the purpose.

4. CONTRACTOR

The term Contractor shall mean

.....

.....

.....

(Name and Address of the contractor and his/their legal representative, assign and successors.)

5. SITE

The site shall mean where the works are to be executed and as shown in layout plan as mentioned in quotation document elsewhere.

6. DRAWINGS

The works is to be carried out in accordance with drawings, specifications the schedule of quantities and any further drawings which may be supplied or any other instructions, which may be given by the Architect, during execution of the work.

All drawings relating to the contractor together with a copy of schedule of quantities are to be kept at site and the Employer/ Architect shall be given access to such drawings or schedule of quantities whenever necessary.

In case any detailed drawings/"Farma" are necessary contractor shall prepare detailed drawings/"Farma" and / or dimensional sketches there for have it confirmed by the Employer /Architect prior taking up the work.

The contractor shall ask in writing for all clarifications on matters occurring drawings, specifications and schedule of quantities or to additional instructions at least 7 working days ahead from the time when it is required for implementation so that the Employer may be able to give decision thereon.

1. "The works" shall mean the work to be executed or done under this contract.
2. "Act of Insolvency" shall mean the presidency town Insolvency Act or in provincial Act or any amending status.
3. "The Bill of Quantities " is schedule of quantities shall mean the bill of quantities as specified and forming part of this contract.
4. "Priced Bill of quantities" shall mean the Bill of quantities duly priced with the accepted quoted rates of the contractors.

7. SCOPE

The work consists of Interior/furnishing in accordance with the "drawings" and bill of quantities. The civil, electrical, sanitary plumbing, Interior/ furnishing works etc, Within the scope of this quotation. It includes furnishing all materials, labour, tools and management necessary for and incidental to the construction and completion of work during its progress and upon completion, shall confirm to the lines, elevation and grades as shown on the drawings furnished by the Employer / Architect. Should any details essential for efficient completion of the work be omitted from the drawings and specifications it shall be the responsibility of the Contractor to inform the Employer/Architect and to furnish and install such detail with the Employer's /Architect's concurrence, so that upon completion of the proposed work the same will be acceptable and ready for use.

Employer/Architects may in their absolute discretion issue further drawings and /or written instructions, details, directions, and explanations which are hereafter collectively, referred to us "the Employer /Architect's instructions" in regard to:

1. The variation or modifications of the design quality or works or the additions or omission or substitution of any work.
2. Any discrepancy in the drawings or between the schedule of quantities and/or drawings and/or specification.
3. The removal from the site of any defective materials brought thereon by the contractor and the substitution of any other material thereof.
4. The demolition removal and /or re execution of any work executed by the contractor/s.
5. The dismissal from the work of any persons employed thereupon.
6. The opening up for inspection covered up.
7. The rectification and making good of any defects under clauses herein after mentioned and those arising during the maintenance period (retention period).

8. CONTRACTOR SHALL VISIT THE SITE

Intending Contractor shall visit the site and works himself thoroughly acquainted with the local site condition, nature and requirement of the works, facilities of transport conditions, effective labour and materials, access and storage for materials and removal of rubbish. The Contractor shall provide in their quotation for cost of carriage, freight and other charges as also for any special difficulties and including police restrictions for transport etc. for proper execution of the work as indicated in the drawings. The successful Contractor will not be entitled to any claim of compensation for difficulties faced or losses incurred on account of the Employer or the Architect.

9. QUOTATIONS

The entire set of quotation papers issued to the Contractor should be submitted full priced and also signed on the last page together with initials on every page initials/ signature will indicate the acceptance of quotation papers by the Contractor.

The schedule of quantities shall be filled in as follows:

1. The "Rate" column to be legible filled in English Figure.
2. Amount column to be filled in for each item and the amount for each sub head as detailed in the "Bill of Quantities".
3. All corrections are to be initiated.
(In case of any errors/ omission in the quoted rates,)
4. Only one rate should be quoted for each item(s).

No modifications, writing or corrections can be made in the quotation papers by the Contractor, but may at his option offer his comments or modifications in a separate sheet in envelope.

The employer reserves the right to reject the lowest or any quotation and also to discharge any or all quotations for each sections or to split up and distributed any item of work to any firm or firms, without assigning any reason.

The Contractor should note that the quotation is strictly on the item rate basis and their attention is drawn to the fact that the rates for each and every item should be correct, work able and self supporting. If called upon by the Employer /Architect detailed analysis of all the rates shall be submitted by the Contractor. The Employer /Architect shall not be bound to recognize the contractor's analysis.

The works will be paid for as "measures work" on the basis of actual work done and not as "lump sum" contractor.

All items of work described in the bill of quantities are to be deemed and paid as complete works in all respects and details including preparatory and finishing works involved, directly related to and reasonably detectable from the drawings, specifications bill of quantities and no further extra charges will be allowed in this connection. In case of lump sum charges in the quotation in respect of any item of works, the payment of such items of work will be made for the actual work done on the basis of lump charges as will be assessed to be payable by the Employer /Architect.

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

10. AGREEMENT

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

11. PERMITS AND LICENCES

Permits and licenses for release of materials which are under Government control will be arranged by the contractor. The employer will render necessary assistance, sign any form or applications that may be necessary.

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

The contractor shall at his own cost arrange for storage shed adequate for taking delivery and storing, transporting etc. of all materials including those under government control are to be included by the Contractor in his quoted rates.

The Employer /Architect shall be indemnified against all Government or legal actions for thefts or misuse of controlled materials in the custody of the contractor.

12. GOVERNMENT AND LOCAL RULES

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

13. TAXES AND DUTIES

The Contractor must include in their quotation prices quoted for all duties royalties, Value Added Tax, Contract tax, Turnover Tax, trade Tax etc.

Against any other taxes or local charges applicable No extra claim on this account will in any case be entertained. Only GST will be paid extra as per prevailing rates

14. OTER PERSONS ENGAGED BY THE EMPLOYER

The employer reserves the right to execute any part of work included in this contract or any work which is not included in this contract by other agency or persons and

contractor shall all responsible facilities for the execution of such work. The main contractor shall extend all cooperation in this regard.

15. RETENTION MONEY/ SECURITY DEPOSIT

Retention money shall be deducted from progressive running bill of the gross value of each running bill. The total security deposit will be retained money for the defect liability period.

The retention money i.e. the total security deposit will be refunded to the contractor 14 days after the end of defect liability period provided he has satisfactorily carried out all the work and attended to all defects in accordance with the conditions of contract. No interest is allowed on retention money.

16. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY

The contractor shall provide everything necessary for proper execution of the work according to the intent and meaning of the drawing, schedule of quantities and specifications taken together whether the same may or may not be inferred there from and if the contractor finds any discrepancies therein he the Employer shall on no account be responsible for the be expenses incurred by the contractor for hired ground or fresh water obtained from elsewhere.

The rates quoted against individual items will be inclusive of everything necessary to complete the said items rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplation of the contract and beyond the unit price no extra payment will be allowed for specific items, if any, stipulated in the quotation document.

The contractor shall supply, fix and maintain at his own cost, for the execution of any work, all tools, tackles machineries and equipments and all the necessary centering, scaffolding staging, planking, timbering, strutting, shoring pumping, fencing, barding, watching, and lighting by night as well as by day required not only for the proper execution and protection of the said work but also for the protection of public and safety of any adjacent roads, streets, walls, house, buildings all other erections, matters, and things and the contractor shall take down and remove any or all such centering, scaffolding, planking, timbering, strutting, shoring etc. as occasion shall be required or when ordered so to do and shall fully reinstate and make good all matters and things disturbed during the execution of works to the satisfaction of the Employer/ Architect.

The contractor shall at all times give access to works employed by the Employer or any men employed on the building and to provide such parties with proper sufficient and if required, special scaffolding, special hoists and ladders and provide them with water and lighting and leave or make any holes, grooves etc. in any work, where directed by the employer as may be required to enable such work to lay or fix pipes, electrical wiring, special fitting etc. The quoted rates of the Contractor shall include all these above-mentioned contingent works.

17. TIME OF COMPLETION, EXTENSION OF THE TIME AND PROGRESSIVE CHART

- a) **TIME OF COMPLETION:** The entire work is to be completed in all respects within stipulated period as specified. The work shall be deemed to be commenced within 5 working days from the date of issue of work order. **Time is the essence of the contractor and shall be strictly observed by the Contractor.** The work shall not be considered as complete until the Employer/ Architect have certified in writing that this has been completed and the Defects liability Period shall commence from the date of such certificate.
- b) **EXTENSION OF TIME:** If in the opinion of the Employer /Architects the works be delayed (a) by reason of any exceptionally inclement weather or (b) by reason of instructions from the Employer in consequence of proceedings taken or threatened by or disputes, with adjoining or neighboring client/ Employers or (c) by the works, or delay, of other contractors or tradesman engaged or nominated by the Employer and not referred to in the specification or (d) by reason of authorized extra and additions or (e) by reason of any combinations of workmen or strikes or lock out affecting any of the building trades or (f) from other causes which the Employer at the Completion of the time allowed for the contract shall make fair and reasonable extension of time for completion in respect therefore in the event of the employer failing to give possession of the site upon the day specified above the time of completion shall be extended suitably. In case of such strikes or lock outs as are referred to above, the Contractor shall, immediately give the Employer to proceed with the works and on his doings so that it will be ground of consideration by the Employer to proceed with the works and on his doings so that it will be ground of consideration of the Employer for an extension of time as above provided. The decision of the employer as to the period to be allowed for an extension of time for completion hereunder (which decision shall be final and binding on the

contractor) shall be promulgated at the conclusion of such strike or lock outs and the Employer shall then in the event of an extension being granted, determine and declare the final completion date. The provision in clause 14 with respect to payment of liquidated damages shall, in such case, be read and constructed as if the extended date fixed by the Employer were substituted for and the damage shall be deducted accordingly.

- c) **PROGRESS OF WORK:** During the period of work execution of work the contractor shall maintain proportionate progress on the basis of a program chart approved by the Architect immediately before commencement of work.

18. PENALTY/ LIQUIDATED DAMAGES

The Work not completed to the satisfaction of the Employer/ Architect within the stipulated period, the contractor shall be bound to pay to the Employer a sum calculated as **0.15% of tender amount** per week or part thereof. Subject to a ceiling of **10%** of the accepted contracted sum by way of Penalty/ liquidated damages. **In addition to the above mentioned Penalty/ liquidated damages there will be penalties on missing mile stones.** This mile stone penalties will be **0.15%** (of Total work order value) per day. The mile stones for penalty will be as per project schedule issued and agreed by the contractor before starting the project.

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

The contractor's representative and staff shall be available at site all reasonable hours to receive instruction notices or communications.

All drawings maintained on the site are to be carefully mounted on boards of appropriate size.

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

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

20. PROTECTIVE MEASURES

The contractor from time to time of being placed in possession of the site must suitable arrangements for watching, lighting, and protecting the work, the site and the surrounding property by day by night on Sunday and other holiday at his own cost.

Contractor shall indemnify the employer/Architect against all possible damaged to the building, roads, or members of the public in course of execution of the work.

The Carpenters shall provide necessary temporary enclosures, gates, entrance etc. for protection of the work and materials and for altering and adopting the same as may be required and removing on completion of the works and making good all works disturbed at his own cost.

The carpenters and the super visors on the works shall carry with them always one meter or two meter steel tape, a measuring tape of 30 meter, a spirit level, a plumb bob gauge and a square and shall check Employer/ Architect will use any or all measuring instruments or tools belonging to the contractor s as he choose for checking the works executed or being executed in the contract.

The contractor should cover in his rate for making provisions for all reasonable facilities for the use of his scaffolding, tools and plant etc. by other contractors for their work.

21. NOTICE AND PATIENTS OF APPROPRIATE AUTHORITY AND OWNERS

The contractor shall confirm to the provisions of any Acts of the Legislature relating to the work, and to the regulations and Bye Laws of the any authorities, and / or any water, lighting and other companies and /or authorities with whose systems the structures were proposed to have connection and shall before making any variation from the drawings or specifications that may be associated to so confirm, give the Employer /Architect written notices specifying the variations proposed to be made and the reasons for making them and apply for instructions there on. The Employer/ Architect on the receipt of such intimation shall give a decision within a reasonable time. The contractor shall arrange to give all notices required for by the said Acts, Regulations Bye laws to be given to any authorities, and to pay such authority or to the public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the Employer.

The contractor shall indemnify the employer /architect against all claims in respect of patent rights, royalties, damages to buildings, roads or members of public in course of the work and shall defend all actions arising out from such actions, costs and expenses.

22. CONTRACTOR IMMEDIATELY TO REMOVE ALL OFFENSIVE MATTERS.

All soil, filth or other matters of any offensive nature taken out of any trench, sewer, drain cesspool or other place shall not be deposited on the surface but shall be at once carted away by the contractor to place provided by him at his own cost.

23. ACCESS

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

24. MATERIALS WORKMANSHIP, SAMPLES, MOCK-UP OF ITEMS, TESTING OF MATERIALS.

All the works specified and provide for in the specifications or which may be required to be done in order to perform and complete any part thereof shall be executed in the best and most workmanlike manner with materials of the best and approved quality of the respective kinds in accordance with the respective kinds in according to such other additional particulars contained in and implied by the specifications and as represented by drawings or according to such other additional particulars and instructions as may from time to time be given the Employer /Architect during the execution of the work and to his entire satisfaction.

If required by the Employer / Architect the contractors shall have to carry out tests on the materials etc. and workmanship in approved materials testing laboratories or as prescribed by the Employer /Architect at his own cost to prove that the materials etc. under test confirms to the relevant IS standards or as specified in the specifications. The necessary changes for transporting testing etc. shall have to be borne by the contractor. No extra payment on this account should in any case be entertained.

Contractor at his own cost should erect mock- up of items suggested/ requested by Client /Architect during execution of work and also modify as per Client /Architects instruction. And only after finalization of the mock-up contractor should execute the work.

All the materials (except where otherwise described) stores and equipment required for the full performance of the work under the contract must be provided through normal channels and must include charge for import duties, sales tax/ Value Added Tax, octroi and other charges and must be the best of its kind available and the contractors must be entirely responsible for the proper and efficient carrying out of the work. The work must be done in the best workman like manner. Samples of all the materials to be used must be submitted to the Employer/ Architects when so directed by the Architects and written approval from the Employer /Architect must be obtained prior to placement of order.

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

Should the work be suspended by reason rain, strike, lock outs, or any other cause, the contractor shall take all precautions necessary for the protection of work and at his own expenses and shall make good any damage arising from any cause, all new work and supply all temporary doors, protection to windows, and any other requisite protection for the execution of the work whether by himself or special traders men or sub contractor and any damage caused must be made good by the contractor at his own expenses.

25. CONTRACTOR'S EMPLOYEES

The contractor shall employ technically qualified and competent supervisors for the works who shall be available through out the working hours to receive and comply with instructions of the employer /Architects. The contractor shall employ in connection with the work persons having the appropriate skill or ability to perform efficiently.

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

No labour supplied by the contractor to be engaged on the work on day work basis either wholly or partly under order or control of the Employer or his representative shall be deemed to be person employed by the contractor.

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

1. The Payment of wages Act
2. Employer's Liability Act.
3. Workman's Compensation Act.
4. Contractor Labour (Regulation & Abolition) Act'1970 and central Rulse1971
5. Apprentices Act 1961
6. Minimum Wages Act.
7. Any other Act or enactment relating there to and rules framed there under from time to time.

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

The contractor shall comply at his cost with the order of requirements of any Health officer of the state or any Local authority or of the Employer regarding the maintenance of proper environmental sanitation of the area where the contractor's labour are housed or accommodated, for the prevention of small pox, cholera, plague, typhoid, malaria and other contagious disease. The contractor shall provide, maintain, and keep in good sanitary conditions adequate sanitary accommodation and provide facilities for pure drinking water at all times for the use of men engaged on the works and shall be taken by the contractors to prevent nuisance of any kind on the workers or the lands adjoining the same.

The contractor shall arrange t provide first aid treatment to thee labour engaged in the work. He shall within 24 hours of the occurrence of any accident at or about the site or in connection with execution of the works, report such accident to the employer and also to then competent authority where such is required by the law.

26. DISMISSAL OF WORKMEN

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

27. ASSIGNMENT

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

28. DAMAGE TO PERSONS AND PROPERTY DAMAGE INSURANCE ETC.

The contractor shall be responsible for all injury to the work workmen to persons, animals or things and for all damages to the structural and/or decorative part of property which may arise from the operations or neglect of himself or any sub contractor or of any of his or a sub contractor's employees. Whether such injury or damage arise from carelessness, accident or any other cause whatever in any way connected with carrying out of this contract.

The clause shall be held to include inter alia, any any damage to buildings whether immediately adjacent to or otherwise and any damage to roads, street's footpaths, or ways as well as damages caused to the buildings and the works forming the subject of this contract by rain, wind, other inclemency of weather. The contractor shall indemnify the employer and hold harmless in respect of all and any expenses arising from such injury or damage any acts of compensation or damages Consequent upon such claim.

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

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

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

29. INSURANCE

Unless otherwise instructed the contractor shall insure the works and keep them insured until the virtual completion of the contract against loss or damage by fire and /or earthquake, flood. The insurance must be placed with a company approved by the Employer, in the joint names of the Employer and the contractor for contract sum.

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

30. ACCOUNTS RECEIPTS AND VOUCHERS

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

31. DEFECTS AFTER COMPLETION

The contractor shall make good at his own cost and to the satisfaction of the employer all defects, shrinkage, settlements or other faults which may appear within 12 months after completion of the work. In default the employer may employ and other persons to amend and make good such damages, losses and expenses consequent thereon or

incidental there to shall be made good and borne by the contractor and such damages, loss and expenses shall be recoverable from him by the employer or may be deducted by the employer in lieu of such amending such works and in the event of the amount retained being insufficient recover that balance from the contractor from any amount retained under clause no: 11 by the employer together with any expenses the employer may have incurred in connection therewith.

32. CONCEALED WORK

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

33. SUSPENSION

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

After such notice shall have been given the contractor shall not be at liberty to remove from the site of the works or from any ground contiguous thereto any plant or materials to subsist from the date of such notice being given until the notice shall have been complied with. If the contractor fails to start work within seven days after such notice shall have been given to proceed with the works as therein prescribed, the employer may proceed as provided in the following clause (termination of Contract by Employer)

34. TERMINATION OF CONTRACT BY THE EMPLOYER

If the contractor being a company go into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjusted insolvent or shall mean an assignment or a composition for the benefit of the greater part, in number of his creditors or shall enter into a deed or arrangement with his creditors or if the Official Assignee in solvency or the contractor in solvency shall repudiate the contract or if receiver of the contractor's firm appointed by the reasonable satisfaction of the employer that he is able to carry out and fulfill the contract and if so required by the employer to give reasonable security therefore or if the contractor shall suffer execution to be issued or shall suffer any payment under this contract to be attracted by or on behalf of and of the creditors of the contractor or shall assign, charges or workmanship in carrying on the works or shall in the opinion of the employer not exercise such due diligence and make such due progress as would enable the work to be completed within due time agreed upon and shall fail to proceed to the satisfaction of the employer after three clear days notice requiring the contractors so to do shall have been given to the contractor so to do shall have been given to the contractor as hereinafter mentioned or shall abandon the contract then and in any of the said cases the Client/Employer may notwithstanding previous waiver determine the contract by a notice in writing to the effect as hereinafter mentioned but without thereby effecting the powers of the employer of the obligations and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been so determine and as if the works subsequently executed had been executed by or on behalf of the contractor (without thereby creating any trust in favor of the contractor)further tools, scaffolding, sheds, machinery, steam and other power utensils and materials lying upon premises or the adjoining lands or roads and sell the same as his own p[roperty or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other contractor's or other person or person to complete the work and the contractor shall not in any way interrupt the other or do any act matter of thing bto prevent or hinder such other contractors other person or employed fro9m completing and finishing or using the materials and plants for the works when the works shall be completed or as soon thereafter as conveniently may be the employer shall give notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within a period of 14 days after receipt by him the employer may sell the same by Public Auction and shall give credit to the contractor for the amount so realized. Any expenses or losses incurred by the employer in getting the works carried out by other contractor shall be adjusted against the amount payable to the contractor by way of selling his tools and plants or due on account of work carried out by the contractor prior to engaging other contractor or against the Security Deposits.

35. ARBIRATION. (ACT: IARC-1996)

All disputes or difference of any kind whatsoever which shall at anytime arise between the parties here to touching or Concerning the works or execution or maintenance thereof this contract or the construction remaining operation or effect thereof or to the right or liabilities of the parties or arising out of or in relation thereto whether during or after determination fore closure or branch of the contract (other than those in respect of which the decision of any person is by the other of them and to the Employer hereinafter mentioned be referred for adjudication to a sole Arbitrator to be appointed as herein after provided.

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

The contractor shall on receipt of the names as aforesaid, select any one of the person of the persons name top be appointed as sole Arbitrator and communicate his name to the employer within thirty days of the of receipt of the names. The employer shall thereupon without delay appointed the said person as the Sole Arbitrator. if the contractor fails to communicate such selection as provided above within the period specified, the competent authority should make the selection and appoint the selected person as the Sole Arbitrator.

If the Employer fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the employer a panel of three names of persons who shall all be unconnected with either party. The employer shall on receipt of the named as aforesaid select any one of the person names and appoint him as the Sole Arbitrator. If the employer fails to select the person and appoint him as the Sole Arbitrator within 30 days of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from the panel as the Sole Arbitrator and communicate his name to the Employer.

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

G. SPECIAL CONDITIONS

1. RATE ONLY ITEMS, EXTRA ITEMS AND QUANTITIES EXCEEDING THE QUOTED QUANTITIES:

For all the above- mentioned items a variation order (regarding specifications, quantities and rates) signed by the Client/Employer's Representative has to be immediately obtain before procurement and execution. No payments will be entertained without the written variation Order signed by Client / Employer. The onus shall be on the Contractor to obtain such prior written variation order from the Client/Employer's Representative.

The extra item rates will be derived through the analysis and format for rate analysis will be- material cost + 5% wastage, 2% transport, loading, unloading etc. + labour (30% in case of carpentry work) + paints or other + contractor profit 15% + taxes. The rate can also be derived from existing quoted item rate if extra item is similar or addition/ deduction to the quoted item in contract.

2. The Client/Architect has a right to alter the nature of work and to add or omit any items of work or to have the option of the same carried out without prejudice to this contract.

3. WORK TO BE CARRIED OUT BY LICENSED PERSONS/ FIRM:

Any special service installations included in the scope of the Work, shall only be carried out by technically competent person holding valid licenses. The contractor shall not without the written consent of Client/ Architects assign the agreement or sublet any portion of works.

4. REFERENCE DRAWINGS:

The Contractor shall maintain on the Site one set of all the Drawings issued to him for reference.

5. TESTING OF INSTALLATIONS:

All installation shall be tested as specified, in the presence of the architect. The Contractor shall also perform all such tests as may be necessary and required by the local authorities to meet Municipal and other byelaws, regulations in force. The Contractor shall provide all labour, equipment, and materials etc., required for the performance of the tests.

6. SITE INFORMATION:

All information, levels and dimension given in the quotation drawings relating to site conditions are given in good faith; the contractor shall, however, make his own independent inquiries and verify the same. Any claims for extras on account of any deviations or incorrectness of above referred information, levels etc., shall be considered as inadmissible.

7. SITE INSTRUCTION FILE:

The Contractor shall maintain a Site instruction file or Triplicate book at the Site office. All instruction received from the Architect and the Client/Employers Representative relating to the Work shall be retained in the file.

8. PHOTOGRAPHS:

Besides submitting progress charts, reports, etc., the Contractor shall submit progress photographs as directed by Project Manager/ The Architect/ The Client, every week.

9. PROFESSIONAL INTEGRITY AND TEAM SPIRIT:

It is the intent of Client/ Employer and the Project Manager that this Project will be executed in a spirit of teamwork and full professional integrity. The Contractor shall fully co- operate with all agencies concerned to fulfill this objective.

10. QUALITY ASSURANCE AND CONTROL PROGRAMME:

The Contractor shall establish an effective quality control system at the site and implement the same through an independent team consisting of the Contractor's Representative and qualified and experienced engineers and technical personnel to enforce quality control on all items of the Work and the Project at all stages.

11. FIRE PRECAUTIONS:

The Contractor shall take all precautions and preventive measures against fire hazards at the site and shall assume full responsibility for the same.

12. DRILLING, CUTTING ETC:

All cutting and drilling of walls or other elements of the building for the proper entry/installation of inserts, boxes, equipment, etc. shall be carried out using electrically operated tools only. Manual drilling, cutting , chiseling, etc. shall not be permitted. **No structural member shall be cut or chased without the written permission of the Architect/Client/Employer. Cutting and drilling of structural**

members shall be carried out using vibration free diamond wire sawing and diamond drilling only with prior permission from the Architect/Client/Employer.

The Costs for procurement and using such equipment are deemed to be included in the Contract and no extra costs will be paid.

13. BILLING :

The contractor shall submit the bills for payments along with detailed statement showing the actual works carried out different heads of items in the format specified by the clients/ the Architect. Bills submitted in any format other than that specified below by the clients shall not be considered.

BILL FORMAT

Quoted item No.	Description of item (At least 2 lines)	Units	Quoted Quantity	Executed Quantity	Rate	% work done	Amount

The contractor should mention details of net payments received till the bill date. Each bill / Invoice should be as per various applicable tax regulation and should also have all applicable tax registration numbers.

NOTE: ALL QUANTITIES IN THE BILL SHOULD BE IN CUMULATIVE.
ALL MEASUREMENTS SHOULD BE IN THE ORDER OF QUOTATION SEQUENCE.
AND STRICTLY IN THE BELOW MENTIONED FORMAT ONLY.

MEASUREMENT FORMAT

Quotation item No.	Description of item & Location against each Measurement taken	Nos.	Length	Breadth / width	Height	Quantity	Remarks

Each invoice / bill should be submitted in hard and soft copies in duplicate to the architect.

The format of invoice / bill in soft copies should be same as mentioned above and should be done in

Microsoft Excel. (Only one file should be created with different worksheet for the invoice and measurement.)

14. INSURANCE

The contractor shall ensure that workmen employed by him for execution of work are suitably covered against Workmen Compensation Act and that all liabilities arising out of workmen Compensation Act, ESIS and other legislative enactment applicable to such works and workmen shall be to the Contractor's account.

15. Wherever required, the Client/Architects shall instruct for supply of items if erection of mock up, as the case may be, and upon approval of the same, the items shall be fabricated and completed by the Contractor (with or without modifications as the Architects shall instruct). No extra amount will be paid regard shall be final and binding.

16. In case the local authorities such as ward office raise objections about debris disposal etc. the contractors shall solve the matter at their end, without involving or putting financial liability on the Clients. However the Client will make necessary arrangement for stacking the debris temporarily before disposal.

17. Figured dimensions are in all cases to be followed and in no case should they be scaled. Large scale details take precedence over small scale drawings. In case of any ambiguity, conflict of interpretation, generally the provisions giving more vigorous interpretation shall prevail and the Architects decision in this regard shall be final and binding.

18. The Architect will not certify any application for payment to any contractor if there are:

- Defective items of work still uncorrected.
- Any claims or liens filed against the contractor for failure to pay materials, labour on sub-contract amount due or reasonable evidence that indicates probable filing of such claims.
- Damage to another contractor.

- A reasonable doubts that the contract cannot be completed for the balance than unpaid.

When the works are complete in all respect, the contractor shall intimate in writing to the Architect and the Client to enable the Client to take the possession of the same. The work shall not be considered virtually complete until the Clients and the Architect have jointly inspected the work and certified in writing that this has been completed.

19. QUANTITY OF WORK TO BE EXECUTED

The quantities shown in bill of quantities are intended to cover the entire work indicated in the drawings but Employer reserves the right to execute only a part or the whole or any excess there of without assigning any reason therefore.

20. DATUM

All levels shown in the drawings are to be strictly adhered to subject to final Confirmation by the Employer/ Architect.

21. CLEARING SITE AND SETTING OUT WORKS

The contractors shall set the works and shall be responsible for the true and perfect setting out of the work and for the correctness of the positions, levels, dimensions and alignments of all parts thereof. If at any time, any error shall appear during execution of any part of the work, the contractor shall at his own expenses rectify such error to the satisfaction of the employer /Architect. The contractor shall further set out works to the alternative positions at the site until one is finally approved and the rates quoted in his quotation should include for this and no this account will be entertained.

22. REMOVAL OF IMPROPER WORK

The employer shall during the progress of the work have to order in writing time to time the removal from the work within such reasonable time to time as may be specified in the order of any materials which in the opinion of the employer/Architect are not in accordance with specifications or instruction, the substitution or proper re execution of any work executed with materials or workmanship not in accordance with the drawings and specification or instructions. In case the contractor refuses to comply with the order the Employer shall have the power to employ and other agency to carry out then work and all expenses consequent thereon or incidental thereto as certified by the Employer/ Architect shall be borne by the contractor or may be deducted from any money due to the contractor from his liability in respect of unsound work or dad

materials. No certificate which may be given by the Architect shall relieve the contractor from his liability in respect of unsound work or bad materials.

23. MEASUREMENTS

Before taking any measurements of any work the Employer/ Architect shall give notice to the contractor. If the contractor fails to attend at the measurements after such notice or fails countersign or to record difference within a week from the date of measurements taken by the Employer /Architect's is final and binding on the contractor and the contractor shall have no right to dispute the same.

24. PAYMENTS

The contractor in the form prescribed by the Employer /Architect shall prepare all bills. Numbers of interim bill are as stated in Instructions to tenders:

The RA Bill should be based on item rates and will be paid on actual work done on site (% of work done).

Materials delivered on site and advanced paid for materials will not included in RA bills. The advance payment will be deducted from RA Bill on prorata basis.

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

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

The amount stated in an interim certificate should be total value of work properly executed less the amount to be retained by the Employer.

The employer will deduct retention money. The refund of retention money will be made as specified in these general conditions of contract elsewhere.

All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payment for work actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be

removed and taken away and taken and reconstructed or erected or be considered as an admission of the due performance of the contract or any part there-of in any respect or the accruing of any claim nor shall, it concluded determine or effect in anyway the power of the Employer under these conditions or any of them as to the final settlement and adjustments of the accounts or otherwise or in any other way or effect the contract. The final bill shall be submitted by the contractor within one week of the date fixed for completion of the work or of the date of certificate of completion furnished by Architect/Employer and payment shall be made within three months.

25. FINAL PAYMENT

The final bill shall be accompanied by a certificate of completion from the Employer/ Architects. Payment of final bill shall be made after deduction of Retention money as specified elsewhere in these conditions, which sum shall be refunded after the completion of the Defect Liability Period after receiving the Employer's/ Architects Certificates that the contractor has rectified all defects to the satisfaction of the Employer/ Architect. The acceptance of payment of the final bill by the contractor would indicate that he will have no further claim in respect of the work executed.

26. PREPARATION OF WORKS FOR OCCUPATION AND USE ON COMPLETION

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

On completion of the contractor shall clean all windows and doors including the clearing and oiling if necessary, of all hardware inside and outside all floors, staircase and every part of the Premises. He will leave the entire Premises/ furniture neat and ready for immediate occupation/ use and to the satisfaction of the Client /Employer.

27. CLEANING OF SITE.

On completion of the works the contractor shall away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the works clean and in workmanlike conditions to the satisfaction of the Employer /Architect. The contractor should clean site for debris and other waste material on daily basis and keep the environment healthy, no extra payment will be made on that account.

28. ESCALATION:

The rate quoted shall be firm throughout the tenure of contractors (including extension of time, any granted) and will not be subject to any fluctuation due to increase in cost materials, labour, taxes, octroi, or any other new taxes, levies etc.

29. IDLE LABOUR

Whatever the reasons may be, no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entertained under any circumstances. ***Delay due to non-availability of labour at any point of time during execution will be at contractors account and client will not entertain any claim (extension of time period) for the same.***

LT-TECHNICAL SPECIFICATION.

The Electrical installation work shall conform to the following I.S. Standards (latest additions), Local Supply Authorities Rules and Regulations, Indian Electricity Act & rules, National Building code and Fire Safety Norms. All equipment including cables, wires & components thereof should be manufactured & installed as per standards specified by Bureau of Indian Standards (BIS) Where such standards do not exist, then the covered items should be approved from Architects / Consultants/Clients prior to purchase & delivery to site.

- 1) IS: 732 Code of Practice for Electrical wiring installation (System Voltage not exceeding 650V)
- 2) IS: 1646 Code of Practice for fire safety of buildings (General Electrical Installation).
- 3) IS: 9537, PART-II 1981 Rigid steel conduits for electrical wiring.
- 4) IS: 2667 Fittings for rigid steel conduits for electrical fittings.
- 5) IS: 2509 rigid non-metallic conduits for electrical installations.
- 6) IS: 1293 Pin Plugs and Sockets.
- 7) IS: 694 PVC insulated cables with copper conductors for voltages up to 110 Volts.
- 8) IS: 9532 Specification for conduits for Electrical Installation
- 9) IS: 3854 5A & 15A Switches.
- 10) IS: 3043 Earthing.
- 11) Indian Electricity Act, 1956 and Rules and Fire Insurance Regulations.
- 12) IS: 2026 Specification for power transformer ---- Not applicable.
- 13) IS: 2099 Specification for high voltage porcelain bushings ---- Not applicable
- 14) IS: 355 Specification for insulating oil. ----- Not applicable
- 15) IS: 3639 Specification for fittings and accessories for power transformer. ----- No applicable
- 16) IS: 2274 Electrical wiring installations (System voltage exceeding 650 volt)
- 17) IS: 7752 Guide for improvement of power factor consumer's installations
- 18) IS: 5216 Guide for safety procedures & practices in electrical work
- 19) IS: 3072 Installation & maintenance of Switchgear
- 20) IS: 2551 Guide for danger notice plates
- 21) IS: 8923 warning symbols for dangerous voltages

- 22) IS: 13947 Specification for low-voltage switchgear & Control gear
- 23) IS: 1777 Industrial luminaries with metal reflectors
- 24) IS: 1913 General & safety requirement of luminaries
- 25) IS: 116 Circuit Breakers for AC system
- 26) IS: 3427 Metal enclosed switchgear & Control gear
- 27) IS: 3837 Accessories for rigid steel conduits.
- 28) Is: 4047 Heavy-duty Air break switches & composite switch fuse units for voltage exceeding 100 Volts.
- 29) IS: 4237 General requirements for switchgears not exceeding i000 Volts
- 30) IS: 4615 Switch socket outlets
- 31) IS: 159: Busbars & busbars connections
- 32) IS: 415 Marking & arrangement for switchgear boards main connections & auxiliary wiring.
- 33) IS: 415 Tungsten filament lamp
- 34) IS: 722 Three-phase watt-hour meters with MDI
- 35) IS: 1248 directing acting electrical indicating instruments
- 36) IS: 1293 three pin plugs & sockets outlets.
- 37) IS: 1947 Floods lights
- 38) IS: 2147 Degree of protection provided for enclosure for switchgear
- 39) IS: 2418 Tubular fluorescent lamps for general lighting services
- 40) IS: 2509 PVC electrical Conduits
- 41) IS 2075 Current Transformer
- 42) IS 2834 LT Capacitors?
- 43) IS 3106 Code of practice for installation & maintenance of switchgear.
- 44) IS: 2607 Air break isolators for voltage not exceeding 1000 Volts
- 45) IS : 1753 aluminum Conductors for insulated conductor
- 46) IS: 3961 Recommended current ratings for cables
- 47) IS: 3480 Flexible steel conduits for electrical wiring
- 48) IS: 1646 Code of fire safety of building (General Electrical installation)
- 49) IS: 1913 General & safety requirements for electdc lighting fitting.

- 50) IS: 1239 Mild steel tubular & other wrought steel pipefitting
- 51) IS: 6381 Specifications for construction & testing of electrical apparatus,
- 52) IS: 1818 Isolator & Earthing switches
- 53) IS: 3106 Code of practice for selection
- 54) IS: HRC Cartridge fuse unit up to 650 Volts
- 55) IS: 10332 Part I to Part V Specification of Luminaries

A - 01. POINT WIRING: -

a) METAL CONDUITS:

All conduit pipes shall conform to IS 9537 PART-II 1981. Metal conduits shall be ERW black enameled of wall thickness of 1.6 mm, 20mm/25mm as the case may be depending upon the number of wires permitted as table-1. The conduits shall be fixed to walls/ceiling with M.S. saddles and spacers at an interval of 1 meter and on either side of bends.

All conduit accessories shall be 16 gauges & bends shall be of inspection type. All bends, couplers, threaded portions etc. shall be painted with anti-corrosive paint. Bends in the pipes shall be done with bending hickies.

All pipes shall be cleaned for sharp burrs. Switch boxes shall be of E;I. 16G/14G. The switch boxes shall be concealed as per site requirement & as per Architect's/Consultant's Instructions.

Point shall be controlled with 6A switch or directly from DB as specified in schedule of quantities. Where plate type switches are not specified the switchboard shall have 3mm thick hylum sheet on which switches shall be mounted.

The wiring shall be carried out with multi stranded PVC insulated copper wires of 1.5 sq. mm. 2 nos (Phase & Neutral) & 2.5 sq.mm. (Earth). In all cases the earth shall be of green color and neutral shall be black color. All wires used shall be of 1100V grade. The point wiring shall be inclusive of circuit wiring from Distribution Board to the switchboard unless otherwise stated in schedule of quantities. The circuit wiring shall be with 3 nos. of 2.5 sq. Mm PVC insulated multi stranded copper conductors color-coded as detailed above. The rate shall also be inclusive of any chasing as directed by the Architects/Consultant/Clients Engineer to conceal the drops and finishing the same.

In case of group control directly from Distribution Board, the primary point shall be from D.B. to the first point and secondary point from first point to the next point looped. The point shall terminate into three way junction box. (In case of wiring in PVC conduit the 3 plate-ceiling rose to be utilized)

While laying the conduits in the slab before casting the slab, all drops shall be laid accurately to fall in position of the switchboard. Junction boxes shall be sand filled. All joints shall be airtight. Conduits shall be fastened to the re-enforcement properly so that the conduits do not get dislocated while casting the slab. All conduits shall have 18 swg fish wire.

b) PVC CONDUITS:

The PVC Conduits shall conform to latest IS: 2509 and shall be of wall thickness of 2mm. The conduits shall be joined with PVC adhesive at Joints. The Conduits shall be fixed to walls/ceilings with GI, Spacers and Saddles at an interval of 60 cms & on either side of bends. The number of wires drawn in the conduits shall be as per table 1. The point wiring shall be controlled as in (a) above. The wiring shall be done with 2nos. of 1.5 sq. mm (Phase & Neutral).& 2.Ssqmm (earth) PVC

Insulated, copper conductors, multi stranded and color coded with green as earth and black neutral.

The circuit wiring shall be with 3 nos. of 2.5 sq. mm PVC insulated, copper conductors, multi stranded from distribution board to switch board and the rate shall be included in the point wiring unless otherwise stated in the schedule of quantities, All other details shall be as for metal conduits.

TABLE: 1

Size of wires	Capacity of conduit	
	20 mm dia	25 mm dia
1.5 sq.mm	7	15
2.5 sq.mm	5	11
4.0 sq.mm	4	8
6.0 sq.mm	3	6
10.0 sq.mm.	2	4

A.02. DISTRIBUTION BOARDS:

This specification covers the design, manufacture, assembly, testing at works, supply, installation and commissioning of distribution boards at site.

The system and accessories shall be complete in all respects and any device not included specifically in this specification, but essential for proper operation of the equipment and also to meet statutory requirements shall be deemed to be within the scope of the specification whether it is mentioned in the Technical Specification or not.

If the vendor finds that it is required to undertake any work which is not sufficiently defined in this specification, or discovers that this specification conflicts with any other codes, standards and regulations which shall be required to comply, the same shall be clarified in writing from the Owner/Consultant before undertaking work involved for avoiding the delay.

A.2.1 CONSTRUCTION:

The distribution boards shall be fabricated out of 14/16 SWG sheet steel metal, totally enclosed dust damp and vermin proof IP52, dead front, and hinged door type of belted/welded construction suitable for wall or floor mounting.

The board frames shall be fabricated using suitable mild steel structural sections or pressed & shaped cold rolled sheet steel of thickness not less than 2.0mm. The frames shall be enclosed by cold rolled sheet steel of thickness not less than 1.65 mm, smoothly finished, leveled & free from flaws. Doors & covers shall be made of cold rolled sheet steel of thickness not less than 1.65 mm Stiffeners shall be provided wherever necessary.

A.2.2 BUSBARS:

The busbar shall be air insulated and made up of high conductivity high strength aluminum or copper bus bars liberally sized with high safety factor for the required rating. The current density shall not exceed 0.8 amp per sq.mm & 1.25 amp per sqmm for copper & aluminum respectively. The neutral bus shall be rated for capacity of phase bus unless otherwise stated in schedule of quantities/drawings. However, the minimum size of bars shall be 25mm x 3mm. The neutral busbars shall have adequate number of terminals for all number of outgoing single phase circuits and the holes shall be suitable for multistoried wires. In the same way suitable earth bus shall be provided inside each distribution board for earthing of the lighting/power circuits and also earthing of distribution board. In case of 3 phases DB used for single phase outgoing, three independent neutral bars shall be provided.

A.2.3 MINIATURE CIRCUIT BREAKERS:

Miniature circuit breakers (MCB) shall be of heat resistant, moulded type designed, manufactured and tested as per IS-8828.

The MCBs shall have inverse tripping characteristic against overloads and instantaneous trip against short circuits. The MCB shall be of fault current limiting device also.

The MCB shall be clip on type to the DIN rail. The ON & OFF positions of the switch handle shall be clearly marked. The MCB shall be suitable for operating in an ambient temperature of 45 deg C. without derating. The MCB shall be suitable for 415V, 3 phase, 50 Hz system with a fault level of 9-10 KA (RMS) symmetrical. The terminals of MCBs shall be suitable for use with eye lugs. The 4 pole, 3 pole and 2 poles MCBs knobs shall be trunked with adequate strength tandem pin.

Each distribution board shall have individual hinged/bolted gasketed doors with suitable screws. Removable conduit entry plates shall be provided at top and bottom of the DB to facilitate drilling the conduit holes at site to suit individual requirements or knock out shall be provided.

Protective insulated cover plate shall be provided inside the panel to shroud all the live parts. Only the operating handle of the switch and the operating knob of the miniature circuit breakers shall be projecting outside the cover plate in case of ordinary DB and shall be inside the front door in case of dust tight DB. The unused outgoing gap of DB shall be suitably blanked with PVC plates at no extra cost. The incoming switch terminal should be suitably shrouded to avoid accidental contact. Each outgoing in the MCB DB

shall have shrouding between Phases. The distribution board shall be factory wired and assembled and local fabricated DB shall not be accepted.

If the Distribution Board shall be triple pole and neutral, four-pole isolator shall be provided as incomer and for single phase and neutral Distribution Board, double pole isolator shall be provided. Earth *leakage* circuit breaker to be provided wherever called for.

Suitable label shall be provided to mark the circuit number of outgoings circuits.

A.2.4 EARTHING: -

The DBs shall be provided with two numbers brass earthing terminals with suitable nuts, washers, etc., for connecting to earth bus outside the DB. In case of flush mounting DB, these shall be provided inside the DB.

A.2.5 PAINTING: -

The DB sheet steel surface shall be pre treated through seven-tank process chemically cleaned to remove scale etc., rinsed dried and shall be finished with powder-coated paint over two coats of red oxide primer.

A.2.6 TESTS:-

Following factory routine tests shall be performed on the equipment before dispatch. The test results shall be sent along with the supply of DB.

Mechanical Operation

HV test for one minute

Insulation resistance at 500 volt DC before/after one minute HV test.

A.2.7 INSTALLATION: -

The board shall be fixed at accessible heights. The boards shall be solidly fixed to walls/partitions, concealed or open as directed. All connections inside the distribution board shall be neatly arranged and tied with PVC strings. The distribution boards shall be suitably earthed. Legend shall be written on D.B. with paint for identification of D.B. & Circuits.

A-03. CABLES:-

Cables shall conform to latest IS 1554-1988. Cables shall be heavy duty, armoured, PVC insulated & PVC sheathed 1.1 KV grade aluminum or copper. Cable shall be fixed with G.I spacers & saddles at an interval of 45 cms and on every side of bends. The bending radii of cables shall be as per manufacturers instructions and in no case it shall be less than 12 times the overall diameter of the cable. Cable shall be so installed that they are not subject to mechanical damage. If there is a bend in the cable enclosed in a conduit, care has to be taken to prevent undue compression of insulation. This applies also to the top of vertical runs of longer than 5 meters where there could be compression caused by the weight of unsupported vertical cables. Cables may rest without fixing in horizontal runs or ducts or trunkings. The cables run in cable trays shall be fixed with cable ties at intervals of not more than 30 cms. No joints in the cables shall be permitted unless the cables exceed the standard drum length. Joints if so necessary shall be located in accessible position. Termination of the cables shall be done with heavy-duty copper/Aluminum lugs and brass cable glands,

Cables laid underground shall be to a minimum depth of 750 mm. It shall be ensured that cables laid underground are free of water lines, sewage lines etc. The trenches shall be at least 30 cm wide & filled with 10 cms thick of layer of dry sand on which the cable shall be laid. Further, 10 cms thick dver sand layer shall be put on the cable over which a bricklayer shall be kept. The trench shall than be back filled with soft earth, rammed and consolidated to original level. Cable route indicators made up of CI shall be laid at intervals of 20 meters and at all change in directions.

For cables laid on walls aluminum tags shall be fixed showing the size of the cable and the feeder number of the cable. These tags shall be at each end and at least one or two places at intermediate positions.

The mode of measurement of the cables shall be as follows:

- i) For top entry of the cable, the measurement shall be taken up to the bottom of that switch-gear.
- ii) For bottom entry of the cable, the measurement shall be taken up to the top of that switchboard. No wastage shall be allowed for measurements.

A-04. SWITCH FUSE UNITS: -

Switch Fuse Units shall be of sheet metal or iron clad with HRC fuses as described in schedule of quantities. SFUs comply to IS: 4047-. The unit shall be of robust construction of standard specified make, design to withstand adverse working conditions. It shall have quick break type mechanism with ON and OFF position indicators of the operating handle. The switch shall be interlocked so that the unit cannot be opened in ON condition. The interior shall be so arranged that clearance from live parts are adequate and shrouded. Manufacturer's instructions shall be followed for installation of switch fuse units. The switch shall be solidly earthed. The switch shall be mounted on walls on angle iron support grouted to wall. The supports shall be treated for rust treatment & painted with 2 coats of synthetic enamel paint. The height of the switchboard shall be such that it is accessible for operation & maintenance.

A-05. POWER PANELS: -

The Power panels shall be fabricated from MS sheet steel 14/16 gauges and shall be of compartmental design. The main supporting framework shall be of angle iron or of heavier gauge sheet metal. The panel shall be self-supporting design, dust and vermin proof, dead front and fully inter locked with isolating switches. The panel-mounted switches shall have Interlock defeat for testing and inspection.

The board frames shall be fabricated using suitable mild steel structural sections or pressed & shaped cold rolled sheet steel of thickness not less than 2.0mm. The frames shall be enclosed by cold rolled sheet steel of thickness not less than 1.65 mm, smoothly finished, leveled & free from flaws. Doors & covers shall be made of cold rolled sheet steel of thickness not less than 1.65 mm. Stiffeners shall be provided wherever necessary.

The panel shall be powder coated comprising of seven tank pre treatment, degreasing and de-scaling in sulphuric acid etc & shall be finished with powder coated paint over two coats of red oxide primer.

Powder coating synthetic enamel paint for smooth finish. The color of paint shall be battle-ship grey or as directed.

The panel shall be designed so as to facilitate inspection, cleaning and repairs. The clearance between phase to phase and phase to earth or metal parts shall be as per relevant IS standards. The metering instruments like voltmeter, ammeter etc. shall be flush mounted and shall be of 1.0 class accuracy and of standard design size shall be 96 mm x 96. All indication lamps shall be of LED type.

The busbars shall be air insulated and made up of high conductivity, electrolytic aluminium complying with the requirement of IS 5082:1981 and shall have a fault withstand capacity of 50 KA/1 Sec. The current density shall not exceed 0.8 amp per sq.mm & 1.25 amp per sq.mm for copper & aluminum respectively All busbars shall be fully screened by means of PVC sleeves in their own compartment running throughout the length of the Panel. Suitable allowance should be made for bus expansion.

The panel shall have separate cable tray and a bus bar chamber. The bus bars shall be rigid hard drawn tinned electrolytic copper wherever specified & sleeved with heat shrinkable sleeves. The current density shall not exceed 1.25 amp per sq.mm and the neutral bus shall be rated for capacity of phase bus unless otherwise stated in schedule of quantities/drawings. However, the minimum size of bars shall be 25mmx3mm. Minimum electrical clearance shall be maintained between phases, neutral and body as per IS 4237:1982. All Incoming / outgoing feeders shall have neutral link of appropriate capacity in the compartment of switching device.

Wiring inside the switchgear shall be carded out with 1100 V grade, single core PVC insulated, stranded copper conductor wires.

Minimum size of conductor for power circuit is 4.0 sq.mm.

Minimum size of conductor for control circuit is 1.5 sq.mm.

The size for CT circuit wiring should be of 2.5 sq.mm.

The Panel shall be tested at site before commissioning. The Panel drawings shall be got first approved from Consultants before taking up for fabrication.

All wiring inside the panel shall be done with switchboard copper conductors/cables solid copper links. The insulators for supporting the Bus Bars shall be epoxy based cast resin. All hinged doors shall be

earthed with flexible braided copper earth. An earth bus of copper shall be fixed along the length of the panel at the lower section. Adequate ventilation for the panel shall be provided. Logic diagram of operation of switches shall be painted on the panel. The nameplates for *each* feeder shall be of engraved design and pasted to the respective switchgear. The letters shall not be less than 10 mm size for individual feeders and not less than 18 mm for the main feeders. All switchgear to be mounted in the panel shall be as per schedule of quantities.

A-5.1 General Constructional Features: -

Switchgear shall be

On door, floor mounting, modular type (wall mounted wherever specified, instructed)

Provided with protection of IP52

Vermin proof construction

Provided with metal sill frame of structural steel channel section properly drilled for mounting the switchgear along with necessary mounting hardware.

Provided with gaskets all round the perimeter of removable covers & door

No equipment needing manual operation shall be located less than 250 mm above ground level.

A-5.2 MCCBs: -

MCCB shall in general conform to IS: 13947 part-2, All MCCB shall be of P2 duty.

MCCB shall be flush mounted on the AC/DC distribution boards.

MCCBs shall be provided with thermo-magnetic type release for over current and short circuit protection. The setting of the thermal release shall be adjustable between 75% to 100% of the rated current. The magnetic release setting shall be adjustable between 300% to 600% of the thermal release setting at site.

MCCBs shall also have 2 NO and 2NC auxiliary contact either built-in or using auxiliary switch for purchasers use

MCCBs shall be manually operated. The operating handle should give a clear trip indication

Miniature circuit breaker (MCB) shall conform to IEC: 898-1987 and IS: 8828.

The MCCBs shall comprise single units of triple pole construction & shall be rated for 500 V AC.

All live parts shall be totally enclosed in a heat resistant moulded insulating material housing.

Operating mechanism shall be quick make, quick break & trip free type.

A-5.3 INSTRUMENT TRANSFORMERS: -

All CTs will be dry type. All current and voltage transformers shall be completely encapsulated cast. resin insulated type suitable for continuous operation at the temperature prevailing inside the switchgear enclosure, when the switchboard is operating at its rated condition and the outside ambient temperature is 50C.

All instrument transformers shall be able to withstand the thermal and mechanical stresses resulting from

the maximum short circuit and momentary current ratings of the associated switchgear.

All instrument transformers shall have clear indelible polarity markings. All secondary terminals shall be wired to a separate terminal on an accessible terminal block where star-point formation and earthing shall be done.

All CTs utilized in metering circuit will be of class 1.0 & burden of 10 VA minimums wherever not specified. All CTs utilized in protection circuit will be of class 5P10 & burden of 10 VA minimums wherever not specified.

All CTs shall be earthed through a separate earth link.

A-06. EARTH PITS:

The Earthing station shall be done as per latest IS 3043 (1987) and as per drawing no. EI. The earth pit shall be at least 2.5mtrs deep with GI Plate electrode. The GI plate electrode shall be hot dipped of 600mm x 600mm x 6mm thick. The size for copper electrode shall be 600 x 600 x 3mm thk. An alternate layer of salt and charcoal shall be filled up to 200 mm above the top of the electrode. The electrode shall be connected with 25mm x 6 mm thick GI Flat which shall be terminated with nuts and bolts into brick masonry chamber on top. The brick masonry chamber shall be of size 300mm x 300mm x 300mm deep which will carry the funneling arrangement for watering. A GI Flat of 25 mm x 3 mm from brick masonry chamber to the switch gear inside the switch room shall be laid underground and/or fixed to walls and the rate for this shall be paid as a separate item.

A.07 EARTHING SYSTEM: -

All the main earth conductor above the ground level shall be painted with two coats of enamel paint. The following colour codes has to be followed:

- | | |
|------------------------------------|---|
| (a) Main body earth bus | Green colour |
| (b) Main neutral earth bus | Black colour |
| (c) Lightning protection earth bus | Red colour or as preferred by Owner/Consultant. |

Earthing system of equipment earthing, neutral earthing and lightning protection earthing should not be mixed together above the ground. These systems/connections shall be tested in accordance with IS 3043-1987. Earth resistance of the individual system shall be measured after connecting all the electrodes to the bus and the combined value shall be minimum of 1 ohms (One ohms).

A-08. ELECTRICAL FIXTURES

All lighting fittings shall be complete with accessories & fixtures necessary for installation whether so detailed under item description or not.

Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box or fixture opening.

Fixtures shall be completely wired & constructed to comply with the regulations & standards for electrical lighting fixtures, unless otherwise specified. Fixtures shall bear manufacturer's name & factory inspection label unless otherwise approved.

Wiring within the fixtures & for connection to the branch circuit wiring shall be not less than 1.5sqmm copper for 250-volt application. Wire insulation shall suit the temperature conditions inside.

Metal used in lighting fixtures shall be not less than 22 SWG. Or heavier if so required complying with specification of standards. Non-reflective surfaces & trim shall be finished in baked enamel paint.

Fixtures with visible frames shall have concealed hinges & catches. Recessed fixtures shall be constructed as to fit into an Armstrong/Gypsum/POP false ceiling.

Detail catalogue or, if so required by the architects, sample fixtures shall be submitted for approval to the Architect /Consultants. Shop drawings for non-standard fixtures shall be submitted for approval to the Architects.

A-8.1 INSTALLATION OF ELECTRIC FITTINGS: -

Fixtures shall be installed at mounting heights as detailed on the drawings or as instructed on site by the Architect/Consultants.

Fixtures or fixtures outlets boxes shall be provided with hangers to adequately support the complete weight of the fixture. Design of hangers & methods of fastening shall be submitted to the Architects for approval prior to execution at site.

All fluorescent lighting fixtures shall be fixed with down rods or on round blocks as stated in schedule of quantities. The down rods shall be 20 mm dia and 1.6mm wall thickness of ERW black enameled MS. The down rods shall be fixed with ball and socket joints check nuts etc. Lighting fixtures shall be mounted on round block in case of wall mounting.

Fixtures like down lighter, spotlights etc. shall be fixed to the false ceilings as per manufacturer's recommendations.

A-09 POWER FACTOR CORRECTION PANEL: -

The power factor correction panel shall be fabricated from sheet steel & powder coated. The panel shall be compartmentalized with tinned copper bus bars TPN as described for power panels. The capacitor housing should be well ventilated.

The power capacitors shall be APP type, low loss, 3 phases, delta connected & self discharged type.

The power factor control shall be done by automatic power factor control relay for controlling the power factor within the set limits by auto switching of required capacitor Banks. The required Capacity/P.F Banks shall be as per schedule of quantities. The P.F. shall be automatically corrected to near Unity.

The C.T. ratio given in the Schedule/diagram is indicative. The same shall be matched for correct operation depending upon the operating load. The relay shall be totally microprocessor based for setting the desired target power factor band. The APFC relay shall have indications like power ON, low current etc & shall be of required stages as per schedule of quantities. The P.F Panel shall have Auto Manual switching facility.

The general specification shall be as follows: -

i) System supply voltage 415 volts. ii) C.T. secondary rating 5 A, 5 VA Burden. iii) Output switching capacity 5A at 230 V AC & 2-A at 440 V AC, Operating temperature, 10 degree Centigrade to 50 degree Centigrade. Accuracy better than 1%. Low current release 10% of full rated C.T. iv) Switching time between stages 4 to 6 seconds. v) Range of indications of PF 0.5 lag to 0.5 lead digital. vi) Display LED indications. vii) Range of target P.F. setting 0.7 to 0.99. viii) Switch for auto/manual operation. ix) Indications for selection of stages. x) Selection of dead band.

For constructional details refer the specifications mentioned at A.05 .the same are applicable for APFC panel.

A-10. TESTING OF ELECTRICAL INSULATION:

The following tests shall be carried out after completion of the electrical insulation work.

- 1) Insulation Resistance Test.
- 2) Polarity Test of Switches.
- 3) Earth Continuity Test.

1) Insulation Resistance Test: The insulation resistance shall be measured by applying between earth and whole system of conductors or any section thereof with all fuses in place and all switches closed (except in earthed concentric wiring) all lamps in position & both poles electrically connected together, or direct current pressure of not less than twice the working pressure, provided that it need not exceed 500 volts for medium voltage circuits, be applied. Where the supply is derived from 3 wire DC or Poly phase A.C. System, the neutral pole of which is connected to the earth either direct or through added resistance, the working pressure shall be deemed to be that which is maintained between the phase conductor and the neutral. The insulation resistance measured in mega ohms between all conductors connected to one pole of phase conductor of the supply and all the other conductors and switches in off position it's value shall be not less than as specified below:

The insulation resistance measured in mega ohms shall not be less than 50 mega ohms divided by the number of outlets or when PVC insulated cables are used for wiring, 12.5 mega ohms divided by the outlet subject to a minimum value of 1 mega ohm.

A preliminary and similar test may be made before lamps etc. are installed and in this event the insulation resistance to earth shall not be less than 100 mega ohms divided by the number of outlets or when PVC insulated cables are used 25 mega ohms divided by the number of

Outlets subject to a minimum of 1 mega ohm.

2) Polarity Test of Switches: In a 2 wire system a test shall be made to verify that all switches in every circuit are fitted in the same conductor throughout and such conductors shall be labeled or marked for connection to the phase conductor or to the non earthed conductor of supply.

In a 3 wire or 4 wire insulation a test shall be made to verify that every non linked single pole switch is fitted in a conductor which is labeled or marked to one of the phase conductor of supply.

3) Earth Continuity Test: The Earth Continuity Conductor including metal conduits and metallic envelopes of cables in all cases shall be tested for electric continuity and electrical resistance of the same along with the earthing lead but excluding any added resistance or earth leakage

Circuit breaker measured from connection with earth electrode, to any point in the earth continuity conductor in the completed insulation shall not exceed 1 ohm.

TECHNICAL SPECIFICATION OF TESTING AND COMMISSIONING:

The scope of work for testing and commissioning of the total installation shall be for the capital equipments like transformers, switchgears, cables etc., and also for the associated equipments like relays CTs, PTs, etc.

The scope of work for testing and commissioning of electrical equipment for the above shall include but not be limited to the following:

Providing sufficient number of experienced Engineers, Supervisors, and Electricians so that the installation can be commissioned in stipulated time.

All the instruments, tools and tackles required for carrying out the testing and commissioning shall be provided by the bidder.

The testing of electrical equipment shall be carried out as per the relevant Indian Standards/Code or Practices/Manufacturer's instructions.

Cleaning of electrical equipment, contacts cleaning and greasing etc. All the equipment and material required for above shall be supplied by the bidder.

Correcting the panel/equipment wiring for proper functioning of the schemes required/called for.

Installation and wiring of additional equipment on panels like auxiliary contactors, timers, etc. Which may be additionally required for proper functioning of the schemes.

Checking of equipment earthing and system earthing as a whole.

Testing of all the cables.

Co-ordination with other contractors for testing and commissioning of interface cables.

TESTS TO BE CONDUCTED: -

All tests shall be performed in the presence of the bidder and customer/consultant. For all types of visual inspections, checkings, pre-commissioning, commissioning test and acceptance tests, IS Code to be followed for the tests given therein in addition to the instructions in this technical specification. The intention of giving the few test procedures, described below, is to provide a guideline for the bidder. However, bidder shall not restrict them in carrying out only the tests described in this document.

Bidder shall submit their proposed test procedures for approval and shall not commence testing such approval is given.

Bidder shall check and test all electrical equipment and systems installed and supplied them, including equipment supplied by the Owner.

Bidder shall supply all necessary test equipment and personnel both craft and supervisory to carryout the work without danger to personnel or damage to equipment.

Bidder shall ensure that no tests are applied which may stress equipment above the limits for field-testing recommended by the manufacturer. Bidder shall be responsible for any damage to personnel or equipment resulting from improper test procedure.

All defective materials furnished by the bidder and defects due to poor workmanship revealed through field testing, shall be corrected at bidder expense without affecting the completion of the project.

Client/Consultant reserves the right to interpret and approve all test results prior to energisation of circuits or apparatus.

Bidder shall visually inspect all equipment for defects immediately upon arrival at site including those supplied by the Owner.

Relay coordination chart an final setting before/commissioning.

MECHANICAL CHECKOUT: -

After installation, but before any power supply is connected, the contractor shall make a complete mechanical check of all installed electrical equipment and systems. This shall include but not to be restricted to the following:

Check equipment numbers against drawings/documents.

Check nameplates of transformers, switchgears, etc., for conformity with the data given in the drawings and specifications.

Check all equipment bus joints and connections for tightness.

Check all cable and wire connections for tightness.

Check phase sequence.

Check all bushings/insulators to ensure they are clean and unchipped. Inspect tank cooling tubes and radiators for leaks.

Check silicagel for dryness where breathers are supplied. If the colour of the silicagel is pink, remove from the breather and dry out following manufacturers recommended procedure, until a light blue colour is restored and replace it.

Check valve in the connecting pipe between the conservator and transformer tank to ensure that valve is in 'open' position.

Check interlocking on access doors for mechanical and electrical safety. Check that key and electrical interlocking system functional and accomplish their purpose.

Check all plug in contacts for alignment and 'grip'.

Check all contactors for free manual operation.

Remove all locking devices installed for shipment.

Check all the coils for their continuity and proper voltages.

Check the arc chutes, arcing horns; main contacts of breakers are clean and undamaged. Check the carriages ride smoothly and reliably on their guide rails. Check for proper operation of circuit breaker operation mechanism, controls and adjustments.

Check the fuses are correctly rated and installed are clear, undamaged and fit for operation.

Check all relays and instruments are clean, correctly connected and undamaged. Check test plugs are installed in all protective relays. Check relays for free manual operation, if applicable.

Check instrument transformer ratings against drawings. Check for proper installation and connection.

Check interlock and auxiliary devices and the operation of the circuit breaker with the protection relay circuit.

Clean the equipment by vacuum cleaner before energizing.

EARTHING:

Bidder shall test the buried earth grid and shall record the values.

Bidder shall inspect and test all earthing work carded out by him, including all interconnections between ground loops, grounding of equipment and ensure all connections are permanent and that the earthing circuit is continuous.

Bidder shall megger and record *earth* resistance at various earth connection points.

SWITCHGEAR:

Switchgears rated 433 volts or more shall be tested with a 1000 volts megger.

Auxiliary wiring rated less than 415 volts shall be tested with a 500 volts megger.

All protective relays shall be tested at sufficient points to establish their proper functioning in accordance with the manufacturer's specification and curves.

Operation checks and functional checks on all switchgear panels.

For current transformers insulation test, polarity test, ratio test, secondary injection test, operating current check, service setting in consultation with Client/Consultant.

For potential transformers, ratio test, insulation test, etc.

Contact resistance for breaker contacts between male and female.

WIRES AND CABLES:

Continuity testing of all cables.

Wires and cables rated 433 volts or more shall be tested with a 1000 volts megger. Cables rated less than 433 volts shall be tested with a 500 volts megger.

No wires or cable having resistance between conductors or between conductors and ground of less than 100 Meg ohm shall be accepted.

FUNCTIONAL TESTING:

All circuit breakers, contactors, relays, remote devices, etc., shall be checked for its operations.

Note:

- a. All materials shall be of the 1st quality. **Among approved brands, selection of Brand shall be done as per Clients / Architects choice.**
- b. Wherever the contractor proposes to use equivalent makes (i.e. other than specified) the same shall be approved by the Clients / Architects. Any additional work done before prior approval of the expenditure and time; shall be solely on contractor's account and no claims whatsoever shall be entertained, in this regards.
- c. Deduction in item rates will be done if architect or client selected the material who's price is less than the specified basic rates. If material is not available contractor should mention the alternate make and submit the deviation statement.
- d. Contractor should check the availability of material in market (for required quantity) before quoting the rates and if the material is not available contractor should mention the alternate make and submit the deviation statement.

LIST OF PREFERRED BRANDS / MAKES FOR ELECTRIFICATION WORK		
Sr.	Item	Brand
1	LT Panel	MSEDCL / CPRI Test approved Panel Builder
2	C.T.'s 15VA, Class – I	AE / IMP
3	Ammeter / Voltmeter	AE / IMP
4	LT Switch gear , MCCB's	Siemens / Schneider / Merling Gerin
5	Selector Switch	Slazer
6	Indicating Lamps , LED	ALTOS / TECHNIC
7	MCB DB's Double Door	Leagrand / Merline gerin
8	MCB's 10 KA 'CVA' characteristics	Leagrand / Merline gerin
9	ELCB's / RCCBs /ELMCBs	Leagrand / Merline gerin
10	Lighting Fixtures	Wipro/Bajaj/Philips/CG
11	Luminaires	Wipro/Bajaj/Philips/CG
12	MS PIPE, HGERW, 14G,	Wimco / BEC
13	Floor Race Ways	Aluminium, Heavy duty
14	PVC Flexible Wires , FRLS Category	Finolex, RRK ,Polycab
15	Switch/ Sockets / Accessories	Leagrand / clipsal

16	Cable	Finolex, Polycab , RRK
17	cat 6 UTP Cable, Patch Panel , Face plate , Information Outlet , DATA Network Rack	D-Link
18	Control Cable shielded	Lapp
19	PA System	Philips /Ahuja/Bosch
20	Earthing System	Conventional Type
21	DG Set	Kirloskar/Cummins
22	UPS	DB Power/Champion/APC