



BANK OF BARODA.

MUMBAI METRO EAST REGION, 1STFLOOR,
A-WING, DEVDARSHAN BUILDING, STATION ROAD,
BHANDUP (W), MUMBAI- 400 078.

TENDER DOCUMENTS FOR:

**PROPOSED ELECTRICAL WORKS OF SHIFTING OF BRANCH & ME-
LOBBY OF VEENA NAGAR MULUND WEST TO NEW PREMISES AT
SHOP NO.1 &2, NEPTUNE LOTUS, LBS ROAD, VEENA NAGAGER,
MULUND (WEST), MUMBAI-400 080.**

DATE OF ISSUE: - 2.03.2019 TO 25.03.2019

SUBMISSION OF TENDER: 25.03.2019 UPTO 3:00 PM

**VOLUME I
TECHNICAL / CONDITIONS BID**

ARCHITECT :

**KALA AREKHAN
ARCHITECT & INTERIOR DESIGNER,**

101, VINDHYACHAL CO-OP HOUSING SOC,
PLOT NO. 204, SECTOR IV, CHARKOP,
KANDIVLI (W), MUMBAI-400 067.
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NOTICE INVITING TENDERS

BANK OF BARODA invites item rate tender for Proposed Electrical works of shifting of Branch & Me-Lobby of Veena Nagar, Mulund (W), to New Premises at shop No.1 &2, Neptune Lotus, LBS Road, Veena Nagare, Mulund (West), Mumbai -400 080.

The details of tender are as under:

S.No.	Description	
1.	Name of work	Proposed Electrical Works Of Shifting Of Branch & Me-Lobby of Bhayander East Branch to New Premises at Shop No.s 4 to 8, Ostwal Darshan, Bhayander East, Dist. Thane.
2.	Nature of Work	Electical Works
3.	Time allowed for completion	Two Months
4.	Earnest Money Deposit	Rs. 6,850/- (Six Thousand Eight Hundred Fifty only) by means of Demand Draft / Pay Order (Valid for a period of 180 Days from the last date of submission of the tender) from any scheduled Nationalized Bank drawn in favour of Bank Of Baroda and payable in Mumbai.
6.	Initial Security Deposit	2% of contract amount including EMD
7.	Date of issue of tender documents form Bank's website	02-03-2019 to 25-03-2019
8.	Address of tender document has to be submitted.	Dy. General Manager, Bank Of Baroda, Mumbai Metro East Regional Office, 1st floor, A- Wing, Devdarshan Building ,Station Road ,Bhandup(W), Mumbai.-400 078.
9.	Last date & time for opening of Tender.	25-03-2019 by 3.00 PM
12.	Place of opening tenders	Bank Of Baroda, Mumbai Metro East Regional Office, 1st floor, A- Wing, Devdarshan Building ,Station Road ,Bhandup(W), Mumbai.-400 078.
13.	Liquidated Damages	0.50% of contract amount per weeks subject to max. 5% of contract value or final bill value.
14.	Defects liability period	12 Months from the date of Virtual Completion
15.	Validity of offer	90 days from the date of opening of Price-bid
16.	Value of Interim Certificate	Rs. 3 Lakhs. No advance on materials / plant / machinery or mobilization advance shall be paid under any circumstances

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17. Tenders can be downloaded from the bank's website www.bankofbaroda.com. It shall be responsibility of the contractor to arrange and ensure that all pages of technical and financial bid are properly bound separately. Tenders in loose pages may be disqualified.

18. The contractor shall sign and stamp each page of the tender document thereby ensuring the number and sequence of all pages.

19. No conditions other than mentioned in the tender will be considered, and if given they will have to be withdrawn before opening of the price-bid.

20. The Bank Of Baroda reserve their rights to accept or reject any or all the tenders, either in whole or in part without assigning any reason(s) for doing so and no claim / correspondence shall be entertained in this regard.

21. Tenders received without EMD shall be summarily rejected.

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

23. Bank Of Baroda has the right to accept / reject any / all tenders without assigning any reasons and no correspondence shall be entertained in this regard.

24. The eligibility criteria and general scope of work to be carried out by the contractors / firms are as under and will include –

ELIGIBILITY CRITERIA-TENDERER MUST SUBMITT ALL NECESSARY DOCUMENTS GIVEN BELOW FAILING WHICH THE TENDER IS LIABLE TO BE REJECTED (1 TO 13) :

1. The interior and civil contractors should have executed 02 (two) such (Interior and civil) works in the last 02/03 years for Nationalised Banks or other Govt./ Semi Govt. financial Institutions for Rs.30.0Lacs. OR Minimum 4 or more similar types of works for Rs.20.0 Lacs in last 02/03 years. Contractors /firms /Cos should submit the latest IT return/ extracts of form 26AS in this regard. Failing which the tender is liable to be rejected.
2. The interior and civil contractors /firms must submit the completion certificate from the user departments / project architects having completed the works satisfactorily and within time schedule from the user dept/ of PSU / Banks.
3. The interior and civil contractors /firms should be an income tax assesses and should have filled income tax return for the last assessment year. Failing which their tender is liable to be rejected.
- 3a. The interior and civil contractors /firms should be GST assesses and should submit the copy of GST Certificate. Failing which their tender is liable to be rejected.

The interior and civil contractors /firms should have Registration of the firm/ company. They should submit the copy certificate of registration.
4. The interior and civil contractors /firms should have carried out the plumbing work through the licensed plumber of municipal/local fire authority or Other regulating agency for carrying out the required works and if required they should obtain the permissions from Municipal and other Local Authorities and bank will pay the official charges only and contractor has to obtain the permissions from the local authority If required.

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5. Name of the applicant/ organization
Address of the Registered Office
Address of office at Mumbai.
Phone Nos,
Fax Nos
Email ID :
6. Year of establishment
7. Details of registration –
Whether Proprietary/ Partnership firm,
Name of the Proprietor
Names of Partners.
Copy of Registration
Whether registered with Government /
Semi – Government /
OR any other Public Organization
If Yes, in which Category and since when?
(Enclose certified copies of document)
Registration of firm
(under Shop & Establishment Act 1948)
8. Yearly turnover of the organization during last 3 years (year wise)
Furnish audited balance sheet and Certified copies of
Profit & Loss A/c (Audited) for the last –3- years.
Average turnover in Year 2015 – 2016
Year 2016 – 2017
Year 2017 – 2018
9. Name & Address of Banks:
(Enclosed Solvency certificate from the Banks
For satisfactory financial capacity of the organization)
10. Detail Description of Works Carried out Last Three Years (Proforma A):
11. Detail Description of Works in Hand (Proforma B):
12. Have you in past carried out any works for
Bank of Baroda or its subsidiaries? If yes, Furnish the details.

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13. Whether any Civil Suit / litigation pending in contracts executed during the last 5 years. If yes, please furnish the name of the project, employer, Nature of work, Contract value, work order and brief details of the Litigation, place, and status of pending litigation.
14. The work is to be completed within 60 days after issue of work order by the owners/ architects .
15. The tender documents in the manner as prescribed here in after including the set of drawings must be returned to the

**Dy. General Manager,
Bank Of Baroda, Mumbai Metro East Regional Office, 1st floor, A- Wing,
Devdarshan Building ,Station Road ,Bhandup(W), Mumbai.-400 078.**

on or before the last date of submission.

16. At the time of submitting the tender, the tenderer shall deposit an earnest money deposit of Rs. 32,000/- (Rupees Thirty Two Thousand Only) by way of Demand Draft drawn in favour of "Bank Of Baroda" Payable at Mumbai. The Demand Draft should be drawn from a Nationalized Bank/Scheduled Commercial Bank payable at Mumbai in favour of Bank Of Baroda, towards interior and civil work.

The EMD demand draft/Bankers Cheque of the required amount as prescribed in the technical bid should be obtained a fresh after the issue of this tender/ web advertisement and old demand drafts obtained prior to issue of this notice will be not accepted and the tender shall be summarily rejected without assigning any reason thereof.

17. The earnest money deposit will not bear any interest. The earnest money deposit will be forfeited in the event of any evasion, refusal or delay on the part of the tenderer to sign and execute the contract on acceptance of his tender. The earnest money deposit, without any interest, will be returned to the tenderers whose tenders are not accepted.

18. The amount of 8 (Eight) percent of the total amount of work done will be deducted from the interim bills as retention money till the total amount so deducted reaches the value of 5% of the contract amount after which such deduction towards retention will cease. The total Security Deposit i.e. EMD + Retention amount shall both together not to exceed 10% of the contract price as determined after considering all variations as approved. 50% of the Security Amount shall be released after virtual completion against the final certificate and balance 50% (5% of the total amount) at the end of the Defects Liability Period.

19. The tenders shall be submitted as per instructions with the name of the work super scribed on the envelopes written prominently and addressed to the

**Dy. General Manager,
Bank Of Baroda, Mumbai Metro East Regional Office, 1st floor, A- Wing,
Devdarshan Building ,Station Road ,Bhandup(W), Mumbai.-400 078.**

The full name and postal address of the tenderer shall be written on the bottom left hand corner of the sealed cover. The sealed tender shall be submitted to the Dy. General Manager, Mumbai Metro North Region, at the address mentioned above.

20. The tenders shall be submitted in the following manner and shall contain details/ documents as listed below:

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20.1.1. One sealed envelope super scribed (in addition to the name of the work) 'Technical/Conditions Bid' containing the following:

- i) The tender document (Part I - Technical/Conditions Bid), duly filled and signed by the tenderer.
- ii) Demand Draft towards the earnest money deposit. Demand Draft shall be drawn in favour of "Bank Of Baroda".
- iii) All the listed drawings duly signed by the tenderer.

20.1.2. One sealed envelope superscribed (in addition to the name of the work) 'Commercial Bid' containing the following :

- i) The tender document (Part II - Commercial Bid):
duly filled and signed by the tenderer. **The rates shall be entered in figures as well as in words.**

20.2 Tenders shall be signed wherever provided for as well as all the pages of tender documents shall be initialed at the lower right hand corner by the tenderer.

21 The rates quoted shall be valid for a period of 120 days from the date of opening of the Commercial bid.

21. a) Acceptance of the tender will rest with the employer who reserves the right to accept or reject any or all tenders in part or full without assigning any reason thereof. Any tender which does not fulfill any of the prescribed conditions would be liable to be rejected. It is not binding on the employer to accept the lowest or any tender.

21. b) The employer reserves the right to divide and distribute the work section wise or otherwise. In such case, the decision shall be solely at the discretion of the employer in consultation with the Architects, including that of assignment of works.

22. All the rates quoted in the tender shall include all costs, allowances, taxes, excise duties including value added tax + service tax or any other charges and shall remain firm till completion of work. No escalation in price will be payable for whatsoever reasons. Contractor shall furnish an Indemnity Bond to State Bank of India, as per Proforma 'D' attached with the tender, indemnifying the latter against all claims by Government and other statutory authorities in this regard.

23. Samples of various materials shall be submitted by the contractor to the Architect/Employer for approval and only after the approval is accorded by the Employer, shall the materials be ordered and procured. If the Architect/Employer so desires the contractor shall, at his own cost, prepare mockups/samples to indicate the workmanship on various items and effect of use of different materials.

24. No alterations shall be made by the tenderer in the tender document. Any suggestions or disagreement on the part of the tenderer shall be presented in writing before the time of pre-bid meeting. Any other information regarding the work can be obtained from the Architects.

25. This tender notice shall form a part of the contract.

For -----

Date :

Yours Faithfully,

Deputy General Manager,

Bank of Baroda,

Mumbai Metro East Region,

1st Floor, A-Wing Devdarshan Building,

Station Road, Bhandup (W), Mumbai-400 078.

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FORM TENDER

To,
Deputy General Manager,
Bank Of Baroda,
Mumbai Metro East Regional Office,
Bhandup (West),
Mumbai.-400 078.

Dear Sir,

Having examined the drawings, specification, design and schedule of quantities relating to the works specified in the memorandum hereinafter set out and having visited and examined the site of the works specified in the said memorandum and having acquired the requisite information relating thereto as affecting the tender, I/We hereby offer to execute the works specified in the said memorandum at the rates mentioned in the attached Schedule of Quantities and in accordance in all respects with the specifications, design, drawings and instructions in writing referred to in conditions of tender, the Articles of Agreement, Special Conditions, Schedule of Quantities and Conditions of Contract and with such materials as are provided for by, and in all other respects in accordance with such conditions so far as they may be applicable.

MEMORANDUM

Description of work	Proposed Electical Works Of Shifting Of Veena Nager Mulud(W) Branch to New Premises at Shop No.s 1 & 2 , Neptune Lotus, LBS Road, Veena nager, Mulund (West), Mumbai-400 080.
Earnest Money	Rs.6,850/- (Six Thousand Eight Hunder Fifty Only) by means of Demand Draft / Pay Order from any scheduled Nationalized Bank drawn in favour of Bank Of Baroda payable in Mumbai.
Percentage, if any, to be deducted from Bills and total amount to be retained	10 % from Running Bills, subject to maximum Total 5% of contract amount or actual Final Bill value including EMD & Initial Security Deposit.
Time allowed for completion of the Works from fourteenth day after the date of written order or date of handing over of the site (whichever is later) to commence the work	2 (Two) months.

I / We have deposited a sum of **Rs. 6,850/- (Six Thousand Eight Hunder Fifty Only)** of the total tender amount as Earnest Money with the Bank Of Baroda. Ltd. which amount is not to bear any interest. Should I / We fail to execute the Contract when called upon to do so I / We do hereby agree that this sum shall be forfeited by me/us to Bank Of Baroda.

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- a) Name of the applicant/ organization
- b) Address of the Registered Office
- c) Address of office at Mumbai.

Phone Nos,

Fax Nos

Email ID

Our Bankers are:

i)

ii)

The names of partners of our firm are:

i)

ii)

Name of the partner of the firm

Authorised to sign

Or

(Name of person having Power of Attorney to sign the Contract.

(Certified true copy of the Power of Attorney should be attached)

Yours faithfully,

Signature of Contractors.

Signature and addresses of Witnesses

i)

ii)

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ARTICLES OF AGREEMENT

(On non-judicial Stamp Paper of Rs. 500/- or as per latest Govt. Rules)

ARTICLES OF AGREEMENT made the _____ date of _____ between BANK OF BARODA, MUMBAI EAST REGION having its office at 1st Floor, A- Wing, Devdarshan Building, Station Road, Bhandup (W), Mumbai-400 078.. Herein after called "the Service Provider" of the One Part and

WHEREAS the BANK OF BARODA PVT.LTD. is desirous of

_____ and has caused drawings and specifications describing the work to be done to be prepared by **M/s. KALA AREKHAN**, its Architects.

AND WHEREAS the said Drawings numbered _____ to _____ inclusive, the Specifications and the 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 and to the Conditions set forth herein in the Special Conditions and in the Schedule of Quantities and Conditions of Contract (all of which are collectively hereinafter referred to as "the said conditions") the works shown upon the said Drawings and / or described in the said Specifications and included in the Schedule of Quantities at the respective rates therein set forth amounting to the sum as therein arrived at our such other sum as shall become payable there under (hereinafter referred to as "the said Contract Amount.)

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NOW IT IS HEREBY AGREED AS FOLLOWS:

- 1) In consideration of the said Contract Amount to be paid at the times and in the manner set forth in the said Conditions, the Contractor shall upon and subject to the said Conditions execute and complete the work shown upon the said Drawings and described in the said Specifications and the priced Schedule of Quantities.
- 2) The Employer shall pay to the Contractor the said Contract Amount, or such other sum as shall become payable, at the times and in the manner specified in the said Conditions.
- 3) The term "the Architects" in the said Conditions shall mean the said **M/s. KALA AREKHAN**, or in the event of their ceasing to be the Architects for the purpose of this Contract for whatever reason, such other person or persons as shall be nominated for that purpose by the Employer, not being a person to whom the Contractor shall object for reasons considered to be sufficient by the Employer, PROVIDED ALWAYS that no person or persons subsequently appointed to be Architects under this Contract shall be entitled to disregard or overrule any previous decisions or approval or direction given or expressed in writing by the outgoing Architects for the time being.
- 4) The said Conditions and Appendix thereto shall be read and construed as forming part of this Agreement, and the parties hereto shall respectively abide by submit themselves to the said Conditions and perform the Agreements on their part respectively in the said Conditions contained.
- 5) The Plans, Agreements and Documents mentioned herein shall form the basis of this Contract.
- 6) This Contract is neither a fixed lump-sum contract nor a piece work contract but a contract to carry out the work in respect of the entire building complex to be paid for according to actual measured quantities at the rates contained in the Schedule of Quantities and Rates or as provided in the said Conditions.
- 7) The Contractor shall afford every reasonable facility for the carrying out of all works relating to civil works, installation of lifts, Telephone, electrical installations, fittings air-conditioning and other ancillary works in the manner laid down in the said Conditions, and shall make good any damages done to walls, floors, etc. after the completion of his work.
- 8) The BANK OF BARODA reserves to itself the right of altering the drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this Contract.
- 9) 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 14th day after the date of issue of formal work order as provided for in the said Conditions whichever is later and to complete the entire work within **2 Months (Two Months)** subject to nevertheless the provisions for extension of time.
- 10) All payments by the Bank Of Baroda under this Contract will be made only at Mumbai.

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11) All disputes arising out of or in any way connected with this Agreement shall be deemed to have arisen at Mumbai and only the Courts in Mumbai shall have jurisdiction to determine the same.

12) That the several parts of this Contract have been read by the Contractor and fully understood by the Contractor.

IN WITNESS WHEREOF THE BANK OF BARODA and the Contractor have set their respective hands to these presents and two duplicates hereof the day and year first hereinabove written.

SIGNATURE CLAUSE

SIGNED AND DELIVERED by the

_____ By the
(Employer)

hand of Shri _____

(Name and Designation)

(Signature of Employer)

In the presence of :

1) Shri / Smt. _____

(Signature of Witness)

Address _____

(Witness)

SIGNED AND DELIVERED by the

_____ by the
(Contractor)

(Signature of Contractors)

in the presence of :

Shri / Smt. _____

(Signature of Witness)

Address _____

(Witness)

SECTION – 1

INSTRUCTIONS TO THE TENDERERS

1.0 Scope of work

Sealed Tenders are invited by Bank Of Baroda. for **Proposed Electical Works OF Shifting Of Veena Nagar,Mulund (West), Branch AT Shop No. 1 &2 , Neptune Lotus, Road, Veena Nagar, Mulund (West),Mumbai-400 080.**

The proposed work is to be carried out at **Shop No. 1 & 2 , Neptune Lotus, Veena Nagar, Mulund (West).**

2.0 Tender documents

2.1 The work has to be carried out strictly according to the conditions stipulated in the tender consisting of the following documents and the most workmen like manner.

Instructions to tenderers

General conditions of Contract

Special conditions of Contract

Additional specifications

Drawings

Priced Bid A

2.2 The above documents shall be taken as complementary and mutually explanatory of one another but in case of ambiguities or discrepancies, shall take precedence in the order given below;

- a) Price Bid
- b) Additional Specifications
- c) Technical specifications
- d) Drawings
- e) Special conditions of contract
- f) General conditions of contract
- g) Instructions to Tenderers

2.3 Complete set of tender documents including relative drawings can be downloaded from the website www.bankofbaroda.com.

2.4 The tender documents are not transferable.

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3.0 **Site Visit**

- 3.1 The tenderer must obtain himself on his own responsibility and his own expenses all information and data that may be required for the purpose of filling this tender document and enter into a contract for the satisfactory performance of the work. The tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character quality and quantity of the materials, labour, the law and order situation, climatic conditions, local authorities requirement, traffic regulations etc;
The tenderer will be fully responsible for considering the financial effect of any or all the factors while submitting his tender.

4.0 **Earnest Money**

- 4.1 The tenderers are requested to submit the Earnest Money of **Rs. 6,850/- (Six Thousand Eight Hunder Fiffy Only) by means of Demand Draft / Pay Order** (Valid for a period of 120 Days from the last date of submission of the tender) from any scheduled Nationalized Bank drawn **in favour of Bank Of Baroda. Ltd. and payable in Mumbai.**
- 4.2 EMD in any other form other than as specified above will not be accepted. Tender not accompanied by the EMD in accordance with clause 4.1 above shall be rejected.
- 4.3 No interest will be paid on the EMD.
- 4.4 EMD of unsuccessful tenderer will be refunded within 30 days of award of Contract.
- 4.5 EMD of successful tenderer will be retained as a part of security deposit.

5.0 **Initial/ Security Deposit**

The successful tenderer will have to submit a sum equivalent to 2% of accepted tender value less EMD by means of DD drawn in favour of BANK OF BARODA within a period of 15 days of acceptance of tender.

6.0 **Security Deposit**

- 6.1 Total security deposit shall be 5% of contract value. Out of this 2% of contract value is in the form of Initial Security Deposit (ISD) which includes the EMD. Balance 3% shall be deducted from the running account bill of the work at the rate of 10% of the respective running account bill i.e., deduction from each running bill account will be @10% till Total Security Deposit (TSD) including ISD reaches to 5% of contract value. The 50% of the Total Security Deposit shall be paid to the contract on the basis of architect's certifying the virtual completion. The balance 50% would be paid to the contractors after the defects liability period as specified in the contract.
- 6.2 **Additional Security Deposit**
In case L-1 bidder quotes abnormally low rates (i.e. 10% or more, below estimated project cost), the bank may ask such bidder to deposit additional security deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfillment of contract. Such ASD could be in the form of FDR / Bank's

guarantee in the Bank's name as per format approved by the Bank. On successful completion of work ASD will be returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion.

6.3 No interest shall be paid to the amount retained by the Bank as Security Deposit.

7.0 Signing of contract Documents

The successful tenderer shall be bound to implement the contract by signing an agreement and conditions of contract attached herewith within 30 days from the receipt of intimation of acceptance of the tender by the Bank. However, the written acceptance of the tenders by the Bank will constitute a binding agreement between the Bank and successful tenderer whether such formal agreement is subsequently entered into or not.

8.0 Completion Period

Time is essence of the contract. The work should be completed in all respect accordance with the terms of contract within a period of 2 Months (**Two Months**) from the date of award of work.

9.0 Validity of tender

Tenders shall remain valid and open for acceptance for a period of 90 days from the date of opening price bid. If the tenderer withdraws his/her offer during the value period or makes modifications in his/her original offer which are not acceptable to Bank without prejudice to any other right or remedy the Bank shall be at liberty forfeit the EMD.

10.0 Liquidated Damages

The liquidated damages in case of breach of any terms of this RFP & delay in completion of the work within stipulated time shall be 0.50% per week subject to a maximum of 5% of contract value. In the event of liquidated damages exceeding the cap of 5% the award of contract shall be cancelled.

11.0 Rate and prices:

11.1 In case of item rate tender

11.1.1 The tenderers shall quote their rates for individual items both in words and figure. In case of discrepancy between the rate quoted in words and figures, the unit rate quantity in words will prevail. If no rate is quoted for a particular item the contractor shall not be paid for that item when it is executed.

The amount of each item shall be calculated and the requisite total is given. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected.

11.1.2 The tenderers need not quote their rates for which no quantities have been given. In case the tenderers quote their rates for such items those rates will be ignored and will not be considered during execution.

11.1.3 The tenderers should not change the units as specified in the tender. If any unit is changed the tenders would be evaluated as per the original unit and the contractor would be paid accordingly.

The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he should immediately bring to the knowledge of the Architect/ Bank Of Baroda.

11.1.4 Each page of the BOQ shall be signed by the authorized person and cutting or overwriting shall be duly attested by him.

11.1.5 Each page shall be totaled and the grand total shall be given.

11.1.6 The rate quoted shall be firm and shall include all costs, allowances, taxes, levies.

11.1.7 The BANK OF BARODA reserve their rights to accept any tenders, either in whole or in part or may entrust the work in phases or may drop the part scope of work at any stage of the project within its sole discretion without assigning any reason(s) for doing so and no claim / correspondence shall be entertained in this regard.

SIGNATURE OF THE CONTRACTOR

WITH SEAL

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GENERAL CONDITIONS OF CONTRACT

1.0 Definitions: -

“Contract means the documents forming the tender and the acceptance thereof and the formal agreement executed between Bank Of Baroda (client) and the contractor, together with the documents referred there in including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Architects / Bank and all these documents taken together shall be deemed to form one contract and shall be complementary to one another.

1.1 In the contract the following expressions shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

1.1.1 Bank Of Baroda. Ltd. (Service Provider) having its Mumbai East Regional Office, 1st Floor, A-Wing, Devdarshan Building, Station Road, Bhandup (W), Mumbai - 400 080. and includes the client’s representatives, successors and assigns.

1.1.2 ‘Architects/ Consultants’ shall mean M/s KALA AREKHAN, Architects & Interior Designers, Mumbai.

1.1.3 ‘Site Engineer’ shall mean an Engineer appointed by the BANK OF BARODA at site as their representative for day-to-day supervision of work and to give instructions to the contractors.

1.1.4 ‘The Contractor’ shall mean the individual or firm or company whether incorporate not, undertaking the works and shall include legal personal representative of individual or the composing the firm or company and the permitted assignees of individual or firms of company.

The expression ‘works’ or ‘work’ shall mean the permanent or temporary work description in the “Scope of work” and / or to be executed in accordance with the contract includes materials, apparatus, equipment, temporary supports, fittings and things of kinds to be provided, the obligations of the contractor hereunder and work to be done by the contractor under the contract.

1.1.5 ‘Engineer’ shall mean the representative of the Bank/Architect/consultant.

1.1.6 ‘Drawings’ shall mean the drawings prepared by the Architects and issued by the Engineer and referred to in the specifications and any modifications of such drawings as may be issued by the Engineer from time to time ‘Contract value shall mean value of the entire work as stipulated in the letter of acceptance of tender subject such additions there to or deductions there from as may be made under the provide herein after contained.

1.1.7 ‘Specifications’ shall mean the specifications referred to in the tender and modifications thereof as may time to time be furnished or approved by the Architect/ Consultant.

1.1.8 “Month” means calendar month.

1.1.9 “Week” means seven consecutive days.

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- 1 .1.10“Day” means a calendar day beginning and ending at 00 Hrs and 24 Hrs respectively.
- 1.1.11 “BANK OF BARODA’s Engineer” shall mean The Civil / Electrical Engineer in - charge of the Project, as nominated by the M.D. & CEO, Bank Of Baroda. Ltd.

CLAUSE

1.0 Total Security Deposit

Total Security deposit comprise of

Earnest Money Deposit

Initial security deposit

Retention Money

a) **Earnest Money Deposit -**

The tenderer shall furnish EMD of **Rs.6,850/- (Six Thousand Eight Hunder Fifty Only)** in the form of Demand draft or bankers cheque drawn in favour of BANK OF BARODA on any Scheduled Bank. No tender shall be considered unless the EMD is so deposited in the required form. No interest shall be paid on this EMD. The EMD of the unsuccessful tenderer shall be refunded soon after the decision to award the contract is taken without interest. The EMD shall stand absolutely forfeited if the tenderer revokes his tender at any time the period when he is required to keep his tender open acceptance by the BANK OF BARODA or after it is accepted by the BANK OF BARODA the contractor fails to enter into a formal agreement or fails to pay the initial security deposit as stipulated or fails to commence the work within the stipulated time.

b) **Initial Security Deposit (ISD)**

The amount of ISD shall be 2% of accepted value of tender including the EMD in the form of DD/FDR drawn on any scheduled Bank and shall be deposited within 15 days from the date of acceptance of tender.

ADDITIONAL SECURITY DEPOSIT / PERFORMANCE GUARANTEE

In case L-1 bidder quotes abnormally low rates (i.e. 10% or more, below estimated project cost), the bank may ask such bidder to deposit additional security deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfillment of contract as performance guarantee. Such ASD could be in the form of FDR / Bank’s guarantee in the Bank’s name as per format approved by the Bank. On successful completion of work ASD will be returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion.

No interest shall be paid to the amount retained by the Bank as Security Deposit.

c) **Retention Money: -**

Besides the SD as deposited by the contractor in the above said manner, the Retention money shall be deducted from the running account bill at the rate of 10% of the gross value of work done by the contractor and claimed in each bill provided the total security deposit i.e. ISD plus EMD plus Retention Money shall both together not exceed 5% of the contract value. The 50% of the total security deposit shall be refunded to the contractor without any interest on issue of Virtual Completion certificate by the Architect/consultant. The balance 50% of the total

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security deposit shall be refunded to the contractors without interest within fifteen days after the end of defects liability period provided the contractor has satisfactorily attended to all defects in accordance with the conditions of contract including site clearance.

2.0 Language

The language in which the contract documents shall be drawn shall be in English.

3.0 Errors, omissions and discrepancies

In case of errors, omissions and/ or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc., the following order shall apply.

- i) Between scaled and written dimension (or description) on a drawing, the latter shall be adopted.
- ii) Between the written or shown description or dimensions in the drawings and the corresponding one in the specification the former shall be taken as correct.
- iii) Between written description of the item in the specifications and descriptions in bills of quantities of the same item, the former shall be adopted:
 - a) In case of difference between rates written in figures and words, the rate in words shall prevail.
 - b) Between the duplicate / subsequent copies of the tender, the original tender shall be taken as correct.

4.0 Scope of Work:

The contractor shall carryout complete and maintain the said work in every respect strictly accordance with this contract and with the directions of and to the satisfaction Bank to be communicated through the architect/consultant. The architect/consultant at the directions of the BANK OF BARODA from time to time issue further drawings and / or write instructions, details directions and explanations which are here after collectively references to as Architect's /consultant's instructions in regard to the variation or modification of the design, quality or quantity of any work or the addition or omission or substitution work. Any discrepancy in the drawings or between BOQ and / or drawings and / or specifications. The removal from the site of any material brought thereon by the Contractor and any substitution of any other materials therefore the removal and / or re-executed of any work executed by him. The dismissal from the work of any person engaged thereupon.

5.0 i) Letter of Acceptance:

Within the validity period of the tender the BANK OF BARODA shall issue a letter of acceptance directly or through the architect by registered post or otherwise depositing at the of the contractor as given in the tender to enter into a Contract for the execution of the work as per the terms of the tender. The letter of acceptance shall constitute a bind contract between the BANK OF BARODA and the contractor.

ii) Contract Agreement:

On receipt of intimation of the acceptance of tender from the BANK OF BARODA / Architect the successful tenderer shall be bound to implement the contract and within fifteen days there of shall sign an agreement in a non-judicial stamp paper of appropriate value.

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6.0 **Ownership of drawings:**

All drawings, specifications and copies thereof furnished by the BANK OF BARODA through its Architect / consultants are the properties of the BANK OF BARODA They are not to be used on other work.

7.0 **Detailed drawings and instructions:**

The BANK OF BARODA through its architects / consultants shall furnish with reasonable proper additional instructions by means of drawings or otherwise necessary for the execution of the work. All such drawings and instructions shall be consistent with contract documents, true developments thereof and reasonably inferable there.

The work shall be executed in conformity therewith and the contractor prepare a detailed programmed schedule indicating therein the date of start and completion of various activities on receipt of the work order and submit the same to the BANK OF BARODA through the architect/consultant

7.0 **Copies of agreement**

Two copies of agreement duly signed by both the parties with the drawings shall be handed over to the contractors.

8.0 **Liquidated damages:**

If the contractor fails to maintain the required progress in terms of clause 6. 0 of GOC or to complete the work and clear the site including vacating their office on or before the contracted or extended date or completion, without justification in support of the cause of delay, he may be called upon without prejudice to any other right of remedy available under the law to the BANK OF BARODA on account of such breach to pay a liquidated damages at the rate of 0.50% of the contract value which subject to a maximum of 5% of the contract value.

9.0 **Materials, Appliances and Employees**

Unless or otherwise specified the contractor shall provide and pay for all materials, labour, water, power, tools, equipment transportation and any other facilities that are required for the satisfactory execution and completion of the work. Unless or otherwise specified all materials shall be new and both workmanship and materials shall be best quality. The contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him. Workman whose work or behavior is found to be unsatisfactory by the BANK OF BARODA/Architect/consultant he shall be removed from the site immediately.

10.0 **Permits, Laws and Regulations:**

Permits and licenses required for the execution of the work shall be obtained by the contractor at his own expenses. The contractor shall give notices and comply with the regulations, laws, and ordinances rules, applicable to the contract. If the contractor observes any discrepancy between the drawings and specifications, he shall promptly notify the BANK OF BARODA in writing under intimation of the Architect/ Consultant. If the contractor performs any act, which is against the law, rules and regulations he shall meet all the costs arising there from and shall indemnify the BANK OF BARODA any legal actions arising there from.

11.0 **Setting out Work:**

The contractor shall set out the work and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions, and alignment of all parts thereof and get it approved by the architect / consultant before proceeding with the work. If at any time any error in this respect

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shall appear during the progress of the works, irrespective of the fact that the layout had been approved by, the architect / consultant the contractor shall be responsible for the same and shall his own expenses rectify such error, if so, required to satisfaction of the BANK OF BARODA.

12.0 Protection of works and property:

The contractor shall continuously maintain adequate protection. of all his work from damage and shall protect the Bank's properties from injury or loss arising in connection with contract. He shall make good any such damage, injury, loss, except due to causes beyond his control and due to his fault or negligence.

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protections of his employees on the works and shall comply with all applicable provisions of Govt. and local bodies' safety laws and building codes to prevent accidents, or injuries to persons or property on about or adjacent to his place of work. The contractor shall take insurance covers as per clause 24.0 at his own cost. The policy may be taken in joint names of the contractor and the BANK OF BARODA and the original policy may be lodged with the BANK OF BARODA.

13.0 Inspection of work:

The BANK OF BARODA/ Architect / Consultant or their representatives shall at all reasonable times have free access to the work site and / or to the workshop, factories, or other places where materials are lying or from where they are obtained and the contractor shall give every facility to the BANK OF BARODA /Architect/consultant and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorized by the BANK OF BARODA / Architect /Consultant except the representative of Public authorities shall be allowed on the work at any time. The proposed work either during its construction stage or its completion can also be inspected by the Chief Technical Examiner's Organization a wing of Central Vigilance commission.

14.0 Assignment and subletting

The whole of work included in the contract shall be executed the contractor and he shall not directly entrust and engage or indirectly transfer, assign or underlet the contract or any part or share there of or interest therein without the written consent of the BANK OF BARODA through the Architect and no undertaking shall relieve the contractor from the responsibility of the contractor from active & superintendence of the work during its progress.

15.0 Quality of materials, workmanship & Test

All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with Architect/consultant instructions and shall be subject from time to time to such tests as the architect/consultant may direct at the place of manufacture or fabrication or on the site or an approved testing laboratory. The contractor shall provide such assistance, instruments, machinery, labor, and materials as are normally required for examining measuring sampling and testing any material or part of work before incorporation in the work for testing as may be selected and required by the architect/consultant.

ii) Samples

All samples of adequate numbers, size, shades & pattern as per specifications shall be supplied by the contractor without any extra charges. If certain items proposed to be used are of such nature that samples cannot be presented or prepared at the site detailed literature / test certificate of the same shall be provided to the satisfaction of the Bank/Architect/consultant. Before submitting the sample / literature the contractor shall satisfy himself that the material / equipment for which

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he is submitting the sample / literature meet with the requirement of tender specification. Only when the samples are approved in writing by the Bank/ architect / consultant the contractor shall proceed with the procurement and installation of the particular material / equipment. The approved samples shall be signed by the Bank/ Architect / Consultant for identification and shall be kept on record at site office until the completion of the work for inspection / comparison at any time. The Bank/Architect/Consultant shall take reasonable time to approve the sample. Any delay that might occur in approving the samples for reasons of its not meeting the specifications or other discrepancies inadequacy in furnishing samples of best qualities from various manufacturers and such other aspects causing delay on the approval of the materials / equipment etc. shall be to the account of the contractor.

iii) **Cost of tests**

The cost of making any test shall be borne by the contractor if such test is intended by or provided for in the specification or BOQ.

iv) **Costs of tests not provided for**

If any test is ordered by the Bank/ Architect/ Consultant which is either

- a) If so intended by or provided for or (in the cases above mentioned) is not so particularized, or though so intended or provided for but ordered by the Bank/Architect/Consultant to be carried out by an independent person at any place other than the site or the place of manufacture or fabrication of the materials tested or any Government / approved laboratory, then the cost of such test shall be borne by the contractor.

16.0 **Obtaining information related to execution of work**

No claim by the contractor for additional payment shall be entertained which is consequent upon failure on his part to obtain correct information as to any matter affecting the execution of the work nor any misunderstanding or the obtaining incorrect information or the failure to obtain correct information relieve him from any risks or from the entire responsibility for the fulfillment of contract.

17.0 **Contractor's superintendence**

The contractor shall give necessary personal superintendence during the execution the works and as long, thereafter, as the Architect / Consultant may consider necessary until the expiry of the defects liability period, stated here to.

18.0 **Quantities**

- i) The bill of quantities (BOQ) unless or otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurements and quantities. The rate quoted shall remain valid for variation of quantity against individual item to any extent. The entire amount paid under Clause 19, 20 hereof as well as amounts of prime cost and provision sums, if any, shall be excluded.

19.0 **Works to be measured**

The Architect/Consultant may from time to time intimate to the contractor that he require the work to be measured and the contractor shall forthwith attend or send a quantity representative to assist the Architect in taking such measurements and calculation and to furnish all particulars or to give all assistance required by any of them. Such measurements shall be taken in accordance with the Mode of measurements detail in the specifications. The representative of the Architect / Consultant shall take measurements with the contractor's representative and the measurements shall be entered in the measurement book. The contractor or his authorised representative shall sign all the pages of the measurement book in which the measurements have been recorded in token of his acceptance. All the corrections shall be duly attested by both representatives. No over writings shall be

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made in the M book should the contractor not attend or neglect or omit to depute his representative to take measurements the measurements recorded by the representative of the Architect / consultant shall be final. All authorized extra work, omissions and all variations made shall be included such measurement.

20.0 Variations

No alteration, omission or variation ordered in writing by the Architect / consultant vitiates the contract. In case the BANK OF BARODA/ Architect / Consultant thinks proper at any during the progress of works to make any alteration in, or additions to or omission from the works or any. alteration in the kind or quality of the materials to be used therein, the Architect / Consultant shall give notice thereof in writing to the contractor shall confirm in writing within seven days of giving such oral instructions the contract shall alter to, add to, or omit from as the case may be in accordance with such but the contractor shall not do any work extra to or make any alterations or additions to or omissions from the works or any deviation from any of the provisions of the contract, stipulations, specifications or contract drawings without previous consent in writing of the Architect/ Consultant and the value of such extras, alterations, additions or omissions shall in all cases be determined by the Architect / Consultant and the same shall be added to or deducted from the contract value, as the case may be.

21.0 Valuation of Variations

No claim for an extra shall be allowed unless it shall have been executed under the authority of the Architect / Consultant with the concurrence of the BANK OF BARODA as herein mentioned. Any such extra is herein referred to as authorized extra and shall be made in accordance with the following provisions.

- a)
 - (i) The net rates or prices in the contract shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced herein.
 - (ii) Rates for all items, wherever possible should be derived out of the rates given in the priced BOQ.
- b) The net prices of the original tender shall determine the value of the items omitted, provided if omissions do not vary the conditions under which any remaining items of Works are carried out, otherwise the prices for the same shall be valued under sub-Clause 'c' hereunder.
- c) Where the extra works are not of similar character and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items or works are carried out, then the contractor shall within 7 days of the receipt of the letter of acceptance inform the Architect/ consultant of the rate which he intends to charge for such items of work, duly supported by analysis of the rate or rates claimed and the Architect/ consultant shall fix such rate or prices as in the circumstances in his opinion are reasonable and proper, based on the market rate.
- d) Where extra work cannot be properly measured or valued the contractor shall be allowed day work prices at the net rates stated in the tender, of the BOQ or, if not, so stated then in accordance with the local day work rates and wages for the district; provided that in either case, vouchers specifying the daily time (and if required by the Architect/Consultant) the workman's name and materials employed be delivered for verifications to the Architect /consultant at or before the end of the week following that in which the work has been executed.

- e) It is further clarified that for all such authorized extra items where rates cannot be derived from the tender, the Contractor shall submit rates duly supported by rate analysis worked on the 'market rate basis for material, labour hire / running charges of equipment and wastages etc. plus 15% towards establishment charges, contractor's overheads and profit. Such items shall, not be eligible for escalation.

22.0 Final measurement

The measurement and valuation in respect of the contract shall be completed within two months of the virtual completion of the work.

23.0 Post Completion requirements & Virtual Completion Certificate (VCC)

On successful completion of entire works covered by the contract to the full satisfaction of the BANK OF BARODA, the contractor shall ensure that the following works have been completed the satisfaction of the BANK OF BARODA:

- a) Clear the site of all scaffolding, wiring, pipes, surplus materials, contractor's labour equipment and machinery.
- b) Demolish, dismantle and remove the contractor's site office, temporary works, structure including labour sheds/camps and constructions and other items and things whatsoever brought upon or erected at the site or any land allotted to the contractor by the BANK OF BARODA not incorporated in the permanent works.
- c) Remove all rubbish, debris etc. from the site and the land allotted to the contractor the BANK OF BARODA and shall clear, level and dress, compact the site as required by the BANK OF BARODA
- d) Shall put the BANK OF BARODA in undisputed custody and possession of the site and all land allot by the BANK OF BARODA
- e) Shall hand over the work in a peaceful manner to the BANK OF BARODA
- f) All defects / imperfections have been attended and rectified as pointed out by the Architects to the full satisfaction of BANK OF BARODA

Upon the satisfactory fulfillment by the contractor as stated above, the contractor is entitled to apply to the Architect / consultant is satisfied of the completion of work. Relative to which the completion certificate has been sought, the Architect/ consultant shall within fourteen (14) days of the receipt of the application for completion certificate, issue a VCC in respect of the work for which the VCC has applied.

This issuance of a VCC shall not be without prejudice to the BANK OF BARODA's rights and contractor liabilities under the contract including the contractor's liability for defects liability nor shall the issuance of VCC in respect of the works or work at any site be construction as a waiver of any right or claim of the BANK OF BARODA against the contractor in respect of or work at the site and in respect of which the VCC has been issued.

24.0 Work by other agencies

The BANK OF BARODA/ Architect / consultant reserves the rights to use premises and any portion the site for execution of any work not included in the scope of this contract with may desire to have carried out by other persons simultaneously and the contractor shall not only allow but also extend reasonable facilities for the execution of such work. The contractor however shall not be required to provide any plant or material for the execution of such work except by special arrangement

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with the SBI. Such work shall be carried out in such manner as not to impede the progress of the works included in the contract.

25.0 Insurance of works

25.1 Without limiting his obligations and responsibilities under the contract the contractor shall insure in the joint names of the BANK OF BARODA and the contractor against all loss of damages from whatever cause arising other than the excepted risks, for which he is responsible under the terms of contract and in such a manner that the BANK OF BARODA and contractor are covered for the period stipulated I clause of GCC and are also covered during the period of maintenance for loss or damage arising from a cause, occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the contractor in the course of any operations carried out by him for the purpose of complying with his obligations under clause.

- a) The Works for the time being executed to the estimated current Contract value thereof, or such additional sum as may be specified together with the materials for incorporation in the works at their replacement value.
- b) The constructional plant and other things brought on to the site by the contractor to the replacement value of such constructional plant and other things.
- c) Such insurance shall be effected with an insurer and in terms approved by the BANK OF BARODA which approval shall not be unreasonably withheld and the contractor shall whenever required produce to the Architect / consultant the policy if insurance and the receipts for payment of the current premiums.

25.2 Indemnification against Damage to persons and property

The contractor shall, except if and so far as the contract provides otherwise indemnify the SBI against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the works and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation of damages for or with respect to:

- a) The permanent use or occupation of land by or any part thereof.
- b) The right of BANK OF BARODA to execute the works or any part thereof on, over, under, in or through any lands.
- c) Injuries or damages to persons or properties which are unavoidable result of the execution or maintenance of the works in accordance with the contract
- d) Injuries or damage to persons or property resulting from any act or neglect of the BANK OF BARODA their agents, employees or other contractors not being employed by the contractor or for or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the BANK OF BARODA, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

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25.3 Contractor to indemnify BANK OF BARODA

The contractor shall indemnify the BANK OF BARODA against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the provision sub-clause 25.2 of this clause.

25.4 Contractor's superintendence

The contractor shall fully indemnify and keep indemnified the BANK OF BARODA against any action, claim, or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claim made under or action brought against BANK OF BARODA

Pvt. Ltd. in respect of such matters as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expenses to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the BANK OF BARODA if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Architect / consultant in this behalf.

25.5 Third Party Insurance

25.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 24.0 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of BANK OF BARODA, or to any person, including any employee of the BANK OF BARODA, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the matters referred to in the provision to clause 24.0 thereof.

25.5.2 Minimum amount of Third Party Insurance

Such insurance shall be affected with an insurer and in terms approved by the BANK OF BARODA which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the Architect / consultant the policy or policies of insurance cover and receipts for payment of the current premiums.

25.6 The minimum insurance cover for physical property, injury, and death is Rs.5 Lakh per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessary to make insurance valid for four occurrences always.

25.7 Accident or Injury to workman:

25.7.1 The BANK OF BARODA shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workmen or other person in the employment of the contractor or any sub-contractor, save and except an accident or injury resulting from any act or default of the BANK OF BARODA or their agents, or employees. The contractor shall indemnify and keep indemnified BANK OF BARODA against all such damages and compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

25.7.2 Insurance against accidents etc. to workmen

The contractor shall insure against such liability with an insurer approved by the BANK OF BARODA during the whole of the time that any persons are employed by him on the works and shall, when required, produce to the architect / consultant such policy of insurance and receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-contractor the contractor's obligation to insured as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that BANK OF BARODA is indemnified under the policy but the contractor shall require such sub-contractor to produce to the Architect /consultant when such policy of insurance and the receipt for the payment of the current premium.

25.7.3 Remedy on contractor's failure to insure

If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case the BANK OF BARODA may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the BANK OF BARODA as aforesaid from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

25.7.4 Without prejudice to the others rights of the BANK OF BARODA against contractors. In respect of such default, the employer shall be entitled to deduct from any sums payable to the contractor the amount of any damages costs, charges, and other expenses paid by the BANK OF BARODA and which are payable by the contractors under this clause. The contractor shall upon settlement by the Insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with due diligence to rebuild or repair the works destroyed or damaged. In this event all the monies received from the Insurer in respect of such damage shall be paid to the contractor and the Contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged.

26.0 Commencement of Works:

The date of commencement of the work will be reckoned as the date, fifteen days from the date of award of letter by the BANK OF BARODA

27.0 Time for completion

Time is essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period of **2 calendar months** from the date of commencement. If required in the contract or as directed by the Architect / consultant. The contractor shall complete certain portions of work before completion of the entire work. However, the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

28.0 Extension of time

If, in the opinion of the Architect/consultant, the work be delayed for reasons beyond the control of the contractor, the Architect/consultant may submit a recommendation to the BANK OF BARODA to grant a fair and reasonable

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extension of time for completion of work as per the terms of contract. If the contractor needs an extension of time for the completion of work or if the completion of work is likely to be delayed for any reasons beyond the due date of completion as stipulated in the contract, the contractor shall apply to the BANK OF BARODA through the Architect' Consultant in writing at least 30 Days before the expiry of the scheduled time and while applying for extension of time he shall furnish the reason in detail and his justification if an', for the delays. The architect/consultant shall submit their recommendations to the BANK OF BARODA in the prescribed format for granting extension of time. While granting extension of time the contractor shall be informed the period extended time which will qualify for levy of liquidated damages. For the balance period in excess of original stipulated period and duly sanctioned extension of time by the provision of liquidated damages as stated under clause 10.0 shall become applicable. Further the contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

29.0 Rate of progress

Whole of the materials, plant and labour to be provided by the contractor and the mode, manner and speed of execution and maintenance of the works are to be of a kind and conducted in a manner to the satisfaction of the Architect / consultant should the rate of progress of the work or any part thereof be at any time be in the opinion the. Architect / consultant too Slow to ensure the completion of the whole of the work the prescribed time or extended time for completion the Architect / consultant shall thereupon take such steps as considered necessary by the Architect / consultant to expedite progress so as to complete the works by the prescribed time or extended time. Such communications from the Architect / consultant neither shall relieve. The contractor from fulfilling obligations under the contract nor he will be entitled to raise any claims arising out of such directions.

30.0 Work during nights and holidays

Subject to any provision to the contrary contained in the contract no permanent work shall save as herein provided be carried on during the night or on holidays without the permission in writing of the Architect / consultant, save when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the work in which case the contractor shall immediately advise the Architect / consultant. However the provisions of the clause shall not be applicable in the case of any work which becomes essential to carry by rotary or double shifts in order to achieve the progress and quality of the part of the works being technically required / continued with the prior approval of the Architect / consultant at no extra cost to the BANK OF BARODA.

All work at night after obtaining approval from competent authorities shall be carried out without unreasonable noise and disturbance.

31.0 No compensation or restrictions of work

If at any time after acceptance of the tender BANK OF BARODA shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not required the whole or any part of the work to be carried out. The Architect / consultant shall give notice in writing o that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise what so ever on account of any profit or advantage which he might have derived from the execution of the Work fully but which he did not derive in consequence of the foreclosure of the whole or part of the work.

Provided that the contractor shall be paid the charges on the cartage only of materials actually and bonafide brought to the site of the work by the contractor and rendered surplus as a result of the abandonment, curtailment of the work or any portion thereof and then taken back by the contractor, provided however that the Architect / Consultant shall have in such cases the option of taking over all or any such materials at their purchase price or a local current rate whichever is less.

“In case of such stores having been issued from BANK OF BARODA stores and returned by the contractor to stores, credit shall be given to him at the rates not exceeding those at which were originally issued to the contractor after taking into consideration and deduction for claims on account of any deterioration or damage while in the custody of the contractor and in this respect the decision of Architect / consultant shall be final.

32.0 Suspension of work

- i) The contractor shall, on receipt of the order in writing of the Architect / consultant (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as Architect /consultant may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons:
 - a) On account any default on the part of the contractor, or
 - b) For proper execution of the works or part thereof for reasons other than the default the contractor, or
 - c) For safety of the works or part thereof.
The contractor shall, during such suspension, properly protect and secure the works the extent necessary and carry out the instructions given in that behalf by the Architect / consultant.
- i) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:
The contractor shall be entitled to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account.

33 Action when the whole security deposit is forfeited

In any case in which under any clause or clauses of this contract, the Contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit the Architect / consultant shall have the power to adopt any of the following course as they may deem best suited to the interest of the BANK OF BARODA:

- a) To rescind the contract (of which rescission notice in writing to the contractor by - Architect / consultant shall be conclusive evidence) and in which case the security, deposit of the contractor shall be forfeited and be absolutely at the disposal of BANK OF BARODA.
- b) To employ labour paid by the BANK OF BARODA and to supply materials to carry out the work, or part of the work, debiting the contractor with the cost of the labour and materials cost of such labour and materials as worked out by the Architect/consultant shall final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract certificate of architect /consultant as to the value of work done shall be final conclusive against the contractor.
- c) To measure up the work of the contractor, and to take such part thereof as shall unexecuted, out of his hands, and to give it to another contractor to complete in

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which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (The amount of which excess the certificates in writing of the Architects / consultant shall final and conclusive) shall be borne by original contractor and may be deducted f any money due to him by BANK OF BARODA under the contract or otherwise, or from his security deposit or the proceeds of sale thereof, or sufficient part thereof.

In the event of any of above courses being adopted by the BANK OF BARODA the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any material or entered into any engagements or make any advances on account of, or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescind under the provision aforesaid, the contractor shall not be entitled to recover or to be paid any sum or any work thereto for actually performed under this contract, unless, and until the Architect / consultant will have certified in writing the performance of such work and the value payable in respect thereof, and he shall only be entitled to be paid the value so certified.

34.0 **Owner's right to terminate the contract**

If the contractor being an individual or a firm commit any 'Act of insolvency' or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Govt. and of the Official Assignee of the liquidator in such acts of insolvency or winding up shall be

unable within seven days after notice to him to do so, to show to the reasonable satisfaction of the Architect / Consultant that he is able to carry out and fulfill the contract, and to dye security therefore if so required by the Architect / Consultant.

Or if the contractor (whether an individual firm or incorporated Company) shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or sublet this contract without the consent in writing of the BANK OF BARODA through the Architect/Consultant or shall charge or encumber this contract or any payment due to which may become due to the contractor there under:

- a) has abandoned the contract; or
- b) has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving from the BANK OF BARODA through the Architect / consultant written notice to proceed, or
- c) has failed to proceed with the works with such diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or
has failed to remove the materials from the site or to pull down and replace work within seven days after written notice from the BANK OF BARODA through the Architect / Consultant that the said materials were condemned and rejected by the Architect/consultant under these conditions; or has neglected or failed persistently to observe and perform all or any of the acts matters or things by this contract to be

observed and performed by the contactor for seven days after written notice shall have been given to the contractor to observe or perform the same or has to the detriment of good workmanship or in defiance of the BANK OF BARODA or Architect's / consultant's instructions to the contrary subject any part of the contract. Then and in any of said cases the BANK OF BARODA and or the

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Architect / consultant, may not withstanding any previous waiver, after giving seven days' notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the BANK OF BARODA or the Architect / consultant or the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the BANK OF BARODA through the Architect / consultant their agents or employees may enter upon and take possession of the work and all plants, took scaffoldings, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads use the same by means of their own employees or workmen in carrying on and completing the work or by engaging any other contractors or persons to the work and the contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for complement and finishing or using the materials and plant for the works.

When the works shall be completed or as soon thereafter as convenient the BANK OF BARODA or architect / consultant shall give a notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within 14 days after receive thereof by him the BANK OF BARODA sell the same by publication, and after due publication, and shall, adjust the amount realized by such auction. The contractor shall have no right to question any of the act of the BANK OF BARODA incidental to the sale of the materials etc.

35.0 Certificate of payment

The contractor shall be entitled under the certificates to be issued by the Architect / consultant to the contractor within 10 working days from the date of certificate to payment from BANK OF BARODA from time to time. The BANK OF BARODA shall recover the statutory recovering other dues including the retention amount from the certificate of payment.

Provided always that the issue of any certificate by the Architect / consultant during progress of works or completion shall not have effect as certificate of satisfaction relieve the contractor from his liability under clause.

The Architect / consultant shall have power to withhold the certificate if the work or in part thereof is not carried out to their satisfaction.

The Architect / consultant may by any certificate make any corrections required previous certificate.

The BANK OF BARODA shall modify the certificate of payment as issued by the architect / consultant from time to time while making the payment

The contractor shall submit interim bills only after taking actual measurements and properly recorded in the M books

The Contractor shall not submit interim bills when the approximate value of work done by him is less than Rs. 3.0 Lakh.

The final bill may be submitted by contractor within a period of Two Months from the date of virtual completion and Architect / consultant shall issue the certificate of payment within a period of two months. The BANK OF BARODA shall pay the amount within a period of three months from the date of issue of certificate provided there is no dispute in respect of rates and quantities.

The contractor shall submit the interim bills in the prescribed format with all details.

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36.0 A. Settlement of Disputes and Arbitration

Except where otherwise provided in the contract all questions and disputes to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question , claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings specifications, estimates, instructions orders or these conditions or otherwise concerning the work or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

- i) If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Architect or in case the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the contractor shall forthwith give notice in writing of his claim, or dispute to The Dy. General Manager, BANK OF BARODA, Mumbai Metro East Regional Office, 1st Floor , A- Wing, Devdarshan Building, Station Road ,Bhandup (West), Mumbai.-400 078. And endorse a copy of the same to the Architect, within 30 days

from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the contractor shall not be entitled to raise any claim nor shall the BANK OF BARODA be in any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to the Dy. General Manager, BANK OF BARODA, Mumbai Metro East Regional Office, 1st Floor , A- Wing, Devdarshan Building, Station Road ,Bhandup (West),Mumbai – 400 080. in the manner and within the time as aforesaid. The Contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to the Dy. General Manager, BANK OF BARODA, Mumbai Metro North Regional Office, 1st Floor , A- Wing, Devdarshan Building, Station Road ,Bhandup (West), Mumbai – 400 080in writing in the manner and within the time aforesaid.

B. Settlement of Disputes and Arbitration

The Dy. General Manager BANK OF BARODA, Mumbai Metro North Regional Office shall give his decision in writing on the claims notified by the receipt of the contractor may within 30 days of the receipt of the decision of the Dy. General Manager, BANK OF BARODA, Mumbai North / Submit his claims to the conciliating authority namely the Dy. General Manager, BANK OF BARODA, Mumbai Metro East Regional Office, Mumbai – 400 080 For conciliation along with all details and copies of correspondence exchanged between him and the BANK OF BARODA

- iii) If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned Dy. General Manager, BANK OF BARODA, Mumbai Metro East Regional Office for appointment of an arbitrator to adjudicate the notified claims falling which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.
- iv) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the BANK OF BARODA shall be referred

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for adjudication through arbitration by the Sole Arbitrator appointed by the Dy. General Manager, BANK OF BARODA, Mumbai Metro East Regional Office. It will also be no objection to any such appointment that the Arbitrator so appointed is a BANK OF BARODA, Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as BANK OF BARODA, Officer. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said Dy. General Manager, BANK OF BARODA, Mumbai Metro East Regional Office Such person shall be entitled to proceed with the reference from the stage at which it was let by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.

It is also a term of this contract that no person other than a person appointed by such Chief General Manager as aforesaid should act as arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any or any accordance modification or reenactment thereof and the rules made there under.

It is also a term of the contract that if any fees are payable to the Arbitrator these shall be paid equally by both the parties. However, no fees will be payable to the arbitrator if he is a BANK OF BARODA Officer.

It is also a term of the contract that the Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any of the arbitrators shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The Cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof, shall be paid and fix or settle the amount of costs to be so paid.

37.0 **Water supply**

The contractor shall make his own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following condition.

- i) That the water used by the contractor shall be fit for construction purposes to the satisfaction of the Architect / consultant's.
- ii) The contractor shall make alternative arrangements for the supply of water if the arrangement made by the contractor for procurement of water in the opinion of the Architect / consultant is unsatisfactory.
- iii) In case contractor is permitted to use BANK OF BARODA's source of water i.e. Municipal connection, Bore well (existing or new) etc., the BANK OF BARODA may consider recovering @1% of contract amount from the final bill of contractor.

- 37.1 The contractor shall construct temporary well / tube well in BANK OF BARODA land for taking water for construction purposes only after obtaining permission in writing from the BANK OF BARODA The contractor has to make his own arrangements for drawing and distributing the water at his own cost. He has to

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make necessary arrangements. To avoid any accidents or damages caused due to construction and subsequent maintenance of the wells. He has to obtain necessary approvals from local authorities, if required, at his own cost. He shall restore the ground to its original condition after wells are dismantled on completion of work or hand over the well to the BANK OF BARODA without any compensation as directed by the architect / consultant.

8.0 Power supply

The contractor shall make his own arrangements for power and supply / distribution system for driving plant or machinery for the work and for lighting purpose at his own cost, The cost of running and maintenance of the plants are to be included in his tender prices, He shall pay all fees and charges required, by the power supply and include the same in his tendered rates and hold the owner free from all such costs. He has to obtain necessary approval from the appropriate authorities, if required.

39.0 Treasure trove etc.

Any treasure trove, coin or object antique which may be found on the site shall be the property of BANK OF BARODA and shall be handed over to the bank immediately.

40.0 Method of measurement

Unless otherwise mentioned in the schedule of quantities or in mode of measurement, the measurement will be on the net quantities or work produced in accordance with up to date rules laid down by the Bureau of Indian Standards. In the event any dispute / disagreement the decision of the Architect / consultant shall be final and binding on the corrector.

41.0 Maintenance of registers

The contractor shall maintain the following registers as per the enclosed perform at site of work and should produce the same for inspection of BANK OF BARODA Pvt. Ltd /Architect / consultant whenever desired by them. The contractor shall also maintain the records / registers as required by the local authorities / Govt. from time to time.

- i) Register for secured advance
- ii) Register for hindrance to work
- iii) Register for running account bill
- iv) Register for labour

42.0 Force Majeure

42.1 Neither contractor nor BANK OF BARODA shall be considered in default in performance of the obligations if such performance is prevented or delayed by events such as but not war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of or for any other cause beyond the reasonable control of the party affected or prevents or delayed. However a notice is required to be given within 30 days from the happening of the event with complete details, to the other party to the contract, if it is not possible to serve a notice, within the shortest possible period without delay.

42.2 As soon as the cause of force majeure has been removed the party whose ability perform its obligations has been affected, shall notify the other of such cessation and the actual delay incurred in such affected activity adducing necessary evidence in support thereof.

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42.3 From the date of occurrence of a case of force majeure obligations of the party affected shall be suspended during the continuance of any inability so caused. With the caused itself and inability resulting there from having been removed, the agreed time completion of the respective obligations under this agreement shall stand extended a period equal to the period of delay occasioned by such events.

42.4 Should one or both parties be prevented from fulfilling the contractual obligations by state of force majeure lasting to a period of 6 months or more the two parties, shall each other to decide regarding the future execution of this agreement.

43.0 **Local laws, Acts Regulations:**

The contractor shall strictly adhere to all prevailing labour laws inclusive at contract labour (regulation and abolition act of 1970) and other safety regulations. The contractors should comply with the provision of all labour legislation including the latest requirements of the Acts, laws, any other regulations that are applicable to the execution of the project.

- i) Minimum wages Act 1948 (Amended)
- ii) Payment of wages Act 1936 (Amended)
- iii) Workmen's compensation Act 1923 (Amended)
- iv) Contract labour regulation and abolition act 1970 and central rules 1971 (Amended)
- v) Apprentice act 1961 (amended)
- vi) Industrial employment (standing order) Act 1946 (Amended)

- vii) Personal injuries (Compensation insurance) act 1 963 and any other modifications
- viii) Employees' provident fund and miscellaneous provisions Act 1952 and amendment thereof
- ix) Shop and establishment act
- x) Any other act or enactment relating thereto and rules framed there under from time to time.
- xi) Prevailing Indian Electricity rules & act.

44.0 **Accidents**

The contractor shall immediately on occurrence of any accident at or about the site or in connection with the execution of the work report such accident to the architect / consultant. The contractor shall also such report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

SPECIAL CONDITION OF CONTRACT

Scope of work

1.0 The scope of work is to carry out for the Proposed Electrical Works of shifting of Veena Nagar Mulund (West) branch to new premises at shop no.s 1&2, Neptune Lotus, LBS Road, Veena Nagar, Mulund (West), Mumbai 400 080.

2.0 Address of site

The site is located at at shop no.s 1&2, Neptune Lotus, LBS Road, Veena Nagar, Mulund (West), Mumbai 400 080.

3.0 Dimensions and levels

All dimensions and levels shown on the drawings shall be verified by the contractor and the site and he will be held responsible for the accuracy and maintenance of. All the dimensions and the levels. Figured dimensions are in all cases to be accepted and dimension shall be scaled. Large scale details shall take precedence over small scale drawings. In case of discrepancy the contractor shall ask for clarification from the Architect / consultant before proceeding with the work.

04 Notice of operation

The contractor shall not carry out any important operation without the Consent in with from the Architect / consultant:

5.0 Construction records

The contractor shall keep and provide to the Architect / consultant full and accurate records of the dimensions and positions of all new work and any other information necessary to prepare complete drawings recording details of the work as construction.

6.0 Safety of adjacent structures and trees

The contractor shall provide and erect to the approval of the Architect / consultant supports as may be required to protect effectively all structures and protective give to trees, which may be endangered by the execution of the works or otherwise such permanent measures as may be required by the Architect to protect the tree structures.

7.0 Temporary works.

Before any temporary works are commenced the contractor shall submit at least in advance to the architect / consultant for approval complete drawings of all temporary works he may require for the execution of the works. The contractor shall carry out the modifications relating to strength, if required by the architect / consultant may require in accordance with the conditions of contract at his own cost The contractor shall be solely responsible for the stability and safety of all temporary works and unfinished works and for the quality of the permanent works resulting from the arrangement eventually adopted for their execution.

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8.0 Water power and other facilities

- a) The rate quoted by the contractor shall include all expenses that are required for providing all the water required for the work and the contractor shall make his own arrangements for the supply of good quality water suitable for the construction and good quality drinking water for their workers. If necessary the contractor has to sink a tube well / open well and bring water by means of tankers at his own cost for the purpose. The BANK OF BARODA will not be liable to pay any charges in connection with the above.
- b) The rate quoted in the tender shall include the expenses for obtaining and maintaining power connections and shall pay for the consumption charges.
- c) The contractors for other trades directly appointed by the BANK OF BARODA shall be entitled to take power and water connections from the temporary water and power supply obtained by the contractor. However, the concerned contractor shall make their own arrangements to draw the supply and pay directly the actual consumption charges at mutually agreed rates between them. All municipal charges for drainage and water connection for Construction purposes shall be borne by the contractor and charges payable for permanent connections, if any, shall be initially paid by the contractor and the BANK OF BARODA will reimburse the amount on production of receipts.
- d) The BANK OF BARODA as well as the Architect / consultant shall give all possible assistance to the Contractor's to obtain the requisite Permission from the various authorities, but the responsibility for obtaining the same in time shall be of the contractor.

9.0 Facilities for contractor's employees

The contractor shall make his own arrangement for the housing and welfare of his staff and workmen including adequate drinking water facilities. The contractor shall also make the arrangements at his own cost for transport where necessary for his staff and workmen to and from site of work at his own cost.

10.0 Lighting of works

The contractor shall at all times provide adequate and approved lighting as required for the proper execution and supervision and inspection of work.

11.0 Firefighting arrangements

- i) The contractor shall provide suitable arrangement for firefighting at his own cost. This purpose he shall provide requisite number of fire extinguishers and adequate number of buckets, some of which are to be always kept filled with sand and some with water. These equipment shall be provided at suitable prominent and easily accessible place and shall be properly maintained.
- ii) Any deficiency in the fire safety or unsafe conditions shall be corrected by the contractor at his own cost and, to the approval of the relevant authorities. The contractor make the following arrangements at his own cost but not limited the following:

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- a) Proper handling, storage and disposal of combustible materials and waste.
- b) Work operations which can create fire hazards.
- c) Access for fire-fighting equipments.
- d) Type, number and location of containers for the removal of surplus materials and rubbish.
- e) Type, size, number and location of fire extinguishers or other fire fighting equipment.
- f) General house keeping

12.0 Site order book

A site order book shall be maintained at site for the purpose of quick communication between the Architect / Consultant. Any communication relating to the work may be conveyed through records in the site order book. Such a communication from one party to the other shall be deemed to have been adequately served in terms of contract. Each site order book shall have machine numbered pages in triplicate and shall be carefully maintained and preserved by the contractor and shall be made available to the architect / consultant as and when demanded. Any instruction which the architect / consultant may like to issue to the contractor or the contractor may like to bring to the architect / consultant two copies of such instructions shall be taken from the site order book and one copy will be handed over to the party against proper acknowledgment and the second copy will be retained for their record.

13.0 Temporary fencing/ barricading

The contractor shall provide and maintain a suitable temporary fencing / barricading and gates at his cost to adequately enclose all boundaries of the site for the protection of the public and for the proper execution and security of the work and in accordance with the requirement of the architect / consultant and regulations of local authorities. These shall be altered, relocated and adopted from time to time as necessary and removed on completion of the work.

14.0 Site meetings

Site meetings will be held to review the progress and quality evaluation. The contractor shall depute a senior representative along with the site representative and other staff of approved sub-contractors and suppliers as required to the site meetings and ensure all follow up actions. Any additional review meetings shall be held if required by the architect/ consultant. -

15.0 Disposal of refuse

The contractor shall cart away all debris, refuse etc. arising from the work from the site and deposit the same as directed by the architect / consultant at his own cost. It is the responsibility of the contractor to obtain from the local authorities concerned to the effect that all rubbish arising out of contractor's activities at the construction site or any other off-site activities borrow pits has been properly disposed off.

6.0 Contractor to verify site measurement

The contractor shall check and verify all site measurements whenever requested other specialists contractors or other sub-contractors to enable them to prepare the own shop drawing and pass on the information with sufficient promptness as will in any way delay the works.

17.0 Displaying the name of the work

The contractor shall put up a name board of suitable size as directed by the architect/ consultant indicating therein the name of the project and other details as

given by the architect/consultant at his own cost and remove the same on completion of work.

18.0 As built drawings

- i) For the drawings issued to the contractor by the Architect / Consultant. The architect Consultant will issue two sets of drawings to the Contractor for the items for some changes have been made. From the approved drawings as instructed by the BANK OF BARODA/ Architect / Consultant. The contractor will make the changes made on these copies and return these copies to the architect / Consultant for their approval. In cases revision is required or the corrections are not properly marked the architect / Consultant will point out the discrepancies to the contractor. The contractor will have to incorporated these corrections and / or attend to discrepancies either on copies as directed by the architect / consultant and resubmit to him for approval. The architect / consultant will return one copy duly approved by him.

- ii) For the drawings prepared by the contractor

The contractor will modify the drawing prepared by him wherever the changes made by the BANK OF BARODA / architect / consultant. And submit two copies of such modified drawings to the architect/ consultant for approval. The architect / consultant will return one copy of the approved drawing to the contractor.

19.0 Approved make

The contractor shall provide all materials from the list of approved makes at his own cost and also appoint the specialized agency for the waterproofing anti-termite, aluminum doors and windows and any other item as specified in the tender. The architect/consultant may approve any make / agency within the approved list as given in the tender after inspection of the sample/mock up.

20.0 Procurement of materials

The contractor shall make his own arrangements to procure all the required materials for the work .All wastages and losses in weight shall be to the contractors account

21.0 Excise duty, taxes, levies etc.;

The contractor shall pay and be responsible for payment of all taxes, duties, levies, royalties, fees, cess or charges in respect of the works including but not limited to sales tax, tax on works contract excise duty, and octroi, payable in respect of materials, equipment plant and other things required for the contact. All of the aforesaid taxes, duties, levies, fees and charges shall be to the contractor's account and the BANK OF BARODA shall not be required to pay any additional or extra amount on this account. Variation of taxes, duties, fees, levies etc. if any, till completion of work shall be deemed to be included in the quoted rates and no extra amount on this account. Variation of taxes, duties, fees, levies etc. if any, till completion of work shall be deemed to be included in the quoted rates and no extra claim on this account will in any case be entertained. If a new tax or duty or levy or cess or royalty or octroi is imposed under as statutory law during the currency of contract the same shall be borne by the contractor.

22.0 Acceptance of tender

The BANK OF BARODA shall have the right to reject any or all tenders without assigning any reason. They are not to bind to accept the lowest or any tender and the tenderer or tenderers shall have no right to question the acts of the BANK OF

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BARODA However adequate transparency would be maintained by the BANK OF BARODA

23.0Photographs:

- The Contractor shall at his own expense supply to the Architects with duplicate hard copies of large photographs not less than 25 cm. x 20 cm. (10" x 8") of the works, taken from two approved portions of each building, at intervals of not more than Two Months during the progress of the work or at every important stage of construction.
- In addition to above, the contractor shall be bound to submit adequate no. of site photographs along with their each Running Bill for the project clearing showing major progress of work measured and claimed therein failing which the Architect/ BANK OF BARODA may consider returning the Bill to the contractor and no claim for delay on this account will be entertained.

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SAFETY CODE

1. First aid appliances including adequate supply of sterilized dressing and cotton wool shall be kept in a readily accessible place.
2. An injured person shall be taken to a public hospital without loss of time, in cases when the injury necessitates hospitalization.
3. Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from the ground.
4. No portable single ladder shall be over 8 meters in length. The width between the side rails shall not be less than 30 cm. (clear) and the distance between two adjacent runnings shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding ladder.
5. The excavated material shall not be placed within 1.5 meters of the edge of the trench half of the depth of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.
6. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.
7. No floor, roof or other part of the structure shall be so overloaded with debris or material as to render it unsafe.
8. Workers employed on mixing and handling material such as asphalt, cement, mortar, concrete and lime shall be provided with protective footwear and rubber hand gloves.
9. Those engaged in welding works shall be provided with welders' protective eye shield and gloves.
10. (i) No paint containing lead or lead products shall be used except in the form of paste readymade paint.
(ii) Suitable facemasks should be supplied for use by the workers when the paint applied in the form of spray or surface having lead paint dry rubbed and scrapped.
11. Overalls shall be supplied by the contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during cessation of work.
12. Hoisting machines and tackle used in the works including their attachments anchor and supports shall be in perfect condition.
13. The ropes used in hoisting or lowering material or as a means of suspension shall be durable quality and adequate strength and free from defects.

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APPENDIX HEREINBEFORE REFERRED TO

- 1) Name of the organization Offering Contract: Bank Of Baroda, Mumbai Metro East Regional Office, 1st Floor, A- Wing, Devdarshan Building, Station Road, Bhandup (West), Mumbai-400 078.
- 2) Consultants : M/s. KALA AREKHAN
Architect & Interior Designer
101, Vindhychal Co-op Housing Soc.
Plot No. 204, Sector IV, Charkop,
Kandivali (W), Mumbai – 400 067.
Tel No : 2868 2567.
Kala_arekhan@yahoo.com
- 3) Site Address : Shop No.1&2, Neptune Lotus , LBS Road, Veena nager, Mulund (West), Mumbai-400 080.
- 4) Scope of Work : Proposed Electrical Works
Of Shifting Of Veena Nager
Mulund (W), Branch. At Shop No 1
&2, Neptune Lotus, LBS Road, Veena
Nager, Mulund (West),
Mumbai-400 080.
- 5) Name of the Contractor : -----

- 6) Address of the Contractor : -----

- 7) Period of Completion : 2 (Two) months from the dated of Commencement
- 8) Earnest Money Deposit : **Rs.6,850/- (Six Thousand Eight Hunder Fiffy Only)**
By means of Demand Draft / Pay Order (Valid for a period of 180 Days From the last date of submission of the tender) from any scheduled Nationalized Bank drawn **in favour of Bank Of Baroda and payable in Mumbai.**
- 9) Retention Money : As per clause no. 11(a) of general Conditions

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- 10) Defects Liability Period : Twelve Months from the date of Virtual Completion.
- 11) Insurance to be undertaken by the Contractor at his cost : 125% of Contract Value (Contractor's all risk policy)
- 12) Liquidated damages : 0.5% of the Contract amount shown in the tender per week subject to max. 5% of the contract value or actual final bill value.
- 13) Value of Interim Bill (Min.) : Rs. 3.00 Lakhs.
- 14) Date of Commencement : 7 days from the date of acceptance Letter is issued to the Contractor/ or the day on which the Contractor is instructed to take possession of the site whichever is earlier.
- 15) Period of Final Measurement : 3 Months from the date of Virtual Completion.
- 16) Initial Security Deposit : 2% of the Accepted Value of the Tender. (Clause No. 22)
- 17) Total Security Deposit : As per clause No. 11 a
- 18) Refund of initial Security Deposit Comprising of EMD and ISD. : 50% of the Security Deposit shall be refunded to the Contractor on completion of the work and balance refunded only after the Defect Liability Period is over.
- 19) Period for Honoring Certificate : 1. Two Months for R.A. Bills
2. The final bill will be submitted by the Contractor within Two Months of the date fixed for completion work and the Bill shall be Certified within 3 months from the date of receipt of final bill provided the bills are submitted with all pre-requisite documents/test reports etc. prescribed in the tender.

Signature of Tenderer.

Date:

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LETTER OF DECLARATION

To,
The Dy. General Manager,
Bank Of Baroda. Ltd.,
Mumbai Metro East Region,
1st Floor, A- Wing , Devdarshan Building,
Station Road, Bhandup (West),
Mumbai.- 400 078.

Dear Sir,

Proposed Electical Of Shifting Of Veena Nager Mulund (West) Branch AT Shop No. 1 & 2, Neptune Lotus, LBS Road, Veena nager, Mulund (West), Mumbai-400 080.

Having examined the terms & conditions, drawings, specifications, design relating to the works specified in the memorandum hereinafter set out and having visited and examined the site of the works specified in the said memorandum and having acquired the requisite information relating thereto and affecting the quotation, I/We hereby offer to execute the works specified in the said memorandum within the time specified in the said memorandum on the item rate basis mentioned in the attached schedule and in accordance in all respect with the specifications, design, drawings and instructions in writing referred to in conditions of Tender, the articles of agreement, conditions of contract and with such conditions so far as they may be applicable.

MEMORANDUM

(a)	Description of work	Proposed Electical Of Shifting Of Bhayander East Branch AT Shop No. 1 & 2, Neptune Lotus, LBS Road, Veena nager, Mulund (West), Mumbai-400 080. .
(b)	Earnest Money	6,850/- (Six Thousand Eight Hunder Fifty Only) by means of Demand Draft / Pay Order from any scheduled Nationalized Bank drawn in favour of Bank Of Baroda. Ltd. and payable in Mumbai.
(c)	Time allowed for completion of work from the date of issue of work order.	2 Months (Two months) from the date of commencement as per tender.

Should this tender be accepted, I/we hereby agree to abide by and fulfill the terms and provisions of the said conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to BANK OF BARODA, the amount mentioned in the said conditions.

Sign of Contractor with Stamp & Seal

I/we have deposited Demand Draft / Banker's Cheque / FDR for a sum of **Rs.6,850/- (Six Thousand Eight Hunder Fifty Only)** as Earnest money deposit with the Bank Of Baroda. Ltd. Should I/we do fail to execute the contract when called upon to do so, I/we hereby agree that this sum shall be forfeited by me/us to Bank Of Baroda.

We understand that as per terms of this tender, the BANK OF BARODA may consider accepting our tender. We, therefore, undertake that we shall not raise any claim / compensation in the eventuality of Bank deciding to drop any of the item of works from the scope of work of this tender at any stage during the contract period. Further, we also undertake to execute the work entrusted to us in phases on our approved rates and within the stipulated time limit without any extra claim for price escalation as provided for in Clause **11.1.7 and 11.1.8** "Instructions to Tenderers" of this tender.

We, hereby, also undertake that, we will not raise any claim for any escalation in the prices of any of the material during the currency of contract/execution/completion period.

Yours faithfully,

Signature of contractor
With Seal

Sign of Contractor with Stamp & Seal

Proforma 'A'

Details of the works executed in last three Years

Sr.No.	Name of Work	Work executed for (Name of the organization with address, concerned office & telephon no)	Nature of Work	Location of the work	Acual Value of the work	Stipulated time for completion	Actual time for Completion	IF work left incomplete or terminated
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Signature of contractor
With Seal

To be typed on separate sheet

Proforma 'B'

Details of the works in Hand of Equivalent Amount

Sr.No.	Name of Work	Client(Name of the organization with address, concerned office & telephon no)	Nature of Work	Location of the work	Acual Value of the work	Stipulated time for completion	Actual time for Completion	Present Status Of the Project
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Signature of contractor
With Seal

Sign of Contractor with Stamp & Seal

TECHNICAL SPECIFICATIONS FOR ELECTRICAL INSTALLATION WORK

SCOPE OF WORK:-

The Electrical Contractor's scope of work covers the following:-

Supply, testing prior to installation, testing after installation of electric meter/s and other installation and commissioning the complete Electrical Installation work associated with power supply system, lighting and domestic appliances, concealed wiring network as directed, earthing and lightning protection system, installing Heavy Gauge PVC / Black enamelled H.G. threaded conduits suitable for heavy mechanical stresses, concealed / open in slabs, walls / shafts, as required for Electrical wiring, telephones network and TV cable system for distribution in flats, basement, stilts etc., installing telephone and T.V. outlet boxes as required including fish wire. Telephone wires and co-axial cable for T.V. outlets from the shafts as directed, alternate Emergency Power Panel including stand-by Diesel Generator Set and power supply network from this alternate stand-by D.G.Set, installation of fixtures and fittings issued by the Client or as ordered in B.O.Q. after testing, including holding their safe custody until handing over of the installation to the Clients, power supply to Domestic water pumps, fire pumps and any other related works for completion of the Building for its occupancy, Liaisoning with Electric Supply Company and / or Concerned Authorities and getting the installation approved by them and installation of electric meter/s is also included in the scope of Contractors work.

DRAWINGS, SPECIFICATION AND DEVIATIONS:-

The drawings and specification lay down minimum standards of equipment and workmanship. Should the tenderer wish to depart from the provision of the specification and drawings either on account of manufacturing practice or for any other reasons, he should clearly draw attention in his tender to the proposed points of departure and submit such information, drawings and specifications as will enable the relative merits of the deviations to be fully appreciated. In the absence of such information on the deviations, it will be deemed that the tenderer is fully satisfied with intents of the specification and drawings and their compliance with the statutory requirements, all the relevant I.S.Codes, I.E. Rules, Local Codes as governed by the Concerned Electric Supply Company, N.E.C. Electrical Inspector, etc.

The Contractor shall prepare fabrication and working drawings as well as concealed / open conduits layout drawings which will be got approved from the Architect / Clients / Consultants prior to execution and all work shall be to the approved working drawings. Approval of these drawings does not relieve the Contractor of his responsibility to meet the intents of specifications. All such drawings for approval are to be submitted in triplicate to the Owner / Consultants / Architects.

After virtually completing the work, the Contractors should submit AS BUILT drawings of all systems in triplicate along with his Final Bill.

SCOPE:-

The Scope of work shall cover the supply, installation and commissioning of all the power panels, incorporating circuit breakers, switch fuse units, busbars, interconnections, earthing etc., meeting the requirements shown in equipment schedule and the drawings.

Entire works shall comply with the latest issue of following standards, rules, codes of practice, unless specified otherwise in the specific requirements.

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STANDARDS:-

The following standards and rules shall be applicable:-

- IS : 2516 : Specification for A.C. circuit breakers.
- IS : 4047 : Specification for heavy duty air breaker switch gear and fuses for Voltage not exceeding 1000 V.
- IS : 3072 : Code of practice for installation and Maintenance of Switch gear.
- IS : 3106 : Code of practice for selection, installation and maintenance of fuses (Voltage not exceeding 650 V).
- IS : 4237 : General requirements for switch gear and control gear for voltage not exceeding 1000 V.
- IS : 2607 : Air break isolators for voltage not exceeding 1000 V.
- IS : 8623 : Specification for factory built assemblies of switch gear and Control gear for voltage upto and including 1000 V. A.C. and 1200 V. D.C.
- IS : 375 : Marking arrangement of switch gear bus-bars main connections and auxiliary wiring.
- IS : 694 : PVC insulated copper wires for 650 / 1100 Volts grade.
- IS : 1554 : PVC insulated (heavy duty) electric cables for working voltages upto and including 1100 Volts.
- IS : 3961 : Recommended current rating for cables.
- IS : 732 : Codes of practice for electrical wiring.
- IS : 2274 : Installation (system voltage not exceeding 650 Volts).
- IS : 12360 : Voltage bands for electrical installation.
- IS : 2309 : Protection of building and allied structures against lightning.
- IS : 4648 : Guide for electrical layout in Residential Building.
- IS : 1646 : Fire Safety of Buildings.
- IS : 5216 : Guide for Safety Procedures and Practices in Electrical Work.
- IS : 3043 : Code of practice for earthing.
- IS : 3202 :)
- IS : 4047 :) Climate proofing of electrical equipment.
- IS : 2147 :) Heavy duty air-break switches and
- IS : 4064 :) Composite units of air-break switches.

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- IS : 4237) and fuses for voltages not exceeding
) 1000 Volts.
)
 IS : 6875 :)
- IS : 2208 :) HRC cartridge fuse domestic and similar purpose.
- IS : 5133(I):) Boxes for enclosures of electrical accessories.
- IS : 3854 :) Heavy duty air-break switches and
- IS : 3452 :) Switches for domestic and similar purpose.
- IS : 371 :) Three terminals ceiling roses.
- IS : 4615 :)
- IS : 1293 :)
) Switch socket outlet.
 IS : 4160 :)
- IS : 4343 :)
- IS : 8828 : Miniature air-break circuit breaker for A.C. circuits.
- IS : 2312 : Exhaust Fans.
- IS : 374 : Ceiling fans and regulators.
 IS : 2082 :)
- IS : 3725 :) Storage types electrical water heaters.
- IS : 2266 : Call bells and buzzers for indoor use.
- IS : 1534 :)
- IS : 1717 :)
- IS : 1913 :) Luminaires, ballasts, maintenance and safety requirements.
- IS : 10322 :)
- IS : 2713 : Tubular poles for overhead power lines & street lights.
- IS : 2551 : Danger notice plates.
- IS : 2509 :)
) Rigid PVC conduits for electrical wiring.
 IS : 3419 :)
- IS : 9537, Part II : Rigid M.S. conduits.
- IS : 3480 : Flexible steel conduits for electrical wiring.
- TD-S-113-18 Code of practice by India Telephone – Department.
- ITD-S/WS- :)

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144C,) Insulation and conductor resistance of telephone
BS : 6746 :) wires and cables.

IS : 4984 :) HDPE pipe and fittings.

ITD-S/WS- :)
113B,) PVC insulated, colour coded, twisted into pairs,
BS : 6746 :) laid-up taped and overall.

CBL : 7000 :)

BS : 6746 :) PVC sheathed telephone cables.

IS : 1554 :)

MUMBAI Revised code of practice for telephone wiring of multistoreyed
TELEPHONES Buildings – 1985.

Codes of practice of Indian Standards or relevant British Standards in the absence of Indian Electricity Act and Rules National Electrical Code, Local Regulation prevalent in Maharashtra or the state which work-site exists, Regulations of Fire Insurance – Tariff Advisory Committee, Regulations and Standards of Mahanagar Telephone Nigam Ltd., etc.

SYSTEM DETAILS:

Entire electrification work and its associated accessories shall be designed for the system data given hereunder.

Rated System Voltage	:	415 Volts (+/-) 10%, 3 – Phase, 4 Wire.
Rated System Frequency	:	50 Hz (+/-) 3%
Rated System Fault level	:	35 MVA at 415 Volts symmetrical.
Highest System Voltage	:	456 Volts r.m.s. line to line at 415 Volts.
Rated Lighting Control System Voltage	:	250 Volts, 1 – Phase, 2 Wire and earth, 50 Hz
System Earthing	:	Effectively earthed neutral.

All material and its associated accessories shall also be designed to withstand for the desired services due to fluctuations in supply voltage and variation in frequency as permissible under Indian Electricity Act and Rules.

Meter Room Works :

150 mm. dia. R.C.C. pipe/s shall be provided for laying of Electric Supply Company's power cables from outside of plinth protection upto a chamber in the meter room. In case the distance from the outer edge of the plinth protection upto the chamber in meter room is more than 2 meters additional pipes shall be laid and all the pipes shall be properly laid and jointed with collars etc. the pipe at the end of the plinth protection shall be at the level of 600 mm. below the ground level.

One end of the R.C.C. pipe inside the meter room shall open in a brick masonry chamber of size 300 mm. x 600 mm. and 300 mm. deep.

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One no. 8 SWG G.I. Wire shall be laid in the R.C.C. pipe for pulling the power cables.

One / two / three / four light point/s shall be provided in the meter room, the control switches for which shall be near the door but inside, from the wiring provided for the staircase lights. A teak wood plank of 20 mm. thick and varnished (with two coats) on all sides shall be provided in the meter room for fixing of Electric Supply Co s Bus System, Cutouts, I.C. cutouts for individual meters and ELMCBs for flats, cable end box to terminate main incoming supply cables shall be provided for the S.F. unit with suitable cable glands. On the outgoing side of S.F. unit a 3 phase and neutral busbar chamber shall be provided. The busbars rating shall be 50% more than the capacity of the S.F.U. controlling it.

The lead wired to individual meters and cutouts shall be taken out from this busbar chamber. Each load distribution on all phases and the proper colour code is to be observed for lead wire. Lugs shall be crimped at both ends of these lead wires for termination.

Wherever the energy meters are to be fixed in the wooden meter box / cabinet, the same shall be made out of 50 mm. x 25 mm. wooden frame and 20 mm. thick wooden planks on all sides and metal grill shall be fixed on the front door (side). The door shall have locking arrangement and lock with keys shall be provided. The meter box shall be fixed to the wall and before polishing / painting, anti-termites treatment shall be given to it. Polishing / painting, has to be done to all the sides of the box / cabinet.

The meter box shall accommodate main S.F.U. for terminating incoming cable, T.P.N. Bus chamber and other switch gears like I.C. cutouts main switches, ELMCBs energy meters etc. All meters, switches etc., shall be interconnected with wires of size suitable for the connected load / meter capacities as directed.

All wiring in the meter room related to metering etc. shall be carried out with single core PVC stranded copper wires of adequate size, fixed on the T.W. Plank with brass clips and brass takes. Earth wire shall be provided with the lead wires for connecting earth terminations of meters, main switches etc.

The Contractor shall submit the layout drawing of the meter room wherein all the above items shall be shown. This layout shall be got approved by the Contractor from the Clients as well as from the Electric Supply Co. In the meter room, outgoing from the meters will be taken to the main switch, ELMCB, the outgoing from which either cables or copper wires, as specified, will lead to the respective destinations as specified.

All codes and standards mean the latest, wherever not specified otherwise, the installation shall generally follow the I.S. codes of practice of the relevant Standard Codes of Practice in the absence of corresponding Indian Standard.

Switch fuse units and disconnects :

Switch fuse units shall have quick-make, quick-break silver plated preferable double break contacts, with operating mechanism suitable for rotary operation in the case of cubical mounting. All switches shall be rated according to equipment schedule or drawings, and shall withstand the system prospective fault current let through. Cam operated rotary switches with higher rating S.F. units shall be heavy duty type conforming to IS : 4047.

Fuses shall be HRC cartridge type conforming to IS:2208 with a breaking capacity corresponding to system fault level. Fuses shall be line type with visible indication. Screw type diazed fuses are not acceptable for any rating.

All disconnects shall consist of switch units quick-make, quick-break type with silver plated contacts. The switches shall preferably have double breaks. All switches shall be mounted in sheet steel enclosures, which in turn is mounted on suitable angle iron frame work. In wet location switches shall have cast iron enclosures Disconnects shall have minimum breaking capacity.

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Cubical Boards :

All boards shall be combination of 14 & 16 SWG sheet steel, free standing, extensible totally enclosed. Dust-tight, vermin-proof cubical, flush dead front and modular construction suitable for 3 phase, 415 V, 4 Wire, 50 Hz system. All boards shall be accessible from the front for the maintenance of switches, Bus-bars, cable terminations, meters etc. Cables shall be capable of entering the board both from top as well as from bottom. All panels shall be machine pressed, with punched openings for meters etc. All sheet steel shall be rust inhibited through a process of degreasing, acid pickling, phosphating etc. The panels shall be finished with two coats of synthetic enamel paint of approved colour over one coat of red oxide primer. Engraved plastic labels shall be provided indicating the feeder details including the size of the incoming / outgoing cables, capacity and danger signs.

Earthing :

All switches panels shall be provided with an earth bar as specified earthing of the switch boards shall be through the equipment earthing system provided in the building.

All meters shall be calibrated and tested through secondary injection tests.

All field tests shall be witnessed by Clients representatives, test certificates shall be furnished by the Contractors.

Installation :

All panels shall be supported on MS Channels incorporated in the panel during the fabricating. All such supports shall be coated with primer followed by two coats of approved synthetic enamel colour paint. After completion of the work, all panels shall be touched up for damaged painting. All work shall be carried out as per IS: codes, I.E. Rules, NEC.

All panels shall be megged at phase and phase to Neutral using 1000 V megger with all outgoing feeders in closed position. The megger value should not be less than 2.50 megohms between phases and 1.50 megohms between phase and neutral.

Fabrication drawings of all panels shall be submitted by the Contractor to the Clients in triplicate and they shall proceed for fabrication after Clients approval.

Testing and Inspection :

All switch boards shall be factory inspected before finishing and dispatch, with the Clients representatives.

Certificate for all routine and type tests for circuit-breakers in accordance with IS:2516-1963 shall be furnished from the manufactures. In addition, all panels shall be megged phase to phase and phase to Neutral, using 1000 V megger with all the switchgear in closed position. The megger value should not be less than 2.50 megohms between phases and 1.50 megohms between phase and Neutral.

Distribution Board :

Scope :

The scope of work shall cover supply, installation, testing and commissioning of lighting and power distribution boards. Associated civil work required for the erection of the D.B.S. is also included in the scope of this contract.

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Standards :

The following standards and rules shall be applicable :

- 1) IS : 2675 – 1983 : Enclosed distribution fuse boards and cutouts for Voltage not exceeding 1000 V
- 2) IS : 375 – 1963 : Marking and arrangement of switchgear busbars main connections and auxillary wiring.
- 3) IS : 8828 – 1978 : Miniature circuit-breakers.
- 4) IS : 2607 – 1976 : Air-break isolators for Voltage not exceeding 1000 V.
- 5) IS : 9926 – 1981 : Fuse wire used in rewirable type Elec. fuses upto 650 V.
- 6) Indian Electricity Act 1910 and Amendments issued there under.

All codes and standard mean the latest, where not specified otherwise, the installation shall generally follow Indian Standards Codes of Practice and the relevant British Codes of Practice in the absence of Indian Standard.

Distribution boards along with the controlling M.C.B.s, Fuse or Isolator as shown be fixed in an M.S. Box, suitable for recessed mounting and in wall. D.B.S. should be factory made from the standard "approved" manufactures and not fabricated by the tenderer. D.B.S. shall be made of 16 SWG sheet duly rust inhibited through a process of degreasing, acid pickling, phosphating and spray painted or powder coated to an approved colour over a coat of red oxide primer. Three phase boards shall have phase barriers and wire channel on three sides. Neutral bars shall be solid tinned copper bars with tapped holes and chase headed screws. For three phase D.B.S. 3 Nos. independent neutral bars shall be provided.

There shall be earth busbar of adequate size provided separately to terminate all outgoing circuit earth wire conduit knockouts shall be provided as required / shown on drawings and entire board shall be rendered dust and vermin proof and shall have conduit knockout entry.

MCBs shall have quick make and break non-welding self wiping alloy contacts both on the manual and automatic operation. Each pole of the breaker shall be provided with inverse time thermal overload and instantaneous over current tripping elements, with tripping must be on all the poles and operating handle must be common. Breakers must conform to MBS 3871 with facility for locking in off position. Pressure clamp terminals for stranded / solid conductor insertion are acceptable upto 4 sq.mm. aluminium of 2.5 sq.m.. copper conductors and for higher conductor sizes the terminal shall be suitably shrouded. Wherever MCB isolators are specified they are without tripping elements.

Distribution Boards shall have MCBs as shown on the drawing / schedule. D.B.S. shall meet with the requirements of IS:2675 and marking arrangement of Bus-bars shall be accordance with IS: 375, Bus-bars shall be suitable for incomer switch rating and sized for a temperature rise of 35 Centigrade over the ambient temp. circuit diagram indicating the distribution shall be pasted on the inside of the DB s instructed. One earthing terminal for single phase and two terminals for 3 phase D.B.S. shall be provided with an earth strip connecting these earthing studs / terminals and the outgoing ECC earth bar. All

MCBs shall be with a minimum short circuit rating of 10 Kamps. All outgoing feeders shall terminate or by means of insulated single conductor copper wires.

All termination shall be carried out by using crimping type ferrules or reducer type terminal lugs.

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Installation and Testing :

All distribution boards shall be mounted as directed either recessed or on adequate size of angle iron frame work in case they are to be surface mounted. All mounting frames shall be coated with one coat of red oxide primer followed by two coats of synthetic enamel paint of approved colour, after installation. All D.B.S. shall be touched up for damaged painting. All work shall be carried out as per NEC.

All boards shall be meggered phase to phase and neutral, using 1000 V megger with all switchgear in close position. The megger value should be not less than 2.50 megohms between and 1.50 megohms between phase and neutral.

E.L.C.B. (Earth Leakage Circuit Breaker) :

The E.L.C.B.s shall have leakage sensitivity of 30 ma / 30 Secs and shall have a short circuit current rating equal to that of MCB i.e. mini. of 10 KA. Current rating and No. of poles shall be as described in the B.O.Q. / Drawing. A test push knob facility shall be provided to periodically test the operation of E.L.C.B.s.

Medium Voltage Cabling :

Scope :

The scope of work shall be cover supply, laying, connecting, testing and commissioning of medium voltage power cables inclusive of all labour.

Standards :

The following standards and rules shall be applicable :

- 1) IS : 1554 (P-I) : PVC insulated electric cables (heavy duty)
- 2) IS : 1753 : Aluminium conductors electric cables (heavy duty)
- 3) IS : 3961 : Recommended current ratings for cables.
- 4) Indian Electricity Act and Rules.
- 5) NEC.

All codes and standards mean the latest. Whereas not specified otherwise, the installation shall generally follow Indian Standard Codes of Practice and the relevant British Codes of Practice in the absence of Indian Standard.

Cables :

All cables shall be 1100 Volt Grade, PVC insulated and extruded inner sheath with or without steel armouring as specified and with an outer PVC Protective sheet. Cables shall have high conductivity stranded aluminium or copper conductor as specified. Cores shall be colour coded as per Indian Standard.

All cables shall be new without any kind of visible damages. The manufacturer's name, insulating material, conductor size, voltage class and ISI mark shall be embossed on the surface of the cable at every 600 mm. centres.

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Installation :

Cables shall be laid in the routes marked in the drawings, where the route is not marked, the Contractor shall mark it out on the drawing and also on the site and obtain the approval of the Architect / Consultant before laying the cable. Procurement of cables shall be on the basis of actual site measurements and the quantities shown on the schedule of work shall be regarded as a guide. Payment shall be restricted to the quantity of cable installed (and measured jointly as per unit stated) at site. Cables rising indoors shall be laid on walls, ceiling, shafts or trenches. Cables shall be fixed to walls or ceiling with supports/saddles. Cable trays will be used wherever directed / necessary. All supports shall be at not more than 500 mm. apart. Plastic identification tags shall be provided at every 20 M in general at

every floor in the rising shaft in particular. Oversize M.S. Sleeves shall be used for cables passing through the walls. Cables shall be bent to a radius not less than 12 times the recommendations, whichever is higher, in case of direct buried cables the cable route shall be parallel or perpendicular to roadways, walls/cushion to provide cushion against abrasion. Width of excavated trenches/oversand cushion shall be covered with a mini. of excavated trenches will be as per drawings or as directed. The laid cables in protective layer of bricks on both sides and top. Backfill of the trench shall be with a minimum earth cover of 600 mm. to be properly rammed and consolidated. At road / pathway crossings cables shall be pulled through R.C.C. pipe of 150 mm. dia. to be laid for each cable by the Electrical Contractor. A mini. of 100 mm. thick concrete bed has to be spread before laying the RCC pipes, topped by 150 mm. thick concrete to avoid any damage to the RCC pipe.

The cables shall be provided with cable route markers at every 20 meters and also at every in the direction of the route.

All cables shall be full runs from panel to panel without any joints or splices. A minimum of Eight (8) M loop shall be provided at each end of every cable. Cables shall be identified at end terminations indicating the feeder number and the Panel / Distribution

Board from where it is being laid. All cable terminations shall have tinned copper compression lugs. Cable terminations shall have necessary Brass glands. The Brass glands and armoring shall be earthed at both the ends of the cable. The end terminations shall be insulated with a minimum of six half lapped layers of PVC tape.

Testing :

MV cables shall be tested before and upon installations with a 1000 V megger and the following established.

- 1) Continuity on all phases.
- 2) Insulation Resistance
 - a) Between conductors.
 - b) Between all conductors and ground.

All test readings shall be recorded. Cables will be charged only after the above readings are found to be satisfactory.

Mode of Measurement :

Cables will be measured on the basis of unit length and shall include the following :

- 1) Cables, clamps, supports and spacers.
- 2) Installation, testing and commissioning.
- 3) Cable marking.

Each cable termination will be measured as one unit for payment.

- 1) Cable glands, lugs, bolts, nuts.

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- 2) All joining materials.
- 3) Installation, testing and commissioning.
- 4) Earthing of glands and armour.

Cables buried underground will be measured on the basis of unit length and paid for unit rates and shall includes.

- 1) Excavated and backfilling as described above.
- 2) Sand for cushioning and protective bricks.
- 3) Cable route markers.

C.T.S. Wiring :

Scope :

The scope of work shall cover supply, installation, testing and commissioning of all C.T.S. wiring work. All size of teak-wood battens should be varnished before fixing on the wall. The batten should be from good teakwood battens and should not have any knot in between, varnishing of batten is to be done on all sides. As far as possible overlapping of the battens should be avoided by providing the bridge. The wires should be fixed with appropriate types of tinned brass joint clips at every 2" to 2.5 distance. The teak-wood wires shall be fixed nettlefold screws and not by nails. Earthing wires shall be stranded copper conductor with Green / Yellow – Green colour insulation of 440 V Grade.

Conduits Wiring :

Scope :

The scope of work shall cover supply, installation, testing and commissioning of all conduit wiring. All works shall be carried out as per NEC.

Standards :

The following standards and rules shall be applicable :

- | | | | |
|----|-----------|---|----------------------------------------------------------------------------------------------|
| 1) | IS : 732 | : | Code of Practice for Electrical Wiring installation
(System voltage not exceeding 650 V) |
| 2) | IS : 1646 | : | Code of Practice for fire safety of buildings
(General Electrical installation (Part II). |
| 3) | IS : 9537 | : | Rigid steel conducts for Electrical wiring (Part II) |
| 4) | IS : 2667 | : | Fittings for rigid steel conducts for Electrical
Wiring. |
| 5) | IS : 3480 | : | Flexible steel conduits for Electrical Wiring. |
| 6) | IS : 3837 | : | Accessories for rigid steel conduit for Electrical
Wiring. |
| 7) | IS : 694 | : | PVC insulated cables. |
| 8) | IS : 9537 | : | Rigid non-metallic conduits for Electrical Wiring. |
| 9) | IS : 6946 | : | Flexible (pliable) non-metallic conduits for |

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Electrical Wiring.

- 10) IS : 1293 : 3 – Pin plugs and sockets.
- 11) IS : 8130 : Conductors for insulated electric cables and flexible cods.
- 12) IS : 5133 : For switch boxes and other conduit accessories.
- 13) Indian Electricity Act 1910 and Amendments issued thereunder.
- 14) Regulations for the electrical equipment in buildings issued by the Mumbai Regional Council of Insurance Association of India.
- 15) NEC.

Rigid and Flexible conduits.

All conduits shall be heavy gauge black enamelled mild steel or galvanised steel or as specified in schedule of works. Conduits shall be with ISI mark.

Flexible conduits shall be formed from a conditions length of spirally wound inter locked strip steel with a fused zinc coating on both sides. The conduit shall be terminated in brass adaptors.

Accessories :

Conduit fittings such as bends, elbows, reducers, chase, nipples, split couplings, plug, etc., shall be specifically designed and manufactured for their particular application. All conduit fittings shall conform to IS : 2667 – 1964 and IS : 3887 – 1966. Conduit bends and elbows shall not be used. Instead, wherever bending is required, the conduit shall be properly bent using the bending machine. Only in unavoidable conditions, use of bends and elbows may be permitted.

Cast iron round junction boxes used for light and fan points shall be normally 75 mm. deep in case of slabs and 50 mm. deep in case of walls. Bottom of the junction boxes shall be flush with wall / bottom of the slab. The fabricated junction boxes shall be 1.60 mm. thick and of suitable dimension and minimum 75 mm. deep. Other dimensions shall be as per IS:5133. These boxes may be used for light / bell point in walls. Theses boxes shall be galvanised M.S. boxes. Checknuts shall be used on either side of the box for conduits. At conduit entry, bushes shall be provided to avoid cutting of insulation of wires.

Notes of Concealed Conduiting :

- 1) Routing of concealed conduits Location of conduit drop or rise in walls, location of junction boxes, vertical surface conduit runs in shafts etc. Wherever shown on the drawing is schematic only. Adjustments / Re-routing of the same shall be carried out by the Contractor to suit layout of lighting fixtures, ceiling fans, receptacles, telephone outlets, TV outlets room switch boards etc., shown on relevant drawings and to suit site conditions.
- 2) Passing of embedded conduit through columns for any reason whatsoever is totally prohibited, except in any of the really unavoidable situation, where Structural Consultants express permission in wiring will be a must before so doing.
- 3) Cross over of embedded conduit in slab, except at locations unavoidable should not be done, in case of cross-over of conduits where it is a must, the contractor shall obtain the specific permission for the location of cross-overs from the Consultant prior to concerning the slab.
- 4) Conduits droppers in columns shall not be permitted.

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- 5) Concealed conduit running along the length of beam is to be avoided. Suitable conduit sleeves shall be provided in lintel beams where conduit droppers are required to be extended through such beams.
- 6) Standard typical details shall be referred for concealed conduit routing through sunk slab through staircase, walls, etc., and for provision of junction boxes, wherever required.
- 7) Conduit routing at Lift Machine Rooms and at Lift Wells shall be installed in consultation with Elevator Contractor.
- 8) The Contractor shall select the routes of surface conduiting in such a way that embedded conduits laid during civil works need not be punctured. In case embedded conduits get damaged, it shall be the responsibility of the Contractor to rectify the defective work at his own cost.
- 9) All conduit shall be of 25 mm. nominal bore except specified otherwise.
- 10) Bending radius of concealed conduit shall not be less than ten times the outside diameter of the conduit. Maximum distance between two junction boxes shall not be more than four meters.
- 11) Cast iron junction box for fan hooks shall be at appropriate location so as to avoid interference.
- 12) Conduit sleeves with threaded projections (50 mm.) shall be provided at suitable locations in Auxillary Beams, Lintel Beams to facilitate extension of conduits in walls.
- 13) Junction boxes, conduits etc., shall be suitably tied to reinforcing bars in slabs to avoid displacement and misalignment. Minimum 25 mm. thick concrete cover around conduit / junction box shall be ensured.
- 14) To facilities pulling of wires / cables, pull-out wires shall be provided in each length of conduit to be concealed. Also all open faces of junction boxes and open ends of conduits shall be suitably plugged or covered by the Contractor with care to avoid ingress of stones / sand / concrete mix etc. into junction boxes / conduits during pouring of concrete. Similar care must be taken at the locations where couplers etc., are used for extension of conduit.
- 15) During civil works, Contractor shall arrange to provide conduit sleeves (of adequate size and adequate in number) at ceiling level or walls for the passage of surface – conduits so as to avoid routing of conduits along the beam contours at a later stage. Co-ordination in this regard shall be Contractor's responsibility.
- 16) Supply and installation of 150 mm. / 250 mm. dia. Hume pipes for main power cable, for earthing conductors and for direct line telephone cables shall be in Contractors scope. These pipes shall be laid in typical standard details as directed to avoid damage to these pipes.
- 17) Two Nos. earth electrode stations shall be provided for general earthing system of the buildings to be located to suit site conditions. Distance between two earth electrode stations shall not be less than 3.5 meters and that between the outer edge of plinth protection of the building and earth electrodes shall not be less than 2.00 meters.

Wiring :

All wires shall be single core stranded copper PVC insulated to IS: 694 and shall be 1100 V Grade. All wires including earth wire shall be terminated using crimping type ferrules or lugs. Earthing shall be of stranded copper conductor with Green or Yellow Green insulation of 440 V Grade with ISI Mark.

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All wires shall be colour coded as follows:

<u>Phase</u>	<u>Colour of Wires</u>
R	Red
Y	Yellow
B	Blue
N	Black
Earth	Green (insulated)
(if any)	Grey.

All wires shall be with ISI Mark.

Installation :

All works shall be carried out as per National Electrical Code. The size of conduits shall selected in accordance with the number of wires permitted table given below :

Note : Even though 20 mm. dia. conduit is indicated in the table.

Contractor has to use minimum size of the conduit of 25 mm. dia. unless otherwise indicated.
Size of wires shall be not less than 1.5 sq.mm.

Nominal Cross Section & Area (Sq.mm.) of wire.	20 mm.	25 mm.	32 mm.	40 mm.	No. of Strands Dia. in mm.
1.50	6	10	14	---	3/0.80
2.50	5	10	14	---	3/1.04
4.00	3	6	10	14	7/0.85
6.00	2	5	9	11	7/0.04
10.00	---	4	7	9	7/1.35
16.00	---	2	4	5	7/1.70

The above table is applicable for both straight as well as deviated runs.

Conduits shall be kept at a minimum of 100 mm. from the pipes of other Services such as T.V., Telephones etc., Pull / Junction Boxes shall be provided for straight conduit runs of more than 10 meters and also for deviated runs with more than 3 Nos. of 90 bends.

Separate conduits / raceways shall be used for

- 1) Normal lights, and 5 A – 3 pin sockets on lighting circuits.
- 2) Power outlets : 15 A – 3, 20/A 30 A 2 pin + scraping earth metal clad socket.
- 3) Separate conduit runs shall be used for incoming and outgoing circuits.
- 4) Wires of various circuits but of different phases.

Conduits runs in the slab shall be properly laid, fixed to the reinforcement bars, before concerning of the slab all conduit entries shall be properly blocked or sealed to avoid ingress of concrete slurry.

For vertical conduits drops in the wall proper chasing shall be carried out and conduit laid and fixed, chase restoration shall be done after installing the 24 SWG G.I. wiremesh over the chase and after which plastering shall be carried out to give a neat smooth finish.

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As far as possible horizontal chase in the wall shall be avoided. If unavoidable, it shall not exceed 300 mm.

All final branch circuits for lighting and appliances shall be single core stranded copper conductor cable run inside conduits. The conduits shall be properly threaded and screwed into sockets junction boxes etc. or fixed properly, using epoxy soin, in case of PVC pipe. The exposed threading shall be given a coat of rust inhibiting chemical / paint.

Branch circuit conductor sizes shall be as shown in schedule of quantities and / or drawings.

Final branch circuits shall preferably be kept in a separate conduit upto cct. Branch distribution boards. No other wiring shall be bunched in the conduit except those belonging to the same phase. Each lighting branch circuit shall not having more than ten (10) outlets or 800 watts whichever is lower.

Flexible cords for connections to appliance, fans and pendants shall be 650 / 1100 V Grade (three or four cores i.e. with insulated neutral and earth wires of the same size) with stranded copper wires insulated twisted and sheathed. Colour of the sheath shall be subject to Architect's approval.

Looping system of wiring shall be used. Wires shall not be jointed. Where joints are unavoidable they shall be made through approved mechanical connection. Earth wire shall be provided fir all light, fan, bell and socket points, control switches having marking for light or fan as required shall be connected in the phase conductors only and shall be ON when knob is down. Unless otherwise stated, switches shall be fixed in 3 mm. white colour Hylam sheet on M.S. Boxes with cover plate as specified. Chromium plated brass screws shall be used. M.S. switch boxes for switch board shall be of sufficient dimensions to accommodate required no. of choke type fan regulators for flush mounting or electronics regulators as the case may be.

M.S. Boxes shall be fabricated from 1.6 mm. thick M.S. sheet and shall be galvanized. Switch boards accommodating 3 or more than 3 switches shall be provided with slide-in fuse holder of 10 Amps. Rating and proper rating fuse-wire.

Power wiring shall be distinctly separate from lighting circuit, M.S. conduits not less than 2.5 mm. and wires not less than 2.5 sq.mm. shall be used for power wiring. Wire size for circuits will be as per schedule of quantity.

Testing :

The entire installation shall be tested for :

- A) Insulation resistance.
- B) Earth continuity.
- C) Polarity of single pole switches.

A test certificate shall be submitted in the Format, in triplicate as required / specified by the Electric Supply Company / M.S.E.B.

Point wiring rates shall include, but not limited to supply and installation of the following items.

PVC heavy gauge or M.S. conduiting embedded CONCEALED type or exposed SURFACE type as called for, branch and sub-circuit wiring with all items such as fabricated junction boxes, conduit fittings and accessories such as couplers, bends, tees, nipples, spacers, saddles, pull-out wires (2 mm. G.I. Wire), hardware, ceiling fan boxes to be embedded in the ceiling etc. Supports for exposed surface conduits shall be at an interval of 750 mm. for vertical run and at the interval of 450 mm. for horizontal run.

Recessed type M.S. covers as specified for various items such as room switch boards,

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receptacle board or light switch board etc. Housing with knock outs shall be tailor made or as specified to accommodate all switches, sockets, outlets, fan regulators, etc., as necessary for a particular location.

PVC insulated, unsheathed, stranded copper wires for phase, neutral and earth for branch circuits, for sub-circuits and for point wiring, cable, / wire upto lamp holder.

SP or DP or TPN / MCBs / ELCBs individual switches and accessories.

All consumables such as insulation tape, hardware, pipe sleeves and any other item not specified but required for completion of point wiring.

All work in complete wiring of a switch circuit of any length from the D.B. to the following via the switch board.

- 1) 3 Plate ceiling rose.
- 2) Connector.
- 3) Blank Plate.
- 4) Socket.
- 5) Lamp holder – Angle / Straight.
- 6) Fan boxes, hooks.
- 7) Any other terminal outlet.

All metal boards and boxes sunk or surface mounted.

Supply and installation of this item of work shall comply with all above requirements in co-ordination with the construction of civil works for provision of sleeves in walls / beams / slab and for laying embedded junction boxes / inspection boxes / pull out boxes / pull out wire etc. as required.

Earthing :

Scope :

This item of work is required for providing the earth-pits for electrical power network and also for lighting protection network. Earth pits for power network and lighting protection network shall be separate from each other without any interconnection. However, all Earth pits for power supply shall be interconnected with each other through buried earth conductors, similarly all earth pits for lighting protection shall be connected with each other through buried earth conductors. Spike earthing for St. Light poles is also covered. Each down common conductor of lighting protection network shall be terminated to a separate earth electrode pit through test-link.

Standards :

The following Standards and rules shall be applicable

- 1) IS : 3043 – 1987 Code of Practice for earthing.
- 2) Indian Electricity Act and Rules Electric Supply Co.'s Rules.
- 3) NEC.
- 4) IS : 2309 – Protection of building and allied structures against lightning.

All codes and standards mean the latest. Where not specified otherwise, the installation shall generally follow the Indian Standard Code of Practice. In the absence of Indian Standards, the relevant British Standard Codes shall be followed.

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General Requirements :

- 1) The earthing shall generally carried out in accordance with the requirements of I.E. Rules as amended from time to time and relevant regulations of B.E.S.T / Electric Supply Company, If Rules No. 32, 51, 61, 62, 67, 69, 88(2) and 90 are particularly applicable.
- 2) All earth connections shall be carefully made visible for inspection and testing of individual earth electrode shall be possible.
- 3) The earthing electrode shall be away at a minimum distance of 2 mt. From the outer surface of plinth protection / Diaphragm wall in case of basements. A minimum clearance of twice the depth of electrode shall be maintained between two earth stations. Wherever adequate distance cannot be maintained due to site constraints. The decision of the Architect / Consultant will be final and binding.
- 4) A brick masonry chamber cement plastered from both inside and outside shall be provided on the top of the each earth station to house the funnel for watering and the earth connection. The size of this chamber will be 300 mm. x 300 mm. deep. The chamber will be provided with a lockable cast iron cover hinged to the C.I. frame embedded in the top portion of the masonry wall, by providing spikes for grouting. Lock with key shall be supplied for each pit. The top of the masonry chamber shall be 50 mm. above the surrounding G.L.
- 5) The earth conductor from electrode shall be taken out of the masonry chamber through a protecting pipe embedded in the masonry laid atleast 250 mm. below the ground level.
- 6) Earthing system shall be mechanically robust and the joints shall be capable of retaining low resistance even after passage of fault currents / strockes.
- 7) Joints shall be welded / soldered / tinned and double rivetted. All the joints shall be mechanically, electrically continuous and effective, joints shall be protected against corrosion by giving suitable treatment duly approved by Architect.
- 8) Contractor shall use the layout drawing issued by the Architect / Consultant for guidance only. He shall submit working drawings for approval of the Architect prior to execution of the work. He will thereafter submit as built drawings for conductor route showing locations of earth pits etc., for final records and reference alter executing the work.
- 9) Contractor shall use the schematic layout drawings for the quantity and route of the conductor issued by Architect / Consultant for guidance only. He shall work out the exact quantity of earth conductors with its associated accessories required for the job.

Earth Electrodes :

- 1) The materials of earth electrode and earth conductors shall be galvanised iron unless specified otherwise in the bill if quantities, specifications or drawings.
- 2) The earth electrode shall be free from paint, enamel, grease etc.
- 3) The earth electrode shall be embedded as far as possible in the moist soil and below permanent moist level.
- 4) Earth electrode shall not be installed in the proximity of a metal fence.

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Types of Earth Electrodes :

The earth electrode shall be either a pipe electrode or plate electrode, as detailed in schedule of quantities. Plate electrodes shall be used for sub-stations and large medium voltage network and pipe electrodes for small medium voltage network and installations.

Pipe Electrode :

- 1) Pipe Electrode shall consist of 2.50 meter long single piece heavy duty G.I. pipe of minimum 40 mm. N.B. and shall be cut tapered at the bottom. 12 mm. dia. holes in a staggered manner shall be frilled on the pipe as per IS : 3034.
- 2) This Electrode shall be buried vertically in a specially prepared earth pit of size 30 cm. x 30 cm. and the earth pit shall be filled with alternate layers of charcoal, salt and fine washed sand with a minimum thickness of 150 mm. for each layer. A funnel with wiremesh inside shall be fixed to the top of G.I. pipe for watering purpose.
- 3) The earth conductor of 50 mm. x 6 mm. G.I. strips shall be connected to the electrode just below the funnel with proper terminal lugs, check nuts the other end of this 50 mm. x 6 mm. strip shall be terminated through a removable test-link, on the earth bus at meter room. Test link is to be provided in masonry chamber.
- 4) Details of chamber etc., have been already give below.

Plate Electrode :

- 1) The plate electrode shall consist of G.I. Plate of size 600 mm. x 600 mm. x 6.3 mm. as per B.O.Q. or drawings.
- 2) The electrode plate shall be buried vertically in a specially prepared earth pit which shall be dug up 2.50 M. deep from the ground level. The earth plate shall be placed in the earth pit with its faces vertical and embedded in the alternate layers of coal fine washed sand and salt with a minimum thickness of 150 mm.
- 3) The earth conductor of 50 mm. x 6 mm. G.I. strip shall be connected to the earth electrode plate with terminal lugs, the other end of this 50 mm. x 6 mm. G.I. strip shall be terminated through a removable test link provided in the masonry chamber, on the earth bus at meter room.
- 4) A 20 mm. G.I. pipe heavy gauge, shall be provided from the masonry chamber upto the top earth late for watering purpose. The G.I. pipe shall be provided with a funnel having wiremesh inside for watering.
- 5) Details of masonry chamber etc. have been already give above.

Simple Pipe Electrode for earthing individual Street Light Poles etc. with chamber :

- 1) Pipe Electrode shall consist of 2.50 meter long single piece heavy duty G.I. pipe of minimum 40 mm. N.B. and shall be cut tapered at the bottom. 12 mm. dia. holes in a staggered manner shall be frilled on the pipe as per IS : 3034.
- 2) This Electrode shall be buried vertically in a specially prepared earth pit of size 300 mm. x 300 mm. and 3 M. deep. The pit shall be filled with alternate layers of salt, charcoal, salt and fine washed sand, with a minimum thickness of 150 mm. for each layer.
- 3) The earth conductor of 25 mm. x 5 mm. G.I. strips shall be connected to the electrode just below the top with G.I. nuts and bolts and spring and flat washers with check-nuts. Other end of this earth strip shall be connected to the equipment to be earthed using suitable lugs for termination at both ends,

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etc.

Sub-Station Earthing :

In case of Sub-Stations, large installations and wherever specified earth electrode shall be 600 mm. x 600 mm. x 3.15 mm. copper plate. The earth lead shall be connected to earth plate, using termination lugs and brass nuts, bolts and washers, masonry chamber details being as given above, including heavy duty 40 N.B. G.I. Pipe, funnel for watering etc.

Earth leads and connections :

Earth lead shall be either bare copper or aluminium or galvanized steel as specified with sizes in the B.O.Q. Copper lead shall have a phosphor content of not over 0.15% aluminium and galvanized steel buried in ground shall be protected with bitumen and hessian wrap or polythene faced hessian and bitumen coating. At road crossings necessary hume pipes shall be laid. Earth lead run on surface of wall or ceilings, columns, beams etc., using G.I. spacers of minimum 6 mm. thick and saddles. The complete earthing system shall be mechanically and electrically continuous and robust and should provide an independent return path to the earthing source.

Testing of Earth-Stations / Pits :

After the erection of Earth-Stations is complete, Contractor should arrange for an earth-tester, carry out earth-resistance test (- average of 4 – readings -) in the presence of the Clients representative and records the results.

For substation earth-stations, the resistance of each earth station should not exceed 0.5 ohms.

For other earth-station, it shall be less than 0.2 ohms.

In case of higher resistance values, either the electrode shall be driven of more depth or to construct additional earth-pit assesblies at a distance minimum three meter apart to achieve the combined resistance less than or equal to the desired results as stated above.

Sizes of the G.I. Strips to be used :

- 1) 50 mm. x 6 mm. G.I. earth strip shall be used for connecting the earth-bus at meter room / meter box of chamber to be earth electrode pit.
- 2) 40 mm. x 6 mm. G.I. strip shall be used for interconnection of earth pits by directly buried underground system to a minimum depth of 600 mm. to form an earth grid.
- 3) 20 mm. x 3 mm. G.I. earth strip shall be used for connections between earth-bus and S.F. / M.C.B. / M.C.C.B. / E.L.C.B. units at meter room. Two pole units shall be connected with one such earth strip and three or four pole units shall be connected by two such earth strips.
- 4) 32 mm. x 6 mm. G.I. strip shall be used for horizontal air-termination network at terrace / roof level and for down covers to bond with earth-electrode pit through test-link.
- 5) The overlapping of strips at joints where necessary, shall be 75 mm. (minimum). The joints will be double riveted and then welded and painted with silver paint.

Equipment Earthing :

All apparatus and equipment transmitting or utilizing electric power shall be earthed in the following manner. Copper earth wires / strips shall be used where specified in B.O.Q.

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1) **Power transmission apparatus :**

- a) Metallic conduits shall not be accepted as an earth continuity conductor. A separate insulated earth continuity conductor or bar of the size 50% of the size of the phase conductor subject to the maximum as given below shall be provided.

Copper

Minimum 2.5 Sq.mm.

Minimum 6.5 Sq.mm.

Galvanized Iron

6 Sq.m..

200 Sq.m..

The earth continuity conductor may be drawn inside the conduit in which case it should be insulated.

- b) Armour of the cables shall be earthed by two distinct earth connections at both the ends to the armouring, the size of the connection being as for the metallic conduit.
- c) In case of unarmoured cable, an earth continuity conductor shall either be run outside along the cable or should form a separate core of the cable.
- d) 3 phase power panels and distribution boards shall have two distinct earth connections of the size co-related to the incoming cable size. In case of single phase D.B.'s and isolating switches 1 earth connection and in case of 3 phase, two distinct earth connections shall be provided, sizes being co-related to the sizes of incoming cables.

Testing :

The following earth resistance shall be measured with an approved earth-tester and recorded.

- 1) Earth resistance of each earth station.
- 2) Earthing system as a whole.
- 3) Earth continuity conductors.

Prohibited Connections :

Use of following as earth conductor is strictly prohibited for earthing an installation or ever as a link in the earthing system.

Neutral conductor, sprinkler pipes, gas pipes, water pipes, structural steel work, metallic enclosures or armour of cables and conductors, metallic conduits lighting protection system conductors are all prohibited to be used earth conductor.

Mode of measurement – as per schedule of quantity. However, the cost of earthing the following items shall become part of the item itself and no separate payment / rate of earthing these items shall be made.

- a) Motors – earthing forming part of cabling / wiring for the motors.
- b) Isolating switches and starters shall form part of mounting frame, switch starter etc.
- c) Fan lightings, Exhaust fan fittings Light fittings – These shall form part of installation of these fittings only.
- d) Conduit wiring cabling – shall form part of the wiring or cabling.
- e) Street Lighting – should form that of the street light pole.

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External Lighting :

The scope of the work covered the supply, installation and testing and commissioning of lighting poles, wiring to the fixtures, cable laying as specified and shown on drawings / B.O.Q. etc. All work shall be carried out as per NEC.

Standards :

The following standards and rules shall be applicable :

- 1) IS : 1913 – 1969 : General and safety requirements for light fittings.
- 2) IS : 1944 – 1981 : Code of Practice for Lighting Public through fares.
- 3) IS : 3528 – 1966 : Water Proof Electric Lighting fitting.
- 4) IS : 2713 – 1978 : Swaged type tubular poles.
- 5) IS : 2149 – 1970 : Luminaries for street lighting.
650 V.
- 6) Indian Electricity Act & Rules.
- 7) N.E.C.

All codes and standards mean the latest. Where not specified otherwise, the installation shall generally follow the Indian Standards Codes of Practice or the British Standard Codes of Practice in the absence of Indian Standards.

Lighting Poles :

The lighting poles shall be fabricated from heavy duty cold rolled street tubes to IS:2713 and hot dip galvanized or painted as specified. The pole shall have M.S. base plate and Junction Box a large access panel shall provide easy access to multiway porcelain connector and fuse board to be mounted inside the Junction Box. The access shall be specially fabricated with adequate reinforcement and weather gasket to prevent ingress of moisture and vermin proofed. Poles shall have large diameter entries for incoming and outgoing cables and two earth studs. The contractor shall make a drawing and have it approved before fabricated.

Cable Laying :

Cable shall be generally laid as specified in section "Cabling" cable shall be terminated in a 4-way terminal block inside the pole or attached therewith. Contractor shall mark out the cable route and get it approved before laying the cables.

Earthing :

All street lighting fixtures and poles shall be earth as specified under section "Earthing"

Mode of Measurement :

Each light fitting with lamp, control gear, earthing etc., shall be considered as one unit for measurement and payment. Each lighting pole, concreting, coping, base plate, earthing etc., shall be considered as one unit for measurement and payment. Wiring from terminal block to the light fitting shall be considered as one unit for measurement and payment. All cabling work shall be measured on the basis of unit length for supply and installation. The excavation and backfilling of cable trench, cable-termination in Junction Boxes or Terminal Box of the pole etc., shall not be measured separately.

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Power Panel Boards :

The salient features of construction of power panel boards shall be as follows :

- 1) Construction : Totally enclosed, dust and vermin proof conforming to IP-54 of IS:2147, free standing, floor mounting, single front compartment, cubicle extensible type at both ends.
- 2) Welded shall be fabricated with shipping sections bolted together. All such joints to be gaskets. Lifting lugs shall be provided.
- 3) Panel shall be fabricated out of CRCA Sheets 1.6 mm. thick for front and rear doors and cover. Bottom and top of the panel for cable glands and component, mounting plates shall be fabricated out of 2 mm. thick CRCA Sheets. Frame work – 2 mm. thick.
- 4) All doors to be hinged type except bus-bar chamber which shall be bolted type. Panel shall be flush door design suitable for access from front.
- 5) Fabricated panel shall undergo seven tank process and two coats of primer before giving Epoxy resin paint finish. Final colour shall be Shade No. 631 of IS:5. No welding or drilling shall be done on the panel after final painting.
- 6) Vertical bus-bars will be red from main horizontal bus-bars located at top. Panel compartment, bus-bar chamber and cable alley will be operated from, front. Depth of MCCB panel shall be 1000 mm. and the width of it shall be 7000 mm. The depth of the other section shall be minimum 500 mm. and width shall be 500 mm. vertical bus-bar chamber and cable alley width shall be 300 mm. Height of earth bus-bar chamber at the bottom shall not be less than 150 mm. Total height of the panel shall not exceed 2400 mm. Foundation channel shall be provided at the bottom and shall be of type MC 1000.
- 7) Bus-bars shall be electrolytic grade aluminium suitable for the current capacity as per BOQ and shall be supported by high quality FRP insulator of SMC type, to withstand short circuit of 500 KA at 415 Volts. Bus-bars shall be provided with heat shrinkable PVC sleeving with R, Y, B and neutral colour coding for identification. All bus-bar connections (nuts and bolts) shall be accessible so that they can be checked with normal tools.
- 8) In a blank compartment provided at the bottom, G.I. earth bus-bar of 50 mm. x 6 mm. run through entire length shall be provided and project outside in vertical. Formation with facility for connection earth strip at either terminals on opposite sides to connect external earth conductor. All accessible live terminals / portion of components shall be provided with shrouds.
- 9) Separate compartment shall be provided for each three phase feeder. Each feeder compartment shall be provided with three pilot lamps with red lens on each for indication of power supply.
- 10) Indicating lamps shall be panel mounting type with filament or Neon lamps. Filament type lamps shall be provided with series resistors to prevent short circuiting of control supplies on fusing of lamps filaments. The lens shall be easily replaceable from the front.

11) **Indication Instruments and Meters :**

These shall be provided as per BOQ and shall be 96 mm. square size suitable for flush mounting and zero adjustment from outside. All meters except KWN meter shall be AE make. KWN meter shall be GEC / IMP make.

- 12) Current transformers shall be bar primary cast type or dry type, and shall have short-circuit-time withstand rating equal to that of associated switchgear for 1 sec.

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13) **Push Buttons** : The push buttons shall be of the momentary contact to actuate for 10 Amp. At 240 V AC and 2200 V.D.C., provided with integral inscription plates engraved with their functions. They shall have required "NO" and "NC" contacts. Only "Siemens" or E.E. Push Buttons shall be used.

14) All HRC switch Fuse Units, Contactors, single phase preventive and O/L relays, indicating lamps will be only "Siemens", "English Electric" or "Havells" Brands only.

15) **Control and Selector Switches** :

The control switches and selector switches shall be of rotary type having enclosed contacts, adequately rated for application but with a minimum rating of 10 Amps, at 2400 V AC and at 220 V.D.C. the plates shall have clear position markings, control switches shall have momentary contacts, spring return to centre, with pistol grip handles, instrument and selector switches shall have stay-out contacts with oval knurled handles.

16) **Name Plates** : Main name plate shall be fixed at the top centre, name plate giving feeder details shall be provided and are to be fixed by screws. All labels / name plates shall be black plastic with white engravings of letters or minimum 6 mm. size.

17) **Internal Wiring** : All internal power wiring shall be done either stranded PVC Copper wire 2.5 sq.mm. size 1000 V Grade or strips of insulated copper conductor of adequate size.

Small wiring for control circuit shall be done with stranded Copper wire PVC conductor 1100 V Grade.

Each end of control cable shall be provided with identification Ferrules Yellow in colour with black letters.

All wiring shall be terminated on stud type terminal blocks through crimping sockets. Not more than 2 connection shall be made on any one terminal block. All spare auxiliary contacts of contactors shall be wired to terminal block.

18) **Terminal Blocks** :

Terminal blocks for power and control wiring shall be of reputed make stud type, with washers, nuts, and lock nuts, and identification mark. All adjacent terminals shall have insulating barriers. All power terminal blocks shall be rated for a minimum current of 300 Amps. Terminal blocks for controls and instrument circuit shall be rated for minimum 115 Amps., and shall be suitable to receive 100 Sq.mm. conductor. All sets of power control power terminal blocks shall be identified with engraved plastic labels, black background and white letters.

19) **Cable Terminators** :

Double compression type of brass cable glands mounted on gland plates shall be provided to receive and support all power and control cables entering the switchgear. Size of the cable gland shall be suitable for cables entering the switchgear. Cable gland shall have earthing facilities for earthing armour of the cable.

20) **Tariff Advisory Committee and CPRI Tested** :

The switchgear shall be approved by the TAC for fire insurance and CPRI tested for short-circuit test and enclosures test.

21) **Tests** :

Following tests shall be performed before shipped the switchgear panels to Site :

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- 1) high Voltage Test at 2.5 KV.
- 2) Insulation Resistance test before and after H.V. test, using 1000 V Meggar.
- 3) Operational Test.
- 4) Three sets of Test Certificates to be submitted.

22) **Documentation** :

Contractor shall arrange to get from Manufacturers and shall supply following drawings in quadruplicate for approval before starting manufacturing operations within 4 weeks from the LOI / date of order.

- a) General Agreement Drawings.
- b) Scheme and Wiring Diagram Drawings.
- c) Instructions and Service manual for all the Components.

Approval of drawings by Clients / Consultant does not relieve the contractor of the "Performance" of the panels.

After supply and installation and commissioning of the panels and switches Contractor shall submit 6 sets of the above documents of as built in panels.

23) **Air-Break Switches** :

For all places in this project : Metal Clad.

- 1) The air-break switches shall be of AC 23, heavy duty, quick make-quick break type as per IS : 4047.
- 2) Switches shall be capable of withstanding the mechanical and thermal stresses produced by overloads and short-circuits.
- 3) All switches of all rating shall have interlocks with the compartment doors. Switches 250 A and above shall be lockable in "OFF" position. All live parts shall shrouded. It shall be possible to intentionally defeat the interlocks if required.
- 4) Red indicating lamps shall be provided for "ON" indication.
- 5) Brands : Only L & T, Siemens English Electric, Hevels, controls and switchgear brands to be used.

The switches shall have the following standards rating :
32, 63, 100, 125, 200, 250, 300, 400 and 600 Amps.

24) **Fuses** :

The fuses shall comply with the following :

- 1) HRC Cartridge Fuse : Link type with carriers.
- 2) Certified rupturing capacity not less than 46 KA at 415 Volts A.C .as per IS : 2000.
- 3) All fuses shall have visible indication to indicate "Blown" condition.
- 4) Pressure clamp terminals for wires upto 4 sq.mm. and bolted lugs for higher ratings.
- 5) HRC Fuses:Make : E.E., L & T, Siemens, Havells.
- 6) Fuse Puller: Contractor shall supply 3 sets of Fuse Pullers.

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25) **Moulded case circuit breakers :**

M.C.C.B.

- 1) The M.C.C.B.'s shall be 4 pole construction wherever specified and shall have independent Manual opening and closing mechanism of quick make, quick break type and they shall be trip free in operation. "ON", "OFF" and "TRIP" mechanism shall be clearly indicated.
- 2) They shall conform to IS : 2516.
- 3) Bolted type neutral link will be provided with T.P. M.C.C.B. only.
- 4) It shall be possible to mount accessories on the M.C.C.B's like shunt trip, U.V. release, alarm contacts etc.
- 5) The M.C.C.B.'s shall have adjustable thermal / static trip devices.

26) **Contactors :**

- 1) The Motor starter contactors shall be of electro-magnetic type double break, non-gravity type rated for uninterrupted duty suitable for operation under AC – 3 utilization category of as per IS : 2959. The contacts shall be silver plated.
- 2) 2 Nos. and 2 NC auxiliary contacts shall be included.
- 3) The operating coils shall have Class "E" insulation of wire and shall be suitable for operation of any specified control supply systems.

27) **Thermal overload Relays :**

- 1) These shall be 3 elements, positive action, ambient, temperature compensated with a time lag and adjustable settings.
- 2) The setting range shall be selected according to the ratings of the motor.
- 3) The relay shall be self – reset type / hand reset type. The reset button in case of hand reset type – shall be fixed on the compartment door.
- 4) The relay shall have at least one "NO" and one "NC" or changeover contact or as per requirements.

- NB.
- 1) The contractor should obtain prior approval from Employer / Consultants before placing order for any specific materials. Employer may / delete any of the makes or brands out of the above list.
 - 2). All materials should conform to relevant standards and codes of BIS.
 - 3) Materials with I.S.I. mark shall be used duly approved by the Bank Of Baroda's Engineer / Architect.

If any material is found to be not up to the mark, the contractor will have to produce original bills/certificate from the manufacturer or his authorised Distributor for authenticity and genuineness of the material for consideration and as per make approved by the Bank/

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Architect. The same will not be considered for payment.

Note:

The materials Brands/ Make mentioned in the following List should be used ISI Mark Co. by the contractor and Rate quoted should be based on the same. In case of the brand / make is not available, material of other make should be used with prior approval of Architect and Bank.

<u>LIST OF APPROVED MANUFACTURERS FOR LT ELECTRICAL WORKS</u>		
S.N.	MATERIALS	APPROVED MANUFACTURERS
1	Moulded Case Circuit Breaker (MCCB)	i) Legrand ii) Schneider iii) Hager iv) Siemens i) Havells
2	Switch Fuse Unit (SFU)	i) L & T ii) Siemens iii) ABB
3	Power Contactors	i) L & T ii) Siemens iii) Schneider
4	Meters	i) HPL ii) IMP iii) L & T
5	Armoured LT cable	i) Polycab ii) Finolex iii) R R Kabel iv) CCI
6	Cable Termination	i) Dowells ii) Comet iii) Frontier Technologies
7	Cable Tray	i) Profab ii) Metalemmas iii) Asian Ancillary Corporation

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8	PVC Conduit & Accessories	i) Allied Conduits
		ii) SRG
		iii) New India Trading
9	Wires (FRLS only)	i) RR Kabels
		ii) Havells
		iii) Finolex
		iv) Polycab
10	MS Conduit & Accessories (ISI Mark).	i) BEC
	Medium - 1.6 mm thick.	ii) AKG
	Heavy - 2 mm thick.	iii) NIC
11	Modular Switches & Sockets with PVC Box	i) Legrand - (Arteor model)
		ii) MK - (Blenz model)
		iii) Schneider - (Zencelo model)
		iv) Elleys - (Fotolia model)
12	Distribution Board, MCB, RCCB & RCBO	i) Legrand
		ii) Schneider Hager
		iii) Hager
13	Data/ Voice Cable & accessories	i) D-Link
		ii) AMP
14	Light Fixtures	i) CG
		ii) Philips
		iii) CGL
		iv) Osram
		ii) Bajaj
		iii) Orient
		iv) Havells
15	Tubes, PL's & CFL's	i) Philips
		ii) Osram
16	Ceiling Fan	i) CG
		ii) Havells
		iii) Bajaj
17	Exhaust Fan	i) CG
		ii) Almonard
		iii) Alstom

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18	Speakers	i) BOSCH
		ii) Ahuja
19	Amplifier	i) BOSCH
		ii) Ahuja
20	Electrical LT Panel	CPRI Approved Panel Manufacturer Only.
21	Capacitors	i) Siemens
		ii) L & T
		iii) GE
		iv) ABB
		iii) Universal
21	CT'S / PT'S	i) AE
		ii) Kappa
		iii) Ricco
		iv) Rishabh
22	APFC Relay.	i) HPL
		ii) Emercon
		iii) Alstom
		iv) Beluk
		v) L & T
23	Contactora / Timer	i) Schneider
		ii) Hager
		iii) L & T
		iv) Siemens
		iv) Legrand
24	Energy Meters	i) Trinity
		ii) Schneider
		iii) L & T
		iv) Tecnic
		v) AE
		vi) HPL

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PREAMBLE TO SCHEDULE OF QUANTITIES

Note: While quoting rates for each item of work, the contractor shall include for the following irrespective whether it has been mentioned or not in the description of the item without any extra claim / payment.

1. All unexposed surfaces of timber (any variety) used shall be treated with necessary coats of wood preservative.
2. All exposed surfaces of timber (any variety) shall also have necessary coat of wood primer / putty and paint / polish as per description in the item.
3. Before making bulk quantities , the contractor shall make each of the item as sample and get it approved in writing from the consultants minor modification if and as suggested by the consultant the same shall have to be incorporated without any extra cost.
4. All exposed edges of ply board shall be fixed with cedar / teak wood lipping.
5. All fabrics / leatherite to be used shall cost Rs. 300/ - per meter unless otherwise specified in the item.

Difference in cost for approved sample shall be adjusted accordingly.

6. For furniture item where required whether mentioned or not shall be include providing an fixing of Brass / Power coated handles /knobs multipurpose locks, mini tower bolts ,ball catchers, hinges, screws and sliding rails etc.
7. Back of all storage, cabinets, and consoles shall be in 6mm commercial ply only.
8. Thickness of laminates to be used shall be 1 mm except where specified.
9. Ant termite treatment is to provide for all wood / board /ply used in the storage.

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18. Ant termite treatment is to provide for all wood / board /ply used in the storage.

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SECTION – A: MATERIALS

- 1) Material shall be of best approved quality obtaining and they shall comply with the respective Indian Standard Specification.
- 2) Samples of all materials shall be got approved before placing order and the approved sample shall be deposited with the Architect.
- 3) In case of non-availability of materials in metric sizes the nearest size in FPS units shall be provided with prior approval of the Architects for which neither extra will be paid nor shall any rebates be recovered.
- 4) If directed, materials shall be tested in any approved Testing Laboratory and the test certificates in original shall be testing including charges for repeated tests, if ordered, shall be borne by the Contractor.
- 5) It shall be obligatory for the Contractor to furnish certificate, if deemed by the Architects, from manufacturer or the material supplier that the work has been carried out by using their material and as per their recommendations.
- 6) All materials supplied by the Employer / any other Specialist Firms shall be properly stored and the Contractor shall be responsible for its safe custody until they are required on the works and till the completion of the work.
- 7) Unless otherwise shown on the Drawings or mentioned in the "Schedule of Quantities" or special specification, the quality of materials, workmanship, dimensions, etc., shall be as specified as hereunder.
- 8) All equipment and facilities for carrying out field tests on materials shall be provided by the Contractor without any extra cost.

a) **Cement** :

Cement shall comply in every respect with the requirements of the latest publications of IS: 269 and unless otherwise specified ordinary Portland Cement shall be used.

The weight of ordinary Portland Cement shall be taken as 1440 kg. per cu.m. (90 lbs. per C.Ft.). Cement shall be measured by weight and in whole bags, and each undisturbed and sealed 50 kg. bag being considered equivalent to 35 liters (1.2 c.ft.) in volume care should be taken to see that each bag contains full quantity of cement. When part bag is required cement shall be taken by weight or measured in measuring boxes.

No other make of cement but that approved by the Architects will be allowed on works and the source of supply will not be changed without approval of Architect in writing. Test certificates to show that cement is fully complying the specifications shall be submitted to the Architects and notwithstanding this, the Architect may at his discretion, order that the cement brought on site and which he may consider damaged or of doubtful quality for any reason whatsoever, shall be re-tested in an approved testing laboratory and fresh certificates of its soundness shall be produced.

Cement ordered for re-testing shall not be used for any work pending results of re-test.

Cement shall be stored in weather-proof shed with raised wooden plank flooring to prevent deterioration by dampness or intrusion of foreign matter. It shall be stored in such a way as to allow the removal and use of cement in chronological order of receipt i.e., first received being used first used. Cement deteriorated and or clotted shall not be used on the work but shall be removed at once from the site. However, allowing use of warehouse set cement shall be determined by the Architects.

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b) **Lime** :

Lime shall comply in every respect with the requirements of IS: 712 and shall be made from approved lime stone or Kankar and properly burnt. It shall be free from excess of unburnt Kankars or lime stone ashes or other extraneous materials and shall be stored in weather-proof sheds. Lime which has been damaged by rain, moisture, or air slacking shall not be used but shall be removed from the site of work forthwith. Lime shall be slacked with fresh water and screened through appropriate screens and stored and used within 14 days provided it is protected from drying out.

Field tests according to IS: 1624 shall be carried out from time to time to determine the quality of lime.

c) **River Sand** :

River sand shall conform to IS: 383 and relevant portion of IS: 515. It shall pass through a I.S. sieve 4.75 mm. (3/16 B.S.) test sieve, leaving a residue not more than 5%. It shall be from natural source i.e. only river or crushed stone screenings, if allowed, chemically inert clean, sharp, hard durable, well graded and free from dust, pebbles, clay, shale, salt, organic matter, loam, mica or other deleterious matter. The sum percentages of all deleterious substances shall be within acceptable limits. River sand shall not contain any trace of salt and it shall be tested and river sand containing any trace of salt shall be rejected.

The fine aggregate i.e. river sand for concrete shall be graded within limits as specified in IS: 383 and the fineness Modulus may range between 2.60 to 3.20.

The fine aggregate shall be stacked carefully on a clean hard dry surface so that it will not get mixed up with deleterious foreign materials. If such a surface is not available a platform of planks or corrugated iron sheets or brick floor or a thin layer of lean concrete shall be prepared.

d) **Fine & Coarse Aggregate** :

Shall consist of crushed or broken stone 95% of which shall be retained on 4.75 mm. IS tests sieve. It shall be obtained on crushing Granite, Quartzite, Trap, Basalt, or similar approved stones from approved quarry and shall conform to IS:383 and IS 515. Fine & Coarse aggregate shall be chemically inert when mixed with cement and shall be cubical in shape and be free soft, friable, thin, porous, laminated or flaky pieces. It shall be free from dust and any other foreign matter.

Gravel / Shingle of desired grading may be permitted as a substitute in part or full in plain cement concrete if the Architect is otherwise satisfied about the quality of aggregate. For all the R.C.C. works the size of coarse aggregate shall be 20 to 25 mm. and fine aggregate shall be 10 to 15 mm.

e) **Reinforcement** :

Reinforcement shall be of mild steel tested quality conforming to I.S. : 432-1966 and any other I.S. applicable or deformed bar conforming to IS:1786 and IS:1139 or hard drawn Fe 415 (Tor Steel) steel wire fabric conforming to IS:1566;1967.

All finished bars shall be free from cracks, surface flaws, laminations, jagged and imperfect edges.

f) **Bricks** :

Bricks shall generally comply with IS:1077 except in size which shall be classified as 1st and 2nd class. 1st class bricks shall be the best quality locally available table moduled, well burnt but not over burnt, have plain rectangular faces with parallel sides and sharp right angled edges, have a fine compact and uniform texture. The bricks shall be free from cracks, chips, flaws, stones or subsequent to soaking in water. It shall emit a clear ringing sound on being struck and shall not absorb water more than 20% by weight. Common building bricks shall have a compressive strength of 35 kg. / sqm unless otherwise specified for first class bricks.

g) **Neeru** :

Shall be made of Class "C" Lime (i.e. pre fat lime) as mentioned in IS: 712. It shall be slaked with fresh water then sifted and reduced to a thick paste by grinding in a mill. Neeru thus prepared shall be kept moist until used and no more than that can be consumed in 15 days shall be prepared at time.

h) **Surkhi** :

Shall be made by grinding well burnt bricks, brick bats, burnt clay balls, etc., the brick etc., to be used shall be prepared from selected clay. The quality shall conform to IS:1344.

Bricks bats, etc., shall be ground in mechanical disintegrator to a fine powder passing through IS Sieve No. 9 (2.36 mm.) with a residue not exceeding 10% by weight.

Surkhi for lime surkhi plaster shall be ground to fine powder in a mortar mill to pass through IS Sieve 150 micron (No. 100)

Surkhi shall be stored in a weather-proof shed on a brick paved platform.

i) **Water** :

Water for mixing cement / lime / surkhi mortar or concrete shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil, acid and injurious alkali, salts, organic matter and other deleterious materials which will either weaken the mortar or concrete or cause efflorescence or attack the steel in reinforced cement concrete. Water shall be obtained from sources approved by the Architect. Potable water is generally considered satisfactory for mixing and curing concrete, mortar masonry, etc., where water other than main source is used this shall be tested in an approved testing laboratory to establish its suitability. All charges connected therewith shall be borne by the Contractor.

j) **Timber** :

Timber shall be well seasoned and of the best quality Indian Teak of specified species viz., Dandeli, Balashah, Melabar, C.P.

Timber shall be considered as well seasoned, if its moisture content does not exceed the following limits.

a) Timber for frames	14%
b) Timber for planking, shutters, etc.	12%

The moisture content of timber shall be determined according to method described in paragraphs 4 of IS:287 for Maximum permissible moisture content of timber used for different purpose in different climatic zones.

In measuring cross-sectional dimensions of the frame pieces tolerance upto 1.5 mm. shall be allowed for each planed surface.

k) **Superior quality Indian Teak Wood :**

Superior quality Indian Teakwood means Dandeli, Balarshah, and Malabar Teak. It shall be of good quality and well seasoned. It shall have uniform colour, reasonably straight grains, and shall be free from large. Loose, dead knots, cracks, shakes, warp, twists, bends, borer holes, sap-wood or defects of any kind. No individual hard and should knot shall be more than 1 cm. in diameter and aggregate areas of all knots shall not exceed ½% of area of the piece. There shall not be less than 6 growth rings per 2.5 cm. width.

l) **1st Class Indian Teakwood :**

1st Class Indian Teakwood means C.P. and Bulsar teak of good quality and well seasoned. It shall have uniform colour, reasonably straight grains and shall be free from large. Loose dead knots, cracks, shakes, warp, twists, bends, sap-wood or defects of any kind. No individual hard and should knot shall be more than 2.5 cm. in diameter and aggregate areas of all the knots exceed 1% areas of the piece. There shall not be less than 5 growth tings per 2.5 cm. width.

m) **IInd Class Indian Teakwood :**

Shall be similar to first class Indian teak wood except that knot upto 4 cm. diameter and aggregate area of all knots upto 1 ½% of the area of the piece shall be allowed. There shall not be sapwood upto 15% is allowed.

n) **Flush Doors :**

All flush doors shall be solid core exterior grade unless otherwise specified and it shall generally confirm to IS:2202 and shall be fabricated as described under specification.

o) **Steel Windows and Doors :**

Steel windows and doors shall be fabricated of steel sections conforming to IS:226. They shall conform to IS 1038. Unless otherwise specified the details of construction etc., shall be as described under specification.

p) **Floor Tiles :**

Designer pre-cast concrete tiles and interlocking paver block, plain cement tiles, chequered tiles, mosaic tiles terrazzo tile shall conform to IS:1237. For neutral shade tiles grey cement shall be used. Tiles shall be compacted by mechanical vibration and hydraulically pressed. It shall be of choice shade and shall have desired pattern of chip distribution. The sizes of chips to cement in terrazzo or mosaic floor shall be as specified in IS:1237. The size and thickness of tiles shall be as approved by the Architect.

q) **Ceramic / Vitrified Tiles :**

White or coloured glazed tiles shall comply with IS:777 or relevant or latest I.S. code. It shall be from an approved manufacturer and shall be flat and true to shape. They shall be free cracks, crazing, spots, chipped edges and corners. The glazing and colour shall be uniform shade and unless otherwise specified the tiles shall be 6 mm. thick.

r) **Marbles :**

Marble slabs for flooring, dado veneering etc., shall be of kind specified in the item such as white or pink, Makrana, Chittor black, Bhanslana black, Jaisalmer yellow, Baroda green, Patiala (Pepsu) grey, etc., Marble from which slabs are made shall be selected quality, hard, sound dense and homogenous in texture and free from cracks, weathering, decay and flaws. Before starting the work the contractor shall get the sample of Marble slabs approved by the Architect.

The slabs shall be machine cut and machine polished.

s) **Kotah / Shahbad / Cudappa / Granite :**

Shall be of selected quality, hard, sound, dense, and of homogenous texture, free from cracks decay, weathering and flaws. Stone slabs shall be of uniform colour as approved by the Architect. They shall be machine cut and machine polished where specified and shall conform to the required size. Thickness shall be specified in the respective items.

t) **Glazing :**

Glass used for glazing shall be float glass of best quality, free from flaws, specks bubbles and shall be 2.9 mm. thick upto 0.60 x 0.60 mm. size and for larger size it shall be 4 mm. thick unless otherwise specified in the Schedule of Quantities.

The following type of glasses shall be used:-

- | | | |
|------------------------|----|------------------------------------------------------------|
| 1) For Office Building | .. | Clear glass or as specified in the Schedule of Quantities. |
| 2) Office (toilets) | | Clear or frosted |
| 3) Partitions | | Frosted |

u) **Asbestos Roofing & rain Water Pipes :**

All Asbestos pipes and fittings shall comply with IS:459 and shall be free from cracks, chipped edges of corners and other damages.

v) **Paints :**

Lime for lime wash, dry distemper, oil bound distemper cement primer, oil paint, enamel paint, flat oil paint, plastic emulsion paint, anti-corrosive primer, red lead, water-proof cement paint and exterior grade Acrylic Emulsion paint, cement paint, sand-tex matt shall be from an approved manufacturer and shall conform to the latest Indian Standard for various paints. Ready mixed paints as received from the manufacturer without any admixture shall be used, except for addition of thinner, if recommended by the manufacturer.

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w) **Mortar** :

Lime Surkhi Mortar :

Lime and surkhi shall conform to the specifications. It shall be composed of approved lime and surkhi in proportion of 1 lime to 2 surkhi mixed thoroughly. The ingredients shall be accurately gauged by measure and shall be well and evenly mixed together on a platform and water added to make it homogenous. When large quantities are required the mortar shall be mixed in a mechanical grinder.

Cement Mortar :

Cement mortar shall be of proportions specified for each type of work in the schedule. It shall be composed of Portland Cement and sand. The ingredients shall be accurately gauged by measure and shall well and evenly mixed together in a mechanical pan mixer, care being taken not to add more water than is required. No mortar that has begun to set shall be used. River sand shall be used unless otherwise specified.

If hand mixing is allowed, then it shall be done on pucca water-proof platform. The gauged materials shall be put on the platform and mixed dry. Water will then be added and the whole mixed again until it is homogenous and of uniform colour. Not more than one bag of cement shall be mixed at one time and which can be consumed within half an hour of its mixing.

Composite lime, cement, sand mortar :

The mortar shall be of proportions specified for each type of work in the schedule of quantities. It shall comprise of Portland cement, lime and sand. Lime shall be measured in gauge boxes similar to one used for measuring cement and sand to the proportion specified and sufficient water then added to it to form a thick slurry thus obtained shall then be added to dry cement and sand mixture and thoroughly mixed to make a workable homogenous mortar of uniform colour by adding more water if necessary. Mechanical mixers shall generally be used for mixing such mortars. If hand mixing is allowed it shall be done on pucca platform.

1) **Brick Work** :

Except walls of half-brick thickness or less, all brick work shall be measured in cubic meters.

Thickness of Wall:

Brick walls upto and including three bricks in thickness shall be measured in multiples of half-brick which shall be deemed to be inclusive of the mortar joints. Where fractions on half-bricks occur due to architectural or other reasons, the measurement shall be taken half-bricks.

For walling, which is more than three bricks in thickness, the actual thickness of the wall be measured to the nearest centimeter.

Honey-combed brick walling shall be given in square meters stating the thickness of wall and the pattern of honey-combing. Honey comb openings shall not be deducted.

Deductions:

No deductions or additions shall be made on any account for

- a) Ends of dissimilar materials (i.e. joists, beams, lintels, lofts, grinders, rafters, purlins, trusses, corbels, steps, etc.) upto 500 square centimeters in section.
- b) Opening upto 0.1 sq. in section.
- c) Wall plates, bed plates and bearing of slabs, chajjas and the like where the thickness does not exceed 10 cm. and the bearing does not extend over the full width of the wall.

2) **Wood Work:**

All work shall be measured net as fixed. No extra measurement will be given for shape, joints, splayed meeting styles of doors and windows and shall be measured in unit of square meters.

Area over the face inclusive of exposed frame thickness (excluding width of cover mould) shall be measured in case of door, windows and ventilators when frames are included in the item. Portions embedded in masonry or flooring shall not be measured. Where frames are measured separately mode of measurement shall be as per C.P.W.D. practice or IS:1200.

3) **Steel doors, windows, ventilators, louvers:**

Clear area over one face inclusive of exposed frame shall be measured. Holdfasts or portions embedded in masonry or flooring shall be measured.

4) **Steel rolling shutters and rolling grilles:**

Clear width between side jambs and clear height between floor and bottom of lintel / beam shall be measured. Hood shall not be measured separately. The rate should be inclusive of the cost of hood.

5) **Flooring, Skirting, Dado:**

Flooring shall be measured from skirting to skirting and where the wall surface are plastered or provided with Dado, it shall be measured from plaster to plaster or dado to dado.

6) **Plastering and Pointing:**

All plastering and pointing shall be measured in square meters unless otherwise described.

Net area of surface plastered shall be measured. No deductions will be made for ends of joints, beams, posts, etc., and opening not exceeding 0.5 sq.m. each and no additions shall be made neither for reveals, jambs, soffits, sills, etc. of these openings nor for finishing the plaster around openings, ends, of joists, beam and posts, etc.

Full deductions will be made for door, window and ventilator from each side with adding jambs for door, window and ventilator.

7) **Painting, White washing, colour washing and distempering:**

All painting work shall be measured in square meters.

Net are of surface painted shall be measured. No deductions will be made for unpainted surfaces of ends of joists, beams, posts etc., and opening not exceeding 0.5 sq.m. each and no additions shall be made for reveals, jambs, soffits, sills, etc., of these openings.

Full deductions will be made for door, window and ventilator from each side with adding jambs for door, window and ventilator.

No coefficient will be considered for painting over sponge finished or sandfaced plaster.

The following multiplying factors for obtaining equivalent areas shall be adopted.

No.	Description of works	How measured	Multiplying Factor
a)	Wood paneled framed ledged, braces and battened.	Measured flat (not girthed) including frame, edges, chawkats, cleats, etc., shall be deemed to be included in the item.	1 1/8 (for each side).
b)	Wood flush part paneled and part.	-- do -- glazed or gauzed.	1 (for each side).
c)	Fully glazed or gauzed or glazed louvered ventilators / window / door.	-- do --	1/4 (for each side).
d)	Fully venetioned of louvered (not with glazing).	-- do --	1 1/2 (for each side).
e)	Weather boarding.	Measured flat (not grithed supporting frame work shall not be measured separately).	1 1/8 (for each side).
f)	Trellis (or Jaffri) work one way or two way.	Measured flat overall, no deduction shall be made for opening (supporting members shall not be measured separately)	1 (for each side).
g)	Guard bars, balustrades, gratings, grille railings, grille partitions, etc.	--- do ---	1 (for painting all over).
h)	M.S. gates & open palisades fencing, door including standards, braces, rails, stays, etc.	See not below	1 (for painting over all).
i)	Steel rolling / alligator type shutters.	Measured flat over jambs, guides, bottoms, rails and locking arrangement etc. shall be deemed to be included in the item.	1 1/4 (for each side).
j)	Carved or enriched work.	Measured flat.	2 (for each side).
k)	Fully glazed or gauzed steel windows or partitions.	Measured flat.	1 1/4 (for all over).

Note :

The height shall be taken from the bottom of the lowest rail, if the palisades do not go below it (or from the lower end of the palisades, if they project below the lowest rail) upto the top of the palisades, but not upto the top of the standards, if they are higher than the palisades. Similarly for the gates, depth of roller shall not be considered while measuring the height.

Area painted over sand cement plaster, sponge finished / sand faced plaster / rough cast plaster area painted without considering any coefficient for painting over sand faced plaster

WOOD WORK

Timber used shall conform to specifications described under Materials, Doors, Windows, Ventilators, walls, Paneling, False Ceiling, etc., shall be in accordance with Architect's drawing in every detail and all joiner's work shall be accurately set out, framed and finished in a proper workman-like manner, frames of doors, windows and ventilators etc. and shutter styles and rails shall be best solid teak of quality specified in the schedule of quantities. The scantlings shall be accurately planed smooth, rebates, rounding and mouldings shall be made as shown on the drawings, patching or plugging of any kind shall not be allowed. Joints shall be simple, neat and strong. Framed joints shall be coated with suitable adhesive like glue or synthetic resin before the frames are put together. All mortice and tenon joints shall be fit and fully and accurately without wedging or filling. The joints shall be pinned with hard wood or bamboo pins of 10 mm. to 12 mm. dia. or rust resisting star shaped metal pins 8 mm. after the frames are put together and pressed in position by means of press. The frames are put together and pressed in progress of work by suitable boxing. All portions of timber abutting against or embedded in masonry or concrete shall be treated against termites by giving a coat of any approved wood preservative.

Unless otherwise specified all doors frames shall have six M.S. flat holdfasts and window frames shall have four holdfasts shall be provided to the ventilators, if directed. Size of holdfasts shall be 30 mm. x 40 mm. x 6 mm. M.S. flat bent to shape worth fish tail end and it shall be fixed to frame with sufficient number of screws as directed. When door / window frames are to be fixed to R.C.C. column or R.C.C. wall, holdfasts shall be substituted by suitable arrangements such as coach crews, rawl bolts etc., to secure frames to R.C.C. column or R.C.C. wall as directed by the Architect.

Frames and shutter shall not be painted or erected before being approved by Architect.

Paneled Shutter :

Panels shall be of pattern and size as shown on the drawings or as directed by Architect. Solid teak wood panels shall be in one piece wherever possible. Where two or more pieces are permitted, they shall be of equal width. Panels shall be framed into grooves made in styles and rails to the full depth of groove and faces shall be closely fitted to sides of groove.

Where panels specified are block board, it shall be solid core with teak internal lipping and of approved make.

Partly paneled and partly glazed shutter shall be similar to paneled shutters except that such parts as are directed shall be glazed with plain or ground glass as specified. Styles and rails shall be rebated 12 mm. to receive glass. Sash bars shall be moulded and rebated and mitered on sides to receive the glass which shall be fixed with putty and beads.

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Hardware Fittings :

Unless otherwise specified all hardware fittings and fixtures shall be supplied by the employer free of charge. However, the cost of fixing fittings shall be included in the rate quoted. The fixing shall be done in the best workman-like manner in accordance with the manufactures specifications. The Contractor shall be held responsible for working of all moving parts dependent on proper fixing. He will also be responsible for any breakage due to negligence during fixing or lack of protection before the building is handed over. The Contractor shall also take delivery of all hardware fittings etc., as and when supplied and arrange for safe storage etc.

Hardware required for fixing false ceiling, wall paneling etc., shall be arranged by the Contractor at his cost. Apart from the hardware fittings required for the joinery items, the Contractor shall have to fix all other items of hardware fittings to be supplied by the employer viz. coat / picture hooks, numerals, letters to denote buildings, hanging rods etc., as directed by the Architects.

Painting and polishing of wood work shall be as per specifications under respective heads.

Flush Doors :

All flush doors shall be solid core unless otherwise specified. It shall conform to the relevant specifications of I.S. 2202 and shall be obtained from approved manufactures. The finished thickness of the shutter shall be mentioned in the items. Face veneers shall be of the pattern and colour approved by the Architect and an approved sample shall be deposited with the Architect for reference.

The solid core shall be wood laminae prepared from battens of well seasoned and treated good quality wood having straight grains. The battens shall be of uniform size of about 2.5 cm. width. These shall be properly glued and machine pressed together, with grains of each piece reversed from that of adjoining one. The longitudinal joints of the battens shall be staggered and no piece shall be less than 50 cm. in length. Alternatively, the core shall be of solid teak particle board. Edges of the core shall be lipped internally with 1st Class teak wood battens of 4 cm. (1.5") minimum depth, glued and machine pressed along with the core.

The core surface shall then have two or three veneers firmly glued on each face. The first veneer (called cross band) shall be laid with its grains at right angles to those of the core and the second and the third veneers with their grains parallel to those of the core. The under veneers shall be of good quality, durable and well seasoned wood. The face veneers shall be of minimum 1 mm. thickness and of well matched and seasoned 1st class teak, laid along with grains of the core battens. The combined thickness of all the veneers on each face shall not be less than 4 mm. Thermosetting synthetic resin conforming to I.S. 303 or moisture-proof plywood grade MPF.I. shall be used in manufacture. In addition to internal lipping all doors shall have external lipping all round.

STEEL DOORS, WINDOWS, VENTILATORS ROLLING SHUTTER, M.S. GRILLES ETC.

Steel used in the manufacture of rolled steel sections shall not have more than 0.060 per cent of sulphur and 0.065 per cent of phosphorus. The carbon content shall not exceed 0.30 per cent and shall be of weldable quality. In all other respects, the rolled steel sections shall conform to I.S. 226-1955 and I.S. 1977-1962.

Frames shall be square and flat. Both the fixed and openable frames shall be constructed of sections which have been cut to length, mitred and electrically welded at corners. Sub-dividing bar units shall be tenoned and rivetted into the frames. All frames shall have the

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corners welded to a true right angle and welds shall be neatly cleaned off. Couplings, moulding and weather bar shall be provided as directed by the Architects.

Outer frames shall be provided with fixing holes centrally in the web of the sections and fixing screws and lugs shall be used for fixing the frame to masonry. Mastic cement shall be used for making the joints watertight.

Hinges shall be strong projecting type. If directed friction type hinges shall be used in which case windows shall not be fitted with peg stays.

Projecting type hinged shutter shall be fitted with bronze or brass peg stays, 30 cm. long with peg and brackets welded / rivetted to the frame or as stated under item.

All windows shall be provided with handles of brass or bronze or otherwise as stated under them.

Top hung ventilators shall be fixed with plain hinges rivetted / welded to the fixed frame. A brass or bronze peg stay 30 cm. long as in windows shall be provided or as stated under item.

Center hung ventilators shall be hung on two pairs of brass or leaded tin bronze cup pivots rivetted to the inner and outer frames of the ventilators to permit the ventilators to swing through an angle of approximately 85. The opening position of the ventilator shall be so balanced to keep it open at any desired angle under normal weather conditions. A bronze spring catch shall be fitted in the center of the top bar of the ventilator for the operation of the ventilator. This spring catch shall be secured to the frame with brass screws and shall close into a mild steel malleable iron catch plate rivetted or welded to outside of the outer ventilator frame bar. A brass cord pulley wheel in mild steel or malleable iron brackets shall be provided along with card eye.

The windows and ventilators shall be painted. All the steel surfaces shall be thoroughly cleaned free of rust, scale or dirt and millscale by picking or phosphating and before erection painted with one coat of approved primer and after erection painted with two finishing coats of synthetic enamel paint of approved shade and quality.

Glazing of specified thickness shall be provided on the outside of frames and unless otherwise specified, metal beading of approved shape, and section shall be used for fixing glasses. Special metal sash putty of approved make shall be used, if directed.

Rolling Shutters :

Shall be of approved manufacture suitable for fixing in the position ordered i.e. outside, inside, on or below lintel or between jambs. Shutters upto 12 sqm.(130 Sq.ft.)in area shall be manually operated or Push Up type while bigger sizes shall be of reduction gear type mechanically operated chain or handles.

These shall be consist of 8 gauge or as specified with 75 mm. (3") M.S. laths of best quality mild steel strips machine rolled and straightened with an effective bridge depth of 16 mm. (5/8") and shall have convex corrugation. These shall be interlocked together throughout their entire length with end locks. These shall be mounted on specially designed pipe shaft.

The spring shall be of approved make coiled type. These shall be manufacture from tested high tensile spring steel wire or strip of adequate strength to balance the shutters in positions. The spring pipe, shaft etc., shall be supported on strong M.S. or malleable cast iron brackets.

Both the side guides and bottom rail shall be jointless and of single piece of pressed steel.

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Top cover of shaft, spring etc., shall be of the same material as that of lath.
For rolling shutter with wicket-gate, night latch shall be provided free of cost.
The shutter and cover etc., shall be painted with one coat of anti-corrosive paint and two coats of synthetic enamel paint of approved quality and shade.

Collapsible Steel Gate :

It shall consist of vertical double channels at 10 cm. centers. The sizes of channels T-Section for top and bottom shall be as approved by the Architects. The gate shall be provided with necessary bolts, nuts, locking arrangements, stoppers and brass handles on both sides. The gate shall be painted with one coat of anti-corrosive paint before erection and two coats of synthetic enamel paint of approved quality and shade.

Wrought Iron Grilles :

Grilles shall be manufactured as per drawings and the welded joints shall be smooth. The grilles shall be painted with one coat of anti-corrosive paint before fixing and two coats of synthetic enamel paint of approved quality and shade.

Aluminium Doors, Windows, Ventilators & Partitions etc. :

These shall be obtained from approved and established manufactures and shall be of Aluminium alloy conforming to I.S. 733 and sections shall generally conform to I.S. 1948. These shall be fabricated as per the details drawings,

Frames for windows, ventilators etc., shall be square and flat. Both fixed and openable frames shall be constructed of section which have been cut to length, mitred and welded at corners. Sub-dividing bars shall be tenoned and rivetted into the frames. All frames shall have corners welded to a true right angle. For side hung shutters, hinges shall normally be of projecting type made of Aluminium alloy and rivetted / welded to frames. Handles, peg stays etc., or approved quality Aluminium or its alloy conforming to IS Specifications.

All types of shutters shall be fabricated, supplied and fixed as specified in the IS:1948. The rate shall include supplying and fixing all fittings and fixtures required for proper and safe operation.

The doors shall be fabricated by using standard aluminium alloy extruded sections as specified in IS:1948. The rate shall include supplying and fixing all fittings and fixtures including approved locking arrangement as directed.

All aluminium fabricated work shall be anodised to the British Standard 1616:1961 to give an anodised film of 25 micorn.

The Contractor shall take to stack the fabricated frames etc., on site under cover. They shall be handled with care, stacked on edge on level bearers and supported evenly. Before erecting, the frames coming in contact with concrete, masonry, plaster of dissimilar metals shall be coated with a coat of Zinc Chromate conforming to IS:104-1950. The Contractor shall cover all anodised finish work with a thick layer of clear transparent lacquer based on methacrylates or cellulose butyrate to protect the surface from wet cement during installation. This coating shall removed on completion. Before handing over, the aluminium work shall be washed with mild solution of non-alkali soap and water.

Glazing :

Glazing shall be approved specially quality glass of specified thickness and unless otherwise directed it shall be provided the exterior with metal beading.

FLOORING, SKIRTING, DADO AND STONE VENEERING

All flooring, skirting, dado and stone veneering etc., shall be executed strictly as per relevant IS Specification and in workman-like manner.

Indian Patent Stone :

Selection of materials, method of mixing, placing and compacting shall generally conform to the specifications under plain and reinforced cement concrete described earlier. A stiff mix consistent with workability shall be used.

Preparation of Surface :

Before the operation for laying topping is started the surface of base concrete shall be thoroughly cleaned of all dirt, loose particles coked mortar droppings and laitance if any, by scrubbing with coir or steel wire brush. Where the concrete has hardened so much that roughening of surface by wire brush is nor possible, the surface shall roughened by chipping or hacking at close intervals. The surface shall then be cleaned with water and kept wet for 12 hours and surplus water shall be removed by mopping before the topping is laid.

Laying :

The screed strips shall be fixed over the base concrete dividing it into suitable panels. Before placing the concrete for topping, neat cement slurry shall be thoroughly brushed into the prepared surface of the base concrete just ahead of the finish. Concrete of specified proportion and thickness shall be laid in alternate panels to required level and slope and thoroughly tamped.

Finishing the Surface :

After the concrete has been fully compacted it shall be finished by troweling or floating with neat cement rendering. Finishing operations shall start shortly after the compaction of concrete and the surface shall be troweled three times at intervals so as to produce a uniform and hard surface. The satisfactory resistance of floor to wear depends largely upon the care with trowelling is carried out. The time intervals allowed between successive trowellings is very important. Immediately after placing cement rendering, only just sufficient troweling shall be done to give a level surface. Excessive troweling in the earlier stages shall be avoided as this tends to bring a layer rich in cement to the surface. Sometime, after the first troweling, the duration depending upon the temperature, atmospheric conditions and the rate of the set of cement used, the surface shall be retrowelled to close any pores in the surface and to bring to surface and to scrape off any excess water in concrete or laitance. No dry cement shall be used directly on the surface to absorb moistures or to stiffen the mix. The final troweling shall be done well before the concrete has become too hard but at such time that considerable pressure is required to make any impression on the surface.

If directed by the Architect, approved mineral pigment shall be added to the rendering to give desired colour and shade to the flooring at no extra cost.

When instead of 1:2:3 or 1:2.5:3.5 mix, 1:2:4 is specified the topping shall be rendered with 1:1 cement mortar with a suitable mineral pigment, if directed, instead of cement only. If specified in the Schedule of Quantities, the flooring shall be machine polished as per the Architect's instructions.

Wherever the patent stone flooring is used as finishing on roof the joints shall be filled with an approved bitumastic filler in workman like manner.

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Ironite Topping :

Instead of finishing the top with rendering coat of 1:1 cement mortar, the top shall be finished with 12 mm. thick ironite topping. Unless otherwise specified, one part of ironite and four parts of ordinary cement by weight shall be mixed dry thoroughly. This dry mixture shall be mixed with stone grit 6 mm. (1/4") and down size or as otherwise directed in the ratio of 1:2 by volume and well turned over. Just enough water shall be added to this dry mix and mixed thoroughly well and laid to uniform thickness of 12 mm. and compacted. After initial set has started the surface shall be finished as directed.

Plain and Coloured Cement Tiles, Marble Mosaic and Terrazzo Tiles Flooring:

The tiles shall conform to IS : 1237 having the colour approved the Architect and the rate shall include provision of border tiles and tiles of different colours in pattern if directed. The mosaic topping of lighter shade tiles shall be made of White Cement with an approved shade pigment and neutral shade shall be of Grey cement with an approved shade pigment. The type of tiles shall be as specified in respective items.

The sub-grade shall be thoroughly wetted after cleaning of all dirt, laitance, and loose material. A bed of lime mortar consisting of one part of lime and two parts of sand shall be laid and properly leveled to an average thickness of 25 mm. and the surface shall be kept slightly rough to form a satisfactory key for tiles. Neat cement paste of honeylike consistency shall be spread over mortar bed, over such area at a time as would accommodate about 20 tiles. Tiles shall be soaked in water for 15 minutes and allowed to dry for the same duration. Tiles shall then be fixed with a thin coat of cement paste on back of each tile and then each tile being gently tapped with a wooden mallet till it is properly bedded and in level with adjoining tiles. Joints shall be fine and as imperceptible as possible.

After tiles have been laid in a room or a day's fixing work is completed, surplus cement grout that may have come out of the joints may be wiped off gently and joints cleaned. A

thin slurry of coloured cement matching to the colour of tiles shall be spread over it and rubbed so as to seal even a thinnest joint between the tiles and make it impervious and the flooring cured for 7 days. The tiles shall be polished and finished according to IS:1443.

Dado, Skirting and Risers:

Tiles shall conform to IS:1237 and shall be of approved design. The tiles shall be fixed near cement grout on a blacking coat consisting of 1:4 cement sand plaster of 15 mm. thick. The top and bottom junctions of tiles shall be rounded off neatly as directed. The joints shall be filled with matching shade coloured cement slurry. The surface shall be kept wet for 7 days and then polished with carborundum stone to obtain smooth surface and fine polish.

Shahabad / Tandur / Kotah / Cuddappa Stone Flooring :

The flooring shall be either with rough stone or machine cut and machine polished as specified in respective items and shall be of specified thickness and of approved quality and size, free from cracks and flakes and shall be uniform in colour with straight edges. The sides of machine cut and machine polished stone shall have perfect right angles and surface smooth. The stone slabs shall be laid and finished as described under plain cement or colour cement tiles on a bedding of 1:2 lime mortar 25 mm. (Average) thickness. The finished stone surface thus laid shall then be polished to the required degree as approved by the Architect.

In Dado, Skirting, Risers etc. :

Stone slabs shall be laid on backing plaster of cement mortar 1:4 of 15 mm. to 20 mm. thick and finished as described under plain and coloured cement tile dado.

Marble mosaic / Terrazzo in situ work in flooring, dado, skirting etc. :

The terrazzo / mosaic finish shall be laid on an under layer of thickness as specified in the respective items. The topping shall consist of a layer of marble chips of selected sizes, colour and design approved by Architect, mixed with cement with desired shade of pigment.

For lighter shade mosaic .terrazzo white cement shall be used and for neutral shade, grey cement shall be used. The proportion of terrazzo mix shall be three parts of cement one part of marble powder by weight. For every part of cement marble powder mix, the proportion of marble aggregate by volume shall be 1.5 parts unless otherwise specified.

The topping shall be mixed and laid in panels as described in IS:2114 and as per decorative designs prepared by Architects. The dividing strips of panels shall be Aluminium or as specified in the Schedule of Quantities. It shall be polished as specified in IS: 2114.

Broken Mosaic Flooring :

Broken mosaic finish shall be laid on an underlayer of thickness as specified in the item. Pieces of mosaic tiles shall be obtained from broken marble mosaic tiles of approved shade conforming to IS:1257. The sizes of pieces shall be suitable to obtain the desired pattern of flooring as shown on the drawings or as approved by Architect.

Broken pieces shall be thoroughly wetted before fixing them. Ordinary or coloured cement grout shall be spread on the bedding. Mosaic tile pieces shall be fixed piece by piece to the desired pattern. The flooring shall be laid to correct level and slopes and compacted by straight screed tamper. The grout shall cream upto the surface. The junctions of the flooring and the wall shall be rounded and the flooring shall be extended along the wall to about 15 cm. (6"). After the day's work, the surplus cement grout that may have come out of the joints shall be cleaned off. The flooring shall be cured for seven days and then polished with a machine as stipulated in IS:1443.

Broken China Mosaic :

Broken China Mosaic flooring shall be exactly as per broken mosaic tile flooring except that the broken pieces shall be of China of approved colour and manufacturer and the floor shall not be polished.

Marble Flooring:

Marble slabs shall be of the best Indian marble of White or other approved colour as specified in the item. They shall be hard, dense, uniform and homogeneous in texture. They shall have even crystalline grain and free from defects and cracks. The surface shall be machine polished to an even and perfectly plane surface and edges machine cut true to square. The rear face shall be rough enough to provide a key for the mortar.

No slab thinner than the specified thickness at its thinnest part. The sizes of the slabs shall be as specified in the respective items.

The slabs shall be laid as described under mosaic tile flooring in every respect.

White Glazed / Ceramic Tiles / Vitrified Tiles in Flooring and Dado :

White Glazed Tiles from an approved manufacturer conforming to IS:777 shall be used. They shall be of specified size and thickness. All specials viz. coves, internal and external angles, corners, beads etc., shall be used wherever directed. Underlayer of specified thickness and mortar of stipulated proportion shall be laid as described in marble mosaic flooring. Tiles shall be washed clean and set in cement grout and each tile being gently tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern. After the tiles have been laid, surplus cement grout shall be cleaned off.

The joints shall be cleaned off the grey cement grout with a wire brush or trowel to a depth of 5 mm. (3/16") and all dust and loose mortar removed. Joints shall then be flush pointed with white cement. The floor shall then be kept wet for seven days. After curing, the surface shall be washed with mild hydrochloric acid and clean water. The finished floor shall not sound hollow when tapped with a wooden mallet.

Scaffolding :

Scaffolding for carrying out plastering work shall be double steel scaffolding having two sets of vertical supports so that the scaffolding is independent of the walls.

Preparation of surface :

All putlog holes in brick work and junction between concrete and brick work shall be properly filled in advance. Joints in brick work shall be raked about 10 mm. if not raked out while constructing brick masonry work and concrete surface hacked to provide the grip to the plaster, if not hacked earlier projecting burns of mortar formed due to gaps at joints in shuttering shall be removed.

The surface shall be scrubbed clean with wire brush / coir brush to removed dirt, dust etc., and the surface thoroughly washed with clean water to remove efflorescence, grease and oil etc., and shall be kept wet for a minimum of six hours before application of plaster.

Neeru Plaster :

Cement mortar of specified proportion and thickness shall be prepared in small batches and applied to the wall surface / ceiling. To ensure proper thickness, gauged patches shall be made at 1.5 to 2 m. apart and the surface plastered true to line, level and plumb taking special care to finish jambs of windows, doors, wall returns, corners, junctions etc. A thin layer of neeru shall then be applied and rubbed into surface and finished by means of trowel until the surface is even and smooth. The surface shall be kept moist for seven days and then given a coat of white wash.

Sand-faced Plaster :

The surface shall be prepared as above.

The coat of cement mortar in proportion of 1:4 or as specified, shall be applied uniformly all over the surface to a thickness of 12 mm. and finished true to level and line and keys shall be formed on the surface. The surface shall be kept moist till the finishing coat is applied.

The finishing coat shall be applied a day or two after. The proportion of mortar for finishing coat shall be one part of cement and three parts of selected, well graded and washed sand, or as specified under item and it shall be applied in a uniform thickness of 6 mm. (1/4").

The surface shall be tapped to uniform grained texture by using sponge pads as directed. Curing shall start after 24 hours and the surface kept wet for seven days.

Rough Cast Plaster:

Except for the finishing coat the surface shall be prepared and base coat of plaster applied as under sand-faced plaster.

Finishing coat mortar shall be in proportion of one part of cement and one part of specially selected and graded sand and one part of gravel of 3 to 6 mm. size. It shall be flung upon the first coat with large trowel to form an even and decorative coat. The work shall generally conform to clause 16.5 of IS:1661-1960. The thickness of the coat shall be about 12 mm. (1/2"). It shall be cured for seven days.

Rough coat plaster with colour finish :

This finish shall be similar to Rough cast plaster above except a high grade mineral pigment of approved shade shall be mixed with white cement instead of ordinary grey cement while preparing the mortar.

Water-proofing Treatment :

Unless otherwise specified, the Contractor shall carry out waterproofing treatment of basements, terrace and water retaining structures through reputed firms having specialisation in the line and approved by the Architects. The Contractor shall also furnish full details of such treatment to the Architects and provide all information / proof etc., regarding the effectiveness of the treatment when called upon to do so. All such treatment shall have to be guaranteed in the form approved by the Employer for a minimum period of ten years. Any defects / leakages noticed during the guarantee period shall have to be rectified free of cost by the Contractor including reinstating the surface to its original condition and finish.

Water-proofing of sunk portions of floor slabs for baths, W.C. and kitchen moories etc., in residential buildings, unless otherwise specified, shall be done as specified in the schedule and shall generally comprise of :

- a) A coat of hot bitumen, min. 6 mm. thick screeded with stone grit.
- b) Min. 20 mm. thick cement plaster in cement mortar 1:3 with approved water-proofing cement compound as per manufactures specifications. The plaster shall be cured by pounding for seven days.

The rate for the above treatment shall include drying and cleaning surfaces free of dust etc., and wiping with kerosene before application of bitumen. The vertical faces and returns shall also be treated similarly. The actual area treated including vertical faces and returns shall be measured and paid for. The work should be done in such a way that the finished flooring in bath has a minimum slope of 20 to 25 mm.

PAINTING

General:

Wherever scaffolding is necessary, it shall be double scaffolding.

The surface shall be thoroughly brushed free from mortar droppings and foreign matter. All steel work shall be cleaned of loose rust, mill scales etc. so as to expose the original surface. All broken edges, cracks, loose plaster and wavy surface shall be brought up either by patch plaster work or by plaster of paris.

All materials viz., dry distemper, oil bound distemper, oil paint, flat oil paint, synthetic enamel paint, plastic emulsion paint, cement primer, red lead and other primers and metallic paints shall conform to respective I.S. specifications and shall be obtained from approved manufactures. All paints shall be brought on site in sealed thins in ready mixed form and shall be applied direct with the addition of thinner, if recommended by the manufacturers.

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White Washing:

White wash shall be prepared from lime slaked on spot, mixed and stirred with sufficient water to make a thin cream. This shall be allowed to stand for 24 hours and shall be screened through clean cloth. Four kg. gum dissolved in hot water shall be added to each cubic meter of the cream (115 gm. per cft.).

Blue shall be added to give required whiteness. The approximate quantity of water to be added in making cream shall be five liters per kg. of lime.

White wash shall be applied in specified coats by using flat brushes or spray pumps. Each coat shall be allowed to dry before next coat is applied. If additional coats than what have been specified, are necessary to obtain uniform and smooth finish, it shall be given at no extra cost.

The finished dry surface shall not show any signs of cracking and peeling nor shall it come off readily on the hand when rubbed.

If directed by the Architects one coat of chalk and glue shall be applied before application of white / colour wash at no extra cost.

Colour Wash :

Colour wash shall be prepared by adding mineral colours not affected by lime to white wash. No colour wash shall be done until a sample of the colour wash to the required tint or shade has been got approved from the Architects.

Colour wash shall be applied as specified under white wash.

Dry Distemper :

Shade shall be got approved from the Architects before application of distemper.

The surface shall be prepared as specified earlier. A primer coat using approved primer or sizing shall be applied. Distemper prepared as per manufacturer's directions shall be applied and each coat shall be allowed to dry before subsequent coat is applied. The finished surface shall be free from chalking when rubbed, even uniform and shall show not brush marks. If additional coats are necessary, they shall be given at no extra cost.

Oil Bound Distemper:

The surface shall be prepared as specified above. A primer coat of either cement primer or any approved distemper primer shall be applied.

After the primer coat has dried, the surface shall be lightly sand papered and dusted to make to smooth to receive distemper.

Distemper shall be prepared as per the directions of the manufacturer and conforming to shade approved. It shall be applied in specified coats, taking care to allow for drying of each coat before subsequent coats are applied.

Water-proof Cement Paint / Sand-tex matt Paint:

The surface shall be prepared as specified above and thoroughly wetted with clean water before water-proof cement paint is applied.

The paint shall be prepared strictly as per manufacturers specifications and in such quantities as can be used up in an hour of its mixing, as otherwise the mixture will set and thicken, affecting flow and finish.

The paint thus prepared shall be applied on clean and wetted surface with brush or spraying machine. The solution shall be kept stirred during the period of application. It shall be applied on the surface which is on the shady side of the building so that the direct heat of the sun on the surface is avoided. The completed surface shall be watered after the days work. Number of coats shall be as specified in the item.

Painting – Oil / Enamel / Plastic Emulsion etc. :

Ready mixed oil paint, flat oil paint, plastic emulsion paint, ready mixed synthetic enamel paint, etc., shall be brought in original containers and in sealed tins. If for any reason thinner is necessary, the brand and quantity of thinner recommended by the manufacturer or as instructed by the Architect shall be used. The surface shall be prepared as specified above and a coat of approved primer shall be applied. After 24 hours drying approved or specified quality paint shall be applied evenly and smoothly. A filler putty coating may be given to give a smooth finish. Each coat shall be allowed to dry out thoroughly and then lightly rubbed down with sand paper and cleaned of dust before the next coat is applied. Number of coats shall be as specified in the item and if the finish of the surface is not uniform, additional coats as required shall be applied to get good and uniform finish at no extra cost. After completion no hair marks from the brush or clogging of paint puddles in the corners of panels, angles or mouldings etc., shall be left on the work. The glass panes, floor etc. shall be cleaned of stains.

When the final coat is applied, if directed, the surface shall be rolled with a roller or if directed, it shall be stippled with a stippling brush.

POLISHING AND VARNISHING

French Polishing :

French spirit polish shall be of an approved make conforming to IS:348. If it has to be prepared on site, the polish shall be made by dissolving 0.7 kg. of best shellac in 4.5 liters of methylated spirit without heating. To obtain required shade pigment may be added and mixed.

Surface shall be cleaned. All unevenness shall be rubbed down smooth with sand paper and well dusted. Knots, if visible, shall be covered with a preparation of red lead and glue. Resinous or loose knots and gaps shall be filled with season timber pieces and make level with rest of the surface. Holes and indentations on surface shall be filled with putty made of whiting and linseed oil. Surface shall be given a coat of filler made of 2.25 kg. of whiting in 1.5 liter of methylated spirit. When it dries, surface shall again be rubbed down perfectly smooth with sand paper and wiped clean.

Piece of clean fine cotton cloth and cotton wool made into shape of pad shall be used to apply polish. The pad shall be moistened with polish and rubbed hard on the surface applying the polish sparingly but uniformly and completely over the entire surface. It shall be allowed to dry and another coat applied in the same way. To give finishing coat, the pad shall be covered with a fresh piece of clean fine cotton cloth, slightly dampened with methylated spirit and rubbed lightly and quickly with a circular motion, till the finish surface attains uniform texture and high gloss.

Wax Polishing :

Wax polish shall either be prepared on site or obtained readymade from market. Polish made on the site shall be prepared from a mixture of pure bees wax, linseed oil, turpentine oil and varnish in the ratio of 2:1.5:1:1/2 by weight. The bees wax and the boiled linseed oil shall be heated over a slow fire. When the wax is completely dissolved the mixture shall be cooled till it is just warm, and turpentine oil and varnish added to it in the required proportions and the entire mixture is well stirred.

Surface shall be prepared as described under French polishing except that the final rubbing shall be done with sand paper which has been slightly moistened with linseed oil.

Mixture or polish shall be applied evenly, with a clean cloth pad in such a way that no blank patches are left, and rubbed continuously for half an hour. When the surface is quite dry a second coat shall be applied in the same manner and rubbed continuously for an hour or until the surface is dry. Final coat shall then be applied and rubbed for two hours or more if necessary, until the surface has assumed a uniform gloss and is quite dry showing no sign of stickiness when touched. Gloss of the polish depends on the amount of rubbing, therefore rubbing must be continuous and with uniform pressure and frequent change in direction.

Varnishing :

Surface shall be prepared as described above. After preparation of surface, two coats of clean boiled linseed oil shall be applied at sufficient interval of time. After the linseed oil has dried two coats of varnish obtained from approved manufacturer shall be applied at sufficient interval of time. If the surface fails to produce the required gloss an additional coat shall be applied without any extra cost.

TECHNICAL SPECIFICATIONS FOR INTERIOR MATERIALS

1. GENERAL

This specification is for work to be done, item to be supplied and materials to be used in the works as shown and defined on the drawings and described herein, all under the supervision and to the satisfaction of the Competent Authority.

Competent authority means Architects / Engineer in charge.

- 1.1** The workmanship is to be the best and of high standard, use must be made of special trades men in all respects of the work and allowances must be made in the rates for doing so.
- 1.2** The materials and items to be provided by the contractor shall be approved by the Competent Authority in accordance with any samples which will be submitted for approval by Contractor and generally in accordance with the Specifications Also if products are specified in the catalogue reference, the contractor will be required to obtain the approval of the Competent Authority before using a materials. The Contractor shall produce all invoices, vouchers or receipts for any material if called upon to do so by the Competent Authority.
- 1.3** Samples of all materials are to be submitted to the Competent Authority for approval before the Contractor orders or delivers the materials at site. Samples together with the their packing are to be provided free of charge by the Contractor and should any materials be rejected, they will be removed from the site at the Contractor's expense. All samples will be retained by the Competent Authority for comparison with materials, which will be delivered at the site. Also, the Contractor will be required to submit specimen finishes of colours, fabrics etc. for the approval of the Competent Authority before proceeding with the work.
- 1.4** The contractor shall be responsible for providing and maintaining and boxing or other temporary coverage required for the protection of dresses or finished work if left unprotected. He is also to clean out all shelving's, out ends and other waste from all parts of the works before coverings or in-fillings are constructed.
- 1.5** Templates, boxes and moulds shall be accurately set out and rigidly constructed so as to remain accurate during they are in use.

- 1.6 All unexposed surface of timber e. g. false ceiling, backing fillets, backs of door frames, cupboard framing, grounds, etc. are to be treated with two coats of approved timber preservative before fixing or converging.
- 1.7 Only first class workmanship will be accepted. Contractor shall maintain uniform quality and consistency in workmanship throughout.

2. JOINERY:

- 2.1 Joinery is to be prepared immediately after the placing of the contract, framed up, bonded and waged up. Any portions that are wrapped or found with other defects are to be replaced before wedging up. The whole of the work is to be framed and finished in a workmen-like manner in accordance with the detailed drawings wrought and wherever required, fitted with all necessary metal ties, straps, belts, screws, glue etc. Running beaded joints are to be cross-tongued with teak wherever 1(1/2) thick double cross tongued. Joiners work generally to be finished with fine sand/glass paper.
- 2.2 **Joints:** All joints shall be standard mortise and tenon, dowel, dovetail, and cross-halved. Nailed or glued butt joints will not be permitted, screws, nails etc. will be standard iron or wire of oxidized nettle fold tenon should fit the mortises exactly.
- 2.3 Nailed or glued butt joints will not be permitted except in exceptional cases with approval of Competent Authority.
- 2.4 Where screws shown on a finished surface, those will be sunk and the whole plugged with a wood plug of the same wood and grain of the finished surfaces will be neatly punched and the hole filled with wood filler to match the colour.
- 2.5 Should joints in joiner's work open, or other defects arise within the period stated for defect liability in the contract and the clause thereof, be deemed by the Competent Authority to be due such defective joinery shall be taken down, and refilled, redecorated and/or replaced if necessary and any work disturbed shall be made good at the Contractor's expense.
- 2.6 Nails spikes and bolts shall be of lengths and weights approved by the Competent Authority. Nails shall comply with is 1959-1960 or equivalent approved quality sample. Brass-headed nails are to comply with B. S. 1210. Wire staples shall comply with B. S. 1494 or equivalent.
- 2.7 The contact surface of dowels, tennons wedges etc., shall be glued with an approved adhesive.
- 3 Where glued, joinery and carpentry work is likely to come into contact with moisture, the glue shall be waterproof.

3.0 HARDWARE AND METALS:

The hardware throughout shall be of approved manufacture or supplier well made and equal to in every respect to the samples to be deposited with the Competent Authority. The contractor may be required to produce and provide samples from many different sources before the Competent Authority takes decision and he should allow his rates for doing so.

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- 3.1 Fittings generally shall be brass oxidized, unless otherwise specified and shall be suitable for their intended purpose. In any case, it will have to be approved by Competent Authority before the Contractor procures it at site of work.
- 3.2 Screws are to match the finish of the article to be fixed, and to be round or flat headed or counter sunk as required.
- 3.3 The contractor should cover up and protect the brass and bronze surfaces with a thick grease or other suitable productive material, renew as necessary and subsequently clean off away on connection.
- 3.4 Aluminium and stainless steel shall be of approved manufacture and suitable for its particular application. Generally, the surface of aluminium shall have an anodized finish and both shall comply with the samples approved by the Competent Authority. All stainless steel sheets shall be 304 S. S. Japan or equivalent with gauge as specified but not thinner than 16G.
- 3.5 All steel, brass, bronze, aluminium and stainless steel articles shall be subjected to a reasonable test at the Contractor's expense.
- 3.6 All brazing and welds are to be executed in a clean and smooth manner rubbed down and left in the flattest and tidiest way, particularly where exposed.
- 3.7 Chromium plating shall be in accordance with I. S. Standard or as per approved specification for normal outdoor conditions and shall be on a base material of copper or brass.

4.0 GLAZIER:

- 4.1 All glass to be of approved manufacturer complying with IS 3548-1966 as per approved quality and sample to be of the selective qualities specified and free from bubbles, smoke, air holes and other defects.
- 4.2 Polished plate glass shall be "glazing glass" (G. G.) quality and that for mirrors shall be "silvering quality" (S.G.) conforming to IS 3438-1965 or as per approved sample and quality.
- 4.3 The compound for glazing to metal is to be a special non-hardening compound manufactured for the purpose and of a brand and quality approved by the Competent Authority.
- 4.4 While cutting glass, proper allowance be made for expansion. Each square of glazing to be in one whole sheet. On completion of work clean all glass inside and cut, replace all cracked scratched and broken panes and leave in good condition.

5.0 PAINT AND POLISHES:

- 5.1 All material required for the works shall be of specified and approved manufacturer, delivered to the site in the manufacturer's container's name or trade mark with a description of the contents and colour. All materials are to be stored on the site.
- 5.2 Spray painting with approved machines will be permitted only if written approval has been obtained from the Competent Authority prior to painting. No spraying will be permitted in the case of priming coats nor where the soiling of adjacent surfaces is likely to occur. The buzzer and pressure to be so operated as to give an even coating throughout to the satisfaction of the Competent Authority. The paint used for spraying is to comply generally with the specification concerned and is to be specially prepared

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by the manufacturer for spraying. Thinning of paint made for brushing will not be allowed.

- 5.3 Wood preservative shall be Solignum or other equal and approved impregnating wood preservative and all concealed woodwork shall be treated with wood preservative.
- 5.4 All brushes, tools, pots kettles etc. used in carrying out the work shall be clean and free from foreign matter and are to be thoroughly cleaned out before being used with a different type of class of materials.
- 5.5 All iron or steel surfaces shall be thoroughly scraped and rubbed with wire brushes and shall be entirely free from rust, mill scale etc. before applying the priming coat.
- 5.6 Surfaces of new wood work which to be painted are to be rubbed down, cleaned, down to the approval of the Competent Authority.
- 5.7 Surfaces of previously painted woodwork which are to be painted are to be cleaned down with soap and water, detergent solution or approved solvent to remove dirt, grease etc. Whilst wet the surfaces shall be flatted down with a suitable abrasive and then rinsed down and allowed to dry. Minor areas of defective paint shall be removed by scraping back to a firm edge and the exposed surface touched in with primer as described and soaked with putty. Where woodwork has been previously painted or polished and it is to be newly polished, with scrapping, burning off or rubbing down and making surface properly.
- 5.8 Surfaces of previously painted metal which shall be painted are to be cleaned down and flattened down as described in surfaces of any rust and loose scale shall be removed completely by chipping, scrapping and wire brushing back to the bare metal and touched in with primer as described.

5.0 UPHOLSTERY:

- 5.1 This will be of first class standard workmanship with webbing, no-sag springs, coiled springs, padding and filling as specified on drawing. Covering fabrics will be seen, tufted, and corded as shown on the drawing and as approved by the Competent Authority.
- 5.2 **Cushion Vents:** Brass "cushion Vents" should be installed at the back or under side or seat cushions (especially those covered in leather vinyl plastic or very tightly woven fabric) to allow air to escape easily and to prevent torn seems.
- 5.3 **Materials:** Finished timber shall be of the type specified. Furnishing fabrics, colour, pattern, substance to be as specified, no variations of this will be permitted unless with prior approval of the Competent Authority.

6.0 POLISH:

- 6.1 **French polish:** The basic material shall be shellac dissolved in mentholated spirit.

Preparation:

The timber must be well sanded and cleaned and the grain filled with grain filler. Any staining must be done before applying the polish.

Equipment:

The polishing rubber the most important implement in French polish shall consist of a pad of cotton wool, which acts as a reservoir for the polish, and a cover of soft white linen of cotton fabric, similar to a well-worn handkerchief which acts as a fitter.

The rubber must never be dipped into the polish; it should be charged by pouring the polish on to the pad with the cover removed.

Application:

Work evenly over the surface with a slow figure-of-eight motion until the timber is coated with a thin layer of polish. The object is to apply a series of thin coats, allowing only a few minutes for drying between the coats. When a level and even-bodied surface is obtained the work is ready for the second stage i.e. spiriting off.

Allow the work to stand for at least eight hours, then take a fresh rubber with a double thickness of cover material and charge it with mentholated spirit. The object of spiriting off into and remove the rubber marks and to give the brilliance of finish.

Finally, work in the direction of the grain and continue until the surface is free from smears and rubber marks then leave to harden off.

6.2 Wax polish:

Wax polish shall contain silicones and driers. A good silicon wax is to be used not a creamy or spray. The timber shall be sealed first with another finish such as Ron seal, before applying wax.

Application:

Apply coat of the sealer by brush or cloth direct to the unfilled timber, working it well in and finishing evenly with the grain. Allow to dry thoroughly then sand lightly with fine abrasive paper. Apply a heavy coat of wax by cloth on flat surfaces, with a stiff brush. Work it well into the timber and finish off by stroking with the grain before leaving to harden. Leave for four hours before rubbing up with a soft brush. Finally, buff the grain with a soft cloth.

6.03 Transparent Coloured Polyurethane (Melamine)

This shall be applied where natural grain of the wood is required to show. Polyurethane gives tough surface which resist chipping, scratching and boiling water.

Application:

Clean off all grease and wax with an abrasive and white spirit, this should not be applied in humid conditions. Apply the first coat, preferably of clear hard glaze with a cloth pad. Leave this to dry for at least six hours, then apply further coats with a paintbrush. If you wait for longer than 24 hours between coats, rub down the previous coat with fine glass paper or a medium grade of steel wool. Obtain a matt finish, if required, by giving a final coat of clear Reseal Matt coat.

7.0 TIMBER:

7.1 Only seasoned Teakwood to be used.

7.2 Use of Rose wood wherever specified.

7.3 All the wood shall be properly seasoned, natural growth and shall be free from worm holes, loose or dead knots or other defects, saw die square and shall not suffer warping, splitting or other defects.

7.4 The moisture content shall not exceed 12%.

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7.5 All internal frame work shall be treated with approved wood preservative.

7.6 All wood brought to site should be clean shall not have any preservative or other coating/covering.

7.7 All rejected decayed, bad quality wood shall be immediately removed from site.

7.8 All wood brought to site must be stacked-stored properly as per instructions.

8.0 PLYWOOD:

1.1 Plywood/medium density fibre board/teak practical board/ Veneer shall be as specified in the approved list of manufacturers shall be used.

8.2 Commercial ply shall conform I. S. I. 303 of approved make.

8.3 Marine plywood shall generally conform to generally I. S. 303 BWR or unless specified I.S.710-1980(BWP)

8.4 Particle board shall be phenol formaldehyde bonded and generally conform to I. S. 3087-1965.

8.5 Only 3mm to 4mm thick straight-grained groups matching approved veneers shall be used. No extra claim will be entertained for veneer if found of extra thickness.

MODE OF MEASUREMENT

1. Unless otherwise stated, all pipes shall be measured net, length as laid and measured overall fittings, such as bends, junctions, etc., and given in running meters. The length shall be taken along the center line of the pipes and fittings.
2. Length of fittings viz, taps, valves, traps etc., which are paid under appropriate items shall not be re-measured under linear measurements as enumerated above.
3. Soil waste and vent pipes shall be measured along the center line of the stack including the connecting bends/tees to W.C. Pan, Nahani trap, etc. and shall be paid as enumerated above.
4. W.C. Pans, Lavatory basins, Sinks, Drain boards, Urinals, Mirrors, Glass shelf Toilet paper Holder, shall be measured by number and shall include all accessories as enumerated in detail specification under each item.
5. Unless otherwise specified, all types of taps, valves, etc., shall be measured by number and paid separately.
6. Manholes, inspection Chambers, Gully traps, etc. shall be constructed according to detail specification and measured by number and paid separately. The depth of Manhole shall mean the vertical distance from the top of the Manhole cover to the outgoing invert of the main drain channel.
7. Water meter shall include Y strainer and other appurtenances required by the local bodies and shall include brick masonry chamber, etc., as per detailed specifications and item shall be measured by number and paid for accordingly or as per schedule of quantity.
8. Brick Wall will be measured as Length X Breadth X Height.
9. Tiling Dado will be measured as Length X Breadth.
19. Pantry Counter will be measured in Running Feet including Sink and white tile Dado below counter.
20. Vitrified Flooring shall be measured in Sq. Ft. ie; Length x Breadth.
21. Granite Flooring shall be measured in Sq. Ft. ie; Length x Breadth.
22. Italian Marble Flooring shall be measured in Sq. Ft. ie; Length x Breadth.
23. Decorative engraving Granite Flooring Pattern will be measured as per the design per No. as per the intricacy of the design.
24. Step / Riser of the staircase will be measured in Square Ft.
25. Step / Riser of the staircase will be measured in Square Ft.
26. Breaking of the existing work will be measured as Lump Sum as per the actual Quantity.
27. Fibred Glass Roofing will be measured as Length X Breadth of bottom surface only. (Curvature shall not be considered in the dimensions)

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28. Water proofing Coba on Terrace & Toilet Blocks will be measured as follows:
 - a) Depth upto 12" ht. Length X Breadth ie; in Sq. Ft. (Area of slab in plan.) Wata will not be calculated separately.
 - b) For Depth above 12" will be measured as Length X Breadth x Height ie; in CFt
20. Water Proof Plaster shall be measured in Sq.Ft. ie; Length X Height.
21. Bank Counter shall be measured in Running length along center of the depth of the counter.
22. Cash Counter shall be measured in Running length along center of the depth of the counter.
23. Tables shall be measured as per No.s Rate will vary as per the Size and finish ie; Laminate, Veneer, Corean Surface etc.
24. Partitions will be measured in Length x Height up to the soffit of the false ceiling including door frames and doors.
25. Low Height Partition will have additional Rate for top Moulding/ Laminate & shall be measured in Length x Height.
26. Panelling will be measured in Length x Height up to the soffit of the false ceiling Nitches will be measured separately as per the actual sizes.
27. Main Entrance Toughened Glass Door will be measured separately as Length x Height.
28. Wicket Gate will be measured as No. as per the Size.
29. Storage Units shall be measured in Length x Height. Rate varies as per the depth.
30. Sofa Set will be measured externally in Running Length including Arms.
31. Plaster of Paris/ Gypsum False Ceiling will be measured in Length x Breadth.
32. Aluminum Powder Coated/ G.I. / Acrylic / Wooden False Ceilings will be measured as Finished Length x Breadth.
33. Wall Curtains will be measured as finished Length x Finished Height.
34. Vertical/ Roller Blinds will be measured in actual size Length x Breadth.
35. Notice Boards/ Suggestion Box etc. will be measured per Unit No.s
36. Bank's Monogram/ Letters of various size in Steel/ Acrylic etc. will be measured as per No.

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PREAMBLE TO SCHEDULE OF QUANTITIES

Note: While quoting rates for each item of work, the contractor shall include for the following irrespective whether it has been mentioned or not in the description of the item without any extra claim / payment.

29. All unexposed surfaces of timber (any variety) used shall be treated with necessary coats of wood preservative.
30. All exposed surfaces of timber (any variety) shall also have necessary coat of wood primer / putty and paint / polish as per description in the item.
31. Before making bulk quantities , the contractor shall make each of the item as sample and get it approved in writing from the consultants minor modification if and as suggested by the consultant the same shall have to be incorporated without any extra cost.
32. All exposed edges of ply board shall be fixed with cedar / teak wood lipping.
33. All fabrics / leatherite to be used shall cost Rs. 300/ - per meter unless otherwise specified in the item.

Difference in cost for approved sample shall be adjusted accordingly.

34. For furniture item where required whether mentioned or not shall be include providing an fixing of Brass / Power coated handles /knobs multipurpose locks, mini tower bolts ,ball catchers, hinges, screws and sliding rails etc.
35. Back of all storage, cabinets, and consoles shall be in 6mm commercial ply only.
36. Thickness of laminates to be used shall be 1 mm except where specified.
37. Ant termite treatment is to provide for all wood / board /ply used in the storage.

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