NIT NO	DEL/R3 AO4/ 2025-26/26
DATE	20/12/2025

PART-A (TECHNICAL BID)

STATE BANK OF INDIA

INVITES E-TENDER

FOR

COMPOSITE WORKS (INTERIOR FURNISHING, ELECTRICAL & AC WORKS) FOR SBI NEW BRANCH AT SECTOR-40, GURUGRAM, HARYANA

CLIENT:

STATE BANK OF INDIA
Regional Business Office-3
First Floor, CRM Campus - 2,
Plot no – 79, Sector – 18,
Gurugram - 1220015

ARCHITECT:

VASTU SADAN PVT. LTD.
122A/12, G/F, GAUTAM NAGAR
NEW DELHI- 110049

INDEX

Notice Inviting Tender

State Bank of India invites online Tenders on item rate basis from the Bank's Empanelled Contractors / vendors / firms of Delhi Circle for Composite Works- Category - 50 Lakh for ***Interior Furnishing, Electrical & Air Conditioning Work at Sector-40 Branch, Gurugram, HR*** Details of tenders are as under:

1.	Name of Work	:	***Interior Furnishing, Electrical & Air Conditioning Work at Sector-40 Branch, Gurugram, Haryana***
2.	Estimated cost		***Rs.32,31,000/- (Rupees Thirty Two Lakh Thirty One Thousand only)***
3.	Time allowed for completion	:	***30 days*** *from date of handing over of the site.*
4.	Earnest Money Deposit	:	***Rs.32,000/- (Rupees Thirty Two Thousand only)*** *Online*
5.	Initial Security Deposit	:	*2% of the total value of the contract including Earnest Money.*
6.	Pre- Bid Meeting	:	*N/a.*
7.	Last date and time of receipt of Tenders	:	***26/12/2025 upto 3.00 p.m.***
8.	Address at which the Tenders are to be submitted	:	***Technical Bid:*** **State Bank of India, Region-3, First Floor, CRM Campus - 2, Plot no – 79, Sector – 18, Gurugram - 1220015** ***Price Bid:*** **Online.**
9.	Date and time of opening of Tenders	:	***26/12/2025 at 3.30 p.m.*** ***Technical Bid:*** **Online.** ***Price Bid:*** **Online which will be opened after scrutiny of Technical Bid.**
10.	Place of opening Tenders	:	**State Bank of India, Region-3, First Floor, CRM Campus - 2, Plot no – 79, Sector – 18, Gurugram - 1220015**
11.	Defects Liability Period	:	*12 months from the date of handing over of the project to the satisfaction of Bank.*
12.	Validity of Offer	:	*90 days from the date of opening the Tenders.*
13.	Liquidated Damages	:	*At the rate of 0.5% of the Contract Value per week which subject to a maximum of 5% of the accepted Contract Value.* *No tenders will be issued in the delay period.*

14	**Additional Performance Deposit (ASD) / Additional Performance Guarantee (APG)**		***Additional Security deposit (ASD)/ Additional performance Guarantee (APG) shall be applicable if the bid price is below 10% of the estimated cost put to tender. The amount of such ASD/ APG shall be the difference between 90% of estimated cost put to tender and the quoted price. ASD in the format of DD / Banker's Cheque / Bank Guarantee shall be submitted within 15 days of intimation of award of work / work order, without which the contractor will not be allowed to start the work and failure of submission of ASD will result in forfeiture of EMD and cancellation of tender. For e.g, if a contractor is quoting 15% below the estimated cost put to tender (i.e. 85% of the estimate), then ASD of 5% of estimated cost is required to be obtained from the contractor (90%-85%).***
15	**Important Note**		***The Bidders need to enclose list of ongoing works in SBI Delhi Circle with scheduled completion date as per NIT / work order. In case more than 2 works (under SBI Delhi Circle) are delayed beyond scheduled date of completion, such bidders themselves should refrain from participating in bidding process till their works are completed and renovated / completed works are handed over to the Bank. Such bidders may not qualify for the participation in bidding process and their price bid may not be opened at the sole discretion of the Bank.***

Mode of Submission of Tender: Online Mode

State Bank of India has the right to accept/reject any or all tenders without assigning any reasons. For E-Tender related queries: Service provider: M/s Antares Systems Limited, Registered Office at: - #24, Sudha Complex, 3rd Stage, 4th Block, Bangalore – 560079. Ph: - 080-49352000/40482000Fax:-080-49352034
Help Desk: Contact Person: Mr. Pravesh Mani / Mr Abhay / Mr. Sanu
Mobile no. 090443 14492/ 097089 66660/ 096864 49042
(E-mail:praveshmani.t@antaressystems.com

For any other queries, the vendors may contact, State Bank of India, RBO-3, AO- 4 NCR, HARYANA and /or Mr Pritam Singh Project Architect, - 9811208711, M/s. Vastu Sadan Pvt. Ltd.

State Bank of India has the right to accept / reject any or all tenders without assigning any reasons.

Vastu Sadan Pvt. Ltd.

SIGNATURE OF THE TENDERER **(For and behalf of State Bank of India)**

INSTRUCTIONS TO THE TENDERERS

1.0 **Scope of Work**

Sealed tenders are invited by State Bank of India for the ***Interior Furnishing, Electrical & Air Conditioning Work at Sector-40 Branch, Gurugram, HR***

1.1 **Site and its Location**

The proposed work is to be carried out at ***SBI Sector -40 Branch, Gurugram, Haryana.***

Tender Documents

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

Instructions to Tenderers

General Conditions of Contract

Special Conditions of Contract

Additional Specifications

Drawings

Price Bid

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 Condition of Contract

g) Instruction to Tenderers

2.3 Complete set of tender documents including relative drawings can be downloaded from e-tendering portal of the e-tendering service provider engaged by SBI.

2.4 The tender documents are not transferable.

3.0 **Site Visit**

3.1 The tenderer must obtain himself on his own responsibility and his own expenses all information and data which 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, liaison requirements with local authorities/ authorities maintaining the campus, security guarding the campus, traffic regulations in and around the site 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. 32,000/- (Rupees Thirty Two Thousand only)/-*** *in* Online Mode only.

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 tenderers will be refunded/ returned 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 contract value less EMD, by means of Demand Draft drawn in favour of State Bank of India payable at ***Gurugram, HR*** within a period of 7 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, 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 bills i.e., deduction from each running bill account will be 10% till total 3% of contract value is reached. 50% of the total security shall be paid to the contractors 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 provided he has carried out all the work and attended to all the defects in accordance with the condition of the contract and clearance, if any, of the observations of the CTE of CVC.

6.2 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 7 days from the receipt of intimation of acceptance of his tender by the Bank. However, the written acceptance of the tender 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 respects in accordance with the terms of contract within a period of **30 days** from the date of handing over of the site.

9.0 **Validity of Tender**

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

10.0 Liquidated Damages

The liquidated damages shall be 0.5% per week subject to a maximum of 5% of the accepted Contract Value.

11.0 Rate and Prices:

11.1 The tenderers shall quote their rates for individual items both in words and figures. In case of discrepancy between the rate quoted in words and figures the unit rate

quoted 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 total amount will be corrected.

11.2.1 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.

11.2.2 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.

11.3 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 Bank.

11.4 Each page of the BOQ shall be signed by the authorized person and cutting or over writing shall be duly attested by him.

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

11.5.1 The rate quoted shall be firm and shall include all costs, allowances, taxes, levies etc. and deduction at source for Income Tax; Work Contract Tax etc. will be made as per statutory rules.

11.5.2 The contractor shall be required to conduct necessary tests of the water brought from tube well or any other outside source, from approved laboratory.

11.5.3 The contractor is required to comply with all act of the Government relating to labour and the rules and regulations made there under from time to time and to submit at the proper times all particulars and statements required to be furnished to the appropriate authorities.

12.0 E-TENDERING INSTRUCTIONS TO TENDERERS

General

State bank of India hereby publishes the TENDER on e-tendering Portal in Electronic mode hereinafter referred as "e-tendering" and TENDER will be hereunder called as "e-Tender". The e-tender published online through portal (website) consisting of standard tender conditions, specifications, schedule of quantities, drawings (if any) for above referred work. Please note that copy of the above e-tender can be downloaded from portal (website) and should be mandatorily submitted in Online Electronic Mode hereinafter referred as "Online Offer". The submission of Online offer duly Encrypted & Digitally signed on above portal should be in prescribed Electronic Forms (Online) available on portal for respective tender in Online Envelope (s) on or before the key dates mentioned in the Tender Notice in this document and online portal for above tender.

Instructions:

Tender Bidding Methodology:

Electronically Sealed Bid System

Broad outline of activities from Contractor's prospective:

1. Procure a Digital Signing Certificate (DSC).
2. Register on the e-Procurement portal.
3. Create Users and assign roles on the above portal.
4. View Notice Inviting Tender (NIT) on the above portal.

5. Download Official Copy of Tender Documents from the above portal.
6. The contractor has to agree to the terms & conditions mentioned in the tender document online before proceeding further with filling in the data in the bidding schedules.
7. The contractor can fill in the data online & the same will be automatically redirected to the Technical or the BOQ envelope as the case may be.
8. The contractor can also upload any supporting document which he wants to or has been asked by the / Bank official against any particular bidding schedule.
9. All the bidding schedules which have been identified as mandatory by the Bank have to be filled in compulsorily. The system will not allow a contractor to make his final submission till all the mandatory bidding schedules are filled-in by the contractor.
10. The final submission of the response to the tender by the contractor will have to be done on or before the last date & time of the submission. Once the final submission is made by the contractor, it is equivalent to dropping the response in the electronic tender box. The contractor cannot make any change once the same is completed, unless with the permission of the /Bank official, on which he can withdraw his bid. The withdrawal of the bid can only be done before the last date & submission of the tender.
11. The contractor gets an online receipt (Date, Time & IP Address) on which he has made the final submission. This receipt will always be available on his respective login-id against the particular tender submission of the tender.
12. Attend Public Online Tender Opening Event (TOE) on the above portal– Opening of Technical-Part
13. Post-TOE Clarification on the above portal (Optional) – Respond to SBI's Post-TOE queries.
14. Attend Public Online Tender Opening Event (TOE) on the above portal – Opening of Financial-Part Only for Technical Responsive Contractor).

For participating in this tender online, the following instructions are to be read carefully. These instructions are supplemented with more detailed guidelines on the relevant screens of the above portal.

Digital Certificates

For integrity of data and authenticity/ non-repudiation of electronic records, and to be complaint with IT Act 2000, it is necessary for each user to have a Digital Certificate (DC) (as per the latest technical requirements) also referred to as Digital Signature Certificate (DSC).

Registration

To use the Electronic Tender portal, bidders need to register on the portal. Registration of each organization is to be done by one of its senior persons vis-a-vis Authorized Signatory who will be the main person coordinating for the e-tendering activities.

Bidding related Information for this Tender (Sealed Bid)

The entire bid-submission would be online on the portal. Broad outline of submissions are as follows:

· Submission of Bid Security/ Earnest Money Deposit (EMD)
· Submission of digitally signed copy of Tender Documents / Addendum
· Power of Attorney
· Two Envelopes
- Technical-Part
- Financial-Part

NOTE: Please note that above e-Tendering system is an automatically time locked system which will be locked immediately as soon as due date and time is over and will not accept any offer after that. So, the tenderers are strictly advised to do their process well before the due date and time to avoid any such instances.

Tender Opening Event (TOE)

The e-Procurement portal offers facility for 'Public Online Tender Opening Event (TOE)'. Tender Opening Officers as well as authorized representatives of contractor can attend the Public Online Tender Opening Event (TOE) from their offices. For this purpose, representatives of contractor duly authorized are to carry a Laptop and Connectivity to Internet. Legal requirements for a transparent and secure 'Public Online Tender Opening Event (TOE)' has been implemented on the portal. The portal has a facility of 'Online Comparison Chart' which is dynamically updated as each online bid is opened. The format of the chart is based on inputs provided by the Bank for each Tender. The information in the Comparison Chart is based on the data submitted by the Contractor. A detailed Technical and/ or Financial Comparison Chart is provided. The tender details and comparison statement / chart shall be downloaded by the tender opening authority and signed by SBI representative and contractor's representative if present and the hard copy in duplicate shall be supplied to the tender evaluating authority. The portal has facility of a detailed report titled 'Minutes of Online Tender opening Event (TOE)' covering all important activities of 'Online Tender Opening Event (TOE)'.

IMPORTANT NOTE: In case of internet related problem at a contractor's end, especially during critical events' such as – a short period before bid-submission deadline, during online public tender opening event, during e- reverse auction etc., it is the contractor's responsibility to have backup internet connections.

Minimum Requirements at Contractor's end

In order to operate on the electronic tender management system, the user's machine is required to be set up. The machine must have running required version of Windows. Also contractors need to install prescribed web browser and latest Version of Java. For details regarding exact system hardware configurations' and softwares and any other technical information in regards to the e- tendering portal, contractors may contact our e- tendering service provider, **M/s Antares Systems Ltd.**

ANNEXURE-A

FORM OF TENDER

To

Regional Manager
State Bank of India,
Regional Business Office -3,
First Floor, CRM Campus - 2,
Plot no – 79, Sector – 18,
Gurugram - 1220015

Dear Sir,

Reg.: ***Interior Furnishing, Electrical & Air Conditioning Work at Sector -40 Branch, Gurugram, HR***

1. I / We refer to the tender notice issued by you for Interior & Furnishing works and allied works in connection with the above.

2. I / We hereby offer to perform, provide, execute, complete and maintain the works in conformity with the drawings, designs, conditions of contracts, specifications, schedule of quantities relating to the works for the sum of Rs…….. at the respective rates quoted in the schedule of quantities.

3. I / We have satisfied myself / ourselves as to the site conditions, examined the drawings and all aspects of the tender conditions, subject to above, I / We do hereby agree, should this tender be accepted in whole or in part, to:

a. Abide by and fullfill all the terms and provisions of the said conditions annexed here to,

b. Complete the works within **30 days** as per the work programme enclosed with the tender in two or three shifts if considered necessary by the Employer at no extra cost to the Employer.

4. I / We have deposited an earnest money of **earnest money** of ***Rs. 32,000/- (Rupees Thirty Two Thousand only)/-*** in the form of Demand Draft / Banker's Cheque drawn in favour of State Bank of India payable at ***Gurugram, HR*** respectively which, I / We note, will not bear any interest and is liable for forfeiture.

   I. If our offer is withdrawn within the validity period of acceptance by the Employer.

   Or

   II. If the contract agreement is not executed by us within 7 days from the date of receipt of the letter of acceptance.

   Or

   III. If we fail to pay the initial security deposit as stipulated.

   Or

   IV. If the work is not commenced within 3 days after issue of work order.

5. I / We understand that you are not bound to accept the lowest or any tender you receive.

The names of **DIRECTORS** of our Firm are:

1. _____

2. _____

3. _____

4. _____

Yours faithfully,

Signature ……..

Designation ……..

Name of Partner / Director of the Firm, authorized to sign or name of person having power of attorney to sign the contract. (Certified true copy of power of attorney should be attached)

Signature and address of witnesses:

a. Signature ……

Name ……..

Address ……..

b. Signature……

Name …….

Address …….

AGREEMENT

This agreement made on the _____day of _____Two Thousand _____ BETWEEN State Bank of India a corporation constructed under the State Bank of India Act, 1955 and having its ***RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** and many other places, (hereinafter called "the Employer") of the one part and M/s _____ through its _____ having its registered office at _____ (hereinafter called "the Contractor") of the other part.

WHEREAS the Employer is desirous of executing Certain Works to be carried out *i.e.* ***Interior Furnishing , Electrical & Air Conditioning Work at Sector -45 Branch, Gurugram, HR*** as per Schedule-I, to this agreement and has caused Drawings, Bills of Quantities and Specification describing the work to be done, prepared by ***M/s Vastu Sadan Pvt. Ltd., 122A/12, G/F, Gautam Nagar, New Delhi- 110049*** (hereinafter referred as "Architects").

AND WHEREAS the said Drawings, the Bills of Quantities marked pages _____ to _____ (inclusive) and the Specifications as stated have been signed by or on behalf of the parties hereto:

AND WHEREAS the Contractor has agreed to execute the work upon the Conditions of Tender and the Conditions of Contract and further subject to the Special Conditions set forth in Schedule-II hereto attached (hereinafter collectively referred to as "the said Conditions") as per the said Drawings and as described in the said Specification and included in the said Bills of Quantities for the sum of Rupees _____

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the sum of Rupees _____ to be paid at the time and in the manner set forth in the said Conditions, the Contractor shall upon and subject to the said Drawings and described in the said Specification and Bills of Quantities.

2. The Employer shall pay to the Contractor the said sum of Rs._____ _____ _____ or such other sum as shall become payable hereunder at the times and in the manner specified hereinafter.

3. The term "Architects" in the said conditions shall mean ***M/s Vastu Sadan Pvt. Ltd., 122A/12, G/F, Gautam Nagar, New Delhi- 110049*** or in the event of their ceasing to be Architects for the purposes of this Contract, such other persons as shall be nominated for that purpose by the Employer, not being a person to whom the contractor shall object for reasons considered to be sufficient by the Employer mentioned in the said Conditions. Provided always that no persons subsequently appointed to be Architect under this Contract shall be entitled to disregard or overrule any decision or approval or direction given or expressed by the SBI for the time being.

4. The said Conditions, Specifications and Priced Bills of Quantities shall be read and construed as forming part of this agreement, and the parties hereto shall respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their parts respectively in such Conditions, Specifications and Priced Bills of Quantities contained.

5. This agreement is subject to jurisdiction of courts in **Gurugram, HR** only.

6. *The* ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** shall exercise powers on behalf of the said Employer for the purpose of the Contract Agreement.

7. Whereas both the parties agree to sign the following annexure Annexed to this Agreement in token of their acceptance.

(i) Agreement

(ii) General Conditions of contract.

(iii) Special Condition of Contract.

(iv) Safety Codes.

(v) Specifications.

(vi) Material Testing & Their Frequency.

(vii) List of Approved Makes/ Brands

(viii) Priced Bill of Quantities.

(ix) Drawings.

8. The Bank shall pay the contractor such sum as shall become payable hereunder at the times and in the manner specified in the said Conditions mentioned in the General Conditions of Contract.

9. Whereas the Contractor hereby undertakes and agrees to carry out and complete the works within ***30 days*** from the date of handing over site or 15 days from the date of issue of letter of acceptances, whichever is later. The Contractor agrees and has deposited the sum of Rs. _____ by way of Initial Security Deposit for due fulfillment of this Contract for the Works. It is agreed that the Security Deposit shall be deducted from each running bills and refunded to the contractor as per clause 2 of the General Conditions of the Contract Annexed herewith.

10. Whereas it is agreed that the earnest money amounting to ***Rs. 32,000/- (Rupees Thirty Two Thousand only)/-*** deposited by the Contractor in the form of Demand Draft along with the tender shall be forfeited in full in case the Contractor does not remit the Initial Security Deposit within the stipulated period of the start of the works by the stipulated date mentioned in the award letter.

11. Whereas Shri _____ is the accredited representative(s) of the Contractor who would be responsible for taking instructions from the Employer in relation to the Works. The Contractor agrees to pay Sales Tax or any other Tax on material or finished works like Works Contract Tax, Turnover Tax etc. including Income Tax in respect of this Contract of the Works and the Employer will not entertain any claim whatsoever in this report nor the Employer shall be responsible to pay any Tax as mentioned above. If due to non – payment of any of the aforesaid Tax or other Taxes connected with the Works, the Contractor suffers any loss or damages occurred to the Contractor and the Employer will be entitled to claim damages from the contractor for non completion of the Work within ***12 calendar months*** stipulated in Para 9, above.

12. Whereas the Contractor hereby declares the list of all the relative working with the Employer which is annexed herewith.

OR

Whereas the Contractor declares that none of his relative is working with the Employer.

OR

Whereas the Contractor declares that he has associated himself with the agencies of the appropriate classes of person for Sanitary and Water Supply Installation etc. or any other specialized job to complete the works.

The Plans, Drawings, Specifications, Contract Documents and the Documents above mentioned shall form basis of this Contract and the decision of ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** for the time being as mentioned in the Conditions of Contract in reference to all matters of dispute as to material, workmanship or account and as to the intended interpretation of the clauses of the Agreement or any of the document attached hereto shall be final and binding on both parties and may be made rule of the court.

13. The work comprises of the ***Interior Furnishing , Electrical & Air Conditioning Work at Sector -45 Branch, Gurugram, HR*** as mentioned above and all subsidiary and other works connected therewith on the same site as may be ordered to be done from time to time by ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** for the time being even though such works may not have been shown on the, Plans or described in the said Specifications or Schedule of Quantities of various classes of Work to be done.

14. The Employer through the ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** *reserves* himself the right of altering the Plans, Drawings and nature of Work of adding to or omitting any items of work or having portions of the same carried out departmentally or otherwise and such alterations or variations shall be carried out without prejudice to this Contract.

15. All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen in **Gurugram, HR** and only the courts of **Gurugram, HR** shall have jurisdiction to determine the same.

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

In Witness whereof the parties above named have executed these presents today and year first hereinabove written.

Signed, Sealed and Delivered by:

Authorised Representative of Employer

Authorised Representative of Contractor

SCHEDULE I

Interior Furnishing, Electrical & Air Conditioning Work at Sector -45 Branch, Gurugram, HR all as described in Tender and Drawings inclusive hereto as Specifications.

SCHEDULE II

The following Letters/ Correspondence form a part of Agreement:

1.
2.
3.

As witness our hands the day and year first written above,

In presence of

Signature:	Signature by the said Employer
Name:	Name:
Occupation:	Designation:
Address:	Address:

In presence of

Signature:	Signature by the said Contractor
Name:	Name:
Occupation:	Designation:
Address:	Address:

GENERAL CONDITIONS OF CONTRACT

1.0 Definitions:

"Contract means the documents forming the tender and the acceptance thereof and the formal agreement executed between State Bank of India (client) and the contractor, together with the documents referred therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the 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 'SBI/ Bank' shall mean State Bank of India (client) having its Corporate Centre at State Bank Bhavan, Madame Cama Road, Mumbai-400 021 and includes the client's representatives, successors and assigns.

'Architects/Consultants' shall mean ***M/s Vastu Sadan Pvt. Ltd., 122A/12, G/F, Gautam Nagar, New Delhi- 110049.*** 'Site Engineer' shall mean an Engineer appointed by SBI as their representative to give instructions to the contractors.

1.1.2 'The Contractor' shall mean the individual or firm or company whether incorporated or not, undertaking the works and shall include legal personal representative of such individual or the composing the firm or company and the permitted assignees of such individual or firms of company.

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

1.1.3 'Engineer' shall mean the representative of the SBI.

1.1.4 'Drawings' shall mean the drawings prepared by the Architect and issued by the Architect and referred to in the specifications and any modifications of such drawings as may be issued by the Architect from time to time. 'Contract Value' shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions thereto or deductions there from as may be under the deductions there from as may be made under the provision herein after contained.

1.1.5 'Specifications' shall mean the specifications referred to in the tender and any modifications thereof as may time to time be furnished or approved by the Architect. "Month" means calendar month.

1.1.6 "Week" means seven consecutive days.

1.1.7 "Day" means a calendar day beginning and ending at 00 Hrs. and 24 Hrs. respectively.

2.0 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. 32,000/- (Rupees Thirty-Two Thousand only)/-*** in Online mode only. 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 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 SBI or after it is accepted by the SBI 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 D/D drawn on any scheduled Bank and shall be deposited within 7 days from the date of acceptance of tender.

c) Retention Money:

Besides the ISD 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. the ISD plus Retention Money shall both together not exceed 5% of the contract value. 50% of the total security deposit shall be refunded to the contractor without any interest on issue of Virtual Completion certificate by the SBI. The balance 50% of the total 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.

d) 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 correspondence 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 in strictly accordance with this contract and with the directions of and to the satisfaction of the Bank to be communicated through the Architect. The Architect at the directions of the Bank from time to time issue further drawings and / or written instructions, details directions and explanations which are hereafter collectively referred to as SBI's instructions in regard to the variation or modification of the design, quality or quantity of work or the addition or omission or substitution of any work. Any discrepancy in the drawings or between the BOQ 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-execution of any work executed by him. The dismissal from the work of any person employed / engaged thereupon.

5.0 i) Letter of Acceptance:

Within the validity period of the tender, the Bank shall issue a letter of acceptance either directly or through the Architect by registered post or otherwise depositing at the address 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 binding contract between the SBI and the contractor.

ii) Contract Agreement:

On receipt of intimation of the acceptance of tender from the SBI / Architect the successful tenderer shall be bound to implement the contract and within **seven days** thereof he shall sign an agreement in a non-judicial stamp paper of appropriate value.

6.0 Ownership of Drawings:

All drawings, specifications and copies thereof furnished by the SBI through Architect are the properties of the SBI. They are not to be used on other work.

7.0 Detailed Drawings and Instructions:

The SBI through Architect shall furnish with reasonable promptness additional instructions by means of drawings or otherwise necessary for the proper execution of work. All such drawings and instructions shall be consistent with the contract documents, true developments thereof and reasonably inferable there from.

The work shall be executed in conformity therewith and the contractor prepare a detailed programme schedule indicating therein the date of start and completion of various activities on receipt of the wok order and submit the same to the SBI through the Architect.

8.0 Copies of Agreement

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

9.0 Liquidated Damages:

If the contractor fails to maintain the required progress in terms of clause 30 of GCC 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 SBI on account of such breach to pay a liquidated damages at the rate of 0.5% of the contract value per week which is subject to a maximum of 5% of the contract value.

10.0 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 of 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 SBI / Architect he shall be removed from the site immediately.

11.0 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 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 Architect in writing under intimation of the SBI. 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 SBI any legal actions arising there from.

12.0 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 before proceeding with the work. If at any time any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout had been approved by the Architect the contractor shall be responsible for the same and shall at his own expenses rectify such error, if so, required to satisfaction of the SBI/ Architect.

13.0 Protection of Works and Property:

The contractor shall continuously maintain adequate protection of all his work from damage and shall protect the SBI'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 26.0 at his own cost. The policy may take in joint names of the contractor and the SBI and the original policy may be lodged with the SBI.

14.0 **Inspection of Work:**

The SBI/ Architect 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 SBI/ Architect and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorised by the SBI 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 organisation a wing of Central Vigilance Commission.

15.0 **Assignment and Subletting**

The whole of work included in the contact 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 thereof or interest therein without the written consent of the SBI 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.

16.0 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 instructions and shall be subject from time to time to such tests as the Architect 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, labour, and materials as are

normally required or examining measuring sampling and testing any material or part of work before incorporation in the work before incorporation in the work or testing as may be selected and required by the Architect.

ii) **Samples**

All samples of adequate numbers, size, shades and 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 Architect. Before submitting the sample / literature the contractor shall satisfy himself that the material / equipment for which he is submitting the sample / literature meet with the requirement of tender specification. Only when the samples are approved in writing by the Architect the contractor shall proceed with the procurement and installation of the particular material / equipment. The approved samples shall be signed by the Architect for identification and shall be kept on record at site office until the completion of the work for inspection / comparison at any time. The Architect 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 / expenditure required for the tests 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 Architect which is either

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 Architect 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.

17.0 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 form nay risks or from the entire responsibility for the fulfillment of contract.

18.0 Contractor's Superintendence

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

19.0 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 subject to maximum variation of the contract value by 25%. The entire amount paid under Clause 20, 21 hereof as well as amounts of prime cost and provisional sums, if any, shall be excluded.

Variation exceeding 25%: The items of work executed in relation to variation exceeding 25% shall be paid on the basis of provisions of clause 22 (e) hereof.

20.0 Works to be measured

The Architect may from time to time intimate to the contractor that he required the

work to be measured and the contractor shall forthwith attend or send a qualified representative to assist the Architect in taking such measurements and calculations 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 detailed in the specifications. The representative of the Architect shall take joint measurements with the contractor's representative and the measurements shall be entered in the measurement book. The contractor or his authorized 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 made in the M book should the contractor not attend or neglect or omit to depute his representative to take measurements then the measurements recorded by the representative of the Architect shall be final. All authorized extra work, omissions and all variations made shall be included in such measurement.

21.0 Variations

No alteration, omission or variation ordered in writing by the SBI/ Architect shall vitiate the contract. In case the SBI / Architect thinks proper at any time during the progress of works to make any alteration in, or additions to or omissions from the works or any alteration in the kind or quality of the materials to be used therein, the SBI/ Architect shall give notice thereof in writing to the contractor or shall confirm in writing within seven days of giving such oral instructions the contractor shall alter to, add to, or omit from as the case may be in accordance with such notice, 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 SBI/ Architect and the value of such extras, alterations, additions or omissions shall in all cases be determined by the SBI/ Architect and the same shall be added to or deducted from the contract value, as the case may be.

22.0 Valuation of Variations

No claim for an extra shall be allowed unless it shall have been executed under the authority of the Architect with the concurrence of the SBI as herein mentioned. Any such extra is herein referred to as authorised 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 he 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 he receipt of the letter of acceptance inform the Architect 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 shall fix such rate or prices as in the circumstances in his opinion 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 SBI/ Architect) the workman's name and materials employed be

delivered for verifications to the SBI/ Architect 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 authorised 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 wastage etc. plus 15% towards establishment charges, contractor's overheads and profit. Such items shall not be eligible for escalation.

23.0 Final Measurement

The final measurement, valuation and payment in respect of the contract shall be completed within six months of the virtual completion of the work.

24.0 Virtual Completion Certificate (VCC)

On successful completion of entire woks covered by the contract to the full satisfaction of the SBI/ Architect, the contractor shall ensure that the following works have been completed to the satisfaction of the SBI/ Architect.

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, structures 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 SBI and not incorporated in the permanent works.

c) Remove all rubbish, debris etc. from the site and the land allotted to the contractor by the SBI/ Architect and shall clear, level and dress, compact the site as required by the SBI/ Architect.

d) Shall put the SBI in undisputed custody and possession of the site and all land allotted by the SBI.

e) Shall hand over the work in a peaceful manner to the SBI.

f) All defects / imperfections have been attended and rectified as pointed out by the SBI/ Architect to the full satisfaction of SBI/ Architect.

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

This issuance of a VCC shall be without prejudice to the SBI's rights and contractor's liabilities under the contract including the contractor's liability for defects liability period nor shall the issuance of VCC in respect of the works or work at any site be construed as a waiver of any right or claim of the SBI against the contractor in respect of works or work at the site and in respect of which the VCC has been issued.

25.0 Work by other Agencies

The SBI reserves the rights to use premises and any portion of the site for execution of any work not included in the scope of this contract which it 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 provided any plant or material for the execution of such work except by special arrangement 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.

26.0 Insurance of Works

26.1 Without limiting his obligations and responsibilities under the contract, the contractor shall insure in the joint names of the SBI 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 SBI and contractor are covered for the period stipulated in clause 28 of GCC and are also covered during the period of maintenance for loss or damage arising from a cause, occurring prior to 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 SBI which approval shall not be unreasonably withheld and the contractor shall whenever required produce to the SBI/ Architect the policy if insurance and the receipts for payment of the current premiums.

26.2 **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 he 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 SBI 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 contractor, 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 SBI/ Architect, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

26.3 Contractor to Indemnify SBI

The contractor shall indemnify the SBI against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the matters referred to in the provision sub-clause 26.2 of this clause.

26.4 Contractor's Superintendence

The contractor shall fully indemnify and keep indemnified the SBI 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 SBI 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 SBI 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 in this behalf.

26.5 Third Party Insurance

26.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 26.0 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 SBI, or to any person, including any employee of the SBI/ Architect, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the mattes referred to in the provision to clause 26.0 thereof.

26.5.2 Minimum amount of Third Party Insurance

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

26.5.3 The minimum insurance cover for physical property, injury, and death is Rs. 5 lacs 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.

26.6 Accident or Injury to Workman

The SBI 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 SBI or their agents, or employees. The contractor shall indemnify and keep indemnified SBI 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.

26.6.1 Insurance against Accidents etc. to Workmen

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

26.6.2 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 SBI 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 SBI as aforesaid from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

Without prejudice to the others rights of the SBI 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 SBI 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.

27.0 Commencement of Works:

The date of commencement of the work will be reckoned as the date of handing over site or three days from the date of issue of letter of acceptance of the tender by the SBI whichever is later.

28.0 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 **30 days** from the date of commencement. If required in the contract or as directed by the SBI/ Architect, 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.

29.0 Extension of Time

If, in the opinion of the Architect, the work be delayed for reasons beyond the control of the contractor, the Architect may submit a recommendation to the SBI to grant a fair and reasonable 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 SBI through the Architect in writing in detail and his justification if any, for the delays. The Architect shall submit their recommendations to the SBI 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 SBI the provision of liquidated damages as stated under clause 10.0 of Instructions to the Tenderers 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.

30.0 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, should the rate of progress of the work or any part thereof be at any time be in the opinion of the Architect too slow to ensure the completion of the whole of the work by the contractor in prescribed time or extended time for completion the to expedite progress so as to complete the works by the prescribed time or extended time. Such communications from the Architect neither shall relieve the contractor from fulfilling obligations under the contract nor will he be entitled to raise any claims arising out of such directions.

31.0 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, 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. 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 at no extra cost to the SBI.

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

32.0 No Compensation or Restriction of Work.

If at any time after acceptance of the SBI/ Architect 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 shall give notice in writing to 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 whatsoever, 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 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 for SBI 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 shall be final.

33.0 Suspension of Work

i) The contractor shall, on receipt of the order in writing of the Architect (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 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) One account any default on the part of the contractor, or

b) for proper execution of the works or part thereof for reasons other then the default of the contractor, or for safety of the works or part thereof.

c) The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the SBI/ Architect.

ii) If the suspension is ordered for reasons (b) and (c) 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.

34.0 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 SBI shall have the power to adopt any of the following course as they may deem best suited to the interest of the SBI.

a) To rescind the contract (of which rescission notice in writing to the contractor by the Architect shall be conclusive evidence) and in which case the security deposit of the contractor shall be forfeited and be absolutely at the disposal of SBI.

b) To employ labour paid by the SBI and to supply materials to carry out the work, or

any part of the work, debiting the contractor with the cost of the labour and materials (the cost of such labour and materials as worked out by the Architect shall be 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 the certificate of Architect as to the value of work done shall be final and conclusive against the contractor.

c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, to give it to another contractor to complete in 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 (of the amount of which excess the certificates in writing of the Architect shall be final and conclusive) shall be borne by original contractor and may be deducted from any money due to him by SBI under the contract or otherwise, or from his security deposit or the proceeds of safe thereof, or sufficient part thereof. In the event of any of above courses being adopted by the SBI 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 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.

35.0 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 SBI that he is able to carry out and fulfill the contract, and to give security therefore if so required by the SBI.

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 SBI through the Architect or shall charge or encumber this contract or any payment due to which may become due to the contractor thereunder:

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 days after receiving from the SBI through the Architect 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 with in 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 SBI through the Architect that the said materials were condemned and rejected by the Architect under these conditions; or has neglected or failed persistently to observe and perform all or any the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contractor to observe or perform the same or has to he determent of good workmanship or in defiance of the SBI's or Architect's instructions to the

contrary subject any part of the contract. Then and in any of said cases the SBI and or the Architect, 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 SBI or the Architect 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 so determined and as if the works subsequently had been executed by or on behalf of the contractor. And further the SBI through the Architect their agents or employees may enter upon and take possession of the work and all plants, tools, 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 complete the work and the contractor shall not in any was interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for completing and finishing or using the materials and plant for the works.

When the works shall be completed or as soon thereafter as convenient, the SBI or the Architect 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 receipt thereof by him the SBI sell the same by public auction after due publication, and shall adjust the amount realised by such auction. The contractor shall have no right to question any of the act of the SBI incidental to the sale of the materials etc.

36.0 Certificate of Payment

The contractor shall be entitle under the certificates to be issued by the Architect to the contractor within 14 working days from the date of certificate to the payment from SBI from time to time. The SBI shall recover the statutory recoveries towards Income tax, Work contract tax as per the prevailing bye laws and other dues including the retention amount from the certificate of payment.

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

The Architect shall have power to with hold the certificate if the work or any part thereof is not carried out to their satisfaction.

The Architect may by any certificate make any corrections required in previous certificate.

The SBI shall modify the certificate of payment as issued by the Architect from time to time while making the payment.

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

The contractor shall not submit interim bills when the approximate value of work done by him is less than **Rs.15 lacs** and the minimum interval between two such bills/ final bill shall be **30 days.**

The final bill may be submitted by contractor within a period of one month from the date of virtual completion and Architect shall issue the certificate of payment within a period of two months. The SBI 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.

37.0 Settlement of Disputes and Arbitration

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions herein

before mentioned and as to the quality of workmanship or materials used 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 those 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.

ii) 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 ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** 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 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 ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** 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 ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** in writing in the manner and within the time aforesaid.

iii) ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** shall give his decision in writing on the claims notified by the contractor. The contractor may within 30 days of the receipt of the decision of the ***Regional Manager, RBO Region-3, First Floor, CRM Campus–2, Plot No – 79, Sector - 18, Gurugram*** submit his claims to the conciliating authority namely the ***Circle Development Officer, SBI, New Delhi*** for conciliation along with all details and copies of correspondence exchanged between him and the Regional Manager.

iv) 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 ***Chief General Manager of the Bank*** for appointment of an arbitrator to adjudicate the notified claims failing which the claims of the contractor shall be deemed to have been considered absolutely barred and walved.

v) 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 differences arising out of the notified claims of the contractor as aforesaid and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the ***Chief General Manager of the Bank,*** It will also be the objection to any such appointment that the Arbitrator so appointed is a Bank Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as Bank 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 ***Chief General Manager of the Bank,*** Such person shall be entitled to proceed with the reference from the stage at which it was left 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 ***Chief General Manager of the Bank,*** 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 statutory modification or re-enactment 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 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 arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any of the arbitrator) 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.

38.0 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 conditions.

That the water used by the contractor shall be fit for construction purposes to the satisfaction of the Architect.

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 is unsatisfactory.

The contractor shall construct temporary well / tube well in SBI land for taking water for construction purposes only after obtaining permission in writing from the SBI. The contractor has to make his own arrangement for drawing and distributing the water at his own cost. He has to 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 conditions after wells are dismantled on completion of work or hand over the well to the SBI without any compensation as directed by the Architect.

39.0 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 included in his tender prices. He shall pay all fees and charges required for 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.

40.0 Treasure Trove etc.

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

41.0 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 shall be final and binding on the contractor.

42.0 Maintenance of Registers

The contractor shall maintain the following registers as per the enclosed Performa at site of work and should produce the same for inspection of SBI/ ARCHITECT whenever desired by them. The contractor shall also maintain the records / registers as required by the local authorities / Govt. form time to time.

i) Register for Cement / Paint / Lead / Specific Materials
ii) Register for Steel
iii) Register for Secured Advance
iv) Register for Bulkage of Sand
v) Register for Silt Test
vi) Register for Sieve Analysis for Fine Aggregate
vii) Register for Sieve Analysis for Course Aggregate
viii) Register for Slump Test.
ix) Register for Concrete Cube Test.
x) Register for Hindrance to Work.
xi) Register for Consumption of Cement
xii) Register for Running Account Bill
xiii) Register for Labour

43.0 Force Majeure

43.1 Neither contractor nor SBI shall be considered in default in performance of their obligations if such performance is prevented or delayed by event such as but not to war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of god or for any other cause beyond the reasonable control of the party affected or prevented or delayed. However a notice is required to be given within 30 days from the happening of the even 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.

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

43.3 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 cause itself and inability resulting there from having been removed, the agreed time of completion of the respective obligations under this agreement shall stand extended by a period equal to the period of delay occasioned by such events.

43.4 Should one or both parties be prevented from fulfilling the contractual obligations by a 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.

44.0 Local Laws, Acts, Regulations:

The contractor shall strictly adhere to all prevailing labour laws inclusive of contract labour (regulation and abolition act of 1970) and other safety regulations. the contractor shall comply with the provision of all labour legislation including the latest requirements of all 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) Contact labour regulation and abolition act 1970 and central rules 1971 (Amended)

v) Apprentice act 1961 (Amended)

vi) Industrial employed (standing order) Act 1946 (Amended)

vii) Personal injuries (Compensation insurance) act 1963 and any other modifications

viii) Employees' provided 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.

45.0 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. 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.

Signature of Contractor & Seal

SPECIAL CONDITIONS OF CONTRACT

1.0 Scope of Work

The scope of work is to carry out ***Interior Furnishing, Electrical & Air Conditioning Work at Sector -45 Branch, Gurugram, HR***

2.0 Address of Site

The site is located at ***SBI Sector -45 Branch, Gurugram, HR***

3.0 Dimension and Levels

All dimensions and levels shown on the drawing shall be verified by the contractor on the site and he will be held responsible for the accuracy and maintenance of the entire dimension and the levels. Figured dimensions are in all cases to be accepted and no dimension shall be scaled. Large-scale details shall take precedence over small – scale drawing. In case of discrepancy the contractor shall ask for clarification from the ARCHITECT before proceeding with the work.

4.0 Notice of Operation

The contractor shall not carry out any important operation without the consent in writing from the Architect.

5.0 Construction Records

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

6.0 Safety of adjacent Structures and Trees

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

7.0 Temporary Works

Before any temporary works are commenced, the contractor shall submit at least 7 days in advance to the Architect. 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. 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 an unfinished works and for the quality of the permanent works resulting from the arrangement eventually adopted for their execution.

8.0 Temporary Roads

The contractor shall provide access roads to the site from the nearest main road at no extra cost and as directed by the Architect. The contractor shall also responsible for proper maintenance of this access road and would take all care to see that existing services, if any, are maintained in working order at his own cost. The laying and maintaining the temporary roads within the site area shall be the contractor's responsibility and the contractor shall take such measures that are necessary and as directed by the Architect.

9.0 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 SBI will not be liable to pay any charges in connection with the above.

The rate quoted in the tender shall include the expenses for obtaining and maintaining power connections and shall pay for the consumption charges.

The contractors for other trades directly appointed by the SBI 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 SBI will reimburse the amount on production of receipts.

b) The SBI as well as the Architect shall give all possible assistance to the contractors to obtain the requisite.

c) Permission from the various authorities, but the responsibility for obtaining the same in time shall be of the contractor.

10.0 Office Accommodation

a) The contractor shall provide and maintain all necessary offices, workshops, stores, shelters, sanitary facilities, canteens and other temporary structures for themselves in connection with the work at the site own cost after getting the approval from the Architect.

b) All temporary buildings and facilities as mentioned above shall be removed on completion of the work or at any other earlier date as directed by the Architect.

All the expenses for obtaining statutory approvals and maintenance of the above facilities as well as running expense shall be borne by the contractor at no extra cost. It is also the responsibility of the contractor to obtain statuary approvals for providing the above facilities.

11.0 Facilities for Contractors' 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 his arrangements at his own cost for transport where necessary for his

staff and workmen to and from site of work at his own cost.

12.0 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 works.

13.0 Fire Fighting Arrangements

i) The contractor shall at all times provide suitable arrangements for the fighting at his own cost. For this purpose he shall provide requisite number of fire extinguishers and adequate number of buckets, some of which are of be always kept filed with sand and some with water. These equipments shall be provided at suitable prominent and easily accessible places 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 shall make the following arrangements at his own cost but not limited to the following :

a) Proper handling, storage and disposal of combustible materials and waste.

b) Worked operations which can create fire hazards.

c) Access for the fire fighting equipments.

d) Types, 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 housekeeping.

14.0 Site Order Book.

A site order book shall be maintained at site for the purpose of quick communication between the Architect. Any communication relating to the works 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 carefully maintain and preserved by the contractor and shall be made available to the Architect as and when demanded. Any instruction which the Architect may like to issue to the contractor or the contractor may like to bring the Architect may like to issue to the Contractor or the Contractor may like to bring to the Architect 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.

15.0 Site Meetings

Site meetings will be held to review the progress and quality evaluation. The contractors shall depute a senior representative alongwith the site representative 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.

16.0 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 SBI/ Architect at his own cost. It is the responsibility of the contractor to obtain from the locate 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.

17.0 Contractor to Verify Site Measurement

The contractor shall check and verify all site measurements whenever requested by other specialist contractors of other sub contractors to enable them to prepare

their own shop drawings and pass on the information with sufficient promptness as will not in any way delay the works.

18.0 Displaying the Name of the Work

The contractor shall put up a name board of suitable size as directed by the Architect indicating therein the name of the project and other details as given by the Architect at his own cost remove the same on completion of work.

19.0 Bar Bending Schedule

The contractor shall prepare a detailed bar bending schedule for all reinforced concrete works and got them approved by the Architect well in advance.

20.0 As Built Drawings

i) For the drawing issued to the contractor by the Architect. The Architect will issue two sets of drawings to the contractor for the item for which some changes have been made. From the approved drawings as instructed by the SBI. The Contractor will make the changes made on these copies and return these copies to the Architect for their approval. In case any revision is required or the corrections are not properly marked the Architect will point out the discrepancies to the contractor. The contractor will have to incorporate these corrections and /or attend to discrepancies either on the copies as directed by the Architect and resubmit to him for approval. The Architect 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 are made by the SBI. And submit two copies of such modified drawings to the Architect for approval. The Architect will return one copy of the approved drawing to the Contractor.

21.0 Approved Make

The Contractor shall provide all materials form the list of approved makes at his own cost. The Architect may approve any make / agency within the approved list as given in the tender after inspection of the sample / mock up.

22.0 Procurement of Materials

The Contractor shall make his own arrangements to procure all the required materials for the work. All wastage's and losses in weight shall be to the contractors account.

23.0 Excise Duty, Taxes, Levies etc.

The contractors shall pay and be responsible for payment of all taxes except GST, 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, equipments plant and other things required for the contact. All of the aforesaid taxes except GST, duties, levies, fees and charges shall be to the contractors account and the SBI shall not be required to pay any additional or extra amount on this account. Variation of taxes, duty fees, levies etc if any, till completion of work shall be deemed to be included in the quoted 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 statue or law during the currency of contract the same shall be borne by the contractor.

24.0 Acceptance of Tender

The SBI shall have the right to reject any or all tenders without assigning any reason. They are not to bound to accept the lowest or any tender and the tenderer shall have no right to question the acts of the SBI. However, the adequate transparency would be maintained by the SBI.

Signature of Contractor & Seal

TIMBER

As per IS 1708-1969

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
1. Moisture Content and Specific Gravity Test preparation and procedure: a) **Measurement and weight:** Prior to each test, the dimensions of each test specimen shall be measured correct to 0.01 cm and the specimen shall be weighed correct to 0.001 gm. b) **Control of moisture content:** Before the preparation of the test specimens for testing in the seasoned condition, the material shall be brought practically to constant weight by storage under controlled conditions at 27° C ± 2° C temperature and 65 ± 5% relative humidity. This is expected to bring the moisture content at 12% but if it is not exactly 12% it is permitted to test in the neighbourhood of 12% and results shall be adjusted to 12% moisture content. The test shall be made under such conditions that large changes in moisture content do not occur. c) **Control of temperature:** To avoid significant changes in strength properties all test specimen shall be tested within the temperature range of 27° ± 2° C. The temperature at the time of test shall be recorded. For every Ten cum or part thereof.		The loss in weight expressed as a percentage of the oven dry weight shall be taken as the moisture content of the specimen. The formula for calculation shall be as given below: Percentage moisture content = $\frac{WI - WO}{WO} \times 100$ Wl = Weight of sample at test in gms. WO = Oven dry wt. of sample in gms. Moisture content shall not exceed following values i) Timber for frames = 14% ii) Timber for planking shutters etc. = 12%

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
d) Rate of loading: The rate of loading of the rest machine used shall not vary by more than + 20% from the specified speed for a given test. The load shall be applied continuously without interruption at the required speed throughout the test. The approximate percentage of sapwood if any, by volume, is estimated for all the test specimens and recorded. The number of the growth rings for 3 cm length shall be counted in the radial direction on each of the cross-section of such piece and the average shall be recorded as number of rings/cms for each specimen tested. Immediately after each mechanical test, disc approx. 2.5 cm in length and of full section as the test piece, shall be taken normally at the place of failure, failing which, at the central portion of the test specimen. In the case of shear test, the detached portion of the section approximately 5x5 cm shall be taken for determination of moisture content. The sample shall be weighed and then dried in an oven at a temperature of 103 + 20 ^{o}C. The weight shall be recorded at regular intervals.	The drying shall be considered to be complete when the variation between last two weighing shall	

WOODEN PANEL DOOR SHUTTERS

Conforming to IS 2202 (Part I) 1983

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
1. Physical Test **Physical Verification-** i) Name of the manufacturer or trade mark. ii) Thickness of door shutter. iii) Whether ISI Certification Mark exists.	One from each lot.	
2. Glue Adhesion Test - **Procedure-** Two square sections, 150 mm X 150 mm shall be cut from the corners of the door. These corner sections as out from the door, shall be immersed in boiling water at 100^{o} C for four hours, then dried at a temperature of 270^{o} + 20^{o} C and relative humidity of 65 $\pm$ 5% for 24 hours. At the end of the drying period the samples shall be examined for de-lamination. Glue lines in all the four exposed edges of the plywood on both faces of a specimen and the glue lines between the plywood faces and the stile and rail shall be examined for de-lamination.		A specimen shall be considered to have passed the test if no de-lamination has occurred in the glue lines in the plywood and if no single de-lamination. More then 50 mm in length and more than 3 mm in depth has occurred in the assembly glue lines between the plywood faces and the stile and rail.

READY MIXED PAINTS

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
1. Drive Time **Procedure:** The material shall be brushed or sprayed as required on a 150 x 150 mm mild steel panel prepared and allowed to air dry or stored under specified drying conditions. The material shall be examined after specified intervals, for the following conditions: i) Surface dry ii) Hard dry iii) **Tack free:** The procedure of test on the dried film of the panel after specified period as follows: Place the panel in one pan of a suitable balance and counterpoise it with weights. Place a further weight of 2.25 kg and press on the dried film surface of the panel with the thumb till the two pans are balanced. Hold for one minute and then slowly release. No sign of stickiness to the thumb shall be apparent and the thumb impression, if produced, shall be such as can be wiped away with dry cotton wool.	On test each lot, (All containers of same size and same batch of manufacture constitute a lot)	No sign of stickiness to the thumb shall be apparent.

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
2. Consistency- **Procedure:** Insert a clean metal rod or palette knife into the original container and examine the nature of the setting.	using either 20 ml of petroleum hydrocarbon solvent 145/205 (100 aromatic).	
3. Finish- **Procedure:** The material, when applied on an mild steel panel by brushing or spraying, which ever is specified to give a dry film weight commensurate with the weight per 10 litres of the material and allowed to dry in a vertical position under specified conditions, shall dry to hard, firmly adherent, flexible and smooth film, free from sagging and wrinkling with a matt, semi-glossy or glossy surface in accordance with the requirement of the material specification.		The material shall not be cake hard inside the container and shall be in such a condition that stirring easily produces a smooth uniform paint suitable for application. The film produced shall be of normal capacity and in no way inferior to a film prepared in the same manner and at the same time from the approved sample, when examined not earlier than 48 hours and not later than 100 hours after application. In case of failure, the test shall be repeated by keeping the painted panel under standard atmospheric condition.
4. Residue on Sieve- **Outline:** The material is mixed with a suitable solvent and passed through a 63 micron IS sieve. Not less than 20 gms. of the material taken from under the top skin shall be tested. **Procedure:** Accurately weigh the required quantity of the material and transfer to a 250 ml beaker		

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
(Conforming to IS: 1745-1961) or 20 ml of a mixture containing equal parts by volume of petroleum hydrocarbon solvent and benzene. Wet a 63 micron IS sieve on both sides with the solvent. Mix the material and the solvent in the beaker thoroughly, breaking up all lumps without grinding action, with the flattened end of a stirring rod. Transfer the contents of the beaker to the sieve using awash bottle containing the solvent. Remove with the camel-hair brush any small particles of pigment that may be retained on the stirring rod or the walls of the beaker. Wash the residue left on the sieve with the solvent and gently brush with a camel-hair brush unit the solvent passing through the sieve is clear and free from solid particles. When the washing is complete, dry the sieve for one hour at 100 + 2^{o} C. Cool and transfer the residue with the help of the camel-hair brush to a weighed watch glass and determine the weight of residue. **5. Water Content** **Outline of the method:** The material is heated under reflex with an organic solvent which is immiscible with water. The carrier liquid distils into a graduated receiver carrying with it water which then separates to from the lower layer,		

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
the excess carrier liquid overflowing from the trap and returning to the still. **Procedure:** Weigh 100 g. of the material in the flask, add 100 ml of dry petroleum hydrocarbon solvent (boiling point 75 to 85° C) and IMI of dry ethyacetate (conforming to IS:229-1964) or acetate (conforming to IS:231-1957) and thoroughly mix the contents of the flask. Pour petroleum hydrocarbon solvent into the receiver upto the level of the side tube. Attach the flask to Dean and stark condensing and collecting system and heat the flask at such a rate that the condensate falls from the end of the condenser at a rate of two to five drops per second. Continue the distillation unit condensed water is no longer visible in any part of the apparatus except at the bottom of the graduated tube and until the volume of water collected remains constant. Remove the persistent ring of condensed water in the rate of distillation by a few drops per second. **6. Weight per Litre** **Outline of the method:** The calibrated cylinder or CNP is filled with the material and weighed.		

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	3
Procedure: Weight the cylinder or cup when empty and then fill to the brim with the material Assuming that the volume of the contents is 50 ml or 100 ml, calculate and express as kg per 10 litres.		weight of the material taken for test.
7. Lead Restriction		
Outline of the method: Determination of lead in lead restricted paints is carried out by precipitating the lead as sulphide from the separated pigment, which is finally oxidized to lead monoxide.		
Procedure: Shake about one gram of the ground pigment obtained, accurately weighed, continuously for one hour at room temperature with 1000 times its weight of an aqueous solution of hydrochloric acid containing 0.25 percent by weight of hydrogen chloride.		
Allow the mixture to stand for one hour and then filter. Precipitate the lead salt contained in the clear filtrate as lead sulphide, filter, that the lead sulphide in air to convert it into lead sulphate, weigh calculate as lead monoxide (PbO) and express the result as percentage on the dry		

PARTICLE BOARDS

Test Required & Procedure	Frequency	Acceptance Criteria
1	2	
Identification (Physical Verification) Each particle board shall be legibly marked near any of its edge with the following. 1. Name of the manufacturer or trade mark. 2. Designation of particle board. 3. Thickness and date of manufacture. 4. Whether I.S.I. Certification marks exists. 5. Dimensional Tolerace a) Length ± 8 mm b) Width ± 8 mm c) Thickness i) Boards upto and including 25mm thick ± 5.0%] ii) Boards above 25mm thick ± 2.5%. Edges of the board shall be straight with a tolerance of 3 mm. the persistent ring of condensed water in the rate of distillation by a few drops per second.	One from each lot	**Density –** The density of each sample shall not vary from the mean density by more than + 10%. **Moisture content** : The average value of the moisture content shall be between 7 to 16%. **Water absorption :** The value of water absorption shall not exceed 25% for two hrs, soaking and 50% for 20 hrs. soaking. **Exterior grade (I)** : These particle boards shall not delaminate after 3 hrs. boiling in water at 100'C. **Interior Grade (Gr.II)** : These particle boards shall not disintegrate and / or shall not detaminate after 24 hrs. immersion in water at 27% ± 2'C. **Swelling water :** Swelling in thickness in % of original thickness for 2 hrs. immersion shall be determined and the same shall not be more than 5%. The Swelling in thickness due to surface absorption in two hours shall not be more than 5%.

SPECIFICATIONS OF INTERIOR & FURNISHING WORKS

1. General:

1.1 Without forgoing the requirements of the Conditions of Tender and the Conditions of Contract the works in general shall confirm to the "Latest Specifications" published by CPWD, New Delhi and the "Specifications for Works" stated in this tender. In case of items not covered by the General Specifications referred above, reference shall be made to the appropriate I.S. Code. If there is any difference in the particular specifications of individual item of work and the description of item as given in the Schedule of Quantity, the latter shall prevail. In case of any work for which there is no specification in I.S. Specifications or in the specifications forming part of tender documents or in case there is any variation, such work shall be carried out in all respects in accordance with the instructions to be issued by the ARCHITECTs. The term Department shall mean the Employer. Any reference to ISI shall also mean reference to its successor Bureau of Indian Standards. All corrections to "Latest Specifications" or revisions of I. S. shall be deemed to apply to this contract.

1.2 Materials bearing ISI certification mark shall be given highest preference for use in the works.

1.3 Where the Contractor is required to do, perform, execute (etc.) any work or service or the like, it shall be deemed to be at his own cost. Absence of terms providing supplying, installing, fixing, etc. shall not even remotely entitle the Contractor to any additional payment thereof.

1.4 The rates accepted in the Schedule of Quantities apply to all floors, heights, depths, leads, lifts, spans, sizes, shapes, locations, etc. unless a distinction has been included in the very Schedule.

1.5 The Specifications and the Schedules may have been divided into various sub-heads for convenience only. This does not limit applicability of one to the other nor it absolves the Contractor of his responsibility to complete any trade/item of work as reasonably inferred from one or more of such sub-heads.

1.6 The Schedule of Quantities is not necessarily based on "Schedule of Rates" later/earlier versions. Hence the Schedule of Quantities shall be read and construed according to explanations given herein and intentions gathered therefrom. A mere parallel drawn from the said Schedule of Rates shall therefore not form a basis for a variation and, or additional payment.

1.7 All work under this contract is deemed to be performed above subsoil water level. However, removal of water collected from rains and the like shall be treated as part of contractual risk/obligation.

1.8 Screws, bolts, nuts, washers, hold fasts, lugs, anchors, clamps, plugs, suspenders, brackets, straps and fasteners of the like are deemed to be included in the rates of various items unless the Schedule of Quantities expressed a different intention.

1.9 Resetting any displacements, making good holes/chases and such other incidental jobs are included in rates of respective items for which these are required.

2.0 Concrete Work (Plain or Reinforced):

2.1 Centering, shuttering, staging, form work, strutting, propping (their provision and removal) shall not be paid for separately unless exclusion thereof is specifically described in the item.

2.2 The rates of concrete work do not include rendering or plastering but hacking and preparing surface for receiving the finishes shall be done as early as possible.

2.3 Any chamfers, grooves, drips, etc. which are generally and customarily required shall be provided in the concrete work integrally or otherwise without extra charges as directed by the Architect.

3.0 Steel Work:

3.1 The measurement of railing shall be the length of top wood/steel section as per situation along the centre line.

3.2 Painting in relation to steel work shall be two or more coats of approved synthetic enamel plus a coat or primer including preparation of surfaces, fillers etc. The priming coat shall be measured & paid separately in the relevant item.

3.3 Circular work, bends, stepping are not payable extra.

3.4 The steel work in single sections of R.S. Joists, flats, Tees Angles fixed independently with or without connecting plate, is described in these clauses.

(a) Fabrication

The steel section as specified shall be straightened and cut square to correct lengths and measured with a steel tape. The cut ends exposed to view shall be finished smooth. No two pieces shall be welded or otherwise jointed to make up the required length of a member.

All straightening and shaping to form, shall be done by pressure. Bending or cutting shall be carried out in such a manner as not to impair the strength of the metal.

(b) Painting

All surfaces which are to be painted, oiled or otherwise treated shall be dry and thoroughly cleaned to remove all loose rust. Surfaces not in contact but inaccessible after shop assembly, shall receive the full specified protective treatment before assembly. This does not apply to the interior of sealed hollow sections. Part to be encased in concrete shall not be painted or oiled. A priming coat of approved steel primer i.e. Red Oxide Zinc chrome primer conforming to IS: 2074 shall be applied before any member of steel structure are placed in position or taken out of workshop.

(c) Welding

Welding shall generally be done by electric arc process as per IS: 816 and IS: 823. The electric arc method is usually adopted and is economical. Where electricity for public is not available generators shall be arranged by the contractor at his own cost unless otherwise specified. Gas welding shall only be resorted to using oxyacetylene flame with specifiic approval of the Architect. Gas welding shall not be permitted for structural steel work. Gas welding requires heating of the members to be welded along with the welding rod and is likely to create temperature stresses in the welded members. Precautions shall therefore be taken to avoid distortion of the members due to these temperatures stresses.

The work shall be done as shown in the shop drawings which should clearly indicate various details of the joints to be welded, type of welds, shop and site welds as well as the types of electrodes to be used. Symbol for welding on plane and shops drawings shall be according to IS: 813.

As far as possible every efforts shall be made to limit the welding that must be done after the structure is erected so as to avoid the improper welding that is likely to be done due to heights and difficult positions on scaffolding etc. apart from the aspect of economy. The maximum dia of electrodes for welding any work shall be as per IS: 814 and appendix B' of IS: 823. Joint surfaces which are to be welded together shall be free from loose mill scale, rust, paint, grease or other foreign matter, which adversely affect the quality of weld and workmanship.

4.0 Flooring:

4.1 The rates of cement concrete flooring and marble chips flooring are exclusive of dividing strips for formation of panels.

4.2 Borders, margins, bands, nosings, etc. are not payable extra. Treads shall be measured as floors, risers as skirtings. However, areas of returns (finished thickness), nosing shall be added respective items.

4.3 No extra shall be paid for cutting of glazed tiles or for wastage thereof.

4.4 Marble/Kota stone slabs shall be of selected quality, hard & sound and shall be approved by the Architect. The thickness of the slabs shall be as specified in the description of the item. Tolerance of 2mm shall be allowed for the thickness. In respect of length & breadth of slabs (Where flooring to be laid) a tolerance of 5mm shall be allowed. Every slab shall be cut to the required size and shape, top waviness shall be removed, the sides (edges) shall be removed, the sides (edges) shall be table rubbed with coarse sand or machine rubbed before paving. All angles of the tiles shall be true equal and free from chipping and the surface shall be true and plane.

4.5 Marble slab/kota slab shall be cleaned, wetted and mopped before laying.

4.6 Polishing shall be done by machine in four different courses. Ist course shall be of rubbing with carborundum stone No. 60, the second with No. 120, and the third with No. 320 to get even and smooth surface without pinholes. Where ever use of machine is not feasible to work, polishing shall be done by hand with No. 60, No. 80 and with No. 120 carborundum stone respectively. Lastly oxalic acid shall be dusted over the surface @ 33 gm per square meter sprinkled with water and rubbed hard with namdah block (pad of wooden rags).

4.7 Marble chips, kota stone, marble (all floors, skirting, risers, dado, counter tops, treads) shall finally be polished with approved floor wax polish as directed at no extra cost.

4.8 Marble (counter tops) shall be of full width and in single piece upto length of 1.5m. Granite for name-plate shall be in one single piece.

5.0 Finishing:

5.1 Items of plastering apply to all locations including rough sides of walls, curved surfaces, all heights, etc. without limiting generally of para 1.4.

5.2 Preparation of surfaces including raking out joints, hacking, brushing, watering, etc. is included.

5.3 Drip mouldings shall not be payable extra.

5.4 Grooves shall be provided in plaster as directed by Architect at corners of ceiling slabs around the columns & beams at no extra cost.

5.5 Strips of G.I. chicken mesh 250mm wide shall be provided in plaster at all junctions (which are flush) between masonary/columns, masonary/beams.

6.0 Wood Work:

6.1 The areas of doors & windows shutters shall be measured to the nearest cm in closed position covering the rebates of the frame but excluding the gap between the shutter and the frame. Over lap of two shutters shall not be measured. All work shall be measured for finished dimensions. No allowance shall be made for dimensions supplied beyond those specified. Length of each piece shall be measured overall nearest to 1 cm, so as to include projections for tenons, scraves or mitres, width and thickness shall be measured to the nearest mm.

6.2 Where painting, polishing has been included in the item the same shall be executed as per Architect's directions. Painting shall be two or more coats of approved synthetic enamel plus a coat of fire resistant primer to wood work as approved by Architect and shall conform to BS-476 part 7 for class I surface spread of flame. Preparations of surfaces, fillars, etc. are included. This primer shall also be applied before polishing (i.e. French Spirit Polish). The fire resistant primer shall be measured & paid separately in the relevant item.

6.3 All flush door shutters shall have teak lipping on all edges as directed with extra thickness of lipping of meeting edges of double shutter doors.

Glasses 5.5mm thick or 4mm thick shall respectively weigh not less than 13.75 Kg/sqm. Or 10 Kg/sqm.

Bends, stepping and cir cular shapes in railings are integral part of the rate.

The widths of various rails & styles shall be as described in the items or shown in the drawing. All aluminum section & fittings used shall be ISI marked. All screws for fixing of fittings/fixtures shall be of matching finish.

In case of composite units (M.S. frame + teak wood shutter) the hold fasts shall be added or fixed with counter sunk machine screws. Also the M.S. frames shall have necessary holes and other arrangement for receiving/fixing of fittings

7.0 Plaster of Paris Punning (P. O. P.)

If the plaster surface is to be finished with plaster of paris punning, the surface shall be combed slightly with the wire brushes or nails before it is completely set to form key for plaster of Paris punning. The surface shall be thoroughly cleaned of dust then only damped but not soaked before the application of plaster of paris punning. The Gypsum for preparing punning shall be approved quality. It shall be dry and free from lumps and shall be suitably

packed in watertight bags or containers. Paste shall be prepared by adding required quantum of water and it shall be used before it sets. No dropping paste shall be used in the work. Punning shall be applied to the prepared surface with steel trowel to a thickness required to make the surface produce perfectly smooth and even surface working from top to bottom. It shall then be sand papered to give a smooth and even surface. Any unevenness shall be made good by applying putty, made of plaster of paris mixed with water, then sand papering the same after it is dry. Pilling in plaster shall be made good with plaster of paris mixed with colour to be used. The surface shall then be rubbed down again with a fine grade sand paper and made smooth. The surface shall be allowed to dry thoroughly before the regular coat of paint is applied. The measurement shall be in square metre.

8.0 Plastic Emulsion Paint:

Plastic emulsion paint shall be of approved manufacturer and shall generally confirm to IS-5411 (Part-I)-1969.

The colour and shade of the emulsion shall be got approved by the Architect. Double scaffolding shall be used, ladden if used shall be tied with old gunny bags at top to prevent damage or scratches to the walls. The instructions of the manufacturer shall be followed, in application of priming and finishing coats. Turpentine or any other solvent shall not be used for thinning the paint.

Minimum 3 coats of paint shall be applied inclusive of primer coat. If a proper and even surface is not obtained to the satisfaction of the ARCHITECTs in 3 coats, Contract shall carry out additional coats of painting to approval at his expenses. Care shall be taken that dust or other foreign material does not settle or disfigure the various coats. The measurement shall be in square metre.

9.0 Miscellaneous:

The work of cupboard/cabinets shall be done as per drawings. The depth of cupboards shall be as shown in drawings. The work includes holdfasts and other accessories usually required for complete installation. All inner surfaces shall be painted & outer face polished as per Architect's approval.

All exposed cut ends of boards shall be provided with hardwood lippings.

Kail wood to be used shall be of the best available quality.

The joints in cement concrete pavements/roads shall be formed as per design and pattern. The joints shall be cleaned and neatly filled with 'A' grade sealing compound. Side kerbs shall be made in situ to design and volume paid for in the same item. Required side forms shall not be paid separately.

For whitewashing, colour washing, distempering on sand faced plaster or on rough cast plaster with stone aggregate upto 10mm, only flat single surface will be measured and paid.

In the case of R.C.C. Jallies upto 50mm thick only single flat surface will be considered for each side of painting.

SPECIFICATIONS FOR SERVICES

1.0 General

1.1 The drawings for services are diagrammatic but shall be followed as closely as actual construction permits. Any deviations from the drawings shall be in conformity with structural drawings. The dimensions designated by the manufacturers shall take precedence over the drawings.

1.2 At completion of work the Contractor shall submit one set of tracings and two sets of prints of "As-Built-Drawings". These drawings shall, among others, include invert levels, pipe runs, diameters, location of valves, access panels, layout of equipment, piping connections and such other information for maintenance & future extensions. Guarantees given by manufacturers shall be assigned to the Employer along with names & addresses of manufacturers, suppliers and information about spare parts.

1.3 All site test shall be carried out with prior intimation to the Bank Engineer / Architect. All defects shall be rectified and tests conducted again to the satisfaction of the Bank Engineer / Architect. In addition to the test required by the specifications, the Contractor shall also conduct tests required by the Architect and by the Municipal or other Authorities.

1.4 All work shall be executed by competent and licensed persons. The contractor shall maintain liaison with Municipal and other controlling Authorities. He shall obtain their approvals and certificates as required by the bye – laws at appropriate stages.

1.5 No cutting / chasing shall be done in load bearing structural members without prior approval of the Architect. Sleeves and openings shall be provided during the progress of construction in preference to cutting at later date.

1.6 The Architect may require typical mock up(s) to be installed in advance for approval. Undamaged materials from the mock up shall be allowed to be reused in the work.

1.7 Unless otherwise described in the item CI / SCI pipes and fittings shall be a spigot and socket type.

1.8 G.I. pipe spouts shall be paid as per item of G.I. pipes (internal work). Cutting and making good is included. The free ends may be skew-cut.

1.9 Wherever use of G.I. pipes is called for the same shall be medium class (class – B).

2.0 Materials :

2.1 The materials shall conform to the specifications and in absence thereof to Indian Standards. The products should bear the ISI Mark.

2.2 The makes of materials for use in this work are broadly approved as per list given below. The Contractor shall, however, get particular makes and samples approved before ordering:

2.3 Notwithstanding any interim or final approval the Contractor remains responsible for satisfactory performance of all fittings & fixtures. The liability of the Contractor is not limited by any approval of the make of materials.

2.4 The item rate of mirror includes extra packing piece of AC plain sheet, where required due to off set between plaster & glazed tiles surface.

3.0 Testing

3.1 The sand cast iron soil, waste and vent pipes and fittings including joints shall be tested by pumping smoke into the pipe at the lowest end.

3.2 All G.I pipes and fittings including joints shall be tested to hydraulic pressure of 6 kg / cm2 (60 meters) avoiding water hammer. The test pump having been stopped the test pressure should maintain without loss for at least half an hour. The pipes and fittings shall be tested in sections as the work of laying proceeds keeping the joints exposed for inspection during the testing.

3.3 All stone ware pipes shall be tested with water pressure of 1.5m head of water at the highest point of the section under test.

TECHNICAL SPECIFICATION (ELECTRICAL WORKS)

1 SPECIFICATIONS FOR INTERNAL WIRING

1.1. SYSTEM OF WIRING:

The system of wiring shall consist of single/multi core FRLS/FRZH PVC insulated stranded copper conductor wires in non-metallic FRLS PVC conduits/ metallic M.S. conduits as called for in the BOQ. All conduits shall be on the surface, (supported from the Ceiling), in the False Ceiling and concealed in other areas where RCC slab is provided unless otherwise called for in the drawings. All Down conduits shall be concealed unless otherwise called for.

1.2. GENERAL

Prior to laying of conduits, the Contractor shall get approved the conduit layout indicating the route of conduit, number and size of conduits, location of junction/ inspection/pull boxes, size and location of switch boxes, point outlet boxes and other details. These conduit layouts shall be got approved by the Consultant and then only conduit layout should be started. Any modification or suggestions shall be approved by the Consultant before the laying of conduits.

1.3. MATERIALS:

M.S. conduits shall conform to Indian Standards IS: 1653 - 1964 -Specification for Rigid Steel conduits for Electrical wiring with the latest amendments.

M.S. CONDUITS:

M.S. conduits shall be solid drawn or lap welded conduits. Stove enameled inside and outside with minimum wall thickness of 1.6 mm for conduits up to 25 mm diameter and 2.0 mm wall thickness for conduits 32 mm diameter and above.

FRLS PVC conduits to be used for concealed work for all systems except Fire Alarm & Computer system where M.S. conduits shall be used. FRLS PVC conduits shall conform to Indian Standards IS: 9537(Part-3)-1983 -Specification for conduits for Electrical Installation (Part-I) General Requirements.

FRLS PVC CONDUITS:

FRLS PVC conduits shall be rigid, unplasticized, heavy gauge having 1.8 mm wall thickness up to 20 mm diameter and 2.0 mm wall thickness for all sizes above 20 mm diameter. Minimum size of conduit shall be 20 mm dia. Minimum size of conduit for Power point wiring shall be 25 mm dia. The conduits shall be delivered to the site of construction in original bundles and each length of conduit shall bear the label of the manufacturer. The number of insulated copper wires that may be drawn into the conduits of various sizes are given below and the fill shall not exceed 40% the maximum permissible number of 650/1100 volts grade single/multi core PVC insulated copper conductor wires of different sizes, that may be drawn into rigid metallic or non-metallic conduits.

SIZE OF WIRE	**SIZE OF CONDUITS (MM)**				
Nominal cross-Sectional area of wires in sq. mm	20	25	32	40	50 nominal dia in mm
	(Maximum number of wires)				
1.5	5	6	18	-	-
2.5	3	4	10	-	-
4.0	2	3	5	10	-

6.0	-	4	6	8	-
10.0	-	-	3	4	-
16.0	-	-	-	3	5
25.0	-	-	-	2	3

1.4 FRLS PVC CONDUIT ACCESSORIES & CONNECTIONS:

The accessories used for FRLS PVC conduits shall conform to Indian Standards IS: 3419-1988-(Specification for fittings for non-metallic conduits).PVC conduits shall be joined by means of screwed or plain couplers. Where there are long runs of straight conduits, inspection boxes shall be provided at intervals as approved by the consultant. The threads of the pipe and sockets shall be free from grease and oil. It shall be thoroughly cleaned before making the screwed/plain joints. Proper jointing materials as recommended by manufacturers shall be used for jointing of FRLS PVC pipes. Use PVC couplers and connectors for FRLS PVC pipe connections and terminations in boxes. All the joints shall be fully watertight. Junction boxes and running joints shall be provided at suitable places to allow for subsequent extensions if any, without undue dismantling of conduit system. As far as possible diagonal run of conduits shall be avoided. Junction between conduit and adapter boxes, back outlet boxes, switch boxes and the like must be provided with entry spouts and smooth PVC bushes. Joints between conduit and iron clad Distribution Boards or control gear shall be affected by means of conduit couplers into each of which will be coupled smooth PVC bush from the inside of box or case. Conduit system shall be erect and straight as far as possible. All jointing methods shall be subject to the approval of the consultant.

BENDS IN CONDUITS:

Where necessary bends or diversions may be achieved by means of bends and or circular inspection boxes with adequate and suitable inlet and outlet screwed joints. In case of recessed system each junction box shall be provided with a cover properly secured and flush with the finished wall surface, so that the conductors inside the conduits are easily accessible. No bend shall have a radius of less than 2.5 times the outside diameter of the conduit. Conduits shall be cold bend by means of a Bending spring available with the manufacturers. In case it is not available then Heat may be used to soften the PVC conduits, by filling sand in the pipe. Use of PVC conduit in places where ambient temperature is 60 degrees or above is prohibited. PVC Solvent shall be used for joints between conduits, conduits & Junction box etc. PVC checknuts and bushes shall be used for joining conduit with outlet boxes. PVC Closures shall be provided on unused mouths of Junction boxes.

Separate conduits shall be provided for the following system.

i) Lights, Exhaust fans & 5A Light sockets.
ii) Power sockets
iii) Telephone System
iv) Television, Computer & Music system
v) Emergency System.
vi) Public Address System
vii) Fire Alarm System.

Separate switchboards/outlets shall be provided for the following system.

i) Lights, Exhaust fans & 5A Light sockets.
ii) Power sockets & A/C outlets
iii) Telephone System
iv) Television, Computer & Music system

v) Emergency System.
vi) Public Address System
vii) Fire Alarm system.

1.5 FIXING CONDUITS:

Conduits and junction boxes shall be kept in position and proper holdfasts shall be provided. Conduits shall be so arranged as to facilitate easy drawing of wires through them. Adequate junction boxes of approved shape and size shall be provided. All conduits shall be installed so as to avoid steam and hot water pipes. After the conduits, junction boxes, outlet boxes & switch boxes are installed in position their outlets shall be properly plugged so that water, mortar, insects or any other foreign matter does not enter into the conduit system. Exposed conduits shall be fixed by means of spacer bar/ saddles at intervals of not more than 600 mm in normal run and 500 mm from both sides of fitting or accessories. The saddles shall be of 3 mm x 19 mm mild steel flat, properly treated with primer and painted, securely fixed to support by means of nuts and bolts/raw bolts and MS screws as required.

Conduits shall be laid in a neat and organised manner as directed and approved by the Consultant. Conduit runs shall be planned so as not to conflict with any other service pipelines/ducts.

Where exposed conduits are suspended from the structure they shall be clamped firmly and rigidly to hangers of design to be approved by the Consultant. Where hangers are to be anchored to reinforced concrete appropriate inserts and necessary devices for their fixing shall be provided at the time of fixing. Making holes or openings in the concrete will generally not be allowed. In case it is unavoidable prior permission of the Consultant shall be obtained. Conduits shall be fixed in the chase by means of staples not more than 600 mm apart and the chase filled with cement mortar 1 : 4 . Cutting of horizontal chases in walls is prohibited.

1.6. PROTECTION

To minimize condensation or sweating inside the conduit pipes all outlets of conduit system shall be adequately ventilated as directed and approved by the Consultant. All screwed and socketed connections shall be adequately made fully watertight by the use of proper jointing materials i.e. Tropolin for PVC conduits & white lead for metal conduits.

1.7. SWITCH-OUTLET BOXES AND JUNCTION BOXES

All boxes shall conform to Indian Standards IS: 5133(Part-1)-1969 (Specification for boxes for enclosure of Electrical accessories) with the latest amendments. All outlet boxes for switches, sockets & other receptacles shall be fabricated from 1.6mm thick mild steel sheets duly painted with rust proof paint (zinc passivated) as called for, having smooth external & internal surfaces to true finish. Junction boxes and outlet boxes in contact with earth or installed in areas exposed to the weather shall be of 2mm thick mild steel and painted. Where called for, outlet boxes for receiving switches, telephone outlets T.V. outlets, power plugs etc. shall be fabricated to prove shape and size to suit the cover plates of approved make for different utilities. The cover plates shall be of best quality Hylam sheets or ISI grade Urea Formaldehyde Thermosetting insulating material which shall be both mechanically strong and fire retardant, as approved by the Consultant. Proper supports shall be provided in the outlet boxes to fix the cover plates of switches as required. Separate screwed earth terminal shall be provided inside the box for earthing purpose. All boxes shall have adequate number of knockout holes of required diameter for conduit entry. Where called for outlet boxes for receiving switches and fan regulators in one box, shall be fabricated to approved shape and size to accommodate fan regulators and switches

to be fixed on grid plates. These boxes shall be covered with Hylam sheets or ISI grade Urea Formaldehyde Thermosetting insulating material which shall be both mechanically strong and fire retardant. All junction boxes pull boxes and outlet boxes shall be provided with sheet cover Urea Formaldehyde Thermosetting insulating material. The box cover shall be secured to the box with adequate number of round head brass screws of approved make. Outlets exposed to the weather shall be fully weather tight, complete with rubber gasketed covers, glass where used shall be fully heat resistant for the duty. The outlet boxes shall be painted with two coats of bitumastic paint before they are fixed in position. All Outlet boxes fixed in concrete/recessed in wall shall be of a minimum depth of 55mm.

1.8. INSPECTION BOXES

Rust proof (Zinc passivated) inspection boxes of 1.6mm thick mild steel sheet and of required size, having smooth external and internal finish shall be provided to permit periodical inspection and to facilitate removal and replacement of wires when required. Inspection boxes shall be mounted flush with ceiling/walls finished surface and shall be provided with screwed covers of Urea Formaldehyde Thermosetting insulating material sheet cover secured to the box with brass screws. Adequate holes shall be provided for ventilation in the inspection box covers.

1.9. CONDUCTORS

FRLS PVC insulated multistrand copper conductor wires of 1100 Volts grade shall be used for three phase distribution and FRLS PVC insulated multistrand copper conductor wires of 1100 V grade shall also be used for Single phase distribution and shall conform to IS : 694 -1964 with the latest amendments and shall be ISI marked.

1.10. BUNCHING OF WIRES

Wires carrying current shall be so bunched in the conduit that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not be run in the same conduit.

1.11. DRAWING OF CONDUCTORS

The drawing and jointing of copper conductor wires shall be executed with due regard to the following precautions, while drawing insulated wires into the conduits. Care shall be taken to avoid scratches and kinks which cause breakage of conductors. There shall be no sharp bends.

Insulation shall be shaved off for a length of 15mm at the end of wire like sharpening of a pencil and it shall not be removed by cutting it square or ringing.

FRLS PVC insulated copper conductor wire ends before connection shall be properly soldered (at least 15mm length) with special Cu solder for copper conductor or shall be properly crimped with copper lugs/sockets as the case may be. Strands of wires shall not be out for connecting to the terminals. All strands of wires shall be soldered at the end before connection. The connecting brass-screws shall have flat ends. All looped joints shall be soldered and connected through terminal block/connectors. The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less. Conductors having nominal cross-sectional area exceeding 6 Sq mm shall always be provided with cable sockets.

At all bolted terminals, brass flat washer of large area and approved steel spring washers shall be used. Brass nuts and bolts shall be used for all connections.

Only certified wiremen and cable jointers shall be employed to do jointing work. All wire shall bear the manufacturer's label and the voltage grade at one-meter intervals for the full length of coil and shall be brought to site in new and original packages.

The sub-circuit wiring for points shall be carried out in looping system and no joint shall be allowed in the length of the conductors. No wire shall be drawn into any conduit, until all work of any nature, that may cause injury to wire is completed. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire. Before the wires are drawn into the conduits the conduits shall be thoroughly cleared of moisture, dust, and dirt or any other obstruction by Drawing dry cloth through the conduits. The minimum size of FRLS PVC insulated stranded copper conductor wire for all sub circuit wiring for lights, exhaust fans, ceiling fan and 5A Light sockets points shall be 1.5 Sq mm. In case of power circuit not more than two 15 Amp power outlets shall be grouped in one circuit, wiring for the first power outlet shall be carried out with FRLS PVC insulated 6.0 sq mm copper conductor wires. Wiring for the second power outlet shall be carried with FRLS PVC insulated 4.0 sq mm copper conductor wires. All power outlets shall be connected with 4.0 sq mm FRLS PVC insulated copper conductor wires to the earth terminal of outlet. Separate circuit shall run with FRLS PVC insulated 4.0 sq mm copper conductor wires for water heaters, kitchen equipment, window Air conditioners and similar outlets at locations as shown on drawings.

The minimum size of wire from final distribution board to first tapping point in the circuit shall be 2.5 Sq mm FRLS PVC insulated stranded copper conductor wires. Circuit shall not have more than a total of 8 points of fans, 5A Light sockets and Light points and its load shall not exceed 800 watts. Not more than two power circuits shall be drawn through the same conduit. Separate earth wire shall run for each circuit. In case two circuits of the same phase are running in the same conduit then a common earth wire is permissible. The size of earth wire for all the light points, ceiling fans, exhaust fans, light sockets, outlet boxes etc. shall be 1.5 sq mm FRLS PVC insulated copper conductor wires.

1.12. JOINTS

All joints shall be made at main switches, distribution boards, socket outlets, lighting outlets and switch boxes only. No joints shall be made inside conduits and junction boxes. Conductors shall be continuous from outlet to outlet. Joints where unavoidable, due to any specified reasons, prior permission in writing shall be obtained from the Consultant before making such connections.

1.13. MAINS AND SUB-MAINS

Mains and sub-mains wires where called for shall be of the rated capacity and approved make. Every main and sub-main shall be drawn into an independent adequate size conduit. Adequate size draw boxes shall be provided at convenient locations to facilitate easy drawing of the mains and sub-mains. An independent earth wire of proper rating shall be provided. The earth wires shall run along the entire length of the mains and sub-mains. The earth wires shall be fixed to conduits by means of suitable copper clips at not more than 1000mm distance. Where mains and sub-main cables are connected to switch gears, sufficient extra length of sub-main and main cable shall be provided to facilitate easy connections and maintenance.

1.14. LOAD BALANCING

Balancing of circuits in three phase installation shall be planned before the commencement of wiring, shall be got approved by the Consultant and shall be strictly adhered to.

1.15. COLOUR CODE OF CONDUCTORS

Colour code shall be maintained for the entire wiring installation; red, yellow, blue for three phases and "off" circuit black for neutral and green for earth (or bare earth wire)

Telephone Multicore cables shall be of approved make and shall conform to following

specifications.

i) Type of conductor …. Electrolytic Annealed Tinned Cu conductor. (ATC)
ii) Diameter of Conductor ... 0.61 mm dia uniform (minimum size)
iii) Weight of conductor .... 2.52 Kg/Km minimum. iv) Resistance of conductor at 20 degree... 60 Ohms/Km, v) Radial Thickness of PVC insulation...0.3mm ± 0.05mm uniform
vi) Radius Thickness of PVC sheathing ... 1.2mm uniform ± 0.2mm
vii) Overall diameter of insulated conductor. 1.2mm uniform
viii) High voltage Test. Able to withstand upto 500 volts D.C. up to 12 hours immersion in water.

1.16 M.S. CONDUIT ACCESSORIES & CONNECTIONS:

The accessories used for M.S. conduits shall conform to Indian Standards IS: 3837-1966-(Specification for fittings for Rigid steel conduits with the latest amendments. M.S. conduits shall be joined by means of screwed or plain couplers. Where there are long runs of straight conduits, inspection boxes shall be provided at intervals as approved by the Consultant. The threads of the pipe and sockets shall be free from grease and oil. It shall be thoroughly cleaned before making the screwed/plain joints.

Proper jointing and Cleaning materials as recommended by manufacturers shall be used for jointing and cleaning of M.S. pipes. Use M.S. couplers and connectors for M.S. pipe connections and terminations in boxes. All the joints shall be fully watertight. Junction boxes and running joints shall be provided at suitable places to allow for subsequent extensions if any, without undue dismantling of conduit system. As far as possible diagonal run of conduits shall be avoided. Junction between conduit and adapter boxes, back outlet boxes, switch boxes and the like must be provided with entry spouts and smooth M.S. bushes and M.S. Checkouts. Joints between conduit and iron clad Distribution Boards or control gear shall be affected by means of conduit couplers into each of which will be coupled smooth M.S. bush from the inside of box or case. Conduit system shall be erect and straight as far as possible. All jointing methods shall be subject to the approval of the Consultant.

M.S. CONDUIT CONNECTIONS:

Conduit connections for MS conduits shall be screwed metal to metal and be painted with one coat of self-etching zinc chromate primer and two coats of enamel paint. The threads and sockets shall be free from grease and oil. Connections between screwed conduit and sheet metal boxes shall be by means of a brass hexagon smooth bore bush, fixed inside the box. Checkouts to be provided on inside and outside of box and connected through a coupler to the conduit or as directed by the Consultant. The joints in the conduits shall be free of burrs to avoid damage to insulation of conductors while pulling them through the conduits. Connections between PVC and MS conduits shall be through a junction box. Direct connection between PVC and MS conduits is not allowed.

2.0 CABLES

2.1 GENERAL

MV Cables shall be supplied, laid tested and commissioned in accordance with drawing specifications, relevant Indian Standards specification, Indian Electricity Act and manufacturer's instructions. The cable shall be delivered at site in original drums with manufacturers name clearly written on the drums.

2.2 MATERIAL

MV CABLES: MV Cables shall be FR XLPE PVC insulated aluminum conductor armoured and

unarmoured cables conforming to IS: 1554 (part I&II)-1976 & IS : 694-1977 (PVC Insulated cables for working voltages up to and including 1100 volts (second revision) with latest amendments. MV cables shall be suitable for underground use and laid in trenches, ducts, cable trays, under roads and paved areas. MV Cables shall be termite resistant and shall be of approved make.

2.3 JOINTS IN CABLES

The contractor shall take care to see that all the cables are apportioned to various locations in such a manner as to ensure no straight joints in the cable run. If the straight joint in cable is unavoidable due to any specified reasons, prior permission in writing shall be obtained from the Consultant before the use of such straight joints in cable.

2.4 JOINTING BOXES FOR CABLES

Cable jointing boxes shall be of appropriate size, suitable for PVC insulated cables of particular voltage ratings, and shall be manufactured by approved manufacturers.

2.5 JOINTING OF CABLES

All cable joints shall be made in suitable approved cable joint boxes. Jointing of cables in the joint boxes and the filling in of compound shall be done in accordance with the best practice in trade, in accordance with manufacturer's instructions and in an approved manner. All straight Joints shall be done in epoxy mould boxes with TROPOLIC/ M-Seal resin or approved equal. All terminal ends of conductors shall be heavily soldered upto at least 50mm length.

All cables shall be jointed colour to colour and tested for insulation resistance and continuity before jointing commences. The seals of cables must not be removed until preparations for jointing are completed. Joints shall be finished on the same day as commenced and sufficient protection from the weather shall be arranged.

2.6 FILLING OF EPOXY COMPOUND

Equal quantities of resin and hardner shall be taken and mixed thoroughly by hand until the mixture is free from white patches and has uniform colour. No water, oil or any other liquid shall be added to the mixture to make it soft as this will affect the properties of the compound. The mixture shall be used within 30-40 minutes of mixing. The surface on which epoxy compound is to be used shall be free from dust, rust, oil, grease and shall be dry. No disturbance or movement of joint shall be made till the epoxy compound has completely hardened. A smooth surface can be made by rubbing a damp cloth smoothly on the compound before it sets. The joints shall be painted after it has completely hardened.

2.7 CABLES TERMINATION

Cable termination shall be done in terminal cable box using cable glands and the cable ends sealed with sealing compound.

2.8 BONDING OF CABLES

Where a cable enters any piece of apparatus, it shall be connected to the casing by means of an approved type of armoured clamps and gland. The clamps must grip the armouring firmly to the gland or casing, so that in the event of ground movement no undue stress is passed on to the cable conductors. The glands shall be either to the lead sheath by means of 'Plumbing Joint' as on a cone of approved materials, capable of being compressed into lead sheath. The gland or cone shall be capable of effecting a good electrical bond between both the armouring and lead of the cable and the casing.

2.9 LAYING OF CABLES

Cables shall be laid by skilled and experienced workmen using adequate rollers to minimize stretching of the cable. The cable drums shall be placed on jacks before unwinding the cable.

Great care shall be exercised in laying cable to avoid forming kinks. The drums shall be unrolled, and cables run over wooden rollers in trenches at intervals not exceeding 2 meters. Cables shall be laid at depth of 750mm depth below ground level in the case of MV Cables. A cushion of sand, not less than 75mm shall be provided both above and below the cable, joint boxes and other accessories. HV and MV cables shall not be laid in the same trench and/or alongside of water main. The cable shall be laid in excavated trench 80mm layer of sand shall be spread over the cable. The cable then shall be lifted and placed over the sand bed. The second layer of 80mm sand then be spread over the cable. The relative position of the cables laid in the same trench shall be preserved and the cables shall not cross each other as far as possible. At all changes in direction in horizontal and vertical planes, the cable shall be bent smooth with a radius of bend not less than 12 times the diameter of cable. Minimum 3 M long loop shall be provided at both sides of every straight joint and 5 Meters at each end of the cable. Distinguishing marks shall be made on the cable ends for identification. Insulation tapes of appropriate voltage and in red, yellow and blue colours shall be wrapped just below the sockets for phase identification. Aluminium Labels etched with the size of cable shall be provided around the two ends of each cable.

2.10 PROTECTION OF CABLES

The cable shall be protected by placing burnt bricks over the cables 600mm wide on the top layer of sand for the full length of underground cable. Where more than one cable is running in the same trench, the bricks shall cover all the cables and shall project a minimum of 80mm on either side of the cable.

Cable under road crossings and any surfaces subjected to heavy traffic, shall be protected by running them through Hume pipes of suitable size and Heavy grade quality.

Cables under paved areas (which form part of the building) shall be protected by running them through Stoneware/Hume pipes of 150 mm dia (minimum size) one meter below road level.

2.11 CABLES INSIDE BUILDINGS

Cables inside buildings shall be laid either in masonry trenches or carried on through trays or brackets. Where cables run in ducts inside the buildings the cables shall be adequately clamped to angle iron brackets, secured to the wall, as directed and approved by the Consultant. Where cables are suspended from ceilings, they shall be carried over troughs or trays as directed and approved by the Consultant. The supports shall be placed not more than 1.0 meter apart. All cables passing through walls below paved area, and concrete shall run through stone ware pipes or Hume pipes of adequate diameter recessed or exposed as directed. Cables running along walls shall be supported and clamped to saddles, or hanger rigidly anchored at close intervals. Clear space between parallel cables shall be equal to the diameter of the cable but not less than 50mm. Where called for cable trenches shall be filled with fine sand. The contractor shall ensure that hangers, brackets and other supporting arrangements for cables are placed in proper position at the time of building the walls, concreting slabs, etc. cutting holes or opening in concrete may be carried out only with prior permission of the Consultant.

All excavations and back fill including timbering, shoring and pumping required for the installation of the cables shall be carried out as per the drawings and requirements laid down elsewhere. Trenches shall be dug true to line and grades. Back fill for trenches shall be filled in layers not exceeding 150mm. Each layer shall be properly rammed and consolidated before laying the next layer. The Contractor shall restore all surfaces roadways, sidewalks, curbs, walls or other works cut by excavation of their original condition, to the satisfaction of Consultant.

2.12 MARKERS AND WARNING PLATES

Approved CI cables markers shall be provided along the route of the cables at every 30-meter distance and at both ends of road crossing, indicating HV cables and MV cables as applicable. Special CI markers shall be provided at all buried cable joints indicating "Electrical Cable Joints. GI plates engraving the size of cable and the place it serves shall be tied to the cable at regular intervals of 2 meters for easily identification of the cables.

2.13 TESTING OF CABLES

Prior to burying of the cables, following tests shall be carried out:

a. Insulation test between phases and phase to earth for each length of cable before and after jointing.

On completion of cable laying work and jointing the following tests shall be conducted in the presence of the Consultants.

a. Insulation Resistance test (Sectional and Overall)
b. Continuity Resistance Test.
c. Sheath continuity Test.
d. Earth Test.
e. Physical Dimensions Test.

All tests shall be carried out in accordance with relevant Indian Standard Codes of practice and Indian Electricity Rules. The contractor shall provide necessary instruments, equipment and labour for conducting the above test and shall bear all expenses in connection with such tests. All tests shall be carried out in the presence of the Consultant / Consultant.

3.0 EARTHING

3.1 EARTHING

All the non-current metal parts of electrical installation shall be earthed properly. All metal conduits, trunking, cable sheaths, switchgear, outlet boxes, distribution boards, light fittings, fans and all other parts made of metal or conductive material shall be bonded together and connected by means of specified earthing system. All earthing will be in conformity with the relevant provision of Rules 33 and 61 of the Indian Electricity Rules 1956 and Indian Standard Specifications IS:3043-1987 with latest amendments.

3.2. EARTHING CONDUCTORS

All earthing conductors shall be of high conductivity electrolytic copper of 99 % purity and shall be protected against mechanical injury or corrosion.

3.3. SIZING OF EARTHING CONDUCTORS

The cross-sectional area of copper earthing conductor shall be same as the active conductor for sizes of active copper conductor upto 4.0 sqmm and shall be half the size for 16 sq mm active copper conductor and above. All fixtures, fans, outlet boxes and junction boxes shall be earthed with 1.5 sqmm PVC Insulated copper conductor wires. All power sockets and single-phase A/C units shall be earthed with 4.0 PVC Insulated copper conductor wires. All Three phase Final Distribution Boards shall be earthed with 2 nos 4 mm dia bare copper conductor wires. The sizes of the earth continuity conductors should not be less than half of the largest current carrying conductors.

The Sub-Distribution Board shall be earthed to 2 nos 600mm x 600mm x 3mm copper plate earthing stations through 25m x 3 mm copper strips.

3.4. CONNECTION OF EARTHING CONDUCTORS

Main earthing conductors shall be taken from the earth connections at the main switchboards to an earth electrode with which the connection is to be made. Submain earthing conductors shall run from the main switchboard to the sub-distribution boards. Final distribution boards earthing

conductors shall run from sub-distribution boards.

3.5. PROHIBITED CONNECTIONS

Neutral conductor, sprinkler pipes, or pipes conveying gas, water, or inflammable liquid, structural steel work, metallic enclosures or cables and conductors, metallic conduits and lightning protection system conductors shall not be used as a means of earthing an installation or even as a link in an earthing system. The electrical resistance of metallic enclosures for cables and conductors measured between earth connections at the main switchboard and any other point on the completed installation shall be low enough to permit the passage of current necessary to operate fuse or circuit breakers and shall not exceed 1 ohm.

3.6. PROTECTION FROM CORROSION

Connections between copper and galvanised equipment shall be made on vertical face and protected with paint and grease. Galvanised fixing clamps shall not be used for fixing earth conductors. Only copper fixing clamps shall be used for fixing earth conductors. When there is evidence that the soil is aggressive to copper, buried earthing conductors shall be protected by suitable serving and sheathing.

3.7. EARTHING STATION

Plate Electrode Earthing: Earthing electrode shall consist of a tinned copper plate not less than 300mm x 300mm x 3mm thick as called for in the Schedule. The plate electrode shall be buried as far as practicable below permanent moisture level but in any case, not less than 4.2 meters below ground level. Wherever possible earth electrodes shall be located as near the water tap, water drain or a down take pipe as possible. Earth electrodes shall not be installed in proximity to a metal fence. It shall be kept clear of the buildings foundations and in no case shall it be nearer than 2 meters from the outer face of the wall. The earth plate shall be set vertically and surrounded with 150mm thick layer of charcoal, dust and salt mixture. 20mm GI pipe shall run from the top edge of the plate to the ground level. The top of the pipe shall be provided with a funnel and a mesh for watering the earth through a pipe. The funnel over the GI Pipe shall be housed in a masonry chamber, approximately 300mm x 300mm x 300mm deep. The masonry chamber shall be provided with a cast iron cover resting over a GI frame embedded in masonry. Refer Sketch for additional details.

Pipe Electrode Earthing: Earthing electrode shall consist of a GI Pipe (class 'A') Indian Tube Company make or approved equal not less than 40mm dia and 4.5 meters long. GI Pipe electrode shall be cut tapered at the bottom and provided with holes of 12mm dia drilled at 75mm interval upto 2.5 meters length from bottom. The electrode shall be buried vertically in the ground as far as practicable below permanent moisture level with its top not less than 1.25 M below ground level. The electrode shall be in one piece and no joints shall be allowed in the electrode. Wherever possible earth electrodes shall be located as near water tap, water drain or a down take pipe. Earth electrodes shall not be located in proximity to a metal fence. It shall be kept clear of the building foundations and in no case shall be nearer than 2 meters from the outer face of the wall. Refer Sketch for additional details.

The pipe earth electrode shall be kept vertically and surrounded with 150mm thick layer of charcoal dust and salt mixture upto a height of 2.5 meters from the bottom. At the top of the electrode a funnel with a mesh shall be provided for watering the earth. The main earth conductors shall be connected to the electrode just below the funnel, with proper terminal lugs and check nuts. The funnel over the GI pipe and earth connection housed in a masonry chamber, approximately 350mm deep. The masonry chamber shall be provided with a cast iron cover resting over a CI frame embedded in masonry.

3.8. EARTH CONNECTION

All metal clad switches and other equipment carrying single phase current, shall be connected to earth by a single connection. All metal clad switches carrying medium voltage and high voltage shall be connected with earth by two separate and distinct connections. The earthing conductors inside the building wherever exposed shall be properly protected from mechanical injury by running the same in GI Pipe of adequate size.

Earthing conductors outside the building shall be laid 600mm below the finished ground level. The over lapping in copper strips at joints where required, shall be minimum 75mm. The joints shall be riveted and brazed with copper rivets and greased in approved manner. Sweated lugs of adequate capacity and size shall be used for all termination of wires above 1 Sqmm size and bare copper wire above 2.0mm dia. Lugs shall be bolted to the equipment body after the metal body is cleaned of paint and other oily substance and properly tinned. The earth wires entering the Final Distribution Boards shall be terminated with copper sockets crimped to its ends and tightened to the terminal with the help of flat end brass screws.

3.9. EARTH RESISTANCE

The earth resistivity of the soil where the earthing stations are located shall be submitted to the Consultant before the earthing work starts and get the approval of the Consultant/Owner. If the earth resistance is too high and multiple electrode earthing does/not give adequate low resistance to earth, than the soil resistivity immediately surrounding the earth electrodes shall be reduced by adding sodium chloride, calcium chloride, sodium carbonate, copper sulphate, salt and soft coke or charcoal in suitable proportions as directed by the consultants.

3.10. RESISTANCE TO EARTH

The resistance of each earth system shall not exceed 1.0 ohm in the case of Medium Voltage system and 0.5 ohm in the case of High Voltage system.

4.0 TESTING

4.1 GENERAL

On completion of the work the entire installation shall be subject to following tests:

a) Wiring Continuity Test
b) Insulation Resistance Test
c) Earth Continuity Test
d) Earth Resistively Test

Besides the above any other test specified by the local Authority shall also be carried out.

All tested and calibrated instruments for testing, labour, materials and incidentals necessary to conduct the above tests shall be provided by the Contractor at his own cost.

4.2 TESTING OF WIRING

All wiring systems shall be tested for continuity of circuits, short circuits and earthing after wiring is complete and before energising. The Test Certificates for the complete wiring shall be submitted in the Format and the Total Electrical Installation shall be got approved by the Electrical Inspector.

4.3 INSULATION RESISTANCE TEST

The insulation resistance shall be measured by applying between earth and the whole system of conductors, or any section thereof with all fuses in place and all switches closed (except in concentric wiring) all lamps in position of both poles of the installation , otherwise electrically connected together, a direct current pressure of not less than twice the working pressure(provided that it does not exceed 660 volts for medium voltage circuits) be applied. Where the supply is derived from A.C. three phase system, the neutral pole of which is

connected to earth, either direct or through added resistance, pressure shall be deemed to be that which is maintained between the phase conductor and the neutral. The insulation resistance measured as above shall not be less than 50 divided by the number of points on the circuit provided that the whole installation shall not be required to have an insulation resistance greater than one mega ohm. The insulation resistance shall not be measured between all conductors connected to one phase conductor of the supply and all the conductors connected to the middle wire or to the neutral or to the other phase conductors of the supply. Such a test shall be carried out after removing all metallic connections between the two poles of the installation and in these circumstances the insulation resistance between conductors of installation shall not be less than that specified above.

The insulation resistance between the case of frame work of housing and power appliances, and all live parts of each appliance shall not be less than that specified in the relevant Indian Standard Specifications or where there is no such specification shall not be less than half a mega ohm.

4.4 TESTING OF POLARITY OF NON-LINKED SINGLE POLE SWITCHES

In a two wire installation a test shall be made to verify that all non-linked single pole switches have been fitted in the same conductor throughout, and such conductor shall be labeled or marked for connection to an outer or phase conductor or to the non-earthed conductor of the supply. In the three or four wire installation a test shall be made to verify that every non-linked single Pole switch is fitted in a conductor to one of the outer or phase conductor of the supply. The entire electrical installation shall be subject to the final acceptance of the Consultant as well as the local authorities.

4.5. EARTH RESISTIVITY TEST

Earth resistivity test shall be carried out in accordance with Indian Standard code of practice for earthing IS: 3043:1987. All tests shall be carried out in the presence of the Consultant/Owner.

4.6 TEST CERTIFICATES

The Electrical Installation shall be tested as per relevant Indian Standards and Test Certificate to this effect shall be submitted to the Owner. The Contractor has to get the Total Electrical Installation approved by the Electrical Inspector and the permission to energise the same shall be submitted to the Owner.

5.0 SAFETY REQUIREMENTS

5.1 SCOPE

This section covers the requirements of items to be provided in the sub-station for compliance with statutory regulations, safety and operational needs.

5.2 REQUIREMENTS

Safety provisions shall be generally in conformity with the relevant Indian Standards and I.E. Rules and Regulations. In particular the following items shall be provided.

(a) Insulation Mats

Insulation Mats conforming to IS: 5424-1969 shall be providedin front of main switch boards and other control equipment as specified.

(b) First Aid Charts and First Aid Box

Charts (one in English, one in Hindi, one in Regional language), displaying methods of giving artificial respiration to a recipient of electrical shock shall be prominently provided at appropriate place. Standard First Aid Boxes containing materials as prescribed by St. John Ambulance brigade or Indian Red Cross should be provided in each sub-station.

(c) Danger Plate

Danger plates shall be provided on HV and MV equipments. MV danger notice plate shall be 200mm x 150mm made of mild steelat least 2mm thick vitreous enameled white on both sides andwith inscriptions in signal red colour on front side as required.

(d) Fire Extinguishers

Portable CO2 conforming to IS: 2878-1976 dry chemical conforming to IS 2171-1976 extinguishers shall be installed in the sub-station at suitable places as specified.

(e) Fire Buckets

Fire buckets conforming to IS: 2546-1974 shall be installed with the suitable stand for storage of water and sand.

(f) Toolbox

A standardtoolbox containing necessary tools required for operation and maintenance shall be provided in sub-station.

(g) Caution Board

Necessary number of caution boards as "Man online" "Don't switch on' etc. shall be available in the sub-station.

(h) Keyboard

A key board of required size shall be provided at a proper place containing castel key, and all other keys of sub-station and allied areas.

6.0 M V PANELS, SUB-DISTRIBUTION BOARDS & FINAL DISTRIBUTION BOARDS

The PANELSs shall be suitable for operation on 3 phase, 4 wire, 415 Volts, 50 cycles, neutral grounded at transformer and short circuit level not less than 31 MVA at 415 volts.

The PANELS shall comply with the latest edition of relevant Indian Standards and Indian Electricity Rules and Regulations. All PANELSs shall be fabricated by the contractor by using specified components as per the specifications given below:

6.1. CONSTRUCTION FEATURES

The PANELSs shall be metal enclosed sheet steel cubical, indoor, dead front, floor mounting type. The distribution boards shall be totally enclosed, completely dust and vermin proof. Gaskets between all adjacent units and beneath all covers shall be provided to render the joints dust proof. PANELSs shall be preferably arranged in multitier formation. All doors and covers shall be fully gasketed with foam rubber and/or rubber strips and shall be lockable. All MS sheet steel used in the construction of PANELSs shall be 2mm thick and shall be cut to different sizes and bolted as necessary to provide a rigid support for all components. Joints of any kind in sheet metal shall be bolted type and not welded type.

All covers shall be properly fitted and square with the frame, and holes in the PANELS correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with hank nuts. Self-threading screws shall not be used in the construction of PANELSs. A base channel of 75mm x 40mm x 5mm thick shall be provided at the bottom. A minimum of 200 mm between the floor of MV PANELS & Distribution board and lower most unit shall be provided. The PANELS shall be of adequate size with a provision of 20% spare space to accommodate possible future additional switchgear in addition to spare feeders.

Knockout holes of appropriate size and number shall be provided in the PANELSs in conformity with the location of incoming and outgoing cables.

PANELSs shall be provided with removable aluminum plates at top and bottom to drill holes for cable entry at site.

The PANELSs shall be suitable for IP 42 protection.

6.2. CIRCUIT COMPARTMENTS

Each circuit breaker, MCCB and switch fuse units shall be housed in separate compartments and shall be enclosed on all sides. Sheet steel hinged lockable door shall be duly interlocked with the ACB/MCCB/switch fuse unit in 'on' and 'off' position. Safety interlocks shall be provided for air circuit breakers to prevent the breaker from being drawn out when the breaker is in 'on' position. The door shall not form an integral part of the draw out position of the ACB. All instruments and indicating lamps shall not be mounted on the ACB compartment door. Sheet steel barriers shall be provided between the tiers in a vertical section. The Knobs for holding the cubicle door in closed position shall be spring operating rotating type and not screwed type.

6.3. INSTRUMENT ACCOMMODATION

Separate and adequate compartments shall be provided for accommodating instruments, indicating lamps, control contractors and control fuses etc. These shall be accessible for testing and maintenance without any danger of accidental contact with live parts of the circuit breaker, bus bar and connections.

6.4. BUS BARS & BUS BAR CONNECTION

The bus bar and interconnections shall be of electrolytic Copper of 99.9 % purity of rectangular cross sections suitable for full load current for phase bus bars and full rated current for neutral bus bar and shall be extendible on either side. Minimum 200 Amps capacity bus bars shall be provided in the distribution boards. The bus bars and interconnections shall be insulated with PVC heat shrinking sleeves and colour coded. The bus bars shall be supported on unbreakable, non hygroscopic insulated SMC supports at regular intervals to withstand the forces arising from short circuit in the system. All bus bars shall be provided in a separate chamber and properly ventilated. The current density of copper shall not be more than 1.6 Amps per sq.mm cross sectional area of Bus bar. If Aluminium bus bars are provided the current density of Aluminium shall not be more than 0.8 Amps per sq. mm cross section of Aluminium bus bar. Maximum allowable temperature for the Bus bar to be restricted to 85^0 C.

All bus bar connections in PANELS shall be done by drilling holes in bus bars and connecting by cadmium plated M.S. bolts and nuts. 20% Additional cross section of bus bars shall be provided in all distribution boards to cover up the holes drilled in the bus bars. Spring and flat washers shall be used for tightening the bolts.

Automatically operated safety shutters to screen the live cluster when the breaker is withdrawn from cubicle is to be provided.

All connections between bus bars and switches and between switches and cable alley terminals shall be through solid copper strips of proper size to carry full rated current and insulated with PVC heat shrinking sleeves. All the PANELSs shall be completely factory wired, ready for connection. All the terminals shall have adequate current rating and size to suit individual feeder requirements. Each feeder shall be clearly numbered from left to right to correspond with wiring diagram. All the switches and feeders shall be distinctly marked with a small description of the service installed. Minimum width of busbar Alley shall be 300 mm and that of cable alley shall be 450 mm.

6.5. TERMINALS

The outgoing terminals and neutral link shall be brought out to a cable alley suitably located and accessible from the PANELS front. The current transformer for instruments metering shall be mounted on the terminal blocks. Cable compartments shall be provided for incoming and outgoing cables with suitable bus bar extension and supports.

6.6. WIREWAYS

A horizontal wire way with screwed covers shall be provided at the top to take interconnecting control wiring between different vertical sections.

6.7. CABLE COMPARTMENTS

Cable compartment of adequate size shall be provided in the PANELSs for easy termination of all incoming and outgoing cables entering from bottom or top. Adequate proper supports shall be provided in cable compartments to support cables. All incoming and outgoing switch/MCCB's terminals shall be brought out to terminal blocks in the cable compartment. The switch board shall have in each PANELS thermostatically controlled space heaters/ ventilation fans.

6.8. METERS

All meters shall be housed in a separate compartment and accessible from front only. Lockable doors shall be provided for the metering compartment. The details of other meters and indicating lamps are as described in each switch board and neutral selector switch of appropriate range and scale. Wiring for meters shall be colour coded and labeled with approved plastic ferrules for easy identification. All meters shall be digital.

6.9. CURRENT TRANSFORMERS

Where ammeters are called for CT's shall be provided for current measuring more than 60 Amps. Each phase shall be provided with separate current transformer of accuracy class I and suitable V.A. Burden for operation of associated metering and Relays. Current transformers shall be in accordance with IS:2705-1964 as amended upto date and Cast Resin Type. Tape wound CTS are not acceptable. The name plate of CT's. Shall be fixed in such a way it can be easily readable without dismantling.

6.10. INDICATING PANELS AND METERING EQUIPMENT

All meters and indicating instruments shall be accordance with relevant Indian Standards. The meters shall be flush mounted and draw out type. Indicating lamps shall be neon type and of low burden. Indicating lamps shall be backed up with fuses of 5 Amps and toggle switch.

6.11. EARTHING

Copper earth bars of 25mm x 3mm shall be provided for all PANELS for the full length and connected to the framework of the PANELS.

Provision shall be made for connection from this earth bar to the main earthing bar on both sides of the PANELS.

6.12. PAINTING

All sheet steel work shall undergo a process of degreasing pickling in acid, cold rinsing, phosphating, passivating and then sprayed with a high corrosion resistant primer. The primer shall be baked in an oven. The finishing paint treatment shall be by powder coating.

6.13. LABELS

Engraved anodized aluminium labels shall be provided on all incoming and outgoing feeder switches. Circuit diagram showing the control wiring shall be pasted on inside of the PANELS door and covered with transparent laminated plastic sheet. The Label shall indicate the name of the feeder, the specific area it is feeding, ampere rating and the cable size it is receiving. The Labels shall be provided on the backside of the PANELS in case of back access.

All the PANELSs shall be subject to tests specified in relevant Indian Standards and test certificate shall be furnished.

6.14. SHOP DRAWING

Before fabricating the PANELSs the contractor has to submit shop drawing showing the general arrangements, bill of materials and the wiring diagram for all the PANELSs to the Consultant and get approval from the Consultant.

6.15. INSPECTION

At all reasonable times during production and prior to shipment of equipment the contractor shall

provide and secure for Consultant/ Owners representative every reasonable access and facility at their plant for inspection.

6.16. TEST CERTIFICATES

Testing of PANELSs shall be carried out at factory and at site as specified in Indian Standards. The test certificates for the tests carried out at factory shall be submitted in duplicate.

6.17 MINIATURE CIRCUIT BREAKER (MCB)

Miniature circuit breaker shall be quick make and break type and confirm with Indian Standards IS : 8828 – 1978 (Specifications for Miniature Air Break Circuit breakers for voltage not exceeding 1000V) The housing of MCB's shall be heat resistant and having a high impact strength. The fault current of MCB's shall not be less than 9000 Amps at 230 volts. The MCB's shall be flush mounted and shall be provided with trip free manual operating mechanism "ON" and "OFF" indications.

The MCB contacts shall be silver nickel and silver graphite alloy coated with silver. Proper arc chutes shall be provided to quench the arc immediately. MCB's shall be provided with magnetic fluid plunger release for over current and short circuit protection. The overload or short circuit devices shall have a common trip bar in the case of DP and TPN Miniature circuit breakers. The MCB shall be tested and certified as per Indian Standards prior to installation.

6.18 LV MCCB (Moulded Case Circuit Breakers)

6.18.1 General

Moulded case circuit breakers shall be incorporated in the switch board wherever specified. MCCB shall conform to the latest IEC 60947-Part 1&2 & IS 13947:1993 in all respects.

- They shall be of Category A with a rated service breaking capacity (Ics) rating.
- MCCBs shall be available in fixed or plug-in/withdrawable versions as well as in 3-pole and 4-pole versions. For plug-in/withdrawable versions, a safety trip shall provide advanced opening to prevent connection and disconnection of a closed-circuit breaker.
- MCCBs shall be designed for both vertical and horizontal mounting, without any adverse effect on electrical performance. It shall be possible to supply power either from the upstream or downstream side
- MCCBs shall provide class II insulation (according to IEC 60664-1 standard) between the front and internal power circuits.
- Rated insulation voltage shall be 750V AC (50/60 Hz).
- The circuit breaker shall comply with the isolation function requirement of IEC 60947-2 section 7.1.2 to marked as suitable for isolation/disconnection to facilitate safety of operating personnel while the breaker is in use.
- All MCCBs required as per BOQ shall have Ics – rating not Icu rating.

6.18.2 Construction

- For maximum safety, the power contacts shall be insulated in an enclosure made of a thermosetting material from other functions such as the operating mechanism, the case, the trip unit and auxiliaries.
- The operating mechanism of MCCBs shall be of the quick-make, quick-break type with fault tripping overriding manual operation. All poles shall operate simultaneously for circuit breaker opening, closing and tripping
- MCCBs shall be actuated by a toggle or handle that clearly indicates the three positions: ON, OFF and TRIPPED in order to ensure suitability for isolation complying with IEC 60947-2
- The operating mechanism shall be designed such that the toggle or handle can only be in OFF position if the power contacts are all actually separated, in OFF position, the toggle or

handle shall indicate the isolation position. Isolation shall be provided by a double break on the main circuit

- MCCB shall be equipped with a "push to trip" button in front to test operation and the opening of poles.

6.18.3 Current Limiting, Discrimination & Endurance

- MCCBs shall comprise a device, designed to trip the circuit-breaker in the event of high-value short-circuit currents. This device shall be independent of trip unit.
- The electrical endurance of MCCBs, as defined by IEC 60947-2 standard, shall be at least equal to 3 times the minimum required by the standard
- The MCCB shall employ maintenance free double break contact system to minimize the let-through energies and capable of achieving discrimination up to the full short circuit capacity of the downstream MCCB.The manufacturer shall provide both the discrimination tables (with test certificates) and let-through energy curves.

6.18.4 Accessories

1. MCCB shall be provided with the following accessories, as specified in schedule of quantities.
   i) Under voltage trip
   ii) Shunt trip
   iii) Alarm switch
   iv) Auxiliary switches

All the accessories shall be rated for continuous operation. These Auxiliaries shall be common for the similar type and range of MCCBs.

It should be possible to fit MCCBs with a motor mechanism for electrically controlled operation.

6.18.5 Interlocking

Moulded, case circuit breakers shall be provided with the following interlocking devices.

a) Extended door handle.
b) Handle interlock to prevent unnecessary manipulations of the breaker.
c) Door interlock to prevent the door being opened when the breaker is in ON position.
d) Defeat-interlocking device to open the door even if the breaker is in ON position.

The MCCB shall be current limiting type and comprise of quick make – Break switching mechanism. MCCBs shall be capable of defined variable overload adjustment. All MCCBs shall have adjustable short circuit pick-up.

The trip command shall override all other commands.

6.18.6 Protection Functions Wherever Specified

- All the MCCBs shall be with microprocessor-based trip units with adjustable Overload & Short circuit protection. Earth fault/Earth leakage protection shall be provided in the MCCB.
- Trip units shall be fully interchangeable type and it should be possible to upgrade the trip unit anytime without any modifications in the installation.
- In case of overload, Pre alarm indication shall be provided on the MCCB.
- Trip units shall be adjustable, and it shall be possible to fit lead seals to prevent unauthorized access to the settings.
- Trip units shall comply with appendix F of IEC 60947-2 standard (measurement of rms

current values, electromagnetic compatibility, etc.)

- Protection settings shall apply to all circuit breaker poles.
- Trip units shall be equipped with Thermal memory feature to reduce the stress on the installation in case of repetitive overloads.
- All electronic components shall withstand temperatures up to 125 °C.

6.18.7 Testing

a) Original test certificate of the MCCB as per IEC 60947-1 &2 or IS13947 shall be furnished.
b) Pre-commissioning tests on the switch board PANELS incorporating the MCCB shall be done as per standard specifications.

7 FIRE DETECTION AND ALARM SYSTEM:-

7.1 SCOPE

The scope of this section covers design, manufacturers, supply, installation, connecting, testing and commissioning of conventional type fire detection and alarm system.
The work include supply, installation, testing and commissioning of:

a. M S conduit work with all accessories.
b. Complete wiring in existing concealed/surface conduits
c. Photoelectric type smoke detectors.
d. Rate of rise cum fixed temperature heat detectors.
e. Manual alarm stations.
f. Response indicators.
g. Main control and indicating panel/zonal panel.

A high degree of operational safety, high quality and well-designed detectors, signal panels and auxiliary equipment shall be accepted. Supplier shall confirm that the electronic components used in alarm and indicating panels are of standard manufacturers and are approved type, also the name of the manufacturer shall be indicated.
The Contractor shall obtain clearance and approval form the Local Fire Authorities, the insurance company ensuring the building or any other agencies whom approval is required.

7.2 STANDARDS

For Spacing of detectors	BS	:	Code of Practice CP 1019, Section 2.7
For sensitivity of smoke detector	BS	:	5446 - 1977
For control and indicating panel	IS	:	2189 – 1988
For smoke Detector	IS	:	11360 - 1985
For Heat Detector	IS	:	2175 – 1988

7.3 OPERATING VOLTAGE

220 volts AC + 10% 50 cycles (single phase) and 24 volts DC +- 10%

7.4 DETECTORS IN GENERAL

7.4.1 COMPATIBILITY

All automatic fire detectors shall be interchangeable without requiring different mounting bases nor alternations in the signal panel.

7.4.2 RESPONSE SPECTRUM

Combustion gas detectors shall respond to both visible and invisible aerosols, size and colour of the aerosols shall not have a decisive influence on the response of the detector.

7.4.3 SENSITIVITY

On average, 30 mgr of burned material per cu.m (as measured in a 1 cu.m chamber) shall release an alarm.

7.4.4 POWER CONSUMPTION

Each detector shall use the minimum of power, for economic circuits, so that it shall be possible to connect atleast 20 detectors per zone. Distance upto 1000 meters from detector to signal panel shall not influence the number of detectors per zone.

BUILT-IN-RESPONSE INDICATOR

Each detector shall incorporate indicator "LED" at the base of the detector which shall light up on actuation of the detector to locate the detector which is operated. The detector shall not be affected by failure of the response indicator lamp.

RESPONSE INDICATORS

It shall be possible to provide a secondary response indicator for the detector outside the closed room.

MAINTEANCE

All detectors shall be fitted either with plug-in system or bayonet type connections only, from the maintenance and compatibility point of view.

CONSTRUCTION

The detector shall be vibration and shock proof. When disassembling for cleaning purpose, its components must not be damaged by static over voltage.

ATMOSPHERIC AND THERMAL DISTURBANCES

The detector shall also be designed as to be practically immune to environmental criteria such as air currents, humidity, temperature fluctuations, pressure and shall not release false alarm.

CONTINUOUS OPERATION

An alarm release shall not affect a detector's good functioning. After resetting the alarm, the detector shall resume operation without re-adjustment of any kind.

DAPTABILITY TO AMBIENT CONDITIONS

Detectors shall be designed for adaptability to humid and explosion endangered locations.

PHOTOELECTRIC SMOKE DETECTORS

Smoke detectors shall connect with two wires to one of the Fire Alarm Panel Loops. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog value for smoke density. The detectors shall be ceiling mounted type and shall include a twist-lock base.

The detectors shall provide dual alarm and power LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel. Both LEDs may be placed into steady illumination by the control panel; indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED.

The area covered by each smoke detector shall be as per IS-2189.

Detectors shall be suitable for an operating temperature 0 degree C to 55 degree C and Relative humidity of 0% to 95%.

Detectors shall be suitable for a supply voltage of 17 to 28 V DC without affecting the sensitivity.

The detector shall have the approval of UL/FM/VDS/LPC only.

7.5 THERMAL DETECTORS

Thermal detectors shall connect with two wires to one of the Fire Alarm Panel loops. The detectors shall use an electronic detector to measure thermal conditions caused by a fire and shall, on command from the control panel, send data to the panel representing the level of such thermal measurements. The detectors shall be ceiling-mounted type and shall include a twist-lock base.

The detectors shall provide dual alarm and power LEDs. Both LEDs shall flash under normal conditions. Both LEDs may be placed into steady illumination by the control panel, indicating that an alarm condition has been detected.

Detectors shall be suitable for an operating temperature 0 degree C to 22 degree C and relative humidity of 0% to 95%.

Detectors shall be suitable for a supply voltage of 17 to 28 V DC without affecting the sensitivity.

The detector shall have the approval of UL/FM/VDS/LPC only.

7.6 MANUAL CALL STATIONS

Manual Call stations shall be provided to connect to the Fire Alarm Panel loops.

Manual stations shall be constructed of high impact LEXAN sheet with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters. Press/back stations with reset table capacity shall be acceptable.

Stations shall be suitable for surface mounting as shown on the plans, or semi-flush mounting,

and shall be installed not less than 42 inches, nor more than 48 inches above the finished floor unless otherwise specified by applicable building codes.

7.7 RESPONSE INDICATOR

Response indicator shall be LED (light emitting diode) type and shall indicate when a detector senses the fire.

7.8 REPEATER PANEL

Repeater panels are to be provided at remote location for monitoring the health of FAS. It should have 2-line 40 inches character display along with CEO status indicator. Battery backup shall be provided as an in-built feature and all information will be presented in clear English language. It shall be suitable for operation from 0 degree C to 49 degree C and shall be flush mounted.

7.9 ELECTRONIC HOOTERS

All Hooters should be able to provide at least a minimum of 3 different tones, which should be user configurable. The minimum decibel level of each hooter should be 90db at 1 mtr. All hooters should be UL/FM listed.
The Electronic Hooters shall be housed in MS enclosure of 1.5 mm sheet metal.
The Hooters shall be with built on oscillator & amplifier.
The Hooters shall give wailing sound whenever it received 24 V supply from panel on receipt of Fire signal.
The MS box shall be painted with Fire Red (Power Coated)

7.10 MAIN FIRE ALARM CONTROL PANEL

Control Panel
The control cabinet shall be dust proof and shall be provided with a glass door with lock and key to prevent tempering by unauthorized persons.
The control circuit shall consist of glass epoxy (PCB) printed circuit board, silver plated and treated with protective layer of special lacquer for protection against corrosion.
The alarm circuitry shall be 100% solid state without the use of any relays anywhere in zone card.
The zone cards shall be modular and interchangeable.
Every zone shall have individual control for test acknowledge and any zone shall be isolated without effecting the working of the other zones in the panel.
Sounder silencing control shall be provided which shall remain in visual indication at the same time making the panel from to receive alarm from any other zone without the need for resetting the entire panel.
Silencing switches/push buttons – the system shall be so designed that once an alarm has been given it shall continue till the alarm sounder is switched off. The silencing switches/push buttons in their 'OFF' position shall give an indication of this fact on the main control panel or transfer the alarm signal to supervisory sounders under the supervision of the responsible person so that they may put use of the smallest number of call points. Operation of silencing switch shall not prevent sounding of alarm from any other zone simultaneously.
Central control and indicating panel shall be suitable for conventional Fire Detection and Alarm System and shall comply with IS:2189-1988.
Control panel shall support the following Fire-Detection components.

Smoke Detectors

Detectors (Both fixed & rate of temperature rise type)

Manual Call Stations

System shall be completely backed up against Mains failure for at least 8 hours and shall be suitable for the following types of batteries.
Lead acid Maintenance free.
Lead acid non-maintenance free
Lead acid semi-maintenance free
Nickel Cadmium.

System shall be self-diagnostic and shall cover the following:
Components/Modules of the fire panel.
Faulty detectors

Missing detectors
Open circuit short circuit conditions of the detector cable.
Suitable indication shall be given on the panel.

Zone wise annunciation of alarm by using:
Buzzer Sounders

7.11 BATTERY

Suitable rating ampere Hours 24 Volts DC sealed maintenance free batteries shall be provided for Fire Detection and Alarm System. The battery rating is indicative only. It shall be sized by bidder to cater to all momentary and short time loads in addition to supplying the continuously rated loads for a duration of 8 hours. However minimum size shall be 65 AH.

Battery Charger
Bidder shall furnish the battery charging system complete with all necessary accessories such as transformer, rectifier, switches, fuses, starters, contactors, ammeter, voltmeter, protections and other, devices for trouble free operation.

Construction features
Housing of battery charger shall be 2 mm thick CRCA steel sheet cabinet for indoor installation and shall be floor mounted type. The cabinet shall be folded and braced as necessary to provide a rigid support for all components. Louvers shall be provided in the cabinet for ventilation. PVC sheets of 3 mm thick shall be provided on the selves on which the batteries are to be placed.

Input
240 volts AC 50 cycles, single phase with tapings of 0-200-220-240-260 volts on the primary side of the transformer.

Output
DC output shall be 24 volts. DC bridge rectifier shall be of silicon type, having full wave rectification. Suitable contactor, relay, reset shall be provided as required.

7.12 CABLES

All PVC insulated FRLS copper conductor stranded cables shall be 650 volts grade and shall generally conform to IS-1554-1988 and meet the signal cabling requirement of the system manufacturer.
Strands of cables shall not be cut to accommodate & connect to the terminals. Terminals shall have sufficient cross-sectional area to take all the strands.
Cables shall be laid by skilled and experienced workmen using adequate rollers to minimize stretching of the cable. The cable drums shall be placed on jacks before unwinding the cable. Great care shall be exercised in laying cables to avoid forming kinks. At all changes in direction in horizontal and vertical planes, the cable shall be bent smooth with a radius as recommended by the manufacturers. All cables shall be laid with minimum one diameter gap and shall be clamped at every metre and shall be tagged for identification with aluminium tag and clamped properly. Tags shall be provided at both ends and all changes in directions both sides of wall and floor crossings. All cable shall be identified by embossing on the tag the size of the cable, place of origin and termination.
These shall be measured on linear basis including the fittings required like, end termination junction box.

8.0 PUBLIC ADDRESS DEVICES

8.1 Speakers:

All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.
Speaker in corridors and public spaces shall produce a nominal sound output of 84 dBA at 3 meters.
Frequency response shall be a minimum of 400 HZ to 4000 HZ.
The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

- Fixed Emergency Telephone Handset

The telephone cabinet shall be painted red and clearly labeled as "Emergency Telephone". The cabinets shall be located where shown on drawings.
The handset cradle shall have a switch connection so that lifting the handset off of the cradle shall send a signal to the fire command center which shall audibly and visually indicate its on-line (off-hook) condition.
On activating the remote phone, the phone earpiece shall sound a telephone ring signal until the master handset is lifted.
The two-way emergency telephone system shall support a minimum of seven (7) handsets online without degradation of the signal.

8.2 POINT WIRING

The rates for all point wiring items shall include:
1. Conduits, Conduit specials, bushes and other fittings concealed or exposed as called for.
2. Embedding conduit and allied fittings including the outlet boxes in walls, floors etc., during construction and/or in chases including cutting chases and making good with cement mortar as necessary in the case of concealed conduit work.
3. Providing and fixing approved fixing devices, saddles and grouting the same as required for exposed conduits.
4. Fabrication and Supply of G. I. boxes for switches, ceiling fan hooks, Exhaust fans outlet and lighting fixtures with 1.6 mm thick sheet steel.
5. Providing and fixing junction boxes with 3mm Hylam or 3mm/5mm thick Perspex sheet cover duly painted from inside to match the colour of the walls. All Junction boxes shall be MS only.
6. All fixing accessories such as clips, brass screws/brass washer's awl plugs etc.
7. All work & material necessary (including circuit wiring from DB to first tapping point of each circuit with 2.5 sq. mm wires) in complete wiring of a switch circuit of any length from the distribution board to the following via the switch:
   a) Ceiling rose b) Connector c) Back plate d) Socket outlet e) Lamps Holder f) Any other terminal outlet boxes g) Ceiling fan and Exhaust fan
8. Switch, socket outlet as called for.
9. Cable/wire as required up to lamp holder.
10. All metal boxes and boards concealed, or surface mounted including those required for housing fan regulators.
11. All accessories necessary to complete wiring as specified.
12. FRLS PVC Insulated stranded Copper conductor earth wire for fixtures, switch outlet boxes and third pin of 5/15 Amps. socket to common earth.
13. Painting all exposed M.S. conduits, outlet boxes and junction boxes.
14. M.S. conduit for concealed and exposed wiring.
15. 2 mm dia G.I. pull wires in conduit work, wherever necessary.
16. The switch plate shall be made of I.S.I. grade Urea Formaldehyde Moulding powder. The base of the switches shall be made from high heat resistant phenol formaldehyde powder. The cost of switches shall include the cost of cover plates, cadmium fixing screws etc. The switches/sockets shall be rocker operated.
17. Separate Earth wire shall run along with each circuit both for power and light circuits.
18. Cutting of floor and making good for carrying conduits also.
19. Numbering of Circuits with ferrules for all circuits at both ends.
20. Providing 15 Amps capacity Bakelite terminal Blocks for terminating the phase, neutral and earth wire at each fixture location.
21. PVC insulated copper conductor wire ends before connection shall be properly soldered (at least 15 mm length) with special Cu solder for copper conductor or shall be properly crimped with copper lugs/sockets as the case may be. Strands of wires shall not be out for connecting to the terminals. All stands of wires shall be soldered at the end before connection. The connecting brass-screws shall have flat ends. All looped joints shall be soldered and connected through terminal block/connectors.
22. Provide embossing on the sockets engraving "UPS" and "RAW"

8.3 CONDUITING FOR TELEPHONE & COMPUTER SYSTEM

The rates for conduit work shall include:

1. All necessary specials and fittings.

2. M. S. inspection, junction and outlet boxes as required.

3. 3/5 mm thick Perspex sheet covers for inspection & junction boxes.

4. All fixing accessories such as clips, nails, brass screws/brass washers, etc.

5. 2 mm dia G.I. pull wires in conduit work, wherever necessary.

6. Providing and fixing approved saddle, hooks and grouting the same as required in the case of all exposed conduit work.

7. Embedding conduit and allied fittings including the outlet boxes in walls, floors etc., during construction and/or in chases including cutting chases and making good with cement mortar as necessary in the case of concealed conduit work.

8. Painting all inspection, junction and outlet boxes.

9. FRLS PVC conduit for concealed conduit wiring.

10. Painting of Hylam/perspex sheet cover from inside to suit the colour of the surrounding wall with two coats of paint.

11. Supply and fabrication of MS Zinc passivated outlet boxes.

12. The outlet cover plate for Telephone outlets shall be made of I.S.I. grade Urea Formaldehyde Moulding powder. The cost of outlets shall include the cost of cover plates, cadmium fixing screws etc. also.

13. Numbering of wires on both ends of the wires for easy identification with PVC ferrules.

8.4 EARTHING

The rates for earthing items include:

1. All fixing accessories such as brass saddles, brass screws, raw plugs etc.

2. Jointing by riveting in case of copper earth strips (2 per joint) and by welding in case of GI strips.

3. Cutting chase, making holes and making good the same wherever required.

4. All masonry work including earth work for earthing stations, earthing tapes and wires.

5. Effecting adequate and proper interconnections.

6. Use of copper thimbles for all wire terminations in the Distribution Boards, switches and sockets.

8.5 CABLES, MAINS AND SUB-MAINS

The rates for all items of work shall include:

1. Embedding conduits and allied fittings in walls, floors, etc., during construction and/or in chases including cutting chases and making good as necessary in the case of concealed conduit work.

2. Providing and fixing approved saddles, hangers, trays etc., and grouting the same as required for exposed conduits where called for. Providing dash fasteners for the threaded MS down rods (primer coated) used for hanging the cable \trays.

3. Providing and fixing junction boxes with 5 mm thick 'Hylam' sheet covers.

4. Effecting adequate and proper connections at terminations.

5. Ensuring that provision is left in various buildings components and trenches as the work proceeds, for incorporation of cable supports at a later date.

6. Providing all fixing accessories such as clamping devices, nuts and bolts, screws etc.

7. Clamping to supports where laid in trenches.

8. Excavation of trenches and bringing the trenches to exact level as required.

9. Providing sealing compound, thimble, solder etc., at joints and terminations as called for.

10. Providing proper supports for cable terminal boxes as called for.

11. Wherever cables pass through walls, ceiling, paved area or below roads provide sleeves/ hume pipes and making good as necessary.

8.6 DISTRIBUTION BOARDS

The rates for the following items of work generally include:

1. The supporting rigid steel framework.

2. 1.6 mm thick MS boxes complete with dust proof and vermin proof covers and locking arrangements, mounted flush with surfaces.

3. All fixing accessories such as dash fasteners, bolts, nuts, screws, etc. as required.

4. Building into masonry/concrete work including all necessary cutting and grouting with cement mortar 1:2.

5. Effecting adequate and proper connections.

6. Effecting proper bonding to earth.

7. Painting/lettering on switches and distribution boards the location they serve and providing on each board its circuit diagram.

8. Touching up all damaged paint over exposed work with one coat of red oxide primer and two finishing coats of approved synthetic enamel paint.

9. Main Distribution Board and Final Distribution Boards shall be fabricated by Contractor with the specified equipment.

10. Provide 6 Amps. SP MCB for Light Points Circuits, 20 Amps. SP MCB for Power Circuits and 32 Amps. SP MCB for 1.5 Ton AC Unit.

SUPPLY & FIXING OF LIGHTING FIXTURES

The rate for fixing of lighting fixtures and fans shall include:

1. Receiving the fixtures from the Owner's stores and assemble the same at site and testing

the fixture before fixing.

2. All components that may be required to make the installation complete in all respects such as:

   a. Suitable length of down rod, hanger and connecting wires, where called for.

   b. Wires for connecting the fixtures to the point through connector blocks.

   c. All wood and metal blocks to serve as base of fixtures.

   d. Bonding with common earth wires.

3. Drilling holes in supports where required.

4. Fixing clamps, GI bolts and nuts, clips, brass screws, dash fasteners and other fixing accessories as required, including leaving necessary provision for fixing at time of concreting.

5. Approved enamel painting for hanger rods, clamps and other components and fixing accessories as called for.

6. Testing and commissioning of all fixtures and fans after installation.

6. The lighting fixtures shall be suitable for 230 Volts, single phase 50 cycles A.C. supply system.

7. Incandescent lamps shall be 100 Watts (maximum) and fluorescent lamps shall be 18 watts and 36 watts.

9. Use G.I. suspenders and clamping to the slab with dash fasteners (4 per fitting), including turn buckle arrangements for adjustable heights for hanging. They should be the same suspenders as used for hanging the False Ceiling grid ceiling.

10. The contractor to mark the size of light fittings, speaker and fire alarm components on the false ceiling for the interior contractor to cut holes.

SPECIAL CONDITIONS OF CONTRACT (HVAC)

1.0 QUALITY ASSURANCE OF MATERIALS AND WORKMANSHIP

1.1 Materials

The contractor will supply the equipments as indicated in the list of approved makes in the tender. Furthermore, all equipments must strictly conform to the relevant IS code specified in the tender. However, the contractor shall submit Vendors data in the approved format and obtain prior approval from the Engineer in-charge before placing the orders for these equipments. All the materials brought to the site shall correspond with the approved samples. All the rejected material should be removed from the site of work, without delay.

The contractor shall furnish test certificates of the materials procured for the work. Testing of materials shall also have to be done at contractors cost as and when necessary and required by the Engineer in-charge. If the test result of any material does not comply with the results stipulated in the relevant latest IS code, the materials shall be rejected and no claim shall be entertained on any account what so ever.

Where manufacturer have furnished specific instructions relating to the materials used in this job and covering points not specifically mentioned in these documents, manufacturer's instructions shall be followed.

1.2 Quantum of Materials to be ordered

The Schedule of Rates shall not be used as a basis for ascertaining the quantum of materials to be ordered. The Contractor shall be his own resources to assess the quantities of materials to be ordered and shall be entirely responsible for the same.

1.3 Manufacturer Instruction

Where manufacturers have furnished specific instructions relating to the materials and equipment used in this project, covering points not specifically mentioned in these documents, such instructions shall be followed in all cases.

2.0 INSTALLATION INSPECTIONS & TESTING

2.1 When the installation is deemed by the Contractor to be complete, he shall arrange with the Engineer in-charge for inspection and testing of the installation. Test results shall be recorded in the format approved by the Engineer in-charge. An installation shall not be accepted until the Engineer in-charge is satisfied about its compliance with the requirements of the specifications and performance of the system.

The Contractor shall cause interim/stage inspection during execution of the works as and when so called for and carry out any rectification / modification as may be suggested by the Engineer in-charge.

Soon after the work is completed, the Contractor shall inform in writing to the Engineer in-charge for getting the complete system including all sub-systems and instrumentation, control panels etc. thoroughly inspected and tested for satisfactory performance. After satisfactory completion of tests of the system by the Engineer in-charge, the Contractor shall be required to carry out all start up trails of the system provided by him.

Any defects noticed during these tests shall be speedily rectified by the Contractor without any extra claim /cost.

All instruments and materials including consumables required for testing shall be the responsibility of the Contractor.

2.2 Balancing of all air and all tests as called for in the specifications shall be carried out by the contractor in accordance with the specifications and relevant local codes if any. Performance test shall consist of seven days operation of system for each season.

Testes shall be carried out in peak summer and monsoon season.

The results for summer/monsoon and winter air conditioning in duplicate shall be submitted for scrutiny. Two copies of the certified manufacturers performance curves for each piece of equipment shall be submitted along with the test results. The contractor shall also provide two copies of record of all safety and automatic control settings for the entire installation.

The contractor shall pay for the arrange, without any extra cost to the Employer, all necessary balancing and testing equipments, instruments, materials, accessories, refrigerant and the requisite labour. Any defects in materials and/or in workmanship detected in the course of testing shall be rectified by the contractor, entirely at his own cost, to the satisfaction of the Engineer in-charge.

The installation shall be tested again after removal of defects and shall be commissioned only after approval by the Engineer in-charge. All tests shall be carried out in the presence of the representatives of the Engineer in-charge.

2.3 All civil works like foundations for the equipment, breaking and making good of openings for pipes and ducts shall be carried out by Air-conditioning Contractor and nothing extra shall be paid on this account.

3.0 STANDARD OF WORK

The work shall be carried out to the satisfaction of the Engineer in-charge and in accordance with the regulations of the Electricity Supply Authority, the Fire Insurance Company insuring the building, Electricity Rules and other local Regulations and the enclosed specifications.

4.0 PRICES

The prices to be quoted by the Tenderer shall include the supply, installation, testing & commissioning of all the Equipment, Ancillary material, associated Civil and Service Works, and other items, what-so-ever required for carrying out the job, to fulfill the intent and the purpose as laid down in the Specifications and /or the Drawings. The tendered price shall be deemed to include all nuts, bolts, shims, clamps, supports, etc., as required for proper fixing and/or grouting of Equipments, ancillary items, etc. whether specifically mentioned or not. The Contractor shall also include, in his prices, all taxes, duties, other levies, (viz. excise duty, customs duty, sales tax, works contract tax, octroi etc.) which are legally leviable on the Air Conditioning plant and installation entailing the Contractor to any extra claims from the department. The Contractor's rates shall remain firm and fixed during the currency of the Contract. However, the price shall be subject to adjustment, in case of variation in the rate of excise or customs duty due to an act of legislature, within the originally agreed period for the completion of work.

5.0 SHOP DRAWINGS

5.1 Before proceeding with the work, the Contractor shall submit for approval, general layout and assembly drawings and such additional assembly and sub-assembly detailed drawings as necessary to demonstrate fully that all parts of the apparatus to be furnished will conform to Specifications. These Drawings will include plant room layouts, required to complete the project

as per specifications and as required by the Engineer-in-Charge/ Consultant. These drawings will contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipment, as also the details of all related items of work by other Contractors. Each item of equipment proposed shall be a standard catalogue product of an established manufacturer as per specifications.

5.2 When the Engineer-in-Charge/Consultant makes any amendments in the above drawings, the Contractor shall supply fresh sets of drawings with the amendments duly incorporated, along with the drawings on which corrections were indicated.

5.3 The Contractor shall furnish for checking and scrutiny advance sets of prints of the layout, assembly and erection drawings. No modifications shall be made in the drawings after they have been approved by the Engineer-in-Charge/consultant without his prior consent. All drawings necessary for assembly, erection, maintenance, repair and operation of the equipment shall be furnished. Different parts shall be suitably numbered for identification and ordering of spare parts.

5.4 No material or equipment may be delivered or installed at the job site until the Contractor has in his possession, the approved Shop Drawings for that particular material or equipment.

5.5 The Shop Drawings shall be submitted for approval sufficiently in advance of the planned delivery and installation of any materials, to allow the Engineer-in-Charge ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce Shop Drawings at the right time, in accordance with the approved program.

5.6 After approval of the drawings, the Contractor shall furnish a set of tracings of the approved Drawings.

5.7 Approval of Drawings by the Engineer-in-Charge shall not relieve the Contractor of any part of his obligation to meet all the requirements of the Contract or of the correctness of his drawings. The Contractor shall be responsible for any pay for all alterations of the works due to discrepancies or omission in the drawings or other particulars supplied by him, whether such drawings have been approved by the Engineer-in- Charge or not.

5.8 The drawings prepared, and the allocated position for equipment's represents a feasible scheme. The layout in the equipment room may be re-arranged only in the allocated space, subject to the approval of the Engineer-in-Charge/Consultant.

5.9 Where the work of the Contractor has to be installed/executed in close proximity to, or will interfere with the work of other trades, the Contractor executed shall assist in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer-in-Charge, the Contractor shall prepare composite working drawings and sections at a suitable scale, clearly showing how his work is to be installed in relation to the work of other trades. If the Contractor installs his work before coordinating with other trades, or so as to cause any interference with work of other trades, he shall make all the necessary changes without extra cost to the purchaser.

5.10 On completion of work contractor shall provide soft and two sets of hard copies of as-built drawings

6.0 VIBRATION ISOLATION AND NOISE LEVEL

All equipment shall operate under all conditions of load without any sound or vibration which is

objectionable in the opinion of the Engineer-in-Charge. In case of rotating machinery, sound or vibration noticeable outside the room in which it is installed, or annoyingly noticeable inside its own room, shall be considered objectionable. The provision shall be made for vibration isolation of minimum 90% efficiency. Abnormal vibration and noise level conditions shall be corrected by the Contractor at his own expense.

7.0 TECHNICAL DATA

The Tenderers must submit the technical data along with catalogue, literature, and manufacturer's manual for all items as listed in Tender (Technical Specifications) in the indicated format, and submit along with their Tenders. Failure to furnish Technical Data with Tenders may result in summary rejection of Tenders.

8.0 GUARANTEE

8.1 The contractor shall guarantee that all the material, machinery and components supplied, fabricated, designed and installed by him shall be free from defects due to fault design material and/or workmanship, that the plant shall perform satisfactorily specifically the successful performance of the system in monsoon and summer and the efficiency of the system and all the components shall not be less than the values laid down in the specifications and the capacities shall be within +/- 3% of the specified values, in case of deviation greater than +/- 3%, the contractor shall replace the necessary components at no extra cost or alternately the employer shall be entitled to deduct a proportionate amount from payments due to the contractor.

8.2 The period of the guarantee shall be (12) twelve months from the date of first running tests. During which period any or all components found to be defective shall be replaced or repaired free of charge and any shortcomings found in the system as specified shall be removed at no extra cost. The contractor shall provide the necessary personnel and tools for fulfilling the above guarantee.

8.3 If the defects are not removed within a reasonable time the employer may arrange to do at the contractor's risk and cost, without prejudice to any other rights.

9.0 MAINTENANCE & TRAINING

9.1 The maintenance for a period of 12 months from handing over of the plant shall be included under the warranty.

9.2 The Contractor shall associate, during the erection and during the Defects Liability Period with the purchaser staff/department`s staff to familiarize them with the operation and maintenance of the plant.

9.3 If required by the Engineer-in-Charge the Contractor shall agree to train members of the purchaser maintenance staff either at his or the sub- Contractor's work or at such other place or places as may be considered suitable by the Engineer-in-Charge.

10. Maintenance Manual on Completion of Work

Contractor shall provide 2 sets of hard bound operation and maintenance manual duly approved by engineering in charge/consultant. Each set shall also contain as built drawings.

11. Spares

Contractor shall provide a list of recommended spare parts for operation and maintenance of equipments for a period of 3 years.

WORKS & SERVICES TO BE EXECUTED BY OTHER AGENCIES

The following associated works and services are excluded from Scope of this contract and shall be

executed by other agencies in accordance with Contractors approved shop drawings.

a) Provision of 415 volt, 3 phase power at main panel and all indoor unit. 220 volt 1 phase supply /Exhaust Fans.

b) False ceiling work

1.0 CODES & STANDARDS.

1.1 All air conditioning equipments for the project shall meet energy efficiency criterion employing environment friendly HFC requirements based on latest state of art technology.

1.2 ASHRAE Standards and hand books.

1.3 National building codes of India.

1.3 Indoor air quality as per ASHRAE 62.1-2007.

1.4 Motors, cabling, wiring and accessories as per BIS Codes/ I.E. Rules/National Building Code.

TECHNICAL SPECIFICATION - AIRCONDITIONING SYSTEM

1. SYSTEM DESCRIPTION

1.1 All area

VRV system provides for air-conditioning for all area with multi indoor units with single outdoor unit. Each indoor unit connected to dedicated outdoor units.

1.2 Outdoor unit

Outdoor units for all area are located on terrace/stilt level.

1.3 The Refrigerant Piping

Insulated refrigerant piping interconnecting outdoor and indoor units shall be routed as shown in layout drawing.

1.4 Drain Piping

Insulated drain piping shall be terminated at nearest drain point or nearby shaft through pipe

2. VARIABLE REGRIGERANT FLOW SYSTEM

1. SYSTEM

The Variable Refrigerant Flow (VRF /VRV R 410a refrigerant) System should be air cooled, spilt type air conditioning systems consisting of modular condensing units connected to multiple indoor units, each having the capability of individual set point control. Each modular condensing unit should incorporate at least one inverter control scroll/Rotary compressors to obtain 10% to 100% step less capacity control for enhanced Power saving. The indoor units should be provided with Cordless Remote Control as a standard accessory.

The VRF/VRV units shall be capable of operating within a wide range of ambient temperatures. The Condensing units should be capable of provide cooling within an ambient range of -5 Deg. C to 45 Deg. C DB and heating in the range -10 Deg. C to 15 Deg. C DB.

The refrigerant piping shall be extendable minimum 150 m with 50 m level without any oil trap. Ambient conditions.

3. OUTDOOR UNIT

2.1 The outdoor unit shall be a factory assembled unit housed in a sturdy weather proof casing constructed form rust-proofed mild steel panels coated with a baked enamel finish. The ODU must deliver 100% cooling capacity at 49Deg C ambient Temperature.

The outdoor unit shall have multiple scroll / Rotary compressors and be able to operate even in case of breakdown of one of compressors.

The noise level shall not be more than 68 dB(A)at normal operation measured horizontally 1m away and 1.5m above ground.

The outdoor unit shall be modular in design and shall be allowed for side by side installation.

2.2. Compressor

The compressor shall be of inverter type highly efficient hermetic Vapor Injection Scroll/rotary capable of capacity modulation by time averaging method & Vapor injection Technology. Each ODU should have minimum 1 no. variable compressor upto 12 HP capacity.

2.3 Heat Exchanger

The heat exchanger shall be constructed with copper tubes mechanically bonded to aluminum fins to form a cross fin coil. The aluminum fins shall be covered by anti-corrosion resin film. The System must have sub-cooling heat exchanger further to Condenser to increase refrigerating effect in Indoor units.

2.4 Fan Motor Speed Control

The condensing unit fan motors to have at least two speed operations tomaintain constant head pressure control in all ambient temperatures and modes of operation.

2.5. Refrigerant Circuit

The refrigerant circuit shall include an accumulator, liquid and gas shut off valves and a solenoid valves or pulse width modulation valve.

All necessary safety devices shall be provided to ensure the safety operation of the system.

2.6 Safety Devices

The following safety devices shall be part of the outdoor unit;

High Pressure Switch, Low Pressure Switch, Fan Motor Safety Thermostat, Over Current Relay, Fusible Plugs, Fuses.

2.7 Oil Recovery System

Each unit shall be equipped, with an oil separator to ensure stable operation with long refrigerant piping.

3. INDOOR UNIT

3.1 Indoor unit shall be mix-match of duct type . It shall have electronic control valve to control refrigerant flow rate in response to load variations of the room. The fan shall be of the dual suction multi blade type and statically and dynamically balanced to ensure low noise and vibration free operation.

3.2 The address of the indoor unit shall be set automatically in case of individual and group control. In case of centralized control, liquid crystal remote controller shall set it.

3.3 Electronic Expansion Valve

Each indoor unit shall be fitted with an electronic expansion valve to control the refrigerant flow in response to the load variations in the room. The electronic expansion valve is to be controlled via a computerized control sensing the return air temperature, refrigerant inlet and outlet temperatures. During the cooling operation the electronic expansion valve shall control the refrigerant superheat degree at the evaporator.

3.4 Indoor Unit Fans

Shall be direct driven of the DIDW multi-blade type, statically and dynamically balanced to ensure low noise and vibration free operation. The noise level shall not exceed 45dbA.

3.5 Cooling Coils

Shall be direct expansion, constructed from copper tubes expanded into aluminum fins to form a rigid mechanical bond.

4. CABLING BEWTEEN INDOOR AND OUTDOOR UNITS

The cable between indoor and outdoor units shall run in GI conduit.

5. REFRIGERANT PIPEWORK:

5.1 Scope of Refrigerant Piping work shall include Supply, installation, testing and commissioning of all interconnecting pipe-work between the condensing unit & indoor units. Refrigerant quality seamless copper tubes with brazed connections and the appropriate Distribution joints and headers shall be used. The piping should be routed at site in such a manner, that brazed joints in the Refrigeration Piping are kept to a minimum.

5.2 Joint Orientation:

Proprietary Distribution refrigeration pipe joints and headers shall be installed in an appropriate orientation to enable correct distribution of refrigerant. The Distribution joints shall be factory insulated with pre-formed sections of expanded Polystyrene / equivalent.

5.3 Cleanliness of Piping:

All pipe-work must be kept clean and free from contamination to prevent breakdown of the system. All pipe ends shall be kept sealed until immediately prior to making a joint.

5.4 Pressure Testing:

After complete installation of refrigerant piping, it shall be pre-pressure tested and repaired if necessary and further pressure tested to 3,800 Pa, to hold for a minimum 24 hours with dry nitrogen prior to insulating the joints. After satisfactory testing, the refrigerant pipe shall be evacuated and dehydrated to (- 755 MM HG) and held for one to four hours depending on the pipe length.

5.5 Refrigerant Charge

Refrigerant charge must be calculated based on the actual length of the refrigerant pipe work. The refrigerant charging process must be carried out with an appropriate charging station and under supervision of Consultancy.

5.6 Piping Insulation

All suction & liquid lines of the Refrigerant pipe work shall be insulated with cross linked polyethylene pipe sections as specified to avoid condensation. The exposed piping insulation shall be painted with U/V paint

5.7 Fixing Pipe Work & Electrical Conduit:

The insulated refrigerant piping and electrical conduit shall run on GI trayproperly supported by GI rods. The exposed tray on terrace shall be covered by open able GI covers.

5.8 The OD & wall thickness of copper refrigerant piping shall be as follows:

Size	Thickness	Specification
6.4mm (1/4 in)	22 G	C1220T-O (ANNEALED)
9.5mm (3/8 in)	22 G	C1220T-O (ANNEALED)
12.7mm (1/2 in)	22 G	C1220T-O (ANNEALED)
15.9mm (5/8 in)	22 G	C1220T-O (ANNEALED)

19.1mm (3/4 in)	20 G	C1220T-1/2 H (HALF-HARD)
22.2mm (7/8 in)	20 G	C1220T-1/2 H (HALF-HARD)
28.6mm (1 1/8 in)	18 G	C1220T-1/2 H (HALF-HARD)
34.9mm (1 1/4 in)	18 G	C1220T-1/2 H (HALF-HARD)

6.0 DRAIN PIPING

6.1 The indoor units shall have uPVC drain pipe suitable for 10 kg/cm2.

6.2 The pipes shall be laid in proper slope for efficient drainage of condensate water.

6.3 Drain Pipe Insulation

Drain pipes carrying condensate water shall be insulated with 6 mm cross linked polyethylene as specified to avoid any leakage condensation.

The joints shall be properly sealed with synthetic glue to ensure proper bonding of the ends.

7. TESTING

The units shall be tested for capacity and COP as per ARI conditions at manufactures premises before delivery, Owners / their representative reserve the right to witness the tests.

8. TESTING OF AIR-CONDITIONING SYSTEM

8.1 Routine and types tests for the various items of equipment shall be performed at the contractor's works and test certificates furnished. Functional tests shall be conducted at site.

8.2 The performance tests to determine whether or not the full intent of the specification is meant shall be conducted by the contractor. After notification to the employers that the installation has been completed and the plant has run continuously for a period of at least one weeks, the contractor shall conduct under the direction of the consultants and in the presence of the employer's representatives tests such tests as specified to establish the capacity of various equipment supplied and installed by the contractor.

8.3 The contractor shall operate, test and adjust the air conditioning appliances including adjustment of regulators, dampers, etc,.

8.4 All test equipment, labour, operating personnel, oil and refrigerant required for these tests shall be furnished by the contractor to enable the plant to be put in continuous running test for a period of two days after all other tests and adjustments have been made.

The performance tests shall be conducted during peak summer and peak monsoon.

8.5 PROCEDURE

8.5.1 Design Conditions:

The inside and outside conditions will be recorded for 24 hours duration on hourly basis. The outside and inside dry bulb and wet bulb temperatures shall be recoded by means of a sling spectrometer with mercury thermometers. The relative humidity shall be computed from the psychometric chart. The inside dry bulb temperature and relative humidity shall fall within the specified limits.

8.6 FUNCTIONAL TESTS

8.6.1 Electrical Equipment:

a) All the cables shall be tested for continuity and absence of cross phasing. Insulation resistance between the phase conductors and the earth shall be measured shall with the help of a 500-V megger.

b) Motors:

- Starter operation shall be checked for single phasing by removing one of the phases.
- Overload protection shall be checked by altering the starter thermal overload setting.

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 where 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 rungs shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding ladder.
5. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent to fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.
6. No floor, roof or other part of the structure shall be so overloaded with debris or materials as to render it unsafe.
7. Workers employed on mixing and handling material such as asphalt, cement mortar or concrete and lime mortar shall be provided with protective footwear and rubber hand-gloves.
8. Those engaged in welding works shall be provided with welder's protective eye-shields and gloves.
9. I) No paint containing leads or lead products shall be used except in the form of paste or readymade paint.

ii) The workers should supply suitable facemasks for use when the paint is applied in the form of spray or surface having lead paint dry rubbed and scrapped.

10. Overalls shall be supplied by the contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during the periods of cessation of work.
11. Hoisting machines and tackle used in the works, including their attachments, anchorage and supports shall be in perfect condition.
12. The ropes used in hoisting or lowering material or as a means of suspension shall be of durable quality and adequate strength and free from defects.

PROFORMA FOR RUNNING ACCOUNT BILLS

C E R T I F I C A T E

The measurements on the basis of which the above entries for the Running Bill_____ were made have been taken jointly on _____ and are recorded at pages _____of Measurement BookNo._____.

Date & Signature of Contractor.	Date & Signature of SBI's Representative (Seal).	Date & Signature of Site Engineer

The work recorded in the above mentioned measurements has been done at the site satisfactorily as per tender drawings, conditions and specifications.

BANK's ENGINEER

RUNNING A/C BILL

Name of Contractor/Agency: _____
Name of Work: _____
Sr. No. of this Bill: _____
No. and Date of Previous Bill. _____
Reference to Agreement No. _____
Date of Written Order to Commence._____
Date of Completion as per Agreement._____

Sr. No.	Item description	Unit	Rate (Rs.)	As per Tender		Upto Previous R/A Bill		Upto Date (Gross)		Present Bill		Remarks
				Qty.	Amt. (Rs.)	Qty.	Amt. (Rs.)	Qty.	Amt. (Rs.)	Qty.	Amt. (Rs.)	
1.	2.	3.	4.	5.		6.		7.		8.		9.

Note: 1. If Part Rate is allowed for any Item, it should be Indicated with reasons for allowing such a Rate.

Net value since Previous Bill.

2. If Adhoc Payment is made, it should be mentioned specifically.

Date & Signature of Contractor.

PERFORMA FOR APPLICATION BY CONTRACTOR FOR EXTENSION OF TIME

1. Name of the Contractor
2. Name of the Work as given in the Agreement
3. Agreement W O
4. Tender Amount
5. Date of Commencement of Work
6. Period allowed for Completion as per Agreement
7. Date of Completion as per Agreement
8. Period for which Extension of Time has been given

Date **MonthYear**

a) 1st Extension vide Bank's Letter No

b) 2nd Extension vide Bank's Letter No

c) 3rd Extension vide Bank's Letter No

9. Reasons for which extensions have been previously given (Copies of the previous applications should be attached)

10. Period for which extension is applied for and the reasons thereof including hindrances, time for extra work assigned, if any etc.

Signature of Contractor & Seal

PERFORMA OF HINDERANCE REGISTER

Name of Work : Date of State of Work :

Name of Contractor : Period of Completion :

Agreement No : Date of Completion :

Sr No	Nature of Hindrance	Date of occurrence of Hindrance	Date of which Hindrance was removed	Period of Hindrance	Signature SE / PE	Remarks
1	**2**	**3**	**4**	**5**	**6**	**7**

SE = Site Engineer

PE = Project Engineer

ACCOUNT OF SECURED ADVANCE, IF ADMISSIBLE ON MATERIALS HELD AT SITE BY THE CONTRACTOR

No.	Item	Quantity	Unit	Amount	Remarks
1	2	3	4	5	6
Total Value of Materials at Site					
Secured Advance @……% of above Value					B

CERTIFIED (I) That the materials mentioned above have actually been brought by the contractor to the site of the work and no advance on any quantity of any of this item is outstanding on their security, (ii) that the materials are of imperishable nature and are all required by the contractor for use in the work in connection with the items for which rates of finished work have been agreed upon.

Dated Signature of
Site Engineer
preparing the Bill

Designation_____

Dated Signature of
Bank's Engineer

_____
Dated signature of Contractor

LIST OF APPROVED BRANDS / MAKES (CIVIL, PHE & INTERIOR)

One of the following make of the material shall be used. The contractor will have to get the sample approved from the Architect/ Bank's Engineer whose decision shall be binding on the contractor. The condition is also applicable for any material, not mentioned in the specification or schedule of work. No deviations are allowed in these even during/ after Tender:

S. No.	Item	Approved Make
1.	Cement (OPC and White)	A.C.C./ Ambuja/ Ultratech
2.	TMT Steel Bars/ MS Steel Sections	TATA/ SAIL/ Jindal
3.	BWP/ Commercial/ Board/ Ply	Greenply/ Merino/ Century/ Archid
4.	MDF BOARD / EDHMR (Exterior grade) 6mm,12mm,18mm, 25mm	Archid / Greenply/ Merino/ Century
5.	Glass/ Mirror/ Toughened Glass	Saint Gobain/ Modi Float Glass/ TATA
6.	Prelaminated Board	Novapan/ Archidply
7.	Laminates (1.00mm thk./ 1.25mm thick)	Mikasa /Greenlam / Century/ Aica/ Archidlam/ Neolaxe
8.	SS Railing	Dorma/ Jindal Arc
9.	Wooden Laminated Flooring	Pergo/ Tiles/ Xylos/ Armstrong/ Vista
10.	Ceramic floor Tiles (antiskid)	Kajaria/Somany/ H.R.Johnson/ NITCO
11.	Vitrified Tiles	Kajaria/ Somany/ H.R.Johnson/ NITCO
12.	Ceramic wall Tiles	Kajaria/Somany/ H.R.Johnson/ NITCO
13.	Flush Door	Century/ Archid/ Merino
14.	Door Handles	Hettich /Dorma/ Dline/ Haffle/
15.	Marble, Kota	As per approved sample and variety
16.	Water proofing compound	CICO/ ROFF/ FOSROC/ Dr. FIXIT
17.	Bricks	Class designation 75 (CPWD approved)
18.	SS Dash Fasteners/ Anchoring	Hilti/ Fischer
19.	Adhesion Tape	Norton
20.	Silicone	G E Bayer, Dow Coring

21.	Texture Interior Paint	Sandtex Matt/ Dulux/ Berger/ Okios/ Asian
22.	Vitreous China	Hindware/ Parryware/ Cera/ Roca
23.	C.P. Fittings	Jaquar/ Hindware/ Cera
24.	CPVC Pipes	Prince/ Supreme/ Astral
25.	CPVC Fittings	Prince/ Supreme/ Astral
26.	Grating, Floor drain, Floor Trap	Neer, GMGR, Camry, Chilly
27.	Check Valves (Slim type)	Advance, SKG Pneumatic, AIP
28.	C.I. S/S pipes Class LA	Kesoram, Electrosteel
29.	Butterfly valve	Audco, VEESON, AIP
30.	Ball Valves	AIP, DRP
31.	Stoneware Pipes & Gully Traps	Perfect, Anand
32.	R.C.C. pipes	Jain Spun Pipe, Daya Spun Pipe
33.	Manhole cover & Frame (ductile Iron)	NECO, RIF, BIC
34.	SFRC Manhole & Road Gully Chamber covers/ Grating	KK Manholes & Gratings Pvt. Ltd. , New Delhi, SFP
35.	Pumps	Kirloskar, Crompton Greaves, KSB
36.	Electrical Switch Gear & Starters	L&T, Siemens
37	Cables	Skytone/ Finolex/ Polycab
38..	Water Level Indicator	Advance, Unison
39.	Anticorrosive Bitumastic Paint	Shalimar, Asian, Berger
40.	Epoxy Paint	MRF, Berger, J&N
41.	Lugs (Tinned Copper)	Dowel
42.	PVC Copper Wire	Skyline, Ralison
43.	W.C. Pan Connector	Multi, Kwik
44.	SS Sink	Nirali, Jayna

45.	False Flooring	Unifloor/ Flexi Access Floor/ Armstrong

46	Aluminum Fittings	Jindal/ Hindalco/ MAAN
47	Aluminum Extrusion Sections	Jindal/ Hindalco/ MAAN
48	Veneer	Century / Durian/ Sonear/ Archid/ Green
49	Drawer Sliding/ Patch Fittings	Earl Bihari (EBCO)/ Godrej/ Hettich/ Dorma
50	Floor Spring / Door Closer	Godrej / Hardwyn / Hyper/ Dorma/ Haffele
51	Triple Computer Monitor Mount/ Stand Arm	Vivo/ Dell/ HP
52	Readymade Computer Drawer	EBCO/ Hettich/ Blum
53	Cement paint	Snowcem/ Surfacem/ Durocem
54	Synthetic Enamel Paint	Asian/ Nerolac/ Berger/ Dulux
55	Paints & Primer	Asian/ Nerolac/ Berger/ Dulux
56	Acrylic Emulsion Paint (Interior and Exterior)	Asian/ Nerolac/ Berger/ Dulux
57	Glazing	Modi Tuff Glass/ Triveni Glass Ltd./ Indo Asahi Glass Co. Ltd./ Saint Gobain
58	Mineral Fibre False Ceiling	Armstrong/ Indian Gypsum Board/ Gyproc/ Diamond
59	ACP Panels/ Sheets	Alubond/ ALU Decor/ Alstrong/ Alstone
60	Acrylic Sheets	Sanmati Acrylics/Acrylic Sheet India/ Acry Plus
61	Vertical/Roller blinds	Vista/ MAC/ DACK
62	Corian	Dupont/ LG/ Samsung/ Balismo
63	PU Paint	Asian/ Berger/ ICI
64	Wall Paper	Elemento/ Marshel

LIST OF APPROVED MAKES ELECTRICAL WORK		
S.No	**Item**	**Company**
1	PVC/MS CONDUIT PIPE (ISI) MARKED	BEC / NORPECK / AKG / TARUN
2	WIRES 1100V GRADE FR/FRLS MULTI STRANDED ONLY-ISI	RR KABLE/HAVELLS/BONTON/GRATEWHITE
3	CABLES 1100V PVC INSULATED FRLS XLPE	RR KABLE/HAVELLS/BONTON/GRATEWHITE
4	MCBS, MCCBS & ELCBS	SCHNIDER/ LEGRAND/ HAGER/ ABB/ BCH
5	MOULAR SWITCH, SOCKET, PLATES, BOXES & OTHER ACCESSORIES (MDEL MENTIONED)	LEGRAND/**Great White/INDOASHIAN**
6	FLUORESCENT/LED/CFL LUMINAIRES	PHILIPS/GM/TISVA/POLYCAB/WIPRO
7	METAL CLAD SOCKET OUTLETS	ABB/ L&T/ LEGRAND/ NORTH WEST/C&S/NEPTUNE
8	TELEPHONE CABLE	AGILON/LEGRAND/FINOLEX
9	BAKELITE SHEET	HYLAM / FORMICA
10	SOLDERLESS LUGS / FERRULES	DOWELL/COMET
11	CABLE GLANDS	COMET /GRIPWEL/ DOWEL
12	TAG BLOCK (TELE)	KRONE
13	DISTRIBUTION BOARDS (DOUBLE DOOR TYPE)	INDOASIAN/SCHNIDER/ LEGRAND/ HAGER/ ABB/
14	JOINTING KITS/ CONNECTORS	SCREWLESS WAGO & CONTROLS (I) LTD/3M/RPG
15	METERING EQUIPMENTS	RISHAB/ AE/ CONZERV/L&T/SECURE/NEPTUNE
16	ASS/VSS	KAYACEE/ L&T/
17	FANS	Crompton/BAJAJ/USHA/Havells/Orient
18	LAN & VOICE	AMP/ D-LINK
19	VOLTAGE STABILIZER & AC TIMER	RITLINES/ BLUE BIRD/ LOGICSTATE/ INLINE/V-GAURD/SERVOKON/SERVEL/RUPTRONICS
NOTE: Above makes of equipment are approved subject to their meeting the specifications. The contractor however shall seek approval of specific make from Consultant/ Bank's Engineer before commencing the work. The decision of Consultant/ Bank's Engineer shall & binding on the contractor in this respect. Any other make of the equipment not specified shall be got approved by the Bank's Electrical engineer in charge as per requirement.		

LIST OF APPROVED MAKES AIR CONDITIONING WORKS		
S. NO	**ITEM**	**COMPANY**
1	GSS SHEET	JINDAL / TATA / SAIL
2	FACTORY MADE DUCTS	ROLLASTAR/ NUTECH
3	PROPELLER FANS	GE ALSTHOM / CROMPTON/ CARRYAIRE
4	FLEXIBLE PIPE CONNECTION	RESISTOFLEX / DUNLOP
5	EXTRUDED ALUMINIUM GRILLES /DIFFUSER	AIRTECH/AIR COOLING SYSTEM/TRISTAR /CARRYAIRE
6	FIREDAMPER / VOLUME CONTROL DAMPER	AIRTECH/AIR COOLING SYSTEM/TRISTAR /CARRYAIRE
7	FLEXIBLE INSULATED DUCTS	CARYAIRE / ATCO/ MAPRO
8	FIBRE GLASS	OWENS CORNING/ UP TWIGA
9	EXTRUDED POLYSTYRENE BOARD	SUPREME
10	CROSS LINKED POLYETHYLENE	SUPREME/A-FLEX/AEROFLEX
11	CLASS 'O' NITRILE RUBBER INSULATION	SUPREME /K-FLEX / SUPERLON / EUROBATEX / ARMACELL/A- FLEX
12	COPPER PIPE	RAJCO / MANDEV / MAXFLOW / TOTAL LINE / SHREE SHAYAM
13	PVC PIPE	SETIA/ FINOLEX/ PRAKASH/ SURYA
14	CONDUIT FOR ELECTRICAL WIRE	AKG, SETIA, BEC, SUPER
15	EXPANDED POLYSTYRENE	STYRENE PACKING / INDIAN PACKING
16	VIBRATION ISOLATION SPRING	DUNLOP / RESISTOFLEX
17	PAINTS	ICI / ASIAN
18	DASH FASTENERS	CANON / FISHER / TKS/HILTI
19	WELDING RODS	ADVANI / L&T
20	ACB, M.C.B. & MCCB	L&T / GE / CROMPTON/C&S
21	POWER/CONTROL CABLE	CCI/ HAVELLS / GRANDLAY/ UNIVERSAL
22	CENTRIFUGAL / AXIAL FANS	:ABB / KRUGER / COMFREI / NUAIRE (UK)
23	INLINE FANS	KRUGER / NUAIRE / OSTBERG / SYSTEMAIR/ CARRYAIRE

NOTE : 1. **NO DEVIATION FROM THE APPROVED MAKE IS ACCEPTABLE**. HOWEVER, THE ARCHITECT/ CONSULTANT/ BANK RESERVE THE RIGHT TO SELECT ANY OF THE APPROVED MAKE OF THESE ITEMS, WHERE MORE THAN ONE MAKE IS MENTIONED.
2. FOR ANY LEFT-OUT ITEMS, PRIOR APPROVAL FROM CONSULTANT / ARCHITECTS / BANK IS REQUIRED.

BILL OF QUANTITY

PREAMBLE:

TO BE READ ALONG WITH DRAWINGS.

1. RATES TO BE QUOTED BOTH IN FIGURES AND WORDS.
2. ALL PAGES TO BE SIGNED AND STAMPED BY THE TENDERER.
3. THE RATE OF THE ITEMS SHALL BE APPLICABLE FOR ANY FLOOR LEVEL/ ANY NUMBER OF FLOORS, OR ANY QUANTITY.
4. THE SPECIFICATION OF THE ITEMS SHALL BE AS PER LATEST INDIAN STANDARD CODES UNLESS OTHERWISE SPECIFIED.
5. ALL MATERIALS SHALL BE AS PER APPROVED LIST AND SHOULD BE OF Ist QUALITY UNLESS OTHERWISE SPECIFIED.
6. THE RATES ARE INCLUSIVE OF ALL DUTIES AND TAXES (EXCEPT GST) OF ALL GOVERNMENT, MUNICIPAL OR ANY OTHER STATUTORY BODY APPLICABLE FROM TIME TO TIME.
7. RATES SHALL BE FOR ITEMS COMPLETE IN ALL RESPECTS AS PER DRAWING, INSTRUCTIONS AND APPROVAL OF THE ARCHITECT/ BANK'S ENGINEER.
8. THE QUANTITIES ARE APPROXIMATE AND TENTATIVE WHICH MAY VARY DURING COURSE OF EXECUTION. THE RATES QUOTED AGAINST PARTICULAR ITEM SHALL NOT BE CHANGED WITH VARIATION IN QUANTITIES.
9. MAKING OF ANY CUTOUT / OPENING FOR ELECTRICAL / AIR – CONDITIONING WIRING / FITTING IN ANY OF THE ITEM OF FALSE CEILING, PARTITIONS, PANELING MASONRY WORK ETC. AND FINISHING EDGES JAMBS / CILLS / SOFFITS OF THE OPENING SHALL NOT BE PAID EXTRA.
10. THE TENDERER SHALL VISIT THE SITE AND SHALL SATISFY HIMSELF AS TO CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. HE SHALL ALSO CHECK, ASCERTAIN THE LOCATIONS OF ANY EXISTING STRUCTURES OR EQUIPMENT OR ANY OTHER SITUATION WHICH MAY AFFECT THE WORK. NO EXTRA CLAIM AS A CONSEQUENCE OF IGNORANCE OR ON GROUND OF INSUFFICIENT DESCRIPTION WILL BE ALLOWED AT A LATER DATE.
11. THE QUOTED PRICE FOR ITEMS SHALL INCLUDE ALL ACCESSORIES, CONSUMMABLES ETC. AS REQUIRED TO MAKE THE ITEM COMPLETE IN ALL RESPECTS, COMPATIBLE WITH OTHER RELATED / ASSOCIATED ITEMS AND FULLY FUNCTIONAL.
12. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ERROR, DIFFICULTY IN EXECUTION / DAMAGES INCURRED OWING TO DISCREPANCY IN DRAWINGS WHICH HAS BEEN OVERLOOKED BY HIM AND HAS NOT BEEN BROUGHT TO THE NOTICE OF THE ARCHITECT.
13. THERE ARE NUMBER OF ITEMS GIVEN IN THE TENDER WHERE IN BASIC RATES INCLUDING ALL TAXES EXPECTED HAS BEEN MENTIONED IN THE TENDER. THESE ITEMS SHALL BE PURCHASED BY THE CONTRACTOR FROM THE MARKET ONLY AFTER THE APPROVAL OF QUALITY AND RATES BY THE ARCHITECT.
14. ALL HIDDEN SURFACES OF BOARD / PLY / WOOD WORK TO BE PAINTED WITH ANTI BACTERIAL PAINT FROM NAV AIR INTERNATIONAL FR 881 (VIPER) (WHITE COLOUR AS PER MANUFACTURER'S SPECIFICATIONS ON WOOD / BOARD).
15. CONTRACTOR SHALL APPOINT TECHNICALLY QUALIFIED FULL TIME SITE SUPERVISOR TO MONITORING THE DAY TO DAY PROGRESS OF WORK AT SITE ON THEIR OWN COST.

(Refer annexed file/section in e-tender portal for detailed Bill of Quantities)

TENDER DRAWINGS

(Refer annexed file/section in e-tender portal for Tender Drawings)