

**INDIAN BANK, ZONAL OFFICE,
KANCHEEPURAM - PREMISES &
EXPENDITURE DEPARTMENT,
NO:510 /511, GANDHI ROAD,
KANCHEEPURAM – 631 501.**

**PROPOSED ADDITION AND ALTERATION WORKS AT THE
EXISTING BRANCH BUILDING (TO ACCOMMODATE NEW
CURRENCY CHEST) AT NO:28A, THIRUVALLUVAR SALAI,
MARAIMALAI NAGAR, KANCHEEPURAM DISTRICT
CHENNAI – 603 209.**

**PART - I
(TECHNICAL BID)**

TENDER ISSUED TO:-

DUE DATE:- Before 3.00 PM on 30-06-2014

**Pre bid meeting on 20-06-2014, 3.00 PM at Indian Bank,
Zonal Office – Kancheepuram, No:510/511, Gandhi Road,
Kancheepuram – 631 501.**

**INDIAN BANK, ZONAL OFFICE, KANCHEEPURAM
PREMISES & EXPENDITURE DEPARTMENT,
NO:510/511, GANDHI ROAD,
KANCHEEPURAM – 631 501.**

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1	Name of the work	Proposed Addition and Alteration Works at the Existing Branch Building (To Accommodate New Currency Chest) At No:28a, Thiruvalluvar Salai, Maraimalai Nagar, Kancheepuram District Chennai – 603 209.
2	Cost of application/ tender document	Cost of Application - Rs.5000/- (non-refundable) in the form of DD drawn in favour of Zonal Manager, Indian Bank, Zonal Office, Kancheepuram. Tender documents (Technical and Price bid) can be downloaded from Bank's website www.indianbank.co.in/tenders from 12.06.2014 to 29.06.2014.
3	Pre Bid Meeting	20.06.2014, 3.00 PM in the office of Zonal Manager , Zonal Office - Kancheepuram Indian Bank , No:510/511, Gandhi Road, Kancheepuram – 631 501.
4	Last date of Downloading Tender	Up to 29.06.2014– 3.00PM
5	Time and last date of Submission of Tender	30.06.-2014 Up to 3.00 PM
6	Place & Address for submission of tender/ contact person/telephone no/ e-mail add.	Zonal Manager, Zonal Office - Kancheepuram Indian Bank, No:510/511, Gandhi Road, Kancheepuram – 631 501.
7	Date, Time and Place of Opening of tenders	Technical Bid opening : 30.06.2014, 3.30PM . in the office of Zonal Manager , Zonal Office - Kancheepuram , Indian Bank , No:510/511, Gandhi Road, Kancheepuram – 631 501. Price bids of only the shortlisted bidders will be opened at a later date which will be informed separately.
8	Quantum of Earnest Money Deposit (EMD)	Rs. 3,00,000/- in the form of DD drawn in favour of Zonal Manager, Indian Bank, Zonal Office, Kancheepuram. or bank Guarantee from any scheduled bank in favour of zonal manager, Indian Bank Zonal Office, Kancheepuram
8B	Initial security Deposit (payable by L1 bidder after award of the work)	2% of value of the tender value including EMD paid along with the tender, ISD is payable within 14 days of award of the work. 50% of the Initial security deposit shall be refunded after virtual completion of the work. EMD and ISD shall be paid by DD/BG only.

9	Quantum of Retention Money	5% of the value of each interim bill as detailed in the tender document.
10	Terms of payment of Bills, if any. Specify the minimum value of work for payment of running account bills.	Interim bills or periodical running bills on satisfactory completion of minimum value of work of 20% of contract value of work. No advance or mobilization advance shall be paid
11	(penalty clause)Liquidated Damages	In case of delay, a penalty @ the rate of 1% of contract value per week of delay subject to a maximum of 10% of contract value would be strictly imposed.
12	Stipulated time for completion of the work/supply.	5 months
13	Estimated Value of tender/project	Rs 1,44,53,000/-
14	Validity period of the tender.	Three Months.
15	Taxes	Rates quoted should include all Taxes, Octroi VAT and other charges like Transportation etc. However I.T and WCT will be deducted at source.
16	Electronic Payment	Electronic payment shall be preferred.
17	Submission of Work Program in the form of Gantt Chart/Bar Chart/PMP	7 days from the date of Acceptance letter.
18	Insurance of the Work	Before Commencement of the Work (CAR Policy)
19	Date of Commencement	Two weeks from the date of the acceptance letter or the day on which the site is handed over by bank, whichever is later.
20	Period for Certification of Interim bills by the Architect	4 days from the date of Receipt of the bill by the Architect
21	Period for Honouring interim Certificates issued by the Architect	10 days from the date of Receipt of the Certificate from the Architect.
21	Period for Honouring Final Certificates issued by the Architect	6 weeks from the date of Receipt of the final Certificate from the Architect.
22	Period of Certificate of Final Bill by Architect	30 days from the date of Receipt of bill by the Architect.
23	Period of Settlement of Final Bill by the Bank	3 months from the date of issue of certificate by the Architect.
24	Defect Liability Period	12 months
25	Release of Retention Money in 2 Parts (TOTAL SECURITY DEPOSIT = INITIAL SECURITY DEPOSIT+ RETENTION MONEY)	50% of the Retention amount is refunded on issue of Virtual Completion certificate by the Architect. Balance 50% will be refunded 14 days after defects liability period provided all defects are attended satisfactorily in accordance with contractor.

NOTICE INVITING TENDER

TO

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.....
.....

PROJECT: PROPOSED ADDITION AND ALTERATION WORKS AT THE EXISTING BRANCH BUILDING (TO ACCOMMODATE NEW CURRENCY CHEST) AT NO:28A, THIRUVALLUVAR SALAI, MARAIMALAI NAGAR, KANCHEEPURAM DISTRICT CHENNAI – 603 209.

DEAR SIRs,

1. Sealed tenders are invited for the proposed work by **The Zonal Manager Indian Bank, Zonal Office – Kancheepuram, No: 510/511, Gandhi Road, Kancheepuram – 631 501.**
2. SEALED TENDERS IN THE PRESCRIBED FORM ON TWO SEPARATE ENVELOPS SHOULD BE ADDRESSED **The Zonal Manager, Indian Bank, Zonal Office – Kancheepuram, No: 510/511, Gandhi Road, Kancheepuram – 631 501.**and super scribed **Proposed Addition and Alteration works at The Existing branch building (To Accommodate new Currency Chest) At No:28A, Thiruvalluvar Salai, Maraimalai Nagar, Kancheepuram District Chennai – 603 209.**
 - a. Envelope No.1: To contain Contractor's Terms and Conditions Technical assumptions etc, along with demand draft/Bank Guarantee for **Rs. 3.0 lakh** in the favour of Zonal Manager, Indian Bank, Zonal Office - Kancheepuram as EMD and demand draft for **Rs. 5,000/-** in the favour of Zonal Manager, Indian Bank, Zonal Office - Kancheepuram as Tender Cost.
 - b. Envelop No 2: Price Bid - To contain Architects Tender documents along with B.O.Q Completed in all respect and duly signed.

And submitted to the above address **before 3.00 P.M on 30.06-2014** Envelope 1 will be **generally opened on the same day at 3.30 P.M.** in the presence of the Contractors who want to be present. Envelop No 2 will be opened at later date, which will be communicated to the shortlisted tenderers in advance.

The work consists of Civil, Electrical, Air – Conditioning, Fire alarm, Interior furnishing, External development and other relevant works.

3. The contractor should quote in figures as well as in words the rate, and amount tendered by them. The amount for each item should be worked out and requisite total given in English Language only
4. The EMD of the contractor whose tender is accepted, shall be forfeited in full in case he does not remit the initial security deposit within the stipulated period or start the work by the stipulated date mentioned in the work order.
5. The acceptance of the tender will rest with the Indian Bank , which does bind itself to accept the lowest tender, and reserves to it self the authority to reject any or all of the tenders in which any of the prescribed conditions are not fulfilled or are incomplete in any respect or liable to be rejected.
6. The bank reserves the right to accept the tender in full or in part and the tenderer shall have no claim for revision of rates or other conditions if his tender is accepted in parts.
7. Canvassing in connection with tender is strictly prohibited and the tender submitted by the bidders who resort to canvassing will be liable to rejection

8. All rates shall be quoted on the proper form of the tender. Before quoting the rates the specifications of items in tender shall have to read, understood along with the various clauses mentioned in general conditions of this contract along with drawings and specifications.
9. The tenderer must obtain for himself on his own responsibility and at his own expenses all the Information which may be necessary for the purpose of filling this tender and for entering into a Contract for the execution of the same and must examine the drawings and inspect the site of the work and acquaint himself with all local conditions and matters pertaining thereto.
10. Each of the tender document is required to be signed by the person or persons submitting the tender in token of his / their having acquainted himself / themselves with the General Conditions etc as laid down. Any tender with any of the documents not signed will be rejected.
11. The tender documents must be filled in English and all the entries must be made by the hand and Written in ink. If any of the documents are missing or un- signed, the tender shall be considered invalid.
12. All erasures and alterations made while filling the tender must be attested by initial of the tenderer. Over writing of figures is not permitted. Failure to comply with either of these conditions will render the tender void. No advice or any change in rate or conditions after submission of the tender will be entertained. All the rates should be quoted both in figures and words. If on check there are differences between the rates given by the contractor, in words and figure or in amount workout by the contractor, the following procedure shall be followed.
 - i) When there is a difference between the rate in figures and in words, the rate, which corresponds to the amount worked out by the Contractor, shall be taken as correct.
 - ii) When the amount of an item is not worked out by the contractor or it does not correspond with the rate written either in figures or in words, then the rate quoted by the contractor in words shall be taken as correct.
 - iii) When the rate quoted by the contractor in figures and words tallies but the amount is not worked out correctly, the rate quoted by the contractor shall be taken as correct and not the amount.
13. The rate quoted for all the items in the tender shall be valid for the period of 90 days from the date of opening the Envelope No, 1.
14. The intending tenderer shall deposit EMD by DD / BG drawn in favour of Zonal Manager Indian Bank , Zonal – Office, Kancheepuram by demand draft of **Rs 3.0 lakh** as the Earnest Money as guarantee of good faith, which amount shall be forfeited as liquidated damages in the event of any evasive/ refusal or delay in signing the contract. The deposit of the unsuccessful tender will be returned without interest immediately after a decision is taken regarding the award of the Contract. The Earnest Money of the successful tender will be adjusted towards Security Deposit. A tender not accompanied by Earnest Money Deposit will not be considered. No concession will be made to public Sector companies from Payment of Earnest Money Deposit.
15. The successful tender will have to pay as the amount of initial security deposit which shall be 2% of the accepted value of the tender including the EMD, by means of DD/BG in favor of the Zonal Manager , Indian Bank Zonal Office - Kancheepuram , payable at Kancheepuram The initial security deposit is to be paid by the Contractor to Bank within 14 days of intimation to him of the acceptance of the tender. The initial security deposit will be invested with the bank for the duration of the contract period i.e. 5 months and will be refunded to the contractor with out any interest, after issue of the virtual completion certificate. No interest is allowed on the retention money.
16. Together with the money paid under clause 8 & 9 above. Further retention of 5% of the value of the work done from every running bill will be deducted On the Architect's certifying to the completion of the work, 50% of total security deposit shall be released to the contractor with the final certificate of payment and the balance payment will be retained for a further period of TWELVE months after the completion certificate is issued by the Architects and agreed by the Bank.

17. Within one week of the receipt of intimation from Bank of the acceptance of his / their tender, the successful tenderer shall be bound to implement the contract by signing an agreement in accordance with the Agreement and Conditions of Contract attached herewith, but the work order or the written acceptance by the Employer of a tender will constitute a binding agreement between the Employer and the person tendering whether such formal Contract is or not subsequently entered into.
18. All compensation or other sums of money payable by the Contractor under the terms of this contract may be deducted from the security Deposit, or from any sum that may be or may become due to the Contractor on any account whatsoever and in the event of the Security Deposit being reduced by reasons of any such deductions, the Contractor shall within 15 days of being asked to do make good in cash or by cheque any sum which have been deducted from his security deposit.
19. The contractor shall arrange for the procurement of all the materials at site as required and directed, and store them in his godown at the site of construction and also bear all the expenses incurred in therewith payment of taxes, octroi etc.
20. The rates quoted by the Contractor shall include all eventualities such as heavy rain, sudden floods etc which cause damage to the executed work or which may may totally wash out the work. Until the completion certificate is issued to the Contractor, Bank will not be responsible for such damage or wash out of the construction work.
21. Time is the essence of the contract. The work should be completed in **5 months** from the date of the work order issued to the contractor to commence the work. The successful Contractor will have to give CPM/PERT chart of various activities of work to be done so that the work gets completed within the stipulated time. The chart shall be submitted within 15 days from the date of acceptance of the tender.
22. If the contractor fails to complete the work by the Scheduled date of completion or within any sanctioned extended time, he will have to pay liquidated damages at 1% of contract value for each week of delay subject to maximum of 10% of the contract value (without extra items) as per Clause 17 of the General Conditions of Contract.
23. The quantities contained in the Schedule are only approximate. The work as carried out and done will be measured up from time to time, for which payment will be made subject to the terms and conditions of contract.
24. The unit price shall be deemed to be fixed price. In case of extra items, a record of labor charges paid shall be maintained and shall be presented regularly to the Architects for checking. The settlement will be made based on figures arrived at jointly and taking unit price given in the contract assigned to the successful Tenderer. In case, of extra items where similar or comparable items are quoted in the tender, extra rates shall be based on tender rates.
25. Indian Bank do not bind themselves to accept the lowest or any tender and reserve to themselves the right to accept or reject any or all tenders either in whole or in part, without assigning any reason for doing so. Bank also reserves the right to award the work either in whole or part as the case may be.
26. No employee of the Bank is allowed to work as a Contractor for a period of 2 years of his / her retirement from Bank Services without previous permission of the Bank. This contract is liable to be cancelled, if either the contractor or any of his employee is found any time to be such a person who had not obtained the permission of Bank as aforesaid before submission of the tender or engagement in the contractor's service.
27. Estimated cost of work **Rs 1,44,53,000** (approx)

**THE ZONAL MANAGER ,
Indian Bank, Zonal Office - Kancheepuram
No:510/511, Gandhi Road, Kancheepuram - 631 501.**

CRITERIA FOR PRE-QUALIFICATION

The eligibility criteria for pre-qualification of contractors are as under:-

1. Average annual financial turnover during the last 3 years ending 31st March 2014 should be at least Rs. 150 Lakhs.

And

2. Experience of having successfully completed similar works comprising civil works during the last 5 years ending March 2014, should be either of the following

Similar work shall mean a composite work comprising Civil Work

- i. Three similar completed works costing not less than **Rs. 58 Lakh** OR
 - ii. Two similar completed works costing not less than **Rs. 73 Lakh** OR
 - iii. One similar completed work costing not less than **Rs.116 Lakh**
 - iv. The contractor should provide proper documentary proof in support of satisfactory completion of similar works during the last 3 years.
 - v. The Contractors should provide Annual Report (Balance Sheet and Profit & Loss Account) of last 3 financial years – The years are 2013-14 (if available), 2012-13, 2011-12, 2010-11.
 - vi. The Contractor should be having adequate manpower, equipment etc. Manufacturing facility.
 - vii. The contractor having any added certificate from any competent authority for the products quoted will have added advantage.
 - viii. The contractor shall have valid sales tax registration number, Services tax registration etc.,
3. Solvency : The contractor should submit a valid solvency certificate of Rs.45 lakhs issued by a scheduled bank not earlier than 31/12/2013.
 4. Profit /Loss : The Contractor /firm should be profit – making and should not have under losses in the last three continuous financial years.

FINANCIAL INFORMATION

- (i) FINANCIAL ANALYSIS – DETAILS TO BE FURNISHED DULY SUPPORTED BY FIGURES IN BALANCE SHEET/ PROFIT AND LOSS ACCOUNT FOR THE THREE YEARS DULY CERTIFIED BY THE CHARTERED ACCOUNTANT, AS SUBMITTED BY THE APPLICANT TO THE INCOME – TAX DEPARTMENT (COPIES TO BE ATTACHED)

	YEARS			
	2010-11,	2011-12,	2012-13	2013-14
(i). GROSS ANNUAL TURN – OVER IN CONSTRUCTION WORKS :				
(ii) PROFIT / LOSS :				
(iii) FINANCIAL POSITION :				
a) CASH				
b) CURRENT ASSETS				
c) CURRENT LIABILITIES				
d) WORKING CAPITAL (B-C)				
e) CURRENT RATIO: CURRENT ASSETS/ CURRENT LIABILITIES (B/C)				
f) ACID TEST RATIO: QUICK ASSETS / CURRENT LIABILITIES (A/C)				

II . INCOME TAX CLEARANCE CERTIFICATE

III. SOLVENCY CERTIFICATE FROM BANKERS (SCHEDULE BANK) OF APPLICANT

IV. FINANCIAL ARRANGEMENTS FOR CARRYING OUT THE PROPOSED WORK

SIGNATURE OF APPLICANT

(S)

SIGNATURE OF CHARTED ACCOUNTANT WITH SEAL

NOTE: IF AVAILABLE AUDITED DETAILS AS ON 31.03.2014 MAY ALSO PLEASE BE FURNISHED

DETAILS OF ALL WORKS OF SIMILAR CLASS COMPLETED DURING THE LAST FIVE YEARS ENDING 31ST MARCH 2014.

SL.NO	NAME OF WORK / PROJECT & LOCATION	OWNER OF SPONSORING ORGANIZATIONS	AGREEMENT SCOPE OF WORK 1No	SCOPE OF WORK	COST OF WORK IN CRORES	DATE OF COMMENCEMENT AS PER CONTRACT	STIPULATED DATE OF COMPLETION	ACTUAL DATE OF COMPLETION	LITIGATION ARBITRATION PENDING /IN PROGRESS WITH DETAILS	NAME AND ADDRESS/T E LNO OFFICER TO WHOM REFERENCE MAY BE MADE	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12

SIGNATURE OF APPLICANT (S)

****Indicate gross amount claimed and amount awarded by the Arbitrator**

ADDITIONAL INFORMATION FOR COMPLETED WORKS

1. NAME OF WORK :
2. LOCATION:
3. CLIENT'S NAME AND ADDRESS:
4. CONSULTANTS NAME AND ADDRESS:
5. SCOPE OF WORK:
 - a. NUMBER OF FLOORS IN BASEMENT:
 - b. NUMBER OF FLOORS IN SUPERSTRUCTURE:
 - c. HEIGHT OF THE BUILDING:
6. SPECIALIZED EQUIPMENT DEPLOYED FOR THE PROJECT:
7. PROJECT MANAGEMENT ORGANIZATION ADOPTED IN EXECUTION:
8. NUMBER OF SHIFTS AND ITS DURATION ADOPTED IN EXECUTION:
9. SYSTEMS ADOPTED FOR TIMELY COMPLETION OF THE PROJECT:
10. WHETHER ANY INTERIOR FURNISHING WORKS WERE COMPLETED,
IF SO DETAILS THEREOF :

SIGNATURE OF APPLICANT (S)

DETAILS OF ALL WORKS OF SIMILAR CLASS COMPLETED DURING THE LAST FIVE YEARS ENDING 31ST MARCH 2014.

SL.NO	NAME OF WORK / PROJECT & LOCATION	OWNER OF SPONSORING ORGANIZATION	AGREEMENT NO	COST OF WORK	DATE OF COMMENCEMENT AS PER CONTRACT	STIPULATED DATE OF COMPLETION	UP TO DATE PERCENTAGE PROGRESS OF WORK	SLOW PROGRESS IF ANY, AND REASONS THEREOF	NAME AND ADDRESS/ TEL No OFFICER TO WHOM REFERENCE MAY BE MADE	REMARKS (INDICATE WHETHER ANY SHOW CAUSE NOTICE ISSUED OR ARBITRATION INITIATED DURING THE PROGRESS OF WORK)
1	2	3	4	5	6	7	8	9	10	11

PERFORMANCE REPORT FOR WORKS REFERRED TO IN FORM 'B&C'

1. NAME OF THE WORK
PROJECT AND LOCATION
2. SCOPE OF WORK
 - a. NUMBER OF FLOORS IN BASEMENT
 - b. NUMBER OF FLOORS IN SUPERSTRUCTURE
3. AGREEMENT NO:
4. ESTIMATED COST:
5. TENDERED COST
6. VALUE OF WORK DONE:
7. DATE OF COMPLETION
 - a. STIPULATED DATE OF COMPLETION
 - b. ACTUAL DATE OF COMPLETION
8. AMOUNT OF COMPENSATION LEVIED FOR DELAYED
COMPLETION ,IF ANY
9. PERFORMANCE REPORT BASED ON
QUALITY OF WORK, TIME MANAGEMENT
AND RESOURCEFULNESS : VERY GOOD/GOOD/FAIR/
NOT SATISFACTORY

DATE :

SUPERINTENDINGENGINEER/
CHIEF PROJECT MANAGER
OR EQUIVALENT.

STRUCTURE AND ORGANISATION

1. NAME AND ADDRESS OF THE APPLICANT :
2. TELEPHONE No./FAX No/E-MAIL ADDRESS:
3. LEGAL STATUS (ATTACH COPIES OF ORIGINAL DOCUMENT DEFINING THE LEGAL STATUS)
 - a. AN INDIVIDUAL
 - b. A PROPRIETARY FIRM
 - c. A FIRM IN PARTNERSHIP
 - d. A LIMITED COMPANY OR CORPORATION
4. PARTICULARS OF REGISTRATION WITH VARIOUS GOVERNMENT BODIES (ATTACH ATTESTED PHOTO – COPY)
 - a. REGISTRATION NUMBER:
 - b. ORGANIZATION / PLACE OF REGISTRATION
5. NAMES AND TITLES OF DIRECTORS AND OFFICERS WITH DESIGNATION TO BE CONCERNED WITH THIS WORK WITH DESIGNATION OF INDIVIDUALS AUTHORIZED TO ACT FOR THE ORGANIZATION.
6. WAS THE APPLICANT EVER REQUIRED TO SUSPEND WORK FOR A PERIOD OF MORE THAN SIX MONTHS CONTINUOUSLY AFTER YOU COMMENCED THE `CONSTRUCTION IF SO, GIVE THE NAME OF THE PROJECT AND GIVE REASONS THEREOF .
7. HAS THE APPLICANT OR ANY CONSTITUENT PARTNER IN CASE OF PARTNERSHIP FIRM/ COMPANY, EVER BEEN ABANDONED THE AWARDED WORK BEFORE ITS COMPLETION? IF SO, GIVE THE NAME OF THE PROJECT AND GIVE REASONS THEREOF.
8. HAS THE APPLICANT OR ANY CONSTITUENT PARTNER IN CASE OF PARTNERSHIP FIRM/ COMPANY, EVER BEEN DEBARRED /BLACK LISTED FOR TENDERING IN ANY ORGANIZATION AT ANY TIME ?IF SO, GIVE DETAILS:
9. HAS THE APPLICANT OR ANY CONSTITUENT PARTNER IN CASE OF PARTNERSHIP FIRM, OR ANY DIRECTORS IN CASE OF A COMPANY EVER BEEN CONVICTED BY A COURT OF LAW? OR ANY CRIMINAL PROCEEDINGS PRESENTLY PENDING ? If SO GIVE DETAILS.
10. ANY OTHER INFORMATION CONSIDERED NECESSARY BUT NOT INCLUDED ABOVE.

SIGNATURE OF APPLICANT (S)

DETAILS OF KEY TECHNICAL AND ADMINISTRATIVE PERSONNEL EMPLOYED BY THE FIRM / COMPANY

SL.NO	DESIGNATION	TOTAL NUMBER	NAMES	QUALIFICATION	PROFESSIONAL EXPERIENCE CONTINUOUS	LENGTH OF SERVICE WITH EMPLOYER
1	2	3	4	5	6	7

NOTE: ADDITIONAL INFORMATION ABOUT TECHNICAL PERSONNEL, IF ANY, MAY BE SUBMITTED ON

SEPARATE SHEET

SIGNATURE OF APPLICATION (S)

PROFORMA ON ISO CERTIFICATION

1. YEAR OF CERTIFICATION
2. NAME AND ADDRESS OF CERTIFYING AGENCY
3. NAME OF MANAGEMENT REPRESENTATIVE
4. VALIDITY OF CERTIFICATE

NOTE: ATTESTED COPY OF CERTIFICATE (ATTESTED BY GOVERNMENT OFFICER OR NOTARY PUBLIC) TO BE ENCLOSED.

SIGNATURE OF APPLICANT(S)

Agreement Format:

ARTICLES OF AGREEMENT

THIS AGREEMENT is made on thisday of2014 between **THE ZONAL MANAGER , INDIAN BANK ZONAL OFFICE - KANCHEEPURAM , No:510/511, GANDHI ROAD, KANCHEEPURAM – 631 501** (hereinafter referred to as the "Employer") which expression shall include its successors, legal representatives and assigns of the one part.

AND

....., the firm having office at represented by..... (Hereinafter referred to as the "Contractor") which expression shall include its successors, legal representatives and assigns of the second part.

WHEREAS the Employer intends to carry out

WHEREAS the Employer has caused drawings and tender documents to be prepared by his Architect (hereinafter referred to as "Architect").

AND whereas the Contractor has agreed to execute the work as per drawings, specifications, conditions of contract of the tender and Work Order for the Employer's project of

AND whereas the Employer has called for tenders for the as per Employer's NIT dated and whereas the tender dated. submitted by the Contractor has been accepted for such sum as may be ascertained to be payable in terms of the Bill of Quantities and which sum is estimated to be Rs. hereinafter referred to as the said "Contract Sum".

AND whereas the Employer has issued the work order to the Contractor vide letter ref:, dt. for an amount of Rs.

AND whereas parties herein desirous of reducing the agreed terms into writing as under:

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:-

1) In consideration of the said Contract Sum to be paid at the times and in the manner set forth in the said Conditions the Contract shall carry out and complete all theworks as per terms and conditions herein contained and according to the general conditions of the contract, notice inviting tender, special conditions of contract, general scope of work, technical specifications, schedule of rates and instructions to be given by Architect and to the entire satisfaction of the Employer.

2) Contract Price, Taxes and Payment Terms:

Total contract price is Rs..... which is inclusive of cost of materials, equipment, installation charges and tools and tackles required for execution of the job. Above price is inclusive of all taxes & duties including excise duty, sales tax, works contract tax, income tax, octroi, VAT etc. in respect of this contract. No claim in this respect will be entertained. Sales tax on works contract & Income tax on payments will be deducted and deposited by Employer in accordance with the sales tax law of the state and the provisions of tax deductions at source under Income Tax Act 1961.

However, interim payment will be made as per the site measurements on Item Rate basis and certification of the Architect.

3) Completion Period:

Time is the essence of the Contract. The work is to be completed in all respects within months. The date of commencement of work would be reckoned from days from the date of issue of the work order or handing over of site which ever is later. If the Contractor fails to

complete the job within the agreed time period the contractor will have to bear liquidated damages as per the relevant clause mentioned in the Tender Documents.

4) Earnest Money:

The Contractor has deposited a sum of Rs. (Rupees only) towards 2% value of the contract price as Initial Security Deposit which includes adjustment of sum Rs.(Rupees only) deposited as EMD with the tender. The contractor further agrees that the Employer shall deduct% of the gross value of each running bill towards further security, which along with Initial Security Deposit will constitute Total Security Deposit.

5) Inspection of Site:

The Contractor has inspected the site before submitting his tender and has satisfied himself as to the nature of the work to be executed on the site. Any difficulties which the Contractor may come across in the course of the work shall in no way entitle the Contractor to claim or receive extra payment unless the Employer is of the opinion that such difficulties could not have been foreseen and the Employer consents in writing.

6) Supply of Material and Labour:

The Contractor shall arrange all labour, materials, equipments, tools, tackles and everything necessary for the completion of the work. The Contractor will assume all responsibility for the safety, protection and accounting of all material and equipment and the work during construction. All materials used by the Contractor shall be of the best quality conforming to the required specification mentioned in the tender document and will be subject to the approval of the Architect / Employer. All such materials not approved by Architect / Employer shall be removed at once by the Contractor at his own expense. The Contractor shall also at his own expense arrange for carrying out any test of materials which the Architect / Employer may from time to time require or if so desired by the employer.

7) Defective Work / Materials:

If any part of the work done by the Contractor is found defective in workmanship or if bad or inferior materials have been used the Contractor shall at his own risk and cost demolish all such defective work and rebuild the same and / or replace the bad or inferior materials used within a time frame mentioned to the satisfaction of the 'Architect / Employer'. The decision of the Employer / Architect in this regard shall be final and binding on the Contractor. In case of default of the Contractor to remove the defective work and rebuild the same or replace bad or inferior materials as directed by the Employer, the Employer shall be entitled to employ anyone else to carry out the same at risk and cost of the Contractor and recover all expenses incurred in this regard from the Contractor.

8) Inspection of Work:

During progress of the work the site engineer of the Employer and Architect/ Employer shall be entitled at all times to have access to and inspect the work. If the work is inspected by the any Government/ Bank's authorized persons, the Contractor will fully co- operate and extend all help to meet the observations.

9) Supervision:

The Contractor shall provide one or more competent and technically qualified engineers duly and fully authorized to act on his behalf in all matters relating to the works to be carried out under or any other matter concerning this agreement and who shall at all times be present at the works while any work is in progress as per directions, explanations & instructions of Employer / Architect.

10) Compliance with Statutory Regulations & Work Rules:

The Contractor shall be responsible for complying with the applicable laws / bye laws / Regulations in force from time to time and shall have to bear all statutory liabilities to the workers / personnel engaged for the job. Nothing will be paid extra in this regard. If any amount is paid by the Employer in this regard the same amount shall be deducted from the Contractor's dues. The Contractor shall have to arrange insurance cover for the workers / personnel engaged by him for the job.

11) Determination of Contract:

In the event of Contractor failing to keep / adhere to agreed schedule of work, or in the event of the Contractor failing to comply with the provisions of this contract by default and / or negligence and / or suspension of work or in the event of Contractor failing to complete the work within the stipulated period, the Employer may terminate this Agreement forthwith and employ, at the Contractor's risk and cost, another Contractor or sufficient number of workmen to complete the work.

12) Force Majeure:

In case any Force Majeure condition herein mentioned occurs and continues for a period exceeding 15 days the parties hereto undertake to sit together and devise ways for expeditious and proper performance of the obligations of the parties under this order.

This clause will be operative only if the work is delayed by

- a) Acts of God
- b) Earthquake or floods or similar natural calamities.
- c) Serious loss or damage by fire or lightning.

13) Arbitration:

"In the event of any dispute or difference relating to interpretation and application of provisions of the contract and all disputes/claims whatsoever which shall either during the continuance of the contract or afterwards either between the parties to the contract or the respective representatives touching the construction/application of any provision/clause mentioned in the contract or any account or liability between the parties to the contract or as to any act or deed or omission of any party to the contract, in any way relating to these presents, shall be first at the discretion of the Bank attempted to be resolved in good faith by mutual discussion within 30 days of the dispute or question being raised failing which the same shall be settled by arbitration in accordance with provisions of Indian arbitration and Conciliation act 1996.

The Parties concerned shall designate an arbitrator on mutual consent/consensus. In the event of no consensus being arrived, an Arbitral Tribunal shall be constituted comprising three Arbitrators, each party appointing one arbitrator and a third arbitrator to be appointed by the two arbitrators so appointed by the parties. The venue of the arbitration shall be exclusively at and any award passed by arbitrator or the arbitral Tribunal shall be final, conclusive and binding upon the parties and shall be deemed to have been made between parties themselves. The parties to the dispute shall share equally the cost of arbitration as intimated by the arbitrator".

14) Architect :

The term Architect in the said conditions shall mean the said or in the event of it being ordered to be wound up or in ceasing to be the Architect for the purpose of this Contract, such other person 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 person subsequently appointed to be Architects under this Contract shall be entitled to disregard or overrule any provision, decision or approval or direction given or expressed by the Architects for the time being.

IN WITNESS whereof the said contracting parties have set their hands and seals on the day and year first hereinabove witness.

Signed and delivered on behalf of Indian Bank

Shri.....
.....

In the presence of

- 1) Name & Address
- 2) Name & Address

Signed and delivered on behalf of the Contractor..... by

Shri.....
.....

In the presence of

- 1) Name & Address
- 2) Name & Address

GENERAL INSTRUCTIONS TO THE TENDERERS

Tenders are hereby invited by Indian Bank **for** Addition And Alteration Works At The Existing Branch Building (To Accommodate New Currency Chest) At No:28a, Thiruvalluvar Salai, Maraimalai Nagar, Kancheepuram District Chennai – 603 209.

Estimated cost of **Rs. 1,44,53,000/-**

On acceptance of the tender, the name of the accredited representative (s) of the Contractor who would be responsible for taking instructions from the Employer/ Architects shall be communicated to the Employer.

GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual items in the schedule of quantities and in the specifications and conditions laid down herein after and the drawings, the work shall be carried out as per standard specifications and under the direction of the Employer / Architect

1. INTERPRETATIONS

In construing these conditions and the specifications schedule of quantities and contract agreement, the following words shall have the meaning herein assigned to them except where the subject or contract otherwise required.

a. 'Employer' shall mean THE ZONAL MANAGER , Indian Bank, Zonal Office - Kancheepuram , No:510/511, Gandhi Road, Kancheepuram – 631 501 and any of its Employers / Representatives authorized on their behalf.

b. **'Contractor' shall mean**
And shall include his / their heirs, legal representatives, assignees and Successors.

c. **'Site'** shall mean the lands and other places as shown bounded red on the site plan, on which the works are to be provided by the Employer or Architect for the purpose of the contract.

d. **'Site Engineer'** shall mean any other Engineer appointed from time to time by the Employer and certified in writing to the Architects and the Contractor, to act as Engineer for the purpose of the Contract .

e. **'Employer's Representatives'** shall mean any site Engineer or any clerk of works appointed from time to time by the Employer to perform the duties set forth in Clause 27 hereof whose authority shall be notified in writing to the Architects and Contractor by the EMPLOYER.

f. **'Drawings'** shall mean the drawings referred to in the specifications and any modifications of such drawings approved in writing by the Architect and such other drawings as any from time to time during the execution of work be furnished or approved in writing of the Architect and Employer

The Contractor shall ask in writing for all clarifications on matters occurring any where in drawings, specifications and schedule of quantities or to additional instructions at least 10 days ahead from the time when it is required for implementation. So that Employer / Architect may be able to give decisions hereon.

h. **'Works'** shall mean the works to be executed in accordance with the contract specifications and schedule of quantities.

i. **'Act of insolvency'** shall mean any Act of Insolvency as defined by the Presidency Towns Insolvency Act or the Provincial Insolvency Act or any act amending such original.

j. **'Contract'** shall mean the Articles of Agreement, the general conditions special conditions, the appendix, the schedule of quantities, specifications and drawings attached here to and duly signed.

k. **'The Schedule of Quantities'** shall mean the schedule of quantities as specified and forming part of this contract.

l. **'Priced schedule of Quantities'** shall mean the schedule of quantities duly priced with the accepted quoted rates of the contractor.

- m. **'Contract Price'** shall mean the sum named in the Tender subject to such additions thereto or deductions therefrom as may be made under the provisions hereafter contained.
- n. **'Notice in Writing'** or written notice shall mean a notice in writing, type or printed characters sent (unless delivered personally or otherwise provided to have been received) by registered post to the last known private or business address or registered office of the addressee and shall be deemed to have been received when in the ordinary course of post it would have been delivered.
- o. **'Net Prices'** any arriving at the Contract amount the Contractor shall have added to or deducted from the total of the items if the Tender any sum, either as a percentage or otherwise, then the net price of any item in the tender shall be the sum arrived at by adding to or deducting from the actual figure appearing in the tender as the price of that item a similar percentage or proportionate sum. Providing always that in determining the percentage or proportion of the sum so added or deducted by the contractor, the total amount of any Prime Cost items and provisional sums of money shall be deducted from the total amount of the Tender. The expression 'net rates' or 'net prices' when used with reference to the contract or account shall be held to mean rates or prices so arrived at.
- p. **'Virtual Completion'** shall mean the building is in the opinion of the Architect and Employer fit for occupation.
- q. Words importing persons include firms and corporations. Words importing the singular only, also include the plural and vice versa where the Context requires.

2. **SCOPE OF CONTRACT:**

The Contractor shall carry out and complete the said work in every respect in accordance with this Contract and with the directions of and to the satisfaction of the Architect and Employer. The architect with approval of Employer issue further drawings and / or written instructions, details directions and explanations which hereafter collectively referred to as 'Architect's Instructions'. In regard to:

- a. The variations or modifications of the designs, quality of works or the additions or omission or substitution of any work.
- b. Any discrepancy in the drawings or between the schedule of quantities and / or drawings and / or specifications.
- c. The removal from the site of any defective material brought thereon by the Contractor and the substitution of any other material thereof.
- d. The demolition removal and / or re-execution of any work executed by the contractor/s.
- e. The dismissal from the works any person employed thereupon.
- f. The opening-up for inspection of any work covered –up.
- g. The rectification and making good of any defect under clauses hereinafter mentioned and those arising during the maintenance period (retention period).

The Contractor shall forthwith comply and fully execute any work comprised in such Architect's Inspections provided always that instructions directions and explanations given to the Contractor or his representative upon the works by the Architect shall, if involving a variation, be confirmed in writing by the Contractor within 7 days and if not dissented from in writing within 7 days by the Architect, shall be deemed to be the Architect's instructions within the scope of contract.

If compliance with the Architect's instructions as aforesaid involved work and /or expense and /or loss beyond that contemplated by the contract, then unless the same were issued owing to some breach of his Contract by the contractor's, the Employer

shall pay to the Contractor on the Architect's Certificate, the price if the said work (as on extra to be valued as herein after provided) and/or expenses and /or loss.

The Contractor shall set up a field laboratory with necessary equipments for day to day testing of materials like grading of course and fine aggregates, silt content and bulkage of sand etc.

Regarding all factory made products for which ISI marked products are available, only products bearing ISI marking shall be used in the work.

3. CONTRACTOR TO VISIT THE SITE:

Each tenderer must before submitting his tender, visit the site of works so as to ascertain the physical site conditions and prices, availability and quality of materials according to specifications before submitting the quotations. No extra regarding non-availability of materials or charges in the price will be entertained or extra allowed on that account.

1. TENDERS:

The entire set of tender paper submitted by the tenderer should be submitted fully priced and also signed on the last page together with initials on every page with company seal affixed. Initial / signature will indicate the acceptance of the tender papers by the tenderer.

The schedule of quantities shall be filled in as follows:

- i. The 'Rate' column to be legibly filled in ink in English, figures and English words.
- ii. Amount column to be filled in for such item and the amount for each sub head and detailed in the Schedule of Quantities.
- iii. All corrections are to be initialed by the competent signatory
- iv The 'Rate column' for alternative items shall be filled up.
- v. The 'Amount' column for alternative items of which the quantities are not mentioned shall not be filled up.

No modifications, writings or corrections can be made in the tender papers by the tenderer, but may at his option after his comments or modifications in a separate sheet of paper attached to the original tender papers.

The Employer reserves the right to reject the lowest or any tender and also to discharge any or all of the tenders for each section or to split up and distribute any item of work to any specialist firm or firms, without assigning any reason.

The tenderers should note that the tender is strictly on the item rate basis and their attention is drawn to the fact that the rates for each and every item should be correct, workable and self-supporting. If called upon by the Employer / architect detailed analysis of any or all the rates shall be submitted. The Employer / Architects shall not be bound to recognize the contractor's analysis.

The works will be paid for as 'measured work' on the basis of actual work done and not as 'lumpsum' contract.

All items of work described in the schedule of quantities are to be measured and paid as completed works and details including preparatory furnishing works involved, directly, related to and reasonably detectable from the drawings, specifications and schedule of quantities and no further extra charges will be allowed in this connection. In the case of lumpsum charges in the tender in respect of any item of works, the payment of such items of work will be made for the actual work done on the basis of lumpsum charges as will be assessed to be payable by the Employer/Architect.

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

The tenderer shall note that the tender shall remain open for consideration for a period of 90 days from the date of opening of the tender (envelope – 1).

4. AGREEMENT:

The successful Contractor shall be required to enter into an agreement in accordance with the Draft Agreement and Schedule of Conditions within 15 days from the date of the Contract advised by the Employer/Architect that his tender has been accepted. The Contractor shall pay for all stamps and legal expenses incidental thereto. However, the written acceptance by the Employer, of the tender will constitute as a binding contract between the Employer and Contractor, whose tender has been accepted, whether such final agreement is or is not subsequently executed.

5. OPENING UP WORKS:

The Contractor shall notify the Architect in writing immediately, the trenches or excavation as shown on the drawings are get clearance or as soon as any ground is cut into which, from unexpected causes appears to need immediate attention, after notifying the Architect, he shall await instructions which shall within seven days of receipt of such notices, if the Contractor put in any parts of the foundations before he has so notified the Architect and received instructions, shall be liable to reinstate all work that may subsequently be, at any time, damaged on account of any defect or insufficiency of the foundations. The Contractor shall at the request of the Architect, within such time as the Architect so desires, open for inspection any other work, and should the Contractor refuse or neglect, to comply with such request, the Employer, through the Architect may comply other workmen to open up the same. If the said work has been covered up in contravention of the Architect's instructions, or if, on being opened up, it be found in accordance with the drawings and specifications, or the instructions of the Architect, the expenses of such other workmen shall be borne by and recoverable or which may become due to the contractor. If the works has not been covered up in contravention of such instructions, then the expenses aforesaid shall be done by the Employer and be added to or the Contract sum, provided always **that** in the case of foundations or of any other urgent work so opened up and requiring immediate attention, the Architect shall within seven days after receipt of the written notice from the Contractor that the work has been opened, make or cause the inspection thereof to be made, and at the expiration of such time if such inspection shall not have been made, the Contractor may cover the same and shall not be required to open it up again, except at the expenses of Employer.

6. AUTHORITIES, NOTICES, PATENT RIGHTS AND ROYALTIES:

The Contractor shall confirm to the provisions of the statutes relating to the works, and so to the regulation and bylaws of any local authority, and of any water, lighting and other companies or authorities with whose systems the structures are proposed to be connected and shall before making any variation from the drawings or specifications, that may be necessitated by so conforming given to the Architect's written notice, specifying the variations proposed to be made and the reason for making it apply for instruction thereon. In case, the Contractor shall not within the 10 days receive such instruction, he shall proceed with the work conforming with the provisions, regulations or bylaws in questions.

The Contractor shall bring to the attention of the Architect all notices required by the said acts, regulations or bylaws to be given to any Authority, and pay to such authority or to any Public Officer all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Architect / Employer.

The Contractor shall indemnify the Employer against all claims in respect of patent rights, designs, trade marks or name or the protected rights in respect of any constructional plant, machine, work or material used for or in connection with the works or temporary

works and from and against all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall defend all actions arising from such claims, unless he has informed the Architects, before any such infringement and received their permission to proceed and shall himself pay all royalties, license fees, damages, coat and charges of all and every sort that may be legally incurred in respect thereof.

7. TAXES AND DUTIES:

Tenderers must include in their tender prices quoted for all duties, royalties, cost, sales tax, work contract tax, **VAT**, any other taxes or local charges if applicable.

No extra claim on this account will in any case be entertained.

8. NOTICES AND STATUTORY REGULATIONS:

The Contractor shall give all notices and pay all fees and shall comply all Acts and Regulations for the successful completion of the contract works.

The whole of the work including sanitation and electrical is to be complied with as per the requirements and bylaws of the relevant statutory authorities including contract labor (Regulation and Abolition) Act 1970.

9. SCHEDULE OF QUANTITIES & SUFFICIENCY OF SCHEDULE OF QUANTITIES:

The Schedule of Quantities unless otherwise stated shall be deemed to have been prepared In accordance with the Standard Procedure of the Architects shall be considered to be approximate and no liability shall attach to the Architect for any error may be discovered therein. The Employer reserves the right to execute only a part or the whole or any excess thereof without assigning any reason therefore.

The Contractor shall be deemed to have satisfied himself before tendering to the correctness and sufficiency of his tender for the works and of the prices stated in the Schedule of Quantities and /or the Schedule of Rates and Prices, which rates and prices shall cover all things necessary for the completion of the works.

10. OTHER PERSONS ENGAGED BY THE EMPLOYER:

The Employer reserves the right to use the premises and may portions of the site for the execution of any work not included in the contract which he may desires to have carried out by other persons, and the contractors is to allow all reasonable facilities for the execution such work, but is not required to provided any plant or materials for the execution of such work, except by special arrangement with the Employer. (Such work shall be carried out in such a manner as not to impede the progress of the works included in the contract, and the Contractor shall not be responsible for any damage or delay which may happen to or be occasioned by such work)

SUB-CONTRACTORS:

All specialists, Merchants, Tradesmen, and other executing any work or supply and fixing any goods for which prime cost prices or provisional sums are included in the Schedule of Quantities and / or specifications, who may be nominated or selected by the Architect / Employer and hereby declared to be Sub-contractors employed by the Contractor and are herein referred to as nominated sub-contractors.

a. The nominated sub-contractors shall indemnify the Contractor against the same obligation in respect of the sub-contract, as the Contract is under, in respect of this contract.

b. The nominated sub-contractors shall indemnify the Contractor against claims in respect of any negligence by the sub-contractor, his servants or agents or any misuse by him or

them of any scaffolding or other plant, the property of the Contractor or under any Workman's Compensation Act in force

Payment shall be made to the nominated sub-Contractor in 14 days of receipt of the Architects certificate, provided that before any certificate is issued, the Contractor shall upon request furnish to the Architect proof that all nominated sub-contractor's account included in the previous certificates have been duly discharged in default whereof the Employer may pay the same upon a certificate of the Architect and deduct the amount thereof from any sums due to the Contractor. The exercise of the power shall not create privity of contract as between Employer and sub-contractor.

11. EARNEST MONEY DEPOSIT & SECURITY DEPOSIT:

The tenderer will have to deposit an amount of **Rs. 3.00 lakh** In the form of Bank Demand Draft/BG drawn in favour of **Zonal Manager, Indian Bank, - Zonal Office Kancheepuram** at the time of submission of tender as an Earnest Money. The Employer is not liable to pay interest on the Earnest Money. The earnest money of unsuccessful tenderer will be refunded without any interest soon after the decision to award the work is taken or after the expiry of the validity period of the tender.

The successful tenderer to whom the contract is awarded will have to deposit as initial security deposit a further sum to make up 2% of the value of the accepted tender including the earnest money. The initial security deposit will have to be made within 14 days from the date of acceptance of the tender, failing which the Employer at his discretion may revoke the letter of acceptance and forfeit the earnest money deposit furnished along with the tender. The initial security deposit will be held by the Employer for the duration of the contract period it shall be refunded to the Contractor without any interest within 14 days after the issue of certificate of virtual completion.

Apart from the initial security deposit made as above retention money shall be deducted from progressive running bills @5% of the gross value of each running bill.

50% of the retention money shall be released with final certificate of payment after removing all his material, equipment, labour force, temporary sheds/ store from the site.

Balance retention money shall be released 14 days after completion of the defects liability period of one year from the date of virtual completion of the work

12. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY:

The Contractor shall provide everything necessary for the proper execution of works according to the true intent and meaning of the drawings, specifications and Schedule of Quantities taken together whether the same may or may not be particularly shown or described there in provided that the same can be referred there from and if the Contractor finds any discrepancy in the drawings or between the drawings, specifications and Schedule of Quantities, he shall immediately refer the same in writing to the architect, who shall decide which shall be followed and his decisions shall be final and binding on all parties.

The Contractor shall provide for himself fresh water and electricity for the carrying out of the work at his own cost. The Employer shall charge the Contractor for his own unrented ground and shall on no account be responsible for the expense incurred by the Contractor for hired ground. If water from any source other than Municipal main is to be used for construction the same shall be tested at the contractors cost and a report submitted to the Architect for his approval, before such water is used for the works.

The Contractor shall supply, fix and maintain at his cost, during the execution of any works, all the necessary centering, scaffolding, staging, timbering, strutting, shoring, pumping, fencing, hoarding, watching and lighting by night as well as day required not only for the proper execution and protection for the said works, but also for the streets, collars, vaults, pavements, walls, hoses, buildings and all their erections matters or things. The Contractor shall take down and remove any or all such centering, scaffolding, staging,

planking, strutting, shoring etc as fully reinstate at his own cost and make good all the matters and things disturbed during the execution of the works to the satisfaction of the Architects.

13. TIME OF COMPLETION, EXTENSION OF TIME AND PROGRESS CHART:

The Contractor shall be allowed admittance to the site on the 'Date of Commencement' stated in the Appendix, and he shall thereupon and forthwith begin the works and shall regularly proceed with the complete the same (except such painting or other decorative work as the Architect may desire to delay). On or before the 'Day of Completion' stated in the Appendix subject nevertheless the provision for extension of time hereinafter contained.

If in the opinion of the Architect the works be delayed:

- a. by force major or
- b. by reason of any exceptionally inclement weather or
- c. By reason of proceedings taken or threatened by or dispute with adjoining or neighboring owners of public authorities arising, than through the Contractor's own default or
- d. By the works or delays of the contractors tradesmen engaged or nominated by the Employer / Architect and not referred in the Schedule of Quantities and / or specifications or
- e. By reason of civil, commotion, local combination of workmen or strike or lock-out effecting any of the buildings traders or
- f. In consequence of the Contractor not having in due time, necessary instructions from the architect for which he shall have specifically applied in writing ahead of time, giving the Architect reasonable time to prepare such instructions, the Architects shall make a fair and reasonable extension of time for completion of the Contract works

In case of such strike or lock-out, the Contractor shall as soon as possible, give written notice thereof the Architect, but the Contractor shall nevertheless constantly use his endeavors to prevent delay and shall do all they may reasonably be required, to the satisfaction of the Architect to proceed with the work.

The Contractor on starting the works shall furnish to the Employer / Architect a PERT / CPM Programme for carrying out the work stage in the stipulated time fore the approval of Architect /Employer and follow strictly the approved time schedule incorporating charges if any, to ensure the completion of construction work in stipulated time. A graph or chart on individual work shall be maintained showing the proportionate progress of work week by week by Architect a weekly progress report stating the number of skilled and un skilled laborers employed on the work, working hours done, quality of cement used, place, type, and quantity of work done during the period.

The Contractor must inform the Architect within 10 days in advance of all drawings and details required by him from time to time. The Contractor shall adhere to the approved program and arrange for the materials and labour etc accordingly.

Despite repeated instructions, of the Contractor fails to show proportionate progress of the work, the Architect / Employer may take suitable action and deemed fit without prejudice to any terms and conditions of the contract.

14. CERTIFICATE OF VIRTUAL COMPLETION:

The contractors shall intimate in writing to the Architects as and when the works are completed in all respects in order to enable the architect to intimate the Employer to take possession of the same. The works shall not be considered as virtually completed, until the Architect has certified and accepted by the Employer in writing that the same have been 'Virtually Completed'. The defects liability period shall commence from the date of such virtual completion certificate.

15. LIQUIDATED DAMAGES:

1% of the contract value per week subject to a ceiling of 10 % the accepted contracted sum.

16. TOOLS STORAGE OF MATREIALS PROTECTIVE WORKS AND SITE OFFICE REQUIREMENTS:

The Contractor shall provide, fix up and maintain in approved position proper office accommodation for the contractor's representative and staff which offices shall be open at all reasonable hours to receive instructions notices or communications and clear away on completion of the works and make good all work disturbed.

All drawings maintained on the site are to be carefully mounted on boards of appropriate size and covered with a coat of approved varnish. They are to be protected from ravage of termites, ants and other insects.

The Contractor shall provide a suitable temporary but for the watchman and clear away the same when no longer required and to provide all necessary attention, lights etc required.

The Contractor shall arrange for temporary latrines for the use of workers and staff and keep the same in a clean and sanitary condition to the satisfaction of the public health authorities and shall cause such latrines and soil to be cleared away whenever necessary and shall make good all the works disturbed by these conveniences.

Every precaution shall be taken by the Contractor to prevent the breeding of mosquitoes on the works during the construction, and all receptacles, cisterns, water tanks etc. use for storage of water must be suitably protected against breeding of mosquitoes. The Contractor shall indemnify the Employer against any breach of rules in respect of anti-malaria measures.

PROTECTIVE MEASURES:

The Contractor from the time of being placed in possession of the site must make suitable arrangements for watching, lighting and protecting the work, the site and surrounding property by day, by night, on Sundays and other holidays.

Contractor shall indemnify the Employer against any possible damage to the building, roads, or member of the public in course of execution of the work.

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

STORAGE OF MATERIALS:

The Contractor shall provide and maintain proper sheds for the proper storage and adequate protection of materials and other work that may be executed on the site including the tools and materials of sub-contractors and remove same on completion. Sheds for storage are to have pucca floor raised above the ground.

TOOLS:

Theodolite levels, prismatic compass, chain, steel and metallic tapes and all other surveying instruments found necessary on the works shall be provided by the Contractor for the due performance of the contract as instructed by the site engineer.

All measuring tapes shall be of steel and suitable scaffolding and ladders that may be required for safety taking measurements and shall be supplied by the Contractor.

The masons and the supervisors on the works shall carry with them always 1.0m or 2.0m Steel tape, a measuring tape of 30.0m, a spirit level, a plumb bob and a square and shall check the work to see that the work is being done according to the drawing and specifications. The Site Engineer will use any or all-measuring instruments or tools belonging to the Contractors he chooses for checking the works executed or being executed on the contract.

The Contractor should cover in his rates for making provisions for all reasonable facilities for the use of his scaffolding, tools and plant etc by sub-contractors for their works.

17. NOTICE AND PATENTS OF APPROPRIATE AUTHORITIES AND OWNERS:

The Contractor shall confirm to the provisions of any acts of the legislature relating to the work, and to the regulations and by laws of any authorities, and / or any water, lighting and other companies, and / or authorities with whose systems the structures were proposed to have connection and shall before making any variations from the drawings or specification they may be associated to so confirm, give the Architect / Employer written notices specifying the variations proposed to be made and the reasons for making them and apply for instructions thereon. The Architect / Employer on receipt of such intimations shall give a decision within a reasonable time.

The Contractor/s shall arrange to give all notices required for by the said acts, regulations or bye-laws to be given to any authority and to pay such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipt with the Employer.

The Contractor shall indemnify the Employer against all claims in respect of patent rights, royalties, and damages to building, roads or member of public in course of execution of work and shall defend all actions arising from such claims and shall keep the Employer saved harmless and indemnified in all respects from such actions, costs and expenses.

18. CLEARING SITE AND SETTING OUT WORK:

The site shown on the plan shall be cleared of all constructions, loose stone, and materials rubbish of all kinds. All hold or hollows whether originally existing or produced by removal or loose stone or materials shall be carefully filled-up with earth well rammed and leveled off as directed at the contractor's own cost.

The Contractor shall at his own expense, set out the works accurately in accordance with the plans and to the complete satisfaction of the Architect. The Contractor shall be solely 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. If at any time error shall appear during the progress or on completion of any part of the work, the Contractor shall at his cost rectify such error if called upon to the satisfaction of the Architects and Employer. The work shall from time to time inspected by the Architect and / or his representatives, but such inspection shall not exonerate the Contractor in any way from his obligations to remedy defects at his own cost which may be found to exist at any stage of the work or after the same is completed.

The Contractor shall clear the site of works as per the Architect. The site of works shall be cleared of all men, materials, sheds, huts etc belonging to the contractor. The site shall be delivered in a clean neat condition as required by Architect within a period of one week after job is completed. In case of failure by the contractor, Employer, under advice of the

Architect have the right to get the site cleared to his satisfaction at the risk and cost of the Contractor.

19. DATUM:

The average ground level will be considered as the crown of the nearest the road, which should be taken as 'DATUM' which is however, subject to final confirmation by the Architect / Employer. All levels shown in the drawings are to be strictly adhered to.

20. BENCH – MARKS

The Contractor shall construct and maintain proper bench marks at different places at site as required and directed by the Architect so that lines and levels can be checked accurately at all times during the progress of work. In case BMs are disturbed for any reason 'whatsoever' necessary rectification will be carried out by the Contractor at his cost as directed by the Architect / Employer.

21. CONTRACTOR IMMEDIATELY TO REMOVE ALL OFFENSIVE MATTERS:

All soil, filth or other matter of an offensive nature taken out of any trench, sewer, drain cesspool or other place shall not be deposited on the surface, but shall be at once carried out away by the Contractor to some pits or place provided by him and shall be disposed off as per the rules and regulations of the Local Authorities concerned.

The Contractor shall keep the foundations and works free from water and shall provide and maintain at his own expenses electrically or other power driven pumps and other plant to the satisfaction of Architect / Employer for the purpose, until the building is handover to the Employer. The accumulated to the satisfaction of the Employer and the local authority and no claims will be entertained afterwards if he does not include in his rates for the purpose.

22. ACCESS TO WORKS:

The Architect, the Employer and any person authorized by them shall at all reasonable times have free access to the works and to the workshops factories or other places where materials are being prepared or constructed for the Contract and also to any place where the materials are lying or from which they are being obtained. The Contractor shall give every facility to the Architect and the Employer and their representatives if inspection and examination and test of the materials and workmanship. No person unless authorized by the Architect or the Employer, except the representatives of Public Authorities shall be allowed on the works at any time. If any work is to be done at a place other than the site of works, the Contractor shall obtain the written permission of the Architect / Employer for doing so.

23. MATERIALS, WORKMANSHIP, SAMPLES TESTING OF MATERIALS:

All materials and workmanship shall, so far as procurable be of the respective kinds specified in the schedule of quantities and / or specifications and in accordance with the Architect's instructions and the Contractor shall be on the request if the Architect's furnish to them all invoices, accounts receipts and other vouchers to prove that the materials comply therewith. The Contractor shall at his own cost arrange for and / or carry any test of any materials which the Architect and employer may require.

TESTINGS:

The Contractor shall as and when directed by the Architect / Employer arrange to test materials and / or proportions of the work at site or in any approved laboratory at his own cost in order to prove their soundness and efficiency. The Contractor shall transport all the materials from site to the approved laboratory at own cost. The Contractor shall carryout all the mandatory tests as per list attached, at the frequency stated therein. In case these tests

are not carried out as per the frequency stated, then proportionate cost will be deducted from the Contractor which will be worked out by the Architect / Employer and shall be final and binding on him. Even after such test, any materials brought on site or incorporated in the works are found to be defective or unsound or not as per approved samples, the Contractor shall remove the same and re-erect at his own cost.

24. REMOVAL OF IMPROPER WORK AND MATERIALS:

The Architect / Employer shall, during the progress of the works, have power to order in writing from time to time the removal from the works, within such reasonable time as may be specified in order to, of any materials which in the opinion of the Architect / Employer are not in accordance with the specification or the instructions of Architect / Employer, and the substitution of proper materials and the removal and proper re-execution of any work, which has been executed with materials or workmanship, not in accordance with the drawings and specifications or instructions, and the Contractor shall forthwith carry out such orders at his own cost. In case, of default on the part on the Contractor to carry out such orders, the Employer shall have to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor, and shall recoverable from on behalf of the Employer or may deducted by the Architect from any money due or may become due to the Contractor

In view of correcting work not done in accordance with the contract, the Architect / Employer may allow such work to remain and in that case may make allowance for the difference in value together with such further allowance for damage to the Employer, as in his opinion may be reasonable.

No certificate, which may be given by Architects, shall relieve the Contractor from his liability in respect of unsound work or bad material.

25. EMPLOYER'S REPRESENTATIVE (Site Engineer):

The Employer may appoint a Site Engineer or clerk of works who shall be representative of the Employer. The duties of the Employer representative are to watch and supervise the works and to test any materials to be used of workmanship employed in connection with the works. He shall have no authority either to relieve the Contractor of any of his duties or obligations under the Contract, or except those expressly provided hereunder, to order any work involving delay or any extra payment by the Employer or any variation of or in the works.

The contractor shall afford the Employer's representative every facility and assistance for examining the works and materials and checking the measuring time and materials. Neither the Employer's representative nor any assistant to the Architect shall have power to revoke, alter enlarge or relax the requirements of this Contract, or to Sanction any day-work, additions, alterations, deviations or omissions unless such an authority may be specially conferred by a written order of the Architect / Employer.

The Employer's Representative shall have to give notice to the Contractor or his foreman about the non-approval of any work or materials and such works shall be suspended or the use of such material should be discontinued until the decision of the Architect is obtained., the work will from time to time be examined by the Architect or the Employer's representative but such examinations shall not in any way exonerate the Contractor from the obligation to remove the defects which may be found to exist at any stage of the work of after the same is completed. Subject to the limitations of this clause the Contractor shall take instruction from the Architect / Employer.

26. CONTRACTOR'S SUPERINTENDENCE & REPRESENTATIVE ON THE WORKS:

The Contractor shall give all necessary personal superintendence during the execution of the work and so long thereafter as the Architect may consider it necessary until the expiration of the 'Defects Liability Period' stated in clause 42. The Contractor shall meet the Architect or his representative whenever required and so informed by the Architect.

The Contractor shall maintain and be represented on site, at all times while the work is in progress, by a responsible and efficient Foreman, approved by the Architect / Employer and who must thoroughly understand all the trades entitled and be constantly in attendance while the men are at work. Any directions, explanations, instructions or notices given by the Architect / Employer to such foreman shall be deemed to be given to the Contractor and shall be binding as such on the Contractor. The Foreman shall be thoroughly conversant with the English language and should be able to read, write and speak English.

27. CONTRACTOR EMPLOYEES:

The Contractor shall employ technically qualified and competent supervisors for the work who shall be available (by turn) throughout the working hours and receive and comply with instructions of the Architect / Employer the Contractor shall engage at least one experienced engineer as site in charge for execution of the work. The Contractor shall employ in connection with the works persons having the appropriate skill or ability to perform their job efficiently.

The Contractor shall employ local laborers on the work as Indian National shall be employed on the work.

Any laborer supplied by the Contractor to be engaged on the work on day work basis either wholly or partly under the direct order or control of the Employer or his representative shall be deemed to be a person employed by the Contractor.

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

- a. The payment of Wages Act
- b. Employer's liability Act
- c. Workmen's compensation Act
- d. Contractor labor (Regulation & Abolition) Act, 1970 and central rules 1971
- e. Apprentice Act 1961
- f. Any other Act or enactment relating thereto and rules framed there under from time to time.

The Contractor shall keep the Employer saved harmless and indemnified against claims if any of the workmen and all cost and expenses may be incurred by the Employer in connection with any claim that may be made by any workman.

The Contractor shall comply at his own cost with their order of requirement of any Health Office of the State or any local authority or of the Employer regarding the maintenance of proper environmental sanitation of the area when the Contractor's laborers are housed or accommodated, for the prevention of small pox, cholera, plague, typhoid, malaria and other contagious diseases. The Contractor shall provide, maintain and keep in good sanitary condition adequate sanitary accommodation and provide facilities for pure drinking water at all times for the use of men engaged on the works and shall remove and clear away the same on completion of the works. Adequate precautions shall be taken by the Contractor to prevent nuisance of any kind on the works or the lands adjoining the same.

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

28. DISMISSAL OF WORKMEN:

The Contractor shall on the request by the Architect / Employer immediately dismiss from the works any person employed there who may, in the opinion of the Architect / Employer, be unsuitable or incompetent or who may misconduct himself and such person shall not again be employed or allowed on the works without the permission of the Architect / Employer.

29. ASSIGNMENT OF SUB-LETTING:

The works included in the Contract shall be executed by the Contractor and the Contractor shall not directly or indirectly transfer, assign or underlet the Contract or any part share thereof or interest therein without the written consent of the Architect / Employer and no undertaking shall relieve the Contractor from the full and entire responsibility of the Contract or from active superintendence of the works during their progress.

30. DAMAGE TO PERSONS AND PROPERTY INSURANCE ETC.,

The Contractor shall be responsible for all injury to persons, animals or things and for all structural and decorative damage to property which may arise from operation or neglect of himself or any sub-contractor or of any of his or a sub-contractor's employees, whether such injury or damage any arise from carelessness, accident or any other cause whatever in any way connected with the carrying out of this Contract. This clause shall be held to include, inter alia, any damage to buildings, whether immediately adjacent or otherwise, any damage to roads, streets, footpaths, bridges, or ways otherwise any damage caused to the buildings and works forming the subject of this Contract, by frost or other inclement weather. The Contractor shall indemnify the Employer and hold him harmless in respect of all and any expenses arising from any such injury or damage to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage under the acts of Governments or otherwise, and also in respect of any award of compensation or damages consequent upon such claim.

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

The Contractor shall indemnify the Employer against all claims which may be made against the Employer, by any member of the public or other party, in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own cost, effect and maintain until the end of defects liability period of the Contract with an approved office, a policy of Insurance in the joint names of the Employer and the Contractor against such risks and deposit such policy or policies with the Employer on the signing of the Contract. The Contractor shall also indemnify the Employer against all claims which may be made upon the Employer whether under the Workmen's compensation Act or any other statute if force during the currency of this contract or at Common Law in respect of any employee of the Contractor or of any sub-contract and shall at his own expense effect and maintain until the end of defects liability period of the Contract, with an approved office a policy of Insurance in the joint names of the Employer and the Contractor against such risks and deposit such policy or policies with the Employer from time to time, during the currency of the Contract. In default of the Contractor insuring as provided above, the Architect on behalf of the Employer may so insure and may deduct the premium paid from money due or which may become due to the Contractor.

The Contractor shall be responsible for anything which may be excluded from the Insurance Policies above referred to and also for all other damages to any property arising out of and incidental to the negligent or defective carrying out of this contract however, such damage shall be caused.

The Contractor shall also indemnify the Employer in respect of any costs, charges or expenses arising out of any claim or proceedings and also in respect of any Award of or compensation of damages arising there from.

The Employer with the concurrence of the Architect shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs charges and

expenses arising or occurring from or in respect of such claims of damages from any sums due or to become due to the Contractor.

31. CONTRACTOR'S ALL RISK POLICY (INSURANCE):

The Contractor shall within 14 days from the date of commencement of the work insure the works at his cost and keep them insured until one month after the works are taken over by the Employer or three months after the date of completion whichever is earlier, against loss or damage by fire and usual risks other than fire against which insurers generally provide cover in a CONTRACTOR'S ALL RISK POLICY, with an insurer to be approved by the Architects, in the joint names of the Employer and Contractor (the name of the former being placed first in the policy), progressively for the full amount of the Contract, in three stages, beginning with 1/3 of the Contract value, and for any further sum as called upon to do so by the Architect, with the prior written consent of the Employer, the premium of such further sum being allowed to the Contractor as an authorized extra such policy shall cover the property of the Employer only and Architects and Supervisors fees for assessing the claim and in connection with his services generally in re-instatement and shall not cover any property of the Contractor or of any sub-contractor or employee. The Contractor shall deposit the policy and receipts for the premiums paid with the employer within twenty-one days of the date of commencement of the work unless otherwise instructed by the employer/ Architects. In default of the Contractor insuring as provided above, the Employer or the Architect on his behalf may insure and may deduct the premium paid from any money that may be due or that may become due to the Contractor. The Contractor shall as soon as the claim under the policy is settled, or the work reinstated by the insurers should they elect to do so, proceed with all diligence with the completion of the works in the same manner as though the fire or other such risk had not occurred and in all respects under the same conditions of Contract.

The Contractor in case of rebuilding or reinstatement after fire or other such usual risk shall be entitled to such extensions of time for completion as recommended by the Architect.

32. ACCOUNTS RECEIPTS AND VOUCHERS:

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

33. MEASUREMENTS:

The Architect may from time to time intimate the Contractor that he requires the works measured and the Contractor shall forthwith attend or send a qualified agent to assist Architect or the Architect's representative in taking such measurements and calculations and to furnish all particulars or give all assistance required by either of them.

Should the Contractor not attend or neglect or omit to send such an agent, then the measurements taken by the Architect is approved by him shall be taken to be correct measurements. The measurements shall whenever not mentioned in the under, be taken in accordance with the Indian Standard Method of Measurements of Building works (I.S.1200-1958) and its revisions, if any.

The Contractor or his agent may at the time of measurement take such notes and measurements as he may require.

All authorized extra costs, omissions and all variations made without the Architect's knowledge, if subsequently sanctioned by him in writing shall be included in such measurements.

The Contractor shall take joint measurements with the Architect / Employer's representative before covering up or otherwise placing beyond the reach of measurement any item of work. Should the Contractor neglect to do so, the same shall be uncovered at the Contractor's expense or in default thereof. No payment or allowance shall be made for such work or the materials with which the same was executed.

34. PAYMENT:

All bills shall be prepared by the Contractor in the form prescribed by Architect / Employers. Normally one interim bill shall be prepared each month subject to minimum value for interim certificates as stated in these documents. The bills in proper formats must be duly accompanied by detailed measurements in support of the quantities of work done and must show deductions for all previous payments, retention money etc.

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

35. MATERIAL ADVANCE

Material advance of the bill value will be paid of the following item of work only against submission of original bills.

1. Cement
2. Steel
3. Aluminum windows
4. Flooring material / Tiles
5. Wood.

The amount stated in the interim certificate shall be the total value of work properly executed and 75% of invoice value of material brought to site for permanent incorporation into the work up to the date of the bill less the amount to be retained by the Employer as retention money vide clause 13 of these conditions and less installments previously paid under these conditions, provided that such certificates shall only include the value of said material and good as and from such time as they are reasonably, properly and not prematurely brought to or placed adjacent to the work and then only if adequately protected against whether or other casualties.

The Employer will deduct retention money as described in the clause 13 of these conditions. The refund of retention money will be made as specified in the said clause.

If the Employer has supplied any materials or goods to the Contractor, the cost of any such materials or goods will be progressively deducted from the amount due to the Contractor in accordance with the quantities consumed in the work.

All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed, and shall not preclude the requiring of bad, unsound, and imperfect or unskilled work to be removed and taken away and re-constructed, or re-erected or be considered as on admission of the due performance of the Contract, or any part thereof in any respect or the accruing of any claim, nor shall, it conclude determine of effect in any way the powers of the employer under these conditions or any of them as to the final settlement and adjustments of the amounts or otherwise or in any other way vary or affect the Contract. The final bill shall be submitted by the Contractor within one month of the date fixed for completion of the work or of the date of certificate of completion furnished by the Architect / Employer and payment shall be made within three months.

FINAL PAYMENT

The final bill shall be accompanied by a certificate of completion from the Architect / Employer. Payments of final bill shall be made after deduction of retention money as

specified in the clause 13 of these conditions, which sum shall be refunded after the completion of defects liability period after receiving the Architect / Employer certificate that the Contractor has rectified defects to the satisfaction of the Architect / Employers. The acceptance payment of the final bill by the contractor would indicate that he will have no further claim in respect of the work executed. A No dues letter shall be given by the contractor to the employer before receiving the final payment.

36 . VARIATIONS / DEVIATIONS:

The Contractor shall when directed in writing by the Architect, omit from or vary works shown upon the drawings or described in the specifications or included in the priced Schedule of Quantities, but the Contractor shall not make any alterations or additions to or omissions from the works or any deviations from the provisions of the Contract without such authorizations or directions in writing from the Architect / Employer.

No claim for extra shall be allowed unless it shall have been executed by the Authority of the Architect / employer as herein mentioned. Any such extra is hereinafter referred to as on authorised extra. No variations i.e. additions, omissions or substitutions shall vitiate the Contract.

The prices of all such additional items will be worked out on the basis of rates quoted for similar items in the contract wherever existing or on engineering rate analysis based on prevalent fair price of labour, material and other components as required.

37. SUBSTITUTIONS:

Should the Contractor desired to workmanship, he / they must obtain the approval of the Architect / employer in writing for any such substitutions well in advance. Materials designated in this specification indefinitely by such term as 'Equal' or 'Other Approved' etc. specific approval of the architect / Employers has been obtained in writing.

38. PREPARATION OF BUILDING WORK FOR OCCUPATION AND USE ON COMPLETION

The contractor shall handover possession to the Employer of the completed works in stages as and when required and directed by the Architect / Employer.

The Employer will take over the possession of completed works in stages as directed by the Architect and defect liability period will commence only from the date of final handing over of all the works accordingly.

39. CLEARING THE SITE ON COMPLETION.

On completion of the works the Contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of any kind and leave the whole of the site and the works clean and in a workman like condition to the satisfaction of the Architect / Employers.

40. DEFECTS AFTER COMPLETION:

Any defect, arising out of the work in the defects liability period, shall be during notified by employer / architect and the contractor shall make good the same at his own cost. In the event of the failure of contractor to do so the employer shall employ another contractor to rectify the same and deduct the expended amount from retention money of the contractor.

41. CONCEALED WORK:

The Contractor shall give notice to the Architect / Employer whenever any work is to be buried in the earth, concrete or in the bodies of walls otherwise becoming inaccessible later on, in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall, at the option of the Architect / Employer be either opened up for measurements at the Contractor's expenses or no payment may be made for such materials. Should any dispute or difference arise after the execution of any work as to measurements etc., or other matters which cannot be conveniently tested or checked,

the notes of the Architect / employer shall be accepted as correct and binding on the contractor.

42. TREASURE TROVE:

Should any treasure, fossils, minerals or works or act of antiquation interest be found during excavation or while carrying out the works, the same shall be the property of the Employer. The Contractor shall give immediate notice to the Architect / Employer of any such treasure and handover the same to the Employer demand.

43. IDLE LABOUR:

Whatever the reasons may be, no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entertained under any circumstances.

44. SUSPENSION OF WORKS:

If the Contractor, except on account of any legal restraint upon the Employer preventing the continuance of the works, or on account of any of the causes mentioned in the clause 'Extension of Time' or in the case or certificate being withheld of not paid when due, shall suspend works or in the opinion of the Architects, shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default in the respects mentioned in clause 26 (removal of improper work and materials), the employer through the architect shall have the power to give notice in writing to the Contractor requiring that the works be provided within a reasonable manner, and with reasonable dispatch, such notice shall not be unreasonably given and must signify that it purports to be a notice under the provisions of this clause and must specify the acts or defaults on the part of the Contractor upon which it is based. After such notice shall have given, the Contractor shall not be liberty to remove from the site of works, or from any ground contiguous thereto, any plant or materials belonging to the him which shall have been placed thereon for the purpose of work, and the Employer shall have lien upon such plants and materials to subsists from date of such notice being given until the notice shall not under complied with. Provided always that such liens shall not under any circumstance subsist after the expiration of 30 (thirty) days from the date of such notice given, unless the Employer shall have entered upon and taken possession of the works and site as hereinafter provided.

If the Contractor shall fail for seven days after such notice has given, to proceed with the works as therein prescribed, the Employer may enter upon and take possession of the works and site, and of all such plants and materials thereon intended to be used for the works, and the Employer shall retain and held a lien upon all such plants and materials until the work shall have been completed under powers hereinafter conferred upon him.

If the Employer shall exercise the above power, he may engage any other person to complete the works and exclude the Contractor, his agents and servants from entry upon or access to the same, except that the Contractor or any person appointed in writing may have access at all times during the progress of the works to inspect, survey and measure the works. Such written appointments or a copy thereof shall be delivered to the Architects before the person appointed comes on to the works and the Employer shall take such steps as in the opinion of the architect may reasonably necessary for completing the works, without undue delay or expenses using for that purpose the plant and materials above mention in so far as they are suitable and adopted to such use.

Upon the completion of the works, the architects shall certify the amount of the expenses properly incurred consequent on and incidental to the default of the Contractor as aforesaid and in completing the works by other persons.

Should the amount to certified as the expenses properly incurred be less than amount which should have been due to the Contractor upon the completion of the works by him, the difference shall be paid to the Contractor by the employer, should the amount of the former exceed the latter, the difference shall be paid by the Contractor to the Employer. The Employer shall not be liable to make any further payments or compensations to the contractor for or on account of the proper use of the plant for the completion of the works

under the provision herein before mentioned other than such payments as is included in the contract.

After the works shall have been completed by persons other than the Contractor under provisions hereinbefore contained, the Architect shall give notice to the Contractor to remove his plant and all surplus materials as may not have been used in the completion of the works from the site, if such plant and materials are not removed within a period of 14 days after the notice shall have been given the Employer may remove and sell the same, holding the proceeds less the cost of the removal and sale, to the credit of the Contractor. The Employer shall not be responsible for any loss sustained by the Contractor from the sale of the plant in the event of the contractor not removing it after notice.

45. INDEBTEDNESS AND LIENS:

The Contractor agrees to furnish the employer from time to time during the progress of the work as requested, verified statement showing the Contractor's total outstanding indebtedness in connection with the work covered by the Contract. Before final payment is made, the Employer with satisfactory proof that there are no outstanding debts or liens in connections of the Contract. If during the progress of the work, the Contractor shall allow any indebtedness to accrue to sub-contractor or other and shall fail to pay discharge same with five (5) days after demand, then the Employer may withhold any money due to the Contractor until such indebtedness is paid, or apply the same towards the discharge thereof.

46. TERMINATION OF CONTRACT BY THE EMPLOYER:

If the Contractor being an individual or a firm, commit any act of insolvency, or shall be adjudged an insolvent or being on incorporated company shall have an order for compulsory winding up made against it or pass on effective resolution for winding up voluntary or subject to the supervision of the court and if the Official Assignee of the Liquidator in such acts of insolvency or winding up shall be unable within seven days after notice to him requiring him to do so, to show to the reasonable satisfaction of the architect that he is able to carry out and fulfill the contract, and to give security thereof, if so required by the Architect.

Or if the Contractor (whether an individual, firm or incorporated Co.) shall suffer execution to be issued.

Or shall suffer any payment under this Contractor to be attached by or on behalf of any of the creditors of the Contractor.

Or shall assign or subject this contract with out the consent in writing of the Architects / Employer first obtained.

Or shall charge or encumber this Contract or any payments due or which may be due to the Contract there under.

Or the Architect shall certify in writing to the Employer that the Contractor

- a. has abandoned the Contract, or
- b. has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving from the Architect written notice to protect, or
- c.. has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or
- d. has failed to remove materials from the site or to pull down and replace work for 7 days after written notice shall have been given to the contractor requiring the Contractor to observe or perform the same, or
- e. has neglected persistently to observed and perform all or any of the acts, matters or things by this contract to be observed and performed by the Contractor for 7 days after written notice shall have been requiring him to observe and perform the same, or

f. has to the determinant of good workman ship or in defiance of the Architect's instructions to the contrary sublet any part of the Contract.

47. ARBITRATION

a. All disputes or differences of any kind whatsoever which shall at any time arise between the parties here to touching or concerning the works or the execution or maintenance there of this contract or the rights touching or concerning the works or the execution or maintenance thereof this contract or the construction remaining operation or effect there of or to the rights or liabilities of the parties or arising out of or in relation thereof whether during or after determination, foreclosure or breach of the contract (other than those in respect of which the decision of any person is by the contract expressed to be final and binding) shall after written notice by either party to the contract to the either of them and to the appointing Authority who shall be appointed for this purpose by the employer be referred for adjudication to **an Arbitrator/ Arbitral Tribunal** to be appointed as hereinafter provided.

b. The Parties concerned shall designate an arbitrator on mutual consent/consensus. In the event of no consensus being arrived, an Arbitral Tribunal shall be constituted comprising three Arbitrators, each party appointing one arbitrator and a third arbitrator to be appointed by the two arbitrators so appointed by the parties. The venue of the arbitration shall be exclusively at Kancheepuram and any award passed by arbitrator or the arbitral Tribunal shall be final, conclusive and binding upon the parties and shall be deemed to have been made between parties themselves. The parties to the dispute shall share equally the cost of arbitration as intimated by the arbitrator”.

c. The work under the Contract, shall how ever, continue during the arbitration proceedings and no payment due or payable to the Contractor shall be with held on account of such proceeding.

d. The **Arbitrator/ Arbitral Tribunal** shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of first hearing. The **Arbitrator/ Arbitral Tribunal** may from time to time, with the consent of the parties, enlarge the time making and publishing the award.

e. The **Arbitrator/ Arbitral Tribunal** shall give from time to time, with the consent of the parties, enlarge the time for making and publishing the award.

f. The **Arbitrator/ Arbitral Tribunal** shall give a separate award in respect of each dispute or difference referred to him The **Arbitrator/ Arbitral Tribunal** shall decide each dispute in accordance with the terms of the contract and give a reasoned award. The venue of arbitration shall be such place as may be fixed by the **Arbitrator/ Arbitral Tribunal** in his sole direction.

g. The fees, if any, of the **Arbitrator/ Arbitral Tribunal** shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The costs referred and of the award including the fees, if any, of the **Arbitrator/ Arbitral Tribunal** who may direct any by whom and in what manner, such costs or any part there of shall be paid and may fix or settle the amount of costs to be so paid.

h. The award of the **Arbitrator/ Arbitral Tribunal** shall be final and binding on both the parties.

Subject aforesaid the provisions of the Arbitration Act 1999 or any statutory modifications of reenactment thereof and the rules made there under , and for the time being in force , shall apply to the arbitration processing under this clause.

I. The place for arbitration shall be in Kancheepuram.

NOTE :

SPECIAL CONDITIONS OF CONTRACT

1. DRAWINGS AND SPECIFICATIONS

The works shall be carried out to the entire satisfaction of the EMPLOYER and the Architect, in accordance with the signed drawings and specifications and such further drawings and details as may be provided by the Architect, and in accordance with such written instructions, directions and explanations as may from time to time be given by the Architect, whose decision as to the sufficiency and quality of the work and materials shall be final and binding upon all parties. If the work shown on any such further drawings or work that may be necessary to comply with any such instructions directions or explanations, be in the opinion of the contractor extraction that comprised in or reasonably to be inferred from the contract he shall before proceedings with such work, give notice in writing to this effect to Architect, and in the event of the Architects agree to the same in writing the contractor shall be entitled to an allowance in respect of such extra work as on authorized extra. If the Architect and the contractor fail to agree as to whether or to there is an extra, then, if the Architect decided that the contractor is to carry out the said work, the contractor shall do so, and the question whether or not there is any extra, and it so the amount thereof, shall failing agreement, be settled by Arbitration as hereinafter provided, but such references shall in no way delay the fulfillment of this contract.

No drawings shall be taken as in itself on order for variation unless, in addition to the Architect's signature, it bears express words stating that is intended to be such an order or bears a remark '**VALID FOR EXECUTION**'. No claim for payment for extra work shall be allowed unless the said work shall have been executed under the provisions of clause 6 (Authorities notices, patent right and royalties) or by the Authorities of directions in drawing of the Architect as herein mentioned.

One complete set of the signed drawings and specification and scheduled of quantities shall be furnished by the Architect to the Contractor. The Architect shall furnish within such time, as he may consider reasonable, one copy of any additional drawing, which is his opinion, may be necessary for the execution of any part of work. Such copies shall be kept at the works, and the architect or his representatives shall, at all reasonable time have access to the same and shall be return to the Architect by the contractor before the issue of the Final certificate. The contract shall remain in the custody of the Architect, and shall be produced by him at his office as and when required by the Employer or by the contractor.

2. INSPECTION OF DRAWINGS

Before filling in the tender, the contractor will have to check up all drawings and schedule of quantities, and will have to get an immediate clarification from the Architect on any point that he feels is vague or uncertain. No claim of damages or compensation will be entertained on this account.

3. EXECUTION OF WORK (PRICES TO INCLUDE)

The whole of the work is described in the contract (including the schedule of Quantities, the specifications and all drawing pertaining there to) and as advised by Employer / Architect from time to time is to be carried out and completed in all its parts to the entire satisfaction of the Employer /Architect. Any minor details of the work which may not have been definitely referred to in this contract, but which are usual in practice and essential to the work, are deemed to be include in this contract. Rates quoted in the Schedule shall be inclusive of all freights, taxes, such as octroi, sales tax, Royalties, duties, excise, turnover tax, sales tax on works contract, etc., as well as transportation, so as to Execute The contractor as per the rules and regulations of Local Bodies, State Government and Government of India.

The rates quoted in the tender should include all charges for:

- a. Labour, maintenance fixing, carrying, cleaning, making good, hauling, watering etc
 - b. Plant, machinery, scaffolding, framework, English ladders, ropes, nails, spikes, tools, materials and workmanship protection from weather, shuttering, temporary supports, platform and maintenance of the same.
 - c. Covering for the walling with nets and other works during inclement weather or striking or whenever directed as necessary.
 - d. Water for civil works, curing with quality of water, which has been certified as "Fit for Construction" from an approved test laboratory.
 - e. Electricity for pumping water, cutting, lighting etc including employing a generator set if required.
- 3 A The execution of work(timings) : The work has to carried out in the site, partly day time and / or partly night time and / or partly day and partly night time to the best convenience of the occupant and the building. More labour need to deployed during holidays and Sundays with suitable pre planning to carryout more work to the best convenience of the occupants. The bank will not pay any idle wages or over time wages or extra charges on any reason what so ever. Hence contractor may factor these aspects while quoting the rates in the tender.**

4.SITE SUPERVISION

The contractor shall appoint at his own cost competent and adequate number of qualified Engineers at site, for (1) joint measurements and preparations of bills, (2) for testing materials at site and outside laboratory, (3) for other general supervision. Their appointment shall be approved by the Employer / Architect. The site Engineers shall not be removed from the site without the written consent of the Employer / Architect.

5. DIMENSIONS

Figures, dimensions, are in all case to be accepted preferences to scaled sizes. Large-scale details take precedence over small scale drawings. In case of discrepancy, the contractor is to ask for a clarification before proceeding with the work. Accordingly if any work is executed without prior clarification it is liable to be rejected and shall not be paid for.

6.PROGRAMME OF WORKS

Contractor shall have to prepare and submit the CPM/PERT charts for Architect's approval immediately after issue of the work order and display the approved charts in the site office. He shall also make bar charts indicating individual items and during the progress of work he shall update the bar charts showing the proportionate progress of work every week.

He shall strictly adhere to the programme of works as per CPM/PERT charts showing the proportionate progress of work.

7.PROCUREMENT OF MATERIALS

Contractor shall procure all the materials for the work from the open market. Time is the essence of the contract. Acceptance of the completion date by the contractor shall mean that he has taken into consideration the availability of all material of approved make and quality in sufficient quantities at site to enable him to complete the entire work in the stipulated period.

Contractor will get sample of all materials approved by the Employer / Architect before placing order / purchase / procurement. They shall conform to I.S. codes and or tender specification as applicable.

For all materials the contractor shall quote for the best quality of the materials of best make / source or supply and it will be got approved by Employer / Architect before procurement.

In case sufficient quantities of approved quality materials from approved source are not available in time, contractor may have to procure the same for neighboring area with longer leads as required and directed at no extra cost. The material will be, however as per relevant I.S code as and wherever applicable.

8.UNFIXED MATERIALS

When any materials intended for the works shall have been placed at site by the Contract, such material shall not be removed there from (except for the purposes of being used on the works) without the written authority of the Employer / Architect and when the contractor shall have received payment in respect of any certificate in which the architect shall have stated that he has taken in to account to value of such unfixed materials on the works such material shall become the property of the Employer and the contractor shall be liable for any loss or damage to any such materials.

9.CUSTODY AND SECURITY OF MATERIALS

The contractors shall be responsible for the custody and security of all materials and equipment at site and he will provide full time watchman / watchmen to look after his materials, stores equipments etc.

10.RATES

Contractor shall quote all the rates both in figures and in words and any alterations shall have to be **initialed** by the contractor. Rates quoted by the contractor for the same item in different schedules will be same and in case different rates are quoted, the lowest will be taken as correct and the schedule corrected accordingly. In case of discrepancy between figures and the words the rate quoted in words shall be taken as correct one. All quoted rates should be inclusive of sales tax on works contract. Rates quoted by the contractor shall hold good for all the work carried out to any height and depth as shown in detailed drawings and as required and directed by the Architect. Rates quoted by the contractor shall also hold good for any small work at any place at site.

11.PRICES FOR EXTRAS ETC., ASCERTAINMENT OF RATES

Should it be found after the completion of the works from measurements taken (in accordance with the previous paragraph) that any of the quantities or amounts of the work thus ascertained are less or greater than the amounts specified for the works in the priced schedule of quantities and / or tender or that any variations, is made, the valuation of such quantities, amounts or variations, unless previously or otherwise agreed upon, shall be made accordance with the following rules

a. The net rates or prices in the original tender shall determine the valuation of the extra work, where extra work is of a similar character and executed under similar conditions the work priced therein.

b. The net prices the original tender shall determine the value of the item omitted, provided if omissions vary the conditions under which any remaining items of work are carried out, the prices for the same shall be valued under thereof

c. Where 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 of work are carried out of it the amount of any omission or additions relative to the amount of the whole of the contract works or to be any part thereof shall be such that in the opinion of the Architects the net rate or price contained in the priced schedule of quantities or tender or for any item of work involves loss or expenses beyond that reasonably contemplated by the contractor or is by reason of such omission or addition rendered unreasonable or inapplicable, the Architect shall fix in consultation with the Employer such other rate or prices as in the circumstances he shall think reasonable and proper, which shall be final and binding on the contractor.

d. Where extra work cannot be properly measured or valued, the contractor shall be allowed any work prices at the net rates stated in the tender or the priced schedule of quantities, or if not so stated, then in accordance with the local day work rates and wages for the district, provided that in either case vouchers specifying the daily time (and if required by the Architect, the workmen's name) and materials employed at or before the end of the week following that in which the work has been executed.

The measurements and valuations in respect of the extra items of contract shall be completed within the 'period of final measurement' or with in three months of the completion of the contract works as defined under clause no 16 (Certificate of Virtual Completion)

12.EXTRA ITEMS RATES

The work or extra items shall be started only after the approval of extra items rates by client / Architect. Rates for additional or extra items of construction work, which can be derived from the contract item rates and are not covered in the contract, shall be calculated on the basis of actual cost plus 15 % for profit.

13. ARCHITECT'S DRAWINGS AND INSTRUCTIONS

A set of major drawings along with the contract documents shall be provided to the contractor. For any clarifications or further drawings are required by the contract, during or before the start of construction work, the Contractor shall inform the Architects in writing to provide the same. Working details will be given to the contractor from time to time during the progress of work as and when required. Incase of other drawing is required by the contractor he will give a minimum ten days notice to the Employer / Architect.

14. FAILURE BY CONTRACTOR COMPLY WITH ARCHITECT /EMPLOYER'S INSTRUCTIONS

If the contractor after receipt of written notice from the architect requiring compliance with such further drawings and / or Architects instruction, fails within seven days to comply with the same, the Employer / Architect may employ and pay other persons to execute any such work whatsoever as may be necessary to give effect thereto and all cost incurred in connection there with shall be recoverable from the contractors by the Employer on a Certificate by the Architect as a debit or may be deducted by him from any money due or which become due to the Contractors.

15. INFORMATION TO BE SUPPLIED BY THE CONTRACTOR

The contractor shall furnish the Employer / Architect the following:

- a. Detailed industrial statistics regarding the labor employed by him etc.
- b. The Power of Attorney, name and signature of his authorized representative who will be in charges for the execution of work
- c.The list of technically qualified persons employed by him for the execution of this work.
- d. The total quantity and quality of materials used for the works.
- e. The list of plant and machinery employed for this work.

16.ARCHITECT'S DELAY IN PROGRESS

The Architect may delay the progress of the works in case of rains or otherwise, without vitiating the contract and grant such extension of time with the approval of the employer for the completion of the contract as he may think proper and sufficient in consequences of such delay, and the contractor, shall not make any claim for compensation or damage in relation thereto.

17.CERTIFICATE AND PAYMENTS

The contractor shall be paid by the Employer from time to time, by installments under interim Certificates to be issued by the Architect to the contractor on account of the works executed by the contractor when in the opinion of the Architect, work to the approximate value, named in the Appendix as 'Value of work for interim Certificates' (or less at the reasonable discretion of the Employer / Architect) has been executed in accordance with this contract, subject however, to a retention of the percentage of such value need in the Appendix hereto mentioned as 'retention percentage for interim Certificates' until the total amount retained shall reach the sum named in the appendix as Total Retention money after which time the installments shall be up to the full value of the work subsequently so executed in the interim Certificate, such amount as he may consider proper on account materials delivered upon the site by the Contractor for use in the work.

And when the works have been virtually completed and the Architect shall have certified in writing that they have been completed, the contractor shall be paid in accordance with the Certificate issued by the Architect the sum of money named in the Appendix after satisfying themselves as 'Installment after Virtual Completion ' being a part of the said 'Total Retention Money'.

The Contractor shall be entitled to the payment of the final balance in accordance with the final Certificate to be issued in writing by the Architect at the expiration of the period refer to as ' The Defect Liability Period' in the Appendix hereto, from the date of Virtual Completion or as soon as after the expiration of such period as the work shall have been finally completed and all defect made good according to the true intent and meaning hereof, whichever shall happen, provided always that the issue by the Architect of any certificate during the progress of the works or after the completion shall not relieve the Contract from his liabilities in cases of fraud , dishonesty or fraudulent concealment relating to the works of materials or any matter dealt within the certificate, and in case of all defects and insufficiency in the works or materials which reasonable examination world have disclosed. No certificate of the Architect shall of itself be conclusive evidence that any works and materials to which it relates are in accordance with the contract.

The Architect shall have power to withhold any certificate if the works or any part thereof are not being carried out to his / employer satisfaction.

The Architect may by any Certificate make any correction in any previous Certificate, which shall have been issued by him.

Payment upon the Architect's Certificates shall be made within a period named in the Appendix as 'Period of honoring of Certificates' after such Certificates have been delivered to Employer.

18.DELAYED PAYMENTS

Any amounts payable by the Employer to the contractor in pursuance of any Certificate given by the Architect hereunder shall, if not paid within the 'Period of honoring of Certificate' no interest paid by the Employer.

19.FORCE MAJEURE

Neither party shall be held responsible by the other for breach of any condition of this agreement attributable to any 'Act of God' Act of state, lockout of control or any other reason, beyond the control of the parties and any breach of clauses arising from much force majeure conditions as aforesaid shall not be regarded as a breach of the provision of this Agreement.

20.INCOME-TAX AND WORKS CONTRACT TAX

Income Tax and Works Contract Tax shall be deducted at source by the client from the contractor' interim and final bill payments as per Statutory Regulations.

21.SITE MEETINGS

A senior representative of the contractor shall attend weekly meetings at works site and in addition meetings as and when arranged by employer / Architect to discuss the progress of the work and sort out problems, if any and ensure that the work is completed in the stipulated time.

22.WORKING HOURS

Since the site is with all Working Departments, the Contractor has to execute the work judiciously without disturbance to the functioning of the Bank during the day and after working hours, nights & on holidays. No extra payments will be made for the work being done during odd hours.

23.ACTION WHERE THERE IS NO SPECIFICATION

In case of any class of work for which is there is no specification mentioned, the same will be carried out in accordance with the Indian Standards Specifications subject to the approval of the Employer / Architect.

24.REPORTING OF ACCIDENT TO

The contractor shall be responsible for the safety of persons employed by him on the works and shall reports serious accidents to any of them whenever and wherever occurring on the works to employer who shall make every arrangement to render all possible assistance. This shall be without prejudice to the responsibility of the contractor under the Insurance Clause of the general conditions. Contractor shall take all precaution detailed in the safety code attached separately.

25.TYPOGRAPHICAL CLERICAL ERRORS

The Employer / Architect clarification regarding partially omitted particulars of typographical or Clericals errors shall be final and binding on the contractors.

26.WORK PERFORMED AT CONTRACTOR'S RISK

The contractor shall take all precautions necessary and shall be responsible for the safety of the work and shall maintain all lights, goods, signs, temporary passages or other protection necessary for the purpose. All works shall be done by the contractor's risk and if any loss or damage shall result from fire or from others cause, the contractor shall promptly repaid or replace such loss or damage free from all expenses to the employer.

The contractor shall be responsible for any loss or damage to materials, tools or other articles used held for use in connection with the work. The work shall be carried on to completion without interferences with the operations of existing machinery or equipment, if any.

27.SPECIAL CONDITIONS OF CONTRACT

In the event of any discrepancy with clauses mentioned anywhere else in the tender with the clauses mentioned within special conditions of contract, the clauses mentioned within the special conditions of contract shall supersede those mentioned elsewhere.

CONSTRUCTION OF CURRENCY CHEST:

Tang bars shall be of approved make and fixing of tang bars shall be carried out by approved vendor (Godrej or equivalent) as approved by Bank / Architects. Stage wise photographs of construction of currency chest shall be taken by the contractor and submitted to Bank. Concrete Cubes shall be tested at approved laboratory and certificate shall be produced.

30 .GENERAL INSTRUCTIONS TO THE CONTRACTORS

UNLESS SPECIFIED OTHERWISE, THE CONTRACTORS SHALL ADHERE TO THE FOLLOWING GUIDELINES / SPECIFICATIONS FOR DIFFERENT ITEMS OF WORKS	
1	All curing for civil and cement works shall be done for a minimum period of 14 days after construction.
2	Quality of sand shall be approved by the Employer / Architects.
3	All G.I pipes, which are concealed, shall be coated with bituminous paint of relevant BIS code before plastering.
4	All GI works shall be pressure tested to the satisfaction of the Employer/Architect before covering with mortar.
5	Colours, patterns on the walls and the ceiling shall be decided by the Architects / Employer at the site.
6	Any discrepancy in the site conditions shall be brought to the notice of the Architect/Employer.
7	The contractors shall visit the site and understand themselves the site conditions, site logistics, traffic conditions, traffic regulations, the possible working hours and the resources available, etc., before quoting for the tender.
8	Contractors shall refer to the tender drawings for sectional and design details of different items of works and quote for the tender.

32.GENERAL SPECIFICATIONS

LIST OF APPROVED MANUFACTURERS / NATURAL SOURCES OF MATERIALS TO BE USED IN THE WORK SUBJECT TO THE APPROVAL OF SAMPLES BY THE CONSULTANT.

Sl. No.	Materials	Manufacturers
1.	Cement	L&T, Birla, Ramco
2.	Ready Mixed Concrete	L & T, Birla, Ramco
3.	HYSD / MILD Steel (TMT)	Tata / Vsp
4.	Anti-termite chemicals	Chloropyrophos Emulsifiable Concentrates or equivalent
5.	Clay Bricks	Light Weight Clay Bricks From Any Manufacturer Of Repute To Be Got Approved From Bank.
6.	Flush Door Shutters	Kuttys, Elegant, Shakthi
7.	Glass (Plain/pin Headed/Tinted) Brass,Aluminium Hardware/fittings	Modi Float, Saint- Gobain, Asahi
8	Brass Mortice Locks & Latches	Ebco, Hettich, Or Equivalent
9	Latches with Internal locks	Doorset, Ebco, Hettich
10	Hydraulic door closer and floor spring	Godrej, Everite, Dorma
11	Aluminium door, Window and Ventilator sections	Jindal, Indal, Hindalco
12	PVC Water pipes	Supreme, Finolex ,Prince
13	Water Proofing material / Compound for roof Tops and sunken floor	Fosroc, Dr.Fixit, BASF, Sika Or Equivalent Approved Make
14	Vitrified tiles, Glazed Tiles, Ceramic Tiles	Kajaria,Johnson, Nitco
15	Cement Base Paints	Snowcem Plus (M/S Killick Nixon) Or Equivalent
16	Synthetic Enamel Paint	Asian Paints , Nerolac, Berger
17	Exterior Emulsion	Asian Paint, Nerolac, Berger
18	Texture Paint	Spectrum Or Equivalent
19	Polysulphide sealant	Pidilite, Fosroc Or Equivalent
20	Wooden flooring	Pergo , Wiparquet , Or Equivalent
21	Blinds	Hunter douglas, MAC
22	PLY BOARD & PLY WOOD (MR GRADE PLYWOOD)	GREEN PLY, CENTURY, MAYUR
23	LAMINATE	SKIRTING AT LINTEL LEVEL: MERINO 1122 (KINGFISHER BLUE)
		MAIN – MARINO – 854 (NICE PEAR)

		SHUTTER BOX (FRONT & SIDES) – KINGFISHER BLUE
		SHUTTER BOX (BOTTOM): MERINO – 1057 (MARIE GOLD YELLOW)
		STORAGE CABINET (INCL.EDGE LIPPING): MERINO – 854 (NICE PEAR)
		ACCESS LOCK PILLAR: MERINO – 854 (NICE PEAR)
		FOR INSIDE PORTION OF THE ROOM MERINO 1122 (KINGFISHER BLUE)
		FOR OUTSIDE PORTION, OR MATCHING SHADES IN GREENLAM, CENTURY, DURION.

LIST OF TYPE AND MAKE OF MATERIALS TO BE USED

	<i>Approved Make</i>	<i>MAKE OFFERED BY THE TENDERER</i>
<i>FUSE SWITCHES WITH HRC</i>	<i>G.E/ABB</i>	
<i>PVC INSULATED COPPER CONDUCTOR – FRLS GRADE</i>	<i>POLYCAB / FINOLEX/HAVELIS</i>	
<i>PVC CONDUIT – MEDIUM THICK</i>	<i>VASAVI / AVON / ITP</i>	
<i>DBs</i>	<i>HAVELLS/ L&T / WIPRO NORTH WEST</i>	
<i>MCBs, ELCBs, RCBOs</i>	<i>MDS/ WIPRO NORTH WEST</i>	
<i>CABLES</i>	<i>WIPRO SURAKSHA, FINOLEX, HAVELLS</i>	
<i>METAL CLAD SOCKETS</i>	<i>ABB/ MDS</i>	
<i>6 – 16 A SINGLE POLE SWITCHES, SOCKETS, CEILING ROSES ETC.</i>	<i>WIPRO (NOWA), LEGRAND MOSAIC, MK,BLENZE</i>	

34. List of Material of Approved Makes/Brands (Plumbing)

S.No.	Materials		Manufacturers
1.	Sanitary Fixtures	(a)	PARRYWARE or Equivalent
2.	C.P. Fittings ISI Marked	(a)	Metro or Equivalent
3.	CI Pipes & Fittings	(a)	NECO / HEPCO or Equivalent
4.	G.I. Pipes	(a)	TATA / ZENITH or Equivalent
5.	G.I. Fittings	(a)	R / HB or Equivalent
6.	SWG Pipes	(a)	INDO or Equivalent
7.	Gunmetal valves	(a)	LEADER, ZOLOTO or Equivalent
8.	Bath tubs	(a)	HYDROBATH or Equivalent
9.	Stainless steel sinks	(a)	NIRALI or Equivalent
10.	Mirrors	(a)	MODI GUARD or Equivalent
11.	Centrifugal Pumps	(a)	KIRLOSKAR / CROMPTON GREAVES
12.	CPVC Pipes	(a)	Ashirwad, Prince, Astral
13.	SWR Pipes	(a)	Finolex, Prince, Supreme, Astral

NOTE: The contractor shall use only above-mentioned material or equivalent make to be approved by the Consultant. All other materials shall conform to the specifications laid down. The tenderer shall take this into account while tendering rates / prices.

DECLARATION

I/We have inspected the site of works and have made me / us fully acquainted with the local conditions in and around the sites of works. I/We hereby declare that I/We have gone through the conditions laid down in the Notice Inviting Tender, Conditions of Contract, Technical Specifications and understood the same and on the basis of the same I/We quoted our rates in the Schedule of Quantities attached with the tender documents.

I/We shall also uniformly maintain such progress as may be directed by the Employer / Architect to ensure completion of same within the target date as mentioned in the tender document.

Witness:

Signature of Tenderer

Address _____

_____ Date: _____

34. SPECIAL CONDITIONS FOR CEMENT & STEEL

1. The contractor shall, at his own expense procure and provide all materials including cement and steel required for the work.
2. The contractor shall procure all the materials in advance so that there is sufficient time to testing and approving of the materials and clearance of the same before use in work.
3. All materials brought by the contractor for use in the work shall be got checked from the Engineer-In-Charge or his authorized representative of the work on receipt of the same at site before use.
4. The contractor shall also employ necessary watch and ward establishment for the safe custody . of materials at his own cost.
5. Contractor has to produce manufacturers test certificate for each lot of cement & steel procured at site.

6. CONDITIONS FOR CEMENT:-

- 6.1 The contractor shall procure cement (OPC/PPC), as specified in approved makes .The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacture(s) which the tenderer proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufacturers, given by the tenderer, fully or partially. Supply of cement shall be taken in 50 kg. bags bearing manufacturer's name and ISI marking, alongwith manufacturers test certificate for each lot. Samples of cement arranged by the contractor shall be taken by the Engineer-In-Charge and got tested in accordance with provisions of relevant BIS Codes. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS Codes, the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-In-charge to do so.
- 6.2 The cement shall be brought at site in bulk supply as decided by the Engineer-In-Charge.
- 6.3 The cement go-down of the capacity to store a minimum quantum of cement bags as direct by engineer In - Charge shall be constructed by the contractor at site for which no extra payment shall be made. Double lock provision shall be made to the door of the cement go-down. The keys of one lock shall remain with the Engineer-in-charge or his authorized representative and the key of the other lock shall remain with the Contractor. The contractor shall be responsible for the watch and ward and safety of the cement go-down. The contractor shall facilitate the inspection of the cement go-down by the Engineer-in-charge at any time.
- 6.3.1 The cement shall be got tested by the contractor. The cost of tests shall be borne by the contractor.
- 6.5 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained. The theoretical consumption of cement shall be worked out as per procedure stipulated by relevant BIS codes and the same shall apply.

6.6 If the quantity of cement actually used in the work is found to be more than the theoretical quantity of cement including authorized variation, nothing extra shall be payable to the contractor on this account . In the event of it being discovered that after the completion of the work, the quantity of cement used is less than the quantity ascertained the cost of quantity of cement not so used shall be recovered from the contractor @ Rs. 3000/- (Rupees Three Thousand Only) per metric tonne. Decision of the Engineer-In-Charge in regard to theoretical quantity of cement which should have been actually used as per the schedule and recovered at the rate specified, shall be final and binding on the contractor.

For non-scheduled items, the decision of the Employers / Architects regarding theoretical quantity of the cement which should have been actually used, shall be final and binding on the contractor.

6.7 Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-charge.

6.8 Damaged cement shall be removed from site immediately by the contractor on receipt of a notice in writing from the Engineer-in-Charge. If he does not do so within three days of the receipt of such notice, the Engineer-in-Charge shall get it removed at the cost of the contractor.

6.9 In case the contractor brings surplus quantity of cement the same shall be removed from the site after completion of work by the contractor at his own cost after approval of the Engineer-in-charge.

6.10 The cement in bags shall be stacked by the contractor in godowns having weather proof roof and walls and on a proper floor consisting of two layers of dry bricks laid on well consolidated earth at a level at least 30 cm above the ground level. These stacks shall be in rows of two bags deep and 10 bags high with a minimum of 60 cm. clear space all round. The bags should be placed horizontally continuous in each line. Actual size / shape of godowns shall be as per site requirement and nothing extra shall be paid on this account.

6.11.1 Cement register for the cement shall be maintained at site. The account of daily receipts and issue of cement shall be maintained in the register by the authorized representative of the Engineer-in-charge and signed daily by contractor or his authorized agent.

6.12 Cement which is not used within 90 days from its date of manufacture shall be tested at reputed laboratory. Until the results of such tests are found satisfactory, it shall not be used in any work.

PROFORMA FOR THE CEMENT REGISTER

S.No.	Date	Cement in Stock (bags)	Total cement received (bags)	Sources from which received	Item of work where cement is used	Number of cement bags consumed	Balance in stock	Contractors Initial	Site engineer initial	Consultants initials	Bank officials initials
1.	2.	3.	4.	5.	6.	7.	8.	9.	10	11	12

7. CONDITIONS FOR STEEL:-

7.1 The contractor shall procure Thermo-mechanically treated (T.M.T.) -steel reinforcement bars conforming to relevant BIS codes from main producers as approved by the Ministry of Steel . For TMT bars conforming to relevant BIS code, procurement shall be made from main producers . The contractor shall have to obtain and furnish tests certificates to the Engineer-in-Charge in respect of all supplies of steel brought by him to the site of work. Samples shall also be taken and got tested

by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to BIS codes; the same shall stand rejected and shall be removed from the site of work by the contractor at his own cost within a week's time from written orders from the Engineer-in Charge to do so.

- 7.2 The steel reinforcement shall be brought in bulk supply of 20 tonnes or more or as decided by the Engineer-in-Charge alongwith manufacturer test certificate for each lot.
- 7.3 The steel reinforcement shall be stored by the contractor at site of work about 30cm. to 45 cm. above ground. A coat of cement wash shall be given to steel bars when stored at site for long duration so as to prevent corrosion. Nothing extra shall be paid on these account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

FOR CHECKING NORMAL MASS, TENSILE STRENGTH, BEND TEST, RE- BEND TEST ETC. SPECIMEN OF SUFFICIENT LENGTH SHALL BE CUT FROM EACH SIZE OF THE BAR AT RANDOM AT FREQUENCY NOT LESS THAN THAT SPECIFIED BELOW :

SIZE OF BAR	FOR CONSIGNMENT BELOW 100 TONNES	FOR CONSIGNMENT 100 TONNES
Under 10mm dia bars	One set of sample for each 25 tonnes or part thereof.	One set of sample for each 40 tonnes or part thereof.
10mm upto 16mm dia bars	One set of sample for each 35 tonnes or part thereof.	One set of sample for each 45 tonnes or part thereof.
Over 16mm dia bars	One set of sample for each 45 tonnes or part thereof.	One set of sample for each 50 tonnes or part thereof.

- 7.5 The contractor shall submit the test reports for steel and the cost of tests shall be borne by the contractor.
- 7.6 The Actual issue and consumption of steel on work shall be regulated and proper account maintained. The theoretical consumption of steel shall be worked out as per procedure prescribed by relevant BIS codes and the same shall apply for computation of steel quantity.
- 7.7 Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge.
- 7.8 In cases the contractor bring surplus quantity of steel the same after completion of the work will be removed from the site by the contractor at his own cost after approval of the Engineer-in- Charge.
- 7.9 The mild steel and medium tensile steel bars to be used shall conform to latest version of IS 432 and cold twisted bars and TMT bars shall conform to the latest version of IS : 1786.
- 7.10 i) Wastage, cover blocks, chairs, couplings, welded joints, spacer bars, stays, hangers and annealed steel wire for binding shall not be measured and cost of these items shall be deemed to be included in the rates for reinforcement.

- ii) The standard sectional weights referred to as in Table IV in para 5.3.3 in CPWD Specifications 1996 Vol. I to VI and revised Vol. II of 2002 with upto date correction slips for works will be considered for conversion of length of various sizes of M.S. Bars, Tor Steel Bars and T.M.T.bars into Standard Weight.
- iv)
 - a) If the Derived Weight as in sub-para (ii) above is lesser than the Standard Weight above then the Derived Actual Weight shall be taken for payment.
 - b) If the Derived Actual Weight is found more than the Standard Weight, the Standard Weight as worked shall be taken for payment. In such case nothing extra shall be paid out in sub-para (ii) above for the difference between the Derived Actual Weight and the standard Weight.

8. SPECIFICATIONS OF THERMO-MECHANICALLY TREATED BARS (TMT BARS):-

- 8.1 Thermo-Mechanically Treated Bars (TMT Bars) of Fe 415 Grade, conforming to IS-1786 Specifications shall be used in all R.C.C. works.
- 8.2 Bars are currently produced in various grades by M/s. Steel Authority of India Limited (SAIL), M/s. Tata Steel and M/s. Rashtriya Ispat Nigam Ltd. with trade names of SAIL (TMT), TISCON-TMT and Rebars respectively.
- 8.3 The grades, chemical and mechanical properties of different varieties are as per Table I, II & III

35. CONTRACTOR'S LABOUR REGULATIONS

Short Title :

1. These regulations may be called the "Contractor Labour Regulations."
2. **Definitions :-** In these regulations, unless otherwise expressed or indicated, the works and expressions shall have the meaning hereby assigned to them respectively, that is to say :
 - (i) "Labour" means worker employed by the Bank's contractor directly or indirectly through a sub-contractor or other persons or by an agent on his behalf of a payment not exceeding Rs. ____/- per month and will not include supervisory staff like overseers etc.
 - (ii) "Fair Wages" means wages whether for time or piece work notified at the time of inviting tenders for the work and where such wages prescribed by the Government of India in the Ministry of Labour and Employment vide S.O. No. 1917 published in the Gazette of India, Extraordinary Part - II Section (3) sub-section (ii) dated 19-5-1969.
 - (iii) "Contractors" shall include every person whether a sub-contractor or headman or agent employing labour on the work taken on contract.
 - (iv) "Wages" shall have the same meaning as defined in the Payment of Wages Act and includes time and piece rate wages.
- 2.a. No child labour is allowed in the work site.

3. Display of Notice Regarding Wage etc. The Contractor shall :

- (a) Before the contractor commences his work on contract, display and correctly maintain and continue to display correctly maintain in a clean legible condition in conspicuous places on the work, notice in English and in the local Indian Language spoken by the majority of workers, giving the rate of wages as per minimum wages of the area of work as approved by the Central Labour Commissioner as fair wages and the hours of work for which such wages are paid.

4. **Payment of Wages:-**

- (i) Wages due to every worker shall be paid to him direct.
- (ii) All wages shall be paid in current coin or currency or in both.

5. **Wage Book and Wage Slips etc. :** The contractor shall maintain a Wage Book of each worker in such form as may be convenient at the place of work, but the same shall include the following particulars :-

- (a) Name of the worker.
- (b) Rate of daily or monthly wages.
- (c) Nature of work on which employed.
- (d) Total number of days worked during each wage period.
- (e) Dates and periods for which worked overtime.
- (f) Gross wages payable for the work during each wage period.

- (g) All deductions made from the wage with an indication in each case of the ground for which the deduction is made.
- (h) Wages actually paid for each wage period.
- (i) Signature or thumb impression of the worker.
- (ii) The contractor shall also issue a wage slip containing the aforesaid particulars to each worker employed by him on the work at least a day prior to the day of disbursement of wages.
- (iii) The contractor shall issue the Employment Card in the prescribed Form III to each worker on the day of work or entry in to his employment. If the worker has already any such card with him from the previous employer, the contractor shall merely endorse that Employment Card with relevant entries. On termination of employment the employment Card shall again be endorsed by the Contractor and returned to the worker.
- (iv) **THE CONTRACTOR SHALL ISSUE AN ATTENDANCE-CUM-WAGES CARD AS PER FORM** attached to each worker on the day of each worker on entry into his employment.

6. Register of unpaid Wages :- The contractor shall maintain a register of unpaid wages in such form as may be convenient at the place of work but the same shall include the following particulars :

- (a) Full particulars of the labourers where wages have not been paid.
- (b) Reference number of the muster roll and wage register.
- (c) Rate of wages.
- (d) Wage period
- (e) Total amount not paid
- (f) Reasons for not making payment
- (g) How the amount of unpaid wages was utilized.
- (h) Acquaintance with dates.

7. Register of Accidents : The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars :

- (a) Full Particulars of the labourers who met with accident.
- (b) Rate of wages.
- (c) Sex
- (d) Age
- (e) Nature of Accident and cause of Accident.
- (f) Time and date of accident
- (g) Date and time when admitted in hospital
- (h) Date of discharge from the hospital
- (i) Period of treatment and result of treatment.
- (j) Percentage of loss of earning capacity and disability as assessed by the Medical Officer.

- (k) Claim required to be paid under Worker's Compensation Act.
- (l) Date of payment of compensation.
- (m) Amount paid with details of persons to whom the same was paid.
- (n) Authority by whom the compensation was assessed.
- (o) Remarks.

8. Fines and Deductions which may be made from Wages :

- (i) The wages of a worker shall be paid to him without any deduction of any kind except the following :
 - (a) Fines.
 - (b) Deduction for absence from duty i.e. from the place or the places whereby terms of his employment he required to work. The amount of deduction shall be in proportion to the period for which he was absent.
 - (c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody ., or loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to this neglect or default.
 - (d) Deduction for recovery of advances or for adjustment of over-payment of wages, advance granted shall be entered in a register.
 - (e) Any other deduction which the Central Government may from time to time allow.
 - (ii) No fine should be imposed on any worker save in respect of such acts and omission on his part as have been approved by the Chief Labour Commissioner.
 - (iii) No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.
 - (iv) The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of wages, payable to him in respect of that wage period.
 - (v) No fine imposed on any worker shall be recovered from him by instalment, or after the expiry of sixty days from the date on which it was imposed.
 - (vi) Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

9. Register of Fines, etc. :

- (i) The contractor shall maintain a register of fines and a register of deduction for damage or loss in Form Nos. 1 & 2 respectively which should be kept at the place of work.
- (ii) The contractor shall maintain both in English and the local Indian language, a list approved by the Chief Labour Commissioner clearly stating the acts and omissions for which penalty or fine may be imposed on a workman and display it in a good condition in a conspicuous place of the work.

- 10. Preservation of Registers :-** The wage book the wage slips, the register of unpaid wages, the Register of accidents, the register of fines, deductions required to be maintained under these regulations shall be preserved for 45 days after the date of last entry made in them and shall be made available for inspection by the Engineer-in-Charge Labour Welfare Officer or any other officer authorised by the Chief Labour Commissioner in this behalf.

11. Inspection of Books and slips :

The contractor shall allow inspection of the wage books and the wage slips the register of unpaid wages, the register of a accident, and the register of fines and deduction to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour Welfare Officer or any other person authorized by the Central Government on his behalf.

12. Submission of Returns :

The contractor shall submit periodical returns as may be specified from time to time.

13. Amendment :

The Central Government may from time to time add to or amend the regulation and on any question as to the application, interpretation or effect of these regulations the decision of the Chief Labour Commission or Assistant Chief Labour Commission to the Government of India, or any other person authorized by the Central Government in that behalf shall be final.

36.SAFETY CODE

Scaffolds :

- (i) Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder used for carrying material as will, suitable footholds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4) horizontal and 1 vertical)
- (ii) Scaffolding or staging more than 4m. above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached bolted, braced and otherwise secured at least 3 feet high above the floor or platform of such scaffoldings or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
- (iii) Working platform, gangways, and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 12 feet above the ground level on the floor level. They should be closely boarded, should have adequate width and should be suitably fastened, as described in (ii) above.
- (iv) Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be -3'0". Wherever there are open excavations in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.
- (v) Safe means of access shall be provided to all working platforms and the working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. in length while the width between side rail in rung ladder width shall in no case be less than 290mm. for ladder upto and including 3m. in length. For longer ladders this width should be increased at least 20mm. for each additional meter or length.
- (vi) A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the Engineer obtained prior to construction.

Other Safety Measures

- (vii) All personnel of the contractor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all metal workers shall be provided with safety gloves. Persons employed on metal cutting and grinding shall wear safety glasses.
- (viii) Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

Excavation and Trenching

- (ix) All trenches, 1.25m. or more in depth, shall at all times be supplied with at least one ladder for each 30m in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1m. above the surface of the ground. The side of the trench which are 1.5m. or more in depth shall be stopped back to give suitable slope or securely held by timber bracing, so as to avoid the dangers of sides to collapse. The excavated material shall not be placed within 1.5m. of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

- (x) The contractor shall take all measures on the site of work to protect the public from accidents and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any such persons or which may with the consent of the contractor, be paid to compromise any claim by any such person.

Demolition

- (xi) Before any demolition work is commenced and also during the process of the work;
 - (a) All roads and open areas adjacent to work site shall either be closed or suitably protected;
 - (b) No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
 - (c) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

Personal Safety Equipments

- xii). All necessary personal safety equipment as considered adequately by the Engineer should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by these concerned.
 - (a) Worker employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
 - (b) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles.
 - (c) Those engaged in welding works shall be provided with welder's protective eyesight lids.
 - (d) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
 - (e) When workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes and manhole's so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public.
 - (f) The contractor shall not employ men below age of 18 years and women on the work of painting with products containing lead in any form. Where ever men above the age of 18 years are employed on the work of lead paining, the following precautions should be taken.
 - (i) No paint containing lead or products shall be used except in the form of paste or ready .made paint.
 - (ii) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
 - (iii) Overalls shall be supplied by contractors to the workmen and adequate facilities shall be provided to enable the worker painters to wash during the cessation of work.
- (xiii) When the work is done near any place where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for

prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

Hoisting Machines

- (xiv) Use of hoisting machines and tackle including their attachment, anchorage and supports shall conform to the following standards or conditions :
1. (a) These shall be good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repair and in good working order.

(b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.
 2. Every crane driver or hoisting applications operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding which give signals to operator.
 3. In case of every hoisting machine and of every chain ring hook, shackle swivel and fully block used in hoisting or as means of suspension for safe working load shall be ascertained by adequate means. Every hoisting machine and all geared referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load. In case of a hoisting machine having a variable safe working load, each safe working load of the conditions under which it is applicable shall be clearly indicated. No part of any machine of any geared referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
 4. In case of department machines, the safe working load shall be notices by the Electrical-Engineer-in-Charge. As regards contractors machines the contractors shall notify the safe working load to the machine to the Engineer-in-Charge whenever he brings any machinery to site of work and get it verified by the Electrical-Engineer concerned.
- (xv) Motors, gearing transmission, electric wiring and other dangerous parts of hoisting, appliances should be provided with efficient safe guards hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental decent of the load, adequate precautions should be taken to reduce to the minimum the risk of any act of a suspended load becoming accidentally displaced. When workers employed on electrical installations which are ready energized, insulating mats, wearing apparel, such as gloves sleeves and boots as may be necessary should be provided. The workers should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.
- (xvi) All scaffolds, ladders and safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use.
- Adequate washing facilities should be provided at or near places or work.
- (xvii) These safety provisions should be brought to the notice of all concerned by display on a notice board a prominent place at work spot. The person responsible for compliance of the safety code shall be named there in by the contractor.
- (xviii) To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangements made by the contractor shall be open to inspection by the Labour Officer, Engineer-in-Charge of the department or their representatives.
Notwithstanding the above clauses from (i) to (xviii) there is nothing in these to exempt the contractor from the operation of any other Act or Rule in force in the Republic of India.

37. MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY CONTRACTORS

1. Application :

These rules shall apply to the contractor for Construction of "-----" at -----

2. Definitions :

(1) "Work Place" means a place at which, at an average 50 or more workers are employed in connection with construction work.

(2) "Large Work Place " means a place at which, at an average 500 or more workers are employed in connection with construction work.

3. First Aid :

(a) At every work place, there shall be maintained in a readily accessible place first aid appliance including an adequate supply of sterilized dressings and sterilized cotton wool. The appliances shall be kept in good order and, in large work place they shall be placed under the charge of a responsible person who shall be readily available during the working hours.

(b) At large work places, where hospital facilities are not available within easy distance of the work. First Aid post shall be established and be run by a trained compounder.

(c) Where large work places are remote from regular hospitals, indoor ward shall be provided with one bed for every 250 employee.

(d) Where large work places are situated in cities, in towns or in their suburbs and no beds are considered necessary owing to the proximity of city or town hospitals, suitable transport shall be provided to facilitate removal of urgent cases to the hospitals. At other work places, some conveyance facilities, such as a car, shall be kept readily available to take injured person or persons suddenly taken seriously ill to the nearest hospital.

4. Drinking Water :

(a) In every work place, there shall be provided and maintained at suitable places easily accessible to labour, a sufficient supply of cold water fit for drinking.

(b) Where drinking water is obtained from an intermittent public water supply, each work place be provided with storage where such drinking water shall be stored.

(c) Every water supply of storage shall be at a distance of not less than 15m. from any latrine, drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and water proof.

(d) A reliable pump shall be fitted to each covered well the trap-door shall be kept locked and opened only for cleaning or inspection which shall be done at least once in a month.

5. Washing and Bathing place :

(i) Adequate washing and bathing places shall be provided, separately for men and women.

(ii) Such places shall be kept in clean and drained condition.

6. Scale of Accommodation in Latrines and Urinals :

There shall be provided within the precincts of every work place latrines and urinals in an accessible place, and the accommodation, separately for each for each of them, shall not be less than the following scale :

	No. of Seats
(a) Where the number of persons does not exceed 50	2
(b) Where the number of persons exceeds 50, but does not exceed 100	3
(c) For every additional 100	3 per 100

In particular cases, the Engineer shall have the power to vary the scale, necessary.

7. Latrines and Urinals for Women :

If women are employed separate latrine and urinals, screened from those of men and marked in the vernacular in conspicuous letter. "For Women Only" shall be provided on the scale laid in Rule-6. those for men shall be similarly marked "For Men Only". A poster showing the figure of a man and a woman shall also be exhibited at the entrance of latrines for each sex. There shall be adequate supply of water close to the urinals and latrines.

8. Latrines and Urinals :

Except in work places provided with water flushed, latrines, connected with a water borne sewerage system, all latrines shall be provided with receptacles on dry earth system which shall be cleaned at least four times daily and at least twice during working hours and kept in a strictly sanitary condition. The receptacles shall be tarred inside and outside at least once a year.

9. Construction of Latrines :

The inside walls shall be constructed of masonry or some suitable heat-resisting non-absorbent material and shall be cement-washed inside and outside at least once a year. The dates of cement washing shall be noted in a register maintained for the purpose and kept available for inspection. Latrines will not be of a standard lower than borne-hole system and should have thatched roofs.

10. Disposal of Excreta :

Unless otherwise arranged for by the local sanitary authority arrangements for proper disposal of excreta shall be made by septic tank or leach pit duly approved by the Engineer and in conformity with the requirements of local public health authorities.

11. Provision of Shelters during rest :

At every work place there shall be provided, free of cost, two suitable sheds one for meals and the other for rest separately for men and women for the use of labour. The height of the shelter shall not be less than 11 feet from the floor-level to the lowest part of the roof. The sheds should be roofed with at least thatch and mud flooring will be provided with a dwarf wall around not less than 750mm. Sheds should be kept clean and the space should be on the basis of at least 0.50 Square metre per head.

12. Creches :

- (a) At every work place, at which 50 or more women workers are ordinarily employed there shall be provided two huts for the use of children under the age of 6 year belonging to such women. One hut shall be used for infant's games and play and the other as their bed-room. The huts shall not be constructed on a lower standard than the following :

(i) Thatched roofs :

(ii) Mud floor and walls :

(iii) Planks - spread over the mud floor and covering matting.

The huts shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the place clean. There shall be two Dais in attendance. Sanitary utensils shall be provided to the satisfaction of the Health Officer of the area concerned. The use of the hut shall be restricted to children their attendants and mothers of the children.

- (b) Where the number of women workers is more than 25 but less than 50, the contractor shall provide at least one hut and one Dai to look after the children of women workers.
- (c) The size of creche or creches shall vary according to the number of women workers.
- (d) The creches or creche shall be properly maintained and necessary equipment like toys, etc. shall be provided.

13. Canteen :

A cooked food canteen on a moderate scale shall be provided for the benefit of workers where ever it is considered expedient.

- 14.** The above rule shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contract.

39. PROFORMA OF GUARANTEE FOR DAMP PROOFING & WATER PROOFING

“This agreement is made this _____ day of 2014_____ between _____(Name of the Bank), a body . corporate constituted under the _____ (Name of the Act) Act – -----and having its Head Office at _____ (herein after called the “the Employer”) of the one part and -----(Name of the firm / contractor) (herein after called the “Guarantor”) of the other part.”.

Whereas this Agreement is supplementary to a contract(hereinafter called the contract dated --- -----and made between the Employer of the one part and the Guarantor of the other part) where by the Firm / Contractor inter alias undertook to render the building / structure completely water proofing. And whereas the Guarantors agreed to give guarantee to the effect that the said building / structure shall be water proof for a minimum period of ten years from the date of completion .

Now the Guarantor hereby agrees to make good all defects and render the building / structure water proof, during this period of guarantee and to the satisfaction of the Employer. The Guarantor also agrees to take up such rectification work at his own cost and within one week from the date of issue of notice from the Employer, calling upon him to rectify the defects.The decision of the employer as to the cost payable by the Guarantor will be final and binding, in case the Guarantor fails to commence the work as per above notice and the work is got done through some other contractor. That if the Guarantor fails to execute the water proofing work or commits breach there under then the Guarantor will indemnify the principal and his successors against all loss, damage caused, expense or otherwise which may be incurred by him by any reason of any default on the part of the Guarantor in performance and observance of this agreement. As to the amount of loss and / or cost incurred by the Employer the decision of the Employer will be final and binding.

In witness where of these presents have been executed by the obligator-----and by - -----and for on behalf of the Employer on the day, month and year first above written.

40. PROFORMA OF GUARANTEE FOR PRE-CONSTRUCTION ANTITERMITE TREATMENT

“This agreement is made this _____ day of 2014_____ between _____(Name of the Bank), a body corporate constituted under the _____ (Name of the Act) Act --- -----and having its Head Office at _____ (herein after called the “the Employer”) of the one part and -----(Name of the firm / contractor) (herein after called the “Guarantor”) of the other part.”.

Whereas this Agreement is supplementary to a contract(hereinafter called the contract dated -----and made between the Employer of the one part and the Guarantor of the other part) where by the Firm / Contractor inter alia undertook to render the building / structure completely free from any infestation of termites. And whereas the Guarantors agreed to give guarantee to the effect that the said building / structure shall remain free from any infestation of termites for a minimum period of ten years from the date of completion of pre-construction anti-termite treatment carried out as per the relevant I.S.Code.

Now the Guarantor hereby agrees to make good all defects and render the building / structure free from any infestation of termites, during this period of guarantee and to the satisfaction of the Employer. The Guarantor also agrees to take up such rectification work at his own cost and within one week from the date of issue of notice from the Employer, calling upon him to rectify the defects.The decision of the employer as to the cost payable by the Guarantor will be final and binding, in case the Guarantor fails to commence the work as per above notice and the work is got done through some other contractor. That if the Guarantor fails to execute the pre-construction anti-termite treatment or commits breach there under then the Guarantor will indemnify the principal and his successors against all loss, damage caused, expense or otherwise which may be incurred by him by any reason of any default on the part of the Guarantor in performance and observance of this agreement. As to the amount of loss and / or cost incurred by the Employer the decision of the Employer will be final and binding.

In witness where of these presents have been executed by the obligator-----and by - -----and for on behalf of the Employer on the day, month and year first above written.

Signed and delivered by -----(Bank) by the hands of Sri -----in the presence of -----

Signed and delivered by the hand of -----(Contractor) in the presence of -----

41. TECHNICAL SPECIFICATIONS

SUBHEAD - EXCAVATION EARTH WORK AND ANTI-TERMITE TREATMENT

1. **General**

The work to be done under this subhead comprises of supply of all labour, plant materials and other performance of all work necessary for excavation with necessary close timbering, strutting, shoring and bailing/pumping out water including disposing of all surplus excavated material from the site as directed by Engineer in charge / Architect .

2. **Site Clearance:** Before the start of work, the area of the plot shall be cleared of all shrubs, vegetation, grass, bush wood, shrubs etc. All the building shall be laid out to ensure that the layout plan fits at site. After completion of the work, the entire area of the plot shall be cleared from all debris, unwanted materials and level/slope of ground as required at site upto peripheral roads, The debris and unwanted material shall be disposed off away from site without extra cost .

3. **Site Levels :** After site clearance and before commencement of excavation or filling, the Contractor shall take levels at 3.0 mtr. intervals in either directions or at lesser intervals as considered necessary at site for the entire plot. A record of these levels shall be signed jointly by Contractor, Engineer in charge and Architect. These records shall be kept by the Engineer in charge.

4. **Setting out of works:** The Contractor shall set out the works and shall provide and fix all setting out apparatus required and solely be responsible for the true and perfect setting out the same and for the correctness of the position, levels, dimensions and alignment of all buildings as per the drawings. The contractor shall take in writing the approval of the Engineer in charge/ Architect for setting out and levels before starting the works. These approvals shall be recorded in the stage passing register and signed by the Architect and contractor and countersigned by the Engineer in charge.

5. **Surface Excavation :** The surface area to be occupied by the building shall be cleared of all debris, shrubs and plants, grass all round the building including ramps if any. All roots and organic material shall be cleared from the filling area inside the building.

6 **Classification**

All materials to be excavated shall be classified by the Engineer-in-charge into one of the following classes and shall be paid for at the rates quoted for such particular class of material. No distinction shall be made between materials that are dry, moist or wet. The decision of the Engineer-in-charge regarding the classification of the material shall be final and binding on Contractor and may not be opened up or reviewed or amended in any arbitration :

7. **Excavation over Areas**

Excavation over areas shall be carried out to the required depths and profiles for which suitable arrangements shall be made by the Contractor. The sides of the trench shall be kept vertical upto a depth of 2 mtr. from the bottom. For a greater depth, the excavation profiles shall be widened by allowing steps of 50 cm on either side after every 2 mtr. from the bottom. Alternately the excavation can be done so as to give slopes of 1:4. Where the soil is soft, loose or slushy, the width of steps shall be suitably increased or side sloped or the soil shored up as directed by Engineer in charge. It shall be the responsibility of the Contractor to take complete instructions in writing from Architect/Employer regarding the stepping, sloping or shoring to be done for excavation deeper than 2 mtr.

8 **Plinth Filling & outside area filling**

- a) Earth obtained from excavation or approved earth brought from outside shall be filled in layers not more than 20 cm. in depth at a time, spread, leveled, watered and well consolidated around foundations, under floors and other locations. The earth used for filling shall be free from all grass, roots debris etc.

- 9 **Disposal of Surplus Soil/Material:** Surplus soil/earth if any, shall be disposed off with in the site of Indian Bank as directed by the Engineer in charge/ Architect. The same shall be spread out evenly. All excavated material not so used shall only be disposed of in areas approved by the Engineer in charge/ Architect.

10. **Anti-termite Treatment**

- (a) This shall be provided to bottom of trenches sides, including treating the back fill, under floors and other locations as specified in IS-6313 Part II for pre construction soil treatment.

- (b) The work of anti-termite treatment shall be got executed by a specialist firm which must be member of IPCA and approved by the Engineer in charge/ Architect and shall be carried out as per IS 6313 Part I & II of 1981 for pre-construction soil treatment. The firm shall render a ten year guarantee to the employer through the contractor who will be the principal guarantor. The period of ten year shall be reckoned from the date of completion of work as in completion certificate.

- (c) Such guarantee shall be directly given by the specialist agency to the employer through the contractor in the form approved by the employer. In the event of reinfestation at any time during guarantee period, the specialist agency shall undertake such treatment as may be necessary to render the structure free from termite infestation including breaking and reinstalling any other work that may be necessary for the treatment at no extra cost.

- (d) **Time of Application**

Soil treatment should start when foundation trenches and pits are ready to take mass concrete in foundations. Laying of mass concrete should start when the chemical emulsion has been absorbed by the soil and the surface is quite dry. Treatment should not be carried out when it is raining or when the soil is wet with rain or sub-soil water. The foregoing applies also in the case of treatment to the filled earth surface within the plinth area before laying the sub-grade for the floor.

- (e) **Termite Mound Treatment**

If termite mounds are found within the plinth area, these shall be destroyed by breaking open the Earthen structure, making holes with crowbars and pouring into the mound, at several places approximately 4 litres of emulsion per cubic metre of mound.

- (f) **Measurement**

Measurement for payment of pre-construction treatment as detailed above shall be for actual area covered by building at ground level on plan in square metre.

SUBHEAD - CONCRETE (PLAIN AND REINFORCED)

1. **General**

This subhead covers the requirements for furnishing of cement concrete including materials proportioning batching, mixing, testing, placing, compacting, finishing, jointing, curing and all other work as required for cast-in-place/plain cement concrete/RCC.

2. **Submittals**

a) **Materials Reports**

Prior to start of delivery of materials required for cement concrete the following shall be submitted by the Contractor to the Engineer in charge/ Architect for approval.

- (i) Recommended suppliers and / or sources of all ingredients for making concrete including cement fine and coarse aggregates, Water and additives.
- (ii) Quality Inspection Plan to ensure continuing quality control of ingredients by periodic sampling, testing and reporting to the Engineer in charge / Architect on the quality of materials being supplied.

b) **Plant & Equipment**

The Contractor shall submit the following to Engineer – in - charge / Architect well in advance.

- (i) The proposed Programme, methods and details of plant and equipment to be used for batching and mixing of concrete.

c) **Reports for Inspection and Testing**

During concreting operations, the Contractor shall conduct inspection and testing and all reports thereon shall be submitted in summary form to the Engineer in charge/ Architect.

d) **Schedules**

The Contractor shall prepare working schedule for dates and rate of placing of concrete for each item of work and submit the same to the Engineer in charge/ Architect when requested.

3. **Materials**

Before bringing to the site, all materials for cement concrete shall be approved by the Engineer in charge/ Architect. All approved samples shall be deposited in the office of the Engineer in charge/ Architect. The Engineer in charge/ Architect shall have the option to have any of the material tested to find whether they are in accordance with specifications at the Contractor's expenses.

- (a) **Cement** : shall be Ordinary Portland/Portland Pozzolana and shall be stored in a dry waterproof go down.
- (b) **Fine Aggregate**: For all concrete work, it shall be coarse sand conforming to the grading given below:- (Zone I or II only applicable to concrete). Silt content not to exceed 8% by volume. The grading of fine aggregate shall be within the limits given in the following table and shall be described as fine aggregate grading Zone I and II :

IS Sieve Designation	Percentage Passing for	
	Grading Zone I	Grading Zone II
10mm	100	100
4.75mm	90-100	90-100
2.36mm	60-95	75-100
1.18mm	30-70	55-90
600 micron	15-34	35-59
300 micron	5-20	8-30
150 micron	0-10	0-10

(c) **Coarse aggregate:** For concrete it shall be crushed stone graded coarse aggregate. Grading shall be within the limits as given in the following table:-

(d) Coarse aggregate of all grades shall be from the crushers of approved source.

IS Sieve Designation	Percentage Passing for graded aggregate of Nominal size				
	40mm	20mm	16mm	12.5mm	80mm
100	-	-	-	-	-
63mm	-	100	-	-	-
40mm	95-100	100	-	-	-
20mm	30-70	95-100	100	100	-
16 mm	-	-	90-100	-	-
12.5mm	-	-	-	90-100	-
10mm	10-35	25-55	30-70	40-85	-
4.75mm	0-5	0-10	0-10	0-10	-
2.36mm	-	-	-	-	-

NOTE: If directed by Engineer in charge/ Architect, the aggregate (fine as well as coarse) shall be washed at Contractor's expense.

(e) **Broken Brick aggregate :-** Broken brick aggregate shall be prepared from well burnt bricks. These shall be free from under burnt particles and adherent coating of soil or silt.

(f) **Water** Used in concrete, brick work, plasters shall be clean fresh and non saline according to relevant IS codes Water samples should be got tested before use if required by Engineer in charge/ Architect.

(g) **Admixture & Additives**

Chemically admixtures are not to be used until permitted by the Engineer in charge/ Architect in case their use is permitted, the type amount and method of use of any admixture proposed by the Contractor shall be submitted to the Engineer in charge/ Architect for approval.

4. **Mixing :** All cement concrete (plain or reinforced) shall be mixed in mechanical mixers.

5. **Consolidation:** Concrete for all reinforced concrete works in column footings, columns, beams, slabs and the like shall be deposited and well consolidated by vibrating, using portable mechanical vibrators. The rest of the concrete such as shelving etc. shall be deposited and well consolidated by pouring and tamping. Care shall be taken to ensure that concrete is not over vibrated so as to cause segregation.

6. **Grade of Concrete** :- The compressive strength of various grades of concrete shall be given as below:-

SL.NO.	GRADE DESIGNATION	COMPRESSIVE STRENGTH ON 15cm CUBES min.7 (N/mm2)	ON 28 Days	SPECIFIED CHARACTERISTI CS COMPRESSIVE STRENGTH AT 28 Days (N/mm2)	MINIMUM CEMENT CONTENT (Kg.per Cub.mtr)	MAXIMUM WATER CEMENT RATIO
(i)	M -20	As Per Design		20	300	0.55
(ii)	M-25	As per Design		25	310	0.50
(iii)	M-30	As Per Design		30	320	0.45*
(iv)	M-35	As Per Design		35	340	0.40*
(v)	M-50	As Per Design		50	450	0.40*

*As per Mix Design

The contractor is entirely responsible for the design of the concrete mixes. The design is however to be approved by the Engineer. The contractor shall make trial mixes using samples of coarse aggregates, sand, water, plasticizers and cement, typical of those to be used in the works and which have been tested in an approved laboratory.

NOTE :-

- i) In the designation of a Concrete mix letter M refers to the mix and the number of the specified characteristic compressive strength of 15 cm – cube at 28 days expressed in N/mm².
 - ii) It is specifically highlighted that in addition to the above requirements, the maximum cement content for any grade shall be limited to 500 kg/cubic metre. The limitations shall apply to all types of cements of all strengths.
 - iii) The minimum cement content for design mix concrete shall be maintained as per the quantity mentioned above. Even in the case where the quantity of cement required is higher than the minimum specified above to achieve desired strength based on an approved mix design, nothing extra for extra cement used shall become payable to the contractor.
- 1.9 The first concrete mix design / laboratory tests, with admixture will be carried out by the contractor through any one of the reputed laboratories /Test houses.
 - 1.10 The contractor shall submit the report on design mix from any of above approved laboratories for approval of Engineer-in-Charge within 30days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the design mix is approved. In case of white Portland cement and the likely use of admixtures in concrete with ordinary Portland cement, the contractor shall design and test the concrete mix by using trial mixes with white cement and / or admixtures also, for which nothing extra shall be payable.
 - 1.11 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted at laboratory established at site shall be submitted by the contractor as per the direction of the Engineer-in-charge.
 - 1.12 All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the contractor.
 - 1.16 All other operations in concreting work like mixing, slump, laying, placing of concrete, compaction, curing etc. shall be as per latest IS Codes.
 - 1.17 Test Specimens, Frequency of Sampling, Test results of samples, lot size, standard of

acceptance.

- 1.19 In order to keep the floor finish as per architectural drawings and to provide required thickness of the flooring as per specifications, the level of top surface of R.C.C. shall be accordingly adjusted at the time of its centering, shuttering & casting for which nothing extra shall be paid to the contractor.

As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept to 20mm as required lower than general floors shuttering should be adjusted accordingly. Nothing extra is payable on this account.

- 1.22 Nothing extra shall be paid for providing drip course or moulding in the RCC projected surfaces wherever required.

.Nothing extra shall be paid for laying in slanting position of centering, shuttering, reinforcement and RCC work for the slabs and beams of slopping roofs.

13. **Finish to concrete work**

- (a) All concrete while placing against form work shall be worked with vibrators rods & trowels as required so that good quality concrete is obtained.
- (b) All exposed surface of RCC lintels, beams, columns etc. shall be plastered to match with adjoining plastered face of walls after suitably hacking the concrete surface.
- (c) All soffits of RCC slabs, loft slab, cup board slab, shelves and working platform in kitchen etc. and other exposed surfaces of RCC work not continuous to brick work shall be plastered (12mm thick) with cement mortar 1:4 (1 cement : 4 fine sand) to given an even and smooth surface.
- (d) The top of loft slabs and shelves shall be smooth finished while the concrete is green with a floating coat of neat cement to give a smooth and even surface. The exposed front face shall be finished in cement plaster 1:4 (1 cement: 4 coarse sand) to bring it in line and level and finished in neat cement. Such thin slabs shall be carefully cast so that they can be finished within their specified thickness. Additional thickness of plaster which makes these elements look unnecessarily heavy will not be allowed.
- (e) Chicken wire mesh 24 gauge and 20mm mesh will be provided all along RCC surface adjoining brick work giving 150mm lapping on either side using nails etc. for fixing mesh while plastering.
- (f) The rate shall be deemed to include for chicken wire mesh as given above and incidental labour such as chamfer splays, rounded or curved angles, grooves, rebate and drip moulds/courses.

14. **Sampling and testing of concrete:**

Samples from fresh concrete shall be taken as per IS-456-2000 (sampling and testing of strength of concrete) and cubes shall be made, cured and tested at 7th and 28 days. For testing cement concrete the contractor shall arrange for all the tools/moulds for making necessary cubes and shall bear all the charges for making the cubes, curing and testing through an approved laboratory. Further the Contractor shall make available laboratory equipment at site. A temporary room of adequate size having these facilities, shall be constructed by the contractor at his expense. After completion of work the Contractor shall remove the equipment, dismantle the room and clear the site.

15. Compressive strength test at 7 days may be carried out in addition to 28 days compressive strength test for a quicker idea of the quality of concrete. In all cases the 28 days, compressive strength alone shall be the criteria for acceptance or rejection of the concrete.

16. **Test Specimen:** Three test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for such purposes as to determine the strength of concrete at 7 days or to check the testing error.
17. **Test strength of samples:** The test strength of the sample shall be the average of the strength of three specimen. The individual variation shall not be more than ± 15 percent of the average.

LOT SIZE :-

The minimum frequency of sampling of concrete of each grade shall be in accordance with the following :-

QUANTITY OF CONCRETE IN THE WORK (CUBIC METRE PER DAY)	NUMBER OF SAMPLES
1 - 5	1
6 - 15	2
16 - 30	3
31 - 50	4
51 & above	4 Plus one additional sample for each additional 50 cubic metre of part thereof.

NOTE : At least one sample shall be taken from each shift.

18. Mix of cement concrete/reinforced cement concrete required to be used in various locations/ situations shall be shown on drawing. Wherever not mentioned shall be as under :-
- (a) Cement concrete in floors (self finished) and concrete as under layer for terrazzo floor cast in situ shall be PCC 1:2:4 (1 cement: 2 coarse aggregate : 4 graded stone aggregate 12:5 nominal size).
- (b) Cement concrete for RCC work in wall, columns footings, beams/Roof/floor slabs, landing, fins, lintels, chajjas, shelves, staircases, balconies, Loft slabs shall be of M20 Grade mix cement concrete and in Pedestals and Columns shall be of M25 Grade mix cement concrete
- (c) Cement concrete in PCC filling for pressed steel frames, hold fast blocks and rain water pipes etc. shall be 1:3:6 (1 cement :3 of coarse sand: 6 stone aggregate 20 mm nominal size).
- (d) The mix (1:2:4) shall conform to M 15 (nominal) and mix (1:1.5:3) shall conform to M 20 (nominal) as per IS 456-2000 for the purpose of testing and acceptance based on 28 days strength.
- (f) Lean cement concrete below columns/walls footings and in sub flooring of stilt floor shall be of mix 1:4:8 (1 cement : 4 coarse sand : 8 stone aggregate 40 mm nominal size).
19. **Bearing Plaster**
- This shall consist of cement plaster 1:3 (1 cement :3 fine sand) 20mm thick finished with a coat of neat cement laid on top of walls as bearing for RCC lintels, beams and slabs, when dry, a thick coat of lime wash shall be given before starting, shuttering. The shuttering shall be started after minimum one day of bearing plaster so that it is set.
20. **Concrete filling for sunken and lowered portions of slab:** This shall be cement concrete 1:5:10 (1 cement : 5 coarse sand: 10 brick ballast 40mm nominal size) in the entire sunken portions or cinder filling as per specifications shall be provided.

21. **Damp Proof Course:**

- (a) This shall consist of 40mm thick PCC 1:2:4 (1 cement: 2 coarse sand :4 graded stone aggregate :12.5mm nominal size) with water proof compound conforming to IS-2645) as per manufacturer's specifications.
- (b) DPC as specified above shall be provided 40mm thick at level with finish floor to the full width of walls (Ground floor only).
- (c) No DPC shall be provided over dwarf walls but floors shall be carried over to the full width over the dwarf wall finished 10mm projecting over from the wall.
- (d) The dried up surface of DPC shall be cleared with brushes and finally with the piece of cloth soaked in kerosene oil and then applied with hot bitumen using 1.7 Kg. per sqm. of DPC area.
- (e) Vertical Damp proof course shall be provided at ground floor on common walls between floors at different levels and shall consist of 20mm thick plaster of mix 1:4 (1 cement: 4 coarse sand) with water proofing compound as per manufacturers specification and as in (d) above before filling earth/sand is carried out.

22. **Plinth Protection**

PCC 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20mm nominal size) 50mm thick of width as shown on drawing shall be provided and laid in alternate bays in slope over 75mm hard core of rammed dry brick aggregates of 40mm nominal size over well rammed and consolidated earth base with brick edging all around the buildings except in portions covered by steps, ramps and platforms. A joint of 10mm shall be left through depth of concrete all along with junction between wall and plinth protection at all turnings and across at every 2.5m. these joints shall be filled with a mixture of blown grade Bitumen 85/25 and sand. The surface shall be finished smooth without using extra cement. Brick edging shall be laid on header with cement mortar 1:4 (1 cement:4 Coarse sand) as per detail as shown on drawings.

SUB HEAD - BRICK WORK

MATERIAL

- 1. **Sand for Masonry Mortars:** Unless otherwise indicated, sand for masonry mortars shall consist of natural river sand (generally termed as coarse sand) conforming to IS 2116-1965 specifications for sand for masonry mortars. Sand shall be hard, durable, clean and free from adherent coatings and impurities such as iron particles, alkalis, salts, coal, mica, shale or similar laminated or other materials exceeding the specified limit. Grading of sand shall be as under :

-----IS Sieve

Percentage Passing by weight

	<i>Un reinforced masonry</i>	
<i>Reinforced masonry</i>		
		-----4.75mm
	100	100
2.36mm	90-100	90-100
1.18mm	70-100	70-100
600 micron	40-100	40-100
300 micron	5-70	5-70
150 micron	0-75	0-10

- 2. The maximum quantities of clay, fine silt and fine dust in sand shall not be more than 8 percent by volume, Organic impurities shall be below that obtained by comparison the standard solution on specified in 6-2-2 of IS 2386 (Part II 1983). The coarse/fine sand shall be from river Krishna or from any other source conforming to the above standards.

3. **Common Burnt clay building brick :** Common burnt clay building bricks (herein-after termed as bricks shall conform to the requirements laid down in IS-1077-1976 for common burnt clay building bricks. Bricks shall be class designation 75, sub Class 'A' as per parameters given in the IS regarding edges, dimensions etc. The overall dimensions shall however be as per local practice of moulds. Water absorption after immersion in cold water for 24 hours shall not exceed 20% and grading for efflorescence shall be less than moderate. Bricks shall be free from cracks, flaws and nodules of free lime. Dimension shall be all within tolerance. Under/over burnt bricks and warped bricks shall be totally rejected.
4. Test check on random samples from each lot of bricks brought at site shall be carried out for compressive strength and water absorption test. Results of these tests duly signed and dated by Contractor; Architect and Engineer in charge shall be recorded in a separate register, which shall be kept with the Engineer in charge.

WORKMANSHIP - MASONRY MORTARS

5. **Preparation of Cement Mortars:** Mortar shall be of mix as indicated. The mixing specified is by volume. Mixing shall be done in a mechanical mixer. The mortar shall be mixed at least three times after adding of water. The cement mortar shall be freshly mixed for immediate use. Any mortar which has commenced to set shall be discarded and removed from the site.
6. **Bond :** All brick works shall be built in English bond, unless otherwise indicated. Half brick walls shall be built in stretcher bond. Header bond shall be used for walls curve on plan for better alignment, header bond shall also be used in foundation, stretchers may be used when the thickness of wall renders use of header impracticable. Where the thickness of footings is uniform or a number of courses, the top course of the footings shall be of headers. Brick courses at DPC level and at all slab levels below the bearings of slab shall be as bricks on edges.
7. Half or cut brick shall not be used except where it is necessary to complete the bond.
8. Overlap in stretcher bond is usually half brick and is obtained by commencing each alternate course with a half brick. The overlap in header bond which is equally half the width of the brick is obtained by introducing a three quarter brick in each alternate course at quoins. In general, the cross joints in any course of brick work shall not be nearer than a quarter of brick length from those in the course below or above it.
9. **Curing:** The bricks shall be adequately wet before use and brickwork shall be constantly kept wet for atleast seven days.
10. **Half Brick Walls :** The bricks shall be laid in stretcher bond in cement and sand mortar 1:4 (1 cement : 4 coarse sand) or as indicated. The reinforcement shall be 2 Nos. MS round bars or as indicated and as described in SUBHEAD VII steel and Ironwork. The diameter of bars shall be 6mm. The first layer of reinforcement shall be used at second course and then at every fourth course of brick work. The bars shall be properly anchored (min. 150mm) at their ends where the portions and or where these walls join with other walls columns. The inland steel reinforcement shall be completely embedded in mortar. Overlap in reinforcement if any, shall not be less than 30 cm. The cover i.e. the mortar interposed between the reinforcement bars and brick shall not be less than 6mm. The mortar covering in the direction of joints shall be not less than 15mm.
11. **Brick work in foundation upto plinth:** Brickwork in foundation shall be with brick of class designation 75 upto plinth level in cement mortar 1:6 (1 cement: 6 coarse sand).
12. **Brick work in Super structure :** Brickwork in superstructure including parapets shall be bricks of class designation 75 in cement mortar 1:6 (1 cement: 6 coarse sand).
13. **Brick work in Steps of staircase :** Brickwork in steps of staircase shall be in bricks of class designation 75 in cement mortar 1:6 (1 cement: 6 coarse sand).

14. **Parapets and Railings** : Parapets and railing shall be provided to balconies, Terraces, roof tops and stair landing etc. of upper floors as per details shown on drawings.
15. **70mm Thick Brick Work**
70mm thick brick work shall be provided with bricks of class designation 75 in cement mortar 1:3 (1 cement : 3 coarse sand) wherever shown in the drawings.

SUB HEAD - JOINERY WORKS

1. **General**

The type of shutters for doors, windows, ventilators etc. viz. paneled glazed wire gauzed and flush shall be as indicated and detailed in the drawing.

2(a) **TIMBER:**

- **Quality : Unless otherwise specified timber used in wood work shall be of approved quality from the species of wood listed in IS 399-1963.**
- **Timber shall be well seasoned, proper dressed, of uniform colored and durability of reasonably straight grains and shall be free from knots, cracks, shakes, splits, cross grains ,decay and sapwood etc.**
- **Teak Wood : Moisture content of timber used in wood work shall be as close as possible to the lower values laid down in the table below.**

S.No.	Type of Wood work	Recommended range of moisture content (%)
1	Frames of doors and windows etc.	16 to 18 %
2	Shutters of doors and windows etc.	15 to 16 %
3	Frame work for ceiling, cladding etc.	16 to 18 %

- 2(b) **Flush Door shutters:** Door shutters shall be 35 mm thick craft master wooden moulded door having hard wood timber frame of 29 mm th. Core and door facing plates (wooden fiber plates) pasted on both sides with overall thickness of doors to be 35 mm. The core shall be solid core using machine filled rigid expanded polyurethane foam of density 45 kg / cubic meter. Minimum width of frame shall be 65 mm th with additional wooden blocks for fixing of locks etc. door facing plates shall be 3.2 mm th. Phenolic bonded passing the test as required vide IS 2380 and formaldehyde test as per IS and boil test as per is 4020. Water absorption should be less than 16% after 2 hours and less than 36% after 24 hours. Moisture content should not be more than 8%.
3. **Testing of Flush Door / Wooden Moulded Door Shutters:** On receipt of the shutters at site the Engineer in charge or The Architect shall be entitled to get the samples of door shutters tested in any approved laboratory. From each lot of approximately 100 shutters, one shutter shall be selected at random by the Engineer in charge/ Architect. The cost of replacement of the door shutters selected as samples, their transportation to the laboratory and cost of testing by the laboratory shall be borne by the Contractor.
4. **Glazed & Gauzed Door Shutters :** Shutters shall be 35/40 mm thick. These shall consist of second class Teak wood styles, top, bottom and lock rails as per details shown on drawings. Timber to be used for these shutters shall be of good quality, seasoned of material growth and conforming to IS 4021-1963. Seasoning and ASCU treatment shall be done as per IS-402-1962. Styles and rails of shutters shall be in one piece only. Styles and rails shall be jointed to each other by tenon or mortice at right angles. Mountings and glazing bars shall have joints and shall be strub tenoned to the maximum depth which the size of member would permit.
5. **Wire gauge shutters :** Provisioning and fixing of 35mm thick wire gauge shutters to all openable windows is in the scope of work of this contract. Wire cloth shall be securely housed in rebates by giving a right angled bend and fixing by means of suitable staples at intervals of 75mm. Over this wooden bead of specified size shall be fixed with nails, or screws, where indicated to cover the rebate fully. The space

between the beading and the rebate shall be filled with putty to give it a neat finish. Exposed edges of the beads shall be rounded.

6. Door and windows shutters shall be provided as per details shown on the drawings.
7. The bottom of door shutters shall be 5mm above the finished floor level.
8. The glass panes shall be free from flaws, specks or bubbles and shall have square corners and straight edges. The glass panes shall be so cut that it fits slightly loose in the frames. The glass pane shall be fixed to the shutter with first glass hardwood beading of size as indicated properly screwed to the shutter with steel nails and necessary adhesive as per details as shown on drawings.
9. Glazing to windows/doors shutters shall be as follows of quality as approved by Engineer in charge and Architect.
 - (a) Fan light of Doors shutters : 5.5 mm thick plain sheet glass.
 - (b) Door Shutters partly glazed : 5.5mm thick plain sheet glass with itching.
 - (c) Windows (openable & fixed) : 5.5mm thick tinted glass.
 - (d) Ventilators : 5.5mm thick pin head glass.
10. **Polishing and finishing:** Polishing to all wood work is to be done with 3 to 4 coats of melamine polish, including the necessary pigments to get the proper colour and shade as by the Architect / Engineer in charge. Before polishing the base of wooden surface should be properly prepared by applying base primer and filling .The surface should be smoothened by applying sand paper on base. The polish work should be up to the satisfaction of Engineer in charge /Architect.

SUBHEAD – ALUMINIUM DOORS, WINDOWS & VENTILATORS.

1. The Aluminium extruded sections shall conform to Designation 63400 given in IS 737-1986 and shall be of manufacturers such as JINDAL or Hindalco or INDAL or equivalent manufacturers to be approved by the Engineer in charge/ Architect.
2. The Aluminium Doors, Windows, Ventilators and Glazing sections shall be anodized (anodic coating shall conform to IS 1868) As per colour approved by the Engineer in charge/ Architect .
3. The fabrication shall be carried out having mechanical joints, accurately machined and fitted to form hairline joints, with the vertical and horizontal sections at the corners to meet in 45 degrees mitred. The jointing shall be either with accessories such as cleats and cleating screws or by crimping with Hydraulics Press on to heavy duty extruded Aluminium cleats. The relevant arrangement shall be got approved by the Architects/ Engineer in charge. The glazing shall be fabricated and anchored to withstand wind pressures as per the Indian Standard.
4. Before proceeding with any manufacture, Shop Drawings for each typical elevation shall be submitted for the approval of the Architect and no work shall be performed until the approval of the shop Drawings is obtained.
5. All Glazing shall be air tight and water tight, using appropriate extruded EPDM gaskets/ as manufactured by MODI or equivalent; and sealant which shall be of high quality and performance requirements.
6. Each Glazing shall be tailor-made as per openings at Site. No cutting and making good of exposed grit wash plaster surfaces shall be permitted.
7. All the Aluminium sections shall be wrapped with self-adhesive non-staining thick layer of PVC tapes as approved by the Architects, and shall be duly packed for avoiding scratches or blemishes to the powder coated surface of the sections till the installation is completed.

8. The frames shall be fixed to concrete/masonry/brick work with dash fasteners and the method of fixing shall be got approved by the Engineer in charge before installation. The drilling of holes for inserting the dash fasteners shall be carried out with drilling machines and the frame shall be fixed in plump, line and level at jambs, sills and heads.
9. The perimeter gap between the outer frame and the masonry shall be sealed with polysulphide sealant as per the make approved by the Engineer in charge.
10. Glazing : The glass panes shall be free from flaws, specks or bubbles and shall have square corner and straight edges. The glass panes shall be so cut that it fits slightly loose in the frames. The glass pane shall be fixed to the shutter with Aluminium beading and E.P.D.M. gasket properly snapped on as per the drawing. The glass panes shall be of approved make.

SUB HEAD - BUILDERS HARDWARE

1. Mongery shall be provided to all doors, windows and ventilator shutters with necessary matching screws of suitable size.
2. Fittings and fixtures to all doors shall be of **Brass** material from **approved** manufacturing company and for window and ventilators etc. fittings and fixtures shall be Aluminium anodized Matt finish ISI marked of approved make . The contractor shall obtain the approved of the name of the manufacturer and brand of fittings from Engineer in charge/ Architect before placing the supply order. If demanded an approved copy of Bureau of Indian Standard letter under which the manufacturer has been issued the license and authorized to make the items of builder hardware with ISI marking should be attached and one sample of each fittings of the particular brand duly ISI marked shall be given by Contractor.
3. Handles for window shutters shall be 75mm long and door shutters shall be 125mm D-Type Aluminium anodized.
4. Magic eye for entrance door shall be wide angle best quality. This shall be fixed at 1400 mm height from finished door level.
5. One sample piece of each fitting shall be produced for approval of Engineer in charge/ Architect. The bulk supply order shall be placed by the Contractor only after approval is accorded by Engineer in charge/ Architect.

Schedule of Builder's Hardware

8. Schedule of Hardwares/fittings to door, window and ventilator shutters shall be as per drawings.
9. **Mortice Latch (Vertical Type)**

Mortice latch (Vertical type) shall conform to IS 5930-1970, Specification for mortice latch (Vertical Type). These latches shall be capable of being operated inside and outside and shall be provided with a pair of Aluminium anodized lever handle fitted on the handle plate in order to close the door. The latches shall be of brass alloy. Face plate shall be provided in front of the ease plate, size of latch shall be 65mm.

Mortice Locks

These shall conform to IS 2209-1976. Specification for Mortice locks (Vertical Type). These shall have body covers, cast plate, faceplate, skirting plate lever, follower of cast brass and locking bolt and latch bolt extruded brass. Lever spring and latch spring shall be of phosphor bronze. The locks shall be supplied with 2 Nos. stainless steel keys. Locks shall be 6 lever. The lock shall be easily working with lever and shall be

capable of being opened with from both inside and outside and shall be provided with a pair of Aluminium anodized lever handles on the handle plate in order to close the door from both side.

10. **Hydraulic Door Closer (Floor Type)**

The Contractor shall provide double acting Hydraulic Door Closer (floor type) model No. F-32, Cat No. 1204 with SS Plate. Capacity to carry door weight upto 380 Kg. of EVERITE brand. OR Cat No. OFS 9621 of OPEL brand. These shall be approved brand and manufacturer as above (Conforming to IS 6315) for Aluminium door including cost of cutting floor as required, embedding in floors and cover plate etc.

NOTE:-

1. If any of the fittings are not manufactured as ISI marked there shall be of the same brand of other the ISI marked fittings approved by Engineer in charge.

SUB HEAD - STEEL & IRON WORK

1. Steel and ironwork shall be executed as indicated in drawing and as per standard practice.
2. Quality of steel shall conform to the following specifications:-

(a)	Mild steel (Misc.)	IS 432-1966 Part I
(b)	MS reinforcement bars	IS 432 Part II 1962
(c)	Structural steel works	IS 226-1962
(d)	Steel Deformed Bars	IS-1786/1979
3. **Reinforcement:**
 - (a) Reinforcement bars 6mm dia shall be MS bars.
 - (b) All reinforcement bars 8mm and above shall be deformed twisted steel bars.
 - (c) Laps and crossing shall be tied with mild steel binding wire of size not less than 0.9 mm dia.
 - (d) The Contractor shall be responsible for accurate fixing and placing of reinforcement shown in drawing and shall not place the concrete until the reinforcement has been checked, passed and recorded by the Architect and Engineer in charge.
 - (e) Reinforcement shall be bent and fixed as per IS-2502-1963.
 - (f) Laps in reinforcement for columns, beams and slabs etc. will be as stipulated in IS.
Or as shown on drawings.
4. **Holdfasts:** Holdfasts shall be made out of MS flats of size as specified with split fish tail ends coated with anti rust paint/tar. Holdfast shall be welded to door/windows frame as specified.
5. **Steel Door frame and shutters:** Size of door and locations shown on drawing and shall be comprising of frame and shutter fabricated and welded out of MS angle, plate & sheet and 10mm square tie bar. The door shall be painted with two or more coats of synthetic enamel paint of approved quality & shade over one coat of steel primer. Each MS gate shall have hold fast - 6 Nos. Butt hinges 125mm - 3 Nos. MS handles 100mm - 2 Nos. and MS sliding bolts 300 x 16mm - 2 Nos. (1 inside and 1 outside). Hold fasts shall be embedded in PCC block (1:3:6) of size 23 x 23 x 15cm.
6. **Grills :** MS grills manufactured out of flat iron, MS square tubes and round bars and of pattern as shown on drawing shall be provided to all windows openable/fixed, glazed portion of doors and fanlight of doors. All grills shall be fabricated and welded to frames.

7. **Railing to staircases, landings, passages, balconies & parapets:-**
- (a) Railing to staircase, landing etc. shall be fabricated with 25mm square M.S. Hollow pipes , 12x12mm square MS bars with vertical supports, MS Perforated sheet & top handrail made of 65x100mm size in first class T.W. etc., as shown in drawing .
 - (b) Verandah/Balcony Railing shall be fabricated with MS flat and 18mm square MS bars with vertical supports & top handrail made of 40mm dia M.S. pipe (medium grade) welded at joints fixed into floor/steps as shown in drawing.
 - (c) The fixing details and dimensions for 7 (a), 7(b) & 7 (c) above shall be as shown in drawings. All welded joints shall be grounded properly before painting. The finished railing shall be true to plumb, line and levels as called for. The mild steel blusters and other exposed mild steel members shall be painted with approved shade and brand synthetic enamel paint as specified in clause No. 11 of SUBHEAD XI.
8. **Exhaust Fan opening** : In kitchen provision for fixing of exhaust fan shall be made by fixing 19mm thick BWP grade commercial board with a circular hole 300 mm dia in window as shown on drawings. This opening shall be covered by bird guard fabricated out of galvanized iron sheet 18 gauge as shown in drawing.

SUBHEAD - ROOF COVERING, WATER PROOFING & RAIN WATER PIPES.

Exposed roof at terrace floor level : Roof slabs and Sunken slabs shall be cleaned thoroughly and following treatment/covering shall be provided

SPECIFICATION :-

Treatment to wall and slab junction

1. Surface shall be prepared by wire brushing and cleaning to remove loose particles and finally cleaned with copious amount of water and allowed to dry.
2. Bonding coat using a slurry of **Nitobond SBR** a polymer mixed with cement and water in the ratio of 1: ½ :1, shall be applied.

Coving shall be made along the joint using cement mortar 1:3 admixed with **Nitobond SBR** at 3 Lts, per bag of cement, shall be prepared and applied onto the primed surface and finished smooth. This shall be applied when the bonding coat reaches touch hard state.

Waterproof coating

1. Surface shall be mechanically scrubbed, to remove loose particles or any laitance, followed by acid etching and water wash and allowed to dry.
2. The prepared surface shall be coated with ready to use, 2 component polymer modified, cement based, waterproofing slurry Brushbond @ 2mm thick in two coats as per manufacturer's specification and instruction.
3. On top of the coating a 15mm thick cement sand mortar (1:3) admixed with cement waterproofing compound like Conplast X421IC (Fosroc) conforming to IS 2645 at the rate specified by the manufacturer shall be applied and the plastered shall be finished smooth with a steel trowel using cement slurry. The surface shall be cured for 3 to 4 days.

The work is to be carried by approved specialist waterproofing agencies like FOSROC or equivalent as approved by Bank / Architects. Work shall be done carefully after all the sanitary and waste pipes & specials are properly installed and connected, without causing any damage to the sanitary installations) (below 100mm thk. CC (1:2:4) paid separately) up to floor two level.

TERRACE WATERPROOFING TREATMENT

Packing and grouting pipe crossing in slabs and beams of toilets sunken slab and beams. Preparing, shuttering, mixing, grouting and curing the pockets holes left for pipe line crossing in the slabs and beams by using **Nitobond AR** and cement slurry in ratio 1:1:3 (one of **NITOBOND AR**, one of water and one of cement by volume) applied on the prepared clean surface and immediately mixing and applying **CONBEXTRA GPI** using 3 to 6mm hard blue metals at ratio (1: ½) by weight and restrained against upward expansion, etc., complete. Necessary care should be taken to prepare the mechanical key on the PVC pipelines on surface of contact to the grouts.

Surface Preparation

The surface to receive the waterproofing shall be cleaned of all dust dirt, loose material, debris, mortar droppings, laitance, oil, grease or any other form of foreign matter and shall be saturated with water.

Providing Chamfers

Chamfers shall be provided at the junction of slab and Parapet wall with 100 x 100mm fillet using cement sand mortar 1:4 mixed water proofing admixture Conplast X4211C @ 150 ml., per bag of cement and cement modifier Nitobond SBR @ 2 Lit. per bag of cement.

Pressure Grouting

1. Water shall be stagnated for 3 days and cold joint and weak spots shall be identified.
2. 10mm dia holes shall be drilled along the cold joint identified weak spots and construction joints of the roof slab and beams hammer drill at spacing not exceeding 500mm c/c.
3. The depth of nozzles shall be adequate to push the grout at all depth. PVC nozzles shall be fixed in the holes drilled using rapid setting mortar Renderoc Plug.
4. Cement slurry mixed with grout admixture Cebex 100 @ 225 gms per of cement shall be prepared to the required consistency and injected through the prefixed nozzles under pressure using grout pump to fill all possible pores and gaps left within the concrete mass. When the flow of the grout stops the grout mains shall be disconnected.
5. The PVC nozzles shall be sealed off with quick setting water proofing agent Renderoc Plug after the injection operation is over.
6. The grout holes shall then be finished after cutting the projected nozzles.

Water proof Coating

The prepared surface shall be coated with reaAssistant . to use, 2 component polymer modified, cement based waterproofing coating Brushbond @ 1mm thick in two coats and allow to dry completely.

Protective Screed

On top of the coating a 20mm thick plastering using cement sand mortar (1:4) admixed with cement waterproofing compound Conplast X4211C @ 125 ml per bag of cement and polypropylene fibers @ 125 gms per bag of cement, shall be provided and finished smooth.

The work is to be carried by approved specialist waterproofing agencies like FOSROC or equivalent as approved by Bank / Architects . Work shall be done carefully .

2. **Coving/Gola:** Providing coving 75 x 75 in cement concrete 1:2:4 (1 cement: 2 coarse sand : 4 stone aggregate 10mm and down gauge) at the junction of RCC slab and wall

and junction of tiles and parapet/wall including finishing exposed surfaces with cement mortar 1:4 (1 cement : 4 fine sand) as per drawing. Gola shall be done before plastering of parapet. The rates included in item of roof treatment.

3. **Khurras:** Making khurras 600 x 600 with average minimum thickness of 50mm cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 stone aggregate 10mm nominal size) finished with 6mm cement plaster 1:4 (1 cement: 4 coarse sand) and coat of neat cement including rounding of edges and making and finishing the outlets complete as per standard design/ COBA treatment. The rate included in the item of roof treatment.
4. **Chajjas** :- Slab shall be cleaned thoroughly and following treatment/covering shall be provided:
 - a) Finishing with 12mm plaster in cement mortar 1:4 (1 cement: 4 coarse sand) mixed with water proofing compounds as per manufacturer's specifications OR @ 5% of amount by weight. This shall be applied after thoroughly cleaning surface.

NOTE: All CI/GI pipes and fittings passing through the wall of the sunken portion shall be laid/fixd before the treatment as specified above is carried out.

6. Unplasticized Rain Water Pipes:

- a) The rain water pipes and fittings shall be provided with unplasticized PVC pipes conforming to IS-4985-81 and ISI marked. The u PVC pipes shall be of outside diameter 110 mm, 90mm and 165mm as shown on drawings and of working pressure 6 Kg./sq. cm. Internal & external surfaces of the pipes shall be smooth and clean, reasonably free from grooving and other defect. The U PVC pipes shall be jointed with PVC solution for concealed pipes and for exposed pipes with PVC collars by using lubricating solvent solution. Fittings shall be injection moulded or fabricated type conforming to IS-8008-1976 (Part I and IV) and/or IS 8360-1970 (Part-I to III)and/or as per manufacturers recommendations. The pipe shall start from 150mm above plinth protection at ground level with bend and a tee junction shall be provided at all terrace levels to collect water from khurras and vertical pipe shall be extended upto top of parapet. At top PVC cowl shall also be fitted.
- b) Cast iron chamber and grating at the top and outlet of every rain water pipe shall be provided and shall fit in snugly on the socket end of the pipe. The perforations in the grating shall be at least 60% of the total area of gratings.
- c) Where the rain water pipes are to be provided concealed within masonry the pipes shall be embedded in the walls with PCC 1:3:6 (1 cement: 3 coarse sand :6 stone aggregate 20mm down gauge) encasing all round. External surface of the pipes shall be painted with PVC adhesive and than coarse sand shall be sprinkled before embedding the pipe in the concrete for proper griping with concrete.
- d) Rain water pipes running down along the walls/columns shall be firmly fixed to the wall/column at all joints and one meter spacing on pipe with PVC clips as per manufacturer instructions.
- e) Provide angled end pieces CI shoes at bottom and splash stones of size 450 x 300 x 20mm embedded in plinth protection. Stones shall be quartzite chisels dressed.

SUBHEAD - FLOOR FINISHING, SKIRTING & DADO

1. **General**
 - a) This SUBHEAD shall cover all flooring and wall tilling work as shown in the drawing. No work under this SUBHEAD shall be started until specifically allowed by the Engineer in charge/ Architect and until all other major works such as plastering, embedding of conduits and pipes, channels, windows fixing etc. have been completed. Samples of adequate size representing the quality, size, texture after polishing of the tiles to be used in the flooring work fully shall be prepared for all work and got approved from the Engineer in charge/ Architect before proceeding. The approved samples shall be retained up to the end.

- b) Floor shall be laid to level and or to slope as shown on drawings and as required and directed by Engineer in charge/ Architect. Floor shall be carried through all the doors and other openings and over dwarf walls. Exposed edge of floors shall be finished in the same manner as for top surfaces. Skirting shall match with the floor finish.

2. **Sub Flooring**

(a) **For Ground Floor:**

Sub floors (base concrete under floor finish) 75mm thick lean concrete in 1:4:8 (1 cement:4 coarse sand & 8 aggregate 40mm nominal size) for all locations

(b) **For Upper Floors**

- (i) Sunken/lower portion of slabs: Sub base shall be in lean concrete in 1:5:10 (1 cement :5 coarse sand and 10 brick ballast 40mm nominal size).
- (ii) Other floors: Where ever required/directed lean concrete 1:5:10 (1 cement :5 coarse sand and 10 brick aggregate 40mm nominal size) of required thickness laid over RCC slab.
- (iii) Floors under cupboards/book shelves/kitchen counters etc. in 1:5:10 lean concrete (1 cement :5 coarse sand and 10 brick aggregate 40mm nominal size).

3. **Plain cement concrete flooring:**

Cement concrete 1:2:4 (1 cement:2 coarse sand : 4 graded stone aggregate 12.5mm nominal size) flooring of specified thickness. The thickness of flooring finished shall be 40mm/50mm as specified in schedule of quantities with grooves of 10mm wide shall be left through depth of the flooring (finishes) to form bays as specified in para 5 (b) hereinafter OR. The top surface shall be finished with floating coat of neat cement using steel float while the concrete is green. With 6 mm PVC strips. As specified in Schedule of quantities.

4. **Skirting** To match PCC floors 18mm thick plaster in cement mortar of mix 1:3 (1 cement: 3 coarse sand) finished with a floating of neat cement shall be applied to skirting. The skirting shall be 100 high and it shall be projecting uniformly from the plastered surfaces of walls and columns and separated with horizontal groove of 10 mm x 10mm.

5. **Glazed tiles**

- (a) The tiles shall be of first quality and shall generally conform to IS : 777. These shall be flat, and true to shape and free from cracks, crazing, spots, chipped edges and corners. The glazing shall be of uniform shade and shall be provided in Dado of kitchen and toilets. The tiles shall be set over screed/ plaster 12mm thick with cement mortar 1:3 (1 cement: 3 coarse sand) to all surface, set and jointed with laticrete Adhesive. The joints shall be neat and fine. Tiles face shall be kept flush with the skirting below.
- (b) Size of glazed tiles both for toilets, Baths, WC and kitchen shall be as shown on drawings.
- (c) The color of tiles shall be white/colored and the sample shall be got approved before fixing.
- (d) Height of glazed tiles dado above skirting in toilets and in kitchen, above kitchen platform shall be as shown on the drawings.

8. The glazed tiles shall be first quality vitreous china and of the following makes:-

- (a) Kajaria.
(b) Johnson
(c) NITCO

9. **Finish of working plat forms in kitchens**

Finish of the working platform in kitchen shall be with 20mm thick Granite stone slabs diamond cut and mirror polished laid over RCC slab with 20mm cement mortar 1:4 (1 cement: 4 coarse sand). Granite shall be jointed with white cement slurry including grinding smooth and polishing complete

10.(a) **Marble flooring:** 20-25 mm thick marble (Makrana Adanga Doongri marble) stone slabs laid over sub floor with 20mm thick base cement mortar 1:4 (1 cement: 4 coarse sand) Marble shall be jointed with white cement slurry including grinding smooth & mirror polishing complete.

(b) **Marble Skirting:** The marble stone slabs for skirting shall be as specified in clause 12 (a) above and of thickness 15 - 20mm. The stone shall be laid over 12mm thick cement mortar plaster 1:3 (1 cement : 3 coarse sand), jointed with white cement slurry including grinding smooth and mirror polishing.

11.(a) **NON- SKID CERAMIC TILES:**

Where indicated in Schedule of finishes shall be laid with cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with white cement paste pigmented to the tile shade.

b) **NON-SKID CERAMIC TILES SKIRTING:** Where shown/indicated in the drawing/schedule of finishes shall be provided 100mm height over 10mm thick cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with white cement paste pigmented to the tile shade.

VITRIFIED TILE

1. Where shown/indicated in the drawing / schedule of finishes, premium range vitrified polished ceramic tiles of 605 x 605 size (thickness as per manufacturer's specification) of approved manufacture (as per drawings) set over a base coat of CM (1:6) 12mm thick shall be provided and jointed with white cement paste pigmented to the tile shade.

2. The tile to be used should be of first quality, equal size and of same shade as approved by Engineer in charge / Architect.

3. The vitrified tiles shall be made from granite granules and bonding agent in the hydraulic press. The size of granite granules shall be uniform and there shall be no appreciable colour deviation. The shade and size of tiles shall be as shown in architectural drawings or as directed by Engineer in charge. Necessary cutting of tiles where required shall be done.

4. Measurement and rates shall be same as for marble flooring/ skirting

VITRIFIED PAVED TILE FLOORING FOR PARKING :

1. Where shown / indicated in the drawing / schedule of finishes, vitrified paved tiles of approved make or equivalent as approved by engineer-in-charge, 16mm thick of size 300mm x 300mm set over a base coat of CM(1:6) prop. 12mm thick shall be provided and jointed with white cement paste pigmented to the tile shade.

2. The tile to be used should be of first quality, equal size and of same shade as approved by engineer in charge / Architect.

CLAY PAVERS:

MATERIAL SPECIFICATIONS OF INTERLOCKING CLAY PAVERS

Shape: Tri-Hexagon shaped hard burnt Paver .

Three Hexagon shaped pieces combined to make a single unit with each side measuring 57mm x 57 mm. Thickness should be 50mm to allow for any kind of load bearing capacity. All sides of the Paver having bevelled edges 8-10 mm for greater edge strength. The Specifications shall conform to BIS codes.

Colour: Natural Brick red/ Terracotta red with no pigments used.

Material : Clay & clay components.

Compressive Strength of the paving units shall be 400 Kgs./cm²

Water Absorption of the paving units should not exceed 15%.

Efflorescence: NIL

Anti skid/ Anti slip: The pavers should comply to the property of being anti skid/ anti slip. The pavers should be resistant to acid and should not disintegrate when acid poured on them.

Pavers to be coated with a chemical/acrylic coating on the face, further reducing the water absorption and making them resistant to stains.

The pavers when struck with a metallic object or against each other should give a metallic ring.

Laying of Interlocking Clay Pavers

METHOD OF LAYING IN SAND

(i) **Preparation of Ground:**

Ensure you have root and rubble free compacted sub-base of at least 50mm thick. The sub-base should be roughly leveled and damped down before tamping down firmly with hand or mechanical compactor. Hand compaction is usually enough for most domestic applications. Mechanical compaction should be used when paving vehicle traffic areas.

(ii) **Spreading Sand:**

Spread the sand to get the level 1. For level 2. The sand should be screened and spread with guide rods to achieve a uniform thickness of 30mm.

(iii) **Laying the Pavers:**

Commence at a straight fixed edge if possible. Start laying pavers in the desired direction starting from the edge restraint. Start laying the pavers in the desired pattern placing each paver on the sand and tapping lightly with a rubber mallet or hand tamper.

(iv) **Brushing in Sand:**

After the pavers have been laid use a compactor to push pavers into soft sand. Spread dry screened sand over the laid pavers so that the sand fills the grooves. For heavy traffic repeat this process once again.

SUBHEAD - WALL FINISHES

1. General

a) Scope

This SUBHEAD shall cover internal and external plastering/rendering works as shown in the drawings.

b) Mortar : The mortar of specified mix shall be used.

c) Scaffolding

Stage scaffolding shall be provided for plastering work as per standard practice and as directed by Engineer in charge/ Architect. This shall be independent of the walls.

d) Preparation of Surfaces

Joints of brickwork wall shall be raked-out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scraping., shuttering imperfections of all concrete shall be roughened by hacking with chisel and all resulting dust and loose particles cleaned and the surface shall be thoroughly hacked or bush hammered to the satisfaction of Engineer in charge/ Architect. The surface shall be thoroughly washed with water, cleaned and kept wet before plastering is commenced.

e) Approval of Engineer in charge/ Architect to be taken

No plastering work shall be started before all conduits, pipes fittings and fixtures clamps, hooks etc. are embedded, grouted and cured and all defects removed to the satisfaction of Architect/ Engineer in charge. Special approval shall be taken from Engineer in charge/ Architect before starting each plastering work. No cutting of finished plaster shall be allowed. No portion shall be left out initially to be patched up later on.

a) Mixing

The ingredients shall be mixed in specified proportions by volume. The mixing shall be done in a mechanical mixer. The cement and sand shall first be mixed thoroughly dry in the mixer. Water shall then be added gradually and wet mixing continued for at least a minute until mortar attains the consistency of a stiff paste and uniform colours Mortar shall be used within 30 minutes of addition of water. Mortar which has partially set shall not be used and removed from the site immediately.

2. Internal Surfaces

i) Plastering shall be started after the completion of ceiling plaster from top and gradually worked down towards floor. It shall not, at any place be thinner than as specified. To ensure even thickness and a true surface plaster of about 15cm x 15cm shall be first applied horizontally and vertically at not more than 2m interval over the entire surface to serve as gauges. The mortar shall then be applied to the wall/ surface between the gauges and finished even. All corner junctions and rounding shall be truly vertical or horizontal and finished carefully. In suspending work at the end of the day plaster shall be cut clean to line where recommencing the plastering, edge of old work shall be scrapped, cleaned and wetted with cement putty before restarting plastering.

ii) Cement plastering internally on all internal surfaces including soffits of RCC slabs, chajjas, lintels, around shelves, inner side of parapets and around of parabolas etc. shall be as shown on drawing. Wherever not shown it shall be as under :-

- a) 15mm thick plaster in cement mortar 1:6 (1 cement: 6 parts 75% fine sand & 25% coarse sand) over brick and concrete surfaces. Rubbing out wherever required (i.e. bringing up the undulation on the rough face of brick work in level with proudest points) shall also be executed in the same mix along with rendering coat.
- b) 12 mm thick plaster in cement mortar 1:3 (1 cement: 3 fine sand) for all ceiling surfaces and on soffits of RCC slabs, chajjas, and kitchen platforms and around of shelves and pergolas.
- b) 10mm x 6mm grooves shall be provided in ceiling plaster at junction of wall and ceiling.

4. **EXTERNAL SURFACES:**

A. **EXPOSED BRICK WORK**

Facing Bricks (Machine Made Brick Tiles)

The facing bricks made from suitable soils shall be free from cracks, flaws, nodules of free lime warpage and organic matter. These shall be thoroughly burnt and shall have plane rectangular faces with parallel sides and sharp straight right angled edges. Facing bricks shall have uniform colour and even texture. Unless otherwise specified, facing bricks shall be machine moulded. Selected hand moulded bricks may also be used as facing bricks where specified. As far as possible, total requirement of facing bricks for a work shall be arranged from the same kiln. Bricks with chipped edges and broken corners shall not be used.

Dimensions and Tolerances

The standard sizes of machine moulded facing bricks shall be as under:

The brick may be modular or non-modular. Sizes of both types of bricks/tiles shall be as per Table 1. While use of modular bricks/tiles are recommended, non-modular (FPS) bricks/tiles can also be used where so specified. Non-modular bricks/tiles of sizes other than the sizes mentioned in Table 1 may be used where specified.

TABLE 1

Bricks/tiles	Nominal size mm	Actual size mm	Type of
Modular Bricks	200 x 100 x 100 mm	90 x 90 x 90mm	
Modular tile bricks	200 x 100 x 40 mm	190 x 90 x 40mm	
Non-modular tile bricks	229 x 114 x 44 mm	225x111x 44 mm	
Non-modular bricks	229 x 114 x 70 mm	225x 11 x 70 mm	

TABLE 2

The permissible tolerances shall be as under:

Dimension	Tolerance (for Machine mm	moulded bricks) mm
Length	190 or 225	± 3
Width	90 or 111	± 1.5
Thickness	40 or 44	± 1.5

Note: Tolerance and Dimensions for selected hand moulded bricks ± 4mm in length and ± 3mm in width and thickness.

Sampling and Tests :

Samples of bricks shall be subjected to the following tests:

- (a) Dimensional tolerance.

- (b) Water absorption.
- (c) Efflorescence.
- (d) Compressive strength.

Sampling:

For carrying out compressive strength, water absorption, efflorescence and dimensional tests, the samples of bricks shall be taken at random according to the size of lot as given in Table 3 below. the sample thus taken shall be stored in a dry place untill tests are made. For the purpose of sampling, the following definition shall apply:

- (a) Lot : A collection of bricks of same class and size, manufactured under relatively similar conditions of production. For the purpose of sampling a lot shall contain a maximum, of 50,000 bricks.

In case of consignment has bricks more than 50,000 of the same classification and size and manufactured under relatively similar conditions of production, it shall be divided into lots of 50,000 bricks or part thereof.

- (b) Sample: A collection of bricks selected for inspection and/or testing from a lot to reach the decision regarding the acceptance or rejection of the lot.
- (c) Defective: A brick failing to meet one or more of the specified requirements. The samples shall be taken as below :
 - (i) Sampling from a stack: When it is necessary to take a sample from a stack, the stack shall be divided into a number of real or imaginary sections and the required number of bricks drawn from each section. For this purpose bricks in the upper layers of the stack shall be removed to enable units to be sampled from places within the stack.

NOTE: For other methods of sampling i.e. sampling in motion and sampling from lorries or trucks, IS: 5454 may be referred.

Scale of sampling and criteria for conformity for visual and dimensional characteristics:-

Visual characteristics: The bricks shall be selected and inspected for ascertaining their conformity to the requirements of the relevant specification.

The number of bricks to be selected from a lot shall depend on the size of lot and shall be in accordance of Col. 1 and 2 of Table 3 for visual characteristics in all cases and dimensional characteristics if specified for individual bricks.

- (ii) **Visual Characteristics:** All the bricks selected above in accordance with Col. 1 and 2 of Table 3 shall be examined for visual characteristics. If the number of defective bricks found in the sample is less than or equal to the corresponding number as specified in Col. 3 of Table 3 the lot shall be considered as satisfying the requirements of visual characteristics, otherwise the lot shall be deemed as not having met the visual requirements.
- (iii) **Dimensional Characteristics:** The number of bricks to be selected for inspecting the dimensions and tolerance shall be in accordance with Col. 1 and 4 of Table 3. These bricks will be divided into groups of 20 bricks at random and each of the group of 20 bricks thus formed will be tested for all the dimensions and tolerances. A lot shall be considered having found meeting the requirements of dimensions and tolerance if none of the groups of bricks inspected fails to meet the specified requirements.

TABLE-3
Scale of sampling and permissible number of defectives for visual and dimensional characteristics.

No. of individual bricks for the lot	For Visual characteristics specified for group of 20 bricks-No. of bricks to be selected.	For dimensional characteristics bricks in for	No. of bricks to be selected.
(1)	(2)	Permissible No. of defective in the sample	(3)
2001-10000	20	1	40
10001-35000	32	2	60
35001-50000	50	3	80

Note: In case the lot contains 2000 or less bricks the sampling shall be as per decision of the Engineer-in-charge.

(iv) Scale of sampling and criteria for physical characteristics.

The lot which has been found satisfactory in respect of visual and dimensional requirements shall be next tested for physical characteristics like compressive strength, water absorption, efflorescence as specified in relevant material specification. The bricks for this purpose from those already selected above. The number of bricks to be selected for each of these characteristics shall be in accordance with relevant columns of Table 4.

TABLE 4
Scale of sampling for physical characteristics

Lot size	sample size for compressive strength, water absorption and efflorescence	Permissible No. of defectives for efflorescence
(1)	(2)	(3)
2001-10000	5	0
10001-35000	10	0
35001-50000	15	1

Note: In case the lot contains 2000 or less bricks the sampling shall be as per decision of the Engineer-in-charge.

(v) A lot shall be considered having satisfied the requirements of physical characteristics if the condition stipulated here in are all satisfied.

(a) From the test results or compressive strength, the average shall be calculated and shall satisfy the requirements specified in relevant material specification.

Note: In case any of the test results for compressive strength exceeds the upper limit for the class of bricks, the same shall be limited to the upper limit of the class for the purpose of averaging.

(b) Wherever specified in the material specification, the compressive strength of any individual bricks tested in the sample shall not fall below the minimum average

compressive strength specified for the corresponding class of brick by more than 20 per cent.

- (c) From the test results for water absorption, the average for the bricks in the sample shall be calculated and shall satisfy the relevant requirements specification in material specification.
- (d) The number of bricks failing to satisfy the requirements of the efflorescence specified in the relevant specification should not be more than the permissible no. of defectives given in Col. 3 of Table -4.

Physical Requirements

Facing bricks shall be of class designation 75 unless otherwise specified. Average compressive strength shall not be less than 7.5 N/mm² water absorption shall not exceed 20 per cent by weight and efflorescence rating shall be nil when tested in accordance with the procedure laid down and tolerance in dimensions shall be checked as per the procedure laid down in Appendix A-2.

Mortar, Soaking of Bricks and laying:

Mortar: The mortar for the brick work shall be as specified, and conform to accepted standards. Lime shall not be used where reinforcement is provided in brick work.

Soaking of Bricks : Bricks shall be soaked in water before use for a period for the water to just penetrate the whole depth of the bricks. Alternatively bricks may be adequately soaked in stacks by profusely spraying with clean water at regular intervals for a period not less than six hours. The bricks required for masonry work using mud mortar shall be soaked. When the bricks are soaked they shall be removed from the tank sufficiently early so that at the time of laying these are skin-dry. Such soaked bricks shall be stacked on a clean place where they are not again spoiled by dirt earth etc.

Note I: The period of soaking may be easily found at site by a field test in which the bricks are soaked in water for different periods and then broken to find the extent of water penetration. The least period that corresponds to complete soaking will be the one to be allowed for in construction work.

Note II: If the bricks are soaked for the required time in water that is frequently changed the soluble salt in the bricks will be leached out, and subsequently efflorescence will be reduced.

Laying : Bricks shall be laid in English Bond unless otherwise specified. For brick work in half brick wall, bricks shall be laid in stretcher bond. Half or cut bricks shall not be used except as closer where necessary to complete the bond. Closers in such cases, shall be cut to the required size and used near the ends of the wall. Header bond shall be used preferably in all courses in curved plan for ensuring better alignment.

Note: Header bond shall also be used in foundation footings unless thickness of walls (width of footing) makes the use of headers impracticable. Where thickness of footing is uniform for a number of courses, the top course of footing shall be headers.

Joints in the exposed brick work shall be truly horizontal and vertical and kept uniform with the help of wooden or steel strips. The thickness of all types of joints including brick wall joints and cross joints shall be such that four course and three joints taken consecutively shall measure as follows:

- (i) In case of modular bricks conforming to IS : 1077 specification for common burnt clay buildings bricks, equal to 39 cm.
- (ii) In case of non-modular bricks, it shall be equal to 31 cm.

Note: Specified thickness of joints shall be of 1 cm. Deviation from the specified thickness of all joints shall not exceed one-fifth of specified thickness.

Curing and Scaffolding

Curing: The brick work shall be constantly kept moist on all faces for a minimum period of seven days. Brick work done during the day shall be suitably marked indicating the date on which the work is done so as to keep a watch on the curing period.

Scaffolding: Scaffolding shall be strong to withstand all dead, live and impact loads which are likely to come on them. Scaffolding shall be provided to allow easy approach to every part of the work.

Double Scaffolding: Where the brick work or tile work is to be exposed and not to be finished with plastering etc. double scaffolding having two independent supports, clear of the work, shall be provided.

B) Designer Tiles / Dholpur stone / Red stone work

- 1 All concrete/plastered surfaces to receive stone cladding shall be properly hacked and cleaned of all loose particles and wetted with sufficient water.
- 2 Dholpur/Red stone slab of required size, 20-25 mm thick to be fixed over Laticrete adhesive.
3. Laticrete is a dry set adhesive, use with water or latex additives.
4. The stone shall be secured to the bracing by means of clamps @ 4 min/ Sqm.
5. Measurement

The finished length accurate to second decimal shall be measured.
6. Rate shall include all materials, labour and other accessories required to complete the work at all heights and depths as required at the site.

LATICRETE ADHESIVE FOR WALLS

- a) **Material for Plastering :** The product shall be a mix of cement and clean sand in a ratio of 1:6, the applied plaster shall be cured for at least 7 days prior to fixing tiles. Standard procedures shall be adopted to install a plaster of high strength with a good bond between the masonry surface and the new plaster, The plaster should be free of cracks for durable installation of tiles.
- b) **Material for fixing Tiles:** The product shall be laticrete 111 crete filler powder mixed with Laticrete 73, latex admix as manufactured by Laticrete International/ Laticrete India Pvt. Ltd. The tile adhesive formed shall have high bond strength, weather, thermal and shock resistance.
- c) Material for Grouting: **Material for grouting i.e joint filling shall be Laticrete 500 series grout mixed with laticrete 282 grout admix for joints 3mm-12mm as manufactured by Laticrete International/ Laticrete India Pvt. Ltd. The grout formed shall be strong, resistant to weather, cracking and discoloration.**
- C. **Flakes – Granite Finish on cement plaster**

'Flakes – Granite finish' shall given on the external surfaces of building as per detailed elevation drawings.

"Flakes – Granite finish " is a textured surface coating material manufactured by Bakelite Hylam Limited/ Spectrum.

"Flakes – Granite finish" comes in a three packs comprising 'Dry Granite Flakes' 'Flakes Bonding Agent' and Top coat (HGTC). Dry Granite Flakes' are made from china clay, pigments (primarily inorganic), Homo-polymer emulsion, mica etc. 'Flakes Bonding Agent' is made from pure acrylic co-polymer emulsion, broad-spectrum fungicide etc. Top coat (HGTC is made from solvent based acrylic polymer.

The 'Dry Flakes' are mixed with 'Flakes Bonding Agent' is recommended quantity of water. The dough is then trowelled on to the substrate to be coated to get an average coating thickness in the range of 0.8-1.2mm. After through drying of coated Granite flakes the surface is sanded and dust is removed. Top coat is then applied using a brush.

Granite finish " shall be applied only be an authorized dealer of Bakelite Hylam Limited/ Spectrum, with the help of a trained applicator, in accordance with the Company's 'Application Instructions'.

SUBHEAD – PLASTIC EMULSION AND FINISHING

1. Emulsion shall be provided to all ceiling and internal surfaces of lofts staircase, stair lobby and of all building as shown on drawings.
2. Emulsion of approved shade shall be provided to all internal surfaces of walls as shown on drawings.
3. Before application of Emulsion the surfaces shall be prepared to a clean and even surface.
4. Emulsion shall be carried out in three coats.
5. Emulsion shall be carried out over white cement based putty as per manufacturer instructions to give even shade.
6. Emulsion shall be applied in specified coats by using flat brushers or spray pumps. Each coat shall be allowed to dry before next coat is applied, if additional coats than what have been specified are necessary to obtain uniform and smooth finish, it shall be given at no extra cost.
7. The finished dry surface shall not show any signs of cracking and peeling nor shall it come off readily on the hand when rubbed.

WALL PUTTY : NCL ALTEK

APPLICATION

1. Before applying remove all loosely adhering material from the wall surface with sand paper, putty blade or wire brush.
2. Moisten the walls with sufficient quantity of water.
3. Mix the putty with 40- 50% water to make a workable paste.
4. Apply the first coat of putty on moistened surface from bottom to up words uniformly and left to dry for at least 3 hours.
5. Apply second coat and allows to dry for one day and finally rub the surface with fine emery paper to remove unevenness and to get glossy white surface.
6. Emulsion shall be applied in specified coats by using flat brushers or spray pumps. Each coat shall be allowed to dry before next coat is applied, if additional coats than what have been specified are necessary to obtain uniform and smooth finish it shall be given at no extra cost.

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

PAINING

1. **Cement Base Paint:** Before the application of cement based paints, the surface shall be cleaned and wetted with water. Two or more coats of cement base paint shall be applied to give even shade on all external cement plaster surfaces, internal cement plaster surfaces of parapets, soffits of chajjas, lintels, beams, and sills as shown on drawings. The shade of the paint shall be used as approved by Engineer in charge/ Architect. Each coat shall be cured well by wetting surfaces for at least three days. This shall apply to all buildings.
2. **Painting to Steel Surfaces:** All exposed steel surfaces shall be prepared, cleaned with sand paper to completely remove scales and rusts and shall be painted with two or more coats of synthetic enamel paint to give an even shade over one coat of steel primer. The shade of synthetic enamel paint shall be as approved by Engineer in charge/ Architect.
3. **Painting to CI and GI Pipes :** All exposed CI and GI pipes shall be painted by applying two or more coats of synthetic paint. The shade and quality shall be as approved by Architect/ Engineer in charge.

MODE OF MEASUREMENTS: The method of measurement for various items in the tender shall be generally in accordance with the IS : 1200 subject to the following :

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

S.No.	Description of Work.	Multiplying Factor	How Measured
1	Panelled, or framed and braced ledged and braced joinery frame. Edges, chocks, cleats, etc., shall be deemed to be included in the item.	1.30	(for each side) battened and including CHOWKAT or Side Be deemed to be included in the item.
2	Flush joinery measured flat (not girthed Each side) Edges, chocks, cleats, etc. Shall be deemed to be included in the item.	1.20	(for including CHOWKAT or frame. Edges, chocks, cleats, etc. Shall be deemed to be included in the item.
3	Fully glazed or measured flat (not girthed) cleats, etc., shall be deemed to be included in the item.	0.80	(for gauged joinery including CHOWKAT or each side) frame. Edges, chocks cleats, etc., shall be deemed to be included in the item.
4	Partly paneled and measured flat (not girthed), CHOWKAT or each side) gauged joinery frame. Edges, chocks, cleats, etc., shall be deemed to be included in the item.	1.00	(for partly glazed or including CHOWKAT or each side) gauged joinery frame. Edges, chocks, cleats, etc., shall be deemed to be included in the item.
5	Fully venetioned or measured flat (not girthed), including CHOWKAT or frame. Each side) gauged joinery Edges, chocks, cleats, etc., shall be deemed to be included in the item.	1.80	(for louvred joinery or including CHOWKAT or frame. Each side) gauged joinery Edges, chocks, cleats, etc., shall be deemed to be included in the item.
6	Weather boarding measured flat (not girthed), each side) not be measured separately.	1.20	(for supporting framework shall each side) not be measured separately.
7	Wood shingle roofing measured flat (not girthed)	1.10	(for each side)
8	Boarding with cover measured flat (not girthed) side) boarding.	1.05	(for fillets and match each side) boarding.
9	Tile and slate battening measured flat (not girthed) made painting for open spaces. All over)	0.80	(for no deduction shall be made painting for open spaces. All over)

10. Trellis (or JAFRI Measured flat over all; no 2.00 (for work) one – way or deduction shall be made painting two – way. For open spaces; supporting all over) members shall not be measured separately

11. Guard bars, Measured flat over all; no 1.00 (for balustrades, gates, deduction shall be made painting gratings, grills for open spaces; supporting all over) expanded metal and members shall not be berailings. Measured separately

12. Gates, and open Measured flat over all; 1.00 (for palisade fencing, no deduction shall be made for painting including standards, open spaces; supporting all over) braces, rails, stays,etc. members shall not be measured separately.

13. Carved or enriched measured flat 2.00 (for work each side)

14. Steel roller shutters Measured flat (size 1.10 (for of opening) overall each side) jamb guides, bottom rails and locking arrangement, etc., shall be included in the item (top cover shall be measured separately)

15. Plain sheet steel measured flat (not girthed) 1.10 (for doors and windows. Including frame, edges, etc each side)

16. Fully glazed or gauzed measured flat (not girthed) 0.50 (for steel doors and windows including frame, edges, etc. each side)

17. Partly paneled and measured flat (not girthed) 0.80 (for partly glazed or gauzed including frame, edges, etc. each side) steel doors.

18. Collapsible gate measured (size of opening) 1.50 (for painting all over)

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

EXPANSION JOINT

POLYSULPHIDE SEALANT :-

It should conform to BS – 4254 – 1983

Surface should be clean, dry and free from any loose material.

Masking tapes are to be used on edge of the joint.

Sealant shall be applied by using suitable gun.

Immediately after filling the joints, the sealant shall be tooled either with stainless steel or wooden spatula of the size of the joint, while tooling the spatula should be wetted with soap water for wetting.

The rate shall be inclusive of all operation i.e labour, material, T & P, scaffolding etc. complete. Nothing extra shall be payable on any account.

Skin contact shall be avoided.

Polyurethane Sealant

Surface should be clean, dry and free from any loose material.

Expanded polyethylene backup rod of diameter (diameter of the rod should be 5mm greater than the width of the joint) of density not less than 28 kg/cum should be provided to allow unrestrained stretching of the sealant.

Masking tapes are to be used on edge of the joint.

Filling the joint up to a depth of 12mm / 15mm for joint width 25m/40mm respectively.

Immediately after filling the joints, the sealant shall be tooled to ensure neat and clean finish of the joint.

Skin contact shall be avoided.

Rates shall be inclusive of all operations including labour material, backup rod, T&P scaffolding etc. complete. Nothing extra shall be payable on any account.

SUBHEAD - INTERNAL PLUMBING WORK **(INTERNAL WATER SUPPLY , PLUMBING, INTERNAL DRAINAGE)**

GENERAL

1. (a) The form of contract shall be according to the "Conditions of Contract". The following clauses shall be considered as an extension and not in limitation of the obligation of the Contractor .
(b) Work under this contract shall consist of furnishing all labor, materials, equipment and appliances necessary and required. The Contractor is required to completely furnish all the plumbing and other specialized services as described hereinafter and as specified in the schedule of quantities and/or shown on the plumbing drawings.
2. Scope of internal water supply, plumbing, internal sewerage and drainage shall consist of providing and fixing of the following for each blocks as shown on drawings.
 - (a) GI pipe with fittings and valves for cold and hot water supply.
 - (b) Sanitary fixtures, CP fittings and accessories.**
 - (c) Soil, waste, vent, rain water pipes and fittings.
 - (d) Overhead water tank at Terrace with supports.
 - (e) Internal Drainage including gully traps.
3. The entire work shall be carried out by licensed plumbers.

Water Supply

4. Scope of internal water supply will include the following for each Blocks :-
 - (a) One over head water tank of capacity as specified 3 layered PEF insulated for each block complete with all fittings including Man Hole cover, Ball valve and necessary supports for fixing on terrace/roof, as per details shown on the drawings.
 - (b) All GI pipes and fittings from over head tank to all taps, wall mixers, wash basins, cisterns, sinks, geyser points, washing machine and showers as shown on drawings.
 - c). Provision of hot and cold water supply lines in all toilets and kitchen .

NOTE : External water supply distribution mains including water services connection of each Block up to OH tanks (at terrace) and control valves for water supply lines

MATERIALS

1. All GI pipes shall be galvanized steel tubes medium grade conforming to IS-1239 and ISI marked of approved makes.
2. All GI fittings shall be conforming to IS-1879 and ISI marked.

3. Valve shall be heavy Gun metal full way confirming to IS-778-1971 class I and ISI marked.

LAYING, FIXING AND FITTINGS OF GI PIPES

1. All GI pipes below ground shall be laid in trenches and shall have minimum cover of 600mm.
2. The runs of the pipes shall be straight and pipes shall not run diagonally. Proper bends, elbows, tees at turnings/corners shall be used.
3. All GI pipes with necessary fittings wherever they are laid on internal faces of the walls shall be concealed in chase. On external faces they will be laid on walls fixed with G.I. clamps or on M.S. angle iron brackets as shown in drawings.
4. In the concealed portion of plumbing no joints shall be provided in the pipe lines except in the fittings i.e., bends, elbows, tees and nipples where required.
5. All GI pipes for water supply (Hot or cold) within toilets and kitchen shall be laid in walls only. No GI pipe shall be laid in sunken portion of toilets/kitchen.
6. For each block the size of down comers, branch pipes from the ring (at terrace) from over head tank and branch pipes from down comers shall be of sizes as shown on drawing.
7. Pipes and fittings shall be jointed with screwed fittings, care shall be taken to remove burs from the end of the pipe after cutting by a round file. Genuine white/red lead and a few strands of cotton thread shall be applied. All pipes shall be fixed in accordance with layout shown on the drawings. Care shall be taken to avoid air pockets. GI pipes inside toilets shall be fixed in wall chases at least 30cm above the floor.
8. GI pipes in shafts and other locations shall be supported by GI clamps of design as indicated in the Typical detail. Pipes in wall chases shall be anchored by iron hooks.
9. Unions: Contractor shall provide adequate number of unions on all pipes to enable dismantling later. Unions shall be provided near each gun metal valve, stop cock, or check valve and on straight runs as necessary at appropriate locations as per direction of Engineer in charge of SBH/ Architect.
10. Puddle Flanges: Puddle flanges shall be provided to all connection i.e. inlet overflow, and scour of the over head tank wherever required.
11. Pipe Protection : All pipes in chase or under floors or below ground shall be protected against corrosion by applying two coats of bitumen paint, covered with polythene tape and finished with final coat of bitumen paint.
12. Painting: All exposed pipes shall be painted with two coats of oil paint over one coat of primer. pipes shall be painted to standard color code as approved by Engineer in charge/Architect.

Over Head Tanks

- (a) RCC Over Head Water Tanks shall be provided at terrace as shown in the drawing.
- (b) These tanks shall be constructed on the roof terrace as per details shown on drawings.
- (c) Each over head tank shall be complete with the following:
 - i) Inlet, outlet, over flow(25mm), scour pipe (20mm) and Air vent pipe with all fittings.
 - ii) Mosquito proof coupling shall be provided to overflow and air vent pipes.

- iii) The inlet pipe to the over head tank shall be provided with ISI marked full way gunmetal brass valve and each outlet pipe shall be provided with ISI marked full way gunmetal valve of size of out let pipe as shown in the drawing.
 - iv) The over flow pipes shall be brought down up to the finished terrace level on terrace.
- (d) Vent pipes : Each down take pipe shall be provided with a vent pipe. The height of the vent pipe shall be 150mm above the top of the water tank.

Testing of GI pipes

- (a) All pipe lines shall be tested hydraulically to pressure of 7Kg./Sq.cm. for a minimum period of 24 hours for leakage.
- (b) The pipe line in chase of under floors/ground shall be covered up only after the testing is carried out satisfactorily and passed by the Engineer in charge/Architect.
- (c) The instrument, equipment and water for testing shall be arranged by the contractor without extra charges. (i.e. Hydraulic testing machine with pressure gauge).
- (d) A test register shall be maintained by the Engineer in charge and all entries shall be signed and dated by the Contractor, Engineer in charge/Architect.

Insulation

- (a) Hot water line in chases shall be provided with 20mm thick insulation by wrapping 6mm dia asbestos rope and finishing with a coat of 85% magnesia.

Approval of layout of GI pipes and position of fixtures at site

- a) The Contractor shall mark the location of all fixtures and fittings and layout of GI pipes on the terrace walls/ground at site and taken approval of Engineer in charge/Architect before commencement of cutting chases for GI pipes within the building and digging trenches outside the building.

Sanitary Fixture and CP Fittings and Accessories

- a) All sanitary ware shall be first quality white-vitreous china and shall be inclusive of all fixing devices nuts, bolts and hangers/Brackets. The fittings shall be of approved manufacture.
- b) It will be ensured that all sanitary fixtures are from one manufacturer only for the entire work. However, if due to any reason contractor proposes to provide part quantity from other manufacturer as approved above, then he may be permitted, but he will have to obtain specific approval of Engineer in charge/Architect for this change in brand. This will be subject to that all items and fixtures in any particular block/other buildings shall be always of one manufacturer only. In no circumstances items of two manufacturers shall be used in all of the toilets of particular block/other buildings.

Kitchen sink and draining Board:

- a) Kitchen sink and draining boards shall be of stainless steel of standard make. The sink and draining board shall be in one piece of following sizes with rectangular compartment/bowl. Each sink shall be provided with one CP brass waste and PVC waste pipe.
- d) Kitchen Sink shall be supported on RCC platform having suitable cut for the bowl of the sink as per the details shown on the drawings.
- e) All bib cocks, stop cocks, angle-valves, pillar taps, mixtures, showers rose & arm, bottle traps, CP waste and inlet connections and other minor fittings shall be brass chromium plated. These shall be ISI marked where manufactured. Contractor shall obtain the

approval of the name of the manufacturer and brand of CP brass fittings from Engineer in charge/Architect before placing the supply order. If demanded, a copy of the Bureau of Indian Standard letter under which the manufacturer has been issued the license and authorized to mark the five items of CP brass fittings as listed in hereinafter below with ISI marking should be submitted One sample of each fittings of the particular brand duly ISI marked shall be given by Contractor.

- e) If any of the CP brass fittings which are not manufactured as ISI marked these shall be of the same brand of other ISI marked CP brass fittings approved by Engineer in charge SBOP.
- f) All chromium plated brass fittings and accessories shall be provided with CP cast brass wall flanges.
- g) For fixing of CP brass fittings wherever required CP brass extension pieces shall be provided.
- h) Fixing screws shall be half round head chromium plated brass screws with CP washers.
- i) All exposed pipes, if any, within the toilets and near the fixtures shall be chromium plated brass except otherwise specified.

Schedule of Sanitary and CP Brass fittings in each Block shall be as under :-

(a) **Kitchen**

- (i) Stainless steel Sink with drain board of overall size 510x1060 with bowl size of 500x 400 x 200 mm.
 - (ii) CP Brass waste coupling.
 - (iii) Sink Mixer
 - (iv) GI Waste pipe 40mm dia from CP Waste to floor drain grating.
- (b) Toilets: All vitreous china sanitary wares. The fittings and fixtures in toilets of each Block shall be as under :

(A) **Wash Hand Basin**

- i) Vitreous china first quality.
wash basin 550x400mm counter top type
- ii) CP Brass waste 32mm dia with over flow.
- iii) CP Brass bottle trap with CP brass pipe to
wall with CP brass wall flange.
- iv) CP Brass Basin Mixer.
- v) CP Brass angle valves with PVC
connecting pipes with nuts and washers.

NOTE: Outlet of CP brass bottle trap shall be connected to nearest floor trap by GI waste pipe (concealed) as per details shown on drawings.

(B) **Water Closets and Cisterns**

- i) European type white vitreous china ware pedestal type and cistern
- ii) White 6.00 litre capacity low level flushing cistern with fittings and C.I /M.S brackets.
- iii) W.C with concealed type flush bend, over flow arrangements, mosquito proof coupling.
- iv) CP brass angle valve with PVC connecting pipe with nut and washer.
- v) Bakelite solid type seat and cover ISI marked Type 1A (IS-2548-1983) with CP brass Hinges commander brand (white colour).

- vi) C.P jet spreader complete set with concealed stop cock.

BATH TUBS

Hydro bath make corner model of size 1230 x 1230 x 380mm.

Hydro bath make rectangular model of size 1690 x 755 x 435mm.

- (C) **Urinals**
White vitreous chinaware flat back urinal of size 630 x 400 x 420 mm with 12 mm angle valve, C.P spreader, C.P dome grating, C.P brass flush pipe.
- (D) **Shower and Taps**
- i) CP brass wall mixer with bend for over head shower with central control knob for three positions, for supply to spout, second to stop and third for supply of shower.
- ii) 125mm dia CP brass shower rose 15mm with ball joint and 230mm long CP brass extension pipe.
- (E) **Towel Rail**
- i) CP brass towel rail 20mm dia 16 gauge 600 mm long including brackets.
- (F) **Towel Ring**
- i) CP brass towel ring 200 mm dia with CP brass brackets fixed to wall with flanges and CP brass screws.
- (G) Mirror of size as specified in the items and 4mm thickness over every wash hand basin. The mirrors shall be of make Modi float or Atul Brand made from Tata Ashi float glass. The mirror shall have marine ply backing 9mm thick with teak wood moulding all around of size 1-1/2" x 3/4 "
- (H) **Peg Sets:** Aluminium Anodized with 3 hooks.
- (I) **Gratings:**
- i) All floor traps (FT) and floor drains (FD) shall be provided with 100mm round stainless steel gratings respectively of approved design and shape. The weights of 100mm dia gratings shall not be less than 100 gms.
- ii) Gratings for floor drain (FD) below sink in kitchen shall have suitable hole for passing GI waste pipe from sink.
- Geysers:** Scope for arrangement of fixing of Geysers included in this contract is as under :-
- (a) **Residential Block: Arrangement for fixing electric geyser vertical type on each in toilets.**
- (b) **At the inlet pipe of all Geysers one number CP brass angle valve shall be provided.**
- (c) **The ends of inlet and outlet pipes shall be connected with on PVC connecting pipe with CP brass nuts and washers. This is to pass the water from inlet to outlet till Geyser is installed at a later date.**
- (d) Provisioning and fixing of Geysers is beyond the scope of this contract.

Installation of Sanitary Fittings

- (a) **European Type water closets shall be fixed with brass screws of suitable length with PVC plugs or phill plugs embedded in the floor after drilling hole in floor. It**

should be coupled with low level flushing cistern complete with rubber cone adapters etc, all as per manufacturer instructions.

- (b) Wash hand basins shall be fixed firmly to wall with MS angle iron brackets. The brackets shall be given two coats of white enamel paint over a coat of primer. In addition the wash basin shall be securely fixed to walls with a pair of 25x3mm MS clips screwed with rawl plugs to walls (placing of basin over the brackets with out secure fixing on wall shall not be accepted).
- (c) Indian type Water Closets shall be embedded firmly in the floor and its surrounding packed with cement concrete (1:3:6) 40mm graded aggregate below the level of top of the Closet to receive the top layer of floor finish. WC shall be set in the CI trap in cement concrete 1:3:6 (1 cement:3 coarse sand:6 graded stone aggregate 20mm nominal size), joint between WC and Flush pipe will be made in the pre-moulded rubber joint.
- (d) Urinals: Urinals shall be flat back white glazed vitreous china of first quality and size 630 x 400 x 420 mm size.
 - (i) **Urinals shall be provided C.P spreader, 32mm dia CP domical waster and C.P angle valve, and shall be fixed to wall by one CI bracket and two CI wall clips complete as recommended by manufacturer's directives/Engineer in charge.**
 - (ii) Half stall urinals shall be fixed with C.P. brass screws.
 - (iii) Flush pipes shall be G.I. pipes concealed in wall chase but with chromium plated bends at inlets and outlets.
 - (iv) Urinals may be flushed with flush valves as described in the item.
 - (v) Waste pipes for urinals shall be any of the following.
 - a) G.I. pipes. b)Rigid PVC.

Waste pipes may be exposed on wall or concealed chase as directed by the engineer-in-charge.

Specifications for waste pipes shall be same as given in SUBHEAD II.

Internal Drainage:

Scope of internal sewage disposal and drainage system for all buildings/under this contract will include the following and shall be provided as per the layout/locations shown on drawings:

- (a) GI floor drains in toilets and kitchen.
- (b) HCl waste pipes and their connections up to Gully traps.
- (c) HCl soil pipes and their connections up to nearest manholes.
- (d) Vent pipes with vertical stacks
- (e) All floor traps and gully traps.

Soil, Waste, Vent and Rain Water Pipes: All pipes shall be sand cast iron and shall comply to IS-1729 of 1979 and shall be ISI marked. Where shown on drawings the floor drains (FD) shall be of GI pipe medium grade ISI marked.

All cast iron pipes fittings like bends, branches, floor traps, tees 'Y' junctions, in waste, soil and vent pipes shall be sand cast iron comply with IS 1729 and shall be ISI marked. These shall be spigot and socket "Access door shall be made up with 3mm thick insertion rubber washer and white lead. The bolts shall be lubricated with grease or white lead for easy removal later. The fixing shall be air and water tight".

Cast Iron Traps

Floor trap shall be cast iron, deep seal with an effective seal of 50mm. The trap and waste pipes shall be set in cement concrete blocks firmly supported on the structural floor. The blocks shall be in cement concrete 1:2:4 (1 cement:2 coarse sand: 4 graded stone aggregate 20mm nominal size) and extended to 40mm below finished floor level. The concrete portion at top of the floor trap inlet shall be finished smooth and water proofed by applying neat cement slurry mixed with water proofing compound. Size of the blocks shall be 30x30cms of the required depth. The trap shall be 100mm inlet and 100mm outlet for kitchen and for toilets. Traps shall have extension pieces to receive waste lines as indicated in typical details.

Urinal Traps

Urinal traps shall be cast iron P&S trap with or without vent and set in cement concrete block specified in para above without extra charge.

Clean out Plugs

Contractor shall provide cast brass cleanout plugs as required. Cleanout plugs shall be thread and provided with key holes for openings. Cleanout plugs shall be fixed to the pipe by a G.I. socket lead caulked.

Laying and Joining of CI (Cast Iron) Pipes:

- (a) Pipes and fittings shall be fixed truly vertical horizontal or in slope as required in a neat workmanship. Pipes shall be fixed in a manner as to provide easy accessibility for repairs and maintenance and shall not cause obstruction in shafts etc.
- (b) All vertical pipes shall be fixed by MS clamps truly vertical Branch pipes shall be connected to the stack at the same angle as that of fittings. No collar shall be used in HCl pipes laid in sunken portion of slabs and vertical stacks. Each stack shall be terminated at top with a cast iron COWL and to the height as specified hereinafter.
- (c) MS clamps shall be standard design and fabricated from MS flat 40x3mm thick anchored directly to walls, concrete slabs, beams or column or as indicated in detailed drawings or and as directed by Engineer in charge/Architect.
- (d) Joints in cast iron soil, waste, vent and rain water pipes shall be lead caulked joints. Quantity of lead to be used for each joint shall be 1.2Kg. for 100 dia pipes, 1.00 Kg. for 75 mm dia pipe and 0.80 Kg. for 50mm dia pipe.
- (e) The water closet in ground, first and second floor shall be connected to the common soil pipe coming vertically downwards along the external face of walls with single branch connections with necessary bends/Y junction containing access doors. A vent pipe shall be provided from the single branch connection at the last floor level (as a continuation of the soil pipe) taken vertically upwards up to 800mm above the top of parapet wall and shall be provided at top with cast iron cowl.
- (f) CI/GI waster pipes and HCl soil pipes laid under floors shall rest in cement concrete 1:2:4 (1 cement:2 coarse sand:4 parts stone aggregate 20mm, 70mm thick minimum) 300mm wide. All pipes and fittings shall also be encased around with concrete 1:2:4 70mm thick.
- (g) Floor traps shall have extension pieces to receive waste pipes. Waste pipes from floor traps shall be connected to common waster pipe coming downward along the external face of walls with single branch connections with necessary

bends/Y junctions containing access doors. The common waste pipe shall run vertically downwards up to gully trap. A vent pipe shall be provided from the single branch connection at top of parapet wall and shall be taken vertically upward up to 800mm above the top of parapet wall and shall be provided at top with a cowl and fixed with iron clamps.

- (h) Cast iron drain pipes passing under the building shall be laid before commencement of works in foundations and where passing through concrete work inserts/sleeves should be left before casting the concrete.
- (i) Drain pipe shall be laid to levels/slopes indicated in drawings.
- (ii) Soil, waste, vent and rain water pipes in exposed location in shafts and pipe space shall be painted with two or more coats of oil paint to give an even shade. G.I. pipes in chases shall be painted with two coats of bitumen paint.

Gully Traps

- (a) Gully traps shall be of the same quality as described for stoneware pipes.
- (b) After excavation gully traps shall be fixed on 100 mm thick cement concrete 1:5:10 mix (1 cement:5 coarse sand:10 stone aggregate 40mm nominal size). After fixing the gully trap and pipe a brick masonry chamber 1'x1' inside in 4-1/2" thick brick work around the gully trap in cement mortar 1:5(1 cement: 5 coarse sand) shall be constructed up to the ground level. The space between chamber wall and the trap shall be filled in with cement concrete 1:5:10 (1cement: 5 coarse sand:10 stone aggregate 49mm nominal size). The upper portion of the chamber shall be plastered inside with cement mortar 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement with all corners rounded off sloping towards the grating. A square CI grating shall be fixed on trap inlet.

Testing:

- a) HCl soil and waste and vent pipes. These shall be tested to hydraulic test of 8 mtr. head.
- b) The joints of CI pipes coming under floors/walls shall be covered up only after testing is carried out satisfactorily and passed by Engineer in charge/Architect.
- c) For SWG pipes test as indicated in particular specification part III shall be carried out.
- d) A test register shall be maintained which shall be signed and dated by Contractor, Engineer in charge and Architect.

Approval of layout of waste/soil/GI/CI/SWG pipes, Floor traps, gully traps and manholes. The Contractor shall mark the location of these pipes, floor traps, gully trap and MG on floors / walls/ground at site and take approval of Engineer in charge/Architect before commencement and cutting of holes in walls, digging of trenches and laying of pipe lines. Record of these approvals should be recorded in a register and kept in Engineer in charge's office.

SUB HEAD - BOREWELL

1. **Drilling with direct Rotary reverse hydro pneumatic rotary rig drill with 150 mm dia bore.**
2. Fixing M.S (ERW) Housing pipe 300 mm dia with 5.6 mm wall thickness including sockets etc.
3. Fixing M.S (ERW) 200 mm dia slotted pipe with 1.5 mm to 3 mm slots as per strata conditions including sockets and reducer etc.
4. Fixing M.S Blind pipe 200 mm dia medium class coupling etc.
5. Fixing bail plug with hook 200 mm dia.
6. Fixing M.S centering guides 200 mm dia.
7. Fixing 300 mm dia M.S clamps 1.00 Meter long 100 x 12 mm flat.
8. Inserting of pea gravel and packing the same in space between boring and well assembly with pea gravel of 3-6 mm size after screening and washing.
9. Development with air compressor (80 Hours).
10. Sanitary sealing as per Specifications.
11. Testing of water sample for drinking purpose in standard Laboratory approved by the Engineer in charge/ Architect or furnishing the report.
12. Testing of tube well for yield Test.
13. Fixing of M.S well cap.
14. Fixing of submersible pump of 16 HP with all electrical fittings of approved make.

44. LIST OF REGISTERS / RECORDS TO BE MAINTAINED AT SITE BY THE CONTRACTOR FOR THE FOLLOWING MATERIALS / ITEMS

- Cement
- Steel
- Anti – termite chemical
- Test Reports
- Brick work
- Hindrance
- Labour wages
- Site Order Book
- RMC Register
- Compliance to labour Norms

Apart from the above, some other registers also to be maintained as and when required.

45. LIST OF MANDATORY TESTS :

TEST	TEST PROCEDURE	MINIMUM QUANTITY	FREQUENCY
Cement	From Manufacturer		For each lot
SAND			
Silt Content	Field	40 Cum	40 cum or part thereof
Bulking	Field	40 cum	50 cum or part thereof
Particle size distribution	Field	80 cum	Every 80 cum or required in RCC work.
COARSE AGGREGATE Particle size Distribution		135 cum	Every 135 cum or part thereof for RCC work for rest of work as desired.
R.C.C.			
Slump			Once a day or as desired.
Cube Strength	From lab	20 cum in slabs, beams and connected columns & 5 cum in column	Every 20 cum of a days concrete. Every 5 cum in column concrete.
BRICKS :			
Water absorption and efflorescence	From lab	Designation 40	One test for each source of manufacture
Compressive Strength	Rom lab	Designation 40	1,00,000 or part there of Two tests for 1 st lot of 1,00,000 and one test later for every 2,00,000 and part thereof.
TIMBER :			
Species		1 cum	Every three cum and part.
Moisture		1 cum	Every three cum and part.
ALUMINIUM DOORS, WINDOWS & VENTILATORS Thickness of anodic coating	IS - 5523		5% of Nos. Manufactured.
MORTICE LOCK : Testing of Springs		50 nos	100 OR part thereof
STEEL :			
A. Tensile Strength	IS 1529	20 Tonne	Every 20 Tonne or part
B. Bend Strength	IS 1529		-- DO --
MARBLE, MOSAIC / TERRAZO TILES			
1. Transverse Strength	IS 1237	10,000 Tiles	10,000 tiles or part
2. Water absorption	IS 1237	10,000 Tiles	10,000 tiles or part
3. Abrasion test	IS 1237	10,000 Tiles	10,000 tiles or part
VITRIFIED TILES, GLAZED TILES			
1. Water absorption	IS 777	10,000 Nos	10,000 or part
2. Craxing	IS 777	10,000 Nos	10,000 or part
3. Impact	IS 777	10,000 Nos	10,000 or part

1. Cost of testing and transport will be borne by the contractors. The testing reports shall be obtained from one of the certified centers as stipulated by the employer / architects.
2. Any other material will be tested by contractors at his own cost as per the instructions and Bank from time to time.
3. Frequency stated above is minimum and the contractor may have to test materials with any frequency as instructed by Architect / **Employer** without any cost.

46. CODE BOOKS

IS - 3764	-	Safety Code for Excavation Work.
IS - 2720	-	Part - II - Determination of Moisture Content Part - VII - Determination of Moisture Content Dry Density Relation using Light Compaction. Part - VIII - Determination of Moisture Content Dry Density Relation using Heavy Compaction. Part -XXVIII- Determination of Dry Density of Soils,in-place, by the Sand Replacement Method. Part - XXIX - Determination of Dry Density of Soils in-place, by the Core Cutter Method.
IS-6313 (Part I)	:	Code of practice for Anti-termite treatment in buildings constructional measures.
IS-6313 (Part II)	:	Code of practice for Anti-termite treatment measure in building (pre-constructional chemical treatment).
IS 269		Specification for Ordinary, rapid-hardening and low heat Portland cement.
IS 455		Specification for Portland Blast Furnace Slag Cement.
IS 1489		Specification for Portland-Pozzolana Cement.
IS 4031		Method of physical tests for hydraulic cement.
IS 650		Specification for Standard Sand for Testing of Cement.
IS 383		Specification for coarse and fine aggregates from natural sources for concrete.
IS 2386		Methods of tests for aggregates for concrete (Parts I to VIII)
IS 516		Method of tests for strength of concrete.
IS 1199		Method of sampling and analysis of concrete.
IS 3025		Methods of sampling and test (physical and chemical) water used in industry.
IS 432		(Parts I & II) Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement.
IS 1139		Specification for hot rolled mild steel and medium tensile steel deformed bars for the concrete reinforcement.
IS 1566		Specification for plain hard drawn steel wire (Part I) fabric for concrete reinforcement.
IS 1785		Specification for plane hard drawn steel wire for prestressed concrete.
IS 1786		Specification for cold twisted steel bars for concrete reinforcement.

IS 2090	Specification for high tensile steel bars used in prestressed concrete.
IS 4990	Specification for plywood for concrete shuttering work.
IS 2645	Specification for integral cement water-proofing compounds.
BS 4461	Cold worked steel bars for the reinforcement of concrete.
IS 10262	Recommended

Equipment

IS 1791	Specification for batch type concrete mixers.
IS 2438	Specification for roller pan mixer.
IS 2505	Specification for concrete vibrators, immersion type.
IS 2506	Specification for screed board concrete vibrators.
IS 2514	Specification for concrete vibrating tables.
IS 3366	Specification for pan vibrators.
IS 4656	Specification for form vibrators for concrete.
IS 2722	Specification for portable swing weigh batchers for concrete (single and double bucket type.)
IS 2750	Specification for steel scaffoldings.

Codes Of Practice

IS 456	Code of Practice for plain and reinforced concrete.
IS 1343	Code of Practice for prestressed concrete.
IS 3370	(Parts I to IV) Code of Practice for concrete structures for storage of liquids.
IS 3935	Code of Practice for composite construction.
IS 3201	Criteria for design and construction of precast concrete trusses.
IS 2204	Code of Practice for construction of reinforced concrete shell roof.
IS 2210	Criteria for the design of R.C.shell structures and folded plates.
IS 2751	Code of Practice for welding of mild steel bars used for reinforced concrete construction.
IS 2502	Code of Practice for bending and fixing of bars for concrete reinforcement.

IS 3558	Code of Practice for use of immersion vibrators for consolidating concrete.
IS 3414	Code of Practice for design and installation of joints in buildings.
IS 4014	Code of Practice for steel tubular, scaffolding (Parts I & II)
IS 2571	Code of Practice for laying in situ cement concrete flooring.
IS 13920	Code of Practice for ductile detailing of reinforced concrete structures subjected to seismic forces.

Construction Safety

IS 3696	(Parts I & II) Safety Code for scaffolds and ladders.
IS 383	Coarse aggregates for concrete, except as stated above and for other than light weight concrete
IS 4031	Test blocks shall be prepared and tested in accordance with the requirements of IS 4031.

Water

Method of Test (Clause Ref. IS 3025-1964)

MASONRY

a) RUBBLE MASONRY

IS 1129 (1972)	Stone; Dressing
IS 8348 (1977)	Stone; slabs, stacking and packing for transportation
IS 1805 (1973)	Glossary of terms: quarrying and dressing
IS 1121 (1957)	Compressive, transverse and sheer strength determination
IS 8759 (1977)	Maintenance and preservation of stone
IS 4348 (1973)	Permeability determination
IS 1122 (1957)	Specific gravity and porosity determination
IS 4121 (1967)	Water transmission rate through natural building stone
IS 1706 (1972)	Wear resistance, determination by abrasion method

Coursed Rubble (First Sort) in Superstructures

IS 1597 (Part I).

BRICKWORK AND BLOCK WORK

IS 1077	Specification for Common Burnt Clay Building Bricks
IS 2116	Specification for Sand for Masonry Mortar
IS 2212	Code of Practice for Preparation and Use of Masonry Mortar
SP 27	Handbook of Method of Measurement for Building Works
IS 432	Specifications for Mild Steel and Medium Tensile Bars
IS 2185	Specification for Cement Concrete Block
IS 2572	Code of practice for Construction of Concrete Walls
IS 9103	Specification for Admixture of Concrete

Concrete Block work

Hollow or solid concrete blocks shall conform to IS 2185

Mortar for Brickwork and Block work : IS 2250

Sand shall be natural sand in accordance with : IS 383

Workmanship for Brickwork : IS 2212

WALL AND CEILING FINISHES

IS 383	Specification for Coarse and Fine Aggregates
IS 412	Specification for Expanded Metal Sheets for General Purposes
IS 1542	Specification for Sand for Plaster
IS 1635	Code of Practice for Field Slaking of Building Lime and Preparation of Putty
IS 1661	Code of Practice for the Application of Cement and Cement-lime Plaster Finishes
IS 2394	Code of Practice for the Application of Lime Plaster Finish
IS 2402	Code of Practice for External Rendered Finishes
IS 2645	Specification for Integral Cement Waterproofing Compound

Materials

Cement shall be ordinary Portland cement conforming to IS 269

Lime shall conform to IS 712.

Sand shall conform to IS 1542

Pigments mixed with cement shall conform to IS 2114.

Integral waterproofing compound shall conform to IS 2645.

Expanded metal backgrounds for plastering and/or rendering shall conform to IS 412.

PAINTING

IS 427 Specification for distemper – dry colour

IS 428 Specification for distemper – oil emulsion colour

IS 1477 Code of Practice for painting of ferrous metals in buildings – Parts I and II (Pre-treatment and Painting)

IS 2395 Code of Practice for painting concrete, masonry and plaster surfaces

IS 2932 Specification for enamel synthetic exterior undercoating and finishing

IS 2933 Specification for enamel exterior undercoating and finishing

IS 3140 Code of Practice for painting asbestos cement building products

IS 3537 Specification for reamixed paint, finishing, interior, for general purposes to IS colours

IS 3631 Specification for reamixed paint for finishing interior, alkyd and non-alkyd for general purposes to IS colours

IS 5410 Specification for coloured cement paints

IS 6005 Code of Practice for phosphating iron and steel

IS 6278 Code of Practice for whitewashing and colour washing

Washable oil bound distemper shall conform to IS 428

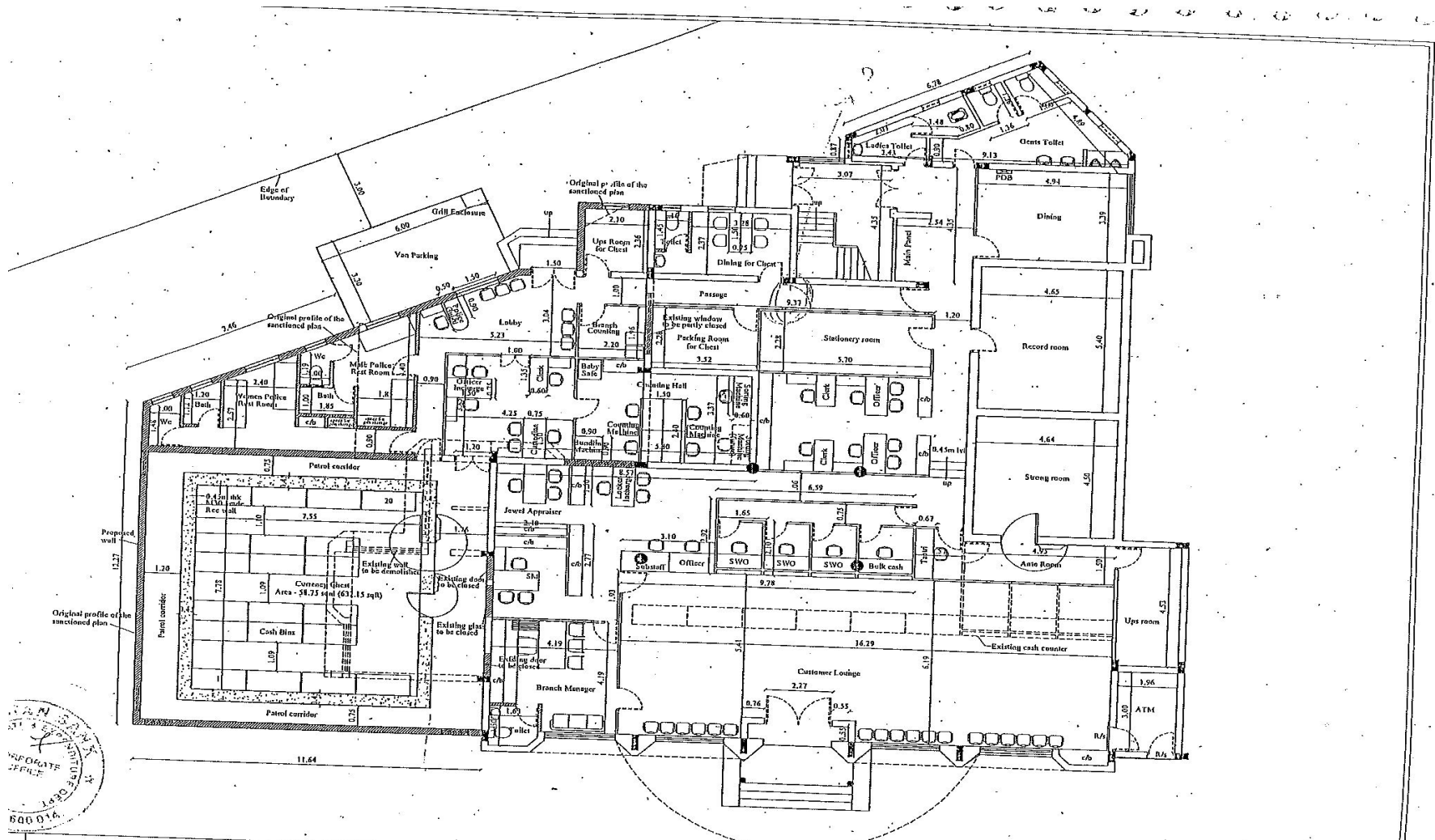
EXTERNAL SANITARY WORKS

IS 651 – 1992 Specification for Salt Glazed stoneware pipes and fittings (fifth revision).

IS 6924 – 1973 Code of practice for construction of refuse chutes in multistoried buildings

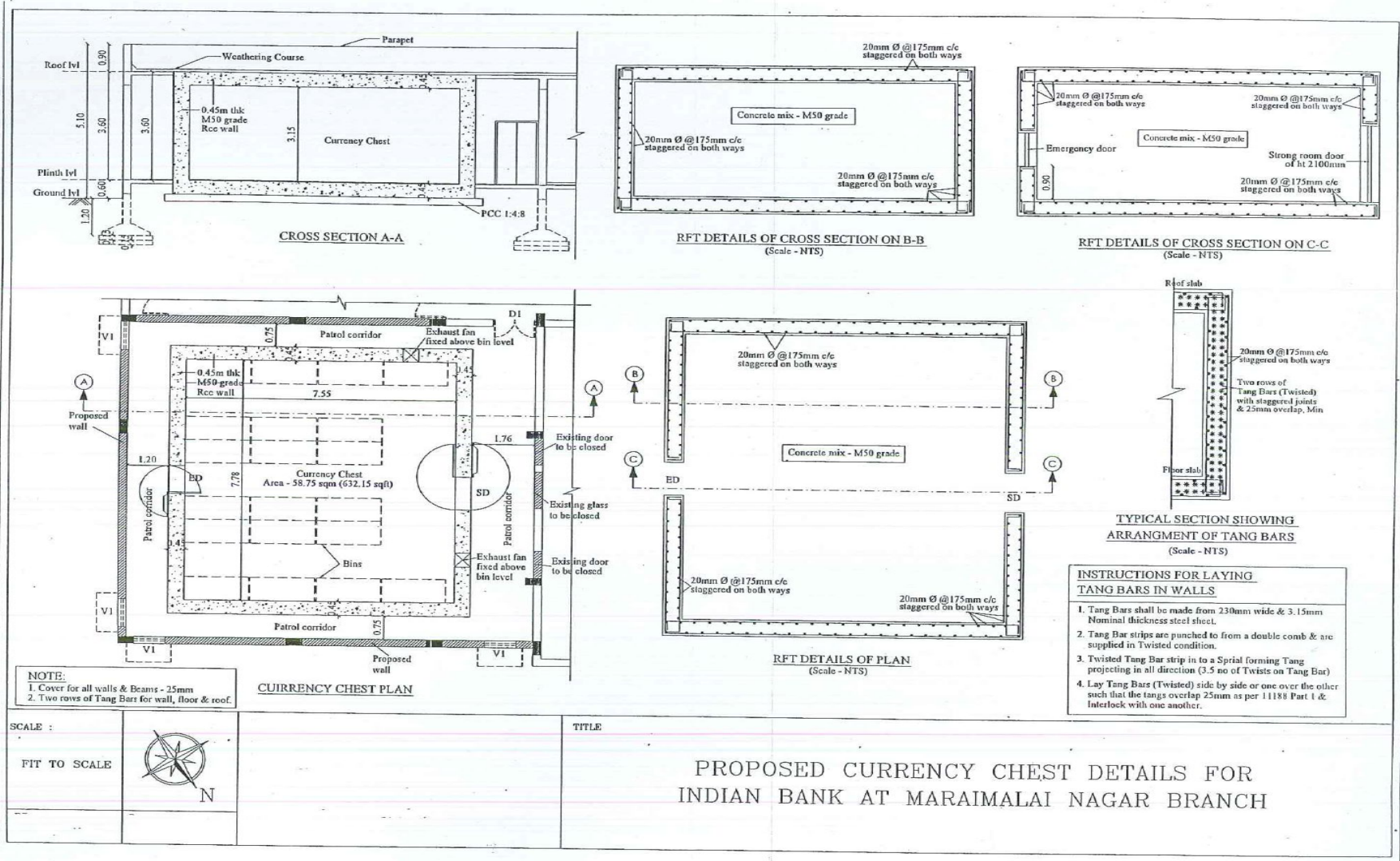
IS 1200 (Part 1) Method of measurement of building earthwork IS 1200 (Part 16) Method Of measurement of laying of water and sewer lines including Appurtenant

IS 1200 (Part 19)	Method of measurement of Water supply, plumbing and drains.
IS 783 – 1959	Code of practice for laying of concrete pipes
IS 13592 –IS 1992	Specification for unplasticized PVC pipes for soil and waste discharge system inside building including ventilation and rainwater.
IS 2527 – 1984	Code of practice for fixing rainwater gutters and down pipes for roof drainage.
IS 458 – 1988	Specification for precast concrete pipes (with or without reinforcement)
IS 782 – 1978	Specification for Caulking Lead.(Third revision)
IS 1172 – 1983	Code of basic requirements for water supply, drainage & sanitation (revised).
IS 1239 – 1990	Specifications for mild steel tube, tubular and other steel pipe (Part I) fittings.
IS 1239 – 1992	Specifications for mild steel tube, tubular and other steel pipe fittings.
IS 1726 – 1991	(Part II) Code for cast iron manhole frame and cover (third revision).
IS 1742 – 1983	Code of practice for building drainage.(Second revision)
IS 2065 – 1983	Code of practice for water supply to buildings.
IS 3114 – 1985	Code of practice for Laying of CI pipes
IS 4111 – 1986	Code of practice for Ancillary structures in sewerage system
IS 1536 – 1976	Specification for centrifugally cast (spun) iron pressure pipes for water, gas and sewage
IS 1537 – 1976	Specification for vertically cast iron pressure pipes for water, gas and sewage

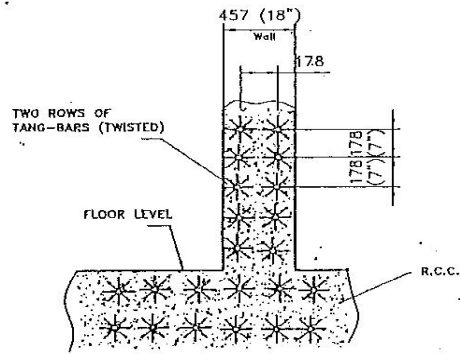


TITLE
PROPOSED INTERIOR LAYOUT OF BRANCH & CURRENCY CHEST FOR INDIAN BANK AT MARAIMALAI NAGAR BRANCH,

INDIAN BANK KANCHEEPURAM



PROPOSED CURRENCY CHEST DETAILS FOR INDIAN BANK AT MARAIMALAI NAGAR BRANCH



SECTIONAL DETAILS OF WALLS (12" & 18" THICK)
SHOWING LAID TANG BARS (TWISTED)

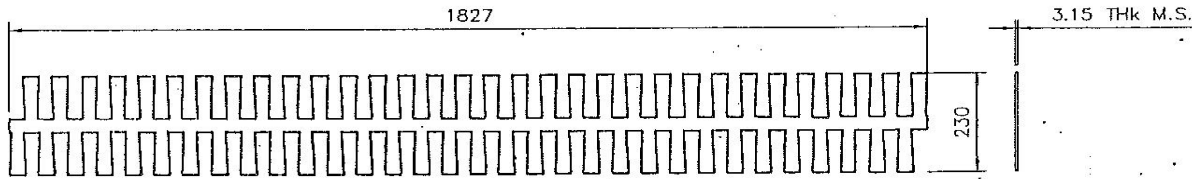
INSTRUCTIONS FOR LAYING TANG-BARS IN WALLS.

1. Tang bar strips are punched to form a double comb and are supplied in untwisted condition.
2. Twist tang bar strip into a spiral forming fang projecting in all direction (3.5 No. of Twists on tang bar.)
3. Lay tang bars (twisted) side by side or one over the other, such that the fangs overlap and interlock with one another.
4. The tang bar are to be laid horizontally in one, two or three rows on 7" centres for 12", 18" or 24" RCC wall respectively.

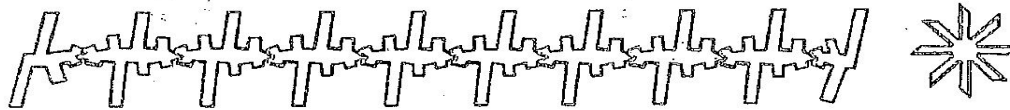
To estimate the quantity of Tang bars to be ordered, consider 3.25 nos. of tang bar per sq. meter area of walls for laying single row of tang bars.

For laying double row : 6.5 nos. of tang bar / meter area.

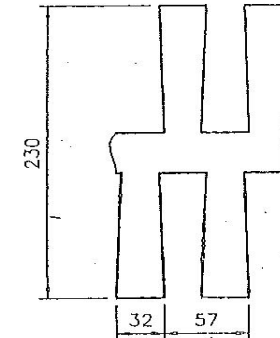
For laying triple row : 9.75 nos. of tang bar / meter area.



TAPERED TANG BAR (UNTWISTED)
AS PER RELEVANT ISO SPECIFICATION
NET WT. :- 6.1KG. (±10%)



TWISTED TANG BAR



ENLARGED VIEW OF TAPERED TANG BAR

DESCRIPTION:

INSTRUCTIONS FOR LAYING TANG BAR.