STATE BANK OF INDIA
LOCAL HEAD OFFICE
GUWAHATI

INVITES ON-LINE TENDERS

THROUGH SBI SERVICE PROVIDER

M/S e-PROCUREMENT TECHNOLOGIES PVT. LTD., AHMEDABAD

TECHNICAL BID (PART-A)

Sl. No.	Description	
(a)	Tender ID	P&E/2025-26/Tender/33
(b)	Tender Name	CIVIL WORK : CONSTRUCTION OF BRANCH BUILDING WITH CURRENCY CHEST AT DAPORIJO, ARUNACHAL PRADESH
(c)	Last date of submission of tender	22.07.2025 up to 02:00 PM

The Contractors/Vendors who are in the list of approved empanelled contractors/vendors finalised in September, 2022 by SBI, Local Head Office, Guwahati (North Eastern Circle) Category- I(Above ₹300.00 Lakh Upto₹500.00 Lakh), for Civil works.

Note: i) Firm should possess valid digital signature for this e-tendering process.

TENDER SUBMITTED BY

NAME :

ADDRESS :

DATE :

ASSISTANT GENERAL MANAGER
Premises & Estate Department
3rd Floor, SBI Guwahati LHO Building,
P.O. Assam Sachivalaya,
Dispur-781006

NOTICE INVITING TENDERS

SBI Local Head Office, Guwahati invites tender in two bid system (Technical and Price bid through online e-tendering) from the Contractors/Vendors who are in the list of approved empanelled contractors/vendors as mentioned in Tender document attached herewith.

1.	Name & location of Work	:	**CIVIL WORK : CONSTRUCTION OF BRANCH BUILDING WITH CURRENCY CHEST AT DAPORIJO, ARUNACHAL PRADESH**
2.	Project Architect	:	**M/S DESIGNERS GUILD** **HOUSE NO. 197, 2ND FLOOR, BIHUTOLI, RAJGARH ROAD, GUWAHATI-781007**
3.	Eligible Contractors	:	**The Contractors/Vendors who are in the list of approved empanelled contractors/vendors finalised in September, 2022 by SBI, Local Head Office, Guwahati (North Eastern Circle) for Category- III (Above ₹100.00 Lakh Upto₹500.00 Lakh), for Civil works.**
4.	Availability of tender documents	:	Tender documents can bedownloaded from the Bank's website www.sbi.co.in under section '**SBI IN THE NEWS'>>>'Procurement news'**.
5.	Technical Bid	:	The following Documents should be submitted in the Technical Bid in a sealed envelope addressed to the "Assistant General Manager", Premises & Estate Department, SBI Local Head Office Building, 3rd Floor, 'A' Block, P.O. Assam Sachivalaya, Dispur, Guwahati-781006, Assam **or** the scanned **copies of the following documents may be e-mailed to**agmpne.lhoguw@sbi.co.inon or **before 22.07.2025 upto 02:00 PM** :- i) **Earnest Money Deposit (EMD)** amounting to **Rs. 3,05,165.00 (Rupees Three Lakh Five thousand One hundred Sixty Five only)**to be deposited to the Bank's A/C No. 10242804581 (Name of the Account: - SBI, LHO, PREMISES & ESTATE Department Misc. Deposit account, maintained at SBI, Dispur Branch, IFSC code-SBIN0003030) and submit the deposit voucher copy as proof of deposit the amount as part of the Technical

			Bid. The Firms registered under Micro, Small and Medium Enterprises (MSME) are exempted from payment of EMD as per criteria mentioned in https://msmeregistration.org/benefits. ii)**<u>The Process Compliance Form as at Annexure-I</u>** Duly filled, signed and stamped by the Bidder as token of acceptance of all the terms & conditions stipulated in this tender. The Bidder, who failed to submit any of the above-mentioned documents, will be disqualified in Technical Bid and will not be allowed to participate in the Price Bid. Moreover, the conditional tenders are liable for rejection and will not be allowed to participate in e-Tendering Process.
6.	Price Bid	:	**The Lowest Bidder will be finalized from the Price Bid submitted by the Contractors through on-line Price Bid**on Item rate system (The details of the tendering process are indicated in "**BUSINESS RULES FOR e-TENDERING". The Details of the events is as under:-** i) Submission of **On-Line Price Bid**: **On 23.07.2025 from 11:00 AM upto 05:00 PM.** Only the bidders who qualified in Technical Bid (***who submitted, EMD and duly filled & signed Process Compliance Form***) will be eligible to participate in the Online Price Bid submission of this e-Tendering Process. The bidder should have valid digital signature for participation in e-Tendering Process.
7.	Opening of Price Bid	:	**23.07.2025** after completion of the time period of e-Tender.
10.	Validity of Tenders	:	For a period of **90 days** from the date of opening of Price Bid.
11.	Initial security deposit (ISD)	:	2% of the awarded value of work including EMD
12.	Retention money		5% (Including EMD+ISD) of the awarded value of work.
13.	Commencement of the work		The date of commencement of the work will be reckoned as the date of handing over site or 15 days

			from the date of issue of Work Order of the tender whichever is later
14.	Time allowed for completion	:	**12 Months**
15.	Deduction of Income Tax and GST	:	A) TDS on Income Tax/GST will be deducted at source as per Govt. Guidelines. B) The contractor should comply with the following; i. Contractor should have GST Registration Number ii. Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provision iii. In case of Correction in the bills after scrutiny, contractor should submit fresh invoice for payment iv. Contractor should timely file his GST return in accordance with GST provisions to enable the bank to claim the credit of GST paid to the contractor.
16.	Terms & mode of payment	:	**i) No advance is payable.** ii) Value of Interim Certificate: Rs. 50.00 Lac iii) Security deposit and statutory deductions will be made as applicable. iv) The contractor should furnish details of the Bank, A/c no, IFSC code etc.
17.	Liquidated Damages	:	If the bidder is not able to complete the work within the stipulated completion period as per tender, liquidated Damages will be imposed at the rate of 0.5% of the contract value per week subject to a maximum of 5% of the contract value.
18.	Defects Liability Period	:	**12 Months** (Twelve months) from the date of completion of the work and handing over to the Bank.
19.	Contact details for any clarification	:	Premises & Estate Department ,3rd Floor, SBI, LHO Building, Guwahati, Dispur-**781006,**
20.	Contact details for any e-Tender	:	**Service provider:** M/s e-Procurement Technologies Ltd.

	related queries		(Procure Tiger)A- 201, Wall Street - II, Opp. Orient Club, Nr. Gujarat College, Ahmedabad - 380 006. Gujarat State, India Tel.:- PH. NOS. : +91 79-68136800/43/89/7859800617/ 7859800624, You are requested to contract the agency for further guidance on e-tendering process.
21.	Any additional Information	:	The estimated rates as per the Break-up Of Quantities (BOQ) uploaded in this tender are inclusive of materials, labour, wages, fixtures, transportation, installation, all taxes & charges , cost of the insurances as specified in the tender, cost towards testing of materials supplied, wastages, Octroi, machinery, temporary works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work. However, **GST on work contract will be extra as applicable.**
22.	**Additional Security Deposit (ASD) / Additional Performance Guarantee (APG):**		**Additional security deposit (ASD)/ Additional performance Guarantee (APG) shall be applicable if the bid price is below 10 % of the estimated cost put for tender. The amount of such ASD/AGP shall be the difference between 90 % of estimated cost put for tender and the quoted price.** **The ASD/AGP shall cover defect liability period of 12 months from virtual completion of work and in the from a schedule commercial bank other than SBI or to be deposited in the Bank's A/C No. 10242804581 (Name of the Account :- SBI, LHO, PREMISES & ESTATE Department Misc. Deposit account, maintained at SBI, Dispur Branch, IFSC code-SBIN0003030) in addition to the normal security deposit of 2% of quoted amount which will be released after defect liability period is over subjected to satisfactory performance without any interest.**
23.	**Notes:**		
a)	All Bidders are informed that, price bidding for the work will be through e-tendering method. The bill of quantity of tender i.e. **"Price Bid"** is to be submitted online on e-tendering portal.		

	Orders will be placed on the basis of closing price by bidders in the "Price Bid".
b)	The Bidders are expected to examine all instructions, forms, terms and specifications in the tender documents. Failure to furnish all information required as per the Tender Documents or submission of bids not substantially responsive to the Tender Documents in every respect will be at the Bidders risk and shall result in rejection of the Tender.
c)	In case the date of submission of Tender Processing Fee, EMD, and Online Price Bid is declared as a holiday, the respective date will be considered on the next working day at the same time. The bidder, who is the authorized representative and participating on behalf of company/ Dealer/vendor, should have a valid digital signature certificate (DSC) for this tender.
d)	SBI reserves the right to cancel or postpone or modify the tenders at any stage without assigning any reason.
e)	The Bidders are strongly advised to visit the site before submitting their Price Bid to make the work complete in all respects within the stipulated completion time.
f)	Corrigendum: (If any) is to be followed as published in https://etender.sbi/ portal.
	(For and on behalf of State Bank of India) **M/S DESIGNERS GUILD** **HOUSE NO. 197, 2ND FLOOR, BIHUTOLI,** **RAJGARH ROAD, GUWAHATI-781007**

P&E/2025-26/Tender/33 dated 07.07.2025

BUSINESS RULES FOR e-TENDERING

NAME OF WORK/PROJECT : CIVIL WORK : CONSTRUCTION OF BRANCH BUILDING WITH CURRENCY CHEST AT DAPORIJO, ARUNACHAL PRADESH

BUYER NAME	State Bank of India, LHO Guwahati.
TENDERING TO BE CONDUCTED BY	SBI Service Provider: M/s e-Procurement Technologies Ltd. (Procure Tiger) A- 201, Wall Street - II, Opp. Orient Club, Nr. Gujarat College, Ahmedabad - 380 006. Gujarat State, India. Tel.:- PH. NOS. : +91 79-68136800/43/89/7859800617/ 7859800624.
DATE & TIME OF ON-LINE PRICE BID	**23.07.2025 from 11:00 AM to 05:00 PM.** in e-Tendering Website: https://etender.sbi/
DOCUMENTS ATTACHED	i) Notice Inviting Tenders (NIT) ii) Business rule for finalization of tender iii) Terms & conditions of e-tendering iv) Process Compliance Statement (Annexure I) v) TERMS & CONDITIONS OF THE CONTRACT vi) SPECIAL CONDITIONS OF THE CONTRACT vii) Bid Confirmation (Annexure –II) ix) BOQ- Break-up-of Quantity (Annexure-III) x) Contact Information

Type of On-line Price Bid: -

The On-line Price Bid e-tendering will be conducted on the basis of "**Item Rate System**" by adopting the following broad process flow as under: -

1. For the proposed e-tendering process, already empanelled vendors for the said purpose who fulfill all terms and conditions including deposit of Earnest money amount only shall be eligible to participate.
2. SBI will engage the services of a service provider who will provide all necessary training and assistance before commencement of online bidding on Internet.
3. SBI will inform the service provider to enable them to contact and get trained.
4. Business rules like event date, time, etc. also will be communicated through service provider for compliance.

5. Vendors have toe-mail the compliance form in the prescribed format (provided by service provider) before start of e-tendering process. Without this the vendor will not be eligible to participate in the event.
6. E-tendering process will be conducted on schedule date & time.
7. The lowest bidder has toe-mail the duly signed filled-in prescribed format as provided on case-to-case basis to SBI through service provider within 24 hours of completion of tendering without fail.
8. Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vender to conduct business with SBI as per prevailing procedure.

Procedure of "E-TENDERING PROCESS" :-

9. For the proposed e-Tendering Process, already empanelled vendors for the said purpose who qualified in Technical Bids only shall be eligible to participate.
10. SBI will engage the services of a service provider **M/s e-Procurement Technologies Pvt. Ltd, Ahmedabad (ETL)**who will provide all necessary training and assistance before commencement of online bidding on Internet.
11. SBI will inform the vendor in writing, the details of service provider to enable them to contact and get trained.
12. Business rules, tender details, event date, time etc. will be communicated through service provider for compliance in addition to uploading the same in Bank's website.
13. Bidders have to send the duly signed Process compliance form in the prescribed format (provided by service provider), On-line Payment details for Tender Fee and Earnest Money Deposit within the stipulated date & Time as Technical Bid, failing which, the vendor/contractor will not be eligible to participate in the price bid event.
14. E-Tendering Process will be conducted on schedule date & time.
15. The lowest bidder has to send e-mail the duly signed filled-in prescribed formats as provided on case-to-case basis to SBI within 24 hours of completion of E-Tendering without fail.
16. Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vender to conduct business with SBI as per prevailing procedure.

Terms & Conditions of E-Tendering Process

1. LOG IN NAME & PASSWORD: Each Bidder is assigned a Unique Username& Password by ETL. The Bidders are requested to change the Password after the receipt of initial Password from ETL. All bids made from the Login ID given to the bidder will be deemed to have been made by the bidder.

2. BIDS PLACED BY BIDDER: The bid of the bidder will be taken to be an offer to execute the work. Bids once made by the bidder cannot be cancelled. The bidder is bound to execute the work as mentioned above at the price that they bid. Should any bidder back out and not executed the work, SBI and / or ETL shall take action as appropriate.

3. E-TENDERING TYPE: Online Sealed Price Bid.

4. E-TENDERING WINNER: At the end of the Price Bid, who quoted the lowest Grand Total Price (L1 Price) as mentioned above in "**Type of On-line Price Bid**" will be the winner.

5. GENERAL TERMS & CONDITIONS: Bidders are required to read the "Terms and Conditions" section of the e-Tendering site using the Login Ids and passwords given to them.

6. OTHER TERMS & CONDITIONS:

- The Bidder shall not involve himself or any of his representatives in Price manipulation of any kind directly or indirectly by communicating with other bidders.
- The Bidder shall not divulge either his Bids or any other exclusive details of SBI to any other party.
- SBI's decision on award of Contract shall be final and binding on all the Bidders.
- SBI along with ETL can decide to extend, reschedule or cancel any E-Tender. Any changes made by SBI and / or ETL, after the first posting will have to be accepted if the Bidder continues to access the site after that time.
- ETL shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause.
- ETL is not responsible for any damages, including consequential damages, including but not limited to systems problems, inability to use the system, loss of electronic information etc.

N.B

- **All the bidders are requested to ensure that they have a valid digital signature certificate well in advance to participate in the online event.**

Annexure- I

Process Compliance Form

(The bidders are required to print this on their company's letter head and sign, stamp and send the scanned copy to Premises & Estate Department, LHO Guwahati through e-mail)

To Date:

e-Procurement Technologies Ltd. (Procure Tiger)
A-201-208, Wall Street-II, Opp. Orient Club,
Nr. Gujarat College, Ahmedabad-380 006,
Gujarat, India.
Tel: (079) 40016837 / 835
Fax: (079) 40016876

Sub: Agreement to the Process related Terms and Conditions for the e-Tendering works

Dear Sir,

This has reference to the Terms & Conditions for "**CIVIL WORK : CONSTRUCTION OF BRANCH BUILDING WITH CURRENCY CHEST AT DAPORIJO, ARUNACHAL PRADESH**

This letter is to confirm that:

1. The undersigned is authorized representative of the company.
2. We have studied the all the terms & conditions specified in the tender, Commercial Terms and the Business rules governing the e-Tendering Process and the RFP as mentioned in your letter and confirm our agreement to them.
3. We also confirm that we have taken the training on the E-Tendering tool and have understood the functionality of the same thoroughly.
4. We confirm that SBI and ETL shall not be liable & responsible in any manner whatsoever for my/our failure to access & bid on the e-Tendering platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the E-Tendering event.
5. We also confirm that we have a valid digital certificate issued by a valid Certifying Authority.
6. We also confirm that we will send the e-mail the price confirmation of our quoted price as per Annexure II and the format as requested by SBI/ ETL.
7. We, hereby confirm that we will honour the Bids placed by us during the e-Tendering process.
8. **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, General Conditions of Contract, Special Conditions of Contract, Technical Specifications and understood the same and on the basis of the same I/We will quote our price in the E-Tendering.**

With regards
Signature with company seal
Date:
Name:
Company / Organization:
Designation within Company / Organization:
Address of Company / Organization:
Scan it and sent this document on agmpne.lhoguw@sbi.co.in

TERMS & CONDITIONS OF THE CONTRACT

GENERAL INSTRUCTIONS TO THE TENDERERS

1.0 Scope of Work

Tenders are invited by State Bank of India for **CIVIL WORK : CONSTRUCTION OF BRANCH BUILDING WITH CURRENCY CHEST AT DAPORIJO, ARUNACHAL PRADESH**

1.1 Site and Its Location: The proposed work is to be carried out at Daporijo, Arunachal Pradesh.

2.0 Tender Documents

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

a) Instructions to tenderers
b) General Conditions of Contract
c) Special Conditions of Contract
d) Technical Specifications
e) Drawings
f) Price Bid

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

a) Price Bid
b) Drawings
c) Technical Specifications
d) Special Conditions of Contract
e) General Conditions of Contract
f) Instructions to Tenderer

2.3 The tender documents are not transferable.

3.0 Site Visit

The tenderer must obtain himself on his own responsibility and his own expenses all information and data which may be required for the purpose of filling this tender document and enter into a contract for the satisfactory performance of the work. The tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character quality and quantity of the materials, labour, the law and order situation, climatic conditions local authorities requirement, traffic regulations etc.

The tenderer will be fully responsible for considering the financial effect of any or all the factors while submitting his tender.

4.0 Earnest Money Deposit(EMD):

The tenderers are requested to submit the Earnest Money Deposit as specified to the Bank's A/C No. 10242804581 (Name of the Account :- SBI, LHO, PREMISES & ESTATE Department Misc. Deposit account, maintained at SBI, Dispur Branch, IFSC code-SBIN0003030). No tender shall be considered unless the EMD is so deposited in the required form. No interest shall be paid on this EMD

5.0 Initial Security Deposit(ISD) :

The successful tenderer will have to submit a sum equivalent to 2% of contract value to be deposited to A/C No. 10242804581 (SBI, LHO, PREMISES & ESTATE Department Misc. Deposit account) maintained at SBI, Dispur Branch (IFSC code-SBIN0003030) through Bank draft or Bankers Cheque in favour of The Assistant General Manager(premises & Estate) within a period of 15 days of acceptance of tender.

6.0 Security Deposit:

6.1 Total security deposit shall be 5% of contract value. Out of this 2% of contract value is in the form of initial security deposit. Balance 1% shall be deducted from the running account bill of the work at the rate of 10% of the respective running account bill i.e. deduction from each running bill account will be 10% till total 5% of contract value is reached. 50% of the total security shall be paid to the contractors without interest on the basis of certifying the virtual completion. The balance 50% would be paid to the contractors without interest within 15 days after the end of the defect liability period provided the contractor has satisfactorily attended to all defects in accordance with the conditions of contract including site clearance

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

7.0 Signing of Contract Documents

The successful tenderer shall be bound to implement the contract by signing an agreement and conditions of contract (draft agreement attached herewith) within 7 days from the receipt of intimation of acceptance of his tender by SBI. However, the written acceptance of the tender by the Bank will constitute a binding agreement between SBI and successful tenderer whether such formal agreement is subsequently entered into or not.

8.0 Completion Period

Time is essence of the contract. The work should be completed in all respects in accordance with the terms of contract within a period of **12 months** from the date of handing over site or 15 days from the date of issue of letter of acceptance of Bank whichever is later.

9.0 Validity of Tender

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

10.0 Liquidated Damages

The liquidated damages shall be 0.5% of the accepted tendered cost per week subject to a maximum of 5% of contract value.

11.0 Tendered Rates and Prices

11.1 The tenderers shall quote their rates for individual items through online submission in the Price Bid as per the attached BOQ of this tender. The rate quoted shall be firm and shall include all costs of labour, material, allowances, taxes if any (other than GST) as may be applicable. No extra claims/PVA by any means due to increase rates etc. will be entertained. Bank will only pay GST in addition to quoted rates.

11.2 Rates as bid in the "Price Bid" will be the basis of final order placement.

P&E/2025-26/Tender/33 dated 07.07.2025

Form of Tender

To
ASSISTANT GENERAL MANAGER
PREMISES & ESTATE DEPARTMENT
3rd Floor, SBI Guwahati LHO Building,
P.O. Assam Sachivalaya,
Dispur-781006.

Dear Sir,

Re: CIVIL WORK : CONSTRUCTION OF BRANCH BUILDING WITH CURRENCY CHEST AT DAPORIJO, ARUNACHAL PRADESH"

1. I/We refer to the tender notice issued by the Bank for above work at CAPTIONED SITE in connection with the above.
2. I/We do hereby offer to perform, provide, execute, complete and maintain the works in conformity with the drawings, conditions of contract, specifications, percentage offered price in the bill of quantities applicable for all the items uniformly.

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

a) Abide by and fulfil all the terms and provisions of the said conditions annexed hereto.
b) Complete the works within 30days as stipulated in two or three shifts if considered necessary by the Bank/Consultant at no extra cost to the Bank.

4. I/We have deposited the Earnest money deposit in the specified A/Cs and also submitted Process Compliance form confirming our acceptance of all the tender terms & conditions stipulated in the tender. I/We note, the Earnest Money Deposit will not bear any interest and is liable for forfeiture:

i) If our offer is withdrawn within the validity period of acceptance.
Or
ii) If the Contract is not executed within 10 days from the date of receipt of the letter of acceptance.
Or
iii) If the work is not commenced within 10 days after issue of work order or handing over of site whichever is later.

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

6. Name of Partners/Directors of our Firm :

i)
ii)
iii)

Yours faithfully

Signature:
Designation:

Name of Partner/Director of the firm authorized to Sign or Name of person having power of attorney to sign the contract (Certified true copy of Power of Attorney should be attached)

Signature and address of witness

a) Signature:
Name:
Address:
b) Signature:
Name:

Address:

ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT made the……day of …….. between the State Bank of India, a Corporation constitute under the State Bank of India Act, 1955 and having its LHO at Dispur, Guwahati and many other places (hereinafter referred to as "the OWNER").

AND M/s……..……..having its registered office at ……(hereinafter referred to as the 'Contractor' of the OTHER PART.

WHEREAS the Owner is desirous of executing ……work at…….. (hereinafter called the 'works')

AND WHEREAS the owner has caused the plans, drawings and specifications, price schedule of quantities of the work to be executed at the SBI …….. as per conditions of the contract and special conditions prepared subject to which the offer of the Contractor shall be accepted.

AND WHEREAS the Contractor has deposited with the owner Rupees……..……
as security deposit for the due performance of the agreement AND WHEREAS the Owner issued work order therefore to the contractor.

AND WHEREAS said drawings……..inclusive of the specifications, priced schedule of quantities, condition of contract and special conditions (hereinafter collectively referred to as the said condition) have been signed by the parties hereto and the contractor has agreed to execute the works upon and subject to the said conditions.

Agreed to execute upon and subject to the conditions set forth herein and Schedule of Items and quantities general conditions of contract, Specification and all correspondences exchanged by or between the parties from the submission of tender till the award of work, both letter inclusive, (all of which are collectively hereinafter referred to as "the said condition") the work shown upon the said drawings and/ or described in the said specification and included in the schedule of items and quantities at the respective rates therein at of such other sum as shall become payable there under (Hereinafter referred to as "the said contract amount").

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the payment to be made to the contractor as hereinafter provided the contractor shall upon and subject to the said conditions executed the completed the works shown upon the said drawings etc. and such further detailed drawings as may be furnished to the contractor by the said owner through the Architect(if engaged) as described in the said specifications and the said priced schedule of quantities.
2. The owner will pay to the contractor the sum of Rs……(Rupees…… ……), hereinafter call the contract sum or such other sum as shall become payable hereunder at the times and in the manner specified in the said condition. However, the actual sum will be paid on the actual value of work done, irrespective of the contract sum.

3. The plans, agreement and documents above mentioned shall form the basis of this contract and all disputes to be decided in the manner prescribed in the conditions attached hereto.

4. The said contract comprises the Construction of ..... works as above mentioned, and shall subsidiary works connected therewith within the same site as may be ordered to be done from time to time by the said Owner even through said works may not be shown on the drawings or described in the said specifications or the priced schedule of quantities.

5. Notwithstanding what are stated in the special condition, conditions, of contract and hereinafter stated the owner reserves to himself the right to alter the drawings and nature of the work and of adding to or omitting any items of works from or of having portions of the same carried out departmentally or otherwise and such alternations or variations shall be carried out without prejudice to this contact.

6. The said condition shall be read and be treated as forming part of this Agreement, and the parties hereto will respectively be bound thereby and to abide by and submit themselves to the conditions and perform the same on their part to be respectively observed and preferred.

7. Any dispute arising under this Agreement shall be referred to the arbitration of a sole arbitrator appointed with consent of the Owner and the contractor as indicated in the Article of the general conditions. The award of the arbitrator shall be final and binding on both parties.

IN WITNESS WHEREOF, the parties hereto have executed these presents the day and year first hereinabove written

WITNESS	EXECUTANTS
1.	1. OWNER
2.	2. CONTRACTOR
	Common Seal

In case of the company, the common seal be affixed pursuant to resolution of Board of Directors in accordance with Articles of Association of the Company the director etc. as the case may be affixing common seal may be initial in token thereof and also by putting their names.

GENERAL CONDITIONS OF CONTRACT

1.0 Definitions

"Contract" means the documents forming the tender and the acceptance thereof and the formal agreement executed between State Bank of India (Client) and the contractor, together with the documents referred therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Bank and all these documents taken together shall be deemed to form one contract and shall be complementary to one another.

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

1.2 "Employer" shall mean State Bank of India (client) having its Corporate Centre at State Bank Bhavan, Madame Cama Road, Mumbai 400 021 and includes the client's representatives, successors and assigns.

1.3 'Architects/Consultants' shall mean M/s Designers Guild, House No. 197, Bihutoli, Rajgarh Road, Guwahatl, 781007, Assam

1.4 'Site Engineer' shall mean an Engineer (***if appointed***) by the Bank as their representative to give instructions to the contractors.

1.5 'The Contractor' shall mean the ----------(name of the contractor) undertaking the works and shall include legal personal representative of such individual or the composing the firm or company and the permitted assignees of such individual or firms of company.

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

1.7 'Engineer' shall mean the representative of the Architect/Consultant.

1.8 ''Drawings' shall mean the drawings prepared by the Architects and issued by the Engineer and referred to in the specifications and any modifications of such drawings as may be issued by the Engineer from time to time 'Contract value shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions there too reductions there from as may be made under the provision herein after contained'

1.9 'Specifications' shall mean the specifications referred to in the tender and any modifications thereof as may time to time be furnished or approved by the employer.

1.10"Month" means calendar month.

1.11"Week" means seven consecutive days.

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

CLAUSE

1.0 Total Security Deposit:

Total Security deposit comprise of:

- Earnest Money Deposit
- Initial Security Deposit
- Retention Money

a. **Earnest Money Deposit:** The tenderer shall furnish EMD to be deposited to the Bank's A/C No. 10242804581 (Name of the Account:- SBI, LHO, PREMISES & ESTATE Department Misc. Deposit account, maintained at SBI, Dispur Branch, IFSC code-SBIN0003030).No tender shall be considered unless the EMD is so deposited in the required form. No interest shall be paid on this EMD. The EMD of the unsuccessful tenderer shall be refunded soon after the decision toward the contract is taken without interest. The EMD shall stand absolutely forfeited if the tenderer revokes his tender at any time during the period when he is required to keep his tender open acceptance by the SBI or after it is accepted by the SBI the contractor falls to enter in to a formal agreement or fails to pay the initial security deposit as stipulated or fails to commence the work within the stipulated time.

b. **Initial Security Deposit (ISD):** The amount of ISD shall be 2% of accepted value of tender including the EMD. Balance of ISD (i.e. excluding EMD) to be deposited to A/C No. 10242804581 (SBI, LHO, PREMISES & ESTATE Department Misc. Deposit account) maintained at SBI, Dispur Branch (IFSC code-SBIN0003030) through Bank draft or Bankers Cheque in favour of The Assistant General Manager (premises & Estate) within a period of 15 days of acceptance of tender.

c. **Retention Money:** Besides the ISD as deposited by the contractor in the above said manner the retention money shall be deducted from the running account bill at the rate of 10% of the gross value of work done by the contractor and claimed in each bill provided the total security deposit i.e. the ISD plus Retention Money shall both together not exceed 5% of the contract value. 50% of the total security deposit shall be refunded to the contractor without any interest on issue of Virtual Completion certificate by the Architect/consultant. The balance 50% of the total security deposit shall be refunded to the contractors without interest within fifteen days after the end of defects liability period provided the contractor has satisfactorily attended to all defects in accordance with the conditions of contract including site clearance.

2.0 Language

The language in which the contract documents shall be drawn shall be in English. All communications by employer & Contractor will be in English

3.0 Errors, Omissions and Discrepancies

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

i) Between scaled and written dimension (or description) on a drawing, the latter shall be adopted.

ii) Between the written or shown description or dimensions in the drawings and the corresponding one in the specification the former shall be taken as correct.

iii) Between written description of the item in the specifications and descriptions in bills of quantities of the same item, the latter shall be adopted.

iv) In case of difference between rates written in figures and words, the rate in words shall prevail.

v) Between the duplicate/subsequent copies of the tender, the original tender shall be taken as correct.

4.0 Scope of Work

The contractor shall carry out, complete and maintain the said work in every respect strictly in accordance with this contract and with the directions of and to the satisfaction of the Bank to be communicated through the architect/consultant. The architect/consultant at the directions of the Bank from time to time issue further drawings and/or written instructions, details directions and explanations which are hereafter collectively referred to as Architect's/Consultant's instructions in regard to : the variation or modification of the design, quality or quantity of work or the addition or omission or substitution of any work, any discrepancy in the drawings or between the BOQ and/or drawings and/or specifications, the removal from the site of any material brought thereon by the contractor and the substitution of any other materials thereof, the demolition, removal and/or re-execution of any work executed by him, the dismissal from the work of any person employed/engaged thereupon.

5.0 (i) Letter of Acceptance

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

5.0 (ii) Contract Agreement:

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

6.0 Ownership of drawings:

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

7.0 Detailed drawings and instructions:

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

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

Copies of Agreement

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

8.0 Liquidated Damages

If the contractor fails to maintain the required progress in terms of clause 30 of GCC orto complete the work and clear the site including vacating their office on or before the contracted or extended date or completion without justification in support of the cause of delay, he may be called upon without prejudice to any other right of remedy available under the law to the SBI on account of such breach to pay a liquidated damages at the rate of 0.5% of the contract value per week subject to a maximum of 5% of the contract value.

9.0 Materials, Appliances and Employees

Unless or otherwise specified the contractor shall provide and pay for all materials, labour, water, power, tools, equipment transportation and any other facilities that are required for the satisfactory execution and completion of the work. Unless or otherwise specified all materials shall be new and both

workmanship and materials shall be best quality. The contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the work any unfit person or any one not skilled in the work assigned to him. Workman whose work or behaviour is found to be unsatisfactory by the SBI/ architect/ consultant he shall be removed from the site immediately.

10.0 Permits, Laws and Regulations

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

11.0 Setting out Work

The contractor shall set out the work and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions, and alignment of all parts thereof and get it approved by the bank before proceeding with the work. If at any time any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout had been approved by the bank the contractor shall be responsible for the same and shall at his own expenses rectify such error, if so, required to satisfaction of the SBI.

12.0 Protection of works and property

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

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protections of his employees on the work and shall comply with all applicable provisions of Govt. and local bodies safety laws and building codes to prevent accidents, or injuries to persons or property on, about or adjacent to his place of work. The contractor shall take insurance covers as per clause 25.0 at his own cost. The policy may be taken in joint names of the contractor and the SBI and the original policy may be lodged with the SBI.

13.0 Inspection of work:

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

14.0 Assignment and subletting

The whole of work included in the contract shall be executed by the contractor and he shall not directly entrust and engage or indirectly transfer assign or underlet the contract or any part or share thereof or interest therein without the written consent of the Employer and no undertaking shall relieve the contractor from the responsibility of the contractor from active superintendence of the work during its progress.

15.0 Quality of Materials, Workmanship & Test

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

ii) Samples: All samples of adequate number, size, shades & pattern as per specifications shall be supplied by the contractor without any extra charges. If certain items proposed to be used are of such nature the samples cannot be presented or prepared at the site detailed literature/ test certificate of the same shall be provided to the satisfaction of the Architect/consultant. Before submitting the sample/literature the contractor shall satisfy himself that the material/ equipment for which he is submitting the sample/ literature meet with the requirement of tender satisfaction. Only when the samples are approved in writing by the Architect/consultant the contractor shall proceed with the procurement and installation of the particular material/equipment. The approved samples shall be sign by the Architect/ consultant for identification and shall be kept on record at site office until the completion of the work for inspection/ comparison at any time. The Architect/consultant shall take reasonable time to approve the sample. Any delay that might occur in approving the samples for reasons of its not meeting the specifications or other discrepancies inadequacy in furnishing samples of best qualities from various manufacturers and such other aspects causing delay on the approval of the materials/ equipment etc. shall be to the account of the contractor.

iii) Cost of tests:

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

iv) Cost of test not provided for

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

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

16.0 Obtaining Information related to execution of work

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

17.0 Contractor's superintendence

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

18.0 Quantities

i) The bill of quantities (BOQ) unless or otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurements and quantities. The rate quoted shall remain valid for variation of quantity against individual item to any extent subject to maximum variation of the contract value by 25%. The entire amount paid under Clause 20 hereof as well as amounts of prime cost and provisional sums, if any, shall be excluded.

ii) Variation exceeding 25%: The items of work executed in relation to variation exceeding 25% shall be paid on the basis of provisions of clause 21(e) hereof.

19.0 Works to be measured

The Architect/Consultant may from time to time intimate to the contractor that he required the work to be measured and the contractor shall forthwith attend or send a qualified representative to assist the Architect in taking such measurements and calculation and to furnish all particulars or to give all assistance required by any of them. Such measurements shall be taken in accordance with the Mode of measurements detailed in the specifications. The representative of the Architect/Consultant shall take joint measurements with the contractor's representative and the measurements shall be entered in the measurement book. The contractor or his authorized representative shall sign all the pages of the measurement book in which the measurements have been recorded in token of his acceptance. All the corrections shall be duly attested by both representatives. No over writings shall be made in the M book. Should the contractor not attend or neglect or omit to depute his representative to take measurements then the measurements recorded by the representative of the Architect/consultant shall be final. All authorized extra work, omissions and all variations made shall be included in such measurements.

20.0 Variations

No alteration, omission or variation ordered in writing by the Architect/Consultant shall vitiate the contract.

In case the SBI/Architect/Consultant thinks proper at any time during the progress of works to make any alteration in, or additions to or omission from the works or any alteration in the kind or quality of the materials to be used therein, the Architect/Consultant shall give notice thereof in writing to the contractor or shall confirm in writing within seven days of giving such oral instructions the contractor shall alter to, add to, or omit from as the case may be in accordance with such notice but the contractor shall not do any work extra to or make any alteration or additions to or omissions from the works or any deviation from any of the provisions of the contract, stipulations, specifications or contract drawings without previous consent in writing of the Architect/Consultant and the value of such extras, alterations, additions or omissions shall in all cases be determined by the Architect/Consultant and the same shall be added to or deducted from the contract value, as the case may be.

21.0 Valuation of Variations

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

a) i) The net rates or prices in the contract shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced herein.

ii) Rates for all items, wherever possible should be derived out of the rates given in the priced BOQ.

b)The net prices of the original tender shall determine the value of the items omitted, provided if omissions do not vary the conditions under which any remaining items of works are carried out, otherwise the prices for the same shall be valued under sub clause (c) hereunder.

c)Where the extra works are not of similar character and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items or works are carried out, then the contractor shall within 7 days of the receipt of the letter of acceptance inform the Architect/Consultant of the rate which he intends to charge for such items of work, duly supported by analysis of the rate or rates claimed and the Architect/Consultant shall fix such rate or prices as in the circumstances in his opinion are reasonable and proper, based on the market rate.

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

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

22.0 Final Measurement

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

23.0 Virtual Completion Certificate (VCC)

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

a) Clear the site of all scaffolding, wiring, pipes, surplus materials, contractor's labour, equipment and machinery.

b) Demolish, dismantle and remove the contractor's site office, temporary works, structures including labor sheds/camps and constructions and other items and things whatsoever brought upon or erected at the site or any land allotted to the contractor by the SBI and not incorporated in the permanent works.

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

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

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

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

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

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

24.0 Work by other agencies

The SBI/ Architect consultant reserves the rights to use premises and any portion of the site for execution of any work not included in the scope of this contract which it may desire to have carried out by other persons simultaneously and the contractor shall not allow but also extend reasonable facilities for the

execution of such work. The contractor however shall not be provided any plant or material for the execution of such work except by special arrangement with the SBI. Such work shall be carried out in such manner as not to impede the progress of the works included in the contract.

25.0 Insurance of Works

Contractor will have to obtain the following insurance covers for the full tenure of the work to cover risks detailed in the following pares/clauses:

i) Contractor's All Risk Policy including third party compensation as detailed below.

ii) Workmen Compensation Policy.

25.1 Without limiting his obligations and responsibilities under the contract the contractor shall insure in the joint names of the SBI and the contractor against all loss or damages from whatever cause arising other than the excepted risks, for which he is responsible under the terms of contract and in such a manner that the SBI and contractor are covered for the period stipulated in clause 28 of GCC and are also covered during the period of maintenance for loss or damage arising from a cause, occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the contractor in the course of any operations carried out by him for the purpose of complying with his obligations under clause.

a)The works for the time being executed to the estimated current Contract value thereof, or such additional sum as may be specified together with the materials for incorporation in the works at their replacement value.

b)The constructional plant and other things brought on to the site by the contractor to the replacement value of such constructional plant and other things.

c)Such insurance shall be effected with an insurer and in terms approved by the SBI which approval shall not be unreasonably withheld and the contractor shall whenever required produce to the Architect/Consultant the policy of insurance and the receipts for payment of the current premiums.

25.2 Damage to persons and property:

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

a) The permanent use or occupation of land by or any part thereof.

b)The right of SBI to execute the works or any part thereof, on, over, under, in or through any lands.

c)Injuries or damages to persons or properties which are unavoidable result of the execution or maintenance of the works in accordance with the contract.

d)Injuries or damage to persons or property resulting from any act or neglect of the SBI, their agents, employees or other contractors not being employed by the contractor or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the SBI, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

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

25.4 Contractor's superintendence
The contractor shall fully indemnify and keep indemnified the SBI against any action, claim, or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claim made under or action brought against SBI in respect of such matters as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expenses to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the SBI if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Architect/Consultant in this behalf.

25.5 Third Party Insurance

25.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 26.0 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of SBI, or to any person, including any employee of the SBI, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the matters referred to in the provision to clause 26.0 thereof.

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

25.6 The minimum insurance cover for physical property, injury, and death is Rs.5.0 lacs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessary to make insurance valid for four occurrences always.

25.7 Accident or Injury to Workmen

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

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

25.7.3 Remedy on Contractor's failure to insure:

If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case the SBI may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the SBI as aforesaid and also deduct 15% of contract value from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

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

26.0 Commencement of Works

The date of commencement of the work will be reckoned as the recorded date of handing over site by the SBI or 15 days from the date of issue of Letter of Acceptance of Bank, whichever is later

27.0 Time for completion

Time is the essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period of 12 months from the date of commencement. If required in the contract or as directed by the Architect/Consultant, the contractor shall complete certain portions of work before completion of the entire work. However the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

28.0 Extension of Time

If, in the opinion of the Architect/Consultant, the work be delayed for reasons beyond the control of the contractor, the Architect/Consultant may submit a recommendation to the SBI to grant a fair and reasonable extension of time for completion of work as per the terms of contract. If the contractor needs an extension of time for the completion of work or if the completion of work is likely to be delayed for any reasons beyond the due date of completion as stipulated in the contract, the contractor shall apply to the SBI through the Architect/Consultant in writing at least 30 days before the expiry of the scheduled time and while applying for extension of time he shall furnish the reasons in detail and his justification if any, for the delays. The architect/consultant shall submit their recommendations to the SBI in the prescribed format for granting extension of time. While granting extension of time the contractor shall be informed the period extended time which will qualify for levy of liquidated damages. For the balance period in excess of original stipulated period and duly sanctioned extension of time by the SBI the provision of liquidated damages as stated under clause 8 of GCC shall become applicable. Further contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

29.0 Rate of progress

Whole of the materials, plant and labour to be provided be the contractor and the mode, manner and speed of execution and maintenance of the works are to be of kind and conducted in a manner to the satisfaction of the Architect/ consultant /SBI should the rate of progress of the work or any part thereof be at any time be in the opinion of the Architect/ consultant too slow to ensure the completion of the whole of the work by the prescribed time for completion the Architect/ consultant /SBI shall thereupon take such steps as considered necessary by the Architect/ consultant to expedite progress so as to complete the works the works by the prescribed time or extended time. Such communications

from the Architect/ consultant /SBI neither shall relieve the contractor from fulfilling obligations under the contract nor will he be entitled to raise any claims arising of such directions.

30.0 Work during night and holidays

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

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

31.0 No compensation for restrictions of work

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

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

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

32.0 Suspension of work

i)The contractor shall, on receipt of the order in writing of the SBI (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as SBI may consider necessary so as not cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons.

a) On account any default on the part of the contractor, or
b) For proper execution of the works or part thereof for reasons other than the default of the contractor, or
c) For safety of the works or part thereof.

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

ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:

The contractor shall be entitled to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account.

33.0 Action when the whole security deposit is forfeited.

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

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

b) To employ labour paid by the SBI and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and materials (the cost of such labour and materials as worked out by the Architect/ Consultant shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract the certificate of Architect/Consultant as to the value of work done shall be final and conclusive against the contractor.

c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess the certificates in writing of the Architects/ Consultant shall be final and conclusive) shall be borne by original contractor and may be deducted from any money due to him by SBI under the contract or otherwise, or from his security deposit or the proceeds of sale thereof, or sufficient part thereof.

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

34.0 Bank's Right to Terminate the Contract

If the contractor being an individual or a firm commit any 'Act of Insolvency' or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Government and of the Official Assignee of the liquidator in such acts of insolvency or winding up shall be unable within seven days after notice to him to do so, to show to the reasonable satisfaction of the Architect/Consultant that he is able to carry out and fulfil the contract, and to give security therefore if so required by the Architect/Consultant.

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

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

a) Has abandoned the contract; or

b) Has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving from the SBI through the Architect/Consultant written notice to proceed, or

c) Has failed to proceed with the works with such diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or has failed to remove the materials from the site or to pull down and replace work within seven days after written notice from the SBI through the Architect/ Consultant that the said materials were condemned and rejected by the Architect/ Consultant under these conditions; or has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contractor to observe or perform the same or has to the detriment of good workmanship or in defiance of the SBI's or Architect's/Consultant's instructions to the contrary subject any part of the contract. Then and in any of said cases the SBI and or the Architect/Consultant, may not withstanding any previous waiver, after giving seven days notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the SBI or the Architect/Consultant or the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been so determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the SBI through the Architect/Consultant, their agents or employees may enter upon and take possession of the work and all plants, tools, scaffoldings, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads, use the same by means of their own employees or workmen in carrying on and completing the work or by engaging any other contractors or persons to complete the work and the contractor shall not in any was interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for completing and finishing or using the materials and plant for the works.

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

35.0Certificate of Payment

The contractor shall be entitled under the certificates to be issued by the Architect/ Consultant to the contractor within 10 working days from the date of certificate to the payment from SBI from time to time. The SBI shall recover the statutory recoveries and other dues including the retention amount from the certificate of payment.

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

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

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

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

The contractor shall submit interim bills only after taking actual measurements and properly recorded in the Measurement book (M.B).

The contractor shall not submit interim bills when the approximate value of work done by him is less than Rs. 50.00 Lac and the minimum interval between two such bills shall be one month.

The final bill may be submitted by contractor within a period of one month from the date of virtual completion and Architect/Consultant shall issue the certificate of payment within a period of two months. The SBI shall pay the amount within a period of three months from the date of issue of certificate provided there is no dispute in respect of rates and quantities.

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

36.0 Settlement of Disputes and Arbitration

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

i) If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Architect or in case the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the Contractor shall forthwith give notice in writing of his claim, or dispute to the Assistant General Manager (Premises & Estate)/ Dy. General Manager (Premises) and endorse a copy of the same to the Architect, within 30 days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the contractor shall not be entitled to raise any claim nor shall the Bank be in any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to the Assistant General Manager (Premises & Estate)/Dy.General Manager (premises) in the manner and within the time as aforesaid. The contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to the Assistant General Manager (Premises & Estate)/Dy.General Manager (premises) in writing in the manner and within the time aforesaid.

ii) The Assistant General Manager (Premises & Estate)/Dy.General Manager (premises) shall give his decision in writing on the claims notified by the contractor. The contractor may within 30 days of the receipt of the decision of the Assistant General Manager (Premises & Estate)/Dy.General Manager (premises) submit his claims to the conciliating authority namely the Circle Development Officer/General Manager (Corporate Services) for conciliation along with all details and copies of correspondence exchanged between him and the Assistant General Manager (Premises & Estate)/Dy.General Manager (premises)

iii) If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned Chief General Manager/Dy.Managing Director &Corporate Development Officer of the Bank for appointment of an arbitrator to adjudicate the notified claims failing which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.

iv) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the Chief General Manager/ Dy.Managing Director &Corporate Development Officer. It will also be no objection to any such appointment that the Arbitrator so appointed is a Bank Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as Bank Officer. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due

to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said Chief General Manager/ Dy.Managing Director &Corporate Development Officer. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

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

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

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

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

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

37.0Water Supply

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

i) That the water used by the contractor shall be fit for construction purpose to satisfaction of the Architect/ consultant.

ii) The contractor shall make alternative arrangements for the supply of water if the arrangement made by the contractor for procurement of water in the opinion of the Architect/ consultant is unsatisfactory.

iii) The contractor shall construct temporary well /tube in SBI land for taking water for construction purpose only after obtaining permission in writing from the SBI. The contractor has to make his own arrangements for drawing and distributing the water at his own cost. He has to make necessary arrangements. To avoid any accidents or damages caused due to construction and subsequent maintenance of the wells. He has to obtain necessary approvals from local authorities, if required, at his own cost. He shall restore the ground to his original condition after well are dismantled on the completion of work or hand over the well to the SBI without any compensation as directed by the Architect /consultant.

38.0 Power Supply

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

39.0 Treasure trove etc.

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

40.0 Method of Measurement

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

41.0 Maintenance of registers

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

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

42.0 Price Variation adjustment:

No PVA will be paid for the work on account of variation of rate of material or labour. Bidders are advised to consider the effect of any variation of price of material and labour during the execution period in the quoted rate itself.

43.0 Force Majeure

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

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

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

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

44.0 Local Laws, Acts, Regulations

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

i) Minimum Wages Act, 1948 (Amended)
ii) Payment of Wages Act 1936 (Amended)
iii) Workmen's Compensation Act 1923 (Amended)
iv) Contract Labour Regulation and Abolition Act 1970 and Central Rules 1971 (Amended)

v) Apprentice Act 1961 (Amended)
vi) Industrial Employment (Standing Order) Act 1946 (Amended)
vii) Personal Injuries (Compensation Insurance) Act 1963 and any other modifications
viii) Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof
ix) Shop and Establishment Act
x) Any other Act or enactment relating thereto and rules framed there under from time to time.
xi) Indian Electricity Act
xii) Tariff Advisory Committee Manual

45.0SAFETY CODE:

SAFETY MEASURES AT SITE:

i. All personnel at site should be provided with Helmets and Safety Boots with some Identification Mark. Visitors also should be provided with Helmets. It should be ensured that these are used properly.
ii. First Aid Box should be kept at site with all requisite materials.
iii. No one should be allowed to inspect / work at a height without Safety Belt.
iv. 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 is used for carrying materials as well as suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1 (¼ horizontal and 1 vertical).
v. Scaffolding or staging more than 3.5 meters above the ground or floors, 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 1 Meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings 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.
vi. Working platforms, Gangways, and Stairways should be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Gangway or the Stairway is more than 3-5 Meters above ground level or floor level they should be closely boarded, should have adequate width and should be suitably fenced, as described.
vii. 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 1 Meter.
viii. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 Meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder upto and including Meters in length. For longer ladders this width should be increased at least 6mm for each additional 30 cms. Uniform step spacing shall not exceed 30 cms.
ix. Adequate precautions shall be taken to prevent danger from electrical equipments. For electrical on line works gloves, rubber mats, and rubber shoes shall be used.
x. All trenches 1.2 Meters or more in depth shall at all times be supplied with at least one ladder for each 30 Meters length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 Meter above the surface of the ground. The sides of the trenches, which are 1.5 Meters or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 Meters of the edge of the trench or half

of the depth of the trench whichever is more cuttings shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.

xi. Before any demolition work is commenced and also during the process of the work :-

a) All roads and open areas adjacent to the Work Site shall either be closed or suitably protected;

b) No electrical 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 or fire or explosion or flooding. No floor, roof or other part of the building shall be so over-loaded with debris or materials as to render it unsafe.

d) All necessary personal safety equipment as considered adequate by the Site Engineer should be kept available for the use of the persons 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 those concerned.

e) Workers employed on mixing Asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

f) Those engaged in white washing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.

g) Those engaged in welding works shall be provided with Welder's protective eye-shields.

h) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

i) 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 the manholes so opened shall be cordoned off with suitable railing and provided with warning signals and boards to prevent accident to the Public.

xii. Use of hoisting machines and tackle including their attachments, anchorage and support shall conform to the following standard or conditions:-

a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repairs 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.

c) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffold, winch or give signals to the operator.

d) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension the safe working load shall be ascertained by adequate means.

e) Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of 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 or of any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

f) Motor, Gearing, Transmission, Electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load, adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.

g) When workers are employed on electrical installation, which are already 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.

xiii. All scaffolds, ladders and other 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 shall be provided at or near places of work.

46.0Accidents

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

47.0BANK'S BUILDING PROJECTS – MAINTENANCE OF RECORDS

A.	**Registers at the site office of the Bank's Engineer:**
1	Measurement Books.
2	Cement Register (Daily Record).
3	Steel Register.
4	Steel Consumption Register – Bill wise.
5	Drawings register
6	Materials at site register.
7	Hindrance Register.
8	Concrete cube Test Register.
9	File and Register for extra / variation items.
10	Materials test Register and File.
11	Site Order Book (in triplicate).
12	Lead caulking Register.
13	Labour Reports and progress Reports Register.
14	Site Visit & Instructions Register.
15	Certified true copies of the contracts.

SPECIAL CONDITIONS OF CONTRACT

1.0 Notice of operation

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

2.0 Temporary works

Before any temporary works are commenced the contractor shall submit at least 2 days in advance to the architect/ consultant for approval complete drawings of all temporary works he may require for the executions of the works. The contractor shall carry out the modifications relating to strength, if required by the architect / consultant in accordance with the conditions of the contract at his own cost. The contractor shall be solely responsible for the stability and safety of all temporary works and unfinished works and for quality of the permanent works resulting from the arrangement eventually adopted for their execution.

3.0 Office Accommodation

a) The contractor shall provide and maintain all necessary offices, workshops, stores, shelters, sanitary facilities, canteens and other temporary structures for themselves in connection with the work at the site at their own cost after getting the approval from the Architect/ consultant.
b) A site office for the use of SBI/ architect/ consultant shall be provided by the contractor at his own expenses.
c) All temporary buildings and facilities as mentioned above shall be removed on completion of the work or at any other earlier date as directed by the architect/ consultant.
d) All the expenses for obtaining statutory approvals and maintenance of the above facilities as well as running expenses shall be borne by the contractor at no extra cost. It is also the responsibility of the contractor to obtain statutory approvals for providing the above facilities.

4.0 Facilities for contractor's employees

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

5.0 Lighting of works

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

6.0 Fire fighting arrangements

a) The contractor shall provide suitable arrangement for fire fighting at his own cost. For this purpose he shall provide requisite number of fire extinguisher and adequate number of buckets. Some of which are to be always kept filled with sand and some water. These equipments shall be provided at suitable prominent and easily accessible places and shall be properly maintained.

b) Any deficiency in the fire safety or conditions shall be corrected by the contractor at his own cost and to the approval of the relevant authorities. The contractor shall make the following arrangements at his own cost but not limited to the following:

i) Proper handing, storage and disposal of combustible materials and waste.
ii) Work operations which can create fire hazards.
iii) Access for firefighting equipments.
iv) Type, number and location of containers for the removal of surplus materials and rubbish
v) Type, size, number and location of fire extinguishers or fire fighting equipment
vi) General housekeeping.

7.0 Site order book

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

8.0 Site Meetings

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

9.0 Disposal of refuse

The contractor shall cart away all debris, refuse etc. arising from the work from the site and deposit the same as directed by the construction site or any other off-site activities borrow pits has been properly disposed off.

10.0 Contractor to verify site measurement

The contractor shall check and verify all site measurements whenever requested by other specialists contractors or other sub contractors to enable them to prepare their own shop drawings and pass on the information with sufficient promptness as will not in any way delay the works.

11.0 Displaying the name of the work

The Contractor shall put up a name board of suitable size as directed by the architect/ consultant indicating there in the name of project and other details as given by the architect /consultant at his own cost and remove the same on completion of work.

12.0 As built drawings:

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

b. For the drawings prepared by the contractor. The contractor will modify the drawing prepared by him wherever the changes are made by the SBI/ Architect/ consultant. And submit two copies of such modified drawings to the architect/ consultant/SBI for approval. The architect/ consultant will return one of the approved drawings to the contractor.

13.0 Approved make

The contractor shall provide all materials from the list of approved makes. The architect/ consultant may approve any make /agency within the approved list as given in the tender.

14.0 Procurement of materials

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

15.0 Tendered Rates / Amount

a) **Price Bid : The Bidder has to submit online item wise rates and Total Amount as per BOQ at annexure-III of this tender inclusive of all overhead, contractor's profit, the cost and variation of cost during execution period of materials/labours including all other costs, taxes, charges etc. and exclusive of GST only on work contract. GST on work contract will be paid extra as applicable.**

16.0 Acceptance of tender:

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

17.0 Government and Local Rules:

The Contractor shall conform to the provisions of all local byelaws and Acts relating to the work and to the Regulations etc. of the Government and Local Authorities and of any company with whose system the structure is proposed to be connected. The contractor shall give all notices required by the said Act, Rules, Regulations and byelaws etc. and pay fees payable to such authority/ authorities for execution of the work involved. The cost, if any, shall be deemed to have been included in his quoted rates, taking encroachment and restorations etc. and shall indemnify the Employer against such liabilities and shall defend all action arising from such claims of liabilities.

18.0 Possession Prior to Completion

The Owner shall have the right to take possession of or use any complete or partially completed part of the work. Such possession or use shall not be an acceptance of any work not completed in accordance with the contract Agreement.

19.0 Tools, Storage of Materials, protective Works and Site Office Requirements

a) The contractor shall provide, fix up and maintain in an approved position proper office accommodation for the Contractor's representative and staff which office shall be open at all reasonable hours to receive instruction notices or communications and clear away on completion of the work and make good all work disturbed.
b) All drawings maintained on the site are to be carefully mounted on boards of appropriate size and covered with a cost of approved varnish. They are to be protected from ravages of termites, ants, and other insects and made available to the Owner /architects for inspection or such other purposes they may require.
c) The contractor shall provide at his own cost all artificial light required to complete the work within the specified time.
d) The contractor shall provide a suitable temporary hut for the watchmen and clear away the same when no longer required and to provide all necessary attendance, lights etc. required.
e) The contractor shall arrange for temporary latrines for the use of workers and field 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 good all the work disturbed by the conveniences.
f) Every precaution shall be taken by the Contractor to prevent the breeding of mosquitoes on the work during the construction and all receptacles, cisterns, water tank etc. used for storage

of water must be suitably protected against breeding of mosquitoes. The contractor shall indemnify the owner against any breach of rules in respect of anti-malarial measures.

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

20.0 Protective Measures

The contractor from the time of being placed at 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.

The contractor shall indemnify the SBI 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 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 work and making good all work disturbed.

21.0 Storage of Materials:

The contractor shall provide and maintain proper sheds for the proper storage and adequate protection of the materials etc. and other work that may be executed on the site including the tools and materials of nominated sub-contractors and remove same on completion.

22.0 Tools

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

The Mistries and the supervisor on the work shall carry with them always a one meter or two meter steel tapes and a measuring tape of 30 meters, a spirit level, a plumb bob and a square 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 as he chooses for checking the work 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 nominated sub-contractors for their work.

23.0 Removal of Improper Work

The SBI/ Consultant shall during the progress of the work have power to order in writing from time to time the removal from the work within such reasonable time or times as may be specified in the order of any materials which in the opinion of the SBI/ Consultant are not in accordance with specifications or instructions, the substitution or proper re-executed with materials or workmanships not in accordance with the drawings and specifications or instructions. In case the Contractor refuses to comply with the order the SBI/ consultant shall have the power to employ and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereto as certified by the SBI/ consultant shall be borne by the Contractor or may be deducted from any money to or that may become due to the contractor. No certificate which may be given by the consultant shall relieve the contractor from his liability in respect of unsound work or bad materials.

24.0 Dismissal of Workmen

The Contractor shall on the request of the SBI/ Consultant immediately dismiss from work any person employed thereon by him, who may in the opinion of the SBI/ Consultant be unsuitable or incompetent or who may misconduct himself. Such discharge shall not be the basis of any claim for compensation or damages against the SBI/ Consultant or any of their officer or employee.

25.0 Concealed Work

The Contractor shall give not less than 5 days notice of the SBI/ Architects whenever any work is to be buried in the earth, concrete or in the bodies of walls or otherwise becoming inaccessible later on in order that the work may be inspected and correct dimensions taken before such burial. In default whereof the same shall at opinion of the SBI/ Architect be either opened up for measurement at the

Contractor's expense 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 SBI/ Architects shall be accepted as correct and binding on the contractor.

26.0 Substitution

Should the contractor desire to substitute any materials and workmanship, he/they must obtain the approval of the SBI/Architects in writing for any such substitution well in advance. For materials designed in this specifications by such term as "Equal" or "other approved" etc. specific approval of the SBI/ Architects has to be obtained in writing.

27.0 Preparation of Building Works for Occupation and Use of Completion

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

On completion, the contractor shall clean all windows and doors including cleaning and oiling, if necessary, of all hardware, inside and outside, all floors, staircases every part of the building. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the SBI.

28.0 Defects after Completion

The Contractor shall make good at his own cost and to the satisfaction of the SBI all defects and other faults which may appear within 12 months after completion of the work. In default the SBI may employ other persons to amend and make good such damages, defects etc. Expenses consequent thereon or incidental thereto shall be recoverable from the contractor by the SBI from any money due to the contractor. In the event of the amount being insufficient the SBI may recover the balance from the contractor, from the amount retained under Clause No. 1 (total security deposit) of General Conditions of Contract together with any expenses the SBI may have incurred in connection therewith.

29.0 Idle Labour

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

30.0 Guarantee for the Specialized Works

Wherever provision for submission of a guarantee has been advised, the same shall be submitted from the specialized agency along with a counter guarantee by the main contractor engaged for the work. The guarantee shall be furnished on a non-judicial stamp paper of appropriate value. If the contractor is required to submit guarantee/ guarantees for any items for a period of more than 12 months, the guarantee/ guarantees in case of those items shall remain valid even expiry of the defects liability period of 12 months as stipulated in the contract.

31.0 Safety Measures at Site

All personnel at site should be provided with Helmets and Safety Boots with some Identification Mark. Visitors also should be provided with Helmets. It should be ensured that these are used properly.

1. First Aid Box should be kept at site with all requisite materials.
2. No one should be allowed to inspect / work at a height without Safety Belt.
3. 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 is used for carrying materials as well as suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1 (¼ horizontal and 1 vertical).
4. Scaffolding or staging more than 3.5 meters above the ground or floors, 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 1 Meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings 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.

5. Working platforms, Gangways, and Stairways should be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Gangway or the Stairway is more than 3-5 Meters above ground level or floor level they should be closely boarded, should have adequate width and should be suitably fenced, as described.
6. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 Meter.
7. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 Meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder upto and including Meters in length. For longer ladders this width should be increased at least 6mm for each additional 30 cms. Uniform step spacing shall not exceed 30cms.
8. Adequate precautions shall be taken to prevent danger from electrical equipments. For electrical on line works gloves, rubber mats, and rubber shoes shall be used.
9. All trenches 1.2 Meters or more in depth shall at all times be supplied with at least one ladder for each 30 Meters length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 Meter above the surface of the ground. The sides of the trenches, which are 1.5 Meters or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 Meters of the edge of the trench or half of the depth of the trench whichever is more cuttings shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.
10. Before any demolition work is commenced and also during the process of the work :
    a) All roads and open areas adjacent to the Work Site shall either be closed or suitably protected;
    b) No electrical 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 or fire or explosion or flooding. No floor, roof or other part of the building shall be so over-loaded with debris or materials as to render it unsafe.
    d) All necessary personal safety equipment as considered adequate by the Site Engineer should be kept available for the use of the persons 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 those concerned.
    e) Workers employed on mixing Asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
    f) f) Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to the eyes shall be provided with protective goggles.
    g) Those engaged in welding works shall be provided with Welder's protective eye-shields.
    h) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
    i) 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 the manholes so opened shall be cordoned off with suitable railing and provided with warning signals and boards to prevent accident to the Public.
11. Use of hoisting machines and tackle including their attachments, anchorage and support shall conform to the following standard or conditions:-

a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repairs 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.
c) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffold, winch or give signals to the operator.
d) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension the safe working load shall be ascertained by adequate means.
e) Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of 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 or of any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
f) Motor, Gearing, Transmission, Electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load, adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.
g) When workers are employed on electrical installation, which are already 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.

12. All scaffolds, ladders and other 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 shall be provided at or near places of work.

32.0 Fire Safety Measure

Cutting / drilling machine and other electrically operated equipment used at site shall be plugged into correctly rated electrical outlets.

1. Only ISI marked 3 pin plug and other appliances and equipment shall be used.
2. Electrical power cables/wires used shall not have any joints and shall be properly rated.
3. All electrical appliances i.e. welding, drilling, cutting machine etc. shall be safely and securely earthed to prevent leakage current while in operation.
4. Before commencing the welding work, fire section shall be informed and required precautions should be taken.
5. Two buckets of water, sand and a fire cloth of suitable size shall be kept in an easily accessible area on the site.
6. Fire extinguishers recommended by fire officers shall be kept on the site.
7. Used paint drums shall be stored in specified store only after closing them properly.
8. Personal protective equipment such as safety shoes, hand gloves, welder's mask, ear plug etc. depending upon the requirement of the work shall be provided by the contractor to the workmen to prevent occupational health hazards.
9. The safety belt shall be provided by the contractor and used by the workmen while working from height for more than 10 Mtr. from Ground level.
10. None of the passages near lift lobby and staircases shall be used for stacking / dumping any kind of materials/waste.
11. Any debris/ waste generated from the work shall be collected on daily basis, removed from site and stored at the designated place in proper manner.
12. Battery operated emergency light/torches shall be provided by the contractor to the workmen while working beyond office hours.

FORMAT OF GUARANTEE TO BE EXECUTED BY THE FIRM/ CONTRACTOR INRESPECT OF THE WORK OF PRE

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

The agreement made this Day _____ of_____Two Thousand_____between Assistant General Manager, Premises & Estate Department, State Bank of India, Local Head office, Guwahati of one part and_____(Name of the Firm/ Contractor (hereinafter called the Guarantor) of the other part.

WHEREAS THIS AGREEMENT is supplementary to the Contract (hereinafter called Contract dated_____ made between the Employer of the one part and the Guarantor of the part) whereby the Firm/Contractor interlaid undertook to render the building/ structure completely free of any infestation of termites, and whereas the Guarantors agreed to give guarantee to the effect that the said building/ structure shall remain free from infestation for the period of10 years from the date of Completion of pre-construction anti termite treatment as per IS 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 by the Guarantor will be final and binding in the case, the Guarantor fails to commence the work as per the above notice and the work is got done through the 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, damaged caused expenses 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 damage and / or cost incurred by the Employer, the decision of the Employer will be final and binding.

In witness where of these presents have executed by the obligator_____ and by_____

and for of behalf of the Employer on the day, month and year first above written, Signed and delivered by State Bank of India, by_____

In the presence of_____

Signed and delivered by the hands of_____

Contractor_____

In presence of_____

PROFORMA OF GAURANTEE BOND FOR WATERPROOFING TREATMENT TO BASEMENT (WALLS & BOTTOM SLAB).

OVERHEAD RESERVIOR, TERRACE, STAIRCASE TOWER & SUNKEN FLOOR

(On non-judicial Stamp Paper of Rs. 500/

We hereby guarantee that after completion of the Water Proofing Workmentioned above and before Day_____ of_____ month of Two Thousand_____ if at any time or times the underground reservoir, overhead reservoir, terrace, staircase tower & sunken floor of washrooms and any other portion thus treated by M/s_____(Hereinafter called 'The Contractor')starts leaking or in any way give way to the influence of water including wet patches, dampness etc. due to inadequacy of the work carried or due to any other reason whatsoever relating to the specification, workmanship etc. including the responsibility for any surface treatment and plumbing etc. work carried out by other agencies, the contractor should, without any extra cost to Assistant General Manager, Premises & Estate Department, State Bank of India, Local Head office, Guwahati or to the occupants, carry out necessary remedial measure to such extent and so often as may be necessary to free the said premises from leakage/dampness etc.

The question of whether there is any leakage or the treatment has given away to water or moisture of the treatment aforesaid and before 5 (five) years after the completion date, shall be decided by Assistant General Manager, Premises & Estate Department, State Bank of India, Local Head office, Guwahati, and the decision made by Employer shall be final and binding on us. We shall reinstate the surface to the original condition after carrying out the rectification work, if necessary, by bringing in new materials at no extra cost to state Bank of India.

Signature of witness with address

Signature of contractor with seal
Place:
Date:
(Note: Guarantee to be submitted by both the contractor's i.e. main contractor& the water proofing specialist agency)

Annexure II

To

e-Procurement Technologies Ltd. (ProcureTiger)

A-201- 208, Wall Street-II, Opp. Orient Club,

Nr. Gujarat College, Ahmedabad-380 006,

Gujarat, India.

Tel: (079) 40016837 / 835

Fax: (079) 40016876

Sub*: e-Tendering work for Civil work* : CIVIL WORK : CONSTRUCTION OF BRANCH BUILDING WITH CURRENCY CHEST AT DAPORIJO, ARUNACHAL PRADESH vide NIT No _____ dated _____.

Ref : 1 _____

2. e-tendering dt. .....

Dear Sir,

We confirm that we have quoted.

1. ----------

as our final lump sum prices during the e-tendering process conducted today.

Thanking you and looking forward to the valuable order from SBI.

Yours sincerely,

For _____

Name:

Company:

Date:

Seal:

I - RUNNING A/C BILL

i) Name of Contractor/Agency :

ii) Name of Work :

iii) Sr No. of this bill :

iv) No. and date of previous bill :

v) Reference to Agreement No. :

vi) Date of written order to commence :

vii) Date of completion as per agreement

Sl. No.	Item Description	Unit	Rate (Rs.)	As per tender	
				Qty	Amount (Rs.)
1	2	3	4	5	

Upto Previous R/A Bill		Upto Date (Gross)		Present Bill		
Qty	Amount (Rs)	Qty	Amount (Rs.)	Qty	Amount (Rs.)	Remarks
6		7		8		9

Note : 1. If part rate is allowed for any item, it should be indicated with reasons for allowing such a rate.

2. If adhoc payment is made, it should be mentioned specifically.

Net value since previous bill

II – ACCOUNT OF SECURED ADVANCE, IF ADMISSIBLE ON

MATERIALS HELD AT SITE BY THE CONTRACTOR

No.	Item	Quantity	Unit	Amount	Remarks
1	2	3	4	5	6

Total Value of materials at site

Secured Advance @ .....% of above value B

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

Dated signature of Site Engineer preparing the bill

Name of Site Engineer

Dated signature of Bank's Consultants

(Name of the Consultants)

Signature of the Contractor----------

III. C E R T I F I C A T E

The measurements on the basis of which the above entries for the Running Bill No. _____ were made have been taken jointly on _____ and are recorded at pages _____ to _____ of measurement book No. _____ .

Signature and date of contractor	Signature and date of Consultant's representative (seal)	Signature and date of Site Engineer

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

Consultants Site Engineer

IV - MEMORANDUM FOR PAYMENT

R. A. BILL NO. _____

1.	Total amount of work done since previous bill (A)				Rs.	
2.	Total amount of secured advance due since previous bill (B)				Rs.	
3.	Total amount due since previous bill (C) (A+B)				Rs.	
4.	Total amount due to the contractor (E) (C+D)				Rs.	
5.	Deductions :					
i.)	Sales Tax @ 5%					
ii)	Secured Advance paid in the previous R.A. Bill		Rs.			
iii)	Retention money on value of works as per accepted tenders :upto date amount		Rs.			
	Less : Already recovered (-)		Rs.			
	Balance to be recovered		Rs.	(-)	Rs.	
iv)	Any other departmental service charges to be recovered if any, as per contract (water, power etc) Enclose statement		Rs.			
	Total deduction as per contractor (F)			(-)	Rs.	
6.	ADJUSTMENT IF ANY					
(i)	Amount less received by the contractor in .....R/A bill (per Statement contractor)				Rs.	
(ii)	P.V.A.				Rs.	
7.	Total amount of adjustment due since previous				Rs.	

bill (G)

8. Net amount payable as per Contract (E-F+G) Rs.

(Rupees.…..) in words

The bill amounting to Rs……..(both figures and words) has been scrutinized by me after due test check of the measurement of works as required and is recommended for payment.

Date:..... .....

Signature of the Consultant's with seal

The bill amount to Rs……..(both figures and words) certified by the Consultants has been scrutinized by me after due test check of the measurement of works as required and is recommended for an amount of Rs..... payment.

Date..... .....

Signature of the Bank's Engineer

In Charge of the Project

STATUTORY DEDUCTIONS:

1.	Total amount due (E)	Rs.
2.	Less : Income Tax Payable	Rs.
3.	Less : Trade Tax	Rs.
Net Payable		Rs.

The figure given in the Memorandum for Payment has been verified and the bill passed for payment Rs…….. (Words and figures)

Date:

Signature of Assistant General Manager

PROFORMA OF CERTIFICATE OF PAYMENT BY CONSULTANTS

Certificate No. Interim/	Dated	
Client :	Project No.	Building Work/Interior Work
	Particulars :	
Contractor :	Contract/Letter NO.	Dated :
	Contractor's Bill No.	Dated :

This is to certify that the amount given below (*) is due to the Contractors for the work done by them and/or against materials delivered at site and/or for advance towards contact on the above referred project.

Advance against contract	Rs.	
Less : Advance adjusted to-date	Rs.	
Balance Advance	Rs.	
Advance against material delivered at site	Rs.	
Amount of work done to-date	Rs.	
Total	Rs.	
Less : Retention on work done	Rs.	
Less : Previously certified upto	Rs.	
PRESENT CERTIFICATE (*)	Rs.	

RUPEES .....

The cost of cement or any other material supplied or payments made by SBI directly, if any and not covered herein above, should be adjusted before making the payment of the certified amount (*)
Necessary Deduction U/S 194C of the Income Tax 1961 and sales tax may be made before paying the above certified amount.
By a copy of this letter, we are intimating the Contractors to call on you for the necessary payment.

Remarks, if any :

The details of Insurance Policy are given in the next page.

Signature of Consultants _____

Enclosures : Bill Client's Copy

DETAILS OF INSURANCE POLICIES

Type of policies	Name of Insurance	Amount Rs.	Policy No.	Validity
CAR Policy including 3rd Party liability				
Workmen's Compensation				

Remarks :

1. This is only an 'on-account' payment and is not to be interpreted either as approval of work, materials brought or affixed at site or for that matter approval of any sort.

2. The quantum of work done and materials delivered at site have been certified by ……..

3. Should you wish to audit such work, kindly contact the undersigned and oblige.

Consultants

PROFORMA FOR APPLICATION BY CONTRACTOR FOR EXTENSION OF TIME

1. Name of the Contractor
2. Name of the work as given in the Agreement
3. Agreement WO
4. Tender amount
5. Date of commencement of work
6. Period allowed for completion as per agreement
7. Date of completion as per agreement
8. Period for which extension of time has been given

Dated Month **Year**

a) 1st extension vide Bank's Letter No.

b) 2nd extension vide Bank's Letter No.

c) 3rd Extension vide Bank's Letter NO.

9. Reasons for which extensions have been previously given (copies of the previous applications should be attached)
10. Period for which extension is applied for and the reasons thereof including hindrances, time for extra work assigned, if any etc.

Signature of Contractor

STATEMENT SHOWING QUANTITIES OF THEORETICAL CONSUMPTION OF CEMENT FOR MAJOR ITEMS OF WORK (AS PER CPWD NORMS)

Sl.No.	Description of item of work	Unit	Quantity of cement per unit Quantity of work in quintals
1	2	3	4
1	*Plain Cement Concrete Work*		
	a) Cement concrete (1:2:4)	**Cum**	**3.20**
	b) Cement concrete (1:3:6)	**Cum**	**2.20**
	c) Cement concrete (1:4:8)	**Cum**	**1.70**
	d) Cement concrete (1:5:10)	**Cum**	**1.30**
2.	*Damp Proof Course*		
	a) **25 mm thick in C.C (1:2:4)**	**100 Sqm**	**8.00**
	b) **38 mm thick in C.C (1:2:4)**	**100 Sqm**	**12.16**
	c) **50 mm thick in C.C (1:2:4)**	**100 Sqm**	**16.00**
3.	*Reinforced Cement Concrete Work*		
	a) **RCC work in C.C (1:2:4)**	**Cum**	**3.20**
	b) **RCC work in C.C (1:1 ½:3)**	**Cum**	**4.00**
	c) **RCC work in C.C (1:1:2)**	**Cum**	**6.10**
	d) **Providing and fixing precast RCC mortar 1:2 including finishing with cement plaster 1:3 of thickness not exceeding 6 mm.**		
	i) Kerb, step and the like	**Cum**	**3.68**
	ii) Coping bed plates anchor blocks, window sills and the like	**Cum**	**3.86**
	iii) Small lintels not exceeding 1.5 mm clear, coping shelves and the like	**Cum**	**3.90**
4.	a) *Brick work (all classes) in cement mortar 1:3*		
	i) **With modular brick**	**Cum**	**1.12**
	ii) **With F.P.S brick**	**Cum**	**1.28**
	b) *Brick work (all classes) in cement mortar 1:4*		
	i) **With modular brick**	**Cum**	**0.84**
	ii) **With F.P.S brick**	**Cum**	**0.95**
4.	c) *Brick work (all classes) in cement mortar (1:5)*		
	i) **With modular brick**	**Cum**	**0.68**
	ii) **With F.P.S brick**	**Cum**	**0.78**

1	2	3	4
	d) *Brick work (all classes) in cement mortar (1:6)*		
	i) ***With modular brick***	***Cum***	***0.55***
	ii) ***With F.P.S brick***	***Cum***	***0.62***
	e) *Half brick (all classes) in cement mortar (1:3)*		
	i) ***With modular brick***	***100 Sqm***	***12.75***
	ii) ***With F.P.S brick***	***100 Sqm***	***14.28***
	f) *Half brick (all classes) in cement mortar (1:4)*		
	i) ***With modular brick***	***100 Sqm***	***09.50***
	ii) ***With F.P.S brick***	***100 Sqm***	***10.64***
	g) *Brick work 3" in cement mortar 1:3 with FPS brick*	*100 Sqm*	*9.23*
	h) *Honey comb brick work half brick thick in cement mortar (1:4)*		
	i) ***With modular brick***	***100 Sqm***	***05.54***
	ii) ***With F.P.S brick***	***100 Sqm***	***06.56***
	i) *Brick drip course at junction of roofs and walls in cement mortar (1:4)*		
	i) ***10 cm thick with modular brick***	***100 m***	***0.84***
	ii) ***7.6 cm thick with F.P.S brick***	***100 m***	***0.83***
	j) *Brick drip course at junctions of roofs and walls in cement mortar (1:6)*		
	i) ***10 cm thick with modular brick***	***100 m***	***0.55***
	ii) ***7.6 cm thick with F.P.S brick***	***100 m***	***0.54***
	k) *Providing brick band 5 cm projected from wall face in cm (1:4)*		
	i) ***10 cm thick 5 cm projected with modular brick***	***100 m***	***0.42***

1	2	3	4
4.	k) ii) ***7.5 thick 5.7 cm projected with FPS brick***	***100 m***	***0.41***
5.	*Stone Work*		
	a) ***Random rubble masonry within foundations or super structure in cement mortar 1:6 including leveling up with cement concrete 1:6:12 at plinth or sill o ceiling level.***	***Cum***	***0.85***
	b) ***Coursed rubble masonry in foundation***	***Cum***	***0.75***

		and superstructure in cement mortar 1:6		
	c)	***Stone work plain ashlar cyclopean, sunk or moulded and as hlarpunched in cement mortar 1:6 including pointing with cement mortar 1:2 with an admixture of pigment matching the stone shade.***	***Cum***	***0.54***
	d)	***Stone work in plain ashlar cyclopean sunk or moulded arch, dome or circular moulded and curve columns in cement mortar 1:3 including painting with cement mortar 1:2 with an admixture of pigment matching the stone shade.***	***Cum***	***1.07***
	e)	***Stone work plain in coping cornices, string courses and plinth courses in cement mortar 1:6 including pointing with cement mortar 1:2 with an admixture of pigment matching the stone shade.***	***Cum***	***0.54***
	f)	***Stone work for wall lining etc average thickness 40 mm to 70 mm in cement mortar 1:3 including pointing with cement mortar 1:2 with an admixture of pigment matching the stone shade.***	***100 Sqm***	***8.75***
	g)	***30 mm thick sand stone shelves, fixed in walls in cement mortar 1:3 including finishing complete.***	***100 Sqm***	***1.64***
6.	*Flooring*			
	a)	***Brick flooring in cement mortar 1:4***	***100 Sqm***	***11.02***
	b)	***Brick flooring in cement mortar 1:6***	***100 Sqm***	***7.25***
	c)	***25 mm thick cement concrete flooring 1:2:4 finished with a floating coat of neat cement***	***100 Sqm***	***10.20***
	d)	***40 mm thick cement concrete flooring 1:2:4 finished with a floating coat of neat cement***	***100 Sqm***	***15.00***
1		***2***	***3***	***4***
	e)	***40 mm thick cement concrete flooring 1:2:4 finished with a floating coat of neat cement***	***100 Sqm***	***18.20***
	f)	***75 mm thick cement concrete flooring 1:2:4 finished with a floating coat of neat cement***	***100 Sqm***	***26.20***
	g)	***Cement concrete pavement (25 mm to 50 mm thick) with 1:2:4 including finished complete***	***Cum***	***03.20***
	h)	***50 mm thick cement concrete flooring with metallic concrete hardener topping, under layer of 40 mm thick cement concrete 1:2:4 and top layer 10 mm thick metallic cement hardener consisting of mix 1:2 by volume with metallic***	***100 Sqm***	***21.10***

	hardening compound of approved quality is mixed in the ratio of 4:1		
	i) 40 mm thick cast in situ mm flooring (28 mm thick under layer and 12 mm thick top layer)		
	i) Neutral shade with cement with Grey cement	***100 Sqm***	***01.95***
	ii) Light shade with white cement (Grey cement)		***04.05*** ***10.90***
	iii) Medium shades 50% Grey Cement (white cement)	***100 Sqm***	***12.92*** ***02.02***
	j) Precast terrazzo tiles 20 mm thick with marble chips of sizes upto 6 mm, laid in 25 mm thick bed of lime mortar jointed with neat cement slurry mixed with pigment.		
	i) Light shade using white cement Grey Cement	***100 Sqm***	***04.40***

1	2	3	4
	ii) Medium shade using 50% white cement, 50% grey cement	***100 Sqm***	
	White cement		***02.20***
	Grey Cement		***06.60***
	iii) Neutral shades (with grey cement)	***100 Sqm***	***08.80***
	k) Precast terrazzo tiles 20 mm thick with marble chips of sizes upto 6 mm in skirting or on walls, laid on 12 mm thick cement plaster (1:3) jointed with neat cement slurry		
	i) Light shade using	***100 Sqm***	
	White cement		***02.20***
	Grey Cement		***11.74***
	ii) Medium shade using 50% white cement & 50% grey cement	***100 Sqm***	
	White Cement		***01.10***
	Grey Cement		***12.84***
	iii) Neutral shades (with grey cement)	***100 Sqm***	***13.94***
	l) Chequered terrazzo tiles 22 mm thick with marble chip of sizes upto 6 mm on 25 mm thick bed of lime mortar jointed with neat cement slurry		
	i) Light shade using	***100 Sqm***	
	White cement		***04.40***
	Grey Cement		***04.40***
	ii) Medium shade using 50% white cement & 50% grey cement	***100 Sqm***	

	White Cement *Grey Cement*		*02.20* *06.60*
	iii) Neutral shades (with grey cement)	*100 Sqm*	*08.80*
	m) White glazed tiles 5.5 mm thick in flooring treads and risers of steps skirting and dado on 12 mm thick cement plaster 1:3 in base and jointed with white cement slurry etc *White cement* *Grey Cement*	 *100 Sqm* *100 sqm*	 *02.50* *10.44*
1	*2*	*3*	*4*
	n) Marble stone slab flooring over 20 mm thick base line mortar and jointed with grey cement slurry etc.		
	i) 25 mm thick *ii) 30 mm thick* *iii) 40 mm thick*	*100 Sqm* *100 Sqm* *100 Sqm*	*05.00* *05.12* *05.36*
	o) Marble stone slab flooring over 20 mm thick base of cement mortar (1:4 and jointed with grey cement slurry)		
	i) 25 mm thick *ii) 30 mm thick* *iii) 40 mm thick*	*100 Sqm* *100 Sqm* *100 Sqm*	*13.51* *13.63* *13.87*
	p) Extra if white cement slurry used instead of grey cement slurry in joints of stone flooring White cement	*100 Sqm*	*0.76*
	q) Marble tiles 25 mm thick in risers of steps, skirting and pillars, laid on 12 mm thick cement mortar (1:3) and jointed with grey cement slurry etc/.	*100 Sqm*	*12.34*
	r) Kota stone slab flooring over 20 mm thick base of lime mortar and jointed with cement slurry etc.		
	i) 25 mm thick *ii) 30 mm thick* *iii) 40 mm thick*	*100 Sqm* *100 Sqm* *100 Sqm*	*3.40* *6.80* *7.60*
	s) Kota stone slab flooring over 20 mm thick base of cement mortar (1:4) nd joint with neat cement slurry etc.		
	i) 25 mm thick *ii) 30 mm thick* *iii) 40 mm thick*	*100 Sqm* *100 Sqm* *100 Sqm*	*14.91* *15.31* *16.11*
	t) Kota stones slab 25 mm thick in rise of steps skirting dado and pillars laid on 12 mm thick cement mortar 1:3 and jointed with neat cement slurry etc	*100 Sqm*	*13.74*
	u) 40 mm sand thick sand stone flooring over 20	*100 Sqm*	*7.75*

	mm thick base of cement mortar 1:5 with joints finished flush.		

1	2	3	4
	v) ***40 mm thick sand stone flooring over 20 mm thick base of cement mortar 1:5 including pointing with cement mortar 1:2 (1 cement : 2 stone dado)***	***100 Sqm***	***9.31***
	w) ***40 mm thick sand stone flooring over 20 mm thick lime mortar including pointing with cement mortar 1:2***	***100 Sqm***	***1.56***
	x) ***40 mm thick fine dressed and rubbed stone, flooring over 20 mm thick base of cement mortar 1:5 (1 cement : 5 sand) with joints 0 mm thick finished flush***	***100 Sqm***	***8.28***
	y) ***40 mm thick fine dressed and rubbed stone, flooring over 20 mm thick base of cement mortar 1:5 with joints 5 mm thick including pointing with cement mortar 1:2 (1 cement : 2 stone dust).***	***100 Sqm***	***9.84***
7.	***Finishing***		
	a) ***12 mm cement plaster 1:3***	***100 Sqm***	***7.34***
	b) ***12 mm cement plaster 1:4***	***100 Sqm***	***5.47***
	c) ***12 mm cement plaster 1:5***	***100 Sqm***	***4.46***
	d) ***12 mm cement plaster 1:6***	***100 Sqm***	***3.60***
	e) ***15 mm cement plaster 1:3***	***100 Sqm***	***8.77***
	f) ***15 mm cement plaster 1:4***	***100 Sqm***	***6.54***
	g) ***15 mm cement plaster 1:5***	***100 Sqm***	***5.33***
	h) ***15 mm cement plaster 1:6***	***100 Sqm***	***4.30***
	i) ***20 mm cement plaster 1:3***	***100 Sqm***	***11.42***
	j) ***20 mm cement plaster 1:4***	***100 Sqm***	***8.51***
	k) ***6 mm cement plaster to ceiling 1:3***	***100 Sqm***	***3.67***
	l) ***6 mm cement plaster to ceiling 1:4***	***100 Sqm***	***2.34***
	m) ***Neat cement punning***	***100 Sqm***	***2.20***

1	2	3	4
	n) ***18 mm cement plaster in two coats under layer 12 mm cement plaster 1:5 finished with a top layer 6 mm thick with cement plaster 1:6***	***100 Sqm***	***6.26***

	o) 18 mm thick cement plaster in two coats under layer 12 mm thick cement plaster 1:5 and top layer 6 mm thick with cement plaster 1:3.	***100 Sqm***	***6.26***
	p) 12 mm cement plaster 1:2 (1 cement : 2 stone dust)	***100 Sqm***	***8.13***
	q) 18 mm thick or artificial red stone plaster of 12 mm thick under layer of cement plaster 1:4 with 6 mm thick finishing coat of cement mortar 1:1:3 mixed with red oxide (1 cement : 1 marble dust : 3 stone dust).	***100 Sqm***	***9.47***
8.	*Pointing*		
	a) Flushed or ruled or cut or weather pointing or brick work with cement mortar 1:3	***100 Sqm***	***1.53***
	b) Raised and cut pointing on brick work with cement mortar 1:3	***100 Sqm***	***2.35***
	c) Flush or ruled pointing on stone work with cement mortar 1:3	***100 Sqm***	***1.17***
	d) Raised and cut pointing on stone work with cement mortar 1:3	***100 Sqm***	***1.94***
9.	***Mortar***		
	Cement mortar 1:1	***Cum***	***10.20***
	Cement mortar 1:2	***Cum***	***6.80***
	Cement mortar 1:3	***Cum***	***5.10***
	Cement mortar 1:4	***Cum***	***3.80***
	Cement mortar 1:5	***Cum***	***3.10***
	Cement mortar 1:6	***Cum***	***2.50***
1	*2*	*3*	*4*
10.	*Miscellaneous*		
	a) Lime concrete terracing average 10 cm thick with 25 mm brick ballast and 50% lime concrete 1:2 (1 lime putty : 2 surkhi) rammed and finished with gur and belgri treatment and covered with flash brick tiles grouted with cement mortar 1:3 over 1 2mm layer of cement mortar 1:3.	***100 Sqm***	***6.63***
	b) Providing and laying average 10 cm thick cement based water proofing treatment with brick bat coba as per manufacturers specification.	***100 Sqm***	*******
	c) Providing and filling with water proof brick bat cement concrete	***Cum***	*******
	d) Rough cast or pebble dash plaster in two	***100 Sqm***	***10.58***

		layers under layer 12 mm cement plaster 1:4 and top layer 10 mm cement plaster 1:3		
	e)	*Plinth protection 50 mm thick in cement concrete 1:3:6 over 75 mm bed of dry brick ballast.*	*100 Sqm*	*11.00*
	f)	*Brick edging 10 cm wide 10 cm deep to plinth protection including grouting with cement mortar (1:4)*	*100 m*	*1.14*
	g)	*Fixing of pre-cast cement concrete jail 1:2:4 in cement mortar 1:3*		
		i) 50 mm thick *ii) 40 mm thick* *iii) 25 mm thick*	*100 Sqm*	*1.64*

* ***As specified by the specialist firm at the time of tendering for the job.***

Note: ***For any other item of work Site Engineer shall refer to the C.P.W.D Specifications and norms. In case no coefficient is available for a specific item, the decision of SBI shall be final and binding on the contractor.***

UNIT WEIGHTS OF REINFORCING BARS TO BE ADOPTED

Sl.No.	*Nominal size of the bar in mm*	*Unit weight of kg per metre run*
1.	*6*	*0.222*
2.	*8*	*0.395*
3.	*10*	*0.617*
4.	*12*	*0.888*
5.	*16*	*1.579*
6.	*18*	*1.999*
7.	*20*	*2.467*
8.	*22*	*2.985*
9.	*25*	*3.855*
10.	*28*	*4.836*
11.	*32*	*6.316*
12.	*36*	*7.994*
13.	*40*	*9.869*
14.	*45*	*12.490*
15.	*50*	*15.424*

Steel manufactured only by the main producer (TATA/SAIL/RINL) will be used in the Work.

A. Technical Specification of General Building Works

INDEX

Sl. No.	Description
1.	Excavation of Earth
2.	Pre-construction anti-termite treatment
3.	Concrete
4.	Precast Concrete Works and Precast RCC Jali
5.	Brick Works
6.	Floor Finish Works
7.	Wood Work and Joinery
8.	Steel Doors, Windows and Ventilators
9.	Cement Plaster (Internal & External)
10.	Rule Pointing
11.	Plaster of Paris Punning
12.	White Washing, Colour Washing & Distempering
13.	Plastic Emulsion Paint
14.	Cement Painting
15.	Painting, French Polishing and Wax Polishing
16.	Roof Treatment
17.	Aluminium door, window etc
18.	Iron Mongery (Rain Water Pipe)
19.	Collapsible Gate
20.	Rolling Shutter
21.	Standard Specification

TECHNICAL SPECIFICATIONS FOR GENERAL BUILDING WORKS

1.0 EXCAVATION AND EARTHWORK:

1.1 GENERAL

The excavation will generally refer to open excavation of foundation wet or dry and in all sorts of soils.

1.2 EXAMINE THE SITE

The Contractor shall visit and ascertain the nature of the ground to be excavated and the work to be done and shall accept all responsibility for the cost of the work involved.

1.3 SETTING OUT

The contractor shall set out the building or other involved works after clearing and dewatering if required the site and get the same approved by Bank/Consultants. It shall be the responsibility of the Contractor to install substantial reference marks, bench marks etc. and maintain them as long as required by the Bank/Consultants. The contractor shall assume full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of the work.

1.4 GROUND LEVEL AND SITE LEVEL

Before commencement of excavation spot levels on an approved grid covering the entire plot shall be taken by the Contractor in consultation with the Bank/Consultants and a proper record of these levels shall be kept jointly signed by the Contractor and the Bank/Consultants. A block level plan showing all ground levels of the plot shall be prepared by contractor and shall also be jointly signed by the Contractor and the Bank/ Consultants.

1.5 EXCAVATION & PREPARATION OF FOUNDATION FOR CONCRETE

Excavation shall include removal of all materials of whatever nature at all depths and whether wet or dry necessary for the construction of foundation and sub-structure (including mass excavation for basement underground reservoir where applicable) exactly in accordance with lines, levels, grades and curves shown in the drawings or as directed by the Bank/ Consultants. The bottoms of excavation shall be leveled both longitudinal and transversely or sloped as directed by the Bank/Consultants.

Should the contractor excavate to a greater depth or width than shown on the drawings or as directed by the Bank/Consultants, he shall at his own expense fill the extra depth or width in cement concrete in proportion as to be directed by the Bank/Consultants but in no case with concrete of mix leaner than I:4:8 cement concrete.

The contractor shall report to the Bank/Consultants when the excavations are ready to receive concrete. No concrete shall be placed in foundations until the contractor has obtained Bank/Consultants approval. In case, the excavation is done through different types of oil and if different rates are applicable as per provision in the Schedule of Quantities, the contractor must get the dimensions of the strata agreed by the Bank/ Consultants for payment. If no specific provisions is made in the schedule of quantities it will be presumed that excavation shall be in all types of soil and the contractor's rate hall cover for the same.

After the excavation is passed by the Bank/Consultants and before laying the concrete, the contractor shall get the depth and dimensions of excavation and levels (and nature of strata as applicable as per Schedule of Quantities like hardrock, soft rock) and measurements recorded

by the Bank/Consultants.

1.6 SHORING

The sides of the excavations should be timbered and supported in such a way as is necessary to secure these from falling in, and the shoring shall be maintained in position as long as necessary. The contractor shall be responsible for the proper design of the shoring to be approved by Bank/Consultants to hold the sides of the excavation in position and ensure safety of persons and properties etc. The shoring shall be removed as directed after the items for which it is required are completed. Unless otherwise mentioned in the Schedule of Quantities no extra payment will be made for shoring.

1.7 PROTECTION

If instructed by the Bank/Consultants all foundation pits, and similar excavations shall be strongly fenced and marked with red lights at night to avoid accidents. Adequate protective measure shall be taken to make sure that the excavation does not affect or damage adjoining structures. All measures required for the safety of excavations, the people working in & around the foundation trenches, property and the people in the vicinity shall be taken by the contractor at his own cost. He shall be entirely responsible for any injury and damage to property caused by his negligence or accident due to his constructional operations, storage of materials etc.

1.8 STACKING OF EXCAVATED MATERIALS

All materials excavated will remain the property of the Bank and rate for excavation shall include sorting out of useful materials and stacking them on site as directed. Materials suitable and useful for back filling, plinth filling or levelling of the plot or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach on the area required for constructional purposes.

1.9 BACKFILLING

All shoring and form work shall be removed after their necessity ceases and trash of any sorts shall be cleaned out from the excavation. All space between foundation masonry or concrete and sides of excavation shall be refilled to the original surface with approved excavated materials in layers l5 cm in thickness watered and rammed. The filling shall be done after concrete or masonry is fully set and done in such a way as not to cause undue thrust on any part of the structure. Where suitable excavated materials is to be used for refilling it shall be brought from the place where it is temporarily stacked and used in refilling.

No excavation of foundations shall be filled in or covered up until all measurements of excavations, masonry concrete and other works below ground level are jointly recorded. Black cotton soil shall not be used for back filling or in plinth filling.

1.10 DEWATERING

Rates for excavation shall include bailing or pumping out water which may accumulate in the excavation during the progress of work either from seepage, springs, rain or any other cause and diverting surface flow if any by bunds or other means. Pumping out of water shall be done in such approved manner as to preclude the possibility of any damage to the foundation trench concrete or masonry or any adjacent structure. When water is met in foundation trenches or in tank excavations, pumping out water shall be carried out from auxiliary pit of adequate size dug slightly outside the building excavations. The depth of auxiliary pit shall be more than the working foundation trench levels. The auxiliary pit shall be refilled with approved excavated materials after the dewatering is over.

The excavation shall be kept free from water :-

a) during inspection and measurement.

b) when concrete and/or masonry works are in progress and till they come above the natural water level and

c) till the Bank/Consultants consider that the concrete/mortar is sufficiently set.

1.11 SURPLUS EXCAVATED MATERIALS:

All excavated materials certified as surplus and not useful shall be removed by the Contractor from the site in an approved manner with the approval of the Local Authority as required to his own dump and shall be paid as a separate item as in the Schedule of Quantities. No extra claim on any account will be paid.

The items of removal of surplus excavated materials shall only be undertaken by the Contractor when specific instruction in this regard has been obtained from the Bank/Consultants. The contractor must also secure the approval of the Bank/Consultants regarding the quantity of surplus materials to be removed prior to commencement of this item of work.

1.12 RATES TO INCLUDE FOR EXCAVATION ITEMS

Apart from other factors mentioned elsewhere in this contract, rates for the item of excavation shall also include for the following :-

i) Clearing Site

ii) Setting out works as required.

iii) Providing shoring and shuttering to avoid sliding of soil and to protect adjacent structures and subsequently by removing the same, if not started separately in the schedule of quantities.

iv) Bailing and pumping out water as required and directed.

v) Excavation at all depth (unless otherwise specified in the Schedule of quantities) and removal of all materials of whatever nature wet or dry and necessary for the construction of foundation underground reservoir etc. and preparing bed for laying concrete.

vi) Sorting out useful excavated materials and conveying beyond the structure and stacking them neatly on the site for back filling or re-use as directed.

vii) Necessary protection works involving, labour, materials, and equipment to ensure safety and protection against risk or accident.

viii) Drilling of small holes as directed to explore the nature of substrata if necessary.

1.13 MEASUREMENT FOR EXCAVATION

Excavation for foundation of columns, beams, walls and the like shall be measured and paid net as per drawing, dimensions of concrete (bed concrete where so specified) and the lowest level in regard to length and breadth and depth shall be computed from the excavation levels and ground levels taken before excavation for that area. Any additional excavation required for working space, form work, planking, shuttering for concrete work, dewatering and strutting etc.

shall not be measured and shall not be paid for separately but rates quoted for excavation shall include for all these factors. No increase in bulk after excavation shall be allowed.

1.14 RATES TO INCLUDE FOR BACKFILLING ITEM

Apart from other factors mentioned elsewhere in this contract, rates for the item of backfilling item of work shall also include for the following :-

i) Backfilling the trenches along side masonry or concrete with approved excavated materials upto the natural ground level in layers as specified including watering and ramming.

ii) **Earth filling in Plinth**

If there is approved surplus earth after backfilling the sides of excavations, the same will be used for plinth filling if required. Any additional quantities of good quality earth, if required for plinth filling, shall be brought to the site, by the contractor from outside. No borrow pits shall be opened on the site. Filling in plinth shall be done in layers of l5 cm thick each layer being consolidated by ramming and watering. The payment of back filling item shall be made on measurement of finished consolidated quantity, arrived by difference levels taken before and after the back filling.

iii) No payment shall be made for backfilling to the trenches excavated by the contractor for working space, form work, planking, shuttering for concrete work, dewatering and strutting etc with approved excavated materials upto the natural ground level in layers as specified including watering and ramming.

2.0 PRE CONSTRUCTION ANTI-TERMITE TREATMENT

Soil treatment shall conform to the following :-

2.1 CHEMICALS

The treatment of the area shall be carried out by applying of chlorphyriphos chemical 20% EC at not less than the designated concentration.

2.2 RECORDS

A daily record shall be maintained by the contractor indicating the amount of work done and quantity of chemical consumed for the work. This record book shall be property of the Bank.

2.3 TESTS

The contractor should perform test at his own cost of the chemical to be used in the work and the result of the test should be submitted to the Bank through Consultants.

2.4 METHOD OF APPLICATION

The following paragraphs specify the manner and sequence of operations, which must be followed. The rates of applications of chemical as indicated in the following paras for various operations should be followed. These specifications represent the minimum rates of application of each operation and the contractor shall actually apply chemical at rates higher than those specified to the extent he may consider then necessary for effectiveness during the 10 years guarantee period. In other words onus of responsibility of applying adequate amounts of chemicals as required to sustain the 10 years guarantee shall be that of the contractor, but in no case shall actual rates of applications be less than those specified in the Technical

Specifications.

2.4.1 Backfill in immediate contact with RCC Basement Wall

The treatment will start at a depth of 500 mm below the ground level except when such ground level is raised or lowered by filling or cutting. After the basement wall have been cast and soil in immediate contact with vertical surface of basement wall a trench should be made and chemical emulsion to be injected with high pressure pump along the wall at the rates of 7.5 litres per square metre of vertical surfaces and the excavated soil shall also be treated before refilling. Should the earth outside the building be carried out on completion of such grading.

2.4.2 Treatment soil under apron along External Perimeter of Building

Top surface of the consolidated earth over which the apron is to be laid shall be treated with chemical emulsion at the rate of 5 litres per square metre of the vertical surface before the apron is laid. If consolidated earth does not allow emulsion to sleep through, holes upto 50 to 75 mm deep at 150 mm centres both ways shall be made with 12 mm diameter mild steel rod on the surface to facilitate saturation of the soil with the chemical emulsion.

2.4.3 Treatment of Soil Surrounding Pipes, Wastes and Conduits

When pipes, wastes and conduits enter the soil inside the area of the foundations, soils surrounding the point of entry shall be loosened around each of such pipe, waste or conduit for a distance of 150 mm and to a depth of 75 mm before treatment is commenced. When they enter the soil external to the foundations, they shall be similarly treated for a distance of over 300 mm unless they stand clear of the walls of the building by about 75 mm.

2.4.4 Treatment of Expansion Joints

The soil beneath the expansion joints at ground floor should receive special attention when the treatments as specified above are carried out. This treatment should be supplemented by treating through the expansion joint after the sub-grade is laid at the rate of 2 litres per linear metre.

2.4.5 Door, window frames & shutters

All wooden doors & frames of the building which comes in contact with brick/concrete wall are to be treated before & after fixing. All external wall upto window level (in ground floor only) is also to be treated. All electrical conduits & switch boxes in all floors are to be treated.

2.4.6 Treatment of soil along External Perimeter of Building

After the building is completed the earth along the external perimeter of the building should be rodded at intervals of 150 mm and to a depth of 300 mm. The rod should be moved backward and forward parallel to the wall to back up the earth and chemical emulsion poured along the wall at the rate of 7.5 litres per square meter of vertical surfaces. After the treatment, the earth should be tampted back into place. Should the earth outside the building be graded on completion of the building, this treatment should be carried out on completion of such grading. In the event of filling being more than 300 mm, the external perimeter treatment shall be extended to the full depth of filling up to the ground level so as to ensure continuity of the chemical barrier.

2.5 Treatment shall not be made the soil or fill is excessively wet or immediately after heavy rains to avoid surface flow of toxicant from application site. Unless the treated areas are to be immediately covered, precautions shall be taken to prevent disturbance of the treatment by human or animal contact with treated soil.

2.6 GUARANTEE

10 (Ten) years guarantee should be submitted on non-judicial stamp paper as per the Performa attached. The guarantee shall be signed by the main contractor and the specialized who have executed the work. In the unlikely even of any treatment becoming necessary subsequently during the guarantee period, required inspection and treatment shall be carried out free of cost.

2.7 INSTRUCTIONS TO CONTRACTOR FOR QUOTING RATES

Tenderer should include in his rates given in Schedule of Quantities in sqm area all the stages of treatment as mentioned above. Where the rates of application of the chemical, has not been specified clearly the rates should be governed to that during the guarantee period no trouble may arise. Payment will be made on the plinth area measurement and the rate for the same should include all the stages of work as mentioned above and no extra on this account will be entertained.

The work should be executed in stages according to the progress of work and in co-ordination with the general building and other contractors. Idle labor, if any, for the same shall not be entertained.

The work should be executed through a specialised firm approved by the Bank/ Consultants. Approval of such firm shall be obtained from the Bank/Consultants before commencement of work.

3.0 CONCRETE

3.1 GENERAL

3.1.1 SUPERVISION

A competent person approved by the Bank/Consultants shall be employed by the contractor whose first duty will be to supervise all stages in the preparation and placing of the concrete. All cubes should be made and necessary site tests carried out under his direct supervision in the presence of Bank/Consultants.

3.1.2 APPROVAL OF CONCRETING ARRANGEMENT ETC.

Before commencement of construction the contractor shall submit detailed arrangements for concreting, system of form work and all other devices which he proposes to use for the construction of structural frame work for approval of Consultants/Bank.

3.1.3 SAMPLE AND TESTS

Every facility shall be provided by contractor at site to enable the Bank/Consultants to select samples, get contractor to collect samples and carry out tests on the materials and construction. At least 50% of the cube tests should be carried out in Laboratory/ Institution approved by the Consultants/Bank. If those tests showsthat strength of cubes do not comply with the acceptance criteria of specifications, the contractor will be responsible for replacement of the defective construction. The necessary cost of all such sampling and testing has to be borne by the contractor.

3.1.4 REJECTED MATERIALS

All materials which have been damaged, contaminated or have deteriorated or do not comply in any way with the requirements of this specification, shall be rejected and shall be removed immediately from the site at the Contractor's own expense.

3.1.5 LOADING OF FLOOR SLABS

No materials shall be stored or stacked on suspended floors and roofs without the Bank's/Consultants' prior approval.

3.1.6 ORDINATION

The Contractor shall be responsible for the co-ordination with sub-contractors or other contractors for incorporating any inserts, electrical conduit pipes, fixing blocks, chases, holes etc in concrete members brick works as required. The contractor shall ensure that these requirements have been approved by the Bank/Consultants before the operations are put in hand. All blocks, chases, inserts, holders etc. to be left in the concrete shall be of the sizes specified and be accurately set out and placed before pouring concrete.

The Contractor's rates quoted for concrete items shall include all these factors. No holes and chases shall be cut in concrete without prior approval of the Bank/Consultants.

3.1.7 INSERTS TO CONCRETE

The contractor should note that he shall provide necessary wooden plugs, m.s inserts, sleeves etc. required for the works for which no extra payment will be made. He will have to provide if so directed, any inserts, wooden plugs sleeves for other contractors, such as Electrical Contractor, Fire Fighting Contractors, Contractor for Lifts etc for which he will be entitled for payment but in case the other contractors provide such inserts, then he will have to take proper measures (at his expense) and care not to disturb their work while laying concrete.

3.1.8 EQUIPMENT

The contractor shall keep at work site testing equipment for aggregate and concrete, viz. test sieves, balance, slump cones, concrete cube testing machine etc all items required conforming to relevant I.S. specification. Dial gauge of cube testing machine should have been calibrated recently from a Govt approved laboratory.

3.2 MATERIALS

All materials shall be of approved quality as per relevant I.S. specifications/or as specified in the contract.

3.2.1 CEMENT

a) Ordinary Portland cement and Portland Slag Cement shall conform to the I.S. specification I.S. 269 and IS 455 of latest edition.

b) Cement at site shall be stored in dry weather proof go downs (or shed) built at the cost of the contractor. Cement must not be stacked in more than l0 bag height. Sufficient space shall be provided for circulation and rotation of bags in order to minimize the length of storage of any of the bags. The floor of the go down shall consist of wooden planks resting on base prepared of dry bricks laid on edge.

c) The contractor shall be fully responsible for the quality of cement brought by him at the work site. The contractor shall ensure that the cement brought to the work site conforms to the requirements of IS 269 or IS 455 and shall procure manufacturer's certificate to this effect, in his own interest. In case the client / consultant has any doubt regarding the quality of cement brought on work site by him, it is up to him to have it tested at his own expenses & make sure that cement is of right quality.

d) Bank/Consultants can order on the contractor to have the cement tested or they can take samples in the presence of contractor from cement bags stored at work site and

forward them to a approved Laboratory for testing & the contractor shall be responsible for the cost of testing including transporting of samples to the laboratory.

Daily record of cement received and consumed shall be maintained by the Contractor in cement register at site and submitted to Consultants if called for. Theoretical consumption vis-a-vis materials brought at site by the Contractor shall also be submitted with proper documents with every bill for verification. A chart showing the consumption of cement for different items of work is annexed.

Consumption of cement in the corresponding items of work under the contract shall be computed on the basis of the quantities shown in the table subject to a variation of plus/minus three percent (The weight of 1 cum of cement shall be taken as 1,440 kg). For the items not available in the enclosed cement consumption chart, C.P.W.D schedule shall be followed.

e) Cement of doubtful quality shall not be used until satisfactory results are obtained after testing. All cement not conforming to specifications and cement that has deteriorated, damaged or set shall not be allowed to be used. All such cement shall be immediately removed from work site by the contractor. The cost of all such cement shall be borne by the contractor.

3.2.2 AGGREGATE

Aggregate shall conform to IS 383 of latest edition.

3.2.3 FINE AGGREGATE : SAND

a) The fine aggregate - sand shall be hard, strong, dense, and durable clean with uncoated grains. The maximum size of the particles shall be 4.75 mm (3/l6 in) and shall be graded down. The sand shall not contain any harmful materials such as iron, Pyrites, coal, mica, silt, clay, alkali, sea shells organic impurities, loam etc. or in case of reinforced concrete work, any materials which might attack the reinforcement or detrimental to concrete. Aggregate, which are chemically reactive with the alkalis of the cement, shall not be used. The maximum quantity of deleterious materials shall not exceed the limit specified in the relevant I.S. Specifications. The silt content shall be within 8%.

b) Grading : The natural sand used for work shall have a grading conforming to grading zones of I and II of I.S. 383 of latest edition.

3.2.4 COARSE AGGREGATE

a) Coarse aggregate shall consist of hard, dense, durable uncoated crushed rock. Gravel aggregate shall be allowed to be used only if specially specified in the bill of quantities. Otherwise it shall be taken that only crushed rock shall be permitted as coarse aggregate.

b) The aggregate shall be free from soft, friable thin or long laminated pieces. Aggregate shall be free from injurious amounts of alkali, organic matter and other deleterious materials. Flaky or weathered stones shall not be used. The maximum percentage of deleterious materials shall not exceed those specified in the relevant I.S. specification.

c) The contractor shall arrange to supply coarse aggregate of nominal size conform to the grading in the limits specified in I.S. 383 of latest edition.

d) Size of Aggregate :

i) Generally for reinforced concrete work, nominal maximum size of aggregate be 20 mm graded suitably.

e) In selecting the aggregate, the contractor shall satisfy himself that the source is suitable for regular supply and a watch shall be maintained that the particles shape and grading remain reasonably uniform throughout the progress of work.

f) Where so directed by Bank/Consultants aggregate shall be washed by approved methods at Contractor's expenses.

3.2.5 WATER

Water used for both mixing and curing shall be clean and free from injurious amounts of deleterious materials which are likely to affect the strength or durability of concrete. Water containing any sugar shall not be allowed for use. Water is to be tested in accordance with I.S. 456 of latest edition. The pH values of water shall generally be not less than 6.

3.3 MIXING AND PLACING OF CONCRETE

3.3.1 CEMENT

Cement shall be batched by weight even though aggregate are batched by volume. Where the weight of the cement is deter-mined by accepting the maker's weight per bag, a number of bags as directed by Bank/Consultants shall be weighed separately to check the net weight. Where the cement is weighed on the site and not in bags, it should be weighed separately from Aggregate.

3.3.2 AGGREGATE

The aggregate shall be batched by volume; the form as used shall be of the correct sizes to be certified by the Bank/Consultants before use. Heaping of aggregates on the form is prohibited and aggregates shall be filled level in form and struck off with a horizontal timber or steel rule. Where sand is measured by volume, bulk age allowance as determined by the Bank/Consultants shall be accounted for while measuring sand.

3.3.3 WATER

Water shall be measured either by volume in calibrated tanks/vessels having conical shape narrow at top or water shall be weighed. Water shall not be measured using ordinary buckets which are wider at top and narrower at the base. The measurement of water to control and maintain a constant water cement ratio is of utmost importance and adequate attention to this end by the contractor to the satisfaction of the Bank/Consultants shall be made so as to produce concrete of adequate workability as required.

3.3.4 MIXING OF CONCRETE

a) Machine Mixing :

Concrete shall be mixed in Mechanical Mixer. Mixing shall be continued until there is uniform distribution of materials and the mass is uniform in color and consistency. The mixing time from the time of adding water shall be in accordance with I.S. 1791 of latest edition but in no case mixing shall be done for less than two minutes.

b) Hand Mixing :

Hand mixing shall not be permitted except for unimportant structural members and purely at the discretion of the Bank/Consultants. When hand mixing is permitted it shall be taken to ensure that the mixing is continued until the mass is uniform in color and consistency.

If hand mixing is permitted by the Consultants/ Bank, the contractor shall use l0% extra cement for hand mixing for which no extra payment will be made.

3.4 TRANSPORTING, PLACING, COMPACTION AND CURING OF CONCRETE

3.4.1 TRANSPORTING

Concrete shall be handled from the place of mixing to the place of final deposit as rapidly as practicable, by method which will prevent the segregation or loss of any of the ingredients. If segregation occurs during transport, the concrete shall be remixed before use. The concrete shall be placed in position and compacted before the initial set of cement has commenced and shall not be subsequently disturbed. During hot or cold weather concrete shall be transported in deep container to reduce loss of water by evaporation during hot weather and loss of heat during cold weather. Deep containers are specified on account of their lower ratio of surface area to mass.

3.4.2 DROPPING OF CONCRETE

Concrete shall not be dropped into position from a height greater than l.0 meter unless directed otherwise by Bank/Consultants.

3.4.3 DEBRIS ETC. REMOVED

All debris saw dust etc. shall be removed from the shuttering before any concrete is placed. Care shall be taken to see that the shuttering is water-tight and has been properly treated with approved composition to prevent absorption of water.

3.4.4 PROTECTION AND PLACING IN LAYERS

Concrete shall be placed into the forms in layers not exceeding 300 mm (approx) in thickness. Concrete after placing and finishing shall be protected by use of covering as approved by the Bank/Consultants during first stage for hardening against high winds, heat, rain, surface water etc. No shock or vibration shall be allowed to be imparted to forms supporting fresh finished concrete.

3.4.5 COMPACTION

Concrete shall be thoroughly compacted during operation of placing by the use of Mechanical Vibrators. Sufficient number of vibrators (including stand by) of adequate capacities shall be used for compaction of concrete. Vibration shall be carried out by trained men and in the presence of a qualified supervisor trained in the use of vibrators and vibrated concrete. In certain portions where vibration is not effective, careful rodding and taping shall be carried out and sufficient men employed to ensure that thorough consolidation takes place. Where manual compaction becomes necessary, the workability of the mix should be controlled to strength requirement.

3.4.6 CONTINUOUS CONCRETING

Concreting shall be carried out continuously up to predetermined positions of construction joints. The position and arrangement, for construction joints shall be approved by the Bank/Consultants. Rest pauses for meals etc. shall be subject to the Bank's/ Consultants approval.

3.4.7 PACKING ROUND REINFORCEMENT

In the case of reinforced concrete work, the concrete shall be carefully consolidated and packed round the reinforcement and care shall be taken to ensure that reinforcement is not displaced during the placing and compaction of concrete. If reinforcement moves out of its place, it must be brought back in position immediately.

3.4.8 CURING

All concrete work shall be water cured for a minimum period of 7 days after concreting or as directed by Bank/ Consultants. Horizontal surfaces shall be kept covered with water ponded by means of bunds and vertical surfaces like those of columns, fins etc. by burlaps kept constantly wet with water sprays. Mere sprinkling of water on vertical surface without sacks will not be allowed.

In respect of concrete made out of pozzalana cement, curing shall be continued for another 8 days.

3.4.9 TRAINED SUPERVISOR

It is essential that the contractor's supervisor who is in charge of the construction of all concrete work whether reinforced or not, shall be skilled in this class of work and shall superintend personally the whole construction and pay special attention to :-

a) the quality, testing, proportioning and mixing of the materials and particularly control of water cement ratio

b) Laying of materials in place and thorough consolidation of the concrete to ensure solidity and freedom from voids.

c) Position of reinforcements.

3.5 CONSTRUCTION JOINTS

3.5.1 GENERAL

a) Location

The position of all construction joints shall be as approved by the Bank/ Consultants. The contractor shall submit details of the location where he proposes to provide construction joints for the approval of the Bank/Consultants.

b) Stop Boards

All vertical construction joints shall be formed with proper wooden stop board at the joints. Where directed, the joint shall be rebated or joggled and of approved shape.

c) Water Bar & Water Sealer

Wherever shown in the drawing or whenever instructed by the Bank/Consultants water bar or water sealer of approved quality shall be used in construction joints for R.C. works. It is necessary to ensure that water bars form continuous diaphragms. The water bars shall be made out of special chemically treated rubber materials for retaining the flexibility indefinitely. Unless otherwise instructed by the Bank/Consultants the water bars shall be "Centre Bulb type" corrugated and with end grip of approved quality. These shall be of any width as mentioned in the Schedule of Quantities and l0 mm thickness or other sizes & thickness approved by the Consultants/Bank. The rate for supplying and fixing water bar in construction joints shall also include all appliances necessary for fixing the same in position as well as the extra cost for all necessary inter-section pieces.

3.5.2 CONSTRUCTION JOINTS IN BASEMENT

a) Location and Formation

The contractor shall prepare a drawing showing the proposed construction joints and submit

for approval of the Bank/Consultants.

Stop board shall be placed well in advance at approved positions and concreting shall be carried out right up to the stop boards. Under no circumstances departure from this procedure to determine the position of construction joints as day work joint shall be allowed.

Special care shall be taken is to form and treat construction joints in basement to ensure water-tightness for which the contractor shall be responsible.

b) Joints in Base Slabs

Joints in base slabs and beams of a basement shall be located so that the joint is parallel to the principal reinforcement, where it is unavoidable and is at right angle to the principal reinforcement, the joints shall be in the middle of the span of the slab or beams.

c) Formation-Vertical Joints

Vertical construction joints in base slab and walls of basement shall be formed by using vertical stop boards in predetermined approved positions.

d) Formation-Horizontal Joints

Horizontal joints in wall shall be rebated and care shall be taken to establish a proper and good bond between the hardened concrete and freshly laid concrete to produce a water tight joints which shall be contractor's responsibility.

e) Wall Slab Junctions

Each layer must be compacted before placing the next layer. Concrete in the splays at the junction of wall and the slab shall be placed without joint at the time of concreting the slab.

3.5.3 TREATMENT OF CONSTRUCTION JOINTS IN BASEMENT

i) When work is resumed on the surface which has hardened such surface shall be roughened. It shall be thoroughly cleaned and wetted and covered with a 12 mm layer of mortar composed of cement and sand in the same ratio as cement and sand in the concrete mix. This 12 mm layer of mortar shall be freshly mixed and placed immediately before the placing of the concrete.

ii) Where the surface has not fully hardened the laitance shall be removed by scrubbing the wet surface with wire bristle brush, care being taken to avoid dislodgement of aggregates. The surface shall be thoroughly wetted and all free water removed. The surface shall then be coated with neat cement grout.

iii) Care shall be taken to obtain good bond between the hardened and freshly placed concrete. Ramming and moulding of concrete around water bar shall be carefully carried out. Labour and materials for treatment of concrete joints are to be included in the rate of respective items.

3.5.4 CONSTRUCTION JOINTS IN SUPERSTRUCTURES:

a) Column

Joints shall be formed horizontally above top of foundation and 75 mm below the lowest soffit of the beams meeting at the head of the column. Concrete in the head of a column where one or more beams meet shall be placed at the same time that in the beam or beams

without any joint.

b) Beams

Concrete in the beams shall be placed throughout without a joint but if the provision of joint is unavoidable the joint shall be vertical and at positions approved by the Bank/Consultants.

c) Slab

Where the joint is unavoidable it shall be vertical and parallel to the principal reinforcement. However, if joints is required to be provided at right angles to the principal reinforcements it shall be vertical and at l/3rd to l/4th position of span/at positions approved by the Bank/Consultants.

d) Treatment of Construction Joints

i) When work is resumed on the surface which has hardened such surface shall be roughened. It shall be thoroughly cleaned and wetted and covered with a l2mm layer of mortar composed of cement and sand in the same ratio as cement and sand in the concrete mix. This l2 mm layer of mortar shall be freshly mixed and placed immediately before the placing of the concrete.

ii) Where the surface has not fully hardened the laitance shall be removed by scrubbing the wet surface with wire bristle brush, care being taken to avoid dislodgement of aggregates. The surface shall be thoroughly wetted and all free water removed. The surface shall then be coated with neat cement grout.

iii) Care shall be taken to obtain good bond between the hardened and freshly placed concrete. Ramming and moulding of concrete around water bar shall be carefully carried out. Labour and materials for treatment of concrete joints are to be included in the rate of respective items.

3.5.5 EXPANSION JOINTS:

a) Expansion joints shall be provided as shown in the drawings.

b) Expansion joints are meant to provide discontinuity in the structure. Care shall be taken to ensure this discontinuity by having clear joints throughout the length and height of the expansion joints. There shall be no connection between two sides of an expansion joint except with the materials used to form the expansion joints like fillers, water bar and other materials indicated in the drawings.

c) Unless otherwise specified, the filler materials for Expansion joints shall be shalitex joint filler as manufactured by M/s. Shalimar of appropriate thickness. The filler materials shall extend to the entire depth of the joint except for a distance of 25 mm from the exposed faces as shown in the drawing.

d) Expansion joints shall be leak proof and the Contractor shall be responsible for any leakages and resulting damages.

3.5.6 TESTS FOR CONCRETE

Tests shall be conducted in accordance with I.S. : 5l6 of latest edition.

TEST CUBES

a) Works tests cubes shall represent quality of concrete incorporated in the work and taken out in sets of 6 cubes. The concrete for preparation of one set of 6 cubes shall be taken from one batch of mixed concrete discharged from mixer. The cubes shall be moulded in accordance with Indian Standard Code of Practice.

b) A minimum of one set of 6 cubes shall be taken for every 20 cum or part thereof in case of beam, slabs & connected columns; one set for 5 cum or part thereof of concrete poured for columns and they shall be considered as representative for said quantity. This is an average figure, and may be increased to cater for special conditions at the discretion of the Bank/Consultants at site.

c) The cubes shall be cured as per IS Code of Practice. The entire operation of casting, arranging and despatch of cubes to Laboratory will be carried out by the Contractor under the supervision of the Bank's Site Engineer/Consultants. Out of 6 cubes, 3 cubes shall be tested at an age of 7 days and balance at an age of 28 days in an approved Laboratory

d) The cubes shall be initialed, numbered, dated jointly by the contractor's representatives and the Site Engineer of Bank/Consultants' representative with a piece of wire or nail so that an indentation of the initials is left on the cubes.

e) The contractor shall arrange to transport the cubes to the approved laboratory and arrange to have the test results forwarded (in duplicate) directly from the laboratory to the Bank/Consultants. The contractor shall bear all expenses in connection with the preparation of test cubes, i.e provision of moulds, cost of concrete, labor and transportation charges to the approved laboratory, laboratory testing charges etc and his rates for concrete items should be quoted accordingly.

f) A Register shall be maintained at site by the Contractor with the following details entered and initialled by the Contractor and the Site Engineer/Consultants.

i) Reference to specific structural members receiving the batch of concrete from which the cubes were cast.

ii) Mark on cubes.

iii) The mix of concrete.

iv) Date and time of casting.

v) Slump

vi) Crushing strengths as obtained at the end of 7 days for 3 cubes out of a set of 6 and at the end of 28 days for the other 3 cubes.

vii) Laboratory in which tested and reference to test certificate.

viii) Any other information directed by the Bank/Consultants.

g) A record of the quality of concrete incorporated in the work that is represented by the quality of concrete of the set of cubes along with the description of the structural members where concrete has been deposited shall be mentioned.

3.5.7 VIBRATION OF CONCRETE:

a) Water Cement Ratio

The water cement ratio (by weight) for all vibrated concrete (except controlled concrete) shall generally conform to relevant I.S. provision and it shall not be varied unless otherwise directed. In respect of "Design Mix" the water cement ratio shall be as determined in the laboratory mix design suitable for vibrated concrete.

b) Placing

Concrete shall be placed in layers not over 45 to 60 cm (l8 to 24 inches) deep and each layer shall be vibrated into places by methods which will not permit the ingredients to separate. Surfaces shall be smooth and free from voids caused by stone pockets, where necessary vibration shall be supplemented by hand spading to secure these results.

c) Number and size of vibrators

Vibrators shall be of sturdy construction, adequately powered. The vibration shall be sufficiently tense to cause the concrete to flow or settle readily into place

and visibly affect the concrete over a radius of at least 450 mm (l8") when used in concrete having slump of one inch. A sufficient number of vibrators (at least one vibrator for a rate of concreting of l.5 cum. (50 cft) per hour shall be employed so that at the required rate of placement, vibration throughout the entire volume of each layer of concrete and complete compaction are secured.

d) Manipulation of Vibrators

Internal vibrators shall be kept constantly moving in the concrete and shall be applied at points uniformly placed not further apart than the radius over which the vibrator is visibly effective. The vibrator shall not be held in one location long enough to draw a pool of grout from surrounding concrete. The vibration shall be such that the concrete becomes uniformly plastic and there shall be at least 200 seconds of vibration per square metre (20 second of vibration per sq.ft.) of surface of each layers of concrete, computed on the basis of visibly affected radius and taking overlap into consideration.

3.5.8 a) Grade of Concrete

The concrete shall be of grades designated as M-l5, M-20, M-25, M-30 of cube crushing strengths as specified in I.S. Code 456 of latest edition.

Note : The designation of concrete mix : Letter M refers to the mix and the number to the characteristic compressive strength of 15 cm cube of 28 days, expressed in N/sq.mm.

b) i) Ordinary Concrete

Concrete made without preliminary tests but by adopting volumetric concrete mix, shall be called "ORDINARY CONCRETE" unless otherwise mentioned in the bill of quantities all R.C. concrete shall be ordinary concrete as per Table 3 I.S. 456 of latest edition.

ii) Nominal Volumetric Mixes

If in the bill of quantities concrete is specified in volumetric proportions such as l:4:8, l:3:6, l:2:4, l:l l/2:3, l:l:2 etc. it shall be taken to mean that the proportions by volume of cement; sand and coarse aggregate shall be in the order in which the mix is specified.

Minimum cement content for different volumetric mix of concrete are as under :

Cement : Fine Aggregate : Course Stone Aggregate

		Minimum cement content (Kg/Cum)
I:I I/2:3	-	4I2
I:2:4	-	3I7
I:3:6	-	235
I:4:8	-	I80

c) Strength Requirements of Concrete

Where ordinary Portland cement is used, the compressive strength requirements for various grades of concrete shall be as given in Table 2 of I.S. 456 of latest edition. It shall be the contractor's responsibility to obtain specified strengths for the various grades of concrete. Where rapid hardening Portland cement is used, 28 days' compressive strength requirements specified shall be met at 7 days.

d) Design Mix Concrete

Concrete made with preliminary tests by designing concrete mix in a laboratory shall be called "DESIGN MIX CONCRETE" and shall be designated as M-20, M-25 and M-30.

i) Concrete Mix for Various Grades of Design Mix Concrete

Concrete mixes shall be designed for various grades of concrete (M-20, M-25, M-30) by the contractor to achieve the respective strength, durability and workability necessary for the job by the most economical use of various ingredients. The design should be made conforming to the relevant IS Specifications (IS-456, 5I6 of latest edition) in respect of proportioning of fine aggregate to coarse aggregate, maximum quantity of dry aggregates and water cement ratio, the minimum cement content as mentioned in the Schedule of Quantities. The contractor will arrange for the testing of various trial mixes of sufficient number (as per direction of the Consultants/Bank) at his own cost in laboratory approved by the Consultants/Bank for the preliminary test for different grades of concrete. The Consultants/Bank will adopt the concrete mixes for the respective concrete grades from the test results of the said trial mixes, conducted and certified by the approved laboratory and the contractor will accordingly proceed with the concreting at work site. Constant check on grading and mix proportion shall be done by the contractor who will always be responsible to produce quality concrete of required grades as per the acceptance criteria of IS 456 of latest edition. If there is any change in the quality of aggregates (both coarse and fine), necessary alteration to the mix proportion should further be approved by the Consultants/Bank before the same are used at work site.

The Consultants will always have the unquestionable right to revise the minimum cement content as decided above, if in his opinion, there is any chance of deterioration of quality of aggregate or other reason.

3.6 CLASSIFICATION OF CONCRETE OF LOWER OR HIGHER STRENGTH THANSPECIFIED :

Where the strength of concrete mix (for ordinary concrete or design mix concrete) as indicated by tests, lies in between the strengths of any of two grades, such concrete shall be classified as a grade belonging to the lower of the two grades between which its strength lies. In case the cube test strength show higher strengths than those specified for the particular grade, the concrete

shall not be placed in any higher grade nor shall contractor be entitled for any extra payment on such account.

3.6.1 WATERTIGHT CONCRETE :

Concrete in all underground works such as water tanks and the like where concrete of mix 1:1 1/2:3 grades or richer is specified, will be considered as water-tight concrete even if not specifically mentioned in the Schedule of Quantities. In respect of such concrete it shall be contractor's responsibility to ensure that the resulting construction is watertight, failing which, the contractor shall carry out at his own cost, all necessary remedial measures as per direction of Bank/Consultants.

3.6.2 SAMPLE SIZE AND ACCEPTANCE CRITERIA :

All tests shall be carried out in accordance with I.S 5l6 of latest edition. The Criteria for acceptance of a concrete of a specific grade shall be in accordance with recommendation of IS-456 of latest edition.

3.6.3 CEMENT CONCRETE MUDMAT

Concrete for the purpose shall be in the proportion of (l:3:6) l part of cement, 3 parts of sand and 6 parts of stone chips and l:4:8 (l cement, 4 parts of sands and 8 parts of stone chips/jhama khoa) may be mixed by volumetric batching as mentioned in the Schedule of Quantities.

3.6.4 WATERPROOF OF CONCRETE

Excepting internal R.C. columns and R.C. walls all structural concrete of basement slab and retaining walls, Ramp wall& slab, water tanks and underground tanks shall be cast with admixture of water proofing compound as advised by the specialist waterproof agency. The waterproofing compound for the purpose shall be of approved manufacturers and shall be mixed as per manufacturer's specification. The resulting concrete shall be perfectly waterproof. The work of waterproofing concrete by the admixture of waterproofing compound shall be done under direct supervision of a senior representative of the approved manufacturers. The Contractor shall give a guarantee for l0 years non judicial stamp paper of appropriate value as per the proforma enclosed against water leakages through the resulting concrete work and shall rectify all defects during the guarantee period without any extra charges. The waterproofing compound for this purpose shall be paid in a separate item if not otherwise mentioned in the Schedule of Quantities. Full payment against this item of work shall be made after testing & satisfactory result and submission of guarantee at an approved proforma.

3.7 FORM WORK

3.7.1 MATERIALS AND DESIGN

a) The form work shall be of approved dressed timber of not less than 3.5 cms thick except where otherwise stated. As an alternative sufficiently rigid steel/ply board shuttering of approved design may be used. Joints of the shuttering must not allow loss of liquid from concrete. In timber shuttering the joints shall therefore be either tongued or grooved or the joints must be perfectly closed and lined with craft paper or other types of approved materials. In case of steel shuttering also the joints are to be similarly lined. If any particular material or materials be specified in the Schedule of Quantities for formwork such particularly specified material or materials shall be used in work. The form work shall be constructed as to remain sufficiently rigid during placing of the concrete. All shuttering and framing must be adequately stayed and braced to the satisfaction of the Bank/Consultants for properly supporting the concrete during the period of hardening. The forms shall have

sufficient strength and rigidity to hold concrete and withstand the pressure of ramming and vibration without deflection from the prescribed lines and levels. The surface of all forms in contact with concrete shall be clean, rigid, watertight and smooth. Suitable devices shall be used to hold corners, adjacent ends and edges of panels of other forms together in accurate alignment.

b) The form work shall conform to the shape, lines and dimensions to suit the R.C.C. members as shown on drawing. Form work shall be adequately designed to support the full weight of workers, fresh placed concrete without yielding to settlement or deflection and to ensure good and truly aligned concrete finish in accordance with the construction drawings. A camber in all direction of 6 mm for every 5 meter span in all slab and beam centering shall be given to allow for unavoidable sagging due to compression or other causes.

c) The form work shall be so designed that the sides of the beams shall be first struck leaving the soffit of beams and supporting props in position. Props shall be designed to allow accurate adjustment & to permit of their being struck without jarring the concrete.

d) Temporary openings shall be provided at the base of columns forms and at other points where necessary for facilities of cleaning and observations immediately before concrete is deposited.

e) Vertical Shuttering

The vertical shuttering shall be carried down to such solid surface as is sufficiently strong to afford adequate support and shall remain in position until the newly constructed work is able to support itself. Props shall be securely braced against lateral deflection. Steel props of approved quality shall be used. In case timber props and bullies are allowed to use these shall be of minimum l0 cm diameter and shall be straight and adequately strong. Bamboo props shall not be used. The spacing of such struts shall be designed to carry loads imposed on it without undue deflection of the members supported by the props and shall be approved by the Bank/Consultants. Any alterations suggested by them shall be carried out at Contractor's expenses. Bracing shall be provided as directed without extra cost. The contractor shall allow in his rates for providing props and struts for any height shown in the working drawings issued to the contractor from time to time.

3.7.2 WATER TIGHTNESS :

The Contractor shall ensure that the forms are checked for water tightness just before concreting operation starts and shall make good any deficiencies. If instructed by the Bank/Consultants building paper or any other approved materials will have to be used without any extra charge for the same.

3.7.3 CLEANING AND TREATMENT OF FORMS

All rubbish, particularly wood chippings, shavings and saw dust, shall be removed from the interior of the forms before the concrete is placed and the form work in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition. Care shall be taken that such approved composition is kept out of contact with the reinforcements. Interior of all moulds and boxes must be thoroughly washed out with hose pipe or otherwise so as to be perfectly cleaned and free from all extraneous matter before deposition of concrete. Prior approval of the form work should be taken from Consultants before placing reinforcement on the form work.

3.7.4 STRIPPING

Form shall be left in place until their removal is authorised by the Bank/Consultants and shall then be removed with care so as to avoid injury to concrete. Under no circumstances shall form be struck until the concrete reaches strength of at least twice the stress to which the concrete may be subjected at the time of striking. The strength referred to shall be that of concrete using the same cement and aggregate with the same proportion, and cured under conditions of temperature and moisture similar to these existing on the work. Where possible, the form work should be left longer as it would assist the curing.

3.7.5 STRIPPING TIME

In normal circumstances (generally where temperatures are above 20°C and where ordinary cement is used) forms shall be struck after expiry of the following periods unless otherwise directed at site by the Bank/ Consultants.

	Location	Striking Time in days	
		Ordinary Portland Cement	Pozzalana Cement
a)	Vertical sides of walls slabs beams and columns	2	4
b)	Bottom of slabs up to 4.5 M span	7	14
c)	Bottom of slabs above 4.5 M span & Bottoms of beams up to 6.0 M span.	14	21
d)	Bottoms of beams over 6 M span & arch rib bottoms above 6 M span	21	30
For rapid hardening cement, 3/7 of the above periods will be sufficient in all cases except vertical sides of walls, slabs, beams and columns which should be retained for a minimum period of 24 hours.			

3.7.6 FORMWORK IN LIFTS FOR CONTINUOUS SURFACE :

Where forms for continuous surface are placed in successive units, (as for example in columns or walls) the forms shall fit tightly over the completed surface so as to prevent leakage of mortar from the concrete and to maintain accurate alignment of the surface.

3.7.7 POROCEDURE WHILE REMOVING THE FORMWORK :

All formwork shall be removed without such shock or vibration as would damage the reinforced concrete. Before the soffit and struts are removed the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occurs with all cement in the cold weather.

3.7.8 TOLERANCE

The following shall be the maximum permissible tolerance:

a) In general, setting out dimensions up to 4M in length a tolerance up to 3 mm will be allowed.

b) On lengths of more than 4 M tolerance of not more than 5 mm will be allowed.

c) On the cross sectional dimensions of columns, beams, slabs, facias, chajja, mullions, grills, fins, louvers, and such other members, tolerance of more than 3 mm will not be allowed.

d) The top surface of concrete floor slab will be within 6 mm of the level and line shown on the drawings.

e) Columns and walls and other vertical members shall not be more than 3 mm out of plumb in their storey height and not more than 6 mm out of plumb in their full height.

f) If work is not carried out within the tolerance set out above in (a) to (e), the cost of all rectification measures of dismantling and reconstructing as decided by the Bank/ Consultants shall be borne by the contractor. In case of work dismantled the same not to be measured and paid for.

3.8 DEFECTIVE OR POOR CONCRETE - PROCEDURE FOR DEALING WITH

3.8.1 GENERAL

If in the Bank's/Consultants' opinion there is doubt as to the strength of the structure due to the works test cube failing to attain specified strength due to poor workmanship like honeycombing etc. or any reason attributable to negligence on the part of the contractor then the Bank's/Consultants' decision regarding dismantling, of such concrete or rectification if concrete is allowed to be retained in its place shall be final and binding on the contractor.

3.8.2 WHERE CONCRETE IN STRUCTURE IS ALLOWED TO BE RETAINED

In the case of concrete showing the result of the tests strength less than those specified, the quantities in cubic meter certified by the Bank/Consultants as so deficit may be allowed to remain in such a case subject to deduction for such sums as are or may become due under the contract not exceeding Rs. 50.00 per cum of the quantity so certified in case where deficiency does not exceed five percent and Rs.l00.00 per cum of the said quantity where the deficiency exceeds five percent. The Bank/Consultants shall have full power in their absolute discretion to fix the actual rate of deduction subject only to that the rate so fixed shall not exceed the maximum as provided above.

3.8.3 CONCRETE ORDERED TO BE DISMANTLED

If the deficiency exceeds standard Deviations arrived as per IS 456 of latest edition, the Bank/Consultants may at their discretion direct the portion of concrete certified by them so as deficient in strength to be dismantled from the structure and replaced by concrete of specified strength and the contractor shall in that case have to carry out that direction at his own cost irrespective of the amount of loss, inconvenience and difficulties involved. Concrete thus dismantled will not be measured and paid for.

3.8.4 CONCRETE RETAINED WITH RECTIFICATION

Where the Bank/Consultants consider that defective concrete be strengthened, the contractor shall carry out all rectification work as per direction of Bank/Consultants at contractor's expense. The concrete of lower strength thus accepted shall, however, be paid for concrete as mentioned above after necessary strengthening.

3.8.5 QUALITY OF DEFECTVE CONCRETE REPRESENTED BY CUBES

In all cases of defective concrete as revealed by work test cubes strength falling below the

specified strength, the quantity of concrete thus affected and represented by the cubes will be decided by the Bank/Consultants whose decision shall be final and binding on the contractor.

3.8.6 HONEY COMBING

a) Where honeycombed surface are noticed in the concrete, the contractor shall not patch up the same until examined by the Bank/Consultants and decision given regarding the acceptance with rectification or rejection of the same. If the contractor patches up such defects without the knowledge of the Bank/Consultants the Bank/Consultants will be at liberty to order demolition of the concerned concrete members to the extent they consider necessary. In such case, the contractor at his expense, shall demolish and reconstruct defective work. The demolished work shall not be measured and paid for.

b) If in the opinion of the Bank/Consultants the honeycombing is harmful to the structure and where so directed by the Bank/Consultants the full structural members affected by honey combing as decided by Bank/Consultants shall be dismantled and reconstructed to Bank/Consultants' approval at the contractor's expense. The demolished concrete will not be measured and paid for.

c) Where in the opinion of the Bank/Consultants the Structural members containing honeycombing can be allowed to be retained with rectification, the rectification shall be carried out as directed by the Bank/Consultants by gunitting (with cement mortar l:3 proportion)the areas concerned at the contractor's expense.

d) If such honeycombed areas are not severe in the opinion of the Bank/Consultants and where so directed shall be patched up with cement mortar consisting of l part of cement and 3 parts of sand after removing defective concrete up to sound concrete surface to the satisfaction of Bank/Consultants all at the expense of the contractor.

3.8.7 LOAD TESTING

The Bank/Consultants reserve the right to reject proposal of any load testing on structure and proceed to deal with defective concrete as stated in the paragraph. However, purely at their discretion, they may instruct the contractor to make a loading test on the work part thereof. The nature of the test and the loading shall be left to the discretion of the Bank/Consultants. The contractor shall bear the cost of the test and the cost of dismantling and reconstruction or concreting the defects by rectification in accordance with their instructions. Where such structure is allowed to remain in the work the concrete shall be accepted as belonging to the next lower grade and payment shall be made accordingly to the contractor.

3.8.8 OTHER DEFECTS

Any other defects in concrete shall be made good as directed by the Bank/Consultants at the contractor's expenses.

3.9 CONTRACTOR'S RATES TO INCLUDE

The rates of the contractor for providing and laying cement concrete in various grades or proportion in the schedule of quantities shall, apart from any other factors specified elsewhere in the tender documents, include for the following:

a) For all factors and method of work described in this specification and relevant Indian Standards.

b) For all materials, labours, tools and plants, scaffolding, staging etc. mixing conveying and placing concrete in position, ramming, vibrating, trowel ling, curing, and removing the

scaffolding after the work is complete.

c) Unless otherwise specified in the Schedule of Quantities the cost for concrete items shall include for providing, stays, struts, bolts, nuts and every item necessary to keep the forms rigid, smoothing the surface to receive concrete as per detailed drawing, striking and stripping formwork after the concrete is cured or as specified, hacking the concrete surfaces required to receive plaster etc. Where shuttering is described as a separate item in the schedule of quantities, rate for shuttering shall be inclusive of all the works mentioned in this para apart from other factors mentioned in specification for form work and also elsewhere in this contract. Shuttering to curve structure will be measured and paid as detailed in Schedule of Quantities.

d) The reinforcement in case of reinforced concrete work will be paid for separately unless otherwise stated in the particular items, but rate shall include for pouring concrete and packing around reinforcement.

e) The measurement of concrete will be as per detailed drawing, shapes and size based on net structural sizes as per drawing i.e. exclusive of plaster.

f) Rates for concrete items shall cover for any shape of structural members like columns, beams, facia, fins, louvers etc. and for cantilever beams, slabs, etc. including curve structures.

g) Formation and treatment of construction joints, and expansion joints where water bars of approved materials or joint fillers like "Shalitex" are specified such materials shall be paid as per separate rates.

h) Design of mixes, if required by specification, testing in an approved laboratory, tests of materials and work required in the opinion of the Consultants and described in these specification.

i) Fixing all inserts like pipe, plugs, forming holes etc as described.

j) Weigh-batching using a Mechanical Weigh Batcher of a batching plant or where so specified for volumetric batching.

k) For taking out dowel bars, fan hooks, etc. through shuttering.

l) For forming drip moulds in chajja, sills etc. as shown in the drawings or as described.

m) For work at all levels.

n) In cases where at the junctions of beams, column and slab the composition of concrete mix of specified strength be different for columns, beams and slab then in such cases only the richer concrete among those specified for in all these members shall be used at the junctions and rate quoted for columns, beams and slabs or any members entering such junctions shall allow for the same. Rate shall also cover for spill over of rich concrete in beams to natural angle of repose of wet concrete required from practical consideration while concreting the junctions.

3.10 STEEL REINFORCEMENT

3.10.1 MILD STEEL BARS

Mild steel reinforcement bars shall conform to I.S. 226 of latest edition "Standard Quantity" or I.S. 432 of latest edition "Grade I". Other qualities of steel shall not be acceptable.

3.10.2 HIGH STRENGTH DEFORMED BARS

Where high strength deformed steel bars and wires are specified, the material shall be as manufactured by M/s. SAIL, M/s. Tata Iron & Steel Company Ltd or by RINL only having valid BIS Licence on approval of Employer/Consultants conforming to IS 1786 of latest edition accompanied by a certificate from manufacturer.

Test : Necessary tests on steel reinforcements bars & wires shall be carried out by the contractor as per instruction of Bank/Consultants in this contract at no extra cost.

3.10.3 CLEANING OF REINFORCEMENT

Before steel reinforcement is placed in position, the surface of the reinforcement shall be cleaned of rust, dust, grease and any other objectionable substances.

3.10.4 BAR BENDING SCHEDULE OF REINFORCEMENT

On receipt of structural drawing, Contractor shall prepare bar bending schedule of reinforcement and shall obtain approval of the Bank/Consultants.

3.10.5 CUTTING OF REINFORCEMENT

Before steel reinforcement bars are cut, the contractor shall study the lengths of bars required as per drawing and shall carry out cutting only to suit the sizes required as per drawing.

3.10.6 PLACING AND SECURITY

Reinforcement bars shall be accurately placed and secured in position and firmly supported or wedged by precast concrete blocks of suitable thickness at sufficiently close intervals so that they will not sag between the supports or get displaced during the placing of concrete or any other operation of the work. Contractor shall maintain reinforcement in its correct position without displacement and correct specified cover. The con-tractor shall be responsible for all costs for rectification required in case the bars are displaced out of their correct position.

3.10.7 BINDING WIRE

The reinforcement shall be securely bound wherever bars cross or whenever required for with 20 gauge soft black annealed steel wire.

3.10.8 WELDING

Welding of bars shall not be carried out unless specifically authorized in writing by Bank/Consultants as per I.S. Code of Practice in place of splicing. However, no extra payment shall be allowed for the same.

3.10.9 BENDS ETC

Bends, cranks, etc. in steel reinforcement shall be carefully formed, care being taken to keep bends out of winding. Otherwise all rods shall be truly straight. If any bend shows signs of cracking the rod shall be removed immediately from the site. Minimum radius of 9 times diameter of the bar shall be used unless otherwise specified in the drawings. However, in respect of standard hooks the radius of bend shall be 2 times the diameter of bar. Heating of reinforcement of bars to facilitate bending will not be permitted. The bars shall always be bent cold. In case of mild steel reinforcement bars of larger sizes where cold bending is not possible they may be bend by heating with written permission of the Bank/Consultants. Bars when bent shall not be heated beyond cherry red colour and after bending shall be allowed to cool slowly without quenching. The bars damaged or weakened in any way in bending shall not be used on the work. High strength deformed bars

shall in no case be heated to facilitate bending or cranking.

3.10.10 INSPECTION OF REINFORCEMENT

No concreting shall commence until the Bank/Consultants have inspected the reinforcement in position and until their approval have been obtained. A notice of at least 72 hours shall be given to the Bank/ Consultants by the contractor for inspection of reinforcement. If in the opinion of the Bank/Consultants any materials are not in accordance with the specification or the reinforcement is incorrectly spaced, bent or otherwise defective, the contractor shall immediately remove such materials from the site and replace with new and rectify any other defects in accordance with the instruction of the Bank/Consultants and to their entire satisfaction.

3.10.11 NETT MEASUREMENT

Reinforcements shall be placed as shown on the structural drawings and payment will be made on the net measurements from drawings. Only such laps, dowels, chairs and pins in reinforcement as approved by the Bank/Consultants or shown on drawings shall be paid for. The contractor shall allow in his quoted rates for all wastage which will not be paid separately.

3.10.12 STOCK PILING OF STEEL

Steel required shall be stock piled well in advance of need in the work. Contractor shall stock pile l/3 requirement within 15 days, 2/3rd requirement at l/4 contract time and full requirement at l/2 contract time or to suit the accepted work programmed.

3.10.13 COVER FOR REINFORCEMENT :

Cover shall be measured from the outer surface of main reinforcement. Cover shall be as follows if not specified/shown in construction drawings.

a) At each end of a reinforcing bar, 25 mm or twice the diameter of such rod or bar, whichever is greater.

b) For longitudinal reinforcing bar in beams 25 mm or the diameter of such rod or bar, whichever is greater.

c) For tensile, compressive shear or other reinforcement in a slab l5 mm or the diameter of such reinforcement whichever is greater.

d) For reinforcement in any other member such as a lintel, chajja, canopy or pardi, l5 mm or the diameters of such reinforcements, whichever is greater.

e) For main reinforcement in isolated footings (side and bottom) clear cover shall be 50 mm.

f) For column bars clear cover shall be 40 mm, unless other-wise specified as in drawing. In case of columns of minimum dimension of 200 mm or under, whose reinforcing bars do not exceed l2 mm, minimum cover of 25 mm should be provided.

g) For bars in slabs of strip footings and mat foundations the clear cover shall be 50 mm. Beam bars shall be placed over slab bars in respect of beam & slab type foundations.

3.10.14 RATES QUOTED FOR REINFORCEMENT IN ADDITION TO ANY FACTORS MENTIONED ELSEWHERE SHALL ALSO INCLUDE FOR

a) All cutting to length, labor in bending and cranking, forming hooked ends, handling, hoisting and everything necessary to fix reinforcement in work as per drawing.

b) Decoiling, straightening (coiled bars, bent bars to facilitate transporting).

c) Cost of binding work required as described.

d) Cost of precast concrete cover blocks to maintain cover and holding reinforcement in position.

e) For fabricating and fitting reinforcement in any structural member irrespective of its location, dimensions and level.

f) Removal of rust and every other undesirable substances, using wire brush etc as described.

g) Work at all levels.

h) Rolling tolerance and wastage.

i) Stock piling of reinforcements as described.

3.11 DAMP PROOF COURSE :

Damp proof course shall be 40 mm/25 mm thick (as specified in the Schedule of Quantities) artificial stone 1:1 1/2:3 (1 part cement, 1/2 parts sand and 3 parts stone chips of 6 mm graded down Approved waterproofing compound of proportion as specified by manufacturer should be mixed with the concrete during mixing, as per manufacturer's specification. Before laying the concrete on the wall, the top surface shall be thoroughly cleaned of dirt, loose particles, make mortar dropping and latiance, if any kind by scrubbing with coir or steel wire brush or by hacking if necessary. The surface shall be moistened before laying the concrete. The concrete should be laid in every case over the full width of the superstructure walls or as shown in the drawing. The top surface shall be finished with double chequered marks for adhesion of mortar for brick work. Proper curing should be done before starting the brick work over the damp proof course.

If any particular materials or any other treatments be specified in the schedule of quantities for damp proof course such particular materials or specifications shall be followed.

4.0 PRECAST CONCRETE WORKS AND PRECAST R.C.C JALLI

4.1 PRECAST CONCRETE WORK

4.1.1 The design/details of the precast units as shown in the drawings will be normally adhered to. However, for changes in respect of size of units, method of jointing decided during the progress of work by the Bank/Consultants, the contractor will not be entitled to any extra over the rate quoted for such items of work. The contractor should quote rate to include this into account while submitting tender.

4.1.2 The rates to be affixed to the items of manufacturing and supplying precast concrete works shall include all labors and materials (reinforcements measured separately), unless otherwise mentioned in Schedule of Quantities) including the entire cost of supplying, fixing and removing moulds and/or form work, approved finish to face, drawing and direction of the Bank/ Consultants.

4.1.3 Samples of precast unit should be submitted for inspection and approval by the Bank/Consultants as regard texture, colour and quality.

4.1.4 Unless otherwise mentioned in Schedule of Quantities the proportion for precast concrete works shall be 1:2:4 (1 cement, 2 coarse sand, 4 aggregate).

4.1.5 Water cement ratio for this class of concrete work should not exceed 0.5.

4.1.6 Form shall be composed of high quality timber of approved variety consisting mainly of two basic units-mould and perimeter frame as per drawing. Mould units are to be assembled with nail.

4.1.7 Where required, joints of precast units are to be grouted with sand cement (2:1) mortar with admixture of approved waterproofing compound as per manufacturer's specification.

4.1.8 Curing of concrete units should be as prolonged as possible (not less than 21 days) but they should be allowed to dry before fixing for as long a period as possible and should never be fixed in a green or wet condition.

4.1.9 During installation of the precast unit in position special care should be taken to avoid the possible damage to the units and danger to workmen. Any loss, damage or injury caused to the units or workmen due to carelessness, will be the contractors responsibility and if ordered by the Bank/Consultants the damaged units are to be replaced by new units which are absolutely at the risk and cost of the contractor.

4.1.10 The rates of the contractor for the same unless otherwise mentioned in Schedule of Quantities shall be inclusive of supplying and casting of the concrete blocks of specified thickness, necessary formwork as specified in drawings, installation of the units in position with light crane, fixing the units to adjacent units (precast or cast in situ) and supporting frame work as shown in drawing, finally to have the cement rendering or 6 mm thick cement plastering with all other ancillary and contingent works which may arise to have the work finished as per drawing and to the satisfaction of the Bank/ Consultants.

4.2 PRECAST R.C.C. JALLI

Specification same as 'Precast Concrete Work'.

5.0 BRICK WORKS :

5.1 BRICKS

a) The bricks shall be locally available kiln burnt bricks of generally regular and uniform size, shape &colour, uniformly well burn but not over burnt. The bricks shall be free from cracks, chips, flaws, stones or lumps of any kind and the rating of effloresence shall not be more than "moderate", when tested as per I.S. 3495 of latest edition. They shall not have any part unburnt. They shall not break even after being dropped on the ground on their flat face in a standard condition from a height of 60 cms.

b) The size of brick shall normally 250 mm x 125 mm x 75 mm or 230 mm x 115 mm x 65 mm. Bricks of one standard size shall be used on one work unless specially permitted by the Bank/Consultants.

c) After immersion in water, absorption by weight shall not exceed 20% of dry weight of the brick when tested according to IS I077 of latest edition. Unless otherwise specified the load to crush the brick when tested according to IS I077 of latest edition shall not be less than 75 Kg/Sq.cm.

d) Prior approval of Bank/Consultants shall be obtained for the brands of bricks to be used in the work after compliance with the above specifications/tests.

5.2 MORTAR

Unless otherwise specified, mortar for brick work shall be composed of l part of cement to 6 parts of approved sand for walls of one brick thick (25 cm) and over and one part of cement to 4 parts of approved sand for half brick thick and brick on edge walls.

5.3 CONSTRUCTION DETAILS

a) Soaking

All brick shall be immersed in water for 24 hours before being put into work so that they will be saturated and will not absorb water from the mortar.

b) Bats

No bats or cut bricks shall be used in the work unless absolutely necessary around irregular openings or for adjusting the dimensions of different course and for closers, in which case, full bricks shall be laid at corners, the bats being placed on the middle of the courses.

c) Laying

The bricks shall be laid in mortar to line, level and shapes shown on the plan, slightly pressed and thoroughly bedded in mortar and all joints shall be properly flushed and packed with mortar so that they will be completely filled with mortar and no hollows left any where. Bricks shall be handled carefully so as not to damage their edges. They should not also be thrown from any height to the ground but should be put down gently. All courses shall be laid truly horizontal and all vertical joints made truly vertical. Vertical joints on one course and the next below should not come over one another and shall not normally be nearer than quarter of a brick length. For battered faces beading shall be at right angles to the face. Fixtures, plugs, frame etc. if any, shall be built in at place shown in the plans while laying the courses only and not later by removal of bricks already laid. The top layer of bricks of one or more thick wall coming in contact with R.C.C beam, slab and at window sill level etc shall be laid on edge as per direction.

Care shall be taken during construction to see those edges of bricks at quoins, sills, heads etc. are not damaged.

The verticality of the walls and horizontality of the courses shall be checked very often with plumb bob and spirit level respectively.

All external walls should have fair face on exterior surface.

d) Bond

Unless otherwise specified, brick work shall be done in English Bond. All walls, coming in contract with reinforced concrete columns, beams etc. should be properly bonded by inserting reinforcements. Extra labour shall be included in the rates (reinforcements will be measured and paid separately against reinforcement item provided in the Schedule of Quantities.

e) Joints

Joints shall not exceed l0 mm (about 3/8") in thickness and this thickness shall be uniform through out. The joints shall be raked out not less than l0mm (about 3/l8") deep when the mortar is green where pointing is to be done. When the brick surface are to be plastered, the joints shall be raked to a depth of 5 mm when the mortar is green, so as to provide good key to plaster.

f) Uniform Raising

Brick work shall be carried up regularly in all cases where the nature of work will admit, not leaving any part 60 mm lower than another. But where building at different levels is necessary, the bricks shall be stepped so as to give later at uniform level and effective bond. Horizontal courses should be to line and level, and face plumb or to later as shown on the plan. The rate of laying masonry may be up to a height of 80 cm (about 32") per day if cement mortar is used, and 45 cm (about l8") if lime mortar is used.

5.4 SCAFFOLDING

The scaffolding must be of approved type strong and rigid stiffened with necessary cross bearers and safe to prevent injury to persons or materials. The contractor shall have to allow other trades to make reasonable use of his scaffolding as directed by the Bank/ Consultants. If for the interest of work the contractor have to erect scaffolding in the other properties including local bodies or Corporation, the arrangement for the same including the cost of licensing fees etc. shall have to be borne by the contractor and the Bank should be kept free from any liability on this account. Put log holes shall be made good by bricks to match the face work when put logs are removed after ensuring that the holes behind are solidly filled in with l:4:8 cement concrete.

5.5 CURING

All brick works shall be kept well watered for l4 days after laying. While pozzalana cement is used for mortar the curing shall be extended by one week at contractor's expense.

5.6 EXPOSED BRICK WORK

Where exposed brick work is specified the usual specification for 'Brick Work' as mentioned above will be applicable for 'Exposed Brick Work', but in addition specially selected brick shall be used for facing, ensuring regular and clean faces of uniform colour. No bricks which are broken chipped wrinkled or which have irregular edges or corners shall be used. Depending on the quality of bricks and if instructed by the Bank/ Consultants the exposed faces of every bricks shall be rubbed before laying without extra charge. Wooden fillets l0 mm thick and l0 mm wide shall be placed at the edge of joints so that the mortar comes on the surface of the bricks and a regular thickness of joints is maintained. The surface shall be rubbed down with brush on bricks if necessary, and thoroughly washed. No mortar shall be allowed to stick to the surface, which shall be left clean to the Bank's/Consultants' satisfaction with all joints even and true to straight line. Double scaffolding shall be used for exposed brick work, if necessary.

5.7 HALF BRICK/BRICK ON EDGE WORK

Half brick thick and brick on edge walls, shall be provided H.B. wire netting of approved quality as reinforcements. For half brick thick wall and brick on edge wall H.B. wire netting reinforcements of approved quality shall be provided at every third course and in alternate course respectively according to standard practice.

5.8 RATES TO INCLUDE :

Apart from other factors mentioned elsewhere in this contract, the rates for items of brick work shall include for the following :

a) All labor, materials, use of tools, equipment and other items incidental to the satisfactory completion of brick masonry at all heights and levels.

b) Erecting and removing of all scaffolding, ladders and plant required for the execution of the work to the height and depths and shapes as shown on the plan or as ordered by the

Bank/Consultants including extra labor and materials for using cut bricks in the construction of wall of varying thickness other than one brick, one and half brick, half brick and brick on edge walls as per drawings.

c) Constructing brick work to lines, levels, batters, pillars, curve, projection, cutting, toothing etc. in strict conformity with the drawings and to any position or shape, to any heights or levels including raking out joints and housing frames, fixtures etc.

d) Necessary charges of outside scaffolding work for construction of external brickwork from outside to have fair face on exterior surface.

e) Curing brick work.

f) Extra labor for bonding brick work to R.C. works as specified.

g) Removing of all stains and adhering mortar lumps on the brick work surface.

h) Cost of reinforcement in half brick walls and brick on edge walls.

i) Raking out joints for receiving plaster as specified.

5.9 MEASUREMENTS :

a) Half brick thick and brick on edge walls shall be measured in sq.m unless otherwise mentioned.

b) One brick wall and thicker walls shall be measured in cum. Brick walls up to and including 3 brick in thickness should be measured in multiples of half bricks which shall be deemed to be inclusive of mortar joints. Widths of more than three bricks in walls will be measured actually and limited to the width specified.

c) No deduction or addition shall be made on any account for :-

i) Ends of dissimilar materials (i.e. joists, beams, lintels, posts, girders, rafters, purlins, trusses, corbels steps etc.) up to 0.1 sqm in section.

d) For details of measurements not mentioned elsewhere in the contract, the method of measurement should be as per relevant I.S. Code.

5.10 BRICK FLAT SOLING

For soling the bricks shall be of approved, quality and sound, hard, tough, durable, dense, clean, and free from soft spots, cracks decay and other defects. Brick bats shall not be used. All the fillings shall be watered and compacted to get maximum consolidation.

All necessary trimming or filling for laying of the soling in line and required grade shall be done.

The sub-grade shall be marked by stacks and strings for required depth for laying of soling. The cushioning will also consist of local sand.

The bricks shall be laid on flat (unless otherwise specified) touching each other. Brick shall be laid in parallel rows breaking bond or in herring bone pattern as directed and firmly embedded true to line and filled with local sand. Measurement shall be in sqm.

6.0 FLOOR FINISHING WORKS

6.1 MARBLE FLOORING :

i) Marble slabs

The marble shall be of approved shade and sources as mentioned in the Schedule of Quantities and their size and the thickness shall be as shown on the drawings and as approved by the Bank/Consultants. Sample thus approved shall be kept at site office of Bank/Consultants for verification as to whether the materials brought & used conform to approved samples. They shall be of selected quality, dense uniform and homogenous in texture and free from cracks or their structural defects. It shall have even and crystalline grains. The surface shall be machine polished to an even and perfectly plain surface and edges machine cut true and square.

The rear face shall be rough enough to provide a key for the mortar. No slab shall be thinner than the specified thickness at its thinnest part. The dimensions of the slabs shall be as specified. A few approved samples of finished slabs to be used shall be deposited by the contractor in the office of the Bank/Consultants. Unless otherwise mentioned, the thickness of the marble shall be minimum 18 mm.

ii) Concrete Base & Mortar Bedding

Unless otherwise specified the proportion of mortar bedding shall be 1:2 cement mortar (1 cement and 2 sand).

iii) Laying Marble Slabs :

Before laying the marble shall be thoroughly wetted with clean water. Neat cement grout of honey like consistency shall be spread on the mortar bed over as much area as could be covered with the slabs within l/2 an hour. The specified type of marble slabs shall be laid to pattern as directed on the neat cement float and shall be evenly and firmly bedded to the required level and slope in the mortar bed. Each slab shall be gently tapped with a wooden mallet, till it is firmly and properly bedded. There shall be no hollows left. If there is a hollow sound on gently tapping on the slabs, such slabs shall be removed and rest properly. The joint shall be hair fine in width and in straight line grouted with neat coloured cement slurry to match the colour of the marble. The joints shall be struck smooth but there shall be no smearing over the mortar of the slabs. The edges of the adjoining slabs shall be in one plane.

iv) Curing

The flooring shall be kept undisturbed at least seven days, and wet for fourteen days.

v) Polishing &Finishing :

Unevenness at the meeting edges of slabs shall be removed by approved type grinding machine set with carborandum stones of required grade.

vi) Rates to include :

Apart from other factors mentioned elsewhere in this contract, the rates for item of marble flooring shall include for the following:-

a) All labour, materials and equipments, cleaning the sub-base, laying mortar bed and cement grout and fixing marble slabs, as specified above and making up the joints and machine polishing.

b) Any cutting and waste if required.

c) Curing

d) Cleaning the floor from all stains etc.

vi) Mode of Measurement :

The measurement shall be in sq meters for the actual marble flooring provided.

6.2 ARTIFICIAL STONE FLOORING, DADO & SKIRTING

6.2.1 ARTIFICIAL STONE FLOORING :

a) Preparation of Sub grade

The surface of the structural slab shall be struck of reasonably true and at a level average 40 mm below the level of finished floor. All water, laitance or dirt on the surface of the structural slab shall be removed before the base course is laid. The slope required should be provided in the concrete of the structural slab to obtain uniform thickness of artificial stone towards the predetermined positions of outlets.

b) Base Course

The mix for the base of the artificial stone shall be part of Portland cement, 2 parts of fine aggregate and 4 parts of coarse aggregate by volume. The stone chips for the base course should be 6 mm and down and should be properly screened and washed before use. Not more than 27.l/2 liters (5.l/2 gallons) of mixing water including the moisture in the aggregate shall be used for each bag of Portland cement in the mixture. The concrete shall be of the driest consistency possible to work with a sawing motion of the strike off board or straight edge. Changes in consistency shall be obtained by adjusting the proportions of aggregate and cement. In no case, shall be the specified amount of water exceeded.

c) Sectors

Artificial stone flooring shall be laid in sections not exceeding 1.5 sqm with a maximum length of 1.5 M as directed. Flooring of the panels laying diagonally shall be completed first. The edges of the panels to be concreted shall be bounded by about 50 mm wide oiled wooden battens of the finished floor thickness. Immediately before the placing of the concrete the sub-base will be given a coat of neat cement grouting.

d) Top Layer :

After striking off the base course to the required slope, it shall be compacted with a wood flat. The surface shall be tested with a straight edge to direct high and low spots which shall be eliminated, before the concrete of the base course has hardened, the topping shall then be floated with a wooden float to render the surface even. After the surface is slightly hardened it shall be trowelled three times at intervals, so as to produce a uniform and hard surface. Excessive trowelling in the earlier stage shall be avoided. Trowelling of rich mix of dry cement and fine aggregate on to the surface shall not be permitted.

The whole thing left undisturbed for l0 to l2 hours. After this period the whole floor should be left flooded with water for a minimum period of l4 days.

e) When working on alternate bay principle of the ponding of flooring should be deferred till the whole floor is complete. But the portions already completed should be occasionally damped with water by moist sand till the whole floor is complete. After this the whole floor will be flooded with water. For coloured finishes a suitable colour mixture shall be added to

top cement finishing coat. The quality of colouring matter to be added to cement should be in the proportion of one part of pigment to three parts of Portland cement mixed thoroughly and screened before making to paste. The pigment shall be of approved manufacturer and tints shall be uniform. Any cracks, rust, disfiguration or discoloring of surfaces shall have to be made good without any extra charges to the satisfaction of the Bank/Consultants.

f) f) Rates to Include :

Apart from other factors mentioned elsewhere in this contract the rate quoted for 'Artificial stone flooring' shall include for the following :

i) All labor, materials and equipment, cleaning the sub-grade, laying base course and top layer to have finished 40 mm thick flooring as per above specifications.

ii) Curing

iii) Cleaning the floor from all stains etc.

Mode of Measurement :

The measurement shall be square metre for the actual flooring provided.

6.2.2 ARTIFICIAL STONE DADO AND SKIRTING :

The specification for materials and workmanship will be same as that of Artificial stone flooring except that the finished thickness of dado and skirting will be 20 mm. The thickness of base course and top layer to be adjusted, accordingly to have a finished thickness of 20 mm after polishing. The rate quoted for the same shall include for all the stages as mentioned in case of flooring except that the finished thickness will be 20 mm. Dado and skirting shall be measured in square meter. The measuring of skirting or dado shall be on the basis of wall length of area in contact with skirting & the dado respectively.

6.3 CAST IN SITU GRANOLITHIC CONCRETE FLOOR TOPPING WITH HARDENER

a) Metallic Hardening Compound :

The compound shall be of approved quality consisting of uniformly graded iron particles, free from non-ferrous metal particles, oil, grease, sand, soluble alkaline compounds.

b) The surface of the structural slab shall be struck of reasonably and at a level average 40 mm or otherwise required to suit the thickness of floor finish as mentioned in the Schedule of Quantities below the level of finished floor. All water, laitence or dirt on the surface of the structural slab shall be removed before the base course is laid. The slope required should be provided in the concrete of the structural slab to obtain uniform thickness of concrete floor towards the predetermined positions of outlets/levels.

c) The mix for the base of the concrete floor shall be one part of cement, 2 part of fine aggregate and 4 parts of coarse aggregate by volume. Not more than 27.l/2 liters (5.l/2 gallons of mixing water, including the moisture of the aggregate shall be used for each bag of Portland cement in the mixture. The concrete shall be of the driest consistency possible to work to with a sawing motion of the strike off board straight edge. Changes of consistency shall be obtained by adjusting the proportions of aggregates and cement. In no case the specified amount of water shall be exceeded. The base course shall have minimum thickness of 28 mm for 40 mm finished flooring.

d) Sectors :

Concrete flooring shall be laid in sections not exceeding 4 SM. (with a maximum length of 2.0 M) in squares or rectangles. Flooring of the panels laying diagonally shall be completed first. The edges of the panels to be concreted shall be bounded by wooden battens. Immediately before the placing of the concrete the sub-base will be given a coat of cement slurry which shall be thoroughly brushed into the prepared surface.

e) Topping :

This shall consist of minimum l2 mm thick layer of mix l:2 (l cement mixed with hardener : 2 stone aggregate 6 mm nominal size) by volume or as otherwise specified with which metallic hardening compound is mixed in the ratio of l:4 (l metallic concrete hardener : 4 cement) used by weight. Concrete hardener shall be dry mixed thoroughly with cement on a clean dry platform. This dry mixture shall be mixed with coarse aggregate of specified size in the ratio of l:2 (l cement mixed with hardener : 2 coarse aggregate) by volume and well turned over. Just enough water shall then be added to this dry mix as required for flooring concrete.

The mixture so obtained shall be laid in minimum l2 mm thickness on cement concrete floor within 2 to 4 hours of its laying. The topping shall be laid true to provide a uniform and even surface. It shall be firmly compacted with the bottom concrete by using screed vibrators. After the initial set has started, the surface shall be finished smooth and true to slopes with steel floats.

The junction of floor with wall plaster, dado or skirting and the finished operations shall be dealt with as described earlier.

The men engaged on finishing operation shall be provided with raised wooden platform to sit on, as to prevent damage to new work.

f) Curing

The floor shall be kept continuously moist for at least l4 days by means of wet gunny bags, 50 mm thick layer of damp sand spread over the surface or pooling water on the surface.

g) Polishing

After curing period is over the granolithic concrete surface shall be polished with floor cutting machine (single cut) as per direction to achieve required polish finished surface. Polishing shall be done if specifically mentioned in the Schedule of Quantities.

h) Clearing the Surface

The top surface of the granolithic concrete shall be cleaned properly by sweeping to remove dust and dirt. The top surface shall be wetted and washed with clean water.

i) Rates to Include

Apart from other factors mentioned elsewhere in this contract the rate quoted for "Concrete floor topping with hardener" shall include for the flooring.

j) All labor, materials and equipment, cleaning the sub-base, laying base course and top layer with hardener, polishing, steel dividers etc. complete.

6.4 CERAMIC TILES DADO

a) Tiles

NAVEEN/Kajaria/NITCO/JHONSON make Ceramic tiles including specials shall be of approved make and quality. Samples of tiles shall be got approved by the Bank/Consultants, who will keep them in the site office of Bank/Consultants for verification as to whether the materials brought, used conform to the approved samples.

b) Mortar Backing :

All joints in the face work shall be raked out to a depth equal to not less than the width of the joints or as directed by the Bank/Consultants. Concrete surface shall be properly hacked. All dirt, soot, oil, or any other material which might interfere with satisfactory bond shall be removed. The surface shall be cleaned and scrubbed with fresh water and kept wet for 6 hours prior to applying backing mortar. The dado work shall not be commenced unless the preparatory work is passed by the Bank/Consultants. The proportion of mortar for backing shall be 1:3 cement mortar. Sand in mortar bedding shall be from approved source. The thickness of mortar backing shall not be less than l2 mm and not more than 20 mm to match with adjacent finished surface.

c) Fixing Dado Tiles

Dado work shall be done only after fixing tiles on the floor. The white glazed tiles/ceramic tiles shall be soaked in water for at least 2 hours before being used for dado work. Tiles shall be fixed with waterproof adhesive of approved quality and make. The back of tiles shall be covered with a layer of adhesive and the tile shall then be pressed on the backing surface and gently tapped against the wall with a wooden mallet. The fixing shall be done from bottom of wall upwards without any hollows in the bed or joints. Each tile shall be fixed as close as possible to the one adjoining mortar so that all tiles faces are in one vertical plane. The joints between the tiles shall not exceed l.5 mm in width. Joints of the tiles shall be pointed with white cement with admixture of pigment to match with the shade of tiles. If doors, windows or other openings are located within the dado area, the sills, jambs, angles etc. shall be provided with white glazed tiles/ceramic tiles and appropriate cut pieces according to the foregoing specification and such tiled area shall be measured along with the dado.

Fixing of tiles with water proof adhesives shall be done as per manufacturer's specification.

d) Cleaning :

After the tiles have been fixed the surplus adhesive and cement grout that may have come out of the joints shall be cleaned off before it sets. After the complete curing the dado or skirting work shall be washed and thoroughly cleaned.

Rates to Include

Apart from other factors mentioned elsewhere in this contract, the rates for the item of dado or skirting shall include the following :-

i) Backing Mortar

ii) Providing and fixing tiles including all cutpieces in water proof adhesive on backing mortar.

iii) Jointing of the tiles with white cement slurry with pigment.

iv) Curing

v) Cleaning

vi) All labor, materials, use of tools and equipments for carrying out the items as specified above.

e) Mode of measurements

Dado shall be measured in square meters for the actual area provided.

6.5 CERAMIC TILE FLOORING

6.5.1 MATERIALS

a) NAVEEN/Kajaria/NITCO make approved quality and shade Ceramic tiles shall be used. They should have breaking strength of 400 - 450 kg/sq.cm.

b) Sizes of the tiles shall either be (300 x 300) mm or any other sizes suggested/ approved by the Bank/Consultants.

c) Thickness shall be 8 mm.

d) Tolerance in length, breadth and thickness - ± 1%.

Samples of tiles shall be got approved by the Bank/ Consultants, who will keep them at the site office of Bank/Consultants for verification as to whether the materials brought & used conform to the approved samples.

6.5.2 WORKMANSHIP

6.5.2.1 Concrete Base and Mortar Bedding

The base of cement concrete be laid and compacted to a reasonably true plain surface and to the required slopes and below the levels of the finished floor to the extent of thickness of the tiles and mortar bedding. Cement concrete base shall be paid under separate item.

Before spreading mortar, sub floor or base shall be cleaned or all dirt, scum, latiance and all loose materials and then well wetted without forming any pools of water on the surface. In case of R.C.C. floors, the top shall be left a little rough. All points of level for the finished paving surface shall be marked out. The mortar shall then evenly and smoothly spread over the base by the use of screed battens. The thickness of mortar bed shall not be less than 15 mm or otherwise approved by the Consultants/Bank. Unless otherwise specified, the proportion of mortar bedding shall be composed of one cement and 4 medium sand by volume.

6.5.2.2 Laying, Curing &Cleaning :

Tiles shall be laid in position and tamped down gently with a wooden mallet to make it level with other tiles. The surface during laying shall be frequently checked with a straight edge batten so as to obtain a true surface and level. The joints of the tiles shall be 3 - 4 mm wide and shall be filled with neat white cement slurry admixture with pigment to match the colour of the tiles. To maintain a perfect gap between tiles a uniform thick hard board strip can be placed between the tiles during laying.

Finally, cleaning and finishing off must be carried out as grouting proceeds, all traces of adhesive and cement must be removed with a sponge dipped in cleaned water.

6.5.3 RATES TO INCLUDE

Apart from other factors mentioned elsewhere in this contract, the contractor's rate quoted shall include for the following :

a) Cleaning for the base and providing and laying bedding mortar and leveling mortar where required.

b) Providing and fixing the tiles with waterproof tile fixing adhesive on the bedding mortar.

c) Filling of joints of tiles with neat white cement slurry with admixture of pigment to match the colour of the tiles.

d) All labor and materials and use of tools and carrying out the item as specified above, cleaning, finishing, curing complete as directed.

6.5.4 MODE OF MEASUREMENT

Measurement for tile flooring shall be in square meter on actual area laid.

6.6 KOTA STONE FLOORING

It shall be of selected quality, hard, sound, dense and homogenous in texture free from cracks, decay and weathering and flaws. These shall be machine cut to the requisite thickness, they should be the colour indicated in the Schedule of Quantities or as directed by the Consultants/Bank.

The slab shall have the top (exposed) face polished before being brought to site.,

The slabs shall conform to the size required. Before starting the work, the contractor shall get the samples of slabs approved by the Consultants/Bank. Sample thus approved shall be kept at site office for verification as to whether the materials brought and used conform to approved sample.

6.6.1 DRESSING AND RUBBING

Each slab shall be cut to the required size and shape and machine cut and fine chisel dressed at all the edges of the full depth. The sides thus dressed shall have a full contact if a straight edge is laid along. The sides shall be table rubbed with coarse sand or machine rubbed before paving. All angles and edges of the slabs shall be true square and free from chippings giving a plane surface.

Thickness shall be as specified in the Schedule of Quantities.

6.6.2 BEDDING

Bedding for the kota stone slabs shall be cement mortar l:4 (l cement 4 coarse sand) of average thickness 20 mm as given in the description of the item. Minimum thickness at any place shall be not less than l0 mm.

6.6.3 LAYING

Sub-grade shall be cleaned, wetted and mopped. Mortar of the specified mix and thickness shall then be spread on an area sufficient to receive one slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar is then allowed to harden a bit. Over this surface, cement slurry of honey like consistency at 4.4 Kg of cement per square metre. The edges of the slabs already paved shall be buttered with white cement with pigment to match the shade of the kota stone slabs as given in the description of item, The slab shall then be gently placed in position and tapped with wooden mallet till it is properly bedded in level with and close to the adjoining slab. The joint shall be as fine as possible. Surplus cement on the surface of the slab shall

be removed. The slabs fixed in the floor adjoining the walls shall enter not less than l0 mm under the plaster, skirting or dado. The junction between the wall and floor shall be finished neatly. The finished surface shall be true to levels and slopes as directed by the Consultants/Bank.

Machine polishing to achieve high polished surface and cleaning of the whole floor would be done as per direction.

Rates to include :

Apart from other factors mentioned elsewhere in this contract, the rates for item of kota stone flooring shall include for the following :-

a) All labour, materials and equipment, cleaning the sub-base, laying mortar bed and cement grout and fixing kota stone slabs as specified above and making up the joints, pigments, white cement etc.

b) Any cutting and waste if required.

c) Curing

d) Machine polishing and cleaning the floor from all stains etc.

Mode of Measurement : The measurement shall be in square metres for the actual kota stone flooring provided.

6.7 MARBLE WORK IN WALL LINING/DADO/SKIRTING/RISERS ETC

6.7.1 MARBLE

Same as for marble flooring.

6.7.2 DRESSING AND RUBBING

Every stone shall be cut to the required size and shape, fine chisel dressed to give a smooth and even surface on bed and all sides to the full depth so as to be free from any waviness and to give truly vertical, horizontal, radial or circular joints as required. The exposed faces and joints 12 mm from the face shall be fine tooled such that the straight edge laid along the face of the stone is in contact with every point on it. These surfaces shall then be rubbed smooth. All visible angles and edges shall be true, square and free from any chippings. Beyond the depth of 12 mm from face, the joints shall be dressed with a slight splay so that the thickness of joints increases in an inverted 'V' shape. The surface of the stones coming in contact with backing need not be chisel dressed. Marble slabs in borders, jambs, soffits etc of the entrances and openings shall be in full width and marble slabs in treads and risers shall be in single pieces with rounded edges, as directed.

A sample of dressed and rubbed stone shall be prepared for approval and it shall be kept on work after being approved by the Consultants/Bank.

6.7.3 MORTAR

The mortar used shall be of the mix as specified in the Schedule of Quantities.

6.7.4 LAYING & FIXING

The marble slab be sufficiently wetted before laying to prevent absorption of water from mortar.

They shall then be fixed with mortar/water proof adhesive of approved quality as per direction of the Consultants/Bank. The adjoining marbles shall be secured to each other by means of copper

pins 75 mm long and 6 mm dia.

The slabs shall also be secured to the backing masonry work/concrete surface by means of 25 mm x 6 mm brass cramps of 150 mm long or other sizes.

Pins, crampsetc shall be got approved before use. They shall be fixed using cement mortar 2:1 (2 coarse sand : 1 cement).

Marble shall be fixed on concrete surface with waterproof adhesive where crampcan not be used, on backing mortar surface of proportion 2:1 and copper pins for side joints as per direction.

6.7.5 JOINTS

All joints shall be full of mortar and special care shall be taken to see that the joint between centre of the mass being compacted at the time of the depositing proceeds by means of a suitable type the facing stone slabs and the back masonry is properly filled with mortar. The hollowness behind the veneer stone slab or post jointing the back masonry can be detected by tapping the face stone and any such defective work shall be rectified by relaying the stone slabs. The face joints shall be uniform, straight and as fine as possible but not more than 1.5 mm and in face joints, the top 12 mm depth shall be filled with mortar specified for the pointing.

6.7.6 POINTING

All exposed joints shall be pointed using mortar, water proof adhesive as directed by the Consultants/Bank with admixture of pigment to match the shade of stone as specified. The pointing when finished shall be sunk from stone face by 5 mm or as specified. The depth of mortar in pointing shall be full depth of the slab.

6.7.7 CURING AND PROTECTION

Green work shall be protected from rains by suitably covering the same. The work shall be kept constantly moist for a period of at least seven days.

6.7.8 MODE OF MEASUREMENTS :

The measurement shall be square meters for the finished exposed area.

6.7.9 RATES TO INCLUDE :

Apart from other factors mentioned elsewhere in this contract, the rates for item of marble work shall include for the following :

a) All labour, materials, equipment, scaffolding, cleaning sub-base, copper pin, brass cramp, bedding and jointing mortar, water proof adhesives, pigment, white cement.

b) Any cutting and waste as required for finishing to recess, jambs, window sill, edges etc.

c) Curing

d) Cleaning the wall from all stains etc.

e) Work at any level.

6.8 GRANITE STONE WORK IN WALL LINING

6.8.1 MATERIALS

The granite slab and tiles shall be of approved shade, sources and quality as mentioned in the Schedule of Quantities and their sizes and the thickness shall be as shown on the drawings and as approved by the Bank/Consultants. Sample thus approved shall be kept at site office of Bank/Consultants for verification as to whether the materials brought & used conform to approved sample. They shall be of selected quality, dense, uniform and homogenous in texture and free from cracks or their structural defects. It shall have even and crystalline grains. The surface shall be machine polished, true and even & perfectly plain surface and edges machine cut true and square. The rear face shall rough/ grooved enough to provide a key for the mortar. No slab shall be thinner than the specified thickness at its thinnest part. The dimensions of the slabs and tiles shall be as specified. A few approved samples of finished slab and tiles to be used shall be deposited by the contractor in the office of the Bank/Consultants. Unless otherwise mentioned, the thickness of slabs and tiles shall be average 18 mm and 8 mm respectively.

6.8.2 MORTAR

The mortar used shall be of the mix as specified in the Schedule of Quantities.

6.8.3 LAYING AND FIXING :

The granite slabs and tiles shall be sufficiently wetted before laying to prevent absorption of water from mortar.

They shall then be fixed with mortar/waterproof adhesive of approved quality as per direction of Consultants/Bank.

For granite slabs, adjoining slabs shall be secured each other by means of copper pins 75 mm long and 6 mm dia.

The slabs also be secured to the backing masonry work/concrete surface by means of 25 mm x 6 mm brass cramps of 150 mm long or other sizes as required.

Pins, crampsetc shall be got approved before use. They shall be fixed using cement mortar 1:4 (1 cement & 4 coarse sand).

Granite slab shall be fixed on concrete surface with water proof adhesive where cramps can not be used, on base mortar surface of proportion 1:4 (1 cement : 4 coarse sand) and copper pins for side joints as per direction. Granite tiles shall be fixed with water proof adhesive on the base prepared with cement mortar (1:3) and joints pointed with jointing materials of approved quality and shade to match with shade of tiles as per direction unless otherwise stated in the Schedule of Quantities.

6.8.4 JOINTS AND POINTING

All joints shall be full of mortar and special care shall be taken to see that the joint between the centre of the mass being compacted at the time of depositing proceeds by means of a suitable type, the facing stone slabs and the back masonry is properly filled with mortar. The hollowness behind the veneer stone slab or post jointing the back masonry can be detected by tapping the face stone and any such defective work shall be rectified by relaying the stone slabs. The face joints shall be uniform, straight and as fine as possible but not more than 1.5 mm and in face joints, the full depth of the slab shall be filled with polysulphide sealant or any other approved materials for the pointing.

6.8.5 CURING AND PROTECTION

Green work shall be protected from rains by suitably covering the same. The work shall be kept constantly moist for a period of at least seven days.

6.8.6 MODE OF MEASUREMENT

The measurement shall be square metre for the actual finished surface area of granite stone slab/tiles laid.

6.8.7 RATES TO INCLUDE :

Apart from other factors mentioned elsewhere in this contract, the rates for item of granite stone work shall include for the following :-

a) All labour, materials, equipment, scaffolding, cleaning subbase, bedding and jointing mortar, pigment, white cement, waterproof adhesive, polysulphide sealant, or other approved materials, gunmetal pin and brass cramp for granite slab work.

b) Any cutting and wastage as required for finishing to recess, jambs, window sill, edges etc.

c) Curing

d) Cleaning the wall from all stains etc

e) Work at any level

f) Providing 'V' grooving at joints as per direction.

6.9 VITRIFIED TILES FLOORING

6.9.1 Materials

a) Johnson/NITCO/Naveen/KAJARIA make approved quality and shade Vitrified/Ceramic tiles shall be used.

b) Sizes of the tiles shall either be approx (600 x 600) mm or any other sizes suggested/approved by the Bank/Consultants.

c) Thickness shall be approx 9 to 10 mm.

d) Tollerance in length, breadth and thickness ± 1%.

Samples of tiles shall be got approved by the Bank/ Consultants, who will keep them at the site office of Bank/Consultants for verification as to whether the materials brought & used conform to the approved samples.

6.9.2 WORKMANSHIP

6.9.2.1 Concrete Base and Mortar Bedding

The base of cement concrete be laid and compacted to a reasonably true plain surface and to the required slopes and below the levels of the finished floor to the extent of thickness of the tiles and mortar bedding. Cement concrete base shall be paid under separate item or otherwise as mentioned in the BOQ.

Before spreading mortar, sub floor or base shall be cleaned or all dirt, scum, latiance and all loose materials and then well wetted without forming any pools of water on the surface. In case of R.C.C. floors, the top shall be left a little rough. All points of level for the finished paving surface shall be marked out. The mortar shall then evenly and smoothly spread over the base by the use

of screed battens. The thickness of mortar bed shall not be less than 15 mm or otherwise approved by the Consultants/ Bank. Unless otherwise specified, the proportion of mortar bedding shall be composed of one cement and 4 medium sand by volume.

6.9.2.2 Laying, Curing& Cleaning

Tiles shall be laid in position with tile fixing adhesive and tamped down gently with a wooden mallet to make it level with other tiles. The surface during laying shall be frequently checked with a straight edge batten so as to obtain a true surface and level.

Finally, cleaning and finishing must be carried out as grouting proceeds, all traces of adhesive and cement must be removed with a sponge dipped in cleaned water.

6.9.3 RATES TO INCLUDE

Apart from other factors mentioned elsewhere in this contract, the contractor's rate quoted shall include for the following :

a) Cleaning for the base and providing and laying bedding mortar and leveling mortar where required.

b) Providing and fixing the tiles with waterproof tile fixing adhesive on the bedding mortar.

c) Filling of joints of tiles with neat white cement slurry with admixture of pigment to match the colour of the tiles.

d) All labour and materials and use of tools and carrying out the item as specified above, cleaning, finishing, curing complete as directed.

e) Cutting and wastage of tiles for end prices, skirting and for uneven shape of the floor.

6.9.4 MODE OF MEASUREMENTS

Measurement for tile flooring & skirting shall be in square metre on actual area laid.

6.10 NON-SLIPARY CEMENT CONCRETE POLISHED COLOURED TILES FLOORING

6.10.1 FLOORING

i) Tiles

Heavy duty polished concrete tiles shall be manufactured as per IS 1237 of latest edition. This tiles having 6 mmth plain wearing surface wherein pigments are used but no stone chips. Tiles shall be of approved quality, colour, shade and make. The tiles shall be of approved shape & size and the minimum thickness shall be 25 mm. A few samples of tiles to be used shall be deposited by the contractor in the office of the Bank/Consultants at site for approval. Samples thus approved shall be kept at site office of Bank/Consultants for verification as to whether the materials brought and used conform to the approved sample. Defective/rejected tiles shall not be used in the work.

ii) Concrete Base and Mortar Bedding :

The base of cement concrete shall be laid and compacted to a reasonably true plain surface and to the required slopes and below the levels of the finished floor to the extent of thickness of the tiles and mortar bedding. Cement concrete base shall be paid under separate item.

Care shall be taken in preparing the mortar to ensure that there are no hard lumps that would interfere with the even bedding of the tiles before spreading mortar, sub base shall be cleaned of all dirt, scum laitance and all loose materials and then well wetted without forming any pools of water on the surface. In case of RCC floors the top shall be left of little rough. All points of level for the finished paving surface shall be marked out. The mortar shall then evenly and smoothly spread over the base by the use of screed battens only over so much area as will be covered with tiles before the setting of the mortar. The thickness of the mortar bed

shall not be less than 15 mm and not more than 25 mm. Unless otherwise specified, the proportion of mortar bedding shall be composed of 1 cement and 3 medium sand by volume.

iii) Laying, curing, polishing and cleaning

Tiles shall be laid as per approved pattern on the mortar bed and floated in neat cement slurry. The joints of the tiles shall not be more than 1.5 mm wide and shall be filled with white cement slurry with admixture of pigment to match with the shade of tiles. If required, the border tiles shall be cut to proper sizes and the rate quoted shall cover for the same. No border tile shall be less than 100 mm in width, unless otherwsie approved by the Bank/Consultants. Grinding and polishing shall be done as per the manufacturer's specification.

Flooring shall be kept wet for 14 days.

iv) Rates to Include : Apart from other factors mentioned elsewhere in this contract, the contractor's quoted rates shall include for the following :

a) Cleaning for the base and providing and laying bedding mortar and levelling.

b) Providing and fixing the tiles in neat cement float on the bedding mortar.

c) Filling of joints of tiles with white cement slurry of required colour to match with the colour of the tiles.

d) Polishing, finishing and cleaning. All labour, materials and use of tools and carrying out the item as per manufacturer's specification.

v) Mode of Measurement

Measurement for tile flooring shall be in square metre for the actual area provided.

7.0 WOOD WORK AND JOINERY

7.1 TIMBER

i) Unless otherwise specified, all timber for frames and shutters for doors, windows, ventilators, etc. shall be of approved quality with permissible defects for "First Grade" of timbers as per IS 1003 of latest edition. The planed surface shall be smooth and free from blemishes and discolourations.

ii) All timber for carpentry and joinery in touch with masonry or concrete shall be creosoted before fixing.

iii) All full fabricated timber shall be air seasoned at site of work for a period of not less than two months to allow for any shrinkage that may take place. The preparation of timber for joinery is to commence simultaneously with the beginning of the project work generally and should

proceed continuously until all the wood work is prepared and fixed/stacked on or near the site as the case may be.

7.2 HOLDFASTS

Three holdfasts shall be fixed to each post of the door frame. The M.S. holdfasts shall be of the size as mentioned in the Schedule of Quantities and shall be fixed to the fames by means of screws and not nails. The other end of the holdfasts shall be fixed into jambs with l:2:4 P.C.C. of dimensions as directed. Ends of holdfasts will be fish tailed.

Whenever the frames are abutting to concrete surface approved metal expansion fastener as directed shall be provided for frame, hangers, rough grounds etc.

The rates quoted for wood work and joinery shall exclude the cost for all types of holdfasts or other approved fasteners.

The items of holdfast, metal fasteners etc. shall be paid as a separate item as described in Schedule of Quantities. The rate for holdfast shall include for cement grouting and fixing to frame work with screws etc. The rate for metal fasteners shall include for nuts etc. as required.

7.3 WORKMANSHIP AND CONSTRUCTIONS

a) The workmanship shall be first class and to the approval of the Bank/Consultants. Scantlings and board shall be accurately sawn and shall be of required width and thickness. All carpenter's work shall be wrought except where otherwise described. The workmanship and joinery shall be accurately set out in strict conformity according to the drawings and shall be framed together and securely fixed in approved manner and with properly made joints. All work is to be properly tenoned shouldered, wedged, pinned, braced etc. and properly glued with approved quality glue to the satisfaction of the Bank/Consultants.

b) Screws

Unless otherwise specified all screws to be used in woodwork and joinery shall be of cadmium plated and of approved quality. The size (diameter and length) should conform to those specified in hardware schedule.

c) Tolerance

l.5 mm (l/l6") will be allowed for each wrought face of sizes specified except where described as finished in which case they shall hold to the full dimensions.

d) Protection

All edges of timber frames etc. shall be protected from being damaged during construction by providing rough timber casing securely fixed and other adequate protective measures.

e) If it is decided by the Bank to provide antitermite treatment, the buildings contractor shall co-ordinate his work suitable as directed by the Bank/Consultants.

f) Door/Windows frames shall have cut rebate. Planted rebates shall not be permitted.

g) Where door frames are fixed flush with plaster to wall, teak wood cover mould 40 x l2 mm as per drawings shall be provided all round and shall be painted or polish finished to match with finished shutters. This will be paid as a separate item as described in Schedule of Quantities.

7.4 WOODEN FLUSH SHUTTERS : (Solid Core Type)

Solid core flush shutters shall be commercial or teak veneered type as specified in the item manufactured by approved manufacturer registered with ISI and shutter shall bear ISI mark. An approved sample shall be deposited in the office of the Bank/Consultants at site for reference. The shutter will be provided with lipping. Finished thickness of the shutter shall be as mentioned in the item. Shutter should be hot pressed and phenol formaldehyde should be used as glue.

7.5 FACTORY MADE PANELLED SHUTTERS

Shutters shall be manufactured from Kiln Seasoned and chemically treated commercial hardwood of approved quality. Thickness and sizes of styles, rails etc shall be as specified in the Schedule of Quantities and or drawings. Panel shall be of phenol bonded plywood (BWP) conforming to I.S 303 of latest edition of thickness as specified in the Schedule of Quantities. Panel shall be in a single width piece. Shutters shall be manufactured conforming to the relevant I.S. specification and an approved sample shall be kept in the site office of the Bank/Consultants for reference.

7.6 WOODEN HANDRAIL

Wooden handrail will be of specially selected Indian teak wood conforming to "First Grade" quality as mentioned in IS 1003 of latest edition fixed to concrete or metal balustrades with concealed screws and dowels. All bends, mitres, covers, moulds etc. will be strictly to proper shape and finely smoothed with sand papers. The handrail shall be finished with french polishing or painting as per direction of the Bank/Consultants. The rate should include cost of polishing/painting and also the wastage of materials for the completed works.

7.7 HARDWARE FITTINGS

All hardware fittings for doors shall be oxidised iron, brass, anodisedaluminium as specified in the schedule of quantities. These hardware fittings shall be obtained from approved manufacturers and shall bear ISI mark wherever available. The samples for the fittings shall be submitted to the Bank/Consultants for their approval. Hardware fittings for door shutters shall be paid as separate item as given in schedule of quantities. The rate for hardware fittings shall include for supplying, fitting and fixing the fittings with necessary cadmium plated screws, washers bolts, nuts etc. as required. All locks shall be provided with keys in duplicate and rate shall include for the same.

Approved samples of hardware fittings shall be deposited with Bank/Consultants for reference.

7.8 RATES TO INCLUDE :

Apart from other factors mentioned elsewhere in this contract the rate for item of wood work and joinery shall include for the following :-

A. Items of scantling :

i) All labour, materials and equipments for fixing frame work as per drawing excluding the cost of holdfasts, Rawl plugs, or other fasteners etc.

B. Items of shutters :

i) All labour, materials and equipments for carrying out the work as per drawing.

ii) Labour for fixing the shutters in position (excluding the cost of fittings)as per drawing.

7.9 MODE OF MEASUREMENT :

All measurements shall be as per relevant section of I.S. I200 of latest edition.

i) Scantling shall be measured in cum. The sectional area shall be the area of the least square, or rectangles from which the scantling may be cut. The length shall be actual length of timber required for the purposes including the extra portion required for jointing.

ii) Shuttering shall be measured in square metre for closed door shutters area i.e. rebate to rebate without extra measurement for rebates and/or splayed meeting styles of door.

8.0 STEEL DOORS, WINDOWS AND VENTILATORS :

8.1 Pressed Steel Door Frames

8.1.1 Materials

Steel door frames shall be manufactured from commercial mild steel sheet of 1.25 mm thickness, conforming to IS:226 and 4351.

Steel door frames with or without fan light shall be made in the profiles 105 mm x 60 mm x 4 mm which may be manufactured to suit doors of either type opening inwards or outwards as directed by the Engineer-in-Charge.

8.1.2 Construction

Each door frame shall consist of hinge jamb, lock jamb, head and if required angle threshold. These shall be welded or rigidly fixed together by mechanical means. Where no angle threshold is required, temporary base tie shall be screwed to the feet of frames in order to form a rigid unit. Where so specified base ties shall be of pressed mild steel 1.25 mm thick adjustable to suit floor thickness of 35 or 40 mm and removable, or alternatively, threshold of mild steel angle of section 50 x 25 mm, minimum shall be provided for external doors frames.

8.1.3 Fabrication

The pressed steel door frames shall be got fabricated in an approved workshop as approved by the Bank's Engineer/Consultants.

8.1.3.1 Fixing Lugs : There shall be three adjustable lugs with split end tail to each jamb without fan light, and four for jamb with fan light.

The head of the fixing lug shall be of the following lengths :

a) 95 mm long

The head shall be made from flat steel strip 25 mm wide and not less than 1.60 mm thick.

The tail of the lugs shall be 200 mm long and shall be made of steel strip not less than 40 mm wide and not less than 1 mm thick.

8.1.3.2 Hinges : 100 mm mild steel butt hinges shall be used. For door frames 89 cm wide and under, three hinges shall be rigidly fixed to one jamb and for frames and for door above 89.0 cm wide, four hinges shall be rigidly fixed to one jamb, if it is single shutter. Where the height of door shutter exceeds 2.15 metres, one additional hinge shall be provided for every 0.5 m or part thereof of the additional height.

In all cases the hinges shall be so fixed that the distance from the inside of the head to rebate to the top of the upper hinge is 20 cm and distance from top of upper range to the lower range is

about 175 cm.

Hinges shall be made of steel 2.5 mm thick with zinc coated removable pin of 6 mm diameter. The space between the two leaves of the hinge when closed shall be 3 mm and the leaf that is not welded to the frame shall have four counter sunk holes to take no. 10 wood screws.

8.1.3.3 Mortar Guards

Mortar guards as instructed by Engineer-in-Charge shall be provided. These shall be welded to the frame at the head of the frame for double shutter doors to make provision for bolts.

8.1.3.4 Lock-Strike Plate

There shall be an adjustable lock-strike plate of steel complete with mortar guard to make provision for locks or latches complying with the relevant Indian Standards. Lock-strike plates shall be of galvanized mild steel and fixed at 95 cm from the head of the frame.

8.1.3.5 Shock Absorbers

For side hung door there shall not be less than three buffers or rubber or other suitable material inserted in holes in the rebate and one shall be located on the centre line of the lock strike plate and the other two at least 45 cm above and below the centre line of the lock strike plate. For double shutter doors, there shall be two buffers of rubber or similar suitable material inserted in holes in the rebate in the lock jamb only at the head and spaced 15 cm at either side of the center line of the door.

8.1.4 Finish

The surface of door frame shall be thoroughly cleaned, free of rust, mill-scale dirt, oil etc either by mechanical means, for example, sand or short blasting or by chemical means such as picking. After pretreatment of the surface one coat of approved primer i.e. red oxide zinc chrome primer conforming to IS 2074 and two coats of paints as directed by the Engineer-in-Charge shall be applied to the exposed surface.

8.1.5 Fixing

Frames shall be fixed up right in plumb. To avoid sag or bow in width during fixing or during construction phase, temporary struts across the width preventing sides building inwards may be provided. Wall shall be built solid on each side and grouted at each Course to ensure solid contact with frame leaving no voids behind the frame.

Three lugs shall be provided on each jamb with spacing not more than 75 cm. The temporary struts should not be removed till the masonry behind the frame is set. In case screwed base tie is provided this should be left in position till the flooring is laid when it can be removed.

After pretreatment of the surface, one coat of steel primer and two coats, of paint, as directed by the Engineer-in-Charge shall be applied to the exposed surface.

8.1.6 Measurements

The length shall be measured in running metre correct to a cm along the centre line of the frames.

8.1.7 Rate

The rate shall include the cost of labour and material involved in all the operations described above including one coat of approved steel primer but excluding two coats of paint and filling the hollow

section with cement concrete (1:2:4).

8.2 I.S. SPECIFICATION

Unless stated the Indian Standard Specification applicable for steel doors, windows and ventilators shall be IS : l038 of latest edition "Specification for steel doors, windows and ventilators" and shall be manufactured from hot rolled steel sections conforming to I.S 7452 of latest edition.

8.3 OPENING

All the windows and ventilators shutters should open outside unless otherwise specified.

8.4 FABRICATION

Both the fixed and opening frames of the doors, windows and ventilators shall be formed by cutting section to required lengths, andmitres. The corners shall be electrically welded. Sash bars of the units shall be tenoned and rivetted into the frames. Slots shall be cut in the fixed frames and the hinges shall be welded into a slot in the outer frame and other lead of the hinge riveted to the opening shutters.

8.5 HANDLES, PEGSTAYS

Each side hung shutter shall be provided with extended non-friction Hopes type hinges and pegstay arms 300 mm (l2") long and shall have holes to keep the shutter open in three different position upto 90 degree (The peg and the arm for the pegstay shall be revetted). The handle shall be mounted on a handle plate and the plate shall be welded to the opening frame. The handle shall have two point nose which will engage with suitable tapered brass striking plate provided on the fixed frame to keep the shutter open in a slightly open position as well as in a fast position.

8.6 TOP/BOTTOM HUNG VENTILATORS

Top hung and bottom hung ventilators shall be provided with two plain hinges, with 300 mm (l2") pegstay arms, which will keep the shutter open in three different positions and will act as a stopper too.

8.7 CENTRE-HUNG-VENTILATORS

Centre hung ventilators shall be made with two outer frames with mastic waterproof compound embedded between these two outer frames. They shall also be provided with a spring catch which when pulled by a cord. The upper half shall open inside and the lower half shall open out.

8.8 BEADING

Where metal beading is specified in the Drawing or elsewhere for fixing the glazing, the contractor should provide windows with threaded holes for fixing the beading with screws.

8.9 SAMPLES OF WINDOWS

A typical approved sample window should be kept in the office of the Bank/Consultants at site until the satisfactory completion of the building. All windows and ventilators supplied and fixed at site should be of the same quality as of the approved sample; otherwise they shall be rejected.

The decision of the Bank/Consultants or their authorised representatives whether window or ventilator compared well with the approved sample shall be final and binding on the contractor.

8.10 BANK/CONSULTANTS' APPROVAL

All windows and ventilators are subject to the approval of the Bank/Consultants and they shall be strictly in accordance with the specification without any bends, etc.

8.11 AS PER DRAWINGS

All windows and ventilators shall be manufactured as per drawings supplied to the contractor.

8.12 FIXING TO BRICK WORK/CONCRETE

Steel windows and ventilators shall be fixed to brick work by means of standard M.S. lugs of size as mentioned in I.S. 1038 of latest edition and to concrete work by means of l25 mm long counter sunk screws with rawl plugs or other approved metal (brass) fastener after drilling into concrete with a power drill. Steel windows/ventilators etc shall be fixed as per manufacturer's recommendations or I.S. specifications. Holdfasts shall be grouted in concrete (I:2:4) mix of dimensions as directed. Quoted rates shall cover for all these factors.

8.13 STRUCTURAL SUFFICIENCY OF WINDOWS

All windows, doors, and ventilators shall be manufactured from a standard extruded sections of approved, appropriate sizes suitable for the particular type and size of the windows etc. Details shop drawings including the full design of every type of windows and ventilators shall be furnished in duplicate, for approval before undertaking the work. Contractor shall assume full responsibility regarding soundness of the windows, doors and ventilators and adequacy of the sections used for the particular sizes required to provide appropriate stiffness and strength. If in the opinion of the Bank/Consultants deficiencies in the sections used are found, the contractor shall replace the windows,

ventilators, etc. at his expenses by windows and ventilators etc. made from approved sections.

8.14 IMPORT LICENCE

No import licence shall be made available for obtaining any material not available in India.

8.15 ALL TYPES OF WINDOWS

Rates quoted for steel windows and ventilators shall cover for all types of windows and ventilators whether of standard sizes or purpose made. Where composite continuous windows over long lengths (in plan) are required, rates shall cover for mullions, transoms at vertical or horizontal junctions of approved design, rates should also cover for partly fixed and partly openable type of continuous windows shutters of any type like side hung, centre hung, top hung, etc. as per detailed drawings.

8.16 GLAZING

Unless otherwise mentioned the whole of the glass shall be of required thickness as mentioned in the Schedule of Quantities float glass of selected quality and free from speck, valves, bubbles & other imperfections. The glazing shall be fixed with beads or bedded and packed and putting with putty suitable for use in tropical countries. Putty for glazing to wood work shall be best oil putty. In case of metal windows it shall be special gold size putty. The glass should be obtained from approved manufacturer. Prior to placement of order the sample for all glasses to be used will have to be approved by the Bank/Consultants as regards their quality and tint etc. and the same should be kept in the office of the Bank/Consultants. The quality of all the glasses should used in the site should conform with the approved one in quality otherwise the Bank/Consultants will be at liberty to reject the same for which no claim shall be entertained. On completion of the works the general building contractor shall clean and wash all the glass and leave the same perfectly clean

and in tidy condition.

8.17 RATES TO COVER

Unless otherwise stated, contractors rate for steel windows, ventilators shall, apart from any other factors mentioned elsewhere in this contract, include for providing and fixing the following :-

a) Window/Ventilator frames and shutters with hinges as described.

b) M.S hold fasts or lugs as specified in I.S. 1038 of latest edition in the position and as per design of I.S. specification or where fixed to concrete 125 mm long countersunk screws with rawl plugs or other approved fasteners.

c) Rolled Steel Mullions.

d) Transomes with projected weather bars for side hung shuttering and plain ones for fixed windows.

e) Aluminium beading with screws.

f) Bolts, nuts, screws.

g) Manganese brass spring catches.

h) Chords for centre hung windows.

i) Grouting of holdfasts in 1:2:4 concrete

8.18 MEASUREMENT

Measurement shall be in square metre.

9.0 CEMENT PLASTER (INTERNAL & EXTERNAL)

a) Preparation of Surface

The walls to be plastered to have all joints raked out to a depth of 10 mm, if not already done. R.C.C surface shall be properly hacked to get good key to the plaster. All dust and oily matter, if any, shall be brushed and cleaned and surface to be plastered shall be kept wet for 6 hours before plastering is commenced.

b) Proportion of Mortar :

The plaster in walls, lintels, columns, ceiling, ceiling beams, projected slabs, rails, chajja, marquise, domes etc. shall be done with sand cement mortar in the proportion as described in the Schedule of Quantities). No more cement mortar shall be prepared than that can be used within half an hours.

c) Application of Plaster :

The mortar shall be applied evenly with force on the surface to be plastered. The mortar surface shall be finished at once by being rubbed over with a trowel till the cement appears on the surface. All corners, angles and junctions shall be truly vertical and horizontal as the case may be, carefully and neatly finished. Rounding of corners and junctions where required shall be done without extra charge. The mortar shall adhere to the surface intimately when set and there should be no hollow sound when struck.

d) When neat cement finish is specified over the plaster surface, a coat of pure portland cement slurry, l.5 mm thick shall be applied and well rubbed to the plaster surface while the plaster surface is still fresh.

e) When no finish is specified, the plastered surface shall be rubbed well to an even plane with a wooden float for external surface and finished smooth with a steel trowel for internal surface.

f) Rates to include

Apart from other factors mentioned elsewhere in the contract rates for the item of plaster shall include for the following :-

i) Erecting, dismantling and removing the scaffolding.

ii) Preparing the surface to receive the plaster.

iii) Providing cement plaster of the specified average thickness.

iv) All labour, materials, use of tools and equipment to complete the plastering as per specification.

v) Curing for 7 days

vi) Any moulding work if shown on the drawings or as specified unless separately provided in the tender.

vii) Labour for plastering the surface in two operations when thickness of plaster is more than l2 mm thick.

viii) Plaster work in bends, arises, rounded angles, fair edges, narrow returns, quriks 'V' joints, splays, drip mouldings, making good to metal frame junctions with skirting of dados narrow width and small quantities, making good round pipes, conduits, timbers, sills, brackets, railings, etc and making good after all the sub-contractors or nominated sub-contractors have done their work.

ix) Neat cement finish when specified in the item.

g) **Mode of Measurement**

Plaster shall be measured in square metre.

Walls : The measurement of wall plastering shall be taken between the walls or partitions (the dimensions before plastering shall be taken) for the length and from the top of floor or skirting depending upon the situation to the ceiling for the height.

Deductions : For jambs soffits, sills, etc. for openings not exceeding 0.5 sq.m each in area, ends of joists, beams, posts, girders, steps etc. not exceeding 0.5 sqm each in area, and opening not exceeding 3 sqm each, deductions and additions shall be made in the following manners :-

a) No deductions shall be made for ends of joists, beams, posts, etc. and openings not exceeding 0.5 sqm and no additions shall be made for reveals, jambs, soffits sills etc. of these openings nor for finishing the plaster around ends of joists, beams, posts, etc.

b) Deductions for openings exceeding 0.5 sqm but not exceeding three sqm each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc.

of these openings :-

i) When both faces of wall are plastered with the same type of plaster, deduction shall be made for one face only.

ii) When two faces of wall are plastered with different type of plasters or if one face is plastered and other pointed, deductions shall be made in the plaster or pointing on the side on which the width of reveals is less than that on the other side but no deduction shall be made from plaster or pointing on the other side. Where widths of reveals on both faces of wall are equal, deduction of 50 per cent of area of opening on each face shall be made from areas of plastering and/or pointing as the case may be.

iii) When width of door frame is equal to thickness of wall or is projecting beyond thickness of wall, full deduction for opening shall be made from each plastered/pointed face of the wall.

iv) In case of openings of area above 3 sqm each deductions shall be made for the openings but jambs, soffits and sills shall be measured.

c) Ceiling

i) Ceiling shall be measured between the walls or partitions and the dimensions before plastering shall be taken.

ii) Ceiling with projected beams shall be measured over beam and the plastered sides of beams shall be measured and added to plastering on ceilings.

10.0 RULE POINTING

The external brick work to be pointed, as shown on drawings is to be executed with specially selected bricks uniform in size and colour and with true and undamaged faces and arises. The joins are to be raked out at least l2 mm (l/2") deep and pointed with line gauge in cement. No cutting of bricks or facing up with coloured plaster will be allowed.

11.0 PLASTER OF PARIS PUNNING

If the plastered surface is to be finished with plaster of paris punning, the surface shall be combed slightly with the wire brushes or nails before it is completely set to form key for plaster of paris punning. The surface shall be only damped but not soaked before the application of Plaster of Paris punning. The Gypsum for preparing punning shall be approved quality. It shall be dry and free from lumps and shall be suitably packed in water tight bags or containers.

Paste shall be prepared by adding required quantum of water and same shall be used before it sets. No dropping paste shall be used in the work.

Punning shall be applied to the prepared surface with steel trowel to a thickness required to make the surface produce perfectly smooth and even surface, working from top to bottom.

The finished surface shall not show any sign of disintegration, topping or pilling. The surface shall be protected from injury and damage.

11.1 RATES TO INCLUDE

Apart from other factors mentioned elsewhere in this contract, rates for the item of plaster of

parispunning shall include the following

i) Erecting, dismantling and removing the scaffolding.

ii) Preparing the surface to receive the said finish.

iii) Providing plaster of paris punning of the required thickness to make the surface perfect smooth and even including cost of materials.

iv) Any moulding work if shown in the drawings or as specified.

v) Finishing in bends, arises, rounded angles, fair edges, narrow returns, quirk, 'V' joints, splays, drip mouldings, making good to metal frames, junctions with skirting or dados, narrow widths and small quantities, making good round pipes, conduits, timbers, sills, brackets, railings etc. and making good after all the sub-contractors or nominated sub-contractors have done their works.

11.2 MODE OF MEASUREMENTS

The measurement shall be in square metre. The mode of measurement shall be as applicable to that for plaster.

12.0 WHITE WASHGING COLOUR WASHING & DISTEMPERING

12.1 i) White Washing

a) **Materials** : White wash shall be prepared from 5 parts of stone lime and I part of shell lime. The lime shall be dissolved in tub with sufficient quantity of water (about 4/5 litres/kg of lime) and the whole thoroughly mixed and stirred until it attains the consistency of thin cream. The wash shall be taken out in small quantities and screened thorough a clean coarse cloth. Clean gum dissolved in hot water shall then be added in suitable proportion of 4 Kg of gum arabic per cum of lime to prevent the white wash coming off easily when rubbed. Indigo as necessary (upto 3 gm per kg of lime) shall be mixed as per standard practice.

b) **Scaffolding** : This shall be double or single according to requirements and as directed. If ladders are used, pieces of old gunny bags or cloth rags shall be tied on their tops to avoid damage or scratches to the plastered surfaces, etc. Proper stage scaffolding shall be erected when white washing the ceilings.

c) **Preparation of Surface** : The surface shall be prepared by removing all mortar droppings and foreign matter and thoroughly cleaned with hair or fibre brush or other means as may be ordered by the Bank/Consultants to produce an approved clean and even surface. All loose pieces and scales shall be scrapped off and holes, cracks etc stopped with mortar to match with the surrounding finish. The mortar should be cured sufficiently.

d) **Application of White Wash** : On the surface so prepared the white wash shall be laid on with a brush. The first stroke of the brush shall be from top downwards, another from bottom upwards over the first stroke, and similarly one stroke from the right and another from the left over the first brush before it dries. This will form one coat, each coat must be allowed to dry and shall be subject to inspection and approval before the next coatis applied.

When dry, the surface shall show no signs of cracking. It shall present a smooth and uniform finish free from brush marks and it should not come off easily when rubbed with a finger. Minimum 3 coats of white wash shall be applied.

No portions in the surface shall be left out initially to be patched up later on.

For new work, the white washed surface shall present a smooth and uniform finish.

Doors, windows floors and other articles of furniture etc. shall be protected from being splashed upon. Splashing and droppings, if any, shall be removed and the surfaces cleaned.

e) **Rates to Include** : Apart from other factors mentioned elsewhere in this contract, the rates for white wash include for the following :-

i) All labour, materials, equipment required for white washing.

ii) Scaffolding including erection and removal.

iii) Providing and preparing the white wash.

iv) Preparing the surface for white wash including the scaffolding.

v) Applying the white wash in three coats minimum. If a proper even surface is not obtained to the satisfaction of the Bank/ Consultants in 3 coats, contractors shall carry out additional coats of white wash to approval, at contractor's expense.

f) Mode of measurement : The measurement shall be in square metre. The mode of measurement shall be as applicable to that for plaster.

12.2 DISTEMPERING

Providing Oil bound Distemper :

a) Material

The oil bound distemper shall be of approved quality color shade manufactured by ICI, Berger Paints (India) Ltd, M/s. Asian Paints Ltd.

b) Scaffolding

This shall be double or single as required and directed.

c) Preparing the surface

The surface to be distempered shall be cleaned and all cracks, holes and surface defects shall be repaired by applying putty, made of plaster of paris mixed with water. All irregularities shall be sand papered smooth and wipped clean. The surface so prepared must be completely dry and free from dust before distempering is commenced. In the case of walls newly plastered, special care shall be taken to see that it is completely dry before any treatment is attempted.

d) Priming Coat

The priming coat shall be applied over the complete dry surface in the manner recommended by the manufacturer.

e) Application of Distemper

The instruction of the makers shall be followed regarding the preparation of the surface and application of priming and finishing coats. Distemper shall not be mixed in a larger quantity than is actually required for a day's work. Distempers shall be applied in dry weather with broad stiff brush in long parallel strokes. The treated surface shall be allowed to dry and harden. Second or succeeding coats shall not be applied until the preceeding coat has been passed by the Bank/ Consultants. Two more coats of distemper shall be given in exactly the same manner as the first one but only after the earlier coat laid has thoroughly dried.

f) Rates to include

The rates shall include all labour, materials equipment and tools for carrying out the following operations :-

i) Providing the primer and distemper and mixing the distemper.

ii) Scaffolding.

iii) Preparing the surface to receive the priming and finishing coats.

iv) Applying the priming coats.

v) Applying the distemper in 2 coats minimum, if a proper even surface is not obtained to the satisfaction of the Bank/Consultants in 2 coat, contractor shall carry out additional coats of distemper to approval, at contractor's expense.

g) Mode of Measurements : Similar to that for white washing.

13.0 PLASTIC EMULSION PAINT

13.1 MATERIAL

The emulsion paint and primers shall be of approved qualitycolour and shade manufactured by ICI/Berger Paints (India) Ltd/Asian Paints Ltd.

13.2 SCAFFOLDING

This shall be double or single as required and directed. If ladders are used, pieces of gunny bags or cloth bags shall be tied on their tops to avoid damage or scratches to the plastered surfaces etc. proper stage scaffolding shall be erected when painting the ceiling.

13.3 PREPARATION OF THE SURFACE

The surface to be painted shall be cleaned and all cracks, holes and surface defects shall be repaired with plaster of paris for spot filling, and with filler prepared with whiting, water and a little quantity paint for filling and levelling the wider areas.

13.4 PRIMING COAT

The priming coat of the cement primer of approved quality make shall be applied over the completely dry surface in the manner as recommended by the paint manufacturers.

13.5 APPLICATION OF EMULSION PAINT

The recommendation of approved paint manufacturer, whose product is used, shall be followed regarding the preparation of the surface and the application of the priming and finishing coats. The contractor shall arrange for technical assistance and supervision from the paint manufacturer, during the execution of the painting work. After the priming coat has been applied and perfectly dried, all holes, scratches, if any, shall be repaired as mentioned in 'preparation of surface' and then the second coat of approved shade and manufacturer shall be evenly applied and allowed to dry.

The third coat shall be carefully applied to achieve smooth and even surface after the previous coat has dried up. Minimum 3 coats of paint shall be applied inclusive of primer coat. If a proper and even surface is not obtained to the satisfaction of the Bank/Consultants in 3 coats, Contractor shall carry out additional coats of painting to approval, at contractor's expenses. Care shall be taken that dust or other foreign materials do not settle or disfigure the various coats.

13.6 RATES TO INCLUDE

Apart from other factors mentioned elsewhere in this contract, the rates for the item of plastic emulsion paint shall include for the following :-

i) All labour, materials and equipment necessary to carry out the work.

ii) Supplying the approved emulsion paint for priming and finishing coats.

iii) Preparing the surface for receiving the primer and finishing coats.

iv) Scaffolding including its erections and dismantling.

v) Application of one primer coat and minimum two coats of finishing. If a proper and even surface is not obtained to the satisfaction of Bank/Consultants in 3 coats mentioned above, the contractor shall carry out additional coats of painting to approval at contractor's expense.

vi) Protection to painted surface till dried and handed over.

vii) Expense, if any, for supervision and technical assistance supplied by the approved paint manufacturers.

13.7 MODE OF MEASUREMENT

The measurement shall be in square metre. The mode of measurement shall as applicable to that for white washing.

14.0 CEMENT BASED PAINTING :

a) Material

External waterproofing cement based paints shall be of approved quality and shall manufactured by Killick Nickshon, Berger Paints (India) Ltd.

b) Preparation of surface

Before painting is commenced on surface, all dirt, oil, grease, efflorescence and organic material shall be completely removed. The surface shall be wetted by sprinkling of water with fine spray. The surface shall be sprayed several times with a few minutes intervals between each spraying to allow the moisture to soak into the surface.

c) Application

Cement based paint solution shall be applied to the surface with hair brush to get uniform finish. After the first coat of paint has dried it shall be cured with water at least for 24 hours, before the application of the second coat should be elapsed between the two coats. The meaning of one coat shall be as described for white washing.

d) Curing

Cement based paint work shall be kept damp at least for 7 days.

e) Rates to include

Apart from other factors mentioned elsewhere in this contract, the rate of providing cement paint shall include for the following :-

i) All labour, materials and equipment to provide cement paint.

ii) Scaffolding, including erecting and removing.

iii) Preparing the surface as stated above.

iv) Applying 2 coats of approved cement based paint. If a proper and even surface is not obtained to the satisfaction of the Bank/Consultants in the coats applied, the contractor shall provide additional coats of painting to approval, at contractor's expense.

v) Curing as stated above.

vi) Mode of Measurement :

Measurement shall be in square metre and as applicable to white wash. Nothing extra shall be allowed for painting on rough surface, for example, external sand faced plaster, rough cast plaster etc.

15.0 PAINTING, FRENCH POLISHING

15.1 PAINTING :

a) Material

Ready mixed oil paints and primer, in general shall be of approved quality, colour and shall manufactured by ICI, Berger Paints (India) Ltd, Asian Paints Ltd. These materials shall be in sealed tins and shall be opened in the pressence of the Bank/Consultants at site.

b) Preparation of Surface

i) Iron and Steel works :

Surface to be painted shall be thoroughly cleaned, sand papered and/or rubbed with emery cloth, if necessary, to remove grease, mortar or any other foreign materials. In case of rusted surface, it shall be first cleaned with wire brushes till the corroded rust is removed. the prepared surface shall be shiny and free from brush marks, patches, blisters and other irrequlrities. The surface thus finished shall be got approved for painting.

ii) Wood work :

All surface to be painted shall be thoroughly cleaned sand papered and removed of all foreign materials. In case of surfaces having knot and nail holes, this shall be filled with knotting and stopping materials. The knotting materials shall consist of pure shellac dissolved in methylated spirit. Stopping materials shall consist of putty. The surface thus treated shall be allowed to dry and then sand papered smooth.

c) Application

After preparing the surface, a primer coat shall be applied. The primer coat shall be ready mix of approved make and manufacturer. After the primer coat is applied and perfectly dried, all holes, cracks, etc. which shall remain, shall be filled in with putty and the surface sand papered smooth. Then a second coat of paint of approved shade and manufacturers shall be evenly applied and allowed to dry.

The third coat shall be carefully applied to achieve smooth and even surface after the previous coat has dried up. Minimum 3 coats of paint shall be applied inclusive of a primer coat. If a proper and even surface is not obtained to the satisfaction of the Bank/Consultants in 3 coats, contractor shall carry out additional coats of painting to approval, at contractor's expenses. Care shall be taken that dust or other foreign materials do not settle or otherwise disfigure the various coats.

d) Rates to include :

Apart from other factors mentioned elsewhere in this contract, the rate for the item of painting shall include for the following :-

i) All labour, materials equipment necessary to carry out the work.

ii) Supplying the approved paint for priming and finishing coats.

iii) Preparing the surface including knotting and stopping for receiving the priming and finishing coats.

iv) Scaffolding including its erection and dismantling.

v) Application ofatleast one primer coat and two coats of finishing for wood work and atleast two finishing coats for steel work unless otherwise specified. If a proper and even surface is not obtained to the satisfaction of the Bank/Consultants, contractor shall carryout additional coats of painting to approval at contractor's expense.

vi) Protection to painted surface till dried and handed over.

Mode of Measurement

Painting to wood work and steel shall be measured separately, as per I.S. I200 (Part XV) of latest edition.

15.2 FRENCH POLISHING

French polish to be used shall comply with I.S. 348 of latest edition in the requirements of quality. Before french polish is applied, the surface of wood work shall be prepared in the same manner as for painting. The wood to be polished should be first painted with a filler composed of I part of whiting mixed with 0.53 part of methylated spirit. After drying, it should be finely sand

papered.

On the wood work thus treated a thin coat of french polish shall be applied and allowed to dry. After drying, the surface shall be lightly rubbed with a fine sand paper prior to the second and third coats. The surface shall show an even polished surface and be approved by the

Bank/Consultants.

i) Rates to Include : Similar to that of painting.

ii) Mode of measurement : Similar to that of painting.

16.0 ROOF TREATMENT

16.1 WATER PROOFING TREATMENT TO ROOFS

16.1.1 Material

Water proofing compound conforming to IS 2645 of latest edition, cement, brick bats, sand etc of approved quality.

16.1.2 Preparation of Surface

The roof and sunken floor surface and vertical wall surfaces shall be thoroughly cleaned with wire brushes. All loose scales shall be removed and chipped of to receive cement plaster and cement slurry.

16.1.3 Laying of Treatments

16.1.3.1 Horizontal Surface

a) One layer cement slurry with admixture of water proofing compound conforming to IS 2645 of required quantity to be spread on the prepared surface.

b) Cement mortar (1:4) of required thickness as specified in the Schedule of Quantities shall be laid with admixture of water proofing compound conforming to IS 2645 of latest edition as per manufacturer's specification.

c) A layer of brick bats (coba) of required thickness as specified in the Schedule of Quantities is to be laid over the mortar layer to get the required gradient for drainage. The joints between the brick bats shall be kept between 15 to 25 mm wide. Joints are to be filled with cement slurry/cement mortar (1:4) with admixture of water proofing compound of required proportion as per manufacturers' specification. Thereafter curing shall be done for two days.

d) The top surface is to be finished smooth with cement plaster (1:4) of required thickness with admixture of waterproofing compound as per manufacturers' specifications. Thereafter curing shall be done for two weeks.

16.1.3.2 Vertical Surface/Side Wall

a) One coat cement slurry with admixture of water proofing compound conforming to IS 2645 of required quantity to be applied on the prepared surface upto required height or as shown in drawing.

b) One layer of cement plaster (1:4) with admixture of water proofing compound as per manufacturer's specifications. Curing shall be done for two weeks.

16.1.3.3 Junction of Horizontal and Vertical Surface

a) A vatta (Gola) of specified design as shown in drawing shall be made with brick bats & cement mortar (1:4) with admixture of water proofing compound as per manufacturers' specifications.

b) One layer of cement plaster (1:4) with admixture of water proofing compound as per manufacturers' specification. Curing shall be done for two weeks.

Note :

i) The proportion of waterproofing compound to be used in respect of Ordinary Portland Cement shall be minimum one percent by weight of cement.

ii) The above specifications are for general guidance any additional treatment is required to provide 10 (ten) years guarantee shall be provided at no extra cost.

iii) Work shall be executed through specialised firm viz. M/s. Overseas Waterproofing Corporation, M/s. India Waterproofing Co, Bombay.

iv) Treatment to vertical surface for the sunken floor shall be provided on completion of plumbing work.

16.1.4 Rates to Include

a) All labour, materials, equipment and different methods of operation necessary to complete the work including preparation of surface.

b) All necessary measure/additional treatment if required for 10 years guarantee as per specifications of the specialised firm.

16.1.5 Mode of Measurement

The measurement shall be in square metrefor actual area treated.

16.1.6 Guarantee

10 (Ten) years guarantee shall be provided on non-judicial stamp paper of Rs.100.00 only at the approved proforma enclosed with the tender, duly signed by the Main Contractor and the specialised firm who have executed the work.

In the unlikely event of treatment becoming necessary subsequently during the guarantee period, required inspection and treatment shall be carried out free of cost by the contractor.

16.2 WATER PROOFING TREATMENT TO SUNKEN FLOOR, COVERED TERRAC ETC WITH POLYURETHANE COATINGS

Water Proofing Treatment to Roofs with Polyurethane Coatings

16.2.1. Material

Clean the surface, wet the RCC surface. Apply one coat of polyurethane coating over the RCC surface by means of brush over the wet surface. This is followed by applications of two coats of polyurethane coatings over the epoxy coating by means of brush at an interval of 12 hours each. Cure the above coatings for 72 hours (self curing). The rates quoted with necessary tools and tackles with materials and labour.

16.2.2 Preparation of Surface

level shall be thoroughly cleaned with wire brushes. All loose scales shall be removed and chipped of to receive cement concreting screeding.

16.2.3 Rates to Include

a) All labour, materials, equipment and different methods of operation necessary to complete the work including preparation of surface.

b) All necessary side and end laps as per manufacturer's specification.

16.2.4 Mode of Measurement

The measurement shall be in square metre for actual exposed area covered by the paint.

16.2.5 Guarantee

10 (Ten) years guarantee shall be provided on non-judicial stamp paper of Rs. 100.00 only at the approved proforma enclosed with the tender, duly signed by the Main Contractor and the specialized firm who execute the work.

In the unlikely event of treatment becoming necessary subsequently during the guarantee period, required inspection and treatment shall be carried out free of cost by the contractor.

17.0 ALUMINIUM DOOR, WINDOW ETC.

17.1 All aluminium doors, windows, jallies, curtain wall, structural glazing etc shall be procured from A class manufacturer subject to the approval of Bank/Consultants. Aluminium

sections for fabricating framework of doors, windows, jallies, etc. shall be of extruded sections as manufactured by Zindal or approved equivalent make conforming to IS Code of latest edition.

Extruded section shall have a wall thickness as specified in the Schedule of Quantities or detail drawings. All sections shall be approved by the Bank/Consultants before fabrication is taken up, Doors, frames and mullions, transoms shall be anodised to required thickness in a bath of sulphuric acid to provide a uniform casting. A protective transparent coating shall be applied to the Sections before shipment from the Factory. All works for doors, windows, and frames etc. shall be fitted and shop assembled to a first class job, and ready for erection. Shop joints shall be made to hair lines and than welded or braced. Work on the above, other than described shall be carefully fitted and assembled with neat joints with concealed fasteners. Wherever possible, joint shall be made in concealed location and on edges of doors field connections of all work may be made with concealed screws or other approved type of fasteners. All fasteners connecting between aluminium members or between aluminium and concrete shall be either high strength aluminium or of stainless steel. Glazing beads shall be shop fit type without visible screw and shall be of sizes to accommodate various thickness of glazing as specified in the Schedule of Quantities. All works shall be adeuately braced and reinforced as necessary for strength and rigidity. The members of the frame work shall be of one piece and no joint shall be allowed unless the same has prior approval of Bank/Consultants. Fabrication drawings for the aluminium curtain wall, jalliesetc shall be prepared by the contractors based on the design of the Consultants indicating the detailed of frame work, fixing arrangement and other necessary details well in advance of the actual fabrication work and casting of structural element supporting the jallies, curtain wall etc and to be approved by the Bank/Consultants. A sample of the jalli, curtain wall etc unit fabricated as per approved drawing shall be produced for approval of Bank/ Consultants before commencement of bulk fabrication of jalli units curtain wall etc at shop.

17.2 HANDLING & STORAGE OF FABRICATING MATERIALS

All aluminium doors, windows, curtain wall, jalliesetc shall be packed and crated properly before despatch, to ensure that there will be no damage to the fabricated materials. Loading in to 'Wagons/ Truck' shall be done with all care to ensure safe arrival of materials at site in undamaged condition.

All the fabricated materials at site shall be stored under cover in such a way to prevent damage or distortion. Special care shall be taken to prevent staining of aluminium products by mortar etc. after erection at site.

17.3 ACCEPTANCE CRITERIA :

17.3.1 For Fabricated Items :

a) Overall dimensions shall be within + l.5 mm of the size shown on drawings.

b) Mullions, transoms etc. shall be in one length and permissible deviations from straighteness shall be limited to + l.5 mm from the axis of the member.

c) Door and window shutters shall operate without jamming. The clearance at head and jamb for door shutters shall not exceed l.5 mm. For double leaf doors, the gap at the meeting stiles shall not be more than l.5 mm.

d) Door leaves shall be undercut where shown on drawings.

e) Doors, windows, frames and curtain wall frame work etc. shall be on a true place, free from wrap or buckle.

f) All welds shall be dressed flush on exposed and contact surfaces.

g) Correctness of location and smoothness of operations of all shop installed hardware and fixtures.

h) Provision for hardwares and fixtures like floor spring etc as directed to be installed at site.

i) Glazing beads shall be cut with mitred corners.,

j) Glazing clips, fixing devices etc. shall be supplied in adequate numbers.

k) Shop coats shall be properly applied.

l) Exposed aluminium surfaces shall be free from scratches, stains and discolouration. Anodised surfaces shall be present a uniform and pleasing look.

m) Anodising thickness shall be minimum 15 micron.

17.3.2 For Installed Items :

a) Installations shall be at correct location, elevation and in general, on a true vertical plane.

b) Fixing details shall be strictly as shown on drawings.

c) Assembly of composite units shall be strictly as per drawings with mastic caulking at transoms and mullions, gaskets, weather strips etc. complete.

d) All openable sections shall operate smoothly without jamming.

e) All frames on external walls shall be mastic caulked to prevent leakage through joint between frames and masonry.

f) Locks, fasteners, floor spring etc. shall be fitted in position properly. Keys shall be non-interchangeable.

g) Cutting to concrete or masonry shall be made good and all abrasions to shop paint shall be touched up with paint of same quality as shop paint.

17.4 METHOD OF MEASUREMENT

a) Supply and installation of doors shall be measured in number of each type used or in sqm as specified in the Schedule of Quantities. The types shall be as shown on drawings and described in Schedule of Items.

b) Supply of windows shall be measured in square metres correct to two places of decimal. The width and height shall be measured overall from out to out of the frame. The height and width shall be measured correct to 0.5 cm. The Jalli& curtain wall shall be measured in sqm. The height and width shall be measured correct to 0.5 cm.

18.0 IRON MONGERY

18.1 RAIN WATER PIPES AND SPOUTS :

The rain water pipes where shown on the drawings shall be cast iron pipes (heavy)/Cast Iron spun pipes (LA Class), of the diameter as specified in the schedule of quantities, of approved manufacturer with socketed ends jointed as follows :-

a) For heavy cast iron pipes with spun yarn upto half the socket depth and the balance packed with cement mortar (I:2).

Where required these are to be run in the chase left or cut inwalls, columns slabs. For exposed lengths of pipes those are to be neatly secured clear from the finished wall face with clip or bracket, nailed or screwed to hard wood tapering plugs embedded in walls.

All cast iron rain water pipes must have shop coat of anticorrosive paint. The exposed cast iron pipes shall be painted to outside with two coats of synthetic enamel paint of approved shade, colour and manufacture over a coat of yellow zinc chromate primer.

The mouth of the rainwater pipe shall be fixed with C.I. grating and the pipe jammed in position in I:2:4 cement concrete with stone chips and neat finish on the surface.

The rate for the work shall include supplying and fixing of materials, cutting, making chases, mending, 2 coats of painting over a coat of yellow zinc chromate primer, jointing, etc and is for the complete work in all respects. Unless otherwise specified in the schedule of quantities, the rate shall also include supplying, fixing and jointing etc all the specials required for the complete work.

Rain water spouts shall be G.I. pipes (medium) cut to exact lengths as per drawing or direction of the Bank/Consultants and fixed in position in I:2:4 cement concrete the adjoining surface being finished in neat cement. The exposed faces shall be painted with 2 coats of painting over a coat of yellow zinc chromate primer.

18.2 CAST IRON SPUN RAIN WATER PIPES (A CLASS)

18.2.1 Pipes

The rain water pipes where shown on the drawings shall be cast iron spun pipes (A Class), of the diameter as specified in the Schedule of Quantities, of approved manufacturer with socket and spigot ends and shall conform to I.S. 1536 of latest edition in all respects. The pipes and specials shall be suitable for jointing with lead unless otherwise specified and only one standard specials shall be used.

18.2.2 Joints

Jointing of the pipes and specials shall be lead caulked joint. The spigot shall be carefully centered in the socket by two or three laps of treated spun yarn (soaked into hot tar or bitumen and dried) twisted into ropes of uniform thickness, wall caulked into the back of the socket, leaving the requisite depth for the lead. Lead shall be rendered thoroughly fluid and each joint shall be filled in by pouring.

Unless otherwise stated the quantity of lead and spun yarn for each joint in cast iron pipes & fittings shall be as under :-

Diameter of pipe in mm	Weight of lead in kg per joint	Weight of spun yarn in kg per joint
150 mm	3.4	0.2
200 mm	5.0	0.30
300 mm	7.2	0.48

The above quantity of lead and spun yarn given above are provisional and a variation as permissible as per I.S. 3114 of latest edition.

18.2.3 Testing of Joints

All joints shall be made leak proof. Test shall be carried out by filling the system with water by plugging the outlets suitably. Any defects is visible shall be cut and made good as per direction.

18.2.4 Laying/Fixing of Pipes

Vertical stack of the pipe line including specials shall be secured by fixed to wall by providing special type of clamps made for the purpose with 40 x 6 mm m.s. flat as per drawing and the clamps shall be fixed to wall by cement concrete (1:2:4), including cutting wall and mending good to damages to match with the adjacent surface.

18.2.4 Painting

All the exposed pipe lines shall be painted with two coats of synthetic enamel paint of approved shade and quality over a coat of yellow zinc chromate primer. Inside face of pipes & fittings shall be painted with two coats of anticorrosive paint having tar or other suitable base.

18.2.5 Rates to Include

Apart from other factors mentioned elsewhere in this contract, the contractors' quoted rate shall include for the following :

a) All cutting to length, labour, hoisting and fixing in position.

b) Cost of all materials including wastage, cast iron gratings, clamps, cast iron grating, jointing materials.

c) Cutting wall, mending good to damages and jamming materials.

d) Tools & Plants, equipment.

e) Scaffolding and work at all levels.

f) Testing of joints

g) Painting as specified.

18.3 M.S. GRILLS, RAILING &GATES :

M.S. grills, railings and gates shall be fabricated and fixed in position strictly as per design and drawings. All intersections or meetings of all members shall be welded and the workmanship shall be high grade quality to the entire satisfaction of the Bank/Consultants. After fixing in position, these shall be cleaned off dust, dirt, rust or scales and rubbed with emery and an anticorrosive priming coat with yellow zinc chromate shall be applied.

The rate for M.S. grills to window shall also include the cost of wood screws to be used for fixing, for M.S. railing the cost of I:2:4 cement concrete for jamming the hold fasts of the railing. The rate is for the complete work in all respects.

19.0 COLLAPSIBLE GATE

The components of the collapsible steel shutters shall be of mild steel. Shutters shall be manufactured as per the following specifications.

Top and bottom guide rails shall be 40 x 40 x 12 mm Tee, vertical channels of size 20 mm x 10 mm x 2 mm (@ 3.50 kg/m) at 100 mm apart in fully stretched position and 20 mm x 5 mm M.S flat as collapsible bracings properly rivetted &washered including 38 mm steel rollers including locking arrangements.

Collapsible gate will be of approved manufacturer. The rate should include the cost of rails, runners, channels including locking and hanging arrangements. It will be fitted and fixed in position with lugs set in cement concrete and including cutting necessary holes, chasing etc. in wall floors etc. and making good damages including one coat of yellow zinc chromate primer complete. The rate shall be inclusive of all these operations unless otherwise mentioned in the schedule of quantities.

20.0 ROLLING SHUTTERS :

GENERAL

Rolling shutters shall be supplied in the following alternative types or as specified in Schedule of Quantities. The shutters shall be complete with accessories. The fixing arrangement shall be as per the drawing with regard to whether it shall be fixed on the inside or outside between jumbs of opening, on or below the lintel, etc.

a) Self coiling type (Push and Pull type or Manually operated type It shall be used upto a maximum of about 8 sqm. clear area without ball bearings and upto area of about l2 sqm with ball bearings.

b) Gear operated type (Mechanical type : It shall be fitted with ball bearings. It shall be used upto a maximum of about 25 sqm clear area, if the rolling shutter is operated by a bevel gear box and crank handle and upto a maximum of about 35 sqm. clear area, if the rolling shutter is operated by chain wheel and hand chain mounted directly on the work sheft.

Shutter shall be constructed with interlocking lath sections formed from cold rolled steel strips not less than 0.9 mm thick and 80 mm wide for shutters upto 3.5 m width and not less than l.25 mm thick and 80 mm wide for shutters 3.5 m in width and above unless otherwise specified.

The guide channels shall be of mild steel deep channel section and of rolled pressed or built up (fabricated) joint less construction. The thickness of sheet used shall not be less than 3.l5 mm.

Hood covers shall be made of mild steel sheets not less than 0.90 mm thick. For shutters having width 3.5 m and above, the thickness ofm.s. sheet for the hood cover shall be not less than l.25 mm.

21.0 STANDARD SPECIFICATIONS

Unless otherwise specified elsewhere in this contract, all work underthis contract shall be carried out in accordance with the technical specification and the latest issue of the Indian Standard Specification applicable to the particular class of work. If Indian Standards are notformulated for any particular material of work, the relevant British Standard Specification shall apply. Relevant issue of I.S. specifications applicable to the particular workhave been describedalong with the specification for the respective works. In case of anyconfusion or dispute regarding the meaning and interpretation of any specification for the respective works, the decision of the Bank/Consultants shall be final and binding on the contractor.

TECHNICAL SPECIFICATION FOR SANITARY AND PLUMBING WORKS

The following specifications are to be read in conjunction with the details given in the Schedule of Quantities

1. 0 STANDARD SPECIFICATIONS

All works under this contract shall carry out in accordance with the technical specifications & the latest issue of the Indian Standard Specifications applicable to the particular class of work. If Indian Standards are not formulated for any particular material or method of execution of work, the relevant British Standards shall apply. Relevant issues of I.S. Specifications applicable to the particular work have been described along with the specification for the respective works. In case of any confusion or dispute regarding the meaning & interpretation of any specification for the respective works, the decision of the Bank/Consultants shall be final and binding on the contractor.

2.0 GENERAL SPECIFICATIONS FOR WATER SUPPLY, SANITARY INSTALLATIONS, SEWERAGE & DRAINAGE WORKS

a) Execution through reputed Sanitary Contractors Firm

All water supply, sanitary installations, sewerage & drainage works shall be executed through reputed sanitary contractors. Particulars of the firm viz. Name & address of the firm, registration &licence number etc (issued by the authorities) shall be furnished along with the tender.

b) Complying with by-laws etc of local Authorities

All water supply, sanitary installations, sewerage & drainage works shall be carried out by skilled and licensed plumbers/technicians in a workman like manner complying in all respects with the relevant by-laws of the Municipal or of the local Authorities under whose jurisdiction the work has to be executed.

c) Contractor's responsibility for sanction from local authorities

For the works undertaken by him & works dependent on his work, the contractor shall prepare plans/drawings as required, including H D Plan and get it sanctioned from the Municipal or other Government authorities as may be required by rules & regulations and law concerned. The contractor shall include the cost for the same in his tender rates unless otherwise specified in the Tender Items.

d) Contractor's responsibility to ensure continuance of existing services

During execution of the new works, the contractor shall ensure that the existing services (viz. water supply, sewer, drain accidentally the services shall be restored immediately at contractor's cost.

However, when in the opinion of the Consultants/Bank, it is imperative to locally divert/disconnect for a short time/reconnect the existing lines, it shall be done by the contractor as directed the Consultants/Bank. Payment for the necessary pipe lines would be made as per tender items, however all other costs including temporary measures shall be borne by the contractor.

3.0 **Documents to be enclosed along with the final bill**

3.1 **Completion Drawings**

On completion of all works under this contract, the contractor shall prepare & submit (at his own cost), 3 sets (I Blue print or drawing on tracing cloth, & 2 Ammonia prints of each drawing) of completion drawings, showing the entire system of water supply, sanitary installations, drainage & sewerage disposal incorporating up to date changes (if any) at site in all the works mentioned above & permanent structures, roads, pathways, boundary lines etc.

The following drawings (in scales as instructed by the Consultants) shall be prepared and submitted to the Consultants along with the contractor's final bill :

a) Site Layout (Water Supply lines)

b) Site Layout (Sewerage & Drainage & Lines)

c) Floor Plans (Water supply, sanitary installations, sewerage & drainage lines)

d) Toilet & kitchen details & Schematic line diagrams of pipelines.

e) Any other drawings as required and instructed to be done by the Consultants.

3.2 **List of materials/installations handed over**

On completion of works in all respects and satisfactory testing, the contractor shall prepare & submit a list, along with the final bill, of all materials/installations handed over to the authorized representative of the Bank.

3.3 **Transfer of manufacturer's guarantee**

When manufacturer's guarantee period for any material/installation expires at a later date that than the expiry date of the defect liability period of the contractor, the contractor shall transfer the guarantee in the name of the Bank. This transfer should be made at the time of submitting the contractor's bill for release of retention money.

4.0 **CEMENT**

The cement must be kept in a dry place under cover. Samples of cement may be taken by the Consultants/Bank from time to time for testing at any approved laboratory whose reports shall be accepted by both parties.

5.0 **SAND**

Sand is to be clean, coarse and sharp and is to be washed, if so directed.

6.0 **AGGREGATE**

The aggregate for the reinforced cement concrete work shall be stone chips or broken gravel of approved quality which will pass through I2 mm mesh but will be retained on 6 mm mesh. The aggregates for the base/foundation etc of drain pipes, manhole chambers etc. shall be of stone chips of 20 mm & down size.

7.0 **CONCRETE**

For reinforced cement concrete work the cement, sand and aggregate shall be in the

proportion of 1:2:4. For foundation work, the mix will be in the proportion of (1:3:6) or (1:4:8) as stated in schedule of quantities. Wherever reinforced cement concrete (RCC) is mentioned in schedule of quantities, it shall mean inclusive of cost of required steel reinforcement bars, providing & removing shuttering etc. all complete.

8.0 **BRICKS**

Bricks shall be of the best quality well burnt sound, hard and giving clear ringing tone of sound when struck against each other and well shaped bricks having crushing strength 50 kg/sq. cm unless stated otherwise in the respective schedule of items, of standard dimensions and to be soaked for atleast six hours in water before use.

9.0 **BRICK WORK**

The brick work shall be in English bond, and shall be laid in cement sand mortar in the proportion stated in schedule of quantities, if not mentioned otherwise. Where corbelling is necessary, projection in each course shall not exceed (2 l/4") 57 mm. All brick work must be kept wet till the mortar has fully set.

10.0 **SOLING**

For soling, the bricks shall be having crushing strength 50 kg/sq. cm, bricks laid flat, the joints being well packed with loose sand.

11.0 a) **Excavation, General**

Excavation shall form part of the item under the schedule and shall not be paid for separately unless otherwise specified in the schedule of quantities. It shall include excavation in all kinds of soil including shoring and bailing out water where necessary and refilling the excavated materials trenches, in l5 cms layers properly rammed and watered and neatly dressed at top. If the excavation is done to dimensions greater than those shown on the drawings or as directed by the Consultants/Bank, the excess depth shall be made good at the cost of the contractor. The excavation work shall be done in a manner that does not in any way endanger the stability of the adjacent buildings or other structures or services. Where any road, pavement or crossing are cut these shall be restored to their original conditions at no extra cost. Moreover, after completion of the work, the contractor shall have to dress the site including disposal of the surplus earth at their own cost as directed by the Consultants/Bank.

b) **Trenches General**

The width of the bed of trenches shall be the exact width as shown on the drawings or as specified.

In the firm soil, the sides of trenches shall be kept vertical upto a depth of l.82 metre; and for a greater depth, the trench shall be widened by allowing steps of 46 cm (l'-6") on either side after every l.82 M depth from the bottom so as to give side slopes of (l/4" to l") 6 mm to 25 mm. Where the soil is soft, loose or slushy the width of steps shall be suitably increased as directed by the Consultants/Bank. It shall be the responsibility of the contractor to take complete instructions in writing from Consultants/Bank regarding the stepping, sloping or shoring to be done for excavation in trenches deeper than l.82 M for firm soil or any depth for soft, loose or slushy soil.

The bed of the trenches shall be made level and firm by watering and ramming. Any soft or defective spots that are found shall be filled with concrete of the same proportion as

specified or as may be directed by the Consultants/Bank.

12.0 **SANITARY INSTALLATION**

a) **Indian Type W.C Pan**

The W.C. pan shall be of white vitreous china of specified size and pattern long pan with a pair of separate footrests or Orissa pattern with integrated footrests etc wash down type unless otherwise specified. It hall be of back flush inlet type. The pan shall be of 1st quality materials of approved brand and shall bear the mark of the manufacturer as well as shall have ISI mark. The pan hall be provided with a l00 mm HCI `P' or `S' trap as specified with minimum 50 mm seal.

b) **Fixing**

The WC Pan shall be sunk or raised from the general floor as specified, but its surrounding floor shall be sloped towards the pan. Care shall be taken so that the pan is not damaged in the process of fixing; if damaged in any way, it shall be replaced immediately. It shall be fixed n a proper cement concrete base of I:3:6 proportion (with a wire netting where required) taking care that the cushion is uniform and even without having any hollows between the concrete base and pan.
The joint between the pan and the trap shall be made with cement mortar 1:1 with jute hessian gasket soaked in coal tar and shall be leak proof.

13.0 **EUROPEAN TYPE W C AND BIDET**

a) **European type W C Pan**

Shall be of 1st quality material of approved brand, readily flushed, of wash down type & shall bear ISI mark. The closet shall be of vitreous china ware having integrated trap `P' or `S' type with or without vent hole right or left as per drawing or as directed.

b) **Seat**

The Seat with lid shall be of solid (white, black or of other colour as specified in schedule of quantities) plastic of approved make with ISI mark, with rubber buffers and shall be fixed in position by using chromium plated (C.P.) brass hinges and screws.

14.0 **URINAL**

a) **Lipped Front Urinal**

The urinal shall be of flat back lipped front basin of required dimensions of White vitreous chinaware of 1st quality of an approved make as specified. It shall be fixed in position by using rawlplugs embedded in the wall with screws of proper size or fixed as per the approved manufacturer's specifications. Each urinal shall be connected to a 32 mm N.B. PVC waste pipe with clamps, which shall discharge into a channel or floor trap, or C.P. bottle trap shall be provided instead of PVC waste etc, if specified in schedule of quantities.

b) **Flushing system for Urinals**

As specified in item no. 15(g) of this T S.

c) **Painting**

The inside of the invisible portions of the fittings and brackets connected with urinal basin shall be painted with approved bituminous paint and outside of the brackets,

etc shall be painted with a priming coat of red oxide and finished with two or more coats of enamel painting to give an even shade to match the colour of surrounding walls. The cost of such painting shall be included in the rate quoted for the concerned tender items.

15. 0 FLUSHING SYSTEM

a) **With CP Flush Valve**

Unless otherwise specified, flushing of European pattern water closet and Orissa type with integrated footrests, shall be done by CP flush valve with controlling cock & operating lever suitable for fitting on surface of wall or within wall as specified in schedule of quantities. Concealed portion of flush pipe & fittings shall be GI and exposed portion of flush pipe with fittings shall be of brass CP.

b) Only where specifically instructed for EPWCs and Orissa type IPWCs, low level type flushing cistern to be provided and shall be of white vitreous china ware of approved make. 10 litres capacity with internal fittings, brackets and CP 40 mm flush pipe & bend with rubber packing, brass CP handle etc. The low level type flushing cistern shall be connected with the WC pan by means of 40 mm dia CP flush bend with rubber packing. The inlet pipe to cistern shall be connected with brass CP heavy connector of required length with both ends CP nuts & washers.

c) **Flushing cistern for Orissa pattern WC with a pair of integrated foot rests**

Unless otherwise specified, pull and letgo type CI flushing cistern high level type of approved make of best quality cast iron, mosquito proof of 10 litres capacity shall be provided together with cover, lever, shell, overflow, GI fancy chain and pulley of specified quality, brass ball valve with polythene float and necessary unions etc for connection with inlet, outlet and overflow pipes. The flushing of the WC pan shall be done through suitable GI (medium quality) flush pipe coupling etc complete.
Brackets

The cistern shall be fixed on cast iron or rolled steel brackets, painted to match surrounding walls which shall be firmly embedded in the wall or fixed by using lugs and screws, phill plug, rawl plug to the satisfaction of the Consultants.

d) *Overflow*

The cisterns shall be provided with l5 mm polythene overflow pipe with fittings which shall terminate into mosquito proof coupling of the approved municipal design with 0.05 mm dia perforations.

e) **Flush Pipe**

The outlet or flush pipe from the high level cistern shall be of 32 mm dia GI medium quality pipe. The flush pipe shall be 2.1 Mtrs high approx, which shall be connected to the WC pan by means of an approved type of joint. The flush pipe shall be fixed to wall by using holder bat clamps or embedded as required. The bends and offsets of GI flush pipes shall be made cold.

f) *Painting*

Inside of CI cistern and fittings shall be painted with approved bitumastic paint and outside of the CI cistern, brackets, overflow and flush pipe etc shall be painted with a primary coat of red oxide and finishing two or more coats of white zinc or any other colour and shade to match with the painting of the surrounding walls. The cost of such painting shall be included

in the rate quoted for CI cistern, brackets, overflow and flush pipe etc shall be painted with a primary coat of red oxide and finishing two or more coats of white zinc or any other colour and shade to match with the painting of the surrounding walls. The cost of such painting shall be included in the rate quoted for the flushing cistern.

g) *Flushing for Urinals*

The flushing of urinals shall be done by individual CP control cock with CP connector and CP spreader or by auto cistern of specified capacity with internal fittings, required size CP flush pipes and fittings etc complete as stated in the schedule of items.

16.0 **WASH HAND BASIN**

a) **Wash Hand Basin**

The basins of approved pattern & shall be of white vitreous china of 1st quality of approved brand with ISI mark. The size of the basin shall be as specified. The basins shall be of approved quality and make.

b) *Fittings*

Each wash hand basin shall be provided with pillar tap as specified, having a centered tap hole with brass C P pillar cock heavy type. The basin must also be provided with 32 mm dia C.P. basin waste, heavy PVC waste pipe of required length with both end CP brass couplings connected to concealed GI waste pipe or CP bottle trap connected to concealed galvanised waste pipe, as stated in the respective schedule of items.

c) **Fixing**

Basins shall be supported on a pair of CI concealed type brackets embedded in wall or fixed in position by means of wooden cleats and screws as required.

d) The GI waste pipes shall discharge into the floor trap inlet or one way or two wayextention pieces as per drawings/directions.

17.0 **SINKS**

a) **Sinks**

The sink with or without drain board shall be of best quality stainless steel, of approved make, quality & brand. The size of the sink shall be as specified.

b) **Fittings**

Each sink shall be provided with CP brass bib cock, CP brass waste or integrated stainless steel waste, etc. The fittings shall be of approved quality.

c) **Fixing**

The sink shall be supported on M S fabricated and galvanised or C I cantilever bracket to match with sink profile, embedded or fixed into position by means of wooden cleats and screws or embedded in wall with concrete as per site condition. The brackets shall be painted with approved shade and colour to match with the surrounding finish.

d) The G I waste pipe shall discharge into floor trap inlet or one way or two way extension pieces

as per drawings/directions.

18.0 TOILET REQUISITES

a) **Mirrors**

The piece glass mirrors shall be of approved make glass as specified. The size and shape of the mirror shall be as specified. It shall be mounted on the asbestos sheet and shall be fixed in position by means of C.P brass dome shaped screws over rubber washers and rawl plug firmly embedded in wall.

b) Water Connection

Water connection to flushing cistern, wash hand basins shall be by means of white PVC connector or CP connector with angular stop cock as specified in the respective schedule of items.

c) Shelf

Unless otherwise specified the shelf shall be of glass or porcelain of approved quality & design. The size of the shelf shall be as specified. The brackets (for glass shelf) or porcelain shelf shall be fixed to the wall with CP brass screws to wooden plug firmly embedded in the wall.

d) Urinal Partition

Unless otherwise specified, partition for urinal shall be shaped out of 900 mm x 600 mm white marble slab of finished thickness of 20 to 22 mm. Fixing shall be done by inserting a portion (approx 75 mm) inside wall & grouting the same in cement concrete 1:3:6. All the exposed surfaces & edges shall be properly ground to shape and polished. Joint with wall to be finished with white cement.

e) **Channels**

Where channels are to be provided, these must be half-rounded (4") l00 mm dia as specified in the schedule of quantities, open end or block end type floor channel, with discharge outlet where required, all made of porcelain white glazed inside and top edges shall be fixed on raised platform as per drawings and instructions.

f) **Towel Rail**

The towel rail with bracket (of brass CP or anodisedaluminium as stated in Schedule of items) shall be of approved shape and design. The size of the rail shall be as specified. The brackets shall be fixed by means of CP brass screws or Rawl Plug firmly embedded in wall.

g) **Paper Holder**

The paper holder shall be of white vitreous chinaware of recessed type & the rate shall include wooden spindle, chase cutting of walls, setting in cement sand mortar & making good the all round joint with white cement.

19.0 **HCI SOIL, WASTE AND VENT (ANTISYPHONAGE) PIPES AND FITTINGS**

a) **HCI Pipes and fittings**

The heavy cast iron pipe and fittings should be centrifugally cast/sand cast with ISI marked conforming to IS 3989 & IS l729 of latest editions of approved make and quality. The pipes

shall be free from cracks and other flaws. The interior of pipes and fittings shall be clean and smooth and painted inside with approved anticorrosive paint.

Nominal Mass

The nominal mass of socket and spigot of pipes and thickness conforming to IS 1729 are given below.

Nominal Dia of Pipe	Minimum MM	Nominal Net Weight Exclusive of Ears for	
		1.5 M Long Pipe Kg	1.8 M Long Pipe Kg
50	5	9.56	11.41
75	5	13.83	16.52
100	5	18.14	21.67
150	5	26.70	31.92

The nominal mass of socket and spigot of pipes and thickness conforming to IS 3989 are given below.

Nominal Diameter (DN)	Thickness	Approx. Mass including Mass of Socket					
		3.00 M (kg)	2.50 M (kg)	2.00 M (kg)	1.80 M (kg)	1.50 M (kg)	1.00 M (kg)
75	3.50	20.00	16.80	13.80	12.50	10.60	7.40
100	4.00	30.00	25.50	21.00	18.80	16.00	11.20
150	5.00	56.00	47.00	38.50	34.90	29.50	21.00
200	6.00	90.00	70.90	56.70	51.00	42.50	33.00

b) **Fixing**

The pipes and fittings shall be fixed to walls by using proper clamps. The pipes shall be fixed perfectly vertical or in a line as directed. All soil pipes shall be carried up above the roof and shall have HCI vent cowl. Where pipes are laid along walls, the cast iron pipes are to be fixed 25mm away from the wall surface. Cast iron bobbins with nails

&clamps etc are to be used for this purpose. Cost of these items shall be included in the item for pipes and specials.

Fabricated M.S clamps/hangers may be used only on specific instructions of Consultants/Banks, where diversions or free suspended horizontal stretches of pipelines are to be provided. Payment for such fabricated MS clamps/hangers shall be made separately as per schedule of items. The access door fittings shall be of proper design so as not to form any cavities in which filth may accumulate. Doors shall be provided with **brass bolts** and rubber insertions.

Connections between main pipe and the branch pipes shall be made by using trenches and bends invariably with access doors for cleaning.

c) **Jointing**

The annular space between the sockets and spigots will be first well packed in with spun yarn leaving a depth of half the depth of the sockets as measured from the lip of the socket for lead.

The joint may be leaded by using proper leading rings or by wrapping a ring of lamp rope covered with clay round the pipe at the end of the socket leaving a hole through, which lead shall be poured in. For pipes with sockets facing upwards 15 mm high clay round the socket edge may be used as guide for leading.

The spigot shall be carefully centered in the socket by two or three laps of treated (soaked in hot coal tar & dried) spun yarn, twisted into ropes of uniform thickness, well caulked, into the back of the socket, leaving the requisite depth of the lead. The lumps of the yarn must be longer than the circumference of the pipe. No making up of the pieces of pipe at the end of the socket leaving a hole through which lead shall be poured in. For pipes with sockets facing upwards 15 mm high clay round the socket edge may be used as guide for leading.

The spigot shall be carefully centered in the socket by two or three laps of treated (soaked in hot coal tar and dried) spun yarn, twisted into ropes of uniform thickness, well caulked, into the back of the socket, leaving the requisite depth of the lead. The lumps of the yarn must be longer than the circumference of the pipe. No making up of the pieces of yarns shall be allowed.

The lead shall be rendered thoroughly fluid and each joint shall be filled in one pouring.

d) **Lead for Joints**

It shall be bluish grey in colour very soft and malleable, readily melted, free from mixture of zinc or tin conforming to IS 782 of latest edition.

e) **Spun Yarn for Joints**

This shall be of best quality preferably white. It shall be free from dust etc. It shall be soaked into hot coal tar or bitumen and dried before use.

f) **Route Markers**

Shall have to be provided, if directly (without extra cost), for underground portion of pipeline (pl. ref. item no. 33).

g) **Caulking**

After the joints have been run they must be thoroughly caulked until they are perfectly water tight. Caulking of joints will be done after convenient length of pipe has been laid and leaded. The leading ring shall first be removed with a flat chisel but leaving enough so that the joint can be finished 3 mm beyond the socket face and then the joint caulked round three times with caulking tools of increasing thickness and hammer of 4 to 6 lbs weights. Lead joints shall not be covered till the pipe line has been tested under pressure but the rest of the pipe line may be covered up to prevent expansion and contraction due to variation in temperature, and any lead outside the socket shall be removed.

h) When it is inconvenient or dangerous to use molten lead for joints, they may be made with lead wool inserted in the sockets not less than 6 mm thick and thoroughly caulked. When working with lead wool, it is very important to use caulking tools of appropriate thickness to fill the joint space and to thoroughly consolidate the materials from the back to the front of the socket.

i) **Testing**

In addition to testing of horizontal stretches of pipe lines by filling water, all HCI pipes and fittings including joints will be tested by smoke test and left in working order after completion. The smoke test shall be carried out as stated under.

Smoke shall be pumped into the drainage at the lowest end from smoke machine, which consists of blower and burner. The materials usually burnt are greasy cotton waste, which form clear pungent smoke, which is usually detectable by sight as well as by smell if leaking occurs as any point of the drain. The contractor will have to rectify all defects traced in such tests at his own expense to the complete satisfaction of the Consultants/Bank. The traps and soil fittings should be of heavy cast iron and should have water seal at least (2") 50 mm deep.

j) **Anti-syphonage pipes**

HCI Antisyphonage pipes shall conform to I.S. 3989 & IS I729 of latest editions with lead caulked joints. The main antisyphonage pipes shall be of 3" (75 mm dia) or (2") 50 mm dia internal as specified.

k) **Paintings**

All the exposed HCI pipes and fittings shall be painted with two coats of synthetic enamel paint of approved quality, manufacture, colour and shade to match with the surroundings. Unless stated otherwise all concealed pipes & fittings shall be painted with 3 coats of anticorrosive bitumastic paint. The cost of such painting shall be included in the contractor's rates.

l) The surface of the pipes and fittings to be painted shall be cleaned thoroughly. Red oxide or other metal primer shall be painted and allowed to dry. The finishing shall be done by applied two (2) or more coats with paint of an approved colour to give an even shade.

20.0 **WATER SUPPLY (FERRULES)**

a) **Ferrule**

Unless otherwise stipulated by KMC's Water Supply Departments, it shall conform to IS 2692. The ferrule shall be connected with 450 mm long GI pipe of appropriate diameter & union socket, and the cost of these items shall be included in the quoted rate of the composite tender item with ferrule.

Nominal size of the ferrule shall be as approved by KMC's Water Supply Departments.

21.0 **GALVANISED IRON PIPES & FITTINGS**

a) The pipes shall be of galvanised (as per I.S :4736 of latest edition steel), screwed and socketed and shall conform to I.S. I239 (Part-I) of latest edition. The fittings shall be of malleable cast iron (galvanised) with ISI mark upto 100 mm nominal bore. For pipes above 100 mm N.B, welded steel fittings (galvanised) may be used. Unless otherwise specified thread shall be screws taper thread and sockets parallel thread and each tube shall be laid beveled sufficiently to prevent damage to the leading thread.

Nominal Bore (mm)	Weight in Pipe in kg/mtr (Screwed and Socketed)		
	Light	Medium	Heavy
15	0.96	1.23	1.46
20	1.42	1.59	1.91
25	2.03	2.46	2.99
32	2.61	3.17	3.87
40	3.29	3.65	4.47
50	4.18	5.17	6.24
65	5.92	6.63	8.02
80	6.98	8.64	10.30
l00	10.20	12.40	14.70
125	-	16.70	18.30
150	-	19.80	21.80

Tolerance : Tolerance in nominal weight shall be as follows for all sizes of pipes.

1. Single Tube (light series) : + 10%
   - 8%
2. Single tube (Medium & heavy series) : ± 10%
3. For quantities per load of 10 tonnes (minimum) light series : ± 5%
4. For quantities per load of 10 tonnes (minimum) Medium & Heavy : ± 7.5%

b) **Laying and Fixing**

Where pipes have to be cut or re-threaded, ends shall be carefully filed out so that no obstruction to bore is offered.

In jointing the pipes, the inside of the socket and the screws end of the pipes shall be rubbed over with white lead and few turns of hemp yarn wrapped round the screwed end of the pipe which shall then be screwed home to the socket with a pipe wrench. Care must be taken that all pipes and fittings are kept at all times free from dust and dirt during fixing. Any threads exposed after jointing shall be painted.

c) All cutting holes, chases, trenches etc at any place necessary in connection with the work as per items of this tender and subsequent mending damages are to be included in the rates and not paid extra unless other-wise specified.

Internal works

Internal GI pipes and fittings inside the duct walls shall be generally fixed on walls by means of standard pattern holder bat clamps keeping the pipe 20 mm clear of the wall every where or concealed where required as directed. If GI pipes and fittings of inside wall are to be concealed, it shall be by chasing floors and walls as directed. Where it is imperative to fix the pipe inside toilets, kitchen, pantries, in front of a house or any conspicuous position, where it looks unsightly, chasing to be adopted. The holder bat clamps shall be fixed at a distance not exceeding 3.00 metre apart for

vertical pipes & l.50 metres for horizontal pipes, which are to be secured to walls by hooks. The valves shall be fitted with a union. In long length run of a pipe at least in every 3.00 metres apart there shall be a long screw/union.

All pipes and fittings shall be fixed truly vertical and horizontal or as directed by the Consultants/Bank.

For pipes carrying hot water, the pipes shall be insulated. The thickness of the insulating materials shall be l2 mm in the case of glass in fibre form, compressed felt and felted slag or mineral wool and 20 mm in the case of asbestos. Cost of the same shall be included in the rate.

d) **External Work**

For external work GI pipes and fittings shall be laid in trenches. The width of the trench shall be of minimum width required for the work. The pipes laid underground shall not be less than 60 cm from the ground level. They shall be surrounded on all sides by sand of approved quality. The work of excavation and refilling shall be done in accordance with the general specification for earth work.

e) **Painting**

All internal GI pipes and fittings shall be painted with 2 coats of oil paint of approved quality manufacture, colour and shade. The cost of such paintings shall be included in the contractor's rate. All pipes and fittings in external work shall be painted with 3 coats of anti-corrosive Bitumastic paint. Unless otherwise specified all conealed pipes and fittings shall be painted with 3 coats of Bitumastic anticorrosive paint.

f) **Testing**

After installation (but before covering up where needed), all GI pipes and fittings shall be tested by hydraulic pressure machine to a pressure of 7 Kg per sq cm. All leaky joints must be made leak proof by tightening or re-doing at contractor's expense and the pipeline must be retested to the above pressure.

g) **Route markers**

Shall have to be provided (without extra cost) for underground pipelines (Pl. ref item 33).

22.0 **BRASS OR CP ON BRASS WATER FITTINGS (AS SPECIFIED IN RESPECTIVE SCHEDULE OF ITEMS)**

All fittings shall be of standard manufacture and shall in all respect comply with the Indian Standard Specifications. The brass fittings shall be fixed in pipeline in a workman like manner. Care must be taken to see that joints between fittings are made leak proof. The fittings and joints shall be tested to a pressure of 7 Kg per sq cm unless otherwise specified. The defective fittings and the joints shall be repaired, redone or replaced at the contractors expense.

22.1 **Bib Cock**

The bib cock shall be of horizontal inlet and free outlet of specified quality of screw down pattern of the size as specified. The closing device shall work by means of disc carrying a renewable non-metallic washer, which shuts against water pressure on a seating at right angles to the axis of threaded spindle, which operates it. The handle (head) shall be of approved design & shape. The cock shall open in anti-clockwise direction. The cock shall be polished bright (for brass) and crome plated on brass (for CP). Minimum weight shall be 0.40 kg for 15 mm size brass/CP bib cock.

22.2 **Stop Cock**

The stop cock shall be plain or angular type as per it's place of installation and of specified quality opening anticlockwise and of screw down pattern of the size as specified. Other specifications shall be as per the specification of Bib cock above.

23.0 **VALVES**

23.1 **Ball Valves**

Ball cock shall be of approved quality and manufactured in brass, with copper ball float or polythene ball float (as mentioned in schedule of quantities) and shall operate freely & efficiently in water.

23.2 **Gun Metal Gate, Globe and Check Valve**

These shall conform to IS 778 of latest edition and shall have ISI marking on it.

Manufacturer's test certificate specifying test pressure at their works shall be submitted.

23.3 **Sluice Valve for Water Works**

It shall conform to IS 780 of latest edition and shall bear ISI mark on it.

Manufacturer's test certificate specifying test pressure at their works shall be submitted.

24.0 **STONEWARE PIPE DRAIN**

a) **Salt Glazed stoneware pipes & fittings**

This shall conform to Indian Standard Specification No. 65l of latest edition and shall be of the size & type as indicated in the schedule. SW pipes and fittings shall be of Grade `A' or `AA' as specified in the schedule and manufacturer's test certificate and identification mark shall be submitted. The rate shall be inclusive of jointing materials and making holes/chases (if required) through masonry and concrete and making good the same, and shall be inclusive of the cost of concrete bed with side haunch and earth works etc complete.

The earthwork and concreting etc shall be done as per directions and drawings of Consultants/Bank.

Pipes shall be laid in straight lines and to even gradients as shown in the drawings or as instructed. Adequate care shall be exercised in setting out and determining the levels of the pipes and the contractor shall provide suitable instruments, templates and equipment necessary for the purpose. All pipes shall be kept free from earth, debris, superfluous mortar and other obstructions during laying and until the completion of the contract when the work shall be handed over in a clean condition.

b) **Buried Services**

All pipes, ducts, cables, mains as other services exposed by the excavations shall be effectively supported by timbering or other means. The contractor shall be responsible for any damage occurring to the buried existing services and make good the same at his own cost to the satisfaction of the Consultants/Bank.

c) **Laying and jointing stone ware pipes**

Stoneware spigot and socket pipes and fittings as specified shall be thoroughly bedded on the solid ground, throughout the length between joint holes laid to true invert, straight lines and falls, each pipe being separately bonded between sight rails. The spigot to each pipe shall be placed in the socket of the one previously laid. The pipes shall then be adjusted and fixed in its correct position but it shall not be jointed until the earth has been partly refilled over the portion of pipe between joint holes. A ring of rope yarn dipped in tar and liquid mortar or neat cement slurry shall next be inserted in the socket of the pipe previously laid and driven home with a wooden mallet. Such yarn, when in position, shall not occupy more than one fourth of the total depth of socket. The socket shall then be completely filled with stiff mixture of cement mortar (1:1) and a fillet of the same worked around the outside. The fillet shall be beveled off at an angle of forty five degrees to the barrel of the pipes. The cost of such jointing shall be included in the concerned schedule item of pipelines.

Special care shall be taken to see that any excess of cement etc. is neatly cleaned off while each joint is being made. Any earth, cement or other materials shall be thoroughly cleaned out of the pipe as the work proceeds. A properly fitting plug is to be well secured to the end of the last laid pipe, and shall only be removed when pipe laying is proceeding. The refilling of trenches shall not be done until the joints of the pipes are thoroughly set and have been inspected and approved and the finest of the excavated soil shall be used immediately under and around the pipes.

No pipes shall be laid until a distance of approx 9 metres along the trench has been prepared and bottomed to receive the pipes, unless otherwise required in special circumstances of which the Consultants shall be the final judge. No greater length of trench shall be opened at one time than the pipe laying can keep pace with, and the filling in of the trench shall be proceeded with to complete the water test.

The trench and joint holes and shall be kept free from water until the pipes are laid and the joints thoroughly set.

The contractor shall exercise every possible care to prevent the accumulation of sand, silt or any deposit during the construction of the drain and will be held responsible for any damage or expense arising from such causes or any costs or charges in connection with the removal of any such accumulation.

Unless otherwise specified by the Statutory Administrative Authority the width at bottom of trenches for different diameters of pipes laid at different depths shall be as given below.

i) For all diameters upto an average depth of 120 cm, width of trench in cm=barrel dia of pipe + 30 cms.

ii) For all diameters above 120 cm depth, width of trench in cm = barrel dia of pipe + 40 cm.

iii) Nevertheless, the total width of trench should not be less than 75 cm for depths exceeding 120 cm.

iv) In special site conditions, Consultants/Bank may instruct width more than stated above.

On completion, all drains are to be flushed from end to end with clean water and left perfectly clear.

d) **Testing**

Comprehensive tests of all appliances shall be made by simulating conditions of use. The pipes shall be subjected to a test pressure of at least 1.5 m head of water at the highest point of the section under test. The tolerance figure of 2 liters per centimeter of diameter per kilometer may be allowed during a period of ten minutes.

The test shall be carried out by suitably plugging the lower end of the drain and the ends of connections, if any & filling the system with water. A knuckle bend shall be temporarily jointed in at the top end and a sufficient length of vertical pipe joined to it so as to provide the required test head. Or the top end may be plugged with a connection to hose ending in a funnel, which could be raised or lowered till the required head is obtained and fixed suitably for observation. Subsidence of water may be due to one or more of the following causes.

i) Absorption by pipes & joints

ii) Sweating of pipes & joints

iii) Leakage at joints or from defective pipes

iv) Trapped Air.

Allowance for cause no. (i) above shall be made by adding water until absorption has ceased after which the test proper should commence. Any leakage will be visible and the defective part of the work shall be cut and made good. A slight amount of sweating which is uniform may be overlooked, but excessive sweating from particular pipe or joint shall be watched for and taken as indicating a defect to be made good.

e) Route markers shall be provided (without extra cost) for underground pipelines (pl. ref item

no. 33).

25.0 **S W YARD GULLY TRAPS**

a) **Yard Gully Trap**

This must be new, perfectly sound, free from fire cracks and other imperfections of glazing of standard nominal diameter and other dimensions. It shall be made of hard burnt stoneware of dark grey colour and thoroughly salt glazed inside and outside. Rate to include supply and installation of gully trap, gratings concrete, masonry, plaster, earth works etc as given in schedule of quantities and testing the assembly.

b) Each gully trap shall have one CI grating 30 cm x 30 cm cover with frame with machined seating faces or as specified.

c) **Excavation**

The excavation for gully traps shall be done true to dimensions and levels as indicated on plans or directed by the Consultants.

d) **Fixing**

The gully trap shall be fixed on cement concrete foundation 60 cm square and not less than 100 mm thick. The mix for the concrete will be 1:3:6 (1 cement, 3 sand and 6 stone ballast 20 mm down) or as specified. The jointing of gully outlet to the branch drain shall be done similar to jointing of SW Pipes.

e) **Masonry Chamber**

After fixing and testing the gully and branch drain a brick masonry chamber as directed/specified inside in bricks (having crushing strength of 50 kg/sq. cm) in cement mortar shall be built with 125 mm/250 mm thick all round the trap from the top of the bed concrete upto ground level. The upper portion of the chamber i.e. above the top level of the trap shall be plastered inside with cement mortar (1:4) (1 cement, 4 sand) finished with a floating coat of neat cement. The corners and bottoms of the chamber shall be rounded off so as to slope towards the grating.

f) **C I Cover/Grating**

CI cover with frame and grating, approx 30 cm x 30 cm or as specified with machined seating faces shall then be fixed on the top of the brick masonry with cement concrete 1:2:4 and rendered smooth. The finished top of cover shall be as specified in drawings and painted with two or more coats of bituminous paint.

26.0 **R C C PIPE DRAIN**

RCC pipes shall conform to Indian Standard Specification No. 458 of latest edition and shall be of the size and type as indicated in the Schedule. All pipes and fittings must be new and perfectly sound, free from cracks and be cylindrical. They shall be made of reinforced cement concrete, manufactured by centrifugal or spun process and shall have an even texture. Each pipe shall have one collar with it. The pipes shall be of 'NP2' class unless otherwise specified. The rate shall be including the cost of making hole/chase in concrete or masonry (if required) and making good the same, and shall also be inclusive of the cost of earth works & concrete works. The rate shall include jointing with materials also.

26A. **Excavation of trenches for RCC Pipes Drains**

Excavation of trenches and connected works such as road crossing, protection of existing services, lighting and watch etc shall generally be carried out in accordance with procedure described for stoneware pipes.

26B. **Concrete Support**

Bed cement concrete shall be provided unless otherwise specified for supporting pipes. These shall be provided throughout. In case the soil is made up or is very soft, other forms of concrete supports may be resorted to form the bed of the trench below the pipe, as directed by the Consultants/Bank.

26C. **Laying of RCC Pipes**

a) Laying

The pipes shall be carefully laid to level and gradients as shown in the plans and sections. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in straight lines without vertical or horizontal undulations.

b) The body of the pipe shall for its entire length rest on an even bed in the trench and at places it shall be excavated to receive the collar for the purpose of jointing.

26D. **Jointing of Pipes (cost to be included in schedule item rate for piping)**

a) **Jointing**

A few skeins of spun yarn soaked in neat cement wash shall be inserted in the groove at the end of the pipe and the two adjoining pipes butted against each other. The collar shall then be slipped over the joints covering equally both the pipes. Spun yarn soaked in neat cement wash shall be passed round the pipes and inserted in the joint by means of caulking tools from both ends of the collar. More skeins of yarn shall be added and well rammed in.

b) The object of the yarn is to centre the two ends of the pipes within the collar, and to prevent the cement mortar of the joint from penetrating into the pipes.

c) Cement mortar 1:1 (1 cement : 1 sand) shall be slightly moistened, and must on no account be soft or sloppy and shall be carefully inserted by hand into the joint. The mortar shall then be caulked into the joint and more cement mortar added until the space of the joint has been filled completely with tightly caulked mortar. The joint shall be finished off neatly outside the collar on both sides at an angle of 45 Degree.

d) Any surplus mortar projecting inside the joint shall be removed and to guard against any such projections, sack or gunny bags shall be drawn past each joint after completion.

e) **Curing**

The cement mortar joints shall be cured at least for seven days.

26E. **Testing**

Same as mentioned in item no. 24 (d).

26F. **Route Markers**

Shall be provided (without extra cost) for underground pipes (pl. ref. item 33).

27.0 **MANHOLES, GULLY CHAMBERS ETC**

a) **Size of Manhole**

The size specified shall be the internal size of the manhole. The work shall be done strictly as per drawing and specification. The following specifications shall be adopted.

b) **Excavation**

The manhole shall be excavated true to dimensions and levels shown on the plan or as directed by the Consultants/Bank.

c) **Brick Work**

The brick works shall be with bricks having crushing strength 50 kg/sq. cm brick in cement mortar 1:6 as specified. It shall be 250 mm thick or as instructed by the Consultants/Bank. Brick work in arches shall be with above quality brick in cement mortar 1:3. The joints shall be made thoroughly leak proof.

d) All angles shall be rounded to 7.5 cm radius and all rendered internal surfaces should have hard impervious finish obtained by using a steel trowel. The external trowel joints of the masonry shall be finished smooth.

e) In wet ground cement plaster shall be done on the outside surface of the walls also. This plaster shall be water proofed with addition of 1 kilogram of Accoproof to 50 kilograms (or I bag) of cement or with addition to any other equal and approved waterproofing compound. The plastering shall be done upto 30 cm above the wet soil line.

f) **Channel and Benching**

Channels shall be semi-circular in the bottom half and of diameter equal to the sewer. Above the horizontal axis of the pipes, the sides shall be extended vertically to the level of the crown of the outgoing pipe and the top edge shall be suitably rounded off. The branch channels shall also be similarly constructed with respect to the benching but at their junction with the main channel on appropriate angle suitably rounded off in the direction of flow in the main channel.

The channel and benching shall be done in cement concrete (1:2:4) rising at a slope of 1 in 6 from the edges of channel. The channels at the bottom of the chamber shall be plastered with cement mortar 1:6 (1 cement : 6 coarse sand) and steel trowelled smooth.

g) **RCC Work**

RCC work for slabs etc. shall be in Cement concrete 1:2:4 with steel reinforcement as per detail drawings.

h) **Plain Concrete**

If used for fixing manhole covers, shall be of the above specifications.

i) **Foot Rests**

These shall be of MS square rods 22 mm or as specified and shall be galvanised or painted with coal tar.

These shall be embedded in cement concrete (1:2:4) at least (9") 23 cm, while the brick work is in progress. These shall be fixed 30 cm apart vertically and staggard laterally and shall not

project more than 11 cm from the wall.

Note: This work shall not be taken up without prior directions of Bank/Consultants.

j) **Manhole Covers and Frames**

All covers shall be of heavy type. These shall be non-locking or locking type as specified and capable of easy opening and closing. These shall ordinarily be gas and water tight. These shall be double water seal type manhole cover and frame. The covers including frames shall be of cast iron and conform to weight as specified in Schedule of Quantities. CI surface box for air valves sluice valves, peet valve etc shall be of sufficient dimensions to suit the sizes of these fittings and shall be of heavy pattern when fitted in level to heavy traffic and shall be of standard design or as directed by the Consultants/Bank.

k) The frame of manhole cover shall be embedded firmly in the RCC slab or plain concrete as the case may be on the top of the masonry.

l) When the manhole is built on the footpath, this shall be provided with 45 cm internal diameter or as specified heavy type CI cover, of 56 cm internal dia as specified. When it is built within the metalled width of the road under traffic, it shall be provided with approx 22" (560 mm) internal diameter heavy type CI cover.

m) **Painting**

All CI/MS fittings like Manhole covers and frames, gratings, footrests etc. shall be painted with two or more coats of bitumastic paint & it's rate shall be included in the rate of the Manholes, Gully chambers etc.

28.0 **TYPES OF MANHOLES**

28.1 **Manhole upto 0.75 Metre Depth**

This shall be 0.6 M x 0.6 M size (internal dimension) unless otherwise shown in drawings/or instructed per site conditions.

a) Thickness of brick wall - 250 mm

b) Cement brick work - (1:6) as specified.

c) Plaster

Plaster on inside surface of walls, bottom & part of outside surface of walls and on RCC cover slabs shall be done as per drawings and directions.

d) Bed concrete (1:4:8) - 150 mm thick with 20 mm down jhama khoa.

e) Brick flat soling - 75 mm thick.

28.2 **Depth of Manhole above 0.75 M up to 1.5 M**

This shall be of 0.8 M x 0.8 M (internal) size unless otherwise shown in drawings or instructed as per site conditions.

Details same as that in item no. 28.1 above.

28.3 **Depth of Manhole above 1.5 M**

This shall be of l.2 M x 0.9 M (internal) size or as specified.

a) Thickness of brick wall

i) 250 mm upto l.5 M from finished G.L.

ii) 375 mm below l.5 M from finished G.L.

Cement brick work plastering and Brick Flat Soling same as in item 28.1 above.

Thickness of bed concrete (1:4:8) - 225 mm with 20 mm down jhama khoa.

28.4 The payment shall be made for complete unit of Inspection Pit as per schedule of quantities. However, if any other size of inspection pit is instructed to be done as per site conditions, the difference would be adjusted as per the concerned civil item rates concerned.

29.0 **PRIOR APPROVAL OF SAMPLE MATERIALS/WORKS**

Samples of all materials and works shall be approved by the Consultants/Bank before the contractor undertakes any major procurement of materials or proceeds with the works concerned. The quantum of materials/works for approval of sample shall be decided by the Consultants/Bank & no extra payment shall be made to the contractor for sample material procurement/or works & replacement of materials altering or redoing of works as required & instructed by the Consultants/Bank.

The typical approved sample material for each work shall be kept in the office of the Bank/Consultants at site until the satisfactory completion of the works. The materials supplied & installed at site shall be of the same quality & size as of the approved sample, otherwise they shall be rejected.

The decision of the Bank/Consultants or their authorized representatives on whether a material compares well with the approved sample shall be final & binding on contractor. The same principle shall be applicable to sample work approved and further works done at site.

30.0 **CLEANING & DISINFECTION OF THE WATER SUPPLY SYSTEM, WATER STORAGE TANKS AND DOWN TAKE DISTRIBUTION PIPES**

All water mains, communication pipes, service and distribution pipes used for water for domestic purposes should be thoroughly and efficiently disinfected before being taken into use and also after every major repair. The method of disinfection shall be subject to the approval of the Bank/Consultants.

The water storage tanks (underground & overhead) & pipes shall first be filled with water & thoroughly flushed out. The storage tanks shall then be filled with water again and disinfecting chemical containing chlorine added gradually while the tanks are being filled, to ensure thorough mixing. Sufficient chemical shall be used to give water a dose of 50 parts of chlorine to one million parts of water. If ordinary bleaching powder is used, the proportions will be 150 gms of powder to 1000 ltrs of water. The powder shall be mixed with water to a creamy consistency before being added to the water in the storage tank. If a proprietary brand of chemical is used, the proportions shall be as specified by the makers. When the storage tank is full, the supply shall be stopped, and all the taps on the distribution pipes opened successively, working progressively away from the storage tank. Each tap shall be closed when the water discharge begins to smell of chlorine. The storage tank shall then be topped up with water from the supply pipe and with more disinfecting chemical in the recommended proportions. The storage tank & pipes shall then remain charged at least for three hours. Finally, the tank and pipes shall be thoroughly flushed out before any water is

used for domestic purposes.

31.0 **SEPTIC TANKS, SOAK WELL & CHLORINATION CHAMBER**

NOT APPLICABLE FOR THIS TENDER.

32.0 **METHOD OF MEASUREMENTS**

32.1 **General**

a) Unless otherwise stated in the schedule of quantities for the concerned items, the method of measurement as given here in Technical Specifications shall be followed.

b) Measurement shall be taken of the installed lengths for pipe lines& no extra payment for cuttings or wastages etc shall be allowed.

c) Lengths shall be measured in Running Metres to the nearest 0.0l metre& fittings shall be enumerated.

d) All pipes, fittings shall be classified according to their nominal diameter, quality & method of jointing.

32.2 **Water Supply (GI) pipes & fittings**

These works shall be measured by the following method :

a) The item rates for piping, as given in the schedule of quantities, provides for supply, fitting and fixing all clubbed together.

i) The pipe lines shall be measured in running metres along the centre line of exposed faces of pipe lines, including all joints& standard fittings like bends, elbows, tees, unions, reducers, sockets etc. No extra payments shall be made for such standard GI fittings & route markers for underground portion of the pipelines (pl. ref. item 33).

ii) However, special fittings like ferrules, valves, stop cocks, bib cocks, or other CP/Brass fittings, shall be paid for separately under other tender items. The lengths of such special fittings shall not be included while measuring the pipe line length.

32.3 **HCI Soil, Waste & Anti-Syphonage& Fittings**

These works shall be measured by the following method :

a) The item rates for piping, as given in the schedule of quantities, are separately specified for supply, fitting & fixing of pipes and for supply, fitting & fixing of HCI specials (fittings).

i) The pipes shall be measured in running metres along the centre line of the pipe faces in straight lengths in fitted condition but excluding the length of joints. Short pieces of pipes of any length shall not be considered as specials and will be paid as pipe length.

ii) The specials (fittings) like traps, bends, tees, branches, inspection/access doors, handhole pieces, cowls, extension pieces, WC connectors etc shall be enumerated and paid for separately. Short pieces will not be considered as specials.

32.4 **Underground Sewerage & Drainage Pipe Line (Glazed Stone Ware Piping)**

The piping shall be measured in running metres including joints, along the centre line of pipe faces in fitted condition.

The length shall be measured between the inside faces of walls of the inspection pits at both ends of that stretch of piping.

The item rates for the piping shall also be inclusive of the costs of the following works.

a) Jointing arrangement with all materials and labours.

b) Thorough cleaning of the entire pipe line after laying & before commissioning as directed by Consultants/Bank.

c) Concrete bed, earth works etc as per schedule of quantities and drawings.

d) Route markers as specified in item no. 33.

33.0 Whether or not specifically mentioned elsewhere in the Technical Specifications or schedule of items, the rate of all underground pipeline works shall include the cost of route markers as follows :

Route marker with cement concrete 1:2:4 (1 cement and 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) of size 60 cm x 60 cm at bottoms and 50 cm x 50 cm at the top with a thickness of 10 cm including inscription duly engraved as required (spacing approx 15 mtrs or as directed at site). No extra payment will be made on this account.

LIST OF MATERIALS OF APPROVED BRAND AND/OR MANUFACTURER

CIVIL WORK

Sl.No.	Description		Approved Brand/Manufacturer
1.	Ordinary Portland/Blast Furnace Slag Cement of 53 grade	:	Lafarge. Ultratech, ACC & Birla White (for white cement)
2.	Steel	:	TATA, SAIL, RINL make
3.	Vitrified Tiles	:	Naveen, Johnson, NITCO, Kajaria make
4.	Ceramic Tiles : Floor & Dado	:	Kajaria, NITCO, Naveen make
5.	Marble : White Variety	:	Abu white
	Colour Variety	:	Udaipur, Baslana
6.	Floor Hardening Compound	:	Kironite, Ironite, Feronite, Floronite.
7.	Flush Door Shutters	:	Green/Century/ Kitply/ Nagaland make
	(Water Proof& Termite Proof)		
8.	Plywood for Panel Doors	:	Green/Century, Kitply make
9.	Fire Door	:	Shakti, Godrej
10.	Waterproofing Compound	:	M/s. Structural Water Proofing Co Pvt Ltd, M/s. Sika India Pvt Ltd, M/s. Pidilite Industries Ltd.
11.	Steel Windows	:	Approved manufacturer with ISI mark.
12.	Rolling Shutter	:	Approved manufacturer with ISI mark.
13.	Collapsible Gate	:	Approved manufacturer
14.	Aluminium Doors, Windows, Curtain Wall, Structural Glazing	:	Indalco, Hindal, Jindal
15.	Synthetic Enamel Paints, Distemper, Plastic Emulsion Paints	:	ICI, Asian Paints Ltd., Berzer make
16.	Kiln Seasoned& Chemically Treated Timber and Factory made panel door shutter	:	Approved manufacturer
17.	Glazing	:	M/s. Modiguard, M/s. Hindustan Pilkington

			M/s. Saint Gobain Glass
18.	Door Closer		Dorma, Godrej, Hafele
19.	Water proofing treatment to roof	:	Approved manufacturer
20.	Waterproofing treatment to sunken floor	:	M/s. Pidlite Industries M/s. Sika India Pvt Ltd
21.	Waterproof Adhesive for tile fixing	:	M/s. Pidilite Industries Tile Fixing Ltd - Fevimate XL. M/s. Laticrete India Pvt Ltd – Laticrete 307
22.	Cement based paint	:	Super Snowcem, Durocem
23.	Exterior grade acrylic emulsion paint	:	ICI, Asian Paints Ltd, Berzer

Note : 1. If the approved brands mentioned above are not available, equivalent make as may be approved by the Employer/Consultants only to be used for the work.

2. The Consultants/Employer shall have the final say about which material amongst the over mentioned shall be used in the project and the contractor shall have no claim on this account.

SANITARY AND PLUMBING WORKS
LIST OF APPROVED BRAND/MANUFACTURERS FORMATERIALS OF THIS SCHEDULE OF ITEMS

Sl.No.	Materials	Specification/Manufacturer
1.	Sanitary Wares (Porcelain)	1st Class approved quality of Hindustan Sanitary Ware Industries or EID-Parryware Hindware Brand of approved design.
2.	EPWC seat with lid and CP hinges	ISI marked products of EMCO, Commander Brand.
3.	Sink	
	a) Stainless Steel	Nirali/Metalcraft Brand/Hindware
4.	Mirror	
	a) Plate Mirror	Saint Gobain, Modi Guard/ Hindustan Pilkington or as approved make.
	b) Piece Mirror	Twin Bird/Atul or Golden Fish Brand of approved quality.
6.	C P stop cock/bib cock/pillar cock/towel rail/towel rack/mixer/curtain rail, robe hook/bottle trap etc all types of CP fittings	Jaquar Ess-Ess Hind-ware

7.	Valves (Gun Metal)	Audco, Leader, Zoloto having ISI mark of approved brand.
8.	C I Valves	Kirloskar make with ISI marking on them.
9.	HCI pipe and fittings	ISI marked good finished conforming to IS 3989/1984 of approved quality and Brand.
10.	a) G. I. Pipes (Medium Quality/Heavy Quality)	TATA make with ISI marked.
	b) G I Fittings	Unik, HB, Zoloto M or other approved brand and quality having ISI marked.
11.	S W Pipes and Fittings `AA" Grade	HIND's Products/Perfect Brand/Orind Brand/ As approved
12.	Paint	ICI/Asian Paints/
13.	Pump	B E Pumps/Kirloskar.
14.	Motor	Crompton/GEC/Kirloskar
15.	C I Manhole Cover and Frame, CI Grating etc	Good finished with approved brand and quality with three coats of black anticorrosive paint. (As per approved sample).
16.	Electrical Wire/Accessories for Pump Set	Best Quality of approved Brand.
17.	C P Flush Valve	`JAQUAR' or Equivalent as approved.
18.	Pressure Gauge	`H'-GURU, Fiebig, Dwyer Brand.

Note : 1. If the approved brands mentioned above are not available, equivalent make as may be approved by the Employer/Consultants only to be used for the work.

2. The Consultants/Employer shall have the final say about which material amongst the over mentioned shall be used in the project and the contractor shall have no claim on this account.

Annexure II

To

e-Procurement Technologies Ltd. (ProcureTiger)

A-201- 208, Wall Street-II, Opp. Orient Club,

Nr. Gujarat College, Ahmedabad-380 006,

Gujarat, India.

Tel: +91 79-68136800/43/89/7859800617/ 7859800624

Sub:e-Tendering for……

vide NIT No…….. dated……

Ref : 1**. e-tendering dated……**

Dear Sir,

We confirm that we have quoted.

1. Rs…….. as our final lump sum prices during the e-tendering process conducted today for the above work.

Thanking you and looking forward to the valuable order from SBI.

Yours sincerely,

For _____

Name:

Company:

Date:

Seal:

BILL OF QUANTITIES (BOQ)

(SEE ANNEXURE-III IN SEPARATE ATTACHMENT FILE)