NIT NO	AOCYB/40/2024-25
DATE	23.07.2024

PROPOSED CIVIL WORKS FOR STATE BANK OF INDIA,

OF SBI GROUND AND FIRST FLOOR AO CYBERABAD, UNDER AO CYBERABAD

.

TENDER SCHEDULE

THROUGH E-TENDERING PROCESS

Chief Manager (Admin& HR),

SBI AO Cyberabad, 1st Floor,

SBI LDAC/ CPD Building, Gachibowli,

Hyderabad, Telangana – 500084,

Ph. 040 23466478.

NOTICE INVITING TENDER (NIT)

AO CYBERABAD, Hyderabad invites online tenders for the following work :

1.	Name of the Work	Civil works for GROUND AND FIRST FLOOR AO CYBERABAD, GACHIBOWLI, , AO CYBERABAD
2.	Estimated cost of work	₹36,30,145/- plus GST as applicable
3.	Quantum of Earnest Money Deposit (EMD)	₹37000- DD Drawn In Favor " **The Chief Manager, SBI" payable at Hyderabad**., Hyderabad", Payable at Hyderabad. EMD will be exempted under submission of valid MSE certificate in the respective category. Those who have submitted one time EMD need not submit EMD.
4.	Time for Completion of work	30 Days from the date of PO or handover of the site whichever is earlier.
5.	Eligibility of the contractor	Empanelled Interior contractors under the respective category
6.	Date and Time where tender forms are available	From 23.07.2024 to 31.07.2024
7.	download from the websites:links	https://etender.sbi
8.	Last date and time of submission of online Tender	31.07.2024 upto 15.00 hours
9.	Date, Time of opening of e-Tenders(Technical bid	31.07.2024upto 15.10 hours
10.	Place of submission of EMD/MSE certificate, opening of tender, contact person /telephone no/email address.	**Office of Chief Manager (Admin& HR),** **SBI AO Cyberabad, 1st Floor,** **SBI LDAC/ CPD Building, Gachibowli,** **Hyderabad, Telangana - 500084.** **Ph. 040 23466478.**
11.	Quantum of Security Deposit (percentage)	1. Initial Security Deposit (ISD) – 2% of the Tender value including EMD 2. Retention Money- 5% from each running bill subject to maximum of 5% of the contract value including EMD & ISD
12.	Terms of payment of Bills, if any (specify the	Only Final Bill

	minimum value of work for payment of running account bills)	
13.	Initial Security Deposit (ISD)	2% of the Contract value
14.	Defects Liability Period	12 Months from the date of completion or commissioning and handover of the work.
15.	Liquidated Damages for delay in work	If the work is delayed beyond the scheduled completion date, then 0.50% of the total value of the contract per week (or part thereof) of delay will be deducted from the final bill value subject to max 5%of the value of work
16.	Validity of tender	90 days.
17.	Eligible Taxes	A)Income Tax will be deducted at source as per Govt. Guidelines. B) Reimbursement of GST will be made only on submission of proper GST invoice as per applicable GST provision. The contractor should comply with the following; 1. Contractor should have GST Registration Number 2. Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provision 3. In case of Correction in the bills after scrutiny, contractor should submit fresh bills for payment 4. 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 5. The GST Number of State Bank of India are For Telangana State -36AAACS8577K1ZQ
18.	Electronic Payment	Payment shall be made by way of Electronic fund transfer and the bill will be paid by the Branch. Firm should furnish details of the bank, a/c no, IFSC code
19.	Any additional Information	The quoted rate should be inclusive of materials, labour, wages, fixtures, transportation, installation, all taxes (excluding GST), wastages, Octroi, machinery, temporary works such as scaffolding, cleaning,

		overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work
20.	For any queries or support in connection with the online tendering process, please contact our E-procurement solutions agency	e-Procurement technologies Limited, Ahmedabad. Primary Contact Numbers :- +91-9081000427, 9904407997 Mr. Anshul Juneja, Ph: 09879996111, anshul@auctiontiger.net 1.Anshul Juneja:- 079-68136840, anshul.juneja@eptl.in 2. Kanchan Kumari:- 079-68136820, kanchan.k@eptl.in 3. Jaymeet Rathod:- 079-68136829, jaymeet.rathod@eptl.in 4. Salina Motani:- 079-68136843, salina.motani@eptl.in 5. Vinayak Khambe:-079-68136835, vinayak.k@eptl.in 6. Imtiyaz Tajani :- 079-68136831, imtiyaz@eptl.in 7. Hemangi Patel:- 079-68136852, hemangi@eptl.in 8. Nadeem Mansuri:-079-68136853, nadeem@eptl.in
In case the date of opening of tenders is declared as a holiday, the tenders will be opened on the next working day at the same time.		
SBI reserves the right to accept or reject any or all bids without assigning any reasons thereof, even after opening of the bids.		
If the final L1 bid is below 7.5% of the estimated cost then the L-1 contractor has to submit Additional Security Deposit (ASD)/Additional Performance Guarantee (APG). The amount of such ASD / APG shall be the difference between 92.5% of estimated cost put to tender and the quoted price. Bank Guarantee or FDR receipt favoring, Chief Manager (Admin & HR), SBI, but drawn on any other Nationalized Bank may also be accepted as ASD / APG.		

The Chief Manager (Admin & HR)

State Bank of India

INSTRUCTIONS TO THE TENDERERS

1. Scope of Work:

Online Sealed Tenders are invited by AO CYBERABAD for and the work as specified in the tender

1.1 Site and Its Location

The proposed work is to be carried out atas specified in the NIT

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 workmanlike manner,

1. Instructions to tenderers
2. General Conditions of Contract
3. Special Conditions of Contract
4. Additional Conditions for Electrical Installation
5. Technical Specifications
6. Drawings
7. Price Bid

2.1 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. Technical Specifications
c. Additional Conditions for Electrical Installation
d. Special Conditions of Contract
e. General Conditions of Contract
f. Instructions to Tenderers

2.2 Complete set of Bid documents can be downloaded from the Bank's website http://www.sbi.co.in under "SBI in the News" link "procurement news" and also at our e-procurement agency's portal https://etender.sbi during the period mentioned in the NIT.

2.3 The tender documents are not transferable.

3 Site Visit

3.1 The tenderer must obtain himself on his own responsibility and his own expenses all information and data which may be required for the purpose of filling this tender document and enter into a contract for the satisfactory performance of the work. The Tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character quality and quantity of the

materials, labour, the law and order situation, climatic conditions local authorities requirement, traffic regulations etc;

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

4 Earnest Money

4.1 The tenderers are requested to submit the Earnest Money as specified in the NIT in the form of Demand Draft or Banker's Cheque in favour of as mentioned in the NIT drawn on any Bank in India. EMD will be exempted subject to submission of valid MSE certificate under respective category.

4.2 EMD in any other form other than as specified above will not be accepted. Tender not accompanied by the EMD in accordance with clause 4.1 above shall be rejected.

4.3 No interest will be paid on the EMD.

4.4 EMD of unsuccessful tenderers will be refunded within 30 days of award of Contract.

4.5 EMD of successful tenderer will be retained as a part of security deposit.

5 Initial Security Deposit

The successful tenderer will have to submit a sum equivalent to 2% of contract value less EMD by means of D/D as mentioned in the NIT within a period of 15 days of acceptance of tender.

6 Security Deposit

6.1 Total security deposit shall be **5%** of contract valueor as per GO issued by central government at that time i.e settlement of final bill. Out of this 2% of contract value is in the form of initial security deposit which includes the EMD. Balance 3% shall be deducted from the running account bill of the work at the rate of 10% of the respective running account bill i.e. deduction from each running bill account will be 3% till total 3% of contract value is reached. 50% of the total security shall be paid to the contractors on the basis of architect's certifying the virtual completion. The balance 50% would be paid to the contractors after the defects liability period as specified in the contract.

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

7 Signing of Contract Documents

The successful tenderer shall be bound to implement the contract by signing an agreement and conditions of contract attached herewith within 15 days from the receipt of intimation of acceptance of his tender by the Bank. However, the written acceptance of the tender by the Bank will constitute a binding agreement between the Bank and successful tenderer whether such formal agreement is subsequently entered into or not.

8 Completion Period: As stipulated in the NIT

9 Validity of Tender

Tenders shall remain valid and open for acceptance for a period of 3 (Three) months from the date of opening price bid. If the tenderer withdraws his/her offer during the validity period or makes modifications in his/her original offer which are not acceptance to the Bank without prejudice to any other right or remedy the Bank shall be at liberty to forfeit the EMD.

10 Liquidated Damages

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

11 Rates and Prices

11.1 In case of item rate tender

11.2 <u>APPLICABLE ONLY FOR OFFLINE TENDER:</u>

a. The tenderers shall quote their rates for individual items both in words and figures in case of discrepancy between the rates quoted in words and figures the unit rate quoted in words will prevail.
b. The amount of each item shall be calculated and the requisite total is given. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected.
c. The tenderers should not change the units as specified in the tender. If any unit is changed the tenders would be evaluated as per the original unit and the contractor would be paid accordingly.
d. The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he should immediately bring to the knowledge of the Architect/ Bank.
e. Each page of the BOQ shall be signed by the authorized person and cutting or overwriting shall be duly attested by him.
f. Each page shall be totaled and the grand total shall be given.

11.3 **<u>APPLICABLE BOTH ONLINE/ OFF LINE TENDERS</u>**

a. The rate quoted shall be firm and shall include all costs, allowances, taxes, , levies, etc except GST. Applicable GST will be reimbursed by the Bank on the executed vale..
b. If no rate is quoted for a particular item the contractor shall not be paid for that item when it is executed.

12. CLARIFICATION /AMENDMENTS AND CORRIGENDUM:

12.1 Bidder requiring any clarification of the bidding document may notify us in writing at the address/by e-mail given in the NIT within the date/time mentioned.

12.2. The clarifications to the queries received or amendments in the tender will be posted on the Bank's website and e-tender portal as a corrigendum/Addendum. No individual communication will be conveyed to the Bidders. The interested parties/Bidders are advised to check the above website regularly till the date of submission of Bid document and ensure that clarifications / amendments issued, if any, have been taken into consideration before submitting the Bid. Such amendments/clarifications, if any, issued by the Bank will be binding on the participating Bidders. Bank will not take any responsibility for any such omissions by the Bidder. Bank, at its own discretion, may extend the deadline for submission of Bids in order to allow prospective Bidders a reasonable time to prepare the Bid, for taking the amendment into account.

12.3. Bank/ SBI reserves the right to amend, rescind or reissue the tender, at any time prior to the deadline for submission of Bids.

12.4. No request for change in commercial/legal terms and conditions, other than what has been mentioned in the tender or any addenda/corrigenda or clarifications issued in connection thereto, will be entertained and queries in this regard, therefore will not be entertained.

12.5. Queries received after the scheduled date and time will not be responded/acted upon.

13. Bank's RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

Bank/ SBI reserves the right to accept or reject any Bid in part or in full or to cancel the Bidding process and reject all Bids at any time prior to award of the contract, without incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Bank's action.

21.4 The acceptance of a tender rests with the Competent Authority, who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all of the tenders received, without assigning any reasons. All tenders in which any of the prescribed conditions are not fulfilled, or are incomplete in any respect are liable to be rejected.

21.5 The notification of award will constitute the formation of the Contract. The selected Bidder should convey acceptance of the award of contract by returning duly signed and stamped duplicate copy of the PO within 15 days of receipt of the communication and to enter into an agreement with the Bank.

GENERAL CONDITIONS OF CONTRACT

a. 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 Architects/Bank and all these documents taken together shall be deemed to form one contract and shall be complementary to one another.

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

1.1.1 'SBI' shall mean State Bank of India (client) a body Corporate created under State Bank of India Act 1955, having its Corporate Centre at State Bank Bhavan, Madame Cama Road, Mumbai 400 021 and a AO CYBERABAD, , Hyderabad and includes the client's representatives, successors and assigns.

1.1.2 'Site Engineer' shall mean an Engineer appointed by the Bank as their representative to give instructions to the contractors.

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

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

1.1.4 'Engineer' shall mean the representative of the Architect/consultant.

1.1.5 '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 thereto or deductions there from as may be made under the provision herein after contained.

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

1.1.7 "Week" means seven consecutive days.

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

CLAUSE

1. **Total Security Deposit**

Total Security deposit comprise of:

a. Earnest Money Deposit

b. Initial Security Deposit

c. Retention Money

(a) Earnest Money Deposit(EMD) :

- The tenderer shall furnish EMD as specified in the NIT in the form of Demand draft or Bankers cheque drawn in favour of as specified in the NIT, on any Scheduled Bank. EMD is exempted subject to submission of valid MSE certificate in respective category.
- No tender shall be considered unless the EMD is so deposited in the required form.
- No interest shall be paid on this EMD.
- The EMD of the unsuccessful tenderer shall be refunded soon after the decision to award the contract is taken without interest.
- The EMD shall stand absolutely forfeited

i. 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

ii. after it is accepted by the SBI the contractor falls to enter into a formal agreement

or

iii. fails to pay the initial security deposit as stipulated

or

iv. fails to commence the work within the stipulated time.

Note: If the tendering process is delayed for any reason, the Bank will insist on the revalidation of the DD and the bidder has to get it revalidated and submit again.

(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) is to be submitted in the form of *DD* drawn on any scheduled Bank and shall be deposited within 15 days from the date of letter 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 3% 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 NA

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

9.0 Materials, Appliances and Employees

Unless or otherwise specified the contractor shall provide and pay for all materials, labour, water, power, tools, equipment transportation and any other facilities that are required for the satisfactory execution and completion of the work. Unless or otherwise specified all materials shall be new and both workmanship and materials shall be best quality. The contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him. Workman whose work or 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 licenses required for the execution of the work shall be obtained by the contractor at his own expenses.

The contractor shall give notices and comply with the regulations, laws, and ordinances rules, applicable to the contractor. 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 architect/consultant before proceeding with the work. If at any time any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout had been approved by the architect/consultant 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 due to his fault or negligence except which are due to causes beyond his control.

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

13.0 Inspection of Work

The SBI/Architect/Consultant or their representatives shall at all reasonable time have free access to the work site and/or to the workshop, factories or other places where materials are lying or from where they are obtained and the contractor shall give every facility to the SBI, Architect/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/execution 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 SBI through the architect and no undertaken 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

1. All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with Architect/Consultant instructions and shall be subject from time to time to such tests as the architect/consultant may direct at the place of manufacture or fabrication or on the site or an approved testing laboratory. The contractor shall provide such assistance, instruments, machinery, labour and materials

2. **Samples**

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

requirement of tender specification. 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 signed 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/equipments etc shall be to the account of the contractor.

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

(iv) Cost of test not provided for If any test is ordered by the Architect/ Consultant which is either :
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 fulfillment 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 Architect/consultant may consider necessary until the expiry of the defects liability period, stated hereto.

18.0 Quantities

i. The bill of quantities (BOO) unless or otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurements

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.

f 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 labour sheds/camps and constructions and other items and

things whatsoever brought upon or erected at the site or any land allotted to the contractor by the SBI and not incorporated in the permanent works.

c. Remove all rubbish, debris etc from the site and the land allotted to the contractor by the SBI and shall clear, level and dress, compact the site as required by the SBI.
d. Shall put the SBI in undisputed custody and possession of the site and all land allotted by the SBI.
e. Shall hand over the work in a peaceful manner to the SBI.
f. AII defects/imperfections have been attended and rectified as pointed out by the SBI to the full satisfaction of SBI.

Upon the satisfactory fulfillment 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 only allow but also extend reasonable facilities for the execution of such work. The contractor however shall not be required to provide any plant or material for the execution of such work except by special arrangement with the SBI. Such work shall be carried out in such manners not to impede the progress of the works included in the contract.

25.0 Insurance of Works

25.1 Without limiting his obligations and responsibilities under the contract the contractor shall insure in the joint names of the 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. lnjuries or damages to persons or properties which are unavoidable result of the execution or maintenance of the works in accordance with the contract.

d. lnjuries 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 SBI

The contractor shall indemnify the SBI against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the 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 Architec/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.

25.7.4 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 as specified in the NIT calendar months from the date of commencement. If required in the contract or as directed by the Architect/Consultant, the contractor shall complete certain portions of work before completion of the entire work. However the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

28.0 Extension of Time

If, in the opinion of the Architec/Consultant, the work be delayed for reasons beyond the control of the contractor, the Architec/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 Architec/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 9 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 by the contractor and the mode, manner and speed of execution and maintenance of the works are to be of a kind and conducted in a manner to the satisfaction of the Architec/Consultant. Should the rate of progress of the work or any part thereof be at any time be in the opinion of the Architec/ Consultant too slow to ensure the completion of the whole of the work by the prescribed time or extended time for completion the Architect/Consultant shall thereupon take such steps as considered necessary by the Architec/Consultant to expedite progress so as to complete the woks by the prescribed time or extended time. Such communications from the Architect/Consultant neither shall relieve the contractor from fulfilling obligations under the contract nor he shall be entitled to raise any claims arising out of such directions.

30.0 Work during nights and holidays

Subject to any provision to the contrary contained in the contract no permanent work shall save as herein provided be carried on during the night or on holidays

without the permission in writing of the Architect/Consultant, save when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the work in which case the contractor shall immediately advise the Architect/Consultant. However the provision 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 and continued with the prior approval of the Architect/consultant 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 require the whole or any part of the 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 bona fide 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 consideration and deduction for claims on account of any deterioration or damage while in the custody of the contractor and in this respect the decision of Architect/Consultant shall be final.

32.0 Suspension of work

i. The contractor shall, on receipt of the order in writing of the Architect/Consultant (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as Architect/ Consultant may consider necessary so as not 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 Owner's Right to Terminate the Contract

If the contractor being an individual or a firm commit any 'Act of Insolvency' or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of 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.

35.0 Certificate of Payment

The contractor shall be entitled under the certificates to be issued by the Architect/ Consultant to the contractor within 10 working days from the date of certificate to 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 amount specified in the NITand 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. lf 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 theAssistant 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. lf 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.

v. 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.

37.0 NA

38.0 POWER & WATER

38.1 Power Supply

The contractor shall make his own arrangements for power and supply/distribution system for driving plant or machinery for the work and for lighting purpose at his own cost. The cost of running and maintenance of the plants are to be included in his tender prices. He shall pay all fees and charges required 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.

38.2 water supply

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

i. That the water used by the Contractor shall be fit for construction purpose to the satisfaction of the Architect/Consultant.

ii. The Contractor shall make alternative arrangements for the supply of water if the arrangements made by the Contractor for procurement of water in the opinion of the Architect/Consultant is unsatisfactory.

The Contractor shall construct temporary well/tube well in SBI land for taking water for construction purposes only after obtaining permission in writing from the SBI. The contractor has to make his own 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 the local authorities, if required.at his own cost. He shall restore the ground to its original condition after

wells are dismantled on completion of work or hand over the well to the SBI without any compensation as directed by the Architect/Consultant.

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 format 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/Government 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

Clause 42.0

PRICE VARIATION ADJUSTMENT (PVA) FOR ALL MATERIALS = NOT APPLICABLE

43.0 Force Majeure

43.1 Neither contractor not SBI 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. CONTRACTOR'S EMPLOYEES

45.1 The Contractor shall employ technically qualified / having appropriate skill and competent personsfully trained and adequately experienced Electricians, who are medically fit. They should be free from any contagious diseases. The Electricians shall be well mannered and properly dressed with shoes etc.

45.2 The contractor shall provide necessary training on safety measures while executing the work wherever necessary so as to avoid accident. The Bank shall not be responsible for any accident occurred or damage incurred or claims arising there from during the execution of work. The contractor shall also provide all risk insurance policy including third party insurance as may be necessary to cover the risk.

45.3 The contractor / firm shall be held responsible for any misdeeds / misbehaviour of their employees within the premises. Bank is not responsible for any damages or claims on account of the misbehavior / misdeeds of his employees. For this purpose, any person supplied by the contractor to be engaged on the work on regular basis or as an alternate arrangement, under the direct order or control of the Employer or his representative shall be deemed to be a person employed by the contractor.

45.4 The contractor shall on the request of the Employer immediately dismiss from works any person employed thereon by him, who in the opinion of the Employer

be unsuitable or incompetent or who may misconduct. Such discharges shall not be the basis of any claim for compensation or damages against the Employer or any of their officer or employee.

45.5 No employee of the Bank is allowed to work as a contractor for a period of 2 years of his/her retirement from Bank Services without previous permission of the Bank. This contract is liable to be cancelled, if either the contractor or any of his employees is any time to be such a person who had not obtained the permission of Bank as aforesaid before submission of the tender or engagement in the contractor's service.

45.6 Contractor should not engage child labour in any of the activities in this contract.

45.7 The contractor shall not employ person who is not an Indian National.

45.8 The Electrician shall not over stay in the Bank premises other than the time permitted by the Bank or in the odd hours or holidays unless or otherwise required by the Branch for specific reasons like maintenance, repair works etc.

45.9 In respect of all labour employed directly or indirectly on the work for the performance of the contractor's part of work, the contractor at his own expense, will arrange for the safety provisions as per the statutory provisions, B.I.S recommendations, factory act, workman's compensation act, CPWD code and instructions issued from time to time.

45.10 The Contractor's workmen will not have any right whatsoever to get absorbed in the Bank. The Contractor shall be responsible for all the claims of the employees of the Contractor and shall not make and claim whatsoever against the Bank. The Contractor shall be responsible for all statutory requirements e.g. ESI, PF, labour registrations, Insurance coverage etc. The operator is responsible for compliance of all the rules & safety regulations etc.

Minimum wages as prescribed by the Labour Act shall be payable to the operator(s) by the contractor as the case may be. The Contractor shall bind himself and keep the Employer saved harmless and indemnified against claims if any of the workmen and all costs and expenses as may be incurred by the Employer in connection with any claim that may be made by any workmen.

46. WORKING HOURS AT THE SITE

As instructed by Bank. Contractor to ensure that the routine operations at the site are not affected by the contract work. If required, they have to work on the Bank Holidays in coordination with other agencies and Bank.

WORKING ON HOLIDAYS:

No work shall be done on Sunday or other Bank holidays that may be notified by the Architect & Employer, without the specific sanction in writing of the Architect & employer or his representatives

47.0 STORAGE OF MATERIALS

47.1 The contractor shall store their materials like fixtures, cables, conduits, wires, tools etc in the site with the permission of the Bank. However, the contractors shall be responsible for the custody and security of all materials and equipment at site. No claim for loss or theft will be entertained by the Bank.

47.2 Shelter or stay and other amenities for the electricians have to be arranged by the contractor at his own expense and responsibility.

47.3 On completion of the works, the contractor shall remove all tools,surplus materials, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a workmanlike condition to the satisfaction of the Bank

48.0 COMPLIANCE OF STATUTORY REGULATIONS

48.1 The contractor shall conform to the provisions of any Acts of the Legislature relating to the work, and to the Regulations and Bye-Laws of any authorities like Electricity, Pollution Control Boards, Municipal Authorities, water and Sewarage boards and shall before making any variations from the drawings or specifications that may be associated to so conform, give the Employer written notices specifying the variations proposed to be made and reasons for making them and apply for instruction thereon. The Employer on receipt of such intimation shall give a decision within a reasonable time.

48.2 The contractor/s shall arrange to give all notices required for by the said Acts, Regulations or Bye-laws to be given to any authority, and to pay to such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the Employer. The Contractor shall indemnify the Employer against all claims in respect of patent rights, designs, trademarks or name or the protected rights in respect of any equipment, machine, work or material used for or in connection with the works or temporary works and from and against all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall defend all actions arising from such claims, unless he has informed the Employer, before any such infringement and received their permission to proceed and shall himself pay all royalties, license fees, damages, coat and charges of all and every sort that may be legally incurred in respect thereof.

48.3 The contractor should strictly abide by the Central/State labour regulation for the Minimum Wages, Payment of wages, Workmen Compensation, PF, ESI, Contract labour, including the latest amendments, if any and other safety regulations.

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

49.0 INSURANCE & DAMAGE TO PERSONS AND PROPERTY ETC

49.1 The insurance shall be for an amount equal to 110 percent of the value of the contract on “All Risks” basis, valid until the Completion of the project or handing over whichever is later.

49.2 Should any loss or damage occur, the Vendor shall initiate and pursue claim till settlement and promptly make arrangements for repair and / or replacement of any 5damaged item to the satisfaction of the Bank, irrespective of settlement of claim by the underwriters.

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

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

49.5 The contractor shall affect the insurance necessary and indemnify the Employer entirely from all responsibility in this respect.

49.6 The contractor shall be responsible for anything, which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this contract.

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

50. TERMINATION OF CONTRACT BY BANK

If the contractor being a company go into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjudicated insolvent or shall make an assignment or a composition for the benefit of the greater part, in number of amount of his creditors or shall enter into a Deed or arrangement with his creditors, or if the Official Assignee in insolvency, or the Receiver of the contractor in insolvency, shall repudiate the contract, or if a receiver of the contractor's firm appointed by the court shall be unable within fourteen days after notice to him requiring him to do so, to show to the reasonable satisfaction of the Bank that he is able to carry out and fulfill the contract, and if so required by the Bank to give reasonable security therefore, or if the contractor shall suffer execution to be issued, or shall suffer any payment under this contract to be attached by or on behalf of and of the creditors of the contractor, or shall assign, charge or encumber this contract or any payments due or which may become due to contractor, there under, or shall neglect or fail to observe and perform all or any of the acts matters of things by this contract, to be observed and performed by the contractor within three clear days after the notice shall have been given to the contractor in manner hereinafter mentioned requiring the contractor to observe or perform the same or shall use improper materials of workmanship in carrying on the works, or shall in the opinion of the Bank not exercise such due diligence and make such progress as would enable the work to be completed within due time agreed upon, and shall fail to proceed to the satisfaction of the Bank after three clear das notice requiring the contractor so to do shall have been given to the contractor as hereinafter mentioned or shall abandon the contract, then and in any of the said cases, the Bank may notwithstanding previous waiver determine the contract by a notice in writing to the effect as hereinafter mentioned, but without thereby effecting the powers of the Bank of the obligations and liabilities of the contractor the whole of which shall continue in force as fully as if the contract, had not been so determine and as if the works subsequently executed by or on behalf of the contractor (without thereby creating any trust in favor of the contractor) further the Bank or his agent, or servants, may enter upon and take possession of the work and all plants tools scaffolding sheds machinery, steam, and other power, utensils and materials lying upon premises or the adjoining lands or roads and sell the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other contractors or other persons or person to complete the works, and the contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other contractors or other persons or person employed from completing and finishing or using the materials and plants for the works when the works shall be completed, or as soon thereafter as conveniently may be the Bank shall give notice in writing to the contractor to remove his surplus materials and plants and should the contractor to remove his surplus materials after receipt by him the Bank may sell the same by Public Auction and shall give credit to the contractor for the amount so realized. Any expenses or losses incurred by the

contractor for the amount so realized. Any expenses or losses incurred by the Bank in getting the amount payable to the contractor by way of selling his tools and plants or due on account of work carried out by the contractor prior to engaging other contractors or against the Security Deposit.

51.0 DISPUTES/ARBITRATION:

51.1 All disputes or differences whatsoever arising between the parties out of or in connection with this contract or in discharge of any obligation arising out of the Contract (whether during the progress of work or after completion of such work and whether before or after the termination of this contract, abandonment or breach of this contract), shall be settled amicably.

52.2 If however, the parties are not able to solve them amicably, either party (Bank or Vendor), give written notice to other party clearly setting out there in specific dispute(s) and/or difference(s) and shall be referred to a sole arbitrator mutually agreed upon, and the award made in pursuance thereof shall be binding on the parties.

52.3 In the absence of consensus about the single arbitrator, the dispute may be referred to joint arbitrator; one to be nominated by each party and the said arbitrators shall nominate a presiding arbitrator, before commencing the arbitration proceedings. The arbitration shall be settled in accordance with the applicable Indian Laws. Any appeal will be subject to the exclusive jurisdiction of courts at Hyderabad.

52.4 The Vendor shall continue work under the Contract during the arbitration proceedings unless otherwise directed by the Bank or unless the matter is such that the work cannot possibly be continued until the decision of the arbitrator is obtained.

52.5 Arbitration proceeding shall be held at Mumbai, India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be in English.

53. Governing Language:

All communication with respect to the Bid, clarifications, replies, contract documents etc shall be in English.

54.0 Local Laws, Acts, Regulations

The contractor shall strictly adhere to all prevailing labour laws inclusive of contract labour (regulation and abolition act of 1970) and other safety regulations. The

contractor shall comply with the provision of all labour legislation including the latest requirements of all the Acts, laws, any other regulations that are applicable to the execution of the project.

i. Minimum Wages Act, 1948 (Amended)
ii. Payment of Wages Act 1936 (Amended)
i. Workmen's Compensation Act 1923 (Amended)
ii. Contract Labour Regulation and Abolition Act 1970 and Central Rules 1971 (Amended)
iii. Apprentice Act 1961 (Amended)
iv. lndustrial Employment (Standing Order) Act 1946 (Amended)
v. Personal Injuries (Compensation Insurance) Act 1963 and any other modifications
vi. Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof
vii. Shop and Establishment Act
viii. Any other Act or enactment relating thereto and rules framed there under from time to time.

55.0 SAFETY CODE:

Safety Guidelines for the Contractor:

The Contractor should follow the following General safety Guidelines while executing the work:

55.1 Smoking is strictly prohibited at workplace.
55.2 No one is allowed to work at or more than three meters height without wearing safety belt and anchoring the lanyard of safety belt to firm support preferably at shoulder level. Chinstrap of safety helmet shall be always on and safety boot is worn.
55.3 Usage of eye protection equipment shall be ensured when workmen are engaged for grinding, chipping, welding and gas-cutting. For other jobs eye protection has to be provided as per the need.
55.4 All safety appliances like Safety shoes, Safety gloves, Safety helmet, Safety belt, Safety goggles etc. shall be arranged before starting the job.
55.5 Excavated pits for earthing, cable laying shall be barricaded till the backfilling is done. Safe approach to be ensured into every excavation.
55.6 Preferably the work shall be carried out during the daytime. However, adequate illumination at workplace shall be ensured in case any work is carried out at night.
55.7 All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded.
55.8 Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work platforms.
55.9 Debris, scrap and other materials to be cleared from time to time from the workplace and at the time of closing of work everyday. Dismantled Material shall

not be thrown from the height and shall be properly disposed off to prevent any injury to public/staff.

55.10 Other than electricians no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.

55.10 All electrical connections shall be made using 3 or 5 core cables, having a earth wire.

55.11 Inserting of bare wires for tapping the power from electrical sockets is completely prohibited and plug tops of suitable capacity only shall be used.

55.12 All the unsafe conditions, unsafe acts identified by contractors, reported by Bank to be corrected on priority basis.

55.13 No children or physically challenged persons shall be allowed to enter the workplace and shall not be utilized for any service during execution of the work.

55.14 All the Gas cutting, sharp tools, flammable materials and tackles shall be stored properly and safely when not in use.

55.15 Clamps shall be used on Return cables to ensure proper earthling for welding works.

55.16 Return cables shall be used for earthling.

55.17 All the pressure gauges used in gas cutting apparatus shall be in good working condition and in case of any leakages, the same shall not be used.

55.18 Proper eye washing facilities shall be made in areas where chemicals are handled.

55.19 Connectors and hose clamps are used for making welding hose connections.

55.20 Tapping of power by cutting electric cables in between must be avoided. Proper junction boxes must be used.

56.0 Accidents

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

SPECIAL CONDITIONS OF CONTRACT

1. **ACCESS OF INSPECTION:**

The contractor is to provide at all times, during the progress of the works and the maintenance period, means of access with ladders, gangways etc., and the necessary attendants to move and adopt the same as directed for the inspection or measurement of the work by the Architect and Employer or any other agency employed by the client.

2. PROGRAMME OF WORKS:

The contractor on starting the work shall furnish to the Employer and Architect a PERT/CPM programme, for carrying out the work stage by stage in the stipulated time, for the approval of Architects and Employer, and follow strictly the approved time schedule by incorporating changes, if any, so authorized by the Architect and Employer, to ensure the completion of construction work ins stipulated time. A graph or chart on individual item/group of items/trades of work shall be maintained, showing the progress both in terms of quantities and value, week by week. The contractor shall submit to the Employer and Architect a weekly progress report stating the number of skilled and unskilled laborers employed on the work, working hours done, quantity of cement, steel and other major items of materials (quantity and value wise) used and corresponding place, type and quantity of work done during the period.

The contractor must inform the Architects, 10 days in advance of requirement of respective drawings and details by him, from time to time. The contractor shall strictly adhere to the approved programme and arrange for the materials and labour etc., accordingly.

Despite repeated instructions, if the contractor fails to show satisfactory progress of the work, the Employer/Architect may take suitable action as deemed fit, including levying of liquidated damages not exceeding ½% of contract price for delay of every week or part thereof, subject to a limit of total liquidated damages levied under this clause to 5% of contract price without prejudice to any terms and conditions of the contract.

3. FACILITIES TO OTHER CONTRACTORS:

The contractor shall give full facilities and co-operation to all other contractors working at site doing plumbing, Electrical, civil works etc., as directed by the Architect & Employer and shall arrange his programme of work, so as not to hinder the progress of other works. The decision of the Architect & Employer, on any point of disputes between the various contractors, shall be final and binding on all parties concerned.

4. TESTING:

The contractor shall, as and when directed by the Architect & Employer, arrange to test materials and/or portions of the work at site in any approved laboratory at his own cost, in order to provide their soundness and efficiency. The contractor shall transport all the materials from site to the approved laboratory at his own cost. The contractor shall carryout all the mandatory tests as per list attached at the frequencies stated therein. Even after such tests, any materials brought to site or incorporated in the works are found to be defective or unsound or not as per approved samples, the contractor shall remove the same and re-erect at his own cost and without any additional time/period for the same, with reference to the date fixed for completing the work. In case these tests are not carried out at the frequencies stated, then proportionate costs of materials not so tested, including cost of testing and quantities of items of work executed with such materials, if otherwise accepted for retention in the work, will be deducted from the dues to the contractor. The deductions will be worked out by the Architect/client and shall be final and binding on him.

Tolerance on various material and items of work shall be allowed laid down in the documents below and the order of precedence shall be:

a) Relevant Indian Standards Specifications.

b) Manufacturer's Specifications.

In absence of above Architect's decision basing on the general practice being following shall be final.

5. SITE MEETINGS:

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

6. NOTICES:

Notices for the Employer, the Architect, or the Contractor may be served personally or by being left at or sent by registered post to the last known place of abode or business of the party to whom the same is to be given or in the case of the contractor by being left on the works. In case of a company or corporation, notices may be served at or sent by registered post to the Registered Offices of the Company or Corporation. Any notice sent by registered post shall be deemed to be served at the time, when in the ordinary course of post it would be delivered.

The contractor shall give all notices and pay all necessary and relevant fees and shall comply with all Acts and Regulations, for the successful completion of the contract work.

7. MEASUREMENT TO BE RECORDED BEFORE WORK IS COVERED UP:

The contractor shall take joint measurements with the Employer's representative (Project Management Consultant or any Engineer identified by the Bank) and Architect's representative before covering up or otherwise placing beyond the reach of measurement any item of work. Should the contractor neglect to do so, the same shall be uncovered at the contractor's expense or in default thereof, no payment or allowance shall be made for such work or the materials with which the same was executed.

8. ACTION WHERE THERE IS NO SPECIFICATION:

In case of any item/class of work, for which there is no specification mentioned (either in part or full), the same will be carried out in accordance with the relevant CPWD specifications (only for the specifications missing in the contract) and if not available even there (either in part or full) in, relevant standards of BIS shall be followed (only for the portions of specifications missing in the contract specifications and CPWD specifications). Indian standard specifications, subject to the approval of the Architect & Employer.

9. REPORTING OF ACCIDENT TO:

The contractor shall be responsible for the safety of all persons employed by him on the works and shall report serious accidents to any of them, whenever and wherever occurring one the works, to Employer who shall make every arrangement to render all possible assistance. This shall be without prejudice to the responsibility of the Contractor, under the Insurance clause of the General Conditions. Contractor shall take all the precautions as detailed in the safety code attached separately.

10. CLEARING THE SITE ON COMPLETION/DETERMINATION OF WORKS:

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

11. POSSESSION OF WORKS/ WORK COMPLETED:

The contractor shall hand over to the Employer possession of the completed works in stages, as and when required, and as directed by the Architect & Employer.

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

12. TYPOGRAPHIC, CLERICAL AND OTHER ERRORS:

The Architects/Employer's clarification regarding partially omitted particulars or typographical, clerical and other errors shall be final and binding on the contractors.

13. WORK PERFORMED AT CONTRACTOR'S RISK:

The contractor shall take all precautions necessary and shall be responsible for the safety of the work and shall maintain all lights, guards, signs, barricades, temporary passages or other protection necessary for the purpose. All work shall be done at the contractor's risk and if any loss or damage shall result from fire or from any other cause, the contractor shall promptly repair or replace such loss or damage free from all expenses to the Employer. The Contractor shall be responsible for any loss or damage to materials, tools or other articles used or held for use in connection with the work. The work shall be carried on to Employer or of others and without interference with the operation of existing machinery or equipment, if any.

14. INSPECTION BY THE CHIEF TECHNICAL EXAMINERS (VIGILANCE):

The proposed work covered under this tender, during the progress and/ or after completion, can also be inspected by the Chief Technical Examiner/ Technical Examiner or Officers of the Central Vigilance Commission, Government of India, on behalf of Architect & Employer to ascertain that the execution of the work has been done with materials and workmanship all as stipulated in the contract and as directed.

Contractor shall afford all reasonable facilities to the above vigilance staff and also provide them with ladders, tapes, tools and tackles etc., as required and directed and also necessary labourers skilled/unskilled to enable them to complete their inspection/study/technical scrutiny and no extra shall be admissible to the contractor on this account.

15. SPECIAL CONDITIONS OF CONTRACT:

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

16. FAILURE BY CONTRACTOR TO COMPLY WITH ARCHITECT'S INSTRUCTIONS:

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

17. ARCHITECT'S DELAY IN PROGRESS:

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

18. BIS CODES

It is compulsory for the contractor to keep all the B.I.S. codes mentioned in this tender document at his cost at the site to ensure the proper supervision/quality of work and materials.

FORM OF SUBMISSION OF TENDER

(To be filled by the tenderer)

The Regional Manager,

SBI

Dear Sir/s,

Ref: TENDER FOR _____

I/We have examined the above tender and subsequent pre-bid clarifications/ modifications / revisions, if any, furnished by Bank and 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 and offer to undertake Contract as detailed in this tender by submitting my/our online bids in the Bank's e-tender portal.

1. While submitting this Bid, I / We certify that:
    i. The undersigned is authorized to sign on behalf of the Bidder and the necessary support document delegating this authority is uploaded along with the bid.
    ii. We certify that we have not made any changes in the contents of the tender document read with its amendments/clarifications provided by Bank, submitted by us in our Bid document.
    iii. The rate quoted in the *price Bids are as per the tender* and subsequent pre-Bid clarifications/ modifications/ revisions furnished by the Bank, without any exception.
2. We agree to abide by all the Bid terms and conditions, contents of Agreement and the rates quoted in the bid, which shall remain binding upon us.
3. If our Bid is accepted, we undertake to enter into and execute at our cost, when called upon by the Bank to do so, a contract in the prescribed form and we shall be jointly and severally responsible for the due performance of the contract.
4. Until a formal contract is prepared and executed, this Bid, together with your written acceptance thereof and your notification of award, shall constitute a binding Contract between us.
5. It is further certified that the contents of our Bid are factually correct. We also accept that in the event of any information / data / particulars proving to be incorrect, Bank will have the right to disqualify us from the Bid.
6. We understand that you are not bound to accept the lowest or any Bid you may receive and you may reject all or any Bid without assigning any reason or giving any explanation whatsoever.
7. We hereby undertake that our name does not appear in any "**Caution**" list of RBI / IBA or any other regulatory body.
8. We also confirm that we have not been **blacklisted** by any Bank / PSU / State or Central Govt departments for any reasons.
9. We confirm that we do not have any **litigation / cases** pending against us in any Bank / PSU / State or Central Govt departments.

10. We confirm that we are responsible to obtain all necessary licenses, permission, NOC from all the statutory /local authorities for the smooth execution of this contract in Bank's premises.

11. We hereby confirm that all the materials/components/spare parts/equipment etc. to be supplied / used as a part of this contract shall be original / new materials / components / parts / equipment only, from respective OEMs of the products and that no refurbished / duplicate / second hand materials/components /parts/ equipment shall be supplied or shall be used.

12. For any type of deviation (to any of above or subsequent instructions), it will be my/ our responsibility to obtain the written instruction of the Engineer-in-charge for the same failing which it shall be deemed that I have carried out any such deviations at my own and I shall be duty bound to replace the all deviated material/ works from the site at my/ our cost as well as I shall be liable to penalized by the Bank as deemed fit and for all such loses made thereof, I/ we shall not have any right to arbitrate in any manner.

Yours faithfully,

Contractors Signature

Name:

Address:

****

DRAFT COPY OF ARTICLES *OF AGREEMENT*

ARTICLES OF AGREEMENT made the _____ day of _____ 2022 between
_____SBICB_____
of _____
(hereinafter called the "Employer") of the one part and _____
of _____ (hereinafter called "The Contractor") of the other part, where as the Employer is desirous of getting the work of "
_____
_" executed and has caused drawings, conditions of contract, specifications and schedule of quantities etc., describing the works prepared by M/s Nandu Associates, Hyderabad.

AND WHEREAS the SAID DRAWINGS numbered as per list attached inclusive of and the conditions of contract, specifications and schedule of quantities etc., have been signed by or on behalf of the parties hereto.

AND WHEREAS THE CONTRACTOR has agreed to execute upon and subject to the conditions set forth in the Schedule hereto (hereinafter referred to as “Said Conditions”) the works shown upon the said drawings and described in the same specifications and included in the said schedule of quantities for such sum as may be ascertained to be payable in terms of the Bills of Quantities, and which sum is estimated to be Rs. -------/- (Rupees ---------- Only. (hereinafter referred to as “Said Contract Amount”).
NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said sum to be paid at the times and in the manner set forth in the said conditions, the contractor shall upon and subject to the said conditions, execute and complete the work shown in the said drawings and described in the said specifications.
2. The Employer shall pay the contractor the said sum or such sums as shall become payable hereunder at the times and in the manner specified in the said conditions.
3. The term “Architect” in the said conditions shall mean the said M/s NanduAssociates, Architects and designers or in the event of their ceasing to be the Architect for the purpose of this contract, such other person as shall be nominated for that purpose by the Employer , not being a person to whom the contractor shall object for reasons considered to be sufficient by the Arbitrator mentioned in the said conditions provided always that no persons subsequently appointed to be the Architect under this contract shall be entitled to disregard or over-rule any previous decision or approval or direction given or expressed by the Architect for the time being.
4. Tender documents containing work order Notice to the Contractor, Conditions of Contract, Appendix thereto, Special Conditions of Contract, Specifications and Schedule of Quantities with the rates entered therein, shall be read and studied as forming part of this agreement and the parties hereto shall respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their part respectively in such conditions contained.
5. The contract is neither a fixed lump sum contract or a piece work contract, but is a contract to carry out work in respect of the entire works to be paid for according to actual measured quantities, including variations from BOQ at the rates contained in the Schedule of rates and Probable bill of quantities or as provided in the said conditions.
6. The Employer through the Architect, reserves to himself the right of altering the drawings and natures of the work, of adding/substitution to or omitting any items of work or having portions of the same carried out through alternate agencies without prejudice to this contract.
7. Time shall be considered a the essence of this agreement and the contractor hereby agrees to commence the work soon after the site is handed over to him but within 15 days reckoned from the date of issue of work order to execute the work, as provided for in the said conditions and complete the entire work as per the

timelines mentioned in NIT subject to nevertheless to the provisions for extension of time.

8. This agreement and contract shall be deemed to have been made in Hyderabad and any questions or dispute rising out of or in any way connected with this Agreement and Contract shall be deemed to have arisen in Hyderabad and only the courts in Hyderabad shall have jurisdiction to determine the same. The limitation period will be 90 days from the date of dispute having arisen.

AS WITNESS our hand this _____ day of _____ 2024

Signed by the said in the presence of:

WITNESS :
SIGNATURE
NAME :
ADDRESS : EMPLOYER

WITNESS :
SIGNATURE
NAME :
ADDRESS :

DRAFT FORMAT OF BANK GUARANTEE IN LIEU OF SECURITY DEPOSIT

(Site specific format shall be approved by the SBI prior to its execution)

(To be submitted on Non-judicial stamp paper of appropriate value purchased in the name of the issuing bank)

Place:.....

Date:..... .

{Onnon-judicialstamppaperofRs ---/-)

BANKGUARANTEEINLIEUOFSECURITYDEPOSIT

B.G.No._____ ValueRs._____

StateBankofIndia,(

Address)

Sub:

BankGuaranteeofRs.....towardsSecurityDepositfortheworkoffo rStateBankofIndia.

{NameofBranch/Office)

DearSir,

WHEREAS (Name and address of contractor/ vendor) (hereinafter called the Contractor)haveenteredintocontractfor(NameofWork)withStateBankofIndia(SBI) asmentionedinthe letter of SBl's Consultants (Name & address of consultants) vide their letterNo.....dated.....Andthecorrespondenceandtenderrelayingtheret owhich is hereinafter referred to as "the said contract" the Contractor has now agreed toproduce a Bank Guarantee amounting to 2% of the contract value less earnest moneydepositofRs ..... (Rupeesonly),toStateBankofIndiaforperformingtheirpartofth e
contractobligations.

AND WHEREAS in terms of said contract, the contractor isrequired to furnish to State Bankof Indiaa Guaranteeof a ScheduledBankforavalue ofRs.. .....to be valid upto(date).

ANDWHEREAS(NameofBankandits
branch)havingtheirofficeat(address)theGuarantor,
attherequestofthecontractorherebyfurnishes
aPBGinfavourofStateBankofIndiaandGuaranteesinthemannerhereinafterappearing.

In consideration of the premise, we (name of Bank and its branch) having our

office at(address)hereaftercalledthe "Guarantor" (which expression shall include itssuccessors andassigns) herebyexpressly, irrevocably &unreservedlyundertakeandguarantee under thatiftheContractorfailstoexecutetheworkaccordingtohisobligationsunderthesaidcontract, thennot withstanding any dispute between State Bank of India and the contractor the Guarantorshall,ondemandwithoutdemurandwithoutreferencetothecontractor paytoStateBank ofIndia immediately any sum claimed by State Bank of India under the said contract up to amaximumamountofRs.___(Rupeesonly).

IncasetheamountdemandedbyStateBankofIndiaisnotpaidwithin48hoursofreceiptofdemand, the Guarantor agrees to pay the aforesaid amount of ₹ .

(i) Such payment shall be notwithstanding any right the contractor may have directlyagainstStateBankofIndiaoranydisputesraisedbytheContractorwithStateBankofIndiaor any suits or proceedings pending in any competent court or before any arbitrator.StateBank of India's written demand shall be conclusive evidence to the Guarantor that suchpayment ispayableunderthetermsoftheContractandshallbebindinginallrespect ontheguarantor.

(ii) The Guarantor shall not be discharged or released from the the undertaking andGuarantee, by any arrangement, variations made between SBI and the Contractor and orindulgence shown to the contractor by SBI, with or without the consent and knowledge of theguarantor or by alterations in the obligations of the contractor by any forbearance, whetherastopayment,timeperformanceorotherwise.

(iii) This guarantee shall remain valid until or as may be caused to be extended by thecontractororuntildischargedbySBIinwritingwhicheverisearlier.

(iv) This guarantee shall be a continuing guarantee and shall not be revocable during itscurrencyexceptwiththepreviouswrittenconsentofSBI.

(iv)(a)Thisguaranteeshallnotbe affectedby anychangein theconstitutionofthecontractor, by absorption with any other body or corporation or dissolution or otherwise andthisguaranteewillbeavailabletoorenforceableagainstsuchbodyorcorporation.

(v) In order to give effect to this guarantee SBI will be entitled to act as if the Guarantorwere the Principal debtor and the Guarantor hereby waives all and any

of its rights or suretyship.

(vi) This guarantee shall continue to be in force not withstanding the discharge of thecontractor by operation of law and shall cease only on payment of the full amount by theGuarantortoSBloftheamountherebysecured.

(vii) This guarantee shall be in addition to and not in substitution for any other guaranteeorsecurityforthecontractorgivenortobegiventoSBIinrespectofthesaidco ntract.

(viii) Any notice by way of request and demand or otherwise here under may be sent bypostoranyothermodeorcommunicationtotheguarantoraddressedasaforesaidan dif sentbypostitshallbedeemedtohavebeengivenatthetimewhenitwould bedeliveredindue course of post and in providing such notice when given by post it shall be sufficient toprove that the envelope containing the notice was posted and a certificate signed by anofficerofSBIthattheenvelopewassopostedshallbeconclusive.

(ix) ThesepresentsshallbegovernedbyandconstructedinaccordancewithIndianLaw.

Notwithstanding anything contained hereinbefore the liability of the guarantor under thisguarantee isrestrictedtoasumofRs._____

This guaranteewillremain validupto _____unlessademandorclaimunderthisguar anteeismadeinwritingonorbefore_____the guarantor shall be discharged fromallliabilityundertheguaranteethereafter.

Datedthe.....

For(NameofBank)

(Signature/swithdesignation/sofsignatory/ies)(Na

meandStampofBank)

TECHNICAL SPECIFICATIONS

9. INDEX FOR SPECIFICATION FOR CIVIL WORK

MATERIALS GENERAL

10. SPECIFICATIONS FOR CIVIL WORK

MATERIALS – GENERAL

a. All the materials required in the construction shall conform to the relevant latest Indian Standards specifications unless otherwise indicated. For patented products, the specifications and instructions of the manufacturers will be followed. In case where there are no specifications, then Architects/Employers instructions will be followed. In Case of any discrepancy/dispute regarding specifications, Architect and Employer's decision will be final and binding.

b. Materials shall be transported, landed and stored at the site or elsewhere in such a manner as to prevent any damage, deterioration or contamination.

c. The samples of all materials shall be got approved by the Architect and Employer prior to ordering and shall be kept at site office of the Architect & Employer. The materials brought to site shall conform in all respects to the approved samples. Any work executed, without approval for the materials, is liable to be rejected. Accordingly, it will be paid either at tender rates or reduced rates or not to be paid at all, at the discretion of Architect & Employer, whose decision will be final and binding.

d. The Architect & Employer shall have an option to have any materials tested at the contractor's cost to find out whether they are in accordance with the specifications. All Bills, vouchers, test certificates shall be produced for inspection on demand by the Architect & Employer to ascertain the quality/ suitability of materials.

e. The materials shall be stacked at site as directed by the Architect & Employer.

f. Any materials rejected by the Architect & Employer, shall be removed by the contractor from the site within 24 hours at his own cost.

g. The contractor shall include the elements of wastage of materials in his rates for various items.

h. The Architect & Employer shall have the power to cause the contractors to purchase and use such material from any particular source at his opinion be necessary for proper execution of work.

A. **PLAIN AND REINFORCED PRECAST CONCRETE WORK:**

B.1. **APPLICATION OF SPECIFICATIONS:**

B.1.1 Not withstanding what is stated in the specification herein, detailed architectural and structural drawings and notes appended there on shall be deemed to form part of the specifications and to supersede these, in case of any discrepancy.

B.2. **GENERAL:**

B.2.1 The structural and architectural drawings shall be studied thoroughly and any discrepancy in the dimensions on the drawings or any other point not clear to the contractor shall be brought to the notice of Architect & Employer well in advance, and got decided from them before further proceeding with the work.

B.2.2. No concrete works shall be carried out in the absence of authorised and qualified supervisor of the client/Architect.

B.3. **MATERIALS:**

B.3.1. **General:**

B.3.1.1. All the materials constituting the concrete shall conform to the relevant latest Indian Standard Specifications, unless otherwise indicated.

B.3.1.2. Materials shall be transported, handled and stored on the site or elsewhere in such a manner as to prevent damage, deterioration or contamination.

B.3.1.3. All the materials such as sand, coarse aggregates, cement and water shall be got tested in any approved laboratory, as directed by the Employer & Architect, before starting the concrete work. During construction also all these materials will have to be tested, as often as deemed necessary by the Employer & Architect.

B.3.2. **Cement:**

Cement shall be ordinary Portland cement 43 grade and of approved brand confirming to IS 1812 – 1989 unless otherwise specified. The contractor shall procure cement of makes – ULTRATECH, BIRLA, ACC, or any other manufacturer as approved by Architect. The contractor may use ordinary Portland Cement of 53 grade of the makes specified above by obtaining written permission from the Architects/Bank. It shall be stored by the contractor in a dry, watertight and

properly ventilated structure as per specified conditions. The cement shall be stacked on a dry raised platform, 1'-0" above the floor level and shall be stacked in the sequence of receipt of consignments. Not more than 10 bags should be kept in one stack. Any cement which has deteriorated , caked or which has been damaged due to any reason whatsoever shall not be used. Cement, concerning which there is any doubt, shall be got tested by the contractor at his cost and used, only if found satisfactory. Condemned/damaged cement shall be removed immediately from the site by the contractor at his cost.

Daily account of receipt and use of cement bags shall be maintained by the contractor in the proforma approved by the Architects/Employer and got checked by the Employer's Engineer at site. Cement should be used in the order in which it is received at site. Cement stored for more than three months shall be got tested, before using it in the work.

B.3.3. **Sand:**

Sand shall be well graded, coarse in texture, clean, hard and free from salt, earth, clay or any other harmful material. Before starting the work, the contractor shall get samples of sand, locally available from different sources, if required, and the same shall be got tested as per latest relevant B.I.S. codes for concrete work and to get the final approval of Employer & Architect. During the course of the construction or for

any reasons it is observed that the sand, procured by the Contractor from previously approved source, is not upto the approved standard or it is not available in sufficient quantity required for the entire project, then the contractor will have to make such alternative arrangements to procure the sand of approved quality from any other source, even with longer lead at no extra cost. Sand shall be screened and washed, if required, as directed by the Employer & Architect/at no extra cost. Field tests shall be carried out regularly and as directed, to ensure the suitability/quality of the same. Silt content should not exceed 8% by volume or 5% by weight, and should be free from other deleterious materials. When sand is mixed by volume, necessary allowance shall be made for bulkage, as required and directed to give correct mixture.

B.3.4. **Coarse Aggregate:**

Coarse aggregates shall consist of hard, dense, durable uncoated crushed Granite rock. It shall be free from soft, friable, thin or long laminated pieces. All aggregates should generally confirm to IS 383 – 1970. For reinforced cement concrete, the maximum size shall be not more than 20mm and minimum shall not be less than 5mm and shall be uniformly graded to the approval of Employer & Architect. If locally available coarse aggregate is not suitable or is not sufficient in quantity, the contractor shall have to procure it from any other source, even with longer leads at no extra cost. As and when directed by Employer & Architect, aggregates shall be washed by approved methods at contractor's cost. Necessary tests shall be carried

out, as and when required to ascertain about the suitability and grading of the aggregated, by the contractor at his cost.

B.3.5. **Water:**

Water shall be clean, fresh and free from organic or inorganic matters in solution or suspension in such amounts, that may impair the strength or durability of the concrete. Water fit for drinking will generally be found suitable for use in concrete and plastering work. However water shall be tested periodically for its use in construction work.

B.3.6. **Reinforcement:**

B.3.6.1. **Mild steel bars:**

Mild steel reinforcement bars shall conform to I.S.432 – 1982 "Part I" Fe 410 – S, other qualities of steel shall not be acceptable.

B.3.6.2. **High strength deformed bars:**

Where deformed high strength reinforcement bars are specified, the contractor shall use tor steel, accompanied by a test certificate from the manufacturer, conforming to IS – 1786 – 1986 and shall be Fe 500 grade. Contractor shall bet steel reinforcement tested at his cost as and when required and directed by Employer & Architect.

Steel shall be from the main manufacturers i.e., TATA / SAIL/VSP or any other manufacturer as approved by Architect & Employer.

B.3.6.3. **Cleaning of reinforcement:**

Before steel reinforcement is placed in position, the surface of the reinforcement shall be cleaned of loose rust or scaling, dust, grease and any other objectionable substances as required and directed.

B.3.6.4. **Bar bending schedule of reinforcement:**

On receipt of structural drawings, contractor shall prepare bar bending schedules of reinforcement and shall get it approved by the Employer & Architect, in advance before starting the work.

B.3.6.5. **Cutting and Reinforcement:**

Before steel reinforcement bars are cut, the contractor shall study the lengths of bars required as per drawings and shall carry out cutting, only to suit the sizes required as per drawings so that the wastage is minimum.

B.3.6.6. **Placing and Security:**

Reinforcement bars shall be accurately placed and secured in position and firmly supported or wedged by precast cement mortar concrete blocks of suitable mix, thickness and size, at sufficiently close intervals, so that the bars will not sag between the supports or get displaced during the placing of concrete or any other operation of the work. It is most important to maintain reinforcement in its correct position without displacement and to maintain the correct specified cover. The contractor shall be responsible for all costs for rectification required in case the bars are displaced out of their correct position.

B.3.6.7. **Binding wire:**

The reinforcement shall be securely bound wherever bars cross/lap or whenever required with 2 strands of suitable length of 18 gauge soft annealed steel wire.

B.3.6.8. **Welding:**

Welding of bars, in place of splicing, shall not be carried out, unless specifically authorised in writing by architect & employer, and the welding shall be as per relevant I.S. code of practice. However, no extra payment shall be allowed for the same.

B.3.6.9. **Bends etc:**

Bends, cranks, curves, etc., in steel reinforcement shall be carefully formed and shall strictly confirm to the drawings/requirements, care being taken to keep bends out of winding. Otherwise, all rods shall be truly straight. If any bend/crank shows signs of cracking, such rods/bars shall be removed immediately from the site. For bending of bars to any curvature, 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 bends shall be two times the diameter of bar. Heating of reinforcement of bars to facilitate bending will not be permitted. The bars shall always be bend cold. In case of mild steel reinforcement bars of larger sizes, where cold bending is not possible, they may be bent by heating, but only with written permission of the Architect & employer. 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.

B.3.6.10 **Inspection of Reinforcement:**

No concreting shall be commenced until the Architect & Employer have inspected the reinforcement in position and their approval obtained. A notice of atleast 72 hours shall be given to the Architect & Employer by the Contractor for inspection of reinforcement. If in the opinion of the Architect & Employer any material is not in accordance with the specification or the reinforcement is incorrectly spaced/bend or otherwise defective, the contractor shall immediately remove such materials from the site and replace with new ones and rectify any other defects in accordance with the instruction of the Architect and Employer and to their entire satisfaction.

B.3.6.11 **Net Measurement:**

Reinforcements shall be placed as shown on the structural drawings and payment will be made based on and limited to the net measurements, as per drawings. Only such laps, dowels, spacers, chairs etc., in reinforcement specifically shown on drawings shall be paid for. The contractor shall allow in his quoted rates for all wastages and rolling margins, which will not be paid for. The measured length of all the bars shall be converted into weight, as per standard weights given in latest

I.S.Schedule. In case the weights of any bar/bars are less than the required weight (beyond rolling margins specified by B.I.S.) the same shall not be used on work. If used, the same shall be replaced with proper ones, at no extra cost.

B.3.6.12 **Cover for Reinforcement:**

Unless otherwise specified in drawings, cover shall be measured from outer surface of the main reinforcement and shall be as follows:

a. For beams and lintels – 25mm or dia of the bar, whichever is higher.

b. For slabs, chajjas, canopies, pardas –20 mm or dia of the bar, whichever is higher.

c. Columns above GL – 40mm, or dia of bar, whichever is higher.

d. Columns below GL – 80mm,

e. Footings – 50mm.

f. Cover blocks shall be of (1:1½:3) P.C.C. and of thickness, not less than the cover specified. Cover blocks of 1:2 cement mortar may be allowed, if specifically permitted by the Architect. PVC cover blocks of required cover is also allowed.

B.3.6.13. Rates quoted for reinforcement, in addition to any factors mentioned elsewhere, shall also include for:

a. Stock piling of reinforcement as described.
b. Decoiling, straightening (coiled bars, bent bars).
c. Removal of rust and every other undesirable substances, using wire brushes etc., as required/directed.
d. Cutting to required lengths, labour for bending and cranking, forming hooked ends (if required), handling, hoisting, placing in position, tying binding with binding wire and every thing necessary to fix reinforcement in work as per drawings/requirements.

e. Cost of binding wire required as described.

f. Fabricating and fitting reinforcement, in any structural member, irrespective of its location, shape, dimension and level.

g. Cost of precast concrete/mortar cover blocks of proper size or nylon spacers to maintain cover and holding reinforcement in position.

h. Work at all levels.

B – 4 **FORM WORK:**

B.4.1. **Materials and design:**

Contractor shall get the materials, sizes/arrangements and method of supports, details of joinery, and design of formwork for beams, slabs, columns etc., approved by Architect, before starting the formwork.

B.4.2. **Design of Form work:**

i) Form work shall be adequately designed to support the full weight of workers, reinforcement, freshly placed concrete, effects of tamping/vibrating, etc., without yielding/settlement or deflection, and to ensure good and truly aligned concrete finish in accordance with the construction drawings.

ii) The formwork shall be so designed that the sides of the beams can be first struck, leaving the soffit of beams and supporting props in positions. Props shall be designed to allow accurate adjustment and to permit of their being struck without jarring the concrete.

iii) The design of form work shall be got approved from the Architect & Employer before starting this item of work.

B.4.2.1 The form work shall be of approved plywood (Marine or boiling waterproof) and not less than 12mm thick and with proper supports as may be approved by Architect & Employer. As an alternative sufficiently rigid steel shuttering with appropriate supports may be used, as may be approved by Architect & Employer at not extra cost. In every case, joints in the shuttering are to be such as to prevent loss of liquid from concrete. In case of steel shuttering, the joints must be perfectly close and sealed with craft paper or any other types of approved sealing materials. If any particular material or materials are specified in the Schedule of Quantities for form work, only such particular/ specified material or materials shall be used in the work.

The form work shall be constructed so as to remain sufficiently rigid during placing and vibrating/tamping of the concrete. All shuttering and framing must be adequately stayed and properly supporting the concrete during period of hardening. The forms shall have sufficient strength and rigidity to hold concrete and withstand the forces/pressure of people and machinery working ramming and vibration, and more so when the concrete is tamped/vibrated. The surface of all forms in contract 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.4.2.2. The form work shall conform to the shape, lines and dimensions to suit the RCC members, as shown in the drawings and be so constructed. A camber of 6mm in all directions, for every 5 meter span, in shuttering for all slabs and beams shall be given to allow for unavoidable sagging, due to self weight (including concrete, workers, machinery etc)/compaction of other causes.

B.4.2.3. Temporary openings or windows shall be provided at the base of column forms, and at other points, where necessary to facilitate cleaning and observation, immediately before concrete is deposited. These shall be properly closed, before placing concrete in position.

B.4.2.4. **Vertical centering/staging:**

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 steel tubes with extension pieces and securely braced against lateral displacement. The spacing of steel tubes shall be designed to carry loads imposed on it without undue deflection of the members, supported by the props. The spacing and sizes of props shall be approved by the Architect & Employer and any alterations suggested by them shall be carried out at contractor's expense. Pipe bracing shall be provided, as required/directed, without extra cost. The contractor shall allow in his rates for providing props and struts upto any height as shown in the working drawings issued to the contractor from time to time. Wooden props and bracing can only be allowed under special sanction of the Architect & Employer.

B.4.2. **Design of form work:**

i) Form work shall be adequately designed to support the full weight of workers, reinforcement, freshly placed concrete, effects of tamping/vibrating, etc., without yielding/settlement or deflection, and to ensure good and truly aligned concrete finish in accordance with the construction drawings.

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

iii) The design of form work shall be got approved from the Architect & Employer before starting this item of work.

B.4.3. **Water tightness:**

It is the contractor's responsibility to ensure that the forms are checked for water tightness during progress of shuttering work and also just before concreting operation starts and to make good deficiencies, if any. If instructed by the Architect & Employer, building paper will have to be used, without any extra charge for the same, viz., to have adequate water tightness.

B.4.4. **Cleaning and treatment of forms:**

All rubbish, particularly chippings, shavings and sew dust, etc., shall be removed from the interior of the forms, before the reinforcement is placed in position and as well before the concrete is placed. The form work to be in contact with the concrete

shall be cleaned and thoroughly wetted or treated with an approved composition before placing concrete. Care shall be taken that such approved composition is kept out of contact with reinforcements. Interior of all moulds and boxes must be thoroughly washed (water) with hose pipe or otherwise so as to be perfectly clean and free from all extraneous matter before depositing of concrete. Prior approval of the form work should be obtained from Architect/Employer, before placing reinforcement on the form work.

B.4.5. **Stripping:**

Form shall be left in place until their removal is authorised by the Architect & Employer and shall then be removed with due care, so as to avoid injury to concrete and or workmen. In no circumstances the forms shall be struck, until the concrete developes a strength of at least twice the stress, to which the concrete may be subjected to at the time of striking. The strength referred to shall be that of concrete, using the same cement and aggregates with the same proportions, 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 in more effective curing.

B.4.6. **Stripping time:**

In normal circumstances (general where temperatures are above 20 degrees C and where ordinary Portland cement is used) forms shall be struck after expiry of the following periods, unless otherwise specifically directed at site by the Architect & Employer.

	LOCATION	STRIKING TIME IN CLEAR DAYS (OPC) (AFTER THE DAY OF CASTING)
a.	Vertical sides of walls slabs, beams and columns	1
b.	Bottoms of slabs upto 4.5m span.	7
c.	Bottom of slabs above 4.5m span/ bottoms of beams & arch rib bottoms upto 6m span.	14
d.	Bottom of beams over 6m span and arch rib bottoms above 6m span.	21

B.4.7. **Form work in lifts for continuous surfaces:**

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 any leakage of water/mortar from the concrete and to maintain accurate alignment of the surface.

B.4.8. **Procedure while removing the form work:**

All formwork shall be removed without shock or vibration, as otherwise it would damage the reinforced concrete. Before the soffit and struts are removed, the concrete surface shall be first exposed partly, 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 occur with cement, in cold weather. Wetting the surface before stripping is preferable, to avoid spalling of corners.

B.4.9. In case of structures with two or more floors, the weight of concrete, centering and shuttering of any upper floor being cast shall be suitably supported on one floor

below the top most floor already cast. The rate quoted for reinforced concrete items is deemed to have included for these arrangements/supports.

B.4.10. **Tolerance:**

a. All RCC work shall be executed to true lines and levels and plumb and to the final approval of Architect & Employer's representative.

b. If work is not carried out within the reasonable tolerance the cost of all rectification measures of dismantling and reconstructing or as decided by the architect and Employer shall be borne by the Contractor. In case of work dismantled, the same will not be measured and paid for.

B.5.1. **Concrete mix proportioning:**

Concrete mix proportioning for all grades of concrete shall be as per IS 456 – 2000 clauses 8 & 9 and as per SP 23 – 1982 Section 6. The constituent materials to be used for concrete making namely cement, aggregates & water shall be as per clause 4 of IS 456 – 2000. The mix proportions shall be so selected as to ensure that the workability of the fresh concrete is appropriate/suitable for the conditions of handling and placing, so that after compaction its surrounds all reinforcements and completely fills the form work. When concrete is hardened, it shall have the required strength, durability and surface finish. The determination of the proportions of Cement, Aggregates and water to attain the required strengths shall be made as follows:

a. By adopting nominal concrete mix, which is called 'nominal mix concrete'.

Batching:

In proportioning concrete the quantity of both cement and aggregate should be determined by mass. The mass of cement can be determined on the basis of mass of cement per bag. Water shall be measured by volume in calibrated containers/tanks or weighed.

In case of design mix of concrete, uniformity of the materials used for the concrete making has been established over a period of time, the proportioning may be done subsequently by volume batching, provided prior approval of Architect & Employer is obtained for same and ensured that periodic checks are made on mass/volume relationships of materials. Where weigh batching is adopted, allowance shall be made for bulking in accordance with IS 2386 (part III) 1963.

The concrete shall be mixed in a Mechanical Mixer as per IS 4791 – 1968. Workability of the concrete should be controlled by direct measurement of water content. Workability should be checked at frequent intervals as per IS 1199 – 1959. The contractor is entirely responsible for the proportioning of concrete mixes of required strengths and must submit the procedure for such

proportioning of concrete mixes for the prior approval of Employer & Architect, whose decision shall be final in the matter.

b. Alternatively, contractor may use suitable ready mix concrete at no extra cost and after obtaining written permission from Architects/Bank.

B.5.2. **Transporting and placing concrete:**

B.5.2.1. Immediately prior to placing the concrete, the shuttering shall be well watered and any water and rubbish lying removed.

B.5.2.2. The concrete shall be transported from mixer to the position of placing as rapidly as possible and in a manner that would prevent separation or bleeding or impair the quality of concrete. Equipment for transportation, pumping or pneumatically conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end, and without any separation of the materials. The chute shall be of metal or metal-lined wood with slopes neither less than 1 vertical to 3 horizontal nor more than 1:2. The discharge end of the chute shall be provided with baffle plates to prevent segregation.

B.5.2.3. Concrete shall not be dropped from a height in a manner, which will cause segregation. It shall be placed directly in its permanent position to avoid segregation due to rehandling. Rate of placing concrete shall be such as to avoid formation of planes of weakness in concrete being placed. No partly set or retempered concrete shall be used on the job.

B.5.2.4. Each layer of concrete being placed shall be consolidated by mechanical vibration supplemented by hand spreading, rodding and tamping as directed, to form dense concrete with all surfaces free from honeycombing and tolerably free

from water and air holes or other blemishes. Vibrators shall in no case be used to work along the forms. Duration of vibration shall be so limited to reduce time necessary for satisfactory consolidation, without causing objectionable segregation. The vibrator shall not be inserted into a lower course, that has already been vibrated/compacted and begun to set.

B.5.2.5. The contractor shall be responsible for the co-ordination with sub-contractors or other contractors for incorporating necessary inserts, electrical conduit pipes, fixing boxes, blocks, chase holes, etc., as required. The contractor shall obtain approval from the Architect/Client as regards the above, before casting of the concrete. No holes or chases shall be made in the concrete, without prior approval of the Architect & Employer.

B.5.2.6. Concrete shall be placed continuously until completion of the work.

B.5.2.7. Accumulation of set concrete on the reinforcement shall be avoided. Before fresh concrete is deposited upon or against any concrete which has already hardened, the surface of the hardened concrete shall be well roughened, if necessary by chipping, and all lattance removed. The surface shall then be swept clean with wire brushes, thoroughly wetted and covered with a thin layer of rich cement mortar and or chemical additives, as may be directed by Architects.

B.5.2.8. In foundation trenches or in like positions, concrete shall be carefully laid and poured from less than over 1 meter height. If the height exceeds 1 meter, the concrete must be deposited through inclined spouts. The trenches shall be maintained free of water during concreting by proper diversion of water flow with dewatering as required and directed, at no cost and without washing over freshly deposited concrete.

B.5.2.9. Concrete footing shall be placed upon undisturbed clean and hard surfaces of specified bearing capacity.

B.5.2.10. Contractor's authorised Engineers/Supervisors/Foremen shall always be present for all concreting work carried out at site.

B.5.3. **Protection of Concrete:**

Newly placed concrete shall be protected by approved means from rain, sun and drying winds. Exposed vertical/inclined/curved faces of concrete shall be kept wet continuously for not less than a fortnight by covering with a layer of sack curing, invariably horizontal surfaces shall be kept covered with water pounded by means of bunds. Concrete placed below the ground shall be protected from falling earth during and after placing. Approved means shall be taken to protect immature concrete from damage due to debris, excessive loading, vibration, abrasion, ground-water, mixing with earth or other materials, flotation and other influences that may impair the strength and durability of the concrete.

B.5.4. **Consistency:**

Only minimum and sufficient water shall be added to the cement and aggregate during the mixing to produce a concrete having sufficient workability to enable it to be well consolidated and to be worked into the corners of the shuttering and around reinforcement, to give the specified surface finish, and to have the specified strength. When suitable and appropriate amount of water has been determined, the resultant consistency shall be maintained through the corresponding parts of the work and approved tests shall be conducted from time to time to ensure the maintenance of this consistency.

The exact determination of the slump for various members and water cement ratio shall be as directed by the Architect & Employer.

Slumps tests shall be made in accordance with the details given in IS 456 – 1978.

B.5.5. **Finishing:**

B.5.5.1. As soon as possible after the form work has been struck holes left by clamping bolts, air and water holes and other rough patches shall be filled in with cement and sand mortar 1:1 mix (sand passing 1/8" sieve) by working into the surface with a wooden float. Excess water shall be avoided. This should be done within 72 hours after removal of form work.

B.5.5.2. Unless instructed to the contrary the face of exposed concrete placed against shuttering shall be rubbed down immediately upon removal of the shuttering to remove fine or other irregularities. All surfaces which are required to be plastered shall be hacked properly.

B.5.5.3. All exposed faces of concrete members for which shuttering is not provided, shall be smoothened with a wooden float, when the concrete is green and setting has not

started, to give a finish equal to that of rubbed down face where shuttering is provided. The top face of a slab, which is not intended to be covered with other materials, shall be levelled and floated while unset to a smooth finish to the levels of falls/slopes shown on the drawings or as instructed. The floating shall be done so as not to bring an excess of mortar to the surface of the concrete. Dentations in the surface of the concrete shall be formed, if specified/ordered, by approved implements to the depths and patterns described. The top face of a slab intended to be surfaces with mortar, granolithic or any other materials shall be finished rough (to receive final finish) and to the approval of the Architect & Employer.

B.5.5.4 **Honey Combing:**

i) Where honey combed surfaces are noticed in the concrete, the contractor shall not patch up the same, until examined by the Architect & Employer and decision given regarding accepting the work with rectifications or rejections of the same. If the contractor patches up such defects without the knowledge of the Architect & Employer, the Architect & Employer will be at liberty to order demolition of the concerned concrete members to the extent they consider necessary. In such cases, the contractor shall reconstruct the demolished work. The cost of demolition and demolished work and disposal of debris shall not be measured and paid for.

ii) If in the opinion of the Architect & Employer the honey combing is harmful to the structure and where so directed by the Architect & Employer, the full structural members affected by honey combing, as decided by Architect & Employer, shall be dismantled and reconstructed to Architect & Employer's approval. The cost of demolished concrete and as well cost of demolishing and disposing the debris will not be measured and paid for.

iii) Where in the opinion of the Architect & Employer the structural members containing honey combing can be allowed to be retained with rectification, the rectification shall be carried out as directed by the Architect & Employer by gunitting (with cement mortar 1:3 proportion) or epoxy bonding and plastering the areas concerned at the contractor's expense.

iv) If such honey combed areas are not severe in the opinion of the Architect & Employer and where so directed shall be patched up with dry-pack cement mortar consisting of 1 part of cement and 3 parts of sand after removing defective concrete down to sound concrete to the satisfaction of Architect & Employer all at the expense of the contractor. Such works should be completed within 72 hours from deshuttering.

v) Concrete faces to be finally concealed shall be left as from the shuttering, except that honey combed surface shall treated as above (i), (ii), (iii) & (iv). Faces of

concrete that are to have finished other than specified shall be prepared in an approved manner and as instructed.

vi) The patched up areas shall be kept moist for 7 days and prevented from drying out too soon. Wherever required or instructed by the Architect & Employer, patching work shall be done using part white cement upto 30% of the total quantity of cement specified.

B.5.6. **Construction joints:**

Concreting shall be carried out continuously upto construction joints, if any, the position and details of which shall be predetermined by the Architects/Employers. Construction joints shall be provided as directed by the Architect. They shall be rebated and or of an approved shape for slabs, beams etc., and shall be provided in the positions described on the drawings or as directed by the Architects/Employer. Inclined "Feather" joints shall not be permitted. Shear keys not less than 2" deep and equal to 50% of the cross sectional area shall be provided to all construction joints. Reinforcing bars shall extend by not less than 60 time dia of respective bars for M:150, 50 times dia, for M:200, beyond construction joints, unless otherwise indicated.

The joints shall be kept only at places, where the shear force is minimum and these shall be at right angles to the direction of main reinforcement. In case of columns,

the joints shall be horizontal and about 3" below the bottom of the deepest beam framing into the columns.

B.5.7. **Structural joints:**

Expansion joints, construction joints, hinges or other permanent structural joints shall be provided in the position and of the form described in the drawings or as directed by the Architects/Employers and shall be got approved before casting.

In no case shall the reinforcement corner protecting angles or other fixed metal items, embedded in or bonded into concrete, run continuously through the expansion joints. The placing of concrete or either side of the expansion joint shall be separated by suitable filler materials during continuous construction or alternately adequate space left during construction and filler materials placed in position later after an interval of atleast seven days.

B.5.8. **Cutting into concrete:**

No concrete shall be neither cut into, nor shall it be interfered with in any way, without the prior approval in writing by the Architect & Employer.

B.5.9. No portion of the structure shall be subjected to any loading in excess of design loads, except with prior written permission of Architect.

B.6.0. **Strength of Concrete:**

B.6.1. The concrete mix shall be so made to produce the desired grade concrete having the required workability and characteristic strength not less than values given below:

Grade Definition	**Specified Minimum Characteristic compressive strength at 28 days**
M – 15	150 Kg/Sq.cm
M – 20	200 Kg/Sq.cm

M – 25	250 Kg/Sq.cm
M – 30	300 Kg/Sq.cm
M – 35	350 Kg/Sq.cm

Strength of concrete required for various situations have been clearly stipulated in the relevant item of the schedule of quantities and/or in the drawings. As required by the Architect, the water content and the water/cement ratio shall be determined from the results of tests of the materials proposed for use, in advance of construction. It is important to maintain constant water cement ratio at its correct value.

If the concrete produced at site does not satisfy the above strength requirements, the Architect & Employer will reserve the right to require the contractor to improve the method of batching, the quality of the ingredients and the mix with increased cement contents, if necessary. The contractor shall not be entitled to claim any extra cost for the extra cement used or for the modifications, for fulfilling the strength requirements as specified. The able guide for the quality and for durability of

concrete. It must also have an adequate cement content and as well a low water – cement ration, as given below, which is applicable for moderate weather conditions, as specified in I.S. 456 – 2000.

MINIMUM CEMENT CONTENT	MAXIMUM WATER – CEMENT RATIO
Moderate conditions 290 Kg/Cum	0.55

The minimum cement contents is based on 20mm aggregates. For 40mm aggregate it should be reduced by about 10% and for 12.5mm aggregate it should be increased by about 10%.

B.6.2. **Strength tests during the work:**

Samples should be taken from each 20 cum of concrete made during the progress of the work, or when a day's concrete work does not amount to 20 cum, then from each day's quota, and as required by Architects/Employers. Six samples of cubes of size

150 x 150 x 150mm shall be taken jointly each time in steel moulds, 3 of which shall be tested for 7 days strength and the remaining 3 shall be tested for 28 days strength on 7th and 28th day respectively, after the day of casting. Proper curing arrangements, as directed by Employers/Architects, shall be made at site by the contractor. Each cube shall be marked and numbered, and dated by the contractor.

The contractor shall maintain a register at site as directed by the Architect Employer, showing all particulars (date of casting, mix of concrete, location of concreting, water cement ratios, approximate concrete quantity represented by samples, no of cubes cast, date and results of testing, and remarks) and all the entries should be signed jointly by the contractor with Architect & Employer. 7 days strength shall not be less than 2/3rds of the 28 days strength. The results of the tests in any of the recognised laboratories and/or contractor's laboratory at site shall be taken as final and binding on the contractor. The average strength shall be higher than the prescribed strength. The average strength of the specimens taken at a time, may be assumed as the compressive strength of concrete, provided the difference between the maximum and minimum strength of the three specimens does not exceed 15% of the average strength. Concrete test cubes shall be taken out and got tested as per time schedule for knowing 7 days and 28 days crushing strength, at no extra cost, either at site or at an approved laboratory. Whenever for any set of cubes, if the 7 days crushing strength is found satisfactory, 28 days tests are not necessary. In cases, where 7 days strength is not satisfactory, tests for 28 days strength must be gone done WITHOUT ANY EXCEPTION.

In case the compressive strength obtained from the test samples of concrete at 28 days is less than the minimum specified characteristic compressive strength, the work is liable to be rejected at the sole discretion of Architect & Employer.

Employer's & Architect's decision regarding dismantling of such works or suitable rectifications or any alternative assessment by load test for allowing the corresponding work to be retained, shall be final and binding on the contractor. These shall be carried out at contractor's cost only. The condition of any test does not guarantee acceptance of concrete covered by the test final decision regarding finally accepting/rejecting such works even after conducting those tests shall be made by the Architect & Employer only.

In case of concrete showing test results lower than the specified strength and in the opinion of the Architect & Employer such works could be allowed to remain, after due and satisfactory rectifications, if any, ordered and or load tests or even otherwise, then the rates quoted by the contractor, corresponding to those items, shall be reduced suitably for paying for that part of work. The Employer/Architect shall have full power in their absolute discretion to fix the actual rate payable after deduction, and it shall be binding on the contractor. If the strength is so low that in the opinion of Architect & Employer, the work has to be dismantled, then the contractor shall do so as directed at his own cost irrespective of the amount of loss,

inconvenience and difficulties involved. Rejected/dismantled work shall not be paid for.

If in the opinion of the Architect & Employer/Engineer any load test or hammer test or any other test is necessary, the same shall be carried out by the contractor as directed and he shall bear the cost of the same. Based on the results of the tests, the Architect shall reduce rates/accept after rectification or modification/reject and order dismantling of concrete, and the decision shall be final and binding on the contractor.

The contractor shall pay all costs incurred in supplying the material for and in making, maturing, delivering and testing the cubes.

B.7. **RECORD OF CONCRETING:**

B.7.1 The contractor shall keep a daily record showing the date when each portion of concrete is poured in slab, beam, column footing etc., curing period, removal of formwork and test cubes results at 7 days and 28 days period and observations on the same.

B.8. The rates for concrete shall also include, apart from any other factors specified elsewhere in the tender, as follows:

B.8.1. All materials required for design/ nominal mix concrete, getting the designs for the design mix from an approved agency, labour, use of tools and plants, scaffolding, mixing, conveying, placing, ramming, vibrating, formwork, finishing, curing, hacking etc., complete as required and directed.

B.8.2. Rates for concrete items shall cover

a. Any shape and size, and for doing at any height and depth (all lifts) as per drawings, providing cover blocks or nylon spacers etc.

b. Fixing all inserts such as pipes, plugs, forming holes/pockets etc.

c. Providing dowel bars, etc., through shuttering and forming drip moulds to chajjas, sills etc., or at any other places as directed.

B.9.0 **MODE OF MEASUREMENT:**

B.9.1. Length of columns will be measured upto top of the slab.

B.9.2. Length of main beams will be measured between columns and depth below the top of the slab. For secondary beams length will be between main beams.

B.9.3. Slabs to be measured in Cum between beam to beam.

B.9.4. Chajjas will be measured in Sqm. Width to be measured beyond lintel width.

B.9.5. For staircase, RCC steps, waist slab, beams will be measured in Cum.

B.10. **PRECAST CONCRETE:**

B.10.1. All provisions in the specifications for concrete shall apply to precast concrete except for the specific variations given herein below:

B.10.2. **Aggregate:**

For maximum size of aggregate shall not be larger than one third of the minimum dimension of the member.

B.10.3. **Concrete Cover:**

For all surfaces not exposed to weather, all reinforcement shall be protected by concrete equal to the nominal diameter of bars but not less than 15mm.

B.10.3. **Concrete Cover:**

For all surfaces not exposed to weather, all reinforcement shall be protected by concrete equal to the nominal diameter of bars but not less than 15mm.

B.10.4. **Care:**

The concrete in one precast piece shall be placed in one operation. No piece shall be removed from the mould or erected until sufficiently natured to ensure that no damage may occur to the piece.

B.10.5. **Details:**

All details of jointing, inserts, anchors and bearing widths etc., shall be as shown in the drawings.

B.10.6. **Identification and Marking:**

All precast concrete members shall be properly marked to indicate the top of the member and its location.

B.10.7 **Transportation, Storage and Erection:**

While handling, including loading/unloading, the members shall be supported/hung at such suitable points, so that the member may safely withstand all the loads/stresses etc., that may occur/develop. For this, suitable hooks/markings etc., shall be provided, while casting itself, as may be necessary and or as directed.

B.10.7.1. Units shall be stored, transported and placed so that they will not be over stressed/pressed or damaged.

B.10.7.2. Precast concrete units shall be adequately braced and supported during erection to ensure proper alignment and safety and such bracing and supports shall be maintained until there are adequate permanent connections.

B. **MASONRY:**

C.1. **AAC BLOCKS MASONRY:**

C.1.1. **AUTOCLAVE AEREATED BLOCKS:**

The Blocks shall be from approved Manufacturer and shall confirm to BIS: 2185 (Part 3) – 1964 and shall be of quality approved by the Employer and Architect before placing orders for the same. All the tests shall confirm to BIS: 6441 – 1972.

a. The maximum variation in length shall not be more than +/- 5mm and that in height / width shall not be more than +/- 3mm.

b. The Block density shall be between 5.51 to 6.50 KN/Cu.M.

c. The shall have a minimum crushing strength of 4N/Sq.mm.

d. The thermal conductivity shall not exceed 0.24 W/m.k

e. The drying shrinkage shall not be more than 0.05%.

f. If the contractor executes the work, without approved quality of blocks, the same shall be liable for rejection or paid at reduced rates, at the sole discretion of the Employer and Architect, which shall be final and binding.

C.1.A. **BRICK MASONRY:**

C.1.A.1. **BRICKS:**

a. The bricks shall be of best locally available quality, and having the specified crushing strength, and shall be of quality approved by the Employer & Architect before placing orders for the same.

b. They shall be sound, hard and well burnt. They must give a ringing sound when struck with a metal piece and shall have frog.

c. They shall be free from cracks, flaws and nodules and also free from lime or stone pieces.

d. All bricks when dry, shall have an average compressive strength not less than 35 Kg/Sqmm, unless otherwise specified.

e. The bricks wherever specified as wire cut and or machine made, shall have compressive strength not less than 75 Kg/sq.cm, unless other wise specified. The crushing strength bricks of bricks which vary by more than 15% of average strength of that group of sample, must be omitted and average strength of balance bricks only shall be considered as representative of that lot of bricks.

f. The contractor shall produce different brands of locally available bricks for approval by the Employer & Architect. If during the execution of the work, it is observed that the bricks of approved brand/quality are not sufficient in quantity or Manufacturer's have not maintained the same approved quality, then the contractor shall make alternate arrangements to procure bricks from any other source even with longer leads without any extra cost, after getting same approved in advance by the Architect & Employer, as done earlier.

g. If the contractor executes the work, without approved quality of bricks, the same shall be liable for rejection or paid at reduced rates, at the sole discretion of the Employer & Architect, which shall be final and binding.

C.1.2. **Mortar:**

The sand should be only of approved quality and 'Coarse' unless otherwise specified. It will be screened and/or washed, if required and directed, without extra cost. Unless otherwise stated, cement mortar for brick work shall be of 1:6 (1 cement : 6 sand) proportion for walls of one brick thick and above. While for half brick walls or brick on edge work cement mortar shall be of 1:4 (1 cement :4 sand) proportion.

C.2. **WORKMANSHIP:**

C.2.1. **Proportion and mixing of cement mortar:**

Cement and sand shall be mixed in the specified proportion by volume by emptying cement bags on measured quantity of sand and thoroughly turning over the mixture in a dry state, till uniform colour is obtained. The mixture is made into the form of a frustrum of a cone with a hollow at top centre, and then water added to it. The whole material is then thoroughly turned and mixed till mortar is homogeneous; and shall be mixed only for such quantities, which can be readily used. Not more than 30 minutes should pass between adding of water to the dry mixture and the actual placings of mortar in position.

C.2.2. **Construction:**

C.2.2.1. All brick work shall be set out and built to lines, levels, batters, curves and to any shape or position to dimensions, thickness and heights shown upon the drawings, and a good bond shall be preserved throughout the work both laterally and transversly. English bond shall be used throughout.

C.2.2.2. All bricks shall be thoroughly wetted before use in the manner that water penetrates to the full depth of brick stock, and every brick is fully soaked.

C.2.2.3. Single or double scaffolding of adequate strength shall be provided for all types of loads likely to come on them during construction. In case of single scaffoldings all the scaffolding holes shall finally be filled with cement concrete 1:3:6 (1 cement :3 coarse sand : 6 graded stone aggregate, 20mm nominal size) at contractor's cost.

C.2.2.4. All courses shall be laid truly horizontal and all vertical joints made truly vertical.

C.2.2.5. Where water is met within foundations, work space shall be kept free of water by the contractor while the brick work is in progress and until the mortar, pointing, plastering have properly set.

C.2.2.6. No half or quarter brick shall be used except as closures. The closures shall be horizontal and the walls shall be raised plumb. Not more than ten courses shall be raised in a day and no part of the work shall be raised more than one meter above another at any time.

C.2.2.7. Joints shall be uniform in thickness. All joints shall be adjusted to its final position in the wall while the mortar is steel soft and plastic. All vertical joints shall be full of mortar and well compacted with trowel and just sufficient water (so that cement/mortar does not flow out of the joints). No looseness/hollows in the mortar (in the joints) shall be permitted. Any unit, which is disturbed after mortar has stiffened or the mortar in the joints is loose or has hollows, shall be removed and re laid with fresh mortar.

C.2.2.8. All joint shall be raked out, while the mortar is still green, to a depth of 10mm (minimum) to ensure a good key for plastering.

C.2.2.9. Half brick walls shall be reinforced at every 4th bedded course with 25 x 1.5mm hoop iron reinforcement well in mortar, properly lagged etc., and as directed by the Architect. Alternatively two 6mm dia bars be embedded in cement mortar in same locations.

C.2.2.10. In brick arches or other circular work, the bricks shall be shaped to slope, joints radiating outward and correctly from the center, front to back of walls and joints shall be not more than 12mm thick.

C.2.2.11. All brick work shall be adequately watered atleast for three times as day, for ten days continuously.

C.2.2.12. During the rains and frosty weather, the work shall be carefully covered, without extra charge, so as to prevent any mortar being washed away etc. Should any brick work be damaged, the same shall be removed and rebuilt at the contractor's expense.

C.2.2.13. Chases and raked out joints shall be kept free from mortar or other debris. Spaces around door frames and other built-in items shall be solidly filled with cement mortar 1:3 (1 cement :3 coarse sand) or cement concrete 1:3:6 (1 cement :3 coarse sand : 6 hard stone aggregate of suitable size). Anchors, wall plugs, accessories, flashings and other items required to be built in with masonry shall be built in as masonry work progresses. Unfinished work shall be stepped back for jointing with new work. Toothing may be resorted to, only when specifically approved by the Architect. Before new work is started, all loose mortar shall be removed and the exposed joints shall be thoroughly cleaned before laying new work.

C.3. **RATES TO INCLUDE:**

Apart from other factors mentioned elsewhere in this contract, the rates for brick masonry shall also include following:

C.3.1. All materials, labour, tools/equipment used and other items intended for the satisfactory completion of brick masonry at all heights and depths.

C.3.2. Erecting and removing of all single or double scaffolding, (as may be directed/specified), ladders required for the execution of the work at any height and depth and shape as shown in drawings or as directed by the Architect & Employer, and as well cleaning everyday the surface of masonry executed on that day.

C.3.3. Cutting of brick work, raking out joints to received plaster, removing stains and mortar lumps, making required chases and openings and filling the chases with cement mortar not leaner than 1:4 (1 cement :4 coarse sand), all as specified/directed.

C.3.4. Reinforcement embedded in cement mortar, including cost of reinforcement, in half brick walls and brick on edge work.

C.3.5. Dewatering, wherever required.

C.4 **MODE OF MEASUREMENT:**

All brick work, except half brick work and brick on edge, shall be measured in cubic meters. Half brick and brick on edge will be measured in Sq.meters. Deductions shall be made for all openings, lintels, beams, chajjas/shelves bearings, and the like and columns etc., occupying full thickness of the walls. No deductions will be made for ends only of

i. Dissimilar materials like girders, beams, lintels, rafters etc., upto 500 Sq.cm. cross section, and for

ii. Openings upto 0.1 Sq.m. in face area.

D.O. **RUBBLE MASONRY:**

D.1. **MATERIALS:**

D.1.1. **Stones:**

D.1.1.1. They shall be blue granite stones from an approved quarry.

D.1.1.2. They shall be tough, hard, dense, durable, sound, uniform in colour and texture and free from flaws, cracks, unjuries, veins, crystals, minerals, salt, cavities, skins (weathered surfaces) and other defects.

D.1.1.3. The stone shall not absorb water more than 5% of its dry weight, when immersed in water and tested as per I.S. 1224.

D.1.1.4. The contractor shall furnish a sample of stones which he intends to use on the works and get the same approved by the Architects, well before start of masonry.

D.1.1.5. All Royalties, Compensations, Taxes, Octroi, duties, etc., payable for securing stones shall be paid by the contractor and included in the rates quoted for respective items.

The mortar shall be as specified in the item or as shown on drawing. The sand shall be coarse and of approved quality and may be screened or washed, if required, without extra cost.

D.2.0. **WORKMANSHIP:**

D.2.1. **Masonry:**

D.2.1.1. The stones shall be hammer dressed, unless otherwise specified in the item, before they are laid in position. For masonry to be plastered, bushes on surfaces shall not exceed 12mm in thickness and for other (exposed) faces not more than 25mm.

D.2.1.2. The masonry shall consist of large stones flat bedded, properly selected for their places and carefully laid, with a suitable proportion of smaller stones and chips to fill up the interstices (but not on faces). No face joint shall exceed 20mm and shall also be not less than 10mm in width. The stones shall be wetted before laying in mortar. The work shall be hand set and solidly bedded in and surrounded with mortar fully and properly on every side except the face.

D.2.1.3. Flat stones shall not be less in breadth than in height and its length shall not be less than 1½ times its height.

D.2.1.4. Through stones or headers shall be laid in every course at a distance not exceeding 1.0 meter apart and shall be staggered. They shall be in one piece for walls upto 600mm width and shall be lap jointed (laps not less than 150mm) in case of greater thickness, if laps are desired by the contractor. In no case length of these stones shall be less than 400mm. Alternately headers may be of precast cement concrete blocks of cement concrete 1:3:6 (1 cement : 3 coarse sand: 6 hard stone aggregate 20mm nominal size) and in cross section, height shall be equal to the height of that course

in the masonry. The face area of each header shall not be less than 0.05 sq.m. They shall be distinctly marked on their face.

D.2.1.5. Quoins shall have the same height as that of the course. They shall be laid header and stretcher alternatively. Faces of quoins shall be fair dressed. No quoin stone shall be less than 0.03 cum in content. Jambs or doors, windows and openings be formed with quoins only. They shall have uniform chisel draft of 40mm at the corner edges.

D.2.1.6. The masonry shall be laid to lines, levels, curves, and shapes as shown in the plans. The face of all masonry work shall be strictly in plumb. In the case of battered walls, the courses on the battered surface side shall be at right angles to the batter. All joints shall be raked out to a depth not less than 20mm, and unless otherwise stated shall be flush pointed for all exposed surfaces with cement mortar of proportion (1 cement :3 fine sand). The width of pointing shall be uniform and constant.

D.2.1.7. The fixtures, plugs, frames etc., if any, shall be built in places as shown on plans, while laying the masonry, and not afterwards, by removing the stones already laid.

D.2.1.8. Bad work shall be pulled down, as directed by the Architect, and shall be rebuilt at the contractor's cost.

D.2.1.9. All masonry shall be washed down on completion and all stains and mortar removed from the faces as scaffolding is removed, on each day.

D.2.1.10. Holes of the required size and shape shall be preferably left during construction alone for fixing pipes, service lines etc. After the pipes are fixed in position the hollows if any, shall be filled in with 1:3 (1 cement : 3 coarse sand) cement mortar or 1:3:6 cement concrete (1 cement: 3 coarse sand: 6 graded stone aggregate 20/12.5mm nominal size as required). The face shall be neatly finished with matching stones. Iron and steel fixtures shall be embedded in cement mortar 1:5 91 cement :5 coarse sand).

D.2.1.11. In wet foundations, work space shall be kept free from water, while the masonry is in progress and until the mortar has sufficiently set.

D.2.1.12. Adequate single/double scaffolding as required and or directed for constructing masonry shall be provided and scaffolding holes filled with cement concrete (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) and finished to have surfaces matching with adjacent stones by the contractor at his expenses.

D.2.2. **Coursed Rubble – Stone Masonry – Second Sort:**

D.2.2.1. Exposed face stones shall be khandki dressed to have the vertical and horizontal sides perfectly straight, parallel at right angles to the adjacent sides. Where the interior face is to be plastered, the backing stones and hearting shall be as specified for uncoursed rubble masonry, chisel drafts of 37mm dia shall be provided at the external corners, when stone face is not chisel dressed.

D.2.2.2. Height of each course shall not be less than 150mm and all the stones in any course shall be of the same height. Unless otherwise stated, height of all courses shall be uniform. In no case the height of any course shall be more than any of the courses below it. The bed and joints shall be hammer or chisel dressed back from the face for 3″ and 1½″ width respectively. The faces of the stones shall be hammer dressed and bushings shall not be more than 10mm. Thickness of the joints shall not exceed 10mm. Stones shall break joints atleast half of the height of the course.

D.2.2.3. Quoins shall be atleast 0.5m long (limited to thickness of wall when single piece placed across the jamb), laid square on their levels and beds shall be fair dressed to a depth of atleast 10mm.

D.2.2.4. Face joints shall not exceed 15mm.

D.2.3. **<u>Uncoursed Rubble Masonry:</u>**

Rubble stones shall be uncoursed blue granite stones from an approved quarry. They shall be tough, hard, dense, durable, sound, uniform in colour and texture and free from flaws, cracks, injuries, veins, crystals, minerals, salts, cavities, skins and other defects.

If ordered by the Architect & Employer, 75 x 75mm or of specified size weep holes shall be provided in the masonry without any extra cost, at spacings as directed by the Architect.

During the progress of the work, if necessary, diversion of the nalla shall be provided and maintained by the Contractor at his own cost.

In wet foundations, work space shall be kept free from water while the masonry is in progress and until the mortar has sufficiently set in. Dewatering shall be done bailing out water or pumping out water by the contractor at his own cost.

Adequate scaffolding required for constructing masonry walls shall be provided by the contractor at his expenses.

Flush cement pointing shall be done in cement mortar 1:3 (1 cement : 3 fine sand) unless otherwise specified. The width of pointing shall be constant and not varying.

Stones shall be hammer dressed. Nearly half the stones shall not be less than 0.01 cum each in content and 25% of stones shall tail back into the masonry by 40mm or more. The stones shall be so arranged to break horizontal joints atleast by 50mm and long vertical joints being carefully avoided.

Cement mortar shall be of (1:6) proportion, unless otherwise specified.

For masonry to be plastered, bushes shall not exceed 12mm, in thickness.

Flat stones shall not be less in breadth than in height and its length shall not be less than 1½ times its height.

The masonry shall consist of large stones flat bedded, properly selected for their places and carefully laid with a suitable proportion of smaller stones and chips to fill up interstices (hearting). The stones shall be wetted before laying in mortar. The whole work shall be hand set and solidly bedded and surrounded well with compacted mortar on all sides, except the face.

Through stones or headers shall be laid in every course at a distance not exceeding 1m. apart and shall be staggered. They shall be in one piece for walls, upto 600mm

width and shall lap atleast 150mm for thicker walls. Face area shall not be less than 0.05 Sqm. They shall be distinctly marked less than 400mm. Alternately headers may be of precast cement concrete blocks of cement concrete 1:3:6 (1cement : 3 coarse sand : 6 hard stone aggregate 20mm nominal size) and in cross section, height shall be equal to the height of that course in the masonry.

Quoins shall have same height as courses and shall be laid alternatively header and stretcher. They shall be fair dressed and shall be less than 0.03 cum in content. Jambs of doors, windows and openings shall be formed with quoins. They shall have uniform chisel draft of 40mm at the corner edges.

The masonry shall be laid to lines, curves, levels and shapes as shown in drawings. The face of masonry shall be in plumb. In case of battered walls the courses on the battered side shall be at right angles to the batter.

All face joints shall be raked out for a depth not less than 20mm, and unless otherwise stated, shall be pointed sunk/raised/flush (as may be decided by the Architect) with cement mortar 1:3 (1 cement : 3 fine sand) in case of all exposed surfaces. The pointing shall be of uniform and constant width. The masonry shall be shaded from the sun and watered well for 10 days.

For the days work, all masonry shall be washed down, on completion of days work, of all stains; and mortar splashes removed from the face for the days work and before the scaffolding is removed.

The joints shall be uniform on the face and be not more than 20mm in width.

D.2.4. **Random Rubble – First Sort:**

D.2.4.1. Stones shall be roughly chisel dressed. They shall be so arranged as to break joints as much as possible, avoiding continuous lines of joints horizontal and vertical. Quoins shall be same as for coursed rubble second sort.

D.2.4.2. All stones shall be carefully fitted with uniform thickness of joints not exceeding 20mm. Face joints shall be chisel dressed for a depth not less than 25mm for fitting in position properly.

D.2.4.3. All other details shall be same as for coursed rubble stone masonry 2nd sort.

D.3.0 **MODE OF MEASUREMENT:**

Masonry work will be paid in Cu.m. All deductions shall be made specified for brick masonry work.

D.4.0. **STORM WATER DRAINAGE:**

Storm water drains shall be constructed as per drawings/directions, and on either one or both sides of the road, (unless the land beyond both the shoulders slopes away adequately), to serve as catch water drains and or for continuing upstream drain. The dimensions and slopes shall be as detailed in the drawings and as required and directed. Bed concrete shall be of P.C.C. 1:3:6 (1 cement : 3 coarse sand :6 hard graded stone aggregate 40mm size) of 150mm thickness. Drains shall be constructed either in rubble masonry or brick masonry as required and shall be plastered in CM 1:6 (1 cement : 6 fine sand) or as specified/directed. The sides of drains may also be of cast-in-situ or precast with cement concrete 1:2:4 (1 cement :2 sand : 4 hard graded stone aggregate 20mm nominal size), if so specified. When the drain is provided by the side of road, adjoining the shoulder necessary stone masonry parapets shall be provided over the drain wall on the road side.

D.5.0. **DRY RUBBLE PITCHING:**

The rubble stones for pitching shall be sound, hard and durable and fairly regular in shape. The average depth of the stones shall be not less than the specified thickness of pitching (and depth of any individual stone shall generally be less by more than 25mm) and each stone shall generally be not less than 0.01 cum or as ordered by the Architect & employer. The smaller size stones shall be brought to site only for the purpose of packing and wedging.

The slopes of the bank shall be made up with morrum and trimmed to the required slope and properly compacted in layers (each not more than 200mm) after adequately watering profile shall be put up with pegs and strings at required intervals for the pitching, to ensure that it is done true to line, curves, levels, thickness and slopes.

Toe wall as shown and directed shall be provided at the toe to support the pitching and shall be measured along with the slope of pitching. The pitching shall be commenced at the toe and laid course by course up the slope. The stones shall be laid closely in position on the prepared bed, and firmly set. The pitching shall be laid to line, levels, curves and slope as indicated in the plans or as ordered by the Architect & Employer. Each stone shall cover the full depth of pitching and shall be perpendicular to the sloping bed. The stones shall be laid with breaking joints as far as possible.

Additional morrum, bedding, if required, for proper slope shall be laid out simultaneously, watered and well rammed. The joints between stones shall be filled in with spalls of proper size and wedged in with hammers to ensure tight packing or filled with CM 1:5 (1 cement :5 coarse sand) for depths not less than 75mm or as specified and directed. The item includes repairing disturbed pitching, if any, as and when required and directed.

Flush pointing shall be done in cement mortar 1:3 (1 cement :3 fine sand), if so specified/directed.

E. CEMENT PLASTERING/CEMENT POINTING:

E.1.0. MATERIALS:

E.1.1. Cement, sand and water constituting the materials for the work shall conform to the specifications laid down for the concrete work. Fine sand shall be used as per IS Code.

E.1.2. Lime required for neeru finish shall be of approved variety fat lime.

E.1.3. Mortar shall be in proportion s specified in the bills of quantities.

E.2.0. WORKMASHIP:

E.2.1. **General:**

E.2.1.1. Adequate single scaffolding (if specifically permitted) shall be provided by the contractor at his expense and the scaffolding holes shall be filled in with cement concrete 1:3:6 (1 cement : 3 coarse sand: 6 hard graded stone aggregate 20mm size) compacted well and plastered over before lowering the scaffolding just below, if any,

without any extra cost. In case double scaffolding is done, nothing extra shall be paid.

E.2.1.1. Dewatering the foundation if required, shall be done by the contractor at his own cost.

E.2.1.2. The surfaces to be plastered shall be first cleaned and watered well in advance and thoroughly wetted before plastering.

E.2.1.3. Smooth surfaces of concrete, old plaster etc., shall be suitably roughened or removed to provide necessary bend for the plaster. All dirt, sports, oil paint etc., which prevents proper bond with plaster, shall be removed.

E.2.1.4. Patches of plaster 150 x 150mm shall be put on about 3 meter apart as gauges, to ensure even plastering in one plane.

E.2.1.5. All plaster work will be done to lines levels and plumb and to the satisfaction of Architect & Employer.

E.2.1.6. For walls, columns and beams, thickness will be minimum 20mm for external faces and 15mm thick for internal faces, while for ceiling it shall be average 10mm, unless otherwise specified in bill of quantities.

E.2.1.7. The thickness specified shall be average and measured from the proudest part of the surface.

E.2.1.8. Unless otherwise stated in Bill of Quantities, cement mortar shall be in 1:4 (1 cement :4 fine sand) proportion.

E.2.2. **Plaster with Neeru Finish:**

E.2.2.1. The surface thus rendered shall then be finished with good quality of lime neeru. Neeru may be prepared at site out of the best quality of fat lime slaked at site with fresh water and sifted as specified. The slaked and sifted lime shall be reduced to a fine paste by grinding in a mortar mill (150 turns). Only sufficient quantity which can be used within 10 days only, shall be prepared at a time. Chopped hessain or jute fibre in the required quantity may also be added to neeru, if directed by the Architect & Employer. Otherwise ready made neeru of approved quality can be used.

If required, plastered surfaces should be finished smooth with junction of skirting and plaster, if any, shall be finished as directed at no extra cost. All door/window jambs shall be finished as directed.

E.2.2.2. Plaster work shall proceed from top to bottom. An entire unobstructed surface shall be plastered in one operation. All exposed angles and junctions of walls and doors etc., shall be carefully flushed so as to furnish a neat and even surface. Before the base coat sets the neeru finish shall be applied and finished smooth. The entire plaster shall be surfaced truly vertical and horizontal. In case thickness item, no extra will be paid to the contractor.

E.2.2.3. All mouldings as shown on drawings or as directed shall be worked true to the template and drawn neat, clean and level, at no extra cost.

E.2.2.4. Bad work shall be pulled down as directed by the Architects/clients and shall be rebuilt by the contractor at his cost.

E.2.2.5. All plaster work shall be cured atleast for 7 days and to the entire satisfaction of the Architect & Employer. The curing shall be so done that damage to plaster with the impact of splashing water is avoided.

E.2.2.6. The contractor shall be responsible for making good any portion of plaster, which requires redoing, at his cost.

E.2.3. **Rough cast Cement plaster:**

E.2.3.1. The surface shall be cleaned as specified under cement plaster with neeru finish.

E.2.3.2. First coat comprising of cement and sand mortar 1:4 (1 cement :4 fine sand) with approved water proofing compound as per manufacturer's instruction, shall be applied uniformly with a trowel and flat board to exact plumb with thickness not less than 15mm and allow it to set for not less than half an hour.

E.2.3.3. While this is still green, the surface shall be roughened with wire brush. The surface shall be cured for 4 days.

E.2.3.4. All loose particles shall be dusted and a second coat of average 6mm thick cement mortar 1:3 (1 cement :3 fine sand) shall then be applied. Sand used shall be screened through a mesh not less than 1/16" and not more than 1/8" size and thoroughly washed, if required. The finished surfaces shall be lightly pressed with close pricked wooden board or a wet sponge to bring the sand particles into prominence.

E.2.3.5. General workmanship, curing etc., shall be all as specified for cement plaster with neeru finish.

E.2.4. **Water proof cement plaster:**

This shall be all as specified herein before for cement plaster work except for the following:

a) No neeru finish shall be applied over the rendered surface, but the rendered surface itself shall be finished smooth by steel trowelling.

b) In the preparation of cement sand mortar, cement shall be mixed with an approved waterproofing compound such as pudlo, CICO No.1 water lock, impermo, composeal or of any other standard manufacturer as per the manufacturer's instructions and as directed by the Architects.

E.2.5. **Rate to include:**

Apart from other factors mentioned elsewhere in the contract, rates for plastering shall also include following:

E.2.5.1. All materials, labour, use of tanks/implements for satisfactory completion of the work.

E.2.5.2. Erection, dismantling and removing single/double scaffolding.

E.2.5.3. Preparing all the surfaces to secure plaster.

E.2.5.4. Providing cement plaster of specified average thickness (measured from the proudest part of BB/stone work) and proportion at all heights and depths and to any shape as directed.

E.2.5.5. Curing for 7 days.

E.2.5.6. Chicken mesh of approved gauge shall be provided at all the junctions of concrete, masonry, timber and grouting of chases made for electrical/plumbing or other prupose as directed at no extra cost. Prover V-grooves must be made at all junctions of walls and slabs/beams/columns etc., at no extra cost.

E.2.5.7. Any moulding, bends, arisers, gooves/drip mould, rounding/Vatas, chamfering, soffits of arches, and also making good damaged plaster after their (Contractor's) all the sub contractor or nominated sub contractors have done their work.

E.2.6. **Mode of Measurement:**

All plastering will be measured in square metre, unless otherwise described, as per relevant I.S. code.

Walls:

The measurement of walls plastering shall be taken between the walls or partitions for the length and from top of floor or skirting upto the ceiling bottom for the height. The dimensions before plastering shall be taken.

Ceiling:

Ceiling shall be measured between walls or partitions and the dimensions before plastering shall be taken. Ceilings with projected beams shall be measured over beam and the plastered side of the beam shall be measured and added to plastering on ceiling.

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 sq.m each in area and openings not exceeding 3 sq.m each., deductions and additions shall be made in the following manner.

E.2.6.1. No deduction shall be made for ends of joists, beams posts etc., and openings, not exceeding 0.5 sq.m. each, and no addition shall be made for reveals, jambs, soffits, sills, etc., of these openings no for finishing the plaster around ends of joists, beams, posts, etc.

E.2.6.2. Deductions for openings exceeding 0.50 sqm but not exceeding 3 sqm each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills,etc., of these openings.

E.2.6.3. Deductions for openings exceeding 0.50 sqm but not exceeding 3 sqm each shall be made as follows and no additions shall be made for reveals, jambs, soffits, sills, etc., of these openings.

When both faces of wall are plastered with the same plaster, deduction shall be made for one face only.

When two faces of wall are plastered with different plasters or if one face is plastered and the other pointed, deduction shall be made from the plaster or pointing, on the side of frames for doors, windows, etc., on which the width of reveals is less than that on the other side, but not deduction shall be made on other side.

E.2.6.4. In case of openings of area above 3 sq.m each, deductions shall be made for the openings, but jambs, soffits and sills shall be measured.

E.3.0. **CEMENT POINTING:**

E.3.1. **Materials:**

E.3.1.1. Cement, sand and water shall conform to the specifications laid down for the concrete work, fine sand to be used as per ISI code.

E.3.2. **Workmanship:**

E.3.2.1. Dust and mortar powder shall be brushed out of all joints. The surface shall then be washed with water and kept wet before pointing is commenced.

E.3.2.2. In case of dry rubble pitching, the cement mortar 1:4 (1 cement : 4 sand) proportion shall be well pressed into the joints with a pointed trowel and rubbed smooth. It shall not be spread over the corners, edges and face of the masonry. All superfluous mortar, if any, shall be removed, with a trowel. All joints shall be generally uniform in size.

E.3.2.3. The pointing shall be kept wet for atleast ten days. It shall be suitably protected from sun, rain and other factors during the period of curing.

E.4. **Mode of Measurement:**

Pointing work shall be measured in Sq.meters. Deductions for openings exceeding 0.5 sq.m. will be made, same as for plaster.

F. FLOORING:

F.5. GRANITE FLOORING SKIRTING AND FACING:

F.5.1. Materials:

F.5.1.1. Granite stone slabs shall of the thickness and type mentioned in the item and of the colour and quality approved by the Architects. Slabs shall be hard, dense, uniform and homogeneous in texture. They shall have even crystallized grain and be free from defects and cracks. The surface shall be mirror polished to an even and perfectly plain surface and edge machine cut, true and square.

F.5.1.2. No slab shall be thinner than the specified thickness, at its thinnest part. The dimensions of the slab shall be as specified in the item. A few specimens of approved finished slabs shall be deposited by the Contractor in the Architect's office for reference.

F.5.1.3. All the Granite slabs brought to site shall be got approved by the Architect & Employer, before using them in the work. Sizes of Granite slabs for floorings,

steps/raisers and dado etc., shall be got approved by Architect & Employer, before ordering for the same.

F.5.2. **Workmanship:**

F.5.2.1 They shall be laid to the pattern shown in the drawings or as directed by the Architects.

F.5.2.2. The surface on which the Granite slabs are to be laid shall be cleaned of all dust and saturated with water.

F.5.2.3. The Granite slabs shall be set in cement slurry over cement mortar bedding as specified and tamped with wooden mallet. The joints shall not exceed 1mm. In thickness and shall be grouted/flushed with white cement mixed with pigment of suitable colour, if required, to match the shade/colour of slabs, and cured for 10 days.

F.6. **GLAZED TILE IN FLOORS, DADOS & SKIRTING:**

F.6.1. **Materials:**

F.6.1.1. glazed tiles shall be of first quality and of approved make and 5.5 mm in thickness. They shall be sound, hard and well and evenly glazed with fine and sharp edges, and free from twists. The rear face shall be grooved and recessed or suitably moulded, in parts, to provide necessary cessed or suitably moulded, in parts, to provide necessary key for mortar. They shall generally confirm to I.S.777:1988 (Second revision). The tiles shall be of sizes 150mm x 150mm or 100mm x 100mm or as specified/directed.

F.6.2. **Workmanship:**

F.6.2.1. The tiles to be used for floor and dado shall be of the same manufacture and of first quality, as per approved sample.

F.6.2.2. Tiles shall be immersed in water for atleast 6 hours prior to their end use.

F.6.2.3. Cement sand mortar 1:4 (1 cement :4 coarse sand) bed (average 20mm thick for flooring and 12mm thick for skirting finished to proper levels and falls. After the surface has hardened sufficiently, it shall be roughened, cleaned and well set to receive a thin cement slurry of honey like consistancy. Tiles with their under side also smeared with cement slurry of honey like consistancy shall then be laid over the bedding and tamped into position properly to have the top surfaces in a true plane and level or to falls as directed.

F.6.2.4. For skirting/dado, the surfaces shall be plastered with cement mortar 1:4 (1 cement : 4 coarse sand) to make the surface even and in plumb. The surface of the plaster shall be scarified with brush for getting a good bond between the back of the tiles shall be battered with cement paste and pressed on the plastered surface as per flooring and tapped in position.

F.6.2.5. Joints shall be thin, uniform, even and straight. The joints shall be cleaned off gray cement and pointed with white cement paste with pigment, if required, to match the shade of the tiles. The work shall be cured for 7 days. After curing, the surface shall be washed clean with water and oxalic acid. The finished floor skirting/dadoo shall not sound hollow, when tapped with a wooden mallet.

F.6.3. **MODE OF MEASUREMENT:**

All flooring work will be measured in Sq.metre basis and shall be measured between unplastered wall surfaces. Skirting and dado will be measured in Sq.meters and the height above flooring will be measured, length between the finishes of adjoining walls, if any.

F.7. The ceramic flooring shall be of first quality and of approved make and 7.5mm in thickness. They shall be sound, hard and tough as per manufacturers specification. The rear face shall be groove and recessed or) suitably manholed in part to provide

necessary key for mortar. The tiles shall be of sizes 12" x 12", 8" x 8" (or) as specified/directed.

G. **WOOD WORK:**

G.1. **MATERIALS:**

G.1.1. Unless otherwise stated the timber used in this project will be second class teakwood and shall be got approved from the Employer & Architect before using it in work. The timber shall be well seasoned and free from shakes, fissures, cracks, large/loose knots or other major defects. It shall also be free from spongy, brittle, flaky wood, sapwood and all such defects, which will affect its strength, durability, appearance or usefulness for the purpose for which it is required. Any effort such as plugging, painting or using any adhesives, to hide any defects, shall render the timber liable to rejection by the Employer & Architect. No individual hard and sound knot shall be more than 40mm dia and the aggregate area of all the knots shall not exceed 1.5% of area of the piece for purposes of acceptance. It should confirm to relevant I.S.I003.

G.1.2. Any timber rejected for any reason whatsoever, shall at once be removed from the site of work.

G.1.3. Glue: Organic type shall comply with specification I.S. 852 –1957 and synthetic type shall comply with I.S.851 – 1957 in all respects.

G.1.4. Nails, screws, ties, straps, bolts, etc., shall be of the material, make and pattern as approved by the Architect. Unless otherwise specified, they must be of mild steel and be of such sections and design, such that they serve the purpose adequately.

G.1.5. The Contractor shall get all the wood approved by Architect & Employer, before taking permission of the Architect to apply paints, oils or otherwise treats wood work in anyway whatsoever.

G.1.6. All embedded parts of wood work shall be well painted with two coats of hot boiled tar or creoseted, as approved by the Architects/Employers.

G.2. **WORKMANSHIP:**

G.2.1. All the wood work shall be neatly and truly finished as per tender item dimensions with not more than 3mm, planning margin. Unless otherwise specified, the exposed wood work shall be accurately planned to the required dimensions, within planning tolerance, smooth and to lines, planes, curves or shapes as required.

G.2.2. All the necessary joinery work shall be carefully done as per normal standard practice and Architects instructions. All framed joinery for external work shall be

put together with white lead and joints pinned with hardwood or Fevicol. For internal work, unaffected by moisture, the joints may be glued and pinned or joined with fevicol as directed.

G.2.3. Framed/Fabricated wood work includes all sawing, cutting, planing, jointing, framing, supply and use of all straps, bolts, holdfasts, nauls, trensils, spikes, screws, etc., as may be necessary to complete the work and for fabricating/framing and or fixing. Fabricating/framing and trussing shall be done in the best possible manner and as shown on the drawings or as directed by the Architects/Employers.

G.2.4. The contractor shall provide labour, scaffolding, ladders and tackle necessary for hoisting and fixing wood work in position and afford facilities for its inspection during construction. The contractor shall be responsible for the safety of the work, workmen and for any action or compensation that may arise in this connection.

G.2.5. All iron work connected with wood work and going to be embedded in masonry shall, before erection, receive 2 coats of solignum/creosote. If it is to be painted, it shall be given one coat of red oxide primer and one coat of finishing paind on the ground, before being fixed in position and afterwards second coat of finishing paint.

G.2.6. All wood shall be got inspected and passed by the Architect & Employer before being put into work. The architect defective quality, despite his having previously

passed the same before it was worked upon. In no case the wood work shall be painted or otherwise, before it is inspected and approved by the Architect.

G.2.7. After fixing the wood work in position, if any defects, including damaged edges of the frames, are notices by the Architect & Employer during the execution of work or in the defects liability period, the contractor shall have to rectify the same or remove and replace the defective work, as directed and to the satisfaction of Architect & Employer, at no extra cost.

G.2.8. Any cutting and waste of timber, that may be incidental in carrying out an item, shall not be paid for extra, but shall be included in the rate for the item.

G.3. **T.W.DOORS AND WINDOWS:**

G.3.1. Timber used for this work, shall be locally available second class teakwood, unless otherwise specified, and of approved quality and as per the sample approved by the Employer and Architect. As specified in the item, all the doors shall have teakwood door frames or pressed steel frames of approved make, quality and size, with three numbers holdfasts on each leg. Teakwood beading/cover moulding will be provided wherever necessary and at no extra cost. Hold fasts shall be embedded in concrete blocks, as shown in drawings or as directed.

G.3.2. For flush doors, shutters to be used shall be solid core of best approved make (BWP quality) with ISI mark, 30mm thick (unless otherwise specified) inclusive of either commercial ply, veneer or formica of approved shade and design/pattern on one or both sides as specified and shown in the drawings and shall be bonded with phenol Formaldehyde synthetic resin. If so specified, all flush shutters shall have teak wood lipping on all four sides, as directed, which shall be fixed at site. All solid core shutters shall generally confirm to IS 2202 (Part I) & (Part 2) :1983.

G.3.3. For full panelled doors, the shutters shall be of best quality factory made with ISI marking and to be approved by the Employer and Architect and having panels of 19mm thick best approved make and quality marine ply, unless otherwise specified, and as shown in drawings or as directed.

G.3.4. The fixtures and fittings required for all the doors and windows shall be got approved from the Employer and Architect before placing the order. Any fixture found damaged or missing at the time of handing over shall be replaced by the contractor and surface of joinery made good as directed at no extra cost.

G.3.5. All the timber work including pressed steel frames shall be painted with 3 coats of synthetic enamel paint (including primer coat) of best approved make and shade as directed. In case of teak ply or decorative ply veneered shutters, they shall be French polished/wax polished, as per specifications and as directed.

G.4. **GLASS:**

G.4.1. All glass used in the doors, windows and ventilators etc., shall be of the best quality, free from specks, bubbles, smoke, veins, airholes, blisters and other defects. The kind of glass and its thickness shall be as mentioned in the item or a shown in detailed drawings or as ordered by the Architect. The glass shall generally confirm to I.S.1765.

G.4.2. Sheet glass shall be best quality of approved make plain/ground/frosted, and either 4mm or 5.0mm thick, as specified. For Bath/W.C. windows 3.8 to 4mm thick frosted glass shall have to be used as directed.

G.4.3. Plate glass shall be polished patent plate glass of best quality. It shall have both surfaces flat and parallel and polished to give clean undistorted vision. All mirrors shall be of plate glass and give clear undistorted reflection. The thickness of the glass shall be as mentioned in the item or shown in the detailed drawings or as directed by the Architect. Minimum thickness of float glass shall be 6mm.

G.4.4. Float glass, wherever specified shall be "Bronze tinted" manufactured by FLOAT GLASS INDIA LIMITED to thickness as specified.

G.4.5. **Obscured or ground glass:**

This glass transmits lights, but the vision is partially or almost completely obscured. Principal types are plain, rolled, double rolled, figured, ribbed, fluted, frosted (on one or both sides) and rough cast. The thickness shall be as specified in the item or as mentioned in the drawings or as directed by the Architect.

G.5. **MODE OF MEASUREMENT FOR DOORS AND WINDOWS:**

Payment will be made for the area of opening in the masonry as per relevant ISI. The height of the door shall be measured from finished floor level to the bottom of lintel on the top.

H.0. **UPVC LUMINIUM DOORS, WINDOWS & VENTILATORS:(Windows & Doors Manufactured from Multi-chambered un-plasticized Poly Vinyl Chloride Profiles.)**

H.1. All UPVC doors, windows & ventilators shall be procured from approved manufacturer and shall be approved by the Architect & Employer before placing the order.

Openable windows shall be double weather-stripped. One weather-strip shall be provided in the outer frame and the other weather-strip in the shutter frame. The weather-strip shall be of extruded neoprene and of a size to make the windows completely weather tight. The weather strip shall be dovetailed into the window section. The hinges of openable windows shall be strong. Pin of the hinges shall be

of stainless steel with nylon/PVC washers. In case the windows are projected type, the hinges shall be provided with brass pivots sliding on stainless steel guides. Concealed type friction stays shall be provided to keep the windows open in any desired position. The window shall be provided with handle for two-point locking or single point 6mm thick or 8mm thick float glass of first quality and approved make, free from scratches, waviness, bubbles etc., all as shown in drawing or as specified and directed.

SLIDING WINDOWS: As per latest specification of CPWD.

All sections of UPVC doors, windows & ventilators shall be as per standard sections as approved by the Employer/Consultant.

H.2. Functional Need of uPVC WINDOW

1. UPVC Windows should be fabricated with "Fusion welded corners". The Mullion / Transom can be either Fusion welded or mechanically joined with desired sealing.

2. Windows / doors must conform to the strength requirements based on wind load as per IS 875-3.

3. Appropriate thickness of steel reinforcement should be selected to meet the desired strength. The reinforcement must be installed within 6 to 50mm distance from the face of the weld.

4. For window size ≤ 1500mm tolerance is ± 3.0mm and sizes above ≥1500 mm tolerance is ± 5.0mm on both height and width.

5. The window diagonal should be less than equal to 5mm for window upto 1500mm, above 1500mm, the diagonal difference should not be more than 10mm

6. The minimum overlap of sashes on Frame/ mullion should be 5mm, higher overlap is desirable.

7. Water drainage / ventilation slot should be provided in sash / frames.

8. Min Gap of 3mm should be maintained per face between aperture and window to allow expansion / contraction of uPVC windows.

9. The gap between window and its aperture should be filled with weatherable & elastic material to allow expansion / contraction of PVC and performance over period of years.

H.3 Glazing Gaskets & Weather strip

The gaskets / weather strip shall be of EPDM/ TPE or any equivalent material which meets the following properties

a) Shore A Hardness of the material should be 60±10° A; (ref ISO 7619)
b) Ozone resistance: No visible cracks; (ref ISO 1431)
c) Compression set: should not exceed 50% ; (ref ISO 815)
d) Aging test: The properties after aging should be (ISO 188)
   i. Hardness +10 / -5
   ii. Tensile Strength not to exceed drop beyond 25%
   iii. Elongation not to exceed drop beyond 25%

H.4 Window Hardware's

The window hardware including the fastenings shall be tested in accordance with ISO 9227: 2006 for corrosion resistance when subjected to neutral salt spray test.

The performance parameters like load bearing, MOC, endurance should be specified by the supplier or mutually agreed between the two parties.

Note1: It should be noted that there is no direct correlation between a given no. of hours salt spray testing and real time natural environment exposure.

Note2: In coastal or industrial environment, the hardware performance should be specified.

H.5 TESTING OF WINDOWS

The window subjected to the testing should adopt the following Sequence of Test.

a) Air Permeability
b) Water tightness
c) Resistance to wind – deflection measurement at Pressure P1 (=P3/1.5)
d) Resistance to wind – pulsating test to P2 pressure (=0.5P1)
e) Resistance to wind – Safety test to pressure P3 (the max wind load as per IS 875)

I.0. **WATER PROOFING TREATMENT:**

I.1. Water proofing treatment to toilet blocks:

I.1.1. Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C., kitchen, and the like shall consist of:

i) 1st course of applying cement slurry @ 4.4 Kg/Sqm, mixed with water proofing compound conforming to IS 2645 in proportions recommended by the manufacturer of the compound.

ii) IInd course of 20mm cement plaster 1:3 (1 cement : 3 sand) mixed with water proofing compound in proportion by the manufacturer of the compound.

iii) The sunken portion will be filled with brick bat aggregate 25mm to 100mm size with 50% of cement mortar 1:5 (1 cement : 5 fine sand) admixed with proprietory water proofing compound conforming to IS 2645 as per manufacturer's specification/directions and finished to receive flooring.

I.1.2. **Mode of Measurement:**

I.1.2.1. For water proof treatment in baths and WCs described at (i) to (iv) above carried out in the sunken floors, both the vertical faces and horizontal surfaces shall be measured in Sqm and paid for the entire treated areas.

I.1.2.2. Brick bat coba treated with waterproofing compound described at (v) above will be measured separately in Cum and paid for.

I.2 **WATER PROOFING TREATMENT:**

I.2.1. Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc., consists of following operations:- (which are as per the specification of specialist company).

i) Applying and grouting a coat of neat cement slurry using cement at 2.75 Kg/sqm and admixed with proprietary water proofing compound, conforming to IS 2645 and in proportions recommended/specified by the manufacturer, RCC slab including cleaning the surface before treatment.

ii) Laying cement concrete using broken bricks/brick bats 25mm to 100mm size with 50% cement mortar 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound, conforming to IS:2645 and in proportions recommend/specified by the manufacturer, over 20mm thick layer of cement mortar of mix 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound, conforming to IS: 2645 and in proportions recommended/specified by the manufacturer, to required slopes and treating similarly the adjoining walls upto 300mm height including rounding of junctions of walls and slabs.

iii) After two days of proper curing, applying a second coat of cement slurry admixed with proprietary water proofing compound, conforming to IS:2645 and in proportions recommended/specified by the manufacturer.

iv) Finishing the surface with 20mm thick jointless cement mortar of mix 1:4 (1 cement, 4 coarse sand) admixed with proprietary water proofing compound, conforming to IS:2645 and in proportions recommended/ specified by the manufacturers, and finally finishing the surface with trowel with neat cement slurry and making grooves to form 300 x 300mm size square panels (grooves for part depth of top plastering only).

v) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations shall be done in above order, and as directed and specified by the Engineer – in – charge.

vii) The average thickness shall be 120mm and minimum thickness at khurra as 60. The controlling/deciding factor is provision of minimum slopes of 1:100.

I.2.2. **Rate:**

For purposes of payment, treatment described above shall be measured over flat areas of floors etc. Vertical areas treated shall not be measured for purposes of payments. Cost of same is included in the rate quoted for flat area.

I.3. Main Building contractor shall get all water proofing work (including and sunkel areas) shall be done from any of the approved agencies for this water proofing. The contractors shall obtain a guarantee for a period of 10 years for all the water proofing treatments from that approved water proofing contractor, and shall be jointly responsible for any defects noticed in the work during the above period of execution and defect liquidation liability period. Rate quoted shall include the same.

I.4. All waterproofing work shall be guaranteed for ten years in approved proforma acceptable to the Employer, on a stamp paper of required denomination. This guarantee will be given by approved waterproofing contractor directly to STATE

BANK OF INDIA as soon as the work is virtually completed and before the final bill is settled.

I.5. Although the waterproofing work is guaranteed by the approved waterproofing contractor for ten years, the main building contractor shall be responsible, if at any time during the defects liquidation liability period, the other surfaces of areas treated for waterproofing (ceiling etc) show leaks, wet patches, dampness or the waterproofing deteriorates/shows signs of distress/ give way either due to the inadequacy of the work carried out or materials/ workmanship etc., used or for any other reason whatsoever, and shall be liable without any extra cost and inconvenience to the Employer or the occupants, to carry out the necessary rectifications/remedial measures, including redoing of work, as and when required, during defects liquidation liability period, to make good the deficiencies.

J. PAINTING/POLISHING WORK:

J.1 LIME WASHING AND COLOUR WASHING:

J.1.1. The materials for preparing the lime wash shall be freshly burnt fat lime of good quality free from unburnt stone and other foreign matter.

This shall be dissolved in sufficient quantity of water (about 4-5 litres/Kg of lime), stirred thoroughly and strained through a clean coarse cloth. Alternately, ready made whiting, complying with I.S.63-1950, may also be used. Clean gum dissolved

in hot water shall then be added in suitable proportion of 2 gm. of gum-arabic to a litre of lime, to prevent lime wash coming off easily when rubbed.

J.1.2. Colour wash shall be lime wash prepared as above, to which a solution of water, lime and fast pigment, boiled if directed, shall be gradually added and stirred until the required shade/tinge is obtained.

J.1.3. As required, single or double scaffolding or ladder shall be used, without damaging or scratching the wall/plastered surfaces/floors.

J.1.4. The surfaces to be painted shall be prepared by removing all mortar droppings and foreign matter and thoroughly cleaned with wire or fibre brush. All holes or depressions shall be stopped with mortar and cured and surfaces made even and smooth before painting.

J.1.5. Colour/lime wash shall be applied with a brush. The first stroke of brush shall be from top downwards, next from bottom upwards over the first stroke and further a stroke over the earlier brushing before it dries. This will form one coat. Each coat must be allowed to dry and shall be subject to inspection before the next coat is applied. When dry, the surface shall not show signs of cracking and shall present a smooth and uniform finish, free from brush marks, and it shall not come off easily, when rubbed with a finger. Patchy or streaky work will be rejected and shall have to

be re-executed at the contractor's own expense. Unless otherwise specified, 3 coats of lime wash or colour wash shall be applied.

J.1.6. 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 surfaces cleaned.

J.2. **CEMENT WASH:**

J.3.1. **Dry Distempering:**

J.3.1.1. **Material:**

Powedered dry distemper shall be of approved make, colour and shade and manufactured by approved manufacturers. It shall generally confirm to IS:427 – 1965.

J.3.1.2. **Scaffolding:**

This shall be double or single as required and directed.

J.3.1.3. **Preparing the surface:**

The surface to be distempered shall be cleaned well and all cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared must be completely dry and free from dust before distempering is commenced. In the case of newly plastered walls, special care shall be taken to see that it is completely dry before any treatment is at tempted. For old surfaces, which has earlier been distempered, the surface shall be cleaned well of grease, dust etc. The flaking of previous coating, if any, shall be removed/ taken off. All cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard and then sand papered and wiped clean. But in case the surfaces were colour or white washed, the wash must be removed thoroughly first.

J.3.1.4. **Priming Coat:**

The priming coat shall be applied over complete dry surface in the manner recommended by the manufacturer in cast of patent distemper. When no priming coat is specified by the manufacturer, finely powdered chalk mixed with a thin solution of glue shall be applied to prepare a good hard background. This coating, when dry, shall be sand papered as close and smooth as possible.

J.3.1.5. **Application of Distemper:**

The instructions of the manufacturer shall be followed, regarding the preparation of the surface and application of priming and finishing coats. Distemper shall not be mixed in quantities larger than is actually required for a day's work. Hot water may be used to prepare the mixture. Distempers shall be applied in dry weather with broad stiff brushes in long parallel strokes. The treated surface shall be allowed to dry and harden. Second or succeeding coats shall not be applied until the preceding coat has passed by the Employer & Architects. 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. All the operations (strokes of brush) for one coat of white/colour wash will give two coats in case of distempering.

J.3.1.6. **Rates to be inclusive of:**

The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

i) Providing and mixing the primer and distemper separately.

ii) Scaffolding.

iii) Preparing the surface to receive the priming and finishing coats.

iv) Applying the priming coats.

v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.

vi) Applying the distemper in 3 coats minimum, including primer coat. If a proper even surface is not obtained to the satisfaction of the Employer & Architects in 3 coats contractor shall carryout additional coats of distemper to approval, at contractor's own expense.

J.4. **ACRYLIC WASHABLE DISTEMPER:**

J.4.1. Washable acrylic distemper shall be conforming to IS 2395 – 1 – 1966 and shall be of approved make and shade.

J.4.2. As required, single or double scaffolding shall be used. Ladders, if used, shall be tied with old gunny bags at top to prevent damage or scratches to the walls/floors etc.

J.4.3. The instructions of the manufacturer shall be followed regarding preparation of the manufacturer shall be followed regarding preparation of the surface and application of priming and finishing coats.

J.4.4. Where the specifications of the manufacturer are not available, the following instructions shall be carried out:

J.4.5. The surface shall be cleaned and all clears, holes and surface defects shall be repaired with gypsum and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared shall be completely dry and free from dust before distempering is commenced. In case of newly plastered surfaces/walls, special care shall be taken to see that it is completely dry before treatment is attempted.

The old surfaces which had earlier been distempered, shall be cleaned of grease and dust etc. All cracks, holes and surface defects shall be repaired with plaster of Paris and allowed to set hard and then sand papered smooth and wiped clean. The flakings of previous coatings, if any, shall be taken off. But in case the surfaces are colour or white washed, the wash must be removed thoroughly first.

J.4.6. The priming coat shall be applied over complete dry surfaces as recommended by the manufacturers or patent distemper.

J.4.7. Distemper shall be applied in dry weather with a broad stiff brush in long parallel strokes. This shall be allowed to dry thoroughly before the next coat is applied. All

the operations (strokes of brush) for one coat of white colour wash will give tow coats in case of distempering.

Rates to be inclusive of: The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

i) Providing and mixing the primer and distemper separately.

ii) Scaffolding.

iii) Preparing the surface to receive the priming and finishing coats.

iv) Applying the priming coats.

v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.

vi) Applying the distemper in 3 coats minimum, including priming coat. If a proper even surface is not obtained to the satisfaction of the Employer and Architects in

3 coats contractor shall carryout additional coats of distemper to approval, at contractor's own expense.

J.5. **WATERPROOF CEMENT PAINT:**

The waterproof cement paint shall be of Super Snowcem or of any approved manufacture and it shall be of approved colour and shade. It shall be brought to site in original air tight containers with seals intact.

Double scaffolding and ladders shall be provided, if necessary, without damaging the wall surfaces to be painted.

The preparation of surface, mixing of paint and application shall be done as specified by the manufacturer. In the absence of manufacturer's specifications, the following shall be followed:

The surfaces shall be thoroughly cleaned free from dirt, dust, etc., by brushing and washing down with clean water. Any grease, oil paint or other foreign material shall be removed by approved method.

Colour/Lime wash and or distemper shall be thoroughly removed by washing, brushing and if necessary the accumulated coats of oil paint shall be removed by thoroughly brushing or scraping and washing and a clean even surface obtained.

Rough cast plaster and pebble dash surfaces shall be thoroughly brushed and washed to remove dust and dirt.

Dry cement paint shall be thoroughly mixed with clean fresh water to produce paint of required consistency. It shall be strained through a paint strainer. The paint shall be kept stirred thoroughly and applied within the specified time. Hardened or damaged paint shall not be used.

The paint shall be applied by brush. Each paint coat shall be properly cured and got inspected and approved by the Architects/Employer before the next coat is applied. Minimum 2 coats will be applied but if the work is not satisfactory, more coat/coats shall be applied as directed at no extra cost.

Absorbent surfaces shall be evenly damped so as to give even suction in dry weather, freshly painted surfaces shall be kept damp for atleast two days.

For smooth surfaces one coat of primer shall be applied as per manufacturer's specifications and three more coats of cement paint of approved shade shall be applied. All operations (strokes of brush) for one coat of white (colour wash will give two coats of cement painting).

Rates to be inclusive of: The rates shall include all labour, materials, equipment and tools for carrying out the following operations:

i) Providing and mixing the primer and waterproof cement paint distemper separately.

ii) Scaffolding.

iii) Preparing the surface to receive the priming and finishing coats.

iv) Applying the priming coats.

v) Each coat to be completed in all parts of one building and got approved, before starting next coat in that building, and shall not be done room wise or floor wise.

vi) Applying the waterproof cement paint in 3 coats minimum, including primer coat. If a proper even surface is not obtained to the satisfaction of the Employer & Architect in 3 coats, contractor shall carryout additional coats of work to approval, at contractor's own expense.

vii) **Water repellant silicon liquid paint:**

Multipurpose protective coating.

PIDICOTEW – 100 is a protective coating system designed for vertical walls, and acts as a one-way membrane, allowing moisture to escape to the surface but prevents moisture ingress into the treated structure.

Application Areas:

- External wall surface for durable insulation effect.
- For wall surfaces, can be used as protective coating in the desired colour.
- For protecting industrial as well as residential structures from weathering effect.

Coverage:

- 10 to 12 Sq-m/lit of PIDEBIND P – 100 on smooth surface once the area is covered properly with primer coat then, apply one coat of PIDICOTEW – 100 with a coverage rate of 5 sqm/lit.

- After 1 hour of drying of first coat, second coat of PIDICOTEW – 100 shall be applied with the coverage rate of 5 sqm/lit.

J.6. **MODE OF MEASUREMENT (FOR J1 TO J5):**

For all the above painting items, Mode of measurement shall be same as that of plastering and shall be in Sq.meters. No extra payment shall be made for painting rough cast surfaces or sandfaced surfaces.

J.7. **ENAMELLED PAINTING:**

J.7.1. **Materials:**

J.7.1.1. The paint shall be of the specified colour and shade and of an approved make by the Architect & Employer. The paint shall comply in all respects with relevant Indian Standard Codes.

J.7.1.2. The make and brand of the paint to be used on the work shall first be got approved by the Architects/Employer. The material shall be obtained directly from the approved manufacturers or authorised dealers and brought to the site in the manufacturers drums etc., with seals unbroken.

J.7.1.3. Paint for undercoating and finishing coat shall be ready mixed. Mixing by contractor is not permissible except with prior written approved of the Architects/Employer, in which case the preparations of ingredients and their quality shall be strictly maintained as per manufacturer's instructions and relevant I.S. codes.

J.7.1.4. All the materials shall be kept properly protected when not actually in use. Lids of containers shall be kept closed and surfaces of paint in open shall be covered with a thin layers of turpentine to prevent formation of a skin.

In case of doubt regarding the quality, the paint supplied by the contractor shall be got tested in an approved laboratory as described in I.S. 101 – 1964, if considered necessary by the Architect. The cost shall be borne by the client, if the results are satisfactory, and by the contractor if otherwise. The rejected paint shall be removed from the site of work forthwith.

J.7.2. **PREPARATION OF SURFACE:**

J.7.2.1. **Plastered Surfaces:**

New plaster shall not be primed or painted till it is completely dry and hard. The surface shall be carefully rubbed smooth and thoroughly cleaned. The surface shall be dry, smooth, clean and free from dirt.

J.7.2.2. **Steel work (NEW):**

Degreasing shall be done by either proprietary brands of approved solvent cleaner or by mineral turpentine or petroleum and other petroleum solvents, like trichloroethylene alkali solutions or detergents as directed by the architects.

The de-rusting shall be done by manual scraping (by wire brushes, fine steel wool scraper, sand paper etc.) and/or mechanically by sand blasting, shot blasting or flame cleaning or chemical methods as approved by the Architects.

J.7.2.3. **Steel work (Old):**

For repainting necessitated due to any specified reason the relevant instructions given in I.S. 1447:1966 shall be followed. If necessary and ordered by the Architect, the surface shall be cleaned completely as for new steel.

J.7.2.4. **Wood Work:**

The surface to be painted shall be thoroughly dry, clean and smooth. It shall be sand papered with coarse medium grade sand papers and the finished surface shall be free from scratches.

J.7.2.5. Before applying primer, knots, if any, shall be covered with preparation of red lead made by grinding red lead in water and mixing with glue sized and used hot. The surface prepared for painting shall be dry before paint is applied. The holes and indentation on the surface shall be stopped with putty. Stopping shall not be done before the priming coat is applied.

J.7.3. **Application:**

J.7.3.1. All brushes, tools, etc., used shall be cleaned of all foreign matter at the beginning of different operations being undertaken.

J.7.3.2. Paint may be applied by spraying or brushing. Unless otherwise specified, paint shall be applied with brushes. Brushes of appropriate size shall be either round or oval shaped and they shall be maintained carefully throughout the work so as to be pliable and free from bristles.

J.7.3.3. The contents of the drum and tins shall be well stirred with a small clean and smooth stick before using and ocassionally during use to prevent sedimentation at the bottom of the container.

J.7.3.4. Painting shall be carried out as far as possible in dry and warm weather.

J.7.3.5. Single or double scaffolding shall be used as necessary, by the contractor at his cost. Ladders, if used, shall be tied with old gunny bags at top to prevent damage or scratches to the walls, floors etc.

J.7.3.6. The primer coat shall be applied as soon as the surface has been cleaned and before deterioration of surface by rust and contamination of the surfaces by dust, dirt or any other foreign material.

J.7.3.7. Sufficient time shall be allowed for each coat of paint to dry before the next is applied.

J.7.3.8. Painted surface, shall be protected from sun, rain, condensation, contamination or surface damage, till it is completely dry. 'Wet paint' shall be put, when necessary.

J.7.3.9. Preparation of surfaces, priming coat, undercoat and finishing coats shall be applied as specified or recommended by the manufacturer. Where no specifications are available, the following specifications will be followed.

J.7.3.10. **Primer Coat: Plastered surface:**

Priming coat shall consist of equal parts of white and red lead mixed in boiled linseed oil to the required consistency applied uniformly over the surface. When this coat is dry, all cracks, holes and other such defects shall be filled with a mixture of one part of white lead and 3 parts of ordinary putty. After drying, the surface shall be rubbed with sand paper and dusted clean. An undercoat shall be applied thinly so that plaster may be thoroughly saturated. One or more undercoats with putty shall be applied as required and directed to obtain thoroughly saturated surface to the satisfaction of Architect & Employer.

Steel Work:

The primer coat be of red lead conforming to I.S.102 – 1962. Undercoating and puttying shall be done, if necessary. For old painted surfaces and new surfaces already primer with red lead/red oxide, the surface shall be cleaned thoroughly and primed with red lead/ red oxide, at some places, where necessary or over the whole surface as directed by the Architects.

Wood Work:

The primer coat shall consist of red lead, white lead, raw and boiled linseed oil and patent driers.

After priming coat, all small holes, cracks, open joints and other minor defects shall be stopped with putty made from whitening mixed to proper consistency with raw linseed oil and little white lead to help hardening of putty. The surface shall then be lightly rubbed down smooth with sand paper. One or more undercoats, with putty shall be applied as required and directed to obtain thoroughly saturated surface to the satisfaction of Architect & Employer.

J.7.3.11. **Finishing coats:**

Unless otherwise specified in the item, the finishing shall be done with atleast two coats of paint of approved made and shade confirming to the latest I.S. codes. The last coat of paint shall give a matt/flat, semi-glossy or glossy finish as specified for each item of painting or as directed by the Architect & Employer. Striple finish shall be given at no extra cost, if required, by the Architect & Employer. The finished surface shall be of the required shade and present an even appearance. It shall not show any brush marks. If required, final coat will be applied with rollers at no extra cost.

J.8. **ENAMEL PAINT:**

General specifications, preparation of surface and priming coat shall be same as specified for oil painting. Finishing shall be done in two coats or more as required with synthetic enamel paint of approved make and shade and shall generally conform to relevant I.S.codes.

J.9. **RATE FOR ALL PAINTING WORKS TO INCLUDE:**

Apart from other factors mentioned elsewhere in this contract, the rate for painting shall also include.

J.9.1. Providing all the materials/labour and equipment that is required to execute the work as specified.

J.9.2. Scaffolding (single/double) erection and removal.

J.9.3. Preparing the surfaces before painting.

J.9.4. Applying three cots of approved paint including priming coat. If proper & even surface or shade is not acquired, then extra cost/coats shall be applied as directed and to the final approval of the Architect & Employer, at no extra cost.

J.9.5. Applying additional priming coat/coats to obtain thoroughly saturated surface and filling the putty as required and directed.

J.9.6. No extra coat shall be paid for painting smooth/rough surfaces such as precast concrete pardis, rough cast plaster, sand faced plaster etc.

J.9.7. Curing the cement paint as directed for minimum 7 days.

J.9.8. Doors, windows, floors and other materials of furniture etc., shall be protects from being splashed upon. Splashing and droppings, if any, shall be removed and the surfaces cleaned as directed.

J.9.9. If any cracks develop in the plaster, before or after final painting, the same will have to be filled in by suitable putty and the surface painted again as directed to give an even surface to the approval of Architect & Employer at no extra cost. If neeru surface is damaged due to any reason before painting, then the surface shall be redone by using plaster of paris as directed, at no extra cost.

J.10. **MODE OF MEASUREMENT FOR OIL, ENAMEL PAINT, POLISHING ETC:**

J.10.1. Measurement of painted/polished surfaces shall be in Sq.m and as per plaster work.

J.10.2. For measurement of polishing/painting to joinery and steel work etc., multiplying coefficients, as in standard table shall, be as follows:

S.NO.	DESCRIPTION OF WORK	HOW MEASURED	COEFFICIENT
I.	**Wood Work – doors and windows etc:**		
1.	Panelled doors/windows.	Measured flat including frame.	1.30 (for each side).
2.	Flush doors.	- do -	1.20 (for each side).
3.	Partly panelled and partly glazed or glazed doors/windows (for glazed portions only – for panelled portions as per 1 above).	- do -	1.00 (for each side).
4.	Fully venetioned or louvered doors/windows.	- do -	1.80 (for each side).
II.	**Steel Work – Doors and Windows:**		
1.	Fully glazed doors & windows.	Measured flat including frame.	0.50 (for each side).
2.	Plain sheeted steel door, windows.	- do -	1.10 (for each side)

3.	Collapsible gate.	Measured flat.	1.50 (for painting all over)
4.	Rolling shutters of interlocked laths.	-do- jamb guides bottom rails, locking arrangement included (top cover shall be measured separately)	1.10 for each side.
III.	**General work:**		
1.	Expanded metal, M.S. grill work, grating in guard bars, ballustrades, railing and partitions.	Measured flat.	1(for painting all over).
2.	R.C.C. grill.	- do -	1(for each side).

The table given above is as per C.P.W.D. specification.

J.11. **FRENCH SPIRIT POLISHING:**

J.11.1. **Materials:**

French spirit polish shall be of an approved make conforming to I.S.348:1968 and shall be approved by the Architects. If it is to be prepared, the polish shall be made by dissolving 0.7 Kgs of best shellac in 4.5 litres of spirit or wine without heating. To obtain required shade, approved pigment shall be added and mixed in required proportions.

J.11.2. **Workmanship:**

J.11.2.1. **Preparation of Surface:**

The surface shall be cleaned. All unevenness shall be rubbed down smooth with sand paper and well dusted. Holes and indentations of the surface shall be filled with putty made of whiting and linseed oil. The surface shall be given a coat of filler made of 2.25 Kg of whiting and 1.5 litre of methylated spirit. When it dries, the surface shall again be rubbed down perfectly smooth with sand paper and wiped clean.

J.11.2.2. **Application:**

A piece of clean fine cotton cloth or cotton wool made into the shape of a pad shall be used to apply polish. The pad shall be moistened with polish and applied sparingly but uniformly and completely over the entire surface. It shall be allowed to dry and then only another coat is applied in the same way. To finish off, the pad shall be covered with a fresh piece of clean fine cotton cloth, slightly damped with methylated spirit and rubbed lightly and quickly with a circular motion. The

finished surface shall have a uniform texture and high gloss. Irrespective of number of coats, this will be carried out to the entire satisfaction of Architect & Employer.

J.12. **POLISHING:**

J.12.1. **Materials:**

This shall be of approved quality and make and brought to site in sealed containers as marketed by the manufacturers.

J.12.2. **Workmanship:**

J.12.2.1 **Preparation of Surface:**

Woodwork to be treated, shall be finished smooth. It shall then be stopped and rubbed down perfectly smooth with different grades of sand paper. (The final rubbing shall be done with sand paper which has been slightly moistened with linseed oil and rubbed one over the other for a few seconds).

J.12.2.2. **Application:**

The mixture of the polishing shall be applied evenly, with a clean cloth pad in such a way that no blank patches are left, and rubbed continuously for half an hour. When the surface is quite dry, a second coat shall then be applied and rubbed for two hours or more if necessary, until the surface has assumed a uniform glass and is quite dry, showing no signs of stickiness when touched. Irrespective of number of coats, this will be carried out to the entire satisfaction of Architect & Employer.

J.13. **MEASUREMENT:**

Measurement for French/wax polishing and or polishing with ready made polish will be as per schedule stated herein before and the explanatory note on coefficient shall be as per C.P.W.D. specifications.

J.14. For all painting and polishing works (J.1. to J.12):

(i) Detailed register shall be maintained, by the contractor, showing daily account of receipts, consumption and balance of different materials showing materials received and their consumption with location, and shall be checked by Employer & Architect as their discretion.

(ii) Each coat of work shall be done in one building at a time and got approved before starting next coat in that building; and shall not be done room wise or floor wise.

11. INDEX FOR SPECIFICATIONS FOR WATER SUPPLY AND SANITARY WORKS

WATER SUPPLY:

1. G.I. pipe and Socket etc.

2. C.I. and spun iron pipes & fittings

DRAINAGE:

1. Stoneware pipes etc.

2. Cement Concrete pipes

3. Manholes, Inspection chambers etc.

4. Soil, Waste, Rainwater, Vent, etc.

5. Lead Pipes

"A" Cutting, Patching and Making good

"B" Equipment, Material & Workmanship, Tests

"C" Cleaning, Operation and Tests

6. Sanitary Fixtures and Fittings

7. Mode of Measurement

"C" Tools and materials and storage

"D" Safety codes

} General & Applicable for all types of work costs of these shall be included in the rates quoted.

12. SPECIFICATIONS FOR WATER SUPPLY & SANITARY WORKS

1. WATER SUPPLY:

1.1 G.I.PIPES AND SOCKETS:

1.1.1. Materials:

The pipes shall be galvanised mild steel welded pipes and seamless, screwed and socketed tubes and conforming to the requirements of I.S.1239 – 1982. They shall be of the diameter (nominal bore) and grade specified in the description of the item. The sockets shall be designated by the representative nominal bores of the pipes, for which they are intended.

The pipes and sockets shall be cleanly finished, well galvanized inside and outside and free from cracks, surface flaws, laminations and other defects. All screw threads shall be clean and well cut. The ends shall be cut clean and square to the axis of the tube. Unless otherwise specified, the pipes below ground level or concealed in walls or floors and those supported on walls shall be of "B" class only.

The weights of GI pipes for various glasses and diameter are reproduced below:

Weight in Kg.per meter of common G.I. pipes of various dia (plain ends).

DIA	(LIGHT) "A" CLASS	(MEDIUM) "B" CLASS	(HEAVY) "C" CLASS
15	0.952	1.22	1.45
20	1.41	1.58	1.90
25	2.01	2.44	2.97
32	2.58	3.14	3.84
40	3.25	3.61	4.43
50	4.11	5.10	6.17
65	5.80	6.51	7.90

1.1.2 **Pipe fittings:**

The fittings shall be of malleable cast iron or mild steel tubes complying with all the appropriate requirements given in para 1.1.1. or as specified. The fittings shall be designated by the respective nominal bores of the pipes for which they are intended.

1.1.3. **Cutting, Laying and Jointing:**

The pipes and fittings shall be inspected at site before use, to ascertain that they conform to the specifications given in para 1.1.1. above. The defective pipes shall be rejected. Where the pipes have to be cut or rethreaded, the ends shall be carefully filled out so that no obstruction to bore is offered. The end of the pipes shall then be threaded with pipe dies and taps carefully in such a manner as will not result in slackness of joints when screwed/jointed. The taps and dies shall be used only for straightening screw threads, which have become bent or damaged and shall not be used turning the threads become slack, as the later procedure may result in a joint, which may not be water tight. The screw threads of pipes and fittings shall be protected from damage until they are fitted.

The pipes shall be cleaned and cleared of all foreign matter before being laid. In jointing the pipes, the inside of the socket and the screwed end of the pipes shall be oiled and rubbed over with white lead and a few turns of spun yarn wrapped round the screwed end of the pipe. The end shall then be screwed in the socket, tee, etc., with the pipe wrench. Care should be taken that all pipes and fittings are properly jointed so as to make the joints completely water tight and pipes are kept at all times free from dust removed after screwing. After laying, the open ends of the pipes shall be temporarily plugged to prevent access of water, soil or any other foreign matter.

Any threads exposed after jointing shall be painted or in the case of underground piping thickly coated with approved anti-corrosive paint to prevent corrosion.

1.1.4. **Internal work:**

For all internal work the galvanized iron pipes and fittings shall run outside the surface of the walls or ceiling (not in chase), unless otherwise specified. The fixing shall be done by means of standard battern holder butt clamps, keeping the pipes about 1.5 cm clear of the wall. When it is found necessary to conceal the pipes, chasing may be adopted or pipes fixed in the ducts or recesses etc., provided there is sufficient space to work on the pipes with usual tools.

The pipes shall not ordinarily be burring in walls or solid floors. Where unavoidable, pipes may be burried for short distances, provided adequate protection is given against the damage and where so required joints of M.S. tubes be not buried. Where directed by the Architect & Employer, M.S. tube sleeves shall be fixed at places a where pipes passed through walls or floors for reception of the pipe and to allow freedom for expansion and contraction and other movements. In case the pipe is embedded in walls or floors, it should be painted with anti-corrosive bitumastic paint or approved quality and the pipe shall be wrapped in burlap of hesain cloth impregnated with bitumen. The wrapping shall be made to fit tightly over the pipe and where wrapping with new piece, it shall overlap the old one and the joint shall be tied with M.S. wire or nylon thread. Where pipes are encased within chases made

in the wall, they shall be fixed to the wall and M.S. clamps so as to prevent movement before filling in and making good the chase. The pipe should not come in contract with lime mortar or lime concrete, as the pipe is affected by lime under the floors, the pipes shall be laid in a layer of sand filling done under concrete floors.

1.1.4.1. **Insulation for hot water pipes:**

Pipes carrying hot water from storage heater or from central heating system shall be insulated for preventing loss of heat. The materials used for insulation shall be hair felt, asbestos fibre, mineral wool, glass wool or glass wool felt on sufficient thickness as directed and shall be wrapped around the pipe tightly and tied in position by wire loops at certain intervals.

This shall be covered by hesain cloth wrapping as detailed above for cold water pipes. All pipes and fittings shall be fixed truly vertical and horizontal, unless unavoidable. The pipes shall be fixed to walls with standard batten holder – bat clamps of required shape and size, so as to fit tightly on the pipes, when tightened with screwed bolts. The bats shall be of teakwood, painted with coal tar.

These clamps shall be embedded in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) and shall be spaced at regular intervals in straight lengths.

The clamps shall be fixed at shorter lengths near the fittings or as directed by the Architect & Employer.

For G.I.pipes 15mm to 25mm diameter, the holes in the walls and floors shall be made by drilling or with chisel or jumper and not by dismantling the birck work or concrete. However, for bigger dimension pipes, the holes shall be carefully made of the smallest but of adequate size, as directed by the Architect & Employer. After fixing the pipes the holes shall be made good with cement mortar 1:4 (1 cement : 4 coarse sand) and properly finished to match the adjacent surface.

1.1.5. **External work:**

The galvanised iron pipes and fittings shall be laid in trenches. The widths and depths of the trenches for different diameters of the pipes shall be given as in the table below, and shall be deep enough to have a clear cover of atleast 400mm above the top of pipes.

Dia of Pipe	Width of trench	Depth of trench
15mm to 50mm	30 Cms.	60 Cms.
65mm to 100mm	45 Cms.	75 Cms.

At joints the trench width shall be widened where necessary. The work of excavation and refilling be done true to line and gradient.

The pipes shall be painted with two coats of anticorrosive bitumastic paint of approved quality. The pipes shall be surrounded with sand (The pipes shall be laid on a layer of 7.5 cm sand and filled with sand upto 15 cm above the pipes. Remaining portion of the trench shall then be filled with excavated earth) before the trenches are back filled with excavated earth.

When excavation is done in rock the bottom shall be cut deep enough to permit the pipes to be laid on a cushion of sand, minimum 7.5 cm thick. In case of bigger diameter pipes, where the pressure is very high, thrust blocks of cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20mm nominal size) and of suitable size shall be constructed at all bends, tees etc., to transmit the hydraulic thrust by and spreading it over a sufficient area, without impairing the ground, as directed by the Architect & Employer.

1.1.6. **Testing the joints:**

After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 Kg/cm^2. (60 metre head or double the designed working pressure whichever is more). The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer.

The draw off takes and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually. Pressure gauge must be accurate and preferably should have been recalibrated before the test. The test pump having been stopped the test pressure should maintain without loss for atleast half an hour. The pipes and fittings shall be tested in sections as the work of laying proceeds, keeping the joints exposed for inspection during the testing.

1.1.7. **Measurements:**

The lengths shall be measured in running meter correct to a cm., for the finished work, which shall include G.I.pipe and G.I. fittings such as bends, tees, elbows, reducers, crosses, plugs, sockets, nipples and nuts etc., unless otherwise specified, but exclude brass and gun metal taps(cocks), valves, lead connection pipes and shower roses. The measurements shall be taken separately for internal and external work. For this, the internal and external work shall have meaning given in 1.1.4 and 1.1.5. The length shall be taken along the central line of the pipe fittings. All pipes and fittings shall be classified according to their diameters, method of joining and

fixing substance, quality and finish. The diameter shall be the nominal diameter of the internal bore of the pipes. The rates shall include all cuttings and wastages. In case of fittings of unequal bore, the largest bore shall be measured.

Digging and refilling of trenches is clubbed with main item if so specified. If digging and refilling is clubbed with the item, the maximum depth of trench shall be as specified.

Internal work:

The rate for internal work shall include the cost of labour and material involved in all the operations described above except in para 1.1.5. The rate shall include the cost of cutting holes in walls and floors and making good the same. Insulation of pipes for hot water supply will be paid separately as extra over. The rates shall include cutting chases, drilling/making holes etc., and making good the same, after testing/painting etc.

External work:

The rate for external work shall include the cost of labour and materials involved in all the operations described above except in para 1.1.4. The rate shall include

excavation trenches, testing painting of pies etc., and re-filling all round the pipes etc., complete.

1.2. MAKING CONNECTION OF G.I. DISTRIBUTION BRANCH WITH GI MAIN:

1.2.1. Materials:

Pipes and fittings – Para 1.1.1. and 1.1.2. shall apply.

1.2.2. Preliminary work:

A pit of suitable dimensions shall be dug at the point, where the connection is to be made with the main, and earth removed upto 15 cm below the main. The flow of water in the water main shall be disconnected by closing the sluice or wheel valves on the mains.

1.2.3. Making connection:

For cutting and jointing para 1.1.3 shall apply. The G.I main shall first be cut. Water, if any collected in the pit shall be bailed out and ends of the G.I.pipe threaded. The connection of distribution pipe shall then be made by fixing malleable G.I. tee of the required size and fittings such as jam nut, G.I.socket, connecting piece etc.

1.2.4. **Testing of joints:**

Para 1.1.6 shall apply.

1.2.5. The portion of the pipe in the pit shall be painted with bitumastic paint and encased with sand 15 cm. alround. The pit shall be filled with earth in level with the original ground surface, watered, rammed and the area dressed.

1.2.6. **Measurements:**

The work of making connections should be counted in numbers, if paid separately.

1.2.7. **Rate:**

The rate shall include the cost of labour and materials involved in all the operations described above.

1.3 **FIXING WATER METER AND STOP COCK IN G.I. PIPE LINE:**

1.3.1 **Materials:**

Pipe and fittings para 1.1.2. shall apply.

1.3.2. **Cutting G.I. pipe line:**

The G.I. line shall be cut to the required length at the position where the metre and stop cock required to be fixed. The ends of the pipe shall then be threaded. For cutting and threading the pipe, para 1.1.3 shall apply.

Fixing meter and stop cock:

For cutting and jointing para 1.1.3 shall apply. The G.I. main shall first be cut. Water, if any, collected in the pit shall be bailed out and ends of the G.I. pipe threaded.

The meter and stop cock shall be fixed in position by means of connecting pipes, G.I jam nut and socket etc. The stop cock shall be fixed near the inlet of the water meter. The paper disc inserted in the nipples of the meter shall be removed and the meter installed exactly horizontal or vertical in the flow line in the direction shown by the arrow cat on the body of the meter. Care shall be taken that the factory seal of the meter is not disturbed. Wherever the meter shall be fixed to a newly fitted pipe line, the pipe line shall have to be completely washed before fitting the meter. For this purpose a piece of pipe equal to the length of the meter shall be fitted in the proposed position of the meter in the new pipe line. The water shall be allowed to flow completely to wash the pipe line and then the meter installed as described above by replacing the connecting piece.

Testing of joints:

Testing of joints shall be done as described in para 1.1.6.

The portion of the pipe in the pit shall be painted with bitumastic paint and encased with sand15 cm alround. The pit shall be filled with earth in level with the original ground surface watered, rammed and the area dressed.

Measurements:

The work of fixing meters and stop cocks shall be counted in numbers according to the diameters.

Rate:

The rate shall include the cost of labour and materials involved in all the operations described above excluding the cost of stop cock and water meter.

1.4. **FITTINGS:**

General:

The brass or gun metal fittings shall be of heavy quality and of approved manufacture and pattern, with screwed or flanged ends, as specified. The fittings shall in all respects comply with Indian Standard specifications No. I.S. 778 – 1957 and I.S. 781 – 1959. The standard size of brass or gun metal fittings shall be designated by the nominal bore of the pipe outlet to which the fittings are attached. A sample of each kind of fittings shall be got approved from the Architect & Employer and all supplies made according to the approved samples.

1.4.1. All cast fittings shall be sound and free from pits, blow holes and projections. Both internal and external surfaces shall be clean, smooth and free from sand etc. Burning, plugging, stopping or patching of the casting shall not be permissible. The bodies, bonnets, spindles and other parts shall be truly machined so that when assembled the parts shall be axial, parallel and cylindrical, with surfaces smoothly finished. The area of the water way of the fittings shall not be less than the area of the nominal bore.

The fittings shall be fully examined and cleaned of all foreign matter before being fixed. The fittings shall be fitted in the line in a workman like manner. The joints between fittings and pipes shall be made leak-proof, when tested to a pressure of 6 Kg/sq.cm as described in para 1.1.6, and the defective fittings and joints shall be replaced or redone without any extra cost.

1.4.2. **Brass bib cock and stop cock:**

A bib cock (bib tap) is a draw off tap with a horizontal inlet and free outlet and a stop cock (stop tap) is a valve with a suitable means of connections for insertion in a pipe line for controlling or stopping the flow. They shall be of specified size and shall be of screw down type. The closing device should work by means of a disc carrying renewable non-metallic washer which shuts against water pressure on a seating at right angles to the axis of the threaded spindle which operates it. The handle shall be either crutch or butterfly type, securely fixed to the spindle. Valve shall be of the loose leather seated pattern. The cocks (taps) shall open in anti-clock wise direction.

The bib cock and stop cock shall be polished bright. The minimum finished weights of bob tap (cock) and stop tap (cock) as given in the I.S. specifications are reproduced below:

Size in mm.	**Minimum finished Weight.**	
	Bib Tap in Kgs.	**Stop Tap in Kgs.**
8	0.25	0.25
10	0.30	0.35
15	0.40	0.40
20	0.75	0.75

When the bib cocks or stop cocks are required to be chromium plated, the chromium plating shall be of grade B type conforming to I.S. 1068 – 1958. The chormiumn shall never be deposited on brass unless a heavy coating of nickel is interposed. In case these are required to be nickel plated, the plating shall be of the first quality with a good thick deposit of silvery whiteness capable of taking high polish, which will not easily tarnish or scale.

In finish and appearance, the plated articles, when inspected shall be free from plating defect such as blisters, pits, roughness and unplanted areas and shall not be stained or discoloured. Before a cock is plated, the washer plate shall be removed from the fittings. The gland packing shall be protected from the plating solution.

Gun metal bib cock and stop cock:

These shall be of gun metal screw down pattern of the size as specified. So far as the general requirements of material are concerned, these shall be similar to those as described in para 1.4.2. The weight of these shall be the same as for brass bib cocks and stop cocks as described in para 1.4.2.

1.5.1. **Brass full way valve:**

Full way valve is a valve with suitable means of connection for insertion in a pipeline for controlling or stopping the flow. The valve shall be of brass, fitting with

a cast iron wheel and shall be of gate valve type, opening full way of the size as specified.

The valve shall be of best quality as approved by the Architect & Employer.

1.5.2. **Gun metal full way valve with wheel:**

These shall be of the gun metal fitted with wheel and shall be of gate valve type opening full way and of the size as specified. These shall generally conform to I.S. 778 – 1978.

1.6. **Ball valve:**

The ball valve shall be of high pressure or low pressure class and shall be of sizes as specified and directed.

The nominal size of a ball valve shall be that corresponding to the size of the pipe to which it is fixed. The ball valve shall be of gun metal as specified with standard valve shall be of gun metal as specified with standard polyurethane float. The float shall be spherical in shape, the jointing of the float shall be made by efficiently finished, lapped and soldered seam or by brazing. Polyurethane floats shall be used as specified.

The ball valve shall generally conform to I.S. specification No.1703 : 1977. The weight of ball cock and the size of ball be as per table given below:

Both low pressure and high pressure ball valves are designed for use on mains having pressures upto 17.5 Kg/cm².

Ball valve size in mm			Total Wt. H.P.	Total Wt. L.P.
Dia	15	-	524 gms	481 gms
	20	-	986 gms	867 gms
	25	-	1549 gms	1411 gms
	32	-	2120 gms	1873 gms
	40	-	2646 gms	2303 gms
	50	-	4454 gms	3959 gms

1.7 CPVC PIPES: (CHLORINATED POLYVINYL CHLORIDE PIPES FOR POTABLE HOT AND COLD WATER)

1.7.1 The pipes shall be conforming to the requirements of I.S.15778: 2007. They shall be of the diameter (nominal bore) and grade specified in the description of the item. The sockets shall be designated by the representative nominal bores of the pipes, for which they are intended.

1.7.2 Material:

1.7.2.1 Virgin Material – Material in such form as granules or powder that has not been subjected to use or processing other than that required for its manufacture and to which no re-processible or recyclable material(s) have been added.

1.7.2.2 Own Rework Material – Material prepared from rejected unused pipes, including the trimmings from the production of pipes, which will be reprocessed in a manufacturer's plant by a process such as extrusion and for which the complete formulation is known.

1.7.2.3 Standard Thermoplastic Pipe Dimension Ratio (SDR) – The standard thermoplastic pipe dimension ratio (SDR) is the ratio of pipe diameter to wall thickness.

1.7.3 Classification of Pipes:

The pipes shall be classified by pressure rating (working pressure) at 270C and 820C

– see table given below.

Working Pressure for Pipes: (All values are in Mpa.)

S. No.	Pressure Class.	Working Pressure at		
		SDR.	270C.	820C.
1.	1	11	2.76	0.68
2.	2	13.5	2.18	0.55
3.	3	17	1.73	0.42

Note: The above pipes are recommended for water temperatures ranging from +1 to +900C. The recommended maximum safe working stress for these pipes is 8.6 MPa at 270C. At higher temperature upto 900C, the strength of the pipe reduces and the working pressure shall be modified in accordance.

1.7.4 Composition – The material from which the pipe is produced shall consist substantially of chlorinated polyvinyl chloride to which may be added only those additives

that are needed to facilitate the manufacture of the pipe and the production of sound and durable pipe of good surface finish, mechanical strength and opacity under conditions of use. None of these additives shall be used separately or together in quantities sufficient to constitute a toxic, organoleptic or microbial growth hazard or materially to impair the fabrication or welding properties of the pipe, or to impair the chemical, physical or mechanical properties (in particular long-term mechanical strength and impact strength) as defined in the standard.

1.7.5 Dimension of Pipes:

The outside diameter and outside diameter at any given point and wall thickness shall be as given in table below.

1.7.5.1 Diameter – The outside diameter and outside diameter at any given point and wall thickness shall be as given in table below shall be measured according to the method given in IS 12235 (Part I).

1.7.5.2 Diameter at any Point – The difference between the measured maximum outside diameter and measured minimum outside diameter in the same cross-section (also called tolerance on ovality) shall not exceed the greater of the following two values: 0.5mm and 0.012 rounded off to the next higher 0.1mm.

1.7.5.3 The wall thickness of the pipes shall be as given in the table below.

Dimensions of Chlorinated Polyvinyl Chloride Pipes:

S. No.	Nominal Size.	Nominal Outside Diameter.	Mean Outside Diameter.		Outside Diameter at Any Point.		Wall Thickness.					
							Class 1, SDR 11.			Class 2, SDR 13.5.		
			Min.	Max.	Min.	Max.	Avg. Max.	Min.	Max.	Avg. Max.	Min.	Max.
1.	15	15.9	15.8	16.0	15.8	16.0	2.2*	1.7*	2.2*	1.9*	1.4*	1.9*
2.	20	22.2	22.1	22.3	22.0	22.4	2.5	2.0	2.5	2.2	1.7	2.2
3.	25	28.6	28.5	28.7	28.4	28.8	3.1	2.6	3.1	2.6	2.1	2.6
4.	32	34.9	34.8	35.0	34.7	35.1	3.7	3.2	3.7	3.1	2.6	3.1
5.	40	41.3	41.2	41.4	41.1	41.5	4.3	3.8	4.3	3.6	3.1	3.6
6.	50	54.0	53.9	54.1	53.7	54.3	5.5	4.9	5.5	4.6	4.0	4.6
7.	65	73.0	72.8	73.2	72.2	73.8	-	-	-	-	-	4.0
8.	80	88.9	88.7	89.1	88.1	89.7	-	-	-	-	-	5.0
9.	100	114.3	114.1	114.5	113.5	115.1	-	-	-	-	-	7.0
10.	150	168.3	168.0	168.6	166.5	170.1	-	-	-	-	-	11.0

Notes: 1) All dimensions with " * " are not a function of SDR.

2) For CPVC pipes SDR is calculated by dividing the average outer diameter of the pipe in mm by the minimum wall thickness in mm. If the wall thickness 1.52mm, it shall be increased to 1.52mm. The SDR values shall be rounded to the nearest 0.5.

1.7.6 Guidelines for Storage and Installation:

1.7.6.1 Storage – CPVC pipes of all sizes are packed in polyethylene packing rolls and both the ends of the packed roll are sealed with air bubble film cap in order to provide protection during handling and transportation. After packing, the whole bunch of pipes is tightened with polypropylene / HDPE strapping. Each role is then marked with size / type of the pipe, lot number and quantity. The packed pipe rolls are stored in their respective racks in properly covered storage area. Apart from providing protection during handling and transportation, the packing rolls also protect the pipe from ultra violet rays.

1.7.7 Installation Guidelines:

1.7.7.1 Visually inspect pipe ends before making the joint. Use of a chamfering tool will help identify any cracks, as it will catch on to any crack.

1.7.7.2 Pipe may be cut quickly and efficiently by several methods. Wheel type plastic tubing cutters are preferred. Ratchet type cutter or fine tooth saw are another options. However, when using the ratchet cutter be certain to score the exterior wall be

rotating the cutter blade in circular motion around the pipe. Do this before applying significant downward pressure to finalize the cut. This step leads to a square cut. In addition, make sure ratchet cutter blades are sharp. Cutting tubing as squarely as possible provides optimal bonding area within a joint.

1.7.7.3 Burrs and filing can prevent proper contact between the tube and fittings during the assembly, and should be removed from the outside and inside of the tube. A chamfering tool is preferred, but a pocket knife or file is also suitable for this purpose.

1.7.7.4 Use only CPVC cement jointing. Use CPVC cement, which is dully recommended by the manufacturer.

1.7.7.5 When using adhesive solution / solvent cement be certain for proper ventilation.

1.7.7.6 When making a joint, apply a heavy, even coat of cement to the pipe end. Use the same applicator without additional cement to apply a thin coat inside the fitting socket. Too much cement can cause clogged waterways. Do not allow excess cement to puddle in the fitting and pipe assembly. This could result in a weakening of the pipe wall and possible pipe failure when the system is pressurized.

1.7.7.7 Rotate pipe one-quarter to one-half turn while inserting it into the fitting socket and remove the excess adhesive solution / solvent cement from the joint with clean rag. Once the pipe end is seated, hold it in place for 5 s to 10 s to allow the joint to set.

1.7.7.8 When making a transition connection to metal threads, use special transition fitting or CPVC male threaded adapter whenever possible. Do not over-torque plastic threaded connections. Hand tight plus one-half turn should be adequate.

1.7.7.9 Hang or strap CPVC systems loosely to allow for thermal expansion. Do not use metal straps with sharp edges that might damage the rubbing.

1.7.7.10 CPVC stub outs for lavatories, closets and sinks are appropriate. However, on areas where there is a likelihood that movement or impact abuse will occur, metal pipe nipples may be a more appropriate stub-out material. Showerheads, tub spouts and outside sill cocks are examples.

1.7.7.11 When connected to a gas water heater, CPVC tubing should not be located within 50cm of the flue. For water heaters lacking reliable temperature control, this distance may be increased upto 1 m a metal nipple or flexible appliance connector should be utilized. This measure eliminates the potential for damage to plastic piping that might result from excessive radiant heat from the flue.

2.0 CAST IRON AND SPUN IRON PIPES AND FITTINGS:

2.1 MATERIALS:

Pipes and Specials:

The cast iron pipes shall conform to I.S. 1537 – 1967, while spun iron pipes shall conform to I.S. 1537 – 1967, while spun iron pipes shall conform to I.S. 1536 – 1976. The pipes shall be either with spigot and socket ends or flanged ends. The cast iron pipes shall be vertically cast, either class A or class B, as specified. The spun iron pipes, shall be of cast iron casted centrifugally and shall be of class LA, class A and class B, as specified in the item.

Specials:

The specials shall conform to I.S. 1538 (Parts 1 to 23): 1976 and shall be of medium or heavy class, as specified, depending on their thickness.

All cast iron pipes shall be capable of easily worked with a drill or file. Pipes and specials should be sound with smooth inner and out surfaces, neatly dressed and carefully selected, free from laps, pinhole, and other imperfections, and shall ring

clearly when struck with a light hammer. The ends of the pipes and specials shall be reasonably square to their axis.

All pipes and specials, before they are affected by rust, shall have been coated with an approved anti-corrosive treatment or by heating and dipping in Dr.Angus Smith's solution at the factory.

Stacking:

The pipes and specials shall be handled with sufficient care to avoid damage to them. These shall be lined up on one side of the alignment of the trench, socket facing uphill or in the direction of flow of water.

2.2 TRENCHES FOR C.I. PIPES AND SPECIALS:

The trenches for the pipes shall be excavated to lines and levels as directed. The bed of the trench shall have to be truly and evenly dressed throughout from one change of grade to next.

The gradient is to be set out by means of boning rods and the required depth be excavated at any point. The trench shall be excavated as directed by the Engineer/

Architect. The depth of the trench shall not be less than 1 meter, measured from the top of the pipe to the surface of the ground under roads crossing, and not less than 0.75m. elsewhere.

The width of the trench shall be the nominal diameter of the pipe plus 40 cm but it shall not be less than 80 cm. in case of all kinds of soils excluding rock and not less than 0.55 metres in case of rock.

The bed of the trench, if in soft or made up earth, shall be well watered and rammed before laying the pipes and the depressions, if any, shall be properly filled with earth and consolidated in 20 cm layers.

If the rock is met with, it shall be removed to 15 cm, below the level of the pipe and the trench shall be refilled with excavated materials (soil) and consolidated.

The excavated materials shall not be placed within 1 meter or half of the depth of the trench, whichever is greater, from the edge of the trench.

The materials excavated shall be separated and stacked so that in refilling they may be relaid and compacted in the same order to the satisfaction of the Architect & Employer. The trench shall be kept free of water. Shoring and timbering shall be

provided wherever required. Excavation below water table shall be done after dewatering the trenches.

After the excavation of the trench is completed, hollows shall be cut at the required positions to receive the sockets of the pipes and these hollows shall be of sufficient depth to ensure that the barrels of the pipes shall rest throughout their entire length on the solid ground and that sufficient space is left for jointing to underside of the pipe joint. These socket holes shall be refilled with sand after jointing the pipe.

Where the pipe line or drain crosses an existing road, the road crossing shall be excavated half at a time, the second half being commenced after the pipes have been laid in the first half and the trench refilled. Necessary safety measures for traffic, as directed, shall be adopted. All types of pipes, water mains, cables etc., met within the course of excavation shall be carefully protected and supported. Care shall be taken, not disturb the electrical and communication cables.

2.3 **Laying of pipes and specials:**

Before being laid, the pipes shall be examined to see that there are no cracks or defects, as described in para 1.7.1. above. Subject to the approval of the Architect & Employer, the damaged portion of the cracked pipe may be cut at a point not less than 15 cm beyond the visible extremity of the crack.

The pipe shall be thoroughly cleaned of all dust and dirt and special care shall be taken to clean the inside of the socket and outside of the spigots.

The pipes shall be lowered into the trench by means of suitable pulley blocks, shear legs, chains, ropes etc. In no case the pipes shall be rolled and dropped into the trench. After lowering, the pipes shall be so arranged that the spigot of one pipe shall be carefully laid central to the socket of the next pipe, and pushed to the full distance that it can go. The pipe line shall be laid to the levels required. Specials shall also be laid in their proper position as stated above.

Where so directed, the pipes and specials may be laid on masonry or concrete pillars. The pipe laid on the level ground, shall be laid with socket facing the direction of the flow of water. In all other cases, the sockets shall be laid facing up hill.

Any deviation either in plan or elevation less than 11¼ degree shall be effected by laying the straight pipes round a flat curve, of such radius that minimum thickness of lead at the face of the socket shall not be reduced below 6mm or the opening between spigot and socket increased beyond 12mm at any point. A deviation of about 2¼ degree can be affected at each joint in this way. At the end of each day's work, the last pipe laid shall have its open ends securely closed with a wooden plug o prevent entry of water, soil, rats and any other foreign matter into the pipe.

Cement concrete thrust blocks of suitable design as approved by the Architect & Employer shall be provided at 45 degrees and 90 degrees bends of the pipes and also at places where there is likelihood of thrust so as to withstand the dynamic and static forces developed due to water in the pipe line. The thrust blocks shall be made after the joints have been caulked with lead.

2.4 **Lead caulked joints:**

2.4.1. **Lead caulked joints with molten lead:**

This type of lead chalking is generally done in providing joints in water but not in case of wet conditions.

a. Materials : Pig lead and spun yard.

Pig lead shall be of uniform quality, clean and free from foreign materials. It shall be of uniform softness and capable of being easily caulked or driven. It shall conform to I.S. 782 – 1978 for caulking lead.

Spun yarn shall be of clean hemp and of good quality. It shall be soaked in hot coal tar or bitumen and cooled before use.

The approximate depth of pig lead for various diameters of C.I. pipes and specials shall be given below with a tolerance of plus or minus 5 percent.

Nominal size of pipe mm (1)	Lead per jointKg (2)	Depth of lead jointmm (3)
80	1.8	45
100	2.2	45
125	2.6	45
150	3.4	50
200	5.0	50
250	6.1	50
300	7.2	55
350	8.4	55
400	9.5	55
450	14.0	55
500	15.0	60
600	19.0	60
700	22.0	60

750	25.0	60

Note:

1. The quantity of lead given in the table are on average basis and a variation of 10 percent is permissible.

2. Before pipes are jointed on large scale, three or four sample joints shall be made and the average consumption of lead per joint shall be got approved by the Engineer-in-charge.

Just sufficient quantity of spun yarn shall be put so as to give the specified depth of lead.

b. Jointing:

Preparing the joint: The interior of the socket and exterior of the spigots shall be thoroughly cleaned and dried. The spigot end shall be inserted into the socket right upto the back of the socket and carefully entered by two or three laps of treated spun yarn, twisted into ropes of uniform thickness, well caulked into the back of the socket. No piece of yarn shall be shorted than the circumference of the pipe. The jointed pipe line shall be at required levels and directions.

Leading: The leading of pipes shall be made by means of ropes covered with clay or by using special leading rings. The lead shall be melted so as to be thoroughly fluid and each joint shall be filled in one pouring.

The following precautions shall be taken for melting lead:

a. The pot and the ladle in which lead shall be put shall be clean and dry.

b. Sufficient quantity of lead shall be melted.

c. Any scum which may appear on the surface of the lead during melting shall be skimmed off.

d. Lead shall not be overheated, as it is not desirable to overheat it.

Caulking: After the lead has been run into the joint, the lead shall be thoroughly caulked. Caulking of joints shall be done after a convenient length of the pipes has been laid and leaded. The leading ring shall first be removed and any lead outside the socket shall be removed with a flat chisel and then the joint chalked round three times with caulking tools of increasing thickness and hammer 2 to 3 kg weight. The joints shall not be covered till the pipe line has been tested under pressure though the rest of the pipe line should be covered upto prevent expansion and contraction due to variation in temperature.

2.4.2. Lead caulked joints with lead wool yarn: This type of lead caulking is generally done when it is inconvenient or dangerous to use molted lead for joints, for example in cases such as inverted joints or in wet trenches or in exceptional cases. In such cases, the joints shall be made with lead wool or yarn. Caulking with lead, wool or yarn shall however be carried out, only after detaining the prior permission of Architect & Employer in writing.

Materials:

Lead wool or yarn and spun yarn:

Sub para (a) materials of para 1.7.4.1. shall apply except that the approximate weights and depths of lead wool or lead yarn required for each joint of various dia of C.I. pipes and specials shall be as given in the following table. Just sufficient quantity of spun yarn shall be put so as to give specified depth of lead wool.

Diameter of pipe in m.	Wt. of lead wool or lead yarn in Kgs.	Depth of lead wool or lead yarn in mm.
80	0.80	19
100	0.90	19

125	1.25	20
150	1.60	23
200	2.05	23
250	2.95	25
300	3.50	25
350	4.65	29
400	5.70	31
450	6.70	32
500	8.30	33
600	10.00	35
700	11.80	36
750	13.60	38
800	15.40	40
900	16.80	40

An allowance of five percent variation in the specified weight and depths shall be permissible.

Jointing:

The spun yarn shall be first inserted and caulked into the socket as described under jointing with pig lead. Lead wool or yarn shall then be introduced in the joint in strings not less than 6mm thick and the caulking shall be repeated with each turn of lead wool or yarn. The whole of the lead wool or yarn shall be compressed into a dense mass. The joint shall then be finally finished flus with face of the socket.

2.4.2. **Testing of joints:**

Para 1.1.6 shall apply.

2.5 **REFILLING OF EXCAVATED EARTH IN TRENCHES:**

The excavated earth shall be spread in layers of 200mm thickness and shall be compacted after proper watering. Initially, only thin filling shall be done, such that the joints remain completely open for working. Rest of the filling shall be done in the same manner, after the line is satisfactorily tested. The excavated material such as brick bats, asphalts cakes etc., shall be properly arranged in the top most layer of 23 cm only and shall be consolidated thoroughly. The excess materials shall be spread over the surrounding ground within a radius of 1.5 kilometers from the point of excavation at his own cost. If extra earth, for complete filling, will be necessary, the same shall be brought from other places by the contractor at his own cost, and the same shall be filled up into the trench as per the manner shown above.

2.5 **MEASUREMENTS:**

The lengths of pipes shall be measured complete as laid or fixed in running meter correct to a cm, excluding specials which shall be enumerated separately. The lengths of pipes shall however not include the portion of spigots within the sockets of specials and pipes at the joints.

Excavation, refilling, shoring and timbering in trenches, masonry or concrete pillars and thrust blocks, wherever required, shall not be measured separately by included in the item if so specified and provided for in bill of quantities, excavation in hard rock shall be measured and paid separately (on stack measurement basis after deducting 40% for voids).

Lead caulked joints shall be enumerated separately or may be clubbed with the item laying of pipes.

2.7. **RATE:**

The rate shall include the cost of all the materials and labour etc., involved in all the operations described above.

2.8. **MASONRY CHAMBERS:**

2.8.1. **General:**

All masonry chambers for stop cocks, shall be built as per supplied drawings.

2.8.2. **Excavation:**

The excavation for chambers shall be done true to dimension and levels as indicated on plans or as directed by the Architect & Employer.

2.8.3. **Bed Concrete:**

This shall be of cement concrete 1:3:6 (1 cement :3 fine sand : 6 graded stone aggregate 40mm nominal size) and 100mm thick. In case of chambers for stop cocks, thickness can be 75mm.

2.8.4. **Brick work:**

This shall be with 2nd class bricks (average crushing strength not less than 35 Kg/sqcm) with cement mortar 1:6 (2 cement :6 fine sand) and one brick thick.

2.8.5. **Plastering:**

Plastering not less than 12mm thick shall be done in cement mortar 1:4 (1 cement : 4 coarse sand). It shall be finished with a floating coat of neat cement for inner surfaces only.

2.8.6. **Surface Box:**

This shall be of cast iron, well made and free from casting and other defects. All sharp edges shall be removed and finished smooth. The shape and dimensions for surface boxes for stopcocks, water meters etc., shall be as given in drawings.

Drawing for this shall be supplied as a typical drawing and the item 1.8.1. to 1.8.5 to be checked to tally with drawings.

The C.I. Surface box shall be fixed on the top of masonry chamber in plain or reinforce cement concrete 1:2:4 (1 cement : 2 coarse sand: 4 grades stone aggregate 20mm, normal size).

The C.I. surface box shall be fixed on the top of masonry chamber in plain or reinforce cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm, normal size).

2.8.7. **Measurements:**

Masonry chambers shall be enumerated under the relevant items as per sizes.

2.8.8. **Rate:**

The rate shall include the costs of all materials and labour involved in all the operations described above, including excavation in all soils, morrum, soft rock, boulders or decomposed rock, hard rock and disposal as directed. If so specified and provided for in bill of quantities the excavation in hard rock will be measured and paid for separately on stack basis after 40% deduction for voids.

B. **DRAINAGE:**

B.1 **STONE WARE PIPES:**

B.1.1. All pipes with spigot and socket ends shall conform to IS 651 – 1980 and shall be of grade "A". These shall be sound, free from visible defects such as fire cracks or hair

cracks etc. The glaze of the pipes shall be free from crazing. The pipes shall give a sharp clear not when struck with a light hammer. There shall be no broken blisters or chipping. The approximate thickness of pipes shall be as given in the table below: (for pipes of 60 cm length only).

Internal diameter mm	**Minimum thickness of the barrel and of socket in mm**	**Weight of each pipe per M in Kgs (minimum)**
100	12	14
150	16	22
200	17	33
230	19	44
250	20	52
300	25	79
350	30	112
400	35	148
450	38	180

The length of pipes shall be about 65 or 75 or 90 cm, exclusive of the internal depth of the socket.

The pipes shall be handled with sufficient care, to avoid damage to them.

B.1.2. **Laying of Stoneware pipes:**

Para 2.2 "Trenches for C.I. pipes & specials" shall apply. All pipes shall be laid on a bed of 15 cm cement concrete 1:5:10 as specified, projecting on each side of the pipe to a width of 15 cm. The pipes shall be covered with 15 cm thick concrete 1:5:10 around the crown of the pipe and sloped off to meet the outer edges of the bed concrete to give a minimum thickness of 15cm. all round the pipe.

The pipes shall be carefully laid to the alignments, levels and gradients shown on the plans and sections. Great care shall be taken to prevent earth stones, sand etc., from entering the pipes. The pipes between two manholes shall be laid truly in a straight line without vertical or horizontal undulations. The pipes shall be laid with socket up the gradient. The body of the pipe shall, for its entire length rest on an even bed of concrete, and pockets shall be excavated in the concrete to receive the socket of the pipe.

Where pipes are not bedded on concrete, the trench floor shall be left slightly high and carefully bottomed up as pipe laying proceeds, so that the pipe barrels rest on firm and undisturbed ground. If the excavation has been carried too low, the desired levels shall be made up with concrete 1:5:10 (1 cement : 5 fine sand: 10 graded stone aggregate 40mm nominal size), for which no extra payment shall be made.

If the floor of the trench consists of rock or very hard ground that cannot easily be excavated to a smooth surface, the pipe shall be laid on a levelling course of concrete as desired.

B.1.3. **Jointing:**

Tarred gasket of hemp yarn soaked in thick cement slurry shall first be placed round the spigot of each pipe and spigot shall then be slipped home well into the socket of the pipe previously laid. The pipe shall then be adjusted and fixed in the correct position and the gasket caulked tightly home so as to fill not more than 1/4th of the total depth of the socket.

The remainder of the socket shall then be filled with stiff mixture of cement mortar in the proportion of 1: 1 (1 cement : 1 fine sand). When the socket is filled, a fillet shall be formed round the joint with a trowel forming an angle of 45 degrees with

the barrel of the pipe. The joints shall be tested hydraulically as per para 1.9.4 and no concreting for encasement shall be done unless pipes are satisfactorily tested and atleast 24 hours elapse after the pipe joints are rectified to the extent necessary. After a day's work, all extraneous materials shall be removed from the inside of the pipes. The newly made joints shall be cured well.

B.1.4. **Testing of joints : Hydraulic tests:**

Stoneware pipes used for sewers shall be subjected to a test pressure of 1.5m or required head of water at the highest point of the section under test. The test shall be carried out by suitably plugging the lower end of the drain and the ends of the connection, if any, and filling the system with water. A knuckle bend shall be temporarily jointed at the top and a sufficient length of vertical pipe jointed to it, so as to joint with a connection to a hose ending in a tunnel, which could be raised or lowered till the required head is obtained, and fixed suitably for observation.

During the test the required head is maintained for 30 minutes by adding water from a measuring vessel at 10 minutes interval and the average quantity added shall not exceed 1 litre per hour per 100m length per 10mm dia of pipe.

Where leakage is visible the defective part of the work shall be removed and made good, at no extra cost.

B.1.5. **Refilling of trenches:**

Para 2.5 under water supply shall apply.

In case where pipes are not bedded on concrete, special care shall be taken in refilling trenches, to prevent the displacement and subsequent settlement at the surface, resulting in uneven surfaces and dangers to foundations etc. Initially, the back filling materials shall be packed by hand under and around the pipe and rammed with a shovel and light tamper. This method of filling will be continued upto the top of pipe. The refilling shall then rise evenly on both sides of the pipes and continued upto 60 cm above the top of pipes, so as not to disturb the pipes. No tamping should be done within 15 cm of the top of pipe. The remainder of backfill shall not be done until 7 days have elapsed for brick sewers and 14 days for concrete sewers, unless local conditions or materials are suitable for earlier placing of loads on the pipes. The tamping shall become progressively heavier, as the depth of the backfill increases.

B.1.6. **Measurements:**

The lengths of pipes shall be measured in running meters nearest to a cm, as laid or fixed from inside of one manhole to the inside of the other manhole. The length shall

be taken along the center line of the pipes, over all fittings such as bends, junctions etc., which shall not be measured separately.

Excavation, shoring, timbering, backfilling in trenches and cement concreting, wherever required, is clubbed with the item only if so specified and provided for in bill of quantities, excavation in hard rock will be paid for separately, based on stack measurement basis, after deducting 40% towards voids.

B.1.7. **Rate:**

The rate shall include the cost of all materials and labour involved in all the operations described above, including excavation in all soils, morrum, soft rock, boulders or decomposed rock, hard rock and disposal as directed. If so specified and provided for in bill of quantities the excavation in hard rock will be measured and paid for separately on stack basis after 40% deduction for voids.

B.1.8. **S.W.Gully Trap:**

B.1.8.1. Gully traps shall conform to IS:651-1980. These shall be sound, free from visible defects, such as fire cracks or hair cracks. The glaze of the traps shall be free from crazing. They shall give a sharp clear note when struck with light hammer. There shall be no broken blisters.

The size of the gully trap shall be as specified and all dimensions will be as per drawing.

Each gully trap shall have one C.I. grating of square shape corresponding to the dimensions of inlet of gully trap. It will also have a water tight C.I. cover with frame, inside dimensions 300 x 200mm and the cover weighing not less than 2.72 Kg. The cover and frame shall be of sound and good casting and shall have truly square machined seating faces.

B.1.8.2. **Excavation:**

The excavation for gully traps shall be done true to dimensions and levels as indicated on plans or as directed by the Architect & Employer.

B.1.8.3. **Fixing:**

The gully trap shall be fixed on cement concrete foundation 600 x 600 cm square and not less than 10 cm thick. The mix for the concrete will be 1:5:10 (1 cement : 5 fine sand: 10 graded stone aggregate 40mm nominal size). The jointing of gully outlet to the branch drain shall be done similar to jointing of S.W. pipe as directed in 2.1.3.

B.1.8.4. **Brick masonry chamber:**

After fixing and testing gully and branch drains, a brick masonry chamber 300 x 200 (inside) in best quality locally available bricks of strength not less than 35 Kg/Sqcm in cement mortar 1:5 (1 cement : 5 fine sand) shall be built with a 10 cm. thick brick work round the gully trap from the top of the bed concrete upto ground level. The space between the chamber walls and the trap shall be filled in with cement concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stones aggregate 400mm nominal size). The upper portion of the chamber i.e., above the top level of the trap shall be plastered inside with cement mortar 1:4 91 cement : 4 coarse sand), finished with a floating coat of neat cement. The corners and bottom of the chamber shall be rounded off as to slope towards the grating and or a hopper.

C.I. cover with frame 300 x 200mm (inside) shall then be fixed on the top of the brick masonry with cement concrete 1:2:4 (1 cement : 2 coarse sand: 4 graded stone aggregate 20mm nominal size and rendered smooth. The finished top of cover shall be left about 4 cm above the adjoining ground level so as to exclude the surface water from entering the gully trap.

B.1.8.5. **Measurements:**

The work shall be enumerated including excavation.

B.1.8.6. **Rate:**

The rate shall include the costs of all materials and labour involved in all operations described above, including excavation in all soils, morrum, soft rock, boulders or decomposed rock, hard rock and disposal as directed. If so specified and provided for in bill of quantities the excavation in hard rock shall be measured and paid for separately on stack basis after 40% deduction for voids.

B.1A.0 **DROP CONNECTION:**

B.1A.1. In cases where branch pipe sewer enters the manhole of main piper sewer at a level higher than the main sewer by more than 600mm, a drop connection should be provided. A typical drawing for drop connection shall be supplied to the contractor.

For 150 and 250mm main lines, if the difference in levels between the main – sewer water line (peak-flow-level) and the invert level of branch line is less than 60 cm, a drop connection may be provided within the manhole by giving a ramp. If the difference in level is more than 60 cm., the drop should be provided externally.

B.1A.1.1. **The Excavation:**

The excavation shall be done for the drop connection at the place where the branch line meets the manhole. The excavation shall be carried upto the bed concrete of the manhole and to the full width of the branch.

B.1A.1.2. **Laying:**

At the end of branch sewer line a stoneware "T" shall be fixed to the line, which shall be extended through the wall of the manhole by a horizontal piece of C.I.pipe to form an inspection or cleaning eye. The open end shall be provided with a chain and lid. The stone ware drop pipe shall be connected to the tee at the top and to the S.W.bend at the bottom. The bend shall be extended through the wall of the manhole by a piece of C.I. pipe, which shall discharge into the channel. Necessary channel shall be made with cement concrete 1:2:4 (1 cement : 2 fine sand : 4 graded stone aggregate 20mm nominal size) finished smooth (with a floating coat of neat cement), to connect the main channel. The joints between S.W. pipes and C.I./S.W. fittings shall be cement jointed.

The joint between S.W. tee and S.W. branch line shall be made with cement mortar 1:1 (1 cement :1 fine sand) as per para B.1.3. for S.W.pipes. The exposed portion of the drop connection shall be encased all round with a single brick work in C.M. 1:4 and pointed. The holes made in the walls of the manholes shall be made good with brick work in cement mortar 1:6 (1 cement : 6 coarse sand) and plastered with cement mortar 1:4 (1 cement : 4 coarse sand) on the inside of the manhole wall. The excavated earth shall be backfilled in the trench in level with the original ground level.

B.1A.2. **Measurements:**

Prop connections shall be enumerated. The "depth" beyond 60 cm shall be measured in running meters correct to a cm under relevant items.

B.1A.3. **Rates:**

The rates shall include the cost of labour and materials involved in all the operations described above but excluding the cost of excavation and refilling.

B.2.0 **CEMENT CONCRETE PIPES:**

B.2.1. The pipes shall be with or without reinforcement as required and of the class as specified. These shall conform to IS: 458 – 1961. The reinforced cement concrete pipes shall be manufactured by centrifugal (or spun) process. All pipes shall be true to shape, straight, perfectly sound and free from cracks and flaws. The external and internal surfaces of the pipes shall be smooth and hard. The pipes shall be free from defects resulting from imperfect grading of the aggregate, mixing or moulding. The pipes shall be of R.C.C. light duty, NP2 type, unless otherwise specified.

B.2.2. **Trenches for concrete pipe:**

Para 2.2 "Trenches for C.I. pipes and specials" shall apply. Where the pipe shall be bedded directly on soil, the bed shall be suitably rounded to fit the lower part of the pipe; the cost of this operation shall be included in the rate for laying the pipe itself.

B.2.3. **Laying of pipes:**

Loading, transporting and unloading of concrete pipes shall be done with due care. Handling shall be such as to avoid impact. Gradual unloading by inclined plane or by chain pully block is recommended. All pipe sections and connections shall be inspected carefully before being laid. Broken or defective pipes or connections shall not be used. Pipes shall be lowered into the trenches carefully. Mechanical

appliances may be used. Pipes shall be laid true to lines and grades as specified. Laying of pipes shall proceed upgrade of a slope.

If the pipes have spigot and socket joints, the socket end shall face upstream. In case of pipes with joints to be made with loose collars, the collars shall be slipped on, before the next pipe is laid. Adequate and proper expansion joints shall be provided where directed.

In cases, where the foundation conditions are unusual such as in the proximity of trees or holes, under existing or proposed manholes etc., the pipes shall be encased alround in 15 cm thick cement concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40mm nominal size) or compacted sand as per directions of the Architect.

In cases, where the natural foundation is inadequate, the pipes shall be laid either in concrete cradles supported on proper foundations or on any other suitably designed structures as specified. If a concrete cradle bedding is used, the depth of concrete below and the bottom of the pipes shall be atleast ¼ of the internal dia and not least than 100mm thick, and shall extend on the sides of the pipe atleast to a distance of ¼th of the outside diameter for pipes 300mm and over in dia and 75mm in case of lesser diameter pipes. The pipes shall be laid on this concrete bedding, before the concrete has set. Pipes laid in trenches in earth shall be bedded evenly and firmly and initially filled up as far the haunches of the pipes, as to safely transmit the load

expected from back-fill through the pipe to the bed. This shall be done either by excavating the bottom of the trench to fit the curve of the pipe or by compacting the earth under around the curve of the pipe to form an even bed. Necessary provision shall be made for joints, wherever required.

When the pipes is laid in trench in rock, hard clay, shale or other hard material, the space below the pipe shall be excavated and replaced with an equalizing bed of concrete of sand. In no place, shall pipes be laid directly on such hard material.

When the pipes are laid completely above the ground, the foundations shall be made even and sufficiently strong to support the pipes lines without any material settlement. Alternatively, the pipelines shall be supported on P.C.C. or similar saddles blocks. Similar arrangement shall be made to retain the pipe line in proper alignment, such as by shaping the top of the supports to fit the lower part of the pipe. The distance between the supports shall in no case exceed the length of a pipe. The pipes shall be supported as far as possible, close to the joints. In no case, shall the joints come in centre of the span. Care shall be taken to see that superimposed loads, greater than the total load equivalent to the weight of the pipe when running full shall not be permitted.

B.2.4. **Jointing of pipes:**

Joints are generally of rigid type.

B.2.4.1. **Spigot and socket joints (rigid):**

The spigot of each pipe shall be slipped home well into the socket of the pipe previously laid and adjusted in the correct position. The opening of the joint shall be filled with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand), which shall be rammed with a caulking tool.

After a day's work, all extraneous materials shall be removed from the inside of the pipes and the newly made joints shall be cured thoroughly for 7 days.

B.2.4.2. **Collar joint (Rigid):**

The two adjoining pipes be butted against each other and adjusted in correct position. The collar shall then be slipped over the joint, covering equally both the pipes. The annular space shall be filled with stiff mixture of cement mortar 1:1 (1 cement : 1 fine sand), which shall be rammed with a caulking tool.

After a day's work all extraneous material shall be removed from the inside of the pipe and the newly made joints shall be cured thoroughly for 7 days.

B.2.5. **Testing of joints, refilling of trenches, measurements and rate:**

Para B.1.4. to B.1.7 shall apply for stoneware and concrete sewers.

B.3. **MANHOLES, INSPECTION CHAMBERS, STORM WATER GULLIES ETC.**

B.3.1. **Inspection Chambers:**

B.3.1.1. Where depth of sewer is less than 1.5m rectangular chambers shall be used having size as specified. Usual sizes are 450 x 900 or 600 x 900. These shall be constructed in the sewer line at such places and levels and dimensions as indicated on the drawing. Sizes specified shall be clear internal dimensions of the chamber.

B.3.2. **Manholes:**

B.3.2.1. Where depth of sewer exceeds 1.5m circular conical manholes shall be provided. Various types and sizes of manholes are specified for different depths. Typical drawing of various types of manholes shall be supplied to the contractors. In the absence of such drawings the standard drawings of the MCH sewerage department of local body if available shall be followed.

B.3.2.2. Manholes and inspection chambers are provided on roads or where heavy vehicular traffic is expected are provided with "heavy duty" C.I. airtight frame and cover.

For those built on foot paths carriage drives and cycle tracks "medium duty" covers are provided. For locations within domestic premises or areas not subjected to wheel traffic loads they shall be provided with "light duty" covers.

B.3.3. **Construction of manholes, Inspection chambers and gullies:**

B.3.3.1. **Excavation:**

This shall be done to dimensions and levels on the drawing.

B.3.3.2. **Bed concrete:**

Base of the manhole shall be constructed in P.C.C. 1:4:6 may fulfil this as specified, and of thickness as specified and shown on drawings or as directed.

B.3.3.3. **Brick work:**

Brick work shall be in CM 1:6 constructed with second class bricks of crushing strength not less than 35 Kg per sqcm. Brick masonry in arches and arching over the

pipes shall be in CM 1:3. Walls shall be generally built in 230mm thickness for inspection chambers and manholes upto a depth of 2.1m and 350mm thick for depths over 2.1m. However the exact thickness shall be based on structural design and shall be specified by the Architect & Employer.

B.3.3.4 **Plastering:**

Walls of manholes shall be plastered inside with 12mm thick cement plaster 1:4 and finished smooth with a floating coat of neat cement. Where ground water table is high external surfaces of manholes shall also be plastered in CM 1:4.

B.3.3.5. **Vatas:**

75mm fillet shall be made with CM 1:3 all round the external joints between the bed concrete and brick masonry walls for manholes.

B.3.3.6. **Benching:**

Channels and benching inside he manhole or inspection chamber shall be done in CC 1:2:4 and rendered smooth with neat cement. Depth of channels and benching shall be as per the table given below:

Size of drain in mm	Top of channel at center in cm. above bed concrete	Depth of benching at side walls in C.M. above bed concrete.
100	15	29
150	20	30
200	25	35
250	30	40
300	35	45

B.3.3.7. **P.C.C.Cap:**

PCC M 150 cap of 150mm thickness shall be provided on top of manholes for fixing the manhole frame.

B.3.3.8. **Footrests:**

Footrests shall be of C.I. rings, weighing 5.41 Kg each and made up of 20mm dia M.S. square of round bars, as specified. These shall be embedded in 1:3:6 cement concrete and properly secured. Footrests shall be placed 300mm apart vertically and

375mm horizontally in staggered fashion. First footrest shall be 450mm below top. Foot rests shall be painted with coal tar or bituminous paint and the portion embedded shall be painted with thick cement slurry before fixing.

B.3.3.9. **Manhole frames and covers:**

Approximate weights for various dimensions of frames and covers of various duties shall be as specified in the respective items.

Covers shall have raised chequered design on the top surface to provide adequate non slip grip. The cover shall be capable of easy opening and closing, and it shall be fitted in the frame in a workmanlike manner. Covers shall be gas and water tight. Size of the cover shall be the clear internal dimensions of frame. 2½% variation in weights shall be permissible. Covers and frames shall be coated with a black anticorrosive paint of bituminous composition. The coating shall be smooth and tenacious. The covers shall be so fixed as to be flush with ground surface. After completion, the manhole covers shall be sealed by means of grease.

B.3.3.10. **Testing:**

Manhole after it is raised above highest expected sub soil water level in the monsoon, shall be tested for water tightness. The mouths of all pipes entering the manhole shall be suitably plugged with brick masonry or wooden or any other type of plug. Manhole under test shall then be filled with water upto general sub-soil water level and the level observed for one hour. If the level does not drop by more than 50mm in one hour, it shall be deemed as water tight. During testing the pit around shall be kept free of water, and contractor shall observe the places where leakages takes place and take steps to correct the same.

B.3.4. **Measurements:**

Manholes, Inspection Chambers, gullies etc., shall be enumerated under relevant items in the schedule of quantities. Depth shall be measured from top of C.I. cover to the invert level of channel. Depth shall be measured to correct centimeter. The extra depths shall be measure as an extra, over the depth specified under enumerated item, and paid for running meter, under a separate item, following the main item.

B.3.5. **Rate:**

The rate shall include the cost of materials and labour involved in all operations from (2) to (9) under B.3.3. above, upto specified depth in the item. Payment for

extra depths shall be paid separately under relevant item. Excavation and refilling is clubbed with the item of manhole Para 2.8.8 of "Water Supply" shall apply. If the duty of the cover in the item is changed during execution by the Architect & Employer, amount due to difference in weight of the cover shall be paid extra or deducted, as the case may be.

B.4.0. **SOIL, WASTE, RAIN WATER, VENT AND ANTI-SIPHONAGE PIPES AND FITTINGS:**

B.4.1. All soil, waste, rain water, vent and anti-siphonage pipes and fittings used within sunken floor areas or within plumbing shafts vertical run, shall be send cast iron socket and spigot type pipes conforming to IS 1729 – 1964 or its subsequent revision. All cast iron pipes and fittings shall be of the best approved Indian make of soil variety and free from flaws, air bubbles, cracks, sand-holes and other defects and truly cylindrical and uniform in thickness. They shall not be brittle, but shall allow for heavy cutting, chipping and drilling and shall not be less than the diameter, mentioned in the schedule of quantities, and shall be of the largest length available, and shall be fixed against the wall with special "U" clamps – 25mm wide, 3mm thick and hot dip galvanized, by means or round headed flat nails on brickwalls.

B.4.2. Jointing shall be carried out with molten lead. The spigot of the pipe or fitting must be forced well home into socket of next pipe or fitting (as may be the case) and must

be centered, so that the joint may be of even thickness alround. Atleast, one complete lap of clean white hemp spun yarn without being forced through the joint. As many laps as may be needed, to leave a space of not less than 25mm for the lead shall then be placed in the joint and caulked tight. The joints shall then be run with molten lead in sufficient quantity so that after being caulked, the lead may project about 1/8" beyond the face of the socket, against the outside of the spigot, but must be flush with the outside edge of the socket.

B.4.3.A. The joints, if so specified in the respective items, shall be done in cement mortar in place of lead. In case of cement jointing, the joints shall be done as specified in b.5.2, but after the hemp soaked in thick cement slurry is forced in the socket for one complete lap, a stiff mixture of cement mortar in proportion 1:1 (1 part of cement to 1 part of clean fine sand) is filled in the remainder of the socket. When the socket is filled, a fillet shall be formed round the joint, with a trowel and finished smooth cured well.

B.4.3.B. Clean outs at the head of C.I. S/S horizontal pipes running under the floor shall be of cast brass screwed in type. Floor and wall cleanouts shall be of cast brass screwed type. The connecting pipes shall be G.I. threaded coupling to suit the cleanout with lead caulked joint.

B.4.4. Inspection chambers, gully traps, etc., within the building shall be of approved make cast iron chambers with bolts, nuts to close the cover, all to be fabricated as per actual requirement.

B.4.5. Supports, pedestals and base for inspection chambers, gully traps and pipes shall be in 1:2:4 cement concrete mix.

B.4.6. Pipe sleeves and inserts, etc., through RCC walls either external or internal shall be of C.I. or M.S. provided with water bar flange.

B.4.7. During installation, open ends of pipes shall be plugged with wood cut into required shape and gunny bags and to be maintained to be free from dirt.

B.4.8. G.I. waste pipes and fittings shall be of "C" class I.T.C. or equivalent with G.I.a unions, tall pieces reducers and connections to be provided between joints with either lead or C.I. pipes.

B.4.9. The sizes of branch waste pipe for different fittings shall be as follows:

Lavatory Basin	-	32 dia
Urinal	-	40 dia
Sink	-	40 dia

Nahani trap - 75 dia

B.4.10. W.C. pan connectors shall be to suit the requirements as per drawing, with 40mm dia vent horn for connection to the antisiphonage pipe and with pan connector of C.I. or lead.

B.4.11. Connection to the sewage or storm water collection sumps to be perfectly water tight.

B.4.12. Rain water flashing shall be with C.I.dome shape grating and extension piece as specified in the item.

B.4.13. All rainwater pipes and fittings shall be soil type variety conforming to I.S. 1729 – 1964 or equivalent. This shall apply to pipes outside buildings or within the buildings or for separate shafts.

B.4.14. The floor traps for toilet blocks shall be of cast iron with C.I./brass grating, bolted down design. The traps shall be 'P' type and of dimensions as given in table 26 of IS 1729 – 1979 (clause 7.1).

B.4.15. Where toilet slabs are sunk, the floor trap shall be of 100 x 75mm heavy duty type with C.I. "P" trap and C.P. brass grating of bolted down design.

B.4.16. Bathroom C.P.grating shal be of bolted down design out of heavy cast brass, with chromium plating of best approved standard.

B.4.17. Cast iron grating shall be flat with perfect edges and of best quality procurable and of the specified width and thickness and in the available lengths.

B.4.18. Spigotted and socketed 75mm, 100mm and 150mm C.I. pipes shall be of heavy pattern for the portions below the floor and embedded and laid over 150mm cement concrete 1:2:4 with width of concrete being

For 75mm dia pipes	-	320mm wide
For 100mm dia pipes	-	400mm wide
For 150mm dia pipes	-	450mm wide
For 200mm dia pipes	-	600mm wide.

The pipes shall be laid to a slope of minimum 1 in 100 and preferably to 1 in 50, and connected to the drain. On no account should lime or lime concrete come in direct contact.

B.4.19 **Measurements:**

All pipes shall be measured along their lengths, including length over the fittings and be paid under relevant items. Alternatively, straight pipes shall be laid measured along their lengths along centre line, excluding length, over fittings and fittings shall be enumerated and paid per number. Whatever method of measurements is to be followed for the to item in the schedule, the description of respective items in the schedule shall be worded accordingly. Traps, clean outs etc., shall be enumerated separately and paid separately per number.

B.4.20. **Rate:**

The rate shall include the costs of all materials and labour involved in all the operations described above, including excavation in all soils, morrum, soft rock, boulders or decomposed rock, hard rock and disposal as directed. If so specified and provided for in bill of quantities the excavation in hard rock will be measured and paid for separately on stack basis after 40% deduction for voids.

B.5. **LEAD PIPES:**

B.5.1. Lead pipes shall be of solid drawn lead, the size mentioned being their internal diameter and shall conform to the requirements of relevant Indian Standard Specifications.

B.5.2. The weights for lead pipes of various bores shall be as follows:

BORE OF PIPE	WEIGHT OF PIPE	REMARKS
100 dia 75 dia 65 dia 50 dia 40 dia	11.4 Kg per m. 8.5 Kg per m. 7.2 Kg per m. 6.0 Kg per m. 4.47 Kg per m.	For soil, waste, anti siphonge and vent.
40 dia 32 dia 15 dia	6.00 Kg per m. 4.47 Kg per m. 1.50 Kg per m.	For flushing and washing pipes.
25 dia 10 dia 15 dia	6.20 Kg per m. 4.47 Kg per m. 3.00 Kg per m.	Supply and distribution pipes.

B.5.3. The joints between the lead pipes and other fittings shall be made with brass thimbles and tail pipes and jointing shall be with wiped solder joints.

B.5.4. **Rates:**

The rate shall include the costs of all material and labour involved in all the operations described above. The following paras B "A" to B "C" and B.6 to B.7 are applicable for all works under "A" Water Supply and "B" drainage.

B. "A" CUTTING, PATCHING, REPAIRING AND MAKING GOOD:

B.A.1 Cutting, patching and repairing required for the proper installation and completion of the work, specified in each division, including chasing, plastering, masonry work, concrete work, etc., and making good shall be carried out by the contractor wherever required. Holes which are cut over size shall be refilled, so that a tight fit is obtained around the pipe or other passing throughout.

B.A.2. Any damages to water proofed locations should not be patched up, without rectification by the water proofing agency (specialist contractor) to ensure his guarantee.

B.A.3. **Equipment Protection:**

B.A.3.1. Keep all pipe and conduit openings closed by means of plugs or caps to prevent the entrance of foreign matter. Protect all piping, conduit, fixtures, equipment or apparatus. Any such items damaged prior to final completion of work shall be restored to its original conditions or replaced at no expense to the owner.

B.A.3.2. **Accessibility:**

The installation of valves, thermometers, cleanout fittings and other indicating equipment or specialities requiring frequent reading, adjustment, inspection, repairs, removal or replacement, shall be conveniently and accessibly located with reference to the finished buildings. Thermometers and gauges shall be installed so as to be easily read from the floor. For floor cleanout, minimum distance of 600mm shall be available from any wall.

B.A.3.3. **Insets & Sleeves:**

General:

In advance of placing of concrete slabs or construction of walls, required inserts and sleeves necessary to complete the work. Cost of cutting or patching made necessary as a result of this operation shall be at no expense to the owner. Openings shall be as per structural consultants approval.

B.B.0 **EQUIPMENT, MATERIAL AND WORKMANSHIP, TESTS:**

B.B.1 Determine that each piece of equipment meets the detailed requirements of the contract documents and that it is suitable for the installation shown. Notify the Architect of any short comings found during the tendering period. Each piece of equipment furnished shall meet at all detailed requirements of the contract documents. Equipments not meeting all requirements will not be acceptable, even though specified by name along with other manufacturers.

B.B.2. Where two or more units of the same class of equipment are furnished, use product of the same manufacture, component parts of entire system need not be product of the same manufacturer but conform to ISI standard. Provide all materials and equipment, new and free from defects and of size, make, type, and quality specified or approved by the Architect & Employer. All shall be installed in a neat and workman like manner.

B.C. **CLEANING, OPERATION AND TESTS:**

B.C.1. Plumbing equipment, fixtures, piping etc., shall be free of stampings, marking (except those required by codes) iron cuttings and other foreign materials.

B.C.2 Hot, cold and drinking water systems shall be cleaned thoroughly and flushed with water.

B.C.3. The entire mechanical apparatus shall operate at full capacity without any objectionable noise or vibrations, at specified efficiency.

B.C.4. Test all plumbing systems in the presence of the Employer's/ Architect. Provide all equipment, materials and labour necessary for inspection and tests, and replace/ rectify/ repair all work, not passing the tests. After repairs are made, repeat the tests until the systems are found satisfactory and to the approval of above authorities. Carry out tests prior to concealing, insulating or back filling over any piping. No exceptions shall be made.

B.C.5. Test entire system of soil, waste and vent piping with water after the general inspection and test are completed and before the fixtures are set. After setting the fixtures, conduct smoke test, after sealing all traps.

B.C.6. **Water Test:**

Test entire system or sections of system by closing all opening in piping except the highest opening and filling the section/system with water to the point of overflow. If the system is tested in sections, plug each opening except the water in system or in portion under test for atleast 45 minutes before inspection starts at test pressure/head, lasting for two hours. The system must be water tight at all joints.

B.C.7. **Final Test:**

After all fixtures are set, test the system with smoke test as follows:

B.C.8. Test all drawings/rain water pipes and their branches within the building by water as described for the soil, waste and vent system.

B.C.9. **All Water piping:**

Hydro-static tests shall be conducted at 10 Kg/cm² or twice the working pressure (whichever is higher). The lest pressure shall be maintained for 0.5 hours, without any drop in pressure.

B.C.10. All tests on below grade lines shall be continued until backfill on such lines is completed, to disclose any damages caused by back-filling.

B.C.11. All systems be tested in sections as required to expedite the work or other trades and meet construction schedules and final tests on completion.

B.C.12. On completion of the works, the following tests shall be performed to the satisfaction of the Architects/ Employer before issue of virtual complete certificate, if so required.

a. Smoke test.

b. Hydraulic test.

c. Self inducted test for fixtures.

d. Test for anti-syphonage system

e. Pump rating and output.

f. Inspection of all units and fixtures.

B.C.13. The contractor shall arrange on his own initiative for similar tests during the progress of works to ensure that there are no defects in material/workmanship in portions of work to be concealed or embedded under the floor or walls or in ceiling.

Any pipe, fittings or fixtures found damaged or stolen during the progress of the work and before handing over of the building, the same shall be replaced by the contractor including patching up of the surfaces etc., as directed, at no extra cost.

6. SANITARY FIXTURES AND FITTINGS:

6.1 Unless otherwise specified, the sanitary fixtures shall conform to following specifications:

6.1.1. Water closets (European type) shall be of vitreous china of approved pattern, quality and colour. The closet shall be fixed with C.P.brass screws in floor for floor mounted type, and mounted on C.I. chair brackets with bolts for wall mounted type and shall be provided with solid plastic seat and cover with chrome-plated pillar brass hangers as specified.

6.1.2. Indian pattern shall be of similar quality of specified above. The pan shall be 675/575mm in length with "S" or "P" trap of materials same as that of the pan. The W.C. with the trap shall be fitted and fixed in position and built round solid with brick and cement, to required level after all connections are made. The finished floor of the water closet shall be of 25mm below the level of the room or passage in front of it.

6.1.3. Both types of closets should conform to the requirements of IS 771 (Part I): 1979 for glazed vitreous china sanitary appliances.

6.1.4. The flushing cisterns shall conform to the requirements of I.S.774 – 1984. High level cisterns shall be of cast iron, unless other specified. Low level cisterns shall be of the same material as the water closet. The cisterns shall be mosquito proof and shall fulfil the requirements of the local authority.

6.1.5. The flush pipes shall be 32mm dia and of lead if concealed, and if exposed brass/C.I.

6.1.6. Where flush valves are specified, there shall be of the best approved quality procurable with C.P. control valve and C.P. flush pipe. Prior approval of Architect shall be obtained before placing orders.

7. MODE OF MEASUREMENT:

7.1 All drain pipes shall be measured in linear lengths along the centre line of the drainage line laid. Deductions shall be made for chambers and fittings lengths etc. The rate shall include all work as specified in the respective items.

7.2. Stoneware or cast iron, bends, junctions, sewer traps etc., shall be measured in numbers and paid separately, only if item for pipe works does not specifically include "Fittings/Fixtures".

7.3. All cast iron spigots and sockets or flanged pipes for water supply, shall be measured in linear lengths along the centre line of completed work. Deductions shall be made for fittings lengths if fittings/ specials etc., are provided for separately in the schedules/bill of quantities. The rate shall include lead caulking or jointing with nut and bolts, rubber gaskets, etc., complete as specified in the respective items.

7.15. Same rate shall be applicable for pipes of same size and material laid in any building at any level or floor.

7.4. Cast iron fittings such as spigot and socket fittings, flanged fittings like tees, bends, tapers, cross etc., shall not be measured in numbers and paid for separately unless otherwise provided for in the bill of quantities/schedules.

7.5 The rock cutting shall be measured in cum of the stacks of excavated rock. Deduction for voids will be 40% of the gross stack volume. Only the rock which is removed by chiselling or blasting etc., shall be measured for this item of work, boulders shall not be considered as a rock. The excavated rock will become the owner's property.

7.6 All cast iron pipes, such as soil, waste, vent and rain water shall be measured in linear lengths along the centre line, to nearest cm as completed including length over fittings. The rates shall include all joints and clamps, etc., as specified in the respective items.

7.7 Length over cast iron fittings, for soil, waste, vent or rain water pipes like single or double waves of various degrees, bends, cowls etc., shall be measured in meters, as extra over the item for 7.6 above, if so provided for in the schedule/bill of quantities. Otherwise, the rate for these shall be same as for respective pipe work.

7.8 Plan cement concrete for supports and for encasement or bedding etc., shall be measured as specified in the respective items in the schedule of quantities.

7.9 Lead pipes shall be measured in linear length and shall be of weights as per specifications of the respective item in installation work. The rate shall include making of necessary offsets, bends etc.

7.10 All sanitary fittings and fixtures shall be measured in numbers, only if so provided in the Schedule/bill of quantities, and the rate shall include all the work specified and described under item in the schedule of quantities.

7.11 All G.I. pipes shall be measured in linear lengths along the centre line of the pipe, including G.I. fittings. The rate for pipe line upto and including 50mm die shall be inclusive of all G.I. fittings. In the case of pipe line of dia above 50mm dia G.I. fittings will be measured in nos., pipe lengths will be measured after deducting the lengths over fittings from linear measurements only if provided in the schedule/bill of quantities. The rates, in all cases, will be inclusive of all work as specified in the respective items. Lengths over valves shall be excluded.

7.12 All peet valves, ball valves, non-return valves, sluice valves, pressure reducing valves etc., shall be measured in numbers after excluding them from linear measurement, and paid for separately.

7.13 The diameters of pipes and fittings mentioned in the specification are the inside nominal diameters in all cases, unless otherwise stated. H.D P.E. pipes shall be specified as outside diameter and class.

7.14 In case fittings of C.I., G.I or stoneware of unequal bore, the largest bore shall be measured if paid separately.

7.15 Same rate shall be applicable for pipes of same size and material laid in any building at any level or floor.

C. **TOOLS AND MATERIALS AND STORAGE:**

a. The contractor at his own cost and charge shall provide all materials, tools, tackles, scaffolding, labour and water, necessary for execution and completion of the whole work in all respects.

b. The contractor shall pay the fees for testing the materials and bear the costs of the samples, and as well of packing and despatching/delivering in the respective laboratories/test houses, if tests are directed by the Architects, local authorities or any other statutory authorities.

c. The contractor at his cost shall obtain, from time to time various permissions and the completion certificates as per rules of all local and statutory authorities.

d. The contractor shall arrange proper and adequate storage facilities at site for all materials.

e. Any materials, brought at site, shall not be removed without the written authority of the architects/employer. Materials either damaged or rejected shall be immediately removed from the site. Materials, paid in the interim bills as on site but not used, shall be the property of the Employer and the contractor only shall be liable for any loss or damage thereto.

f. All the brackets and hangers for pipes shall be fixed to the walls or RCC, using "Dash" fasteners, wherever necessary.

g. Surplus material from the site shall be carted away by the contractor without any cost to the employer. On complete of work, storage "space" provided to the contractor shall be handed over to the Employer, clear and fit for occupation.

13. LIST OF MANDATORY TESTS

MATERIALS	TEST	TEST PROCEDURE	MIN.QTY.	FREQUENCY
SAND	a. Stilt Content	Field	20 Cum	20 cum or par thereof.
	b. Bulking	Field	20 Cum	50 Cum or par thereof
	c. Particle size distribution.	Field	40 Cum	Every 40 Cum or part, required in RCC work.
COARSE AGGREGATE	a. Particle size distribution b. Crushing value	Field	45 Cum	Every 45 cum or par thereof for RCC work. For rest of work as desired. b. Every 300 Cum
R.C.C.	1. Slump	Field		Once a day as desired.
	2. Cube strength		20 cum in slabs, beams	Every 20 cum of a days concrete.

			and connected columns	
BRICKS	1. Water absorption and Efflorescence		Designation 35	One test for each source of manufacture.
	2. Compressive Strength.		Designation 35	1,00,000 or par thereof. For larger quantities two tests for 1 lot of 1 lakh. One test for every additional 2 lakhs or par thereof.
TIMBER	Moisture Content		1 Cum	Every three cum or part.
STEEL	a. Tensile strength	IS – 1529	20 Tonne	Every 20 tonne or part.
	b. Bending strength	IS – 1529	20 Tonne	Every 20 tonne or part.

Note: Minimum quantity give above is the quantity of work which warrants conduction of respective tests.

1. Cost of samples, testing and transport will be borne by the contractors only.

2. Any other materials shall also be got tested by contractors at his own cost as per the instructions of Architects/Employer from time to time.

3. Frequency stated above is minimum and the contractor may have to test materials with any other frequency, as instructed by Architect/Client, without any costs.

14. **SAFETY CODE**

Suitable scaffolds should be provided for workman for all the works that cannot safely be done from the ground or from solid construction, except in cases of short duration works, which 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, it shall be of rigid construction made either of good quality wood or steel. The steps shall have a minimum width of 450mm and a maximum rise of 300mm. Suitable foot and hand holds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal to 4 vertical).

Scaffolding or staging more than 300mm above the ground or floor, swung or suspended from an overhead support, shall be erected with stationery supports and shall have guard rails properly attached, bolted, braced and otherwise secured and atleast 900mm high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such openings as may necessary for the access of persons and delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

Working platform, gangways and stairways should be so constructed that they should not sag unduly or unequally and if the height of the platform or the gangway or the stairway is more

than 3-6m above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened, as described in (ii) above.

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 900mm.

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 M in length while the width between side rails in ring ladder shall be in no case be less than 300mm. For longer ladders, this width should be increased atleast 6mm for each additional foot of length. Spacing of steps shall be uniform and shall not exceed 300mm.

Adequate precautions shall be taken to prevent danger from electrical equipment. At the work site, no materials shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall also provide all necessary fencing and lights to protect the public from accident, and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay damages and costs, which may be awarded in such suit, action or proceedings to any such persons or which may with the consent of the contractor be paid to compromise any claim by any such person.

I. **Excavation and Trenching:**

All trenches, 1.2m or more in depth, shall at all times be supplied with atleast one ladder for each 30m in length or fraction thereof. Ladder shall be extended from bottom of the trench to atleast 900mm above the surface of the ground. The side of the trenches which are 1.5m or more in depth shall be stepped back to give suitable slope or securely held by timber shoring, so as to avoid any danger to sides collapse. The excavated material shall not be placed within 1.5m of the edge of the trench or half of the depth of the trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.

II. **Demolition:**

Before any demolition work is commenced and also during the progress of the work.

a. All roads and open areas adjacent to the work site shall either be closed or suitably protected.

b. No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.

c. All practical steps shall be taken to prevent danger to persons employed, from the risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so over- loaded with debris or materials, so as to render it unsafe.

III. All necessary personal safety equipments as considered adequate by the Architects 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 the concerned.

a. Workers employed in mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.

b. 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.

c. Those engaged in welding works shall be provided with welder's protective (eye) shields.

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

e. When workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and are ventilated atleast for an hour before the workers are allowed to get into the manhole and the manholes so opened shall be cardoned off with suitable railing and provided with warning signals or boards to prevent accidents to the public.

f. The contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken.

i) No paint containing lead or lead products shall be used except in the form of paste or ready made paint.

ii) Suitable face masks should be supplied for use to the workers when paint is applied in the form of spray or a surface having lead paint is rubbed and scrapped.

iii) Overalls shall be supplied by the contractors to the workers and adequate facilities for washing shall be provided to the working painters during and on cessation of work.

IX. When the work is done near any place, where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

X. Use of hoisting machine and shackle including their attachments, in charge and supports shall conform to the following standards or conditions.

1.a. These shall be of good mechanical construction, sound material and adequate strength and free from any patent defects and shall be kept in good working order.

b. Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.

2. Every crane driver or hoisting 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 scaffolding or give signals to the operator.

4. 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. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

5. In case of departmental machines, the safe working load shall be notified by the clients. As regards contractor's machines the contractor shall notify the safe working load of the machines to the consultants, whenever he brings any machinery to site of work and get it verified by the consultants.

XI. Motors, 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 and minimise the risk of accidental descent of loads. Adequate precautions should be taken to reduce to the minimum risks of any part of a suspended load becoming accidentally displaced. Sleeves and boots as may be necessary should be provided, whenever workers are employed on electrical installations. The workers should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.

XII. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition. No scaffold, ladder, or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near place of work.

XIII. To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangements made by the contractor shall be open to inspection by the clients or the Architect.

XIV. These safety provisions should be brought to the notice of all concerned by display of a notice board at a prominent place of the workspot. The person, responsible for compliance of the safety code, shall be named therein by the contractor.

XV. Not withstanding the above clauses for (i) to (xiv), there is nothing in these to exempt the contractor from the operation of any other Act or Rules in force in the Republic of India.

14. LABOUR LAWS AND RULES

The Site Engineer shall ensure that the contractor maintains relevant records and fulfils all conditions and requirements in accordance with

a. The payment of Wages Act

b. Employer's Liability Act

c. Workmen's Compensation Act

d. Contract Labour (Regulations & Abolition) Act 1970 and Central Rules 1971.

e. Apprentices Act 1961.

f. Any other Act or enactment relating thereto and rules framed thereunder from time to time.

The Site Engineer shall refrain from involving himself and the supervisors under him by comments/advice/attempts at mediation in any kind of labour dispute at site. His job is only to report to his superiors any happenings of the this sort in an objective manner.

EMPLOYER'S RESPONSIBILITY – CONTRACT LABOUR (REGULATIONS AND ABOLITION) ACT 1970 AND RULES 1971

With a view to ensuring that the provisions of the Act are not contravened, the Site Engineer should give particular attention to the following points and see that all the provisions of the Act are enforced:

1. Principal Employer (Banks) is registered as per the Act.

2. Contractor holds a licence under the Act from the Local Labour Commissioner for the appointment of Contract labour.

3. Required notice boards, registers and records as provided in section 29 of the Act are maintained by the contractor.

4. Payment of proper wages as per the rules are effected within the prescribed time limits by the contractor.

5. Prescribed facilities and amenities are provided by the contractor.

6. Proper efforts are made by the contractor to set right contravention of law, as soon as the notice pointing out the same is received from the Labour Enforcement Officer, and reports "on action taken" are sent to the Labour Enforcement officer at the earliest with copies to the Employer.

14. **PROFORMAS.**

FORMAT OF GUARANTEE TO BE EXECUTED BY THE FIRM/CONTRACTOR IN RESPECT

OF THE WORK OF PRE-CONSTRUCTION ANTI TERMITE TREATMENT

This agreement made this _____ day of _____ Two thousand _____ between _____ (Name of Bank) a body corporate constituted under the _____ (Name of the Act) Act 19 having its Head Office at _____ (herein after called 'The Employer') of the one part and _____ (Name of Firm/ Contractor) (Hereinafter called the Guarantor) of the other part.

WHEREAS THIS AGREEMENT is supplementary to a contract (hereinafter called the contract dated _____ and made between the Employer of the one part and the Guarantor of the other part) where by the Firm/Contractor interalia understood to render the building/structure completely free from any infestation of termites. And whereas the Guarantors agreed to give guarantee to the effect that the said building/structure shall remain free from any infestation of termites for a minimum period of ten years from the date of completion of pre-construction antitermite treatment carried out as per the relevant I.S. code.

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

In witness where of these presents have been executed by the obligation _____ and by _____ and for on behalf of the employed on the day, month and year first above written.

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

Signed, and delivered by the hand of _____ (Contractor) in the presence of _____.

Signed, and delivered by _____ (Bank) by the hands of Sri _____ in the presence of _____.

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

FORM OF GUARANTEE FOR WATERPROOFING

Name of the Project:

Free Maintenance Guarantee – Water proofing work

by _____

We _____ hereby guarantee that the surfaces treated by us for

waterproofing in the above work, for M/s _____ the general building

contractor for the above work, shall remain entirely water tight. Should, however, due to any unforeseen defect left out in the work carried out by us during the period of ten years from the date of virtual completion of the work i.e. from _____ to _____ the same shall be rectified by us without any extra cost to the _____ (name of the Bank).

However, we shall not be responsible in any way if our work is tamper with or if the body of the structure is damaged due to sinking, cracking and/or by any other act of God beyond our control.

_____

Signature of the

Waterproofing Contractor

_____

Signature of the General

Building Contractor

15. SPECIAL CONDITIONS.

1. **Contractor shall not be entitled to any compensation for any loss suffered by him on account of delays in commencing or executing the work, what ever the cause of the delays may be, including delays arising out of modifications to the work entrusted to him or in any subcontract connected there with or delays in awarding contracts for other trades of the project or in commencement or completion of such works in obtaining water and power connections for construction purpose or for any other reason what so ever and the Employer shall not be liable for any claim in respect thereof. The Employer does not accept liabilities for any sum besides the tender amount, subject to such variations as are provided for herein.**

2. **The successful tenderer is bound to carry out any items of work necessary for completion of the job if such instructions in respect of such additional items and their quantities will be issued in writing by the Architects with the prior consent in writing of the Employer.**

3. **The contractor must bear in mind that the work shall be carried out strictly in accordance with specifications made by the Architects.**

4. **The rates quoted in tender shall also include electric consumption charges for power. If no power is available at site the contractor shall have to make his own arrangement to obtain power connection and maintain at his expense an efficient service of electric light and power and shall pay for the electricity consumed. The Employer shall give all possible assistance to the contractor to obtain the requisite permission from the various authorities, but the responsibility for obtaining the same shall be that of contractor.**

5. **Contractor shall strictly comply with the provisions of safety code in addition to all local rules and regulations.**

6. **The contractor shall be responsible for the observance of all rules and regulations framed by the government under the contract labour act. The Employer shall be entitled to deduct all losses, damages that he might suffer on account of non-observance of these rules by the contractor, from the amount payable to the contractor.**

7. **Time shall be considered the essence of this contract. The entire work must be completed within 45days from the commencement of the work. If the completion of the work is delayed beyond 1 month, a penalty at the rate of ½ % per week over the contract value will be imposed subjected to a maximum of 5%.**

   If the work is delayed beyond 30 days after the date of completion, the remaining work will be carried out through other agencies at the risk and cost of the contractors under the contract with prevailing market rates.

8. **The successful tenderer shall submit the phased programme of execution of different items of work within 2 days after receipt of acceptance letter.**

9. **Payment will be made subjected to a minimum of** as mentioned in NIT **and will be made within a period of TWO weeks after the bill is submitted to the Employer's Office with Architects Certificate.**

10. **Before filling in the tender the contractor will check all the drawings and schedule of quantities and will get an immediate clarification from the employer / Architects on item not clearly understood. No claims for any loss or compensation will be entertained on this account.**

11. **All the work shall be carried out as per detail drawings and specifications or as directed by employer / Architects.**

12. **The rates quoted in the tender shall be for the finished items of work They shall include all the charges labour, materials, transportation of material equipment, double scaffolding water and electric charges, tool and plants, marking out and cleaning of site, to do all things necessary to provide complete finished item for work consistent with the specifications attached to this tender document. The rates shall be inclusive of octroi duty, excise duty, packing and forwarding, loading or unloading or any other duties or fees levied by any government, public or local bodies. The rates shall be firm and shall not be subject to exchange variations, labour conditions or any other conditions whatsoever.**

13. **The calculations made by the tenderer should be based upon the probable quantities of the several items of work which are furnished for the tenderer's convenience in the schedule of quantities ,but it must be clearly understood that the contract is not a lumpsum contract , that neither the probable quantities nor the value of individual items nor the aggregate value of the entire tender will form part of the contract and that the employer / Architects do not in any way assure the tenderer or guarantee that the work would correspond there to.**

14. **Adequate engineering and technical staff to be appointed at site. CIVIL contractor should inform of their number and qualification. An Approval of employer / Architects should be taken prior to appointing such technical staff on site.**

15. The contractor shall keep the tender submitted by him open for acceptance for a minimum period of three months from the date of it's submission **.When once the tender is accepted the rates quoted by the successful tenderer shall be firm and the variation in rates of any one or all the items on any account shall not be allowed during the entire duration of the contract.**

16. **During the execution of work, contractor must check the work with his drawings .The contractor shall be responsible for all the errors in this connection and shall have to rectify all the defects at his own cost, failing which the client reserves the right to get the same rectified at the risk and cost of contractor.**

17. No claim for extra item or deviation from specification shall be entertained unless the same is pointed out and accepted as such before the work is taken in hand or within 15 days of work by the successful tenderer.

18. The contractor shall comply with all bye- laws and tax regulations (including GST) of local and other statutory authorities having jurisdiction over the works and shall be responsible for the payment of all the fees and other charges and for giving and receiving of all necessary notices drawings and test certificates.

19. **The successful tenders shall properly safeguard against damage or injury to the public and to any property or thing and shall alone be responsible for any such damage and injury to any person or persons or thing arising in connection with it's execution of work .The successful tenderer shall protect and hold harmless the employer against any or all claims for any such injury or damage.**

20. **The work in every respect during the progress and till final acceptance by the employer, including raw materials delivered at the site to be incorporated or used in CIVIL work by the successful tenderer will be at his own risk . Any loss or damage to any such material or work shall immediately be replaced by the successful tenderer at his own expense.**

21. **The employer shall have the right to direct the contractor to purchase and use the materials from any source for proper execution of work.**

22. **The employer / Architects or their authorized representatives shall have full power for inspecting the contractor's works or at any place from which the material is obtained. Acceptances of any such materials shall no way relieve the contractor of his responsibility for meeting the requirements and /or analysis not called for in the specifications shall be borne by the employer in case the material or work is found defective or of inferior quality .tests and /or analysis shall be done in the laboratory approved by the client and the contractor shall permit SBI and or the client's or their authorized representative to be present during any of the tests and /or analysis.**

23. **INSURANCE**

The contractor shall indemnify the employer up to CAR Policy (Contractor's All Risk Policy) against all claim which may be made against SBI by any member of the public or third party in respect of anything which may arise in consequence thereof and shall at his own expense arrange to effect and maintain up to one month, after the virtual completion from an office approved by the SBI a policy of insurance in the joint names and deposit such policy or policies with the employer from time to time during the currency of this contract. The contractor shall also indemnify SBI against all claims which may be made upon the employer under the workman's compensation act or any other statute in force during the currency of this contract or at common law in respect of any employee of the contractor or any sub contractor and shall at his own expenses effect and maintain upto one month after virtual completion of the contract, from an office approved by SBI a policy or policies of insurance in the joint names of the employer and the contractor as aforesaid .The contractor shall be responsible for any other thing which may be excluded from the insurance policies above referred to and also for any other damage to any property arising out of and incidental to the negligent or defective carrying out of this contract.

He shall also indemnify SBI in respect of any costs,. charges or expenses arising out of any claim or proceedings and also in respect of any award of compensation or damage arising therefrom. SBI shall be at liberty and is hereby empowered to deduct the amount of any damages, compensation caused, charges and expenses arising or occurring from or in respect of any such claims or damages from any sum or sums due

or to become due to the contractor.

24. WORKMAN AT SITE :

The contractors workpeople shall not be allowed to live on the site at any time throughout the contract nor to trespass beyond the limits of the site. The contractor will be held responsible for any acts of trespass by his workpeople.

25. DIMENSIONS :

Figures dimensions are to be taken in preference to scaled dimensions in all cases. Before commencing any work the contractor shall verify all measurements. If any discrepancies are found they shall immediately be brought to the notice of the Architects.

26. DISCREPANCIES

All the items shown on the drawings or specifications are taken to be included in both. Any discrepancies , which occur in either the drawings or specifications, shall immediately be brought to the attention of the Architects.

27. CUTTING AND MAKING GOOD

Where it is found necessary to interfere with finished work in order to execute this contract, the contractor will be required to do all necessary work at his expenses. Only approved hangers and bolts or other metal fixing devices shall be used to secure frames panels and other units in position .Wooden plugs will not be permitted .Holes shall be formed with electric drills whenever possible .Structural members shall not be cut or drilled without prior consent of the client .

28. MAINTENANCE AND GUARANTEE

The whole of the work to be performed under this contract shall be completed to the satisfaction of the Architects / Bank.

The contractor without additional charge to the employer renew or replaces any works which prove faulty from workmanship or materials and fully maintain the whole installations for a period of 6 months after the commencement of defects liability period of the main contract and a sum of 5% of the contract amount shall be retained by the employer for his period.

29. PREVENTION OF SPOIL DUMPING

The contractor shall take all reasonable steps to prevent spoil, rubbish, debris surplus materials etc.. arising from a work being dumped on an area other than a recognized or approved tipping area and the Contractor will be held responsible for and shall indemnify the employer against any claim or loss arising therefrom.

30. LEAVE PERFECT :

The Contractor shall remove all rubbish and superfluous material from the site of the works with all reasonable speed from time to time and at completion. On no account shall W.C' S or the employer's receptacles to be used for this purpose.

The client reserves its right to clear contractors un cleared debris at contractors own cost without any reasons & not more than one notice will be given for this.

31. 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 of materials used on the work or as to any other question, claim, right matter or thing whatsoever in any way arising out of our 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 work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

(a) **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, State Bank Of India, Premises and Estate Department, Local Head Office, Bank Street, Kothi, HYDERABAD – 500 195**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 have been given by the Contractor** The Assistant General Manager, State Bank Of India, Premises and Estate Department, Local Head Office, Bank Street, Kothi, HYDERABAD – 500 195**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, State Bank Of India, Premises and Estate Department, Local Head Office, Bank Street, Kothi, HYDERABAD – 500 195**in writing in the manner and within the time aforesaid.**

(b) The Assistant General Manager, State Bank Of India, Premises and Estate Department, Local Head Office, Bank Street, Kothi, HYDERABAD – 500 195 **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, State Bank Of India, Premises and Estate Department, Local Head Office, Bank Street, Kothi, HYDERABAD – 500 195**submit his claims to the conciliating authority namely the Circle Development Officer, State Bank of India, Local Head Office, Hyderabad for conciliation along with all details and copies of correspondence exchanged between him and** The Assistant General Manager, State Bank Of India, Premises and Estate Department, Local Head Office, Bank Street, Kothi, HYDERABAD – 500 195**.**

(c) **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 SBI 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.**

(d) **Except where the decision has become final, binding and conclusive in terms of the contract, all disputes of 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 SBI . It will also be no objection to any such appointment that the Arbitrator so appointed is a Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as 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 SBI . 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 SBI as aforesaid should act 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 mad 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 settlement 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 parities. 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.

32. TERMINATION OF CONTRACT BY EMPLOYER:

If the contractor (being an individual or a firm) commit any " Act of Insolvency ", or shall be adjudged as insolvent, or shall make an assignment or composition of the greater part in number of amount of his creditors, or shall enter into a Deed of Assignment with his creditors, or (being an incorporated Company) shall have an order made against him or pass an effective Resolution for winding up either compulsorily, or Subject to the supervision of the court or voluntarily, or if the official Assignee of the contractor shall repudiate the Contract, or if the Official Assignee or the Liquidator in any such winding up shall be unable, within seven days after notice to them requiring him to do so, to show to the reasonable satisfaction of the Architect that he is able to carry out and fulfill the Contract and if required by the Architect to give a security there for, or if the contractor shall suffer any payment under this contract to be attached by or on behalf of any of creditors of the Contractor, if the Contractor shall assign or sublet the contract without the consent in writing of the Architect first obtained, or if the contractor shall charge or encumber this Contract for any payments due or which may become due to the Contractor thereunder, or if the Architect shall certify in writing to the Employer that in his opinion the Contractor:

- **(a) Has abandoned the Contract, or**
- **(b) Has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the work for fourteen days after receiving from the Architect written notice to proceed, or**
- **(c) Has failed to proceed with the work with such due diligence and failed to make such due progress as would enable the works to completed within time agreed upon or**
- **(d) Has failed to remove materials from site or to pull down and replace works within seven days after receiving from Architect written notice that the said materials or work where condemned and rejected by the Architect under these conditions or**
- **(e) Has neglected or failed persistently to observe and perform all or any of the acts, matters or things required by this Contract to be observed and performed by the Contractor for seven days after written notice shall have been given to the Contractor requiring the contractor to observe or perform the same, or**
- **(f) Has to the detriment of good workmanship or in defiance of the Architects instructions to the Contrary, submit any part of the contract or has used in the permanent works important materials which are substandard and not as per**

specification fraudulently making the Architect / Employer to believe that it is the specified material.

Then and in any of the said caused the Employer with the written consent of the Architect may, notwithstanding any previous waiver, after giving seven days notice in writing to the Contractor, determine the contract, but without thereby affecting the powers of the Architect or the obligations and liabilities of the Contractor, the whole of which shall continue to be in force as fully as if the contract has not been so determined and as if the works subsequently executed and being executed by or on behalf of the contractor. And further, the Employer with the consent of the Architect by his agents or servants may enter upon and take possession of the works and all plant, tools, scaffoldings, shed, machines, steam and other power utensils and materials lying upon premises or the adjoining lands or roads, and use the same as his own property or may employ the same by means of his own servants and workman in carrying on and completing of the works or by employing any other Contractor or any other person or persons to complete the works and the Contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other Contractor or other person or persons employed for completing and finishing or using the materials and plant for the works, when the work shall be completed, or as soon thereafter as convenient, the Architect shall give a notice in writing to the Contractor, to remove his surplus material and plant and should the Contractor fail to do so within a period of fourteen days after receipt thereof by him, the Employer may sell the same by public auction and shall give credit to the Contractor for the amount so realized. The Architects shall thereafter shall assertion and certify in writing under his hand what (if anything) shall be due or payable to or by the Employer, for the value of the said plant and materials so taken possession of by the Employer, and the expense or loss which the Employer shall have been put to in getting the works to be so completed, and the amount, if any owing to the Contractor and the amount which shall be so certified shall, thereupon, be paid by the Employer to the Contractor or by the Contractor to the Employer as the case may be, and the certificate of the Architect shall be final and conclusive between the parties.

33. The mode of measurements shall be as per IS: 1200.

34. The contractor should co-ordinate with other agencies viz., Electrical, HVAC (Air-Conditioning), Civil, LAN cabling etc.,

35. CONTRACTOR SHOULD WORK AT ODD HOURS, ON HOLIDAYS TO KEEP UP TIME SCHEDULE. CONTRACTOR TO CO-ORDINATE WITH L/W WITH REGARDS TO WORKING HOURS.

36. Partitions shall be measured from finished floor level to bottom level of false ceiling.

38. The Contractor shall not be eligible for any material advance.

IST OF APPROVED MANUFACTURERS / NATURAL SOURCES OF MATERIALS TO BE USED IN THE CIVILAND SANITARY WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY SBI / ARCHITECT.
(ALL THE MATERIALS USED HAVE TO CONFIRM TO GREEN NORMS OF IGBC)

S.No	MATERIAL NAME.	BRAND / MANUFACTURER.
1.	CEMENT.	43/53 GRADE – L&T, BIRLA, ACC OR APPROVED EQUIVALENT.
2.	REINFORCEMENT STEEL.	Fe500 – TATA, SAIL, VSP / TMT OR APPROVED EQUIVALENT.
3.	AAC BLOCKS.	AEROCON / BIRLA OR APPROVED BY ARCHITECTS.
4.	METAL.	APPROVED BY ARCHITECTS.
5.	SAND.	MACHINE MANUFACTURED SAND OR APPROVED BY ARCHITECTS.

6.	READY MIX CONCRETE.	BIRLA / L & T / ACC OR EQUIVALENT.
7.	STRUCTURAL STEEL.	TATA OR EQUIVALENT.
8.	ASBESTOS SHEETS.	CHARMINAR OR EQUIVALENT.
9.	PVC PIPES.	SUPREME / PRINCE OR EQUIVALENT.
10.	WATER PROOFING COMPOUNDS.	B-DRY OR EQUIVALENT.
11.	PAINT.	NEROLAC / ASIAN / ICI / BEGER OR APPROVED EQUIVALENT.
12.	UPVC WINDOWS.	FENESTA/ NATURE / NCL VIKA/ KOMMERLING / LINGEL OR APPROVED EQUIVALENT.
13.	FLOAT GLASS.	TRIVENI OR APPROVED EQUIVALENT.
14.	FLUSH DOORS.	EGGWOOD / KUTTY OR EQUIVALENT.
15.	VITRIFIED TILES. (DOUBLE CHARGE OR NANO ONLY.)	JOHNSON / SIMPOLO / MARBITO / KAJARIA / NITCO / RAK OR APPROVED EQUIVALENT.
16.	CERAMIC AND GLAZED TILES.	JOHNSON / KAJARIA / NITCO/RAK OR EQUIVALENT.
24.	NATURAL WOOD.	APPROVED BY ARCHITECT
18.	GATE MOTOR.	NICE, ITALY MAKE OR APPROVED EQUIVALENT.
19.	CORBELLING STONE	APPROVED BY ARCHITECTS.
20.	ROOFING TILES.	LAFARGE OR APPROVED EQUIVALENT.
21.	GLASS MOSAIC TILES.	BISSAZA OR APPROVED EQUIVALENT.
21.	SANITARY FIXTURES AND FAUCETS:	JAGUAR / HINDWARE /Kohilara OR APPROVED EQUIVALENT.
22.	CPVC pipes	Ashirvad/ Supreme / Astral / Finolex

NOTE: The Contractor shall use only above mentioned material. All other materials shall confirm to the specifications laid down. The Contractor shall take this into account while tendering rates / prices. All materials and sections used should adhere to the manufacturer's guidelines and the contractor has to submit certificate from the manufacturer on usage of their specified product / sections.

The contractor shall submit all the parameters, for IGBC Certification, obtained from manufacturers, mentioned in " NOTES FOR CONTRACTOR" on page no 3 of this document to Architects / SBI and get their approval before procuring the material at site.

SPECIALISED AGENCIES:

1. Water proofing work : Work to be executed throughAuthorized / specialist agencies of B-DRY / FOSROC with prior approval of Architects/ Bank.

2. Anti termite treatment : Pest Control (India) Pvt. or any other equivalent.

GENERAL NOTE:

Any item/specification where in it is stated as equivalent means it should be equal in respect of quality and cost. While opting any "Equivalent" make, prior written approval of Architects and Bank shall be obtained.

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
1.0	Dismantling and Removing the old filled up material from the sunken portion old GI & CI lines, walls, sunken area at all levels inclusive of all consumable, tools, tackles, labour, lead and lift, scaffolding works chargers for all heights for all heights etc. complete as directed by the Bank. Disposal of debris out of Campus complete in all aspects. The scope of work and rate is inclusive of safe removal all the fixtures like wash basins, taps etc and handing over safely to Main Branch Hyderabad. The old GI & CI lines, sunken area fillings are to be sent out of Bank campus complete in all respects as directed by the Bank.	Cum	86.00		
2.0	**Brick Work -230mm:** Providing and constructing 230mm thick brick masonry in CM 1:6 using approved quality table moulded bricks of minimum 75kg / Sq.cm including raking, curing, MS scaffolding and staging, lead and lift, in all situations such as walls / pillasters / pillars / stub supports etc. complete as per drawing and as directed at all levels and heights.	Cum	29.00		
3.0	**Brick Work -115mm:** Providing and constructing 115mm thick Brick masonry in CM 1:4 straight or curved walls, piers and architectural features at all levels including a concrete band of 75mm thick with 3-nos of 8mm dia reinforcement rod at every 750mm ht with M20 grade concrete mix including shuttering, staging, MS scaffolding, centering, formwork, curing, etc., cement mortar of 1:4 including packing the residual space between masonry & other structural members like columns, beams, slabs etc., providing openings as directed and finishing neatly around the same, the cost of all materials including reinforcement steel, cost of labour,	Sqm	42.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	cost of equipment and machinery, work at all leads and lifts, loading and unloading, transportation, and all other incidental charges etc., complete. The work shall be carried out as per the directions of the Engineer in charge				
4.0	Plastering in 2 coats with 16mm thk 12mm thk in CM (1:6)prop and top coat 4mm thk in CM (1:4)prop for internal walls with dubara sponge finishing including cost and conveyance of all materials seignorage fee, all taxes, water to work site and all operational, incidential labour charges such as MS scaffolding, mixing, motor, lift charges, curing etc. complete for finished item of work as directed by the Engineer in charge/Architect	Sqm	168.00		
5.0	Water Proofing work: i. **Cement slurry:** Providing water proofing in 20 mm thick cement mortar 1:4, mixing with water proof compound of approved make Forsroc, Dr Fixit, ultratech or equivalentas approved in the proportions as permanufactures specifications including curing etc complete **ii.Brush Bond:** Providing and applying brush bond in two coats over the existing water proofing surface completeThe scope of work inclusive of all lead and lift chargers for all heights. including all labour, material, consumables, tools, tackles, lead, lift and transportation etc all complete as per direction of the Bank.	Sq.M.	100.00		
6.0	Providing and Filling with brick bats/cinder /AAC blocks to raise upto floor level from a depth of 250mm over existing flooring in layers (each layer should not exceed 150 mm), including compacting each layer by rolling/ ramming and watering including all labour, material, consumables, tools, tackles, lead and lift, scaffolding works chargers for all heights and transportation etc all complete as per direction of the Bank.	Cum	51.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
7.0	Providing and laying plain cement concrete 1:4:8 (1: cement 4: coarse sand 8: graded stone aggregate 40mm nominal size) using H. B. G coarse graded aggregate of 40 mm and down size for levelling course under sunken portion walls, platform etc., at all levels including laying layers of specified thickness in alternative bays not exceeding 10 sqm including form work wherever necessary and well compacted etc., including labour ,necessary tools &tackles ,cost of cement, lead and lift, scaffolding works chargers for all heights complete etc as directed by Bank.	Cum	12.00		
8.0	**TOILET FLOORING with EPOXY Grout**	Sq.M.	169.00		
	Providing and laying of anti skid vitrified floor tiles of approved colour and design 10 mm thick floor tiles of approved make and 300x300mm/600x600mm size fixed over 20 mm thick cement base mortar 1:6. The scope work is inclusive of providing proper slopes for better drainage of water to the traps, filling the joints with 3mm thick EPOXY Grout and matching pigment etc complete in all respects as directed by the Bank. **The basic cost of the tile is Rs 60.00 per sft.** The above basic basic cost does not include GST, transportation etc. at site should be assumed to arrive the tender rate. No extra claim towards wastage complete as per direction of the Bank.The rates all be inclusive of all the material, labour, hardware, transportation necessary lead and lift, scaffolding works chargers for all heights etc required for the complete as per direction of the Bank. **Note:** The scope work is also inclusive of disposal of debris out of Bank campus on weekly basis, failing which Bank will make arrangementsfor the disposal at the risk & cost ofthe contractor.				
9.0	**TOILET DADOING with EPOXY Grout**	Sq.M.	406.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	Providing and fixing of wall tiles of 300x600 mm size or approved size of approved colour, design and makeover a **base plaster of 15mm thick** on the brick work and **12 mm thick cement plaster 1:4** leveling course and filling / grouting the joints with white cement slurry mixed with approved matching colour with tiles at all levels with all required tools, plants, materials and labour required to complete the work in all respects as directed by Bank. The scope work is also inclusive of disposal of debris out of Bank campus on weekly basis, failing which Bank will make arrangementsfor the disposal at the risk & cost ofthe contractor. The **Basic cost of the tile is Rs.55.00 per sft** the abovebasic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. No extra claim towards wastage.The rates all be inclusive of all the material, labour, hardware, transportation necessary lead and lift chargers etc required for the complete as per direction of the Bank.				
10.0	**WPC DOORS INCLUDING FRAMES**	Sq.M.	8.00		
	Frame: Providing and Fixing WPC of Size 75mm x 100 mm section.Fixing the frame to ceiling, walls with MS hold fastners in cement motor etc in cement motar 1:4 and including one coat of anti termite chemical treatment and one coat primer and 2 coats of Enamel paint complete as directed by the Bank. **Door:** Providing and fixing 30mm thick solid core flush shutter cladded with both sides laminate 1mm thick of approved make and design **Hardware:** Providing and fixing Hardware of approved make to the 35 mm thick wpc door with cylinderical lock Aldrop, 2 Nos. SS Handle, 1 No SS Tower Bolt, 1 No SS Coat Hook, 4 Nos. SS 2 ball-bearing hinges ZERO VOC or NO VOC paint finish for all exposed surfaces of etc., complete as directed by the Bank. The rate shall be inclusive of all the material				

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	,labour, hardware, transportation consumables, tools, tackles, labour, lead and lift chargers for all heights etc. complete as directed by the Bank. Make: Alstone or Equivalent as approved by the Bank				
11.0	**UPVC VENTILATORS INCLUDING SUPPLY AND INSTALLING EXHAUST FAN & SS MESH OUT SIDE**	Sq.M.	12.00		
	Providing, supplying & fixing of Top hung Ventilator with Exhaust Fan made out of multi chambered uPVC sections with TPV Gasket for sash & Glazing bead shall be co-extruded with Grey colour soft PVC and reinforced with Galvanized Iron profiles through out the window and SS Mesh. The outer frame having an overall size of 60mm x 55 mm x 2.40 mm with reinforcement of 1 mm thickness, Mullion with overall size of 74 mm x 60 mm x 2.40 mm with reinforcement of 1 mm thickness and Sash with overall size of 75 mm x 60 mm x 2.40 mm with reinforcement of 1.0/1.2 mm thickness. (Composition of profile shall consists a minimum of 5.5 PHR of TiO2 and not more than 12 PHR of CaCo3 for every 100 parts of PVC resin). Glazing bead for fixing of glass shall be of size 34 x 20 mm coextruded with soft PVC gasket. Ventilator shall be provided with 4.5 mm Pin Head glass, standard hardware, single point locking using cockspur handle and friction stays. Wall thickness of frame, mullion and sash shall be 2.4 mm., including cost and conveyance of all materials, accessories, labour charges, lead and lift, scaffolding works chargers for all heights for transportation, erection at site complete for finished item of work.				
12.0	**OIL BOUND DISTEMPER PAINTING:**	Sq.M.	254.00		
	Providing of Painting works to thewall, Ceiling with Two coats putty Birla / JK wall Putty and one quote primer and two coats of Oil Bund				

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	Distemper to walls & Ceiling etc. The Rate quote should inclusive of all materials, labours, tools, tackles,consumables, lead and lift, scaffolding works chargers for all heights etc complete as directed by the Bank.				
13.0	EWC: Providing and fixing of Floor mounted EWC with Syphonic model of approved make & design along with required fixtures like Seat cover, Hinges, Accessories set etc. The scope of work inclusive of provision of PVC Pipe connector's, material, labour, hardware, transportation, tools, tackles,consumables, lead and lift for all heights necessary required to the complete the work as per direction of the Bank. The Basic Cost of the EWC should be Rs.12,000/- The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.	No's	22.00		
14.0	Wash basin: Providing and fixing of wash basin of approved make & design along with all required fixtures, Bottle trap with coupling, hose pipe, consumable, tools, tackles, labour, lead and lift, chargers for all heights etc. complete in all respects as directed by the Bank. Basic cost of wash basin is Rs.8,500/- The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.	No's	18.00		
15.0	Piller cock: Providing and fixing of Pillar Cock of approved make & design sutiable for wash basin with with all consumable, tools, tackles, labour etc. all complete as directed by the Bank. The Basic cost of Piller cock is Rs.2,100/- The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate.	No's	18.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	Make: Jaquar, Hindware, Parryware, Cera or Equivalent.				
16.0	CERAMIC URINALS : Supply and installation of ceramic urinals suitable for sensor operation with supply hose including all consumable, tools, tackles, labour etc all complete as directed by the Bank. Basic cost should be Rs.7,000/- per No. The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.	No's	15.00		
17.0	CONCEALED URINAL SENSOR : Supply and installation of senso-tronic concealed type Flushing Valve for urinal complete set with installation box with control cock including all consumable, tools, tackles, labour etc all complete as directed by the Bank. Basic cost should be Rs.9,000/- per No. The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.	No's	15.00		
18.0	**GLASS SEPARATOR:** Providing & fixing 12 mm thick white colour toughened glass partition wedge shape Between the Urinals form ht of 2' up to 5' ht with a varying width upto 2'-0" as per the design & fixed to wall with patch fittings at directed locations. All the exposed Edges of the Glass shall be machine polished,rounded as per the directions. The rate shall be inclusive of all the material ,labour, hardware, transportation necessary required for the complete and as directed by the Bank.	No's	14.00		
19.0	Health Faucet: Providing and fixing of Health Faucet of approved make and design including	No's	22.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	all consumable, tools, tackles, labour, transportation etc all complete as directed by the Bank. Basic cost should be Rs.1,100/- per No. The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.				
20.0	Supplying and fixing 100 mm dia inlet - 75 mm (3") outlet **PVC floor traps** 1st quality ISI marked with C.P grating fixing with white cement as per the site requirements with standard practice including CP cockroach trap with gratting, black painted for all floors including cost and conveyance of all materials to site, labour charges etc, complete for finished item of work.	No's	32.00		
21.0	Two way Bib Cock:Providing & fixing C.P. heavy quality 2 way Bib cock, with wall flange, including jointing using Teflon tape etc.complete.The rate shall be inclusive of all the material,labour, hardware, transportation necessary required for the complete as per direction of the Bank.. Basic cost should be Rs.2,100/- per No. The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.	No's	22.00		
22.0	Angle cock: Providing & fixing C.P. heavy quality Angle cockwith wall flange, including jointing using Teflon tape etc.complete.The rate shall be inclusive of all the material,labour, hardware, transportation necessary required for the complete as per direction of the Bank.. Basic cost should be Rs.1075/- per No. The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate.	No's	40.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	Make: Jaquar, Hindware, Parryware, Cera or Equivalent.				
23.0	Soap dispenser: Providing and fixing Soap Dispenser of approved make and design of 1 liter liquid soap capacity Including all necessary fittings, material,labour, hardware, transportation necessary required for the complete as per direction of the Bank.. Basic cost should be Rs.1350/- per No. The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.	No's	10.00		
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24.0	Providing & Fixing 6mm thick beveled edge mirror (Mirror of ap-proved quality & as per specifications) with 6mm thick asbestos plain sheet backing fixed with SS Studs & washers & complete as per approval. Size 1200mmX900mm complete and as directed by the Bank.	Sqm	12.00		
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25.0	Towel Ring: Providing and fixing Towel Ring of approved make and design Including all necessary fittings. The rate shall be inclusive of all the material,labour, hardware, transportation necessary required for the complete as per direction of the Bank.. Basic cost should be Rs.1350/- per No. The Basic cost does not include GST, transportation etc at site should be assumed to arrive the tender rate. Make: Jaquar, Hindware, Parryware, Cera or Equivalent.	No's	6.00		
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26.0	Supply & fixing in position of approved make and quality type B, **SWR PVC** soil waste and vent pipes jointed with good quality of lubricant for sunken slab and walls. The scope work in inclusive of all necessary fittings,				

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	specials like bends, tees, offset junctions, pan connections, cowls and suitable clamps, consumables, tools, tackles, lead and lift, scaffolding works chargers for all heights etc complete in all respects as directed by Bank.				
26.1	75 mm Dia	RMT	85.00		
26.2	110 mm Dia	RMT	46.00		
27.0	Providing and fixing in position CPVC SDR - 11pipes of different dais having thermal stability for hot and cold water supply with all necessary fittings, spe-cials like bends, tees, offset junctions, suitable clamps, including cutting, chasing and making good of the walls concealed including all consumables, tools, tackles, lead and lift, scaffolding works chargers for all heights etc complete in all respects as directed by Bank.				
27.1	50mm dia	RMT	45.00		
27.2	32 mm Dia	RMT	35.00		
27.3	25mm Dia	RMT	37.00		
27.4	20mm Dia	RMT	59.00		
28.0	Supplying, fixing and testing of Concealed stop cock of approved make including cost and conveyance of all materials to site, labour charges, sales and other taxes on all materials etc., complete for finished item of work for all floors. including all consumables, tools, tackles, lead and lift, scaffolding works chargers for all heights etc complete in all respects as directed by Bank.				
28.1	50mm dia	No's	4.00		
29.0	**INSPECTION CHAMBERS:**	No's	2.00		
	Constructing (3'x3') brick in CM 1:6 prop. Masonry. **Inspection chamber** upto (3'0") and fitted with light weight (3'x3') C.I frame and cover of 25 Kg including cost and conveyance of all materials like cement, sand, bricks, water etc., to site, cost of seigniorage charges on all materials and all incidental and operational,				

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	labour charges like mixing cement mortar, constructing masonry, lift charges, curing , overheads & contractors profit etc., complete for finished item of work as per Standard specification.				
27.0	Restroom Cubicle System (Approximate Size:5'X4'X8'):	No's	20.00		
	i. Providing Intermediate Panel, Pilas ter& Door: The intermediate panel is one continued panel without any joints. All intermediate panels, panels, pilasters and doors shall be 12mm thick with edges chamfered. The solid compact laminate (Phenolic Core Board) is based on thermosetting res ins, homogeneously reinforced with cellulose fibers. Top surface on both sides is melamine coated which is scratch and impact resistant. ii. Providing Hardware and fixing: All pilasters are to be supported by ad justable foot and non corrosive in serts. Top rail and wall fixing with and exterior polyamide coating guar antees resistance to breakage, heat, humidity and chemicals. The base of the adjustable foot will be anchored to the floor with a clearance height of 100mm. Aluminum U- Channel will be used for the fixing of intermediate panels to the wall.				
	iii. Each Toilet compartment shall be equipped with accessories Privacy Thumb turn, Aluminum U-Channel, Door Knob, Coat Hook, Auto Return Hinges, Adjustable legs, Coated Alu minum Top Profile, Aluminum Door stopper lining. (Basic cost of each module is Rs.22,000/- .The above basic cost does not include tax, transportation, Installation Charges etc at site should be assumed to arrive the tender rate **Make: Merino, Megha Systems line, Super Creations or Equivalent)**				
28.0	False ceiling works: Providing & Fixing of Mineral Fiber Acoustical Suspended Ceiling	Sqm	169.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	System with 15mm Tiles and Exposed GRID. The tiles should have Humidity Resistance (RH) of 90% - 99%, NRC 0.5, Light Reflectance ≥87%, Thermal Conductivity k = 0.052 - 0.057 w/m K, Colour White, Fire Performance UK Class 0 / Class 1 (BS 476 pt - 6 &7) in module size of 600 x 600 x 16mm , suitable for Green Building application, with Recycled content of 30% - 45% . The tile shall be laid on Micro line / Silhouette profile grid system with 15mm - 16mm white flanges incorporating a 6mm central reveal in white/black colour and with a web height of 38mm and a load carrying capacity of minimum 8 Kgs/M2 & minimum pull out strength of 100 Kgs. Micro line / Silhouette, Main Runners & Cross Tees to have mitred ends & "birds mouth" notches to provide mitred cruciform junctions. The T Sections have a Galvanizing of 90 grams per M2 and need to be installed with Suspension system as per manufacturers details. The Installation to comprise main runner spaced at 1200mm centers securely fixed to the structural soffit using US Boral / Gyproc / Armstrong suspension system (specifications below) at 1200mm maximum centre. The First/Last suspension system at the end of each main runner should not be greater than 450mm from the adjacent wall. Flush fitting 1200mm long cross tees to be interlocked between main runners at 600mm centre to form 1200 x 600 mm module. Cut cross tees longer than 600mm require independent support. 600 x 600mm module to be formed by fitting 600mm long flush fitting cross tees centrally between the 1200 mm cross tees. Perimeter trim to be Wall angles of size 3000mm x 19mm x 19mm, secured to walls at 450 mm maximum centers.				
29.0	PVC Water tank -5KLD Cylindrical Vertical Water Tank (5000 Ltrs). (a) Provisioning of double layered cylindrical	Nos	2.00		

Sl. No	Item./Particulars with description	Unit	Quantity	Rate	Amount
	vertical type rotational moulded polyethylene water storage tanks (colour: black/green/blue) with lid, 5000 Ltr capacity. Make: SINTEX / STAR/ VECTUS/SUPREME or Equivalent to IS 12701-1996. (b) The tank shall be durable for a minimum pd of 2 yr under varied temperature conditions ranging from ± 50 Degree Celsius. The firm shall furnish guarantee to this effect. (c) The water tank meant for outdoor use shall be manufactured from carbon black compound polyethylene. The carbon black content shall be 2.0 to 3.0%.				
	Grand Total (Excluding GST)				

Note:

BASICK RATE EXCLUDING GST, Transportation loading and unloading and valid Bills to be submitted for the confirmation.