

Technical Bid, GITC, CBD Belapur



**State Bank of India
State Bank Global IT Centre, Estate Dept.
C.B.D. Belapur, Navi Mumbai.**

NOTICE INVITING TENDER

For:

“Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

Technical Bid

RFP No. 992

Tender Submitted By:

Name of Vendor : _____

Address of Vendor : _____

GSTN No. of Vendor: _____

Date : _____

Technical Bid, “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

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NOTICE INVITING TENDER

Percentage on Bank's estimate e-Tenders are invited on behalf of State Bank of India, GITC, CBD Belapur "Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai"

From the SBI Empaneled contractors under appropriate category and who receive NIT from e-Procurement Technologies Pvt. Ltd. are only entitled to quote for this tender.

RFP No. 992

1	Name of work	"Proposed Interior Work, on 3 rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai"
2	Time allowed for Completion of Work	60 Days including Monsoon, from the 3 rd day of the date of award of work.
3	Earnest Money	₹ 4,08,000/- (Four Lakh Eighth Thousand Only) by means of (mode of Transaction) NEFT, RTGS and intra-Bank transfer (SBI to SBI only), as per details mentioned in Para 4.6, of Information and Instruction for Bidders EMD to be deposited on or before the time and last date of submission of the technical bid.
4	Security Deposit (SD)	As per Part B - Point 6 of Information and Instruction to Bidders.
5	Date of availability of tender documents on Service Provider's website	
	(a) Technical Bid	From 21.08.2023 to 29.08.2023 Available at M/s e-Procurement Technologies Ltd., our Service Provider's portal https://etender.sbi/
	(b) Price Bid (shall be opened of only of those bidders who qualify as per clause no. 15 of Information & Instructions to Bidders.)	From 21.08.2023 to 29.08.2023 Available at M/s e-Procurement Technologies Ltd., our Service Provider's portal https://etender.sbi/
6	Pre – Bid Meeting (Date, time & Place of Meeting)	On 25.08.2023 at 03.00 PM at the following address: The Dy. General Manager (F & OA), Estate Dept., State Bank Global IT Centre, 1st Floor, "C" Wing, Sector 11, C.B.D. Belapur, Navi Mumbai – 400614.

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7	Last date & time for submission of EMD of tender document	Up to 3.30 PM on 29.08.2023 . Note: It is sole responsibility of the bidder to ensure submission of their EMD by stipulated date and time at specified SBI Account failing which they will not be allowed to participate in E-Tendering. The proof of the same is to be uploaded at https://etender.sbi/ , mentioning UTR no. / Transaction ID.
8	Award Criteria and Award of Contract	Refer Clause no 16 Part-B Information and Instruction to Bidders for e-Bidding.
9	Last date & time for submission of Online Technical Bid & Price Bid	up to 3.30 PM on 29.08.2023 at Service Provider’s portal https://etender.sbi/SBI/
10	Date and Time of opening of Online Technical Bid	4.00 PM on 29.08.2023
11	Date and Time of opening of Online Price Bid	up to 4.30 PM on 29.08.2023 at Service Provider’s portal https://etender.sbi/SBI/
12	Defects Liability period	As per Clause No. 1.1.11 (a) of GCC.
13	Liquidated Damages	As per Clause No 8 of GCC.
14	Validity of offer	As per Clause No. Part A- Point 5 of Information and Instruction to Bidders.
15	Value of Interim Certificate	Minimum Rs. 30 Lakhs. No advance on materials / plant / machinery or mobilization advance shall be paid under any circumstances.

16	Eligible Taxes	<p>A) Income Tax will be deducted at source as per Govt. Guidelines.</p> <p>B) Payment of GST will be made as applicable. The contractor should comply with the following. Contractor should have GST Registration Number. Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provisions/Rules.</p> <p>In case of Correction in the bills after scrutiny, contractor should submit fresh bills for payment. 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. The GST Number of State Bank Of India are for Maharashtra State – 27AAACS8577K2ZO.</p>
17	Electronic Payment	<p>Electronic payment shall be preferred. All the contractor must furnish details such as</p> <ol style="list-style-type: none"> 1) Name of the their Bank 2) Name of their branch 3) Account number 4) Name of the account holder as in the Bank account 5) IFSC No of the branch 6) PAN number.
18	Submission of Technical Bid	<ol style="list-style-type: none"> 1) Contractors shall download the entire Technical Bid to get acquainted with the terms and conditions and shall upload compulsorily the technical bid without fail in the e-tendering portal after putting the digital signature of their authorized signatory on submitted documents/ bid. (participating through e-tender portal they must have class III digital certificate.) 2) Failing to upload as stated above, the tender will be rejected.
19	Agency for arranging e-tender/online bidding, contact numbers :	You are requested to contact the agency for further guidance for e-tendering.
	Name of Auction Agency	M/s e-Procurement Technologies Limited Auction Tiger
	Address	B-704, Wall Street - II, Opp. Orient Club,Nr. Gujarat College, Ellis Bridge, Ahmedabad - 380006 Gujarat (India)

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	Bidder Support	9904407998, 9510813194, 9510813436, 9879996111, 9265562821 - 079 61200 594 / 598 / 568 / 587/538
	Email Address	mp@auctiontiger.net
	Website Address	https://sbi.auctiontiger.net
	Bidder Support :	E-Procurement Technologies Limited, Ahmedabad. 1. Komal Dave:- 9904407998 Komal.d@eptl.in
		2. Salina Motani:- 079-68136843, salina.motani@eptl.in 3. Jaymeet Rathod:- 079-68136829, jaymeet.rathod@eptl.in 4. Kanchan Kumari:- 079-68136820, kanchan.k@eptl.in 5. Vinayak Khambe:- 079-68136835, vinayak.k@eptl.in 6. Anshul Juneja:- 079-68136840, anshul.juneja@eptl.in 7. Nandan Valera:- 079-68136843, nandan.v@eptl.in 8. Hemangi Patel:- 079-68136852, hemangi@eptl.in 9. Nadeem Mansuri:- 079-68136853, nadeem@eptl.in 10. Deepak Narekar:- 079-68136863, deepak@eptl.in 11. Sujith Nair:- 079-68136857, sujith@eptl.in 12. Devang Patel:- 079-68136859, devang@eptl.in Primary Contact Numbers :- +91-9081000427, 9904407997 Alternate Contact No.:- Mr. Dinesh Pamwani :- 079-68136889, 6354919567, dinesh.p@auctiontiger.net You are requested to contact the agency for further guidance on E tendering.

20	Any additional Information	The quoted rate should be inclusive of materials, labor, wages, fixtures, transportation, installation, wastages, Octroi, levies, all cess, royalties, all taxes (but excluding GST), machinery, temporary works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work. GST shall be as applicable on actuals.
21	Additional security Deposit	Additional Security deposit (ASD)/Additional performance Guarantee (APG) shall be applicable if the bid price is below 7.5 % of the estimated cost put to tender. The amount of such ASD/ APG shall be the difference between 92.5 % of estimated cost put to tender and the quoted price. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion.

22. The contractor has to provide their E-mail id, contact nos. and postal address in the bid documents. Henceforth, all official communication from Bank shall be through E-mail and SMS also. The SBI reserves the right to cancel or postpone or modify the Tender at any stage without assigning any reason.

23. The digitally signed technical bid document, by authorized signatory of contractor, has to be uploaded on specified web portal of e-Procurement Technologies Limited, Ahmedabad. It shall be responsibility of the contractor to arrange and ensure that all pages of Tender Document digitally signed & uploaded.

24. No conditions other than mentioned in the Tender will be considered, and if given bid will be summarily rejected. There should not be any deviation or assumption in terms and conditions as have been stipulated in the tender documents. Prior to the detailed evaluation, the Bank will determine the responsiveness of each Bid to the RFP. For purposes of this clauses, a responsive Bid is one, which conforms to all the terms and conditions of the RFP in to, without any deviation or assumption.

25. The SBI reserve their rights to accept or reject any or all the Bids/Tenders either in whole or in part without assigning any reason(s) for doing so and no claim / correspondence shall be entertained in this regard.

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

27. Tenders received without EMD shall be summarily rejected and such tenders shall not be allowed for evaluation or to participate in the online price bidding process.

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28. For any clarifications regarding E-Tendering procedure, System requirements etc. please contact M/s E-Procurement Technologies Limited, Ahmedabad, whose address is mentioned in the NIT.

29. The contractor who is having single or multiple number of major project/projects (i.e. Project value – 50Lacs and above) under execution is not eligible to participate in the tender process for better expedition of the work

Yours’s faithfully,
Architects Approach

INFORMATION & INSTRUCTIONS FOR BIDDERS FOR e-BIDDING
(IIBeB)

PART-A of INFORMATION & INSTRUCTIONS FOR BIDDERS FOR e-BIDDING:

1. DISCLAIMER:

- i. The information contained in this RFP or information provided subsequently to Bidder(s) whether verbally or in documentary form/email by or on behalf of SBI, is subject to the terms and conditions set out in this RFP.
- ii. This RFP is not an offer by State Bank of India, but an invitation to receive responses from the eligible Bidders.
- iii. The purpose of this RFP is to provide the Bidder(s) with information to assist preparation of their Bid proposals. This RFP does not claim to contain all the information each Bidder may require. Each Bidder should conduct its own investigations and analysis and should check the accuracy, reliability and completeness of the information contained in this RFP and where necessary obtain independent advices/clarifications. Bank may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information in this RFP.
- iv. The Bank, its employees and advisors make no representation or warranty and shall have no liability to any person, including any Bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this RFP or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the RFP and any assessment, assumption, statement or information contained therein or deemed to form or arising in any way for participation in this bidding process.
- v. The Bank also accepts no liability of any nature whether resulting from negligence or otherwise, howsoever caused arising from reliance of any Bidder upon the statements contained in this RFP.
- vi. The Bidder is expected to examine all instructions, forms, terms and specifications in this RFP. Failure to furnish all information required under this RFP or to submit a Bid not substantially responsive to this RFP in all respect will be at the Bidder's risk and may result in rejection of the Bid.
- vii. The issue of this RFP does not imply that the Bank is bound to select a Bidder or to award the contract to the Selected Bidder, as the case may be, for the Project and the Bank reserves the right to reject all or any of the Bids or Bidders without assigning any reason whatsoever before issuance of purchase order/LOI and/or

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its acceptance thereof by the successful Bidder as defined in Award Criteria and Award of Contract in this RFP.

2. COST OF BID DOCUMENT:

The participating Bidders shall bear all the costs associated with or relating to the preparation and submission of their Bids including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstration or presentations which may be required by the Bank or any other costs incurred in connection with or relating to their Bid. The Bank shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder regardless of the conduct or outcome of the bidding process.

3. CLARIFICATION AND AMENDMENTS ON RFP/PRE-BID MEETING:

- i. Bidder requiring any clarification on RFP may notify the Bank in writing strictly as per the format given in **Table-XX** at the address/by e-mail within the date/time mentioned in the Notice Inviting Tender (NIT).
- ii. A pre-Bid meeting will be held in person or online on the date and time specified in the Notice Inviting Tender (NIT) which may be attended by the authorized representatives of the Bidders interested to respond to this RFP.
- iii. The queries received (without identifying source of query) and response of the Bank thereof will be posted on the Bank’s website or conveyed to the Bidders.
- iv. The Bank reserves the right to amend, rescind or reissue the RFP, at any time prior to the deadline for submission of Bids. The Bank, for any reason, whether, on its own initiative or in response to a clarification requested by a prospective Bidder, may modify the RFP, by amendment which will be made available to the Bidders by way of corrigendum/addendum. The interested parties/Bidders are advised to check the Bank’s website regularly till the date of submission of Bid document specified in the Notice Inviting Tender (NIT)/email and ensure that clarifications / amendments issued by the Bank, 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. The 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. Nothing in this RFP or any addenda/corrigenda or clarifications issued in connection thereto is intended to relieve Bidders from forming their own opinions and conclusions in respect of the matters addresses in this RFP or any addenda/corrigenda or clarifications issued in connection thereto.

4.0 MODIFICATION AND WITHDRAWAL OF BIDS:

- i. The Bidder may modify or withdraw its Bid after the Bid's submission, provided modification, including substitution or withdrawal of the Bids, is received on eProcurement portal, prior to the deadline prescribed for submission of Bids.
- ii. No modification in the Bid shall be allowed, after the deadline for submission of Bids.
- iii. No Bid shall be withdrawn in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified in this RFP. Withdrawal of a Bid during this interval may result in the forfeiture of EMD submitted by the Bidder and other action as per terms of RFP.

5.0 PERIOD OF BID VALIDITY AND VALIDITY OF PRICE QUOTED BY BIDDER:

1. Technical Bid shall remain valid for duration of 180 days from the date of submission of Bid.
2. Price quoted by the Bidder shall remain valid for duration of 180 days from the date of submission of Bid
3. In exceptional circumstances, the Bank may solicit the Bidders' consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. A Bidder is free to refuse the request. However, in such case, the Bank will not forfeit its EMD. However, any extension of validity of Bids or price will not entitle the Bidder to revise/modify the Bid document.

Once Purchase Order or Letter of Intent is issued by the Bank, the said price will remain fixed for the entire Contract period and shall not be subjected to variation on any account except as explicitly mentioned in this RFP. A Bid submitted with an adjustable price quotation will be treated as non-responsive and will be rejected.

6.0 BID INTEGRITY:

Willful misrepresentation of any fact within the Bid will lead to the cancellation of the contract without prejudice to other actions that the Bank may take. All the submissions, including any accompanying documents, will become property of the Bank. The Bidders shall be deemed to license, and grant all rights to the Bank, to reproduce the whole or any portion of their Bid document for the purpose of evaluation and to disclose the contents of submission for regulatory and legal requirements.

7.0 WAIVER OF RIGHTS:

Each Party agrees that any delay or omission on the part of the other Party to exercise any right, power or remedy under this RFP will not automatically operate as a waiver of such right, power or remedy or any other right, power or remedy and no waiver will be effective unless it is in writing and signed by the waiving Party. Further the waiver or the single or partial exercise of any right, power or remedy by either Party hereunder on one occasion will not be construed as a bar to a waiver of any successive or other right, power or remedy on any other occasion.

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8.0 BANK’S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS:

The Bank 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 contract award as specified in Award Criteria and Award of 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.

9.0 CODE OF INTEGRITY AND DEBARMENT/BANNING:

- i. The Bidder and their respective officers, employees, agents and advisers shall observe the highest standard of ethics during the bidding Process. Notwithstanding anything to the contrary contained herein, the Bank shall reject Bid without being liable in any manner whatsoever to the Bidder if it determines that the Bidder has, directly or indirectly or through an agent, engaged in corrupt/fraudulent/coercive/undesirable or restrictive practices in the bidding Process.
- ii. Bidders are obliged under code of integrity to suo-moto proactively declare any conflicts of interest (pre-existing or as and as soon as these arise at any stage) in RFP process or execution of contract. Failure to do so would amount to violation of this code of integrity.
- iii. Any Bidder needs to declare any previous transgressions of such a code of integrity with any entity in any country during the last three years or of being debarred by any other procuring entity. Failure to do so would amount to violation of this code of integrity.
- iv. For the purposes of this clause, the following terms shall have the meaning hereinafter, respectively assigned to them:
 - (a) **“Corrupt practice”** means making offers, solicitation or acceptance of bribe, rewards or gifts or any material benefit, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process or contract execution.
 - (b) **“Fraudulent practice”** means any omission or misrepresentation that may mislead or attempt to mislead so that financial or other benefits may be obtained or an obligation avoided. This includes making false declaration or providing false information for participation in a RFP process or to secure a contract or in execution of the contract;
 - (c) **“Coercive practice”** means harming or threatening to harm, persons or their property to influence their participation in the procurement process or affect the execution of a contract;
 - (d) **“Anti-competitive practice”** means any collusion, bid rigging or anticompetitive arrangement, or any other practice coming under the purview of the Competition Act, 2002, between two or more bidders, with or without the knowledge of the Bank, that may impair the transparency, fairness and the progress of the procurement process or to establish bid prices at artificial, non-competitive levels;
 - (e) **“Obstructive practice”** means materially impede the Bank’s or Government agencies investigation into allegations of one or more of the above mentioned prohibited practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/or by threatening,

harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding the Bank's rights of audit or access to information.

v. Debarment/Banning

Empanelment/participation of Bidders and their eligibility to participate in the Bank's procurements is subject to compliance with code of integrity and performance in contracts as per terms and conditions of contracts. Following grades of debarment from empanelment/participation in the Bank's procurement process shall be considered against delinquent Vendors/Bidders:

(a) Holiday Listing (Temporary Debarment - suspension):

Whenever a Vendor is found lacking in performance, in case of less frequent and less serious misdemeanors, the vendors may be put on a holiday listing (temporary debarment) for a period up to 12 (twelve) months. When a Vendor is on the holiday listing, he is neither invited to bid nor are his bids considered for evaluation during the period of the holiday. The Vendor is, however, not removed from the list of empaneled vendors, if any. Performance issues which may justify holiday listing of the Vendor are:

- Vendors who have not responded to requests for quotation/tenders consecutively three times without furnishing valid reasons, if mandated in the empanelment contract (if applicable);
- Repeated non-performance or performance below specified standards (including after sales services and maintenance services etc.);
- Vendors undergoing process for removal from empanelment/participation in procurement process or banning/debarment may also be put on a holiday listing during such proceedings.

(b) Debarment from participation including removal from empaneled list

Debarment of a delinquent Vendor (including their related entities) for a period (one to two years) from the Bank's procurements including removal from empanelment, wherever such Vendor is empaneled, due to severe deficiencies in performance or other serious transgressions. Reasons which may justify debarment and/or removal of the Vendor from the list of empaneled vendors are:

- Without prejudice to the rights of the Bank under Clause 45(i) hereinabove, if a Bidder is found by the Bank to have directly or indirectly or through an agent, engaged or indulged in any corrupt/fraudulent/coercive/undesirable or restrictive practices during the bidding Process, such Bidder shall not be eligible to participate in any EOI/RFP issued by the Bank during a period of 2 (two) years from the date of debarment.
- The Vendor fails to abide by the terms and conditions or to maintain the required technical/operational staff/equipment or there is change in its production/service line affecting its performance adversely, or fails to cooperate or qualify in the review for empanelment;

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- If Vendor ceases to exist or ceases to operate in the category of requirements for which it is empaneled;
- Bankruptcy or insolvency on the part of the vendor as declared by a court of law; or
- Banning by Ministry/Department or any other Government agency;
- Other than in situations of force majeure, technically qualified Bidder withdraws from the procurement process or after being declared as successful bidder: (i) withdraws from the process; (ii) fails to enter into a Contract; or (iii) fails to provide performance guarantee or any other document or security required in terms of the RFP documents;
- If the Central Bureau of Investigation/CVC/C&AG or Vigilance Department of the Bank or any other investigating agency recommends such a course in respect of a case under investigation.
- Employs a Government servant or the Bank’s Officer within two years of his retirement, who has had business dealings with him in an official capacity before retirement; or
- Any other ground, based on which the Bank considers, that continuation of Contract is not in public interest.
- If there is strong justification for believing that the partners/directors/proprietor/agents of the firm/company has been guilty of violation of the code of integrity or Integrity Pact (wherever applicable), evasion or habitual default in payment of any tax levied by law; etc.

(c) Banning from Ministry/Country-wide procurements

For serious transgression of code of integrity, a delinquent Vendor (including their related entities) may be banned /debarred from participation in a procurement process of the Bank including procurement process of any procuring entity of Government of India for a period not exceeding three years commencing from the date of debarment.

PART -B of INFORMATION & INSTRUCTIONS FOR BIDDERS FOR e-BIDDING:

1.0 Scope of work

As per Clause No. 1 of NIT.

1.1 Site and its location

“3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

2.0 Tender documents

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

- Instructions to Tenderers
- General Conditions of Contract
- Special Conditions of Contract
- Technical Specifications
- Drawings
- Price bid

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

- a. Price Bid
- b. Technical specifications
- c. Special conditions of contract
- d. General conditions of contract
- e. Instructions to Tenderers

2.3 The tender documents are not transferable.

3.0 Site Visit

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

3.2 The rates quoted by the Tenderer in the tender will be adequate to complete such work according to the specifications and conditions attached thereto and he has taken into account all conditions and difficulties that may be encountered during its progress and to have quoted labor and material rates, which shall include cost of materials with taxes, octroi, levies, royalties, cess, and other duties, lead, lift, loading and unloading freight for materials, and all other charges including the furnishing of all plant, equipment, tools, scaffolding and other facilities and services necessary or proper for the completion and maintenance of the work, except such as may be otherwise expressly provided in the contract documents for the completion and maintenance of the work to the entire satisfaction of the Bank/ Bank. The TDS amount on prevailing rate shall be deducted from Contractor's Running Account/ Final bills and paid to the Government. However, GST will be paid extra as actual.

3.3. The successful Tenderer shall make his own arrangements for all materials except as specified in the contract if any.

3.4. The quantities shown if any in the attached schedule are given as a guide and are approximate only and are subject to variation according to the needs of the Employer. The

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Employer accepts no liability for their accuracy. The Employer does not guarantee work under each item of the schedule.

3.5 The Form of Agreement, Form of Tender, Invitation to Tender, Instruction to Tender, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, Time Schedule and the rates and amounts accepted against the items of the Tender Schedule together with the Tender covering letter, and all correspondence entered into between the Bank/Bank and the Tenderer prior to the issue of the Letter of Intent and the Letter of Intent awarding the work and acceptance by tenderer shall form the contract.

3.6 The Security Protocol, Systems & Procedures of Security Department of GITC, SBI, CBD Belapur has to be meticulously followed & complied with during the currency of contract.

4.0 Earnest Money

4.1 The tenderers are requested to submit the Earnest Money of the amount as per Clause No. 3 of NIT by means of (mode of Transaction) NEFT, RTGS and intra-Bank transfer (SBI to SBI only), as per details mentioned in para 4.6, of Information and Instruction for Bidders .EMD to be deposited before the last date of submission of the technical bid.

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

4.3 No interest will be paid on the EMD.

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

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

4.6 The bid can only be submitted after deposition of EMD amount as per Clause No. 3 of NIT by means of (mode of Transaction) NEFT, RTGS and intra-Bank transfer (SBI to SBI only), as per details mentioned below:

DETAILS OF TENDER FEE / EMD COLLECTION/REFUND ACCOUNT NUMBER

Account Name Subsidy Inward Remittance
Account No. 4897932113433
IFSC SBIN0011343
Branch OAD, GITC, Belapur.
Mode of Transaction- NEFT only.

Account Name System Suspense Branch Parking A/C

Account No. 37608352111

IFSC SBIN0011343

Branch OAD, GITC, Belapur.

Mode of Transaction- RTGS and intra-Bank transfer (SBI to SBI only)

EMD to be deposited before the last date of submission of the technical bid and the proof of the same is to be uploaded at <https://etender.sbi/>, mentioning UTR no. / Transaction ID.

5.0 Initial/ Security Deposit

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 D/D drawn on any scheduled Bank and shall be deposited within 15 days from the date of letter of acceptance of tender.

6.0 Security Deposit / Retention amount :

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

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

7.0 Signing of contract Documents

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

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8.0 Completion Period

Refer Clause No 27 of GCC.

9.0 Validity of Tender

Refer Clause No. Part A- Point 5 of Information and Instruction to Bidders

10.0 Liquidated Damages

Please refer Clause No 8 of GCC.

11.0 Rate and prices:

11.1 In case of percentage rate tender

11.1.1 The tenderers shall quote their percentage rate above or below the Banks total estimate mentioned both in words and figure. In case of discrepancy between the rate quoted in words and figures, the unit rate quantity in words will prevail. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected.

11.1.2 The tenderers 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/ Vendor would be paid accordingly.

11.1.3 The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he should immediately bring to the knowledge of the SBI.

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

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

11.1.6 The quoted rates should be firm & inclusive of materials, labor, wages, fixtures, transportation, installation, wastages, Octroi, levies, all cess, royalties, all taxes (but excluding GST), machinery, temporary works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges and all related expenses to complete the work during the currency of contract including authorized extension, if any, but excluding GST, which shall be mentioned in the bills/invoices separately, as applicable. GST shall be as applicable on actuals.

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

11.1.8 In case, it is decided by the SBI to drop one or more Items from the scope of work at any stage of the project, the Contractor/ Vendor shall not be entitled to raise any claim / compensation for such deleted scope of work. Also, the SBI may consider issuing work order for various branches/offices in phases but within a reasonable

time interval and the Contractor/ Vendor shall be bound to execute the same within the stipulated time period and as per rates quoted by them in this tender without any claim for price escalation.

12.0 Nil

13.0 Pre-bid conference: As per clause no 3 Part-A of Information and Instruction to Bidders for e-Bidding. (IIBeB)

14.0 The bid submitted shall become invalid if:

The bidder does not deposit EMD on given address

- i. The bidder does not upload all the documents as listed in “List of Documents to be scanned & uploaded within the period of bid submission”.

15.0 List of Documents to be scanned and uploaded within the period of bid submission.

Sr. No.	Documents to be Uploaded Online at M/s e-Procurement Technologies Ltd., our Service Provider’s portal https://etender.sbi/	Documents to be Submitted in Hard Copy on address as per Clause no. 8 of NIT. (**Refer Note Below)
1	Technical Bid as per Clause No. 18 (1) of NIT.	Nil
2	Corrigendum, if any	Nil
3	Scan copy of duly executed original Declaration form (on the Last page of Technical bid)	Nil
4	Scan copy of Proof of remittance of EMD	Nil
5	Scan copy of Duly executed original LETTER OF TRANSMITTAL	Nil

15.1 Bidders may please note:

- (a) The Bidder should quote for the entire package on a single responsibility basis for the services required under this RFP.
- (b) Care should be taken that the Technical Bid shall not contain any price information. Such proposal, if received, will be rejected.

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- (c) The Bid document shall be complete in accordance with various clauses of the RFP document or any addenda/corrigenda or clarifications issued in connection thereto, duly signed by the authorized representative of the Bidder. Board resolution authorizing representative to Bid and make commitments on behalf of the Bidder is to be attached.
- (d) It is mandatory for all the Bidders to have class-III Digital Signature Certificate (DSC) (in the name of person who will sign the Bid) from any of the licensed certifying agency to participate in this RFP. DSC should be in the name of the authorized signatory. It should be in corporate capacity (that is in Bidder capacity).
- (e) Bids are liable to be rejected if only one Bid (i.e. either Technical Bid or Indicative Price Bid) is received.
- (f) If deemed necessary, the Bank may seek clarifications on any aspect from the Bidder. However, that would not entitle the Bidder to change or cause any change in the substances of the Bid already submitted or the price quoted.
- (g) The Bidder may also be asked to give presentation at no extra cost to the Bank for the purpose of clarification of the Bid.
- (h) The Bidder must provide specific and factual replies to the points raised in the RFP.
- (i) The Bid shall be typed or written and shall be digitally signed by the Bidder or a person or persons duly authorized to bind the Bidder to the Contract.
- (j) All the enclosures (Bid submission) shall be serially numbered.
- (k) Bidder(s) should prepare and submit their online Bids well in advance before the prescribed date and time to avoid any delay or problem during the bid submission process. The Bank shall not be held responsible for any sort of delay or the difficulties faced by the Bidder(s) during the submission of online Bids.
- (l) Bidder(s) should ensure that the Bid documents submitted should be free from virus and if the documents could not be opened, due to virus or otherwise, during Bid opening, the Bid is liable to be rejected.
- (m) The Bank reserves the right to reject Bids not conforming to above.

15.2 Evaluation of Technical Bids:

- I) The bidders who submit above documents without any conditions shall be treated as technically qualified bidders.
- II) Price Bid shall be opened of only of those bidders who qualify as per clause no. 15 of Information & Instructions to Bidders

16.0 Award criteria and Award of contract:

The price bids of technically qualified vendors will be opened. The contract will be awarded to contractor on L-1 Basis

SAMPLE BUSINESS RULE DOCUMENT

ONLINE E-TENDERING FOR PROPOSED WORK As per Clause No. 1 of NIT.

(A) Business rules for E-tendering:

1. Only empaneled contractors with SBI under appropriate category who are invited by the Bank/SBI shall only be eligible to participate.
2. SBI will engage the services of an E-tendering service provider who will provide necessary training and assistance before commencement of online bidding on Internet.
3. In case of e-tendering, SBI will inform the vendor in writing, the details of service provider to enable them to contact and get trained.
4. Business rules like event date, closing and opening time etc. also will be communicated through service provider for compliance.
5. Contractors have to send by email, the compliance form in the prescribed format (provided by service provider), before start of E-tendering. Without this the vendor will not be eligible to participate in the event.
6. The Contractors will be required to submit the various documents in sealed Envelope to the office of SBI at the address mentioned hereinbefore by the stipulated date i.e. (1) Hard Copy of Technical Bid duly signed and stamped on each page (2) Account Name: SBI Subsidy Inward Remittance Account No.: 4897932113433 IFSC: SBIN0011343 Branch OAD, GITC, Belapur of specified amount of EMD. Contractors not submitting any one or more documents shall not be eligible to participate in the on-line price bidding.
7. E-tendering will be conducted on schedule date & time.
8. The e-tendering will be treated as closed only when the bidding process gets closed in all respects for the item listed in the tender.

(B) Terms & conditions of E-tendering: SBI shall finalize the Tender through e-tendering mode for which M/s E-Procurement Technologies Ltd. has been engaged by SBI an authorized service provider. Please go through the guidelines given below and submit your acceptance to the same along with your Commercial Bid.

1. E-tendering shall be conducted by SBI through M/s E-procurement Technologies Ltd., on pre-specified date. While the Contractors shall be quoting from their own offices/ place of their choice, Internet connectivity and other paraphernalia requirements shall have to be ensured by Contractors themselves. In the event of failure of their Internet connectivity, (due to any reason whatsoever it may be) it is the bidders' responsibility. In order to ward-off such contingent situation bidders are requested to make all the necessary arrangements/ alternatives such as back-up power supply whatever required so that they are able to circumvent such situation and still be able to participate in the E-tendering successfully.

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Failure of power at the premises of Contractors during the E-tendering cannot be the cause for not participating in the E-tendering. On account of this the time for the E-tendering cannot be extended and SBI is not responsible for such eventualities.

2. M/s E-Procurement Technologies Ltd, shall arrange to train your nominated person(s), without any cost to you. They shall also explain you all the Rules related to the E-tendering. You are required to give your compliance on it before start of bid process.
3. BIDDING CURRENCY AND UNIT OF MEASUREMENT: Bidding will be conducted in Indian currency & Unit of Measurement will be displayed in Online E-tendering.
4. BID PRICE: The Bidder has to quote the rate as per the Tender Document provided by SBI their appointed Banks.
5. VALIDITY OF BIDS: The Bid price shall be firm for a period specified in the tender document and shall not be subjected to any change whatsoever.
6. Procedure of E-tendering: i. Online E-tendering:

(a) The NIT & Technical bid available on the Bank’s website during the period specified in the NIT. (b) Online e-tendering is open to the empaneled bidders who receive NIT from the Bank and qualified for participating in the price bidding as provisions mentioned hereinabove through SBI approved Service Provider. (c) The Price-Bid shall be made available online by the Service Provider wherein the contractors will be required to fill-in their Item-wise rates for each item. (d) The Contractors are advised not to wait till the last minute to submit their online item-wise quote in the price bid to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc. (e) It is mandatory to all the bidders participating in the price bid to quote their rates for each and every item. (f) In case, contractor fails to quote their rates for any one or more tender items, their tender shall be treated as “Incomplete Tender” and shall be liable for rejection.

7. LOG IN NAME & PASSWORD: Each Bidder is assigned a Unique User Name & Password by M/s E-Procurement Technologies Ltd. The Bidders are requested to change the Password after the receipt of initial

Password from M/s E-Procurement Technologies Ltd. All bids made from the Login ID given to the bidder will be deemed to have been made by the bidder.

8. BIDS PLACED BY BIDDER: Bids will be taken as an offer to execute the work as specified. Bids once made, cannot be cancelled / withdrawn and the Bidder shall be bound to execute the work at the quoted bid price. In case the L-1 Bidder backs out or fail to complete the work as per the rates quoted, SBI shall at liberty to take action as deemed necessary including de-panelling such contractors and forfeiting their EMD.
9. At the end of the E-tendering, SBI will decide upon the winner. SBI decision on award of Contract shall be final and binding on all the Bidders.

10. SBI shall be at liberty to cancel the E-tendering process / tender at any time, before ordering, without assigning any reason.
11. SBI shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause.
12. Other terms and conditions shall be as per your techno-commercial offers and other correspondences till date.

13. OTHER TERMS & CONDITIONS:

- The Bidder shall not involve himself or any of his representatives in Price manipulation of any kind directly or indirectly by communicating with other suppliers / bidders.
- The Bidder shall not divulge either his Bids or any other exclusive details of SBI to any other party.
- SBI decision on award of Contract shall be final and binding on all the Bidders.
- SBI reserve their rights to extend, reschedule or cancel any E-tendering within its sole discretion.
- SBI or its authorized service provider M/s E-Procurement Technologies Ltd shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause.
- SBI or its authorized service provider M/s E-Procurement Technologies Ltd is not responsible for any damages, including damages that result from, but are not limited to negligence.
- SBI or its authorized service M/s E-Procurement Technologies Ltd will not be held responsible for consequential damages, including but not limited to systems problems, inability to use the system, loss of electronic information etc.

N.B. - All the Bidders are required to submit the Process Compliance Statement duly signed to M/s E-Procurement Technologies Ltd.

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

Technical Bid, “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

PROCESS COMPLIANCE STATEMENT

(The bidders are required to print this on their company’s letter head and sign, stamp before emailing)

To,
E-Procurement Technologies
Ltd. (Auction Tiger)
A-201 / 208, Wall Street - II, Opp.
Orient Club, Nr. Gujarat College,
Ahmedabad - 380006.
Gujarat State, India

AGREEMENT TO THE PROCESS RELATED TERMS AND CONDITIONS FOR THE ONLINE E-TENDERING FOR “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

Dear Sir,

This has reference to the Terms & Conditions for the E-tendering mentioned in the Tender document

This letter is to confirm that:

- i. The undersigned is authorized representative of the company.
- ii. We have studied the Commercial Terms and the Business rules governing the E-tendering as mentioned in RFP of SBI as well as this document and confirm our agreement to them.
- iii. We also confirm that we have taken the training on the E-tendering tool and have understood the functionality of the same thoroughly.
- iv. We confirm that SBI and E-Procurement Technologies Ltd. , shall not be liable & responsible in any manner whatsoever for my/our failure to access & bid on the e-E-tendering platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the E-tendering event.
- v. We confirm that we have a valid digital signature certificate issued by a valid Certifying Authority.
- vi. We, hereby confirm that we will honour the Bids placed by us during the E-tendering process.

With regards, Date:

Signature with company seal Name:

Company / Organization:

Designation within Company / Organization:

Address of Company / Organization:

Scan it and send to this Document on -----

(A) Contact Information

<p>E-Procurement Technologies Ltd.</p>	<p>State Bank of India</p>
<p>B-704, Wall Street - II, Opp. Orient Club, Nr. Gujarat College, Ahmedabad- 380 006. Gujarat State, India</p> <p>Tel.: +91 79 61200 579 580 567 569 566</p> <p>Name : Komal Dave E-mail :komal.d@eptl.in Contact :9904407998 9510813194</p>	<p>The Assistant General Manager (Estate), State Bank of India, Navi Mumbai. Officer Name : Mr. Arvind Kumar Mishra Department :Estate</p> <p>The Assistant Manager (Civil) State Bank of India, Navi Mumbai. Officer Name : Mr. Abhijeet Kumbhar Department :Estate Contact No 9028762306</p> <p>The Assistant General Manager (Electrical), State Bank of India, Navi Mumbai. Officer Name : Mr. A.K Sahu Department : Estate Contact No : 9769008435</p> <p>The Manager (Computer and Communication) State Bank of India, Navi Mumbai. Officer Name : Mr. H.S Godbole Department :Estate Contact No 9653654913</p> <p>The Assistant General Manager (Security)/AM (Fire) State Bank of India, Navi Mumbai. Officer Name :Mr.PC Joshi/ Mr. Vipin Palliwal Department :Estate Contact No 9425505016/8823046635</p>

LETTER OF TRANSMITTAL

Annexure-I

Technical Bid, “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

(The bidders are required to print this on their company’s letter head and sign, stamp before emailing)

To,
The Dy. General Manager (F & OA),
Estate Dept., State Bank Global IT Centre,
1st Floor, “C” Wing, Sector 11, C.B.D.
Belapur, Navi Mumbai – 400614.

Dear Sir,

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

MEMORANDUM

(a)	Description of work	Work As per Clause No. 1 of NIT.
(b)	Earnest Money	Of amount as per Clause No. 3 of NIT by means of (mode of Transaction) NEFT, RTGS and intra-Bank transfer (SBI to SBI only), as per details mentioned in para 4.6 of Information and Instruction for Bidders,
(c)	Time allowed for completion of the Works shall start from third day after the date of written Order or date of handing over of the site (Whichever is later) to commence the work	As per Clause No 27 of GCC.

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

- 2) I / We have deposited a sum of the amount as per Clause No. 3 of the total tender amount as Earnest Money with the SBI which amount is not to bear any interest. Should I / We fail to execute the Contract when called upon to do so I / We do hereby agree that this sum shall be forfeited by me/us to State Bank of India.
- 3) I/ We understand that as per terms of this tender, the SBI may consider accepting our tender in part or whole or may entrust the various work proposed in phases. We, therefore, undertake that we shall not raise any claim/ compensation in the eventuality of Bank deciding to drop any of the work from the scope of work of this tender at any stage during the contract period. Further, we also undertake to execute the work entrusted to us in phases on our approved rates and within stipulated time limit without any extra claim for price escalation unless otherwise separately mentioned as also provided for in the clauses of "Instructions to Tenderers" of this tender.
- 4) I/ We, hereby, also undertake that, we will not raise any claim for any escalation in the prices of any of the material during the contract/execution/completion period including authorized extended contract period, if any.
- 5) Our Bankers are:
 - i)
 - ii)

The names of partners of our firm are:

- i)
- ii)

Name of the partner of the firm Authorized to sign

Or

(Name of person having Power of Attorney to sign the Contract.
(Certified true copy of the Power of Attorney should be attached)

Yours faithfully,

Signature of Contractors.

Signature and addresses of Witnesses

- i)

GENERAL CONDITIONS OF CONTRACT (GCC)

1.0 Definitions: -

Technical Bid, “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

“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 there in including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Banks/ 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 (a) ‘RFP’ means the documents forming the tender i.e. the Technical bid document, Price bid document, along with its corrigendum and clarification and the acceptance thereof and together with the documents referred there in including these conditions, the specifications, designs, drawings, Pre-Qualifications – Expression of Interest, any correspondence from RFP till work order, etc. Complete.

1.1 (b) ‘Bid’ means the written reply or submission of response to this RFP.

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 it’s office at F&OA Department, Estate Dept. SBI GITC, Sector 11 at Navi Mumbai 400706 and includes the client’s representatives, successors and assigns.

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

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

1.1.3 ‘Drawings’ shall mean the drawings prepared by the Banks 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.

1.1.4 Specifications’ shall mean the specifications referred to in the tender and modifications thereof as may time to time be furnished or approved by the Bank

1.1.6 “Month” means calendar month and “Week” means seven consecutive days.

1.1.7 “Contract Value” shall mean value of the entire work as stipulated in the letter of acceptance of tender subject such additions there to or deductions there from as may be made under the provide herein after contained.

1.1.8 (a) "Week" means seven consecutive days.

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

1.1.9 "SBI's Engineer" shall mean The Civil / Electrical Engineer in - charge of the Project, as nominated by the Dy. General Manager (F & AO), Estate Department, GITC, State Bank of India, CBD Belapur, Navi Mumbai.

1.1.10 The following shall constitute the Joint Project Committee (herein under referred to as JPC) for assessing and reviewing the progress of the work on the project and to issue instructions or directions from time to time for being observed and followed by the Banks Site Engineer /BANK and other consultants / contractors engaged in the execution of the project.

- i) Dy. Gen. Manager (F & OA),
- ii) Assistant General Manager, Estate Department of SBI
- iii) SBI Engineer (Civil and Electrical) in-charge of the Project, as may be nominated by the Estate Department, State Bank of India, Navi Mumbai.
- iv) SBI Engineer (Telecom, Fire Officer, Security Officer)

1.1.11 "**Complete Project Closure Report**" by SBI means following conditions are satisfied and all works related to it are complete & reports closed after due repairs, replacements, test, etc.

The project shall be considered complete & closed only when:

- a. **Defect Liability Period (DLP) for all items of work is over : DLP is for 12 months from the date of virtual completion (as per para 23 of GCC) of work or one complete monsoon season, whichever is later, and**
- b. **Acceptance & closure of all queries & works after due rectification/replacements/ tests as referred by Chief Technical Examiner, CVC and**
- c. **Acceptance and closure of all arbitration, court cases, etc.**

**Related to the said project, as decided by the Bank
... Whichever is later.**

1.2 **Total Security Deposit**

Total Security deposit comprise of

Earnest Money Deposit

Initial security deposit

Retention Money

a) **Earnest Money Deposit -**

Technical Bid, “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

The tenderer shall furnish EMD of the amount as per Clause No. 3 of **NIT** by means of (mode of Transaction) NEFT, RTGS and intra-Bank transfer (SBI to SBI only), as per details mentioned in para 4.6, of Information and Instruction for Bidders. No tender shall be considered unless the EMD is so deposited in the required form. No interest shall be paid on this EMD. The EMD of the unsuccessful tenderer shall be refunded soon after the decision to award the contract is taken without interest. The EMD shall stand absolutely forfeited if the tenderer revokes his tender at any time the period when he is required to keep his tender open acceptance by the SBI or after it is accepted by the SBI the contractor fails to enter into a formal agreement or fails to pay the initial security deposit as stipulated or fails to commence the work within the stipulated time or if a Bidder makes any statement or encloses any form which turns out to be false / incorrect at any time prior to signing of Contract. EMD of successful tenderer shall also be refunded on receipt of ISD.

b) Initial Security Deposit (ISD)

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

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

c) Retention Money: -

As per Part B - Point 6 of Information and Instruction to Bidders.

2.0 Language

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

3.0 Errors, omissions and discrepancies

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

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

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

4.0 **Scope of Work:**

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

5.0 i) **Letter of Acceptance:**

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

ii) **Contract Agreement:**

On receipt of intimation of the acceptance of tender from the SBI/ Bank, the successful tenderer shall be bound to implement the contract and within fifteen days there of shall sign an agreement in a non-judicial stamp paper of appropriate value. All expenses, stamp duty and other charges/ expenses in connection with the execution of the Agreement as a result of this RFP process shall be borne by successful Bidder. The Agreement/ Contract would be stamped as per Maharashtra Stamp Act, 1958 and any amendment thereto.

6.0 **Ownership of drawings:**

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

7.0 Detailed **drawings and instructions:**

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

Technical Bid, "Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai"

7.1 Copies of agreement

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

8.0 Liquidated damages:

If the contractor fails to maintain the required progress in terms of clause 28/29 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 damage at the rate of 0.50% of the Contract Value for delay of per week or part thereof which subject to a maximum of 5% of the Contract Value.

9.0 Materials, Appliances and Employees

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

10.0 Permits, Laws and Regulations:

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

11.0 Setting out Work:

The contractor shall set out the work and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions, and alignment of all parts thereof and get it approved by the BANK before proceeding with the work. If at any time any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout had been approved by, the BANK the contractor shall be responsible for the same and shall 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 to all SBI's adjacent properties 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, Contractor shall indemnify this to SBI in format finalized by the SBI at no extra cost.

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

13.0 Inspection of work:

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

14.0 Assignment and subletting

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

15.0 Quality of materials, workmanship & Test

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

ii) Samples

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

iii) Cost of tests

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

iv) Costs of tests not provided for

The Contractor shall arrange to carry out the tests in accordance with the relevant Indian Standards Specifications in an approved laboratory and the test reports in original be submitted to Bank. The entire cost of testing shall be borne by the Contractor.

16.0 Obtaining information related to execution of work

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

17.0 Contractor’s Superintendence

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

18.0 Quantities

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

19.0 Works to be measured

The Bank/Consultant may from time to time intimate to the contractor that he requires the work to be measured and the contractor shall forthwith attend or send a representative to assist the Bank in taking such measurements and calculation and to furnish all particulars or to give all assistance required by any of them. Such measurements shall be taken in accordance with the Mode of measurements detail in the specifications. The representative of the BANK shall take 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 Measurement Book (M.B.) should the contractor not attend or neglect or omit to depute his representative to take measurements, the measurements recorded by the representative of the BANK shall be final. All authorized extra work, omissions and all variations made shall be included such measurement.

In case there will not clarity of mode of measurements then IS 27:1987, IS 1200 with all up to date releases /versions to be followed to finalize the measurements.

20.0 Variations

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

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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 BANK 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 BANK 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 Bank/Consultant) the workman’s name and materials employed be delivered for verification to the Bank /consultant at or before the end of the week following that in which the work has been executed.
- e) It is further clarified that for all such authorized extra items where rates cannot be derived from the tender, the Contractor shall submit rates duly supported by rate analysis worked on the ‘market rate basis for material, labor hire / running charges of equipment and wastage etc. plus 15% towards establishment charges, contractor’s overheads, and profit. Such items shall, not be eligible for escalation.

22.0 Final measurement

The measurement and valuation in respect of the contract shall be completed within three months of the virtual completion of the work, provided all the related documents, test reports, compliance, documentation, as built drawings etc. are submitted by the contractor.

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 the satisfaction of the SBI:

- a) Clear the site of all scaffolding, wiring, pipes, surplus materials, contractor's labor equipment and machinery.
- b) Demolish, dismantle and remove the contractor's site office, temporary works, structure including labor sheds/camps and constructions and other items and things whatsoever brought upon or erected at the site or any land allotted to the contractor by the SBI not incorporated in the permanent works.
- c) Remove all rubbish, debris etc. from the site and the land allotted to the contractor by the Bank 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 allot by the SBI
- e) Shall hand over the work in a peaceful manner to the SBI
- f) All defects / imperfections have been attended and rectified as pointed out by the Banks to the full satisfaction of SBI

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

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

24.0 **Work by other agencies**

The BANK reserves the rights to use premises and any portion 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

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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 manner as not to impede the progress of the works included in the contract.

25.0 Insurance of works

25.1 Without limiting his obligations and responsibilities under the contract the contractor shall insure in the joint names of the SBI and the contractor against all loss of damages from whatever cause arising other than the excepted risks, for which he is responsible under the terms of contract and in such a manner that the SBI and contractor are covered for the contract period stipulated including vide 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 affected with an insurer and in terms approved by the SBI which approval shall not be unreasonably withheld and the contractor shall whenever require produce to the Bank the policy if insurance and the receipts for payment of the current premiums.

25.2 Damage to persons and property

The contractor shall, except if and so far as the contract provides otherwise indemnify the SBI against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and

Maintenance of the works and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation of damages for or with respect to:

- a) The permanent use or occupation of land by or any part thereof.
- b) The right of SBI to execute the works or any part thereof on, over, under, in or through any lands.
- c) Injuries or damages to persons or properties which are unavoidable result of the execution or maintenance of the works in accordance with the contract

- d) Injuries or damage to persons or property resulting from any act or neglect of the SBI their agents, employees or other contractors not being employed by the contractor or for or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the SBI, 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 25.2 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 BANK in this behalf.

25.5 **Third Party Insurance**

- 25.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 24.0 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of 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 24.0 thereof.

25.5.2 **Minimum amount of Third-Party Insurance**

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

- 25.6 The minimum insurance cover for physical property, injury, and death is Rs.5 Lakh per occurrence with the number of occurrences limited to four. After each occurrence

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contractor will pay additional premium necessary to make insurance valid for four occurrences always.

25.7 Accident or Injury to workman:

25.7.1 The 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 that any persons are employed by him on the works and shall, when required, produce to the Bank 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 Bank /consultant when such policy of insurance and the receipt for the payment of the current premium.

25.7.3 Remedy on contractor's failure to insure

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

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

25.8 Insurance Policies:

Before commencing the execution of work, the Contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property, at site of work. The Contractor shall obtain and submit to the BANK proper **Contractor All Risk Insurance Policy** for an amount 1.25 times the contract amount for this work, with BANK as the first beneficiary. The insurance shall be obtained in joint names of BANK and the Contractor (who shall be second beneficiary). Also, he shall indemnify the BANK from any liability during the execution of the work. Further, he shall obtain and submit to the SBI/, a **third-party insurance policy** for maximum Rs. 10 lakhs for each accident, with the BANK as the first beneficiary. The insurance shall be obtained in joint names of BANK and the Contractor (who shall be second beneficiary).

The Contractor shall, from time to time, provide documentary evidence as regards payment of premium for all the Insurance Policies for keeping them valid till the completion of the work. The Contractor shall ensure that Insurance Policies are also taken for the workers of his Sub- Contractors / specialized agencies also. Without prejudice to any of its obligations and responsibilities specified above, the Contractor shall within 10 days from the date of letter of acceptance of the tender and thereafter at the end of each quarter submit a report to the Department giving details of the Insurance Policies along with Certificate of these insurance policies being valid, along with documentary evidences as required by the SBI. No work shall be commenced by the Contractor unless he obtains the Insurance Policies as mentioned above. Also, no payment shall be made to the Contractor on expiry of insurance policies unless renewed by the Contractor. Nothing extra shall be payable on this account. No claim of hindrance (or any other claim) shall be entertained from the contractor on these accounts. (Table-XIX).

26.0 Commencement of Works:

The date of commencement of the work will be reckoned as the date, three days from the date of award of contract letter by the SBI/Banks.

27.0 Time for completion

Time is essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period of **60 Days including Monsoon, from the 3rd day of the date of award of work** from the date of commencement. If required in the contract or as directed by the Bank / 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 Bank/consultant, the work be delayed for reasons beyond the control of the contractor, the Bank/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

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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 Bank' Consultant in writing at least 30 Days before the expiry of the scheduled time and while applying for extension of time he shall furnish the reason in detail and his justification if any', for the delays. The Bank/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 provision of liquidated damages as stated under clause 8.0 shall become applicable. Further the contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

29.0 Rate of progress

Whole of the materials, plant and labor 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 BANK should the rate of progress of the work or any part thereof be at any time be in the opinion the. BANK too Slow to ensure the completion of the whole of the work the prescribed time or extended time for completion the BANK shall thereupon take such steps as considered necessary by the BANK to expedite progress so as to complete the works by the prescribed time or extended time. Such communications from the BANK neither shall relieve the contractor from fulfilling obligations under the contract nor will he be entitled to raise any claims arising out of such directions.

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 Bank / 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 Bank / consultant. However, the provisions of the clause shall not be applicable in the case of any work which becomes essential to carry by rotary or double shifts in order to achieve the progress and quality of the part of the works being technically required / continued with the prior approval of the BANK 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 or restrictions of work

If at any time after acceptance of the tender SBI shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not required, the whole or any part of the work to be carried out. The SBI shall give notice in writing 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 BANK 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 BANK shall be final.

32.0 Suspension of work

- i) The contractor shall, on receipt of the order in writing of the SBI whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as Bank /consultant may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons:
 - a) On account any default on the part of the contractor, or
 - b) For proper execution of the works or part thereof for reasons other than the default the contractor, or
 - c) For safety of the works or part thereof.

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

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deposit the BANK 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 – BANK 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 labor paid by the SBI and to supply materials to carry out the work, or part of the work, debiting the contractor with the cost of the labor and materials cost of such labor and materials as worked out by the Bank/consultant shall final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract certificate of Bank /consultant as to the value of work done shall be final conclusive against the contractor.
- c) To measure up the work of the contractor, and to take such part thereof as shall unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (The amount of which excess the certificates in writing of the Banks / consultant shall final and conclusive) shall be borne by original contractor and may be deducted f 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 rescind under the provision aforesaid, the contractor shall not be entitled to recover or to be paid any sum or any work thereto for actually performed under this contract, unless, and until the BANK 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 SBI’s right to terminate the contract

If the contractor being an individual or a firm commit any ‘Act of insolvency’ or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Govt. and of the Official Assignee of the liquidator in such acts of insolvency or winding up shall be unable within seven days after notice to him to do so, to show to the reasonable satisfaction of the BANK that he is able to carry out and fulfill the contract, and to dye security therefore if so required by the BANK 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 Bank/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 BANK 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 BANK that the said materials were condemned and rejected by the Bank/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 or Bank'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 Bank / 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 BANK or the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the SBI through the BANK their agents or employees may enter upon and take possession of the work and all plants, took scaffolding, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads use the same by means of their own employees or workmen in carrying on and completing the work or by engaging any other contractors or persons to the work and the contractor shall not in any was interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for complement and finishing or using the materials and plant for the works.

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

35.0 Certificate of payment

The contractor shall be entitled for the certificates to be issued by the BANK within 10 working days from the date of submission provided it is with all required documents, test reports, recording in MB etc. The SBI shall recover the statutory recovering other dues including the retention amount from the certificate of payment.

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

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

The BANK may by any certificate make any corrections required previous certificate.

The SBI shall modify the certificate of payment as issued by the BANK 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 value of work done by him is less than the limit as prescribed in NIT, Clause No. 15.

The Contractor shall get the various trades of work in his Bill certified by respective trade/ specialized Engineer/Officer. He shall then consolidate the whole Bill and submit it for payment with Tax Invoice.

The final bill may be submitted by contractor within a period of one month from the date of virtual completion and BANK 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 A. Settlement of Disputes and Arbitration

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

- i. If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Bank 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 (Estate)/ Dy. General

Manager (F & OA) and endorse a copy of the same to the Bank, 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 (Estate)/ Dy. General Manager (F & OA) 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 (Estate)/ Dy. General Manager (F & OA) in writing in the manner and within the time aforesaid.

- ii. The Assistant General Manager (Estate)/Dy. General Manager (F & OA) 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 (Estate)/ Dy. General Manager (F & OA) submit his claims to the conciliating authority namely the Circle Development Officer/General Manager (ITSS) for conciliation along with all details and copies of correspondence exchanged between him and the Assistant General Manager (Estate)/ Dy. General Manager (F & OA)
- iii. If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned Chief General Manager/ Dy. Managing Director (HR) & Corporate Development Officer of the Bank for appointment of an arbitrator to adjudicate the notified claims failing which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.
- iv. Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the Chief General Manager/ Dy. Managing Director (HR) & 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 (HR) & 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.

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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 Water Supply

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

- i) That the water used by the contractor shall be fit for construction purposes to the satisfaction of the Bank / consultant's.
- ii) The contractor shall make alternative arrangements for the supply of water if the arrangement made by the contractor for procurement of water in the opinion of the Bank is unsatisfactory.
- iii) In case contractor is permitted to use SBI's source of water i.e. Municipal connection, Bore well (existing or new) etc., the SBI may consider recovering @1/2 % of Bill amount from the final bill of contractor.

38.0 Power Supply

The contractor shall make his own arrangements for power and supply / distribution system for driving plant or machinery for the work and for lighting purpose at his own cost, The cost of running and maintenance of the plants are to be included in his tender prices, He shall pay all fees and charges required, by the power supply and include the same in his tendered rates and hold the owner free from all such costs. He has to obtain necessary approval from the appropriate authorities, if required. Bank will charge ½% of Bill amount from the final bill of contractor for electrical power consumed by contractor.

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 SBI shall be final and binding on the contractor. Precedence to be followed for measurements is mentioned below;

- a) As mentioned in Price Bid
- b) As mentioned in Technical Bid

41.0 Maintenance of Registers

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

- I) Register for secured advance
- II) Register for hindrance to work
- III) Register for running account bill
- IV) Register for labor

42.0 Force Majeure

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

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

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

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

43.0 Local laws, Acts Regulations:

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

- i) Minimum wages Act 1948 (Amended)
- ii) Payment of wages Act 1936 (Amended)
- iii) Workmen’s compensation Act 1923 (Amended)
- iv) Contract labor regulation and abolition act 1970 and central rules 1971 (Amended) v) Apprentice act 1961 (amended)
- vi) Industrial employment (standing order) Act 1946 (Amended)
- vii) Personal injuries (Compensation insurance) act 1 963 and any other modifications
- viii) Employees’ provident fund and miscellaneous provisions Act 1952 and amendment thereof
- ix) Shop and establishment act
- x) Any other act or enactment relating thereto and rules framed there under from time to time.
- xi) Prevailing Indian Electricity rules & act.

44.0 Accidents

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

45.0 The contractor’s shall be bound to comply the following provision in terms of “Restrictions imposed by the Government of India, Ministry of Finance Department of Expenditure under Rule 144 (XI) of General Financial Rules 2017 vide their order no. F. No 6/18/2019/PPD dated 23rd July 2020” as under;

- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender ONLY if the bidder is registered with the Competent Authority (registration committee constituted by the Department for Promotion of Industry and Internal Trade).
- II. Bidder’ (including the term ‘tenderer’, ‘consultant’ or ‘service provider’ in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or

companies), every artificial judicial person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or Office controlled by such person, participating in a procurement process.

III. 'Bidder from a country which shares a land border with India (such a country)' for this purpose means:

- a. An entity incorporated, established or registered in such a country; or
- b. A subsidiary of an entity incorporated, established or registered in such a country; or
- c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
- d. An entity whose beneficial owner is situated in such a country; or
- e. An Indian (or other) agent of such an entity; or
- f. A natural person who is a citizen of such a country; or
- g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above IV. The beneficial owner for the purpose of (iii) above will be as under:

1. In case of A Company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more judicial person, has a controlling interest or who exercises control through other means.
Explanation

a. "Controlling ownership interest" means ownership of or entitlement to more than twenty five percent of shares or capital or profits of the company;

b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more judicial person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of Individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more judicial person, has ownership of or entitlement to more than fifteen percent of the property or the capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

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6. An Agent is a person to do any act for another, or to represent another in dealings with third person.
7. The successful bidder shall not be allowed to sub-contract works to any contractor from country which shares a land border with India unless such contractor is registered with the Competent Authority.
8. All bidders need to submit a declaration-cum-certificate (along with evidence) in this regard. Failure to submit such valid declaration-cum Certificate will make the bid liable for rejection."

46.0 Extension of time:

The time allowed for carrying out the work as entered in the agreement shall be strictly observed by the contractor and shall be reckoned from the date of commencement of work. The work shall throughout the stipulated period of contract be proceeded with care and due diligence (time being the essence of the contract) on the part of the contractor. To ensure good progress of the work during the execution, the contractor shall be bound in all cases, by the time schedule submitted by him.

- i) If the contractor shall desire an extension of time for completion of work on the grounds that there having been unavoidable hindrances in execution or on any other ground he shall apply in writing in format enclosed at Table XVIII to the Bank within 30 days of the hindrance on account of which he desires such extension.
- ii) The Site Engineer shall consider the application with reference to the reasonableness of the grounds cited therein and the recordings in the Hindrance register maintained at site (Proforma enclosed at Table- XII). They shall thereafter forward their comments/recommendations to the Banks. The Banks shall refer the case to the /Estate Department, GITC of the Bank along with their recommendations.
- iii) The Estate Department, GITC on being satisfied about the reasonableness of the request of the contractors, in terms of the relevant contract conditions, may recommend a fair and reasonable extension of time as per Bank Guidelines for granting extension of time.
- iv) Extension of time shall be granted before expiry of the contract period so that the contract is in force at the time of granting extension of time. Even if the contractor fails to apply for extension of time, the Site Engineer/BANK and Banks shall bring the fact to the notice of the Estate Department, GITC.
- v) While granting extension of time, it shall be clearly stipulated that the extension of time is being given without prejudice to the Bank's right to recover liquidated damages under relevant contract clause.
- vi) The letter granting extension of time is to be issued by the Banks as per Bank's standard format
- vii) If the contractors fail to complete the work within the stipulated period, the extended time as above or if the delay in completion of the work is attributable to the contractor in any way whatsoever, liquidated damages shall be recovered from the contractor's dues as stipulated

in the contract. The authority to decide as to whether liquidated damages are to be levied or not is as per Bank guidelines.

47.0 Substandard works and materials:

The contractors are required to execute all works satisfactorily and according to the specifications.

i) If any material or work is found to be unsound, imperfect, or inferior, from what is specified in the contract, the contractor shall be advised to rectify or re-execute the work or remove the material as the case may be within a reasonable time depending upon the nature of work. If the contractor fails to do so, the work shall be got redone or rectified or the material replaced through any other agency at the contractor's risk and cost as per the provisions of the contract. The form of letter to be given to the contractor in regard to rectification of defective work and removal of substandard material is to be issued as per Bank's Standard Format.

ii) Under certain exceptional circumstances, when the substandard work done cannot be rectified or redone because of structural or other constraints, the matter shall be reported to the Banks and Estate Department, GITC and if it is subsequently decided to accept the said work, payment for such work shall be allowed at a reduced rate arrived at keeping in view the nature and extent of deviation from the specifications or drawings.

48.0 DELINQUENCIES

The under noted delinquencies / defaults / misconduct / misdemeanors on the part of tenderer or enlisted contractor will attract disqualification action.

- Incorrect information about credentials, about his performance, equipment, resources, technical staff etc.
- Non-submission of the fresh / latest income tax clearance certificate
- Irregular tendering practice.
- Submission of tender containing far too many arithmetical errors and freak rates.
- Revoking a tender without any valid reasons.
- Tardiness in commencing work
- Poor organization at site and lack of his personal supervision
- Ignoring Bank's notices for replacement / rectification of rejected materials, workmanship etc.
- Violating any of the important conditions of contract i.e. site facilities, insurance, labor laws, ban on subletting etc.
- Lack of promptitude and co-operation in measurement of work and settlement of final account.
- Non-submission of vouchers and proof of purchases etc.
- Tendency towards putting up false and untenable claims.
- Tendency towards suspension of work for frivolous reasons.
- Treatment of labor
- Bad treatment of sub-contractors (piece workers) and unbusiness like dealings with suppliers of material.
- Lack of co-operation with nominated contractors of Bank
- Contractors becoming Bankrupt or insolvent.
- Contractor's conviction by a Court of Law.
- Failure to satisfactorily rectify defects during Defects Liability Period (DLP) and discovery of latent defects in contractor's work after the expiry of DLP of his contract.

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48.1 DISQUALIFICATION ACTION AGAINST (DELINQUENCIES OF)

CONTRACTOR The award of the under noted disciplinary action shall be considered.

- a) Placing embargo on issue of tenders or temporary suspension from the Bank's approved list.
- b) Permanent ban on issue of tenders and removal from the Bank's approved list.

48.2 PROCEDURE

- Correspondence on this subject shall be initiated (marked confidential) by the concerned Engineer in charge of project who discovered the contractor's misdemeanors / delinquencies etc.
- The correspondence shall contain facts and proofs and not mere suspicions.
- No disqualification action shall be taken against a contractor by an officer below rank of DGM or the authority who have accorded approval for empanelment of prequalification.
- Record of disqualification action taken against contractors shall be maintained in a separate file as also in the concerned contractor's dossier.

49.0 SAFETY CODE:

Safety code to be followed as per para 67 of GCC -

50.0 Observance of Contract Labor Act 1970

Various provisions of the Contract labor Act 1970 and the rules made there under cast certain obligations on the Bank in respect of Bank's Projects under construction at various centers. Under the Act, the AGM/DGM of Estate Department, GITC would be considered as the "Principal Employer", even though the laborers are employed by the building contractor. The Act applies to every establishment in which twenty or more workmen are employed or were employed on any day of the preceding 12 months as contract labor. A workman shall be deemed to be employed as contract labor in connection with the work of an establishment when she/he is hired in connection with such work through a contractor with or without the knowledge of the principal employer.

However, in the cases of package deal agreements, it would not apply until the builder/vendor is deemed to be a contractor after execution of Deed of Conveyance, if so provided in the agreement. The Act also does not apply to the work of gardening, maintenance of residential colonies and services therein. Such arrangements need not be included in the records to be maintained under the Act and rules made thereunder. During the construction of a project the "Principal Employer" shall comply with certain provisions of the Act in so far as they are applicable to the particular case. These provisions relate to- (I) Registration of Establishment (Section 7).

The principal employer shall make an application to the registering officer in the prescribed manner for registration of establishment. The application for registration shall be made in triplicate in Form No.1 to the registering officer of the area in which the establishment sought to be registered is located. The application shall be accompanied by the Treasury receipt showing

payment of fees for the registration of the establishment. The application shall be either personally delivered to the registering officer or sent to him by registered post. The employer can not employ the contract labor in his establishment unless he registers under Section 7 of the Act.

(ii) Maintenance of registers and other records (Section 29).

The following registers and records are required to be maintained by the Principal Employer:

a) Register of contractors in Form XII of the Contract Labor (Regulation & Abolition) Control Rules 1971.

b) Notice showing the rates of wages, hours of work, wage period, dates of payment of wages, names and address of the Inspectors having jurisdiction and date of payment of unpaid wages, shall be displayed in English and in Hindi and in local language, in conspicuous places at the work site.

c) Return intimating the actual date of the commencement or completion of each contract work, under each contractor, shall be submitted to the Inspector within 15 days from the commencement or completion of the work as the case may be. The return shall be filed in Form No.VI B.

d) The annual return in duplicate in Form No. XXV shall be submitted to the Registering Officer concerned so as to reach him not later than the 15th February following the end of the year to which it relates.

All the registers, records and notices shall be produced on demand before the Inspector or any other authority under the Act.

(iii) Responsibility of payment of wages of workmen (Section 21).

Every principal employer shall nominate a representative duly authorized by him to be present at the time of disbursement of wages by the contractor and it shall be the duty of such representative to certify the amounts paid as wages in the prescribed manner. The authorized representative shall record under his signature, a certificate at the end of the entries in the Register of wages or in the Register of wage and Muster Roll, in the following form.

"Certified that the amount shown in Column No. ____ has been paid to the workmen concerned in my presence on _____ at _____."

The Contractor shall be advised to disburse the wages in the presence of the authorized representative. If the contractor fails to make payment of wages within the prescribed period or makes short payment, the principal employer shall be liable to make payment of wages in full or the unpaid balance due to the contract labor employed by the contractor and recover the amount so paid from amounts payable to the contractors.

(iv) Welfare measures (Sections 16 to 19)

The welfare measures like canteen, rest rooms and other facilities to the contract labor are required to be provided by the contractor himself, but if any of the facilities is not provided by the contractor, then it shall be provided by the employer within 7 days of the commencement of the employment of contract labor. However, all expenses incurred by the Bank in providing the amenity shall be recovered from the Contractor either by deductions from any amount payable to the contractor or as a debt payable by the contractor.

(v) Penalty for contravention (Section 22 to 27).

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a) Whoever obstructs an Inspector in the discharge of his duties under the Act or refuses or willfully neglects to afford the Inspector any reasonable facility for making any inspection, examination, enquiry or investigation authorised by or under the Act in relation to an establishment, shall be punishable with imprisonment for a term which may extend to 3 months or with fine which may extend to Rs.500/- or with both.

b) The contravention of any provision of the Act or of the rules made thereunder or contravention of any condition of a license granted under the Act is punishable with imprisonment which may extend to 3 months or with fine which may extend upto Rs.1000/- or with both.

The Site Engineer/BANK shall ensure that all the obligations under the relevant provisions of the Act including obtaining licenses by the contractor under Section 12 of the Act are complied with. Before releasing the contractor's final payment, they shall also ensure that the contractors have paid all dues to their contract labor. Note : The contractor has to meticulously comply with para 50 about the Observance of Contract Labor Act 1970 and its updated version/ amendments time to time.

51.0 Programme charts and Progress Report:

i) As soon as the contract is awarded, a suitable program of work, preferably in the form of a bar / PERT chart shall be drawn up for completion of the different stages of the work, so as to ensure its completion within the allotted period of time. This program shall be submitted by the contractor in consultation with Bank or Site Engineer.

ii) The monthly progress chart as given in Table-V indicating there in the programme and progress achieved both physical and financial with reasons for short fall, if any, shall be sent by the Site Engineer/BANK to concerned Department of the Bank before 10th of the following month.

52.0 Co-ordination and Monitoring:

i) It is the prime responsibility of the Banks to ensure that execution of the work progresses smoothly in accordance with the programme and in proper co-ordination among different agencies.

ii) The Banks shall keep a close watch on the progress of work, the resources position etc. and take suitable timely remedial measures to sort out the bottlenecks in consultation with the concerned Department of the Bank.

iii) Site meetings shall be held at periodical intervals at least once in a month or at closer intervals where Bank/BANK /Site Engineer/Bank's Engineer and the representatives of various agencies who are involved in the project shall attend and review the progress of work and sort out hindrances, if any.

iv) Concerned Project Engineers/A.G.M./DGM shall attend site meetings as often as possible in the interest of expeditious progress of the work. Minutes of the site meetings shall be prepared by the Banks and furnished to the concerned Department and others concerned immediately after of holding such meeting.

v) In terms of the contract provisions, the contractors for general building work are required to submit progress photographs (in triplicate) at the beginning of each month. The photographs shall be so taken in such a manner so as to give a fair idea of progress of construction and the date of photographs taken shall be written on the reverse.

vi) As a faster means of coordination and monitoring, the use of advanced technology may be used.

53.0 Nil

54.0 Site order book:

i) For issuing instructions to contractors in the course of day to day supervision of works, site order book shall be maintained by the Site Engineer/BANK in a prescribed form (Refer Table XVII). Instructions should be prepared in triplicate and serially numbered. A copy of these instructions can be given to the contractor and Bank for necessary action. While issuing such instructions, the contractor/his authorized representatives' signature shall be obtained on the office copy. ii) Instructions in the site order book shall be recorded under the signature of the Site Engineer/BANK. The Bank's Engineer during his periodical inspection/visit shall peruse and record his instructions, if any, in this book.

iii) All instructions to the contractors which are at variance with tender provisions as also pointing out lapses on the part of the contractors to adhere to the tender specifications shall be issued in writing through site order book by the Site Engineer/BANK as well as Bank and Bank's officials visiting the site.

iv) The site order book shall be kept in the custody of the Site Engineer/BANK at site. This fact shall be made clear to the contractors at the beginning of the work.

v) The site order book shall be referred to at the time of making final payments to the contractors.

vi) The site order book shall be preserved for a period of 5 years or upto the time of all disputes/arbitration cases of the work are finally settled, whichever is later, after completion of a work in the same manner as a M.B.

55.0 Hindrance Register:

In order to have a record of hindrance in the progress of work which may result in delays and consequent claims from the contractors for extension of time a Hindrance Register shall be maintained at the construction site. The details of hindrances with time period shall be recorded by the Site Engineer/BANK therein when these occur and all recordings shall be signed jointly by the Site Engineer/BANK and the contractor's representative. The extract of the same shall be sent to the Estate Department, GITC. While considering the contractor's request for extension of time for completion of work, this register shall be referred to.

56.0 Site Register:

The following registers are to be maintained at site office (if required by the Bank):

- i) Daily Progress record
- ii) Site order book
- iii) Cement and steel register (Receipts, consumption, balances).
- iv) Concrete cube test register/slump cone test register.
- v) Register of drawings and working details.
- vi) Log book of defects.

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- vii) Test reports of building materials.
- viii) Sand bulkage register/silt content register.
- ix) Lead register.
- x) Daily labor register.
- xi) Variation order register.
- xii) Hindrance register
- xiii) Electrical wiring system testing register.
- xiv) Equipment test certificate register.

These registers and a set of latest drawings shall be kept in the safe custody of the Site Engineer/BANK

Other than above registers, more may be required to be maintained at site as per project requirements.

ANNEXURE -II

Declaration-Cum- Certificate on the Letter Head of Bidder Regarding Restrictions on Procurement from Bidders from A Country Or Countries, On Grounds Of Defence In India, Or Matters Directly Related Thereto, Including National Security.

Restrictions under Rule 144 (XI) of General Financial Rules 2017 of Ministry of Finance, India order no. F. No 6/18/2019/PPD dated 23rd July 2020

I/We have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India;

I/We, the bidder (Specify full name -----
-----)

Certify that we are NOT from such a country OR, if from such a country, has been registered with Competent Authority.

I/We hereby certify that we fulfil all requirements in this regard and is eligible to be considered.

(Signature of Authorised Signatory along with Seal) Name

of authorised signatory:

Designation of Authorised signatory:

List of Evidence enclosed:

1. Copy of certificate of valid registration with the Competent Authority (Score out if not applicable)
2.
3. ...

ARTICLES OF AGREEMENT

**Agreement for _____
Between**

State Bank of India

Technical Bid, "Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai"

And

Date of Commencement: _____

THIS Agreement is made on ____ day of2022 (hereinafter referred to as "**Agreement**") by and between State Bank of India, a corporation incorporated under State Bank of India Act 1955 having its Global IT Centre at Sector 11, CBD Belapur, Navi Mumbai, Maharashtra, India 400614 through F&OA Department, Estate Department (hereinafter referred to as the "**Bank/SBI**") and which expression shall unless repugnant to the context, mean and include its successors and assigns, And

M/s_____ incorporated under the Companies Act 1956 having its registered Office at_____ <Please provide address of the Service Provider> (hereinafter referred to as the "**Service Provider / Contractor/ Agency**") which expression unless repugnant to the context shall mean and include its successors and permitted assigns.

SBI and M/s_____ are each sometimes referred to individually as a "Party" and together as the "Parties."

WHEREAS, the Bank is desirous for_____ <name of services>. As described in the Request for Proposal (read with its corrigendum and clarifications) no. _____ dated _____ (hereinafter referred as "**RFP**" and annexed as **Annexure-A**):

- (i) Work Order No.....dated _____ (hereinafter referred as "**PO/ Work Order**" and annexed as **Annexure-B**) and the same shall be part of this Agreement;
- (ii) _____; and

Service Provider has agreed to provide the product/services as may be required by the Bank under the RFP.

NOW THEREFORE, in consideration of the mutual covenants, undertakings and conditions set forth below, and for other valid consideration the acceptability and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

1 COMMENCEMENT & TERM:

- 1.1 This Agreement shall commence from its date of execution mentioned above/ deemed to have commenced from _____ (**Effective Date**).
- 1.2 This Agreement shall be in force till acceptance and approval of Complete Project Closure Report as per clause no 1.1.11 of General Conditions of Contract of the RFP unless terminated by the Bank by notice in writing in accordance with the termination clauses of the RFP.
- 1.3 Unless terminated earlier in accordance with this Agreement, the Agreement shall come to an end on completion of the term specified in the Agreement or on expiration of the renewed term.

2 SCOPE OF SERVICES:

- 2.1 The scope is defined in the RFP and PO

3 FEES, TAXES DUTIES & PAYMENTS:

- 3.1 Service Provider shall be paid fees and charges in the manner detailed in RFP and PO, the same shall be subject to deduction of income tax thereon wherever required under the provisions of the Income Tax Act by the Bank. The remittance of amounts so deducted and issuance of certificate for such deductions shall be made by the Bank as per the laws and regulations for the time being in force. Nothing in the Agreement shall relieve Service Provider from his responsibility to pay any tax that may be levied in India on income and profits made by Service Provider in respect of this Agreement.

3.1.1 _____¹

3.1.2 _____

3.2 Payments

- 3.2.1 The payment for the works to be executed under this Agreement shall be made as described under RFP and PO.

4 MISCELLANEOUS:

¹ Please provide the payment details.

Technical Bid, “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

- 4.1 Any provision of this Agreement may be amended or waived, if, and only if such amendment or waiver is in writing and signed, in the case of an amendment by each party, or in this case of a waiver, by the Party against whom the waiver is to be effective.
- 4.2 No failure or delay by any Party in exercising any right, power or privilege hereunder shall operate as a waiver thereof nor shall any single or partial exercise of any other right, power or privilege. The rights and remedies herein provided shall be cumulative and not exclusive of any rights or remedies provided by law.
- 4.3 If this Agreement is signed in counterparts, each counterpart shall be deemed to be an original.
- 4.4 Service Provider agrees that they shall not use the logo, trademark, copy rights or other proprietary rights of the Bank in any advertisement or publicity materials or any other written communication with any other party, without the prior written consent of the Bank.

5 ENTIRE AGREEMENT

- 5.1 This Agreement constitutes the entire agreement between the Parties with respect to the subject matter hereof and supersedes all prior written agreements, undertakings, understandings and negotiations, both written and oral, between the Parties with respect to the subject matter of the Agreement, except which are expressly annexed or attached to this Agreement and saved by this Agreement. No representation, inducement, promise, understanding, condition or warranty not set forth herein has been made or relied upon by any Party hereto.
- 5.2 The following documents along with all addenda issued thereto shall be deemed to form and be read and construed as integral part of this Agreement and in case of any contradiction between or among them the priority in which a document would prevail

over another would be as laid down below beginning from the highest priority to the lowest priority:

- 5.2.1 This Agreement;
- 5.2.2 RFP
- 5.2.3 Purchase Order/Work Order

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives as of the date and day first mentioned above.

State Bank of India

.....

By _____
Authorized Signature

By _____
Authorized Signature

Name _____

Name _____

Designation _____

Designation _____

Date: _____

Date: _____

Witness: _____

Witness: _____

APPENDIX HEREIN BEFORE REFERRED TO

Technical Bid, “Proposed Interior Work, on 3rd Floor, C & D Wing at State Bank Global IT Centre, C.B.D. Belapur, Navi Mumbai”

1	Name of the organization Offering Contract:	The Dy. General Manager (F & OA), Estate Dept., State Bank Global IT Centre, 1st Floor, “C” Wing, Sector 11, C.B.D. Belapur, Navi Mumbai – 400614.
3	Site Address	SBII GITC , Sector 11, CBD Belapur.
4	Scope of Works	Work As per Clause No. 1 of NIT.
5	Name of the Contractor	
6	Address of the Contractor	
7	Period of Completion	As per clause 2 of NIT.
8	Earnest Money Deposit	Of the amount as per Clause No. 3 of NIT by means of (mode of Transaction) NEFT, RTGS and intra-Bank transfer (SBI to SBI only), as per details mentioned in para 4.6, of Information and Instruction for Bidders
9	Security Deposit (SD)/ Retention Money	As per Part B - Point 6 of Information and Instruction to Bidders. A
10	Defects Liability Period	As per Clause No. 1.1.11 (a) of GCC.
11	Insurance to be undertaken by the :	As per Clause 25 of GCC.
12	Liquidated damages:	As per Clause No 8 of GCC.
13	Value of Interim Bill (Min.) :	As per clause 15 of NIT. As per Clause no. 15 of NIT.
14	Date of Commencement	As per Clause 26 of GCC.
15	Period of Final measurement	As per Clause 22 of GCC.
16	Initial Security Deposit:	As per clause no. 1.2 (b) of GCC.
17	Total Security Deposit: As per clause No.	1.2 of GCC
18	Refund of Total Security Deposit Comprising of EMD and ISD	This Retention amount shall be released by the SBI in Two stages ie. 50% of Security Deposit be released after issuing of VCC and

		remaining 50% shall be released after completion of Defect Liability Period and Completion of Project Closure report from SBI and BANK (para 1.1.11 of GCC) whichever is later and provided no complaint is received or the defects has been rectified by replacing the same satisfactorily.
19	Period for Honoring Certificate	<ol style="list-style-type: none"> 1. One Month for R.A. Bills 2. The final bill will be submitted by the Contractor within one month of the date fixed for completion work and the Bill shall be Certified as per Clause 22 of GCC provided the bills are submitted with all pre-requisite documents, compliances of Statutory Authorities, test reports, etc. prescribed in the tender.

Signature of Tenderer.

Date:

SPECIAL CONDITIONS OF CONTRACT (SCC)

GENERAL

- 1) Unless otherwise specified, IS Codes, NBC Guidelines, CPWD Specifications 2019 volume I - II with correction slips up to 28.02.2022 shall be followed. Any additional item of work, if taken up subsequently, shall also conform to the relevant IS Code, CPWD specifications mentioned above. Should there be any difference or discrepancy between the description of items as given in the schedule of quantities, particular specifications for individual items of work and I.S. Codes etc., the following order of preference shall be observed;
 - i) Minimum specification and standards, Tender Drawings, Schedule of Quantities
 - ii) Particular Specifications, Special Conditions
 - iii) CPWD Specifications.
 - iv) Indian Standard Specifications of BIS
 - v) National Building Code 2016 with up-to-date amendments
 - vi) Sound engineering practices as per directions of the SBI
- 2) The work shall be carried out in accordance with the Architectural drawings, structural drawings & MEP drawings, relevant codes, specifications etc. before commencement of any item of work, the contractor shall correlate all the relevant Architectural and structural drawings issued for the work and satisfy himself that the information available therein is complete, suitable and unambiguous. The discrepancy, if any, shall be brought to the notice of the SBI before execution of the work, the contractor shall be solely responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and or incomplete information. The BANK, in no case, shall be held responsible for the accuracy thereof and/or interpretations or conclusions drawn there from by the Contractor and all consequences shall be borne by the Contractor. It is presumed that the Contractor shall satisfy himself for all possible contingencies, incidental charges, wastage, bottlenecks etc. likely during execution of work and acts of coordination which may be required. Nothing extra shall be payable on this account.
- 3) The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/or described in the specifications, provided that the same can be reasonably inferred. There may be several incidental works, which are not mentioned in the scope of work but will be necessary to complete the item in all respect. All these incidental works/ costs which are not mentioned in specifications / drawings / tender document but are necessary to complete the item shall

be deemed to have been included in the rates quoted by the contractor. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation / change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such items in all respects) on account of the directions of BANK. Nothing shall be payable on the account of incidental works.

- 4) If any further details/elaboration or any miscellaneous clarifications etc. to the attached drawings required to the contractor for execution of work, the same may be asked by the contractor at least one month prior to its requirement so that consultant of the work may provide within a month to him. No hindrance shall be given on this account. Requirement of more Elaboration/detailing/Miscellaneous Drawings as required by contractor and provided by the consultant/department shall not mean change of Scope of Work etc. and for that nothing extra shall be payable to contractor.
- 5) In the event of any variation/ discrepancy in the drawings, specifications and tender Documents etc. the decision of the BANK, shall be final binding and conclusive on the contractor and in the case the contractor have any doubt and the same should be got clarified immediately from the BANK, and no claim of the contractor shall be entertained thereafter. Moreover, the agency is not allowed to take benefit out of any clerical/ grammatical mistake in the standard clauses/Specifications etc. being used in the agreement.
- 6) Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor, in case any damages to such existing services take place the same shall be rectified by the contractor at his own expense to the satisfaction of the BANK. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.
- 7) Existing Storm water drains around periphery of site shall be maintained by the Contractor free of cost by regular cleaning, repairing, protecting, Debris removing, making smooth path for the flow of storm water.
- 8) The contractor shall be responsible for the watch and ward / guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against theft/ pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department.
- 9) The entire work up to the plinth level, as required for obtaining approval up to the plinth (Further commencement certificate after plinth level) from the local authority, shall be completed by the Contractor simultaneously. Work above plinth shall be allowed to be carried out only after obtaining approval from the local body. No delay shall be allowed on this ground and also no

claim whatsoever on account of any delay in approval at plinth level by the local body shall be entertained from the Contractor.

- 10) The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, preparatory works, working during monsoon, working at all depths, height, lead, lift and location and any other incidental works required to complete this work.
- 11) For works below ground level the contractor shall keep that area free from water. If dewatering or bailing out of water is required, the same shall be responsibility of contractor. Nothing extra shall be paid on this account.
- 12) Any legal or financial implications resulting out of disposal of earth shall be carried out by the contractor at his own cost. Nothing extra shall be payable on these accounts
- 13) The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by local body and any other statutory bodies shall be adhered by the contractor, during the execution of work. The Contractor shall also adhere to all traffic restrictions notified by the local authorities.
- 14) The cost of water for construction and labors (for municipal water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for the drinking purposes from the municipal authorities or any other statutory body, the consequent charges shall be borne by the contractor. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges) payable to such authorities for carrying out the work, shall be borne by the Contractor.
- 15) The Contractor shall arrange to give all notices as required by any statutory / regulatory authority for labor licenses, registration with EPFO, ESIC and BOCW Welfare Board etc. and shall pay to such authority all the fees, cess, labor cess, etc. that is required to be paid for the execution of work. He shall protect and indemnify the Department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts.
- 16) All payments or fees related to all works shall be payable to Government/ Local Body including statutory payments demanded either in the name of Customs Department Contractor for obtaining the various applicable permissions/ all required and applicable Approvals/licenses like CFO

approvals, excavation approval, Certificate and making and getting all permanent civil and E & M service connections, Payments payable to electrical supply company etc. for the scope of this work shall be borne by the Contractor. No extra payment shall be done to Contractor on this account.

- 17) Royalty at the prevailing rates shall be paid by the Contractor on all materials such as boulders, metals, sand and bajri etc. collected by him for the execution of the work, directly to the revenue authority of the state government concerned.
- 18) No foreign exchange shall be made available by the Department for importing (purchase) of equipment, plants, machinery, materials of any kind or any other items required to be carried out during execution of the work. No delay and no claim of any kind shall be entertained.
- 19) The Contractor shall carry out his work so as not to interfere with or hinder the progress of the work being carried out by any other agency. As far as possible, he shall arrange his work and place, so as not to interfere with the operations of other Contractors or shall arrange his work with that of the others, in an acceptable and coordinated manner and shall perform it in proper sequence
- 20) If the work is carried out in more than one shift or during night, no claim on this account shall be entertained. The agency must take permission from the police authorities etc. if required for work during night hours, no claim / hindrance on this account shall be considered if work is not allowed during night time.
- 21) The Contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the SBI from any and all damages and claims that may arise on any account. The Contractor shall indemnify the SBI against all claims in respect of patent rights, royalties, design, trademarks of name or other protected rights, damages to adjacent buildings, roads or members of public, residents, visitors, other agencies/vendor's workers, etc. at SBI Residential Colony at Sector 13, Nerul & their vehicles in course of execution of work or any other reasons whatsoever, and shall himself defend all actions arising from such claims and shall indemnify the SBI in all respect from such actions, costs and expenses. Nothing extra shall be payable on this account.
- 22) The Contractor shall make all necessary arrangements for protection from rains, the work already executed and for carrying out the further work, during monsoon including providing and fixing temporary shelters, protections etc.
- 23) In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained notwithstanding any other provisions elsewhere in the contract

agreement. Also, the Contractor shall make good, at his own cost, the damages caused, if any.

- 24) The Contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupants of the adjacent properties and to the public in general. The Contractor shall take all care, as not to damage any other adjacent property or other services running adjacent to the plot. If any damage is done, the same shall be made good by the Contractor at his own cost and to the entire satisfaction of the BANK. The Contractor shall use such methodology and equipment for execution of the work, so as to cause minimum environmental pollution of any kind during construction, to have minimum construction time and minimum inconvenience to road users and to the occupants of the buildings on the adjacent plot and public in general, etc. He shall make good at his own cost and to the entire satisfaction of the BANK, any damage to roads, paths, cross drainage works or public or private property whatsoever caused, due to the execution of the work or by traffic brought thereon, by the Contractor. Further, the Contractor shall take all precautions to prevent any pollution of streams and waterways. All waste or superfluous materials shall be carted away by the Contractor, entirely to the satisfaction of the BANK. Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the occupants / users of adjoining buildings. No claim whatsoever on account of site constraints mentioned above or any other site constraints not specifically stated here, shall be entertained from the Contractor. Therefore, the Contractors are advised to visit site and get firsthand information of site constraints. They should quote their rates accordingly.
- 25) The quoted rates shall also be inclusive of all ancillary/enabling and incidental works required for execution of work like labor camp, stores, fabrication yard, offices, watch and ward, temporary structure for plants and machineries, scaffolds, H frames, Props, Spans, Cup lock system, Safety Platforms, Covering external scaffold with green shade nets, polypropylene sheets to avoid direct fall of any materials from higher side, Safety equipment, watch and ward security, vehicles, labs, water storage tanks, arrangement for temporary connection for electricity, telephone, water etc. including their consumption charges, protection works, barricading, providing testing facilities / laboratory at site of work for various field and laboratory tests or any other activity which is necessary for execution of work and as directed by BANK. Before start of the work, the Contractor shall obtain approval of the BANK, before locating various temporary structures/ site office, positioning of machinery, material yard, cement and other storage, steel fabrication yard, site laboratory, water tank, etc.
- 26) The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc. under various labor laws and other regulations applicable, at his site office.

27) The Contractor shall cooperate with and provide facilities to the sub-Contractors and other agencies working at site for smooth execution of the work. The Contractor shall

i) Properly co-ordinate his work with the work of other agencies.

ii) Provide control lines and benchmarks to his Sub-Contractors and the other Contractors.

iii) Provide electricity at mutually agreed rates.

iv) Co-ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.

v) Adjust his work schedule and site activities in consultation with the SBI and other Contractors to suit the overall completion schedule.

vi) Resolve the disputes with other Contractor amicably and the SBI shall not be made intermediary or arbitrator. The contractor shall indemnify the SBI against any claim(s) arising out of such disputes.

vii) In case of variation / conflicting provisions is observed in any condition of bid document forming part of contract, the decision of tender accepting authority shall be final and binding on the contractor

28-29) Nil

30) SUFFICIENCY OF TENDER

The Tenderer shall be entirely responsible for sufficiency of rates quoted by him in his tender.

Sufficiency of tender prices: Subject to any provisions laid down in the tender document, the Contractor shall be deemed to have satisfied himself before submitting his tender as to the correctness and sufficiency of the tender and to have taken account of all that is required for the full and proper execution of the contract and to have included in his rates and prices all costs related to the completion of work.

31) PROGRAM /SCHEDULE

The Contractor shall prepare an integrated programme chart within three days of issue of award letter including Civil as well as E & M activities for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the program within the stipulated period and submit the same for approval of the BANK. These shall be submitted by the contractor through electronic media besides forwarding hard copies of the same. The integrated programme chart so submitted should not have any discrepancy with the physical milestones attached in the contract agreement. The programme chart should include the following: i) Descriptive note explaining sequence of various activities.

ii) Construction Programme prepared on PRIMAVERA/MS Project Software, which will indicate resources in financial terms, manpower and specialized equipment for every important stage. One planning engineer should be engaged in project who is familiar in PRIMAVERA/MS Project software. No extra payment shall be made in this regard to the contractor. lii) Programme for procurement of materials by the contractor.

iv) Programme for arranging and deployment of manpower both skilled and unskilled so as to achieve targeted progress.

v) Programme of procurement of machinery/equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.

vi) Programme for achieving fortnightly micro milestones and periodic milestones.

32) In case of noncompliance/delay in compliance in this, a recovery amount as specified in Schedule will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

33) If at any time, it appears to the BANK, that the actual progress of work does not conform to the approved programme referred above, the contractor shall produce a revised program within seven days showing the modifications to the approved program by additional inputs to ensure completion of the work within the stipulated time. A recovery of amount/Penalty as specified shall be made in case of delay as per

34) The submission for approval by the BANK of such programme or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of BANK, to take action against the contractor as per terms and conditions of the agreement.

QUALITY ASSURANCE & TESTING OF MATERIALS

35) The contractor shall establish field laboratory at site including all necessary equipment for field tests as given in tender document. All the relevant and applicable standards and specifications shall be made available by the contractor at his cost in the field laboratory.

Quality Assurance Engineer of the contractor shall be responsible for carrying out all mandatory field/ laboratory tests. The contractor shall so provide adequate supporting staff as his cost for carrying out field tests, packaging & forwarding of samples for outside laboratory tests and for maintaining test records. All the registers of tests carried out at site or in outside laboratories shall be maintained by the contractor. The test register shall be issued to the contractor by the BANK. All the entries in the test register will be made by the designated engineer of the contractor and same shall be regularly reviewed by the BANK, or his authorized representatives at site.

36) The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the list attached with the tender documents, as

per the conditions and specifications for the work. The equivalent brand for any item shall be permitted to be used in the work, when any of the preferred make is not available. This is, however, subject to documentary evidence produced by the contractor regarding non availability of the preferred brand and also subject to independent verification by the BANK. In exceptional cases, where such approval is required, the decision of BANK,as regards equivalent make of the material shall be final and binding on the Contractor. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Also, the sample work/ material shall be procured only after obtaining written approval of the BANK.

- 37) All materials shall be got checked by the BANK,or his authorized supervisory staff on receipt of the same at site before use.
- 38) The Contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case he or his authorized representative is not present or does not associate him, the result of such tests and consequences thereon shall be binding on the Contractor. The Contractor or his authorized representative shall remain in contact with the SBI or his authorized representative associated for all such operations. No claim of payment or claim of any other kind, whatsoever, shall be entertained from the Contractor.
- 39) All the hidden/Buried/ Concealed items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions before covering.
- 40) Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to bylaws and municipal body/ corporation where Specifications are not available.
- 41) BIS marked materials except otherwise specified shall be subjected to quality test at the discretion of the BANK,besides testing of other materials as per the specifications described for the item/material. Wherever BIS marked materials are brought to the site of work, the agency shall, if required, by the BANK,furnish manufacturer's test certificate or test certificate from approved testing laboratory to establish that the material / procured by the agency for incorporation in the work satisfies the provisions of specifications / BIS codes relevant to the material and / or the work done.
- 42) The contractor shall procure the required materials in advance so that there is sufficient time to testing of the materials and clearance of the same before use in the work.
- 43) The contractor shall supply free of charge the materials required for testing including packing and transportation to testing laboratory. The testing of materials shall be conducted in Govt. Laboratory/ Govt. colleges/ IITs/NITs or from the laboratory approved by SBI the charges for testing of materials shall be borne by the Contractor.

- 44) All expenditure to be incurred for testing of samples e.g., packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor in all cases irrespective of testing results.
- 45) Contractor shall submit minimum "Quality Assurance" plan within 45 days after award of work which shall be consisting of:
- 46) Lot size, number of required tests and frequency of testing.
- 47) While deciding these criteria Tender Specifications & Provisions of BIS Codes and Standard Practices may be referred. Volume of work, Practical Difficulties and Site Conditions etc. may also be kept in view. The lot size, number of tests and frequencies of testing can be altered or modified by the BANK, from the prescribed limits.
- 48) It should clearly indicate the Machinery and other Tool & Plants required to be deployed at site by the agency. Entire Machinery and T&P may not be required at the start of work, therefore, a proper time schedule by which each Machinery & T&P is to be brought at site should also be indicated.
- 49) The Contractor shall allow access to Third Party Quality Assurance (TPQA) Agency if any appointed by SBI or any other Committee related to SBI which required to visit the site to have a control on quality and methodology of execution. Samples of materials including Cement Concrete Cubes shall be taken jointly by Contractor and BANK, or his authorized representative. All arrangements for transporting and getting them tested shall be made by the Contractor.
- 50) All material received at site shall be entered in MAS Register and copy of Supply order, Manufacturer's Test Certificate & Bill-invoice shall be maintained in order.
- 51) The MAS Registers, Cement Register, Steel Register, Paint and Chemical Register, Bitumen Register, Test Register etc. shall be maintained by a qualified staff of Contractor which may be inspected by BANK, or his/her representative at any time. The daily report of receipt of material shall be sent to Project Manager / Project Bank of BANK or his/her representative.
- 52) The safe custody of all registers shall be the responsibility of Contractor. Submission of copy of all test registers and Material at Site Register along with each alternate Running Account Bill and Final Bill shall be mandatory.
- 53) As and when any important item is taken up for execution, the Contractor shall submit the specifications and develop a checklist and Pour card. This sample checklist should be got approved from the BANK, and should be used at site. This check list should be shown to the BANK, or his/her representative during inspection. This procedure is to be followed for all hidden items, CC/RCC work, Steel reinforcement, shuttering, flooring, doors & windows, plumbing, including water supply pipe lines, roof treatment, earth filling etc.
- 54) In addition, the contractor shall submit theoretical consumption statements for the items involving use of cement, steel reinforcement, chemical, paints, ready mix concrete, bitumen etc. as directed by the BANK, along with every running

account bill for record and reconciliation of material issued, consumed and balance.

- 55) These measurements shall then be 100% checked & verified by the authorized representatives of the BANK. Subsequently measurements shall be checked by SBI engineer as per SBI guidelines along with BANK. The contractor shall incorporate all such changes or corrections, as may be done during these checks, to his draft computerized measurements and submit the corrected computerized measurement Books with its pages machine numbered to the BANK.
- 56) The Computerized Measurement Book shall be allotted a serial number as per the Register of Computerized Measurement Books and processed for payment.

57.0 WATERPROOFING WORKS

The Contractor has to submit 5 Yr Guarantee bond for all Water proofing works executed on site and in addition to Security Deposit additional 2.5% security deducted for completed work of the respective waterproofing work based on the cost of work executed. This security Deposit shall be released after satisfactory compliance of this 5 Yr Period. BG shall not be entertained for it.

Note: Interest shall not be paid on any security deposit, retention amount, etc., whatsoever be the duration of it.

58.0 CLEANLINESS OF SITE

The Contractor shall not stack building material / malba / muck on the land or road of the local development authority or on the land owned by the others. The site of work shall be always kept clean. The Contractor shall take all care to prevent any water- logging at site. The waste water, slush etc. shall not be allowed to be collected at site. It may be directly pumped out to public drainage system with the prior approval of the concerned authorities at his cost. The work shall be carried out in such a way that the entire area is kept clean and tidy.

59.0 SECURITY & TRAFFIC ARRANGEMENTS

l) In event of any restriction being imposed by the Department, traffic or any other statutory authority having control over the project, on the working or movement of Labor, materials, etc., the Contractor shall strictly follow all such restrictions or instructions issued regarding the) same and nothing extra shall be payable to the Contractor on account of such restrictions or instructions. No delay or claims of any kind shall be entertained from the Contractor on this account.

- iii) The Contractor shall be wholly responsible for security of site and works. The Contractor shall be not permit entry of any unauthorized persons in the Site; and entry shall be limited to the Employees of the Contractor, Sub Contractor or persons authorized by the SBI
- iv) Lighting: The contractor shall provide sufficient lighting at project site, during periods of insufficient natural light, if required.

60.0 CONDITIONS SPECIFIC TO GREEN BUILDING PRACTICE/ENVIRONMENTAL CLEARANCE

The contractor shall strictly adhere to the following conditions as part of his contractual obligation.

- I) The Contractor should follow the construction plan as proposed by the Bank /SBI to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating materials at site. Protect topsoil from erosion by collection storage and reapplication of top soil, constructing sediment basin, contour trenching, mulching etc.
- ii) No excavated earth shall be removed from the campus unless suggested otherwise by SBI. All subsoil shall be reused in backfilling/landscape, etc. as per the instructions of the SBI. The surplus excavated earth shall be disposed of by the contractor for reuse. A certificate of reuse as required by the SBI shall be submitted by the contractor.
- iii) The contractor shall not change the natural gradient of the ground unless specifically instructed by the SBI. This shall cover all natural features like water bodies, drainage gullies, slopes, mounds, depressions, etc. Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by the SBI.
- iv) The contractor shall not carry out any work which results in the blockage of natural drainage.
- v) The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the BANK.
- vi) Contractor shall reduce pollution and land development impacts from automobiles used during construction.
- Vii) Overloading of trucks is unlawful and creates the erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering must take place. No overloading shall be permitted.
- Viii) Preserve and Protect Landscape during Construction
- ix) The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and

other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.

x) The contractor shall take steps to protect trees or saplings identified for preservation within the construction.

xi) Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by SBI.

Xii) The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.

Xiii) The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.

Xiv) The permission for cutting of trees and / or Transplanting of the trees shall be obtained by the Contractor from BMC/NMMC/Local Authorities or any other authority of the State Government, and execution of cutting and transplanting the trees or any other action in this regard will be taken by the contractor for which provision is already available in amount quoted by the contractor. No extra payment will be made on this ground.

xv) Contractor shall collect all construction waste generated on site. Segregate these wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc.

xvi) The contractor shall provide potable water for all workers.

xvii) The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. The total no. to be provided shall not be less than 1 per 30 employees in any one shift. Toilet facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.

Xviii) The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure proper screening, covering stockpiles, covering brick and loads of dusty materials, wheel-washing facility, gravel pit, and water spraying. Contractor shall ensure the following activities to prevent air pollution during construction:

xix) Clear vegetation only from areas where work will start right away.

xx) Vegetate / mulch areas where vehicles do not ply.

Xxi) Apply gravel / landscaping rock to the areas where mulching /paving is impractical.

Xxii) Identify roads on-site that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10 - 20%

xxiii) Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged.

Xxiv) Water spraying shall be done on:

Any dusty materials before transferring, loading and unloading

Area where demolition work is being carried out any un-paved main haul road

xxv) Areas where excavation or earth moving activities are to be carried out the contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.

Xxvi) All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust / particulate emissions.

Xxvii) Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / cleaned up immediately before they can infiltrate into the soil / ground or runoff in nearby areas

xxviii) Provide hoardings of not less than 3m high along the site boundary, next to a road or other public area

xxix) Provide dust screens, sheeting or netting to scaffold along the perimeter of the building

xxx) Cover stockpiles of dusty material with impervious sheeting

xxxii) Cover dusty load on vehicles by impervious sheeting before they leave the site

xxxiii) The contractor shall ensure that no construction leachate (e.g., cement slurry etc.), is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this including, reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutantladen water directly to the treatment device or facility (municipal sewer line).

Xxxiiii) The storage of material shall be as per standard good practices as specified in Storage, Stacking and Handling practices, NBC 2016 shall be to the satisfaction of the BANK, to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. Watch and ward of the Contractor is materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipment with proper access and proper maneuverability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipment at different stages of construction shall be considered.

Xxxv) The contractor shall ensure the following activities for construction workers safety, among other measures:

Guarding all parts of dangerous machinery.

Precautionary signs for working on machinery

Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.

Durable and reusable form work systems to replace timber form work and ensure that form work where used is properly maintained.

Ensuring that walking surfaces or boards and/or working platforms, etc. at height are of sound construction and are provided with safety rails or belts.

Provide protective equipment; helmets etc. -

Provide measures to prevent fires. Fire extinguishers and buckets of sand to be provided in the fire-prone area and elsewhere.

Provide sufficient and suitable light for working during night time

The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labeled in both Hindi and English with suitable symbols.

The contractor shall prepare and submit spill prevention and control plans before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.

Contractor shall collect & submit the relevant material certificates for materials with high recycled (both post-industrial and postconsumer) content, including materials like RMC mix with fly-ash, glass with recycled content, calcium silicate boards etc.

The contractor shall ensure that a flush out of all internal spaces is conducted prior to handover. This shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.

The providing & fixing Safety nets at various levels of Buildings as per instruction from BANK. Safety Net shall be of Garware nylon Ropes made of three layers of (100 mm X 100 mm square with 8 mm thick nylon rope.), net with 2.5 mm nylon rope with 25mm x 25 mm square and mono filament net on top having width of 5.0 mts. horizontal to the periphery of the Building with supporting structure of 50 mm dia MS hollow (40 nb) pipe duly anchored on slab/beam with 10 mm thick base plate and anchor fastner (hilti) 4 Nos. at all corners, and free end of pipe to be tied up with upper floor column with the help of nylon rope 16 mm dia. same supporting system is to be followed for every 4.5 Mtr. in such a way to have a proper slope during Construction, and removing and re fixing part of the same as and when required/ necessary for smooth progress of the work.

No extra payment shall be done against all such safety measures.

61.0) WATER USE DURING CONSTRUCTION

I) Contractor should spray curing water on concrete structure and shall not allow free flow of water. Concrete structures should be kept covered with thick cloth/gunny bags and water should be sprayed on them. Contractor shall do water poundings on all sunken slabs using cement and sand mortar.

62.0) Warning / Caution Boards/Signage

i) All temporary warning / caution boards / glow signage display such as "Construction Work in Progress", "Keep Away", "No Parking", Diversions etc. shall be provided and displayed by the Contractor, wherever required and as directed by the BANK. All signage shall be suitably illuminated during night also. The Contractor shall be solely responsible for damage and accident caused, if any, due to negligence on his part. Also, he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work.

ii) In addition, the Contractor shall also provide a sign board of approved size, design & pattern at an approved location giving the details of the project, client / SBI, Banks, structural consultants, Department etc. besides providing space for names of Contractor/Sub- Contractors.

iii) All signage shall be dismantled & taken away by the Contractor after completion of the work with the approval of the Engineer – in – Charge of BANK.

63.0) Make in India Policy

i) The main contractor as well as associate contractor of each discipline shall comply with Government of India Public Procurement (Preference to Make in India), Order-2017 amended up to last date of submission of bid.

64.0) Training and Awareness:

All workmen are checked for their suitability before development by the Contractor. Workers physical fitness knowledge about the activity and his previous experience are checked before deployed. Workmen involved in physical activity (such as driver, operators, Height workers, Food handlers at Canteen and Pantries, welders) shall be subjected to pre- employment medical check-up, those who do not clear the medical examination shall not be employed.

Adequate number of safety equipment and personals protective equipment (PPE) as per Indian Standards will be planned and procured.

Recommendations as per following table/Matrix should be followed:

ACTIVITY	WORKMEN CATEGORY	PPE- RECOMMENDED
General – Entry into work premises	All Employees	Safety Helmet, Safety Shoes & Reflective Jacket
Signaling	Security/marshal	Reflective Jacket
Working at Height – Morethan1.8 meters	All	Full body harness Double lanyard
Involved with cement & Concrete Handling	All	Gum Boots & Rubber Hand Gloves

Breaking of ceramics & Agglomerate Materials	Chippers	Eye protection– Clear Goggles
Welding & Gas Cutting	Welders & Cutters	Leather gloves, Safety shoe, Welding Shield with proper number
Working with slush	Unskilled & Excavation gang	Gumboots
Forming and Making shuttering materials	Carpenters and Woodworkers	Face shield & Nose Mask
Rebar's handling & Working	Bar benders	Cotton hand Gloves
Scaffolding	Scaffolders	Cotton hand gloves
Painting	Painters	Clear, Goggles, Nose mask
DG Operators & Other Noise prone areas	Operators	Ear Muff, Rubber Hand Gloves (Electrical Grade)
Electrical Maintenance & Repairs	Electricians	HV Rubber hand gloves
Concrete Batching Plant	Operators & Loaders	Nose Mask

Color Coding of Helmets:

Grey	All Staff of Contractor/other Respective Person
Green	Safety Inspectors
Red	Electricians & Signal men
Blue	Supervisors
Yellow	Workmen
Orange	New Workmen (for one month)
Purple	Visitor
White	SBI/client

65.0 Standard Operating Procedures (SOPs) and Guidelines for Construction Sites for COVID-19 Outbreak

- i) The agency shall follow all the COVID 19/Any Epidemic protocols enforced by state / central Government, NMMC / MCGM / NDMA / MHA / MOH&FW etc. from time to time and the guidelines issued by SBI from time to time as per directions of the BANK, and nothing extra payable on this account.
- ii) Agency shall ensure they are in safe working conditions throughout the execution period and safety of the persons.

66.0 PRODUCT DELIVERY, STORAGE AND HANDLING OF CHEMICALS

- I) The contractor shall construct storage space for Chemicals materials to ensure that the storage conditions are as recommended by the manufactures.
- ii) All the materials shall be procured and delivered in sealed containers with labels legible and intact.
- iii) All the chemicals (polymers, epoxy, water proofing compound, plasticizer, Poly-sulphide, SBR based elastomeric, APP)
- iv) Polypropylene Polymer), all exterior and interior paints, polish etc.) shall be procured in convenient packs say 20 liters/kg} capacity packing only or as approved by the BANK, and not in bigger capacity containers, say 200 liter (kg) drums unless otherwise specifically permitted by the BANK. One sample from each lot of the chemical procured by the contractor shall be tested in a laboratory as approved by the BANK.
- v) All material required for the execution of the work shall be got approved, procured and deposited with the Departmental supervisory staff. The materials shall be kept in joint custody of the contractor and the Department. The watch and ward of such material shall, however, remain to be the responsibility of the contractor and no claim, whatsoever, on this account shall be entertained. Different containers of each chemical shall be serially numbered on packing and also consumed in that order. Day-to-day account of receipt, issue and balance shall be regulated by the Department and proper account shall be maintained at site of work in the prescribed form as per the standard practice.
- vi) All the chemicals shall be procured by the contractor directly from the manufacturer. In exceptional circumstances, the contractor may be allowed to procure the materials from the authorized dealers of the manufacturers, if specifically permitted by the BANK.
- Vii) The original copies of challan /cash memos towards the quantity of various chemicals procured shall be made available by the contractor at the request from the BANK, and a copy of the same shall be kept in record.
- viii) The Name of manufacturer's, manufacturer's product identification, and manufacturer's mixing instructions, warning for handling and toxicity and date of manufacturing and shelf life shall be clearly and legibly mentioned on the labels of each container.

ix) The contractor shall submit for the chemicals procured, manufacturer's and / or authorized dealer's certificate regarding supplying and verifying conformance to the material specifications, as specified.

x) All filled containers shall be handled in safe manner and in a way to avoid breaking container seals.

xi) Empty containers of the chemicals should not be removed from site till the completion of work and shall be removed only with the written approval of the BANK.

Xii) All arrangements for measuring, dosing and mixing of material / chemicals at site have to be made by the contractor.

Xiii) Contractor shall suitably advise his site Engineer and all the workers as regards safe handling of chemicals. Necessary protective and safety equipment in form of hand gloves, goggles etc. shall be provided by the contractor and be also used at site.

Xiv) All incidental charges of any kind including cartage, storage and wastage and safe custody of material etc. shall be borne by the contractor and no claim, whatsoever, shall be entertained on this account.

xv) The chemicals shall be tested in an independent laboratory as approved by the BANK, at the frequency as specified. If required, more samples may have to be tested as per the directions of the Engineer-in-Charge of BANK. Nothing extra shall be payable on this account.

67.0 SAFETY CODE

SAFETY MEASURES AT SITE:

1. All personnel at site should be provided with Helmets and Safety Boots with some Identification Mark. Visitors also should be provided with Helmets. It should be ensured that these are used properly.
2. First Aid Box should be kept at site with all requisite materials.
3. No one should be allowed to inspect / work at a height without Safety Belt.
4. Suitable scaffolds should be provided for workmen for all Works that cannot safely be done from the ground, or from solid construction except such short period Work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well as suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than $\frac{1}{4}$ to 1 ($\frac{1}{4}$ horizontal and 1 vertical).
5. Scaffolding or staging more than 3.5 meters above the ground or floors, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 Meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for

the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

6. Working platforms, Gangways, and Stairways should be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Gangway or the Stairway is more than 3-5 Meters above ground level or floor level they should be closely boarded, should have adequate width and should be suitably fenced, as described.
7. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 Meter.
8. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 Meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder upto and including Meters in length. For longer ladders this width should be increased at least 6mm for each additional 30 cms. Uniform step spacing shall not exceed 30 cms.
9. Adequate precautions shall be taken to prevent danger from electrical equipments. For electrical on line works gloves, rubber mats, and rubber shoes shall be used.
10. All trenches 1.2 Meters or more in depth shall at all times be supplied with at least one ladder for each 30 Meters length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 Meter above the surface of the ground. The sides of the trenches, which are 1.5 Meters or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 Meters of the edge of the trench or half of the depth of the trench whichever is more cuttings shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.
11. Before any demolition work is commenced and also during the process of the work :-
 - a) All roads and open areas adjacent to the Work Site shall either be closed or suitably protected;
 - b) No electrical cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
 - c) All practical steps shall be taken to prevent danger to persons employed from risk or fire or explosion or flooding. No floor, roof or other part of the building shall be as over-loaded with debris or materials as to render it unsafe.
 - d) All necessary personal safety equipment as considered adequate by the Site Engineer should be kept available for the use of the persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.
 - e) Workers employed on mixing Asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

- f) Those engaged in white washing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.
- g) Those engaged in welding works shall be provided with Welder's protective eye-shields.
- h) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- i) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals and boards to prevent accident to the Public.

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

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

as may be necessary should be provided. The workers should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.

13. All scaffolds, ladders and other safety devices, mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities shall be provided at or near places of work.

68.0 Provision of BIS codes, CPWD Manuals, CPWD trade specific guidelines, Catalogues, etc. : Contractor has to arrange all the relevant BIS codes, CPWD Manuals, catalogues, Technical details from manufactures, etc. as mentioned in the Technical bid & Price Bid and has to be kept at site till closure of the project.

69. Conditions specific to Project:

a) In response to the tenders invited by Bank, the CONTRACTOR have inspected the site and surroundings of the works specified in the tender documents and have before accepting the Contract, satisfied themselves by careful examination about the nature of the work and nature of the site and local conditions, quantities nature and magnitude of work, the availability of labor and material necessary for the execution of work, the means of access to work site, the supply of power and water thereto and the accommodation they may require and have made local and independent enquiries and obtained complete information as to the matters and things referred to, or implied in the Contract or having any connection therewith and have considered the nature and extent of all probable and possible situations, delays, hindrances, or interferences to or with the execution and completion of work to be carried out under the Contract being awarded hereunder and have examined and considered all other matters, conditions, and things and probable and possible contingencies thereto affecting the execution and completion of work and which might have influenced them in accepting the Contract.

b) The CONTRACTORS shall provide, execute and complete all the works mentioned in the CONTRACT and shall do and perform all other acts and things mentioned or described in the CONTRACT or which are to be implied there from or may be reasonably necessary for the completion of the said works and the times and in the manner and subject to the terms and conditions or stipulations mentioned in the CONTRACT.

c) It has been understood by the parties hereto that the Bank will have right to make reasonable changes in the drawings and designs during the progress of the construction works without prejudice to the CONTRACT. Notwithstanding anything to the contrary contained in any of the Annexure hereto the CONTRACTORS shall commence the work and shall complete the same as per stipulated date of Completion

d) The Contractors do hereby agree that the amount of liquidated damages specified in conditions of contract/ special conditions of contract represents a genuine and fair estimate of the loss likely to be suffered by the Bank in the event of the works not being completed in time.

e) It is specifically and distinctly understood and agreed between the Bank and the CONTRACTORS that the CONTRACTORS shall have no right, title or interest in the site made available by the Bank for the execution of the works or in the building, structures or works executed on the said site by the CONTRACTORS in the goods articles, materials etc. brought on the said site (unless the same specifically belongs to the CONTRACTORS) and the CONTRACTORS shall not have or deemed to have any lien or charge whatsoever for unpaid bills and it will not be entitled to assume or retain possession or control of the site or structure and the Bank shall have an absolute and unfettered right to take full possession of the site and to remove the CONTRACTORS, their servants, agents and materials belonging to the CONTRACTORS lying in the site.

f) The CONTRACTORS shall be allowed to enter upon the site for execution of the works only for the purpose of executing the contract work and shall not have any claim, right, title or interest in the site or the structures erected thereon and shall not enter upon at any time without assigning any reason.

g) The Contractor shall afford every reasonable facility for the carrying out of all works relating to civil works, installation of lifts, Telephone, electrical installations, fittings and other ancillary works in the manner laid down in the said Conditions, and shall make good any damages done to walls, floors, etc. after the completion of his work.

h) The SBI reserves to itself the right of altering the drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this Contract.

TECHNICAL SPECIFICATIONS

SECTION-1: Brief Scope of Work:

1.0 Brief Scope of work is as follows:

- i. The Contractor may have to execute all required works at his own cost, if left omitted in above scope, for making the building fit for occupation and functional use by the user department. Nothing extra shall be paid on this account.
- ii. Execution of the works and construction for Projects per approved drawings, design and plans as well as obtaining clearances required for occupation of the building from the local bodies.
- iii. Scope of work, Schedule of Quantities, General Conditions, Additional and other conditions/specifications for **Structural Repairing, Civil, Interior, Electrical,**

Telecommunication and Networking, Air-conditioning, Fire Alarm, CCTV, P.A.System, works have been given in detail in respective chapters & schedules of this bid document and same may be referred.

v) Execution of work

- a) The Contractor should visit/revisit and examine the site of work and satisfy himself as to the nature of the existing roads, municipal drains, supply lines and other means of communication and other details pertaining to the work and local conditions and facilities for obtaining his own information on all matters affecting the execution of work. No extra charge made in consequence of any misunderstanding, incorrect information on any of these points or on ground of insufficient description shall be allowed.
- b) The work shall be carried out in conformity with the drawings & design and within the requirements of Civil, Interior, Electrical, Data cabling, Security and Firefighting and other specialized services drawings.
- c) The Contractor shall cooperate with all trades and agencies working on the site. He shall make provision for hangers, sleeves, structural openings and other requirements well in advance to prevent hold up of progress of the construction schedule. All supports to the civil structure shall be provided with dash fasteners.
- d) On award of the work, Contractor shall submit a schedule of construction as Per clause of the agreement for approval of the BANK. All dates and time schedule agreed upon shall be strictly adhered to within the stipulated time of completion/ commissioning along with the specified phasing, if any.
- e) Since the said Building is occupied hence the Contractor has to take utmost care for the safety of men, material, building, vehicles etc thereat and shall indemnify the Bank from any claims/penalty raised thereat.

vi) Completion drawings

On completion of work, Contractor shall submit three complete set of "As built drawings" for Various Trades of Work to the SBI. These drawings shall have the following information.

1. Location of all mechanical equipment with layout and piping connections and mechanical equipment.
2. All shop drawings shall be updated from time to time for the purpose of making completion drawings.
3. No completion certificate shall be issued unless the above drawings are submitted. Piping and drainage works shall be tested as specified under the relevant clauses of specifications.
4. Contractor or his associate agency engaged to do this work must hold a valid plumbing or any other as required license by the municipal authority or other competent authority under whose jurisdiction the work falls.

vii) ALL NOC's/Permissions/Approvals required before/after completion of any/all Specialised Works like, tree cutting permission/Garden NOC, Plumbing, Water Supply, Drainage, and Water Meter NOC from the local bodies are to be secured by the contractor. Further Contractor has to complete the work as required by the Local Authorities / NMMC / CIDCO and assist the BANK /Bank in related documentation, if required, for getting the completion certificate, stability certificates as per the cases.

viii) Development works

The work is to be carried out complete in all respect including services.

Internal water supply

- a. Execution of the internal water supply system in all building components.
- b. Providing and laying of internal water supply grid with external water supply grid network in all building components.

ix) Defects Liability Period: As per Clause No. 1.1.11 (a) of GCC.

x) Facilities for the Site Staff

Facilities for the Site Staff shall be provided as mentioned in special conditions in part. The quoted amount by the contractor shall include these elements also.

xi) Health & Safety Manual provisions

a. The Contractor will comply of the provisions contained safety, Health and Environment guidelines failing which he / they will be liable for the penalties on each violation subject to compounding of the same to maximum of such default as mentioned in the various unsafe act / unsafe conditions in this manual. This apart from the other fines/ levies / penalties are mentioned in the documents elsewhere. It is incumbent upon the contractor to ensure in undertaking all health and safety compliance for safety of all concern to generate safety conscious and safety regulatory as his primary statutory duties or responsibilities in the contract.

b. General pest control, fogging, fumigation etc. should be carried out regularly and adjoining areas.

Xii) SAFETY MEASURES:

Before starting of works The permission for cutting of trees and / or Transplanting of the trees shall be obtained by the Contractor from BMC/NMMC/Local Governing Authority or any other authority of the State Government, and execution of cutting and transplanting the trees or any other action in this regard will be taken by the contractor at his own cost. Contractor to take note of this while quoting the rates.

Xiii) Specialized Civil, Electrical & Mechanical works:

The tenderer must associate himself with agencies of the appropriate eligibility for each of specialized nature of items/work listed in Tender Document Such works shall be got

executed only through associated agencies specialized in these fields. The tenderer whose tender is accepted shall indicate the name(s) of his associated specialized agencies those fulfilling the eligibility criteria laid down in Tender Document after award of work and at least 30 days before commencement of such items / work but within 90 days of award of work with their credentials whichever is earlier for the approval of the BANK, of that component, whose decision shall be final and binding.

ivX) Rate Analysis

The L1 contractor shall provide detailed Rate Analysis for all items of works within 3 days of opening of Price Bid Rate analysis shall include break up of materials, labor, wages, fixtures, transportation, installation, wastages, Octroi, levies, all cess, royalties, all taxes (but excluding GST), machinery, enabling works such as scaffolding, cleaning, overheads, profit, statutory expenses, incidental charges Water and Electricity Charges and his overheads and profits for the same and all related expenses to complete the work

Xv) The Work shall be carried out as per Minimum Specifications, particular specifications and drawings (Architectural, Structural and MEP). Any deviation, extra items & substitute Items shall be dealt as per Clause of General Conditions of Contract.

Note: All works has to be executed as per specifications provided in the bid document, CPWD Specifications-2019 (with updated correction slips) Vol-I &Vol. II, and National Building Codes 2016, Relevant BIS Code (in case of difference, if any, stringent / higher specification of the two shall be followed). In absence of Tender Specification, CPWD, IS Codes, MoRTH Specifications, National Building Code 2016, Specifications, or sound engineering practices shall be adopted as per order of precedence defined in the contract. (Refer clause 1 of SCC).

The scope of works & specifications is given in general but they are not exhaustive i.e., does not mention all the incidental works required to be carried out for complete execution of the item of work. The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/ or described in the specifications, provided that the same can be reasonably inferred there from. There may be several incidental works, which are not mentioned in the contract document/specifications but will be necessary to complete the item in all respect. All these incidental works/ costs which are not mentioned but are necessary to complete the work shall be deemed to have been included in the overall amount quoted by the contractor for various components of work. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation/change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such items in all respects) on account of the directions of BANK. Nothing extra shall be payable on this account.

In case, some of items are missing in the scope of work or specifications in the bidding documents same shall be taken from the specification mentioned in similar type of items mentioned for similar type of buildings in the scope of work or shall be executed as given in the CPWD Specifications, NBC-2016, IS Codes or according to sound engineering practices so as to make the building including related services fully functional. No claim whatsoever may be entertained at later stage. All cost of providing and making buildings with services, landscape and horticulture works fully complete in all aspect unless specifically mentioned in the contract document and making buildings with services fully functional are included in the cost tendered for this work.

LIST OF MATERIALS OF APPROVED BRAND AND THEIR MANUFACTURER'S

(The Make Listed below Should Be First Approved by the Bank before use in Construction)

A) LIST OF MATERIALS FOR CIVIL WORKS:

The materials, accessories, fittings, etc. be used in the civil, Electrical, plumbing machinery, and lift installation work, shall be one of the following particular make or equivalent IS Make. The direction of selection of any particular make shall be rest with SBI.

Sr. No.	Description Of Materials	Brand / Manufacturer Name
1	Cement	Ultratech, Gujarat- Ambuja, Birla, Jaypee, Vasavdatta, A.C.C., Coromandal, L&T.
2	Flush Shutter	Century, Anchor, Archid, Kitply, Tower, Oswin, Kutti
3	P.V.C. Shutter/ U.P.V.C. Shutter	Sintex, Cactus, Yashpoly, Godr, Splendor
4	R.C.C. door Frame	Supriya Wonderwood/ As approved
5	Aluminium Section for Sliding Window	Jindal, Indal, Hindalco
6	Steel Window Sections	Ahmadabad/ As approved
7	White / Colour Glazed Tiles (1 st quality)	Nitco, Kajaria, Jonson & Jhnsn, Bell, Somani, RAK, AGL./As approved
8	Ceramic Tiles/ Vitrified tiles	Nitco, Kajaria, Johnson & Johnson, Bell, Somani, RAK, AGL./As approved
9	Red Oxide	Asian paints, Shalimar, Nerolac/ Burger Indigo/Jotun/As approved.
10	Powder Distemper, Synthetic paint and O.B.D.	First quality paint of Asian paints, Shalimar/ Nerolac /Burger/ Indigo / Jotun / As approved.
11	Water Proof Cement Paint	First quality paint of Asian paints, Shalimar/ Nerolac /, Indigo/Jotun / snowcem Topecem, Nitcocem / As approved.
12	Oil Paint	First quality paint of Asian paints, Shalimar/ Nerolac /Burger/ Indigo / Jotun / As approved.
13	Fully Acrylic Paint	First quality paint of Asian paints/Shalimar/ Nerolac /Berger/ Indigo / Jotun / As approved.
14	T.M.T. bars	TISCO/ SRMB SAIL Rebars (Rastriya Ispat Nigam Ltd.)/ Vizag steel/ Jindal/As approved
15	R.C.C. pipe	Indian Hume pipe/ As approved
16	S.W.G. pipe	Bharat or equivalent I.S.I./ As approved
17	S.W.G. Gully trap	Bharat or equivalent I.S.I./ As approved
18	R.C.C. cover & frame	K.K.Wardhman, Pratibha, Bharat.

19	W.C.Pan / Urinals	Jaquar/Kohler/Cera/Johnson/Hindware / Parryware / American Standard As Approved
20	Wash Hand Basin	Jaquar/Kohler/Cera/Johnson/ Hindware / Parryware As approved
21	P.V.C. S.W.R. Grade Pipe	Ajay / Astral/Prince/Supreme/Finolex/As approved
22	P.V.C./C.P.V.C. /U.P.V.C. fittings	Ajay / Astral/Prince/Supreme/Finolex/As approved
23	AAC Blocks	Buildtech/ Siporex/Ultratech/ Citadel /As approved
24	C.I. Waste, Soil Pipe, C.I. Fittings	Neco, I.S.I mark
25	Steel Sink	Nirali, Diamond, Frankee.
26	C.P. Waste coupling	Metro, Natraj, Deep, ISI Mark
27	C.I. bracket for wash basin	„ R „ Mark , ISI Mark
28	G.I. pipe	Tata, Zenith,Surya,Siddhartha, GNT Gujarat steel tubes/As approved
29	G.I. fittings	Tata, Zenith,Surya,Siddhartha, GNT Gujarat steel tubes/As approved
30	Brass bib /Stop Tap	Jaquar/Kohler/Cera/As approved
31	Pillar Tap	Jaquar/Kohler/Cera/As approved
32	Half Turn Flush Cock	Coronet, H.M., K.K., K.M., ISI mark.
33	Gate Valve	Coronet/ Guide/ Leader/ Zoloto/As Approved
34	Ball Cock	Coronet/ Guide/ Leader/ Zoloto/As Approved
35	Integral Weather proofing Compound	Sunanda / Dr. Fixit / Choksey / Pidilite / Cico/ Sica/ MYK Arment /Kerakol/ As approved
36	Flushing Cistern	Jaquar/Kohler/Grohe/Johnson/Cera
37	Admixture & Plasticiser	Cico/ Sica/ MYK Arment / kerakol / Fosroc/ As approved
38	Night Latch	Godrej/ Yale/ Doorsafe/As approved
39	C.I.M.H. Cover	Neco. C.I.C., B.I.C., I.S.I. mark
40	Construction Chemical	Foscroc / Myk /Cico /Sica /Kerakol /As approved
41	U.P.V.C. Sliding Window	Fenesta/Encraft/Deceunick/AIS /As approved

42	U.P.V.C. Openable Windows	Fenesta/Encraft/Deceunick/AIS /As approved
43	U.P.V.C. Glass Door	Fenesta/Encraft/Deceunick/AIS /As approved
44	U.P.V.C. Doors for toilet / Bath	Fenesta/Encraft/Deceunick/AIS /As approved
45	U.P.V.C. Partitions	Fenesta/Encraft/Deceunick/AIS /As approved
46	U.P.V.C. Ceiling	Fenesta/Encraft/Deceunick/As approved
47	Glass	Indo Asahi Glass/ MODI/ SAINT GOBAIN
48	Neeru	Ishan gold with IS mark
49	Mineral Fibre False Ceiling	Armstrong/India Gypsum/ As approved
50	Tapered Edge Gypsum Plain Board	India Gypsum/ As approved
51	ACP Panels	Aluco bond, ALU Décor, Alstrong, Alstone
52	Acrylic Sheets	Sanmati Acrylics, Acrylic Sheet India, Acry Plus
53	Veneer	Archid, Greenply, Century, Duro
54	Plywood	Archid Ply, Duro, Century, Greenply Ecotec
55	Wooden Flooring	Pergo, Xylox, Armstrong, Vista
56	Laminates	Archid, Aerolam, Greenlam, Century, Royal Touch
57	White Cement	Birla, JK Cement
58	Putty (Internal/ External)	Birla, JK White
59	Ready mix Concrete	Lafarge /Godrej/ Ultratech/As approved

B. LIST OF ITEMS FOR INTERIOR & OTHER CIVIL WORKS:

Sr. No	Description of materials	Manufacturer/Brand Name
1	Brick	Ghole Bricks of Metric System
2	Wood	First Class C.P. Teak Unless otherwise specified

3	Soft Wood	Kail Wood,Hollock
4	Bitumen	STO or any other ISI marked brand
5	External Paints	Asian,Berger,Nerolac,Shalimar,Indigo,Jotun
6	Steel Primer	Asian,Berger,Shalimar,ICI
7	Butt Hinges	ISI Marked Hinges
8	Galvanised Steel Sheets	Tata,Jindal,Hindalco or equivalent.
9	Galvalume Sheets	Trac,Kirby,Cril
10	C.I. Pipes and fittings	BIC,Hepco,Neco or equivalent
11	G.I. Pipes	GSI,Ambica,Zenith,Tata or equivalent.
12	Brass C.P. Fittings	L&K, K.B., Techno or Equivalent
13	GUN Metal Valves	Leader,Sant or Equivalent.
14	E.W.C. Seats	Commander,Patel or Equivalent.
15	Flushing system	RANK-A-1, JAMCO OR EQUIVALENT
16	Water Meter	Anand,Asahi,Kaycel,Kapstan or Equivalent
17	Asbestos cement Pipes	Locally available approved make fittings
18	Pigments	Tata/Shalimar.
19	Fire Fitting Sluice and NRV	Kirloskar/Kalpana
20	Cement Board/Partical	Bison Boards/Nowud boards
21	Mortice lock, Handle	Godrej/Doorset
22	Door Closer,Floor Springs	Everite/Doorking/Hardwyn
23	M.S / Brass Screws	Nattle fold
24	Mild Steel for Fabrication	Tata/Sail or equivalent
25	Ceramic floor Tiles (antiskid)	Kajaria/Somany/ H.R.Johnson/ Nitco/Simpolo
26	False Flooring	Unifloor /Flexi Access Floor/Armstrong
27	Laminates (1.00mm thk.)	Royale touch/Century / Green lam/ Archid
28	Veneer	Century / Durian /Green
29	Drawer Sliding Fittings	Earl Bihari (EBCO)/ Godrej/ Hettich/Heffle
30	Floor Spring / Door Closure	Godrej /Hardwyn /Hyper
31	Triple Computer monitor mount/stand arm	Vivo/ Dell/ HP
32	Texturized Interior Paint	Asian,Sandtex Matt/ Dulux/ Berger.
33	Readymade Computer Drawer	Ebco/ Hettich/ Blum
34	Glazing	Modi float Glass, Triveni Glass Ltd., Indo Asahi Glass Co.Ltd.
35	Fibre Mineral False Ceiling	Armstrong /Indian Gypsum Board/Gypro.
36	ACP Panels	Aluco bond/ ALU Décor/ Alstrong/Alstone
37	Acrylic Sheets	Sanmati Acrylics/Acrylic Sheet India/ Acry Plus
38	Vertical/Roller blinds	Vista/MAC/DACK

C) LIST OF APPROVED MAKES FOR PLUMBING SYSTEM :

S. No.	Details of Materials / Equipment	Manufacturer's Name
	Vitreous China Sanitary ware	Jaquar, Kohler, Hindware, Grohe, American Standard
2	WC Connectors	Viega, Hindware, Geberit
3	Stainless Steel Sink	Nirali, Anupam, Prestige, Neelkanth
4	Auto Urinal Flush System	Jaquar, Euronics AOS Auto Robo Flushing System Askon Engineers
5	Flush Valve	Jaquar
6	CP Brass Fittings	Jaguar Kohler Crabtree
8	Flow Control Devices	Aquaplus Con-Serv Jaquar
9	Geyser	A O Smith Racold Venus
10	Floor Drain Fixture, Rain Water Outlets & Channel Gratings	SGE, Viega, Mufle ACO, SNK Denmark
11	Car parking channel	SGE, Viega, Mufle ACO, SNK Denmark
12	C.P. Grating for Floor Trap	SGE, Viking, Chilly
13	GI / M.S Pipes (IS : 1239 and IS : 3589)	Jindal Tata Steel Hi-tech
14	Pipe clamp & supports	Mupro Kanwal Industrial Corporation Mungo
15	D. I. Pipes	Electro Steel Jindal Lanco Kalahasthi
16	UPVC Pipe	Astral Aashirwad Supreme
17	PP Pipe	Wavin Hulliot Poloplast
18	CPVC pipes	Astral Ashirwad

19	HDPE Pipe	Geberit, Sosoon Duraline, Reliance
20	RCC Pipe	K K , Dhere, Local & Approved
21	GM / Forged Brass Valves	Tiemme, Lehri RB Italy Danfoss
22	Sluice Valves	Indian Valve Company Kirloskar Lehri
23	Butterfly Valve	Audco Danfoss Lehri
24	Check Valve – WaferType	Advance Danfoss Lehri
25	Check Valve – Dual Plate	Advance Lehri
26	Pressure Reducing Valve	Tiemme RB Italy Honeywell
27	Solenoid Valve	Avcon Danfoss Lehri
28	Thermostatic valve	Oventrop Lehri
29	Air Release Valve	Fouress Arco Zoloto
30	Ball Float Valve	Esseti HBD Zoloto
31	NRV–Ball type – Sewage application	Danfoss Tiemme Lehri
32	Y & Pot Strainer	Emerald Tiemme Zoloto Lehri
33	Hydropneumatic System	Willo – Mather & Platt DP - Holland Grundfos CRI, Kirloskar
34	Storm Water Drainage Sump Pumps (Submersible)	Willo – Mather & Platt DP - Holland Grundfos CRI, Kirloskar
35	Sewage Handling Pumps	Willo – Mather & Platt DP - Holland Grundfos CRI, Kirloskar
36	Transfer Pumps	Willo – Mather & Platt DP - Holland Grundfos CRI, Kirloskar

37	Self-Priming Pumps	Willo – Mather & Platt DP - Holland Grundfos CRI, Kirloskar
38	Drinking Water Cooler	Blue Star Usha Voltas
39	Borewell Pump	Willo – Mather & Platt DP - Holland Grundfos CRI, Kirloskar
40	Mechanical Seal	Burgmann Sealol
41	Couplings	Victaulic Shur Joint Kanwal Industrial Corporation Lovejoy
42	Anti-Vibration Mounting & Flexible Connections (EPDM & Metallic)	Mupro Kanwal Industrial Corporation Dunlop Flexionics
43	Pressure Gauge	Emerald Fiebig H Guru
44	Water Meter (Mechanical Type)	Aquamet Capstan Kaycee
45	Electronic Flow Meter	Krohne (Forbes Marshall) Rockwin Aquamet
46	Level Controller & Indicator (Water)	Auto Pump Cirrus Engineering Technika Techtrol
47	Paints	Asian Paints Berger ICI
48	MH / Water Tank Plastic Steps	KGM Patel Pranali Industries
49	Insulation for Hot Water Pipes	Aflex Armacell - Armaflex K-Flex ST Thermaflex
50	Three Way Motorized Valve	Oventrop Honeywell Johnson Control Schneider
51	Grease Trap	ACO Wade Kesal
52	Welding Rods	ADOR Cosmos Esab
53	Fastner	Mupro Mungo Fisher Hilti
54	Fire Sealant	Stanvac-Firex Birla 3 M Hilti

55	Pressure Switch	Danfoss Oventrop Honeywell
56	Solar Panels	Ecotherm Solahart Tata BP
57	Lawn Hydrants	Rain Bird Cirtikin Ripple
58	Panel for Booster Pumps	L&T Schneider Or equivalent as per Pump Vendor Proposal

D) LIST OF MATERIALS OF APPROVED BRAND AND THEIR MANUFACTURERS

SR. No	Application	Product/Make
1	Rust cleaner for reinforcement	Krishna Conchem/ BASF/ Fosroc/ Sunanda/ Sika or equivalent.
2	Anti-corrosive Coating system for reinforcement	Protecting system for Krishna Conchem/ BASF/ Fosroc/ Sunanda/ Sika or equivalent.
3	Non shrink additive and water proofing compound	Krishna Conchem/ BASF/ Fosroc/ Sunanda/ Sika or equivalent.
4	Corrosion Inhibitor	Krishna Conchem/ BASF/ Fosroc/ Sunanda/ Sika or equivalent.
5	Anchorage material for fixing rebars	Krishna Conchem/ BASF/ Fosroc/ Sunanda/ Sika or equivalent.
6	Injection Grouting to arrest porosity	Krishna Conchem/ BASF/ Fosroc/ Sunanda/ Sika or equivalent.
7	Bonding Agent for Concrete	Krishna Conchem/ ENAM/ Infinite option/ Sunanda/ BASF/ Sika/ Fosroc/ Rossary/ JSR or equivalent.
8	Polymer modified mortar repair for concrete	Krishna Conchem/ ENAM/ Infinite option/ Sunanda/ BASF/ Sika/ Fosroc/ Rossary or equivalent.
9	Micro-concrete	Krishna Conchem/ Sunanda/ Sika/ Fosroc/ Dr. Fixit or equivalent.
10	Steel (TOR/HCRM/CRS)	TATA/Zindal/Vizag or equivalent

Notes: -

- 1) Besides the above makes, Bank has the right to permit use of any equivalent brand / material matching the specified criteria / quality standards.

- 2) The contractor should obtain prior approval from BANK before placing order for any specific materials. BANK may / delete any of the makes or brands out of the above list.
- 3) All materials should conform to relevant standards and codes of BIS.
- 4) Materials with I.S.I. mark shall be used duly approved by the BANK.
- 5) If any material is found to be not up to the mark, the contractor will have to produce original bills/certificate from the manufacturer or his authorized Distributor for authenticity and genuineness of the material for consideration and as per make approved by the BANK. The same will not be considered for payment.

D) PIPE COLOUR CODE:

S. No.	Pipe Lines	Base Colour
1	Domestic Cold Water (After treatment)	Sea Green
2	Treated Water (Soft Water)	Cyan Blue
3	Domestic Hot Water	Orange
4	Drainage (Storm Water)	Navy Blue
5	Drainage (Sewage Water)	Black
6	Gas	Canary Yellow
7	Fire System	Post Office Red
8	Flushing Water	Purple

PROFORMAS/TABLES OF VARIOUS TESTS, MATERIALS, PACT, GUARANTEES

Sr. No	Particulars	Nos
1.	Record of Cement/Received/Used/Balance.	Table I
2.	Proforma of Paint/Lead/CICO Register	Table II
3.	Proforma for Reinforcement Bars Received	Table III
4.	Format of Receipt Of Materials At Site	Table IV
5.	Format of Monthly Progress Report	Table V
6.	Proforma for Bulkage Test of Sand Register	Table VI
7.	Proforma for Silt Test Register	Table VII
8.	Proforma for Sieve Analysis of Fine Aggregate Register	Table VIII
9.	Proforma for Sieve Analysis of Coarse Aggregate Register	Table IX
10.	Proforma for Slump Test Register	Table X
11.	Proforma of Cube Test Register	Table XI
12.	Proforma for Hindrance to Work	Table XII
13.	Proforma for Running A/c. Bill	Table XIII
14.	Account of Secured Advance if Admissible on Materials Held at Site by the Contractors	Table XIV
15.	Format for Memorandum For Payment	Table XV
16.	Format of Measurement Book	Table XVI
17.	Format of Site Order Book	Table XVII
18.	Format For Application By Contractor For Extension Of Time.	Table XVIII
19.	Details of Insurance Policies	Table XIX
20.	Prebid Query Form	Table XX
21.	Guarantee Bonds Of Civil Works Format Of Guarantee To Be Executed By The Firm/ Contractor In Respect Of The Work Of Pre Construction Anti-Termite Treatment	Table- XXI
22.	Proforma Of Guarantee Bond For Waterproofing Treatment To Basement (Walls & Bottom Slab), Underground Reservoir, Overhead Reservoir, Terrace, Staircase Tower & Sunken Floor Of Washrooms.	Table- XXII

TABLE-I

RECORD OF CEMENT RECEIVED / USED / BALANCE

S. No.	Cement in stock Bags	Cement received (Bags)	Total Cement received (Bags)	Source from which received	Description of work where cement is used	Number of cement bags consumed	Balance in stock	Signature of Contractor & BANK / (Bank's Representative (Periodical))
1	2	3	4	5	6	7	8	9

TABLE-II
RECORD OF PAINT / LEAD / CICO REGISTER

Name of work :

Name of the Contractor :

Agreement No. :

Date of Receipt	Source Receipt with Ref. To S.O./Indent	Qty. Received	Progressive Total	Item of work for which issued with approx. qty. work done in case of paint only	Date of issues	Quantity issued	Qty. returned at the end of the day	Total issued	Delay Balance at hand	Contractors initials	Site Engineers initials	Signature of ARCHITECT / (Bank's Representative (Periodical))
1	2	3	4	5	6	7	8	9	10	11	12	13

Register for bitumen should be maintained. The format will be similar to that for cement.

TABLE-III

BANK FOR REINFORCEMENT BARS RECEIVED (In KGS.)

Truck No.	Challan No.	Name of Supplier	Binding Wire	6mm dia.	8mm dia.	12m m dia.	16mm dia.	20m m dia.	25mm dia.	Total Received
1	2	3	4	5	6	7	8	9	10	11

Number of diameters given is only illustrative. Open more columns for other diameters wherever needed.

TABLE-IV

FORMAT OF RECEIPT OF MATERIALS AT SITE

Sr. No.	Description	Opening balance	Receipt during month	Consumption during month	Closing balance	Total Quantity received till date
1	Cement (M.T.)					
2	Mild steel (M.T.)					
3	Tor steel (M.T.)					
4	Coarse aggregate (cu.mt.)					
5	Fine aggregate (cu.mt.)					
6	Teak wood (cu.mt.)					
7	Bricks (Nos.)					
8	Tiles (Nos.)					

Sr. No.	Description of work	Date of Commencement	Due date of completion	Percentage progress achieved
1	General building work			
2	Security equipment work			
3	Pest control treatment work			
4	Sanitary & Plumbing work			
	Fire Fighting Works			
7	Other work			

**TABLE-V
FORMAT OF MONTHLY PROGRESS REPORT**

Name of work:

Progress report for the month:

Report No. :

Sr No.	Description	Approximate e quantity executed (Till Previous Month)	Details of work location where work is done	Approximate quantity executed (Current Month)	Total Quantity Executed
A.	GENERAL BUILDING WORK:				
1	Foundation work				
2	Reinforcement fabrication				
3	Shuttering work				
4	Reinforced cement concrete				
5	Masonry work				
6	Wood work				
7	Plastering work				
8	Flooring work				
9	Glazing work				
10	Roof treatment work				
11	Painting work				
B.	Pest control treatment				
C.	Security equipment work				
D.	Sanitary and plumbing work:				
1	Water supply				
2	Drainage work				
3	Fitting and fixtures				
E.	Electrical installation work				
F.	Fire Fighting Works				

G.	OTHER TRADES				
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TABLE-VI

PROFORMA FOR BULKAGE TEST OF SAND REGISTER

Sr. .No.	Date of Test	Volume of dust sand in Cylinder inundated & stirred	Volume inundated Sand Cylinder in	Percentage of Bulkage	Signature of Site Engineer	Signature of Contractor	Initial BANK / Bank's representative (Periodical) of
1	2	3	4	5	6	7	8

TABLE-VII

PROFORMA OF SILT TEST REGISTER

Sr. No .	Date of Test	Height of Sand in Cylinder inundated & stirred	Height of Silt	Max percentage of silt as specified	Percentage of silt obtained	Signature of Site Engineer	Signature of Contractor	Initial of BANK / Bank's Representative (Periodical)
1	2	3	4	5	6	7	8	9

TABLE-VIII

PROFORMA SIEVE ANALYSIS OF FINE AGGREGATE REGISTER

Sr. No	Date of Test	Wt. of Material to be tested	Sieve as per I.S. designation	Wt. of Sand retained in sieve	%a retained in each sieve successively	Cumulative % retained in each sieve	F. M.	Signature of Site Engineer	Signature of Contractor	Signature of BANK / Bank's representative (Periodical)

TABLE-IX

PROFORMA OF SIEVE ANALYSIS OF COARSE AGGREGATE REGISTER

S. No.	Date of Testing	Wt. of Material to be tested	Nominal size of Aggregate	I.S. Sieve designation	Standard passing for graded aggregate. of nominal size	Test Result	Obtained passing	Signature of Site Engineer	Signature of Contractor	Signature of BANK /Bank's representative (Periodical)
1	2	3	4	5	6	7	8	9	10	11

TABLE-X

PROFORMA FOR SLUMP TEST REGISTER

Sr. No.	Date of Testing	Type of work for which slump taken	Specified slump		Slump Obtained		Signature of Site Engineer	Signature of Contractor	Signature of BANK / Bank's representative (Periodical)
			When Vibrators are used	When Vibrators are not used	When Vibrators are used	When Vibrators are not used			
1	2	3	4	5	6	7	8	9	10

TABLE-XI

PROFORMA OF CUBE TEST REGISTER

Date of taking Cube + Lime	Sample No.	No. of Cubes taken	Specific marking of Cubes	Proportion of mixture	Description of work carried out	Signature of Engineer taking sample	Signature of Contractor	7/28 Days Testing				Permissible Compressive strength of Concrete / 28 Days / 7 days		Remarks on Test Report and No.	Remarks of ARCHITECT /Bank's representative Periodical
								Date of Test	Test Result Kg / Sq. cm	Av. Strength Kg. / Sq. cm	Standard strength Kg / Sq. cm.	7 Days	28 Days		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

TABLE-XII

PROFORMA FOR HINDRANCE TO WORK

Name of Work : Date of Start of work :
 Name of Contractor : Period of Completion :
 Agreement No. : Dt. of Completion of work:

S.No.	Nature of Hindrance	Date of Occurrence of Hindrance	Date which Hindrance was removed	Period of which Hindrance existed	Signature of Site Engineer	Signature of BANK / Bank's Representative
1	2	3	4	5	6	7

TABLE XIII
PROFORMA FOR RUNNING A/C BILL

- i. Name of Contractor / Agency
- ii. Name of Work
- iii. Sl.No. of this Bill
- iv. No. & Date of previous Bill
- v. Reference to Agreement No.
- vi. Date of Written order to commence
- vii. Date of Completion as per Agreement :

S.No.	Item Description	Unit	Rate (Rs.)	As per Tender	
				Quantity	Amount (Rs.)
1	2	3	4	5	

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

- Note: 1. If part rate is allowed for any items, it should be indicated with reasons for allowing such a rate. _____
_____ Net Value since previous bill
2. If ad-hoc payment is made, it should be mentioned specifically.

CERTIFICATE

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

Signature and date of Contractor	Signature and date of Bank's Representative (Seal)	Signature and date of Site Engineer
-------------------------------------	--	--

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

TABLE - XIV

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

S.No.	Item	Quantity	Unit	Amount	Remarks

Total value of materials at Site.

Secured Advance @ ----- of above value - B

CERTIFIED:

- (i) That the materials mentioned above have actually been brought by the Contractor to the site of the work and on advance on any quantity of any of this item is outstanding on their security.
- (ii) That the materials (are of imperishable nature) and are all required by the Contractor for use in the work in connection with the items for which rates of finished work have been agreed upon.

Dated Signature of
Site Engineer
Preparing the bill
Rank -----

Date signature of
Banks
----- (Name of the Banks)

Dated Signature of the Contractor

TABLE - XV

MEMORANDUM FOR PAYMENT

R/A BILL NO.

1.	Total value of work done since previous bill (A)	Rs. -----
2.	Total amount of secured advance due since Previous Bill (B)	Rs. -----
3.	Total amount due since Previous Bill (C) (A+B)	Rs. -----
4.	PVA on account of declaration in price of Steel, Cement and other materials and labor as detailed in separate statements enclosed.	Rs. -----
5.	Total amount due to the Contractor	Rs. -----
 <u>OBJECTIONS:</u>		
i)	Secured Advance paid in the previous R/A	Rs. -----
ii)	Retention money on value of works as per accepted tenders upto date amount Rs.	Rs. -----
	Less already recovered	Rs. -----
	Balance to be recovered	Rs. -----
iii)	Mobilization Advance, if any	
(a)	Outstanding amount (principal + interest) as on date	Rs. -----
(b)	To be recovered in this bill	Rs. -----

iii.	Any other Departmental materials cost to be recovered as per contract, if any	Rs. -----
iv.	Any other Departmental service Charges to be recovered if any, as per contract (water, power etc.) enclose statement.	Rs. -----
	Total Deduction as per contract (F)	Rs. -----
	Adjustments, if any ----- Amount less received by Contractor in ----- R/A Bill (as per statement of Contractor)	Rs. -----
	P.V.A.	Rs. -----
	Total amount payable as per contract (E+F+G)	Rs. -----
	(Rupees ----- in words)	

The bill amount to Rs. ----- (both figures and words) has been scrutinized by us after due checking of the measurements of work as required and is recommended for payment.

Date: -----

Signature of Bank
with Seal

The bill amount to Rs. ----- certified by Consultants has been scrutinized by me after due test checking of measurements of works as required and is recommended for payment for an amount of Rs.....

Date: -----

Signature of SBI
Engineer

<u>STATUTORY DEDUCTION:</u>		
i)	Total Amount due (E)	Rs. -----
ii)	Less I.T. Payable	Rs. -----
iii)	Less S.T. Payable	Rs. -----
	Net Payable	Rs. -----

These figures given in the Memorandum for payable has been verified and bill passed for payment ----
 ----- (in words and figures)

Date: -----

 Signature of the Premises Officer

Table XVI

FORMAT OF MEASUREMENT BOOK

1ST Page:

STATE BANK OF INDIA

.....office,

Measurement Book No.

(Pages 1 to.....)

This book is issued to Shri.....

Signature of A.G.M. (Estate) / D.G.M. (F & OA)

Certified that this book contains..... pages

Signature of the official (to whom the book is issued)

MEASUREMENT BOOK PAGES NOS. 1 TO.....

Item No.	Description	Measurement No.L B D/H	Quantity	Remarks

Site Engineer
(Head of PMC)

Bank
(Head of Bank Consultant)

Contractor

Checking/Test checking

Bank's Engineer

Date of

checking/Test checking

NOTE:

Checking and test checking pertains to items wherever initialed.

Table XVII

FORMAT OF SITE ORDER BOOK

Name of the work_____

Date of Commencement_____

Sr. No	Remarks/ Instructions of the site Engineer/ Bank	Dated Initials of site Engineer/ Bank	Initials of the Contractor for having received the instructions	Action taken with date	Dated initials of the site Engineer	Remarks of the Banks BANK /SBI Officials
1	2	3	4	5	6	7

Table XVIII

Format for Application by Contractor for Extension of Time

1.	Name of the Contractor				
2.	Name of the work as given in the Agreement				
3.	Agreement WO				
4.	Tender amount				
5.	Date of commencement of work				
6.	Period allowed for completion as per agreement				
7.	Date of completion as per agreement				
8.	Period for which extension of time has been given				
			<u>Date</u>	<u>Month</u>	<u>Year</u>
	a)	1 st extension vide Bank's Letter No.			
	b)	2 nd extension vide Bank's Letter No.			
	c)	3 rd extension vide Bank's Letter No.			
9.	Reasons for which extensions have been previously given (copies of the previous applications should be attached)				
10.	Period for which extension is applied for and the reasons thereof including hindrances, time for extra work assigned, if any etc.				

Signature of Contractor

Table XIX

DETAILS OF INSURANCE POLICIES

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

Remarks:

1. This is only an 'on-account' payment and is not to be interpreted either as approval of work, materials brought or affixed at site or for that matter approval of any sort.
2. The quantum of work done and materials delivered at site have been certified by.....
3. Should you wish to audit such work, kindly contact the undersigned and oblige.

BANK

Table XX

Pre-bid Query Form

Vendor name	Sr. No	RFP Page No	RFP No	Clause	Existing Clause	Query Suggestion

Table- XXI

**Guarantee Bonds of Civil Works FORMAT OF GUARANTEE TO BE EXECUTED BY THE FIRM/
CONTRACTOR IN RESPECT OF THE WORK OF PRE-CONSTRUCTION ANTI-TERMITE
TREATMENT**

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

The agreement made this Day of _____ Two Thousand _____ between Assistant General Manager, Estate Department, GITC, State Bank of India, Navi Mumbai of one part and _____ (Name of the Firm/ Contractor (hereinafter called the Guarantor) of the other part.

WHEREAS THIS AGREEMENT is supplementary to the Contract (hereinafter called the Contract dated made between the Employer of the one part and the Guarantor of the part) whereby the Firm/Contractor interlaid undertook to render the building/ structure completely free of any infestation of termites, and whereas the Guarantors agreed to give guarantee to the effect that the said building/ structure shall remain free from infestation for the period of 10 years from the date of Completion of pre-construction anti-termite treatment as per IS Code.

Now the Guarantor hereby agrees to make good all defects and render the building/ structure free from any infestation of termites, during this period of guarantee and to the satisfaction of the employer. The Guarantor also agrees to take up such rectification work at his own cost, and within one week from the date of issue of notice from the Employer, calling upon him to rectify the defects.

The decision of the Employer as to the cost by the Guarantor will be final and binding in the case, the Guarantor fails to commence the work as per the above notice and the work is got done through the other Contractor, that if the Guarantor fails to execute the preconstruction anti-termite treatment or commits breach thereunder then the Guarantor will indemnify the principal and his successors against all loss, damaged caused, expenses otherwise which may be incurred by him by any reason of any default on the part of the Guarantor in performance and observance of this agreement, as to the amount of loss and /or damage and / or cost incurred by the Employer, the decision of the Employer will be final and binding. In witness where of these presents have executed by the obligator and by and for of behalf of the Employer on the day, month and year first above written,

Signed
and delivered by State Bank of India, by
In the presence of

Signed and delivered by the hands of
Contractor
In presence of

Table- XXII

PROFORMA OF GUARANTEE BOND FOR WATERPROOFING TREATMENT TO BASEMENT (WALLS & BOTTOM SLAB), UNDERGROUND RESERVOIR, OVERHEAD RESERVOIR, TERRACE, STAIRCASE TOWER & SUNKEN FLOOR OF WASHROOMS.

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

We hereby Guarantee that after completion of the Water Proofing Work mentioned above and before Day of _____ Two Thousand _____ if at any time or times the underground reservoir, overhead reservoir, terrace, staircase tower, Lift Pits, Sumps, Basement rafts, Retaining Walls, podiums, Windows Sills, Lintels & sunken floor of washrooms and any other portion thus treated by M/s _____ (Hereinafter called 'The Contractor') starts leaking or in any way give way to the influence of water including wet patches, dampness etc. due to inadequacy of the work carried or due to any other reason whatsoever relating to the specification, workmanship etc. including the responsibility for any surface treatment and plumbing etc. works carried out by other agencies, the Contractor should, without any extra cost to Dy. General Manager, (F&OA) State Bank of India or to the occupants, carry out necessary remedial measure to such extent and so often as may be necessary to free the said premises from leakage/dampness etc.

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

Signature of witness with address

Signature of Contractor with seal Place:

Date:

(Note: Guarantee to be submitted by both the Contractors i.e. Main Contractor & the Water Proofing Specialist Agency)

Mode of Measurements

1.0 EXCAVATION:

1.1.1 Footings : Area of excavation for footing shall be measured equal to area of lowest concrete course as shown on drawing. Depth shall be measured vertically from ground level to bottom of concrete course or dry rubble packing as the case may be.

1.1.2 Plinth beams : Depth of excavation for plinth beam shall be measured from ground level up to bottom of beam and width equal to width of beam.

1.1.3 Where excavation is made, in trenches, measurements for cutting depth shall be taken by means of tape and staff and the width of lowest concrete or rubble packing shall be considered as the width of excavation. When excavation is made for leveling the site, levels shall be taken before start and after completion of work and the total quantity of excavation in cutting computed from these levels.

1.1.4 Where soil including decomposed or soft rock and hard rock are mixed, hard rock after excavation shall be stacked separately. Measurements of the entire excavation shall be taken as indicated above. Excavation of hard rock shall be measured from stacks of excavated hard rock and reduced by 50% to allow for bulkage and voids. The quantity so arrived at, shall be paid under hard rock. The difference between the quantity of entire excavation and quantity payable for hard rock shall be paid as soil. (Including decomposed or soft rock)

1.1.5 Extra width of excavation may be allowed by Clerk of Works / Banks if required as working space due to site conditions such as deep foundations, loose soil etc.

1.1.6 The unit of measure in all the above cases shall be in cubic meters or as specified in the Bill of Quantities.

1.2. EARTH FILLING :

Measurement for filling when it has been stipulated to be separately paid for, shall be, unless otherwise specified, as follows:-

1.2.1 In open spaces: Filling shall be measured from cross sections of embankments, before start of work and after completion of work by means of level taken at suitable places. When it is not possible to measure filling from cross section, it may be measured in loose stacks or lorry measurements with previous written permission of Clerk-of-Works and 20% deduction shall be made from measured quantity to arrive at payable quantity.

1.2.2 In plinth: Consolidated filling shall be measured without any deduction of voids.

The unit of measure in above cases shall be in cubic meters or as specified in the Bill of Quantities.

1.3. BRICK MASONRY:

1.3.1 Walls exceeding 150 mm brick/ thick shall be measured in unit of one cubic meter. Deductions for all openings, lintels, recesses shall be made except for the following:

- i) When openings are less than 45 cm in both the directions and less than 45 cm dia on the surfaces.

ii) When beams & wall plates do not have bearing over entire thickness of wall.

iii) No extra will be paid for providing such openings, recesses etc.

1.3.2 Half brick walls: Net area over one surface shall be measured. Deductions for all openings, lintels, recesses shall be made as in 1.3.1.

1.4. CEMENT CONCRETE (Plain and Reinforced):

1.4.1 Cement concrete items shall be measured exclusive of the steel reinforcement and plaster thickness but shall include necessary cost of shuttering, centering and curing. Items like R.C.C. precast jalis, R. C. pipes and other such articles which are normally manufactured in factories as well as those items which have been so specifically mentioned in schedule of quantities shall be measured inclusive of reinforcement. No deductions will be made when openings are less than 45 cm in both directions or 45 cm in diameter and no extra will be paid for providing such openings.

1.4.2 Foundation concrete: Will be measured in the unit of one cubic meter and to exact dimensions as shown on drawing or as actually laid as per instructions.

1.4.3 Footings, columns, beams, lintels, sills and bed blocks: Shall be measured in cubic meters. Portions of beams and columns embedded in slab shall be paid at the rate of slab. Only projecting rib of beam shall be paid for at the rate of beam. In case of junctions of columns and beams and/or lintels, columns shall be measured between slabs. In case of junction of columns and footings, the footing will be measured in full and the column above the footing.

1.4.4 Slabs and Chajjas: Shall be measured in cubic meters. Slab shall be measured full throughout. Where slabs of different thickness meet, the highest thickness will be taken into account. For chajja only projected portion shall be measured.

1.4.5 Parapet wall, apron wall and drop wall from chajja having drop exceeding 5 cm. Actual cubic contents for portion projecting over slab or beam shall be measured. If drop from chajja is 5 cm or less, the same shall be measured under chajja item.

1.4.6 Projected bands: Projection of 15 cm or less in breadth and thickness shall only be considered as band. The band shall be measured in cubic meters. Deductions will not be made on account of grooves, patties, bands, molds etc. nor will any extra be paid for forming such grooves or features.

1.4.7 Staircase: Measurements shall be per cubic meter comprising of step and soffit slab. All landings, and landing beams shall be paid separately under slab and beam measurements. In the case of soffit slab resting on beams, the portion of beam projecting below landing slab shall be measured and paid as beam. Side parapet walls, railings, finishing of risers and treads and plastering etc. shall be paid separately.

1.4.8 Reinforcement: Shall be measured on standard weight basis for the length and size of bars as shown in drawing. Wastage, rolling margin, spacers, chairs etc. required for construction purpose, and binding wire will not be measured. Lapping of bars shall

be provided only as per instructions of the RCC Consultant, and the same shall be paid for. The rate will be inclusive of labor involved in cleaning, cutting, bending & erecting.

The rate will be inclusive of labor involved in cleaning, cutting, bending and erecting in position. The unit of measure shall be in metric tons.

1.5. STRUCTURAL STEEL WORK:

1.5.1 Weight of bolts, nuts, rivets, washers etc. used will not be considered for payment. Only the weight of the main members calculated on length basis at standard weight will be paid to nearest cm. No deduction shall be made for holes, bolts or rivets and wastage involved in cutting, for notching ends of sections or intermediate points for making connections. No additional payment shall be made for welding, riveting and bolting. The units of measure shall be in Kg. or MT as per Schedule of Quantities. Gusset plates shall be actually weighed and paid accordingly.

1.6. DOORS, WINDOWS, ROLLING SHUTTERS AND GATES:

1.6.1 These shall be measured in the unit of Square Meters.

- i) Teak wood doors, windows and ventilators: Clear area over one face inclusive of frame shall be measured. Hold fasts and portions embedded in masonry or flooring shall not be measured.
- ii) Steel doors, windows and louvers: Clear area over one face inclusive of frame shall be measured. Hold fasts or portions embedded in masonry or flooring shall not be measured.
- iii) Steel rolling shutters and rolling grills; Dimensions shall be the clear width between side jambs and clear height between floor and bottom of lintel or beam. Cover will not be measured separately.

1.7. FLOORING, SKIRTING AND DADO:

The net area covered shall be measured in sq. mts.

1.8 PLASTER:

Net area of surface plastered shall be measured in Sq. Mts. No deduction will be made for openings each less than half Sq.Mt. in area. No extras will be payable for any grooves, patties, bands, molds, (including drip molds) which are deemed to be included in the internal and external plastering items.

1.9. PAINTING AND COLOUR OR LIME WASH:

NOTE: All woodwork and steel items given in Schedule of Quantities are generally inclusive of painting, but if these are required to be measured separately, then the following procedure shall be adopted.

1.9.1 Net area of surface painted shall be measured in sq.mts. No deductions shall be made for unpainted surfaces or openings less than half sq.mt. each. The rates shall be inclusive of cleaning glasses and fittings.

a) Walls: Net area of surface painted shall be measured. Extra for moldings, recesses and the like shall not be paid.

b) WOOD WORK:

Description	How measured	Multiplying factor
i) Paneled framed ledged braced and battened	Measured flat (not girthed) including frame; edges; chocks cleats etc shall be deemed to be included in the item	1.30 (for each side)
ii) Flush	Measured flat (not girthed) including frame edges; chocks cleats etc shall be deemed to be included the item.	1.20 (for each side)
iii) Partly paneled & partly glazed / glazed	----- As above -----	1 (for each side)
iv) Fully glazed or partly glazed	----- As above -----	0.80 (for each side)
v) Guard bars balustrades gratings and railings	Measured flat over all, no deduction shall be made for opening. (Supporting members shall not be measured separately)	1 (for painting all over)

c) METAL WORK :

Description	How measured	Multiplying factor
i) Fully glazed or gauzed doors and windows / partitions	Measured flat over) frame. No deduction shall be made for openings. In case of gates supporting members like stays, guide rails, hinges shall not be measured	0.50 (for each side)

ii) Rolling Shutters	Measured flat (size of opening) overall; jamb guides, bottom rails and locking arrangements etc. shall be included in the item (top cover shall be measured separately)	1.10 (for each side)
iii) Collapsible gate	Measured flat (size of opening)	1.50 (for painting overall)
iv) R.C.C jali and Fencing	Measured flat overall No deductions shall be made for openings	1 (for each side)

MATERIALS MINIMUM SPECIFICATIONS/ REQUIREMENTS

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

a) Cement:

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

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

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

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

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

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

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

c) **River Sand:**

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

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

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

d) **Fine & Coarse Aggregate:**

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

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

e) **Reinforcement:**

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

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

f) **Bricks :**

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

g) **Neeru:**

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

h) **Surkhi :**

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

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

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

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

i) **Water :**

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

j) **Timber :**

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

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

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

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

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

k) Superior quality Indian Teak Wood :

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

l) 1st Class Indian Teakwood :

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

m) 2nd Class Indian Teakwood :

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

n) Flush Doors :

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

o) Steel Windows and Doors :

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

p) Floor Tiles :

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

terrazzo or mosaic floor shall be as specified in IS: 1237. The size and thickness of tiles shall be as approved by the Bank.

q) **Ceramic / Vitrified Tiles :**

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

r) **Marbles :**

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

s) **Kotah / Shahabad / Kadapa / Granite:**

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

t) **Glazing:**

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

The following type of glasses shall be used:-

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

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

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

v) **MPI. Sheets :**

MPI. Sheets shall be of a gauge specified in the description of the item and shall conform to the IS: 277. The sheets shall be free from cracks, spilt edges, twists, surface flaws, etc. They shall be clean bright and smooth. Galvanizing shall be uninjured and the perfect condition. The sheet shall show no sign of rust or white powdery deposits on the surface. The corrugations shall be uniform in depth and pitch and parallel.

w) **Paints :**

Lime for lime wash, dry distemper, oil bound distemper cement primer, oil paint, enamel paint, flat oil paint, plastic emulsion paint, anti-corrosive primer, red lead, water-proof cement paint and

exterior grade Acrylic Emulsion paint, cement paint, sand-tex matt shall be from an approved manufacturer and shall conform to the latest Indian Standard for various paints. Ready mixed paints as received from the manufacturer without any admixture shall be used, except for addition of thinner, if recommended by the manufacturer.

x) **Mortar :**

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

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

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

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

y) **AAC Blocks:**

AAC (Autoclaved Areated Concrete Blocks) All units shall be sound and free of cracks or other defects which interfere with the proper placing of unit or impair the strength or performance of the construction. Minor chipping resulting from the customary methods of handling during delivery, shall not be deemed grounds for rejection.

Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall be free of chips, cracks, or other imperfections, except that if not more than 5 percent of a consignment contains slight cracks or small chippings not larger than 25 mm, this shall not be deemed grounds for rejection.

The maximum variation in the length of the units shall not be more than 5 mm and the maximum variation in the height and width of unit, not more than ± 3 mm

The drying shrinkage shall be not more than 0.95 percent for Grade 1 blocks and @ 10 percent for Grade 2 blocks when tested as per table no 9.4 of IS 2185 -3(1984).

z) UPVC Windows

The cross section of the profile must confirm to the shape and dimensions of the manufacturer's specification and drawing maximum tolerance on outer surface shall not be more than ± 0.5 mm and glazing and seal grooves shall not deviate more than ± 0.3 mm.

The straightness of the profile as measured on the surface shall not deviate by more than 1.0 mm/meter.

The weight of the profile section per meter shall not be less than 3% of normal value.

RMC GUIDELINES

1.0 GENERAL REQUIREMENTS OF RMC

1.1 Basis of Supply: All concrete shall be supplied and invoiced in terms of cubic meters (full or part) of compacted fresh concrete as discharged from the transportation unit. The RMC shall be supplied in the quantity and having the quality in accordance with the requirements agreed by the producer or supplier and purchaser or user; however the concrete supplied shall generally comply with the requirements of IS 456/ IS 457 and IS 4926. The volume of fresh concrete in a given batch shall be determined from the total mass of the batch divided by the density of the concrete. The total mass of the batch shall be determined as the mass of the concrete in the batch including the total mixing water. All Batching shall be carried out by mass, except water and admixture, which may be measured by volume.

1.2 Specifying Concrete – Ordering RMC shall be manufactured and supplied on either of the following basis.

- a) Performance basis: Specified characteristic strength based on 28 days (or any other specific age) compressive strength in accordance with IS 456/ IS 457.
- b) Prescriptive basis: Specified Mix Proportion. When concrete is supplied on the basis of specified strength, responsibility for proportioning of mix rests with the producer/ seller whereas in case of specified mix proportion, the responsibility for proportioning of mix rest with the purchaser and the purchaser accepts the responsibility for concrete strength and its performance. Thus, it is desirable to place the **supply order on specified strength basis**. This system is based on performance parameters and is best way to order the RMC because RMC producer, who is expert in the field would design an economical mix with desired properties. In all cases the purchaser/user is required to furnish the following information for the guidance of the producer/ seller.

- a) Type of cement to be used.
- b) The max. Size and type of aggregates to be used.
- c) The workability specified by slump or any other requirements.

- d) Following additional requirements should be specified to satisfy durability requirements:
- i) Minimum and maximum cement content to be used in production of concrete.
 - ii) Maximum water cement ratio to be kept.
 - iii) Total chloride content in concrete: - Total chloride content should not exceed 0.15% by mass of cement in case of RCC work (IS: 456). For pre-stressed concrete work, total chloride content should not exceed 0.06% by mass of cement. (IS: 1343)
 - iv) Total sulphate content: - It should not exceed by 4% by mass of cement.
 - v) Permeability test requirements. (if any)
 - vi) Any special requirements such as pump ability or self-compacting concrete (SCC) etc.

1.3 Mixing of Concrete Ready mix concrete is mixed and delivered to the point/site designated by the purchaser/user by means of one of the following combinations of operations.

- a) Central Mixed or Stationary mixed Concrete: Concrete that is mixed in a stationary mixer at plant that mixes the concrete completely before it is discharge into either in a truck agitator or truck mixer operating at agitating speed or in non-agitating equipments as agreed to by the purchaser/user. Central mix plants are sometimes referred to as wet batch or pre mix plants. When a truck mixer or agitator is used for transporting concrete which has been mixed before leaving the plant, the concrete shall agitated during transit and re-mixed at the site for at least 2 minutes so that the concrete is of the required uniformity.
- b) Shrink Mixed Concrete: Concrete that is first partially mixed in a stationary mixer and then mixed completely in a truck mixer. The time of partial mixing shall be minimum required to intermingle the ingredients. After transfer to the truck the amount of mixing at the designated mixing speed will be that necessary to meet the requirements for uniformity of concrete. Generally it is two minutes of mixing in truck drum at mixing speed. This is not being practiced.
- c) Truck mixed concrete: Although, truck mixed concrete is also one of the methods of mixing of Ready Mixed Concrete, for the purpose of this chapter , truck mixed concrete shall not be allowed as RMC, as automatic record keeping arrangement such as digital computer slips etc. are not possible in such type of mixing. Regarding mixing whether in a stationary or central mixer it shall be ensured that it complies with performance criteria of mixing efficiency test as per IS 4634:1991. Mixing efficiency test shall be performed at least once in a year.

1.4 Information to be supplied by the purchaser/user of RMC plant. The purchaser shall provide the details of the concrete mix or mixes required by him and all pertinent information on the use of the concrete and the specified requirements. Where the purchaser specifies a designed mix to be supplied it is essential that all relevant information is conveyed to the producer. In order to assist in this, the format given in IS 4926 Annex D may be completed and forwarded to the producer at the time of enquiry. The concrete mix shall be specified by its constituent materials and the properties or quantities of those constituent to produce a concrete with the required performance. The assessment of the mix proportions shall form an essential part of the compliance requirements. The purchaser shall provide the producer with all pertinent information on the use of the concrete and the specified requirements. In order to assist in this, the format given in IS 4926 Annex D may be followed with suitable modifications as applicable to prescribed mixes. Purchaser responsibilities: The purchaser of Ready mix concrete has the following responsibilities

- i When placing procedures can potentially alter the characteristics of fresh concrete, it is the responsibility of the purchaser to inform the producer of changes to the mixture requirements to accommodate these effects. An example is pumping concrete in place.
- ii When a job uses more than one type of concrete mixture, it is the purchaser's responsibility to verify the mixture delivered and direct it to the correct placement location.
- iii The purchaser should check and sign the delivery ticket and document any special occurrences on the ticket.
- iv When strength tests are used for acceptance of concrete, the samples should be obtained at the point of discharge from the transportation unit.
- v The purchaser or his representative should ensure that proper facilities are available for curing the test specimens at the jobsite and that standard practices are followed for subsequent curing and testing. Certified personnel should conduct the tests.
- vi Test reports should be forwarded to the producer in a timely manner to ensure that deficiencies are rectified.

1.5 Information to be supplied by the producer/owner of RMC plant upon the request, the producer shall provide the purchaser with the following information before any concrete is supplied:

- a) Nature and source of each constituent material.
- b) Source of supply of cement, and
- c) Proposed proportions or quantity of each constituent/m³ of fresh concrete. d) When requested, the producer shall provide the purchaser the following information of admixtures:
 - i) Generic type(s) of the main active constituent(s) in the admixture.
 - ii) Whether or not the admixture contains chloride and if so, the chloride content of the admixture expressed as a percentage of chloride ion by mass of admixture.
 - iii) Where more than one admixture is used, confirmation of their compatibility. Producer's responsibilities: The producer of Ready mix concrete has the following responsibilities
 - a) The concrete producer is responsible for the concrete slump as specified for a period of 30 minutes after the requested time or the time truck arrives at the placement site, whichever is later.
 - b) The concrete producer is required to deliver concrete at the requested slump and air content, within the accepted tolerances, as measured at the point of discharge from the transportation unit. Note: The purchaser shall not alter the quality of concrete by any addition or modification at the job site. These include addition of water, admixture, fiber or special products into the ready mix concrete supplied by the producer; in case the purchaser does this, then producer is not responsible.

1.6 GENERAL INFORMATION ABOUT RMC FACILITY

1.6.1 Location of RMC Plant

The RMC plant from where the concrete is being procured by the purchaser/user can be a commercial plant owned/operated by a third party or a captive plant owned and operated by the constructor/user himself.

In case of commercial plant the location is already decided as they are operational plants and the user of RMC has no control on its location. The nearness to the site and availability of good haul roads can be the deciding factors in such cases.

However, when the RMC plants are captive plants and are erected on their site the constructor/user has to see the location of plant is suitable from all the considerations, the factors to be considered while deciding the location of plant can be

- 1) Availability of land
- 2) Availability of Raw materials such as sand, aggregates, cements, fly-ash etc. and their leads.
- 3) Availability of Electric power
- 4) Availability of water
- 5) Nearness to site
- 6) Nearness to village
- 7) Environmental concerns; waste management, dust and noise control, safety etc. Hence, it is necessary that the owner of captive batching plant takes a judicious decision by considering all the above factors with respect to their technical and financial viability.

1.7 Components of RMC plant RMC plant/facility has in general the following components

1.7.1 PROPERTIES OF FRESH CONCRETE

1.7.1.1 Workability of concrete

Workability is a broad term which encompasses a range of properties of fresh concrete such as consistency (fluidity) , mobility (ability of concrete to move around the reinforcement and in restricted areas), compatibility, finishability and pump ability (for pumped concrete). The degree of workability varies depending upon the type of construction and method of placing, compacting and finishing. Workability is measured in terms of slump of concrete using the standard procedure laid down in IS 1199:1959. The IS 456 provides guidance on the range of workability requirements for different placing conditions and applications. Consistency of fresh concrete is considered to be a close indication of its workability and slump test has been the most widely used test for ascertaining consistency and hence workability. For applications requiring very high slumps (higher than 150mm) the IS 9103 recommends use of flow table test. For a majority of concrete supplied by RMC producers, slump test is the most commonly used test. The IS 4926 specifies the following tolerance limits of workability as criteria for acceptance.

- i) Slump: + 25 mm or + 1/3rd of the specified value whichever is less.
- ii) Compacting factor : + 0.03 For specified value > 0.9 + 0.04 For specified value < 0.9
+ 0.05 For specified value > 0.8

- iii) Flow Table Test: Acceptance criteria to be established between the producer and the purchaser.

The test for workability needs to be performed upon discharge from producer's delivery vehicle on site or upon discharge into the purchaser's vehicle. On some occasions, lack of preparedness on the part of purchaser at construction site may result in delay of placement. RMC producer will be responsible for maintaining the slump within the permissible range for a period of 30 minutes starting from arrival of transit mixers at job site. However, after 30 minutes, the IS 4926 clearly states that the responsibility for delay passes on the purchaser. Slump of concrete is quite sensitive to a variety of environmental and other factors such as concrete temperature, ambient temperature, surface rate of evaporation, changes in grading, batch mass differences, admixture dosage, presence of mineral admixtures or otherwise, variation in air content, variation in testing, etc.

1.7.12 Density of concrete

The plastic density (unit weight) of conventional normal-weight concrete varies depending upon the variation in the density of different ingredients, the amount of entrapped air and entrained air (if air-entraining agents are used), the maximum size of aggregate and water and cement contents in the mix. Increasing the aggregate volume and reducing the cement paste would increase the density of concrete. Ready Mixed concrete is measured on the basis of volume. The volume of fresh concrete can be determined by dividing the total weight of all batched materials by the unit weight or plastic density of concrete determined in accordance with IS 1199. Sometimes there is likelihood a discrepancy in the concrete ordered and that actually supplied. Also it should be understood that the volume of hardened concrete may be or appear to be less than expected. There could be variety of reasons for this discrepancy. These include wastage and spillage of concrete, over excavation, miscalculation in form volume, deflection or distortions of forms, settlement of wet mixes, loss of entrained air, etc. Such difference can be reconciled if plastic density of concrete is monitored regularly. While carrying out mix proportioning, the plastic density of designed (Proportioned) mix is measured and tallied with the theoretical density. It would be a good practice to measure the plastic density at regular interval so as that the quantities supplied match orders. The plastic density measurement can be done by filling a container of known volume with fully compacted concrete and taking the mass of concrete in that volume by following procedures detailed in IS 1199. Additionally for concrete of Road and Bridge work the guidelines given in section 1717.7.3 and 1717.7.4 of MORT&H specifications published by IRC (Fifth revision) 2013.

1.7.1.3 Air content of fresh concrete

In most parts of India, tropical weather prevails, necessitating adoption of adequate precautionary measures associated with hot weather concreting practices. Absence of adequate measures may lead to rapid loss of workability, accelerated stiffening of concrete, poor compatibility and finishability, and cracking of concrete owing to plastic and/or thermal shrinkage. To avoid adverse effect of hot weather, both RMC producer and the purchaser need to take adequate precautionary measures. It shall also be noted that generally retarding effect of retarder is smaller at higher temperatures and sometimes few retarders seem to be

in-effective at extremely high temperatures. Thus it is desirable to keep the temperature of concrete as low as possible. Although in the IS 4926:2003 the requirements of temperature of concrete has been deleted it is advisable that the temperature of concrete produced shall not be less than 50 C and shall not exceed 350 C Additionally for concrete of Road and Bridge work the guidelines given in section 1708.5 and 1715.6 of MORT &H specifications published by IRC (Fifth revision) 2013 shall be referred to.

As far as RMC producer is concerned, he needs to design the concrete mix using a combination of OPC and supplementary cementitious materials or blended cement for reducing the heat of hydration. The aggregate stockpiles in the plant should be covered to avoid direct exposure to sun and water should be sprinkled on the stockpile to bring down the temperature. Some RMC producers use chilled water or ice flakes to bring down the temperature of mixing water during hot summer months. Covering the drum of transit mixer by hazen cloth helps in maintaining the temperature of concrete during transit. The requirements of extreme weather (hot weather conditions) concreting are given in IS 7861(part 1):1975 and shall be referred to.

1.8 PROPERTIES OF HARDENED CONCRETE

1.8.1 Strength of concrete

- a. Concrete Cubes: - When strength of concrete is used as a basis for acceptance of concrete, which is generally adopted parameter, the standard specimen shall be made, cured and tested at 28 days in accordance with IS 516. The compliance shall be assessed against the requirements of IS 456. The testing frequencies and sampling shall be as per para 9.0 – sampling and testing of concrete of this guideline. While the strength at 28 days has emerged as a basis for contract specification; in order to get relatively quicker idea of the quality of concrete, compressive strength at 7 days may be carried out; however it is important to establish a relationship between early age and 28 days strength for a particular concrete. But in all cases 28 days compressive strength shall alone be the criteria for acceptance or rejection of concrete.

- b. Concrete Cores: - The most widely accepted method of determining the in-place compressive strength of concrete in existing structures, pavements and linings is the testing of core specimens obtained by drilling with a diamond core bit. While core strength tests are more reliable than the less expensive & less tedious non-destructive test methods now in use, the results can be affected by many structure and testing variables which must be controlled or taken into consideration while evaluating the concrete strength. Where possible, a length to diameter ratio L/D of 2 should be used but the diameter of core should be at least three times the nominal maximum size of coarse aggregate (MSA) and in no case shall the diameter of specimen be lower than twice the maximum nominal size of aggregate(MSA). Any specimen intended for strength testing shall not contain embedded reinforcing steel. Testing variables includes considerations such as method of end preparation. Often sawing is necessary, to thin cores so that ends are perpendicular to the axis of the core, to eliminate reinforcing steel or honeycombed areas or to eliminate surface irregularities. Usually cores shall be capped to produce the required plainness for testing and it shall be ensured that good practices of capping are followed as per IS 516. The capping shall be thin with a strong material. The use of thick caps or ones that are not properly bonded to the specimen or are made with a weak material may cause markedly reduced core strengths especially in short cores of L/D less than 2.0.

Shorter cores with L/D less than 2.0 give a higher indicated strength which increases as L/d decreases, therefore these higher strengths must be corrected by a factor (correction factor) given

in IS 516 for each ratio which, on the average, will produce a corrected strength on a parity with the standard L/D = 2.0 specimen. The equivalent cube strength of the concrete shall then be determined by multiplying the corrected cylinder strength by 5/4.

1.8.2 Acceptance criteria for concrete cubes: The IS 456:2000 provides guidance on the acceptance criteria of concrete based on compressive strength and shall be adhered to. Accordingly, i. The test results of the sample shall be average of the strength of the three specimens. The individual variation should not be more than + 15% of the average. If more, the test results of the sample are invalid. ii. The concrete shall be deemed to comply with the strength requirements when both the following conditions are met the mean strength determined from any group of four consecutive non overlapping test results complies with appropriate limits in column 2 of Table 1. Any individual test result complies with the appropriate limits in column 3 of Table 1.

Table1: Characteristic compressive strength compliance Requirement

Specified Grade	Mean of the group of 4 Non overlapping consecutive test results in N/sq.mm	Individual test results in N/sq. mm
M15	> or equal to $f_{ck} + 0.825 \times$ established standard deviation (rounded off to nearest 0.5 N/sq mm) or $f_{ck} + 3$ N/sq mm whichever is greater.	> or equal to $(f_{ck} - 3)$ N/sq mm
M20 And Above	> or equal to $f_{ck} + 0.825 \times$ established standard deviation (rounded off to nearest 0.5 N/sq mm) or $f_{ck} + 3$ N/sq mm whichever is greater.	> or equal to $(f_{ck} - 3)$ N/sq mm

Additionally for concrete of Road and Bridge work the guidelines given in section 1717.7 of MORT &H specifications published by IRC (Fifth revision) 2013 shall be referred to.

Table 2: Assumed Standard deviation.

Grade of Concrete	Assumed Standard Deviation N/sq.mm
M10	3.5
M15	

M20	4.0
M25	
M30	5.0
M35	
M40	
M45	
M50	

b. Cores The IS 456:2000 gives the acceptance criteria for the core test on concrete. Accordingly, Concrete in the member represented by a core test shall be considered acceptable if the average equivalent cube strength of the cores is equal to at least 85% of the cube strength of the grade of concrete specified for the corresponding age and no individual core has strength less than 75%.

1.9 QUALITY AUDITS & Q.C. TECHNIQUES

1.9.1 General

RMC is both a service and a product. It is essential that the user is assured of quality of concrete received from RMC producer/plant. Unfortunately, there are no guidelines on the regulatory framework in India through which a certain level quality is assured to the user about the product being supplied to him. To maintain the quality & to have the quality assurance the following measures can be taken:

- 1) Quality Audit
- 2) Internal quality audits
- 3) Cusum Techniques or its variants.

1.9.2 Quality Audit

The RMC production facility/plant shall be audited by Third party audit on annual basis. In such case the owner and the auditors are involved in a audit called as appraisal – that is someone other than the owner or purchaser is to decide whether the owner/production plant can be certified as meeting prescribed quality standards/norms. In India, RMCMA having its office in Mumbai which has developed regulatory framework based on RMC quality schemes in developed countries and which have certified /accredited quality auditors used to carry out the third party audits of RMC and they had audited and certified around 250 RMC plants at 45 locations in India. Recently this scheme was upgraded by RMCMA and scope enlarged by making the scheme truly third party certification scheme. The scheme is owned jointly by Quality Council of India (QCI) and Building Materials & Technology Promotion Council (BMTPC) and they have developed a document – Criteria for RMC production control –Basic level certification for production control of RMC, the draft of which is under wide circulation and finalization. Hence, QCI-BMTPC can be contacted for third party audit of RMC plants. Additionally, there can be external audit called as second party

audit, where in the purchaser of RMC or his representative will decide whether the plant/ RMC production facility is well/ enough organized to be able to meet their requirements as per quality standard

1.9.3 Internal quality audits

Internal quality audit also called as First party audit in which the owner of RMC plant or the same group will help the plant meet and improve on its own quality standards. For this, each RMC plant shall preferably develop its own QA-QC plan and documentation. Each plant Owner/producer can develop its own quality norms over and above the provisions in Indian Standards. The RMC producer shall bear in mind that there is always the scope for continuous improvement in quality and should strive for it. There shall be a system for reporting on quality parameters to the organization; for that there shall be norms and well defined practices to monitor and control quality of input and output materials. The QA-QC plan incorporated as internal quality audit shall consists of information such as source & properties of all ingredients of concrete; Mix design; process control; information on fresh and hardened properties of concrete; statistical analysis of results etc.

1.10 ENVIRONMENTAL CONCERNS AND SITE SAFETY

1.10.1 Site Safety

As in all civil engineering constructions, at the RMC plant safety shall be given a paramount importance and "Safety first" rule shall be followed. Ready Mixed Concrete plants are industrial operations relying on heavy equipment and vehicles with potential for accidents. So safety of workers should be a critical objective. All guardrails and machinery guards shall be fixed securely in position and walkways kept clean and with clear access. The facility shall provide suitable communication system between batching plant operator, transit mixer and delivery site. The RMC producer shall provide working conditions which have regard to the health and safety of employee's .Plant should adopt a written safety program that includes formal safety training and provide incentives for workers who maintain safe practices. The following arrangements shall be ensured from safety point of view.

- i Earthing arrangement: RMC equipment essentially needs to be earthed in view of abundant use of metal. Necessary earthing facility needs to be created by the owner/producer.
- ii Air conditioning: Control unit of the RMC plant needs to be kept air-conditioned for trouble free running of computer systems and to provide good environment to the operators and staff.
- iii Plumbing and drainage work: Water supply network needs to be laid at site for availability of water at different locations. Similarly, site drainage for rainwater or spillages need to be provided to keep it workable.

1.10.2 Environmental Considerations

Due regard shall be given to the environment in any RMC production facility. The technologies used shall be such that to reduce the environmental impact to the lowest realistic level at the same time the technologies shall be proven, economic and reasonable. The RMC facility shall endeavor that plant operations are well landscaped and screened from the surrounding residential or rural community such that the impact is minimal. The producer shall ensure that the traffic routes chosen

are such as to avoid congested and sensitive areas wherever practicable and to minimize the fuel consumption. Concrete spillage on the public highway roads and pathways shall not be there. On the rural roads the dust menace shall be reduced by watering the pathways/roads near the rural community/site. As concrete producers in RMC plant the producer shall be aware and know the details of responsibilities regarding the environmental regulations such as Air Quality

Permits; Discharge permits; Storm water management, clean water permits, Solids management, Hazardous waste regulations, Dust control, Recycling, reuse and sustainability.

1.10.3 Air and Noise Pollution and Vibration

Particulate matter emissions to air, also known as dust emissions are the major air quality concerns at the ready mixed plant site. These very small particles can pose a health and safety risk to persons who may inhale those particles. The dust emissions can be process (point source) emissions and fugitive emissions. Process or point source emissions occur at discrete and definable locations during various activities such as silo filling; material handling and stacking; truck batching etc. Fugitive dust emissions are difficult to pin point and may arise from onsite vehicle movement, loading/transfer activities. The dust emissions can be reduced by plant enclosures and dust suppression wherein water is sprayed at the source of dust to prevent it from becoming airborne. There are many techniques and strategies available and the producer shall utilize appropriate technology to prevent or minimize dust emissions in line with local and national regulations. Noise is defined as “unwanted sound” and is primarily a concern of surrounding community and plant employees. While sound is inherent to RMC facility there are many areas where noise can be minimized, and the producer should take steps to ensure that plant and vehicle noise are minimized through plant designs, landscaping, berms and sound walls, and through the use of appropriate technology and strategies.

1.10.4 Fuel, Oil and chemical spillage: The risk of leaks and spills can be minimized by proper design of storage facilities. The producer shall take appropriate measures and employ best management strategies to prevent leaks and spills and prevent pollution of surrounding areas and ground water by accidental effluent discharges and fuel, oil and chemical spillage.

1.10.5 Waste management Waste is defined as materials disposed of in an unproductive manner for example being land filled or discarded in a quarry or back lot. Comprehensive waste management and programs will reduce environmental burden of waste disposal. Re use of the waste material alleviates the burden of raw materials extraction. Excess concrete and returned concrete mainly forms the solid waste in RMC industry and forms the major waste concern. The producer shall introduce processes, strategies and practices that minimize the production of waste.

1.10.6 Training it is the responsibility of RMC producer to ensure that the employees/workers are properly trained and educated in safe handling of materials, hazardous chemicals and responsibility towards the environment. The producer shall give high priority to site care and good housekeeping along with participation of local community. It is also essential that emergency response procedures be established and employees be made familiar with the procedures. A formal training plan shall be prepared and implemented. Drivers play a key role in fuel management. Training to drivers can improve fleet efficiency and reduce spillage and leakages.

WORKMANSHIP

CLEARING OF SITE, EXCAVATION AND EARTH FILLING

Note: Workmanship for all items related to the construction work should be as per relevant I.S. Code.

General:

Trenches for wall foundations, column footings, raft foundations, pile caps, plinth beams, water tanks, cess pits, etc., shall be excavated to the exact length, width and depth shown in the figure on the drawing or as may be directed by the Bank. If taken out to greater length, width or depth than shown or required, the extra work occasioned thereby shall be done at the Contractors own expenses. Extra depth shall be brought up by plain cement concrete filling 1:4:8 proportion and extra length and width filled in by rammed earth or murum or if the Bank thinks it necessary for the stability of the work by 1:4:8 concrete, as may be directed by the Contractors costs.

Excavated material shall be used for filling in plinth, or each side of the foundation blocks or trenches or it shall be spread elsewhere on or near the site of work including watering, ramming and consolidating or carted away from site free of charge, as may be ordered. The Contractor shall at his own expenses and without any extra charge, make provision for supporting all utility services, lighting the trenches, separating and stacking, serviceable materials neatly, shoring, timbering, stuttering, bailing out of water either sub-soil or rain water including pumping at any stage of the work. Trenches shall be kept free of water while masonry or any concrete works are in progress and until the Banks consider that concrete is sufficiently set.

Excavation excluding in Hard Rock:

Excavation shall be carried out in any type of soil, murum (soft or hard), soft rock, boulders, old foundation, concrete asphalt or stone paved surfaces, old masonry or concrete (plain or reinforced).

Excavation in Hard Rock:

Rock which is in solid beds, which can only remove either by wedging or chiseling shall be treated as hard rock. A boulder or detached rock measuring one cubic meter or more, shall wedging or chiseling.

Where hard rock is met with the blasting operations is considered necessary, the Contractor shall intimate about the same to the Bank.

The Blasting shall not be permitted in any case and contractor have to carry out hard rock excavation in hard rock by means of Wedging and chiseling only.

Excavation shall be done by wedging or chiseling and it shall be restricted to the quantity required to enable the necessary foundation etc. to be put in. In case, the dimension of trenches exceeds those shown in drawings or as directed by the Bank, the excess quantity shall not be paid for, the item also covers bailing out subsoil or rain water including pumping at any stage of work, shoring strutting, etc.

Earth Filling:

General: Filling shall be done with good earth, murum, stone chips, or disintegrated building debris. It shall be free from salts, organic matter, black cotton or slushy earth and combustible material. All clods shall be broken.

a) Filling in Plinth :

Filling shall be done in layers not exceeding 25 cm. amply watered and consolidated by ramming with iron or wooden rammers weighing 7 to 8 kgs. and having base 20 cm. Square or 20 cm. diameter. When the filling reaches the finished level, surface shall be flooded with water for at least 24 hours, allowed to dry and then rammed and consolidated, after making good any settlement in order to avoid settlement at a later stage. Special care shall be taken to pack earth under plinth beams and column corners. Finished level of filling shall be kept to a slope intended to be given to the floor.

b) Filling in Outdoor portions and for Site Development:

Shall be done in layer of 30 cm. Each layer shall be adequately watered. When filling reaches the required level the top most layer shall be dressed to proper section, grade and camber and rolled by 8 to 10 ton's power roller and adequately watered to aid compaction.

DRY RUBBLE PACKING & LEVELING COURSE.

Dry Rubble Packing: Ground shall first be leveled up and thoroughly consolidated by means of heavy log hammer or frog rams. Rubbles of specified thickness shall then be laid and set with hand. It shall be consolidated by either hand roller or wooden log hammer; free use of water being made during consolidation. All hollows and interstices after consolidation shall be filled up with quarry spalls, stone chips etc., and the packing blinded with stone grit and watered and consolidated by log hammer.

Rubble packing in Road work shall be thoroughly consolidated by means of power rollers of 8 ton's capacity instead of log hammers and the surface shall be brought to proper grade and camber. After checking the level, grade and camber the surface will again be watered and rolled to receive road structure.

Leveling Course:

It shall be either plain cement concrete of leaner mix or lime concrete which shall be proportioned as stipulated in the relevant item and mixed and placed in position confirming to line and level show on the drawing and compacted by approved means and cured adequately.

Lime concrete shall be prepared by mixing sand and slaked lime in proportion of three parts of sand and one part of lime and ground in a suitable mill and the mortar so prepared shall be added to six parts of the brick bat passing through 50 mm. mesh, mixed well and placed in position and compacted by approved means. The concrete shall be cured adequately.

PLAIN & REINFORCED CEMENT CONCRETE

A) VOLUMETRIC BASIS: -

General: Except where they are varied by the requirements of this specification due provision of Indian Standard Specification IS-456-1964 for plain and reinforced concrete and IS-432 part I and II for Mild and Medium Tensile steel Bars and hard drawn steel wire for concrete reinforcement and any other relevant ISS applicable together with the latest amendments shall be held to be incorporated this specifications. It shall be intent of these specifications to ensure that all concrete placed at various location of the job should be durable, strong enough to carry design, loads, it should wear well and practically be impervious to water. It should be free from such defects as shrinkage, cracking and honeycombing.

Proportioning the Mix:

In ordinary concrete, excluding controlled concrete, proportions of cement to fine and coarse aggregate shall be as specified in the respective items and shall be accurately measured as in table "A" below. These proportions are based on assumption that the aggregates are dry. If aggregates are moist allowance shall be made for bulking in accordance with IS: 2386/-. Allowance shall also be made for surface water present in aggregate when computing water contents. Surface water present shall be determined by one of the field methods described in IS: 2386/- (Part III). In the absence of exact data, the amount of surface water may estimate by the value given in table "B" below (Table "A" and "B").

Mixing:

Concrete of 1:2:4 or richer mix shall be mixed in an approved mechanical mixer. The mixer and mixing platform shall be suitably protected from wind and rain. Aggregates shall be accurately measured out in boxes and mixed dry along with cement, water shall be then added in measured quantity and mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and in consistency but in no case shall he mixing be done for less than 2 minutes.

When hand mixing is permitted with the approval of the Bank it shall be carried out on water-tight mixing platform and care shall be taken to ensure that mixing is continued until mass is uniform in colour and consistency.

Consistency:

Quantity of water for making reinforced concrete shall be sufficient so as to ensure that concrete shall surround and properly grip all the reinforcement. The best consistency shall be that, which will flow sluggishly without flattening out and without separation of coarse aggregates from the mortar. The degree of plasticity shall depend on the nature of work and atmospheric temperature and whether the concrete is vibrated or hand compacted. The slumps shown in table "C" obtained by standard slump test carried out in accordance with the procedure laid down in IS: 119-1959 shall be adopted for different types of work.

Admixtures:

The usage of admixtures is allowed only if approved by the structural consultant and his decision in this regard shall be final.

Transportation:

Concrete shall be conveyed from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of any of the ingredients. If segregation does occur during transport, the concrete shall remix before being placed. In no case, more than 30 minutes shall elapse between mixing the consolidation in its position.

Placing and Compacting:

Concrete shall be placed in layers of suitable thickness or in strips and compacted before initial setting commences and should not be subsequently disturbed. Method of placing shall be such as to preclude segregation and as far as practicable the placing shall be continuous. Special care shall be taken in accordance with IS: 456 while laying concrete under extreme weather.

Concrete shall be thoroughly compacted during the operation of placing and thoroughly working around the reinforcement, embedded fixtures and spaded against corners of the form work and by punning, rodding, mechanically vibrating or by any other approved means. In addition, form work shall be tapped lightly by using wooden mallet at the pouring head. The number and type of vibrator to be used shall be subject to the approval of the Banks and in general immersion type vibrators shall be used. External vibrators shall also be used whenever directed.

The intensity and duration (of vibration shall be sufficient to cause complete settlement and compaction without any stratification of successive layers or separation of ingredients or formation of laitance. Vibrator shall be inserted vertically in the concrete at points not more than 45 cm. apart and withdrawn very slowly when air bubbles no longer come on the surface. Over vibration or vibration of very wet mixes is harmful and should be avoided. Care shall be taken to utilize the vibrator only to compact the concrete and not to spread it, sufficient number of reserve vibrator in good working condition shall be kept on hand at all times, so as to ensure that there is no slackening or interruption in compacting.

Construction Joints:

Concreting shall be carried out end to end continuously as far as possible and when construction joints are totally unavoidable, it shall be located in a predetermined position approved by the Bank. The joints shall be kept at places where the shear force is the minimum and these shall be straight and at right angles to the direction of main reinforcement. When the work has to be resumed, on a surface which has hardened, such surface shall be roughened. It shall be swept clean, thoroughly wetted and covered with a 13 mm. layer of mortar composed of cement and sand in the same ration as the cement concrete mix. This 13 mm. layer of mortar shall be freshly mixed and placed immediately before the placing of the concrete.

Where the concrete has not fully hardened, all laitance shall be removed by scrubbing the Wet surface with wire or bristle brushes, care being taken to avoid dislodgment of particles of aggregate. The surface shall then be coated with neat cement grout. In horizontal joints the first layer of concrete to be placed on this surface shall not exceed 15 cm. thickness and shall be well rammed against old work, particular attention being paid to corners.

Expansion Joint:

Expansion joint shall be provided where required as shown on the drawings or as directed by the Bank / Consultant. The joints shall be filled by the approved quality filler.

Curing:

Concrete shall be carefully protected during first stage of hardening from harmful effects of excessive heat, drying winds, rain or running water. It shall be covered with a layer of sacking, sand canvas, hessian, or similar absorbent materials and kept constantly, wet for ten days from the date of placing of concrete. Alternatively, the concrete being thoroughly wetted and covered by layer of approved water-proof material which should be kept in contact with it for seven days.

Form Work:

The form work shall conform to the shape, lines and dimensions as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete and shall be sufficiently watertight to prevent loss of cement slurry from the concrete. Form work or centering shall be constructed of steel or timber and adequately designed to support the full weight of wet concrete without deflection and retain its form during laying, ramming and setting of concrete. Timber used shall be properly seasoned so as to prevent deformation when wetted.

All props shall be straight and of full height and no joints shall be allowed. Props shall be braced with thin bamboos or wooden battens and where additional staging is necessary, extra care shall be taken to use bigger diameters props with bracing at 4 or 5 levels. All props shall be supported on sole plates and double wedges. At the time of removing props these wedges shall be gently eased and not knocked out.

All rubbish, chippings, shavings and saw dust shall be removed from the interior of the forms before the concrete is placed and the form work in contact with the concrete shall be cleaned and thoroughly wetter or treated with non-staining mineral oil or any other approved materials is kept out of contact with the reinforcement.

All form work shall be removed without shock or vibration and shall be eased off carefully in order to allow the structure to take up its load gradually. Forms shall not be disturbed until concrete has adequately hardened to take up superimposed load coming on it and in no circumstances shall forms be struck until the concrete may be subjected at the time of striking.

In the normal circumstances (generally where temperatures are above 21 degrees centigrade) and where ordinary cement is used, forms may be struck after expiry of following periods:

a)	Walls, Columns and Vertical sides of beam}	48 hours
b)	Bottom of slab up to 4.5 m. span.	7 days.
c)	Bottom of slab up to 4.5 m. span.	14 days.
d)	Bottom of beams and archrib over 6 m. Span.	21 days.

However, this period may be increased or decreased at the discretion of Banks. Special care shall be taken while striking the centering of cantilevered slab canopies, portal frames, folded plate construction and period of striking centering shall be as determined by the Bank. If directed, form shall be given an upward camber to ensure that the beams do not have any sag. Surface that becomes exposed on removal of forms shall be carefully examined and any fins, burrs, projections etc., that are detected shall be removed. Any honeycombing of minor nature shall be finished neatly with cement mortar 1:2.

Any work showing signs of damage through premature or careless removal of centering or shuttering, shall be reconstructed by the contractor at his own cost.

Strength:

Concrete mixed in the proportion desired shall have compressive strength after placing, not less than the following:

Concrete mixed in the proportion desired shall have compressive strength after placing, not less than the following:

No	Concrete Mix.	Minimum compressive strength @ 7 days	Minimum compressive strength @ 28 days
1	1:1:2	160 Kg. / Sq.mtr. (2250 Lbs. / Sq. inch).	250 Kg. / Sq.mtr. (3500 Lbs. / Sq. inch).
2	1:1½:3	132 Kg. / Sq.mtr. (1875 Lbs. / Sq. inch).	200 Kg. / Sq.mtr. (2850 Lbs. / Sq. inch).
3	1:2:4	106 Kg. / Sq.mtr. (1500 Lbs. / Sq. inch).	150 Kg. / Sq.mtr. (2250 Lbs. / Sq. inch)

Tests:

Tests on concrete shall be carried out in accordance with IS-456/- and any other is applicable. The frequency of work test shall be at such intervals as ordered by the Bank and subject to that every 150 cu.m. of concrete placed or part thereof and for a day's concrete exceeding 30 cu.m. a batch of 6 cubes shall be made for every sample and 3 of them tested after 7 days and the remaining 3 cubes shall be tested after 28 days. The criteria for acceptance of a concrete as confirming to a specified proportion / grade of concrete shall be in accordance with IS: 456 and the Contractor shall entirely re-do the rejected work at his own cost. Strength of 28 days shall alone be considered for acceptance.

The Contractor shall arrange to carry out the tests in accordance with the relevant Indian Standards Specifications in an approved laboratory and the test reports in original be submitted to Bank. The entire cost of testing shall be borne by the Contractor.

Steel Reinforcement:

Reinforcement shall be accurately fabricated, placed and adequately maintained in position as shown on the drawings or as directed by the Bank. All finished bars shall be free from cracks, surface flaws, and laminations, jagged and imperfect edges. Cement mortar blocks shall be used to give requisite cover as shown be firmly tied with binding wire of 16 to 18 gauge. Reinforcement shall be bent in accordance with the procedure stipulated in IS: 2502-1963 and will not be straightened in a manner which will injure the material.

All reinforcement shall immediately before placing in concrete be thoroughly cleaned of loose mill scale, loose rust, oil and grease or other deleterious matter that would destroy or reduce bond. Reinforcement in reinforced concrete members shall not be connected by welding or coupling except in accordance with relevant ISS and with the previous approval of the Bank. Overlaps and

joints shall be staggered and located at points, along the spans where neither shear nor bending moment is maximum.

Cover:

Reinforcement shall have cover as shown on the R.C.C. drawings and where not specified the thickness of cover shall be as follows. Cement mortar blocks in C.M. 1:1 shall be used for making cover blocks.

- a) At each end of reinforcing bar not less than 25 mm. not less than twice the diameter of such rod or bar.
- b) For a longitudinal reinforcing bar in a column not less than the diameter of such rod or bar. In the case of columns of minimum of 20 mm. or under whose reinforcing bars do not exceed 13 mm. the cover of 25 mm. may be used.
- c) For longitudinal reinforcing bar in a column not less than 25 mm. not less than diameter of such rod or bar.
- d) For tensile, compressive, shear or other reinforcement in a slab not less than 13 mm. nor less than diameter of such reinforcement, and
- e) For any other reinforcement not less than 13 mm. not less than the diameter of such reinforcement.

B) WEIGH-BATCHING BASIS i.e. (DESIGN MIX CONCRETE):

Workmanship of Design Mix Concrete shall be carried out in accordance with I.S:456 – 2000 and any other I.S. Code is applicable.

TABLE – A

No	Nominal Mix.	Quantity of aggregates required per 50 kgs of cement.		Quantity of water required per 50 kgs of cement. Vibrated	
		Fine Cu.m.	Coarse Cu.m.	Unvibrated (For dry aggregate)	
1	1:1:2	0.035 (1.2 C.ft.)	0.070 (2.4 C.ft.)	22 lit. (4.8 Gal.)	27 lit. (6 Gal.)
2	1:1½:3	0.052 (1.8 C.ft.)	0.106 (3.6 C.ft.)	23 lit. (5 Gal.)	30 lit. (6 Gal.)
3	1:2:4	0.070 (2.4 C.ft.)	0.138 (4.8 C.ft.)	27 lit. (6 Gal.)	32 lit. (7 Gal.)
4	1:3:6	0.105 (3.6 C.ft.)	0.210 (7.2 C.ft.)	28 lit. (6.25 Gal.)	34 lit. (7.5 Gal.)
5	1:4:8	0.150 (4.8 C.ft.)	0.280 (9.6 C.ft.)	-- --	45 lit. (10 Gal.)

TABLE – B

No.	Type of Work	SLUMPS When vibrated When not vibrated
1.	Mass concrete in R.C.C. foundation footings.	2.5 cms. 5 cms. (1") (2")
2.	Beams, slabs, columns with simple reinforcement.	2.5 cms. to 5 cms. 5 cms. to 10 cms. (1" to 2") (2" to 4")
3.	Thin sections with congested reinforcement.	5 cms. to 10 cms. 10 cms. to 15 cms. (2" to 4") (4" to 6")

BRICK AND STONE MASONRY

General:

All brick work should be carried out as shown on the drawings with setbacks, projections, cuttings things, etc. Wherever the proportion of cement mortar has not been specifically mentioned, cement mortar in the proportion of 1:6 shall be used. Flat bricks arches shall be provided wherever required without any extra cost. Brick work shall be kept wet while in progress, till mortar has properly set. On holidays or when work is topped, top of all unfinished masonry shall be kept wet. Should the mortar become dry, white or powdery, for want of curing work shall be pulled down and rebuilt at the Contractor's expense.

Brick Work 1stClass:

Bricks shall be thoroughly cleaned, well wetted and soaked for at least twelve hours in fresh water before being used on the work. Bricks shall be of locally, available best quality. English bond shall be used throughout in walling. A good bond shall be maintained throughout the work, both laterally and transversely. In walling, the courses shall be kept perfectly horizontal and in plumb with the frogs facing upwards. Vertical joints shall not exceed 10 mm. thickness and shall be full of mortar. No broken bricks shall be used except as closers. After day's work all joints shall be raked to 12 mm. depth to provide for proper key to plastering.

Mortar used shall be as specified in respective items and every third course of brick work shall be flushed with mortar grout.

Whole of the masonry work shall be brought up at one uniform level throughout the structure; but where breaks are unavoidable, joints shall be made in good long steps. All junctions of walls and cross walls shall be carefully bounded into the main walls. The rate of laying masonry may be up to a height of 60 cm. per day if cement mortar is used and 45 cm. per day if lime mortar is used. Greater heights may be built only if permitted by the Bank. During rains, the work shall be carefully covered to prevent mortar from being washed away. Should any mortar or cement be washed away, the works shall be removed and rebuilt at the Contractor's expenses.

Bricks Work 2ndClass:

Shall be similar to 1st class brick work except that 2nd class bricks shall be used and joints shall be 10 mm. to 12 mm. thick.

Half Brick Masonry:

Shall be set in cement mortar as specified. Hoop iron bands of 2.5 cm. x 0.16 (1" x 1/16") shall be embedded in every fourth course with thick mortar band or 2 Nos. 6 mm. (1/4") dia. bars shall be used in every sixth course otherwise as specified under item.

RUBBLE MASONRY

General:

Stones shall be of the kind specified in the item and shall be from an approved quarry. Stones shall be well wetted before laying in position. The mortar shall be as specified in the item. Face stone shall not be less than in breadth than in height, it shall also tail into the work more than its height. Jambs of doors, windows and openings shall be formed with quoins. In case of battered walls, the courses on battered surface shall be at right angle to the batter.

Through stones or headers shall be laid in every course at a distance not exceeding 2 meters part and shall be staggered. They shall be in one piece for walls up to 1.5-meter width and shall be lap jointed in case of wall having thickness more than half meter. The face area of each header shall not be less than 0.50 sqm. 1:2:4 cement concrete may also be allowed where good length headers are not available. Headers shall be marked with oil paint for ready identification.

Height of quoins shall be same as that of the course. Length of quoins shall be 0.50 m. and shall be laid header and stretcher alternatively. Faces of quoins shall be fair dressed. No quoins stones shall be less than 0.30 cum. In content. Joints of masonry shall be raked out and unless otherwise stated, shall be raised cement pointed by using cement mortar 1:1 to all exposed surfaces. All masonry work shall be well watered for a period of seven days.

a) Coursed Rubble Masonry – First Sort :

Height of course shall not be less than 15 cm. and all courses shall be of uniform height. All stones in the course shall be of same height. In no case height of course shall be more than any of the course below it. Bed and sides shall be hammer or chisel dressed back from the face 75 mm. and 35 mm. respectively.

Faces of stones shall be hammer dressed and bushing shall not be more than 35 mm. Thickness of joints shall not be more than 10 mm. Stones shall break joints at least half the height of the course. Work on interior face shall be precisely the same, as on exterior face. Quoins shall be at least 0.5 m. long laid square on their beds and shall be fair dressed to a depth of at least 10 cm.

b) Uncoursed Rubble Masonry :

Stones shall be hammer dressed. Nearly fifty per cent of stones shall not be less than 0.30 cum. in content each, and twenty-five per cent of stone shall tail back in masonry by 40 cm or more. Stones shall be so arranged as to break joints as much as possible.

Long vertical joints shall be carefully avoided. Thickness of joints shall in no case exceed 12 mm.

Pillar offsets shall be properly dressed with hammer or chisel to form proper angle. Stones used for the backing shall be of fairly large size.

c) Random Rubble Masonry – First Sort :

Stones shall be roughly chisel dressed. They shall be solidly bedded in mortar. Height of stone shall not be more than width of face or length of tail. Stones shall be of equal size and so arranged

as to break joints as much as possible, avoiding long lines of horizontal or vertical joints. Quoins shall be same as described in Coursed Rubble Masonry – 1st Sort. All stones shall be carefully fitted. Thickness of face joint shall be not exceeded 25 mm. Edges of stones shall be chisel dressed for fitting in position properly.

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

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

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

Paneled Shutter:

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

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

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

Hardware Fittings:

Unless otherwise specified all hardware, fittings and fixtures shall be supplied by the employer free of charge. However, the cost of fixing fittings shall be included in the rate quoted. The fixing shall be done in the best workman-like manner in accordance with the manufactures

specifications. The Contractor shall be held responsible for working of all moving parts dependent on proper fixing. He will also be responsible for any breakage due to negligence during fixing or lack of protection before the building is handed over. The Contractor shall also take delivery of all hardware fittings etc., as and when supplied and arrange for safe storage etc.

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

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

Flush Doors:

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

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

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

In addition to internal lipping all doors shall have external lipping all round.

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

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

Frames shall be square and flat. Both the fixed and openable frames shall be constructed of sections which have been cut to length, mitred and electrically welded at corners. Subdividing bar units shall be tenoned and rivetted into the frames. All frames shall have the corners welded to a true right angle and welds shall be neatly cleaned off. Couplings, mouldings and weather bar shall be provided as directed by the Banks.

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

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

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

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

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

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

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

Rolling Shutters:

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

These shall be consisting of 8 gauges or as specified with 75 mm. (3") M.S. laths of best quality mild steel strips machine rolled and straightened with an effective bridge depth of 16 mm. (5/8") and shall have convex corrugation. These shall be interlocked together throughout their entire length with end locks. These shall be mounted on specially designed pipe shaft. The spring shall be of approved make coiled type. These shall be manufacture from tested high tensile spring steel wire or strip of adequate strength to balance the shutters in positions. The spring pipe, shaft etc., shall be supported on strong M.S. or malleable cast iron brackets.

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

Top cover of shaft, spring etc., shall be of the same material as that of lath.

For rolling shutter with wicket-gate, night latch shall be provided free of cost.

The shutter and cover etc., shall be painted with one coat of anti-corrosive paint and two coats of synthetic enamel paint of approved quality and shade.

Collapsible Steel Gate:

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

Wrought Iron Grilles:

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

Aluminum Doors, Windows, Ventilators & Partitions etc.:

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

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

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

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

All aluminum fabricated work shall be anodized to the British Standard 1616:1961 to give an anodized film of 25 micron.

The Contractor shall take to stack the fabricated frames etc., on site under cover. They shall be handled with care, stacked on edge on level bearers and supported evenly. Before erecting, the frames coming in contact with concrete, masonry, plaster of dissimilar metals shall be coated with a coat of Zinc Chromate conforming to IS: 104-1950. The Contractor shall cover all anodized finish work with a thick layer of clear transparent lacquer based on methacrylate or cellulose buy rate to protect the surface from wet cement during installation. This coating shall remove on completion.

Before handing over, the aluminum work shall be washed with mild solution of non-alkali soap and water.

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

FLOORING, SKIRTING, DADO AND STONE VENEERING

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

Indian Patent Stone:

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

Preparation of Surface:

Before the operation for laying topping is started the surface of base concrete shall be thoroughly cleaned of all dirt, loose particles coked mortar droppings and laitance if any, by scrubbing with coir or steel wire brush. Where the concrete has hardened so much that roughening of surface by wire brush is not possible, the surface shall have roughened by chipping or hacking at close intervals. The surface shall then be cleaned with water and kept wet for 12 hours and surplus water shall be removed by mopping before the topping is laid.

Laying:

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

Finishing the Surface:

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

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

When instead of 1:2:3 or 1:2.5:3.5 mix, 1:2:4 is specified the topping shall be rendered with 1:1 cement mortar with a suitable mineral pigment, if directed, instead of cement only. If specified in the Schedule of Quantities, the flooring shall be machine polished as per the Bank's instructions. Wherever the patent stone flooring is used as finishing on roof the joints shall be filled with an approved bitumastic filler in workman like manner.

Ironite Topping:

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

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

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

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

After tiles have been laid in a room or a day's fixing work is completed, surplus cement grout that may have come out of the joints may be wiped off gently and joints cleaned. A thin slurry of coloured cement matching to the colour of tiles shall be spread over it and rubbed so as to seal even a thinnest joint between the tiles and make it impervious and the flooring cured for 7 days. The tiles shall be polished and finished according to IS: 1443.

Dado, Skirting and Risers:

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

Shahabad / Tandur / Kotah / Cuddappa Stone Flooring:

The flooring shall be either with rough stone or machine cut and machine polished as specified in respective items and shall be of specified thickness and of approved quality and size, free from

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

In Dado, Skirting, Risers etc.:

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

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

The terrazzo / mosaic finish shall be laid on an under layer of thickness as specified in the respective items. The topping shall consist of a layer of marble chips of selected sizes, colour and design approved by Bank, mixed with cement with desire shade of pigment. For lighter shade mosaic. Terrazzo white cement shall be used and for neutral shade, grey cement shall be used. The proportion of terrazzo mix shall be three parts of cement one part of marble powder by weight. For every part of cement marble powder mix, the proportion of marble aggregate by volume shall be 1.5 parts unless otherwise specified. The topping shall be mixed and laid in panels as described in IS: 2114 and as per decorative designs prepared by Banks. The dividing strips of panels shall be Aluminum or as specified in the Schedule of Quantities. It shall be polished as specified in IS: 2114.

Broken Mosaic Flooring:

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

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

Broken China Mosaic:

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

Marble Flooring:

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

rough enough to provide a key for the mortar. No slab thinner than the specified thickness at its thinnest part. The sizes of the slabs shall be as specified in the respective items. The slabs shall be paid as described under mosaic tile flooring in every respect.

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

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

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

PLASTERING

Scaffolding:

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

Preparation of surface:

All put log holes in brick work and junction between concrete and brick work shall be properly filled in advance. Joints in brick work shall be raked about 10 mm. if not raked out while constructing brick masonry work and concrete surface hacked to provide the grip to the plaster, if not hacked earlier projecting burns of mortar formed due to gaps at joints in shuttering shall be removed. The surface shall be scrubbed clean with wire brush / coir brush to removed dirt, dust etc., and the surface thoroughly washed with clean water to remove efflorescence, grease and oil etc., and shall be kept wet for a minimum of six hours before application of plaster.

Neeru Plaster:

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

Sand-faced Plaster:

The surface shall be prepared as above.

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

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

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

Rough Cast Plaster:

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

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

Rough coat plaster with colour finish:

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

Water-proofing Treatment:

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

Type 1: Water-proofing of sunk portions of floor slabs for baths, W.C. and kitchen moories etc., in residential buildings, unless otherwise specified, shall be done as specified in the schedule and shall generally comprise of:

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

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

Type 2: The methodology for the waterproofing work for areas is as follows:

1. Surface preparation: Cleaning and preparation of surface with the help of wire brush or grinder. Wash the roof with clean water. Remove all loose concrete, grease, oil using wire brush, and scrubber. Repair and fill all cracks, joints and annular space, bore pack around G.I. pipes are sealed with non- shrink grout of approved company 10M or by preparing polymer modified mortar mixed with approved chemical URP in the ratio of 1:3 by adding polymer 10% by weight of the cement.
2. JOINT TREATMENT: Providing and applying 2 coats of acrylic polymer modified cementitious coating Dr. Fixit Fastflex of M/s Pidilite Industries having elongation at break 120%; 5 Bar resistance to positive water pressure, Adhesive Strength ASTM D 7234- 1 N/mm², Water Vapor Transmission as per ASTM E96 of 0.7 Perms and Crack bridging ability as per EN 1062-7 up to 2mm. Apply two coats of Dr. Fixit Fastflex slurry @ coverage of 0.42 - 0.50 M² / Kg of mix slurry. Allow the first coat to dry for 6 to 8 hours. Then, apply the second coat at a direction perpendicular to first coat. Apply the coating up to 300 mm height on vertical surfaces, sprinkle the quartz sand / fine sand over the second and final coat when it is still wet for vertical wall application for creating a firm key for plastering to ensure complete waterproofing. Allow the coating to air cure for 4-5 days.
3. BRICK BAT COBA FOR PROTECTION AND SLOPE: Providing & laying brickbat coba of minimum 120 mm thick laid over a bed of cement mortar (1:4), including integral waterproofing admixture, Approved chemical conforming to IS 2645:2003@ 200 ml per bag of cement. The surface should be neatly finished with the help of wooden / steel hand trowel with false marking of 300 mm x 300 mm square. The vertical surfaces of the adjoining walls are to be treated up to a height of 300mm including rounding of junction, groove cutting, pointing, coving etc. The curing should be done for 2 weeks.
4. CHINA MOSAIC OVER BRICK BAT COBA FOR TERRACE: Finishing the surface with 20 mm thick cement mortar of mix 1:4 (1cement:4 coarse sand) admixed with water proofing compound (conforming to IS: 2645) at the rate of 1 Kg per bag, Including laying in required position flooring of broken China Mosaic (broken pieces of China Chips) of approved colour and pattern including neat cement float, giving proper slops, compaction, curing, finishing preparing.

PAINTING

General:

Wherever scaffolding is necessary, it shall be double scaffolding.

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

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

White Washing:

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

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

White wash shall be applied in specified coats by using flat brushes or spray pumps. Each coat shall be allowed to dry before next coat is applied. If additional coats than what have been specified, are necessary to obtain uniform and smooth finish, it shall be given at no extra cost. The finished dry surface shall not show any signs of cracking and peeling nor shall it come off readily on the hand when rubbed.

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

Colour Wash:

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

Colour wash shall be applied as specified under white wash.

Dry Distemper:

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

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

Oil Bound Distemper:

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

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

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

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

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

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

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

Painting – Oil / Enamel / Plastic Emulsion etc.:

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

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

Dry Rubble Pitching:

The pitching shall consist of large stones, regular in shape, as far as possible, and no stone shall be less than 20 cm. x 20 cm. on face and depth shall be s specified in the item. The edges of the stone shall be dressed even and regular by hammer and shall be laid regularly and evenly braking joint as much as possible and shall be beaten down with heavy hammer so as to be embedded into the earth. The interstices between the stones shall be carefully filled in with stone chips, closely and firmly packed and well driven with hammer. Loose stone in packing shall on no account be allowed. The entire surface shall be thoroughly rammed, set in place and made compact with a log hammer so that the surface of entire pitching when completed shall be flat and even.

Water Bound Macadam:

6 cm. to 7.5 cm. size hand broken metal shall be spread over the prepared base to a thickness of 12 cm. The metal layer shall then be rolled and compacted by an 8 to 10-ton power roller. The thickness of the compacted layer after completing all the operations described below shall not be less than 7.5 cm.

Rolling shall start from edge of rod and proceed towards the crown in longitudinal strips overlapping on successive strips by at least one half the width of the rear wheel of the roller. The operation shall continue till no visible settlement of the metal or movement under the roller is observed. The gradient and camber shall be checked from time to time by means of level stakes,

strings camber board etc. Any depression or hump shall be corrected by removing completely the metal layer there at and rolling the same satisfactorily till refusal.

After the dry rolling is completed either murum or stone dust, grit or sand shall be spread. Moderate sprinkling of water and rolling shall be continued and stone dust shall again be spread if required till all voids are completely filled and movement of metal under the wheel ceases. If there is excess powder the same shall be removed by light brooming. The surface shall be checked for camber etc. The unevenness or undulations shall be rectified as required. The whole surface shall be then watered and extra powder added if required, brushed and rolled to obtain mosaic surface. This surface shall be maintained till an upper layer is laid.

The rate of spreading either hard core or earth shall not be less than 0.3 cum. to 0.35 cum. per 10 sqm. area. The first layer of either murum / stone / grit / sand shall not be spread over a wet or watered metal layer.

FULL – GROUT

Spreading of Metal:

2.5 cm. to 4 cm. size stone metal shall be spread to a loose thickness of 10 cm. And compacted to a thickness of about 7.5 cm. by 8-ton power roller.

Applied Bitumen:

Bitumen 30/40 penetration of approved manufacturer, heated to a temperature of 200 C. (400 F) shall be applied hot by means of a pressure distributor or hand spray at the rate of 65 kg. / 10 sqm.

Blinding the Surface:

Immediately following the application of bitumen and while it is still hot, key aggregate 12 mm. size shall be evenly spread at the rate of 0.2 cum. / 10 sqm. After spreading the aggregate, the whole area shall be thoroughly rolled with a six to eight-ton power roller. It is important that this rolling shall be done when the bitumen is still movement under the roller.

Protection of the Surface:

The surface shall be protected from all traffic.

SEMI – GROUT

Spreading of Metal:

2.5 cm. to 4 cm. size stone metal shall be spread to a loose thickness of 7.5 cm. thick and compacted to a thickness of about 5 cm. by 8 ton power roller.

Applied Bitumen:

Bitumen 30/40 penetration of approved manufacturer, heated to a temperature of 200 C. (400 F) shall be applied hot by means of a pressure distributor or hand spray at the rate of 25 kg. / 10 sqm.

Blinding the Surface:

As in Full–Grout.

Seal Coat (For Full Grout and Semi Grout Surface):

The surface shall be brushed free of any loose blindage, taking care that the brushing is not as severe as to remove the blindage but of the voids into which it is set. The surface shall then be

tested for depression, which shall be made up by painting with bitumen 30/40 penetration and blinding with aggregate of a size, equivalent to the depth of depression.

Application of Bitumen:

Bitumen 80/100 penetration of approved manufacturer, heated to a temperature of 177 to 190 C. (350 to 375 F) shall than be applied evenly to the road surface by means of a pressure distributor or hand-spray at the rate of 12.5 kg. / 10 sqm.

Blinding and Final Consolidation:

While the bitumen is still hot the surface shall be blinded evenly with stone aggregate of 6 mm. and down gauge size. The blindage shall be clean and not contain any dust and the rate of application shall be 0.1 cum. per 10 sqm.

After spreading of the blindage the road shall be given a final rolling with a eight ton power. Any soft or depressions detected at a later date shall be made up as directed by the Bank without any extra cost.

Premix Asphalt Carpet:

The rate shall include preparation of surface.

Preparation of Surface:

Clean the surface with wire brush and dust it with gunny bags. All pot holes, depressions and corrugations shall be made good and applying a tack coat of 80/100 penetration bitumen heated to 177 to 191 C. and the depressions made up with suitable size premix aggregate and consolidated by approved means. The surface shall then be painted with 80/100 penetration bitumen heated to 177 to 191 C. at the rate of 7.5 kgs. Per 10 sqm.

Preparation of Premix:

Premix shall be prepared as under:
2.5 cm. thick consolidated.

No	Item of Work	Per 100 Sft.	Per 1000 Sft.
1	Stone metal 2 cm. (3/4")	5 Cft.	15.25 Cum.
2	Stone chips 10 mm. (3/8")	3 Cft.	9 Cum.
3	Grit / sand (of desired grade and quality)	4 Cft.	12 Cum.
4	Asphalt 80/100 penetration from approved manufacturer heated to 177 C.	50 lbs.	2450 Kgs.
5	Solvent*	3 lbs.	150 Kgs.
6	Filler	Either clean lime stone powder or Hydrated lime in desired quantity	

4 cm. thick consolidated (to be done in 2 courses) Base Course (2.5 cm. Thick)

No	Item of Work	Per 100 Sft.	Per 1000 Sft.
1	Stone metal 2.5 cm. (1")	8 Cft.	24.5 Cum.
2	Stone chips 12 mm. (1/2")	4 Cft.	12 Cum.
3	Asphalt 60/70 penetration from approved manufacturer heated to 177 C.	36 lbs.	1760 Kgs.
4	Filler	As Above	

Wearing Course (1.5 cm. Thick)

No	Item of Work	Per 100 Sft.	Per 1000 Sft.
1	Stone metal 12 cm. (1/2")	5 Cft.	15.25 Cum.
2	Stone metal 6 mm. (1/4")	2 Cft.	6 Cum.
3	Asphalt 60/70 or 80/100 penetration from approved manufacturer heated to 177 C	22 lbs.	1075 Kgs.
4	Solvent*	1.5 Lbs.	65 Kgs
5	Filler	As Above	

The quantity of solvent may vary depending upon the local weather conditions. Use of solvent and its quantity shall be determined by the Banks before commencement of the work. Batches should be proportioned in accordance with the capacity of the mixer being used. Place clean stone metal and chips in the mixer. Add 2/3 of the batch of quantity of the hot asphalt at the designed temperature along with solvent and mix well. Add grit / sand and filler and continue mixing until the sand / grit is uniformly disturbed throughout the mix. then add remaining quantity of hot asphalt and continue mixing till the whole mix is uniform and homogenous. If desired, the sand / grit shall be heated before use. The mix shall then be carried to the place of deposition by means of wheel barrows.

The proportion suggested above should in the normal course give a dense mix. If necessary the proportions may be varied to obtain a dense mix, at the discretion of the Banks, at no extra cost.

Laying of Premix:

The mix shall be laid to a uniform thickness and to proper level, grade and camber and rolled with six to eight-ton power roller. The surface shall be checked for grade and camber during rolling and premix added and removed as required. The thickness shall be as specified after consolidation. When the base course is rolled the wearing, course is laid similarly and rolled to give a consolidated thickness as specified in the time.

Premixed Seal Coat:

After the premix carpet is laid the surface shall be sealed with premix grit prepared as described under wearing course above with a suitable cutback added. The premixed seal must be brushed in to fill the interstices, additional material being applied during rolling of found necessary. The quantity of premixed seal shall be approximately 0.15 cum. Per 10 cum. The surface shall be finally dusted with stone powder and rolled to give a smooth finish.

Road Concrete:

Specification for aggregate cement and concreting shall be as specified in the section under "Materials".

Before concreting, the surface shall be checked for the given profile. Wooden forms equal to the depth road slab thickness shall be erected to correct line and level and held by stakes driven into the ground along the outside edge at suitable intervals and two stakes being placed at each joint. Forms should be supported, strengthened or braced, whenever necessary so that they are able to prevent deformation and resist deformation under pressure of concrete or impact of tamping or vibrating. Working faces of all forms shall be thoroughly cleaned and oiled before use and forms which are used more than once, shall be carefully examined and trued if necessary before re-use.

Sub-grade shall be properly moistened before any concrete is deposited on it, care being taken to see that there are no standing pools of water. It may be advisable to have the sub grade watered 12 to 24 hours in advance of placing concrete. Concrete shall be laid in alternate bays not exceeding 30 sqm.

Concrete shall be deposited on sub-grade for the entire width of the slab and shall be kept sufficiently above the level of forms so that when tamped, it becomes a dense mass.

I.R.C. fabric reinforcement, if specified, shall be placed in correct position before commencing concreting.

The concrete shall be brought to the specified contour by means of heavy screed or tamper handles weighing not less than 10 kgs. / meter and not less than 7.5 cm. wide or surface vibrator if directed by the Banks. This screed or tamper may be steel. It shall be drawn with a saw in motion in combination with a series of lefts and drops. At transverse joint tamper shall be drawn not closer than one meter towards the joint and shall than be lifted and set down at the joint and drawn backwards away therefrom. Surplus concrete shall then be taken up with shovels and thrown ahead of the joint. Immediately after the screeding or tamping has been completed the surface shall be inspected for high and low spots and any needed correction made by adding or removing concrete. The entire surface shall then the floated with hand floats one meter long and 7.5 cm. wide and this operation must be performed from bridge provided across the slab. The surface shall be roughened by brooming.

The longitudinal and transverse edges of the slab shall be properly formed with suitable tools and the same should be rounded to 10 mm. radius.

The finished surface of the slab must conform to the grade, alignment and contours as directed and cured for fourteen days.

After curing period is over the joints shall be filled up with approved bitumastic filler. Unless otherwise specified, the rate shall include filling of joints as specified.

STORM WATER DRAINAGE

The work shall be carried out in accordance with rules and regulations of local Drainage Authority. Necessary provision for sight rails, boning staves etc. shall be made.

Tests regarding water-tightness of joint and cleanliness of pipes shall be performed before the trenches are covered.

Work of laying pipe lines and provided Manholes, Chambers, etc., shall include necessary excavation in any strata including old foundations of any description, refilling the trenches in layers of 20 cm. watering and consolidation.

Pipes:

All Hume pipes (Reinforced) shall conform to the relevant I.S.S. and shall be new, perfectly sound, free from cracks, cylindrical, straight and of specified nominal diameter. They shall be made of reinforced cement concrete manufactured by centrifugal or spun process and shall have even texture.

Trenches:

The trenches for laying shall be excavated to lines and levels as directed. The bed of the trench shall be truly and evenly dressed throughout from one change of grade to the next.

The gradient is to be set out by means of boning roads and should the required depth be exceeded at any point; the trench shall be brought to proper grade by means of cement or lime concrete of the specification of the bed concrete without any extra cost.

The bed of the trench, if in soft or made-up earth, shall be well watered and rammed and depressions thus formed filled with sand or other suitable materials as directed by the Banks.

If rock is met with, it will be removed to 15 cm. below the level of the pipe and the trench will be refilled with bed concrete, sand or other suitable material approved by the Banks.

The trench shall be kept free from water. Shoring and timbering shall be provided wherever required.

The width of trench shall be nominal diameter of the pipe plus 38 cm. but it shall not be less than 52 cm.

Laying of Pipes:

No concreting is ordinarily necessary. In cases where the soil is made up is very soft, concreting may be resorted to form the bed of the trench below the pipe, if directed by the Banks at no extra cost.

The pipes shall be carefully laid to levels and gradients shown in the plans and sections. Great care shall be taken to prevent sand etc., from entering the pipes. The pipes between two manholes shall be laid truly in straight lines without vertical or horizontal undulations. The body of the pipe shall for its entire length on an even bed in the trench and places shall be excavated to receive the collar for the purpose of jointing.

Jointing:

A few skeins of spun soaked in neat cement wash shall be inserted in the groove at the end of the pipe and the two adjoining pipes butted against each other. The collar shall then be slipped over the joint, covering equally both the pipes. Spun yarn soaked in neat cement wash shall be passed round the pipes and inserted in the joint by means of caulking tools from ends of the collar. More skeins of yarn shall be added and well rammed above.

The object of the yarn is to center the two ends of the pipes within the collar and to prevent the cement mortar of the joint penetrating into the pipes.

Cement mortar with one part of cement and one part of sand shall be slightly moistened and must on no account be soft or sloppy and shall be carefully inserted by hand in to the joint and more cement mortar added until the space of the joint has been filled completely with tightly caulked mortar. The joint shall be finished off neatly outside the collar on both sides at an angle of 45.

Any surplus mortar projecting inside the joint is to be removed and to guard against any such projections sack or gunny bag shall be drawn past each joint after completion. Cement mortar joint shall be cured at least for seven days.

Testing:

All joints shall be tested to a head of 60 cm. of water above the top of the highest pipe between two manholes.

The lowest end of the pipe shall be plugged watertight. Water shall then be filled in manhole at the upper end of the line.

The depth of water in the manhole shall be 60 cm. plus the diameter of the pipe. The joint shall then be examined. Any joint found leaking or sweating shall be remade and embedded into 15 cm. layer of cement concrete (1:2:4) 30 cm. in length and the joint retested without any extra cost.

Manholes:

Size of manholes shall be as specified in the item and the sizes specified shall be internal size of the manhole. The work shall be done strictly as per standard drawing and specifications.

Bed Concrete:

Shall be in 1:4:8 cement concrete 23 cm. (9") thick.

Brick Work:

Shall be with best quality local bricks and proportion of mortar shall be 1:4 unless otherwise specified.

Plaster:

Inside of the walls shall be plastered with 12 mm. thick cement plaster 1:3 and finished with floating coat of neat cement. The external face shall be pointed with 1:3 cement mortar.

Benching:

Channels and benching shall be done in cement concrete 1:2:4 rendered smooth with neat cement.

Foot Rests:

M.S. square rods of 22 mm. (7/8") diameter or C.I. rungs shall be embedded in masonry where the depth of manhole exceeds one meter and they shall be fixed 35 cm. apart and projecting 11 cm. from the wall. Foot rests shall be painted with bitumen as directed.

Manhole Covers:

Covers for manhole in the road proper shall not be less than 200 kgs. on footpaths and backyards. Lightweight covers shall be used whose weight for 45 cm. dia. shall not be less than 58 kgs. and that of 90 cm. x 45 cm. or 61 cm. x 45 cm. 90 kgs.

Drop Connection:

The case of drop connection C.I. pipes shall be provided with heel rest bend at the bottom and bend with access door at the top for cleaning purposes. The pipe shall be encased in 1:3:6 plain concrete.

GLAZIER:

All glass to be of approved manufacturer complying with IS 3548-1966 as per approved quality and sample to be of the selective qualities specified and free from bubbles, smoke, air holes and other defects.

Polished plate glass shall be "glazing glass" (G. G.) quality and that for mirrors shall be "silvering quality" (S.G.) conforming to IS 3438-1965 or as per approved sample and quality.

The compound for glazing to metal is to be a special non-hardening compound manufactured for the purpose and of a brand and quality approved by the Competent Authority.

While cutting glass, proper allowance be made for expansion. Each square of glazing to be in one whole sheet. On completion of work clean all glass inside and cut, replace all cracked scratched and broken panes and leave in good condition.

Transparent Coloured Polyurethane (Melamine)

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

Application:

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

Miscellaneous Items of Work:

The rates quoted by the Contractor for all miscellaneous items of work viz. Cooking platforms, mories, built-in cupboards, counters, partitions, railings, electrical meter, switchboard cupboards, etc., shall be for the work as described in the schedule of quantities and as show in detailed drawings and shall be to the entire satisfaction of the Banks.

METHODOLGY FOR REPAIRS OF RCC ELEMENTS

(PMM & Micro Concrete Works)

- A.** The methodology for the repair of spalled/ distressed concrete members/ areas is as follows:
1. **Surface preparation:** The loose dilapidated concrete shall be removed from the substrate using mechanical breakers. The concrete shall be removed up to a minimum depth of 10mm beyond steel reinforcement. The chipping should continue till sound concrete is available. The chipped concrete shall be cleaned using high pressure water jet with clean potable water. This would make the substrate free from all impurities and unwanted organic deposits. In case of slabs the edges shall be cut to a minimum depth of 20mm to avoid formation of feather edges.
 2. **Reinforcement treatment :**
 - a) Thoroughly clean the corroded reinforcement/ steel rebar by wire brush or rotary grinder. Apply chemical rust remover over the reinforcement surface thoroughly all around the circumference and along the full length of rusted reinforcement. After 24 hours of its application; the surface shall be cleaned with wire brush and all loose particles removed. It shall be washed with water thoroughly and allowed to dry.
 - b) Apply two coats of interpenetrating polymer network for rebars: IP Net RB epoxy coating on a coating is for old as well as newly provided steel. This system (Interpenetrating polymer network system for rebars: IP Net RB) once applied on steel shall provide extended protection against future carbonation and chloride attack on steel.
 - c) Carry out application of Bi-polar migratory corrosion inhibitor EPCO KP 100 on concrete surface by brush in two coats. This inhibitor has migratory kind of property which permits the material to migrate to a virtual extent of 60mm, through pores of concrete, inhibiting the corrosion and de-passivating the Electro-chemical reaction. It has property to attack anode as well as cathode, which is purely alkaline in nature (ph-9.5), so it has no carcinogen activity with concrete. Material shall have evaluated test reports indicating significant reduction in corrosion rate after minimum 90 thermal cycles at 60% centigrade followed by 8 weeks of accelerated corrosion indicative of its suitability for tropical applications.
 3. **Provision of additional Reinforcement:** Wherever the reinforcement loss is heavy (>30%) or reinforcement is lost completely, additional rebars of same diameter shall be provided with the help of shear connectors/ welding/ links. The shear connectors are typically provided in the repair area in a grid pattern 200mmX 200mm by drilling holes of 10-12mm diameter holes shall be grouted with epoxy acrylate based anchoring material.
 4. **Injection Grouting to arrest porosity:** Holes should be drilled in the concrete where the leakage and cracks are observed to fix injection packers. The packers are fixed using Epoxy putty on the surface. Injection is done using hydro swelling, water based, low viscous, thermo-setting resin based on vinyl metha- acrylate chemistry, to fill the pores within the concrete.
 5. **Application of boning agent:** The prepared and treated concrete substrate to be repaired shall be given a bonding coat using two components, epoxy bonding agent having a long open time. The bonding agent is applied using either by brush or roller. The bonding agent application shall be done to only that much area that can be covered within the open time. Under normal conditions, bonding agent has an open time of at least 3hrs before it loose its tackiness. However a small patch shall be applied to confirm the same before applying

over the entire area since the open time varies with ambient conditions. In case the bonding agent is found to be dried, a further coat of bonding agent shall be given.

6. **Refurbishment of Damaged concrete:** The primed concrete substrate shall be repaired with single component, fiber reinforced, dual shrinkage compensated, cementitious, thixotropic repair mortar by hand and trowel application.

The mortar shall be prepared by mixing the powder with water at the recommended water powder ratio initially add 80% of the water in the mixing bucket, mix slowly adding powder component using slow speed paddle mixer. Add remaining amount of water and continue mixing for 2 minutes till lump free paste consistency is achieved.

The mixed mortar shall be used within its workable time and no further addition of water for workability is allowed. To enable this mix only required amount of powder which can be applied within its workable time.

The mortar mixed shall be applied initially by hand carefully pressing the same against the concrete surface and filling all the corners of the repair area starting from centre of damaged area.

The mortar shall be applied in layers of 50mm on vertical surface and 30mm on overhead surface. The final layer shall be finished with steel trowel to make it in line with existing concrete surface.

In case further layers of mortar were not applied immediately, then the surface shall be made rough using steel trowel to provide mechanical key further layers of mortars. The initial dried layer shall be saturated with water prior to application of further layers.

7. **Curing:** The repaired area shall be kept wet by covering with wet Hessian cloth for a minimum period of 7 days for ceiling its water should be sprinkled continuously for minimum 7 days.
8. **Polymer based plaster over repaired mortar:** The entire surface shall be plastered with polymer mix with cement mortar of 1:5:15.

Alternatively: The repair of RCC elements using Micro concrete in place of Polymer Modified Mortar is also recommended for making of concrete more than 25mm.

B. The methodology for recasting of slabs is as follows:

1. **Surface preparation:** The loose dilapidated concrete shall be removed from the substrate using mechanical breakers. The concrete shall be removed. The chipped concrete shall be cleaned using high pressure water jet with clean potable water. This would make the substrate free from all impurities and unwanted organic deposits. In case of slabs the edges shall be cut to a minimum depth of 20mm to avoid formation of feather edges.
2. **Slab Pre-concreting Checks:** There are many checks that need to be performed prior to concreting of reinforced concrete slab.
3. **Checking Slab Formwork:** Check whether the formwork is fixed properly or not for example sleeves and supports. Damaged materials employed for formwork or shutter should not be utilized. All formwork surfaces in contact with concrete need to be treated with shuttering oil and dampen with water sometime prior to concrete placement. Check the level of the projected top surface of the slab and place level strips if necessary to mark the exact level.
4. **Re-baring or Reinforcement work:** Rebars of same diameter shall be provided with the help of shear connectors/ welding/ links. The shear connectors are typically provided in the

repair area in a grid pattern 200mmX 200mm by drilling holes of 10-12mm diameter holes shall be grouted with epoxy acrylate based anchoring material using HILTI.

5. Checking slab reinforcement work :Check and approve that reinforcements are fixed as per the approved drawings.Examine reinforcement spacing (including vertical and horizontal spacing) and cover.Ensure that adequate support for reinforcements are provided to prevent any movement during concreting process.Loose ties along the splices of reinforcement bars must be tightened again.Free end of binding wires shall be bended inward.Reinforcements are fixed as per the approved drawings.Examine reinforcement spacing (including vertical and horizontal spacing) and cover. Ensure that adequate support for reinforcements are provided to prevent any movement during concreting process. Loose ties along the splices of reinforcement bars must be tightened again. Free end of binding wires shall be bended inward.
6. Slab Concreting Work Procedure
 - a. Providing Construction Joint: The construction joint shall be pre-decided and fixed prior to start of the concreting. It is planned to have two construction joints for main building as decided. In case of major break down of the Batching plant, the additional Construction joint may be left. The location of the construction joint shall be at the one-third span. Construction joint shall be straight and have profile of 'L'shape so that successive layer of concrete shall be perfectly bonded with previous laid layer. Preparation of construction joint shall include roughening, removing all laitance adhering to the joint and application of thick slurry before start of the new concrete.
 - b. Pouring of Concrete :Proper walkways/platforms shall be arranged so that the supports of the pipeline and manpower are not directly stand on reinforcement.Concrete of grade M-25shall be produced from batching plant or mixed at and directly pumped to the location of concrete placement through the pipeline or manually. The pouring sequence shall be from grid A towards construction joint. Since the grade of concrete for column is M-40 and surrounding concrete is M25, sufficient offset around column shall be casted with M-40.Sufficient carpenters along with supervisor shall inspect the behaviour of supports below the slab during the casting. Extra Props shall be stocked below slab to provide additional supports in case of any failure of supports.
 - c. Finishing Concrete Surface: Use the power float for the smooth finish surface purpose. The casted area or member shall be protected by placing barricade to prevent plants and machineries damaged the concrete. Concrete pour card shall be filled by Quality Engineer and to be submitted to the Engineer including concrete delivery notes, this task will be done whenever required.
 - d. Curing Concrete: The curing shall be started immediately after thumb set of the concrete laid. Hessian clothe /Plastic shall be covered over the set concrete to reduce moisture evaporation from the concrete during hardening and thus to minimize shrinkage crazy cracks. These cracks are inheriting property of the concrete specially appears during casting of flat surfaces. Final curing shall be done by ponding and stacking water for minimum period of 7 days. Form work shall be removed after 3-4 days after inspection of Engineer.

C - METHODOLOGY FOR STRENGTHNING OF SLAB BY USING PURE MICRO CONCRETE

a	Supporting of beams adjacent to column from all 4 sides by providing wooden runner perpendicular to beam main reinforcement (If required support slab by any on direction of runner).
b	Chipping entire plaster of column by chipper machine of 6kg

c	Checking concrete by doing tapping concrete surface by hammer also checking of hairline cracks & honeycombed area.
d	Chipping out debonded,cracked concrete also removing loose pockets it is there.
e	Cleaning of exposed reinforcement surface by hard core wire brush & tachha.Removing rust scales from existing reinforcement.
f	Application of Alkaline base Rust Remover of any approved brand in tender documents.
g	Allow the surface for air cure for 24 hours
h	Wash entire surface by water & allow to dry surface
i	Fixing of New reinforcement by using Lock fix of 'FOSROC' make
j	Application of 2 coats of Zinc rich primer on exposed reinforcement. The duration between 2 coats should be minimum 4 hours.
k	Application of Migratory corrosion inhibitor on entire concrete surface
l	Making 4 holes in concrete slab (grid) and pouring pure micro without addition of metal.(At some grid practically 4 core are not possible so we prefer 3 holes in that grid.)
m	Deshttering of slab & hacking surface by using Tachha
n	Curing Entire surface by 7 days
o	Application of plaster upto 15mm thick on slab & beam surface by using river sand & cement.
p	Water cure entire plastered surface by 7 days.

POUR CARD						
Name of Work :						
Location :						
S.No.	Activity Detail	Yes	No	Sign of Contractor' s Engineer	Sign of Bank	Remarks
1	Fixing of MS Support					
2	Removing & cleaning of existing concrete carefully					

3	Applying two coats of alkaline rust converting primer-FEOVERT					
4	Applying anti corrosive treatment to reinforcements by ipnetrb / nitozinc primer.					
5	Application of corrosion inhibitor (EPCO kp 100) two coat to concrete surface					
6	Fixing of steel reinforcement					
7	Fixing of Shear key					
8	Fixing of cover to the steel					
9	Providing and applying structural grade epoxy latex bond coat of EPIBOND 21lp					
10	Checking shuttering line level					
11	Mixing of Micro concrete by using stirrer (Pure Micro concrete)					

INDICATIVE CHECK LIST

Project:

Column/Beam/Ceiling/Floor:

Check List No

Sr. No	Description	Date	Completed		Area as per Tender Item Unit	Checked by	
			Yes	No		Contractor's Sign.	Client Sign
1	Fixing MS props Supports						
2	Tapping Work						
3	Breaking Work						

4	Chipping loose concrete						
5	Application of Rust removal of existing bars						
6	Application of Anti Corrosive coating to existing bars						
7	Application of 2 coats KP 100 on entire concrete surface						
8	Fixing Steel Work						
a)	Steel Fixing work						
b)	Shear Connector fixing						
9	Grouting Work (Epoxy grout)						
10	Application of Polymer modified mortar						
a)	Upto 15mm thick						
b)	Beyond 15 mm to 30mm thick						
11	Application of corrosion inhibitor to existing surface						
12	Application of Epibond to concrete surface column						
13	Shuttering column by using waterproof plywood shuttering						
14	Micro Concrete work						
15	Plaster 1st Coat & 2nd Coat						

MEASUREMENT FORM

M/s _____								
Name of the Work :						Page No.:		
Date :								
S.No.	Description	Unit	No.	Length	Breadth	H/Depth	Qty.	Remarks

MATERIAL TEST LIST

The Contractors will have to take necessary material test as per I.S. code which is applicable, at their own cost for the following materials or any other material using in construction work periodically or as and when required by the Banks / Consulting Engineer.

The materials should be got tested in an approved Laboratory as per IS standard and test reports in duplicate should be submitted to the Bank’s Office.

Sr. No	Material	Tests to be Carried out
1	Sand	a) Silt Content. b) Bulking. c) Particle size distribution. d) Or as directed.
2	Stone Aggregates	a) Soft and deleterious Materail

		b) Particle Size Distribution
3	Cement Concrete RCC Mix Design	a) Slump
		b) Cube Strength
		c) Or as per IS456-2000
4	Bricks/Blocks	a) Dimensions
		b) Water absorption and efflorescence.
		c) Compressive Strength
5	Timber	Moisture
6	Ceramic/Vitrified Floor Tiles	a) Transverse Test
		b) Water absorption
		c) Abrasion Test
7	Steel	a) Tensile Strength
		b) Ductility

Note: The Contractor will have to take necessary material test other than above test as per relevant I.S. code, if required and as directed by BANK.

MATERIAL TESTING FREQUENCY CHART

A chart showing the recommended time and quantity scheduled for conducting test on various building materials is given. Please ensure that tests are carried out according to the above guidelines. Contractor's rate should include for necessary expenditure for testing including transport of samples of following tests.

No	Material	Test	Test Procedure	Minimum Quantity	Frequency
1	Sand	a) Silt Content b) Bulking c) Particle size distribution	Field Field Field	20 Cum 20 Cum 40 Cum	20 Cum or part thereof --- Do --- Every 40 Cum required for RCC work

2	Stone	a) Soft and Deleterious b) Particle size distribution	IS - 2336 Part – II Field	45 Cum.	As required. Every 45 Cum part thereof for RC work. For rest of work as desired.
3	Cement Concrete or RCC	Slump Cube Strength	Field Field / Laboratory	20 Cum slab, beams and connected columns 5 Cum in columns	Once a day or as desired. Every 20 Cum of a day's concrete. Every 5 Cum column concrete
4	Steel	a) Tensile Strength	IS - 1529	20 tonnes	Every 20 tonnes or part.
		b) Bend Strength	---- Do ----	---- Do ----	---- Do ----
5	Lime	Chemical and Physical properties of lime.	IS - 6932	5 M.T.	10 M.T. or part thereof
6	Bricks	Dimensions Water absorption Efflorescence compressive strength		Designation 100 75) 50) 40,000 35) --- Do --- 100-40,000 75) 50) 100,000 35)	Every 40,000 or part thereof. Every 100,000 or part thereof one test for source of 40,000 or part thereof. Two tests for 1st lot of 40,000 and one test later for every 40,000
					and part thereof.
7	Brick Tiles	Compressive Strength Efflorescence		40,000 40,000	For 40,000 or part. One test per Source.
8	Marble	Moisture absorption Mhos scale hardness	IS – 1124 – 1974 IS – 1706 – 1972	Rs.10,000/- Value	Rs. 10,000/- or part thereof. (Value)

9	Timber	Moisture	IS- 11215 – 1985	1 Cum.	Every one Cum and part.
10	Aluminum door or window fitting	Aluminum door or window fitting	IS – 5523 – 1969	Rs. 5,000/-	Rs. 10,000/- or part thereof.
11	Ceramic Tiles / Vitrify Tiles / Designer pre cast Concrete Tiles and interlocking paver block	a) Transverse Strength b) Water Absorption c) Abrasion test	IS-1237 --- Do --- --- Do ---	200 Tiles 200 Tiles 200 Tiles	2000 Tiles Part there off --- Do --- --- Do ---
12	Flush Door	a) End Immersion b) Knife c) Adhesion	IS 2207	22 – 65 66 – 100 101 – 180 181 – 300 301 – 500 501 – above	Destructive tests No. of shutters. 1 2 2 3 4 5
13	Tar felt Type3 Grade - I	Conform to I.S. 1322 – 1970			One Test
14	Pig Lead	Conform to I.S. 782 – 1978			One Test
15	RCC Mix Design	All test as per I.S.:456-2000		As Directed	As Directed

Note: The Contractor will have to take necessary material test other than above test as per I.S. code for above material or other than above material, if required and as directed by the BANK / SBI as his own cost.

THEORETICAL CEMENT CONSUMPTION STATEMENT (BASE CPWD)

No	Description of item of work.	Quantity of cement to be used per Unit Quantity of work.	Unit.
1	Cement Concrete (Cast in Situ) Plain or Reinforced.		
a.	1:1:2 (1 Cement : 1 Sand :2 Graded Aggregate).	12.20 Bags.	Cubic Meter
b.	1:1.5:3(1 Cement:1.5 sand:3 Graded Aggregate).	8.00 Bags.	Cubic Meter
c.	1:2:4 (1 Cement : 2 Sand :4 Graded Aggregate).	6.40 Bags.	Cubic Meter
d.	1:3:6 (1 Cement : 3 Sand :6 Graded Aggregate).	4.40 Bags.	Cubic Meter
e.	1:4:8 (1 Cement : 4 Sand :8 Graded Aggregate).	3.40 Bags.	Cubic Meter
f.	1:5:10(1 Cement: 5 Sand :10 Graded Aggregate).	2.60 Bags.	Cubic Meter

g.	Providing and laying cement concrete 1:2:4 (1 Cement: 2 Coarse Sand: 4 Graded Aggregate of 20 mm. nominal size) including finishing exposed surface with 6 mm. thick cement mortar 1:3 (1 Cement: 3 Fine Sand). Kerbs, Steps, and the like.	7.02 Bags.	Cubic Meter
h.	String or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills and the like moldings in cornices, window sills etc.	7.62 Bags.	Cubic Meter
1.1	Ready Mix/Designmix Concrete		
	M20 & Above Grades	As per Approved Design Mix /RMC Batch Report	As per Approved Design Mix /RMC Batch Report
2.	Cement Mortar		
a.	1:1 (1Cement: 1 Sand)	20.40 Bags.	Cubic Meter
b.	1:2 (1Cement: 2 Sand)	13.60 Bags.	Cubic Meter
c.	1:3 (1Cement: 3 Sand)	10.20 Bags.	Cubic Meter
d.	1:4 (1Cement: 4 Sand)	7.60 Bags.	Cubic Meter
e.	1:5 (1Cement: 5 Sand)	6.20 Bags.	Cubic Meter
f.	1:6 (1Cement: 6 Sand)	5.00 Bags.	Cubic Meter
g.	1:2 (1Cement: 2 Stone Dust)	13.60 Bags.	Cubic Meter
h.	1:2 (1Cement: 2 Marble Dust)	13.60 Bags.	Cubic Meter
i.	1:5 (1Cement: 5 Marble Dust)	6.20 Bags.	Cubic Meter
j.	1:1:3 (1Cement: 1 Marble Dust: 3 Stone Dust)	7.60 Bags.	Cubic Meter
k.	White Cement Mortar 1:2	13.60 Bags.	Cubic Meter
	(1 White Cement : 2 Marble Dust)		
l.	White Cement Mortar 1:3 (1 White Cement : 3 Marble Dust)	10.20 Bags.	Cubic Meter
m.	White Cement Mortar 1:5 (1 White Cement : 5 Marble Dust)	6.20 Bags.	Cubic Meter
3.	Cement Lime Mortar		
a.	1:1:3 (1 Cement:1 Lime putty:3 Sand)	8.20 Bags.	Cubic Meter
b.	1:1:6 (1 Cement:1 Lime putty:6 Sand)	5.00 Bags.	Cubic Meter
4.	Brick Work in All Classes		
a.	In Cement Mortar 1:3 (1 Cement:3 Sand)	2.56 Bags.	Cubic Meter
b.	In Cement Mortar 1:4 (1 Cement:4 Sand)	1.90 Bags.	Cubic Meter

c.	In Cement Mortar 1:5 (1 Cement:5 Sand)	1.56 Bags.	Cubic Meter
d.	In Cement Mortar 1:6 (1 Cement:6 Sand)	1.24 Bags.	Cubic Meter
5.	Half Brick Work in All Classes		
a.	In Cement Mortar 1:3 (1 Cement:3 Sand) With or without hoop iron.	28.56 Bags per 100 Square Meter	
b.	In Cement Mortar 1:4 (1 Cement:4 Sand)	21.28 Bags per 100 Square Meter	
c.	In Cement Mortar 1:5 (1 Cement:5 Sand)	14.50 Bags per 100 Square Meter	
d.	Molding and cornices in brick masonry in cement mortar 1:4 Cement:4 Sand) Joining old brick work with new brick work.	0.18 Bags per 100 Square Meter per cm. Girth	
	a) Old Brick in metric or FPS. System with new brick work in metric system in cement mortar 1:4 (1 Cement : 4 Sand).	4.20 Bags per 100 Square Meter	
	b) Old Brick work in FPS. System with new brick work in cement mortar 1:4 (1 Cement: 4 Sand).	5.44 Bags per 100 Square Meter	
6.	Random Rubble Masonry		
a.	Cement Mortar 1:6 (1 Cement : 6 Sand)	1.70 Bags.	Cubic Meter
b.	Cement Lime Mortar 1:1:8 (1 Cement : 1 Lime Putty : 8 Sand)	1.32 Bags.	Cubic Meter
7.	Coursed Rubble Masonry		
a.	Cement Mortar 1:6 (1 Cement : 6 Sand)	1.50 Bags.	Cubic Meter
8.	Ashlar Masonry In plain ashlar punched (ordinary) in superstructure in cement mortar 1:6 (1 Cement : 6 Sand) including pointing with	1.08 Bags.	Cubic Meter
	cement mortar 1:2 (1Cement:6 Stone dust) with an admixture of pigment matching the stone shade.		

9.	Stone Veneering Work For wall lining etc., average thickness 40 mm. to 170 mm. in cement lime mortar 1:1:6 (1Cement:1 Lime Putty:6 Sand) including pointing in White cement mortar 1:2 (1 White Cement : 2 Stone Dust) with an admixture of pigment matching the stone shade.	17.50 Bags per 100 Square Meter	
10.	Marble work in steps jambs, walls, pillars and other plain work in cement mortar 1:4 (1 Cement: 4 Sand) including pointing in White cement mortar 1:2 (1 Cement: 2 Marble dust).	0.136 Bags per 1.52 Bags per	Cubic Meter (Grey Cement) Cubic Meter (White Cement)
11.	Marble work in steps jambs, walls, pillars and other plain work in cement mortar 1:4 (1 Cement: 4 Sand) including pointing in cement mortar (1 Cement: 2 Marble dust).	1.66 Bags per	Cubic Meter
12.	Marble work for wall lining (Veneer) work) 2.5 cm. thick in cement mortar 1:3 (1 Cement: 3 Sand) including pointing in White cement mortar 1:2 (1 Cement: 2 Marble dust).	14.28 Bags per 100 Square Metre (Grey Cement) 3.40 Bags per 100 Square Metre (White Cement)	
13.	Marble work for wall lining (Veneer) work) 2.5 cm. thick in cement mortar 1:3 (1 Cement: 3 Sand) including pointing in cement mortar 1:2 (1 Cement: 2 Marble dust).	17.68 Bags per	Square Meter
14.	Marble work for wall lining (Veneer) work) 4 cm. thick in cement mortar 1:3 (1 Cement: 3 Sand) including pointing in White cement mortar 1:2 (1 Cement: 2 Marble dust).	20.40 Bags per 100 Square Metre. (Grey Cement) 3.40 Bags per 100 Square Metre (White Cement)	
15.	Marble work for wall lining (Veneer) work) 4 cm. thick in cement mortar 1:3 (1 Cement: 3 Sand) including pointing in cement mortar 1:2 (1 Cement: 2 Marble dust).	23.80 Bags per 100 Square Metre.	
16.	Cement Concrete Flooring		

	Flooring 1:2:4 (1 Cement : 2 Sand : 4 Graded Stone Aggregate) finished with a floating coat of neat cement including cement slurry rounding of edges and strips etc., but excluding cost of nosing of steps etc., complete.		
a.	25 mm. thick with 20 mm. nominal size stone aggregate.	0.244 Bags	Square Meter
b.	40 mm. thick with 20 mm. nominal size stone aggregate.	0.34 Bags	Square Meter
c.	50 mm. thick with 20 mm. nominal size stone aggregate.	0.404 Bags	Square Meter
d.	75 mm. thick with 20 mm. nominal size stone aggregate.	0.564 Bags	Square Meter
17.	Cement Plaster Skirting (upto 30 cm. height) with cement mortar 1:3 (1 Cement : 3 Coarse Sand) finished with a floating coat of neat cement including rounding of junctions with floor, including slurry complete.		
a.	18 mm. thick.	0.32 Bags	Square Meter
b.	21 mm. thick.	0.35 Bags	Square Meter
18.	Pavement (25 to 50 mm. thick) with 1:2:4 (1 Cement: 2 Coarse Sand: 4 Graded Stone Aggregate 20 mm. nominal size) including finishing complete.	6.80 Bags	Cubic Meter
19.	Terrazzo Flooring 40 mm. thick marble chips flooring rubbed and polished to granolithic finish, under layer 34 mm. thick cement concrete 1:2:4 (1 Cement: 2 Coarse Sand: 4 Graded Stone Aggregate 12.5 mm. nominal size) and top layer 6 mm. thick with white, black or white and black marble chips of size 1 mm. to 4 mm. nominal size laid in cement marble powder 3:1 mix. (3 Cement : 1 Marble Powder) by weight in proportion of 4:7 (4 Cement marble powder) by weight in marble powder mix:7 Marble chips) by volume including cement slurry etc., complete.		

a.	Dark shade / Light shade pigment with ordinary cement.	0.339 Bags per	Square Meter
b.	Light shade pigment with white	0.258 Bags per	Square Meter

	Cement.	0.081 Bags per	(Grey Cement) (White Cement)
c.	Medium shade pigment with approximately 50% white cement and 50% ordinary cement.	0.298 Bags Per 0.0440 Bags per	Square Meter (Grey Cement) (White Cement)
20	40 mm. thick marble chips flooring rubbed and polished to granolithic finish, under layer 31 mm. thick cement concrete 1:2:4 (1 Cement: 2 Coarse Sand : 4 Graded Stone Aggregate 12.5 mm. nominal size) and top layer 9 mm. thick marble chips, chips, size 4 to 7 mm. size, laid in cement marble powder mix. 3:1) (3 Cement : 1 Marble Powder) by volume in proportion of 4:7 (4 Cement marble powder mix. 7 Marble chips) by volume Including cement slurry etc., complete.		
a.	Dark shade / Light shade pigment with ordinary cement.	0.357 Bags	Square Meter
b.	Light shade pigment with white cement.	0.241 Bags 0.116 Bags	Square Meter (Grey Cement) Square Meter (White Cement)
c.	Medium shade pigment with approximately 50% white cement and 50% ordinary cement.	0.299 Bags 0.058 Bags	Square Meter (Grey Cement) Square Meter (White Cement)
21	40 mm. thick marble chips flooring rubbed and polished to granolithic finish, under layer 28 mm. thick cement concrete 1:2:4 (1 Cement: 2 Coarse Sand : 4 Graded Stone Aggregate 12.5 mm. nominal size) and top layer 9 mm. thick marble chips, chips, sizes 7 mm to 10 mm. nominal size, laid in cement marble powder mix. 3:1) by weight in proportion of 2:3 (2 Cement Marble Powder mix. 3 Marble Chips) by volume including cement slurry etc., complete.		

a.	Dark or Light shade pigments with grey cement.	0.381 Bags	Square Meter
b.	Light shade pigment or without any pigment with white cement.	0.219 Bags 0.162 Bags	Square Meter (Grey Cement) Square Meter

			(White Cement)
c.	Medium shade pigment with approximately 50% grey cement and 50% white cement.	0.300 Bags 0.081 Bags	S.M. (Grey Cement) S.M.(White Cement)
22	Marble chips skirting (up to 300 mm high) rubbed and polished to granolithic finish top layer 6 mm. thick marble chips of sizes from smallest to 4 mm. nominal size laid to cement marble powder mix. 3:1 (3 Cement: 1 Marble Powder mix. By weight in proportion of 4:7 (4 Cement Marble Powder mix: 7 marble chips) by volume including cement slurry complete.		
a.	18 mm. thick with under layer 12 mm. thick cement plaster 1:3 (1 Cement: 3 Course Sand) dark or light shade pigment with grey cement.	0.298 Bags	Square Meter
b.	Light shade pigment or no pigment with cement.	0.217 Bags Per S 0.081 Bags Per	quare Meter (Grey Cement) quare Meter (White Cement)
c.	Medium shade colour pigment with 50% grey cement and 50% white cement.	0.258 Bags Per 0.0406 Bags Per Squ	Square Meter (Grey Cement) are Meter (White Cement)
d.	21 mm. thick with under layer 15 mm. thick cement plaster 1:3 (1 Cement: 3 Course Sand) dark or light shade pigment with grey cement.	0.327 Bags	Square Meter
e.	Light shade pigment or no pigment with white cement.	0.246 Bags Per 0.081 Bags Per Cement)	Square Meter (Grey Cement) quare Meter (White Cement)
f.	Medium shade pigment with 50% grey cement and 50% white cement.	0.286 Bags Per 0.04 Bags Per Cement)	Square Meter (Grey Cement) Square Meter (White Cement)

23.	Tile Flooring :		
a.	Precast terrazzo tiles 20 mm. thick white black or white and black marble chips of size up to 6 mm. laid in floors treads of steps and landings jointed with neat cement slurry mixed with pigment to match the shade of the tile including rubbing polishing with precast tiles of 30 mm. thick bed of lime mortar 1:1.2 or 1:3 light shade using white cement.	0.088 Bags Per Square Meter (Grey Cement) 0.088 Bags Per Square Meter (White Cement)	
b.	Medium shade colour pigment with 50% white cement and 50% grey cement.	0.132 Bags Per Square Meter (Grey Cement) 0.044 Bags Per Square Meter (White Cement)	
c.	Dark shades using ordinary cement precast terrazzo tiles 20 mm. thick with marble chips of size 6 mm. in skirting and risers of steps not exceeding 30 cm. in height on wall, laid on 12 mm. thick cement plaster 1:3 mix. (1 Cement: 3 Sand) joint with neat cement slurry, light shades using white cement.	0.235 Bags Per Square Meter (Grey Cement) 0.044 Bags Per Square Meter (White Cement)	
d.	Medium shade colour pigment with 50% white cement and 50% ordinary cement.	0.257 Bags Per Square Meter (Grey Cement) 0.022 Bags Per Square Meter (White Cement)	
e.	Dark shades using ordinary cement.	0.279 Bags	Square Metre
24.	ChequeredTerrazzo Tile Flooring		
A	ChequeredTerrazzo Tile 22 mm. thick with marble chips of sizes upto 6 mm. in floors, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including robbing, polishing complete on 28 mm. thick bed of lime mortar 1:1.2 or 1:3.		
a.	Light shade using white cement.	0.088 Bags Per Square Meter (Grey Cement) 0.096 Bags Per Square Meter (White Cement)	

b.	Medium shades using 50% grey cement and 50% white cement.	0.136 Bags Per Square Meter (Grey Cement) 0.048 Bags Per Square Meter (White Cement)
c.	Dark shade using grey cement.	0.184 Bags Per Square Meter (Grey Cement)
B	Chequered Terrazzo Tile 30 mm. thick with marble chips of sizes upto 6 mm. in stairs, treads, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing polishing rounding of nosing etc., complete on 20 mm. bed of : Lime mortar 1:1:1 (1 Lime putty:1 Surkhi:1 Coarse Sand) :	
i.	Light shade using white cement.	0.088 Bags Per Square Meter (Grey Cement) 0.136 Bags Per Square Meter (White Cement)
ii.	Medium shades using 50% grey cement and 50% white cement.	0.154 Bags Per Square Meter (Grey Cement) 0.066 Bags Per Square Meter (White Cement)
iii.	Dark shade using grey cement.	0.220 Bags Per Square Meter (Grey Cement)
C	Cement mortar 1:4 (1 Cement:4 Coarse Sand)	
i.	Light shade using white cement.	0.258 Bags Per Square Meter (Grey Cement) 0.132 Bags Per Square Meter (White Cement)
ii.	Medium shades using 50% grey cement and 50% white cement.	0.324 Bags Per Square Meter (Grey Cement) 0.066 Bags Per Square Meter (White Cement)
iii.	Dark shade using grey cement.	0.39 Bags Square Meter (Grey Cement)
25.	White Glazed Tiles.	
	White Glazed Tiles 5,6 or 7 mm. thick in flooring treads risers of steps skirting and dado on 12 mm. thick cement plaster 1:3 (1 Cement : 3 sand) in base and cement jointed with white cement slurry etc. complete.	0.188 Bags Per Square Meter (Grey Cement) 0.050 Bags Per Square Meter (White Cement)
26.	Marble Stone Flooring	

	Marble Stone slab flooring over 20 mm. thick base of lime mortar 1:1:1 (1 Lime putty: 1 Surkhi: 1 Sand) and jointed with grey cement slurry etc. (all marble slabs).		
a.	20 mm. thick	0.098 Bags	Per Square Meter
b.	30 mm. thick	0.102 Bags	Per Square Meter
c.	40 mm. thick	0.107 Bags	Per Square Meter

	Marble stone slab flooring over 20 mm. thick base of cement mortar 1:4 (1 Cement: 4 Sand) and jointed with grey cement slurry etc., (all marble slabs).		
d.	20 mm. thick	0.268 Bags	Per Square Meter
e.	30 mm. thick	0.273 Bags	Per Square Meter
f.	40 mm. thick	0.277 Bags	Per Square Meter
g.	Extra if white cement slurry is used instead of grey cement slurry in joints of marble stone flooring.	0.015 Bags	Per Square Meter (White Cement)
h.	Marble slabs 30 mm. thick in risers of steps, skirting dado, wall and pillars, laid on 12 mm. thick cement mortar 1:3 (1 Cement : 3 Sand) and jointed with grey cement slurry.	0.246 Bags	Per Square Meter (White Cement)
27.	Kotah Stone Flooring		
	Kotah stone slab flooring over 20 mm. thick base of lime mortar 1:1:1 (1 Lime putty:1 Surkhi:1 Sand) and jointed with neat cement slurry etc.		
a.	25 mm. thick	0.128 Bags	Per Square Meter
b.	30 mm. thick	0.136 Bags	Per Square Meter
c.	40 mm. thick	0.152 Bags	Per Square Meter
	Kotah Stone slab flooring over 20 mm. thick base of cement mortar 1:4 (1 Cement:4 Sand) and jointed with neat cement slurry etc.		
d.	25 mm. thick	0.298 Bags	Per Square Meter
e.	30 mm. thick	0.306 Bags	Per Square Meter
f.	40 mm. thick	0.322 Bags	Per Square Meter
g.	Kotah stone slab 25 mm. thick risers of steps, skirting, dado and pillar laid on 12 mm. thick cement mortar 1:3 (1 Cement:3 Sand) and jointed with neat cement slurry etc.	0.275 Bags	Per Square Meter

28	Sand Stone Flooring	
a.	40 mm. thick sand stone flooring over 20 mm. thick base of cement mortar 1:5 (1 Cement :5 Sand) with joints finish flush.	0.155 Bags Per Square Meter
b.	40 mm. thick sand stone flooring over 20 mm. thick base of cement mortar 1:5 (1 Cement :5 Sand) including pointing with cement mortar 1:2 (1 Cement : 2 Stone Dust).	0.186 Bags Per Square Meter
c.	40 mm. thick sand stone flooring over 20 mm. thick base of lime mortar 1:1:1 (1 Lime :1 Surkhi:1 Sand) including pointing with cement plaster 1:2 (1 Cement :2 Stone Dust).	0.031 Bags Per Square Meter
d.	40 mm. thick fine dressed and rubbed stone flooring over 20 mm. thick base of cement mortar 1:5 (1 Cement :5 Sand) with joints 5 mm. thick finished flush.	0.166 Bags Per Square Meter
e.	40 mm. thick fine dressed and rubbed stone flooring over 20 mm. thick base of lime mortar 1:5 (1 Cement : 5 Sand) with joints 5 mm. thick including pointing with cement mortar 1:2 (1 Cement : 2 Stone Dust).	0.196 Bags Per Square Meter
f.	25 mm. thick cast iron grid flooring using grid tiles of required size weighing 47 kg. per square metre on bed of 12 mm. thick cement concrete 1:2 (1 Cement : 2 Stone Aggregate 6 mm. nominal size) including filling the hollows with cement concrete same mix and tamping with 10 mm. dia. iron bars and grouting the joints with neat cement slurry complete.	0.025 Bags Per Square Meter
g.	Filling cement concrete 1:2:4 (1 Cement :2 Coarse Sand : 4 Graded Stone Aggregate 12.5 mm. nominal size) in gaps of A.C.Sheet corrugations and wings of ridges.	3.82 Bags Per Square Meter
29.	Cement Plaster	
a.	12 mm. 1:3 (1 Cement: 3 Sand).	14.68 100 Per Square Metre
b.	12 mm. 1:4 (1 Cement: 4 Sand).	10.94 100 Per Square Metre

c.	12 mm. 1:5 (1 Cement: 5 Sand).	8.92 100 Per Square Metre
d.	12 mm. 1:6 (1 Cement: 5 Sand).	7.20 100 Per Square Metre
e.	15 mm. 1:3 (1 Cement: 3 Sand).	17.54 100 Per Square Metre
f.	15 mm. 1:4 (1 Cement: 4 Sand).	12.08 100 Per Square Metre
g.	15 mm. 1:5 (1 Cement: 5 Sand).	10.66 100 Per Square Metre
h.	12 mm. 1:6 (1 Cement: 6 Sand).	8.60 100 Per Square Metre
i.	20 mm. 1:3 (1 Cement: 3 Sand).	22.84 100 Per Square Metre
j.	20mm. 1:4 (1 Cement: 4 Sand).	17.02 100 Per Square Metre
k.	20 mm. 1:5 (1 Cement: 5 Sand).	13.88 100 Per Square Metre
l.	20 mm. 1:6 (1 Cement: 6 Sand).	11.20 100 Per Square Metre
30.	Cement Plaster with a Floating Coat of neat cement	
a.	12 mm. 1:3 (1 Cement: 3 Sand).	19.08 100 Per Square Metre

b.	12 mm. 1:4 (1 Cement: 4 Sand).	15.34 100 Per Square Metre
c.	12 mm. 1:3 (1 Cement: 3 Sand).	21.94 100 Per Square Metre
d.	12 mm. 1:4 (1 Cement : 4 Sand).	17.48 100 Per Square Metre
e.	15 mm. 1:3 (1 Cement : 3 Sand).	27.24 100 Per Square Metre
f.	15 mm. 1:4 (1 Cement : 4 Sand).	21.42 Per 100 Square Metre
31.	Cement Plaster in two coats	
a.	20 mm. Cement Plaster in two coats under layer 12 mm. cement plaster 1:4 (1 Cement :4 Sand) finished with a top layer 8 mm. thick cement plaster 1:3 (1 Cement : 3 Sand)	20.00 Bags per 100 Square Metre
b.	18 mm. thick Cement Plaster in two coats under layer 12 mm. thick cement plaster 1:5 (1 Cement :5 Sand) finished with a top layer 6 mm. thick cement plaster 1:3 (1 Cement : 3 Sand)	16.26 Bags per 100 Square Metre
32.	6 mm. Cement Plaster	
a.	6 mm. Cement Plaster to ceiling 1:3 (1 Cement :3 Sand)	7.34 Bags per 100 Square Metre
b.	6 mm. Cement Plaster to ceiling 1:4 (1 Cement :4 Sand)	5.48 Bags per 100 Square Metre
c.	6 mm. Cement Plaster to ceiling 1:3 (1 Cement :3 Sand) finished with a floating coat of neat cement.	11.74 Bags per 100 Square Metre
d.	Neat Cement Punning.	4.40 Bags per 100 Square Metre
33.	Sand Cement Neeru Finished Plaster	

a.	Sand cement smooth neeru finished plaster for ceiling in cement mortar mix 1:4 (1 Cement :4 Sand), 10 to 15 mm. thick average, finished top smooth with neeru.	13.00 Bags per 100 Square Metre
b.	Sand cement smooth neeru finished plaster for walls in cement mortar mix 1:4 (1 Cement :4 Sand), 18 to 20 mm. thick average, finished top smooth with neeru.	19.00 Bags per 100 Square Metre
34.	Rough Cast Plaster	
	Rough Cast Plaster with a mixture of sand and gravel or crushed stone from 2.36 mm. to 12.5 mm. nominal size dashed over and including the fresh plaster in two layers, top layer 10 mm. cement plaster 1:3 (1 Cement: 3 Sand) mixed with 10% finely ground hydrated lime by volume of cement and under layer 12 mm. cement plaster : 1:4 (1 Cement: 4 Sand)	
a.	With ordinary cement finish or cement pigment finish.	23.18 Bags per 100 Square Metre
b.	With white cement and pigment finish.	10.94 Bags Per 100 Sqm.(Grey Cement) 12.24 Bags Per 100 Sqm. (White Cement)
	1:5 Cement Sand (1 Cement:5 Sand)	
c.	With ordinary cement finish or cement and pigment finish.	21.16 Bags Per 100 Sqm.(Grey Cement)
d.	With white cement and pigment finish.	8.92 Bags Per 100 Sqm.(Grey Cement) 12.24 Bags Per 100 Sqm. (White Cement)
35.	Pointing on Stone Work	
a.	Flush or ruled pointing on stone work with cement mortar 1:3 (1 Cement : 3 Sand)	2.34 Bags per 100 Square Metre
b.	Raised and cut pointing in stone work with cement mortar 1:3 (1 Cement : 3 Sand)	3.88 Bags per 100 Square Metre
36.	Waterproofing	
a.	Proprietary waterproofing treatment to the terrace with brick-bat coba, cement base.	55.00 Bags per 100 Square Metre
b.	Proprietary waterproofing treatment to the canopy with brick-bat coba, cement base.	45.00 Bags per 100 Square Metre

c.	Waterproofing chajja with sand cement plaster average 25 mm. thick in cement mortar 1:3 (1 Cement :3 Sand)	25.00 Bags per 100 Square Metre
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No	Description of item of work.	Quantity of cement to be used per Unit Quantity of work.	Unit.
1.	Cast Iron Pipes		

	Providing and fixing on wall face C.I. rain water pipes including filling the joints with spun yarn soaked in neat cement slurry and cement mortar 1:2 (1 Cement : 2 Sand)		
a.	75 mm. dia pipe	0.132 Bags per 100 Metre	
b.	105 mm. dia pipe	0.176 Bags per 100 Metre	
c.	150 mm. dia pipe	0.264 Bags per 100 Metre	
2.	Cast Iron Accessories		
	Providing and fixing on wall face C.I. Accessories for rain water pipes including filling the joints with spun yarn soaked in neat cement slurry and cement mortar 1:2 (1 Cement : 2 Fine Sand)		
a.	75 mm. dia pipe C.I. Plain bend.	0.0052	Each
b.	100 mm. dia pipe C.I. Plain bend.	0.0062	Each
c.	150 mm. dia pipe C.I. Plain bend.	0.010	Each
d.	75 mm. dia C.I. head flat or corner type.	0.003	Each
e.	100 mm. dia C.I. head flat or corner type.	0.003	Each
f.	150 mm. dia C.I. head flat or corner type.	0.0052	Each
g.	75 mm. dia C.I. plain shoe.	0.003	Each
h.	100 mm. dia C.I. plain shoe.	0.003	Each
i.	150 mm. dia C.I. plain shoe.	0.0052	Each
j.	75 mm.dia C.I. single branch (plain)	0.0052	Each
k.	100 mm. dia C.I. single branch (plain)	0.0062	Each
l.	150 mm. dia C.I. single branch (plain)	0.0010	Each
m.	75 mm.dia C.I. double branch (plain)	0.008	Each
n.	100 mm. dia C.I. double branch (plain)	0.009	Each

o.	150 mm. dia C.I. double branch (plain)	0.0052	Each
p.	C.I. off-sets (plain) 75 mm. dia. 55 mm. projection.	0.0052	Each
q.	C.I. off-sets (plain) 75 mm. dia. 150 mm. projection.	0.0052	Each
r.	C.I. off-sets (plain) 100 mm. dia. 55 mm. projection.	0.0052	Each
s.	C.I. off-sets (plain) 100 mm. dia. 55 mm. projection.	0.0062	Each
t.	C.I. off-sets (plain) 100 mm. dia. 75 mm. projection.	0.0062	Each

3	Sanitary fixings		
a.	Fixing long pan pattern or Orissa 0.10 Each Fixing flat back or wall corner 0.050 type, lipped front, urinal basin of 430 x 260 x 350 mm. and 340 x 430 x 265 mm. size respectively, white glazed earthenware with automatic C.I. flushing cistern with fittings, brackets, standard size flush pipe and spreaders with brass union and G.I. clamps complete including painting of cistern and fittings, cutting and making good the walls and floors.		
b.	One urinal basin with 5 litres C.I. automatic flushing cistern.	0.050	Each
c.	Range of two urinal basins with 10 litres C.I. automatic flushing cistern.	0.08	Each
d.	Range of three urinal basins with 10 litres C.I. automatic flushing cistern.	0.134	Each
e.	Range of four urinal basins with 15 litres C.I. automatic flushing cistern.	0.190	Each

	Fixing white glazed fire clay stall urinal with automatic C.I. flushing cistern with fittings R.S. or C.I. brackets standard size C.P. brass flush pipe and spreaders with unions and clamps, C.I. trap with outlet grating and other coupling in C.P. brass including painting of cistern and fittings, cutting and making good the walls and floors.		
f.	Single stall urinal with 5 litres C.I. automatic flushing cistern.	0.102	Each
g.	Range of two urinal basins with 10 litres C.I. automatic flushing cistern.	0.204	Each
h.	Range of three urinal basins with 10 litres C.I. automatic flushing cistern.	0.306 Bags	Each
i.	Range of four urinal basins with 15 litres C.I. automatic flushing cistern.	0.406 Bags	Each
	Fixing one-piece construction white squatting plate urinal with an integral longitudinal flushing pipe 100 mm. dia. half round channel automatic C.I. flushing cistern with fittings R.S. or C.I. brackets, standard size. G.I. flush pipe for back and front flush with		
	standard spreader pipes with fittings G.I. clamps, white vitreous tiling 1200 mm. high to the front and side walls with white vitreous china corners and angles set in neat cement, standard urinals C.I. trap 65 mm. diameter with vent arm and outlet grating and coupling in C.P. brass complete, including painting the cistern and fittings and making good the walls and floors.		
j.	Single squatting plate with 5 litres C.I. automatic flushing cistern.	0.102 Bags	Each
k.	Range of two squatting plates with 10 litres C.I. automatic flushing cistern.	0.204 Bags	Each
l.	Range of three squatting plates with 10 litres C.I. automatic flushing cistern.	0.306 Bags	Each

m.	Range of four squatting plates with 15 litres C.I. automatic flushing cistern.	0.406 Bags	Each
n.	Fixing lavatory basin with brackets, pillar taps, rubber plug, waste of standard pattern, trap and unions complete including cutting and making good the walls.	0.050 Bags	Each
o.	Fixing white pedestal for wash basin completely recessed at the back for reception of pipes and fittings.	0.032 Bags	Each
p.	Fixing sink with brackets, 40 mm. rubber plus, brass chain, waste, trap with necessary unions complete including cutting and making good the walls.	0.050 Bags	Each
q.	Fixing teal-wood draining board with skirting and beading, wax polished with brackets painted white complete including making good the walls.	0.028 Bags	Each
4.	Sanitary Fittings (Items separately ordered)		
a.	Fixing long pan pattern or Orissa pattern squatting, or pedestal type W.C. pan.	0.050 Bags	Each
b.	Fixing a pair of white glazed earthenware or vitreous china foot rests of standard pattern for	0.010 Bags	Each

	Indian type W.C. pan.		
c.	Fixing flat back or wall corner type lipped front urinal basin of 430 x 260 x 350 mm. and 340 x 430 x 265 mm.	0.020 Bags	Each
d.	Fixing white glazed fire clay stall urinal of standard size.	0.04 Bags	Each
e.	Fixing white squatting plate urinal with integral longitudinal flush pipe. .	0.040 Bags	Each
f.	Fixing wash basin including making all connections excluding cost of fittings.	0.030 Bags	Each
g.	Fixing kitchen sink including making all connections complete.	0.030 Bags	Each

h.	Fixing in position 32 mm. diameter galvanised steel telescopic flush pipe complete including cutting and making good the walls and floor.	0.020 Bags	Each
5.	Sand Cast Iron Pipe and Fittings		
a.	Fixing M.S. holder bat clamp to 100 mm. dia. sand cast iron pipe embedded in cement concrete blocks 10 x 10 x 10 cm. of cement concrete 1:2:4 (1 Cement : 2 Sand : 4 Stone Aggregate) including cost of cutting holes and making good the walls etc.	0.010 Bags	Each
b.	Fixing M.S. stays and clamps for 100 mm. diameter sand cast iron pipe.	0.010 Bags	Each
c.	Fixing M.S. holder bat clamps for 50 mm. diameter sand cast iron pipe embedded in cement concrete block 10 x 10 x 10 cm. of 1:2:4 (1 Cement : 2 Sand : 4 Stone Aggregate) including cost of cutting holes and	0.010 Bags	Each
	making good the walls etc.		
d.	Fixing M.S. stays and clamps for 50 mm. diameter sand cast iron pipe.	0.010 Bags	Each
e.	Fixing sand cast iron trap 100 mm. inlet 100 mm. outlet of selfcleaning design with sand cast iron screwed down or hinged grating with or without vent arm complete including cost of cutting without and making good the walls and floor.	0.050 Bags	Each
f.	Fixing 100 mm. inlet and 50 mm.	0.050 Bags	Each
	outlet sand cast iron floor trap of self cleaning design with sand cast iron screwed down or hinged grating with or without vent arm complete including cost of cutting and making good the walls and floors.		
6.	Asbestos Cement Soil, Waste and Vent Pipes and Fittings		

	Providing and fixing on wall face asbestos cement soil waste and vent pipe including jointing with spun yarn soaked in bitumen and cement mortar 1:2 (1 Cement: 2 Sand) complete.		
a.	For 100 mm. diameter.	0.300 Bags	100 Metre
b.	For 50 mm. diameter.	0.150 Bags	100 Metre
	Fixing wooden plugs and standards holder bat clamps comprising of two semicircular halves of flat iron and cast iron base screwed on wooden plugs.		
c.	For 100 mm. diameter.	0.0004 Bags	Each
d.	For 50 mm. diameter.	0.0004 Bags	Each
	Providing and fixing A.C. bends of required degree with access door insertion rubber washer 3 mm. thick, bolts and nuts or plain bend of heel rest unitary bend including jointing with spun yarn soaked in bitumen and cement mortar 1:2 (1 Cement : 2 Sand)		
e.	For 100 mm. diameter.	0.0020 Bags	Each
f.	For 50 mm. diameter.	0.0010 Bags	Each
	Providing and fixing double equal or unequal A.C. junctions of required degree plain or with access door, insertion, rubber washer 3 mm. thick bolts and nuts, including jointing with spun yarn cement mortar 1:2 (1 Cement : 2 Sand) complete.		
g.	100 x 100 x 100 x 100 mm. double equal junctions or 100 x 100 x 50 x 50 mm. double unequal junctions.	0.004 Bags	Each
h.	50 x 50 x 50 50 mm. double equal junctions.	0.002 Bags	Each
	Providing and fixing single equal or unequal A.C. junctions of required degree plain or with access door, insertion, rubber		
	washer 3 mm. thick bolts and nuts, including jointing with spun yarn cement mortar 1:2 (1 Cement : 2 Sand) complete.		
i.	100 x 100 x 100 x 100 mm. single equal junctions or 100 x 100 x 50 x 50 mm. single unequal junctions.	0.0030 Bags	Each

j.	50 x 50 x 50 50 mm. single equal junctions.	0.0016 Bags	Each
	Providing and fixing plain A.C. invert branch of required degree including jointing with spun yarn soaked in bitumen and cement mortar 1:2 (1 Cement : 2 sand).		
l.	50 x 50 x 50 x 50 mm.	0.002 Bags	Each
m.	50 x 50 x 50 x 50 mm.	0.0016 Bags	Each
	Providing and fixing A.C. offset including jointing with spun yarn soaked in bitumen and cement mortar 1:2 (1 Cement : 2 Sand)		
n.	100 mm. dia. A.C. offset with any projection.	0.002 Bags	Each
o.	50 mm. dia. A.C. offset with any projection.	0.0010 Bags	Each
	Providing and fixing A.C. loose socket including jointing with spun yarn soaked in bitumen and cement mortar 1:2 (1 Cement : 2 Sand) complete.		
p.	100 mm.	0.002 Bags	Each
q.	50 mm.	0.0010 Bags	Each
	Providing and fixing A.C. Terminal guard including jointing with spun yarn soaked in bitumen and cement mortar 1:2 (1 Cement : 2 Sand).		
r.	100 mm.	0.002 Bags	Each
s.	50 mm.	0.0010 Bags	Each
t.	Cutting chase in brick masonry walls for fixing 100 mm diameter sand cast iron pipes and making good the same with brick work in cement mortar 1:3 (1 Cement : 3 Sand)	10.00 Bags	100 Metre
u	Cutting chase in brick masonry walls for fixing 50 mm. diameter sand cast iron pipes and making good the same with the brick work in cement mortar 1:3 (1 Cement : 3 Sand).	6.66 Bags	100 Metre
7.	Drainage		
	Jointing glazed stone ware pipes grade "A" with stiff mixture of cement mortar in the proportion of 1:1 (1 Cement : 1 Sand)		
a.	100 mm. dia.	4.34 Bags	100 Metre

b.	150 mm. dia.	6.46 Bags	100 Metre
c.	200 mm. dia.	8.66 Bags	100 Metre
d.	230 mm. dia.	9.74 Bags	100 Metre
e.	250 mm. dia.	10.80 Bags	100 Metre
f.	300 mm. dia.	12.94 Bags	100 Metre
g.	450 mm. dia.	19.54 Bags	100 Metre
	Laying cement concrete 1:5:10 (1 Cement : 5 Sand : 10 Graded Stone Aggregate 40 mm. nominal size) around S.W. pipe including bed concrete 15 cm. thick.:		
h.	100 mm. dia. S.W. Pipe.	47.32 Bags	100 Metre
i.	150 mm. dia. S.W. Pipe.	50.70 Bags	100 Metre
j.	200 mm. dia. S.W. Pipe.	58.24 Bags	100 Metre
k.	230 mm. dia. S.W. Pipe.	62.92 Bags	100 Metre
l.	250 mm. dia. S.W. Pipe.	66.04 Bags	100 Metre
m.	300 mm. dia. S.W. Pipe.	73.58 Bags	100 Metre
n.	350 mm. dia. S.W. Pipe.	81.12 Bags	100 Metre
o.	400 mm. dia. S.W. Pipe.	88.40 Bags	100 Metre
p.	450 mm. dia. S.W. Pipe.	96.20 Bags	100 Metre
	Laying cement concrete 1:5:10 (1 Cement : 5 Sand : 10 Graded Stone Aggregate 40 mm. nominal size) upto haunches of S.W. pipe including bed concrete 15 cm. thick.:		
q.	100 mm. dia. S.W. Pipe.	31.72 Bags	100 Metre
r.	150 mm. dia. S.W. Pipe.	34.84 Bags	100 Metre
s.	200 mm. dia. S.W. Pipe.	40.56 Bags	100 Metre
t.	230 mm. dia. S.W. Pipe.	44.20 Bags	100 Metre
u.	250 mm. dia. S.W. Pipe.	46.54 Bags	100 Metre
v.	300 mm. dia. S.W. Pipe.	52.26 Bags	100 Metre
w.	350 mm. dia. S.W. Pipe.	58.24 Bags	100 Metre
x.	400 mm. dia. S.W. Pipe.	62.96 Bags	100 Metre
y.	450 mm. dia. S.W. Pipe.	69.94 Bags	100 Metre
z.	Laying light duty non-pressure NP2 or P1 class R.C.C. pipes with collars jointed with stiff mixture of cement mixture of cement mortar in the proportion of 1:2 (1 Cement : 2 Sand) including joints etc.		
Z1.	100 mm. dia. R.C.C. pipe (NP2) or (P1)	1.00 Bags	100 Metre
Z2.	150 mm. dia. R.C.C. pipe (NP2) or (P1)	1.20 Bags	100 Metre
Z3	250 mm. dia. R.C.C. pipe (NP2) or (P1)	1.80 Bags	100 Metre

Z4.	300 mm. dia. R.C.C. pipe (NP2) or (P1)	2.20 Bags	100 Metre
Z5.	450 mm. dia. R.C.C. pipe (NP2) or (P1)	4.80 Bags	100 Metre
Z6.	500 mm. dia. R.C.C. pipe (NP2) or (P1)	5.20 Bags	100 Metre
Z7.	600 mm. dia. R.C.C. pipe (NP2) or (P1)	6.40 Bags	100 Metre
Z8.	700 mm. dia. R.C.C. pipe (NP2) or (P1)	7.40 Bags	100 Metre
Z9.	800 mm. dia. R.C.C. pipe (NP2) or (P1)	8.40 Bags	100 Metre
Z10	900 mm. dia. R.C.C. pipe (NP2) or (P1)	9.80 Bags	100 Metre
Z11	1000 mm. dia. R.C.C. pipe (NP2) or (P1)	11.00 Bags	100 Metre

TECHNICAL SPECIFICATIONS FOR INTERIOR MATERIALS

1. GENERAL

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

1.1 The workmanship is to be the best and of high standard, use must be made of special trade's men in all respects of the work and allowances must be made in the rates for doing so.

1.2 The materials and items to be provided by the contractor shall be approved by the Competent Authority in accordance with any samples which will be submitted for approval by Contractor and generally in accordance with the Specifications Also if products are specified in the catalogue reference, the contractor will be required to obtain the approval of the Competent Authority before using a materials. The Contractor shall produce all invoices, vouchers or receipts for any material if called upon to do so by the Competent Authority.

1.3 Samples of all materials are to be submitted to the Competent Authority for approval before the Contractor orders or delivers the materials at site. Samples together with their packing are to be provided free of charge by the Contractor and should any materials be rejected, they will be removed from the site at the Contractor's expense. All samples will be retained by the Competent Authority for comparison with materials, which will be delivered at the site. Also, the Contractor will be required to submit specimen finishes of colours, fabrics etc. for the approval of the Competent Authority before proceeding with the work.

1.4 The contractor shall be responsible for providing and maintaining and boxing or other temporary coverage required for the protection of dresses or finished work if left unprotected. He is also to clean out all shelving's, out ends and other waste from all parts of the works before coverings or in-fillings are constructed.

1.5 Templates, boxes and moulds shall be accurately set out and rigidly constructed so as to remain accurate during they are in use.

1.6 All unexposed surface of timber e. g. false ceiling, backing fillets, backs of door frames, cupboard framing, grounds, etc. are to be treated with two coats of approved timber preservative before fixing or converging.

1.7 Only first class workmanship will be accepted. Contractor shall maintain uniform quality and consistency in workmanship throughout.

2. JOINERY:

2.1 Joinery is to be prepared immediately after the placing of the contract, framed up, bonded and waged up. Any portions that are wrapped or found with other defects are to be replaced before wedging up. The whole of the work is to be framed and

finished in a workmen-like manner in accordance with the detailed drawings wrought and wherever required, fitted with all necessary metal ties, straps, belts, screws, glue etc. Running beaded joints are to be cross-tongued with teak wherever 1(1/2) thick double cross tongued. Joiners work generally to be finished with fine sand/glass paper.

- 2.2** Joints: All joints shall be standard mortise and tenon, dowel, dovetail, and crosshalved. Nailed or glued butt joints will not be permitted, screws, nails etc. will be standard iron or wire of oxidized nettle fold tenon should fit the mortises exactly.
- 2.3** Nailed or glued butt joints will not be permitted except in exceptional cases with approval of Competent Authority.
- 2.4** Where screws shown on a finished surface, those will be sunk and the whole plugged with a wood plug of the same wood and grain of the finished surfaces will be neatly punched and the hole filled with wood filler to match the colour.
- 2.5** Should joints in joiner's work open, or other defects arise within the period stated for defect liability in the contract and the clause thereof, be deemed by the Competent Authority to be due such defective joinery shall be taken down, and refilled, redecorated and/or replaced if necessary and any work disturbed shall be made good at the Contractor's expense.
- 2.6** Nails spikes and bolts shall be of lengths and weights approved by the Competent Authority. Nails shall comply with is 1959-1960 or equivalent approved quality sample. Brass-headed nails are to comply with B. S. 1210. Wire staples shall comply with B. S. 1494 or equivalent.
- 2.7** The contact surface of dowels, tennons wedges etc., shall be glued with an approved adhesive.
- 3** Where glued, joinery and carpentry work is likely to come into contact with moisture, the glue shall be waterproof.

3.0 HARDWARE AND METALS:

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

- 3.1** Fittings generally shall be brass oxidized, unless otherwise specified and shall be suitable for their intended purpose. In any case, it will have to be approved by Competent Authority before the Contractor procures it at site of work.
- 3.2** Screws are to match the finish of the article to be fixed, and to be round or flat headed or counter sunk as required.

- 3.3** The contractor should cover up and protect the brass and bronze surfaces with a thick grease or other suitable productive material, renew as necessary and subsequently clean off away on connection.
- 3.4** Aluminium and stainless steel shall be of approved manufacture and suitable for its particular application. Generally, the surface of aluminium shall have an anodized finish and both shall comply with the samples approved by the Competent Authority. All stainless steel sheets shall be 304 S. S. Japan or equivalent with gauge as specified but not thinner than 16G.
- 3.5** All steel, brass, bronze, aluminium and stainless steel articles shall be subjected to a reasonable test at the Contractor's expense.
- 3.6** All brazing and welds are to be executed in a clean and smooth manner rubbed down and left in the flattest and tidiest way, particularly where exposed.
- 3.7** Chromium plating shall be in accordance with I. S. Standard or as per approved specification for normal outdoor conditions and shall be on a base material of copper or brass.
- 4.0** GLAZIER:
- 4.1** All glass to be of approved manufacturer complying with IS 3548-1966 as per approved quality and sample to be of the selective qualities specified and free from bubbles, smoke, air holes and other defects.
- 4.2** Polished plate glass shall be "glazing glass" (G. G.) quality and that for mirrors shall be "silvering quality" (S.G.) conforming to IS 3438-1965 or as per approved sample and quality.
- 4.3** The compound for glazing to metal is to be a special non-hardening compound manufactured for the purpose and of a brand and quality approved by the Competent Authority.
- 4.4** While cutting glass, proper allowance be made for expansion. Each square of glazing to be in one whole sheet. On completion of work clean all glass inside and cut, replace all cracked scratched and broken panes and leave in good condition.
- 5.0** PAINT AND POLISHES:
- 5.1** All material required for the works shall be of specified and approved manufacturer, delivered to the site in the manufacturer's container's name or trade mark with a description of the contents and colour. All materials are to be stored on the site.
- 5.2** Spray painting with approved machines will be permitted only if written approval has been obtained from the Competent Authority prior to painting. No spraying will be permitted in the case of priming costs nor where the soiling of adjacent surfaces is

likely to occur. The buzzle and pressure to be so operated as to give an even coating throughout to the satisfaction of the Competent Authority. The paint used for spraying is to comply generally with the specification concerned and is to be specially prepared by the manufacturer for spraying. Thinning of paint made for brushing will not be allowed.

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

6.0 UPHOLSTERY:

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

7 POLISH:

7.1 French polish: The basic material shall be shellac dissolved in mentholated spirit.

Preparation:

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

Equipment:

The polishing rubber the most important implement in French polish shall consist of a pad of cotton wool, which acts as a reservoir for the polish, and a cover of soft white linen of cotton fabric, similar to a well-worn handkerchief which acts as a fitter. The rubber must never be dipped into the polish; it should be charged by pouring the polish on to the pad with the cover removed.

Application:

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

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

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

7.2 Wax polish:

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

Application:

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

7.3 Transparent Coloured Polyurethane (Melamine)

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

Application:

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

8. TIMBER:

- 8.1** Only seasoned Teakwood to be used.
- 8.2** Use of Rose wood wherever specified.
- 8.3** All the wood shall be properly seasoned, natural growth and shall be free from worm holes, loose or dead knots or other defects, saw die square and shall not suffer warping, splitting or other defects.
- 8.4** The moisture content shall not exceed 12%.
- 8.5** All internal frame work shall be treated with approved wood preservative.
- 8.6** All wood brought to site should be clean shall not have any preservative or other coating/covering.
- 8.7** All rejected decayed, bad quality wood shall be immediately removed from site.
- 8.8** All wood brought to site must be stacked-stored properly as per instructions.

9.0 PLYWOOD:

- 9.1** Plywood/medium density fibre board/teak practical board/ Veneer shall be as specified in the approved list of manufacturers shall be used.
- 9.2** Commercial ply shall confirm I. S. I. 303 of approved make.
- 9.3** Marine plywood shall generally conform to generally I. S. 303 BWR or unless specified I.S.710-1980(BWP)
- 9.4** Particle board shall be phenol formaldehyde bonded and generally conform to I. S. 30871965.
- 9.5** Only 3mm to 4mm thick straight-grained groups matching approved veneers shall be used. No extra claim will be entertained for veneer if found of extra thickness. NB:
 1. The contractor should obtain prior approval from Employer / Consultants before placing order for any specific materials. Employer may / delete any of the makes or brands out of the above list. The materials shall be only of the approved makes as specified in this. The Contractor shall submit samples of all the makes as specified in this list and the SBI.
Engineer in Charge / Owner shall have the power to select any of them. The SBI Engineer in Charge / Owner decision in this regard shall be binding on the Contractor.

In case any materials is not available for any one or all of these approved makes the consultant / Owner shall select and approve alternative make(s).

2. All materials should conform to relevant standards and codes of BIS.
3. Materials with I.S.I. Mark shall be used duly approved by the SBI Engineer/ Bank.
4. If any material is found to be not up to the mark, the contractor will have to produce original bills / certificate from the manufacturer or his authorized distributor for authenticity and genuineness of the material for consideration and as per make approved by the SBI Engineer in Charge. The same will not be considered for payment. All the materials to be ISI marked.

TECHNICAL SPECIFICATION & SCOPE OF ELECTRICAL WORKS

SAFETY CODE

1 First aid appliances including adequate supply of sterilized dressing and cotton wool shall be kept in a readily accessible place.

2 An injured person shall be taken to a public hospital without loss of time, in cases when the injury necessitates hospitalization.

3 Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from the ground.

4 No portable single ladder shall be over 8 meters in length. The width between the side rails shall not be less than 30 cm. (clear) and the distance between two adjacent runnings shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding ladder.

5 The excavated material shall not be placed within 1.5 meters of the edge of the trench half of the depth of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.

6 Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.

7 No floor, roof or other part of the structure shall be so overloaded with debris or material as to render it unsafe.

8 Workers employed on mixing and handling material such as asphalt, cement, mortar, concrete and lime shall be provided with protective footwear and rubber hand gloves.

9 Those engaged in welding works shall be provided with welders' protective eye shield and gloves.

10. (i) No paint containing lead or lead products shall be used except in the form of paste readymade paint.

(ii) Suitable facemasks should be supplied for use by the workers when the paint applied in the form of spray or surface having lead paint dry rubbed and scrapped.

11. Overalls shall be supplied by the contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during cessation of work.

12 Hoisting machines and tackle used in the works including their attachments anchor and supports shall be in perfect condition.

The ropes used in hoisting or lowering material or as a means of suspension shall be durable quality and adequate strength and free from defects.

TECHNICAL SPECIFICATIONS FOR ELECTRICAL INSTALLATION WORK

SCOPE OF WORK:-

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

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

DRAWINGS, SPECIFICATION AND DEVIATIONS:-

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

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

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

SCOPE:-

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

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

STANDARDS:-

The following standards and rules shall be applicable:-

IS 2516	:	:	Specification for A.C. circuit breakers.
IS 4047	:	:	Specification for heavy duty air breaker switch gear and fuses for Voltage not exceeding 1000 V.
IS 3072	:	:	Code of practice for installation and Maintenance of Switch gear.
IS 3106	:	:	Code of practice for selection, installation and maintenance of fuses (Voltage not exceeding 650 V).
IS 4237	:	:	General requirements for switch gear and control gear for voltage not exceeding 1000 V.
IS 2607	:	:	Air break isolators for voltage not exceeding 1000 V.

IS : 8623	:	:	Specification for factory built assemblies of switch gear and Control gear for voltage upto and including 1000 V. A.C. and 1200 V. D.C.
IS : 375	:	:	Marking arrangement of switch gear bus-bars main connections and auxiliary wiring.
IS : 694	:	:	PVC insulated copper wires for 650 / 1100 Volts grade.
IS : 1554	:	:	PVC insulated (heavy duty) electric cables for working voltages upto and including 1100 Volts.
IS : 3961	:	:	Recommended current rating for cables.
IS : 732	:	:	Codes of practice for electrical wiring.
IS : 2274	:	:	Installation (system voltage not exceeding 650 Volts).
IS : 12360	:	:	Voltage bands for electrical installation.
IS : 2309	:	:	Protection of building and allied structures against lightning.
IS : 4648	:	:	Guide for electrical layout

IS : 1646	:	in Residential Building. Fire Safety of Buildings.
IS : 5216	:	Guide for Safety Procedures and Practices in Electrical Work.
IS : 3043	:	Code of practice for earthing.
IS : 4047 :		Climate proofing of electrical equipment.
IS : 2147 :		Heavy duty air-break switches and
IS : 4064 :		Composite units of air-break switches. and fuses for voltages not exceeding
IS : 4237		1000 Volts.
IS : 2208 :		HRC cartridge fuse domestic and similar purpose.
IS : 5133(I):)		Boxes for enclosures of electrical accessories.
IS : 3854 :)		Heavy duty air-break switches and
IS : 3452 :)		Switches for domestic and similar purpose.
IS : 371 :)		Three terminals ceiling roses.
IS : 1293 :)		Switch socket outlet.
IS : 8828 :		Miniature air-break circuit breaker for A.C. circuits.

IS : 2312 :	Exhaust Fans.
IS : 374 :	Ceiling fans and regulators.
IS : 2082 :)	
IS : 3725 :)	Storage types electrical water heaters.
IS : 2266 :	Call bells and buzzers for indoor use.
IS : 1913 :)	Luminaires, ballasts, maintenance and safety requirements.
IS : 2713 :	Tubular poles for overhead power lines & street lights.
IS : 2551 :	Danger notice plates.
	Rigid PVC conduits for electrical wiring.
IS : 9537, Part II	: Rigid M.S. conduits.
IS : 3480	: Flexible steel conduits for electrical wiring.
TD-S-113- 18 144C,) BS : 6746) IS : 4984)	Code of practice by India Telephone – Department. Insulation and conductor resistance of telephone wires and cables. HDPE pipe and fittings.

113B,) PVC insulated,
 colour coded, twisted
 into paris,
 BS : 6746 laid-up taped and
 overall.
 :) BS : 6746 PVC sheathed
 :) telephone cables.
 IS : 1554
 :)
 MUMBAI Revised code of
 practice for
 telephone wiring of
 multistoried
 Buildings – 1985.

TELEPHONES

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

SYSTEM DETAILS:

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

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

		Wire and earth,
System Voltage		50 Hz
System Earthing	:	Effectively earthed neutral.

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

Cubical Boards:

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

Earthing:

All switches panels shall be provided with an earth bar as specified earthing of the switch boards shall be through the equipment earthing system provided in the building. All meters shall be calibrated and tested through secondary injection tests.

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

Installation:

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

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

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

Testing and Inspection:

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

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

Distribution Board:

Scope:

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

Standards:

The following standards and rules shall be applicable:

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

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

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

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

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

Distribution Boards shall have MCBs as shown on the drawing / schedule. D.B.S. shall meet with the requirements of IS:2675 and marking arrangement of Bus-bars shall be accordance with IS: 375, Bus-bars shall be suitable for incomer switch rating and sized for a temperature rise of 35 Centigrade over the ambient temp. circuit diagram indicating the distribution shall be pasted on the inside of the DB s instructed. One earthing terminal for single phase and two terminals for 3 phase D.B.S. shall be provided with an earth strip connecting these earthing studs / terminals and the outgoing ECC earth bar. All MCBs shall be with a minimum short circuit rating of 10 Kamps. All outgoing feeders shall terminate or by means of insulated single conductor copper wires.

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

Installation and Testing:

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

All boards shall be meggard phase to phase and neutral, using 1000 V mega with all switchgear in close position. The meggar value should be not less than 2.50 megohms between and 1.50 me ohms between phase and neutral. E.L.C.B. (Earth Leakage Circuit Breaker) :

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

Medium Voltage Cabling:

Scope :

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

Standards:

The following standards and rules shall be applicable:

- 1) IS : 1554 (P-I) : PVC insulated electric cables (heavy duty)

- 2) IS : 1753 : Aluminum conductors electric cables (heavy duty)
- 3) IS : 3961 : Recommended current ratings for cables.

4) Indian Electricity Act and Rules.

5) NEC.

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

Cables:

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

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

Installation:

Cables shall be laid in the routes marked in the drawings, where the route is not marked, the Contractor shall mark it out on the drawing and also on the site and obtain the approval of the Bank before laying the cable. Procurement of cables shall be on the basis of actual site measurements and the quantities shown on the schedule of work shall be regarded as a guide. Payment shall be restricted to the quantity of cable installed (and measured jointly as per unit stated) at site. Cables rising indoors shall laid on walls, ceiling, shafts or trenches. Cables shall be fixed to walls or ceiling with supports saddles. Cables trays will be used wherever directed / necessary. All supports shall be at not more than 500 mm. apart. Plastic identification tags shall be provided at every 20 M in general at every floor in the rising shaft in particulars. Oversize M.S. Sleeves shall be used for cables passing through the walls. Cables shall be bent to a radius not less than 12 times the recommendations, whichever is higher, in case of direct buried cables the cable route shall be parallel or perpendicular to roadways, walls cushion to provide cushion against abrasion. Width of excavated trenches oversand cushion shall be covered with a mini. of excavated trenches will be as per drawings or as directed. The laid cables in protective layer of bricks on both sides and top. Backfill of the trench shall be with a minimum earth cover of 600 mm. to be properly rammed and consolidated. At road / pathway crossings cables have a pulled through R.C.C. pipe of 150 mm. dia. to be laid for each cable by the Electrical Contractor. A mini .of 100 mm. thick concrete bed has to be spread before laying the RCC pipes, topped by 150 mm. thick concrete to avoid any damage to the RCC pipe.

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

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

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

Testing :

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

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

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

Mode of Measurement:

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

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

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

- 1) Cable glands, lugs, bolts, nuts.
- 2) All joining materials.
- 3) Installation, testing and commissioning.
- 4) Earthing of glands and armor.

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

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

C.T.S. Wiring:

Scope:

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

Conduits Wiring:

Scope:

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

Standards:

The following standards and rules shall be applicable:

- 1) IS : 732 : Code of Practice for Electrical Wiring installation (System voltage not exceeding 650 V)
- 2) IS : 1646 : Code of Practice for fire safety of buildings (General Electrical installation (Part II).
- 3) IS : 9537 : Rigid steel conducts for Electrical wiring (Part II)
- 4) IS : 2667 : Fittings for rigid steel conducts for Electrical Wiring.
- 5) IS : 3480 : Flexible steel conduits for Electrical Wiring.
- 6) IS : 3837 : Accessories for rigid steel conduit for Electrical Wiring.
- 7) IS : 694 : PVC insulated cables.
- 8) IS : 9537 : Rigid non-metallic conduits for Electrical Wiring.
- 9) IS : 6946 : Flexible (pliable) non-metallic conduits for Electrical Wiring.
- 10) IS : 1293 : 3 – Pin plugs and sockets.
- 11) IS : 8130 : Conductors for insulated electric cables and Flexible cods.
- 12) IS : 5133 : For switch boxes and other conduit accessories.
- 13) Indian Electricity Act 1910 and Amendments issued thereunder.
- 14) Regulations for the electrical equipment in buildings issued by the Mumbai Regional Council of Insurance Association of India.

Rigid and Flexible conduits.

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

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

Accessories:

Conduit fittings such as bends, elbows, reducers, chase, nipples, split couplings, plug, etc., shall be specifically designed and manufactured for their particular application. All conduit fittings shall conform

to IS: 2667 – 1964 and IS : 3887 – 1966. Conduit bends and elbows shall not be used. Instead, wherever bending is required, the conduit shall be properly bent using the bending machine. Only in unavoidable conditions, use of bends and elbows may be permitted.

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

Notes of Concealed Conducting:

- 1) Routing of concealed conduits Location of conduit drop or rise in walls, location of junction boxes, vertical surface conduit runs in shafts etc. Wherever shown on the drawing is schematic only. Adjustments / Re-routing of the same shall be carried out by the Contractor to suit layout of lighting fixtures, ceiling fans, receptacles, telephone outlets, TV outlets room switch boards etc., shown on relevant drawings and to suit site conditions.
- 2) Passing of embedded conduit through columns for any reason whatsoever is totally prohibited, except in any of the really unavoidable situation, where Structural Consultants express permission in wiring will be a must before so doing.
- 3) Cross over of embedded conduit in slab, except at locations unavoidable should not be done, in case of cross-over of conduits where it is a must, the contractor shall obtain the specific permission for the location of cross-overs from the Consultant prior to concerning the slab.
- 4) Conduits droppers in columns shall not be permitted.
- 5) Concealed conduit running along the length of beam is to be avoided. Suitable conduit sleeves shall be provided in lintel beams where conduit droppers are required to be extended through such beams.
- 6) Standard typical details shall be referred for concealed conduit routing through sunk slab through staircase, walls, etc., and for provision of junction boxes, wherever required.
- 7) Conduit routing at Lift Machine Rooms and at Lift Wells shall be installed in consultation with Elevator Contractor.
- 8) The Contractor shall select the routes of surface conduiting in such a way that embedded conduits laid during civil works need not be punctured. In case embedded conduits get damaged, it shall be the responsibility of the Contractor to rectify the defective work at his own cost.
- 9) All conduit shall be of 25 mm. nominal bore except specified otherwise.
- 10) Bending radius of concealed conduit shall not be less than ten times the outside diameter of the conduit. Maximum distance between two junction boxes shall not be more than four meters.
- 11) Cast iron junction box for fan hooks shall be at appropriate location so as to avoid interference.
- 12) Conduit sleeves with threaded projections (50 mm.) shall be provided at suitable locations in Auxillary Beams, Lintel Beams to facilitate extension of conduits in walls.

- 13) Junction boxes, conduits etc., shall be suitably tied to reinforcing bars in slabs to avoid displacement and misalignment. Minimum 25 mm. thick concrete cover around conduit / junction box shall be ensured.
- 14) To facilities pulling of wires / cables, pull-out wires shall be provided in each length of conduit to be concealed. Also all open faces of junction boxes and open ends of conduits shall be suitably plugged or covered by the Contractor with care to avoid ingress of stones / sand / concrete mix etc. into junction boxes / conduits during pouring of concrete. Similar care must be taken at the locations where couplers etc., are used for extension of conduit.
- 15) During civil works, Contractor shall arrange to provide conduit sleeves (of adequate size and adequate in number) at ceiling level or walls for the passage of surface – conduits so as to avoid routing of conduits along the beam contours at a later stage. Co-ordination in this regard shall be Contractor's responsibility.
- 16) Supply and installation of 150 mm. / 250 mm. dia. Hume pipes for main power cable, for earthing conductors and for direct line telephone cables shall be in Contractors scope. These pipes shall be laid in typical standard details as directed to avoid damage to these pipes.
- 17) Two Nos. earth electrode stations shall be provided for general earthing system of the buildings to be located to suit site conditions. Distance between two earth electrode stations shall not be less than 3.5 meters and that between the outer edge of plinth protection of the building and earth electrodes shall not be less than 2.00 meters.

Wiring :

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

All wires shall be colour coded as follows:

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

All wires shall be with ISI Mark.

Installation:

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

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

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

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

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

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

Separate conduits / raceways shall be used for

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

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

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

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

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

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

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

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

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

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

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

Earthing :

Scope :

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

The following Standards and rules shall be applicable

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

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

General Requirements:

- 1) The earthing shall generally carried out in accordance with the requirements of I.E. Rules as amended from time to time and relevant regulations of B.E.S.T / Electric Supply Company, If Rules No. 32, 51, 61, 62, 67, 69, 88(2) and 90 are particularly applicable.

- 2) All earth connections shall be carefully made visible for inspection and testing of individual earth electrode shall be possible.
- 3) The earthing electrode shall be away at a minimum distance of 2 mt. From the outer surface of plinth protection / Diaphragm wall in case of basements. A minimum clearance of twice the depth of electrode shall be maintained between two earth stations. Wherever adequate distance cannot be maintained due to site constraints. The decision of the Bank will be final and binding.
- 4) A brick masonry chamber cement plastered from both inside and outside shall be provided on the top of the each earth station to house the funnel for watering and the earth connection. The size of this chamber will be 300 mm. x 300 mm. deep. The Chamber will be provided with a lockable cast iron cover hinged to the C.I. frame embedded in the top portion of the masonry wall, by providing spikes for grouting. Lock with key shall be supplied for each pit. The top of the masonry chamber shall be 50 mm. above the surrounding G.L.
- 5) The earth conductor from electrode shall be taken out of the masonry chamber through a protecting pipe embedded in the masonry laid at least 250 mm. below the ground level.
- 6) Earthing system shall be mechanically robust and the joints shall be capable of retaining low resistance even after passage of fault currents / strokes.
- 7) Joints shall be welded / soldered / tinned and double riveted. All the joints shall be mechanically, electrically continuous and effective, joints shall be protected against corrosion by giving suitable treatment duly approved by Architect.
- 8) Contractor shall use the layout drawing issued by the Bank for guidance only. He shall submit working drawings for approval of the Bank prior to execution of the work. He will thereafter submit as built drawings for conductor route showing locations of earth pits etc., for final records and reference after executing the work.
- 9) Contractor shall use the schematic layout drawings for the quantity and route of the conductor issued by Bank for guidance only. He shall work out the exact quantity of earth conductors with its associated accessories required for the job.

Earth Electrodes :

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

Types of Earth Electrodes:

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

Pipe Electrode:

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

Plate Electrode:

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

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

- 1) Pipe Electrode shall consist of 2.50 meter long single piece heavy duty G.I. pipe of minimum 40 mm. N.B. and shall be cut tapered at the bottom. 12 mm. dia. holes in a staggered manner shall be frilled on the pipe as per IS : 3034.
- 2) This Electrode shall be buried vertically in a specially prepared earth pit of size 300 mm. x 300 mm. and 3 M. deep. The pit shall be filled with alternate layers of salt, charcoal, salt and fine washed sand, with a minimum thickness of 150 mm. for each layer.

- 3) The earth conductor of 25 mm. x 5 mm. G.I. strips shall be connected to the electrode just below the top with G.I. nuts and bolts and spring and flat washers with check-nuts. Other end of this earth strip shall be connected to the equipment to be earthed using suitable lugs for termination at both ends, etc.

Sub-Station Earthing:

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

Earth leads and connections:

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

Testing of Earth-Stations / Pits :

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

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

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

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

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

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

- 5) The overlapping of strips at joints where necessary, shall be 75 mm. (minimum). The joints will be double riveted and then welded and painted with silver paint.

Equipment Earthing :

All apparatus and equipment transmitting or utilizing electric power shall be earthed in the following manner. Copper earth wires / strips shall be used where specified in B.O.Q. 1) Power transmission apparatus :

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

Copper	Galvanized Iron
Minimum 2.5 Sq.mm.	6 Sq.m..
Minimum 6.5 Sq.mm.	200 Sq.m..

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

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

Testing :

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

- 1) Earth resistance of each earth station.
- 2) Earthing system as a whole.
- 3) Earth continuity conductors.
- 4)

External Lighting :

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

Standards:

The following standards and rules shall be applicable:

- 1) IS : 1913 – 1969 : General and safety requirements for light fittings.

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

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

Cable Laying:

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

- 1) Indication Instruments and Meters :
These shall be provided as per BOQ and shall be 96 mm. square size suitable for flush mounting and zero adjustment from outside. All meters except KWN meter shall be AE make. KWN meter shall be GEC / IMP make.
- 2) Current transformers shall be bar primary cast type or dry type, and shall have short-circuit time withstand rating equal to that of associated switchgear for 1 sec.
- 3) Push Buttons: The push buttons shall be of the momentary contact to actuate for 10 Amp. At 240 V AC and 2200 V.D.C., provided with integral inscription plates engraved with their functions. They shall have required “NO” and “NC” contacts. Only “Siemens” or E.E. Push Buttons shall be used.
- 4) All HRC switch Fuse Units, Contactors, single phase preventive and O/L relays, indicating lamps will be only “Siemens”, “English Electric” or “Havells” Brands only.
- 5) Control and Selector Switches :

The control switches and selector switches shall be of rotary type having enclosed contacts, adequately rated for application but with a minimum rating of 10 Amps, at 240 V AC and at 220 V.D.C. the plates shall have clear position markings, control switches shall have momentary contacts, spring return to centre, with pistol grip handles, instrument and selector switches shall have stay-out contacts with oval knurled handles.
- 6) Name Plates: Main name plate shall be fixed at the top centre, name plate giving feeder details shall be provided and are to be fixed by screws. All labels / name plates shall be black plastic with white engravings of letters or minimum 6 mm. size.

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

Small wiring for control circuit shall be done with stranded Copper wire PVC conductor 1100 V Grade. Each end of control cable shall be provided with identification Ferrules Yellow in colour with black letters.

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

- 8) Terminal Blocks :

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

- 9) Cable Terminators :

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

- 10) Tariff Advisory Committee and CPRI Tested :

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

- 11) Tests :

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

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

- 12) Documentation :

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

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

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

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

13) Air-Break Switches :

For all places in this project: Metal Clad.

- 1) The air-break switches shall be of AC 23, heavy duty, quick make-quick break type as per IS: 4047.
- 2) Switches shall be capable of withstanding the mechanical and thermal stresses produced by overloads and short-circuits.
- 3) All switches of all rating shall have interlocks with the compartment doors. Switches 250 A and above shall be lockable in "OFF" position. All live parts shall shrouded. It shall be possible to intentionally defeat the interlocks if required.
- 4) Red indicating lamps shall be provided for "ON" indication.
- 5) Brands: Only L & T, Siemens English Electric, Hevels, controls and switchgear brands to be used.
- 6) The switches shall have the following standards rating: 32, 63, 100, 125, 200, 250, 300, 400 and 600 Amps.

14) Fuses :

The fuses shall comply with the following:

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

15) Moulded case circuit breakers : M.C.C.B.

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

16) Contactors :

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

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

8	PVC Conduit & Accessories	i) Allied Conduits iv) Diamond ii) SRG v) Precision iii)New India Trading
9	Wires (FRLS only)	i) RR Kabels, ii) Havells iii) Finolex, iv) Polycab v) KEI
10	MS Conduit & Accessories (ISI Mark).	i) BEC

	Medium - 1.6 mm thick.	ii) AKG
	Heavy - 2 mm thick.	iii) NIC
11	Modular Switches & Sockets with PVC Box	i) Legrand - (Arteor model) ii) MK - (Blenz model) iii) Schneider - (Zencelo model) iv) Elleys - (Fotolia model) v) Anchor/Roma
12	Distribution Board, MCB, RCCB & RCBO	i) Legrand v) Seimens ii) Schneider iii) Hager iv) L&T
13	Data/ Voice Cable & accessories	i) D-Link iv) Legerand ii) AMP v) DG-Link iii) iball
14	Light Fixtures	i) CG ii) Philips iii) CGL iv) Osram v)Bajaj vi) Orient vii)Havells viii) Wipro
15	Tubes, PL's & CFL's	i) Philips ii) Wipro iii) Osram iv) Bajaj v) Syska vi) CG
16	Ceiling Fan	i) CG iv) Orient ii) Havells v) Usha iii) Bajaj

17	Exhaust Fan	i) CG ii) Almonard iii) Alstom	iv) Orient v) Usha
18	Speakers	i) BOSCH ii) Ahuja iii) Boat	(iv) JBL v) Philips
19	Amplifier	i) BOSCH ii) Ahuja iii) Boat	iv) JBL v) Philips
20	Electrical LT Panel	CPRI Approved Panel Manufacturer Only/ i) Legrand ii) HPL iii) Hager iv) L&T	
21	Capacitors	i) Siemens ii) L & T iii) GE iv) ABB v) Universal	
22	CT'S / PT'S	i) AE ii) Kappa iii) Ricco iv) Rishabh v) Keycee	
23	APFC Relay.	i) HPL ii) Emercon iii) Alstom iv) Beluk v) L & T	
24	Contactora / Timer	i) Schneider ii) Hager iii) L & T iv) Siemens iv) Legrand	
25	Energy Meters	i) Trinity ii) Schneider	

		iii) L & T
		iv) Tecnic
		v) AE
		vi) HPL
		Vii) Meco/Nippen

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

Note: - If any material is found to be not up to the mark, the contractor will have to produce original bills/certificate from the manufacturer or his authorised Distributor for authenticity and genuineness of the material for consideration and as per make approved by the SBI. The same will not be considered for payment.

Scope of work of Fire Fighting works

Scope of Work: Supply, Installation, testing and commissioning of firefighting system at SBI GITC , GITC Belapur as stipulated in Bill of Quantities (BOQ). The fire fighting works includes SITC fire alarm system, Public Address System, Fire Extinguisher and Fire Signages.

1. Completeness of the System: The work shall comprise of entire labor including supervision and all material necessary to make a complete installation and such tests and adjustment and commissioning as may be required by the purchaser. All sundry equipment, fittings, assemblies, accessories, hardware items, foundations bolts, supports, excavation and refilling of trenches, sealings, termination lugs for electrical connections, suspenders and/or cable trays, cable glands, junction box, earthing, integration of control components and all other items which are useful and necessary for proper assembly and efficient working/ functional requirement of various equipment and components of the work shall be deemed to have been included in the tender, irrespective of the fact whether such items are specifically mentioned in the tender or not.

Note:1) The quantities of components/equipment mentioned in the Bill of Quantities (BOQ) are indicative for bid purpose only. These quantities shall be finalized during detailed engineering and payment shall be made as per actual measurement at site upon completion of the work,

2. Site Visit: Bidders are advised to visit the site for familiarization of site conditions and collection of any information considered vital for submission of tender. The purchaser will not take any responsibility for the same.

3. Coordination with other Agencies: The contractor shall coordinate with all other agencies involved at the site and ensure that work of other agencies is not hampered due to delay in his work. Cabling Fitting of system or any other work which directly affect the progress of work of other agencies shall be given priority.

4. Guarantee: All equipment shall be guaranteed for a period of 12 months from the date of taking over the installation by purchaser against unsatisfactory performance and/ or breakdown due to defective design, workmanship or material. The equipment or component, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost to the satisfaction risk and cost of the contractor. The decision of Engineer-in-Charge in this regard shall be final & binding on the contractor. Bidder shall guarantee among other things, the following:

i. Quality, strength and performance of the material used as per manufacturer's standards.

ii. Safe mechanical and electrical stress on all part under all specified conditions of operation.

iii. Satisfactory operation during the maintenance period.

6. Material: All equipment/component/accessories to be used in this contract shall be UL/FM listed. The material brought at site shall be approved by the Engineer-in-charge before use in the work. In case during execution, any material used in the work is found not as per agreement specifications, Engineer-in-charge may issue instruction to the contractor to remove the material from site.

10.0 Manufacturer's Instructions:

10.1 Where manufacturers have furnished specific instructions, relating to the materials used in this job, covering points not specifically mentioned in the documents, these instructions should be followed in all cases.

11.0 Completion Certificate:

11.1 On completion of the Installation a certificate should be furnished by the Contractor counter signed by a licensed supervisor, under whose direct supervision the installation was carried out. This certificate should be in the prescribed form as required by the local authority. The Contractor should be responsible for getting the Fire Installation inspected and approved by the local Authority concerned.

12.0 Qualified Competent Supervision:

12.1 The Contractor should employ competent fully licensed, qualified full time Engineer to direct the work of Fire installation in accordance with drawings and specifications. The Engineer should be available at all times on the site to receive instructions in the day-to-day activities, throughout the duration of the contract. The foremen should co- relate the progress of the work in conjunction with all relevant requirements of the supply authorities.

13. Drawing of fire works:

Drawing for approval after award of work: The contractor is required to prepare & submit the drawings of fire alarm and PA system for approval of Engineer-in- charge before commencement of installation. The approval of drawings however does not absolve the contractor of his responsibility to supply the equipment/materials as per agreement / applicable law and fire regulation. In case of any contradiction between the approved drawings and agreement the decision of EIC shall be final and binding on the contractor. The drawings are broadly mentioned as under:- a) General arrangement drawing

ii. Completion Drawings: 3 sets of Drawings shall be submitted by the contractor while handing over the installations to purchaser. Out of this one of the sets shall be laminated on a hard base for display in the fire control room.

FIRE & ALARM SYSTEM

TECHNICAL SPECIFICATIONS

SPECIFICATIONS FOR ADDRESSABLE FIRE DETECTION & ALARM SYSTEM

1. DESCRIPTION IN GENERAL

The Fire Detection & Alarm System supplier shall furnish and install a fully integrated Fire Detection & Alarm system for SBI GITC, CBD BELAPUR.

All the sensors, modules, devices are to be installed in all areas and voids to cover the entire office premises.

This section of the specification includes the furnishing, installation, and connection of a microprocessor controlled, analog addressable, intelligent fire alarm equipment required to form a complete coordinated system ready for operation. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, control panels, auxiliary control devices, annunciators, power supplies, and wiring as shown on the drawings and specified herein.

The Panel shall be interface with a Public Address System to relay evacuation messages in case of a fire emergency.

Each designated zone shall transmit separate and different alarm, supervisory and trouble signals to the Central Monitoring Stations and designated personnel, and if required, in other buildings at the site via a multiplex communication network.

The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall be in compliance with the UL listing.

2. SCOPE

The basic system comprises of Main Addressable Intelligent fire alarm panel, Smoke Multi Sensors, Smoke Optical Sensors, Heat Detectors, Audio Visual Indicators, Isolator Modules, Monitor Control and Relay modules connected by an Armoured Cable. The SITC of Fire alarm system as per latest Indian standard 2189 , NBC, NFPA 72 any other applicable standard.

- 4 Loop_640-Character Display Main fire Alarm panel shall be Installed in BMS Room.

The panel shall be of the multiple loops to accommodate all the sensors and devices with the spare loop capacity of 20%. All the sensors and devices are connected to main panel and all output circuits are activated from the same.

The Fire alarm system are divided in different zones as per bank requirement and integrated, programming with the existing fire alarm system.

The photoelectric sensors are installed in three voids viz. ceiling void, room void & floor void (where 200mm floor void is available). The heat detectors are provided in the Pantry/Kitchen Areas. And multi-sensor detectors shall be installed in critical rooms.

The Hooter cum strobe is located at strategic Location to ensure audible alarm. The Strobes intensity shall be in line with the NFPA 72 requirement, and the Hooter cum strobe shall be placed in such a fashion that there shall be no area blind to the light being emitted by the strobe on an open floor plate.

The panel shall be capable to zone all the sensors and devices and shall be able to activate outputs against activation of zone. The panel shall be capable to zone all the sensors and devices and shall be able to activate outputs against activation of zone. The panel shall be supplied with UPS power 230VAC and shall have its in-built battery backup and battery charger.

Basic Performance:

- Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style 6 (Class A) Signaling Line Circuits (SLC).
- Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style D) as part of an addressable device connected by the SLC Circuit.
- Notification Appliance Circuits (NAC) shall be wired Class A (NFPA Style Z) as part of an addressable device connected by the SLC Circuit.
- On Style 6 or 7 (Class A) configurations a single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
- Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.

When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

The System Alarm LED shall flash.

The LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.

All system output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm shall be executed, and the associated system outputs (notification appliances and/or relays) shall be activated.

The audio portion of the system shall sound the proper signal (tone or voice) to the appropriate zones.

The fire alarm system shall detect all changes in status of monitored points and shall initiate appropriate acts to alert/evacuate occupants, provide event annunciation and activate auxiliary controls as specified herein.

The system shall accept process and evaluate the following types of input signals:

- Automatic Fire Detectors
- Manual Alarms
- Supervisory (Tamper) Condition
- Trouble

The system shall store a record of alarm, supervisory and trouble events in non-volatile history file.

This file shall contain the most recent 1000 events, with time and date of each event. It shall be possible to select the number of events to be viewed in the history file by date, so the entire file does not have to be downloaded. The history file shall remain intact in the event of a loss of AC and battery power.

The system shall be capable of being expanded and field reprogrammed at any time up to the predetermined maximum capacity of the system, without the requirement to return the operating system to the factory for program changes. All field programming shall be done by an authorized manufacturer's representative.

Intelligent, Analog and Addressable input devices shall receive power and communication protocol signals over a single pair of wires per channel (SLC) from the control unit.

Each channel (SLC) shall support Minimum of 125 analog and/or addressable devices.

Channels shall be field programmable for NFPA 72(1993) Style 4 and 6 operations, with capability for Style 7 when used with approved loop isolation units.

Photoelectric and Thermal detectors shall be of the Intelligent, analog addressable type, and shall provide dual level alarm and pre-alarm reporting. Pre-alarm shall serve as early warning of an impending alarm condition, and shall generate a trouble condition in the panel.

Each detector head shall incorporate a microprocessor which provides for distributed system intelligence. The microprocessor shall provide full monitoring and control of the device with memory for storage of pre-set sensitivity levels and other detection device parameters. For security purposes and system integrity no mechanical addressing switches shall be allowed for field devices. All setting of device parameter shall be done electronically.

System Power shall be adequate to accommodate all connected addressable and analog input devices in alarm simultaneously and shall be capable of operating all connected addressable output relays while all addressable inputs are in alarm.

Prior to owner / contractor acceptance of installed system, manufacturer or his representative shall demonstrate 100% system alarm status with no loss of performance.

Activation of any manual alarm station or any other approved alarm initiating device (excluding Automatic Fire Detectors which will be described later) shall immediately result in the following:

Display the alarm condition, back-lit LCD Display; a minimum of 40 characters which will be available for user-defined messaging.

Visual alarm signals shall be provided as indicated on the plans.

System shall shutdown/redirect all HVAC system fans, dampers, etc.; close fire doors, recall elevators, etc., in accordance with the schedule provided and with appropriate local/national code.

Operation of the system alarm silence switch shall silence all alarm audible connected to the system. When properly configured, a silence command shall not extinguish visual alarm appliances. Circuits containing alarm visual circuits shall not be silenceble except upon system reset.

The system alarm LED and all other associated alarm displays shall remain illuminated until the alarm condition has been corrected and the panel has been reset.

A connected system printer (if supplied) shall record all the status changes that take place within the fire protection system, including alarm / trouble restoration. All status changes shall be logged.

The activation of an Automatic Fire Detector shall provide for all operations. Alarm Verification is as per device in accordance with NFPA 72 - 1993 and UL 864. Positive Alarm Sequence is in accordance with NFPA 72 -1993 and UL 864.

Analog-Addressable smoke detectors shall be equipped with a Day/Night Sensitivity Mode which may be selected by either manual or automatic input. Because certain smoke detector environments change from day (occupied) to night (unoccupied), a more sensitive or Night setting may be desirable. Adjustable sensitivity smoke detector values shall be distinctly identified in the system memory and by display.

Supervisory conditions shall cause a distinct annunciation at the panel. The system printer shall record supervisory events in a manner consistent for all status changes.

The fire alarm panel shall fully supervise its operation. The physical opening or cutting of the wiring to any initiation, alarm indicating, signaling line, or associated supervisory monitoring circuit shall cause distinct annunciation via the LCD

display.

Wiring Arrangements

It shall be the responsibility of the Contractor to determine the number of loops and other circuits required for the system.

Where the system is distributed, the network linking the control panels shall be capable of being extended in the future to link to further compatible control panels. The capacity of the network shall be expandable by 20% .

All wiring shall be monitored for faults.

Loop wiring shall tolerate a single open-circuit fault without affecting any device on the same loop. Loop wiring shall also tolerate multiple open-circuit or short-circuit faults in one area, without affecting the devices in any other area or on any other loop or circuit.

Removal of a device from a loop shall not cause any remaining devices in the system to become inoperative.

It shall be possible to disable detectors on the system. The controlling software shall permit individual detector disablement and detector group disablement. As a minimum, a group shall correspond with the detectors in a particular zone. Group detector disablement shall not render manual call points in the same area inoperative.

False Alarms

Great care shall be taken, at the design stage, to minimize the likelihood of false alarms occurring in the new or modified system.

Devices shall be of types appropriate to the local environment. For example, optical smoke detectors shall not be installed in areas where there is likely to be steam or dust present. Also, manual call points shall be fitted with transparent hinged covers where there is the possibility of accidental operation, e.g. in kitchens or service areas.

Battery

- 1) Shall be 12 volt, Lead Acid Maintenance free type.
- 2) Battery shall have sufficient capacity to power the fire alarm system for not less than 48 hours plus 30 minutes of alarm upon a normal AC power failure.
- 3) The batteries are to be completely maintenance free. No liquids are required. Fluid level checks refilling, spills and leakage shall not be required.

Battery Charger

- 1) Shall be completely automatic, with constant potential charger maintaining the battery fully charged under all service conditions. Charger shall operate from a 240-volt 50/60 hertz source.
- 2) Shall be rated for fully charging a completely discharged battery within 48 hours while simultaneously supplying any loads connected to the battery.
- 3) Shall have protection to prevent discharge through the charger.
- 4) Shall have protection for overloads and short circuits on both AC and DC sides.

PUBLIC ADDRESS SYSTEM

The objective is to have an effective Public address system for entire premises of SBI SOC ROOM BELAPUR.

Requisite number of Audio Amplifiers shall be provided to meet the load of the Speaker Circuits, The System shall have a built-in Message manager which will relay an emergency Message to all zones on Floor, in case of a Fire / Likewise emergency.

Voice Evacuation Messages shall be relayed immediately after the alarm activated by either manual call point or sprinkler flow switch / hooter cum flashers are sounded.

Requisite number of Booster Amplifiers shall be provided to meet the load of the Speaker Circuits shall be kept in Reception area. The System shall have a built-in Message manager which will relay an emergency Message to all zones on all Floors, in case of a Fire / Likewise emergency.

The system shall comprise of Network Voice Alarm Controller, Audio (Booster) amplifiers, ceiling mount/wall mount speakers- 6W Speakers, Call Station with 6 Zone Selection Switch, & other related accessory.

The Main PA controller and amplifiers shall be Rack mounted kept in BMS Room. Call station shall be kept in BMS room and Reception area.

Installation shall be as shown on the drawings, and as recommended by the major equipment manufacturer.

All cables, junction boxes, cables supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. . If construction is ongoing during this period, measures shall be taken to protect detectors/ sensors from contamination and physical damage.

All speakers/controllers/amplifiers/call stations shall be installed in accordance with installation instructions provided by the manufacturer.

All speakers shall be installed in the exact locations specified in the design drawings; thus providing the best possible coverage.

All speakers shall be securely fixed to approved boxes and allow for easy fitting and removal of it.

Cable and wire entries to speakers shall be fitted with grommets to prevent possible damage to the insulation

SCOPE OF WORK OF DATA CABLING

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

SUPPLY, TESTING, AFTER INSTALLATION OF o LAN CABLING NETWORK, TELEPHONE CABLING AND NETWORK RACK as under:

- (i) Supply of necessary materials as per the BOQ.
- (ii) Laying, Termination, Installation of IOs, Surfaces boxes, Single Face Plates, Racks and other related accessories.
- (iii) Network numbering and identification at Jack Panel, IOs etc as per industry standard.
- (iv) Network cable Routing / Laying Diagram with testing confirmation.
- (v) Testing of end to end LAN cabling i.e. from IOs till Jack Panel in the Network Racks.
- (vi) Supply and Laying of Cat 6A Cable, Termination, Installation of IOs with Face Plate fixing ,termination mount boxes, RJ11 JACK IOs, MDF Installation, Krone Modules and other related accessories, with punching, labelling etc.
- (vii) Termination and testing upto intercom points at the identified workstations

SCOPE OF SECURITY SYSTEM WORK

State Bank India GITC Belapur proposes to procure additional Access Control Devices and CCTV Surveillance System devices to enhance the security in office workstation at SBI GITC annex premises i.e. SBI GITC , GITC Belapur at Navi Mumbai.

A. Equipment to be installed: -

The RFP is issued to identify prospective vendor for SITC for Access Control System and CCTV Surveillance System, at SBI GITC , GITC Belapur. Details of items to be installed are given in Appendix A.

B. The successful bidder will have to tie up with the respective software/ hardware providers at their own end for hassle free service. No additional charges will be paid for co-ordination with software/hardware providers for hiring/using their services. Bidders to ensure site inspection of the site before giving the quote. No separate charges will be entertained at a later stage.

C. To ensure that Installed Security Gadgets in SBI GITC , GITC Belapur mentioned in Appendix - A, are maintained in optimum operational condition. For the purpose, the successful bidder shall ensure following:-

- a. Quarterly preventive maintenance.
- b. Call based visits to address system malfunction/ technical issues.
- c. Regular cleaning of all the gadgets.
- d. Checking the System health at site and maintain proper record thereof.
- e. The following data should be maintained at site.
 - i. Proper inventory of all equipment containing details of specification.
 - ii. Date of maintenance carried out.
 - iii. Next due date of maintenance.
 - iv. Present operational status.
- f. Any spares/ components required to be replaced/will be replaced with same brand or equivalent brand or a higher brand free of cost.
- g. No labor charges will be paid.

D. A technically qualified supervisor/technician to be provided on call at the site i.e. at SBI GITC , GITC Belapur for maintenance of all the installed gadgets provided at SBI GITC , GITC Belapur as per RFP schedule and for any contingency coming in during the contract period. The identified firm has to ensure 100% functionality of all the gadgets installed.

- a. Agency/Firm should deploy additional technicians in case of heavy workload or in case of urgency to complete the work promptly in time, the emergency breakdown calls must be attended within 3 hours from time of reporting. Agency/Firm should also deploy

additional technician to undertake quarterly Preventive Maintenance schedules of all the gadgets installed in the SBI GITC , GITC Belapur.

- b. The technician shall wear the identity card and shall be bound by the security/norms/instructions of the Bank from time to time.
- c. The technicians working are to be covered by insurance under Workman Compensation Policy through reputed insurance companies at the vendor's cost during the contract period. Copies of the insurance policies are to be submitted to the Bank along with first quarter bill.
- d. Whenever technician is attending to repairs and services the information and location where repairs and services being carried out must be recorded in the Movement Register existing in the security control room at SBI GITC , GITC Belapur along with time at which they have left. On returning the same to be recorded.
- e. The attending technician/supervisor shall make necessary endorsement in the following register/report:-
 - i. Complaint/Breakdown Register: All complaints received are to be recorded with time and date of receipt, as and when complaints are received. Details of attending the complaint and making the equipment serviceable with time and date.
 - ii. Service reports are to be made after carrying out repair work and endorsement (Sign and Seal) to be obtained from the security officer.
 - iii. Spares and parts replaced to be recorded and endorsement from the security officer has to be obtained in register.
- f. Apart from regular letter communications, all the E-Mail communications from SBI Security Department/Estate Department are to be treated as formal communication for all practical purposes.
- g. The mobile number of the technician working at office must be registered with Security/Estate Department and whenever the numbers are changed the same must be intimated to the dept. The numbers registered must be accessible round the clock.
- h. The mobile number, landline number and email id of the supervisor to whom the technicians are reporting and that of Top Management level is to be provided to Bank for Communication purpose.
- i. All security and safety regulations and guidelines as per the applicable law are to be followed. All guidelines/directions of Banks security division must be followed.
Note: The scope of the work includes replacement/repairs of any spares for the smooth running of all the security equipment/gadgets as mentioned in RFP without any additional cost.
- j. For the System and other Software/hardware, the following will apply:

- i. The vendor shall tie up with the concerned Software/Hardware providers at SBI GITC , GITC Belapur for support during the tenure of the contract. The Firm/Agency if not dealing in the software/hardware used at SBI GITC , GITC Belapur and it is not his proprietary software/hardware, then he has to submit evidence in the form of an agreement he has entered into with the software/hardware vendor, which includes support from the software/hardware vendor for the proposed software/hardware for the full period required by the Bank during the period of contract.
- ii. The vendor shall explicitly absolve the Bank of any responsibility/liability for use of system/application software/hardware already installed with the installed security equipment's. (i.e. the vendor shall absolve the Bank in all cases of possible litigation/claims arising out of any copyright/license violation) for software/hardware's published either by third parties, or by themselves.
- iii. The vendor shall submit the inbuilt warranty certificate received from OEM on Hardware supplied with work completion report.
- iv. Agency shall ensure that the equipment is not down at any time for want of spares/spare parts.
- v. During the quarterly maintenance schedules, the technician will give training to the security staff available in the respective Control rooms/BMS operators/security staff.
- vi. The vendor should undertake to implement the observations /recommendations of the Banks IS audit, Security Audit or any other audits conducted by the Bank or external agencies and any escalation in cost on this account will not be accepted by the Bank.
- vii. During the period of the contract, due to any reason, if there is shortage of spares or the replacement of some gadget's same model is not available in the market, then the agency will provide another model, same brand with equivalent configuration or higher will have to be provided so that there is no equipment which is un-operational at any point of time.
- viii. On account of negligence, commission, or omission by the technicians of the Agency and if any loss or damage caused to the security equipment or to any other electronic equipment's of the Bank or its property, the Vendor shall indemnify/pay/reimburse the loss suffered by the Bank to its full present cost.
- ix. The visits have to be carried out once in each quarter. However, there should be a minimum gap of 75 days between two visits.
- x. No charges will be payable after each quarterly visit, subject to maintenance services.
- xi. Visit be construed to be done only when the system is found to be functioning completely/fully. Vendor will submit service reports.
- xii. Vendor will keep sufficient standby security equipment's and spares of essential kits or parts of the equipment all the time, as may be required to keep the downtime minimal.

- k. Sub-Contracting: The vendor shall not assign or sub-contract, in whole or in part, its obligations to perform under the contract, except with the Bank's prior written consent. However, such restriction is not applicable for service repairs/maintenance, if being provided by the OEM's under vendors tie up or the Software/hardware providers, whose software/hardware is being used by the Bank.

APENDIX-A

Sr. No	PARTICULARS	MAKE	QTY	UNIT
1	<p>ACCESS CONTROL - CONTROLLER Supply, Installation, Testing and Commissioning of HID V2000 Reader Interface/ Networked Controller with enclosure and required power Supply. Model (and Part #):EVO V2000 (72000BEP0N01A) or latest, Mounting: Mount to any wall surface, using four screws. For UL compliance, one or more gateways can be mounted inside a locking customer supplied NEMA-4 rated enclosure, Dimensions: 5.8" W x 4.825" H x 1.275" D (147.32 mm x 122.55 mm x 32.38 mm), Weight: 12.4 oz (.35 kg), Housing Material : UL94 polycarbonate Audio / Visual Indicators : Power LED and Communications LED, Operating Temperature : 32° to 120° F (0° to 49° C), Operating Humidity :5% to 85% relative, non-condensing, Storage Temperature : -67° to 185° F (-55° to 85° C), Communication Ports: Ethernet (10/100), Certifications: UL294 (US) Listed Component, CSA 205 (Canada), FCC Class A (US), ICES-003 Class A (Canada), CE Mark EN 301 489-3 EN 55022 EN 50130-4 (EU), C-Tick S/NZS CISPR 22 (Australia, New Zealand) & Korea (KCC), Operating Current (MAX) @ 12-24VDC : 1000mA Operating Current: (AVG) @ 12VDC: 625mA (with 2 iCLASS Readers), Supervised Inputs Power (MAX): 0.025W (5mA sink, 5V nominal) 0 to +5VCD Ref, Output Power (MAX) for individual field devices Wiegand / C&D Reader : 12VDC, 250mA each, Relay Outputs : 30VDC, 2Amp, resistive. Integration With SSI, Snehapadma, Cybernetics or HID Authorised Application</p>	HID		NOS
2	<p>ACCESS CONTROL - BIO CLASS READER Supply, Installation, Testing and Commissioning of HID ICLASS BIO-METRIC READER at OUT side of define Door, card plus finger Two way Authentication, Enrollment Mode, Verification Mode.</p>	HID		NOS
3	<p>ACCESS CONTROL - R10 READER Supply, Installation, Testing and Commissioning of HID ICLASS SE R10 Card READER at IN side of define Door, suitable to read Mifare, Proximate Card and SBI formatted HID cards.</p>	HID		NOS
4	<p>ACCESS CONTROL - ELECTROMAGNETIC LOCK Supply, Installation, Testing and Commissioning of EM LOCK with all required accessories on define Door, Power Input through HID controller EVO V2000, 12V capacity, Electromagnetic mechanism for interlocking with all required Components.</p>	essl or equivalent		NOS

6	CABLING FOR CCTV and Networking Communication Supply, laying, Testing and Commissioning of CAT 6 UTP cable solid cable, Conductor : 23 AWG (Solid) , META : Bare Copper, Insulation Material : HD-PE, OD : 61.mm +- 0.2 , Resistance Unbalance : 5% Max, Capacitance Unbalance : 330pF/100m, Delay Skew : < 45Ns, laying through conduit with required accessories.	d-link or equivalent		Mtr.
7	CABLING FOR ACCESS SYSTEM Supply, laying, Testing and Commissioning of 04 core 22 AWG Shielded Cable laying through conduit with required accessories.			Mtr.
8	NETWORK VIDEO RECORDER (NVR) Supply, Installation, Testing and Commissioning of Network Video Recorder having Minimum 64 Channel Input and 16 SATA support up to 10 TB by each SATA slot. Resolution : Minimum 1920*1080, Audio Output : Yes with latest Ports	ANY OUT OF OR EQUIVALENT TO AXIS, BOSCH , SAMSUNG		Nos
9	CCTV CAMERAS Supply , Installation, Testing and Commissioning of CCTV cameras 2.0MP Starlight Motorized Vandal proof IR Dome Camera with required accessories ,1/2.8" 2MP CMOS Sensor,H.265/H.264 HP/MP/BP/M-JPEG Encoding, Triple Stream, Up to 1920X1080 High Resolution, Motorized Lens:2.8mm/12mm, IR LEDs: 20m-30m, VCA: Tripwire/Perimeter/Crowd/Foreign & Missing Object/ Fast Moving etc., NIR,WDR, 3D DNR, HLC, Dual-ICR, AWB, AGC, BLC,1/1ch Audio I/O, 2/1ch, Alarm I/O, USB, Built-in Mic, PoE, DC12V/AC24V, TVS 6000V Protection, MicroSD Slot up to 128GB, Material: Metal, IP66, IK10.	ANY OUT OF OR EQUIVALENT TO AXIS, BOSCH , SAMSUNG		NOS
10	CCTV CAMERAS Supply , Installation, Testing and Commissioning of CCTV cameras 4.0MP Starlight Motorized Vandal proof IR bullet Camera with required accessories,1/2.8" 4MP CMOS Sensor,H.265/H.264 HP/MP/BP/M-JPEG Encoding, Triple Stream, Up to 1920X1080 High Resolution, Motorized Lens:2.8mm/12mm, IR LEDs: 20m-30m, VCA: Tripwire/Perimeter/Crowd/Foreign & Missing Object/ Fast Moving etc., NIR,WDR, 3D DNR, HLC, Dual-ICR, AWB, AGC, BLC,1/1ch Audio I/O, 2/1ch, Alarm I/O, USB, Built-in Mic, PoE, DC12V/AC24V, TVS 6000V Protection, MicroSD Slot up to 128GB, Material: Metal, IP66, IK10.	ANY OUT OF OR EQUIVALENT TO AXIS, BOSCH , SAMSUNG		NOS
11	NETWORK SWITCH FOR ACCESS CONTROL SYSTEM Supply , Installation, Testing and Commissioning of Switch MAKE : D-LINK 16-Port Gigabit Switch	D-link		NOS
12	NETWORK SWITCH FOR CCTV CAMERA Supply, Installation, Testing and Commissioning of Switch MAKE : D-LINK 28-Port Gigabit Smart Managed PoE Switch, MODEL : DGS-1210-28P,24 x 10/100/1000BASE-T PoE ports,4 x Gigabit RJ45/SFP Combo ports, Advanced L2 switching and security features,L2+ Static Routing, Optional "standard mode" or "surveillance mode" management user interface,193 W PoE budget.	D-link		NOS

13	<p>STORAGE FOR CCTV FOOTAGE Supply , Installation, Testing and Commissioning of Hard Disk into NVR for storing of CCTV Footage Make: WD purple, Model : WD80PUZX, Formatted capacity: 8TB,Form factor 3.5-inch,Advanced Format (AF), RoHS compliant, Interface transfer rate,(max)2 Buffer to host: 6 Gb/s, Host to/from drive (sustained): 178 MB/s, Cache (MB) : 128, Performance Class :5400 RPM Class, Load/unload cycles : 300,000, Non-recoverable read errors per bits read : <1 in 10¹⁴, Average power requirements (W) Read/Write: 6.4, Idle: 5.7, Standby and Sleep :0.7, Temperature (°C, on the base casting) Operating: 0 to 65, Non-operating: -40 to 70, Shock (Gs) :30, Operating (2 ms, read/write) Operating (2 ms, read): 65, Non-operating (2 ms): 250, Acoustics (dBA)7 Idle: 20, Seek (average): 29, Height (in./mm, max): 1.028/26.1, Length (in./mm, max): 5.787/147, Width (in./mm, ± .01 in.): 4/101.6, Weight (lb/kg, ± 10%): 1.43/0.65.</p>	WD		NOS
14	<p>RACK FOR SWITCH MOUNTING Supply , Installation, Testing and Commissioning of 4U rack for mounting Network PoE Switch with 28 Port Patch Paneling and rack Dressing with 1Mtr. D-Link Patch Cable for Each Port. 4 SOCKET Spy Guard for Power Distribution for FAN and Switch.</p>	Schneider or Equivalent		NOS
15	<p>DISPLAY FOR CCTV Supply, Installation, Testing and Commissioning of B2B LED display having screen size 55" with resolution at least 1920*1080. Make : LG / SAMSUNG</p>	LG/ SAMSUNG		NOS
16	<p>Access Software Integration Integration, Installation, Testing & Commissioning of Newly Installed Access Control Devices in existing Access Control Software i.e. Cybernetics , SSI</p>	-		Nos

DECLARATION

(To be typed & given on the letter – head of the Vendor)

I/We have inspected all the sites of the Proposed Work as mentioned in clause No. 1 of NIT, of State Bank of India and I/We have made me/ us fully acquainted with the local conditions in and around the sites of works and proposed layout drawings of works, drawings of each items, RFP, Technical bid & Price bid, etc. complete.

I/We hereby declare that I/ We have carefully gone through the conditions laid down in the Notice Inviting Tender, General notes, General Conditions of Contract, Special conditions, Schedule of approximate quantities and rates , Form of Agreement, General Specification, Approved manufacturers/ natural source of materials (i.e. all parts of Technical bid), Technical Specifications of schedule of quantities (i.e. all parts of Price bid), and clearly understood all the same and on the basis of the same I/ We have quoted our rates in the Schedule of Quantities/ Price Bid attached with the tender documents.

We accept all the terms and conditions of tender documents. We will abide by the technical specification mentioned in the tender. We here by undertake to use only specified material/ make as per the tender schedule.

We hereby declare that we are neither blacklisted nor debarred by the Bank for any work/project. Further we have a valid GST and PAN No.

I/ We hereby declare that, in particular during execution of all works at site; it will be my/ our sole responsibility to strictly adhere to/ meticulously follow the General Specification, Approved manufacturers/ natural source of materials; Safety, Health and Environmental (SHE) guidelines; Labor Laws; Technical Specifications of schedule of quantities, all drawings of layout and items.

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 SBI, appropriate Government Authorities, local bodies 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 all the deviated material/ works from the site at my/ our cost as well as I shall be liable to penalized by the employer as deemed fit and for all such loses made thereof, I/ we shall not have any right to arbitrate in any manner.

I/ We hereby declare that I/ We shall obtain necessary clarifications, drawings of items from SBI in time and also shall uniformly maintain such progress as may be directed by the SBI to ensure completion of same within the target date/ time as mentioned in the tender document.

Date:

Signature and seal of Contractor/Tenderer

Witness:

- 1.
- 2.