Reserve Bank of India /भारतीय रिज़र्व बैंक
College of Agricultural Banking /कृषि बैंकिंग महाविद्यालय
Estate Department /संपदा विभाग
Pune /पुणे

NOTICE INVITING TENDER

Reserve Bank of India, College of Agricultural Banking, Pune, invites E-tenders in two parts from the empaneled contractors of the College for the work – **"Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, Pune."** The work is estimated to cost **₹9,11,000/-** and is to be completed within three months.

2. The mode of submission of tenders will be through e-Procurement System Online (Part I – Techno-Commercial Bid and Part II - Financial Bid through **MSTC Common Portal** at www.mstcecommerce.com/eprocn)

3. The last date of closing of online e-Tender for submission of Techno-commercial Bid and Price Bid is till 02:00 PM of July 30, 2025.

4. The salient details of the work for which bids are invited and important instructions to the bidders are as under:

1.	e-Tender No.	**RBI/CAB, Pune Regional Office/Estate/5/25-26/ET/302**
2.	Name of the Work:	**Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, Pune.**
3.	Mode of Tender:	e-Procurement System Online (Part I – Techno-Commercial Bid and Part II - Financial Bid through **MSTC Common Portal** at www.mstcecommerce.com/eprocn)
4.	Date & time from which NIT (along with complete tender documents) will available to the parties to download	July 18, 2025 from 05:00 PM
5.	Estimated cost of the work:	**₹9,11,000/- (Rupees Nine Lakh Eleven Thousand Only)**
6.	Earnest Money Deposit (EMD)	**₹NIL/- (Rupees NIL only)**

7.	Performance Bank Guarantee (PBG)	**₹NIL/- (Rupees NIL only)**
8.	Retention Money (RM) to be deducted from each bill	**5%** of the bill amount till completion of DLP
9.	Security deposit towards DLP	Total amount deducted as RM or Bank guarantee of 5% of contract amount upto completion of the DLP.
10.	Time allowed for completion of the works from tenth day after the date of written order to commence work	**3 months**
11.	Bidding start date of Techno-commercial Bid and Price Bid at www.mstcecommerce.com/eprocn	**July 23, 2025 from 10:00 AM**
12.	Date of closing of online e-Tender for submission of Techno-commercial Bid and Price Bid	**July 30, 2025 till 02:00 PM**
13.	Date and Time of opening of Part-I (i.e. Techno-Commercial Bid)	**July 30, 2025 at 03:00 PM**
14.	Date and Time of opening of Part-II (i.e. Price Bid)	Opening date and time of Financial Bid will be same as that of Part-I. Otherwise, all the eligible bidders will be informed later regarding the same.
15.	Validity of the tender	Three months from the date of opening of Part I (Techno-commercial bid)
16.	Transaction fee	Charges for participation in e-procurement will be paid to M/s MSTC Ltd. through MSTC Gateway/ NEFT/ RTGS in favour of MSTC Limited or as advised by MSTC Ltd.

The Bank is not bound to accept the lowest tender and reserves the right to accept either in full or in part any of the tender. The Bank also reserves the right to reject all the tenders without assigning any reason thereof.

This notice is being published for information only and is not an open invitation to quote in this limited tender. Participation in this tender is by invitation only and is limited to the selected Procuring Entity's enlisted contractors. Unsolicited offers are liable to be ignored. However, contractors who desire to participate in such tenders in future may apply for enlistment with RBI as per procedure.

Chief General Manager & Principal
College of Agricultural Banking
Pune

Reserve Bank of India/ भारतीय रिज़र्व बैंक
College of Agricultural Banking/ कृषि बैंकिंग महाविद्यालय
Estate Department / संपदा विभाग
Pune/ पुणे

PART - I

TENDER FOR

Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, Pune

Name of the Tenderer: _____

Address: _____

E-mail ID & Contact Number: _____

1	Date of publish of Tender	July 18, 2025 from 05:00 PM
2	Due date of Submission	July 30, 2025 till 02:00 PM
3	Date of opening of Part- I of the Tender	July 30, 2025 at 03:00 PM
4	Date of opening of Part- II of the Tender	Opening date and time of Financial Bid will be same as that of Part-I. Otherwise, all the eligible bidders will be informed later regarding the same.

Last Date of Submission: - July 30, 2025 till 02:00 PM

DISCLAIMER

Reserve Bank of India, Estate Department, Pune, has prepared this Document to give background information on the Project to the interested parties. While Reserve Bank of India has taken due care in the preparation of the information contained herein and believes it to be accurate, neither Reserve Bank of India nor any of its authorities or agencies nor any of their respective officers, employees, agents or advisors give any warranty or make any representations, express or implied as to the completeness or accuracy of the information contained in this document or any information which may be provided in association with it.

The information is not intended to be exhaustive. Interested parties are required to make their own inquiries. Respondents to this e-tender are required to make their own inquiries and they should not rely solely on the information contained in the blank e-tender documents / forms. The Reserve Bank of India is not responsible if no due diligence is performed by the Respondents.

The information is provided on the basis that it is non – binding on Reserve Bank of India or any of its authorities or agencies or any of their respective officers, employees, agents, or advisors.

Reserve Bank of India reserves the right not to proceed with the Project or to change the configuration of the Project, to alter the timetable reflected in this document or to change the process or procedure to be applied. It also reserves the right to decline to discuss the matter further with any party expressing interest. In such scenario no reimbursement of cost of any type will be paid to persons or entities expressing interest based on this document.

Index

NOTICE INVITING TENDER (NIT)

(Only through e-procurement)

SCHEDULE OF TENDER (SOT)

1. e-Tender No.	**RBI/CAB, Pune Regional Office/Estate/5/25-26/ET/302**
2. Name of the Work:	**Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE**
3. Mode of Tender:	e-Procurement System Online (Part I – Techno-Commercial Bid and Part II - Financial Bid through https://www.mstcecommerce.com/eprocn
4. Date of NIT (along with complete tender) available to the parties to download- Tender activation on portal- Tender 'Live' for all	July 18, 2025 from 05:00 PM
5. Estimated cost of the work:	**₹9,11,000/- (Rupees Nine Lakh Eleven Thousand Only)**

<table>
<tr><td>6. Earnest Money Deposit (EMD)</td><td>₹NIL/- (Rupees NIL only, from the successful bidder only) in the form of EMD in favor of Reserve Bank of India, CAB, PUNE to be delivered through the NEFT on given details:
<table>
<tr><td>Name of the Account Holder (as appearing in the Bank Account)</td><td>College of Agricultural Banking, Reserve Bank of India, Pune</td></tr>
<tr><td>Account Number</td><td>8614038</td></tr>
<tr><td>Type of Account (Savings, Current etc.)</td><td>Current</td></tr>
<tr><td>PAN Number</td><td>AAIFR5286M</td></tr>
<tr><td>Name of the Bank</td><td>Reserve Bank of India</td></tr>
<tr><td>Name of the Branch</td><td>CAB,PUNE</td></tr>
<tr><td>Address of the Bank</td><td>CAB, RBI, University Road, PUNE</td></tr>
<tr><td>NEFT/IFS Code</td><td>RBIS0PUPA01 (0 in the code represents ZERO)</td></tr>
<tr><td>Name of the Account</td><td>Sundry Deposit A/c-DAD</td></tr>
<tr><td>GST Number</td><td>27AAIFR5286M1ZG</td></tr>
</table></td></tr>
<tr><td>7. Last date of submission of DD/Bank Guarantee for EMD</td><td>NA</td></tr>
<tr><td>8. Performance Bank Guarantee (PBG)</td><td>Nil % of Work Order Amount</td></tr>
<tr><td>9. Retention Money (RM) to be deducted from each bill as</td><td>5%</td></tr>
<tr><td>10. Bank guarantee towards DLP</td><td>Total amount deducted as RMD or Bank guarantee of 5% of contract amount upto completion of the DLP.</td></tr>
<tr><td>11. Time allowed for completion of the works from tenth day after the date of written order to commence work</td><td>3 months</td></tr>
<tr><td>12. Bidding start date of Techno-commercial Bid and Financial Bid at https://www.mstcecommerce.com/eprocn</td><td>July 23, 2025 from 10:00 AM</td></tr>
</table>

13. Date of closing of online e-Tender for submission of Techno-commercial Bid and Financial Bid	**July 30, 2025 till 02:00 PM**
14. Date & Time of opening of Part-I (i.e. Techno-Commercial Bid)	**July 30, 2025 at 03:00 PM**
15. Date & Time of opening of Part- II (i.e. Financial Bid)	Opening date and time of Financial Bid will be same as that of Part-I. Otherwise, all the eligible bidders will be informed later regarding the same.
16. Transaction fee	Charges for participation in e-procurement will be made to M/s MSTC Ltd through MSTC Gateway/NEFT/RTGS in favor of MSTC Limited or as advised by MSTC Ltd.
17. Tender fees for download from portal	NIL

Schedule A

IMPORTANT INSTRUCTIONS FOR E-PROCUREMENT

This is an e-procurement event of RBI. The e- procurement Service Provider/Contractor is the MSTC Limited.

You are requested to read and understand the Notice Inviting Tender and subsequent corrigenda if any, before submitting your online tender.Bidders who do not comply with the conditions with documentary proof (wherever required) will not qualify in the e-Tender for opening of the price bid.

1. Process of e-Tender:

(A) Registration: The process involves vendor's registration with MSTC e-procurement portal which is free of cost. Only after registration, the vendor(s) can submit his/their bids electronically. Electronic Bidding for submission of Techno-Commercial Bid as well as Price Bid over the internet will be done. The Vendor should possess Class III signing and encryption type digital certificate. Vendors are to make their own arrangement for bidding from a P.C. connected with Internet. RBI is not responsible for making such arrangement. (Bids will not be recorded without Digital Signature).

Special note:

THE PRICE BID AND THE TECHNO-COMMERCIAL BID HAS TO BE SUBMITTED ON-LINE ONLY AT www.mstcecommerce.com/eprocn **/ (Version 3)**

a) Vendors are required to register themselves online with www.mstcecommerce.com/eprocn

Register as Vendor -- Filling up details and creating own user id and password Submit. For further details, go to Download Guide / Video / Registration.

b) Vendors will receive a system generated mail confirming their registration in their email which has been provided during filling the registration form. In case of any clarification, please contact RBI/MSTC, (before the scheduled time of the e- tender).

Contact person (MSTC) For Vendors:

HO Central Help Desk: (For vendors)

Phone Number: 07969066600

helpdeskho@mstcindia.in (Please mention "HO Helpdesk" as subject while sending emails)

WRO Helpdesk:7651915418/02269856817/02269856800

Availability

9:30 AM to 5:00 PM on all working days for all Technical issues e-Tenders, System settings etc.

Contact person (MSTC,WRO)

Tanmoy Sarkar, Deputy Manager Mobile:8349894664

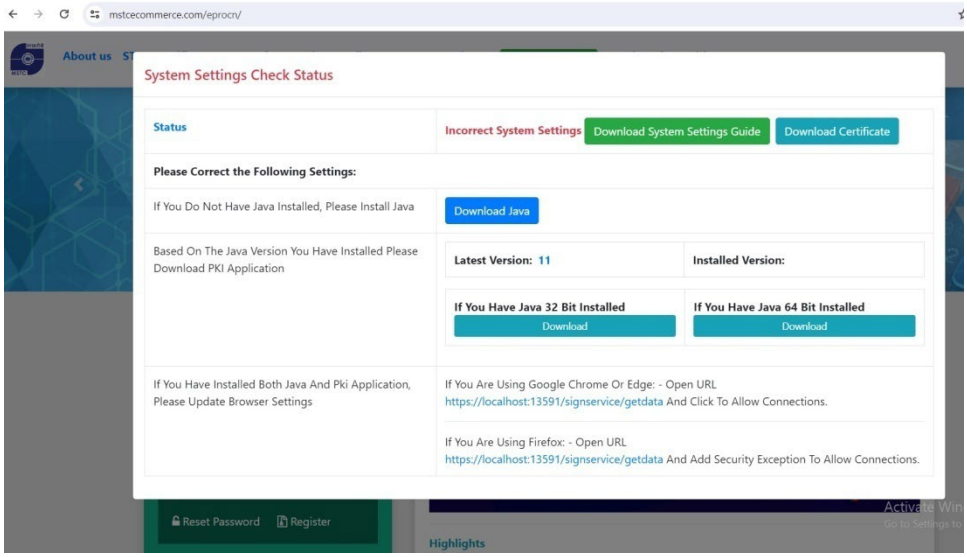
Contact person (RBI):

S/No	Name of the Person	Designation	Phone Number
1	Biswanath Dey	Assistant General Manager	020-25582378/9463952113
2	Jisha Narayanan	Manager	020-25582329
3	Sanjay Gajjar	Assistant Manager (Technical-Civil)	020-25582373/ 9099938217
4	Nayan Santhosh	Assistant Manager	020-25582364/9885320431

e-mail ID of Estate Department, Pune: premisescab@rbi.org.in

(B) System Requirements:

1. For details, vendor may refer to the DOWNLOAD SYSTEM SETTING GUIDE available https://www.mstcecommerce.com/eprocn /



2. **Special Note towards Transaction fee**: The vendors shall pay the transaction fee using "Transaction Fee Payment" Link against the specific tender in the "Bid Floor"/through the "Pay Transaction fee" in "Event catalog" through their login. Service Provider / Contractor / Vendor shall have the facility of making the payment either through NEFT or Online Payment. On selecting NEFT, Service Provider / Contractor / Vendor shall generate a challan by filling up a form. Service Provider / Contractor / Vendor shall remit the transaction fee amount as per the details printed on the challan without making change in the same. On selecting Online Payment, Service Provider / Contractor / Vendor shall have the provision of making payment using its Credit / Debit Card / Net Banking. Once the payment gets credited to MSTC's designated bank account, the transaction fee shall be auto authorized.

Transaction fee is non-refundable. A vendor will not have the access to online e-tender without payment of the transaction fee.

NOTE: Bidders are advised to remit the transaction fee well in advance before the closing time of the event so as to give themselves sufficient time to submit the bid.

3. Information about tenders / corrigenda shall be sent by email only during the process till finalization of tender. Hence the vendors are required to ensure that their corporate email I.D. provided is valid and updated at the time of registration of vendor with the MSTC Ltd. Vendors are also requested to ensure validity of their class III signing and encryption type of DSC (Digital Signature Certificate).

4. E-tender cannot be accessed after the due date and time mentioned in NIT (Notice inviting tender).

5. Bidding in E-tender:

Note: Vendors are instructed to use ***Upload Documents*** link in My menu to upload documents in document library. Multiple documents can be uploaded. Maximum size of single document for upload is 5 MB.

Once documents are uploaded in the library, vendors can attach documents through ***Attach Document*** link against the particular e-Tender. Please note that if the documents are not attached to any e-Tender, the same cannot be downloaded by RBI and it will be deemed that the vendor has not submitted the documents. For further assistance please follow instructions of vendor guide.

a) Bidder(s) need to submit necessary EMD, E-Tender fees (If ANY) and Transaction fee separately for the e-tender. Transaction fees if any are non-refundable. No interest will be paid on EMD. EMD of the unsuccessful bidder(s) will be refunded by RBI.

b) The process involves Electronic Bidding for submission of Techno Commercial Bid as well as Price Bid.

The bidder(s) who have submitted the above fees can only submit their Techno Commercial Bids and Price Bid through internet in MSTC website www.mstcecommerce.com → e-procurement → New Common Portal → Bid Floor Manager→ live event →Selection of the live event→ Transaction fee->Common terms->Attach Documents->Price Bid.

Please Note:The vendor after successful remittance of the transaction fees and EMD details, will get the attach documents and common terms tab enabled in their login. Post successful completion of this step, the vendors will be allowed to save the lot specific terms and submit their price bid against the lot through the portal or download and upload the excel file for submitting price bids, as the case may be. In case the attach documents and/or saving common terms step is unsuccessful, the tabs for saving lot specific terms and submitting price bid would be disabled. The status of whether the same is successful/pending would be displayed in the bid status button.

c) First the vendor needs to fill up the Commercial specification if any and save it. Then the vendor should fill up the Techno-commercial bid. After filling the Techno-Commercial Bid, bidder should click 'save' for recording their Techno-Commercial bid. Once the same is done, the Price Bid link becomes active and the same has to filled up and then bidder should click on "save" to record their price bid. Then once both the Techno-Commercial bid & price bid has been saved, the bidder can click on the "Final Submission" button to register their bid

NOTE: - After clicking the final submission "Delete bid" option would be shown. If the vendor wants to delete the bid after final submission and re submit the bid, then he/she should click delete bid and resubmit the same and again click final submission.

d) In all cases, bidder should use their own ID and Password along with Digital Signature at the time of submission of their bid.

e) During the entire e-tender process, the bidders will remain completely anonymous to one another and also to everybody else.

f) The e-tender floor shall remain open from the pre-announced date & time and for as much duration as mentioned above.

g) All electronic bids submitted during the e-tender process shall be legally binding on the bidder. Any bid will be considered as the valid bid offered by that bidder and acceptance of the same by the Buyer will form a binding contract between Buyer and the Bidder for execution of supply/work. Such successful tenderer shall be called hereafter **SUPPLIER/CONTRACTOR**.

h) It is mandatory that all the bids are submitted with class III signing and encryption type of digital signature certificate otherwise the same will not be accepted by the system.

i) Buyer reserves the right to cancel or reject or accept or withdraw or extend the tender in full or part as the case may be without assigning any reason thereof.

j) No deviation of the terms and conditions of the e-Tender document is acceptable. Submission of bid in the e-tender floor by any bidder confirms his acceptance of terms & conditions for the e-Tender.

k) Unit of Measure (UOM) is indicated in the e-tender Floor. Rate to be quoted should be

in Indian Rupee as per UOM indicated in the e-tender floor/tender document.

l) All entries in the tender should be entered in online Technical & Commercial Formats without any ambiguity. The bid will be evaluated based on the filled-in technical & commercial formats.

m) The documents uploaded by bidder(s) will be scrutinized. In case any of the information furnished by the bidder is found to be false during scrutiny, EMD of defaulting bidder(s) will be forfeited. Punitive action including suspension and banning of business can also be taken against defaulting bidders.

(C) Bidders are requested to read the vendor guide and see the video in the page https://www.mstcecommerce.com/eprocn/eprochome to familiarize them with the system before bidding.

Section I

Form of Tender

Regional Director
Estate Department
Reserve Bank of India
CAB, PUNE 226010

Date:
Place:

Dear Sir,

Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE.

Having read and examined the Notice Inviting e-Tender, Specifications & designs,, Drawings, Schedule of Quantities, various schedules, General conditions of contract and, Special conditions of contract, General rules and instructions to bidders, clauses and all other contents in the tender document for the work specified in the memorandum hereinafter set out and having examined the site of the works 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 within the time specified in the said memorandum at the rates mentioned in the attached schedule of quantities and in accordance in all respects with the specifications & designs, drawings and instructions in writing referred to in General Conditions of Contract, the Articles of Agreement, Special Instructions, Schedule of Quantities and Special 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	**Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE**
(b)	Estimated cost (Rs.)	₹9,11,000
(c)	Earnest Money (Rs.)	₹NIL (from the successful vendor only)
(d)	Percentage, if any, to be deducted from bill	5%

(e)	PBG (Performance Bank Guarantee)	Nil% of the work order amount
(f)	Time allowed for completion of the works from tenth day after the date of written order to commence work	**03 months**

2. We agree to keep the tender open for the validity period specified in Schedule 'B' of the tender and not to make any modification in its terms and conditions during the validity period or any other extended period as agreed mutually.

3. A sum of **₹.NIL** only is hereby forwarded/uploaded in the form as specified in Schedule 'B' of the tender document as Earnest Money Deposit. If I/We, fail to furnish the prescribed performance bank guarantee within the prescribed period, I/We agree that the Reserve Bank of India or its successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money deposit absolutely. Further, if I/We fail to commence work as specified, I/ We agree that Reserve Bank of India or its successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender document upon the terms and conditions contained therein.

4. Further, I/We agree that in case of forfeiture of Earnest Money Deposit or Performance Bank Guarantee as aforesaid, I/We shall be debarred from participation in the re-tendering process of the work.

5. I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Reserve Bank of India, then I/We shall be debarred from tendering in Reserve Bank of India in future. Also, if such a violation comes to the notice of Reserve Bank of India before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

6. I/We hereby declare that I/We shall treat the tender documents, drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived therefrom to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the Reserve Bank of India.

7. Should this tender be accepted, I/We hereby agree to abide by and fulfil the terms and provisions of the said Conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to the Reserve Bank of India the amount mentioned in the said conditions.

8. Our bankers are (Name and full address)

(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 the Bidder with seal

Signatures and addresses of witnesses

	Signature	Address
(i) (ii)		

Articles of Agreement

ARTICLES OF AGREEMENT made on the _____ day of _____ between the Reserve Bank of India, College of Agricultural Banking, Pune having its Central Office at Mumbai 400001 (hereinafter called "the Employer") of the one part and M/s. _____
_____
(hereinafter called "the Contractor") on the other part.

WHEREAS the Employer is desirous of carrying out proposed work of **Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE and** has caused drawings and specifications describing the works to be done.
AND WHEREAS the said Drawings numbered as given inclusive of the Specifications and the Schedule of Quantities have been signed by or on behalf of the parties hereto.
AND WHEREAS the Contractor has agreed to execute upon and subject to the Conditions set forth herein and to the Conditions set forth in the Special Conditions and in the Schedule of Quantities and Conditions of Contract (all of which are collectively hereinafter referred to as "the said Conditions") the works shown upon the said Drawings and/or described in the said Specification and included in the Schedule of Quantities at the Respective rate therein set forth amounting to the sum as therein arrived at or such other sum as shall become payable there under (hereinafter referred to as "the said Contract Amount")

NOW IT IS HEREBY AGREED AS FOLLOWS

1. In considerations of the said Contract Amount to be paid at the times and in the manner set forth in the said Conditions, the Contractors shall upon and subject to the said Conditions execute and complete the work shown upon the said Drawings and described in the said Specifications and the Schedule of Quantities.
2. The Employer shall pay the Contractor the said Contract Amount or such other sum as shall become payable, at the times and in the manner specified in the said Conditions.
3. The term "Architect" in the said Conditions shall mean D.G.M (Tech) for the purpose of architectural planning and designing etc. of the buildings/structures to be constructed under this contract. In the event of their ceasing to be Architects for the work mentioned in this contract for whatever reason such other person or persons as shall be nominated by the Employer for that purpose will function as "Architects".

3(a) The Reserve Bank of India will administer and directly arrange for supervision of works, certification of bills, making payments and implementation of various terms, conditions and stipulations of the contract (except for the scope of work as defined under clause 3 above). For this purpose, the term "Architect" in the said conditions regarding execution of work, quality of construction, quality of

materials, progress and completion of the project etc. shall mean the Dy. General Manager (Tech) or any other person designated for the purpose by the Reserve Bank of India. As far as the operation of the provision under **clause 42** of the contract viz. clause relating to settlement of disputes through arbitration, the term "Architect" shall be read as Chief General Manager/ Principal of Estate Department, Reserve Bank of India, CAB, Pune.

4. The said conditions and Appendix thereto shall be read and construed as forming part of this agreement, and the parties hereto shall respectively abide by, submit themselves to the said Conditions and perform the agreements on their part respectively in the said Conditions contained.
5. The term "Structural Consultant" refers to Bank Engineer (Tech) or in the event of their ceasing to be the Consultants for this project, such other person or persons as may be appointed by the Architect with the approval of the Employer.
6. The plans, agreement and documents mentioned herein shall form the basis of this Contract. The Contractor shall not be entitled for the payment for the quantities beyond the tendered quantities unless ordered for by specific written instructions from the Bank's Engineer/ official.
7. This Contract is neither a fixed Lump Sum Contract nor a piece Work Contract but a contract to carry out the work in respect of the work "**Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE."** to be paid for according to actual measured quantities at the rate contained in the Schedule of rates and Probable Quantities or as provided in the said Conditions.
8. The Contractor shall afford every reasonable facility for the carrying out of all works relating to civil works, installation of sanitary work and fittings, permanent water supply, 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 such works.
9. The Employer 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.
10. Time shall be considered as the essence of this Contract and the Contractor hereby agrees to commence the work soon after the site is handed over to him or from tenth day after the date of issue of formal work order as provided for in the said Conditions whichever is later and to complete the entire work within **03 months** subject nevertheless to the provisions for extension of time.
11. All payments by the Employer under this Contract will be made only at CAB, PUNE.
12. All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen at CAB, PUNE and only Courts in CAB, PUNE shall have jurisdiction to determine the same.
13. That the several parts of this Contract have been read by the Contractor and fully understood by the Contractor.

14. The Contractor shall not disclose directly or indirectly any information, materials and details of the Bank's infrastructure/systems/equipment etc., which may come to the possession or knowledge of the Contractor during the course of discharging its contractual obligations in connection with this agreement, to any third party and shall at all times hold the same in strictest confidence. The Contractor shall treat the details of the contract as private and confidential, except to the extent necessary to carry out the obligations under it or to comply with applicable laws. The Contractor shall not publish, permit to be published, or disclose any particulars of the works in any trade or technical paper or elsewhere without the previous written consent of the Employer. The Contractor shall indemnify the Employer for any loss suffered by the Employer as a result of disclosure of any confidential information. Failure to observe the above shall be treated as breach of contract on the part of the Contractor and the Employer shall be entitled to claim damages and pursue legal remedies.
The Contractor shall take all appropriate actions with respect to its employees to ensure that the obligations of non-disclosure of confidential information under this agreement are fully satisfied.
The Contractor's obligations with respect to non-disclosure and confidentiality will survive the expiry or termination of this agreement for whatever reason."

IN WITNESS WHEREOF the Employer and the Contractor have set their respective hands to these presents and two duplicates hereof the day and year first hereinabove written.

If the contractor is a partnership or an individual.

IN WITNESS WHEREOF the Employer has set its hands to these presents through its duly authorized official and the Contractor has caused its common seal to be affixed hereunto and the said duplicate/ has caused these presents and the said two duplicate hereof to be executed on its behalf, the day and year first hereinabove written.

If the contractor is a company.

Signature Clause

SIGNED AND DELIVERED by the Reserve bank of India by the hand of
Shri

(Name and designation)

In the presence of

(1)

Address

(2)

Address

Witness

SIGNED AND DELIVERED by
In the presence of

If the party is partnership firm or an individual should be signed by all or on behalf of all the partners.

(1)

Address

(2)

Address

Witness

THE COMMON SEAL OF
Was hereunto affixed pursuant to the resolutions passed by its Board of Directors at the meeting held on _____
in the presence of

(1)

(2)

Directors who have signed these presents in token thereof in the presence of

If the Contractor signs under its common seal, the signature clause should tally with the sealing clause in the Articles of Association.

(1)

(2)

SIGNED AND DELIVERED BY the Contractor by the hand of Shri _____ and duly constituted attorney.

If the Contractor is signing by hand of power of Attorney, whether a company or individual.

Section II

SCOPE OF WORK

1.1 Description of Work:

Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE.

Item No	Description of item	Quantity
1	**Dismantling of the existing plaster** Dismantling of the existing plaster of top and side of the existing compound wall including raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground out of premises. Quoted rate shall include the cost of curing & giving proper bonding with existing floor & wall, necessary scaffolding, carting away debris, lifting etc. all complete as directed by Banks Engineer-in-Charge.	110.00
2	**Dismantling of the existing MS Railing along with the old / damaged barbed wires on existing compound wall having tentative length 150 rmt.** Dismantling of the existing MS Railing along with the old / damaged barbed wires from the existing compound wall top and including cleaning the surface and disposal of rubbish to the dumping ground out of premises. Quoted rate shall include the cutting, removing, necessary scaffolding, carting away debris, lifting etc. all complete as directed by Banks Engineer-in-Charge. The vendors are advised to visit the site before quoting the rate.	1.00
3	**Brick wall**	
	Providing & constructing 230 mm brick thick masonry wall in 1: 4 cement mortar (1 Cement: 4 Course Sand) by using 2nd class quality locally available bricks over the existing brick wall. Quoted rate shall include the cost of curing & giving proper bonding with existing floor & wall, necessary scaffolding, carting away debris, lifting etc. all complete as directed by Banks Engineer-in-Charge.	8.00

4	**Plaster of Brick wall**	
	Providing and applying average 15 mm thick or required thickness, smooth finished cement plaster in Cement Mortar of 1:4 proportion (1 part sand: 4 parts coarse screened sand / locally available sand with the approval of Bank's Engineer) over brick wall / RCC surface etc. complete. Quoted rate shall be inclusive of the cost of curing, scaffolding, taking out the existing damaged debris as per requirement, maintaining proper line & level, lifting, carting away debris from premises etc. all complete as directed by Engineer-in-charge.	30.00
5	**Reinforced Cement Concrete Work for beam over the existing compound wall for fixing of the Y-angle.**	
5.1	Providing and laying exposed RCC (M20 grade) 1: 1.5 :3(1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size) for top beam by using graded 20 mm and downsize coarse aggregates including cantering, shuttering with good quality ply board/ steel plate, staging, scaffolding, dewatering, surface preparation, laying at required place, lead & lift, compacting, vibrating, curing, deshuttering, decentering , carting away debris out of Bank's premises etc. all complete as directed by Bank's Engineer-in-charge. all complete as directed by the Bank's Engineer.	6.00
5.2	Providing of required dia. reinforcements in proper line, level, proper lapping & spacing as directed by Consultant and the Bank's Engineer. The reinforcement may be of 8 mm to 20 mm. dia. Tor HYSD bars(Fe500) mentioned in IS Code 456:2000 and should confirm to high strength deformed steel bars as per IS 1786. Quoted rate should include the cost of cutting, bending, binding with double annealed GI binding wires (18 gauge), pins, spacers, chairs and placing in proper position as directed by Bank's Engineer.	700.00
6	**Barbed wire and MS Angle**	
	Providing and fixing the Y angle embedded with the top beam as per the above item-5 having total length 1.50 mt of Y-angle and top & bottom members for holding the polycarbonate sheet along with barbed wires as per following specifications:	
6.1	Providing 50mm x 50mm x 6mm M. S. angle of approx. 0.60 high including necessary welding, cutting and bending lower part is to well embedded with the top beam, drilling 8 holes for fixing barbed wire fencing.	1950.00

6.2	Providing and fixing 14/16 swg barbed wire fencing in 8 horizontal rows and two diagonals in each vertical and inclined bay portion including proper fixing etc. complete as directed by the Bank.	720.00
7	**Concentrina wire**	
	Providing and fixing in position Galvanized Concertina Razor Wire Coil of 610mm dia with tap galvanized coil of 0.50mm thick and duly zinc coated. The core wire shall be hot dip galvanized wire of 2.5mm dia (+/- 0.30mm) and with zinc coating. The physical profile shall be as under:	120.00
	i) Length of barb – 22mm (+/- 2mm)	
	ii) Barb spacing – 35mm (+/-2mm)	
	iii) Nos. of Loops - 72 per Bundle	
	iv) Nos. of G.I. clips per loop – 3 Nos.	
	The concertina wire loops are to be tied on three nos. of razor wire to be laid through out the length of fencing. Proper care at junction or change of direction is to be taken for proper fixing including giving suitable overlap. The rate shall be inclusive of local transportation, all lead and lift, wastage including all necessary cutting, welding, drilling holes, trimming of trees if required, providing & welding 16mm dia M. S. square bars (vertically & pointed at top) of approx. 750mm long at 8' c/c and 'Y' shape at corners etc. for properly fixing on the top of grill on the existing compound wall, painting of the additional MS members using Ist quality enamel paint over a coat of metal primmer, making good all damages caused to the Bank's property, etc. complete	
8.00	**Polycarbonate sheet**	150.00
	Providing and fixing multi wall polycarbonate sheet of 6 mm thick and minimum width of sheet 1200 mm on entire four side wall over MS structure covering joint must be cover with 20 mm wide aluminium flat in line level and fixing the same with Fasteners (Screws) on provided MS structure.	
	The rate shall be incisive of all i.e. cutting, joints, removing unused material after completion of work, finishing of joints, name plate for Badminton court, proper levelling and line etc. complete as directed by Banks Engineers at all heights.	
	Basic rate for sheet Rs.320.00 / Sqm	

Various works covered in this specification shall include furnishing of all materials, labour, tools plants and equipment, transportation, fabrication, supervision and construction as shown herein and as directed by the Engineer-in-Charge.

I/We hereby declare that I/we have read and understood the above information.

Place **Signature of bidder**

Date

Section III

General Rules and Instructions to the Bidders

1. The eligible Bidders who are empanelled in the Bank for respective trade and category shall be eligible to participate in tendering process.

2	Bids in Two bid system		
	The tender in two parts (Part I comprising of duly filled tender part I, complete prequalification criteria, EMD, technical bid/details, literature etc. and Part II comprising of duly filled-in tender part II) should be submitted online as e-Tender using digital signature not later than the date and time of submission of tender/bid on line (as specified in schedule 'B'). Tender inviting authority and Name of work, office are specified in schedule 'B'. No tender will be accepted after the specified date and time for submission of tender under any circumstances whatsoever. Bids shall be submitted online only and those received in physical form will not be entertained		
3.	The intending bidders are advised to follow **the important instructions of e-Tender specified in Schedule 'A'** and must have valid class III digital signature to submit the bid.		
4	**Documents Comprising Tender/ Bid**		
	Part I: (Techno-Commercial Bid)		
	i)	Form of Tender/Bid	
	ii)	e-tender transaction fee shall be paid as specified in schedule 'B'	
	iii)	Earnest Money Deposit (EMD)/Bid Security in approved format as specified in schedule B.	
	iii)	Power of Attorney (as per proforma annexed hereto) in favour of person signing the Bid	
	iv)	Duly filled-in and digitally signed tender document consisting of:	
		a)	Entire Tender Document Section I to Section IX

		b)	All formats towards prequalification/eligibility criteria, etc. annexed hereto duly filled-in along with relevant documents
	Part II: (Price Bid)		
	Schedule of Quantities, duly filled-in online.		
5	**Clarifications and pre-bid meeting**		
	If the bidder shall have any doubt as to the meaning of any portion general rules and instructions to bidders, general conditions, or the special conditions or the scope of the work or the specifications and drawings or any other matter concerning the work, he shall in good time put forth the particulars thereof and submit them to the RBI, in writing, addressed to the Tender Inviting Authority, specified in Schedule 'B' in order that such doubts may be clarified authoritatively at least a week before the last date of submission of bid and shall be conveyed to all the bidders in due course. Once a tender is submitted, the matter will be decided according to tender conditions in the absence of such authentic preclarification the bidders are advised to peruse the tender and visit the site and submit any matter requiring clarification to the RBI.		

6	**Amendment to Tender Document**	
	i)	At any time prior to the deadline for the submission of tender/bids, RBI may, for any reason, whether at its own initiative or in response to a clarification or query raised by a prospective Bidder, modify any part of the tender document by an amendment and will be uploaded on website.
	ii)	The said amendment in the form of the addendum/ corrigendum will be made available on website of RBI to all the prospective bidders to whom the tender documents issued online and this communication will be in writing and same shall be binding on the bidders. The prospective bidders should promptly acknowledge receipt of the addendum/corrigendum by fax/courier/e-mail to RBI. The addendum (s), if any, issued will form part of the contract document.
	iii)	In order to afford prospective Bidders reasonable time for preparing their Bids after taking into account such amendments, the RBI may, at its discretion, extend the deadline for submission of Bids.
7	**Item Rate Tender**	
	The Bidder should note that unless otherwise stated, the tender is strictly on item rates basis and his attention is drawn to the fact that rates for each and every item should be correct, workable and self-supporting. The quantities in the Schedule of Quantities approximately indicate the total extent of work, but may vary to any extent and may even be omitted thus altering the aggregate value of the Contract. Rates quoted shall remain firm for a variation of plus (+)	

	or minus (-) 25% of the specified quantities of each item in the Schedule of Quantity.	
8	**Preparation of bid and Cost of bidding**	
	i)	The bidder must obtain for himself on his own responsibility and at his own expenses all the information which may be necessary for the purpose of making a tender and for entering into a contract and must examine the drawings and must inspect the site of the work and acquaint himself with all local conditions, means of access to the work, nature of the work and all matters pertaining thereto.
	ii)	The Contractor shall be deemed to have carefully examined the work and site conditions including labour, the general and special conditions, the specifications, schedules and drawings and shall be deemed to have visited the site of work, to have fully informed himself regarding the local conditions and carried out his own investigations to arrive at the rates quoted in the tender. In this regard, he will be given necessary information available with the RBI but without any guarantee about its sufficiency and accuracy.
9	**Format to be used**	
	The bidder must fill up and submit only the tender forms/formats issued (online) by the RBI, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates, will be liable for rejection.	
10	**Filling of Rates**	
	i)	Rates should be quoted for each item of work both in figures and words in columns specified in the Schedule of Quantity. Care shall be taken to avoid discrepancy in the rate given in figures and words. The amount for each item should be worked out and requisite totals should be given in the specified column.
	ii)	In the event, no rate has been quoted for any item(s), leaving space both in figure(s), word(s) and amount blank, the tender shall be considered incomplete and shall not be considered.
	iii)	No advice of any change in rate or conditions after the opening of the tender will be entertained.
11	**Earnest Money Deposit (EMD)/ Bid security**	
	i)	The bidders are required to submit Earnest Money Deposit (EMD)/ Bid Security for an amount and in the manner as specified in Schedule ‘B’.

	ii)	A tender, which is not accompanied by EMD, will not be considered. The Earnest Money will be refunded to the bidder if his tender is not accepted but without any interest.
	iii)	The Earnest Money Deposit paid by the successful bidder will be released after award of work on submission of Performance Bank Guarantee. No interest shall be paid on the said deposit.
12	**Signing of Bid, Power of Attorney**	
	i)	Each of the tender documents should be digitally signed as per instruction of e-tender specified in Schedule 'A' hereto by the person or persons submitting the tender in token of his/their acquainted himself/themselves with the General Rules and Instructions to bidders including prequalification criteria, General Conditions of Contract, Specifications, Special Conditions and other terms and conditions etc. as laid down.
	ii)	The tender submitted online on behalf of a firm must be digitally signed as per instructions of e-tender specified in Schedule 'A', it must be digitally signed on his behalf by a person holding a power-of attorney authorizing him to do so, such power of attorney to be uploaded along with the tender, or it must be digitally signed by a partner who has the necessary authority on behalf of the firm to enter into the proposed contract and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952. Otherwise the tender may be rejected by RBI.
	iii)	Bidders shall submit online along with Part-I of the tender, a power of attorney, on a stamp paper of appropriate value and duly notarized, in favour of the person digitally signing the Bid documents authorizing him to sign the Bid documents, make corrections/ modifications thereto and interacting with Reserve Bank of India and act as the contact person. The proforma of the power of attorney shall be as annexed hereto.
13	**Modification / substitution / Withdrawal of Bids**	
	i)	No modification or substitution of the submitted Bid shall be allowed after the due date and time of submission of the tender.
	ii)	A Bidder may withdraw its submitted Bid, provided that written notice of the withdrawal is received by RBI before the last date for submission of Bids. In case a Bidder wants to resubmit his Bid, he shall submit within the due date a fresh Bid following all the applicable conditions.
	iii)	Only a single copy of the withdrawal notice shall be prepared and each page of the notice shall be signed and stamped by the authorized signatory. The notice shall be duly marked "WITHDRAWAL"

14	**Bid Due Date**	
	Bids should be submitted online as specified in instructions to e-Tender on or before the stipulated time and date as specified in Schedule 'B'. Reserve Bank of India may, in exceptional circumstances, and at its sole discretion, extend the Bid due date	
15	**Late bids**	
	No bid will be received after the due date/last date and time specified for submission of bids in schedule 'B' or after the extended Bid due date. If any.	
16	**Opening of Bids**	
	Duly filled tender Part I, accompanied by EMD, prequalification criteria, technical details, literature etc., called Part I of the tender, will be opened on e-Tender mode on the time and date, as specified in Schedule 'B', at his office, by the tender inviting authority, as specified in Schedule 'B' or his authorized representative in the presence of authorized representatives of the bidders who choose to be present. Opening date and time of Financial Bid will be same as that of Part-I. Otherwise, all the eligible bidders will be informed later regarding the same.	
17	**Bid Validity**	
	Tenders shall remain open to acceptance by the RBI for a period as specified in Schedule 'B' from the date of opening of the Part-I of the tender which period may be extended by mutual agreement and the bidder shall not cancel or withdraw the tender during this period.	
18	**Clarification & Evaluation of Bids**	
	RBI would subsequently examine and evaluate bids as below:	
	i)	Only those tenders, which meet the minimum prequalification criteria set out in this tender, shall be processed further. After verification of the correctness/legality and adequacy of the information and supporting documents furnished and considering firms financial standing, business integrity, record of timely completion of works, quality of work executed, etc. and Price Bids of only those Bidders who are technically qualified as per part I of tender shall be opened.
	ii)	The price bids of unqualified bidders will not be opened and communication will be sent in this regard.

	iii)	Rates quoted for each item shall be considered during verification/ scrutiny.
	iv)	If the rates written in figures and in words do not tally, then the rates quoted by the contractor in words shall be taken as correct.
	v)	Where the rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will be taken as correct and the amount will be worked out accordingly.
	vi)	To assist in the examination, evaluation and comparison of the bid, RBI may ask Bidders individually for clarifications. The request for clarification and the response shall be in writing. No change in the price or substance of the Bid shall be sought, offered or permitted except as required to during the evaluation of Bids in accordance with tender clauses.
	vii)	In the case of any tender where unit rate of any item/items appears unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.
	viii)	In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more bidders is same, then such lowest bidders may be asked to submit a revised offer quoting percentage discount on their already quoted tendered amount which shall be applicable on all tender items except buy-back amount. The lowest tender shall be decided on the basis of revised offer. Further, if any such lowest bidder does not revise his bid on lower side, his original bid shall remain valid for further processing.
	ix)	If the revised tendered amount (worked out on the basis of quoted rate of individual items) of two or more bidders received in revised offer is again found to be equal, then the RBI shall decide future course of action which shall be final and binding on all the bidders.
19	**Acceptance of Tender and Award of Work**	
	On receipt of intimation from the RBI of the acceptance of his/their tender, the successful bidder shall be bound to implement the contract and within ten days from the date of issue of work order thereof, the successful bidder shall sign an agreement in accordance with the draft articles of agreement. Further, the written acceptance by the Reserve Bank of India of a tender will constitute a binding contract between the Reserve Bank of India and the person so tendering, whether such formal agreement is or is not executed subsequently.	
20	**Performance Bank Guarantee**	

	The Contractor whose tender is accepted, will be required to furnish performance Bank guarantee of **Nil% (Nil Percent)** of the contract amount within the period specified in Schedule 'E'. This guarantee shall be from any Scheduled Bank as per the approved proforma annexed hereto.	
21	**Retention Money/ Security Deposit**	
	i)	In addition to the Performance Bank Guarantee under para 20 above, as further security for the due fulfillment of the contract by the Contractor, 5% of the value of the work done will be deducted by the RBI from each payment to be made to the Contractor towards Retention Money. This total amount (Performance Bank Guarantee + Retention Money) will be termed as Security Deposit. Earnest Money Deposit (EMD) will be released after award of work and on submission of Performance Bank Guarantee (PBG). RBI will release the Performance Bank Guarantee after completion of work and the remaining Security Deposit after rectification of the defects pointed out during the Defects Liability Period. The amounts retained by the RBI shall not bear any interest.
	ii)	All compensation or other sums of money payable by the Contractor to the Employer under the terms of this Contract may be deducted from the security deposit if the amount so permits and the Contractor shall, unless such deposit has become otherwise payable, within ten days after such deduction make good in cash the amount so deducted.
	iii)	The security deposit of the successful bidder will be forfeited if he fails to comply with any of the conditions of the Contract.
22	**Taxes/ Duties/ Levies**	
	i)	Goods and service tax (GST), purchase tax, turnover tax , Excise duty or any other tax applicable in respect of this contract shall be payable by the Contractor and RBI will not entertain any claim whatsoever in respect of the same
23	**Time for Completion of Work**	
	Time allowed for carrying out the work as mentioned in the Schedule 'B' shall be strictly observed by the Contractor and it shall be reckoned from the 10th day from the date of the written work order.	

24	**Work Programme**
	The work shall throughout the stipulated period of the contract be proceeded with all due diligence and if the Contractor fails to complete the work within the specified period, he shall be liable to pay compensation as defined in the relevant clause of the General Conditions of Contract. The bidder shall, before commencing work, prepare a detailed work programme, as specified in the General Conditions of Contract, which shall be approved by the Engineer-In-Charge.
25	**RBI\Employer's right to accept or reject any or all the bids**
	Notwithstanding anything mentioned above, RBI reserves the right to accept or reject any Bid at any time prior to award of contract without thereby incurring any liability to the affected Bidder or Bidders. The RBI/Employer shall not assign any reason for rejection of any or all Bids.
26	**Integrity pact**
	The bidders/ prospective vendors shall be required to enter in to an agreement with the Reserve Bank of India (RBI) called Integrity Pact (IP). The IP envisages an agreement between the RBI and the bidders/ prospective vendors as per the approved proforma, committing the persons/ officials of both sides not to resort to corrupt practices in any aspect/ stage of the contract. The IP shall be applicable from the stage of invitation of bids till the complete execution of the contract. The tenders of those bidders/ prospective vendors which do not contain the IP in the approved proforma shall be liable for rejection. Provided however, that the Integrity pact shall be applicable when specifically provided in Schedule 'C'.

I/We hereby declare that I/we have read and understood the above instructions.

Place

Signature of bidder

Date

Section IV

General Conditions of the Contract

Definitions	1.	**The Contract** means all the documents forming the tender and acceptance thereof together with any correspondence leading thereto and the formal agreement executed between the competent authority on behalf of the Employer and the Contractor, together with the documents referred to therein including the General Conditions, Special Conditions, General rules and instructions to bidders, the Technical specifications, designs, drawings, correspondences exchanged and instructions issued from time to time by the Engineer-in- Charge. All these documents taken together, shall be deemed to form one contract and shall be complementary to one another.	
	2.	In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:-	
		i)	The expression **works or work** shall, unless there be something either in the subject or context repugnant to such renovation /construction be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional, as defined in Schedule 'C'
		ii)	**The Site** shall mean the land/or other places on, into or through which work is to be executed under the contract including any building and erections thereon or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract, as defined in Schedule 'C'.
		iii)	**Employer** shall mean The Reserve Bank of India (as mentioned in schedule 'C') and shall include its assignees and successors
		iv)	**RBI** shall mean Reserve Bank of India, College of Agricultural Banking, Pune having its Central Office at

			Shahid Bhagat Singh Road, Mumbai – 400001 and having its Regional Offices at various places.
		v)	**Tender document** shall mean document named as such issued/ uploaded by the Employer to the bidders for inviting Bids for the Project / work.
		vi)	**Day** shall mean Calendar day
		vii)	Working day shall mean The days when Employer's office is working i.e. Days excluding Public holidays, Saturdays and Sundays
		viii)	**Month** shall mean the calendar month.
		ix)	**Year** shall mean Calendar Year
		x)	**Bidder** (s) shall mean all parties participating in the bidding process pursuant to and in accordance with the terms of the Tender document.
		xi)	**The Contractor** shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
		xii)	**Sub-Contractor** means the person or persons, firm or company engaged by the Contractor for executing any part or to whom any part thereof has been sub-let with the consent in writing of the Employer
		xiii)	**The Engineer-in-charge** means the Engineer Officer employed and paid by the Employer and acting under the orders of the Employer who shall supervise and be in-charge of the work.
		xiv)	**The Authorized representatives** of Engineer-in-charge (AGM(Tech)/Manager(Tech)/AM(Tech)) means the Engineer officers employed and paid by the Employer and acting under the orders of the Employer who shall supervise day to day execution of work under the direction and guidance of Engineer-in-Charge.
		xv)	**Contract Price** or **Contract Amount** shall mean the total amount as calculated from quoted unit rates by the successful bidder and quantities mentioned in the Schedule of quantities (Price Bid) and as accepted by the Employer and indicated in the letter of award of work.

		xvi)	**Contract Period** shall mean the period specified in the tender document for execution of the contract/ completion of the work, including any authorized extended period by the Employer
		xvii)	**Contract Agreement** shall mean the agreement signed between the Contractor and the Employer for the execution of the Project.
		xviii)	**Notice in writing** or **written notice** shall mean a notice in written, typed or printed characters sent (unless delivered personally or otherwise proved to have been received) by registered post to the last known private or business address or registered office of the addressee and shall be deemed to have been received when in the ordinary course of post, it would have been delivered and/or sent. The communication delivered by any accepted electronic means shall also be deemed to be a written notice..
		xix)	**Act of Insolvency** shall mean any act of insolvency as defined by the Presidency Towns Insolvency Act, or the Provincial Insolvency Act or any Act amending such original.
		xx)	**Manufacturer** refers to a person or firm who is the producer and furnisher of the material or designer and fabricator of equipment
		xxi)	**Contractor's Works** or **Manufacturer's Works** shall mean and include the land and other places which are used by the CONTRACTOR/FABRICATOR or SUB-CONTRACTOR/SUB-FABRICATOR for the manufacture of "Equipment" or performing the "Works".
		xxii)	**Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'C' to cover all overheads and profits.
		xxiii)	**Net Rate/Price** - If in arriving at the contract amount the Contractor shall have added to or deducted from the total of the items in the Tender any sum, either as a percentage or otherwise, then the net price of any item in tender shall be the sum arrived at by adding or deducting from the actual figure appearing in the Tender as the price of that item a similar percentage or determining the percentage or proportion of the sum so added or deducted by the contractor the total

			amount of any Prime Cost items and provisional sums of money shall be deducted from the total amount of the tender. The expression “net rates” or “net prices” when used with reference to the contract or accounts shall be held to mean rates or prices so arrived at.
Scope and performance	3.	Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.	
	4.	Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.	
	5.	The contractor shall be furnished, free of cost one certified copy of the contract documents except Indian standard specifications and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.	
Works to be carried out	6.	The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The Contractor shall provide at his cost everything necessary for the proper execution of the works according to the intent and meaning of the drawings, Schedule of Quantities and Specification taken together, whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred there from and if the Contractor finds any discrepancy in the drawings or amongst the drawings, Schedule of Quantities and Specifications, he shall immediately and in writing refer same to the Engineer-in-Charge who shall decide which is to be followed. The descriptions given in the Schedule of Quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labour necessary in and for the full and entire execution and	

		completion of the work as aforesaid in accordance with good practice and recognized principles. The Contractor shall carry out and complete the said work in every respect in accordance with this Contract and with the directions of and to the satisfaction of the Engineer-in-Charge. The Engineer-in-Charge may in his absolute discretion and from time to time issue further drawings and/or written instructions, detailed directions and explanations which are hereafter collectively referred to as "Employer's Instructions" in regard to : a) The variation or modification of the design, quality or quantity of works or the addition or omission or substitution of any work. b) Any discrepancy in the drawings or amongst the Schedule of Quantities and/or drawings and/or specification. c) The removal from the site of any material brought thereon by the Contractor not fulfilling the tender specifications and the substitution of any other material therefor. d) The removal and/or re-execution of any material/works executed by the Contractor but not fulfilling the tender specifications. e) The dismissal from the works of any persons employed by the contractor thereupon. f) The opening up for inspection of any work covered up. g) The amending and making good of any defects noticed and reported during Defect Liability Period. The Contractor shall forthwith comply with and duly execute any work comprised in such Employer's instructions provided always that verbal instructions, directions and explanations given to the Contractor or his representatives upon the works by the Engineer-in-Charge shall, if involving a variation, be confirmed in writing by the Contractor within seven days, and if the same is not approved/ disapproved by the Engineer-in-charge in writing within a further period of seven days, such shall be deemed to be Employer's Instructions within the scope of the Contract.
Sufficiency of Tender	7.	The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the

		Contract and all matters and things necessary for the proper completion and maintenance of the works.	
Discrepancies and Adjustment of Errors (order of preference)	8.	The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.	
	8.1	In the case of discrepancy between the schedule of Quantities, the Specifications and/ or the Drawings, the following order of preference shall be observed:-	
		i)	Description of Schedule of Quantities.
		ii)	Particular Specification and Special Condition, if any.
		iii)	Drawings.
		iv)	General Specifications.
		v)	Indian Standard Specifications of B.I.S
	8.2	If there are varying or conflicting provisions made in any one document forming part of the contract, the Competent Authority as defined in the schedule 'C' shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.	
	8.3	If there is a discrepancy between actual scaled drawing and written dimension (or description) on a drawing, the latter shall be followed.	
	8.4	The Schedule of Quantities, unless otherwise stated shall be deemed to have been prepared in accordance with standard method of measurement. Any error in description or in quantity in Schedule of Quantities or any omission of items therefrom shall not vitiate the Contract but shall be rectified and the value thereof, as ascertained under clause 12 hereof shall be added to, or deducted from the Contract amount (as the case may be) provided that no rectification or errors, if any, shall be allowed in the contractor's Schedule of rates. The above discrepancies in Schedule of Quantities shall not release the Contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.	
Signing of Contract	9.	The successful tenderer/contractor, on acceptance of his tender by the Employer , shall, within 14 days from the stipulated date of start of the work, sign the contract consisting of:-	

		i)	Articles of agreement on non-judicial stamp paper/s of appropriate values (The cost of the stamp paper/s shall be borne by the contractor. One Certified copy of the agreement will be handed over to the contractor by the Employer)
		ii)	the notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
		No payment for the work done will be made unless contract is signed by the contractor.	

CLAUSES OF CONTRACT

	CLAUSE 1	
Performance Guarantee	i)	The contractor shall submit an irrevocable Performance Guarantee of **NIL% (NIL percent)** of the Contract amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule 'C' from the date of issue of letter of award. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in schedule 'C' on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of Demand Draft of any scheduled bank/Pay Order of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Bank Guarantee issued by any Scheduled Bank in the approved proforma annexed hereto.
	ii)	The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 30 days beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of Performance Guarantee extended to cover such extended time for completion of work. After recording of the completion certificate for the work by the Engineer-In-Charge, the performance guarantee shall be returned to the contractor, without any interest.

		However, in case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance Guarantee shall be retained as Security Deposit and the same shall be returned year wise proportionately as specifically provided in Special conditions of Contract.	
	iii)	The Engineer-in-Charge shall not make a claim under the performance guarantee except for amounts to which the Employer is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:	
		a)	Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee.
		b)	Failure by the contractor to pay the Employer any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in-Charge.
	iv)	In the event of the contract being determined or rescinded under provision of any of the Clause/Condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Employer.	
	CLAUSE 1 A		
Recovery of Security Deposit	i)	The Contractor shall permit Employer at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of the gross amount of each running account and final bill till the sum deducted will amount to security deposit of 5% of the Contract price of the work. Such deductions will be made and held by the Employer by way of Security Deposit till the successful completion of Defect Liability Period.	
	ii)	All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from his security deposit or from any sums which may be due to or may become due to the contractor by Employer on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such	

		deductions, the contractor shall within 10 days make good in cash any sum or sums which may have been deducted from his security deposit or any part thereof. The security deposit shall be collected from the running bills and the final bill of the contractor at the rates mentioned above.
	iii)	The security deposit as deducted above can be released against bank guarantee issued by a scheduled bank, on completion of the work and settlement of final bill at the request of the contractor subject to the condition that amount of such Bank guarantee is equal to security deposit amount which shall be initially valid till end of defect liability period (DLP) + 60 days and shall not be less than ₹5 lakh. Provided further that the validity of bank guarantee including the one given against the earnest money shall be in conformity with provisions contained in clause 17 which shall be extended from time to time depending upon extension of contract granted under provisions of clause 2 and clause 5.
	iv)	In case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance Guarantee shall be retained as Security Deposit and the same shall be returned year wise proportionately as specifically provided in Special conditions of Contract.
	CLAUSE 2	
Compensation for Delay		If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the Employer on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below as per the authority specified in schedule 'C' (whose decision in writing shall be final and binding) may decide on the amount of contract price of the work for every completed day (as applicable) that the progress remains below that specified in Clause 5 or that the work remains incomplete.
		This will also apply to items or group of items for which a separate period of completion has been specified

	i)	Compensation at the rate as specified in schedule 'C' per week of delay for delay of work to be computed on per day basis, Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Contract Price of work or of the Contract price of the item or group of items of work for which a separate period of completion is originally given.
	ii)	The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Employer. In case, the contractor does not achieve a particular milestone mentioned in Schedule 'C', or the re-scheduled milestone(s) in terms of Clause 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.
	CLAUSE 3	
When Contract can be Determined		Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:
	i)	If the contractor has abandoned the contract
	ii)	If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, pull down, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter or has failed to remove the materials from the site within seven days of the written instructions of the

		Engineer-in-charge that the same were condemned and rejected by him under these conditions .
	iii)	If the contractor has failed to commence the work or, without any lawful excuse under these conditions suspended the progress of the work for fourteen days after receiving notice from the Engineer-in-charge to proceed or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.
	iv)	If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-In-Charge.
	v)	If the contractor persistently neglects or fails to carry out his obligations under the contract and/ or commits default in complying with all or any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.
	vi)	If the contractor shall offer or give or agree to give to any person in Employer's service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for Employer
	vii)	If the contractor shall enter into a contract with Employer in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge.

	viii)	If the contractor had secured the contract with Employer as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement.
	ix)	If the contractor being an individual, or if a firm, any partner thereof commits an “Act of Insolvency” or shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall suffer execution or other process of court attaching property to be issued against the contractor or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors and shall be unable within seven days after notice to him requiring him to do so, to show to the reasonable satisfaction to the Engineer-In-Charge that he is able to carry out and fulfil the contract and to give security therefor, if so required by the Engineer-in-charge.
	x)	If the contractor being a company shall pass an effective resolution for winding up voluntarily or shall have an order for compulsory winding up made against it or shall subject to the supervision of court and the official Assignee or the liquidator in such acts of insolvency or winding up, as the case may be, or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.
	xi)	If the contractor shall suffer any payment under this contract to be attached by or on behalf of any of the creditors or the contractor or shall charge or encumber this contract or any payments due or which may become due to the contractor hereunder

	xii)		If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.
	xiii)		If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer in-Charge. When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Employer shall have powers:
		a)	To determine the contract, notwithstanding any previous waiver, after giving seven days' notice in writing to the Contractor, as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Employer.
		b)	After giving notice to the contractor measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands. The action will be without thereby affecting the powers of the Engineer-in-charge or the obligations and liabilities of the Contractor, the whole of which shall continue in force as fully as if the Contract had not been so determined, and as if the work subsequently executed had been executed by or on behalf of the Contractor. And further, the Employer by his agents or servants may enter upon and take possession of the works and all plants, tools, scaffoldings, sheds, machinery steam and other power utensils and materials lying upon the premises or the adjoining lands or roads, and use the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by

			employing any other Contractor or other person or persons to complete the works, and the Contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other Contractor or other person or persons employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or as soon thereafter as convenient the Engineer-in-charge shall give a notice in writing to the Contractor to remove his surplus materials and plant, and should the Contractor fail to do so within a period of fourteen days after receipt thereof by him, the Employer may sell the same by public auction, and give credit to the Contractor for the net amount realized. The Employer shall thereafter ascertain and certify in writing under his hand what (if anything) shall be due or payable to or by the Employer and expense or loss which the Employer shall have been put to in procuring the works to be completed and the amount, if any, owing to the Contractor and the amount which shall be so certified shall thereupon be paid by the Employer to the Contractor or by the Contractor to the Employer, as the case may be, and the Certificate of the Engineer-in-charge shall be final and conclusive between the parties. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work, if resorted to by the Employer.
		In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has 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.
	CLAUSE 3A	
	a)	In case, the work cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or one month whichever is higher, either party may close the contract.
	b)	If the payment of the amount payable by the Employer under Certificate of the Engineer-in-charge shall be in arrears and unpaid for thirty days after notice in writing requiring payment of the amount as aforesaid shall have been given by the Contractor to the Employer, or if the Employer interferes with or obstructs the issue of any such Certificate, or if the Employer shall repudiate the Contract, or if the works be stopped for three months under the order of the Engineer-in-charge or the Employer or by any injunction or other order of any court of Law, then and in any of the cases the Contractor shall be at liberty to determine the Contract by notice in writing to the Employer, through the Engineer-in-charge and he shall be entitled to recover from the Employer, payment for all works executed and for any loss he may sustain upon any plant or materials supplied or purchased or prepared for the purpose of the Contract. In arriving at the amount of such payment, the net rates contained in the Contractor's original tender shall be followed or where the same may not apply, valuation shall be made in accordance with Clause hereof.
	c)	In case contractor wants to close the contract, he shall give notice to the Employer stating the failure on the part of Employer. In such eventuality, the Performance Guarantee of the contractor shall be refunded within following time limits :
	i)	If the Contract price of work is up to ₹15.00 lakh: 15 days.
	ii)	If the Contract price of work exceeds ₹15.00 lakh: 30 days.
	d)	If Performance Guarantee is not released within prescribed time limit, then a simple interest @ 0.25% per month shall be payable on Performance Guarantee amount to the contractor from the date of expiry of prescribed time limit. A compensation for such eventuality, on account of damages

		etc. shall be payable @ 0.25% of Contract price subject to maximum limit of ₹10.00 lakh.
	CLAUSE 3B	
Termination of Contract in case of death of Contractor	Without prejudice to any of the rights or remedies under this contract, if the contractor, being an individual, dies, the Employer shall have the option of terminating the contract without any liability for such termination and compensation to the contractor.	
	CLAUSE 4	
Contractor liable to pay Compensation even if action not taken under Clause 3	In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) or use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates, or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.	

	CLAUSE 5	
Time and Extension for Delay		The time allowed for execution of the Works as specified in the Schedule 'C' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in schedule 'C' or from the date of handing over of the site whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid, Employer shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance guarantee absolutely.
	5.1	As soon as possible after the award of work but in any case, before 14 days from the date of award of work, the Contractor shall submit a Time and Progress Chart for each mile stone and get it approved by the Engineer-in-charge. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (same for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given in Schedule 'C'.
		PROGRAMME CHART
	i)	The Contractor shall prepare a detailed work programme 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 fulfilment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer-in- Charge within ten days of award of the contract.
	ii)	The programme should include the following:

		a)	Descriptive note explaining sequence of the various activities.
		b)	Network (PERT / CPM / BAR CHART).
		c)	Programme for procurement of materials by the contractor.
		d)	Programme for deployment of manpower by the contractor.
	iii)	If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above or after rescheduling of milestones, on his instructions, the contractor shall produce a revised programme within 7 (seven) days, showing the modifications to the approved programme to ensure timely completion of the work. The modified schedule of programme shall be approved by the Engineer-in-Charge.	
	iv)	The submission for approval by the Engineer-in-Charge of such programme or such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.	
	v)	The contractor shall submit the progress report for works costing up to ₹2 Crores with reference to base line programme referred above for the work done during previous month to the Engineer-in-charge on or before 5th day of each month.	
	5.2)	If the work(s) be delayed by:-	
	i)	force majeure, or	
	ii)	abnormally bad weather, or	
	iii)	serious loss or damage by fire, or	
	iv)	civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or	

	v)	delay on the part of other contractors or tradesmen engaged by Engineer-in- Charge in executing work not forming part of the Contract, or
	vi)	non-availability of stores, which are the responsibility of Employer to supply or
	vii)	non-availability or break down of tools and Plant to be supplied or supplied by Employer or
	viii)	any other cause which, in the absolute discretion of the Engineer-In-Charge is beyond the Contractor's control.
		then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the authority as indicated in Schedule 'C' but shall nevertheless use constantly his best endeavours to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.
	5.3)	Request for rescheduling of Milestones and extension of time, to be eligible for consideration with reasons, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay to the authority as indicated in Schedule 'C'. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.
	5.4)	In such case the authority as indicated in Schedule 'C' may give a fair and reasonable extension of time and reschedule the milestones for completion of work. Such extension or rescheduling of the milestones shall be communicated to the Contractor by the authority as indicated in Schedule 'C' in writing, within 3 months or 4 weeks of the date of receipt of such request respectively. Non application by the contractor for extension of time/ rescheduling of the milestones shall not be a bar for giving a fair and reasonable extension of time by the authority as indicated in Schedule 'C' and this shall be binding on the contractor. After giving a fair and reasonable extension of time, the authority shall advise the contractor to reschedule the milestones and submit for approval.

	CLAUSE 6	
Measurements of Work Done	i)	Engineer-in-Charge shall, except as otherwise provided, ascertain, and determine by measurement, the value in accordance with the contract of work done.
	ii)	All measurement of all items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all works performed under the contract.
	iii)	All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties.
	iv)	If for any reason, the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Employer shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.
	v)	The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels.
	vi)	Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local

		custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards (IS 1200) or any other relevant code of practice and if for any item no such standard is available, then a mutually agreed method shall be followed.
	vii)	The contractor shall give, not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work, before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.
	viii)	Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.
	ix)	It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.
	CLAUSE 6A	

Computerized Measurement Book	i)	Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.
	ii)	All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the proforma of Measurement Book annexed hereto, so that a complete record is obtained of all the items of works performed under the contract.
	iii)	All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his authorized representative. After the necessary corrections made by the Engineer-in-Charge or his authorized representative the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in-Charge for the dated signatures by the Engineer-in- Charge and/or his authorized representative and the contractor or their representatives in token of their acceptance.
	iv)	Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-Charge and/or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to the Employer a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in- Charge and/or his authorized representative would thereafter check this MB, and record the necessary certificates for their checks/test checks.

	v)	The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct, and no cutting or over-writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the Employer. Thereafter, the MB shall be taken in the Office records, and allotted a number as per the Register of Computerized MBs. This should be done before the corresponding bill is submitted to the Office for payment. The contractor shall submit two spare copies of such computerized MB's for the purpose of reference and record by the concerned officers of the Employer.
	vi)	The contractor shall also submit to the Employer separately his computerized Abstract of Cost as per format annexed hereto and the bill based on these measurements, duly bound, and its pages machine numbered along with two spare copies of the bill. Thereafter, this bill will be processed by the Employer and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements.
	vii)	The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements/levels by the Engineer-in- Charge or his representative.
	viii)	Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards or any other relevant code of practice and if for any item no such standard is available then a mutually agreed method shall be followed.

	ix)	The contractor shall give not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and/or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.
	x)	Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.
	xi)	It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.
	CLAUSE 7	

Payment on Interim Certificate to be Regarded as Advances	i)	No payment shall be made for work, estimated to cost ₹Ten Lakh or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over Rs. Ten Lakh, the interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the Employer as provided in the proforma annexed hereto. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment/ adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Schedule 'C', in which case the interim bill shall be prepared only after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in-Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in- Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge. The Contractor shall be paid by the Employer from time to time, by instalments under Interim Certificates to be issued by the Engineer-in-Charge to the Contractor on account of the works executed as aforesaid in accordance with this contract, subject, however, to a retention of the percentage of such value named in the schedule 'C' as "Retention percentage for Interim Certificates" until the total amount retained shall reach the sum named in the schedule 'C' as "Total Retention Money". The Engineer-in-charge may in his discretion include in the Interim Certificate such amount as he may consider proper on account of materials delivered upon the site by the Contractor for use in the works. And when the works have been virtually completed and the Engineer-in-charge shall have certified in writing that they have been completed, the Contractor shall be paid by the Employer in accordance with the Certificate, the sum of money named in the schedule as "Instalment after Virtual

		Completion" being a part of the said Total Retention Money. The Contractor shall be entitled to the payment of the Final Balance in accordance with the final certificate to be issued in writing by the Engineer-in-Charge at the expiry of the period referred to as "the Defects Liability Period" in clause 17 or as soon as after the expiration of such period as the works shall have been finally completed and all defects made good according to the true intent and meaning hereof whichever shall last happen, provided always that the issue by the Engineer-in-Charge of any Certificate during the progress of the works or at or after their completion shall not relieve the Contractor from his liability under this contract nor relieve the Contractor of his liability in case of fraud, dishonesty or fraudulent concealment relating to the works or materials or to any matter dealt with in the certificate, and in case of all defect and insufficiencies in the works or materials which a reasonable examination would not have disclosed. No certificate of the Engineer-in-charge shall of itself be conclusive evidence that any works or materials to which it relates are in accordance with the Contract neither will the Contractor have a claim for any amounts which the Engineer-in-charge might have certified in any interim bill and paid by the Employer and which might subsequently be discovered as not payable and in this respect the Employer's decision shall be final and binding.
	a)	75% of the amount payable to the Contractor on the RA bills will be released as ad-hoc payment within 7 working days from the date of certification by the Engineer-in-charge, pending test checking of work and verification of detailed arithmetical accuracy by Employer.
	b)	The Employer shall have power to withhold any certificate if the works or any parts thereof are not being carried out to his satisfaction.
	c)	No payment shall be made to the Contractor if the Contractor fails to insure the works and keep them insured till the issue of the Completion Certificate.
	d)	The amount admissible shall be paid within the specified period of honouring certificates in the schedule 'C' after the day of presentation of the bill by the Contractor to the

		Engineer-in-Charge together with the account of the dismantled materials, if any and all required details/ documents. In case of delay in payment of Running Account bills after 45 days of submission of bill by the contractor, provided the bill submitted by the contractor found to be in order, a simple interest @ 3% per annum shall be paid to the contractor from the date of expiry of prescribed time limit.
	ii)	All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract
	iii)	Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided without prejudice to the right of the Employer to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.
Payments in composite Contracts	iv)	In case of composite tenders, running payment for the major and minor components shall be made after certification of works by concerned engineers of respective discipline.
	v)	In case main contractor fails to make the payment to the contractor associated by him within 15 days of receipt of each running account payment, then on the written complaint of contractor associated for such minor component, Engineer-in-charge shall serve the show cause to the main contractor and if reply of main contractor either not received or found unsatisfactory, she/he may make the payment directly to the contractor associated for minor component as per the terms and conditions of the agreement drawn between main contractor and associate

		contractor fixed by him. Such payment made to the associate contractor shall be recovered by Engineer-in-charge from the next RA/ final bill due to main contractor as the case may be.
	CLAUSE 7A	
Unfixed materials when taken into account to be the property of the Employer	Where in any Certificate (of which the Contractor has received payment), the Engineer-in-Charge has included the value of any unfixed materials intended for and/or placed on or adjacent to the works such materials shall become the property of the Employer and they shall not be removed except for use upon the works, without the written authority of the Engineer-in-Charge. The Contractor shall be liable for any loss of, or damage to, such materials.	
	CLAUSE 8	
Completion Certificate and Completion Plans	i)	Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work if the work is found incomplete, the contractor shall be advised suitably .Further, in the completed work, if there is no defect , the Engineer-In-Charge shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus

		materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.
	ii)	The works shall not be considered as completed until the Engineer-in-charge has certified in writing that they have been completed. The Defects Liability Period shall commence from the date of such certificate.
	CLAUSE 8A	
Contractor to Keep Site Clean		The splashes and droppings from white washing, colour washing, painting etc., on walls, floor, windows, etc shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done. The cleaning shall be carried out as soon as possible without waiting for the actual completion of all the other items of work in the contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor through any other agency. Before taking such action, the Engineer-in-Charge shall give ten days' notice in writing to the contractor.
	CLAUSE 8B	
Completion Plans to be Submitted by the Contractor	i)	The contractor shall submit completion plan (as built drawing in AUTOCAD or any such approved software and one hard copy) as applicable to related drawings depending upon the scope of work within thirty days of the completion of the work.
	ii)	The contractor shall submit all the data and details as regards the work to enable the Employer to prepare the 'As built drawings' for layouts etc.
	iii)	The contractor shall also submit the operation and maintenance manuals and other technical literature/ warranty certificates provided by OEMs in respect of all the electrical/ electro-mechanical and electronic equipment/ systems etc.
	iv)	In case, the contractor fails to submit the completion plan as aforesaid, the Employer will not process its bills for payment till such time the completion plan is submitted.

	CLAUSE 9	
Payment of Final Bill		The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within the period specified hereunder, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge complete with account of materials wherever applicable.
	i)	If the Contract price of work is up to ₹50.00 lakh: 2 months
	ii)	If the Contract price of work is more than ₹50.00 lakh: 3 months
		In case of delay in payment of final bills after prescribed time limit, a simple interest @ 3% per annum shall be paid to the contractor from the date of expiry of prescribed time limit, provided the final bill submitted by the contractor found to be in order.
	CLAUSE 9A	
Payment of Contractor's Bills through electronic means	i)	Payments due to the contractor shall be made to his bank through NEFT. For this purpose, the contractor shall furnish to the Engineer-in-Charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank; to receive payments and all other required particulars in the approved format his own acceptance of the correctness of the amount made out as being due to him by Employer or his signature on the bill or other claim preferred against Employer before settlement by the Engineer-in-Charge of the account or claim by payment to the bank. (2) While the NEFT transaction slip shall constitute a full and sufficient discharge for the payment, the contractor shall whenever possible, present his bills duly receipted and discharged through his bank.

	ii)	Nothing herein contained shall operate to create in favour of the bank any rights or equities vis-a- vis the Employer.
	CLAUSE 10	
Materials to be provided by the Contractor	i)	The contractor shall, at his own expense, provide all materials, required for the works.
	ii)	The contractor shall, at his own expense and without delay, supply to the Engineer-in- Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The materials shall be selected from the list of approved makes of materials at Section VI. The contractor shall, if requested by the Engineer-in- Charge furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-In-Charge shall within thirty days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval, fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.
	iii)	The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.
	iv)	The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in- Charge or his authorized representative shall at all times have access to the works

		and to all workshops, factories or/ and other places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access for inspections and examination and test of the materials and workmanship. No person not authorized by the employer except the representatives of public authorities shall be allowed on the works at any time.
	v)	The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the Contractor.
	vi)	Basic price adjustment shall be done on the measured quantities for the finished items of work with specified “Basic Prices / Rates”. In addition to the difference in the Basic Price / Rate and the actual purchase Price / Rate, Contractor’s overhead and profit @ 15% on the difference shall be considered for the Basic price / Rate adjustment. While carrying out price adjustments, NO other components such as wastage, transportation, handling, insurance, labour, etc. shall be taken in to account.
	Clause 10A	
Price Adjustment - Payment on Account of variation in Material Prices/Wages	i)	Where scheduled period of completion is more than one year, in order to take in to account the variations in Material prices and wages during the contract period when the work is in progress, including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, adjustments in the costs of materials and labour shall be allowed on the basis of formulae as given below:,

		(1) Materials VM = 70/100 {0.88V - (M)} x {(WI - WIO)/WIO}		
		Where VM =		Variation in material cost, i.e., increase or decrease in the amount in Rs to be paid or recovered.
		V	=	Value of work done excluding advances on materials, if any, during the period under reckoning.
		M	=	Cost of materials for which basic rates, if any, are indicated in the tender
		WI	=	Average of All India Wholesale Price Index for all commodities for the period under reckoning as published in the RBI Bulletin.
		WIO = All India Wholesale Price Index for all commodities during the month of receipt of final Price Bid of the tender as published in the RBI Bulletin **(2) Labour** VL = 30/100 {0.88V - (M)} x {(CI - CIO)/CIO}		
		Where VL	=	Variation in labour cost, i.e., increase or decrease in the amount in Rs to be paid or recovered.
		V	=	As stated in (1) above
		M	=	As stated in (1) above
		CI	=	Average of All India Consumer Price Index for industrial workers declared by Labour Bureau, Government of India as published in the RBI Bulletin during the period under reckoning.

		CIO	=	All India Consumer Price Index for industrial workers declared by Labour Bureau, Government of India as published in RBI Bulletin during the month of receipt of final Price Bid of the tender.
	ii)	The base date for working out such price adjustment shall be the last stipulated date of receipt of Final Price bid of the tenders.		
	iii)	The cost of work on which price adjustment will be payable shall be reckoned as below :		
	a)	Gross value of work done up to last price adjustment : (A)		
	b)	Gross value of work done up to the current date : (B)		
	c)	Gross value of work done during the period under reckoning (A-B) :(C)		
	d)	Extra items/deviated quantities of items paid as per Clause 12 Based on prevailing market rates during the period under reckoning: (D)		
	k)	Then, Cost of work for which price adjustment is applicable: V = C - D		
	iv)	Materials which are covered by the provision of basic prices/ rates are excluded from the purview under this adjustment.		
	v)	Adjustments based on the above formulae will be made for each bill as and when the indices are published. The Contractors shall submit the bill for price adjustment with detailed calculations.		
	vi)	The downward adjustment on account of labour element will be made only if the minimum wages also register corresponding fall compared to the minimum wages prevailing in the month of receipt of final price bid of the tenders.		
	vii)	The price adjustment clause shall be applicable only for the work executed during the contract period including authorized extension, if any. In case the work is not completed within the contract period including authorized extension and the provision of liquidated damages has to be enforced, this adjustment clause will not be applicable for work done during that period. It is also clarified that price adjustment clause will not be applicable to any extra variation items, the rates of which are based on prevailing market rate.		
	viii)	In view of the price adjustment in cost being covered as above, no other adjustments viz. increase or decrease due		

		to statutory measures/levies etc. will be allowed for any reason whatsoever.
	ix)	In case the bill is submitted to the Employer prior to 15th of a particular month, index for the previous month will be reckoned for calculating the average indices for arriving at the adjustment. If however, the bill is submitted on or after 15th, the Indices for that particular month shall be taken into consideration.
Work to be Executed in Accordance with Specifications, Drawings, Orders etc.	CLAUSE 11	
	i)	The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.
	ii)	In the case of any class of work for which there is no such specifications as referred above, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers' specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.
	iii)	The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

Action in case Work not done as per Specifications	CLAUSE 11 A	
	i)	All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in-charge, his authorized subordinates in charge of the work and all the superior officers of the Employer or any organization engaged by the Employer for Quality Assurance and of the Chief Technical Examiner's Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.
	ii)	If it shall appear to the Engineer-in-charge or his authorized representatives or to the Superior Officers of the employer or the officers of the organization engaged by the Employer for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskilful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within Defects Liability Period stated in schedule 'C' or, if none stated, then within twelve months (six months in the case of work costing Rs Five Lakh and below)after completion of the work, from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of him failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

	iii)	In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority specified in Schedule 'C' may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.
Deviations/ Variations Extent and Pricing	CLAUSE 12	
		The Engineer-in-Charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided. The Engineer-in-Charge shall be the final authority to decide whether any item of work is extra/ deviation/ substitution item.
	12.1	The time for completion of the works shall, in the event of any deviations resulting in additional cost over the Contract price sum being ordered, be extended, if requested by the contractor, as follows

		i)	In the proportion in which the additional cost of the altered, additional or substituted work (The difference of Final completed cost of work (including the financial impact of all extra, substituted and deviated items but excluding the financial impact due to operation of price adjustment clause) and the Contract price), bears to the original Contract price plus
		ii)	25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.
Deviation - Extra Items and Pricing	12.2	A)	Items that are completely new, and are in addition to the items contained in the contract
			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 of works are carried out or if the amount of any omissions or additions relative to the amount of the whole of the contract works or to any part thereof shall be such that in the opinion of the Engineer-in-charge the net rate or price contained in the Priced Schedule of Quantities or tender or for any item of the works involves loss or expense beyond that reasonably contemplated by the Contractor or is by reason of such omission or addition rendered unreasonable or inapplicable, the Engineer-in-charge shall fix such other rate or price as in the circumstances he shall think reasonable and proper, with the prior approval in writing of the Employer.
			Where extra work cannot be properly measured or valued, the Contractor shall be allowed day work prices as the net rates stated in the tender of the Priced Schedule of Quantities or, if not so stated, then in accordance with the local day work rates and wages for the district, provided that in either case vouchers specifying the daily time (and if required by the Engineer-in-charge, the workman's name) and materials employed be delivered for verification to the Engineer-in-charge or his representative at or before the end of the week following that in which the work has been executed.

				In the case of extra item(s) (items that are completely new, and are in addition to the items contained in the contract), the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper rate analysis (CPWD method shall be followed as far as possible) worked on the "actual cost basis" plus 15% towards establishment charges, contractor's overhead and profit and the Engineer-in-charge shall within prescribed time limit of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.
Deviation - Substituted Items and Pricing		B)		Items that are taken up with partial substitution or in lieu of items of work in the contract
				In the case of substituted items (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall, wherever possible, be derived out of the rates given in priced schedule of quantities in the manner as mentioned in the following para.
			a)	The net rates or prices in the original tender 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 therein.
			b)	The net prices of the original tender shall determine the value of the items omitted provided if omissions vary the conditions under which any remaining items of works are carried out the prices for the same shall be valued under sub-clause (A) thereof.
			c)	If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

			d)	If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).
Deviation - Deviated Quantities and Pricing		C)	In the case of contract items, substituted items, contract cum substituted items which exceed the pre-specified limits over the tender quantity	
			In the case of contract items, substituted items, contract cum substituted items, which exceed the pre-specified limits laid down in Schedule 'C', the contractor may within fifteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper rate analysis (CPWD method shall be followed as far as possible) worked on the "actual cost basis" plus 15% towards establishment charges, contractor's overhead and profit for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities, the Engineer-in-Charge shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.	
			The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Schedule C, and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.	

	12.3		The prescribed time limits for finalising rates for Extra Item(s), Substitute Item(s) and Deviated Quantities of contract items are as under:		
			i)	If the Contract price of work is up to ₹2.00 Lakh:	15 days.
			ii)	If the Contract price of work exceeds ₹2.00 Lakh:	30 days.
	12.4	The contractor shall send to the Engineer-in-Charge once every three months, an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Employer may authorize consideration of such claims on merits.			
	12.5	Any operation incidental to or necessarily has to be in contemplation of tenderer while filing tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.			
Foreclosure of contract due to Abandonment or Reduction in Scope of Work	CLAUSE 13				
	If at any time after acceptance of the tender, Employer shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-In-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.				
	The contractor shall be paid at contract rates, full amount for works executed at site and, in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilized on the work to the full extent in view of the foreclosure;				

	i) Employer shall have the option to take over contractor's materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however Employer shall be bound to take over the materials or such portions thereof as the contractor does not desire to retain. For materials taken over or to be taken over by Employer, cost of such materials as detailed by Engineer-in- Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.	
	The contractor shall, if required by the Engineer- in-Charge, furnish to him, books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this condition.	
Carrying part out work at ris & cost of contractor	CLAUSE 14	
	If contractor:	
	i)	At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; or
	ii)	Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; or
	iii)	Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge.
	The Engineer- in-Charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to E m p l o y e r , by a notice in writing to take the part work / part incomplete work of any item(s) out of his hands and shall have powers to:	
	a)	Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/or

	b)	Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.
	The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor. The liability of contractor on account of loss or damage suffered by Employer because of action under this clause shall not exceed 10% of the Contract price of the work.	
	In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the Employer are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.	
	Any excess expenditure incurred or to be incurred by Employer in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by Employer as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Employer in law or as per agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.	
	If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials kept at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.	

	In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.		
Suspension of Work	CLAUSE 15		
	i)	The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge 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 the following reasons:	
		a)	on account of any default on the part of the contractor or;
		b)	for proper execution of the works or part thereof for reasons other than the default of the contractor; or
		c)	for safety of the works or part thereof. The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in- Charge.
	ii)	If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:	
		a)	the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and;

		b)	If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in- Charge within fifteen days of the expiry of the period of 30 days.
	iii)	If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer-in- Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by Employer or where it affects whole of the works, as an abandonment of the works by Employer, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge. In the event of the contractor treating the suspension as an abandonment of the contract by Employer, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.	

Dismantled Material Employer's Property	CLAUSE 16	
	The contractor shall treat all materials obtained during dismantling work at site (except material mentioned in Bill of quantity under rebate item and debris) etc. as Employer's property and such materials shall be disposed of as per the specific instructions in this regard or in absence of the same to the best advantage of Employer according to the instructions in writing issued by the Engineer-in-Charge.	
Contractor Liable for Damages, defects during defect liability period	CLAUSE 17	
	i)	If the contractor or his working people shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage, settlement or other faults appear in the work within Defects Liability Period stated in schedule 'C' or, if none stated, then within twelve months after a certificate final or otherwise of its completion shall have been given by the Engineer- in-Charge as aforesaid arising out of defect or improper materials or workmanship, the contractor shall upon receipt of a notice in writing on that behalf and within such reasonable times as shall be specified therein, make the same good at his own expense or in case of default the Engineer-in-Charge may employ and pay other persons to amend and make good such defects, shrinkage, settlements or other faults and all damages, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the Contractor and such damage, loss, expenses shall be recoverable from him by the Employer or may be deducted by the Employer, upon the Engineer-in- Charge's Certificate in writing, from any money due or may become due to the Contractor, or the Employer may in lieu of such amending and making good by the Contractor deduct from any money due to the Contractor, a sum, to be determined by the Engineer-in-Charge equivalent to the cost of amending such work and in the event of the amount retained as Security Deposit being insufficient, recover the balance from the Contractor, together with any expenses the Employer may have incurred in connection therewith.

		Should any defective work have been done or material supplied by any sub-contractor employed on the works who has been nominated or approved by the Employer, the Contractor shall be liable to make good in the same manner as if such work or material had been done or supplied by the Contractor and been subject to the provisions of this Clause. The Contractor shall remain liable under the provisions of this Clause notwithstanding the signing of any certificate or the passing of any accounts, by the Employer.
		The security deposit of the contractor shall not be refunded before the expiry of the Defect Liability Period after the issue of the certificate final or otherwise, as provided elsewhere.
	ii)	In case of Maintenance and Operation works of E&M services, the security deposit deducted from contractors shall be refunded within one month from the date of final payment or within one month from the date of completion of the maintenance contract whichever is earlier.
Setting out of works	Clause 18	
	The Contractor shall set out the works 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. If at any time, any error in this respect shall appear during the progress of the works or within the Defect Liability Period after completion of the works, the Contractor shall, if so required, at his own expense rectify such error to the satisfaction of the Engineer-in-Charge. The checking of any setting-out or of any line or level by the Engineer-in-charge or his representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all bench-marks, sight rails, pegs and other things used in setting out the works.	
All relevant Statutory Laws to be complied by the Contractor	CLAUSE 19	
	i)	The contractor shall obtain a valid licence under the Contract Labour (R&A) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour

		(Prohibition and Regulation) Act, 1986, Minimum Wages (Central) Rules, 1950.
	ii)	The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.
	iii)	The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, or the modifications thereof or any other relevant laws and the rules made thereunder from time to time.
	iv)	The contractor shall comply with provisions of any other relevant law in connection with the work, as may be applicable.
	v)	Any failure to fulfil these requirements shall attract the penal provisions of the concerned Act and Contractor shall be liable to face the consequences thereof in addition to any other penal provisions of this contract. The contractor shall indemnify the Employer for any loss caused due to non-compliance with any of the provisions of laws applicable.
Payment of wages:	CLAUSE 19 A	
	i)	The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.
	ii)	The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

	iii)	In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Labour Regulations made by Government from time to time in regard to payment of wages, wage period, deductions from wages, recovery of wages not paid and deductions unauthorizedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.	
	iv)	a)	The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.
		b)	Under the provision of Minimum Wages (Central) Rules, 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor.
	v)	The contractor shall indemnify as per the approved format and keep indemnified the Employer against payments to be made under and for the observance of the laws aforesaid without prejudice to his right to claim indemnity from his sub-contractors.	

	vi)	The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
	vii)	The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered from the wage of workmen.
	CLAUSE 19 B	
	In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at his own expense arrange for the safety provisions as per the Safety Code annexed and shall also at his own expense provide for all facilities in connection therewith.	
	CLAUSE 19 C	
	The contractor shall submit by the 4th and 19th of every month, to the Engineer-In-Charge, a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively:-	
	1. the number of labourers employed by him on the work,	
	2. their working hours,	
	3. the wages paid to them,	
	4. the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them, and	
	The decision of the Employer shall be final in deducting from any bill due to the contractor, the amount levied as fine if any by relevant statutory authorities and be binding on the contractor.	
	CLAUSE 19 D	
	In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by him/her.	

	CLAUSE 19 E	
	The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractor's employment upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements. In respect of maintenance/repair or renovation works etc. where the labour have an easy access to the individual houses, the contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour.	
	CLAUSE 19 F	
	i)	It shall be the responsibility of the contractor to see that the site under renovation is not occupied by anybody unauthorizedly during renovation, and is handed over to the Engineer-in-Charge with vacant possession of the site. If such site though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said site in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, the provisions of clause 2 shall be applied by the Employer whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.
	ii)	However, the Employer, through a notice, may require the contractor to remove the illegal occupation any time on or before renovation and handing over.
Employment of skilled/semi-skilled workers	CLAUSE 19 G	
	i)	The contractor shall, at all stages of work, deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from Industrial Training Institute/National Institute of construction Management and Research (NICMAR)/ National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to

		Engineer-in-charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in- Charge.
	ii)	Provided always, that the provisions of this clause, shall not be applicable for works with estimated cost put to tender being less than ₹ 5 crores.
Contribution of EPF and ESI	CLAUSE 19 H	
	The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. The quoted rate shall be inclusive of these amounts. The contractor shall submit the details of registration of labour for EPF and ESI and documents evidencing these payments shall be submitted every month.	
Ensuring Payment and Amenities to Workers if Contractor fails	CLAUSE 19 I	
	In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, Employer is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and under the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by Contractors. Employer will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the Employer under sub-section(2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, Employer shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by Employer to the contractor whether under this contract or otherwise Employer shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the Employer full security for all costs for which Employer might become liable in contesting such claim.	
Authorities and Notices	CLAUSE 20	
	(i)	The Contractor shall conform to the provisions of any Act of the Legislature relating to the work, and to the regulations and bye-laws of any authority, and of any water, electric supply and other companies and/or authorities with whose systems

		the structure is proposed to be connected and shall before making any variations from the Drawing or Specifications that may be necessitated by so conforming give to the Employer written notice, specifying the variation proposed to be made and the reason for making it and apply for instructions thereon. In case the Contractor shall not within ten days receive such instructions he shall proceed with the work conforming to the provisions, regulations or bye-laws in question, and any variation so necessitated shall be dealt with under Clause 12 thereof.
	(ii)	The Contractor shall bring to the attention of the Employer all notices required by the said Acts, regulations or bye-laws to be given to any authority and pay to such authority, or to any public office all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Employer.
Work not to be sublet. Action in case of insolvency	CLAUSE 21	
	The whole of the works included in the contract shall be executed by the Contractor and the Contract or any part/share thereof or any interest therein shall not be assigned or sublet without the prior written consent of the Employer, and no undertaking shall relieve the Contractor from the full and entire responsibility of the Contract or from active superintendence of the works during their progress. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employment of the Employer in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-In-Charge on behalf of the Employer shall have power to adopt the course specified in Clause 3 hereof in the interest of Employer and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.	

Recovery of Compensation paid to Workmen	CLAUSE 22
	In every case in which by virtue of the provisions of the Workmen's Compensation Act, 1923, or any statutory modification or re-enactment thereof, Employer is obliged to pay compensation to a workman employed by the contractor, in execution of the works, Employer shall be entitled to recover from the contractor, the amount of the compensation so paid; and, without prejudice to the rights of the Employer under the provisions of the said Act, Employer shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by Employer to the contractor whether under this contract or otherwise. Employer shall not be bound to contest any claim made against it under the provisions of the said Act, except on the written request of the contractor and upon his giving to Employer full security for all costs for which Employer might become liable in consequence of contesting such claim.
Changes in firm's Constitution to be intimated	CLAUSE 23
	Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern, such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.
Contractor to Supply Material, Machinery, Equipment, Tools & Plants etc.	CLAUSE 24
	The contractor shall arrange at his own expense all materials (including consumables such as welding rods etc.), all tools, plant, machinery and equipment (hereinafter referred to as T&P) required for execution of the work. In addition to this, appliances, implements, other plants, ladders, cordage, tackle, steel scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or

	complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefor to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials.	
	CLAUSE 25	
Settlement of Disputes & Arbitration	Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in 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 works 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)	The decision, opinion, direction, certificate of payment issued by the Engineer-in-Charge in respect of all or any of the excepted matters as provided in the contract shall be final, conclusive and binding on the parties hereto and shall be without appeal. Such decision may be in the form of a final certificate or otherwise.
	ii)	All other disputes and differences of any kind whatsoever arising out of or in connection with the contract or the carrying out of the works (whether during the progress of the works or after their completion and whether before or after the determination abandonment or breach of the contract) shall be referred to and settled by the Competent Authority of the Employer as specified in the schedule ‘C’. The designated authority shall state its decision in writing within 28 days from the date of receipt of reference from the contractor.

	iii)	But If the Competent Authority (CA) fails to give his decision within the aforesaid period or if either party be dissatisfied on any matter it may, within 28 days after receiving notice of such decision, give a written notice to the other party requiring that the matters in dispute be arbitrated upon. Such written notice shall specify the matters, which are in dispute or difference of which such written notice has been given. If both the parties agree, a single arbitrator would be appointed for the purpose. In case there is no agreement on the appointment of arbitrator, the employer shall prepare a panel of three person's names and forward to the contractor to select one among them as arbitrator. The arbitrator so appointed/selected shall confine himself only to the dispute/difference referred to him while adjudicating and pronouncing his decision. The arbitrator shall make his or their award within one year (or such further extended time as may be decided by him or them as the case may be with the consent of the parties) from the date of entering on the reference. In case during the arbitration proceedings the parties mutually settle or compromise their dispute or difference, on the parties filing their joint memorandum of the settlement or compromise, the arbitrator or the arbitrators as the case may be, shall make an award in terms of such settlement or compromise.

		Upon any such reference, the decision on the cost incidental to the reference and award respectively shall be in the discretion of the arbitrator as the case may be, who may determine the amount thereof or direct the same to be taxed as between the party and party, and shall direct by whom and to whom and in what manner the same shall be borne and paid. This submission shall be deemed to be a submission to arbitration within the meaning of the Indian Arbitration and Conciliation Act, 1996 or any statutory modification thereof. The award of the arbitrator shall be final and binding on the parties. It is agreed that the Contractor shall not delay the carrying out of the works by reason of any such matter, question or dispute being referred to arbitration, but shall proceed with the works with all due diligence and shall until the decision of the arbitrator is given, abide by the decision of the Employer. No award of the arbitrator shall relieve the Contractor of his obligations to adhere strictly to the Employer's instructions with regard to the actual carrying out of the works. The Employer and the Contractor hereby also agree that arbitration under this clause shall be a condition precedent to any right of action under the contract. The place of Arbitration shall be as specified in Schedule 'C'.
Contractor to indemnify Employer against Patent Rights	CLAUSE 26	
	The contractor shall fully indemnify and keep indemnified the Employer 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 himself pay any royalties, licence fees etc. which may be payable in respect of any article or part thereof included in the contract or damages cost and charges of all and every sort that may be legally incurred in respect thereof. In the event of any claims made under or action brought against Employer in respect of any such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the Employer 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 Engineer-in-Charge in this behalf.	

Lumpsum Provisions in Tender	CLAUSE 27		
	When the estimate on which a tender is made includes lump sum in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-Charge payable of measurement, the Engineer-in-Charge may at his discretion pay the lump-sum amount entered in the estimate, and the certificate in writing of the Engineer-In-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of the clause.		
Nominated Sub-Contractors	CLAUSE 28		
	(i)	All Specialists, Merchants, Tradesman and other executing any work of supplying and fixing any goods for which prime cost prices or provisional sums are included in the Schedule of Quantities and/or Specifications who may be nominated or selected by the Engineer-In-Charge are hereby declared to be Sub-Contractors employed by the Contractor and are herein referred to as nominated Sub-Contractors.	
	(ii)	No nominated Sub-Contractor shall be employed on or in connection with the works against whom the Contractor shall make reasonable objection or (save where the Employer and Contractor shall otherwise agree) who will not enter into a Contract provided :	
		a)	That the nominated Sub-Contractor shall indemnify the Contractor against the same obligation in respect of the Subcontract as the Contractor is under in respect of this contract.
		b)	That the nominated Sub-Contractor shall indemnify the Contractor against claims in respect of any negligence by the Sub-Contractor, his servants or agents or any misuse by him or them of any scaffolding or other plant, the property of the Contractor or under any Workmen's Compensation Act in force.

		c)	Payment shall be made to the nominated Sub-Contractor within fourteen days of his receipt of the Engineer-in-charge's Certificate provided that before any certificate is issued, the Contractor shall, upon request, furnish to the Engineer-in-charge proof that all nominated Sub-Contractor's accounts included in previous Certificates have been duly discharged, on the default whereof, the Employer may pay the same upon a Certificate of the Engineer-in-charge and deduct the amount thereof from any sum due to the Contractor. The exercise of this power shall not create brevity of contract as between Employer and Sub-Contractor.
Withholding and lien in respect of sum due from contractor	CLAUSE 29		
		i)	Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Employer shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Employer shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Employer shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract elsewhere with the Reserve Bank of India pending finalization of adjudication of any such claim. It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by Employer will be kept withheld or retained as such by the Employer till the claim arising out of or under the contract is determined by the arbitrator(if the contract is governed by the arbitration clause) or by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under

		the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Employer shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company as the case may be, whether in his individual capacity or otherwise.
	ii)	Employer shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for Employer to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by Employer to the contractor, without any interest thereon whatsoever.
Lien in respect of claims in other Contracts	CLAUSE 29A	
	Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Employer against any claim of the Employer in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Employer or RESERVE BANK OF INDIA elsewhere. It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Employer will be kept withheld or retained as such by the Employer or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect	

	of any sum of money withheld or retained under this clause and duly notified as such to the contractor.	
Return of Surplus materials	CLAUSE 30	
	Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of Employer by purchases made under orders or permits or licenses issued by Government, the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose them off without the written permission of the Employer and return it to Employer, if required by the Employer, all surplus materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the purchase price thereof inclusive of sales tax, octroi and other such levies paid by Contractor in respect thereof. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to action for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to Employer for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.	
Water and Electric power supply for work	CLAUSE 31	
	Bank will make available water and electricity power supply required at one point free of charge. Contractor shall make their own arrangement for further extension of connection if any with safety fixtures and nothing extra will be paid for the same.	
Employer's water supply, if available	CLAUSE 32	
	Water if available may be supplied to the contractor by the Employer at free of cost subject to the following conditions:-	
	i)	The Employer do not guarantee to maintain uninterrupted supply of water and it will be incumbent on the contractor(s) to make alternative arrangements for water at his/ their own cost in the event of any temporary break down in the water mains so that the progress of his/their work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such break down.

Insurance in respect of damages to Persons and Property	CLAUSE 33	
		The Contractor shall be responsible for all injury or damage to persons, animals or things, and for all damage to property which may arise from any factor omission on the part of the Contractor or any Sub-Contractor or any nominated Sub-Contractor or any of their employees. The liability under this clause shall cover also inter-alia any damage to structures, whether immediately adjacent to the works or otherwise, any damage to roads, streets, footpaths, bridges as well as damage caused to the building and other structures and works forming the subject matter of this contract. The contractor shall also be responsible for any damage caused to the buildings and other structures and works forming the subject matter of this contract due to rain, wind, frost or other inclemency of weather. The Contractor shall indemnify and keep indemnified the Employer and hold him harmless in respect of all and any loss and expenses arising from any such injury or damage to persons or property as aforesaid and also against any claim made in respect of injury or damage, whether under any statute or otherwise and also in respect of any award or compensation or damage consequent upon such claims. The Contractor shall, at his own expense, effect and maintain till issue of the virtual completion certificate under this contract, with an insurance company approved by the Employer, an All Risks Policy for Insurance for the full amount of the contract including earth quake risk in the joint names of the Employer and the Contractor (the name of the former being placed first in the policy) against all risks as per the standard all risk policy for Contractors and deposit such policy or policies with the Employer before commencing the works. The Contractor shall reinstate all damage of every sort mentioned in this clause so as to do delivery of the whole of the works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damage to property or third parties.

	The Contractor shall also indemnity and keep indemnified the Employer against all claims which may be made against the Employer by any person in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own expense, effect and maintain until the virtual completion of the contract, with an Insurance Company approved by the Employer a policy of Insurance in the joint names of the Employer and the Contractor (name of the former being placed first in the policy) against such risks and deposit such policy or policies before commencement of the works. The minimum limit of the coverage under the policy shall be ₹2 lakhs per person for any one accident or occurrence and ₹5 lakhs in respect of damage to property for any one accident or occurrence. The Contractor shall also indemnify the Employer against all claims which may be made upon the Employer, whether under the Workmen's Compensation Act or any other statute in force, during the currency of this contract or at Common Law in respect of any employee of the Contractor or Sub-Contractor and shall at his own expense effect and maintain until the Virtual Completion of the Contract with an Insurance Company approved by the Employer a policy of Insurance against such risks and deposit such policy or policies with the Employer from time to time during the currency of this contract. In default of the Contractor insuring as provided above, the Employer may so insure and may deduct the premiums paid from any money due or which may become due to the Contractor.
	The Contractor shall be responsible for any liability which may not be covered by the insurance policies referred to above and also for all other damages to any person, animal or defective carrying out of this contract, whatever, may be the reasons due to which the damage shall have been caused.
	The Contractor shall also indemnify and keep indemnified the Employer against all and any costs, charges or expenses arising out of any claim or proceedings relating to the works and also in respect of any award of damage or compensation arising therefrom. Without prejudice to the other rights of the Employer 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, compensation costs, charges and other expenses paid by the Employer and which are payable by the Contractor 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 money 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. The Contractor, in case of re-building or reinstatement after damage shall be entitled to such extension of time for completion as the Engineer-in-charge may deem fit, but shall, however, not be entitled to reimbursement by the Employer of any shortfall or deficiency in the amount finally paid by the insurer in settlement of any claim arising as set out herein. Without prejudice to his liability under this clause, the Contractor shall also cause all nominated sub-Contractors to effect, for their respective portions of the works similar policies of insurance in accordance with the provisions of this clause and shall produce or cause to produce to the Employer such policies. The Contractor shall not permit a nominated Sub-Contractor to commence work at the site unless said insurance policies are submitted. In the event of failure, of the Sub-Contractor to take out such policy or policies of insurance before commencing the works at the site, the Contractor shall be responsible for any claim or damage attributable to the said Sub-Contractor.	
Employment of Technical Staff and employees	CLAUSE 34	
	Contractor's Superintendence, Supervision, Technical Staff & Employees	
	i)	The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilment of the obligations under the contract until the expiry of the "Defects Liability Period" stated in schedule 'C'. The contractor shall immediately after receiving letter of award of work and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(s) and other particulars along with certificates, of the Project Manager, to be in charge of the work, Principal technical representative and other technical representative(s) who will be supervising the work. Minimum requirement of such

		Project Manager and technical representative(s) and their qualifications and experience shall not be lower than specified in Schedule 'C'. The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative(s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative(s) according to the provisions of this clause. Decision of the Employer shall be final and binding on the contractor in this respect. Such a Project Manager, Principal technical representative and other technical representative(s) shall be appointed by the contractor soon after receipt of the approval from Engineer-in-charge and shall be available at site before start of work. All the provisions applicable to the principal technical representative under the Clause will also be applicable to other technical representative(s). The principal technical representative and other technical representative(s) shall be present at the site of work for supervision at all times when any renovation work is in progress and also present himself/themselves, as required, to the Engineer-in-Charge and/or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available at site fully during all stages of execution of work, during recording/checking/test checking of measurements of works and whenever so required by the Engineer-in-Charge and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative(s) in the site order book and shall affix his/their signature in token of noting down the instructions and in token of acceptance of measurements/ checked measurements/ test checked measurements. Necessary site Registers viz. site instruction register /Hindrance Register/Labour Register etc. shall be strictly maintained by him on daily basis and got duly authenticated from Engineer-in-charge or his designated representative. The representative(s) shall not look after any other work. Substitutes, duly

		approved by Engineer-in-Charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two consecutive days. If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is/are effectively appointed or is/are effectively attending or fulfilling the provision of this clause, a recovery (non- refundable) shall be effected from the contractor as specified in Schedule 'C' and the decision of the Engineer-In-Charge as recorded in the site order book and measurement recorded checked/test checked in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint suitable Project Manager, Principal technical representative and/or other technical representative(s) and if such appointed persons are not effectively present or are absent by more than two continuous days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Engineer-In-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) (in the form of copy of Form-16 or CPF deduction issued to the Technical staff and employees employed by him) along with every on account bill and final bill and shall produce evidence if at any time so required by the Engineer-in-Charge.
	ii)	The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work. The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

	iii)	The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer- in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.
Levy/Taxes payable by Contractor	CLAUSE 35	
	i)	Goods and service tax (GST), Building and other Construction Workers Welfare Cess or any other tax or Cess in respect of this contract shall be payable by the contractor and Employer shall not entertain any claim whatsoever in this respect.
	ii)	The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, sand, stone, kankar, etc. from local authorities.
	If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the Employer and does not any time become payable by the contractor to the State Government/ Local authorities in respect of any material used by the contractor in the works, then in such a case, it shall be lawful to the Employer and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor.	
Conditions for reimbursement of levy/taxes if levied after receipt of tenders	CLAUSE 36	
	i)	All tendered rates shall be inclusive of all taxes and levies payable under respective statutes. However, if any further tax or levy or cess is imposed by Statute, after the last stipulated date for the receipt of tender including extensions, if any, and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Employer (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.

	ii)	The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Employer and/or the Engineer-in-Charge and shall also furnish such other information/document as the Engineer-in-Charge may require from time to time.
	iii)	The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineer-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto.
Other Persons employed by Employer	CLAUSE 37	
	The Employer reserves the right to use premises and any portions of the site for the execution of any work not included in this Contract which it may desire to have carried out by other persons and the Contractor shall allow all reasonable facilities for the execution of such work but shall not be required to provide any plant or material for the execution of such work except by special arrangement with the Employer. Such work shall be carried out in such manner as not to impede the progress of the works included in the Contract and the Contractor shall not be responsible for any damage or delay which may happen to or occasioned by such work.	
If relative working with the Employer, then the contractor not allowed to tender	CLAUSE 38	
	The contractor shall not be permitted to tender for works in the office of the Employer responsible for award and execution of contracts in which his near relative is posted as an officer (in any grade) or assistant (including Junior Engineer). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Officer of the Employer. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of the Employer. If, however, the contractor is registered in any other organization, he shall be debarred from tendering by the Employer for any breach of this condition. NOTE: By the term “near relatives” is meant wife, husband, parents and grandparents, children and grandchildren, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.,	

No Employee of the Employer to work as Contractor within one year of retirement	CLAUSE 39
	No Technical or other officer or assistant (including Junior Engineer) employed with the Employer shall work as a contractor or employee of a contractor for a period of one year after his retirement from the service without the previous permission of Employer in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the Employer as aforesaid, before submission of the tender or engagement in the contractor's service, as the case may be.
Compensation during warlike situations	CLAUSE 40
	The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-In-Charge, such payments being in addition to compensation up to the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Engineer-in-Charge. The contractor shall be paid for the damages/destruction suffered and for restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract. Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations (a) unless the contractor had taken all such precautions against air raid as

	are deemed necessary by the Engineer-in-Charge (b) for any material etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for the work. In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Engineer-in-Charge.
	CLAUSE 41
Direction and approval of Engineer-In-Charge	All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.
	CLAUSE 42
	All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of Employer without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.
Release of Security deposit after labour clearance	CLAUSE 43
	Security Deposit of the work shall not be refunded till the contractor produces a clearance deposit after labour certificate from the Labour Officer. As soon as the work is virtually complete the contractor shall apply for the clearance certificate to the Labour Officer under intimation to the Engineer-in-Charge. The Engineer-in-Charge, on receipt of the said communication, shall write to the Labour Officer to intimate if any complaint is pending against the contractor in respect of the work. If no complaint is pending, on record till after 3 months after completion of the work and/or no communication is received from the Labour Officer to this effect till six months after the date of completion, it will be deemed to have received the clearance certificate and the Security Deposit will be released, if otherwise due.
Non-Disclosure	CLAUSE 44

Pact	The contractor shall not disclose directly or indirectly any information, materials and of the Employer's infrastructure/ system/equipment etc. which may come to the possession or knowledge of the contractor during the course of discharging its contractual obligations in connection with the agreement, to any third party and shall at all times hold the same in strictest confidence. The contractor shall treat the details of the contract as private and confidential, except to the extent necessary to carry out the obligations under it or to comply with applicable laws. The contractor shall not publish, permit to be published, or disclose any particulars of the works in any trade or technical paper or elsewhere without the previous written consent of the Employer. The contractor shall indemnify the Employer for any loss suffered by the Employer as a result of disclosure of any confidential information. Failure to observe the above shall be treated as breach of contract on the part of the contractor and the Employer shall be entitled to claim damages and pursue legal remedies. The contractor shall take all appropriate actions with respect to its employees to ensure that the obligations of non-disclosure of confidential information under this agreement are fully satisfied. The contractor's obligations with respect to non-disclosure and confidentiality will survive the expiry or termination of this agreement for whatever reason.	
Sexual Harassment Of Women at Work Place	CLAUSE 45	
	(i)	The Contractor /Agency shall be solely responsible for full compliance with the provisions of the ''Sexual Harassment of the women at work place (Prevention, Prohibition and Redressal) Act, 2013". In case of any sexual harassment against its employee within the premises of the Bank, the complaint will be filed before the internal complaints committee constituted by the contractor / Agency and the Contractor / Agency shall ensure appropriate action under the said Act in respect to the complaint.
	(ii)	Any complaint of sexual harassment from any aggrieved employee of the contractor against any employee of the Bank shall be taken cognizance of the Regional Complains Committee constituted by the Bank

	(iii)	The contactor shall be responsible for any monetary compensation that may need to be paid in case the incident involves the employees of the contractor, for instance any monetary relief to Bank's employee, if sexual violence by the employee of the contractor is proved.
	(iv)	The contractor shall be responsible for educating its employees about prevention of sexual harassment at work place and related issues

Place:

Date: Signature of the bidder

Section V

SPECIAL CONDITIONS OF CONTRACT

General	CLAUSE SC 1	
	i)	Special conditions of Contract shall be read in conjunction with the General Conditions of Contract, specifications of work, drawings and any other documents forming part of this contract, wherever the context so requires.
	ii)	Notwithstanding the sub-divisions of the document into separate sections, schedules, annexures etc., every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the contract so far as it may be practicable to do so.
	iii)	Where any portion of the Special Conditions of Contract is repugnant to or at variance with any provisions of the General Conditions of Contract then unless a different intention appears, the provision(s) of the Special Conditions shall be deemed to override the provision(s) of the General conditions of Contract only of the extent that such repugnance or variations cannot and shall be to the extent that such repugnance or variance cannot be reconciled with the General Conditions of Contract.
	iv)	Wherever it is stated anywhere in this tender document that such and such supply is to be effected or such and such work is to be carried out, it shall be understood that the same shall be effected / carried out by the Contractor at his own cost, unless a different intention is specifically stated.
	v)	The items given in Schedule of Quantities shall be read in conjunction with materials and job specifications and relevant drawings.
Responsibilities of contractor	CLAUSE SC 2	
	i)	The CONTRACTOR shall be entirely responsible for executing the work covered under this Tender document in a safe, efficient and expeditious manner as per the time schedule, specifications, drawings and Renovation work aids equipment such as transportation equipment, tools and

		tackles as well as teasing appliances such as air compressors etc. and the necessary supervisory personnel, skilled, semi-skilled and unskilled labour shall be provided by the CONTRACTOR to achieve the monthly/weekly targets and the overall time schedule.
	ii)	The CONTRACTOR shall ensure that local labour, unskilled as well as skilled, to the extent possible and available from local resources are preferably employed on the work.
	iii)	All expenses towards mobilization at site and demobilization including bringing in equipment, work force, materials, dismantling the equipment, clearing the site, etc. shall be deemed to be included in the prices quoted and no separate payments on account of such expenses shall be entertained.
	iv)	It shall be entirely the CONTRACTOR's responsibility to provide, operate and maintain all necessary equipment, scaffoldings and safety gadgets, lifting tackles, tools and appliances to perform the work in a safe and efficient manner and complete all the jobs as per time schedules.
	v)	Preparing approaches and working area for the movement materials shall also be the responsibility of the CONTRACTOR. The CONTRACTOR shall acquaint himself with access availability etc. to provide suitable allowances in his quotation.
	vi)	The procurement and supply in sequence and at the appropriate time of all materials and consumables shall be entirely the CONTRACTOR's responsibility and his/her rates for execution of work will be inclusive of supply of all these items.
	vii)	Responsibility for obtaining all statutory approvals (if required) related to the work lies with the CONTRACTOR.
	viii)	The CONTRACTOR shall provide drinking water and other amenities at site for the contract workmen as per the statutory requirements at his own cost.
	ix)	CONTRACTOR shall take all steps to see that normal functioning of Working Office/Public life/ Public traffic is not affected/obstructed while executing the work. Stacking of materials, equipment, tools and vehicles involved in movement of equipment or materials should not make any hindrance for the movement of other vehicles and people.
	x)	CONTRACTOR shall be responsible for implementing the requirements of Local controlling State Pollution Control Board/ statutory authorities (if any).
	xi)	The works to be undertaken by the Contractor shall inter-alia include the following:

		a)	Preparation of detailed SHOP drawings and AS BUILT drawings wherever applicable.
		b)	Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
		c)	Contractor shall provide all the shop drawings or layout drawings for all the coordinated services before starting any work or placing any order of any of the services etc. These shop drawings/layout drawings shall be got approved from Engineer-in-charge before implementation and this shall be binding on the Contractor. The Contractor shall submit material submittals along with material sample for approval of Engineer-in-Charge prior to delivery of material at site.
	xii)	Wherever the 'basic rate' for the material is specified, the contractor shall furnish all the paid bills for Employer's verification. The purchase rate shall be got approved from the Engineer-in-charge before purchasing.	
	xv)	The contractor shall arrange visits of authorized official of the manufacturer whose materials (costing more than Rs 1 lakh) have been selected / approved by the Employer for the work to inspect the materials supplied/ available at site and whether the materials are being used as per the Manufacturer's Specifications and specified consumption standards and shall be required to submit a report on the manufacturer's letterhead addressed to Employer, under official seal, indicating the genuineness or otherwise of the material and its usage methodology. No additional payment on this account shall be considered.	
Role of employer	CLAUSE SC 3		
	The Employer (Reserve Bank of India, CAB, Pune) shall administer and directly arrange for supervision of works, to test and examine any materials to be used or workmanship employed in connection with the works, monitoring of progress, inspection, certification of bills, making payments and implementation of various terms, conditions and stipulations of the contract.		
Architect	CLAUSE SC 4		
	Banks appointed Architect will provide the design and drawings he scope of their work includes interalia Planning & Designing and periodic inspection and supervision.		

Green building requirements	CLAUSE SC 5		
	The Contractor shall strictly follow the instructions of Engineer-in-charge in this regard.		
	CLAUSE SC 6		
Inspection of Site	The intending Tenderer shall be deemed to have visited the site and examined the Site and its surroundings and familiarized themselves thoroughly with the site conditions as to the nature of the ground and subsoil and the form and nature of the Site before submitting the tender. Non familiarity with the site conditions will not be considered as reason either for extra claims or for not carrying out the work in strict conformity with the drawings and specifications. For site visit, the intending tenderer may contact the Employer.		
Underground Services / Utility	CLAUSE SC 7		
	The Contractor shall take due and proper care during execution of telecommunication and fire alarm system work to protect Existing water/electric services from damage. In case, during the execution of work, the Contractor notices some services which require re-routing, the same shall be brought to the notice of the Engineer-in-charge. As per the instructions of Engineer-in-charge, further action for rerouting shall be undertaken. If the Contractor is advised by the Engineer-in-charge to carry out the required re-routing, the work shall be treated as Extra item of work and shall be dealt as per the relevant clause of GCC.		
Handing over of site	CLAUSE SC 8		
	i)	The Contractor shall be required to complete the following documentation with regard to the work within ten days from the date of award of work:	
		a)	Signing of the agreement on adequate value of Non-Judicial stamp paper as per the approved format
		b)	Obtaining and submitting all the required Insurance Policies as specified in the relevant clause of General Conditions of Contract and of specified value mentioned in schedule ‘C’

		c)	Submission of the specified Bank Guarantees mentioned in Schedule 'C' or submission of documentary evidence of having instructed his Banker to prepare the specified Bank Guarantee
		d)	Obtaining and submitting the original Labour License or submitting the documentary evidence of having applied to the statutory authority in the prescribed form for Obtaining the Labour License if applicable.
		e)	Submitting the details/ documents of the Contractor's site team as specified in relevant clause of General Conditions of Contract and schedule 'C' for obtaining approval of Engineer- in-charge.
		f)	Submitting the detailed work programme as specified in the relevant clause of General Conditions of Contract for approval of the Engineer-in-charge
	ii)	After complying to the above documentation and other statutory requirements required to be complied by the Contractor before start of work, the Contractor shall be handed over the possession of the site. The scheduled date of commencement of work shall be reckoned from the tenth day of the date of award of work or the date of handing over the possession of site (if delay is due to any reasons beyond the contractor's control), whichever is later. However, any delay in handing over the possession of site to the Contractor on account of non-submission of the above documents/ details shall not be considered for extension of time.	
Drawings	CLAUSE SC 9		
	The CONTRACTOR shall keep one copy of all drawings on the works and Employer or his representative shall at all reasonable time have access to the same. Before the issue of the final certificate to the CONTRACTOR he shall forthwith return to the EMPLOYER all drawings and specifications. Drawings accompanying the tender documents are indicative of the scope or work and issued for tendering purpose only. Detailed construction drawings on the basis of which actual execution of the work is to be proceeded will be furnished to the CONTRACTOR progressively based on the approved programme after the award of the work.		
	CLAUSE SC 10		

Further drawings and Instructions		
	The Engineer-in-Charge shall have full power and authority to supply drawings to the Contractor from time to time during the progress of the Works such further drawings for adequate execution and maintenance of the Works and the Contractor shall carry out and be bound by the same. Any further drawings or specifications that may be required by the Contractor for execution of the work shall be requested by him to Engineer-in-charge at least 15 days in advance.	
Contractor's Barricades	CLAUSE SC 11	
	i)	Contractor shall erect and maintain at his own cost barricades required in connection with his operation to guard or protect the entire working area including storage, etc.
	ii)	Barricades and hazardous areas adjacent to but not located in normal routes of travel shall be marked with suitable red markers at night without any extra cost.
	iii)	The Contractor shall also comply with the provisions of Environment Protection Act with regard to air, water & noise pollution.
	iv)	The Contractor shall provide suitable construction safety nets to prevent damage to man / material at site without any extra cost
Site Facilities	CLAUSE SC 12	
	CONTRACTOR shall arrange for storage space for keeping own tools/tackles and other materials for performance of work under this contract. Whereas space will be provided by the R B I free of cost, the safety and security including safety of materials for erection purpose as well as subsequent removal of the same on completion of 'Work' under this contract are the responsibility of the CONTRACTOR.	
	Lighting The CONTRACTOR shall ensure that the entire site is provided with adequate lighting at all times when the renovation work is in progress. He shall also make additional arrangements for lighting for carrying out work at night, whenever required. All costs in this connection shall be borne by him.	

	Compressed Air The Contractor shall make his own arrangement for Portable compressors, pumps, temporary piping for compressed air, if required, for the work including all necessary accessories, fittings etc. at his own cost for cleaning, testing, flushing etc.	
Construction/ Renovation work Equipment	CLAUSE SC 13	
	The CONTRACTOR shall without prejudice to his overall responsibility to execute and complete the work as per specifications and time schedule, progressively deploy adequate and appropriate equipment and tools and tackles and augment the same as decided by the Engineer-in-Charge depending on the requirements of the work so as to suit the work schedule. No equipment shall be supplied by the Employer. Contractor shall assess the actual requirement based on the quantum and nature of work and arrange to provide the same to achieve the progress as per the approved work programme.	
Plant etc. to be exclusively for use on the works	CLAUSE SC 14	
	i)	All plants, tools and equipment and materials provided by the Contractor shall when brought on to the Site be deemed to be exclusively intended for the renovation work and completion of the Works and the Contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the Site to another or moving it outside the site for repairs) without the previous consent in writing of the Engineer-in-Charge which shall not be unreasonably withheld.
	ii)	Clearance of Site on Completion : On completion of the Works the Contractor shall remove from the Site all the said Constructional Plant, tolls and equipment remaining thereon and any unused materials
	CLAUSE SC 15	

Care of works /plant/equipment		
	From the commencement to the completion of the Works/Plant/Equipment, the Contractor shall take full responsibility for the care thereof and in case any damage loss or injury shall happen to the Works/Plant/Equipment or to any part thereof from any cause whatsoever shall at his own cost repair and make good the same so that at completion the Works/Plant/Equipment shall be in good order and condition and in conformity in every respect with the requirements of the contract. Finished Flooring shall be protected by suitable means while carrying out any civil/electrical work either internally or externally and no extra cost. Mixing mortar / concrete shall not be permitted on bare slab / waterproofing IPS / tiles and the same shall be done on steel plates / mixing tubs / G.I. Trays. Any damage done to the flooring / IPS shall be rectified by the Contractor at his own cost and which shall be in the form of replacing the total flooring.	
	Temporary used materials (e.g. Cable, pipe, valve etc) shall not be used for permanent work. All the bought-out items supplied by the Contractor and billed to Employer shall be considered as Employer's Property and due care shall be taken for safety of these by the contractor till handing over of work.	
Works to be carried out by licensed technicians under supervision of licensed Supervisors	CLAUSE SC 16	
	a)	All electrical works shall be carried out through a licensed Electrician under the supervision of licensed supervisor. The electrical connections carried out by the CONTRACTOR shall meet the statutory requirements. Changes, if any, as incorporated in the statutory rules and regulations from time to time shall be applicable to the electrical works done by the CONTRACTOR.
Quality Assurance and Quality Control	CLAUSE SC 17	
	i)	The reports of the test shall be submitted to the Engineer-in-charge as and when the tests/ quality assurance & control checks are carried out as per the contract. The Engineer-in-charge, after evaluation of the results of tests may decide to either reject or accept the respective materials/ works etc. In case of rejection, the Contractor shall have to replace the defective material/ work at the earliest without any additional cost.

	ii)	In case the CONTRACTOR fails to follow the instructions of Engineer-in-charge in this regard, the Engineer-in-charge may suspend the work till such time the quality of the work is ensured. No compensation for delays on account of such suspension of work shall be considered.
Materials at Basic Prices/ Basic rates	CLAUSE SC 18	
	i)	For carrying out certain items of work, the tender provides for procurement of certain materials at "Basic Prices/ Basic Rates" as specified in the tender document.
	ii)	While quoting the rates, the tenderer should base their item rates at "the Basic Prices" wherever specified. The said prices are exGodown and are exclusive of GST & all other duties levied by Local authority / Government or any other statutory body and exclusive of Contractor's overhead & Profit, (Ex-Godown referred here will be dealer's Godown or Rail head within the Municipal or city limits or the city where the work is being done).
	iii)	The contractor shall obtain written approval from the Engineer-in-charge before procuring any material for which "Basic Price/ Basic Rate" is specified in the tender Document.
	iv)	Basic Price adjustment shall be done on the measured quantities for the finished items of work with specified "Basic Prices/Rates". In addition to the difference in the Basic Price/ Rate and the actual purchase Rate/ Price, GST & all other duties levied by Local authority / Government or any other statutory body and contractor's overhead and profit @ 15% on the difference shall be considered for the Basic price/ Rate adjustment. While carrying out price adjustments, NO other components such as wastage, transportation, handling, insurance, labour, etc. shall be taken in to account.
	v)	The contractor shall submit copies of all tax paid vouchers (original tax paid vouchers shall be shown to the Engineer-in-charge for verification as and when required by him) for full quantity for all items to the Engineer-in-charge in support of their claim for adjustment in Basic Rates/Prices. In absence of these documents, his claim for adjustment in Basic rates/Prices shall not be considered.
Documents to be maintained at site	CLAUSE SC 19	
	a)	The Registers/ Documents specified at Schedule 'D' shall be maintained at site by the Contractor at his own cost and updated regularly.

	b)	These documents shall be available for inspection by Employer's representative or Engineer-in-charge or his representative during his site visit at all reasonable times.	
	c)	After completion of work, the Contractor shall submit the duly completed registers/ documents along with all the drawings issued to him for construction purpose to the Engineer-in-charge before submission of the Final bill.	
Progress Monitoring by the Engineer-in-charge	CLAUSE SC 20		
	i)	The contractor shall submit his programme for approval of Engineer-In-Charge within 14 days from the date of award of work as specified in the relevant clause of the General Conditions of Contract.	
	ii)	On the basis of the approved programme, the Engineer-in-charge shall monitor/ review the progress through site meetings on monthly interval or earlier, as and when required. The meeting should be attended by the contractor himself (in case of proprietorship firm) or authorized partner/ senior official in case of partnership firm/ limited company along with contractor's site in-charge.	
	iii)	For this purpose, the contractor shall prepare and submit a progress report indicating following:	
		A	Progress for the previous month (duration under review) and the planning for the next month and materials received during the month (duration under review) and expected to be received during next month.
		B	The reasons for major deviations in planned schedule and the actual progress achieved along with any hindrances/ decisions required from the Employer/ Engineer-in-charge.
		C	Statement of deployment of resources (men and machine) and variations, if any, from the planned schedule
		D	List of Variations / extra items if any carried out during the previous month (period under review)
Measurement, Billing and Terms of payment	CLAUSE SC 21		
	i)	The work shall be measured from time to time as provided in the General Conditions of Contract. The units of measurements shall be as defined in the specific item description in the Schedule of quantities. If for any item or part	

		thereof, physical measurement is not practicable, measurements given in the execution drawings shall be adopted.(ii) As and when the Contractor feels that the gross value of work done after adjustment of the value of work already received in any previous bill and adjustment of advances, if any, has crossed the threshold value specified in the Schedule 'C' for Running Account Bill, he may raise a bill and submit to the Engineer-in-charge for payment. The bill shall invariably be accompanied with following documents:	
		a)	The signed measurements, as specified in the General Conditions of Contract.
		b)	The progress reports of the concerned period.
		c)	Test certificates/ reports of any material considered for the first time in the Contractor's bill
		d)	Checklist indicating validity of the labour license, all the Insurance Policies, PBGs
		e)	Documents evidencing the price of materials (e.g. Tax paid vouchers etc.) considered in the bill where Basic Rates are mentioned, as applicable.
		f)	Delivery challans of the materials.
	ii)	The Engineer-in-charge reserves the right to refuse to accept the Running Account bill, if any of the document as above is not submitted along with the bill.	
	iii)	Once the bill is received along with all the required documents, the Engineer-in-charge shall arrange to process the bill and the payments due to the Contractor shall be released through NEFT within the specified period for honouring the certificates.	
	iv)	After completion of work and completing all the contractual responsibility, the measurement sheets shall be signed jointly by the Contractor or his authorized representative and Engineer-in-charge or his authorized representatives. The Contractor shall then submit the Final bill to the Engineer-in-charge. The Final Bill shall necessarily be submitted along with the following documents:	
		a)	The signed measurements, as specified in the General Conditions of Contract.
		b)	The copy of last progress report, evidencing the completion of work.
		c)	Test certificates/ reports of any material considered for the first time in the Contractor's bill
		f)	Checklist indicating validity of the labour license, all the Insurance Policies, PBGs

		g)	Documents evidencing the price of materials (eg Tax paid vouchers etc.) considered in the bill where Basic Rates are mentioned, as applicable.
		h)	Delivery challans for the materials
		j)	All the required documents of Guarantees/ warranties (e.g. Water proofing and electrical equipment's, etc. as mentioned in the specifications of respective items)
		k)	"No claim" certificate by the Contractor except as included in the Final bill.
		l)	Completion plans/ drawings/ details as specified in the General Conditions of Contract
	v)	The Engineer-in-charge reserves the right to refuse to accept the Final bill, if any of the document, as above, is not submitted along with the bill.	
	vi)	Once the Final bill is received along with all the required documents, the Engineer-in-charge shall arrange to process the bill and the payments due to the Contractor shall be released through NEFT within the specified period for honouring the certificates. No revised Final Bill shall be considered by the Employer.	
	vii)	All statutory deductions shall be made from the payments due to the Contractor.	
	CLAUSE SC 22		
Least disturbance to the office and other surroundings.		The tenderer may please note that the area involved for this work is, inside the Main office Building of Reserve Bank of India. As these buildings are in occupation the entire work shall be carried out without any inconveniences and least disturbance to the office and other surroundings. All the necessary arrangements shall be made to prevent dust, noise, debris etc. to the adjacent areas which is required to be cleared on day-to-day basis without any extra cost	
	CLAUSE SC 23		
Incentive for early completion		In case, the contractor completes the work ahead of updated stipulated date of completion considering the effect of extra work (to be calculated as per clause 12.1), a bonus @ 1% (one per cent) of the contract amount per month computed on per day basis, shall be payable to the contractor, subject to a maximum limit of 5% (five per cent) of the contract	

		amount. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Provided always that provision of the Clause 2A shall be applicable only when so provided in Schedule 'C'.

Place:-

Signature of bidder

Date: - .

Section VI

TECHNICAL SPECIFICATIONS

a. Civil and Related Works

A Renovation: Civil works

1 DISMANTLING AND DEMOLITION WORKS

1.1 LIST applicable INDIAN STANDARDS CODES

(i) IS 1200 (Pt – XVIII) Method of Measurements of Building and Civil Engineering Works (Part –XVIII) Demolition and Dismantling

(ii) IS 4130 Demolition of Buildings–Code of Safety

1.2 TERMINOLOGY

i) Dismantling: The term 'Dismantling' implies carefully separating the parts without damage and removing. This may consist of dismantling one or more parts of the building as specified or shown on the drawings.

ii) Demolition: The term 'Demolition' implies breaking up. This shall consist of
demolishing whole or part of work including all relevant items as specified or shown on the drawings.

1.3 GENERAL:

i) All materials obtained from dismantling or demolition shall be the property of the EMPLOYER unless otherwise specified and shall be kept in safe custody until they are handed over to the Engineer-in-charge.

ii) The demolition shall always be well planned before hand and shall generally be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Engineer-in-charge before starting the work. iii) Due care shall be taken to maintain the safety measures prescribed in IS 4130.

iv) Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property. Wherever specified, temporary enclosures or partitions and necessary scaffolding with suitable double scaffolding and proper cloth covering shall also be provided, as directed by the Engineer-in-charge.

v) Necessary precautions shall be taken to keep noise and dust nuisance to the minimum. All work needs to be done under the direction of Engineer-in-charge.

Helmets, goggle, safety belts etc. should be used whenever required and as directed by the Engineer-in-charge.

vi) The demolition work shall be proceeded with in such a way that it causes the least damage and nuisance to the adjoining building and the public.

vii) Dismantling shall be done in a systematic manner.

viii) Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Engineer-in-charge within a lead of site boundary. All unserviceable materials, rubbish etc. shall be disposed of
out of premises as directed by the Engineer-in-charge at place permitted by municipal authority.

ix) The contractor shall maintain/disconnect existing services, whether temporary or permanent, where required by the Engineer-in-charge.

x) No demolition work should be carried out at night.

xi) Screens shall be placed where necessary to prevent injuries due to falling pieces.

xii) Water may be used to reduce dust while demolishing.

xiii) Safety belts shall be used by labourers while working at higher level to prevent falling from the structure.

xiv) First-aid equipment shall be got available at all demolition works of any magnitude.

1.4 RECOMMENDATIONS FOR DEMOLITION OF CERTAIN SPECIAL TYPES AND ELEMENTS OF STRUCTURES

1.4.1 In-situ Reinforced Concrete

i) Before commencing demolition, the nature and condition of the concrete, the condition and position of reinforcement, and the possibility of lack of continuity of reinforcement should be ascertained.

ii) Attention should be paid to the principles of the structural design to determine which parts of the structure depend on each other to maintain overall stability.

iii) Demolition should be commenced by removing partitions and external non-load bearing cladding. It should be noted that in some buildings the frame may rely on the panel walls for stability.

iv) Where hard demolition methods are to be used, the following procedures should be used.

a. Reinforced Concrete Beams: For beams, a supporting rope should be attached to the beam. Then the concrete should be removed from both ends by pneumatic drill and the reinforcement exposed. The reinforcement should then be cut in such a way as to allow the beam to be lowered under control to the floor.

b. Reinforced Concrete Columns: For columns, the reinforcement should be exposed at the base after restraining wire guy ropes have been placed round the

member at the top. The reinforcement should then be cut in such a way as to allow the column to be pulled down to the floor under control.

c. Reinforced Concrete Walls: Reinforced concrete walls should be cut into strips and demolished as for columns.

d. In case of foundations/footings /plinth column/plinth beams the required area to be excavated and RCC to be demolished by mechanical means as approved by Engineer in charge.

1.5 MEASUREMENTS

(i) All work shall be measured net in the decimal system, as fixed in its place, subject to the following limits, unless otherwise stated hereinafter.

a) Dimensions shall be measured correct to a cm.

b) Areas shall be worked out in sqm correct to two places of decimal.

c) Cubical contents shall be worked out to the nearest 0.01 cum.

(ii) Elements of work required to be dismantled/demolished shall only be measured and no allowance for increase in bulk. Excavation for exposing foundations/RCC elements will not be measured and paid under this item as already included in the excavation items.

1.6 RATES

"The rate shall include the cost of all labour involved and tools, equipment used in demolishing and dismantling including shoring/strutting/ scaffolding, dewatering etc. The rate shall also include the charges for separating out and stacking the serviceable material
properly and shall be disposed off out of premises as directed by the Engineer-in-charge at place permitted by municipal authority.
"The rate shall also include for temporary shoring for the safety of portions not required to be pulled down, or of adjoining property, and providing temporary enclosures or partitions, where considered necessary."

2 <u>CONCRETE AND ALLIED WORKS</u>

It shall be very clearly understood that the specifications given herein are brief and do not cover minute details. However, all works shall have to be carried out in accordance with the relevant standards and codes of practices or in their absence in accordance with the best accepted current Engineering practices or as directed by ENGINEER-IN-CHARGE from time to time. The decision of ENGINEER-IN-CHARGE as regards the specification to be adopted and their interpretation and the mode of execution of work shall be final and binding on CONTRACTOR and no claim whatsoever will be entertained on this account.

2.1 APPLICABLE CODES AND SPECIFICATIONS

The following specifications, standards and codes, including all official amendments/revisions and other specifications & codes referred to therein,

should be considered a part of this specification. In all cases the latest issue/edition/revision shall apply.

2.1.1 Materials

a) IS:269 Specification for 33 grade ordinary Portland cement.
b) IS:455 Specification for Portland slag cement.
c) IS:1489 Specification for Portland pozzolana cement(Parts 1 & 2)
d) IS:8112 Specification for 43 grade ordinary Portland cement.
e) IS:12330 Specification for sulphate resisting Portland Cement.

f) IS:383 Specification for coarse and fine aggregates from natural sources for concrete.
g) IS:432 Specification for mild steel and medium tensile (Parts steel bars and hard drawn steel wires for 1 & 2) concrete reinforcement.

h) IS:1786 Specification for high strength deformed steel bars and wires for concrete reinforcement.
i) IS:1566 Specification for hard drawn steel wire fabric for (Parts II) concrete reinforcement.
j) IS:9103 Specification for admixtures for concrete.
k) IS:2645 Specification for integral cement waterproofing compounds.

l) IS:4900 Specification for plywood for concrete shuttering work.
m) IS:4926 Ready mixed concrete
n) IS:12269 Specification for 53 grade ordinary Portland cement.

o) IS:8041 Specification for rapid hardening cement.
p) IS:12600 Specification for low heat cement.
q) IS:6909 Specification for super sulphated cement.
r) IS:12089 Specification for granulated ground blast furnace slag.
s) BS:6699 Specification for granulated ground blast furnace slag.
t) BS:6073 Specifications for precast concrete masonry units (Part 1) Methods for specifying precast concrete masonry (Part 2)
u) IS 13620-1993 Specification for Fusion bonded epoxy coated reinforcing bars

2.1.2 Material Testing

a) IS:4031 Methods of physical tests for hydraulic cement. (Parts 1 to 15)

b) IS:4032 Method of chemical analysis of hydraulic cement.
c) IS:650 Specification for standard sand for testing of cement.
d) IS:2430 Methods for sampling of aggregates for concrete.
e) IS:2386 Methods of test for aggregates for concrete (Parts 1 to 8)

f) IS:3025 Methods of sampling and test (physical and chemical) water used in industry.(Part 1 to 51)
g) IS:6925 Methods of test for determination of water soluble chlorides in concrete admixtures.

2.1.3 Material Storage

a) "IS:4082" Recommendations on stacking and storing of construction materials at site

2.1.4 Concrete Mix Design

a) IS:10262 Recommended guidelines for Concrete Mix Design.
b) "SP:23 " Handbook on Concrete Mixes.

2.1.5 Concrete Testing

a) IS:1199 Method of sampling and analysis of concrete.
b) IS:516 Method of test for strength of concrete.
c) IS:9013 Method of making, curing and determining compressive strength of accelerated cured concrete test specimens.
d) IS:8142 Method of test for determining setting time of concrete by penetration resistance.
e) IS:9284 Method of test for abrasion resistance of concrete.
f) IS:2770 Methods of testing bond in reinforced concrete.

2.1.6 Equipment

a) IS:1791 Specification for batch type concrete mixers.
b) IS:2438 Specification for roller pan mixer.
c) IS:4925 Specification for concrete batching and mixing plant.
d) "IS:5892" Specification for concrete transit mixer and agitator.
e) IS:7242 Specification for concrete spreaders.
f) IS:2505 General Requirements for concrete vibrators: Immersion type.

g) IS:2506 General Requirements for screed board concrete vibrators.
h) IS:2514 Specification for concrete vibrating tables.
i) IS:3366 Specification for pan vibrators.
j) IS:4656 Specification for form vibrators for concrete.
k) IS:11993 Code of practice for use of screed board concrete vibrators.
l) IS:7251 Specification for concrete finishers.
m) IS:2722 Specifications for portable swing weigh batcher for concrete (single and double bucket type).
n) IS:2750 Specifications for steel scaffoldings

2.1.7 Codes of Practice

a) IS:456 Code of practice for plain and reinforced concrete.
b) IS:457 Code of practice for general construction of plain and reinforced concrete for dams and other massive structures.
c) IS:3370 Code of practice for concrete structures for storage of liquids (Parts 1 to 4)

d) IS:3935 Code of practice for composite construction.
e) IS:2204 Code of practice for construction of reinforced concrete shell roof.
f) IS:2210 Criteria for the design of reinforced concrete shell structures and folded plates.
g) IS:2502 Code of practice for bending and fixing of bars for concrete reinforcement.
h) IS:5525 Recommendation for detailing of reinforcement in reinforced concrete works.
i) IS:2751 Code of practice for welding of mild steel plain and deformed bars used for reinforced concrete construction.
j) IS:9417 Specification for welding cold worked bars for reinforced concrete construction.
k) IS:3558 Code of practice for use of immersion vibrators for consolidating concrete.
l) IS:3414 Code of practice for design and installation of joints in buildings.
m) IS:4326 Code of practice for earthquake resistant design and construction of buildings.
n) IS:4014 Code of practice for steel tubular scaffolding. (Parts 1 & 2)
o) IS:2571 Code of practice for laying in situ cement concrete flooring
p) "IS:7861" Part 1 - Recommended practice for hot weather concreting
Part 2 – Recommended practice for cold weather concreting
q) "IS:3370" Code of practice for concrete structures for the storage of liquid (Part I to IV)

2.1.8 Construction Safety

a) IS:3696 Safety code for scaffolds and ladders.(Parts 1 & 2)
b) IS:7969 Safety code for handling and storage of building materials.
c) IS:8989 Safety code for erection of concrete framed structures.

2.2 GENERAL

2.2.1 ENGINEER-IN-CHARGE shall have the right at all times to inspect all operations including the sources of materials, procurement, layout and storage of materials, the concrete batching and mixing equipment, and the quality control system. Such an inspection shall be arranged, and ENGINEER-IN-CHARGE's approval obtained, prior to starting of concrete work. This shall, however, not relieve CONTRACTOR of any of his responsibilities. All materials, which do not conform to this specification, shall be rejected.

2.2.2 Materials should be selected so that they can satisfy the design requirements of strength, serviceability, safety, durability and finish with due regards to the functional requirements and the environmental conditions to which the structure will be subjected. Materials complying with codes/standards shall only be used.

2.3 MATERIALS

2.3.1 Cement

(a) Unless otherwise specified or called for by ENGINEER-IN-CHARGE, cement shall be ordinary Portland cement conforming to IS: 269, IS: 8112 or IS: 12269.

(b) If used, The Portland pozzolana cement shall conform to IS: 1489 and it shall be used as directed by ENGINEER-IN-CHARGE. Where Portland pozzolana cements are used, it shall be ensured that consistency of quality is maintained and there will be no adverse interactions between the materials and the finish specified is not marred.

(c) Only one type of cement shall be used in any one mix unless specifically approved by ENGINEER-IN-CHARGE.

(d) Cement, which is not used within 90 days from its date of manufacture, shall be tested at a laboratory approved by ENGINEER-IN-CHARGE and until the results of such tests are found satisfactory, it shall not be used in any work.

2.3.2 Aggregates

(a) Aggregates shall consist of naturally occurring stones and gravel (crushed or uncrushed) and manufactured sand (M sand) from approved source. They shall be chemically inert, strong, hard, clean, durable against weathering, of limited porosity, free from dust/silt/organic impurities/deleterious materials and conform to IS: 383. Aggregates such as slag, crushed over burnt bricks, bloated clay ash, sintered fly ash and tiles shall not be used.

(b) Aggregates containing reactive materials shall be used only after tests conclusively prove that there will be no adverse effect on strength, durability and finish, including long term effects, on the concrete.

(c) The fineness modulus of manufactured sand (M sand) shall be neither less than 2.2 nor more than 3.2. The CONTRACTOR shall be allowed to use river sand with the prior approval of ENGINEER-IN-CHARGE, if the manufactured sand is not available / shortage.

(d) The maximum size of coarse aggregate shall not be greater than 1/4 of the minimum thickness of the member, if the concrete can be placed without difficulty to surround all reinforcement thoroughly and fill the corners of the form. For most of work 20mm downgraded aggregate is suitable.

(e) In concrete elements with thin sections, closely spaced reinforcements or small cover, consideration should be given to the use of 10mm nominal maximum size.

(f) Plums 150 mm and above of a reasonable size may be used where directed. Plums shall not constitute more than 40% by volume of concrete unless specified by ENGINEER-IN- CHARGE.

2.3.3 Water

a) Water used for both mixing and curing shall conform to IS: 456. Potable water is generally satisfactory. Water containing any excess of acid, alkali, sugar or salt shall not be used.

b) The pH value of water shall not be less than 6.

c) Seawater shall not be used for concrete mixing and curing.

d) The proposed admixtures shall comply with requirements of Specification for admixture.

2.3.4 Reinforcement

a) Reinforcement bars shall conform to IS: 1786 and welded wire fabric to IS: 1566 as shown on the drawing.

b) All reinforcement shall be clean, free from pitting, oil, grease, paint, loose mill scales, rust, dirt, dust or any other substance that will destroy or reduce bond.

c) The reinforcing bars to be provided with Fusion Bonded Epoxy coating shall conform to the and relevant I.S. specifications specified in the subsequent para with the prior approval of ENGINEER-IN-CHARGE.

2.3.5 Samples and Tests

a) All major materials used for the works shall be tested before use as per relevant IS standards. Decision of ENGINEER-IN-CHARGE on testing of such materials is final and binding.

b) Sampling and testing of aggregates shall be as per IS: 2386 under the supervision of ENGINEER-IN-CHARGE. The cost of all tests, sampling, etc. shall be borne by CONTRACTOR. For coarse aggregate crushing value shall be tested.

c) Water to be used shall be tested to comply with Clause 5.4 of IS: 456.

d) CONTRACTOR shall furnish manufacturer's test certificates and technical literature for the admixture proposed to be used. If directed, the admixture shall be got tested at an approved laboratory at no extra cost.

2.3.6 Storing Of Materials

a) All material shall be stored in a manner to prevent its deterioration and contamination, which would preclude its use in the works. Requirements of IS: 4082 shall be complied with

b) CONTRACTOR will have to make his own arrangements for the storage of adequate quantity of cement. If such cement is not stored properly and has deteriorated, the material shall be rejected. Cement bags shall be stored in dry weatherproof shed with a raised floor, well away from the outer walls and insulated from the floor to avoid moisture from ground. Not more than 15 bags shall be stacked in any tier. ENGINEER-IN-CHARGE shall approve storage arrangement. Storage under tarpaulins shall not be permitted. Each consignment of cement shall be stored separately and consumed in its order of receipt. CONTRACTOR shall maintain record of receipt, consumption and current stock of cement.

c) Each size of coarse and fine aggregates shall be stacked separately and shall be protected from dropping leaves and contamination with foreign material. The stacks shall be on hard, clean, free draining bases, draining away from the concrete mixing area.

d) CONTRACTOR shall make his own arrangements for storing water at site in tanks of approved capacity. The tanks shall be cleaned at least once a week to prevent contamination.
e) The reinforcement shall be stacked on top of timber sleepers to avoid contact with ground/ water. Each type and size shall be stacked separately.

2.4 CONCRETE

2.4.1 General
Concrete grade shall be as designated on drawings. Concrete in the works shall be “DESIGN
MIX CONCRETE”. All concrete works of up to grade M15 can be NOMINAL MIX CONCRETE whereas all other grades, M20 and above, shall be DESIGN MIX CONCRE

2.4.2 Design Mix Concrete
a) Design Mix Concrete are classified in three categories, viz. "Normal Concrete (M)", "Heavy Concrete (H)", "Super Heavy Concrete (SH)". A prefix and two numbers shall identify each class of concrete. Prefix "M" would denote Normal Concrete, prefix "H" would denote heavy concrete and prefix "SH" would denote super heavy concrete. The Number would denote the crushing strength of cube at 28 days in N/sq.mm
b) Normal concrete shall have a net dry unit weight of not less than 25 KN/cum, for the finished structure after curing. Heavy concrete shall have a net dry unit weight of not less than 36.30 KN/cum, for the finished structure after curing. Special heavy concrete shall have a net dry unit weight of not less than 41 KN/cum for the finished structure after curing.
c) Mix Design & Testing: For Design Mix Concrete, the mix shall be designed as per any of four methods given in SP: 23 to provide the grade of concrete having the required workability and characteristic strength not less than appropriate values given in IS: 456. The design mix shall in addition be such that it is cohesive and does not segregate during placement and should result in a dense and durable concrete capable of giving the specified finish. For liquid retaining structures, the mix shall also result in watertight concrete. The CONTRACTOR shall exercise great care while designing the concrete mix and executing the works to achieve the desired result.
d)The minimum grade of concrete shall be as per Table 5 of IS: 456 for various exposure conditions of concrete. For various environmental conditions, refer Table 3 of IS: 456.
e) The minimum cement content for Design Mix Concrete shall be as per Table 5 of IS:
456 or as given below, whichever is higher.

GRADE OF CONCRETE, M	Minimum Cement content in kg/cum. of concrete
20	300
25	320
30	340
35	360
40	360
45	400

f) *The minimum cement content stip*ulated above shall be adopted irrespective of whether the CONTRACTOR achieves the desired strength with less quantity of cement. The CONTRACTOR's quoted rates for concrete shall provide for the above eventuality and nothing extra shall become payable to the CONTRACTOR on this account. Even in the case where the quantity of cement required is higher than that specified above to achieve desired strength based on an approved mix design, nothing extra shall become payable to the CONTRACTOR.

g) It shall be CONTRACTOR's sole responsibility to carry out the mix designs at his own cost. He shall furnish to ENGINEER-IN-CHARGE for approval at least 30 days before concreting operations, a statement of proportions proposed to be used for the various concrete mixes and the strength results obtained. The strength requirements of the concrete mixes ascertained on 150 mm cubes as per IS: 516 shall comply with the requirements of IS: 456.

Grade of Concrete M	Minimum Compressive strength	Specified characteristic compressive strength
	N/sq.mm at 7 days	N/sq.mm at 28 days
15	10.00	15.00
20	13.50	20.00
25	17.00	25.00
30	20.00	30.00
35	23.50	35.00
40	27.00	40.00

45	30.00	45.00

h) A range of slumps recommended for various types of construction, unless otherwise instructed by the ENGINEER-IN-CHARGE, shall be as given below:

Structure / Member	Slump in Millimeters	
	Maximum	Minimum
Reinforced foundation walls and footings	75	25
Plain footings, caissons and substructure walls	75	25
T.G. and missive compressor foundations	50	25
Slabs, Beams and reinforced walls	50	25
Pumps & miscellaneous equipment Foundations	75	25
Building Columns	50	25
Pavements	50	25
Heavy Mass Construction	50	25
Liquid retaining / conveying structures	50	25

(NOTE: These values are not meant for pumped concrete)

i) Where single size graded coarse aggregate are not available, aggregates of different sizes shall be properly combined. The CONTRACTOR "s mix design shall show that combined grading of coarse aggregate meets the requirements of Table 2 of IS: 383 for graded aggregates.

j) Design mix adopted shall be got checked by the approved proof checking consultant, appointed by the Employer.

2.4.3 Batching & Mixing of Concrete

a) Proportions of aggregates and cement, as per approved concrete mix design, shall be by weight. These proportions shall be maintained during subsequent concrete batching by means of weigh batchers capable of controlling the weights within ±2% for cement and ±3% for aggregate. The batching equipment shall be calibrated at the frequency decided by ENGINEER-IN-CHARGE.

b) Amount of water added shall be such as to produce dense concrete of required consistency, specified strength and satisfactory workability and shall be so adjusted to account for moisture content in the aggregates. Water- cement ratio specified for use by ENGINEERIN-CHARGE shall be maintained. Each time the work stops, the mixer shall be cleaned out, and while recommencing, the first batch shall have 10% additional sand and cement to allow for sticking in the drum.

c) Arrangement should be made by the CONTRACTOR to have the cubes tested at his own expense in an approved laboratory or in field with prior consent of ENGINEER-IN-CHARGE. Sampling and testing of strength and workability of concrete shall be as per IS: 1199, IS: 516 and IS: 456. It is preferable to cast additional cubes (minimum 3 specimen) for testing at 7 days and 28 days. Concrete cube compressive strength which shall be reported & carried out as per relevant IS code e.g. IS 456:2000 etc. in addition to following parameters:

(i) Ultrasonic Pulse Velocity Measurements on Cubes (2 measurements from opposite faces where load is not to be applied) before evaluating the 28-day Compressive Strength of Cubes – 5 Samples

(ii) 28-day Compressive Strength of Cylinders: As per IS: 516 – 1959 (Reaffirmed2004) – 5 Samples

(iii) Modulus of Elasticity: As per IS: 516 – 1959 (Reaffirmed 2004) – 5 Samples.

(iv) Tensile Strength: As per IS: 5816 – 1999 (Reaffirmed 2004) – 5 Samples

(v) Hydraulic Permeability: As per IS: 3085 – 1965 (Reaffirmed 2002) – 5 Samples

2.5 NOMINAL MIX CONCRETE

2.5.1 Mix Design & Testing

Mix Design and preliminary tests are not necessary for Nominal Mix Concrete. However works tests shall be carried out as per IS: 456. Proportions for Nominal Mix Concrete and w/c ratio may be adopted as per Table 9 of IS: 456. However, it will be CONTRACTOR"s sole responsibility to adopt appropriate nominal mix proportions to achieve the specified characteristic strength.

2.5.2 Batching & Mixing of Concrete

Based on the adopted nominal mixes, aggregates shall be measured by volume. However cement shall be by weight only. Appropriate correction shall be made for bulking of sand after testing.

2.6 QUALITY CONTROL

2.6.1 ENGINEER-IN-CHARGE may furnish quality control formats for concrete works after award of work. CONTRACTOR shall note that it is required to adopt all such formats

2.6.2 Alternatively, if CONTRACTOR has his own QC formats he may adopt them subjected to such modifications considered necessary and approval by ENGINEER-IN-CHARGE.

2.6.3 In either case CONTRACTOR shall submit his detailed Quality Assurance Plan after the award of contract. This would be reviewed, appropriately modified and approved by
ENGINEER-IN-CHARGE.

2.7 INSPECTION

All materials, workmanship and finished construction shall be subject to continuous inspection and approval of ENGINEER-IN-CHARGE. Materials rejected by ENGINEER-IN-CHARGE shall be expressly removed from site within 3 (three) working days and shall be replaced by
CONTRACTOR immediately at no extra cost to OWNER.

2.8 CLEAN-UP

Upon the completion of concrete work, all forms, equipment, construction tools, protective coverings and any debris, scraps of wood, etc. resulting from the work shall be removed and the premises left clean.

5. MASONRY, PLASTERING AND PAINTING WORKS:

This specification covers the general requirements for building works comprising Autoclaved Aerated Concrete blocks, brick and stone masonry, pointing plastering, Gypsum plastering /POP cladding, painting and such other related works forming a part of this job, which may be required to be carried out. The work under this specification shall consist of furnishing of all tools, plants, labour, materials, and everything necessary for carrying out the work

5.1 APPLICABLE IS CODES AND SPECIFICATIONS

5.1.1 The following codes, standards and specifications are a part of this specification. All standards, specifications, codes of practice referred to herein shall be as per the latest editions including all applicable official amendments and revisions.

5.1.2 In case of discrepancy between the specification and those referred to herein, these IS specification shall govern.

i. IS:110/1983 Ready mixed paint, brushing, and grey filler, for enamels for use over primers.
ii. IS:269/1989 Specification for 33 grade ordinary Portland cement.
iii. IS:280/1978 Specification for mild steel wire for general engineering purposes.
v. IS:337/1975 Varnish, finishing interior.
vi. IS:348/1968 French polish.
vii. IS:383/1970 Specification for coarse and fine aggregates from natural sources for concrete.
viii. IS:412/1975 Expanded metal steel sheets for general purposes.
ix. IS:419/1967 Specification for putty for use on window frames.
x. IS:428/1969 Distemper, oil emulsion, colour as required.
xi. IS:702/1988 Specification for industrial bitumen.
xii. IS:712/1984 Specification for building limes.
xiii. IS:733/1983 Wrought aluminium and aluminum alloys, bars, rods and sections for general engineering purposes. IS:1077/1992 Specification for common burnt clay building bricks.
xiv. IS:1124/1974 Method of test for determination of water absorption, apparent specific gravity and porosity of natural building stones.
xv. IS:1322/1993 Bitumen felts for water- proofing and damp proofing.
xvi. IS:1397/1990 Specification for Kraft paper.

xvii. IS:1477/1971 Code of practice for painting of ferrous metals in buildings (Part 1).
xviii. IS:1477/1971 - do- (Part 2)
xix. IS:1542/1992 Specification for sand for plaster.
xix IS:1580/1991 Specification for bituminous compounds for waterproofing and caulking purposes.
xx IS:1597/1992 Code of practice for construction of stone masonry: Part 1 Rubble stone masonry.
xxi IS:1661/1972 Code of practice for application of cement and cementlime plaster finishes.
xxii IS:1834/1984 Specification for hot applied sealing compound for joint in concrete.
xxiii IS:1838/1983 Specification for preformed fillers for expansion joint in concrete pavements and structures (non extruding and resilient type): Part 1 Bitumen impregnated fibre.
xxiv IS:2074/1992 Ready mixed paint, air drying, red oxide-zinc chrome, and priming.
xxv IS:2116/1980 Specification for sand for masonry mortars.
xxvi IS:2185/1967 Specification for concrete masonry units (Parts 1, 2 & 3).
xxvii IS:2212/1991 Code of practice for brickwork.
xxviii IS:2250/1981 Code of practice for preparation and use of masonry mortars.
xxix IS:2339/1963 Aluminum paint for general purposes, in dual container.
xxx IS:2395/1994 Code of practice for painting Concrete, masonry and plaster surfaces (Part 1).
xxxi IS:2395/1994 -DO- Part 2 xxxii IS:2402/1963 Code of practice for external rendered finishes.
xxxiii IS:2572/1963 Code of practice for construction of hollow concrete block masonry.
xxxiv IS:2750/1964 Specification for steel scaffoldings.
xxxv IS:2932/1993 Specification for enamel, synthetic, exterior type (a) undercoating, (b) finishing.
xxxvi IS:3495/1992 Method of test for burnt clay building bricks: Part 1 to 4.
xxxvii IS:3536/1966 Specification for ready mixed paint, brushing, wood primer, pink.
xxxviii IS:3696/1987 Safety code of scaffolds and ladders (Part 1).
xxxix IS:3696/1991 -DO- (Part 2).
xl IS:4443/1980 Code of practice for use of resin type chemical resistant mortars.
xli IS:4832/1969 Specification for chemical resistant mortars (Part 2)
xlii IS:4860/1968 Specification for acid resistant bricks.

xliii	IS:4948/1974	Specification for welded steel wire fabric for general use.
xliv	IS:5410/1992	Cement paint, colour as required.
xlv	IS:15489/2004	Specification for plastic emulsion paint .
xlvi	IS:6041/1985	Code of practice for construction of autoclaved cellular concrete block masonry.
xlvii	IS:6042/1969	Code of practice for construction of light weight concrete block masonry Methods of tests for autoclaved cellular concrete
xlviii	IS 6441(part products 1,2,4,5,6,8)	
xlix	IS:8042/1989	Specification for white Portland cement.
l	IS:8543	Methods of testing plastics (all Parts/ all Section)
li	IS:12200/1987	Code of practice for provision of water-stops at transverse contraction joints in masonry and concrete dams.

5.1.3 **GENERAL**

(a) The work to be built plumb, curved, or batters as may be required by the design and to be carried out in a thoroughly workman like manner and to the entire satisfaction of the Engineer-in-charge The Contractor to provide at his own expense all moulds, templates, centering, scaffolding etc. as may be required for the proper execution of the work which shall be included in the prices of the work, as no separate change to be made for them.

(b) All stones to be thoroughly cleaned and wetted with fresh water before being put into the work and the mortar to be used stiff.

(c) The work to be kept wet (curing) while in progress to the entire satisfaction of the Engineer-in-charge till the mortar is properly set. On Sundays and other holidays also when the work is stopped, the top of all unfinished masonry to be kept flooded and labourers to be employed for this purpose. Watering& Curing to be done carefully so as not to wash the mortar out of the joints. The Engineer-in-charge shall be at liberty to employ labourers for watering curing of the works, if the contractors fail to do the same to his (the Engineer's) satisfaction.

(d) Should the mortar perish that is becomes dry, white or powdery through neglect of watering, the work shall be pulled down and rebuilt at the contractor's expense.

(e) As a rule the whole of the masonry work in any structure to be carried up at one uniform level throughout but where breaks are unavoidable the joint to be made in good long steps, so as to prevent cracks arising between the new and old work. All junctions of walls to be formed at the time the walls are being built, and cross walls to be carefully bonded into the main walls.

(f) When new work is to be added to existing structure, the old work must be prepared to receive the new and both must be carefully bonded together.

(g) During the rains, the work to be carefully covered without extra charge, so as to avoid the fresh mortar being washed away.

(h) Where the word cement is used it is to be understood Portland cement of the best description, specified under the head of the Cement.

5.2 AUTOCLAVED AERATED CONCRETE BLOCK MASONRY

5.2.1 Materials

(a) Masonry units of Autoclaved Cellular Concrete blocks shall conform to the requirements of IS: 2185 (Part 3).

(b) The height of the concrete masonry units shall not exceed either its length or six times its width.

(c) The nominal dimensions of concrete block shall be as under.

(i) Length - 600 mm.

(ii) Height- 100 or 200 mm.

(iii) Width- 100 to 300 mm in 50 mm increments

(iv) Half blocks shall be in lengths of 200, 250 or 300 mm to correspond to the full-length blocks. Actual dimensions shall be 10 mm short of the nominal dimensions.

(d) The maximum variation in the length of the units shall not be more than + /- 5mm and maximum variation in height or width of the units shall not be more than +/- 3mm.

(e) Concrete blocks shall be solid blocks. Concrete blocks shall be sound, free of cracks, chipping or other defects which impair the strength or performance of the construction. Surface texture shall be as specified. The faces of the units shall be flat and rectangular, opposite faces shall be parallel and all arises shall be square. The bedding surfaces shall be at right angles to the faces of the block.

(f) Concrete blocks shall be stored at site suitably to avoid any contact with moisture from the ground and covered to protect against wetting.

(g) Concrete blocks shall be of approved manufacture, which satisfy the limitations in the values of water absorption, drying shrinkage and moisture movement, as specified for the type of block as per relevant IS code. CONTRACTOR shall furnish the test certificates and also supply the samples, for the approval of Engineer-in-Charge.

5.2.2 Workmanship

(a) The type of the concrete block, thickness and grade based on the compressive strength for use in load bearing and/or non-load bearing walls shall be as specified in the respective items of work. The minimum nominal thickness of non-load bearing internal walls shall be 100 mm. The minimum nominal thickness of external panel walls in framed construction shall be 200 mm.

(b) The workmanship shall generally conform to the requirements of IS: 2572 for concrete block masonry and IS: 6041 for autoclaved cellular concrete block masonry works.

(c) From considerations of durability, generally concrete block masonry shall be used in superstructure works above the damp-proof course level.

(d) Concrete blocks shall be embedded with a mortar which is relatively weaker than the mix of the blocks in order to avoid the formation of cracks. Cement mortar of proportion 1:6 shall be used for the works unless otherwise specified in the respective items of work. Preparation of mortar shall be as specified.

(e) The thickness of both horizontal and vertical joints shall be 10 mm. The first course shall he laid with greater care, ensuring that it is properly aligned, levelled and plumb since this will facilitate in laying succeeding courses to obtain a straight and truly vertical wall. For the horizontal (bedding) joint, mortar shall be spread over the entire top surface of the block including front and rear shells as well as the webs to a uniform layer of 10 mm. For vertical joints, the mortar shall be applied on the vertical edges of the front and rear shells of the blocks. The mortar may he applied either to the unit already placed on the wall or an the edges of the succeeding unit when it is standing vertically and then placing it horizontally, well pressed against the previously laid unit to produce a compacted vertical joint. In case of two cell blocks with slight depression on the vertical sides these shall also be filled up with mortar to secure greater lateral rigidity. To assure satisfactory bond, mortar shall not be spread too far ahead of actual laying of the block as the mortar will stiffen and lose its plasticity. Mortar while hardening shrinks slightly and thus pulls away from the edges of the block. The mortar shall be pressed against the units with a jointing tool after it has stiffened to effect intimate contact between the mortar and the unit to obtain a weather tight joint. The mortar shall be raked to a depth of 10 mm as each course is laid to ensure good bond for the plaster.

(f) Dimensional stability of hollow concrete blocks greatly affected by variations of moisture content in the units. Only well dried blocks should be used for the construction. Blocks with moisture content/water absorption more than permissible limits specified in the relevant IS shall not be used. The blocks should not be wetted before or during laying in the walls. Blocks should be laid dry except slightly moistening their surface on which mortar is to be applied to obviate absorption of water from the mortar.

(g) As per the design requirements and to effectively control cracks in the masonry, RCC bond beam, joint reinforcement shall he provided at locations as per details indicated in the construction drawings. Joint reinforcement shall be fabricated either from welded wire fabric/MS steel /high strength deformed bars as per the drawings.

(h) Concrete Block for partition walls shall be stacked adjacent to the structural member to pre-deflect the structural member before the wall is taken up for execution. Further, the top most course of walls abutting against either a de-shuttered slab or beam shall be built only after any proposed masonry wall above the structural member is executed to cater for the deflection of the structural element. All Block work shall be built tightly against columns, floor slabs or other structural members

(i) For jambs of doors, windows and openings where solid concrete blocks provided the holdfasts of doors/windows should be arranged so that they occur at block course level.

(j) At intersection of walls, the courses shall be laid up at the same time with a true masonry bond between at least 50% of the concrete blocks. The treatment

at the top of load bearing walls to overcome the possibility of development of cracks in the block masonry following measures shall be adopted.

(I) For resting RCC slabs, the bearing surface of masonry wall shall be finished on top with 12 mm thick cement mortar 1:3 and provided with 2 layers of Kraft paper Grade 1 as per IS:1397 or 2 layers of 50 micron thick polyethylene sheets.

(II) RCC/steel beams resting on masonry wall shall be provided with plain or reinforced concrete bed blocks of dimensions as indicated in the drawings duly finished on top with 2 layers of Kraft paper Grade 1 as per IS:1397 or 2 layers of 50 micron thick polyethylene sheets.

(k) Reinforced cement concrete transoms and mullions of dimensions as indicated in the construction drawings are generally required to be provided in 100mm concrete block partition walls. Reinforced concrete for transoms and mullions will not be measured separately.

(l) Curing of the mortar joints shall be carried out for at least 7 days. The walls should only be lightly moistened and shall not be allowed to become excessively wet.

(m) Double scaffolding shall be adopted for execution of block masonry work. Double scaffolding having two sets of vertical supports shall be provided to facilitate execution of the masonry works. The scaffolding shall be designed adequately considering all the dead, live and possible impact loads to ensure safety of the workmen, in accordance with the requirements stipulated in IS:2750 and IS:3696 (Part 1). Scaffolding shall be properly maintained during the entire period of construction.

(n) Cutting of the units shall be restricted to a minimum. All horizontal and vertical dimensions shall be in multiples of half-length and full height of units respectively, adapting modular co-ordination for walls, opening locations for doors, windows etc.

(o) During inclement weather conditions, newly built block masonry works shall be protected by tarpaulin or other suitable covering to prevent mortar being washed away by rain.

(p) CONTRACTOR shall note that the unit rates quoted for the Concrete block masonry work shall be deemed to include for the installation of miscellaneous inserts such as pipe sleeves, bolts, steel sections with anchors etc and providing pockets, leaving openings, cutting chases etc. in accordance with the construction drawings. Miscellaneous inserts shall be furnished by the CONTRACTOR. Any of the miscellaneous inserts which are required to be fabricated and supplied by the CONTRACTOR and cement concrete to be provided in the pockets for the hold fasts of door/window frames etc.

5.2.3 Measurement

Measurement shall be in cum correct up to two places of decimal for walls of thickness 200 mm and above. Measurement shall be in sqm correct up to two places of decimal for walls of 100mm/150mm in thickness. Measurement shall be for the quantities for actually executed duly deducting for openings as per IS1200.

The rate quoted shall be for the type of masonry blocks specified in the respective items of work which shall include for the specific sequential operations as stipulated in the construction drawings.

5.5 CEMENT PLASTERING WORK

5.5.1 Materials

The proportions of the cement mortar for plastering shall be 1:4 (one part of Cement to four parts of Coarse Sand) for external work and 1:4(one part of Cement to four parts of fine Sand) for internal work, unless otherwise specified under the respective item of work. Cement and Sand (Manufactured sand) shall be mixed thoroughly in dry condition and then water added to obtain a workable consistency. The quality of water and cement shall be as per relevant IS. Cement shall be of Ordinary Portland Cement, 43 Grade of approved make. The quality and grading of Manufactured Sand for plastering shall conform to IS: 1542 & IS 383. Manufactured Sand shall be approved by Engineer-in-Charge and if so directed it shall be washed/screened to meet specification requirements. The mixing shall be done thoroughly in a mechanical mixer unless hand mixing is specifically permitted by the Engineer-in-Charge. The mortar thus mixed shall be used as soon as possible preferably within 30 minutes from the time water is added to cement. In case the mortar has stiffened due to evaporation of water this may be retempered by adding water as required to restore consistency but this will be permitted only upto 30 minutes from the time of initial mixing of water to cement. Any mortar which is partially set shall he rejected and removed forthwith from the site. Droppings of plaster shall not be reused under any circumstances.

5.5.2 Workmanship

(a) Preparation of surfaces and application of plaster finishes shall generally confirm to the requirements specified in IS: 1661 and IS: 2402.

(b) Plastering operations shall not be commenced until installation of all fittings and fixtures such as door/window panels, pipes, conduits etc. are completed as per drawing.

(c) All joints in masonry shall be raked as the work proceeds to a depth of l0mm/20mm for block/stone masonry respectively with a tool made for the purpose when the mortar is still green. The masonry surface to be rendered shall be washed with clean-water to remove all dirt, loose materials, etc., Concrete surfaces to be rendered shall be roughened suitably by hacking or bush hammering for proper adhesion of plaster and the surface shall be evenly wetted to provide the correct suction. The masonry surfaces should not be too wet but only damp at the time of plastering. The dampness shall be uniform to get uniform bond between the plaster and the masonry surface. Render with a mortar of specified parts of Portland cement and fine sand of specified thickness and rough but do not beat. Float or set with a thin coat 3 mm of Portland cement and polished

well immediately with a trowel or flat board. The cement mortar to be used within 30 minutes after it leaves the mixing board or mill. Before work is started patches of plaster 150 x 150 mm. should be put on about 3 meters apart as gauges. By this means an even thickness is ensured. The finishing surface should be as specified and directed

(d) Exterior Sand Faced Plaster - This plaster shall be applied in 2 coats of total thickness of 20mm. The first coat shall be 12mm thick and the second coat shall be 8mm thick. The first coat or the rendering coat shall be approximately 12mm thick. The rendering coat shall be applied except finishing it to a true and even surface and then lightly roughened by cross scratch lines to provide bond for the finishing coat. The rendering coat shall be cured for at least two days and then allowed to dry. The second coat or finishing coat shall be 8 mm thick. Before application of the second coat, the rendering coat shall be evenly damped. The second coat shall be applied from top to bottom in one operation without joints and shall be finished leaving an even and uniform surface. The mortar proportions for the coats shall be as specified in the respective item of work. The finished plastering work shall be cured for at least 7 days. M-Sand for the finishing work shall be coarse and of even size and shall be dashed against the surface and sponged. The mortar proportions for the first and second coats shall be as specified in the respective items of work.

(e) Smooth Cement Plaster (to internal surface) - This plaster shall be laid in a single coat of 12mm thickness. The mortar shall be dashed against the prepared surface with a trowel. The dashing of the coat shall be done using a strong whipping motion at right angles to the face of the wall or it may be applied with a plaster machine. The coat shall be troweled hard and tight forcing it to surface depressions to obtain a permanent bond and finished to smooth surface. Interior plaster shall be carried out on jambs, lintel and sill faces, etc. as shown in the drawing and as directed by the Engineer-in-Charge. Rate quoted for plaster work shall be deemed to include for plastering of all these surfaces.

(f) Wherever more than 20mm thick plaster is required, which is intended for purposes of providing beading, bands, drip moulds, etc. as per drawings this work shall be carried out in two or three coats as directed by the Engineer-in-Charge duly satisfying the requirements of curing each coat (rendering/floating) for a minimum period of 2 days and curing the finished work for at least 7 days. Rate quoted for this deemed to have been included in the external plastering item no extra payment will be made on this account.

(g) In the case of pebble faced finish plaster, pebbles of approved size and quality shall be dashed against the final coat while it is still green to obtain as far as possible a uniform pattern all as directed by the Engineer-in-Charge.

(h) Where specified in the drawings, rectangular grooves of the dimensions indicated shall be provided in external plaster by means of timber battens when the plaster is still in green condition. Battens shall be carefully removed after the initial set of plaster and the broken edges and corners made good. All grooves shall be

uniform in width and depth and shall be true to the lines and levels as per the drawings.

(i) Curing of plaster shall be started as soon as the applied plaster has hardened sufficiently so as not to be damaged when watered. Curing shall be done by continuously applying water in a fine spray and shall be carried out for at least 7 days.

(j) When the specification items of work calls for waterproofing plaster the CONTRACTOR shall provide the waterproofing compound as specified while preparing the cement mortar. Cost of water-proofing compound shall be included in the rate for plastering work.

(k) For external plaster, the plastering operations shall be commenced from the top floor and carried downwards. For internal plaster, the plastering operations for the walls shall commence at the top and carried downwards. Plastering shall be carried out to the full length of the wall or to natural breaking points like doors/windows etc. Ceiling plaster shall be completed first before commencing wall plastering.

(l) Double scaffolding to be used shall be as specified in clause 5.2.2.(m).

(m) The finished plaster surface shall not show any deviation more than 4mm when checked with a straight edge of 2m length placed against the surface.

(n) To overcome the possibility of development of cracks in the plastering work following measures shall be adapted.

(o) Plastering work shall be deferred as much as possible so that fairly complete drying shrinkage in concrete and masonry works takes place.

(p) GI/Steel wire fabric shall be provided at the junction of block masonry and concrete to overcome reasonably the differential drying shrinkage/thermal movement. This GI/steel wire mesh cost shall be included in the rate of plastering work.

(q) Ceiling plaster shall be done, with a trowel cut at its junction with wall plaster. Similarly trowel cut shall be adopted between adjacent surfaces where discontinuity of the background exists.

5.5.3 Measurement

Measurement for plastering work shall be in sqm correct to two places of decimal for finished exposed surface. Unless a separate item is provided for grooves, mouldings, etc., these works are deemed to be included in the unit rates quoted for plastering work. The quantity of work to be paid for under these items shall be calculated by taking the projected surface of the areas plastered after making necessary deductions for openings for doors, windows, fan openings etc. The plaster work carried out on jambs/sills of windows, openings, etc. shall be measured as per IS: 1200 for payment.

5.6 CEMENT POINTING

5.6.1 Materials

The cement mortar for pointing shall be in the proportion of 1:3 (one part of cement to three parts of fine sand (M-Sand) unless otherwise specified in the respective items of work. Sand shall be of sound, hard, clean and durable particles. M- Sand shall be approved by Engineer-In-Charge and if so directed it shall be washed/screened to meet specification requirements.

5.6 .2 Workmanship

(a) Where pointing of joints in masonry work is specified on drawings/respective items of work, the joints shall be raked at least 15mm/20mm deep in stone/stone masonry respectively as the work proceeds when the mortar is still green.

(b) Any dust/dirt in the raked joints shall be brushed out clean and the joints shall be washed with water. The joints shall be damp at the time of pointing. Mortar shall be filled into joints and well pressed with special steel trowels. The joints shall not be disturbed after it has once begun to set. The joints of the pointed work shall be neat. The lines shall be regular and uniform in breadth and the joints shall be raised, flat, sunk or 'V' as may be specified in the respective items of work. No false joints shall be allowed.

(c) The work shall be kept moist for at least 7 days after the pointing is completed. Whenever coloured pointing is to be done, the colouring pigment of the colour required shall be added to cement in such proportions as recommended by the manufacturer and as approved by the Engineer-in-Charge.

5.6.3 Measurement

The quantity of work to be paid for under this Item shall be measured in sqm correct to two places of decimal by taking the projected surface of the area pointed after making necessary deductions for openings, etc. as per IS 1200.

5.7 WATER-PROOFING ADMIXTURE

Water-proofing admixture shall conforming to the requirements of IS: 2645 and shall be of approved manufacture/ make and to be used in both coats of plastering work. The admixture shall not contain calcium chloride. The quantity of the admixture to be used for the works and method of mixing etc. shall be as per manufacturer's instructions and as directed by the Engineer-in-Charge. Cost of approved water proofing compound admixture shall be included in the rate for the plastering work.

5.8 PAINTING WORKS

5.8.1 General

(a) The painting work is to be executed according to the valid standards, codes and regulations on their latest revision. The following standards, codes and regulations shall be taken into consideration:

(b) The contractor has to deliver all the materials and work tools which are needed for performing the job. For instance, painting, cleaning solvents, dilution

solvents, brushes, special equipment, scaffolding, ladders, collective protection material etc. Painting jobs are considered as high risk jobs and a safety and environment prevention plan has to be set up by the contractor before start of the work.

(c) Storage of the paints/ coatings and solvents: The coatings and solvents shall be stored in a ventilated container or storage room and in an ambient temperature

(d) Method of appliance of the layers: On the surfaces shall the layer been applied one after each other and between the appliance of each layer shall a drying time been respected according to the technical specification of the paint/coating manufacturer. The minimum thickness as stated in the technical specifications of the manufacturer and in this specification shall be respected.

(e) General precautions: Bolts, nuts, stud bolts, screws shall not been painted and temporarily protected for accidental paint, unless otherwise asked by the Client. Tag plates, name plates shall not been painted and temporarily protected for accidental paint. The contractor collects all removed dust, rust, spilled solvents and paints and any leftovers of paint and solvents and removes them from the site of the contractor. All these materials are destroyed or deposit conform the local regulations. The contractor shall avoid any spill of paint and / or solvent on parts or surfaces belonging to the site of the client. To avoid spills on these parts, the contractor shall cover during the execution of the painting work (when needed) the parts.

(f) Cleaning and removal of rust or other foreign matters: Cleaning of steel and removal of rust: All the surfaces which shall be protected by a coating shall thoroughly been cleaned and prepared with as objective to remove dust, mill scale, protective coating applied during the rolling process, rust, greases, oil, humidity and other foreign matters to assure that the coating adhere on the surface and that should last as long as the normal lifetime is expected.

(g) When painting on wood, the work shall first be cleared of all such projections as glue or whiting spots being carefully removed with the stopping knife and duster, after which all knots shall be filled with one or more layers of oil and white zinc and size of glue laid on warm and rubbed down when dry with sand paper or pumice stone.

(h) The Concrete/plastered surface shall be thoroughly dried before the priming coat is applied.

(i) The steel work shall when be primed shall be either as per manufacturer's specifications or by providing with a coat of four parts by weight of white zinc mixed with one part twice boiled linseed oil.

(j) In wood works all holes, cracks and nail heads shall then be stopped with putty, and irregularities reduced with sand paper and pumice stone.

(k) Iron work shall be first thoroughly cleaned from rust and dirt, after which red lead alone shall be used as a primer.

(l) For other materials when the work is to be finished in a dark colour the priming may be zinc colour, if to be finished orange, red and similar tints the priming may be pink.

(m) All colour to be laid on evenly and properly with English made or best approved brushes. Each coat of colour to be allowed to dry thoroughly before the next is laid on and all, except the last coat to be slightly rubbed down with pumice stone.

(n) No hair marks from the brush shall be left on the work or puddle in the corners of panels, angle of mouldings etc.

(o) White paint to be made of the best mineral white zinc paint and double boiled linseed oil properly ground and mixed together with a small quantity of turpentine. A small quantity of Victoria blue to be added if directed.

(p) Linseed oil used shall be of best-approved quality limpid, pale and brilliant, yellow and sweet to the taste with every little small, and shall boiled twice.

(q) Putty shall be made of best whiting and oil, the whiting to be specially dry and passed through a sieve of 43 mashes to the inch, and then mixed with as much raw linseed oil as will form it into a stiff paste, this after being well needed, shall be left for twelve hours and worked up in small pieces till quite smooth. If the putty become dry it should be restored by heating and working it up again while hot.

(r) When tinted colour are required, a small quantity of the proper tint should be first prepared to serve as a guide by which to mix the whole quantity. The ground white zinc shall first be well mixed with a portion of the oil, and then the tinting colour shall be added to match the pattern thoroughly after which the remaining portion of the oil or turpentine is to be added, and the whole passed through fine canvas or a fine sieve. The consistency shall be that of cream so as to work easily.

(s) Varnish to be done with copal varnish or such other as may be specified by the Engineer.

(t) Wood oiling, when employed as a substitute for painting timber work to be of linseed oil with a small quantity of dammer oiled up with it or red ochre.

(u) In case of doubt regarding the quality, the paints supplied by the contractor shall be tested in an approved laboratory as described in IS 101-1964 if considered necessary by the Engineer-in-charge.

(v) Paints, oils, varnishes etc. of approved brand and manufacture shall be used. Only ready mixed Paint as received from the manufacturer without any admixture shall be used. If for any reason, thinning is necessary in case of ready mixed Paint, the brand of thinner recommended by the manufacturer or as instructed by the Engineer-in-Charge shall be used.

(w) Approved Paints, oil or varnishes shall be brought to the site of work by the contractor in their original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The empties shall not be removed from the site of work, till the

relevant item of work has been completed and permission obtained from the Engineer-in-Charge.

(x) Commencing Work: Painting shall not be started until the Engineer-in-Charge has inspected the items of work to be painted, satisfied himself about their proper quality and given his approval to commence the painting work. Painting of external surface should not be done in adverse weather condition like hail storm and dust storm. Painting, except the priming coat, shall generally be taken in hand after practically finishing all other building work. The rooms should be thoroughly swept out and the entire building cleaned up, at least one day in advance of the Paint work being started.

(y) Preparation of Surface: The surface shall be thoroughly cleaned and dusted off. All rust, dirt, scales, smoke splashes, mortar droppings and grease shall be thoroughly removed before painting is started. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection, before painting is commenced

(z) Before pouring into smaller containers for use, the Paint shall be stirred thoroughly in its containers, when applying also, the Paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform.

(aa) Where so stipulated, the painting shall be done by spraying. Spray machine used may be (a) high pressure (small air aperture) type, or (b) a low pressure (large air gap) type, depending on the nature and location of work to be carried out. Skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding a suitable thinner.

(bb) Spraying should be done only when dry condition prevails. Each coat shall be allowed to dry out thoroughly and rubbed smooth before the next coat is applied. This should be facilitated by thorough ventilation. Each coat except the last coat, shall be lightly rubbed down with sand paper or fine pumice stone and cleaned off dust before the next coat is laid."

(cc) The painting shall be laid on evenly and smoothly by means of crossing and laying off, the latter in the direction of the grains of wood. The crossing and laying off consists of covering the area over with Paint, brushing the surface hard for the first time over and then brushing alternately in opposite direction, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat.

(dd) No left over Paint shall be put back into the stock tins. When not in use, the containers shall be kept properly closed. No hair marks from the brush or clogging of Paint puddles in the corners of panels, angles of mouldings etc. shall be left on the work.

(ee) In painting doors and windows, the putty round the glass panes must also be painted but care must be taken to see that no Paint stains etc. are left on the glass. Tops of shutters and surfaces in similar hidden locations shall not be left out in painting. However, bottom edge of the shutters where the painting is not

practically possible, need not be done nor any deduction on this account will be done but two coats of primer of approved make shall be done on the bottom edge before fixing the shutters.

(ff) On painting steel work, special care shall be taken while painting over bolts, nuts, rivets overlaps etc. The additional specifications for primer and other coats of Paints shall be as according to the detailed specifications under the respective headings.

(gg) Brushes and Containers: After work, the brushes shall be completely cleaned of Paint and linseed oil by rinsing with turpentine. A brush in which Paint has dried up is ruined and shall on no account be used for painting work. The containers when not in use, shall be kept closed and free from air so that Paint does not thicken and also shall be kept safe from dust. When the Paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that they are clean, and can be used again.

(hh) Measurements (as per IS 1200)

The length and breadth shall be measured correct to a cm. The area shall be calculated in sqm (correct to two places of decimal), except otherwise stated. Small articles not exceeding 10 sq. decimetre (0.1 sqm) of painted surfaces where not in conjunction with similar painted work shall be enumerated. Painting upto 10 cm in width or in girth and not in conjunction with similar painted work shall be given in running metres and shall include cutting to line where so required. Note : Components of trusses, compound girders, stanchions, lattices and similar work shall, however, be given in sq. metres irrespective of the size or girth of members. Priming coat of painting shall be included in the work of painting works.

(ii) In measuring painting, varnishing, oiling etc. of joinery and steel work etc. The coefficients as indicated in following tables shall be used to obtain the area payable. The coefficients shall be applied to the areas measured flat and not girthed.

Equivalent Plain Areas of Uneven Surface

SNO.	Description of work	How measured	Multiplying coefficients
1	2	3	4
I.	**Wood work doors, windows Etc.**		
1.	Panelled or framed and braced Ledged and battened or ledged, battened and braced doors, windows etc.	Measured flat (not girthed including) Chowkhat or frame, Edges, chocks,	1.30 (for each side)

		cleats, etc. shall be deemed to be included in the item.	
2	Flush doors etc.	-do-	1.20 (for each side)
3	Partl panelled and part glazed or gauzed doors, window etc.	-do-	1.00 (for each side
4.	Fully glazed or gauzed doors, windows etc. (Excluding painting of wire gauze portion)	-do-	0.80 (for each side)
5.	Fully venetioned or louvered doors, windows etc.	-do-	1.80 (for each side)
6.	Trellis (or Jaffri) work one way or two way	Measured flat overall, no deduction shall be made for open spaces, supporting members shall not be measured separately	2 (for painting all over)
7.	Carved or enriched work	Measured flat	2 (for each side)
8.	Weather boarding	Measured flat (not girthed supporting frame work shall not be measured separately	1.20 (for each side)
9	Wood shingle roofing	Measured flat (not girthed)	1.10 (for each side)

10.	Boarding with cover fillets and match boarding	Measured flat (not girthed)	1.05 (for each side)
11.	Tile and slate battening	Measured flat overall no deductions shall be made for open spaces	0.80 (for painting all over)
II.	**Steel work doors, windows Etc.**		
13.	Plain sheeted steel doors or windows	Measured flat (not girthed) including frame edges etc.	1.10 (for each side)
14.	Fully glazed or gauzed steel doors and windows (excluding painting of wire gauze portion)	-do-	0.50 (for each side)
15.	Partly panelled and partly glazed or gauzed doors and windows (excluding painting of wire gauze portion)	-do-	0.80 (for each side)
16.	Corrugated sheeted steel doors or windows	-do-	1.25 (for each side)
17.	Collapsible gates	Measured flat	1.50 (for painting all over)
18.	Rolling shutters of interlocked laths	Measured flat (size of opening) all over; jamb guides, bottom rails and locking arrangement etc. shall be	1.10 (for each side)

		included in the item (top cover shall be measured separately)	
III.	**General**		
19.	Expanded metal, hard drawn steel wire fabric of approved quality, grill works and gratings in guard bars, balustrades, railing partitions and MS Bars in windows frames.	Measured flat overall; no deduction shall be made for open spaces; supporting members shall not be measured separately	1 (for Paint all over)
20.	Open palisade fencing and gates including standards, braces, rails stays etc. in timber or steel	-do- (see note No. 12)	1 (for Paint all over)
21.	Corrugated iron sheeting in roofs, side cladding etc.	-do- Measured flat (not girthed)	1.14 (for each side)
22.	AC corrugated sheeting in roofs, side cladding etc.	-do-	1.20 (for each side)
23.	AC semi corrugated sheeting in roofs, side cladding etc. or Nainital pattern using plain sheets	-do-	1.10 (for each side)
24.	Wire gauze shutters including painting of wire gauze	-do-	1.00 (for each side)

Explanatory Notes

1. Measurements for doors windows etc., shall be taken flat (and not girthed) overall including chowkhuts or frames, where provided. Where Chowkhuts or frames are not provided, the shutter measurements shall be taken.
2. Where doors, windows etc., are of composite types other than those included in Table 1 the different portion shall be measured separately with their appropriate coefficients, the centre line of the common rail being taken as the dividing line between the two portions.
3. The coefficients for door and windows shall apply irrespective of the size of frames and shutter members.
4. In case steel frames are used the area of doors, windows shutters shall be measured flat excluding frames.
5. When the two faces of a door, window etc. are to be treated with different specified finishes, measurable under separate items, the edges of frames and shutters shall be treated with the one or the other type of finish as ordered by the Engineer-in-Charge and measurement of this will be deemed to be included in the measurement of the face treated with that finish.
6. In the case where shutters are fixed on both faces of the frames, the measurement for the door frame and shutter on one face shall be taken in the manner already described, while the additional shutter on the other face will be measured for the shutter only excluding the frame.
7. Where shutters are provided with clearance at top or/and bottom each exceeding 15 cm height, such openings shall be deducted from the overall measurements and relevant coefficient shall be applied to obtain the area payable.
8. Collapsible gates shall be measured for width from outside to outside of gate in its expanded position and for height from bottom to top of channel verticals. No separate measurements shall be taken for the top and bottom guide rails rollers, fittings etc.
9. Coefficients for sliding doors shall be the same as for normal types of doors in the table. Measurements shall be taken outside to outside of shutters, and no separate measurements shall be taken for the painting guide rails, rollers, fittings etc.
10. Measurements of painting as above shall be deemed to include painting all iron fittings in the same or different shade for which no extra will be paid.
11. The measurements of guard bars, expanded metal, hard drawn steel wire fabric of approved quality, grill work and gratings, when fixed in frame work, painting of which is once measured else where shall be taken exclusive of the frames. In other cases the measurements shall be taken inclusive of the frames.

(jj) Width of moulded work of all other kinds, as in hand rails, cornices, architraves shall be measured by girth.

(kk) For trusses, compound girders, stanchions, lattice girders, and similar work, actual areas will be measured in sq. metre and no extra shall be paid for painting on bolt heads, nuts, washers etc. even when they are picked out in a different tint to the adjacent work.

(ll) Painting of rain water, soil, waste, vent and water pipes etc. shall be measured in running metres of the particular diameter of the pipe concerned. Painting of specials such as bends, heads, branches, junctions, shoes, etc. shall be included in the length and no separate measurements shall be taken for these or for painting brackets, clamps etc.

(mm) Measurements of wall surfaces and wood and other work not referred to already shall be recorded as per actual.

(nn) All furniture, fixtures, glazing, floors etc. shall be protected by covering and stains, smears, splashing, if any shall be removed and any damages done shall be made good by the contractor at his cost.

(oo) Rate :Rates shall include cost of all labour and materials involved in all the operations described above and in the particular specifications given under the several items.

(pp) PAINTING PRIMING COAT ON WOOD, IRON OR PLASTERED SURFACES

(1) Primer : The primer for wood work, iron work or plastered surface shall be as specified in the description of item.

(2) Primer for plaster/wood work/Iron & Steel/Aluminum, etc surfaces shall be as specified below:

S.no.	Surfaces	Primer to be used
1.	Wood work (hard and soft wood)	Pink conforming to IS 3536
2.	Resin wood and plywood	Aluminium primer conforming to IS 3585
3.	(A) Aluminium and light alloys (B) Iron, Steel and Galvanized steel	Zinc chromate primer conforming to IS 104 Red Oxide/ Zinc chromate Primer conforming relevant IS code
4.	Cement / Concrete / RCC / concrete blocks/brick work, Plastered surfaces, non-asbestos surfaces to	Cement primer conforming to IS 109

	receive Oil bound distemper or Paint finish.	

The primer shall be ready mixed primer of approved brand and manufacture.
Where primer for wood work is specified to be mixed at site, it shall be prepared from a mixture of red lead, white lead and double boiled linseed oil in the ratio of 0.7 kg : 0.7 kg : 1 litre.
Where primer for steel work is specified to be mixed at site, it shall be prepared from a mixture of red lead, raw linseed oil and turpentine in the ratio of 2.8 kg : 1 litre : 1 litre.

(qq) The specifications for the base vehicle and thinner for mixed on site primer shall be as follows:

1) White Lead : The White lead shall be pure and free from adulterants like barium sulphate and whiting. It shall conform to IS 103.

2) Red Lead : This shall be in powder form and shall be pure and free from adulterants like brick dust etc. It shall conform to IS 102.

3) "Raw Linseed Oil : Raw linseed oil shall be lightly viscous but clear and of yellowish colour with light brown tinge. Its specific gravity at a temperature of 30 degree C shall be
between 0.923 and 0.928."

Note : The oil shall be mellow and sweet to the taste with very little smell. The oil shall be of sufficiently matured quality. Oil turbid or thick, with acid and bitter taste and rancid odour and which remains sticky for a considerable time shall be rejected. The oil shall conform in all respects to IS 75. The oil shall be of approved brand and manufacture.

4) Double Boiled Linseed Oil : This shall be more viscous than the raw oil, have a deeper colour and specific gravity between 0.931 and 0.945 at a temperature of 30 degree C. It shall dry with a glossy surface. It shall conform in all respects to IS 77. The oil shall be of approved brand and manufacture.

5) Turpentine : Mineral turpentine i.e. petroleum distillate which has the same rate of evaporation as vegetable turpentine (distillate product of oleeresin of conifers) shall be used. It shall have no grease or other residue when allowed to evaporate. It shall conform to IS 533.

All the above materials shall be of approved manufacture and brought to site in their original packing in sealed condition.

(rr) The number of coats shall be as stipulated in the item. The Paint will be applied in the usual manner with brush, spray or roller. The Paint dries by evaporation of the water content and as soon as the water has evaporated the film gets hard and the next coat can be applied. The time of drying varies from one hour on absorbent surfaces to 2 to 3 hours on non-absorbent surfaces. The thinning of emulsion is to be done with water and not with turpentine. Thinning with water will be particularly required for the under coat which is applied on the absorbent

surface. The quantity of water to be added shall be as per manufacturer's instructions. The surface on finishing shall present a flat velvety smooth finish. If necessary more coats will be applied till the surface presents a uniform appearance.

(ss) QUALITY ASSURANCE

For Quality Assurance the Contractor shall ensure that colour and texture of finish coats, shall match the approved sample. Also,

i) Colour of priming coat shall be lighter than body coat. ii) Colour of body coat shall be lighter than finish coat.

iii) Colour

prime and body coats as required so as not to show through the finish coat and to mask surface imperfections.

Before starting application of each type of paint, the Contractor shall apply the paint to a specimen area, not to exceed 10 square metre and get finish and texture approved and shall use it as a sample for the remainder of the work.

5.9 PAINTING OF CONCRETE MASONRY & PLASTERED SURFACES

5.9.1 Materials

(a) Acrylic emulsion paint shall be of an approved manufacture.

(b) Plastic emulsion paint shall conform to IS: 15489-2004.

(c) All the materials shall be of the best quality from an approved manufacturer. CONTRACTOR shall obtain prior approval of the Engineer-in-Charge for the brand of manufacture and the colour/shade. All materials shall be brought to the site of works in sealed containers.

5.9.2 Workmanship

(a) CONTRACTOR shall obtain the approval of the Engineer-in-Charge regarding the readiness of the surfaces to receive the specified finish, before commencing the work on painting.

(b) Painting of new surfaces shall be deferred as much as possible to allow for thorough drying of the sub-strata.

(c) The surfaces to be treated shall be prepared by thoroughly brushing them free from dirt, mortar droppings and any loose foreign materials. Surfaces shall be free from oil, grease and efflorescence. Efflorescence shall be removed only by dry brushing of the growth. Cracks shall be filled with Gypsum. Workmanship of painting shall generally conform to IS: 2395.

The surface shall ordinarily not be painted until it has dried completely. Trial patches of primer shall be laid at intervals and where drying is satisfactory, painting shall then be taken in hand. Before primer is applied, holes and undulations, shall be filled up with plaster of paris and rubbed smooth.

(d) Surfaces of doors, windows etc. shall be protected suitably to prevent paint finishes from splashing on them.

(e) Oil Bound Distemper: The prepared surfaces shall be dry and provided with one coat of alkali resistant primer by brushing. The surface shall be finished uniformly without leaving any brush marks and allowed to dry for atleast 48 hours. A minimum of two coats of oil bound distemper having VOC (Volatile Organic Compound) content less than 50 grams/ litre shall be applied as specified in the item of work. The first coat shall be of a lighter tint. Atleast 24 hours shall be left after the first coat to become completely dry before the application of the second coat. Broad, stiff, double bristled distemper brushes shall be used for the work. The operations for brushing each coat shall be as detailed in 5.9.2(e)

(f) Plastic Emulsion Paint: Plastic Emulsion Paint as per IS 15489 of approved brand and manufacture and of the required shade shall be used. The plastic emulsion Paint is not suitable for application on external, wood and iron surface and surfaces which are liable to heavy condensation. These Paints are to be used on internal surfaces except wooden and steel.

Plastic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture in approved shade color including applying additional coats wherever required to achieve even shade and color. The prepared surface shall be dry and provided with one coat of primer which shall be a thinned coat of emulsion paint. The quantity of thinner shall be as per manufacturer's instructions. The paint shall be laid an evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area with paint, brushing the surface hard for the first time over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in a direction at right angles. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off constitutes one coat. The next coat shall be applied only after the first coat has dried and sufficiently become hard which normally takes about 2 to 3 hours. A minimum of 2 finishing coats of the same colour shall be applied unless otherwise specified in the item of work. Paint may also be applied using rollers.

The surface on finishing shall present a flat velvety smooth finish and uniform in shade without any patches.

(g) Acrylic Emulsion Paint: Acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture in approved shade/color including applying additional coats wherever required to achieve even shade and color. This shall be applied in the same way as for plastic emulsion paint. A minimum of 2 finishing coats over one coat of primer shall be provided unless otherwise specified in the item of work.

(h) Premium Acrylic Textured Emulsion exterior paint: The surface shall be prepared in the similar fashion as specified under lime and colour wash. In addition any existing fungus or mound growth shall be completely removed by thoroughly scrapping and rubbing down with bristle brush and sand paper and

then washing down with clean water and allowed to dry. The surface shall be brushed with a soft bristle to remove any dust particles 24 hours after the wash.

(A) With 100% Acrylic Emulsion paint

Preparation

The ready mixed exterior quality 100% Acrylic Emulsion paint shall be prepared strictly according to the manufacturer's specification.

Application of painting

The painting shall be carried out as follows.

- Apply one coat of specified primer of approved quality.
- Apply first coat of paint as per manufacturer's specification. After allowing the first coat to dry, the excessive air holes, indentations, cracks etc. should be made up with approved fillers to yield uniform plain surface.
- After overnight drying and light sand papering of surface, apply second coat of Emulsion paint of final approved shade.
- If directed by the Engineer additional coat of paint should be given to bring the surface to uniform shade and tone at no extra cost.

5.9.3 Measurement

Measurement shall be in sq.m correct to two places of decimal. Measurement shall be for the areas as executed duly deducting for any openings etc. as detailed in the IS: code. Rate quoted shall take into account the provision of necessary enabling works such as double legged scaffolding, painter's cradle etc. Measurement shall be as per IS 1200

5.10 PAINTING OF IRON AND STEEL SURFACES

5.10.1 Materials

(a) Red oxide/Zinc chrome primer shall conform to IS: 2074.

(b) Synthetic enamel paint shall conform to IS: 2932.

(c) Aluminium paint shall conform to IS: 2339.

(d) Chlorinated Rubber Paint

(e) Epoxy micaceous Iron oxide paint

(f) All the materials shall be of the best quality from an approved manufacturer. CONTRACTOR shall obtain prior approval of the Engineer-in-Charge for the brand of manufacture and the color/shade. All the materials shall be brought to the site in sealed containers.

5.10.2 Workmanship

(a) Painting work shall be carried out only on thoroughly dry surfaces.
Painting shall be applied either by brushing or by spraying. CONTRACTOR shall procure the appropriate quality of paint for this purpose as recommended by the manufacturer. The workmanship shall generally conform to the requirement of IS: 1477 (Part 2).

(b) The type of paint, number of coats etc. shall be as specified in the respective items of work.

(c) Primer and finish paint shall be compatible with each other to avoid cracking and wrinkling. Primer and finish paint shall be from the same manufacturer.

(d) All the surfaces shall be thoroughly cleaned of oil, grease, dirt, rust and scale. The methods to be adopted using solvents, wire brushing, power tool cleaning etc., shall be as per IS: 1477 (Part-1) and as indicated in the item of work.

(e) It is essential to ensure that immediately after preparation of the surfaces, the first coat of red oxide-zinc chrome primer shall be applied by brushing and working it well to ensure a continuous film without “holidays”. After the first coat becomes hard dry, a second coat of primer shall be applied by brushing to obtain a film free from holidays.

(f) After the second coat of primer is hard dry, the entire surface shall be wet rubbed cutting down to a smooth uniform surface. When the surface becomes dry, the undercoat of synthetic enamel paint of optimum thickness shall be applied by brushing with minimum of brush marks. The coat shall be allowed to hard dry. The under coat shall then be wet rubbed cutting down to a smooth finish, taking adequate care to ensure that at no place the undercoat is completely removed. The surface shall then be allowed to dry.

(g) The first finishing coat of paint shall be applied by brushing and allowed to hard dry. The gloss from the entire surface shall then be gently removed and the surface dusted off. The second finishing coat shall then be applied by brushing.

(h) At least 24 hours shall elapse between the applications of successive coats. Each coat shall vary slightly in shade and this shall be got approved by the Engineer-in-Charge.

(i) All rust and scales shall be removed by scrapping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought iron during rolling which becomes loose by rusting, shall be removed. All dust and dirt shall be thoroughly wiped away from the surface. If the surface is wet, it shall be dried before priming coat is undertaken.

(j) Treatment on Steel for Aggressive Environment: A second coat of ready mixed red oxide zinc chromate primer may be applied where considered necessary in aggressive environment such as near Industrial Establishment and Coastal regions where the steel members are prone to corrosion. The second coat (which shall be paid for separately) is to be applied after placing the member in position and just before applying Paint. The second coat of primer is not necessary in case of painting with synthetic enamel Paint as it is applied over an under coat of ordinary Paint.

5.10.3 Measurement

Measurement shall be in sqm correct to two place of decimal for the finished work including primer. Rate shall be inclusive of enabling works such as double scaffolding, etc.

Measurement shall be as per IS 1200.

5.11 WOODEN SURFACES:

The wood work to be painted shall be dry and free from moisture. The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well dusted. Knots, if any shall be covered with

preparation of red lead made by grinding red lead in water and mixing with strong glue sized and used hot. Appropriate filler material conforming to IS 345 with same shade as Paint shall be used where specified. The surface treated for knotting shall be dry before Paint is applied. After obtaining approval of Engineerin-Charge for wood work, the priming coat shall be applied before the wood work is fixed in position. After the priming coat is applied, the holes and indentation on the surface shall be stopped with glazier's putty or wood putty. Stopping shall not be done before the priming coat is applied as the wood will absorb the oil in stopping and the latter is therefore liable to crack.

5.11.1 PAINTING WITH SYNTHETIC ENAMEL PAINT : Synthetic Enamel Paint (conforming to IS 2933) of approved brand and manufacture and of the required colour & finish(matt/glossy)shall be used for the top coat and an undercoat of ordinary Paint of shade to match the top coat as recommended by the same manufacturer as far the top coat shall be used

5.12 POLISHING & VARNISHING

5.12.1 (a) Melamine Polish:

For the item of melamine polish, the item includes all the sand papering required to be carried out and wiped properly for cleaning all the loose dust particles. Necessary masking tapes are to be provided where different finishing work is to be carried out, so that the melamine polish does not spread to the other surfaces. Care should be taken while removing the masking tape, so that the surface is not damaged. Cost of melamine polish includes the cost of providing and removing the masking tapes wherever required. The surface shall be sand papered using emery paper no. 180, 320 and 400 as required. Any staining required shall be carried out by applying approved stain & wood filler, to achieve the required colour and shade as directed by the Engineer-in-Charge. The item of melamine polish is deemed to include cost of such staining. Nothing extra shall be payable on this account. Melamine polish shall be applied with spray machine.

5.12.1 (b) French Polishing

French spirit polish shall be of an approved make conforming to IS 348. if it has to be prepared on site, polish shall be made by dissolving 0.7 Kg of best shellac in 4.5 liters of methylated spirit without heating. To obtain required shade pigment may be added and mixed.

Surface shall be cleaned. All unevenness shall be rubbed down smooth with sand paper and well dusted. Knots, if visible, shall be covered with a preparation of red lead and glue. Resinous or loose knots and gaps shall be filled with seasoned timber pieces and made level with rest of the surface. Holes and indentations on surface shall be filled with putty made of whiting and linseed oil. Surface shall be given a coat of filler made of 2.25 Kg of whiting in 1.5 liter of methylated spirit. When it dries, surface shall again be rubbed down perfectly smooth with sand paper and wiped clean.

Surface shall be prepared as described under "French Polishing" except that the final rubbing shall be done with sand paper which has been slightly moistened with linseed oil.

Mixture or polish shall be applied evenly, with a clean cloth pad in such a way that no blank patches are left and rubbed continuously for half an hour. When the surface is quite dry, a second coat shall be applied in the same manner and rubbed continuously for an hour or until the surface is dry. Final coat shall than be applied and rubbed for two hours or more if necessary, until the surface has assumed a uniform gloss and is quite dry showing no sign of stickiness when touched. Gloss of the polish depends on amount of rubbing, therefore rubbing must be continuous and with uniform pressure and frequent change in direction.

5.12.2 Varnishing

Surface shall be prepared as described above. After preparation of surface, two coats of clean boiled linseed oil shall be applied at sufficient interval of time. After the linseed oil has dried, two coats of varnish obtained from approved manufacturer shall be applied at sufficient interval of time. If the surface fails to produce the required gloss an additional coat shall be applied without any extra cost.

Piece of clean fine cloth and cotton wool made into shape of pad shall be used to apply polish. The pad shall be moistened with polish and rubbed hard on the surface applying the polish sparingly but uniformly and completely over the entire surface. It shall be allowed to dry and another coat applied in the same way. To give finishing coat, the pad shall be covered with a fresh piece of clean fine cotton cloth, slightly damped with methylated spirit and rubbed lightly and quickly with a circular motion, till the finished surface attains uniform texture and high gloss.

5.12.3 Wax Polishing

Wax polish shall either be prepared on site or obtained readymade from market. Polish made on the site shall be prepared from a mixture of pure bees wax, linseed oil, turpentine oil and varnish in the ratio of 2:1.5:1:1/2 by weight. The bees wax and the boiled linseed oil shall be heated over a slow fire. When the wax is completely dissolved, the mixture shall be cooled till it is just warm and turpentine oil and varnish added to it in the required proportions and the entire mixture is well stirred.

6. WATER PROOFING TRATMENT

6.1 INTEGRAL CEMENT BASED TREATMENT FOR WATER PROOFING ON HORIZONTAL SURFACE OF UNDER-GROUND STRUCTURE AT ALL DEPTH

6.1.1 Water Proofing of Horizontal Internal Surfaces of Under-ground Structure

i) Preparation of Surface

The Water Proofing Treatment over the lean concrete/leveling course surface should adhere to the surface firmly, the surface of leveling course should be roughened properly when the concrete is still green. In case the surface is not

made rough before the concrete is set, the work of water proofing should not be executed till proper key is provided for the base layer of Cement Mortar 1:3.

ii) Blending Cement/Water with Water Proofing Compound

The required quantity of cement bags to be used for a particular portion of work should be emptied on a dry platform. Water proofing compound bearing ISI mark and conforming to IS

2645 should then be mixed properly with the cement. The quantity of water proofing compound to be mixed should be as prescribed by the manufacturer but not exceeding 3% by weight of cement. The quantity of cement and water proofing compound thus mixed should be thoroughly blended and the blended cement should again be packed in bags.

For the water proofing compound in liquid form, the blending is to be done with water. This can be done by taking the just required quantity of water to be mixed in the particular batch of dry cement mortar.

The required quantity of water thus collected per batch of dry cement mortar to be prepared should be mixed with liquid water proofing compound from sealed tins with ISI mark. The water thus mixed with water proofing compound shall be thoroughly stirred so that the water is blended with water proofing compound properly. iii) Rough Shahabad Stone 22 to 25 mm Thick

The stone slabs to be used for this item shall be in thickness of 22 mm to 25 mm. Larger size of stone slabs i.e. 575 mm x 575 mm or 575 mm x 875 mm shall be used to minimize the number of joints.

(iv) Preparation of Cement Slurry

Cement slurry shall be prepared by using 2.2 kg of blended cement per sqm. area. Each time only that much quantity shall be prepared which can be covered on the surface and the surface in turn would be covered with 25 mm thick cement mortar base within half an hour. Slurry prepared and remained unused for more than half an hour shall be totally rejected.

(v) Preparation of Cement Mortar

Cement mortar 1:3 (1 blended cement: 3 coarse sand) shall be prepared with cement/ water duly blended as explained in clause 6.1.1(ii) Only that much quantity of cement mortar which can be consumed within half an hour, shall be prepared. Any cement mortar that is prepared and remains unused for more than half an hour shall not be used in the work and shall be rejected.

(vi) Laying Water Proofing Course

Before laying the base course of cement mortar 1:3, the lean concrete surface shall be cleaned neatly with water. Cement slurry prepared as per clause 6.1.1 (ii), shall be applied only on the area of the concrete surface, that can be covered with the cement mortar (1:3) base course within half an hour. The cement slurry should cover every spot of the surface and no place shall remain uncovered. Just after the application of cement slurry on the surface, the cement mortar prepared as per clause 6.1.1 (v) should be used for laying the base course. Base Course should be laid to a perfect level with wooden/aluminum straight edge of at least

2 mtrs. long. The top surface of cement mortar should be finished neatly and later scratched when green with a suitable instrument before the base course dries and gets hard that is just before the base course takes up initial set.

When the 25 mm thick base course is just getting set the cement slurry prepared as per clause 6.1.1(iv) should be spread over the base course upto the area that shall be covered with just two to three stone slabs. The cement slurry shall be spread in such a way that the area of base course to be covered immediately shall be covered with slurry without any gap or dry spots. Immediately on applying cement slurry on the base course the Rough Shahabad Stone slab shall be laid over the base course and pressed gently so that the air gap can be removed. The slurry applied on the surface which gets spread when the stone slab is pressed shall get accumulated in the joints of adjacent stone slabs and if any gap still remains between the stone slabs the same should also be filled with additional quantity of cement slurry. For laying the stone slabs in perfect level, two stone slabs at adjacent concerns/ends shall be fixed firmly to the required level and a string stretched over the two slabs, the intermediate slabs shall then be set to the level of the string.

After filling all the joints of the Rough Shahabad stone Slabs with cement slurry the area of stone slab shall be laid with cement mortar 1:3. The surface of stone slabs shall be cleaned and lightly watered. Cement mortar 1: 3 prepared as per clause 6.1.1(iv) shall be used for laying this course. For laying this course 25 mm high wooden strips shall be used and the top surface shall be finished smooth without using additional cement or slurry.

After laying 3rd course and before the mortar layer takes the initial set, Stone aggregate of 10 mm to 12 mm nominal size shall be uniformly spread and lightly pressed into the finished surface @ 8 cudm./sqm. The aggregates shall not be embedded totally inside the mortar and shall be visible on the top surface.

In cases where slope is to be provided for the water proofing layer, grading with additional cement concrete/cement mortar shall be provided and then the water proofing layer shall be laid on the graded surface. Extra payment shall however be made for the grading course.

(vii) Curing

Immediately after completing the fourth layer, arrangements shall be made for the top RCC slab as quickly as possible and in the meantime till the top slab is casted the water proofing treatment shall be kept wet continuously. In case the concreting of slab gets delayed for more than 2 weeks the curing can be stopped after 14 days.

(viii) Measurement

Length and breadth shall be measured along the finished surface correct to a cm and the area shall be worked out to nearest 0.01 sqm.

(ix) Rate

The rate shall include the cost of all labour& materials involved in all the operations described above. The cost of grading with cement concrete / cement mortar shall be paid for separately.

6.2 INTEGRAL CEMENT BASED WATER PROOFING TREATMENT ON THE VERTICAL SURFACE OF UNDER GROUND STRUCTURES.

(i) Preparing the Surface

The surface of the structure to be treated shall be roughed either by raking of joints in case of brick/ stone masonry or by hacking the cement concrete surface with a specifically made hacking tool just after removing shuttering. Alternately, the surface should be roughened by providing spatter dash key as explained under clause 6.1.1 (i). While doing water proofing to vertical faces from inside, it shall be ensured that water proofing treatment of floor slab is not damaged. Preferably, water proofing of vertical surface shall be done before that of horizontal surface.

(ii) Blending Cement/Water with Water Proofing Compound Same as under clause 6.1.1(ii).

(iii) Rough Shahabad Stone Slab

Same as explained under clause 6.1.1(iii).

(iv) Preparation of Cement Slurry Same as explained under clause 6.1.1(iv).

(v) Preparation of Cement Mortar Same as explained under clause 6.1.1(v).

(vi) Laying Water Proofing Course

Same as explained under clause 6.1.1(vi). Further Rough Shahabad stone are not sufficiently rough to remain in vertical position held by cement slurry. Therefore, the grip for the stone slab has to be increased and this can be done by planting 12 mm to 15 mm nominal size stone aggregate fixed with araldite on surface of each sand stone slab. (vii) Curing

Same as explained under clause 6.1.1(vii). Further till the water proofing work on vertical face is in progress, the water proofing work done on floor slab shall be kept wet for a minimum period of 14 days. Immediately after completion of water proofing on vertical faces of side walls, the water tank shall be gradually filled with water for testing. (viii) Measurement

Same as explained under clause 6.1.1(viii).

(ix) Rate

Same as explained under clause 6.1.1(ix).

6.3 CONCRETE WATER PROOFING BY CEMENTITIOUS CRYSTALLIZATION WATER PROOFING:

6.3.1 These products comprise mineral based hydraulically setting products, which when applied to concrete as a cementious slurry which reacts with concrete to

form a crystalline structure deep within the capillary and pore structures, thereby blocking voids and producing a water proofing effect. Cement and sand used in the product are used as a carrying agent for the chemicals. The active components in slurry react with the by-products of cement hydrations and give rise to insoluble crystals. The system becomes permanent, integral part of the concrete itself. There is no other preparation of concrete required beyond the cleaning of surface. Such treatments can be used as solution to dampness due to capillary action of poorly executed plinth damp course. For better results however, downwardly inclined holes are to be bored in the masonry where the liquid compound can be grouted. This will diffuse into the masonry and give plinth protection from dampness.

6.3.2 Method of Application

In this process cementitious Crystallization water proofing powder compound sprinkled onto the surface of concrete (1 kg powder per sqm.) with the use of a mechanical spreader, sieve or similar device after concrete is placed, consolidated, and leveled. As new concrete has high moisture content, the crystalline penetration is immediate with accelerates crystal growth due to chemical reaction. The powder is then worked into the surface of the slab during the normal finishing process with a trowel. If application is being done in direct sunlight, it is extremely important to cover the slab after final troweling with a rigid sheet of polythene. Take care to see that the sheet is not in contact with the surface of the slab. This can be done by placing the sheet on bricks to ensure a gap between the slab and the sheet, which will allow air circulation. Remove the sheet after 48 hours and water pond the treated area to cure regularly.

6.4 WATER PROOFING TREATMENT TO VERTICAL AND HORIZONTAL SURFACE OF DEPRESSED PORTION OF WC, KITCHEN AND THE LIKE

6.4.1 Before the Water Proofing Treatment

Before the water proofing treatment, the internal plaster of ceiling and walls of WC block leaving the portion for dado/skirting should be completed. Grooving / chasing for doing the concealed work of GI/CI pipes/Electrical conduits should be completed. Cleaning the depressed/sunken portion of WC of all debris, extra mortar sticking to the vertical and horizontal surface etc. Necessary holes for ‘P’ trap /Nahani trap/Water escape pipe etc should be completed.

6.4.2 Preparing Surface and Fixing Pipes and Fittings

Before the water proofing treatment work, proper key in the concrete surface should be provided. The depressed/sunken portion should be hacked by a hacking tool, after the concrete slab is cast and when this concrete is still green.

The vertical surfaces of the depressed /sunken portion should be hacked with a hacking tool just after the shuttering is removed.

Fixing the 'P' trap in position and all other pipes work including the water escape pipe shall be fixed properly and the holes should be plugged carefully before taking up the water proofing work.

6.4.3 1st Course

Cement duly blended with water proofing compound as explained in clause 6.1 shall be used for preparing the cement slurry.

The consistency of the slurry should be such that 4.4 kg. of blended cement with water proofing compound is used per sqm area of surface to be treated. The slurry should be started from the vertical faces towards the bottom of the floor. Particular care should be taken to see that the slurry is applied to corners without leaving any gap.

6.4.4 2nd Course

Immediately on applying the blended cement slurry on the surface to be treated cement plaster 20 mm thick in CM 1:3 (1 blended cement: 3 coarse sand) shall be applied both on vertical and horizontal surfaces taking particular care to complete the entire depressed/ sunken portion of WC within a day so that the plaster can be done without any joint. Junctions shall be properly rounded. The surfaces of the plaster shall be left rough but finished in one plain and cured for a week.

On completion of the curing period both horizontal and vertical surfaces shall be cleaned properly and gently and allowed to dry.

6.4.5 3rd Course

Only after the surface is completely dried the blown or residual bitumen shall be applied @ 1.7 kg. of bitumen per sqm area.

6.4.6 4th Course

PVC sheet 400 micron thick shall be spread evenly without any kink immediately, so that the PVC sheet sticks to the surface firmly. PVC sheet shall be continued to be laid over the main slab up to 100 mm.

Overlapping of PVC sheet should be done with a minimum overlap of 100 mm, duly pasting the overlapped sheet with an application of bitumen @ 1.7 kg./sqm.

The projections of pipes and 'P' trap outlet etc. inside the depressed/sunken portion of WC shall also be cladded with water proofing treatment layer upto a height of 150 mm, using a coat of bitumen with PVC sheet complete.

The surfaces of depressed/sunken portion of WC shall not be left without covering with specified filling material and base concrete, otherwise the PVC sheet layer may be tampered by the labour working in the vicinity.

Fixing up of WC pan, filling specified material and the top base concrete should be done as early as possible (filling paid under separate item) and the top horizontal layer of water proofing may be taken up later i.e. just before laying the floor tiles.

6.4.7 Measurement

Length and breadth shall be measured along the finished surface correct to a cm. and area shall be worked out to nearest 0.01 sqm. No payment however shall be made for the 100 mm overlap of PVC Sheet over the roof slab.

6.4.8 Rate

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

6.5 GRADING ROOF WITH CEMENT CONCRETE SCREED

6.5.1 Materials

Over the geo-textile layer concrete screed of M20 (RMC) mixed with polypropylene fibers laid. This screed will provide the required protection to insulation and waterproofing system. The thickness of screed at shall be 75mm (average). Screed shall be laid in panels and finished to a smooth surface. Curing of the screed shall be done for a minimum of 10 days by ponding.

6.5.2 Preparation of the Surface

The surface shall be cleaned properly with brooms bruch, cloth to remove all dirts, dust, mortar droppings.

6.5.3 Laying

Before laying cement concrete for grading, the level markings to the required slope/gradient shall be made only with cement concrete on the surface of the slab at suitable spacing with the help of string and steel tape (Measuring tape) so that the mason can lay the concrete to the required thickness, slope / gradient easily in between the two level markings.

On getting the level marking approved by the Engineer-in-charge the surface should be sprinkled with thick cement slurry and the concrete should be laid carefully, without throwing from height, in predetermined strips.

The concrete should be consolidated by specially made wooden tamping. After the tamping is done the surface should be finished to required slope/gradient with wooden trowels without leaving any spots of loose aggregates etc.

The mixed cement concrete must be laid in position, within half an hour of its mixing. In case any quantity of concrete remains unused for more than half an hour the same should be rejected and removed from the site. Except that screed shall be tamped with wooden and steel trowels and surface finished with steel trowel.

6.5.4 Finishing

(i) The slope of finished surface shall not be more than 1 in 100 unless a steeper slope is specified in the item of work.

(ii) The finished surface of the grading shall present a smooth surface with correct slopes and uniform rounding wherever they are provided. The screed surface shall be free of cracks. Excess trowelling shall be avoided.

6.5.5 Thickness

The minimum thickness of Screed/cement mortar grading at the junction with khurra or parapet wall shall be 50 mm. The screed cement mortar shall be rounded at

the junction of roof slab and parapet. It is desirable to provide a haunch/gola/filler at the junction of parapet wall and the roof slab.

6.5.6 Curing

Curing shall be done either by spreading straw/Hessian cloth over the screed graded surface, keeping the same wet for full 10 days or flooding the graded area with water by making kiaries with weak cement mortar, for 10 days. Occasional curing by simply spraying water now and then shall not be permitted under any circumstances.

6.5.6 PROVIDING WATER STOPS in Water tanks

(i) Water stops conforming to IS 12200 for construction/expansion joints should be fabrication from a plastic compound, the basic resin of which shall be polyvinyl chloride. The compound shall contain additional resin/ plasticizer inhibitors or other materials such that when the materials is compounded itshall meet the requirement given in IS 15058.

(ii) Type of Joints for which Water Bars are provided: The water bars are provided only for the movement of joints in a water retaining structure.

(iii) Rate quoted under relevant item for underground/overhead water tank work shall include providing water stops.

.6.7 WATER-PROOFING ADMIXTURE

Water-proofing admixture shall conform to the requirements of IS: 2645 and shall be of approved manufacture. The admixture shall not contain calcium chloride. The quantity of the admixture to be used for the works and method of mixing etc. shall be as per manufacturer's instructions and as directed by the ENGINEER-IN-CHARGE. Rate for admixture shall be included in the relevant item of work.

6.7.1 Water Proofing Treatment

Note: The Make of materials and authorized applicator for the Waterproofing treatment shall be approved by Engineer-in charge before the commencement. The contractor shall give the Performance Guarantee of the entire Waterproofing works for 10 Years as per the prescribed Proforma on Non judicial stamp paper of required value.

7. FLOORING AND DADO WORKS

7.1 THE FOLLOWING CODES, STANDARDS AND SPECIFICATIONS ARE A PART OF THIS SPECIFICATION. ALL STANDARDS, SPECIFICATIONS, CODES OF PRACTICE REFERRED TO HEREIN SHALL BE THE LATEST EDITIONS INCLUDING ALL APPLICABLE OFFICIAL AMENDMENTS AND REVISIONS.

1. IS 13712:2006 - Ceramic Tiles- definitions, classifications, characteristics and marking
2. IS15622-2006 - Pressed ceramic tiles - specification
3. I.S. 1130-1969 - Specification for marble (blocks, slabs and tiles)
4. IS: 777/1988 - Specification for glazed earthenware tiles.
5. IS: 4457/1982 - Specification for ceramic unglazed vitreous acid resisting tile.

6. IS: 1443/1972 - Code of practice for laying and finishing of cement concrete flooring tiles.
7. IS: 2571/1970 - Code of practice for laying in-situ cements concrete flooring.
8. IS: 2690/1993 - Specification for burnt clay flat terracing tiles: Part 1 Machine made.
9. IS: 4631/1986 - Code of practice for laying epoxy resin floor toppings
10. IS: 5318/1969 - Code of practice for laying of flexible PVC sheet and tile flooring
11. IS: 5491/1969 - Code of practice for laying of in-situ granolithic concrete floor
12. IS 1124/ 1974 - Method of test for determination of water absorption, (Reaffirmed apparent specific gravity and porosity of natural building 2003**)** stones

7.2 GRANITE STONE SLAB/TILES WORK

(a) The slabs shall be of approved selected quality, hard, sound, dense and homogenous in texture, free from cracks, decay, weathering and flaws. The percentage of water absorption shall not exceed 5 percent as per test conducted in accordance with IS: 1124.

(b) The type, size, thickness and colour/shade etc. of the slabs for flooring/dado/ skirting shall be as specified in the respective items of the work in the schedule of quantity.

(c) Granite stone slabs shall be handled carefully to prevent any damage. The stone slab procured shall be free of any surface defect or any edge damage. The damaged stones shall not be allowed to be used in the work. So the Contractor shall procure additional such quantities, to cover such contingencies. However nothing extra shall be payable on this account. The stone slabs shall not be waxed or touched up with dyes / colours.

(d) Slabs shall be supplied to the specified size with machine cut edges or fine chisel dressed to the full depth. All angles and edges of the slabs shall be true and square, free from any chipping giving a plane surface. Slabs shall have the top surface machine polished (first grinding/ mirror polished) before being brought to site. The slabs shall be washed clean before laying. Machine polishing and cutting to required size shall be done with water (as lubricant) only. Sawing shall also be done preferably with water as lubricant but as a special case, the Engineer-in-charge may permit, at his discretion, oil or kerosene as lubricant subject to all kerosene or oil in the body and surface of tiles / slabs being thoroughly dried in ovens. Tiles / slabs with stains or patches due to the use of oil or otherwise, either before or after installation, shall be rejected and shall be replaced by the Contractor at his own cost. Nothing extra shall be payable on this account

(e) Before starting the work, the Contractor shall procure and submit the samples of granite stone slab for the approval of the Engineer-in-charge. The granite stone

slabs to be procured for the work shall match the samples shown to the Contractors. The samples shall be submitted along with the following details:

i) Two/three representative samples for each type of granite stone specified.

ii) Details of physical characteristics such as dimensional tolerances (within the specified limits), water absorption, compressive strength, Mohs Hardness, Specific gravity with reference to IS standards.

iii) Source of supply and confirmation of availability in full quantity and uniformity of colour, tone and textures.

iv) The decision of the Engineer-in-charge as regards the approval of the samples for the various types of the granite stones shall be final and binding on the Contractor. No claim of any kind whatsoever shall be entertained from the Contractor on this account. The Contractor shall then procure and get the mock up prepared at site of work for approval of quality of workmanship and the granite stone as specified. The mock up shall be prepared on one of the floors at the location as decided by the Engineer-In-Charge. The size of the stones shall be as per the Engineer-in-charge architectural drawings. If the quality of the workmanship and the material is as per the required standards, the mock up shall be allowed as part of the work and measured for payment and shall not be dismantled. Otherwise, it shall be dismantled by the contractor as directed by the Engineer-in-charge and taken away from the site of the work at his own cost. Nothing extra shall be payable on this account.

(f) The entire supply for each type of granite stone slab shall be procured from one location and supplied preferably, in one lot to keep variations to the minimum. The Contractor shall also segregate and sort the slabs according to colour, shade, texture and size of grains etc. to keep variation(s) in stones used at any one floor to the minimum. Any slab with variation in the colour, shade, texture and size of grains etc., not acceptable to the Engineer-in-charge, shall not be used in the work and shall be removed and replaced by the Contractor. Nothing extra shall be payable on these accounts. Also, no claim of any kind shall be entertained from the Contractor on this account.

(g) The stone work may be required to be carried out in patterns, design and / or in combination with granite stones of different colour and shade with or without borders and in combination of different stone slabs / ceramic tiles for which nothing extra shall be payable. The stones shall be provided in sizes and shapes as per the approved architectural drawings and wastages and incidental costs, if any, shall be deemed to be covered in the cost of the relevant items. Nothing extra shall be payable on this account. For the purpose of payment, only the actual area of each type of granite stone provided and fixed shall be measured separately under the relevant items as specified in Schedule of quantity.

(h) The following tolerances shall be allowed in the dimension of granite stone slab:

Slabs:	**Tolerance**
a). Length	± 1mm

b). Width	± 1mm
c). Thickness	- 1mm
d). Angularity at corners	± 0.25%

The stones (slab and tiles) not meeting the above tolerance limits shall be rejected and not permitted to be used in the work. Nothing extra shall be payable on this account.

(i) Stones slabs shall have uniform thicknesses with-in the tolerance limits and linear items like treads, sills and jambs, coping, risers, urinal partitions, kitchen / wash basin platforms, vanity counters, facias and other similar locations etc. shall have edge polished calibrated thickness i.e. exposed edges shall have edge polished uniform thickness throughout the length of the work. Nothing extra shall be payable on this account.

(j) The flooring work shall be carried out as per the architectural drawings in design and pattern (geometric, abstract etc.) and in linear and / or curvilinear portions and in combination with stones of different colour and shade and ceramic tiles etc. For the flooring portions curved in plan, the stone slabs (at the edge) shall be cut to the required profile and shape as per the architectural drawings. Nothing extra shall be payable on this account and any consequent wastages and incidental charges on such accounts shall be deemed to be included in the cost of such items. For the purpose of payment, the actual area of each type granite stone as laid shall be measured separately under the relevant items.

(k) For the granite flooring in the curvilinear profile of the steps in the building the same shall be negotiated in segmental manner (using trapezoidal shaped granite stone pieces with straight edges for treads and rectangular stone pieces for the risers) and not in curved profiles as specified earlier. However, the granite stone slabs shall be cut to required sizes and shapes, as per the Engineer-in-charge architectural drawings, to negotiate the curved steps in segmented manner. The risers shall also be cut to required sizes and shapes and the edges chamfered at the joints, all as per the approved architectural drawings. However, the Contractor shall prepare the detailed shop drawings for the same and commence work only after the approval by the Engineer-in-charge. The rate shall also include any consequent wastage, incidental charges involved in this work. Nothing extra shall be payable on this account. For the purpose of payment, the actual area of each type of granite stone as laid shall be measured.

(l) For the steps (risers and treads) in the linear profile, the granite stone shall be provided in single pieces up to 2.0m as per the architectural drawings, unless otherwise specifically permitted by the Engineer-in-charge. Wherever grooves are required to be provided the same is to be done as per architectural drawings and as directed by the Engineer-in-charge. Wherever required, the joints shall be provided as per the architectural drawings and as directed by the Engineer-In-Charge. Nothing extra shall be payable on these accounts.

(m) The granite slabs used for providing and fixing in the sills, soffits and jambs of doors, windows, ventilators and similar locations shall be in single piece unless otherwise directed by the Engineer-in-charge. Wherever stone slab other than in single piece is allowed to be fixed, the joints shall be provided as per the architectural drawings and as per the directions of the Engineer-in-charge. In the cabin areas, the joints in sills shall preferably be provided in line with the partition wall. Depending on the number of joints, as far as possible, the stone slabs shall be procured and fixed in slabs of equal lengths as per the architectural drawings and as directed by Engineer-in-charge.

(n) While fixing the granite slabs in sills, soffits and jambs of doors, windows, ventilators etc., rebates shall be made by overlapping the stones at the required places for fixing shutters for doors, windows and ventilators etc. as shown in the Architectural drawings and as per the directions of the Engineer-in-charge. Epoxy based adhesives shall be used for fixing the granite stones to each other, as per the manufacturer's recommendations. The authorized overlap as per the Engineer-in-charge architectural drawings or as directed by the Engineer-In-Charge shall be measured for payment under the same item. However, any extra mortar thickness required due to the overlap arrangement shall be deemed to have been included in the rate of this item. Nothing extra shall be payable on this account. The cut exposed edges of the granite stones shall be polished, moulded edges / nosing as per the Architectural drawing of the granite work and such cost shall not be payable.

(o) The granite stone slab shall be fixed over low level storage cabinets using necessary adhesive as per the manufacturer's specification. The stone shall have uniform thickness and shall be provided in sizes as per the Architectural drawings. The stone slab shall have uniformly levelled surface after fixing. All the joints shall be finished smoothly in a workmanlike manner.

(p) Granite stone in flooring , skirting and in stair area as covered under the scope of work shall be laid and fixed in portion using suitable adhesive /cement mortar as specified in the schedule of the item in profile, design and pattern as per the approved drawings and direction of the Engineer-in-charge, for which nothing extra shall be paid.

(q) The granite work shall be adequately protected by a layer of Plaster of Paris, which shall be maintained throughout and removed just before handing over of the works, cleaning, disposal of debris and for which nothing extra shall be payable.

(r) Wherever the granite stone slab dry cladding is provided exposed to environment, both the surfaces of the granite stone slabs shall be treated to make the surfaces hydrophobic by applying water repellent/hydrophobic clear coating of water soluble siliconate based impregnating agent of approved make. The formulation shall be prepared and applied as per the manufacturer's recommendations. Before applying the formulation the surface preparation shall be done as per the manufacturer's recommendations. The surface shall be cleaned using water and

the formulation shall be applied on the damp surface. The payment for this treatment to the granite stone slabs shall be included under relevant item.

(s) It shall be applied by spray application before installation of stone on vertical surface has been completed and after necessary surface preparation. The Contractor shall impart training to his supervisors and labour to take adequate precautions and safeguards as per the manufacturer's specifications while handling the chemical. He shall also provide required gears and protective accessories like face masks, gloves, goggles, respiratory masks etc. for the labour for executing the work. Nothing extra shall be payable on this account.

(t) Before the slab/tiling work is taken up, the base concrete or structural slab/masonry shall be cleaned of all loose materials, mortar droppings, dirt, laitance etc. using steel wire brush and well wetted without allowing any water pools on the surface. A layer of average thickness of cement mortar (specified in item) consisting of one part of cement to 6 parts of sand shall be provided as bedding for the tiles over the base concrete. The thickness of bedding mortar shall not be less than 10 mm at any place. The quantity of water to be added for the mortar shall be just adequate to obtain the workability for laying. Sand for the mortar shall conform to IS: 2116 and shall have minimum fineness modulus of 1.5. The surface shall be left rough to provide a good bond for the tiles. The joints shall be in straight lines and shall normally be 1.5mm wide. On completion of laying of the tiles in a room, all the Joints shall be cleaned and washed fairly deep with a stiff broom/wire brush to a minimum depth of 5mm. The day after the tiles have been laid, the joints shall be filled with cement grout of the same shade on the colour of the matrix of the tile. For this purpose white cement or grey cement with or without approved pigments shall be used. The flooring should be kept moist and left undisturbed for 7 days for the bedding/joints to set properly. Heavy traffic shall not be allowed on the floor for atleast 14 days after fixing of the tiles.

(u) slab/tile dado work shall be executed only after laying tiles on the floor. For dado and skirting work, the vertical wall surface shall be thoroughly cleaned and wetted. Thereafter it shall be evenly and uniformly covered with specified thick backing of 1:4 cement sand mortar. The back of each slab/tile to be fixed shall be covered with a thin layer of neat cement paste and the tile shall then be gently tapped against the wall with a wooden mallet. Fixing shall be done from the bottom of the wall upwards. The joints shall be in straight lines and shall normally be 1.5mm wide. Any difference in the thickness of the slab/tiles shall be evened out in the backing mortar or cement paste so that the tile faces are in conformity & truly plumb. Slab/Tiles for use at the corners shall be suitably cut with bevelled edges to obtain a neat and true joint. After the work has set, hand polishing with carborundum stones shall be done so that the surface matches with the floor finish. The thickness of the slabs for dado/skirting work shall not be more than 25mm. Slabs shall be so placed that the back surface is at a distance of 12mm. If necessary, slabs shall be held in position temporarily by suitable method. After checking for verticality, the gap shall be filled and packed with cement Sand

mortar of proportion 1:3.After the mortar has acquired sufficient strength, the temporary arrangement holding the slab shall be removed. Marble/Granite dado work if any shall be carried out with requisite brass clamps and keys in required sizes and pattern as directed.

(v) Measurement

Measurement for floor slab and dado shall be in sq.m correct to two places of decimal. Actual quantity of slab/tiles work as laid shall be measured for payment as per the respective items of work after making deductions for openings etc.

7.3 VITRIFIED/SEMI VITRIFIED/ GLAZED/ANTI-SKID CERAMIC TILES/VITRIOUS

(a) VITRIFIED TILES shall be approved manufacture and shall conform to table 12 of IS 15622 (Tiles with water absorption E ≤ 0.08 per cent Group B I a) and the joint thickness in flooring shall not be more than 1mm. Ceramic tiles shall be of approved manufacture and shall generally conform to IS 15622 . The tiles shall be square or rectangular of nominal size.

Glazed earthenware tiles shall be approved manufacture and conform to the requirements of IS: 777.

The Tiles shall be flat, and true to shape and free from blisters crazing, pinholes, chips, welts, crawling or other imperfections detracting from their appearance and shall have ribs or indentations for a better anchorage with the bedding mortar. Dimensional tolerances shall be as specified in relevant IS.

(b) The size, thickness, colour, with or without designs etc of the tiles for flooring/dado/skirting shall be as specified in the respective items of work. The Ceramic / Vitrified tiles, shall be of approved manufacturer and shall include laying them in desired pattern and colour/combination and to proper slope. The samples of tiles for flooring and dadoing etc. shall be got approved and tested before laying.

(c) The total thickness of glazed tile finish including the bedding mortar shall be as specified in item in flooring/dado/skirting. The minimum thickness and proportion of bedding mortar for flooring and for dado/skirting work as specified in item of schedule of quantity Sand mixed with just sufficient water to obtain proper consistency for laying. Sand for the mortar shall conform to IS: 2116 and shall have minimum fineness modules of 1.5

(d) Where full size tiles cannot be fixed, tiles shall be cut to the required size using special cutting device and the edges rubbed smooth to ensure straight and true joints.

(e) Coloured tiles with or without designs shall be uniform and shall be preferably procured from the same batch of manufacture to avoid any differences in the shade.

(f) Tiles for the flooring shall be laid over hardened concrete base. The surface of the concrete base shall be cleaned of all loose materials, mortar droppings etc well wetted without allowing any water pools on the surface. The bedding mortar shall then be laid evenly over the surface, tamped to the desired level and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it. The top surface shall be left rough to provide a good bond for the tiles. For skirting and dado work, the backing mortar shall be roughened using a wire brush.

(g) Neat cement slurry using 3.3 kg cement per one sq.m of floor area shall be spread over the hardened mortar bed over such an area as would accommodate about 20 tiles. Tiles shall be fixed in this slurry one after the other, each tile being gently tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. For skirting and dado work, the back of the tiles shall be smeared with cement slurry for setting on the backing mortar. Fixing of tiles shall be done from the bottom of the wall upwards. The joints shall be in perfect straight lines and as thin as possible, For vitrified tiles it shall not be more than 1mm wide. The surface shall be checked frequently to ensure correct level/required slope. Floor tiles near the walls shall enter skirting/dado to a minimum depth of 10mm. Tiles shall not sound hollow when tapped.

(h) In bath, toilet W.C. kitchen and balcony/verandah flooring, suitable tile drop or as shown in drawing shall be given in addition to required slope to avoid spread of water. Further tile drop will also be provided near floor trap.

(i) All the joints shall be cleaned of grey cement with wire brush to a depth of at least 3mm and all dust, loose mortar etc. shall be removed. White cement with or without pigment shall then be used for flush pointing the joints. Curing shall then be carried out for a minimum period of 7 days for the bedding and joints to set properly. The surface shall then be cleaned using a suitable detergent, fully washed and wiped dry.

(j) Specials consisting of caves, internal and external angles, cornices, beads and their corner pieces shall be of thickness not less than the tiles with which they are used.

(k) All tile work in skirting, facia and dado shall include scaffolding, working platforms, etc. and the cost of bedding/backing materials. Tiles shall be set in cement paste and joints filled with cement slurry for matching shade (e.g. white tile joints to be filled with white cement).

(l) The rate shall include provision for extra bedding thickness to have the same finished levels when flooring is done with two different materials e.g. Kotah stone/ Granite, Vitrified tiles for adjoining areas, and laying to the required slope, gradient etc. Rate shall include all cuttings and wastage of tiles, curing , cleaning finished surfaces and adequate protection of vitrified/ceramic flooring work by a layer of Plaster of Paris which shall be maintained throughout and removed just before handing over of the works, cleaning, disposal of debris and for which nothing extra shall be payable.

(m) Measurement

Measurement for floor tiling and dado shall be in sq.m correct to two places of decimal. Actual quantity of tiling work as laid shall be measured for payment as per the respective items of work after making deductions for openings etc.

7.4 FALSE OR CAVITY FLOOR

(a) (i) This specification covers the requirements of false or cavity floor constructed over reinforced concrete floor slabs for oval room, conference rooms, computer rooms and other similar structures.

(ii) Preparation: Prior to installation sub floor must be even, without irregularities, clean, dry, free from construction debris and clear from other trades.

(iii) Subfloor: The finished surface of the concrete subfloor shall be level with a minimum wood float finish. The level tolerance shall not exceed +/- 10mm from the specified finished concrete subfloor levels

(iv) The work in general shall be carried out as per the manufacturer's specifications and as specified herein, as per the architectural drawings and as directed by the Engineer-in-charge

(v) The loading panels along with the pedestals and stringers shall be procured from one of the approved manufacturers and shall have the specified strength, durability and fire resistance as per the manufacturer's specifications and as per the requirements specified herein. Panels are to conform to ASTM E84 class O as per BS476 for ignitability, spread of flame, heat evolved and smoke developed. All panels provide low fire hazard.

(vi) The access floor shall be modular type load bearing panels, supported on stringers and pedestals. The system as well as individual components shall be tested for the specified loads and properties in an independent laboratory as approved by the Engineer-in-charge

(vii)The access floor panels along with pedestals, stringers etc., shall be sourced from the approved source and supplied at site free of any damage or defects. There should not be any de-lamination noticed in the loading panels otherwise, it shall be rejected and shall be re-placed. Also there shall not be any damage to the pedestals, the threading, stringers etc. Therefore, while procuring, suitable provision shall be kept for additional panels, pedestals, stringers etc, as may be required. Nothing extra shall be payable on this account. (viii)The manufacturer's certificate for all the individual components for the access flooring shall be obtained by the Contractor and submitted to the Engineer-in-charge. The Contractor shall before start of work submit the samples of individual components of the access floor along with the manufacturer's certificate, for the approval of Engineer-in-charge. The Contractor on request by the Department shall produce the original bills and challan as a proof as regards the source of procuring these materials. In the end, Contractor shall be solely responsible for providing access floor system as required which is level, safe, stable, functional, safe in vibration

and without any rattling of panels, easily removable & replaceable and cater for conductivity of electric charge.

(b) FRAME WORK

(i) The pedestals for supporting the access floor panels shall be fixed at required spacing, to form modular framework for supporting the access floor. G.I. pedestals, pedestal head top flange plate, circular plate, stringers and seating for loading panels of access floor, pre-drilled / machine punched holes of required diameters for fixing nuts, bolts, placing for head cap etc shall be as per the item and manufacturers specification drawing and direction of Engineer-in-charge. The top flange plate shall be snap locked (mechanically) and / or welded to G.I. socket (which shall be screwed onto the pedestal tube) or the GI rod stem, which shall be positively located into the pedestal tube. The G.I. socket shall be 2.0mm thick (minimum) (or as specified), internally threaded to be compatible with threads of the pedestal tube. If the top flange plate is welded to GI rod stem externally threaded, its diameter shall be compatible with the internal diameter of the pedestal tube. A precision moulded antivibration, PVC head cap cast to required shape, thickness and size shall be clenched / positively clipped to the G.I. top flange plate and shall have suitable slots, of specified size and length, for making provision of fixing four G.I. stringers orthogonally, including cruciform up - stands for positive location and modular control of the loading panel. Further, provision shall be made for dissipation / conduction of static electric charges. The pedestals shall be of suitable length to provide finished floor (access floor) required height (plenum depth) from the sub – floor as per the direction of Engineer-in-charge and Architectural drawings with a provision for adjustment in height up to ± 25 mm. (or as specified) G.I. check / lock nut shall be provided, on the threaded portion of the pedestal tube or on the GI rod stem connected to the flange plate, for level adjustment, locking and stabilizing the pedestal head in position at the required level. The pedestals shall be fixed to the sub – floor using structural epoxy adhesives or as per the specification such as two-part araldite of the brand as approved by the Engineer-in-charge. The pedestals in numbers as required as per the site conditions shall be provided and fixed in a workmanlike manner to achieve level flooring. Additional pedestals shall be provided at turn, edges etc. Nothing extra shall be payable on this account.

(ii) The stringers for supporting the access floor loading panels shall be of moulded / roll formed galvanized steel sheet minimum and of size and sections as per manufacturer's specifications for the specified loading. They shall have suitable niches / grooves compatible with the access floor panels and also the pedestal head cap. These shall be fixed to the pedestal head using stainless steel nuts and bolts or shall be snap engaged.

(iii) Besides fixing the pedestal with epoxy to the sub-floor, the pedestals shall also be fixed with one no. brass screw for each pedestal. All the pedestals shall then be interconnected using copper wires connecting all the brass screws of the pedestals for conductivity. Any incidental work including electrical works, earthing

etc. shall be carried out by the Contractor for the functional requirement. Nothing extra shall be payable on this account.

(iv) The galvanizing to all the elements as specified shall not be less than 180 grams per sqm (or as specified). All the material shall be procured in one lot. One sample of each component shall be tested in the laboratory approved by the Engineer-in-charge. The Contractor shall procure all the materials in advance so that there is sufficient time for testing and approving of the material and clearance of the same before use in work. The

Contractor's rates for the items involving the use of materials shall be deemed to cover the cost of samples. The cost of packaging, sealing, transportation, loading, unloading etc. the samples to the approved laboratory shall be borne by the Contractor. Testing charges shall be borne by the department only when the samples satisfy the provisions specified and conform to the requirements of the relevant specifications. If the results show that the samples do not satisfy the relevant specifications, the testing charges shall be borne by the Contractor.

(c) FLOOR PANELS

(i) Suitable backing material shall be provided on the underside of the particle board to prevent warping and/or to cater to specified loading.

(ii) Suitable removable covers shall be provided as indicated in Architectural drawings at no extra cost to serve as outlets for the cables.

(iii) The false flooring should be set out such that the perimeter /edge loading panels are in excess of half a module and such that the edge panels on both the sides are of equal sizes as far as possible. Nothing extra shall be payable on this account.

(iv) Access floor panels shall have structurally rigid linear cell assemblies of approved size fabricated from non combustible component made out of mild steel corrosion resisted treatment done with seven tank treatment and approved powder coated to required colour and of minimum 20 micron thick. The interior of the panel may be filled with non-combustible cementitious compound to support not less that 70% of the top skin. Steel panels welded construction with an enclosed bottom pan formed with uniform pattern of modular pockets having 64 pocket supports or as specified also having reverse dome at top of embossed sheet to reduce top sheet deformation and improved rolling load, 96 weld or as specified point at perimeter which increases load bearing capacity. The panel shall be placed on the pedestal per the direction of Engineer-in-charge.

(v) The bare GI encapsulated loading panels shall be provided on top / exposed face of the loading panels , with anti-static high pressure laminate 1.5 mm thick of approved make as approved by the Engineer-in-charge, of the required colour and shade, fixed to the GI substrate using VC 31 Acrylic adhesive of approved brand, as per the manufacturer's specifications. The edges of the panel shall be protected by providing and fixing PVC trim of required size and shape for antistatic properties, to prevent rattling and maintaining uniform plenum depth and integrity.

(d) FINISHED HEIGHT OF FALSE FLOORING : The finished height from top of reinforced concrete floor to the finished floor surface of false/cavity floor shall be as specified or as shown on drawings.

(e) RAMPS AND STEPS: Ramps and steps shall be provided as shown on Architectural drawings and as directed by Engineer-in-charge without any extra cost to the Bank

(f) FINISH

(i) The finished floor shall be true to lines and levels and present a neat flush surface.

(ii) The installed access floor system shall be level within +/-1.5mm inside a 3 meter radius and +/-2.50mm over the entire floor. The installed floor system and shall be rigid and free of rocking panels.

(iii) Fit and Finish: The fit and finish of cut panels around perimeters, columns and other such structures or intrusions shall have a maximum gap of 3mm. The raised access floor system shall not rely for its lateral stability on such structures. Cut edges of the panels shall be sealed with a PVA sealer without any extra cost

(h) VENDOR DRAWING: Vendor shall prepare and submit a layout drawing for false floor giving all details including supporting system for approval. If so called for, vendor shall also submit his calculations for the supporting system with all relevant data assumed, to the Engineer-in-charge for his approval. Work shall be carried out on approved drawings only.

(i) Following completion , manufacturer of Access Floors shall provide a 'Care and Maintenance Manual' which shall provide clear instruction for maintenance personnel and facilities managers on the safe use, cleaning and correct application of the installed access floor system

(j) The rate shall include cost of all inputs of labour, material (including pedestals / jacks, loading panels, stringers, anti-static high pressure laminates, PVC trims, fabricating loading panels of non-regular sizes for fixing near edges of the rooms, all the required electrical works for functional requirement of Anti-Static / Static flooring), T & P, all wastages, all the incidental charges etc, involved in the work. However, for the purpose of payment, only the plan area of the access floor provided and fixed in position shall be measured in sqm up to two places of decimal.

8. WINDOW, ALUMINUM WINDOWS/VENTILATORS AND GLAZED DOORS

8.1 GENERAL

8.1.1 Extent and Intent

The Contractor shall furnish all materials, labour accessories, equipment, tools and plant and incidentals required for providing and installing Structural semi unitized glazing, Windows, doors, Frameless glazing, cladding and other items as called for in the drawings. The drawings and specifications cover the major requirements only. The supplying of additional fastenings, accessory features

and other items not mentioned specifically herein, but which are necessary to make a complete installation, shall be a part of this contract.

8.1.2 The Scope of Work

This work shall include all labour, materials, equipment, tools and tackles, transportation, unloading and stacking, taxes, insurance, guarantees, warranties etc that are necessary for the complete performance required by the Tender drawings, specifications and other matters as per Tender Documents.

The Scope of Work includes, but is not necessarily limited to the following:

1. Aluminium assemblies on exterior face fixed on Building, comprising of:

(i) All aluminium glazing assemblies including, aluminium windows (fixed, top/side hung/ openable), aluminium door /window assemblies, aluminium glazed ventilators, aluminium louvers and associated aluminium works.

(ii) Any reveals, angles, returns, sills, copings, flashing for any other features described or indicated in drawings and / or in the specifications.

(iii) All clear and obscure frosted, flat and tempered / toughened glass units, Double Glass Units.

2 Flat Aluminium composite panel system fixed in linear, curvilinear profile including copings, flashings to curtain walling and cladding and weeps and vents. Aluminium louvers /pergola

3 Any reveals, angles, returns, cills, coping, flashing or any other feature described or indicated in Architectural drawings and or specifications/schedule of quantity.

4 All insulated spandrel panel assemblies and wall.

5 Sealants, caulking, joint fillers, weeps, vents, gaskets, and metal-to-metal or metal-to-glass factory sealed joints and all internal joints to ensure proper gutter sysem and watertight construction.

6 All required supporting elements and their anchorage including without limitation all necessary inserts, supports, stiffeners, fasteners, brackets, secondary steel, anchors, clips, tie-backs, base plates drilling in Concrete and Block work etc and connection of same to the structure.

7 Including all shims, shimming and adjustment to achieve a fine and plumb installation in accordance with the specified tolerance of the structure and cladding installation.

8 All finishes are to be the colors and finishes as specified and approved by the Engineer-in-Charge

9 Providing of all temporary covers, coating and packing etc of protection of glass, aluminium and other items and removal of the same at the completion of package and as per the instruction of Engineer-in-Charge.

10 Erection of all exposed works in clean condition.

11 Welding at site and at the factory as required and prior approval of the Engineerin-Charge

12 Design and shop drawings, finishes, samples and visual mock-up for architectural approval.

13 On-site mock-up for testing and off-site mock-up for laboratory testing (if required).
14 Incorporation into façade for cleaning installations to aluminium glazed area in terms of tracks, anchor points davits etc.
15 Fixed / openable glazing unit including all fixtures, accessory gasket etc. required for glass installation as well all proprietary iron mongery and fittings.
16 Main Entrance toughened glass door inclusive of all gasketry, weather seals, door closers, iron monger and any necessary structural supports, including provison for slots / holes for security system.
17 All external fixed / openable windows and ventilators
18 Double scaffolding, transportation, off-loading of equipment and materials
19 All Aluminium grills, cut-outs, projections etc.
20 All fixing brackets, assemblies and attachments required for installation.
21 Cutting of holes in metal / aluminium panel for light fixtures, with sealing of such holes.

This scope of work to be read in conjunction with drawings.

Without restricting to the generality of the foregoing, the scope of works shall include:

1. Glazed Doors

- Manufacture, supply and install the glazed door system as per the specification and drawings
- All support steel / brackets / fasteners / inserts / welding / fixing
- All glass and glazing to meet design criteria specified to provide a complete water tight installation
- All necessary gaskets and weather seals
- All necessary chips, angles, support members, lintels, brackets etc required to support the door system
- All iron mongery, door closures, hinges, locks, safety devices etc as per the specification / approval of Engineer-in-Charge and iron mongery schedule including provision for slots and holes for the security system.

2. **Fixed / openable glazing unit including all fixtures, accessory, gaskets etc. required for glass installation as well all proprietary iron mongery and fittings.**
3. **Louvers :** Contractor shall ensure that all joint between panels are sealed and made weather tight

8.6 SPECIFICATIONS FOR ALUMINIUM CASEMENT WINDOWS AND VENTILATORS

1. The window shall be made out of extruded aluminium hollow sections as described in Schedule of Quantity
2. The corner joints shall be mechanical and the joining cleats shall be made out of aluminium extrusions with minimum 3 mm. except for the doors, where the angle cleats should be strong enough to take the load.

3. The openable windows shall be made of double weather stripped. One weather strip shall be provided in the outer frame and the outer in the shutter frame. The weather strip shall be good quality natural rubber and of the size to make the window completely weather tight. The peg stays shall be made out of aluminium extruded sections only.
4. The hinges of openable shutter shall be strong and made out of aluminium extruded sections and pin of hinges shall be non-corrective material preferably stainless steel. Alternatively the openable shutters shall be provided with 4 bar arm S.S. hinges.
5. The window shall be provided with handle for a single point locking. The handle shall be made out of 6 thick aluminium alloy flat.
6. The aluminium sections shall be as described in schedule of quantity.

8.7 ALUMINIUM DOORS

1. The cleats for mechanical horizontal/vertical joints of the fixed frame and shutters shall be of specially extruded aluminium sections so as to avoid any play between jointed members.
2. Single action doors shall be fixed by heavy duty aluminium hinges .
3. A) Single action doors shall be provided with overhead duty door closer of approved make.
4. B) Double action doors shall be provided with door springs of approved make.
5. The active leaf shall have unity lock and shall also.
6. Shutter shall be provided with PVC/Neoperence weather stripping.
7. Neoprene /PVC gasket shall be used in the glazing beads for shutter.
8. For fixed glazing the glass shall be encased in PVC channel so as to avoid metal to glass contact.

8.8. MODE OF MEASUREMENT FOR PAYMENT:

Doors, windows, ventilators, Louvers and Internal Glazed Aluminium Partitions/Glazed panels:

Measurement shall be in sqm indicated in schedule of quantity including glazing works. Measurement shall be for the over all areas of doors, windows etc. The overall surface area of the partition/glazed panels in elevation including the framework shall be considered for payment.

9. METAL WORKS

9.1 the following codes, standards and specifications are a part of This specification. All standards, specifications, codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions.

(a) IS:6248/1979 : Specification for metal rolling shutters and rolling grilles
(b) IS : 808 : Dimensions for Hot Rolled Steel sections

(c) IS : 814 : Covered Electrodes for Manual Metal Arc Welding of Carbon and Carbon Manganese Steel

(d) IS : 1161 : Steel Tubes for structural purposes

(e) IS : 1239 : Mild steel tubes, tubular and other Wrought steel fittings Part 1 - Mild steel tubes Part 2 - Mild steel Tubular and other wrought steel pipe fittings

(f) IS : 1363 : Hexagon Head Bolts, Screws and Nuts of product (Parts 1 to 3) Grade C (Size range M5 to M64)

(g) IS : 1367 : Technical Supply Conditions for Threaded Fasteners (All Parts)

(h) IS : 1395 : Low and Medium Alloy Steel Covered Electrodes for Manual Metal Arc Welding

(i) IS : 1852 : Rolling and Cutting Tolerances for Hot Rolled Steel Products

(j) IS : 1977 : Structural Steel (Ordinary Quality)

(k) IS : 2062 : Steel for General Structural Purposes

(l) IS : 3502 : Steel Chequered Plate

(m) IS : 3757 : High Strength Structural Bolts

(n) IS : 5369 : General Requirements for Plain Washers and Lock Washers

(o) IS : 5372 : Taper Washers for Channels

(p) IS : 5374 : Taper Washer for I Beams

(q) IS : 6610 : Heavy Washers for Steel

(r) IS : 8500 : Structural Steel-micro alloyed (medium and high strength qualities)

(s) IS : 800 : Code of Practice for General Construction in Steel

(t) IS : 801 : Code of practice for use of Cold formed light gauge steel structural members in general building construction

9.2 GENERAL

(a) The description of various items in this sub head of schedule of quantities are made brief and the rates of various items will include providing, fabricating, transporting, hoisting and fixing in position as required in the schedule of work and specifications and drawings. The rates will also include providing, within the rate quoted, necessary MS holdfasts, shop and site weldings, bolting or rivetted and trimming the welded joints and getting the approval Engineer-in-charge before application of shop paints.

(b) The rates shall include for hoisting and to place in position, double scaffolding and equipment etc. The rate shall include supplying and fixing of heavy quality SS Oxidised hardware fixtures and fittings, unless otherwise specified.

(c) All mild steel work are to be provided with one coat of zinc chromate primer and shall be painted with 3 coats of 1st quality synthetic enamel paints of

approved quality, shade and brand and rates shall include for the same unless otherwise specified.

(d) Only finished dimension shall be paid wherever applicable and the rate will include for all wastages, machining, additional welding etc. as required at site.

(e) Wherever directed, for channels, angles, plates, etc. lugs either 16mm dia MS or 12mm Tor Steel Bars. approximately 200 mm long., cut to shape, will have to be welded at approximately 1.00 metre c/c before, embedding in concrete.

(f) Weight of steel works in kilogram shall be worked out on the basis of standards weights of sections as per ISS. In case of doubts by the Bank, the contractor shall arrange for weighment without extra cost. No allowance will be made for welding and rolling margins.

(g) Necessary MS either butt type, cup and socket type or any other as detailed in relevant framings are to be provided for various items and the rates shall be inclusive of such special types of hinges.

(h) Necessary cutting of holes, chases, etc. in masonry or concrete for fixing the holdfasts of various item in this sub-section as also grouting such holes, chases etc. with CC:1:2:4 (1 cement : 2 coarse sand : 4 hard stone aggregate 12 and down gauge) and curing, etc. are deemed to have been included in the rates quoted.

(i) The rate quoted shall include for providing and fixing mild steel hinges of any description, locking and latching arrangement as detailed out in relevant drawings, handles, peg stays to shape and size, screws for fixing panels, dash fasteners and anchor bolts/clamps, coach screws for fixing the metal items to concrete or masonry including
grouting the same with CC 1:2:4 (1 cement : 2 coarse sand : 4 hard stone appropriate 12 and down gauge) as per directions.

(j) Contractor will have to prepare shop drawing for steel work without any charges and get the drawings approved before executing the same.

9.3 STRUCTURAL STEEL WORK: WELDED IN BUILT-UP SECTIONS FOR HAND RAIL USING M.S. TUBULAR PIPES AND G.I. PIPES, ROLLED STEEL BEAMS, JOISSTS, ANGLES ETC

9.3.1 General specifications to be same as for steel work welded in built-up section.

9.3.2 (a) The rolled iron steel beams and joists etc. shall be of the sections and sizes shown on the drawing or as may be ordered by the Engineer-in-charge. They shall be of the best quality and without any defects. They shall be tested to bear such weights as the Engineer may determine.

(b) All workmanship and finish shall be of the best quality and shall conform to the best approved method of fabrication. All materials shall be finished straight and shall be machined/ground smooth true and square where so specified. All holes and edges shall be free of burns. Shearing and chipping shall

be neatly and accurately done and all portions of work exposed to view shall be neatly finished. Unless otherwise directed/ approved, reference may be made to relevant IS codes for providing standard fabrication tolerance. (c)

The rate for the rolled iron steel beam shall include the cost of beams that of approved welding, that of drilling holes for bolts and nuts, required for fixing the plate below and above together with the cost of testing the beam after or before being welded as the Engineer-in-charge may direct and placing them in their position and painting them 3 coats in synthetic enamel paint in any approved tint, one coat being zinc chromate primer. The work as fixed in place shall be measured and their weight calculated on the basis of standard tables as per IS for the rolled built up sections viz. beam, joists, columns, Angles, Chequred plates, & Tubular sections etc. Rate quoted shall include of bolts, nuts, screws, washers, studs, cleats, welding, anchor bolts, grouting & finishing, painting.

9.4 STAINLESS STEEL HAND RAIL

i) Providing, fabricating and fixing in position factory made stainless steel section/pipes and connecting plates, of Grade S.S 304 (SS 316 Grade shall be used for exterior applications) and of required diameter & thickness as per drawings and approval of the Engineer-in-charge and details, at the junctions of doors, on walls, other locations as directed etc. including cutting, grinding, bending to required profile and shape, finish, hoisting, buffing and polishing, cutting chase / embedding in RCC / Masonry, fixing using stainless steel screws, nuts, bolts and washers or stainless steel fasteners as required to make it rigidly fixed & stable and making good the plaster/ flooring etc. all complete, at all floors and all levels as directed by the Engineer-in – Charge. Prototype samples to be approved by Engineer-in-charge before mass fabrication.

ii) Rate includes cost of all inputs of materials, labour, T&P, etc. involved in the work and all incidental charges to execute this item.

iii) Measurement of Hand Rail of Stainless steel / mild steel Tubular Pipes: The work as fixed in place shall be measured in running metres correct to a centimetre.

9.5 ROLLING SHUTTER.

(i) Rolling shutters shall be of an approved manufacture, conforming to the requirements specified in IS: 6248

(ii) The type of rolling shutter viz. self-coiling type (manual) for clear areas up to 12 sq.m with ball bearings (minimum 4nos.), gear operated type (mechanical) for clear areas upto 35 sq.m and electrically operated type for areas upto 50 sq.m shall be as specified in the respective items of work. Mechanical type of rolling shutters shall be suitable for operation from both inside and outside with the crank handle or chain gear operating mechanism duly considering the size of wall/column. Electrical type of rolling shutter shall also be provided with a facility for emergency mechanical operation.

(iii) Rolling shutters shall be supplied duly considering the type, specified clear width/height of the opening and the location of fixing as indicated in the drawings.

(iv)Shutters shall be built-up of interlocking laths 80mm width between rolling centres formed from cold rolled steel strips. The thickness of the steel strip shall not be less than 1.20 mm Each lath section shall be continuous single piece without any welded joint.

(v) Rolling shutters shall be provided with a central hasp and staple safety device in addition to one pair of lever locks and sliding locks at the ends. Hood covers shall be of mild steel sheets not less than 1.2mm thick and of approved shape

(6) The guide channels out of mild steel sheets of thickness not less than 3.15 mm shall be of either rolled, pressed or built up construction. The channel shall be of size as stipulated in IS: 6248 for various clear width of the shutters. Guide channels shall be installed truly plumb at the specified location. Bracket plate shall be rigidly fixed with necessary bolts and holdfasts. Workmanship of erection shall ensure strength and rigidity of rolling shutter for trouble free and smooth operation.

10. FALSE CEILING, WALL CLADDING, PARTITIONS AND ACOUSTIC INSULATION WORKS

FALSE CEILING:

10.1 GENERAL

Modular and acoustical false ceiling shall be provided and installed in all areas as per drawings. All ceilings in the office areas, pantry and all service areas shall be openable. A Combination of fixed board ceiling and openable tiles is used in the interiors for visual effect as long as the majority of the ceiling is openable.

Modular acoustical tile ceilings with high reflectivity of light and recessed grid is to be provided meeting with the international standards.

False ceiling shall be coordinated with the services to achieve maximum height from the finished floor level in the office areas with cove lighting.

The false ceiling material shall be of calcium silicate board, metal, acoustic modular tiles or mineral fibre ceiling tiles. The technical assistance and guidance is to be taken from the respective approved manufacturers and work shall be done strictly according to the manufacturers specifications and manuals. Material from original source shall only be used.

A sample of each finish shall be got approved from Engineer-in-charge before proceeding for bulk production. GI framing shall be erected as per recommendation of the manufacturer specification and approval of Engineer-in-charge.

No sagging, unleveled stretch of work or chipped tiles shall be accepted. Contractor shall take full responsibility for its firmness with the structure.

The false ceiling comprises of calcium silicate board, Acoustical Ceiling Tiles and Metallic Tiles. The Gypsum board false ceiling is to be in different shapes. Such as Vaults, Coffers, cove's and Plain in unison with Acoustical Ceiling Tiles and Metallic Tiles Ceiling. The technical assistance and guidance is to be taken from manufacturers and work has to be done according to the manufacturer's specifications and manuals. A sample of each finish shall be got approved before proceeding for bulk production. GI framing shall be erected as per recommendation of the manufacturer specification and approval of the Engineer-incharge. The work shall be taken up only when specialized agency is approved in writing by Engineer-in-charge.

False ceiling work shall be carried out in accordance with the actual site conditions at different /split-levels. Any sagging, unleveled stretch of work shall be redone /replaced and made good, at no extra charge, to the satisfaction of Engineer-in-charge. No compensation shall be paid on account of provision /coverage of openings for lighting fixtures, airconditioning ducts and the likes as detailed in drawings and /or directed.

The CONTRACTOR shall ensure that the frame to support the ceiling is designed for structural strength and the sizes, weight and strength of false ceiling panels to be fixed and other loads due to live load, air conditioning ducts, grills, electrical cables /wiring and lighting fixtures, thermal insulation etc. as shown on the drawings. The CONTRACTOR shall also submit a detailed drawing to show the grid work, sizes of grid members, method of suspension, position of openings for air-conditioning and lighting, access doors, etc. The false ceiling grid work shall be carried out as per the approved drawings.

FINISH: It is essential that the false ceiling work should be firm and in perfect lines and levels and free from distortion, warp, bulge and other defects. All defective sheets and other materials shall be removed from site immediately and replaced, and ceiling restored to original finish to the satisfaction of the Engineer-in-charge. The workmanship is expected to be of highest quality. The joints for the fame work of grid type ceiling shall be of interlocking type so that when the cross member is in place, it cannot be lifted out.

The quoted rates shall include supply, delivery and erection of all materials for covering the ceiling, frame work, suspenders or hangers and their anchoring system making openings, supporting the main members on masonry walls, beams, leveling and painting, including preparing of detailed false ceiling drawings. Nothing extra shall be payable for modification that may be required at site.

Since the work of false ceiling interconnected with the work of air –conditioning ducts and lighting, and services contractor shall provide necessary openings in the false ceiling work for air conditioning, lighting and other fixtures. Additional framing and hangers where required or as directed by the Engineer-in-charge for the above openings /fixtures shall also be provided at no extra cost to the Bank.

Removable or hinged type inspection or access trap doors shall be provided at locations specified by the Engineer-in-charge.

10.2 FALSE CEILING WITH CALCIUM SILICATE BOARD

10.2.1 SCOPE OF WORK:

"The work envisaged under these specifications refers to supplying and fixing in position false ceiling at any floor, any location and at any height as per drawings.

10.2.2 MATERIAL:

"The plain CALCIUM SILICATE board shall be of the thickness as mentioned in the relevant items of the Schedule of quantities and the size of panels and the arrangement of panels etc. for different area of the building shall be as indicated by the Engineer-in-charge. CALCIUM SILICATE board shall be of approved quality and shall be free from cracks, bends and other defects. Samples of materials to be used on the work shall first be furnished by the contractor and got approved by the Engineer-in-charge. All materials which are used in the works shall strictly conform to the samples, other-wise the materials shall be summarily rejected"

10.2.3 ERECTION:

The plain CALCIUM SILICATE board sheets when brought to site shall be stacked carefully on floor over wooden sleeper supports. The boards shall be cut to required sizes either by sawing or by score and snap method. The edges shall be smoothened by wood rasp file or with emery paper. Wherever required the edges of each panel may require beveling which also shall be done carefully to the correct line and dimensions. The CALCIUM SILICATE board sheets shall be fixed to ridge frames either wooden or metallic as mentioned in the item description. In case of metallic frame, the CALCIUM SILICATE boards are held to the frame by means of self-tapping screws or by the ordinary machine screws and nuts, as directed by the Engineer-in-charge. Teak wood or aluminium beadings if required to be fixed shall be as mentioned in the item description and shall be carried out in best workman-like manner. Any other treatment for finishing such as gluing of wall papers, cement or oil based paint etc. shall be as specified in the item description and shall be done as per relevant specifications.

10.2.4 MODE OF MEASUREMENT:

Unless otherwise mentioned, the wooden or metallic-frame work shall not be separately measured for. The CALCIUM SILICATE board false ceiling shall be measured in square meters as actually laid over the frame work. The area being worked out correct to two places of decimal with length and breadth measured correct to a centimeter. The rates shall include the cost of all materials, metallic frame work all the required hardware, etc. labor, scaffolding etc. as mentioned above and in Item description, unless otherwise specified. Rate shall include for vertical drops, cove if any only horizontal (plan area) measured for payment.

10.2.5 CALCIUM SILICATE BOARD MASKING ETC. WITH GI PRESSED FRAME WORK:

10.2.5.1 The work covered by these specifications shall consist of furnishing all labour, materials and equipment necessary for installation of the suspended false ceiling and vertical masking, with CALCIUM SILICATE board on pressed galvanized sheet steel frame work, inter locking, G.I. frame work suspended by adjustable GI. suspenders with necessary cut outs in the CALCIUM SILICATE board for lighting fixtures, trap doors, A.C. grills& diffusers etc., erecting to proper line and level in the specified areas, and levels as indicated in the drawing and as directed by the Engineer-in-charge.

10.2.5.2 MATERIALS:

All materials which are to be used in work shall be got approval prior to bulk procurement. Fabrication of Pressed Galvanized steel sheet Frame: The frame work for false ceiling shall be made out of tested specially made from GI of specified gauge as per schedule, accurately formed and die cuts with identical ends in automatic machine with precision tools. All workmanship shall be best quality as followed in a modern sheet metal shops equipped with all machines such as press, dies, spot welding machine, baking oven etc. All materials shall be done by a process approved by the Engineer-in-charge and in a manner that will not damage the materials. All work shall be accurately formed to the required dimensions, true to line, level and plane in all directions and properly sized to suit the exact dimension within permissible tolerances. Twisted or bent sections shall not be permitted to be used on work. Main runners and cross members shall be of sizes as specified in the schedule/shown in the drawing. The main runners shall be slotted for cross runners and punched for hangers/suspenders cross runners shall have identified die formed ends accurately cut for easy, correct and proper fit assembly. Shearing, cropping shall be clean, reasonably square and free from distortion. Surfaces and joints to be welded shall be free from loose scale, slag, rust, grease, paint and any other foreign materials. The surface shall be wire brushed vigorously. Welding sequence shall be followed to avoid needless distortion and minimize shrinkage stresses. Holes to be made in pressed M.S. sheet shall not be made by flame cutting.

The flame cut or unfair holes are not acceptable connection of supported members with erection clearance for all members. Where for practical reasons greater clearance is necessary, suitable designed seating should be provided. Any damages done to the walls/ceiling shall be reinstated to original condition. The contractor shall not be entitled for any extra cost on this account.

10.2.5.3 Suspended GI pressed sections Grid system:- GI pressed sections grid system shall be of CALCIUM SILICATE board approved standard suspended G.I.

grid system. The suspended ceiling grid shall be of self-interlocking for main runners and cross runners of specified section and pattern as required to suit the span as per drawing.

10.2.6 Calcium Silicate Board Sheets

The CALCIUM SILICATE board sheets of approved make shall be plain and of specified thickness, approved best quality and shall conform in all respect to the relevant Indian Standard Specifications. The sheets shall be free from cracks, chipped edges or corners, twist dents, rough patches and other damages etc. The CALCIUM SILICATE board sheets shall be approved manufacturer.

10.2.7 All Galvanized Steel Sheet/Components

All the components used in this works shall conform to relevant specification mentioned in the respective item of schedule of quantity.

10.2.8 Fastening

All bolts, nuts, screws, fittings & fixtures shall be of best quality and of approved manufacture.

10.2.9 FIXING:

The contractor shall take all necessary field measurements before the commencement of the frame work to ensure proper fittings of the work to actual condition of work at site. Particular care should be taken to examine the positions of all recessed lighting, trap doors and other openings indicated on drawings or as directed by the Engineer-in-charge.. The correct panel sizes shall be decided to suit each location. The false ceiling levels shall then be marked on walls. Mark the position of the runners to suit the span of the area. Fix up the wall angles with approved metal fasteners and level then correctly. The position of suspender shall then be marked on the R.C. slab as per the sizes of the panels decided for each area with due consideration to location of air-conditioning ducts, grills& diffusers etc. Suspenders of type and design fabricated as per drawing and approved by the Engineer-in-charge., shall then be securely fixed at correct points with approved metal fasteners/expansion bolts of specified dia., as per manufacturers specifications. It shall be ensured that the hanger/suspender shall remain perpendicular and not pulled by the suspension system to any side. Fix up the runner to the suspenders and lock up the runners at the joints, complete the leveling starting from the fixed points and proceed towards the other end. Fix up the cross tees/channels to every runner joints to have stability while leveling. Approved CALCIUM SILICATE board/sheets cut to correct sizes shall then be placed on the runner, starting from the centre of the width and work side wards. Connect all cross tees and put on the approved spring type hold down clip/pins as per drawing. Holes if required to be provided in CALCIUM SILICATE board

sheets shall be drilled and on no account holes shall be punched. Lock the runner tees and tiles with hold down clips/pins as required. Wherever grouting for frame work, suspenders etc. is required to be done in masonry walls columns/beams etc., the same shall be done after the entire frame work is properly levelled.

The contractor shall take into consideration all wastage in the CALCIUM SILICATE board. Sheets, grid system frame work/pressed steel frame work, G.I. suspenders, screws, nuts, bolts, washers etc. required for fixing CALCIUM SILICATE board. Sheet false ceiling and vertical masking while quoting his rates. CALCIUM SILICATE board sheet false ceiling and vertical masking shall be fixed to pressed steel frame grid system by means of spring clip (brass counter sunk machine screws in case of masking of approved size, make and at approved spacing or as shown in drawing or as instructed. After fixing the CALCIUM SILICATE board sheets, all holes of screws etc. shall be filled with approved putty, levelled with the CALCIUM SILICATE board sheets and sand papered, so that no sign of screw is visible on the. For all the sheets false ceiling and vertical masking work, the sheet of required size and shape shall be cut as per approved panel size shown in drawing and fixed on pressed steel frame in the best workman like manner.

Trap doors/lighting recesses/troughs of approved size and shape with approved matching work, shall be provided in the false ceiling and vertical masking at the specified places.

Any damage done to the walls/columns/ceilings/plasters/floors etc. shall be made good to the original condition at his own cost. The contractor shall not be entitled for any extra cost on this account. During the execution of this work, the contractor shall take all the precautions to prevent damage to the painted surface, plaster, floor tiles, doors etc. Contractor should specifically note that the area where the false ceiling is required to be provided will be in advance stage of completion with various finishing items such as painting, floor polishing etc. Any damage to these finishes will have to be made good by him at no extra cost to the Department.

10.2.10 SAFETY PRECAUTIONS:

No person other than workman employed by the false ceiling contractor shall be permitted access to any area over which the sheeting is being laid. The contractor should take protective measures during the progress of work. Cat ladders or roof boards, scaffolding etc. should invariably be used by men working on the roof/false ceiling/masking etc.

10.2.11 WORK TO INCLUDE:

Cost of all approved CALCIUM SILICATE board sheets with /pressed G.I. steel frame work, adjustable M.S. suspenders M.S. cleats, nuts, bolts, washers,

screws, all labour, materials, tools, plants, approval scaffoldings, providing M.S. cleats and fixing them with metal fasteners/expansion bolts, nuts, washers , screws etc. to the concrete/wall surfaces and then fixing the adjustable suspenders in m. s. clamps, painting two coats of synthetic enamel paint on m.s. work as directed/as shown in drawing.

10.2.12 MODE OF MEASUREMENT:

CALCIUM SILICATE Sheet false ceiling with snap grid pressed steel internal grid system frame work completed and accepted as per above specifications shall be measured in square meter up to two places of decimals. The line measurements shall be taken up to two places of decimal of a meter. The width shall be measured, from wall angle to wall angle and length shall be measured as per actual. Areas of trap doors, lighting troughs, air conditioning diffusers, grills and other openings shall be deducted and net areas of false ceiling so computed shall be paid for unless otherwise specified. Areas of false ceiling with additional horizontal M.S. angle supports as per relevant drawing shall be measured separately between such additional supports. Mode of measurement for this item shall also be in square meter as described above.

The Plan area of false ceiling shall be measured and paid at the unit rate less deduction, if any. Openings in false ceiling which are less than 0.2 sq.m. in area shall not be deducted for the purpose of payment. Rate shall also include for vertical drops, cove if any of false ceiling only horizontal (plan area) measured for payment.

10.2.13 LIGHTING TROUGHS / FIXTURES

Opening to made in CALCIUM SILICATE board for lighting fixture, AC grills, diffusers etc along with GI sheet metal frame work at periphery.

10.2.14 TRAPDOORS:

The materials viz. M.S. frame, aluminium frame and CALCIUM SILICATE board of 12 mm and 12mm thick marine plywood sheet of approved make and fabrications shall conform to the relevant specification given in this tender. The trap doors shall be fixed in position with necessary M.S. angle frame out of M.S. angle of size 40 x 40x 6mm. for the shutter and fixed to M.S. wall angle of size 40 x 25 x 6 mm. which is to be fixed by means of 40 x 25 x6 mm. M.S. angle cleats, fixed to wall by means of M.S. hold fasts out of M.S. flats of size 40 x 6mm., 150 mm. long and grouted with cement concrete 1:2:4 in case of brick wall and with 100 mm. long M.S. coach screws and rawl plugs in case R.C. columns etc. M.S. angle of size 40 x 25 x 5 mm. shall be provided for receiving the lever of the locking arrangement. This angle shall be supported by 40 x 6 mm. M.S. flat suspenders from ceiling fixed with 3/8"diameter metal fasteners/expansion bolts. This angle, meant to receive the lever of the lock, shall be supported by two numbers of M.S. angle of size 40 x 25 x 5 mm. on either side. The two angles

also shall be provided with M.S .flat (40 x 6 mm.) suspenders @ 800 mm. centers at all other convenient spacing as per drawing and as approved by the Engineer-in-charge. Sample of trap doors of single, double and multi panels shall be fabricated and fixed in position and got approved before taking up fabrication of trap doors on large scale. All the exposed surfaces of M.S. work including the suspenders shall be painted with two coats of synthetic enamel paint of approved make and shade over a coat of approved primer.

10.2.14.1 MODE OF MEASUREMENT:

"The area of trap door visible from underside of the false ceiling only shall be measured in square meters.

10.2.15 STORING OF CALCIUM SILICATE BOARDS

These boards shall be stored flat in a covered clean and dry place. Different sizes and types of each of these boards shall be stacked separately.

The board shall be stacked on a flat platform on which a wooden frame shall be constructed with 50 mm x 25 mm battens in such a way that it will give support to all four edges and corners of the boards with intermediate battens placed at suitable intervals to avoid warping.

The boards shall be stacked in a solid block in a clear vertical alignment. The top sheet of each stack shall be suitably weighed down to prevent warping wherever necessary.

The boards shall be unloaded and stacked with utmost care avoiding damage to the corners and surface. In case of decorative plywood and decorative boards, the surfaces of which are likely to get damaged by dragging one sheet over another it is advisable that these are lifted as far as possible in pairs facing each other.

10.3 MODULAR /GRID TYPE CEILING WITH MINERAL FIBRE TILES

a) The mineral fibre tiles and insulation shall be procured from an approved manufacturer as per the list of Approved makes.

b) The tiles and the suspension system shall be as specified in the item nomenclature. The Contractor shall prepare the shop drawings for the False Ceiling based on actual measurements at site and based on the Engineer-in-charge architectural drawings, clearly indicating the typical panel as well as edge panel on all sides with details to adjust the minor variations in orthogonality. Also, junction details with different types of false ceiling materials shall be prepared and submitted for the approval of the Engineer-in charge before execution.

c) The false ceiling shall be perfectly level after installation. The Contractor shall then prepare the mock-up at site for approval of material and quality of

workmanship by the Engineer-in-charge. Only after the approval of Mock-up, the Contractor shall start the mass work.

d) The mineral fibre tiles (straight edge type) shall be of size 600x600 mm as per architectural drawings and as per the site requirements and shall be of the texture and physical & other characteristics as per approved brand. The tiles shall have sound absorption, sound attenuation, humidity resistance, impact resistance and fire resistance as specified as per the manufacturer's specifications. The thickness of the tiles shall not be less than 15mm.The tiles shall have light reflectance, thermal conductivity humidity resistance Relative Humidity and sound absorption (Noise Reduction Co-efficient) with sound attenuation as per the item description. The weight shall not be less than 3.5 kg per sqm without grid. The contractor shall obtain and submit to the Department the manufacturer's certificate for compliance of the mineral fibre tiles & the suspension system as per the manufacturer's specifications and also copy of the manufacturer's test report for the record.

e) The tiles shall be made of non -combustible bio-soluble wool and shall have finely granulated surface texture with virtually invisible micro-perforations as specified & as required for its performance. It shall meet the various performance parameters like aesthetics, acoustics (sound absorption), hygiene, humidity resistance, impact resistance, fire resistance, durability etc.

g) The tiles shall have precisely machined edges including edge treatment required for the installation depending on the type of suspension system grid and manufacture as approved by the Engineer-in-charge and as per the Engineer-in-charge architectural drawings. The openings of required size for light fittings, fire detection devices, sprinklers, AC diffusers etc. shall be suitably made in the tiles by cutting in an approved and workmanlike manner. For the purpose of measurement, no deduction shall be made in the area of false ceiling on this account. Also, nothing extra shall be payable on this account. The end tiles shall be cut to the required size in a workmanlike manner as per the site requirement. Nothing extra shall be payable on account of any wastage in the material and /or account of providing grid at closure spacing than 600mm c/c.

h) These tiles shall be fixed on to coordinated suspension ceiling system with supporting grids system that fully integrates with the ceiling tiles. It shall be ensured that the suspension system shall be suitable to take all the incidental and dead loads and other authorized loads efficiently and shall not sag .The permissible sag shall be as per the British Standards BS 8290 - 1991. The Contractor shall provide a guarantee for 10 years against sag on account of defective material and / or workmanship.

The suspension system shall consist of hangers, main runners, cross tees, perimeter trims, wall connectors etc. The hangers shall be securely fixed to the structural soffits / slab / beams at spacing not more than 1200mm centre to centre by using electroplated Galvanized M.S anchor fasteners of 6 mm (minimum) diameter of approved make and of adequate capacity to carry the design loads.

The main runners shall be fixed at spacing not more than 600mm centre to centre. The last hanger at the end of each main runner shall not be placed more than 450 mm from the adjacent walls. Additional hangers shall be placed at a distance not more than 150 mm from the joint in the main runner on either side. The cross tees 600 mm long shall be centrally inter-locked between main runners to form 600 X 600 mm modules. The main runners shall have central notches to accommodate mitred joint of 600 mm long cross tees. Additional runners and hangers shall be provided where change of direction is required as per the site conditions. All the hangers, runners, tees, cleats, brackets etc. required for fixing the false ceiling suspension system shall be of anti-corrosive hot dipped galvanized M.S sections with zinc coating not less than 80 gms per sqm. and shall be as per BS 2989. The Galvanized M.S runners, cross tees, perimeter trims/ edge profile etc. shall be powder/coil coated (the coating as per the manufacturer's specifications) matt finished, of required colour and shade. The cross tees shall be connected to the main runner by stab and hook type (clip in) installation. The runners and cross tees shall have mechanical stitching for enhanced torsional resistance and shall have mitred inter-section. Further, the grid system with main runners and the cross tees shall have 15 mm wide flanges with a 6 mm central recess with reveal profile, with approved as approved by the Engineer-in-charge. The hangers shall be mechanically pre-straightened and shall not be less than 4 mm diameter and of lengths as required for keeping minimum plenum depth as per the Engineer-in-charge architectural drawings. It shall be suitably cut / tied off. The stainless steel level adjuster clips (spring steel, butter fly clips having suitable number and diameter of machine punched holes and bent to required profile) shall be provided on the hangers to achieve the level ceiling. The suspension hangers shall be vertical or near to vertical as far as possible. The hangers shall be suitably designed not to have distributed load more than 12.5 kg. per sqm. and shall have capacity to take incidental loads of fixtures, suspended signages etc. within the tolerance limit of deflection as specified in BS 8290. Increased load if any, may be accommodated by providing additional hangers.

i) The contractor shall ensure that the grid system is designed and installed to carry all incidental loads and no other unauthorized load shall be transferred to this system. The luminaries, air grills / diffusers, signages etc. shall be as far as possible independently supported to avoid any over loading of the ceiling system which may result in excessive deflection or twisting of grids. Any strengthening of grid system by providing additional hangers, fasteners, runners, cross tees etc. or providing additional bracing may be carried out as required for any specific locations or for specific purpose for which nothing extra shall be payable. Perimeter trims / edge profiles of required size and shape, powder/coil coated to required colour and shade, shall be installed at the suspension grid perimeter to completely enclose the ceiling and shall be properly secured to the walls at not

more than 450 mm centre to centre using stainless steel screws and PVC sleeves. It shall be neatly jointed at all external and internal angles and over lap sections in a workman like manner with mitred joints.

j) The main runners and the cross tees shall be 15mm x 8mm x 42 mm roll formed from G.I sheets (0.35 mm thick for main runners and 0.33 mm thick for cross tees), powder/coil coated with 6 mm wide reveal profile. The main runners and the cross tees shall not be fixed to the edge profile/ wall moulding and should only rest on the edge profile/ wall moulding. The edge moulding shall be 19 x 7 x 14mm roll-formed from 0.35 mm thick G.I sheet powder/coil coated on the exposed face to the matching colour and the shade.

k) The ceiling should be set out such that the perimeter boards or tiles are in excess of half a module so that the edge panels on both the sides are of equal sizes as far as possible. The tiles shall be cut to required size and shape with rebates as specified using hand tools or mechanically operated tools in a workman like manner but with all precautions as per the manufacturer's specifications regarding generation of dust and ventilation.

l) The entire installation shall have minimum half an hour fire rating and integrity as specified as per BS 476.

m) The contractor shall ensure that the material is procured and delivered at installation site without any damage. Adequate care shall be taken before installation as well as afterwards till handing over the building for occupation. It shall be protected from rains, excessive humidity, chemical fumes, vibrations, dust etc. The contractor shall ensure careful handling and storage and prevent any rough handling, rolling of cartons or dropping cartons to prevent any edge damage or breakage. Any tile with edge damaged or crack etc. shall not be allowed to be used in the work and shall be replaced by the contractor at his own cost. Similarly, adequate care shall be taken by the contractor while placing or removing and handling the tiles so as not to cause any damage. Also, the contractor shall direct his interior contractors to take adequate precautions to prevent the tiles from any dirt, fingerprints, any other marks / splashes etc. The ceiling shall not be wet cleaned. Abrasive cleaners shall not be used to clean the marks.

n) The rate for the item of false ceiling includes cost of all inputs of labour, materials, wastage if any, T&P, scaffolding, staging or any other temporary enabling structure / services etc. and all other incidental charges including making necessary cut outs for A.C diffusers, Light fittings, grills, Fire detection, alarm, sprinklers devices and fittings etc. Nothing extra shall be payable for making the openings. Also nothing extra shall be payable on account of any wastage in materials. Also nothing extra shall be payable on account of any strengthening of the supporting suspension system for the false ceiling, around the openings in the false ceiling by using additional hangers, fasteners, runners, cross tees, etc.. However, for the purpose of payment only the actual area of the false ceiling shall

be measured in sq.m. The Tile & Grid system used together of all sizes should carry a 15 year warranty.

10.4 GYPSUM LIGHT WEIGHT PLASTER

10.4.1 Scaffolding

For all other work in building, single scaffolding shall be permitted. In such cases, the inner end of the horizontal scaffolding pole shall rest in a hole provided only in the header course for the purpose. Only one header for each pole shall be left out. Such holes for scaffolding shall, however, not be allowed in pillars/columns less than one metre in width, or immediately near the skew backs of arches. The holes left in masonry works for scaffolding purposes shall be filled and made good before plastering.

Note : In case of special type of work, scaffolding shall be got approved from Engineer-in-charge in advance.

10.4.2 Preparation of Surface

The joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scrapping. The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced.

Particles cleaned off and care shall be taken that none of the retarders In case of concrete surface if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose is left on the surface.

10.4.3 Materials

10.4.3.1 Premixed light weight plasters essentially consist of retarded hemihydrate gypsum plaster and light weight aggregate which are characterized by low density, high thermal insulation and sound absorption properties. Other additions may be incorporated to impart desired properties. The physical and chemical requirements shall conform to IS 2547
(Pt. II).

10.4.3.2 The minimum recommended water-premixed plaster ratio is 1:2 as per standard practice or as recommended by the manufacturers.

10.4.4 Application of Gypsum Plaster

Ceiling plaster shall be completed before commencement of wall plaster. Plastering shall be started from the top and worked down towards the floor. All putlog holes shall be properly filled in advance of the plastering as the scaffolding is being taken down. To ensure
even thickness and a true surface, plaster about 15 × 15 cm shall be first applied, horizontally and vertically, at not more than 2 metres intervals over the entire surface to serve as gauges. The surfaces of these gauged areas shall be truly in the plane of the finished plaster surface. The mortar shall then be laid on the wall, between the gauges with trowel. The mortar shall be applied in a uniform surface

slightly more than the specified thickness. This shall be brought to a true surface, by working a wooden straight edge reaching across the gauges, with small upward and sideways movements at a time. Finally the surface shall be finished off true with trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive troweling or over working the float shall be avoided.

All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arrises, provision of grooves at junctions etc. where required shall be done without any extra payment. Such rounding, chamfering or grooving shall be carried out with proper templates or battens to the sizes required.

When suspending work at the end of the day, the plaster shall be left, cut clean to line both horizontally and vertically. When recommencing the plastering, the edge of the old work shall be scrapped cleaned and wetted with cement slurry before plaster is applied to the adjacent areas, to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of wall and not nearer than 15 cm to any corners or arises. It shall not be closed on the body of the features such as plasters, bands and cornices, nor at the corners of arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakages. The plastering and finishing shall be completed within half an hour of adding water to the dry mortar.

No portion of the surface shall be left out initially to be patched up later on. The plastering and finishing shall be completed within half an hour of adding water to the dry mortar.

10.4.5 Thickness

Where the thickness required, as per description of the item is 12 mm, the average thickness of the plaster shall not be less than 12 mm whether wall treated is of block/RCC work.

10.4.6 Finish

The Gypsum plaster shall be finished to a true and plumb surface and to the proper degree of smoothness as required. The work shall be tested frequently as the work proceeds with a true straight edge not less than 2.5 m long and with plumb bobs. All horizontal lines and surfaces shall be tested with a level and all jambs and corners with a plumb bob as the work proceeds.

10.4.7 Measurement

i) Length and breadth shall be measured correct to a cm and its area shall be calculated in square metres correct to two places of decimal.

ii) Thickness of the gypsum plaster shall be exclusive of the thickness of the key i.e. grooves, or open joints in block work.

iii) The measurement of gypsum plaster shall be taken between the walls or partitions (the dimensions before the plaster shall be taken) for the length and from the top of the floor or skirting to the ceiling for the height. Depth of coves or cornices if any shall be deducted iv) The following shall be measured separately from gypsum plaster.

a) Cornice beadings and architraves or architraves moulded wholly in plaster.

b) Circular work not exceeding 6 m in radius.

v) Gypsum Plaster over masonry pilasters will be measured and paid for as gypsum plaster only.

vi) A coefficient of 1.63 shall be adopted for the measurement of one side plastering on honey comb work having 6 x 10 cm. opening. vii)

Moulded cornices and coves.

a) Length shall be measured at the centre of the girth.

b) Moulded cornices and coves shall be given in square metres the area being arrived at by multiplying length by the girth.

c) Flat or weathered top to cornices when exceeding 15 cm in width shall not be included in the girth but measured with the general plaster work.

d) Cornices which are curved in their length shall be measured separately.

viii) Deductions in measurements, for opening etc. will be regulated as follows:

a) No deduction will be made for openings or ends of joists, beams, posts, girders, steps etc. up to 0.5 sqm in area and no additions shall be made either, for the jambs, soffits and sills of such openings. The above procedure will apply to both faces of wall.

b) Deduction for opening exceeding 0.5 sqm but not exceeding 3 sqm each shall be made for reveals, jambs, soffits sills, sills, etc. of these openings.

i) When both faces of walls are plastered with same plaster, deductions shall be made for one face only.

ii) When two faces of walls are plastered with different types of plaster or if one face is plastered and other is pointed or one face is plastered and other is unplastered, deduction shall be made from the plaster or pointing on the side of the frame for the doors, windows etc. on which width of reveals is less than that on the other side but no deduction shall be made on the other side.

Where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of plaster and/or pointing as the case may be.

iii) For opening having door frame equal to or projecting beyond thickness of wall, full deduction for opening shall be made from each plastered face of wall.

c) For opening exceeding 3 sqm in area, deduction will be made in the measurements
for the full opening of the wall treatment on both faces, while at the same time, jambs, sills and soffits will be measured for payment.
In measuring jambs, sills and soffits, deduction shall not be made for the area in contact with the frame of doors, windows etc.

10.4.8 Rate

Rate shall include the cost of all labour & material involved in all the operations described above.

10.5 PARTITION WALLS

10.5.1 GENERAL

The Partition Wall system shall be self-supporting and be able to clip on to the ceiling system. The insulation material inside the wall should provide an acoustical value of 35-40 db inside the offices. Wherever low height partitions are required as per design drawing these shall also be internally insulated as specified.

All Internal walls would have a continuous and strong horizontal framing at 2 meter height or as per Architectural drawing from the floor and vertical framing inside GI frame at 300mm interval or as per Engineer-in-charge to allow pictures and white boards to be hung. All walls would be finished with a 75mm high skirting or as specified at the junction with the floor made up of wood, MDF & veneer combination or as specified in the drawing.

The partitions of overall thickness 100 mm thick with acoustic insulation are being considered in view of higher heights at Ground floor level. This should confirm to BS 5234. The stability and adequacy for supporting the single/double height partitions shall be the responsibility of contractor. 50mm glass wool of minimum density 32Kg/m3 or as specified shall be placed in the cavity. The dimensions given here are broadly indicative and those specified in the item of schedule will be taken as final.

10.5.2 Materials

(a) Tapered edge calcium silicate board

Tapered Edge Calcium Silicate Board are manufactured from Siliceous and Calcareous materials reinforced with fibers. The boards are made in a laminar process and then autoclaved to give a stable crystalline structure. It is lightweight and can be fixed to either side of timber, aluminum or lightweight galvanized metal sections. The partitions are nonload bearing and can easily be assembled at site.

(b) The G.I. frame and board partitions shall be fixed as per nomenclature of the item and directions of Engineer-in-charge.

10.5.3 Jointing & Finishing

Joints of the boards are finished with specially formulated Jointing compound and fibre tape to provide seamless finish. Board surface can be decorated with any type of paint, wall paper, wood veneer & hard laminates. Services should be incorporated before commencement of board fixing.

10.5.4 Fitting and Fixtures

It is easy and simple to attach different fittings to wall panelling boards. Inclined nails can be fixed to the boards itself for light materials. For heavier materials the fastening should be centered on internal stud work or steel or wood frame behind the boards, fixed before boarding. Services should be incorporated before commencement of board fixing.

10.5.5 Tolerance: Tolerance in dimensions shall be ± 5 mm.

10.5.6 Measurements

(a) Length and breadth of superficial area of the finished work shall be measured correct to a cm. Area shall be calculated in square meter correct to two places of decimal. No deduction will be made of openings of areas upto 0.40 sqm nor shall extra payment be made either for any extra material or labour involved in forming such openings.

(b) For openings exceeding 0.40 sqm. in area, deduction in measurements shall be made but extra will be payable for any extra material or labour involved in making such openings.

(c) The rate shall include the cost of all materials and labour involved in all the operations described above including all scaffolding, staging etc.

10.6 ACOUSTIC TREATMENT

10.6.1 RESIN BONDED GLASS WOOL.

1. Chemical stability – Chemically inert.
2. Application should not cause or accelerate corrosion. Should rot proof.
3. Fire safety – Non – Combustible in accordance with BS 476 Part 4, 1970.
4. Biological – Inorganic, should not encourage growth of fungi and vermin .
5. Vibration & jolting resistance – conform to BS 2972.
6. Moisture content – less than 2% in accordance with BS 2972.
7. Water absorption – less than 2% in accordance with BS 2972.
8. Shot content – Nil, in accordance with BS 2972.
9. Odourless – Conforms to BS 2972.
10. No mould growth – Conforms to BS 2972.
11. Recovery after compression – More than 95% in accordance with BS 3958 Part 5.

10.6.2 WOOD WOOL NATURAL SOUND SMOOTH (ANUTONE BOARD)

1. Wood wool – Pune Pinewood.

2. Density – 400Kg/ m3 (+- 10%).

3. Sound Absorption – as per ISO 354 equivalent to ASTM C423.
4. Sound Insulation – as per ISO a 40 – III 1995 and rating as per ISO 717 – 1.
5. Non – Combustibility as per ISO 1182 – AT 750, C.
6. Ignitable classification as per BS 476 Part 5 – 'P' not easily ignitable.
7. Fire propagation index as per BS 476 Part 6 – 5.17.
8. Moisture – 15%.
9. Straight lines of edges - + - 1mm < 1250 + - 2mm > 1250.
10. Straightness of edges - +- 1mm.
11. Weathering - < 1mm change in dimension < 5% changes in density.

10.6.3 FABRICS.

All fabric o be used shall be fire rated for at least two hours. The contractor has to give the fire retardant certificate.

10.6.4 TECSOUND

Tecsound is polymer based asphalt Free, high density (1.99 / cm3) systematic sound proofing membrane, that offers good acoustic Insulation in different building elements. It is available in Tecsound 5kg / M2 & 10 kg /M2Membrane sheet. It has very good sound insulation property.

11. CARPENTRY & JOINERY, FURNISHING WORKS

11. 1 GENERAL

1. The wood selected shall be II class Teak wood or as specified.
2. Specified timber shall be of good quality and well-seasoned. It shall have uniform colour, reasonably straight grains and shall be free from knots, cracks, shakes and sapwood.
3. Wood work shall not be painted/ polished, oiled or otherwise treated before it has been approved by the Engineer-in-charge.
4. All portion of timber including architrave abutting against masonry, concrete, stone or embedded in ground shall be painted with approved wood preservative or with boiling coal tar.
5. Anti-termite Treatment and fire retardant paint to be provided of approved brand and manufacturers as directed.
6. All fittings and fixtures shall be got approved from Engineer-in-charge before procurement well in advance and the approved samples shall be kept at site till completion of the work.
7. Before starting the work, the Contractor shall procure and submit the samples of timber for the approval of the Engineer-in-charge.
8. The samples of species of timber to be used shall be deposited by the contractor with the Engineer-in-charge before commencement of the work. The contractor shall produce cash vouchers and certificates from standard kiln seasoning plant operator about the timber section to be used on the work having been kiln seasoned by them, failing which it would not be so accepted as kiln seasoned.
9. Testing

i) The shutters shall be tested for species, seasoning & treatment, defects in the timber, panel material, construction & workmanship in the approved Laboratory at the frequency as per relevant IS.

ii) If shutters are found defective in any one of the criterion, the shutter shall be tested & if found permissible can be accepted. If shutter is found defective in more than one criterion, the whole lot shall be rejected.

iii) Finish

a) All components of door shutter shall have smooth finish.

b) Panels of the door shutters shall be flat and well sanded to a smooth and level Surface.

c) All the surfaces of door shutters which are required to be painted or polished or varnished shall be got approved from the Engineer-in-charge before applying protective coat of primer, polish or varnish.

10. Poly-sulphide: -The gaps between frames and supports and also any gaps in the door and windows sections shall be raked out as directed and filled with poly-sulphide of approved colour and make to ensure complete water tightness. The poly-sulphide shall be of such colour and composition that it would not stain the masonry/concrete work, shall receive paint without bleeding, will not sag or run and shall not set hard or dry out under any conditions of weather. The sample of poly-sulphide to be used for this purpose shall be got approved from the Engineer-in-charge before its actual use.

11. Fixed cabinetry work

All built-in cabinets and shelves shall have no exposed plywood any of its surfaces including the back side against the walls. All surfaces shall be veneered/ laminated with no paint finish at any edge or sides. Horizontal shelving should be adjustable on stainless steel pins.

12 HARDWARE

(i) Hardware

All hardware for doors and windows shall be of stainless steel or as specified. All hardware shall be installed using routers and counter sunk screws. Panic hardware will be provided in all staircase and escape doors. Drawer slides with steel roller ball-bearings and drawer locking system with master keying option is to be provided for all built in cabinetry work and drawer units.

(ii) The contractor shall procure all the hardware as specified in the schedule. The rate shall include for making mechanical chases to receive the hardware, and also the cost of approved screws, nails, clamps etc. The fixing shall be done in the best workmanship like manner and in accordance with that employed for fixing hardware. Any damage to the joinery or the hardware shall be made good at no extra cost to the Bank.

(iii) Locks

All locks will have a stainless steel body with a stainless steel bolt or as specified. Each furniture unit in fixed cabinetry work such as credenzas, drawer units and shutters shall be openable with a single key.

13. All the ply woods used in the furniture shall be of approved make and confirm to **IS 710-2010**: Marine Plywood- Specifications.

11.2 DOORFRAMES

11.2.1 "Timber for door frames shall be as specified. Timber shall be sawn in the direction of the grains. All members of a frame shall be of the same species of timber and shall be straight without any warp or bow. Frames shall have smooth, well-planed (wrought) surfaces except the surfaces touching the walls, lintels, sill etc., which may be left clean sawn. Rebates, rounding or moulding shall be done before the members are jointed into frames. The depth of the rebate for housing the shutters shall be 15 mm, and the width of the rebates shall be equal to the thickness of the shutters. A tolerance of ± 2 mm shall be permitted in the specified finished dimensions of timber sections in frames.

11.2.2 Fixing of Frames

"The frames shall be got approved by the Engineer-in-charge before being painted, oiled or otherwise treated and before fixing in position. The surface of the frames abutting masonry or concrete and the portions of the frames embedded in floors shall be given a coating of coal tar. Frames shall be fixed to the abutting masonry or concrete with holdfasts or metallic fasteners as specified. After fixing, the jamb posts of the frames shall be plugged suitably and finished neat. Vertical members of the door frames shall be embedded in the floor for the full thickness of the floor finish and shall be suitably strutted and wedged in order to prevent warping during construction. A minimum of three hold fasts shall be fixed on each side of door and window frames one at centre point and other two at 30 cm from the top and bottom of the frames. In case of window and ventilator frames of less than 1 m in height two hold fasts shall be fixed on each side at quarter point of the frames. Hold fasts and metallic fasteners shall be measured and paid for separately.

11.2.4 Measurements

"Wood work wrought, framed and fixed shall be measured for finished dimension without any allowance for the wastage or for dimensions beyond specified dimension. However, in case of members having mouldings, roundings or rebates and members of circular or varying sections, finished dimensions shall be taken as the sides of the smallest square or rectangle from which such a section can be cut. Length of each member shall be measured over all to the nearest cm so as to include projection for tenons. Width and thickness shall be measured to the nearest mm and the quantity shall be worked out in unit of up to three places of decimal.

11.2.5 Rate

"The rate shall include the cost of material and labour involved in all the operations described above including the hold fasts or metallic fasteners.

11.3 SPECIFICATION FOR SHUTTERS (FLUSH DOORS)

1) The shutters to conform to I.S. 2202 part I
2) The timber to be of hard wood, well-seasoned and kiln, dried.

3) The core to be built of timber strips of about 25 mm width closely packed and surfaced to flat uniform and smooth condition. All belt joint to be staggered.

4) The cross bands to be laid at right angles to the core extending the full width of the door shutter. The thickness of cross bands to be about 3 mm.

5) The face veneers to be laid with grain at right angles to the grain of the cross bands, the Thickness of veneers to be about 4 mm.

6) The entire binding to be done with synthetic resin of the hot press type to conform to boiling Waterproof type as per I.S. 848-latest revision.

7) The adhesive should be phenol formaldehyde. The specific letter from the manufacturers should be produced along with the vouchers of the flush door.

8) The beading of equal thickness of flush door and 12mm thick to be provided around the flush door shutter to protect the come out veneer surface over and above the lapping provided as suggested above.

9) Factory made shutters, as specified shall be obtained from factories to be approved by the Engineer-in-charge and shall conform to IS: 2202 (Part-I) 1999. The contractor shall inform well in advance to the Engineer-in-charge names and address of the factory where from the contractor intends to get the shutters manufactured. The contractor will place order for manufacture of shutters only after written approval of the Engineer-in-charge in this regard is given.

10) The contractor is bound to abide by the decision of the Engineer-in-charge and recommend a name of another factory from the approved list in case the factory already proposed by the contractor is not found competent to manufacture quality shutters. Shutters will however, be accepted only if this meet the specified tests. The contractor will also arrange stage wise inspection of the shutters at factory by the Engineer-in-charge or his authorized representative. The contractor will have no claim if the shutters brought at site are rejected by the Engineer-in-charge in part or in full lot due to bad workmanship/quality. Such shutters will not be measured and paid. The contractor shall remove the same from the site of work within 7 days after the written instructions in this regard are issued by the Engineering-charge.

11.4 FIRE DOORS

i) SCOPE

This specification covers the design, supply of materials, Manufacture and installation of factory made special type of approved make steel fire doors of 2Hrs rating.

ii) CODES AND STANDARDS

All standards, specifications, acts, and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions.

List of certain important Indian Standards, Acts and Codes applicable to this work is given below. However, the applicable standards and codes shall be as per but not limited to the list given below:

IS : 277 Galvanized steel sheet (plain and corrugated)

IS : 3614(Part-2) 1992 Metallic and non-metallic fire check doors - Resistance test and Part:

2 performance criteria.

iii) GENERAL

Test Report of the Prototype: The door frames and shutters shall be fabricated from approved manufacturers with materials and specifications identical to those for the prototype test report in accordance with IS:3614 (Part-2) 1992 for prescribed fire rating either by CBRI Roorkee or by the Quality Marking Centre for Engineering Goods , Department of Industries , Bahadurgarh , Haryana shall be submitted to the Engineer-in-charge and execution of the work shall commence only after obtaining his approval in writing. The test report shall include the information prescribed in clause 10 of IS: 3614(Part2) 1992.

Testing: The ENGINEER-IN-CHARGE may select, out of the fire door and shutter, assemblies brought at site, random samples for testing at Accredited Laboratories. The contractor shall make all arrangement for testing of the sample as per IS: 3614 (Part2) 1992 and submit the test result to ENGINEER-IN-CHARGE. Testing charges (which includes the cost of sample and transportation) shall borne by contractor.

The Contractor shall furnish all materials, labour, operations, equipment, tools & plant, scaffolding and incidentals necessary and required for the completion of all metal work in connection with steel doors, as called for in the drawings, specifications and schedule of quantities which cover the major requirements only. Anything called for in the tender documents shall be considered as applicable to the items of work concerned. The supply and installation of additional fastenings, accessory features and other items not specifically mentioned, but which are necessary to make a complete functioning installation shall form a part of this contract.

All metal work shall be free from defects, impairing strength, durability and appearance and shall be of the best quality for purposes specified made with structural proprieties to withstand safety strains, stresses to which they shall normally be subjected to.

All fittings shall be of high quality and as specified and as per approval.

The Contractor shall strictly follow, at all stages of work, the stipulations contained in the Indian Standard Safety Code and the provisions of the safety code and the provision of the safety rules as specified in the General Conditions of the Contract for ensuring safety of men and materials.

Any approval, instructions, permission, checking, review, etc., whatsoever by the

ENGINEER-IN-CHARGE shall not relieve the Contractor of his responsibility and obligation regarding adequacy, correctness, completeness, safety, strength, quality, workmanship, etc.

The fire check doors shall satisfy:

a. Stability: The fire check door should not collapse during the rated period of fire under the specified fire conditions. The fire check doors provide safe access to the escape route in the building namely protected corridors and staircase.

b. Integrity: The fire check door should not allow the passage of hot gases or the flames through the rebate or the gap between the door frame and shutters for the duration of its fire rating.

c. Insulation: The mean temperature of the fire door on the unexposed side should not exceed 140 degrees C above ambient temperature for the duration of its fire rating. The fire/smoke check door assembly being offered shall be as prototype tested by Accredited Laboratories for the prescribed fire rating as per BS: 476 part20/22, IS: 3614 part-II. The fire/smoke check doors should also have Tariff Advisory Committee approval as admissible. The tenderer shall employ specialized agency or manufacturer of the fire check door assembly. Door frame and shutter shall in general be fabricated as per the nomenclature of the item of the work and recommendations of the specialized agencies as approved by the ENGINEER-IN-CHARGE.

d. Fire check doors shall be 2 hour or as specified fire rated and shall satisfy the three performance criteria of stability, integrity and insulation as per BS:476 part20/22, IS:3614 part-II.

e. The tenderer shall be responsible for obtaining 'No Objection Clearance' from local fire authority for the executed work.

iv) FIRE CHECK GLAZED DOORS & WINDOWS

Composition of the Doors & Windows

All materials, items, hardware etc. shall be subjected to approval by ENGINEER-INCHARGE. Necessary documentation/ test certificates shall be furnished by the Contractor for such approval. FCD & FCW shall be fabricated only after approval of materials etc., by ENGINEER-IN-CHARGE.

Each FCD & FCW shall be provided with a small metal identification plate in suitable location indicating Fire rating, name of the Manufacturer, date of installation and approval of approved test house.

Each vision panel shall carry a stamp of the manufacturer.

Unless otherwise mentioned elsewhere, all FCD & FCW shall be of two hours (120 Min) and all door assemblies (except fully glazed fire door) shall satisfy three criteria of fire resistance (stability, fire smoke check integrity and thermal insulation).For glazed fire rated door it should exhibit integrity, stability and radiation control for 120 min. and insulation for the first 15 min.. The glazed fire

doors shall be manufactured as per the nomenclature of the item an as per the manufacturers specification as per the best engineering practice and as per the drawing and direction of ENGINEER-IN-CHARGE.

The glass panels shall be flame-proof with thickness as specified, glass clear, inter layered.

The glass shall comply to Class 1B1 Category of Impact Resistance to EN:12600 safety Glazing Material. The system should be tested as per EN:1364 Part-1-1999 or equivalent standard.

vii) INSTALLATION

Shop drawings of the doors in accordance to the prototype profiles used to obtain fire test certificate by approved national or international test house shall be prepared and submitted for approval by the ENGINEER-IN-CHARGE. The shop drawings shall include all details of construction, anchoring, connections, fastenings etc. Any suitable modification in fittings, fixtures as required for project specific installations shall have to be incorporated in door profile and approval obtained prior to the installation of the door.

viii) DELIVERABLES BY THE CONTRACTOR

Following documentation/ drawings shall be furnished along with the Doors

1 Prototype Test Certificate

2 Shop drawings

3 Specification / Manufacturer's literature, Test certificates and other documentation for materials and items intended to be used.

4 Certificate indicating that design and installation of Doors and hardware conforms to norm laid down by approved test house.

5 Test report attested by Fire rated glass manufacturer.

11. 5 (a) MELAMINE POLISH:

For the item of melamine polish included respective item of wood work, the polishing shall include all the sand papering required to be carried out and wiped properly for cleaning all the loose dust particles. Necessary masking tapes are to be provided where different finishing work is to be carried out, so that the melamine polish does not spread to the other surfaces. Care should be taken while removing the masking tape, so that the surface is not damaged. Cost of melamine polish also includes the cost of providing and removing the masking tapes wherever required. The surface shall be sand papered using emery paper no.180,320 and 400 as required. Any staining required shall be carried out by applying Apcolite Wood Stain or equivalent, to achieve the required colour and shade as directed by the Engineer-in-charge. The melamine polish is deemed to

include cost of such staining. Nothing extra shall be payable on this account. Melamine polish shall be carried out with spray machine.

For Quality Assurance the Contractor shall ensure that color and texture of finish coats, shall match the approved sample. Also, Colour of priming coat shall be lighter than body coat Colour of body coat shall be lighter than finish coat. Colour prime and body coats as required so as not to show through the finish coat and to mask surface imperfections.

Before starting application of each type of polish, the Contractor shall apply the polish to a specimen area and get finish and texture approved and shall use it as a sample for the remainder of the work.

11.4 **(b)** For French polish, varnish etc refer technical specification under Masonry, plastering and painting works.

11.6 GLASS AND GLAZING WORK (in partitions and doors)

(a) GENERAL

Glass panels as indicated in the respective item shall be fully tempered /toughened.

Frameless glass used should be highly polished edges using CNC machines. (b)

Glazing

The contractor shall furnish all labour, material and equipment required completing the installation of all glass and related items. A glass shall be of the type, quality, and substance specified in the schedule of quantities. The contractor shall cut glass sizes by field measurements or dimensions of the approved shop drawings. The responsibility for correct glass sizes shall rest with the contractor. No cracked, chipped or disfigured glass shall accepted, and the contractor shall replace all breakages or faulty installation without extra cost.

The glass shall be set in wood or metal glazing straps and metal sash with elastic glazing and compound. The glass shall be beaded first and so installed as to achieve a completely watertight result. The opaque glass, where called for, shall be set with the smooth surface outside. At the completion of the work all glass shall be thoroughly cleaned off paint and other marks removed. No cracked, chipped or disfigured glass shall be accepted, and the contractor shall replace all breakage or faulty installation without extra cost to the owner before acceptance of fit-out.

The Contractor shall be responsible for protecting all mirrors and glasses fixed by him till final handing over to employer and shall replace at his own expense any broken or damaged mirror / glass caused through lack of adequate protection or care in installation or handling.

c) **Tempered / Toughened Glass:**

Tempered /Toughened glass shall be examined by the glass manufacturer to detect and discard any glass which exceeds the following tolerance: 1.5mm bow in 600mm: 3mm bow in 1500mm; 6mm bow in 3000mm; 9 mm bow in 4500mm.

Where the strengthening process results in essentially parallel ripples or waves, the deviation from flatness at any peak shall not exceed 0.13 mm and the difference between adjacent peaks shall not exceed 0.13mm.
Where bow tolerance and wave tolerance differ, the stricter requirements shall govern. Direction of ripples shall be consistent and in conformance with architectural design.

Following test shall be also carried out by the contractor at his own cost as per following provisions.

Thickness	Impact Strength	Fragmentation	Surface Compression	Bending Strength
IS-2835-1987	IS-2553-PART-I	IS-2553-PART-I	ASTM C-1048-90	DIN 1249-PART – 12

d) **Float Glass**

Glass that gives distorted reflections will not be accepted. Reflections due to pressure, paints poor manufacturing process, uneven thickness or poor storage are some of the reasons for distortion. All clear float glass quality should conform to BS – 952 and ASTM C 1036 – 90.

e) **Mirrors**

(i) Mirrors shall be fabricated from best clear plate or float glass of approved quality in imported variety and shall match the International Standards. All fixed panel mirrors shall be +/- 0.30mm tolerance. The edges of mirrors shall be polished and beveled and mitered as per I.S. specifications wherever, it's indicated in the drawing.

(ii) Mirrors shall be electro coated, 6.0 mm thick glass of approved make, plane or bevelled edge. The size shall be as specified in the Schedule of Quantities or as shown on the drawings. The image shall be clear and without waviness at all angles of vision.

(iii) Mirrors shall be provided with backing of 12mm thick marine plywood, fixed with CP brass semi-round headed screws and cup washers or CP brass clamps as specified or instructed by Engineer-in-charge.

11.7 Specification of Modular Kitchen:

a. Marine plywood used in the modular kitchen work shall conform to IS 710,

b. The contractor shall arrange to test materials like plywood, etc., to be used in the work; at his cost through approved laboratory to confirm that they comply with the latest IS code provisions. The materials, which are not conforming to the relevant,

IS provisions after testing shall be removed by the contractor and replaced with appropriate materials.

c. All joints between plywood shall be with male and female type screws and approved quality synthetic resin based adhesives, approved make mini fixtures & connectors.

d. All edges of the plywood resting on the floor/ exposed shall be provided with 1mm thick PVC edge binding hard-pressed factory made, All the plywood shutters shall be post formed membrane foil finish and design as per approval.

e. All accessories such as SS baskets, telescopic slides, hinges etc shown in the sketches are only indicative and shall be got approved before used in the work.

f. All SS fittings/ accessories shall be 304 grades, approved finish, and customized to the site conditions. They shall be corrosion free.

g. Location of drawers/ shelf is liable to be changed after installation of the sample without altering the size of the units.

k. The indicative sizes of the SS accessories are given in schedule of quantities specifications. are only indicative and may vary as per site Conditions, same shall be got approved by the Engineer-in-charge

i. The finishes in the kitchen shall be made good if damaged/ discoloured/ stained during fabrication or installation of modular kitchen.

j. The dimensions shown in the drawings are tentative and may vary as per site conditions. The entire joinery and fixing shall be customized to the site requirement and carried out in a highly professional manner. Additional supports as required at site may be provided for proper fixity / rigidly of the entire cabinet. Suitable arrangements may be made for fixingof the slides / hinges etc. No extra payment shall be considered on this account.

k. SPECIFICATION FOR GRANITE STONE: The stone shall be of average 18mm thick and shall be got approved for colour/texture from the Engineer-in-charge. The stone shall be hard, sound, durable, resistant to wear, rectangular or square in shape as directed and of required width. They shall have plain surface. Stone flags shall be without any soft veins, cracks or flows and shall have a uniform colour. Araldilte for bedding of the granite over marine grade plywood shall be of the required proportion mixed manually or by a mechanical mixer. The Araldilite should be applied uniformly on entire surface to give sufficient plasticity for lying and satisfactory bedding taking care to see that there are no hard lumps in the bedding. Before spreading the Araldite, the base shall be cleaned of all dirt, scum or laitance, and of loose material and well wetted without having any pool of water on the surface. All point of level for the finished paving shall be marked out. The Araldite shall then be evenly and smoothly spread using screed battens only over so much area as will be covered with stone slabs within half an hour. The required slope shall be given to the bed. Each slab shall be gently tapped with a wooden mallet till it is firmly and properly bedded. There shall be no hollow left. If there is a hollow sound on gentle tapping of the slabs, such slabs shall be removed and reset properly. The joints shall be

uniform thickness and in straight line. The thickness of joints shall not exceed 1.5mm and shall be grouted with neat cement slurry.

m. Silicon Sealant: The silicone sealant shall be applied to a clean, dry and degreased surfaces. The sealant shall be brought ready for use in plastic cartridges. The nozzle shall be cut at an angle to desired bead size. The tip of the cartridge shall be cut and the nozzle shall then be fixed. The cartridge shall then be loaded into the sealant gun and right quantity of sealant shall be applied. Immediately after filling the joint the sealant shall be tooled with a pallet knife or similar tool of the size of the joints to remove air bubbles and to fill up all voids by the compacting action and to achieve proper adhesion to joint sides, and smooth aesthetic surface. For neat finishes the face edges shall be marked with masking tape prior to sealant application and the masking tape shall be removed immediately after sealing work has been completed. Excess sealant shall be wiped clean immediately with cloth moistened with solvent.

11.8 WOODEN CEILING

11.8.1 Boards

11.8.1.1 Boards shall be of the class of timber and of finished thickness as specified in the description of the item and shall be in accordance with the general specifications for wood work. Only selected boards of uniform width shall be used. Unless otherwise specified in the description of the item or shown in the drawings, the width of boards selected for use shall not be less than 100 mm nor more than 150 mm.

11.8.1.2 The specific width of boards once selected within these two limits shall be maintained throughout and shall not be varied except in the first and last lines of boards adjustment to the two walls, where remaining odd width shall be adjacent equally on both sides. The maximum length of the board in the finished work shall be 180 cm. The minimum length of board in the finished work shall be such that it will span at least two spacings of the supporting frame work except where shorter lengths are unavoidable, depending on the arrangements of the lines of heading joints which shall be carried out to the pattern ordered by the Engineer-in-charge. The boards shall be polished true on the exposed side.

11.8.1.3 Unless stipulated otherwise in the description of the item, the longitudinal joints of the boards shall be tongued and grooved, while the heading joints shall be of the square butt type and shall occur under the centre line of the supporting joint. Heading joints in adjacent boards shall not be placed over the same joists, those in alternate boards being arranged in the same line, except where the joints are to be concealed by headings.

11.8.2 Frame

Timber frame of the class of timber and section specified in the description of the item or as ordered by the ENGINEER-IN-CHARGE shall be provided. The width of the frame scantling shall not be less than 50 mm. The arrangements and spacing of the frame scantling shall be as per design furnished. The frame shall

be given two coats of approved preservative paint before the boarding is screwed. The frame and paints thereof shall be paid for separately unless specifically included in the description of the item. M.S. angles or other sections shall be used for suspending the frame and paid for separately.

The bottom surface of the frame shall be checked and corrected to true plans and slopes.

11.8.3 Mild Steel Screws

Screws shall be got approved from the ENGINEER-IN-CHARGE before fixing. They shall be of the slotted counter sunk head type of length not less than the thickness of the board plus 20 mm. The designation number shall not be less than 9 for screws of length 40 to 50 mm and shall not be less than 6 for screws of length 25 to 35 mm.

11.8.4 Fixing

The outer lines of boards shall be accurately fixed, parallel and close to the wall. Each subsequent plank shall be carefully jointed up. The boards shall be fixed to the frame scantling above with two screws at each of frame and one at every intermediate joist. The screws shall be counter sunk and the screw holes filled with putty or sloping out wax. The unexposed faces of planks shall be painted with wood preservative before fixing.

11.8.5 Finishing

The exposed side of the boards shall be truly level and plane. The joints shall be truly parallel and/or perpendicular to the walls.

Beadings shall then be fixed to the ceiling, to the size and pattern required. These shall be measured and paid for separately unless specifically included in the description of the ceiling item.

11.8.6 Measurements

Length and breadth shall be measured correct to a cm. Areas shall be worked out to nearest 0.01 sqm. The superficial area of the finished work ceiling shall be measured in square metres. No deduction in measurements shall be made for openings of areas up to 40 square decimetre. Nothing extra shall be payable either for any extra material or labour involved in forming such openings. For openings exceeding 0.40 sqm in area, deductions in measurements for the full opening will be made and in such case any labour involved in making these openings shall be paid for separately in running metres. Wooden ceiling of boardings fixed to curve surfaces in narrow widths shall be measured and paid for separately and shall include making the joints to proper splay. Circular cutting and waste shall be measured and paid for separately in running metres.

11.8.7 Rate

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

11.9. FURNISHING WORKS

11.9.1 ROLLER BLINDS

11.9.1.1 ROLLER TUBE

Roller tube shall be of extruded Aluminum alloy 32 mm O.D. with a minimum wall thickness of 1.0 mm duly anodized for long life.

11.9.1.2 CLUTCH

Clutch shall be of wrap spring design with high strength fiberglass reinforced polyester assembly and high carbon steel springs to transmit motion from driving to driven members of clutch mechanism. Clutch shall operate by directionally with the use of an endless beaded chain. Clutch mechanism shall be crash proof, prevent slippage and shall raise and lower smoothly to any desired height. Clutch shall never need adjustment.

11.9.1.3 IDLER

Idler shall be of high strength fiberglass reinforced polyester, consisting of an outside sleeve and centre shaft. Sleeve shall provide bearing surface for roller tube and rotate freely on Centre shaft providing smooth quiet and long wearing operation.

11.9.1.4 INSTALLATION BRACKETS

Brackets shall be of tornized steel powder coated to give superior finish. Bracket shall accommodate overhead, side or face mounting with clutch assembly on either end of roller.

11.9.1.5 BOTTOM WEIGHT

Bottom of the blind shall be provided with Aluminum tube powder coated in a colour matching to the fabric. The fabric shall be enclosed in the suitably created pocket along with the tube. The tube shall be closed from sides with end caps to give a neat look.

11.9.1.6 FABRIC STYLE 4000

Fabrics having the white colour finish at the back which helps in reflecting solar energy resulting in energy savings. The Fabric shall 100% Fibre Glass Fabric with fade-resistant polymer ensuring complete opacity with zero light transmittance.

11.9.2 CARPET

11.9.2.1 Carpet shall be of 8mm thick loop pile FRS carpet tiles 500mm x 500mm with pre-dyed nylon PVC backing with the following specifications.

CONSTRUCTION - Tufted 1/10" Loop
STRUCTURE - Tufte 1/10" Boucle
STRUKTUR - Getuftet 1/10" Schlinge
STRUCTUUR - Getuft 1/10" Luspool
PILE MATERIAL - 92% PA6 Solution dyed Aqualon
COUCHE D'USURE - + 8% PA Space dyed

SECONDARY BACKING – Back2 Back: Modified bitumen

DOSSIER - enhanced with a thermoplastic elastomer,
RUCKENAUSSTATTUNG - reinforced with a glass fibre fleece

Rug - covered with 100% PES fleece.
10% recycled content included

11.9.3 WOODEN FLOORING

11.9.3.1Wooden flooring shall be 8 mm thick laminated wood with Toungue and groove joints, AC 4 grade as per the approved manufacturer's specifications

11.9.4 RUBBERISED FLOORING

11.9.4.1 Rubberized flooring as per the approved manufacturer's specification.

13. SANITARY, WATER SUPPLY AND DRAINAGE

This specification covers the general requirements for Supplying, installing, testing and commissioning of sanitary Installations- sanitary fixtures, piping and fittings, Water supply- Internal & External piping and Drainage - Internal & External.

13.1 Applicable Codes, Standards and Publications

13.1.1 All equipment, supply, erection, testing and commissioning shall comply with the requirements of Indian Standards and code of practices given below as amended till date. All equipment and material being supplied by the CONTRACTOR shall meet the requirements of IS, and other Codes/ Publications as given below.

IS 15801	Polypropylene- Random Copolymer Pipes for hot and cold water supplies-Specifications
IS 15778	Chlorinated Polyvinyl Chloride (CPVC) pipes for potable hot and cold water distribution supplies-specifications
IS 4985	Unplasticised P.V.C. pipes for potable water supply – Specifications
IS 13592	Unplasticized Polyvinyl Chloride (UPVC) pipes for soil and waste discharge systems inside buildings including ventilation and rainwater system
IS 14735	Unplasticized Polyvinyl Chloride (UPVC) Injection Moulded Fittings for Soil, Waste rain water pipes
IS 4984	Specification for high density polyethylene pipes for potable water supplies.

IS 13983	Stainless steel sinks for domestic purposes – Specifications.
IS:554	Dimensions for pipe threads where pressure tight joints are required on the threads
IS:779	Specification for water meters (domestic type)
IS:1068	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium
IS:1172	Code of Basic requirements for water supply drainage and sanitation
IS:1367	(Part 1) Technical supply conditions for threaded steel fasteners: Part I Introduction and general information
IS:7181	Specification for horizontally cast iron double flanged pipes for water, gas and sewage.
IS:778	Specification for copper alloy gate, globe and check valves for water works purposes.
IS:780	Specification for sluice valves for water works purposes (50mm to 300mmsize)
IS:1703	Specification copper alloy float valves (Horizontal plunger type) for water supply fittings.
IS: 3950	Specification for surface boxes for sluice valves
IS:5312	(Part 1) Specification for swing check type reflux (non- return) valves: Part 1 Single door pattern
IS:5312	Specification for swing check type reflux (non-return) valves: Part 2 Multi door pattern
IS:12992	Safety relief valves, spring loaded: (Part 1) Part1 Design
IS:13095	Butterfly valves for general purposes
IS:771	(Part 1 to 3) Specification for glazed fire clay sanitary Appliances

IS:774	Specification for flushing cistern for water closets and urinals (other than plastic cistern)
IS:775	Specification for cast iron brackets and supports for wash basins and sinks.
IS:781	Specification for cast copper alloy screw down bib taps and stop valves for water services
IS:1700	Specification for drinking fountains
IS:2326	Specification for automatic flushing cisterns
IS:2548	Part1 Specification for plastic seats and covers for Water closets: Part 1 Thermoset seats and covers
IS: 2548(Part 2)	Specification for plastic seats and covers for Water closets: Part 2 Thermoplastic seats and covers
IS:2556(Part 1)	Specification for vitreous sanitary appliances (Vitreous china): Part 1: General requirements
IS:2556(Part 2)	Specification for vitreous sanitary appliances (Vitreous china) Part 2: Specific requirements of wash down water closets
IS:2556(Part 3)	Specification for vitreous sanitary appliances
	(Vitreous china) Part 3: Specific requirements of squatting pans
IS:2556(Part 4)	Specification for vitreous sanitary appliances (Vitreous china) Part 4: Specific requirements of wash basins
IS:2556	(Part 6 Specification for vitreous sanitary appliances Sec 2) (vitreous china) Part 6 :Specific requirements of Urinals, Section 2 Half stall urinals

IS:2556	(Part 6 Specification for vitreous sanitary appliances Sec 4) (vitreous china) Part 6 :Specific requirements of urinals, Section 4 Partition slabs
IS:2556	(Part 6 Specification for vitreous sanitary appliances Sec 5) (vitreous china) Part 6 :Specific requirements of urinals, Section 5 waste fittings
IS:2556	(Part 6 Specification for vitreous sanitary appliances Sec 6) (vitreous china) Part 6 :Specific requirements of urinals, Section 6 Water spreaders for half stall urinals
IS:2556(Part 7)	Specification for vitreous sanitary appliances (Vitreous china) Part 7: Specific requirements of half round channels
IS:2556(Part 8)	Specification for vitreous sanitary appliances (Vitreous china) Part 8: Specific requirements of siphonic wash down water closets.
IS:2556 (Part 11)	Specification for vitreous sanitary appliances (Vitreous china) Part 11: Specific requirements for shower rose
IS: 2556(Part 12)	Specification for vitreous sanitary appliances (vitreous china) Part 12: Specific requirements of floor traps
IS:2556 (Part 15)	Specification for vitreous sanitary appliances
	(Vitreous china) Part 15: Specific requirements of universal water closets
IS:2692	Specification for ferrule for water services
IS:2717	Glossary of terms relating to vitreous enamel ware and ceramic metal systems
IS:2963	Specifications for copper alloy waste fittings for wash basins and sinks

IS:3311	Specification for waste plug and its accessories for sinks and wash basins.
IS: 5961	Specification for cast iron gratings for drainage purposes.
IS:6249	Specification for flush valves and fittings for marine use
IS:8931	Specification for copper alloy fancy single taps, Combination taps assembly and stop valves for water services
IS: 9758	Specification for flush valves and fitting for water closets and urinals.

13.1.2 General Requirements:

1. Works to comply with local regulations and rates to include all costs. All sanitary installations, water supply and drainage work shall conform to the Local Municipal Bye-Laws and/or rules and regulations of Local Bodies and the work shall be inspected and passed by the various authorities having jurisdiction.
2. The work shall be carried out through a licensed plumber.
3. The Contractor shall arrange with the Local Municipal and/or Public Authorities for obtaining water and drainage connections and the Employer will reimburse the statutory fees/Deposits on production of receipts.
4. The rates quoted shall be for complete items as fixed in position and cover all costs of materials, labour, tools, supervision, cutting of holes, chases etc. and also for providing & fixing arrangements viz. clamps, brackets, wooden blocks etc.
5. The rate shall also include restoration to original condition of all damages to walls, floors etc. during the process of fixing of sanitary installations, water supply and drainage to the entire satisfaction of the Engineer-in-charge. All debris of plumbers, excavation etc. shall be removed without any extra charge. The plumbing work or the other building work affected by the plumber's work shall be left thoroughly cleaned to the satisfaction of the Engineer-in-charge.
6. All CI pipes, brackets, CI cisterns, GI pipes and fixtures, MS fixture and fittings shall be painted with one coat of approved primer and two coats of enamel/flat oil paint. All painting work shall be carried out to the entire satisfaction of the Engineer-incharge. If directed, additional coats of paint shall be applied to get uniform and matching finish without any extra cost.
7. In the interior of the building all pipes whether of PPR/UPVC/CPVC shall be embedded in an approved manner in chases made in walls or floors if required

by the Engineer-in-charge. The plumber shall make necessary holes in the walls etc. and restore them to the original condition.

8. All water supply and sanitary fixtures, pipes and pipe fittings, traps etc. which are to be embedded into the concrete or masonry work or other building work shall be placed in position and embedded or concealed at the time of casting concrete or erecting Block work. In case where chasing or cutting of concrete, masonry or other structural or construction work is unavoidable, the locations of such fittings, pipe lines and traps etc. shall be marked suitably and the cutting, chasing or disturbing of the construction work shall proceed only after due approval of the Engineer-in-charge.
9. All cutting, chasing and fixing work shall be completed before commencement of any plastering, tiling and finishing work.
10. The Contractor shall be responsible for the adequacy and efficiency of the entire plumbing system and if, in his opinion, he finds any serious objection to the system shown on the drawings, he shall set forth his objection or his suggestions to ensure adequacy and efficiency of the said system and notify the Engineer-in-charge before proceeding with the work. Loss or damage to such materials or work prior to final acceptance of the work by the employer shall immediately be replaced by the Contractor at his expense.
11. The Tenderers while quoting the tenders should note that the maximum care will have to be taken during the construction to avoid the leakages from the Sanitary Units, Terrace Slabs, Chajjas, Drop Walls etc. All the R. C. Components including slabs should be properly consolidated with Mechanical Vibrators and all the joints of the Sanitary Appliances must be properly filled in and made leak-proof.

13.1.3 Materials:

1. Materials shall be of the best quality approved make and unless otherwise specified they shall conform to the respective Indian Standard Specification. Where different makes are specified, the choice of make shall rest with the Engineer-in-charge.
2. Samples of all materials shall be got approved before placing order and the approved samples shall be deposited with the Engineer-in-charge.
3. In case of non-availability of materials in SI/ Metric sizes, the nearest size in FPS units shall be provided with prior approval of the Engineer-in-charge for which neither extra will be paid nor shall any rebate be recovered.
4. If directed, materials shall be tested in any approved Testing Laboratory and the Contractor shall produce the test certificate in original to the Engineer-in-charge and entire charges for original as well as repeated tests shall be borne by the Contractor. If required by the Engineer-in-charge, the Contractor shall arrange to test portions of the work at his own cost in order to prove their soundness and efficiency. If after any such test the work or portion of work is found, in the opinion of the Engineer-incharge, to be defective or unsound, the Contractor shall pull down and redo the same at his own cost. Defective materials shall be removed from the site.

5. It shall be obligatory for the Contractor to furnish certificate, if demanded by Engineer-in-charge, from manufacturer or the material supplier that the work has been carried out by using material and installed/fixed as per their recommendations.

13.2 Sanitary And Other Appliances

13.2.1 Scope of Work : Without restricting to the generality of the foregoing, sanitary and other appliances shall inter-alia includes the following:

1. Sanitary appliances and fixtures for toilets
2. Chromium plated brass fittings
3. Stainless steel sinks.
4. Accessories e.g. towel rods, toilet paper holders, soap dish, liquid soap dispensers, towel rails, coat hooks etc.
5. Mirrors, hand driers, etc.
6. The CONTRACTOR shall provide for all appliances and fixtures all fixing devices, nuts, bolts, screws, hangers as required.
7. All exposed pipes within toilets and near appliances/ fixtures shall be of chromium plated brass unless otherwise specified.

General Requirements :

1. All sanitary wares as specified in the schedule of quantities & shall be of best quality manufactured by approved manufacturer, and shall be finally approved by the Engineer-in-charge prior to installation. All samples of materials with necessary catalogues, performance data shall be submitted and approved before use for the work. Approved samples of all materials shall be neatly displayed on a board and such a display board of samples shall always be in exhibition in the sample room of the construction office of the Engineer-in-charge. Such a display shall be used for the day-to-day checking of the materials on site.
2. All appliances, fixtures and fittings shall be provided with all such accessories as are required to complete the item in working condition whether specifically mentioned or not in the Schedule of Quantities, specifications, and drawings. Accessories shall include proper fixing arrangement, brackets, nuts, bolts, washers, screws and required connection pieces.
3. Fixing screws shall be half round head chromium plated (CP) brass screws, with CP brass washers unless otherwise specified.
4. Porcelain sanitary ware shall be glazed vitreous china of first quality free from warps, cracks and glazing defects conforming to IS: 2556. The choice of the colour of the Sanitary ware shall be that of the Employer and nothing extra shall be payable to the CONTRACTOR for fixing of Sanitary ware of any colour.
5. Sinks for kitchen shall be of stainless steel or as specified in the Schedule of Quantities.
6. Chromium plated fittings shall be cast brass chromium plated of the best quality approved by the Bank.
7. All appliances, fittings and fixtures shall be fixed in a neat workmanlike manner true to level and to heights shown on the drawings and in accordance with the

manufacturer recommendations. Care shall be taken to fix all inlet and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, tiling, plaster, paint, insulation or terrace shall be made good by the CONTRACTOR at his own cost.

8. All materials shall be rust proofed; materials in direct or indirect contact shall be compatible to prevent electrolytic or chemical (bimetallic) corrosion.
9. Sanitary appliances, subject to the type of appliance and specific requirements, shall be fixed in accordance with the relevant standards and the following:

i. CONTRACTOR shall, during the entire period of installation and afterwards protect the appliances by providing suitable cover or any other protection in order to absolutely prevent any damage to the appliances until handing over. (The original protective wrapping shall be left in position for as long as possible).

ii. The appliance shall be placed in correct position or marked out in order that pipe work can be fixed or partially fixed first.

iii. The appliance shall be fixed in a manner such that it will facilitate subsequent removal if necessary.

iv. All appliances shall be securely fixed. Manufacturers' brackets and fixing methods shall be used wherever possible. Compatible rust proofed fixings shall be used. Fixing shall be done in a manner that minimizes noise transmission.

v. Appliances shall not be bedded (e.g. WC pans, pedestal units) in thick strong mortar that could crack the unit (e.g. a ceramic unit).

vi. Pipe connections shall be made with de-mountable unions. Pipe work shall not be fixed in a manner that it supports or partially supports an appliance.

vii. Appliances shall be fixed so that water falls to the outlet (e.g. baths).

viii. Appliances shall be fixed true to level firmly fixed to anchor or supports provided by the manufacturer and additional anchors or supports where necessary. ix. Sizes of Sanitary fixtures given in the Specifications or in the Schedule of Quantities are for identification with reference to the catalogues of makes considered. Dimensions of similar models of other makes may vary within +10% and the same shall be provided and no claim for extra payment shall be entertained nor shall any payment be deducted on this account.

13.2.2 European Water Closet

The European Water Closet shall consist of:

1. Approved wash down closet in white vitreous Chinaware with integral "P" trap wall hung type as specified in schedule of quantity
2. Rubber joints for inlet connection, 15mm p.v.c. connector.
3. Bakalite seat and cover with chromium-plated hinges and rubber buffers
4. All the necessary work required for satisfactory working.

13.2.4 Concealed cistern, extended flush pipe concealed dual flush WC cistern designed for locating behind the WCs, designed to be fitted with the top of the cistern at a height of 980mm, maximum width 570mm (includes fixing brackets), can be fitted with either a top or front mounted flushing plate. Comes complete with 380 low pressure (low noise inlet valve (0.1 – 10 bar supply pressure),

Brackets and fixings, Integral flush bend, Isolating valve. The 15 cm cistern can operate as a single 6l flush or 6l/3l dual flush unit. For flush volumes of 4l/2l a low flush beaker is required.

13.2.5 Wash Basin:

Wash Basin shall consist of the following;

1. Wash basins of over the counter of size as specified in the schedule of quantities and shall be in white vitreous Chinaware.
2. Wash basin shall be provided with hot and cold water mixing fitting or as specified in the Schedule of Quantities.
3. Basins shall be fixed at proper heights as shown on drawings. If height is not specified, the rim level shall be 790mm from finished floor level or as directed by the Engineer-in-charge.
4. 12mm p.v.c. connector with wiped joints & 15mm chromium plated brass stop cock (stop cock measured separately)
5. All other necessary work for satisfactory working.

13.2.6 Urinals

These shall be of the approved make and shall consist of the following:

1. Vitreous Chinaware urinal basin as specified in the schedule of quantities.
2. 32mm Chromium plated brass waste coupling 12 mm dia C.P. brass, flush pipe.
3. Suitable supporting arrangement using Raw plugs with C.P. brass screws used for fixing the urinal.
4. All other necessary work for satisfactory working.

13.2.7 Shower Rose:

This shall be of Chromium plated brass and approximately 125mm in diameter with C.P. brass as specified in schedule of Quantities.

13.2.8 Sinks:

1. Stainless steel AISI 304 (18/8) kitchen sink as per IS:13983 of approved make Sinks shall be stainless steel of anti-scratch finish as specified in the Schedule of Quantities
2. Each sink shall be provided with painted CI brackets and clips and securely fixed. Each sink shall be provided with 40mm dia CP waste and rubber plug with CP brass chain as given in the Schedule of Quantities.

13.2.9 Mirrors

1. Mirrors shall be electro coated, 6.0 mm thick glass of approved make, plane or beveled edge. The size shall be as specified in the Schedule of Quantities or as shown on the drawings. The image shall be clear and without waviness at all angles of vision.
2. Mirrors shall be provided with backing of 19mm thick marine plywood, fixed with CP brass semi-round headed screws and cup washers or CP brass clamps as specified or instructed by Engineer-in-charge.

13.2.10 Shower set:

1. Shower set shall as specified in the Schedule of Quantities. Wall flange shall be kept clear off the finished wall. Wall flanges embedded in the finishing shall not be accepted.

13.2.11 Toilet Paper Holder:

1. Toilet paper holder shall be as specified in the Schedule of Quantities.
2. This by means of screws/capping having finish similar to the toilet paper holder in wall/ timber partitions with raw plugs or nylon sleeves. When fixed on timber partition, it shall be fixed on a solid wooden base provided.

13.2.12 Towel Rail

1. Towel rail shall be chromium plated of size, shape and type specified in the Schedule of Quantities.
2. Towel rail shall be fixed with screws/capping having finish similar to the towel rail in wall with raw plugs or nylon sleeves and shall include cutting and making good as required or directed by the Engineer-in-charge.

13.2.13 Liquid Soap Dispenser

1. SS liquid soap Dispenser with Glass Bottle of approved make Liquid Soap dispenser shall be wall/ counter mounted suitable for dispensing liquid soaps, lotions, detergents.
2. Liquid soap dispenser shall be fixed to wall with C.P. brass screws, and screwed on to wooden raw plug.

13.2.14 Hand Drier

1. The hand drier shall be no touch operating type with solid state time delay to allow user to keep hand in any position.
2. The hand drier shall be fully hygienic, rated for continuous repeat use (CRU).
3. The rating of hand drier shall be such that time required to dry a pair of hands up to wrists is approximately 30 seconds.
4. The hand drier shall be of wall mounting type suitable for 230 V, single phase, 50 Hz, ac power supply.

13.2.15 Measurement and rates

1. Sanitary fixtures (Porcelain ware and CP fittings) shall be measured by numbers.
2. Rate for providing and fixing of sanitary fixtures, accessories, shall include all items, and operations stated in the respective specifications and Schedule of Quantities and nothing extra is payable.
3. Rates for all items under specification Clauses above shall be inclusive of cutting holes and chases and making good the same, CP brass screws, nuts, bolts and any other fixing arrangements required and recommended by manufacturers, testing and commissioning etc. complete.

Water supply system Scope of Work:

The water supply system shall inter-alia include the following:

1. Supply from supply main/ underground tank to overhead tank, overhead tank to all fixtures and appliances for cold and hot water.
2. Insulation for hot water pipes, Pipe protection and painting

3. Control valves, masonry chambers and other appurtenances.
4. Connections to all plumbing fixtures, tanks, appliances and municipal mains.
5. Puddle flanges, Inserts, nozzles for R.C.C. tanks
6. The term water supply is used as indicative of all water supply work required and necessary for the building including such external work as may be necessary to make the system functional.

13.3 POLYPROPYLENE RANDOM CO-POLYMER (PP-R) PIPES (For Internal Domestic & Flushing water supplies)

13.3.1 The PP-R is a bonded, multilayer pipe consisting of different layers of the pipe:-

(a) The inner-most layer of the pipe to be anti-bacterial to prevent bacteria growth inside pipe surface.

(b) The middle layer to be of plain PP-R which is neither in contact with Water and nor under direct effect of the atmospheric conditions.

(c) The outer-most layer to be of U.V. stabilized PP-R to prevent the pipe surface from sunlight under exposed atmospheric conditions. The pipes should in general be conforming to the requirements of IS 15801 except that specified with in nomenclature of the item. The pipes should have smooth inner surface with non-contracting diameters. The pipes shall be cleanly finished, free from cracks and other defects. The pipes shall be clean and well cut along ends after taking into consideration the desired length, using the pipe scissors. The Polypropylene used for manufacturing the pipe shall conform to the requirements of IS 10951 and IS 10910. The specified base density shall be between 900 kg/m3 and 910 kg/m3 when determined at 27°C. The resin should be mixed with sufficient quantity of colour master batches. The colour master batch should be uniform throughout the pipe surface. The standard dimension ratio (SDR) i.e. ratio of the nominal outer diameter of a pipe to its nominal wall thickness should be 7.4/11 as given in the item schedule of quantity

13.3.2 Fittings

Plain fittings, Chrome plated brass threaded fittings and Valves shall be as per nomenclature of item or as directed by Engineer- in- charge.

(a) The plain fittings shall be Polypropylene Random Copolymer and comply with all the requirements of the pipes. The plain fittings shall comprise of Socket, Elbow, Tee, Cross, Reducer socket, Reduction Tee, End Cap, Crossover, Omega, Threaded Plug and wall clamps in available sizes.

(b) The Chrome Plated Brass threaded fittings shall be Chrome Plated Brass threaded piece molded inside Polypropylene random copolymer fitting. The maternal shall comply with all the requirements of the pipes. The Chrome plated Brass threaded fittings shall comprise of Socket, Elbow and Tee (Male & Female) in available sizes. These are the fittings for C.P. connections and for continuations from existing Galvanized Irion Pipes and fittings. The Brass/Bronze

Valves can be connected to Polypropylene Random pipes using C.P. Brass threaded fittings of desired sizes.

13.3.3 Laying and Jointing of Pipes and Fittings

The pipes and fittings shall run in wall chase as specified. Pipes shall run only in vertical or horizontal alignment as far as possible. The installation of pipes is similar to that of the metal pipes with the only difference in the jointing procedure. The jointing of the PP-R pipes and fittings are done by fusion welding by means of a welding machine.

The marking on pipe shall carry the following information:-

c) Manufacturer's name/ trade mark
d) PPR pipe
e) SDR
f) Outside diameter and minimum wall thickness
g) Lot No. / Batch No. containing date of manufacturing. And machine number.

13.3.4 The outside diameter of pipes, tolerance in the same and ovality of pipe shall be as given in Table 13.13 below

TABLE 13.13 Outside Diameter, Tolerance and Ovality of Pipes

Sl. No.	Nominal Size	Outside Diameter	Tolerance (Only positive tolerance)	Ovality
	DN	mm	mm	mm
(1)	(2)	(3)	(4)	(5)
(i)	16	16.0	0.3	1.2
(ii)	20	20.0	0.3	1.2
(iii)	25	25.0	0.3	1.2
(iv)	32	32.0	0.3	1.3
(v)	40	40.0	0.4	1.4
(vi)	50	50.0	0.5	1.4
(vii)	63	63.0	0.6	1.6
(viii)	75	75.0	0.7	1.6
(ix)	90	90.0	0.9	1.8
(x)	110	110.0	0.9	2.2

1. The values specified for tolerance on outside diameter have been calculated as 0.009DN, rounded off to the next higher 0.1 mm subject to minimum of 0.3 mm. No negative tolerances are allowed.
2. The basis for the values specified for ovality is:
   (a) For nominal outside diameters ≤ 75 mm, the tolerance equals (0.008 DN+1.0) mm, rounded to the next higher 0.1 mm, with a minimum value of 1.2 mm.
   (b) For nominal outside diameters ≥ 75 mm and ≤ 250 mm, the tolerance equals 0.20 DN, rounded to the next higher 0.1 mm.
   (c) For nominal outside diameter > 250 mm, the tolerance equals 0.35 DN, rounded to the next higher 0.1 mm.

13.3.5 Wall Thickness The minimum and maximum wall thickness of pipes shall be as given in Table below

TABLE 13.14

Sl. No.	Nominal Size	SDR 11		SDR 7.4	
	DN	Min	Max	Min	Max
(1)	(2)	(3)	(4)	(5)	(6)
(i)	16	-	-	2.20	2.70
(ii)	20	1.90	2.30	2.80	3.30
(iii)	25	2.30	2.80	3.50	4.10
(iv)	32	2.90	3.40	4.40	5.10
(v)	40	3.70	4.30	5.50	6.30
(vi)	50	4.60	5.30	6.90	7.80
(vii)	63	5.80	6.60	8.60	9.70
(viii)	75	6.80	7.70	10.30	11.60
(ix)	90	8.20	9.30	12.30	13.80
(x)	110	10.00	11.20	15.10	16.90

Note: The wall thickness tolerances have been calculated on the following basis:

(a) Limit deviation=0.1e + 0.2 mm rounded up to the nearest 0.1 mm.
(b) A local increase in wall thickness of up to +0.2e is permissible for e up to 10 mm and up to
0.15e for e greater than 10 mm. The mean of the measurement shall, however, still lie within the given limit deviations. The quality of each installation system ultimately depends on the tightness, stability and lifetime of its connections. The pipe of the desired length is cut using the pipe scissors. The proper heating piece is taken and mounted on the welding machine. The welding device is switched on - Control lamp and switch lamp will lit. When ready, control lamp gets off, which means that welding temperature of 260 Degrees ±10 Degrees Celsius has been reached. The pipe end and the fitting to be welded are heated on the welding machine. Before heating the fitting and the pipe, the dirty welding tools, pipe and fitting are cleaned with a cloth. When heated up (with heating time as per the Table shown below), the pipe and the fitting is removed from the welding machine and the two pieces connected together by applying a little pressure without twisting. The joint is allowed to cool down for a few seconds. The welding process is that safe because the properly heated part of Polypropylene create a homogeneous connection.

Guidelines for Welding PP-R Pipes and Fittings
Outer diameter of pipe (mm) heating Time (Seconds) Cooling Period (Minutes)

Outer diameter of pipe(mm)	Heating Time (Seconds)	Cooling Period (Minutes)
16	5	2
20	5	2
25	7	2
32	8	4
40	12	4
50	18	4
63	24	6
75	30	8
90	30	8

The same procedure shall be adapted for exposed as well as concealed fittings. The Crossovers may be used wherever the overlapping of the PP-R pipes is required. The fixing shall be done by meansof Wall Support Clamps keeping the pies about 1.5 cm clear of the wall where to be laid on the surface. Where it is specified to conceal the pipes, chasing may be adopted. For pipes fixed in the

shafts, ducts etc. there should be sufficient space to work on the pipes with the usual tools. Pipe sleeves shall be fixed at a place the pipe is passing, through a wall or floor for reception of the pipe and allow freedom for expansion and contraction and other movements. Fixed supports prevent any movement of the pipe by fixing it at some points. Fittings are used in creating the fixed points. Fixed supports must not but installed at bending parts and the direction changes must be done in the pipe itself. In between the fixed supports some arrangements must be done to compensate any potential elongation or shrinkage in the pipe length. For exposed straight pipes having length more than 5 meters, to compensate the expansion an expansion piece must be used.

13.3.6 Piping Installation Support

Piping shall be properly supported by means of wall support clamps as specified and as required, keeping in view the proper designing for expansion and contraction. Risers shall be supported at each floor with clamps. Due to high coefficient of thermal expansion the heat losses though the pipes is highly reduced. Therefore, for internal Bathroom hot geyser water distribution lines, the insulation is often not required.

13.3.7 Installation of Water Meter and Valves

PP-R lines shall be cut to the required lengths at the position where the meter and Valves are

required to be fixed. Suitable C.P. Brass threaded fittings shall be attached to the pipes. The meter and Valves shall be fixed in a position by means of connecting pipes, jam nut and socket etc. The stop cock shall be fixed near the inlet of the water meter. The paper disc inserted in the ripples of the meter shall be removed. And the meter shall be installed exactly horizontally or vertically in the flow line in the direction shown by the arrow cast on the body of the meter. Care shall be taken to not to disturb the factory seal of the meter. Wherever the meter shall be fixed to a newly fitted pipeline, the pipeline shall have to be completely washed before fitting the meter.

13.3.8 Testing

All water supply system shall be tested to Hydrostatic pressure test. Maximum operating pressure at varying degree of temperature is given in Table 13.15

TABLE 13.15

Sl. No.	Temperature Degree C	SDR 11	SDR 7.4
		Pressure MPa	Pressure MPa
(i)	10	1.91	3.02
(ii)	20	1.63	2.58
(iii)	30	1.37	2.17
(iv)	40	1.15	1.84

(v)	50	0.98	1.55
(vi)	60	0.82	1.28
(vii)	70	0.62	0.98
(viii)	80	0.39	0.62
(ix)	95	0.27	0.4

The pressure test is performed in 3 steps being preliminary test, main test and final test. For the Preliminary test a pressure which is 1.5 times higher than the possible working pressure is applied and this is repeated two times in 30 minutes with intervals of 10 minutes. After a test period of 30 minutes, the test pressure must not be dropped more than 0.6 bar and no leak must occur. Main test follows the preliminary test. Test time is two hours, in doing so the test pressure taken from the preliminary test must not have fallen more than 0.2 bar. After completion of these tests, the final test comes which has to be done under a test pressure of 10 bars and 5 bar in the interval of 15 minutes. Between the respective test courses, pressure has to be removed.

All leaks and defects in joints revealed during the testing shall be rectified and got approved at site by retest. Piping required subsequent to the above pressure test shall be retested in the same manner.

System may be tested in sections and such sections shall be entirely checked on completion of connection to the overhead tanks or pumping system or mains. In case of improper circulation, the contractor shall rectify the defective connections. He shall bear all expenses for carrying out the above rectifications including the tearing up and refinishing of floors and walls as required.

After commissioning of the water supply system, contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. Valves which are not working efficiently shall be replaced by new ones.

13.3.9 Measurements

The net length of pipes as laid or fixed shall be measured in running meters correct to a cm for the finished work, which shall include PP-R pipe and fittings including plain fittings and Chrome Plated Brass Threaded fittings. Deductions for the length of valves shall be made. The cost includes cutting chases in the masonry wall and making good the same, excavation/trenching in all soil, refilling and testing of joints. The cost of gate valves/ wheel valves shall be paid for separately.

13.4 CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPES

13.4.1 CPVC pipes & fittings used in hot & cold potable water distribution system shall conform to requirement of IS 15778. The material from which the pipe is produced shall consist of chlorinated polyvinyl chlorides. The polymer from which the pipe compounds are to be manufactured shall have chlorine

content not less than 66.5%. The internal and external surfaces of the pipe shall be smooth, clean and free from grooving and other defects. The pipes shall not have any detrimental effect on the composition of the water flowing through it. Diameter and wall thickness of CPVC pipes are as per given in Table 13.16 below.

TABLE 13.16

Sl. No	Nominal Size	Nominal OutsideDiameter	Mean Outside Diameter		Outside Diameter at any point		Wall thickness					
							Class 1, SDR 11			Class 3, SDR 17		
			Min	Max	Min	Max	Avg. Max	Min	Max	Avg. Max	Min	Max
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	15	15.9	15.8	16.0	15.8	16.0	2.2	1.7	2.2	-	-	-
ii)	20	22.2	22.1	22.3	22.0	22.4	2.5	2.0	2.5	-	-	-
iii)	25	28.6	28.5	28.7	28.4	28.8	3.1	2.6	3.1	-	-	-
iv)	32	34.9	34.8	35.0	34.7	35.1	3.7	3.2	3.7	-	-	-
v)	40	41.3	41.2	41.4	41.1	41.5	4.3	3.8	4.3	-	-	-
vi)	50	54.0	53.9	54.1	53.7	54.3	5.5	4.9	5.5	-	-	-
vii)	65	73.0	72.8	73.2	72.2	73.8	-	-	-	4.8	4.3	4.8
viii)	80	88.9	88.7	89.1	88.1	89.7	-	-	-	5.9	5.2	5.9
ix)	100	114.3	114.1	114.5	113.5	115.1	-	-	-	7.5	6.7	7.5
x)	150	168.3	168.0	168.6	166.5	170.1	-	-	-	11.1	9.9	11.1

Notes

1. For CPVC pipes SDR is calculated by dividing the average outer diameter of the pipe in mm by the minimum wall thickness in mm. If the wall thickness calculated by this formula is less than1.52 mm, it shall be increased to 1.52 mm. The SDR values shall be rounded to the nearest 0.5.

13.4.2 Dimensions of Pipes

The outside diameter, outside diameter at any point and wall thickness shall be as given in Table 13.16.

13.4.2.1 ***Diameter :*** The outside diameter and outside diameter at any point as given in Table 13.16 shall be measured according to the method given in IS 12235 (part 1).

13.4.2.2 *Diameter at any point :* The difference between the measured maximum outside diameter and measured minimum outside diameter in the same cross-section of pipe (also called tolerance on ovality) shall not exceed the greater of the following two values:

(a) 0.5 mm, and

(b) 0.012 dn rounded off to the next higher 0.1 mm.

13.4.2.3 *Wall Thickness :* The wall thickness of the pipes shall be as given in Table 18.16. Wall thickness shall be measured by any of the three methods given in IS 12235 (part 1). To check theconformity of the wall thickness of the pipe throughout its entire length, it is necessary to measure the wall thickness of the pipe at any point along its length. This shall be done by cutting the pipe at any point along its length and measuring the wall thickness as above. Alternatively, to avoid destruction of the pipe, nondestructive testing methods such as the use of ultrasonic wall thickness measurement gauges shall be used at any four points along the length of the pipe.

Tolerance on Wall Thickness

(a) For pipes of minimum wall thickness 6 mm or less, the permissible variation between the minimum wall thickness (eMin) and the wall thickness at any point (e), (e - eMin) shall be positive in the form of +y, where y=0.1 eMin+0.2 mm.

(b) For pipes of minimum wall thickness greater than 6mm, the permissible variation of wall thickness shall again be positive in the form of +y, where y would be applied in two parts.

(c) The average wall thickness shall be determined by taking at least six measurements of wall thickness round the pipe and including both the absolute minimum and absolute maximum measured values. The tolerance applied to this average wall thickness from these measurements shall be within the range 0.1 eMin+0.2 mm (see Table 13.16).

(d) The maximum wall thickness at any point shall be within the range 0.15eMin (see Table 13.16). (e) The results of these calculations for checking tolerance shall be rounded off to the next higher 0.1 mm.

13.4.2.4 ***Effective Length (Le) :*** If the length of a pipe is specified, the effective length shall not be less than that specified. The preferred effective length of pipes shall be 3, 5 or 6 m. The pipes may be supplied in other lengths where so agreed upon between the manufacturer and the purchaser.

13.4.3 Pipe Ends

The ends of the pipes meant for solvent cementing shall be cleanly cut and shall be reasonably square to the axis of the pipe or may be chamfered at the plain end.

13.4.4 Physical and Chemical Characteristics

13.4.4.1 ***Visual Appearance:*** The colour of the pipes shall be off-white. Slight variations in the appearance of the colour are permitted. The internal and external surface of the pipe shall be smooth, clean and free from grooving and other defects.

13.4.4.2 ***Opacity :*** The wall of the plain pipe shall not transmit more than 0.1 per cent of the visible lightfalling on it when tested in accordance with IS 12235 (Part 3).

13.4.4.3 ***Effect on Water :*** The pipes shall not have any determinate effect on the composition of the water flowing through them, when tested as per 10.3 of IS 4985.

13.4.4.4 ***Reversion Test :*** When tested by the method prescribed in IS 12235 (Part 5/ Sec 1 and Sec 2),a length of pipe 200 ±20 mm long shall not alter in length by more than 5 per cent.

13.4.4.5 ***Vicat Softening Temperature:*** When tested by the method prescribed in IS 12235 (part 2), the Vicat softening temperature of the specimen shall not be less than 110°C.

13.4.4.6 ***Density :*** When tested in accordance with IS 12235 (Part 14), the density of the pipes shall be between 1450kg/m3 and 1650kg/m3.

13.4.5 Mechanical Properties

13.4.5.1 ***Hydrostatic Characteristics:*** When subject to internal hydrostatic pressure test in accordance with the procedure given in IS 12235 (part 8/Sec 1), the pipe shall not fail during the prescribed test duration. The temperatures, duration and hydrostatic (hoop) stress for the test shall conform to the requirements given in Table 13.17. The test shall be carried out not earlier than 24 h after the pipes have been manufactured.

TABLE 13.17

Requirements of Pipes for Internal Hydrostatic Pressure Test

Sl. No.	Test	Test Temperature Min	Test Period	Hydrostatic (Hoop) stress
		°C	h	MPa
(1)	(2)	(3)	(4)	(5)
(i)	Acceptance	20	1	43.0

(ii)	Type	95	165	5.6
(iii)	Type	95	1000	4.6
(iv)	Type	95	8760	3.6 (Test for thermal stability)

13.4.5.2 ***Thermal Stability by Hydrostatic Pressure Testing :*** When subject to internal hydrostatic pressure test in accordance with the procedure given in IS 12235 (Part 8/Sec 1) and as per requirement given in Table 13.17, Sl. No. (iv), the pipe shall not burst or leak during the prescribed test duration.

13.4.5.3 ***Resistance to External Blow at 0°C :*** When tested by the method prescribed in IS 4985, with classified striker mass and drop height as given in Table 13.18, the pipe shall have a true impact rate of not more than 10 per cent.

TABLE 13.18

Classified Striker Mass and Drop Height Conditions for the Falling Weight Impact Test

Sl. No.	Nominal pipe size	Mass of falling weight	Falling height
	mm	kg	mm
(1)	(2)	(3)	(4)
(i)	15	0.5±0.5%	300±10
(ii)	20	0.5±0.5%	400±10
(iii)	25	0.5±0.5%	500±10
(iv)	32	0.5±0.5%	600±10
(v)	40	0.5±0.5%	800±10
(vi)	50	0.5±0.5%	1000±10
(vii)	65	0.8±0.5%	1000±10
(viii)	80	0.8±0.5%	1200±10
(ix)	100	1.0±0.5%	1600±10
(x)	150	1.6±0.5%	2000±10

13.4.5.4 ***Flattening Test :*** When tested by the method prescribed in IS 12235 (part 19), pipe shall show no signs of cracking, splitting and breaking.

13.4.5.5 ***Tensile Strength :*** When tested by the method prescribed in IS 12235 (Part 19), the tensile strength at yield shall not be less than 50 MPa at 27 ± 2°C.

13.4.6 Sampling and Criteria for Conformity

The sampling procedure and criteria for conformity shall be as given in Annexure F.

13.4.7. Marking

13.4.7.1 Each pipe shall be clearly and indelibly marked in ink/paint or hot embossed on white base at intervals of not more than 3 m. The marking shall show the following:

(a) Manufacturer's name or trade-mark
(b) Outside diameter,
(c) Class of pipe and pressure rating, and
(d) Bath or lot number

13.4.7.2 ***BIS Certification Marking :*** Each pipe may also be marked with the Standard Mark.

13.4.8 Fittings

The fittings shall be as follows:

(a) Plain CPVC solvent cement fittings from size 15 mm to 160 mm.
(b) Brass threaded fittings.
(c) Valve from size 15 mm to 160 mm
(d) *Brass Threaded Fittings:* All types of one end brass threaded male/female adaptors in various fittings like coupler, socket, elbow, tee are available for transition to other plastic/metal piping and for fixing of CP fittings. Ball, Gate valves in CPVC are available in all dimensions. All fittings shall carry the following information:

(1) Manufacturer's name/trade mark.
(2) Size of fitting

13.4.9 Piping Installation Support and Spacing

13.4.9.1 ***Concealed Piping:*** Pipes can be concealed in chases. The pipes and fitting are to be pressure tested prior to concealing the chases. To maintain alignment of CP fittings while joining, all alignment of fittings and pipe shall be done correctly. DO NOT USE NAILS FOR HOLDING OF PIPES IN THE CHASES.

13.4.9.2 ***External Installations:*** For pipes fixed in the shafts, ducts etc. there should be sufficient space to work on the pipes. Pipes sleeves shall be fixed at a place the pipe is passing through a wall or floor so as to allow freedom for

expansion and contraction. Clamping of the pipe at suitable spacing is done to support it while allowing the freedom for movement.
All pipes exposed to sunlight shall be painted with a water based acrylic paint emulsion to enhance UV protection. Pipes in trenching shall be laid in accordance to the Good Plumbing practices followed for Metal piping.

Recommended Support Spacing (Distance between Pipe Clamps Horizontal Support)

Pipe size	Horizontal supports in meters			
	Temperature			
	23°C	*38°C*	*60°C*	*82°C*
16 mm (1/2")	1.22	1.22	1.07	0.92
20 mm (3/4")	1.53	1.37	1.22	0.92
25 mm (1/0")	1.68	1.3	1.37	0.92
32 mm (1 1/4")	1.83	1.68	1.53	1.22
40 mm (1 1/2")	1.98	1.83	1.68	1.22
50 mm (2")	2.29	2.14	1.98	1.22

13.4.9.3 ***Expansion LOOP:*** CPVC systems, like all piping materials, expand and contract with changes in temperatures. CPVC pipes shall expand 7.5 cm per 30 m length for a 400C temperature change.
Expansion does not vary with Pipe size. Thermal expansion can be generally be accommodated at changes in direction. On a long straight run, an offset or loop based on the following chart is required.

Nominal Pipe size	*Length of Run (Meter), Loop length in cms.*				
	6 metre	*12 metre*	*18 metre*	*24 metre*	*30 metre*
15 mm	43	56	69	79	86
20 mm	38	66	81	91	104
25 mm	53	74	91	104	117

32 mm	58	81	102	117	130
40 mm	63	89	109	127	142
50 mm	71	102	124	145	63

13.4.10 Testing

All water supply systems shall be tested to hydrostatic pressure test. The pressure tests are similar to the test pressure used for other plastic/metal pipes. System may be tested in sections and such section shall be entirely checked on completion of connection to the overhead tank or pumping system or mains.

13.4.11 Measurements

The net length of pipes as laid or fixed shall be measured in running meters correct to a cm for the finished work, which shall include CPVC pipe and fittings including plain and Brass threaded fittings and jointing solvent cement. Rate shall also include for excavation/trenching in all kinds, refilling.

13.5 GUIDELINES FOR STORAGE AND INSTALLATION OF CPVC PIPES

E-1 STORAGE

CPVC pipes of all sizes are packed in polyethylene packing rolls and both the ends of the packed roll are sealed with air bubble film cap in order to provide protection during handling and transportation. After packing, the whole bunch of pipes is tightened with polypropylene/ HDPE strapping. Each role is then marked with size/type of the pipe, lot number and quantity. The packed pipe rolls are stored in their respective racks in properly covered storage area. Apart from providing protection during handling and transportation, the packing rolls also protect the pipe from ultra violet rays.

E-2 INSTALLATION GUIDELINES

E-2.1 Visually inspect pipe ends before making the joint. Use of a chamfering tool will help identify and crakes, as it will catch on to any crack.

E-2.2 Pipe may be cut quickly and efficiently by several methods. Wheel type plastic tubing cutters are preferred. Ratchet type cutter or fine tooth saw are another options. However, when using the ratchet cutter be certain to score the exterior wall by rotating the cutter blade in circular motion around the pipe.

Do this before applying significant downward pressure to finalize the cut. This step leads to a square cut. In addition, make sure ratchet cutter blades are sharp. Cutting tubing as squarely as possible provides optimal bonding area within a joint.

E-2.3 Burrs and filings can prevent proper contact between the tube and fittings during the assembly, and should be removed from the outside and inside of the tube. A chamfering tool is preferred, but a pocket knife or file is also suitable for this purpose.

E-2.4 Use only CPVC cement jointing. Use CPVC cement, which is fully recommended by the Manufacturer.

E-2.5 When using adhesive solution/solvent cement be certain of proper ventilation.

E-2.6 When making a join, apply a heavy, even coat of cement to the pipe end. Use the same Applicator without additional cement to apply a thin coat inside the fitting socket. Too much cement can cause clogged waterways. Do not allow excess cement to puddle in the fitting and pipe assembly. This could result in a weakening of the pipe wall and possible pipe failure when the system is pressurized.

E-2.7 Rotate pipe one-quarter to one-half turn while inserting it into the fitting socket and remove the excess adhesive solution/solvent cement from the joint with clean rag.

E-2.8 When making a transition connection to metal threads, use a special transition fitting or CPVC male threaded adapter whenever possible. Do not over-torque plastic threaded connections. Hand tight plus one-half turn should be adequate.

E-2.9 Hang or strap CPVC systems loosely to allow for thermal expansion. Do not use metal straps with sharp edges that might damage the tubing.

E-2.10 CPVC stub outs for lavatories, closets and sinks are appropriate. However, on areas where there is a likelihood that movement or impact abuse will occur, metal pipe nipples may be a more appropriate stub-out material. Showerheads, tub spouts and outside still cocks are examples.

13.6 UNPLASTICISED POLYVINYL CHLORIDE PIPES AND FITTINGS

13.6.1 UPVC Pipes

Soil, waste and rain water UPVC Pipes shall conform to Type B pipes of IS 13592. The internal and external surfaces of the pipes shall be smooth and clean and free from grooving and other defects. The end shall be clearly cut and shall be square with the axis of the pipe. The end may be chamfered on the plain sides. Slight shallow longitudinal grooves or irregularities in the wall thickness shall be permissible provided the wall thickness remains within the permissible limit.

13.6.2 Colour of Pipe

Surface colour of the pipes shall be as approved by Engineer-in-charge.

13.6.3 Marking

Each pipe shall be clearly and indelibly marked with the following informations at intervals not more than 3 meter.

(a) Manufacturer's name or trade mark.
(b) Nominal outside dia of pipe.
(c) Type 'B'
(d) Batch number.

13.6.4 Dimensions

13.6.4.1 ***Diameter and Wall Thickness:*** Mean outside diameter, outside diameter at any point and wall thickness for type –B manufactured plain or with socket shall be as given in Table- 1 of IS 13592. UPVC soil, waste, rain water pipes shall be of the dia, specified in the description of the item and shall be in

nominal lengths of 2,3,4 or 6 metres either plain or with sliding/grooved socket unless shorter lengths are required at junctions with fittings. Tolerances on specified length shall be + 10 mm and – 0 mm.

13.6.5 Fixing and Jointing

Pipes shall be either fixed on face of wall or embedded in masonry as required in the description of the item. Plain pipes shall be secured to the walls at all joints with PVC Pipes clips by means of 50 x 50 x 50 mm hard wood plugs, screwed with M.S. screws of required length i/c cutting Block work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand). The clips shall be kept about 25 mm clear off finished face of wall, so as to facilitate cleaning of pipes. Pipes shall be fixed perfectly vertical or to the lines as directed. The pipes shall be fitted to fittings with seal ring conforming to IS 5382 allowing 10 mm gap for thermal expansion.

13.6.6 Installation in Wall/Concrete

The walls/concrete slots should allow for a stress free installation. Pipes and fittings to be inserted into the slots without a cement base have to be applied first with a thin coat of PVC solvent cement followed by sprinkling of dry sand (medium size). Allow it to dry. The process gives a sound base for cement fixation. This process is repeated while joining PVC material to CI/AC materials.

13.6.7 Fittings

Fittings used shall be of the same make as that of the PVC pipes Injection moulded or fabricated by the manufacturer and shall have a minimum wall thickness of 3.2 mm. The fittings shall be supplied with grooved socketed ends with square grooves and provided with Rubber Gasket conforming to IS 5382. The plain ends of the fittings should be chamfered. The fittings shall be joined with the help of Rubber lubricant. The details of fittings refer IS 13592.

13.6.8 Measurements

The pipes shall be measured net when fixed correct to a cm. including all fittings along its length.

13.6.9 Rate

The rate shall include the cost of all materials and labour involved in all the operations described above including jointing including the supply and fixing of wall plugs and PVC clips. **13.7 CUTTING HOLES IN R.C.C. FLOORS (UPTO 15 × 15 CM)**

13.7.0 Square holes of size as specified shall be cut in R.C.C. floor and roofs for passing drain pipe etc. Any damage to the adjoining portion or to any other item shall be made good as directed by the Engineer-in-Charge. All the dismantled material shall be removed from the site.

13.7.1 Cement Concrete

After insertion of drain pipe etc. the hole shall be repaired with cement concrete M20 grade and the surface finished to match with the existing surface. The top and bottom shall be finished properly to make the joint leak proof. The

specifications for cement concrete work and finishing etc. shall be the same as detailed under relevant sub-heads.

13.7.2 Measurements

Rate for cutting shall be included in the respective pipe work item

13.8 CUTTING CHASES IN MASONRY WALLS

13.8.1 Making Chases

I. Cutting of chases in 200mm thick and above load bearing walls:

(i) As far as possible services should be planned with the help of vertical chases. Horizontal chases should be avoided.

(ii) The depths of vertical chases and horizontal chases shall not exceed one third and one sixth of the thickness of the masonry respectively.

(iii) When narrow stretches of masonry (or short lengths of walls) such as between doors and windows, cannot be avoided, they should not be pierced with openings for soil pipes or
Waste pipes or timber joints, etc. Where there is a possibility of load concentration, such narrow lengths of walls shall be checked for stresses and high strength Blocks mortar or concrete walls provided, if required.

(iv) Horizontal chases when unavoidable should be located in the upper or lower one third of Height of story and not more than three chases should be permitted in any stretch of a wall.

No continuous horizontal chase shall exceed one metre in length. Where unavoidable, stresses in the affected area should be checked and kept within the permissible limits.

(v) Vertical chases should not be closer than 2 m in any stretch of a wall. These shall be kept away from bearings of beams and lintels. If unavoidable, stresses in the affected area should be checked and kept within permissible limits.

(vi) Masonry directly above a recess, if under than 30 cm (Horizontal dimension) should be supported on lintel. Holes in masonry may be provided up to 30 cm width x 30 cm height without any lintel. In the case of circular holes in masonry, no lintel should be provided up to 40 cm in diameter.

II. Cutting of chases in 100m thick block non-loading bearing walls

In case of non-load bearing half Block walls services should be planned with the help of vertical Chases. Horizontal chases should be provided only when unavoidable.

Iii. Cutting of chases in stone masonry walls

The provision (i) to (vi) under Sl. No. I are equally applicable to stone masonry walls also.

Note:

1. No inclined chase shall be permitted in Block masonry or stone masonry walls. In case inclined chases are unavoidable these shall be cut with written approval of the Engineer-In-Charge, and shall be repaired properly to his satisfaction. However, in half Block masonry wall, no inclined chase will be permitted.
2. Chases shall be made by chiseling out the masonry to proper line & depth. Any damage to the adjoining portion or to any other item shall be made good, as decided by the Engineer-In-Charge, for which no extra payment shall be made. All dismantled material shall be removed from site.

13.8.2 Filling Chases

After G.I. Pipes etc. are fixed in chases, the chases shall be filled with cement concrete 1:3:6
(1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size) or cement mortar 1:4 (1 cement: 4 coarse sand) as may be specified or otherwise directed by the Engineer-In-Charge and made flush with the masonry surface. The concrete surface shall be roughened with wire brushes to provide a key for plastering.

13.8.3 Pipe Encasing/supports:

Cement concrete around pipes shall include any masonry supports, shuttering and centering, curing, cutting etc. complete as described in the relevant specifications.

13.8.4 Angles/ channels

Slotted angles/ channels shall include support bolts and nuts, length embedded in the cement concrete blocks of 1:2:4 (1cement: 2 coarse Manufacture Sand: 4 stone aggregate 20mm nominal size) formed in the masonry walls; nothing extra shall be paid for the cement concrete block and making good the masonry wall, anchor fasteners etc. complete.

13.8.3 Measurements

Rate for chasing and making good shall be included in the respective pipe work item of schedule of quantity

13.9.1 Gunmetal valves:

1. Valves 65mm dia and below shall be heavy gunmetal full way valves or globe valves conforming to Class I of IS: 778. Valves shall be tested at manufacturer's works and the same stamped unit.
2. All valves shall be approved by the Engineer-in-charge before they are allowed to be used in the Work.
3. Sluice valves: Unless otherwise specified all valves 80mm dia and above shall be CI double flanged sluice valves with non-rising spindle. Sluice valves shall be provided with wheel when they are in exposed positions and with a cap top when they are located underground. CONTRACTOR shall provide suitable operating keys for sluice valves with cap tops.
4. Sluice valves shall be of approved makes conforming to IS: 780 of Class as specified.

13.9.2 Butterfly Valves:

1. Where specified Valves 80mm dia and above shall be cast iron butterfly valve to be used for isolation and/ or flow regulation as directed by the Engineer-in-charge. The valves shall be tight shutoff/ regulatory type with resilient seat suitable for flow in either direction and seal in both directions.
2. Butterfly valve shall conform to IS:13095.

13.9.3 Non Return Valve:

Where specified non return valve (swing check type) shall be provided through which flow can occur in one direction only. It shall be single door swing check type of best quality conforming to IS:5312.

13.9.4 Hot water pipes Insulation:

1. All open hot water flow and return pipes (not in chase), shall be insulated approved make thermal insulation material
2. Insulation to pipes shall be with pre moulded pipe sections as per schedule of quantity
3. Application: All surfaces shall be thoroughly cleaned with a wire brush.
4. One layer of approved primer shall be applied and pre moulded pipe insulation sections shall be fixed.
5. Insulation for hot water pipes in chase: All hot water pipes fixed in wall chase shall be painted with two coats of bitumen paint of approved make.

13.9.5 **Sterilization of installation:** The water supply installation shall be sterilized as per standards and as follows:

1. Tanks and pipes shall be filled and flushed out.
2. All bib cocks (taps) shall be closed.
3. Tanks and pipes shall be re-filled while adding a sterilizing admixture containing 50 parts chlorine to one million parts water.
4. When the installation is filled all bib cocks (taps) shall be opened progressively and each allowed running until the water smells of chlorine.
5. The installation shall be topped up and more sterilizer added.
6. The installation shall then be left for three hours and shall then be tested for residual chlorine; if none is found, the installation shall be drained and the process repeated.
7. The installation shall be finally drained and flushed with potable water before use.

13.10 INTERNAL AND EXTERNAL DRAINAGE SYSTEM INTERNAL DRAINAGE Scope of Work:

13.10.1 All soil, waste and storm water disposal for the portion above ground level to the public sewers/ drainage shall be by gravity whereas from the basements it shall be by pumping. Without restricting to the generality of the foregoing, the soil, waste, vent and rain water pipes system shall inter-alia include the following:

1. Vertical and horizontal soil, waste, vent and rainwater pipes and fittings, joints, clamps and connections to fixtures/sanitary wares.

2. Connection of all pipes to sewer lines as shown on the drawings at ground level.
3. Floor and urinal traps, clean out plugs, inlet fittings and rainwater (roof) pipes and outlets.

4. Testing of all pipes and fittings before installation.
5. Testing of all pipes lines after installation.

13.10.2 General Requirements

1. Clause13.2.2 (1) and (2) shall apply.
2. Drainage lines and open drains shall be laid to the required gradients and profiles. Location of all manholes, etc. shall be got confirmed by the Engineer-in-charge before the actual execution of work at site. As far as possible, no drains or sewers shall be laid in the middle of road unless otherwise shown on the drawings or directed by the Engineer-in-charge in writing.

13.10.3 TECHNICAL REQUIREMENTS

(a) Standards and Materials - uPVC SWR Drainage Systems

All materials and the installation shall meet latest of the standards and as specified in clause 13.6 above, uPVC SWR drainage piping shall be factory made complete systems of approved makes with all the fittings. The pipes and fittings shall meet with the relevant IS codes. All joints shall be snap fit type with rubber ring and shall always produce a 100% water tight joint. Pipe and fittings shall be suitable for the snap fit joint.

(b) Cleanouts

Cleanouts other than those integral with the fitting, shall be of brass and screw down type. Cleanouts shall be accessible from the floor served.

(c) Supports; hangers & clamps

All pipe supports, hangers & clamps shall be standard pre-fabricated galvanized (after fabrication) units. Pipe supports shall generally follow the types specified in the specifications drawings. Any other type of support, suspension or clamping to meet site conditions shall be got approved before use.

(d) Cleaning plugs

Cleaning plugs shall be easily accessible and convenient for rodding. Such plugs shall be liberally provided so that the entire drainage system could be easily cleared of all possible chokes. All clean outs shall be behind the flow and as far as possible, plug bends may be avoided. In the case of under slung drainage systems, the clean outs should be on top of the floor and NOT under the floor.

(e) Traps & Seals

1. All traps shall be self-cleaning and the material and the seal depth shall be as specified below wherever the traps are not integral with the appliances or ware.

Appliance or ware	Trap		
	Material	Type	Seal depth (mm)
Lavatory/Wash basin (1)	CP brass	P	50
Sinks (1)	CP brass	P	50
Floor drain	uPVC	P or S	50
Kitchen Floor drain	uPVC	P	50
(All P-traps shall have cleaning eye or other cleaning facility)			
Roof Drain outlet	uPVC	-	-

Any other appliance shall have an appropriate trap as specified by the employer. All floor drains shall be cockroach proof covered with perforated stainless steel grating of size specified or required. Roof drain outlets shall have dome grates unless specified otherwise Plant room floor drains shall have cast iron or fabricated steel grating. (g) Drainage System Installation

1. All pipes before and after testing shall be protected with wooden plugs to prevent ingress of dust, sand or any extraneous matter.
2. All openings and chases in Block walls shall be made neatly and finished with 1:2:4 cement sand plaster on chicken mesh but the final, finish will be done by others. Openings in concrete walls shall, however, be made only with the approval of the Engineer-in-charge. Pipe penetrations, through wall or floor, shall be sealed with an approved fire resistant sealant.
3. Good workmanship and neat pipe layout are the prerequisites of these specifications. Horizontal pipes shall be truly horizontal with necessary slopes and hangers or supports as specified and shown on drawings. Vertical pipes shall be truly vertical and shall be laid away from the walls at least by 50 mm or as per instruction of Engineer-In-Charge. All pipe runs shall be parallel to the ceiling or walls for presenting a neat appearance. Pipes buried in wall shall be laid in machine-made chases with galvanized steel anchors.
4. Shop drawings for the routing of pipes shall be prepared generally on the basis of layout drawings issued. However, the drawings shall reflect the site conditions, structural beams and columns obstructions by way of any construction elements or any other service pipes, ducts etc duly co-ordinate with other services. The drawings should clearly indicate openings required in Block or concrete walls and invert levels at every 15m intervals. The drawings should also indicate typical details of hangers, supports, brackets etc. After approval of the drawings, pipe routes shall be marked with a distinct colour of paint on the site and got approved by the Engineer-in-charge.

(h) Soil & Waste Piping

1. Pipes shall be laid to an optimum slope of 1 in 90 as far as possible. A liberal provision of easily accessible cleanouts shall be made on all horizontal pipes. Cleaning facility shall preferably be from the floor above the ceiling slab for all underflow installations. Where horizontal pipes are laid in a sunken floor slab, adequate slopes shall be achieved through galvanized saddles or cement mortar bedding. All such pipes, after testing, shall be covered with and set in cement concrete of M20 so that the pipes are not disturbed during the filling up of the sunken floor.
2. Horizontal pipes shall be suspended from the structural ceiling slab or wall brackets at centers specified in the drawings
3. Vertical stacks shall be truly vertical and parallel to the wall and supported on saddles so that the pipes are at least 50mm away from the finished surface. Branch pipe connections shall be aligned with the bend or tee on the stack. Where the vertical stack meets the horizontal run or a manhole, a 45^{o} tee connection with a cleanout shall be employed to facilitate smooth flow and easy clean ability.
4. All pipes shall be fixed in a gradient towards the outfalls of drains. Pipes inside a toilet room shall be in wall chase unless otherwise shown on drawings. Where required, pipes may be run at ceiling level in suitable gradient and supports as shown in the drawings
5. Building vent stacks shall be not less than 75mm dia. Where the vent stack becomes one with the main soil or waste stack the main stack size shall not be reduced. Vent connections on any branch waste drain line shall be at least two thirds the diameter of the branch drain subject to a minimum of 25mm. Vent connection to a soil drain line shall be a minimum of 32mm dia. Vent connections shall be as near to the crown of the trap as possible.
6. No water shall enter vent lines. Vent lines shall be laid vertically terminated at least 150mm above the open-to-air roof. Vents may be connected back to the waste or soil stack above the highest appliance connection and the said stack extends beyond the roof by at least 150mm into the air.

13.10.4 Acceptance, Testing & Commissioning

(a) Pre-commissioning checks. A walk-through inspection shall be carried out & the following checks made:

1. Layouts are according to the drawings. Identify variations.
2. Materials used are as specified, new and as per approved samples.
3. All fixtures viz. suspenders, brackets, clamps etc. are adequate and firmly fixed and spaced as specified.
4. Cleaning eyes are duly plugged and are easily accessible.
5. No visible damages or cases of bad workmanship.
6. Check water seals in traps by discharging adequate number of appliances.

(b) During construction, the piping shall be tested in sections so that the maximum static head of water is not more than 4.5m. All such sectional tests shall be witnessed and signed by the Engineer-in-charge. Records of these tests shall form the Acceptance Test documentation.

(c) An air test shall be conducted as specified in IS: 5329 with a test pressure of 50mm water gauge. If the pressure is not holding, then a smoke test shall be conducted through a smoke generator to track down the leaking points. After attending to the leaks, the piping shall be air tested again.

(d) Hydraulic Performance Tests shall be conducted on each stack by simultaneous release of water through various appliances like WC's and bathtubs to ensure water sealing of traps.

13.10.5 Mode of measurement

The following notes shall be taken into account while arriving at the unit rates.

1. UPVC SWR waste piping from wash basins, sinks, fan coil units, AH units and bath tubs are directly connected to cpvc swr waste stack necessary fittings shall be provided in the stack for making the connection, and this shall be measured along with the waste pipe and no extra shall be payable on this account.
2. All waste & vent pipes shall be measured net when fixed correct to a centimeter including all fittings along its lengths including supports, suspenders, brackets,clamps, jointing etc. When collars are used, in soil, waste and vent pipes they shall be measured along with and paid as pipes and no extra shall be paid for collars or fixing them to wall with holder bat clamps. No allowances shall be made for the adjacent pipes or fittings. The above will apply whether pipes are fixed on wall face or pipes are embedded in masonry or pipes suspended from the ceiling.

b. List of Materials of Approved Brand / Manufacturers

1.	Vitrified Tiles and Ceramic Tiles	H.R. Johnson, RAK, KAJARIA, NITCO, Bell, SOMANY
2.	Water proofing compounds	Roffe, Fosroc, Sunanda, Xypex, CICO, Imperno, Pidilite, Accoproof or approved equivalent.
3	Anti-Carbonation Coatings	BASF(India) Ltd; Sika India Ltd; STP India Ltd; Fosroc Chemicals; Pidilie
4.	Sanitary ware	Hindware, Parryware, Cera, JAQUAR or approved equivalent
5.	Plumbing and Sanitary Fittings	Jaquar or approved Equivalent
6.	C.I. Pipe & fittings	NECO or approved equivalent
7.	G.I. Pipe	Tata, Jindal or approved equivalent ISI marked
8.	All Paints & distempers	Jenson & Nicholson, Asian Paints, Shalimar, Goodlass Nerolac, Berger, ICI.
9.	Glass	Modi float, Asahi, Saint Gobain.
10.	Aluminum	Jindal or approved equivalent
11.	Cement	Ambuja, Ultratech,L&T,ACC
12.	SS Sink	Nirali or approved equivalent
13.	UPVC drain/soil pipe & CPVC	Astral, Ashirwad or other approved equivalent
14.	Ready mix polymer modified mortar	Ultra Tech, Wall Plast or other approved equivalent
15.	Cementitious putty	Birla White, JK and other equivalent approved
16	Plywood	Greenply, Greenpanel or approved equivalent

17	Laminate / Veneer	Greenply, Greenpanel or other approved equivalent
18	uPVC Windows/Door	Fenestra, Encraft, Kommerling, Wintech or approved equivalent
19	Kitchen baskets	Evershine, Godrej, Signet or approved equivalent
20	Storage units	Duaco, Methodex or other approved equivalent
21	False ceiling	Armstrong, Gyproc or other approved equivalent

NAME AND ADDRESS OF THE CONTRACTOR:

SIGN & SEAL OF THE CONTRACTOR:

Date:

Place:

Safety Code

1. First aid appliances including adequate supply of sterilized dressing and cotton wool shall be kept in a readily accessible place.
2. An injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalization.
3. Suitable and strong double scaffolds should be provided for workmen for all works that cannot safely be done from the ground.
4. No portable single ladder shall be over 8 meters in length. The width between the side rails shall not be less than 30 cm (clear) and the distance between two adjacent rungs shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding ladder.
5. The excavated material shall not be placed within 1.5 meters of the edge of trench of 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 metre.
7. No floor, roof or other part of the structure shall be so overloaded with debris or materials as to render it unsafe.
8 Workers employed on mixing and handling material such as asphalts, cement mortar or concrete and lime mortar shall be provided with protective footwear and rubber hand gloves.
9. Those engaged in welding works shall be provided with welder's protective eye-shields and gloves.
10. (i) No paint containing lead or lead products shall be used except in the form of paste of ready-made paint.
    (ii) The workers should supply suitable facemasks for use when the paint is applied in the form of spray or surface having lead paint dry rubbed and scrapped.
11. Overalls (Protective clothing) shall be supplied by the contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during the periods of cessation of work.
12. Hoisting machines and tackle used in the works, including their attachments, anchorage and supports shall be in perfect condition.
13. The ropes used in hoisting or lowering material or as a means of suspension shall be of durable quality and adequate strength and free from defects.
14 First aid appliances including adequate supply of sterilized dressing and cotton wool shall be kept in a readily accessible place.
15 An injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalization.
16 Suitable and strong double scaffolds should be provided for workmen for all works that cannot safely be done from the ground.
17 All the workers shall be provided with safety belts, safety shoes and helmets. No workmen shall be allowed to work on scaffolding without safety helmets and safety belts.

18 No portable single ladder shall be over 8 meters in length. The width between the side rails shall not be less than 30 cm (clear) and the distance between two adjacent rungs shall not be more than 30 cm. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder.

FIRE SAFETY CODE

1. Cutting / drilling machine and other electrically operated equipment used at site shall be plugged into correctly rated electrical outlets.
2. Only ISI marked 3 pin plug and other appliances and equipment shall be used.
3. Electrical power cables/wires used shall not have any joints and shall be properly rated.
4. All electrical appliances i.e. welding, drilling, cutting machine etc. shall be safely and securely earthed to prevent leakage current while in operation.
5. Before commencing the welding work for the first time on any day, fire section shall be informed and only after the site inspection by the Fire officers/Personnel, work shall be started.
6. Two buckets of water and sand shall be kept in an easily accessible area on the site.
7. Fire extinguishers recommended and issued by fire officers shall be kept on the site.
8. Used paint drums shall be stored in specified store only after closing them properly.
9. Personal protective equipment such as safety shoes, hand gloves, welder's mask, ear plug, etc., depending upon the requirement of the work shall be provided by the Contractor to the workmen to prevent occupational health hazards.
10. The safety belt shall be provided by the Contractor and used by the workmen while working from height for more than 10' from Ground level.
11. None of the passages near lift lobby and staircases shall be used for stacking / dumping any kind of materials/waste.
12. Both the staircase doors shall be normally kept closed.
13. None of the fire extinguishers shall be removed/shifted from its designated location.
14. Power supply shall be switched off from the mains when equipment is not in use.
15. Wood-shavings and saw-dust generated from the work shall be collected on daily basis, removed from site and stored at the designated place in proper manner.
16. Any debris generated from the work shall be collected on daily basis, removed from site and stored at the designated place in proper manner.
17. Battery operated emergency light/torches shall be provided by the Contractor to the workmen while working beyond office hours.

Schedule B

General Rules and Instructions to Bidders - Information

<table>
<tr><td rowspan="3">Bids in Two Bids System</td><td rowspan="2">2</td><td>Tender Inviting Authority –
Shri Jaikish,
Principal,
Estate Department,
Reserve Bank of India,
CAB, Pune
Tel No.: 020-25582378, 25582380</td></tr>
<tr><td>Name of the Work- Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE.
Estimated cost of work-: ₹9,11,000</td></tr>
<tr><td>2, 14</td><td>Due Date and Time for submission of e-Tender/Bid (Bid close date)- July 30, 2025 till 02:00 PM
Tender submission mode: e-Tender</td></tr>
<tr><td>Earnest Money Deposit (EMD)</td><td>4(iii) and 11</td><td>EMD of ₹Nil only (to be submitted by the successful vendor)
The account details for NEFT transactions are as under:
Account Details: -
<table>
<tr><td>1</td><td>Name of the Account Holder (as appearing in the Bank Account)</td><td>College of Agricultural Banking, Reserve Bank of India, Pune</td></tr>
<tr><td>2</td><td>Account Number</td><td>8614038</td></tr>
<tr><td>3</td><td>Type of Account (Savings, Current etc.)</td><td>Current</td></tr>
<tr><td>4</td><td>PAN Number</td><td>AAIFR 5286M</td></tr>
<tr><td>5</td><td>Name of the Bank</td><td>Reserve Bank of India</td></tr>
<tr><td>6</td><td>Name of the Branch</td><td>CAB,PUNE</td></tr>
<tr><td>7</td><td>Address of the Bank</td><td>CAB, RBI, University Road, PUNE</td></tr>
<tr><td>8</td><td>NEFT/IFS Code</td><td>RBIS0PUPA01 (0 in the code represents ZERO)</td></tr>
<tr><td>9</td><td>Name of the Account</td><td>Sundry Deposit A/c-DAD</td></tr>
<tr><td>10</td><td>GST Number</td><td>27AAIFR5286M1ZG</td></tr>
</table>
Proof of remittance indicating transaction number and other details shall be uploaded on Bank’s approved e-tender portal along with other tender documents.</td></tr>
<tr><td>Opening of Bids</td><td>16</td><td>Date of opening of tenders/bids (Part-I) – July 30, 2025 at 03:00 PM</td></tr>
<tr><td>Bid validity</td><td>17</td><td>Bid validity – Three Months</td></tr>
</table>

Time for Completion of work	23	**Time allowed to complete the work**: Three months from the date of commencement
Transaction fee		Charges for participation in e-procurement will be made to M/s MSTC Ltd through MSTC Gateway/NEFT/RTGS in favor of MSTC Limited or as advised by MSTC Ltd.

Schedule C

General Conditions of the Contract - Information

Definition		i)	**Name of the Work** - Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE.
		ii)	**The Site** – Class III and IV flats at Rajnigandha Staff Quarters, RBI, CAB, Pune
		iii)	**The Employer** – Shri Jaikish, Principal, Estate Department, Reserve Bank of India, CAB, Pune
		xiii)	**The Engineer-In-Charge:** Bank Manager, Reserve Bank of India, Estate Department, CAB, Pune
		xxii)	The percentage mentioned to cover all overheads and profits – 15%
Discrepancies and Adjustment of Errors (order of preference)	8.2	**The Competent Authority –** Shri Jaikish, Principal, Estate Department, Reserve Bank of India, CAB, Pune	

CLAUSES OF CONTRACT

Performance Guarantee	CLAUSE 1	
	(i)	Time allowed for submission of Performance Guarantee from the date of award of work – 14 days
	(ii)	Maximum allowable extension of time for submission of Performance Guarantee beyond the period specified in (i) above without penalty – 7 days

	(iii)	Maximum allowable extension of time for submission of Performance Guarantee beyond the period specified in (ii) above with late fee @ 0.1% of the amount of Performance Guarantee per day – 7 days
Recovery of Security Deposit	CLAUSE 1 A	
	Retention percentage – 5% from every bill subject to 5% of the contract price	
Compensation for Delay	CLAUSE 2	
	Liquidated damages at the rate of ₹326.00 per day of delay subject to a maximum of 10% of the contract value as per Clause Authority for fixing compensation under clause 2 : Shri Jaikish, Principal, Estate Department, Reserve Bank of India, CAB, Pune	
	CLAUSE 5	
Time and Extension for Delay	Date of commencement: 10th day from the date of award of work Time allowed for completion of work: Three months (90 days) from the date of commencement.	
(i)	Authority for granting Extension of Time – Shri Jaikish, Principal, Estate Department, Reserve Bank of India, CAB, Pune	
(ii)	Rescheduling of Milestones -Engineer-in-charge	
(iii)	Shifting of date of commencement in case of delay in handing over of site - Engineer-in-charge	
Measurements of Work Done	CLAUSE 6 or CLAUSE 6A	
	Clause applicable – 6A	
	CLAUSE 7	

Payment on Interim Certificate to be Regarded as Advances	Gross value of work done together with net payment/ adjustment of advances for material collected, if any, since the last such payment eligible for raising Running Account bill (Interim payment) – **Above ₹ Ten Lakh**
	Retention percentage for Interim Certificates – 5% from every bill
	Total Retention Money - 5% of the Contract Price of each RA Bill plus **NIL**% Performance Bank Guarantee.
	Retention period for the Retention Money (5 % of the final bill amount) - up to successful completion of Defects Liability Period (DLP) i.e. one year from the date of virtual completion.
	Instalment due after Completion - Performance Bank Guarantee submitted by contractor towards Performance
	Period of honouring interim certificates-1 month from the date of receipt of complete bill along with all the documents as specified in Special Conditions of Contract
Action in case Work not done as per Specifications	CLAUSE 11 A
	Authority for accepting reduced rate – Shri Jaikish, Principal, Estate Department, Reserve Bank of India, CAB, Pune
Deviations/ Variations Extent and Pricing	CLAUSE 12
Deviation - Deviated Quantities and Pricing	Deviation limit beyond which clause 12.2 C shall apply - 25% beyond the tender item quantity specified in the Schedule of Quantity
Contractor Liable for Damages, defects during defect liability period	CLAUSE 17
	Defects Liability Period – 12 months from the date of completion and handing over the Completion Certificate to the Employer Competent Authority for deciding reduced rates – Shri Jaikish,

	Principal, Estate Department, Reserve Bank of India, CAB, Pune
Settlement of Disputes & Arbitration	CLAUSE 25
	Competent Authority for referring the dispute – Chief General Manger & Principal, College of Agricultural Banking, Reserve Bank of India, Estate Department, Pune Place of Arbitration – Pune, India
Water and Electric power supply for work Alternate water supply arrangements	CLAUSE 31
	Bank will made available water and electricity power supply required at one point free of charge. Contractor shall arrange to make arrangement for connection with safety fixtures.
	CLAUSE 33
Insurance in respect of damages to Persons and Property	Contractor shall take following Insurance Policies: **1.** Contractor's All Risk Policy for the full Contract Value for entire Contract Period **2.** Workmen Compensation Policy for all workmen deployed at site **3.** Third Party Liability Policy as per following details: a) For injury to persons – ₹2 Lakh per person per accident b) For damage to property – ₹5 Lakh per accident Subject to overall ceiling as per extant Insurance guidelines
Employment of Technical Staff and employees	CLAUSE 34
	Site supervisor (Civil)

Schedule D
LIST OF DOCUMENTS TO BE MAINTAINED AT SITE

S. No.	Description of the Document	Remarks
1	Contract Agreement.	Certified true copies of the contracts
2	Drawings	One set of all drawings issued for the work
3	Work Programme chart	Showing latest item wise progress plan
4	Work instruction / Site order Book	For issue of instructions by Bank's Engineer or his representative at site in the course of day to day supervision .This book shall be in the form of Triplicate book with machine numbered pages. After recording the instructions, one copy shall be taken by Bank's Engineer or his representative, another by the contractor and the third copy shall remain in the book on which the compliance shall be recorded by Contractor after taking required action.
5	Labor Report and Daily Progress Report (DPR)	To record the labour and DPR by the contractor
6	Test Reports/ certificates for Materials/ equipment	To maintain record of test reports/ certificates received from manufacturers
7	Measurement Book	To record measurements of works
8	Progress Review reports	To maintain record of progress
9	File and Register for Extra/Variation Order	To maintain record of extra/ variation items
10	Hindrance register	For recording the details of hindrances, reasons & its clearance with time period jointly signed by the Site Engineer/ Bank's Engineer representative and the contractor's representative
11	Log Book of defects	To record defects noticed during inspection

Schedule E

GREEN BUILDING REQUIREMENTS

College of Agricultural Banking, Reserve Bank of India, Pune intends to follow Indian Green Building Council (IGBC) norms for Green Interiors space Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, Pune. IGBC Green Interior involves complying with the green building specification like using of certain green materials, following of sustainable procedures and certain measures during Renovation/up gradation stage, as spelt out in this document. Accordingly, various parameters related to Green building have been incorporated in the design by the RBI/Employer. The contractor shall ensure to comply the material specifications/ works as per Schedule of Quantities for the respective items and all the work procedures/ processes as specified in this schedule.

To comply with Green Building requirement, wherever called for, the Contractor shall provide necessary documents / shop drawings issued by the manufacturers and this document shall generally cover test certificates, Letter of authorization in terms of standards, thermal values, and relevant data, MSDS, write-ups / detailed description of the particular material / equipment, as stipulated by the Bank's Engineer prior to ordering the materials and after the supply of materials or at appropriate stages.

The contractor shall verify with the Bank's Engineer regarding the correctness of the green specification before ordering and procurement of materials and equipment supplied to the work.

If the material specifications, the shop drawings and the relevant documents do not meet the specified norms; it shall be the sole responsibility of the contractor to satisfy the specified Green norms by replacing the materials / equipment with the prior approval of the Bank's Engineer.

The contractor shall ensure that the following facilities for workers are provided
(i)First-aid and emergency facilities
(ii)Adequate drinking water facilities
(iii)Personal protective equipment
(iv)Dust suppression measures
(v)Adequate illumination levels in construction work areas

All Renovation activities over the duration of the project should be sequenced carefully to minimize the impact on the indoor air quality.

Note: The below photographs are given just for reference purpose, they do not refer to any specific brands/makes.

Ducts Wrapped With Plastic to Avoid Dust

Ducts Stored with Properly Wrapped with Plastic

Cleaning Prior To Installation

Equipment Covered during Construction Phase


13/10/2011


23/11/2011


24/11/2011

Cleaning

SECTION VIII

ANNEXURES

TO

VARIOUS SECTIONS AND SCHEDULES

Annex 1

PROFORMA OF BANK GUARANTEE FOR EARNEST MONEY DEPOSIT/ BID SECURITY

(On Non-Judicial Stamp Paper of appropriate value)

Place:_____
Date:_____

Shri……..
Regional Director /CGM Officer -in-Charge
Reserve Bank of
India,
Estate
Department,
…….Office, ……

Dear Sir,

Name of Work: Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE

Ref.: NIT/Advt.No. date

WHEREAS

The Reserve Bank of India, College of Agricultural Banking, Pune having its Central Office at Shahid Bhagat Singh Road, Mumbai (hereinafter called the 'RBI') has invited tenders for the captioned work (hereinafter called "the said tender") on the terms and conditions mentioned in the said tender documents.

It is one of the terms of invitation of tenders that the tenderer shall furnish a Bank Guarantee for a sum of Rs._____ (Rupees _____ only) as Earnest Money Deposit (EMD).

M/s. (Name of the Tenderer/Bidder) _____, (hereinafter called as "the Tenderer/ Bidder"), who are our Clients/Constituents intend to submit their tender/ Bid for the said work and have requested us to furnish Bank Guarantee to RBI in respect of the said sum of Rs _____(Rupees _____ only) in respect of EMD.

NOW THIS GUARANTEE WITNESSETH

1. We _____ (Name of the Bank) do hereby agree with and undertake to RBI, their Successors, Assigns that in the event of the RBI coming to the conclusion that the Tenderer have not performed their obligations under the said conditions of the tender or have committed a breach thereof, which conclusion shall be binding on us as well as the said Tenderer; we shall on demand by the RBI, pay without demur to the RBI, a sum of Rs._____ (Rupees _____ only) or any lower amount that may be demanded by the RBI. Our guarantee shall be treated as equivalent to the Earnest Money Deposit for the due performance of the obligations of the Tenderer under the said Conditions, provided, however, that our liability against such sum shall not exceed the sum of Rs._____(Rupees _____ only).
2. We also agree to undertake to and confirm that the sum not exceeding Rs. _____ (Rupees _____ only) as aforesaid shall be paid by us without any demur or protest, merely on demand from the RBI on receipt of a notice in writing stating that the amount is due to them and we shall not ask for any further proof or evidence and the notice from the RBI shall be conclusive and binding on us and shall not be questioned by us in any respect or manner whatsoever. We undertake to pay the amount claimed by the RBI within a period of one week from the date of receipt of the notice as aforesaid.

3. We confirm that our obligation to the RBI under this guarantee shall be independent of the agreement or agreements or other understandings between the RBI and the Tenderer.

This guarantee shall not be revoked by us without prior consent in writing of the RBI.

We hereby further agree that –

a) Any forbearance or commission on the part of the RBI in enforcing the conditions of the said agreement or in compliance with any of the terms and conditions stipulated in the said tender and/or hereunder or granting of any time or showing of any indulgence by the RBI to the Tenderer or any other matters in connection therewith shall not discharge us in any way and our obligation under this guarantee. This guarantee shall be discharged only by the performance by the Tenderers of their obligations and in the event of their failure to do so, by payment by us of the sum not exceeding Rs. _____ (Rupees _____ only).

b) Our liability under these presents shall not exceed the sum of Rs._____ (Rupees _____ only) .

c) Our liability under this agreement shall not be affected by any infirmity or irregularity on the part of our said constituents/clients in tendering for the said work or their obligations there under or by dissolution or change in the constitution of our said constituents.

d) This guarantee shall remain in force up to _____ (four months from the last date of submission of tender) provided that if so desired by the RBI, this guarantee shall be renewed for a further period as may be indicated by them on the same terms and conditions as contained herein.

e) Our liability under these presents will terminate unless these presents are renewed as provided hereinabove on the _____ or on the day when our said constituents comply with their obligations, as to which a certificate in writing by the RBI alone is the conclusive proof whichever date is later. Unless a claim or suit or action is filed against us within _____ or any extended period, all the rights of the RBI

against us under this guarantee shall be forfeited and we shall be released and discharged from all our obligations and liabilities hereunder.

Yours faithfully,

For and on behalf of _____ Bank.

Authorized Official (with seal)

(NB: This guarantee will require stamp duty as applicable in the state, where it is executed and shall be signed by the official whose signature and authority shall be verified).

Annex 2

PROFORMA OF BANK GUARANTEE for PERFORMANCE (SECURITY DEPOSIT)

(On Non-Judicial Stamp Paper of appropriate value)

Place:_____

Date:_____

_____ Shri……..

Regional Director /CGM Officer -in-Charge

Reserve Bank of India

Estate Department,

…….Office,……

Dear Sir,

Name of Work: Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE

Whereas Reserve Bank of India, College of Agricultural Banking, Pune having its Central Office at Shahid Bhagat Singh Road, Mumbai, (hereinafter called "the RBI") has awarded the Contract for the captioned project (hereinafter called the "Contract") to M/s _____ (Name of the Contractor) (hereinafter called " the said Contractor" which expression shall include its successors and assigns).

AND Whereas the Contractor is bound by the said Contract to submit to RBI a Performance

Security deposit for a total amount of ₹_____ (Rupees___ _____ only) (Amount in figures and words) for the due fulfilment by the said contractor of the terms and conditions contained in the contract.

We,_____(Name of the Bank), (hereinafter called "the Bank"), at the request of M/s _____, the contractor, do hereby undertake to pay to the RBI an amount not exceeding ₹ _____ as Performance Guarantee for due fulfilment of the terms and conditions of the contract.

NOW THIS GUARANTEE WITNESSETH

1. We _____ (Name of the Bank) do hereby agree with and undertake to RBI, their Successors, Assigns that in the event of the RBI coming to the conclusion that the Contractor has not performed his obligations under the said conditions of the contract or have

committed a breach thereof, which conclusion shall be binding on us as well as the said contractor; we shall on demand by the RBI, pay without demur to the RBI, a sum of ₹_____(Rupees _____ only) or any lower amount that may be demanded by the RBI. Our guarantee shall be treated as equivalent to the Performance Guarantee Amount for the due performance of the obligations of the Contractor under the said Contract, provided, however, that our liability against such sum shall not exceed the sum of ₹ _____ (Rupees _____ only).

2. We also agree to undertake to and confirm that the sum not exceeding₹_____(Rupees _____ only) as aforesaid shall be paid by us without any demur or protest, merely on demand from the RBI on receipt of a notice in writing stating that the amount is due to them and we shall not ask for any further proof or evidence and the notice from the RBI shall be conclusive and binding on us and shall not be questioned by us in any respect or manner whatsoever. The Bank shall pay to RBI any money so demanded notwithstanding any dispute/disputes raised by the Contractor in any suit or proceedings pending before any Court, Tribunal or Arbitrator/s relating thereto and the liability under this guarantee shall be absolute and unequivocal. We undertake to pay the amount claimed by the RBI within a period of one week from the date of receipt of the notice as aforesaid.
3. We confirm that our obligation to the RBI under this guarantee shall be independent of the agreement or agreements or other understandings between the RBI and the Contractor.
4. This guarantee shall not be revoked by us without prior consent in writing of the RBI.

We hereby further agree that –

f) Any forbearance or commission on the part of the RBI in enforcing the conditions of the said agreement or in compliance with any of the terms and conditions stipulated in the said Contract and/or hereunder or granting of any time or showing of any indulgence by the RBI to the Contractor or any other matters in connection therewith shall not discharge us in any way and our obligation under this guarantee. This guarantee shall be discharged only by the performance by the Contractor of their obligations and in the event of their failure to do so, by payment by us of the sum not exceeding ₹ _____ (Rupees _____ only).

g) Our liability under these presents shall not exceed the sum of ₹ _____ (Rupees _____ only).

h) Our liability under this agreement shall not be affected by any infirmity or irregularity on the part of our said constituents/clients or their obligations

thereunder or by dissolution or change in the constitution of our said constituents.

i) This guarantee shall remain in force up to _____ (30 days beyond the work completion period) provided that if so desired by the RBI, this guarantee shall be renewed for a further period as may be indicated by them on the same terms and conditions as contained herein.

j) Our liability under these presents will terminate unless these presents are renewed as provided hereinabove on the _____ or on the day when our said constituents comply with their obligations, as to which a certificate in writing by the RBI alone is the conclusive proof whichever date is later. Unless a claim or suit or action is filed against us within _____ or any extended period, all the rights of the RBI against us under this guarantee shall be forfeited and we shall be released and discharged from all our obligations and liabilities hereunder.

In witness whereof I/We of the Bank have signed and sealed this guarantee on the _____day of _____ (Month) _____being herewith duly authorized.

For and on behalf of _____ (Name of the Bank)

Signature of authorized Bank official Name:

Designation

Stamp/ Seal of the Bank

Signed, sealed and delivered for and on behalf of the Bank by the above named in the presence of:

Witness 1	Witness 2
Signature ……	Signature ……
Name ……	Name ……
Address ……	Address ……

Annex 3

FORMAT FOR POWER OF ATTORNEY FOR AUTHORIZED SIGNATORY

(On Non-Judicial Stamp Paper of appropriate value)

To,

Shri……..
Regional Director /CGM Officer -in-Charge
Reserve Bank of
India,
Estate
Department,
…….Office ……

Dear Sir/Madam,

Name of Work: Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE

We……..…… (Name of the Bidder and address of their registered office) do hereby constitute, appoint and authorise Mr. / Ms. …… ……..…… …… (Name and residential address of Power of Attorney holder) who is presently employed with us and holding the position of
……..……. as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to our bid for the captioned Project, including signing and submission of all documents and providing information / responses to the Reserve Bank of India (RBI), representing us in all matters before RBI, and generally dealing with RBI in all matters in connection with our proposal for the said Project.

We hereby agree to ratify all acts, deeds and things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

Signature/(s) of the Bidder

Name/(s)

Stamp/Seal of the Bidder

Note:
Power of Attorney should be properly stamped and notarized Power of Attorney furnished by Contractor shall be irrevocable.

Annex 4

Proforma for Indemnifying the Employer against Contract labour Rules/regulations

(On Non-Judicial Stamp Paper of appropriate value)

To,

Shri……..
Regional Director /CGM Officer -in-Charge
Reserve Bank of India,
Estate Department,
…….Office……

Dear Sir/Madam

Name of Work: Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE

We, M/s …… (Name of contractor), hereby undertake that we shall comply with all the statutory rules/ regulations with regard to the employment of contract labour and their payment. We also hereby fully indemnify and keep indemnified the Employer, i.e. Reserve Bank of India, against payments to be made to the contract labour and for the observance of the laws in this regard without prejudice to our right to claim indemnity from our sub-contractors.

Yours faithfully,

For _____

Authorised signatory

Annex 5

Proforma for Indemnifying the Employer against Patent Rights

(On Non-Judicial Stamp Paper of appropriate value)

To,

Shri……..
Regional Director /CGM Officer -in-Charge
Reserve Bank of India,
Estate Department,
…….Office ……

Dear Sir/Madam

Name of Work: Repairing of the Existing Compound Wall at Rajnigandha Staff Quarters, at CAB, RBI, PUNE

We, M/s _____ (Name of Contractor) hereby undertake to fully indemnify and keep indemnified the Employer i.e. Reserve Bank of India 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 ourselves pay any royalties, licence fees etc. which may be payable in respect of any article or part thereof included in the contract or damages, cost and charges of all and every sort that may be legally incurred in respect thereof.

In the event of any claims made under or action brought against Employer in respect of any such matters as aforesaid, we shall, on being notified thereof, at our own expense, settle any dispute or conduct any litigation that may arise therefrom, provided that we shall not be liable to indemnify the Employer 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 Engineer-in-Charge in this behalf.

Yours faithfully,

For _____

Authorised signatory

NAME AND ADDRESS OF THE CONTRACTOR:

SIGN & SEAL OF THE CONTRACTOR:

Date:

Place:

Annex 6

FORMAT OF MEASUREMENT BOOK

Page
M.B.No._____

No._____

Tender Item No./ Tender Page No.	Full Description of item of work	Measurements				Quantity
		No.	L	B	D/H	

Abstract of cost for Running/Final Bill

Running Bill no: …….

M.B. No. _____ Page No. _____

Serial No.	Tender Item No.	Description	Quantity	Rate ₹	Unit	Amount ₹
1	2	3	4	5	6	7

Part II

Estate Department					
Reserve Bank of India					
CAB, PUNE					
Part II					
Name of Work: Repairing of the Existing Compound Wall at Rajanigandha Staff Quarters, at CAB, RBI, PUNE.					
Item No	**Description of item**	**Quantity**	**Rate (Rs.)**	**Unit**	**Amount**
1	**Dismantling of the existing plaster** Dismantling of the existing plaster of top and side of the existing compound wall including raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground out of premises. Quoted rate shall include the cost of curing & giving proper bonding with existing floor & wall, necessary scaffolding, carting away debris, lifting etc. all complete as directed by Banks Engineer-in-Charge.	110.00		Sqm	
2	**Dismantling of the existing MS Railing along with the old / damaged barbed wires on existing compound wall having tentative length 150 rmt.** Dismantling of the existing MS Railing along with the old / damaged barbed wires from the existing compound wall top and including cleaning the surface and disposal of rubbish to the dumping ground out of premises. Quoted rate shall include the cutting, removing, necessary scaffolding, carting away debris, lifting etc. all complete as directed by Banks Engineer-in-Charge. The vendors are advised to visit the site before quoting the rate.	1.00		L.S.	

3	**Brick wall**				
	Providing & constructing 230 mm brick thick masonry wall in 1: 4 cement mortar (1 Cement: 4 Course Sand) by using 2nd class quality locally available bricks over the existing brick wall. Quoted rate shall include the cost of curing & giving proper bonding with existing floor & wall, necessary scaffolding, carting away debris, lifting etc. all complete as directed by Banks Engineer-in-Charge.	8.00		Cmt	
4	**Plaster of Brick wall**				
	Providing and applying average 15 mm thick or required thickness, smooth finished cement plaster in Cement Mortar of 1:4 proportion (1 part sand: 4 parts coarse screened sand / locally available sand with the approval of Bank's Engineer) over brick wall / RCC surface etc. complete. Quoted rate shall be inclusive of the cost of curing, scaffolding, taking out the existing damaged debris as per requirement, maintaining proper line & level, lifting, carting away debris from premises etc. all complete as directed by Engineer-in-charge.	30.00		Sqm	
5	**Reinforced Cement Concrete Work for beam over the existing compound wall for fixing of the Y-angle.**				
5.1	Providing and laying exposed RCC (M20 grade) 1: 1.5 :3(1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size) for top beam by using graded 20 mm and downsize coarse aggregates including cantering, shuttering with good quality ply board/ steel plate, staging, scaffolding, dewatering, surface preparation, laying at required place, lead & lift, compacting, vibrating, curing, deshuttering, decentring , carting away debris out of	6.00		Cmt	

	Bank's premises etc. all complete as directed by Bank's Engineer-in-charge. All complete as directed by the Bank's Engineer.				
5.2	Providing of required dia. reinforcements in proper line, level, proper lapping & spacing as directed by Consultant and the Bank's Engineer. The reinforcement may be of 8 mm to 20 mm. dia. Tor HYSD bars(Fe500) mentioned in IS Code 456:2000 and should confirm to high strength deformed steel bars as per IS 1786. Quoted rate should include the cost of cutting, bending, binding with double annealed GI binding wires (18 gauge), pins, spacers, chairs and placing in proper position as directed by Bank's Engineer.	700.00		KG	
6	**Barbed wire**				
	Providing and fixing the Y angle embedded with the top beam as per the above item-5 having total length 1.50 mt of Y-angle and top & bottom members for holding the polycarbonate sheet along with barbed wires as per following specifications:				
6.1	Providing 50mm x 50mm x 6mm M. S. angle of approx. 0.60 high including necessary welding, cutting and bending lower part is to well embedded with the top beam, drilling 8 holes for fixing barbed wire fencing.	1950.00		KG	
6.2	Providing and fixing 14/16 swg barbed wire fencing in 8 horizontal rows and two diagonals in each vertical and inclined bay portion including proper fixing etc. complete as directed by the Bank.	720.00		Rmt	

7	**Concentrina wire**				
	Providing and fixing in position Galvanized Concertina Razor Wire Coil of 610mm dia. with tap galvanized coil of 0.50mm thick and duly zinc coated. The core wire shall be hot dip galvanized wire of 2.5mm dia. (+/- 0.30mm) and with zinc coating. The physical profile shall be as under:	120.00		Rmt	
	i) Length of barb – 22mm (+/- 2mm)				
	ii) Barb spacing – 35mm (+/-2mm)				
	iii) Nos. of Loops - 72 per Bundle				
	iv) Nos. of G.I. clips per loop – 3 Nos.				
	The concertina wire loops are to be tied on three nos. of razor wire to be laid throughout the length of fencing. Proper care at junction or change of direction is to be taken for proper fixing including giving suitable overlap. The rate shall be inclusive of local transportation, all lead and lift, wastage including all necessary cutting, welding, drilling holes, trimming of trees if required, providing & welding 16mm dia M. S. square bars (vertically & pointed at top) of approx. 750mm long at 8' c/c and 'Y' shape at corners etc. for properly fixing on the top of grill on the existing compound wall, painting of the additional MS members using Ist quality enamel paint over a coat of metal primmer, making good all damages caused to the Bank's property, etc. complete				
8.00	**Polycarbonate sheet**	150.00		Sqm	
	Providing and fixing multi wall polycarbonate sheet of 6 mm thick and minimum width of sheet 1200 mm on entire four side wall over MS structure covering joint must be cover with 20 mm wide aluminium flat in line level and fixing the same with Fasteners (Screws) on provided MS structure.				

	The rate shall be incisive of all i.e. cutting, joints, removing unused material after completion of work, finishing of joints, name plate for Badminton court, proper levelling and line etc. complete as directed by Banks Engineers at all heights.				
	Basic rate for sheet Rs.320.00 / Sqm				
			Total Amount		

Note:-

1) Materials & consumables of approved quality & make shall be used with the approval of the Bank's Engineers.

2) The tenderer shall inspect the site and satisfy himself about the quantum of work involved before quoting the rates in the tender.

3) Debris generated in the work is not removed / carted away from the Bank's premises by the contractor, then the same will be removed by the Bank at the contractor's risk and cost and the actual expenditure incurred for the same shall be recovered from any payment dues to the contractor. No request/claim in this regard will be entertained by the Bank.

4) The quoted rates shall be inclusive of labour, loading/unloading, scaffolding, tools, transportation and all taxes e.g. GST, octroi, any other local, state & central Govt. taxes etc. applicable. No extra claim in this respect shall be entertained by the Employer.

5) Price Calculation for Basic Rate Item: -

{Purchase rate (excluding CP & GST) per respective item / unit – Basic rate mentioned in the tender} + 15 % CP + GST. No other extra payment shall be made in this regards like transportation, loading, unloading, profit etc.

NAME AND ADDRESS OF THE CONTRACTOR:

SIGN & SEAL OF THE CONTRACTOR:

Date:
Place: