GOVERNMENT OF WEST BENGAL

W-5

PROJECT: West Bengal Major Irrigation and Flood Management Project (WBMIFMP)

PROCUREMENT OF CIVIL WORKSTHROUGHREQUEST FOR QUOTATION (RFQ)/SHOPPING PROCEDURES

(Lump sum and percentage rate tender)
(Two-Envelope with e-Procurement)
(For Contracts valued less than the equivalent of US $ 100,000 each)

RFQ No: **WBMIFMP/NCB/23-24/D3.6/Poshpur**

Issuedon 18.08.2023

Name of work:

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

Amount put to Bid: 4477749.00

Table:

PERIOD OF DOWNLOADING OF BIDDINGDOCUMENT ONLINE	FROM 23/08//2023 (18: 00HoursIST) TO 15/09//2023 (14:00 Hours IST)
LAST DATE AND TIME FOR RECEIPT OF CLARIFICATION BY BIDDERS	31/08/2023 UPTO 12:00 Hours (IST)
TIME AND DATE OF PRE-BID MEETING AT THE OFFICE OF THE EXECUTIVE ENGINEER, HOWRAH IRRIGATION DIVISION.	31/08/2023 AT 12:30 Hours (IST)
START DATE AND TIME FOR SUBMISSION OF BIDS	02/09/2023 AT 15.00 Hours (IST)
LAST DATE AND TIME FOR RECEIPT OF BIDS	15/09/2023UPTO 14:00 Hours (IST)
*TIME AND DATE OF OPENING OF BIDS – TECHNICAL PART	15/09/2023After 14:30 Hours (IST)
VALIDITY REQUIRED FOR BANK GUARANTEE or BANK DRAFT FOR BIDS SECURITY	AT LEAST UPTO 13/01/2023
TIME AND DATE OF OPENING OF BIDS- FINANCIAL PART	*The firms that qualify technically shall be notified subsequently for opening of the financial part of their bids.*
PLACE OF OPENING OF BIDS	**Office of The Executive Engineer Howrah Irrigation Division DPIU-HOWRAH, WBMIFMP, Onkarmal Jetia Road, P.O.- Botanical Garden,P.S. Shibpur, Howrah - 711103,West Bengal,**
OFFICER INVITING BIDS	**The Executive Engineer Howrah Irrigation Division DPIU-HOWRAH, WBMIFMP, Onkarmal Jetia Road, P.O.- Botanical Garden,P.S. Shibpur, Howrah - 711103,West Bengal**

***Should be the same as the deadline for submission of bidsor promptly thereafter**. The firms that qualify technically shall be notified subsequently for opening of the financial part of their bids.*

REQUEST FOR QUOTATIONS

Procurement of Works under RFQ/Shopping Procedures

E-Procurement Notice

(Two-Envelope with e-Procurement Bidding Process)

Memo No:**2336** **Date: 18/08/2023**

Project: ***West Bengal Major Irrigation and Flood Management Project (WBMIFMP)***

Contract title:

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

RFQ No: **WBMIFMP/NCB/23-24/D3.6/Poshpur**

Issued on18.08.2023

Applicable Procurement Guidelines/Regulations Date: "Procurement Regulations for IPF Borrowers, July 2016 Revised August 2018 and November 2018" ("Procurement Regulations")

1. The Government of India has received/has applied for/intends to apply for financing from the World Bank towards the cost of the **West Bengal Major Irrigation and Flood Management Project (WBMIFMP)**Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this request for quotations is issued. The **Executive Engineer,DPIU-Howrah, WBMIFMP** (*implementing agency)*invites quotations electronically from the eligible bidders for the following works.

Package No.	Brief Description of the Works	Approximate value of Works (Rs.)	Period of Completion
WBMIFMP/NCB/23-24/D3.6/Poshpur	**Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].**	Rs. **4477749.00** (Rupees Forty Four Lakh Seventy Seven Thousend Seven Hundreed Forty Nine only)	6(Six) Months including all seasons

2. This e-Procurement notice includes the following documents[1] to facilitate preparation and submission of quotations, criteria for qualification, evaluation, and for award of contract; and relevant forms to be filled by the bidders. Implementing Agency has not issued a separate RFQ document for this purchase. The e-Procurement notice including the various documents and forms to be filled etc. can be downloaded free of cost by logging on to the website**https://wbtenders.gov.in.** The bidders would be required to register in the website which is free of cost.
   i. Detailed Bill of Quantities, with estimated rates and prices;
   ii. Technical Specifications;
   iii. Instructions to Bidders;

[1] IA to modify the list of documents as required.

iv. Qualification Information;
v. Format for Submission of Quotation;
vi. Criteria for Evaluation and Award of Contract;
vii. Relevant Forms; and
viii. Draft Contract Agreement format which will be used for finalizing the agreement for this Contract.

3. For submission of the quotation, the bidder is required to have Digital Signature Certificate (DSC) from one of the Certifying Authorities authorised by Government of India for issuing DSC. Aspiring bidders who have not obtained the user ID and password for participating in e-procurement in this Project, may obtain the same from the website: https://wbtenders.gov.in.

Any bidder not having the DSC may obtain the same from NIC on payment of requisite fees, before the bid submission deadline.

4. Quotations, both Technical Part and Financial Part shall be submitted onhttps://wbtenders.gov.in on or before 14:00hours on.15.09.2023. Any quotation or modifications to quotation received outside e-procurement system will not be considered. The electronic bidding system would not allow late submission of quotations. The 'Technical Part' of the Quotations will be opened online on 15.09.2023 after14:30 hours, this can also be viewed by the bidders online. The electronic summary of quotation opening of technical part will be generated and uploaded online.

5. If the implementing agency's office happens to be closed on the date of opening of the Quotations as specified, the 'Technical Part' of the Quotations will be opened on the next working day at the same time. The Financial Parts of the Quotations shall remain unopened in the e-procurement system, until the subsequent online opening, following the evaluation of the Technical Parts of the Quotations.

6. Other details can be seen in the RFQ document. The implementing agency shall not be held liable for any delays due to system failure beyond its control. A Bidder requiring any clarification of the RFQ document may notify the Implementing agency online or may visit the office of the implementing agency at the address given below.

7. The address for communication is as under:

Name & Designation of Officer: **The Executive Engineer,Howrah Irrigation Division DPIU-HOWRAH, WBMIFMP,**
Official Address: **Onkarmal Jetia Road,P.O.- Botanical Garden,P.S. Shibpur, Howrah - 711103,West Bengal.**
Email: dpiu.howrah21@gmail.com
Telephone: 033-26881521

SECTION - A

1. Scope of Works

The Executive Engineer,Howrah Irrigation Division,DPIU-HOWRAH, WBMIFMP, Onkarmal Jetia Road,P.O.- Botanical Garden,P.S. Shibpur, Howrah - 711103,West Bengal. (*implementing agency*&Employer) invites quotations for the works as detailed in the table given below

Package No.	Brief Description of the Works	Approximate value of Works (Rs.)	Period of Completion
WBMIFMP/NCB/23-24/D3.6/Poshpur	**Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].**	Rs. **4477749.00** (Rupees Forty Four Lakh Seventy Seven Thousend Seven Hundreed Forty Nine only)	6(Six) Months including all seasons

The successful bidder will be expected to complete the works by the intended completion date specified above.

2. Qualification of the bidder

2.1. Qualification Information to be provided by the Bidder: the bidder shall provide information on his qualification which shall include: -

(a) Total monetary value of works executed by him for each year of the last 5 years;

(b) List of works (similar to the works described in Para 1) completed satisfactorily as a prime contractor during the last 5 years, enclosing certificates from the respective Employers in support of experience claimed along with the Employers' contact numbers;

(c) Report on his financial standing, along with last 5 years' financial statements/Profit and Loss Statements; and

(d) Details of any litigation, during the last 3 years in which the bidder is involved, the parties concerned, and disputed amount or award in each case (Give details of both completed and pending cases).

2.2. Qualification Criteria: to qualify for award of the contract, the bidder: -

Should have satisfactorily completed as a prime contractor similar work of value not less than for 80 Percent of work value i,e

(WBMIFMP/NCB/23-24/D3.6/Poshpur)

Rs. 3600000.00 (Thirty Six Lacks only) in the last FIVE years;

3 **Eligibility – Conflict of Interest**: A Bidder (a) shall not participate in more than one Quotation; (b) shall not have conflict of interest as defined in the Bank's Procurement Regulations/ Guidelines and (c) should not have been (i) temporarily suspended or debarred by the World Bank Group in compliance with the Bank's Anti-Corruption Guidelines and its Sanctions Framework.

4. **Clarifications & Amendments**: If the Employer receives any request for clarification of this RFQ document, it will upload its response together with any amendment to this document, on the e-procurement portal for information of all Bidders. Bidders should check on the e-procurement system, for any amendments to this RFQ document.

5. **Quotation Prices**

5.1 The quotation shall be for execution of the whole works as described in the Bill of quantities, drawings and technical specifications. Corrections, if any, in the quotation shall be carried out by editing the information before electronic submission on e-Procurement Portal.

5.2 All duties, taxes and other levies payable by the contractor under the contract shall be included in the total price.

5.3 The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

5.4 The rates should be quoted in Indian Rupees only.

Bid security @ 2% of works value to be submitted only in two modes, eaither in the form of Bank Guarantee or Bank Draft from any scheduled bank in favour of The Executive Engineer,Howrah Irrigation Division,DPIU-HOWRAH, WBMIFMP,, Onkarmal Jetia Road,P.O.- Botanical Garden,P.S. Shibpur, Howrah - 711103, West Bengal. Original B.G./B.D (EMD) in favour of Executive Engineer,Howrah Irrigation Division,DPIU-HOWRAH, WBMIFMP, will have to be submitted physically to the office of the Executive Engineer,Howrah Irrigation Division,DPIU-HOWRAH, WBMIFMP,within the last date of Bid Submission i.e 15/09/2023 upto 14:00 Hours (IST) otherwise the Bid will be cancelled.

Package No	Bid Security
WBMIFMP/NCB/23-24/D3.6/Poshpur	Rs 90000.00

6. **Preparation of Quotations**

6.1 The bidder is advised to visit the site of works at his own expense and obtain all information that may be necessary for preparing the quotation.

6.2 Each bidder shall submit only one quotation. Bidders shall not contact other Bidders on matters relating to this quotation.

6.3 The quotation shall comprise two Parts, namely the Technical Part and the Financial Part. Both Parts shall be submitted online simultaneously.

6.4 The Technical Part of Quotation shall comprise the following:

(a) **Letter of Quotation – Technical Part** as per Format given in Section B;
(b) **Authorization**: Power of Attorney of signatory of Quotation (Paragraph 1.1 of Qualification Information);
(c) **Annual Turnover**: Confirmation showing Annual Turnover in works of similar nature in the last three financial years. [ITB Clause 2.1 (a)];
(d) **Qualifications:**
  (i) Qualification information and supporting documents relating to similar nature of works executed and payments received. (ITB Clause 2.1 (b) and paragraph 1.3 of Qualification Information);
  (ii) Details of proposed sub-contractors; (Paragraph 1.4 of Qualification Information); and
  (iii) Other details listed in Paragraphs 1.6 and 1.7 of the Qualification Information Form;
(e) **Complete address** and contact details of the Bidder having the following information:

Name of Firm
Address for communication
Telephone No(s): Office
Mobile No.
Facsimile (FAX) No.
Electronic Mail Identification (E-mail ID)

(f) The Technical Part of Quotation shall not include any financial information related to the Quotation price. Where material financial information related to the Quotation price is contained in the Technical Part of Quotation, the Quotation shall be declared non-responsive.

6.5 The Financial Part of Quotation shall comprise the following:

(a) **Letter of Quotation** - Financial Part;
(b) **Priced Bill of Quantities**: (using the BOQ uploaded with the RFQ document) wherein the rates shall be entered online.

6.6 Signing of Quotations: The name and position held by each person signing the quotation and related documents must be typed or printed below the signature.

6.7 Deadline for Submission of Quotations: Quotations must be uploaded online no later than the deadline for submission of quotations viz. time 14.00 (hours) and date 21.12.2022 (day, month, year), as per server time. A Bidder may modify its Quotation any number of times by using the appropriate option on the e-Procurement Portal, before the deadline for submission of Quotations.

6.8 Validity of Quotation: Quotation shall remain valid for a period not less than 45 days after the deadline date specified for submission.

7. Quotation Submission:

(a) The Letter of Quotation – Technical Part, and Letter of Quotation – Financial Part shall be filled, signed and scanned copies shall be uploaded along with the Priced Bill of Quantities that shall be entered using the Forms available online, without any alterations. All blank spaces shall be filled in with the information requested. Scanned copies of all other documents shall also be uploaded on the e-procurement website.

(b) All documents are required to be signed digitally by the Bidder. The System generates a Unique Quotation Identification Number, time stamped as per server time, as an acknowledgement for Quotation submission. Detailed guidelines for viewing and submission of Quotations online are given in the website.

8. **Online Opening and Evaluation of Technical Parts of Quotations**: The 'Technical Part' of the Quotations will be opened online on the specified date and time. This can also be viewed by the bidders online, and electronic summary of quotation opening of technical part will be generated and uploaded online. The Financial Parts of the Quotations shall remain unopened in the e-procurement system, until the subsequent online opening, following the evaluation of the Technical Parts of the Quotations.

- The Employer shall examine the technical part of the quotation to determine whether the quotation (a) has been properly signed (Clause 6.6); (b) meets the eligibility criteria (Clause 3); (c) is substantially responsive to the requirements of the RFQ document; and (d) meets the qualification criteria specified in ITB Clause 2.

- Only Quotations that are both substantially responsive to the RFQ document and meet all Qualification Criteria shall qualify for opening of the Financial Parts of their Quotations at the second online opening.

- Employer shall notify in writing those Bidders who have failed to meet the Qualification Criteria or whose Quotations were considered non-responsive to the requirements in the RFQ document, advising them that their Technical Part of Quotation failed to meet the requirements of the RFQ document; and that their Financial Part of the Quotation shall not be opened.

- Simultaneously Employer shall notify in writing those Bidders whose Technical Parts of Quotations have been evaluated as substantially responsive and meeting the Qualification Criteria that their Quotation has been evaluated as substantially responsive to the RFQ document and that their Financial Part of Quotation will be opened online after four working days from the date of upload the Technical Eveluation Sheet of quotetioners.

9. **Online Opening and Evaluation of Financial Parts of Quotations**: The 'Financial Part' of the Quotations will be opened online on the specified date and time. This can also be viewed by the bidders online, and electronic summary of quotation opening of financial part will be generated and uploaded online.

a) The Employer shall examine and confirm that Letter of Quotation – Financial Part and Priced Bill of Quantities are in accordance with the requirements specified in the RFQ document.If any of these documents or information is missing, the offer shall be rejected.

b) During the evaluation of Financial Parts of Quotation, the substantial responsiveness of the Quotations will be further determined with respect to those RFQ conditions that were not examined in evaluation of Technical Parts of Quotations.

10. Award of contract

The Employer will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price and who meets the specified qualification criteria.

10.1 Notwithstanding the above, the Employer reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.

10.2 The bidder whose quotation is accepted will be notified of the award of contract by the Employer prior to expiration of the quotation validity period.

11. Performance Security

Within 15 days of receiving letter of acceptance, the successful bidder shall deliver to theExecutive Engineer,Howrah Irrigation Division,DPIU-HOWRAH, WBMIFMP,OnkarmalJetiaRoad,P.O.- Botanical Garden,P.S. Shibpur, Howrah - 711103, West Bengal(Employer) the performance security (either a bank guarantee or a bank draft in favour of the Employer) for an amount equivalent of 3 % of the contract price. The Performance Security shall be valid till the expiry of the period of maintenance of the work, specified in Clause 12. Failure of the successful Bidder to furnish performance security and to sign the agreement within the period stipulated shall constitute sufficient grounds for annulment of award and debarring the bidder from participation in bidding for works by the Employer for a period of one year, in which case the Employer may make the award to the next lowest evaluated bidder or seek quotations afresh.

SECTION - B

1. **Format for Qualification Information.**

2. **Format for Submission of Quotation.**

3. **Format of Letter of Acceptance.**

QUALIFICATION INFORMATION

1 For Individual Bidders

1.1 Principal place of business: _____

Power of attorney of signatory of Quotation.
[Attach copy]

1.2 Total value of work performed in the last FIVE years (in Rs. Lakhs)

2018-19_____
2019-20 _____
2020-21 _____
2021-22 _____
2022-23_____

1.3 Work performed as prime contractor (in the same name) on works of a similar nature over the last FIVE years.

Project Name	Name of Employer	Descrip-tion of work	Contract No.	Value of contract (Rs. Lakhs)	Date of issue of work order	Stipulated period of comple-tion	Actual date of compl etion*	Remarks explaining reasons for delay and work completed

Existing commitments and on-going works:

Description of Work	Place & State	Contract No. & Date	Value of Contract (Rs. Lakhs)	Stipulated period of completion	Value of works* remaining to be completed (Rs. Lakhs)	Anticipated date of completion
(1)	(2)	(3)	(4)	(5)	(6)	(7)

* ***Enclose a certificate from the Engineer concerned for completion as well as value of pending works.***

1.4 Proposed subcontracts and firms involved.

Sections of the works	Value of Sub-contract	Sub-contractor (name & address)	Experience in similar work
*	*	*	*
	*	*	
*	*	*	*
	*	*	
*	*	*	*
	*	*	

1.5 Evidence of access to financial resources to meet the requirements of working capital: cash in hand, lines of credit, etc. List them below and attach copies of supporting documents.

1.6 Name, address, and telephone, telex, and fax numbers of the Bidders' bankers who may provide references if contacted by the Employer.

1.7 Information on litigation history in which the Bidder is involved.

Name of the work	Agreement number/date	Name & address of Employer	Contract Value in Rs	Cause of dispute	Amount Disputed	Remarks showing present status

Letter of Quotation–Technical Part

The Bidder must prepare the Letter of Quotation on stationery with its letterhead clearly showing the Bidder's complete name and address. The italicized text is for Bidder's guidance in preparing these forms and shall be deleted from the final products.

Description of the Works-

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

RFQ No: **WBMIFMP/NCB/23-24/D3.6/Poshpur**

Issued on 18.08.2023

Our Reference: No..... Dated.....

To:The Executive Engineer
Howrah Irrigation Division
DPIU-HOWRAH, WBMIFMP,
Onkarmal Jetia Road,
P.O.- Botanical Garden,
P.S. Shibpur, Howrah - 711103,
West Bengal,

Subject:

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

Reference : Letter No.....dated.....from.....

Sir,

1. We, the undersigned, hereby submit our Quotation in two parts, namely:

   (a) Technical Part; and

   (b) Financial Part

2. In submitting our Quotation, we make the following declarations:

(a) **No reservations:** We have examined and have no reservations to the RFQ document;

(b) **Conformity:** We offer to execute the subject work in conformity with the RFQ document and in accordance with the Period of Completion specified in Section A.;

(c) **Quotation Validity Period:** Our Quotation shall be valid for the period of 45 days, from the deadline fixed for the Quotation submission;

(d) **Eligibility**:We meet the eligibility requirements and have no conflict of interest, we are not participating in more than one quotation in this bidding process, and we have not been temporarily suspended or debarred by the World Bank.

(e) **Fraud and Corruption:** We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of corrupt, fraudulent, collusive, coercive, or obstructive practices.

(f) **ESHS/GBV Compliance**: We hereby undertake to comply with (i) the applicable Laws/ Rules/ Regulations for protection of environment, public health and safety; (ii) the regulatory authority conditions (if any) attached to any permits or approvals for the project; and (iii) the Management Strategies and Implementation Plan (MSIP) to manage the Environmental, Social (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), Health and Safety (ESHS) risks, and ESHS Code of Conduct, (if any prescribed by the Employer), that will apply to us, our employees and all subcontractors.

Yours faithfully,

Authorized Signature : Date: _____

Name & Title of Signatory : _____
In the capacity of *[insert legal capacity of person signing the Letter of Quotation]*
Name of Bidder : _____
Address : _____
Dated on _____ day of _____, _____ *[insert date of signing]*

* ***To be filled in by the Employer before issue of the Letter of Invitation.***
** ***To be filled in by the Bidder, together with his particulars and date of submission at the bottom of this Form.***

Letter of Quotation–Financial Part

The Bidder must prepare the Letter of Quotation on stationery with its letterhead clearly showing the Bidder's complete name and address. The italicized text is for Bidder's guidance in preparing these forms and shall be deleted from the final products.

Description of the Works*:

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

RFQ No: **WBMIFMP/NCB/23-24/D3.6/Poshpur**

Issued on18.08.2023

Our Reference: No..... Dated.....

To:The Executive Engineer
Howrah Irrigation Division
DPIU-HOWRAH, WBMIFMP,
Onkarmal Jetia Road,
P.O.- Botanical Garden,
P.S. Shibpur, Howrah - 711103,
West Bengal,

Subject:

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

Sir,

1. We, the undersigned, hereby submit the second part of our Quotation, the Financial Part including the Quotation Price and Bill of Quantities. In submitting our Financial Part we make the following additional declarations:

   (a) **Validity**: Our Quotation shall be valid for the period of 120 days from the deadline fixed for the Quotation submission;

   (b) **Quotation Price**: The total price of our Quotation including any unconditional discounts, offered in accordance with the Conditions of Contract is at ..... percentage above / below the estimated rates, i.e., for a total Contract Price of –

   Rs.** _____ [in figures]
   Rs. _____ [in words];

(c)**Commissions, gratuities and fees:** We have paid, or will pay the following commissions, gratuities, or fees with respect to the Bidding process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity. If none has been paid or is to be paid, indicate "none."]*

Yours faithfully,

Authorized Signature

Name & Title of Signatory _____

In the capacity of *[insert legal capacity of person signing the Letter of Quotation]*

Name of Bidder _____

Address _____

Dated on _____ day of _____, _____ *[insert date of signing]*

To be filled in by the Employer before issue of the Letter of Invitation.

*** To be filled in by the Bidder, together with his particulars and date of submission at the bottom of this Form.***

LETTER OF ACCEPTANCE
CUM NOTICE TO PROCEED WITH THE WORK

(LETTERHEAD OF THE EMPLOYER)

Dated: _____

To: _____ [Name and address of the Contractor]
_____
_____
_____
_____

Dear Sirs,

This is to notify you that your quotation dated _____ for execution of the _____ for the contract price of Rupees _____ [amount in words and figures], is hereby accepted by us.

You are hereby requested to furnish performance security for an amount of Rs. _____ (equivalent to 3% of the contract price) within 15 days of the receipt of the letter. The Performance Security in the form of Bank guarantee or a Bank draft in favour of..... (Employer) shall be valid till the expiry of the period of maintenance i.e. up to _____. Failure to furnish the Performance Security will entail cancellation of the award of contract.

You are also requested to sign the agreement form and proceed with the work not later than _____ under the instructions of the Engineer, _____ and ensure its completion within the contract period.

With the issuance of this acceptance letter and your furnishing the required Performance Security, the contract, for the above said work, stands concluded.

Yours faithfully,

Authorized Signature
Name and title of Signatory of Employer

Draft Contract Agreement form for Construction through National Shopping

ARTICLES OF CONTRACT AGREEMENT

1.0 This deed of agreement is made in the form of agreement on _____ day _____ month _____ 20 ___, between the _____ (Employer) or his authorized representative (hereinafter referred to as the first party) and _____ (Name of the Contractor), S/O _____ resident of _____ (hereinafter referred to as the second party), to execute the work of construction of _____ (hereinafter referred to as works) on the following terms and conditions.

2.0 Contract Price

The total Contract Price for the works (hereinafter referred to as the "total price") is Rs. ____ as reflected in Annexure - 1.

3.0 Payments under its contract:

Payments to the second party for the construction work will be released by the first party in the following manner:-

3.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously for a minimum value of executed works of INR 5.00 Lakhs.

3.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.

3.3 The value of work executed shall be determined by the Project Manager.

3.4 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed.[2]

3.5 The value of work executed shall include the valuation of Variations and Compensation Events.

3.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

3.7 If the Contractor was, or is, failing to perform any ES obligations or work under the Contract, the value of this work or obligation, as determined by the Project Manager, may be withheld until the work or obligation has been performed, and/or the cost of rectification or replacement, as determined by the Project Manager, may be withheld until rectification or replacement has been completed. Failure to perform includes, but is not limited to the following:

[2] In lump-sum contracts, replace this paragraph with the following: "The value of work executed shall comprise the value of completed activities in the Activity Schedule."

(a) failure to comply with any ES obligations or work described in the Works' Requirements which may include: working outside site boundaries, excessive dust, failure to keep public roads in a safe usable condition, damage to offsite vegetation, pollution of water courses from oils or sedimentation, contamination of land e.g. from oils, human waste, damage to archaeology or cultural heritage features, air pollution as a result of unauthorized and/or inefficient combustion;

(b) failure to implement remediation as instructed by the Project Manager within the specified timeframe (e.g. remediation addressing non-compliance/s).

Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. The proportion of payments retained (**Retention Money) shall be 6% from each bill subject to the maximum of 5% of final contract price.**If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for

On signing of agreement	**:**	10% of total cost, as interest free advance against receipt of an unconditional bank guarantee from the Contractor for an equivalent amount valid up to the Intended Completion Date, in the format attached.

3.8 Payments at each stage will be made by the first party:

(a) on the second party submitting an invoice for an equivalent amount;
(b) on certification of the invoice (except for the first installment) by the engineer nominated by the first party with respect to quality/quantity of works executed in the format in Annexure - 2; and
(c) upon proper and justified utilization of at least 50 % of the previous installment and 100 % of any prior installment.
(d) Payments shall be adjusted for deductions for advance payments, recoveries if any in terms of the contract, and taxes at source, as applicable under the law.
(e) The advance (if availed by the contractor) shall be repaid with percentage deductions from the interim payments, commencing with the next Interim Payment at the rate of 20 percent of the amounts of all Interim Payment Certificates until the advance has been repaid, provided that the advance shall be completely repaid prior to the expiry of the Intended Completion Date. The Bank Guarantee shall remain effective until the advance payment has been fully repaid.

4.0 Notice by Contractor to Engineer

The second party, on the works reaching each stage of construction, issue a notice to the first party or the Engineer nominated by the first party (who is responsible for supervising the contractor, administering the contract, certifying the payments due to the contractor, issuing and valuing variations to the contract, awarding extensions of time etc.), to visit the site for certification of stage completion. Within 15 days of the receipt of such notice, the first party or the engineer nominated by it, will ensure issue of stage completion certificate after due verification.

5.0 Completion time

The works should be completed in **SIX Months** from the date of this Agreement. In exceptional circumstances, the time period stated in this clause may be extended in writing by mutual consent of both the parties.

6.0 If any of the compensation events mentioned below would prevent the work being completed by the intended completion date, the first party will decide on the intended completion date being extended by a suitable period:

(a) The first party does not give access to the site or a part thereof by the agreed period.

(b) The first party orders a delay or does not issue completed drawings, specifications or instructions for execution of the work on time.

(c) Ground conditions are substantially more adverse than could reasonably have been assumed before issue of letter of acceptance and from information provided to second party or from visual inspection of the site.

(d) Payments due to the second party are delayed without reason.

(e) Certification for stage completion of the work is delayed unreasonably.

7. Any willful delay on the part of the second party in completing the construction within the stipulated period will render him liable to pay liquidated damages@0.05% per day which will be deducted from payments due to him. The first party may cancel the contract and take recourse to such other action as deemed appropriate once the total amount of liquidated damages exceeds 3 % of the contract amount.

(*Note: The amount of liquidated damages per day should be determined between 0.05 to 0.1% of the contract value of the works per day and indicated here).*

8.0 Duties and responsibilities of the first party

8.1 The first party shall be responsible for providing regular and frequent supervision and guidance to the second party for carrying out the works as per specifications. This will include written guidelines and regular site visit of the authorized personnel of the first party, for checking quality of material and construction to ensure that it is as per the norms.

8.2 Possession of the site will be handed over to the second party within 10 days of signing of the agreement.

8.3 The Engineer or such other person as may be authorized by the first party shall hold meeting once in a month where the second party or his representative at site will submit the latest information including progress report and difficulties if any, in the execution of the work. The whole team may jointly inspect the site on a particular day to take stock of activities.

8.4 The Engineer shall record his observations/instructions at the time of his site visit in a site register maintained by the second party. The second party will carry out the

instructions and promptly rectify any deviations pointed out by the engineer. If the deviations are not rectified, within the time specified in the Engineer's notice, the first party as well as the engineer nominated by it, may instruct stoppage or suspension of the construction. It shall thereupon be open to the first party or the engineer to have the deviations rectified at the cost of the second party.

9.0 Duties and responsibilities of the second party

9.1 The second party shall:

(a) take up the works and arrange for its completion within the time period stipulated in Clause 5;

(b) employ suitable skilled persons to carry out the works;

(c) regularly supervise and monitor the progress of work;

(d) abide by the technical suggestions/direction of supervisory personnel including engineers etc. regarding related work;

(e) be responsible for bringing any discrepancy to the notice of the representative of the first party and seek necessary clarification:

(f) ensure that the work is carried out in accordance with specifications, drawings and within the total of the contract amount without any cost escalation;

(g) keep the first party informed about the progress of work;

(h) be responsible for all security and watch and ward arrangements at site till handing over of the work to the first party; and

(i) Maintain necessary insurance against loss of materials/cash, etc. or workman disability compensation claims of the personnel deployed on the works as well as third party claims.

(j) Pay all duties, taxes and other levies payable by executing agencies as per law under the contract (First party will effect deduction (TDS) from running bills in respect of such taxes as may be imposed under the law).

10.0 Variations / Extra Items

The works shall be carried out by the second party in accordance with the approved drawings and specifications. However, if, on account of site conditions or any other factors, variations are considered necessary, the following procedure shall be followed:-

(a) The second party shall provide the Engineer with a quotation for carrying out the Variation when requested to do so by the Engineer. The Engineer shall assess the quotation, which shall be given within seven days of the request before the Variation is ordered.

(b) If the quotation given by the second party is unreasonable, the Engineer may order the Variation and make a change to the Contract Price which shall be based on Engineer's own forecast of the effects of the Variation on the Contractor's costs.

(c) The second party shall not be entitled to additional payment for costs which could have been avoided by giving early warning.

11.0 Securities

The Performance Security (Bank Guarantee from a Nationalized or Scheduled Bank in India in the format attached) shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank or surety acceptable to the Employer. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a Bank Guarantee.

12.0 Termination

12.1 The Employer may terminate the Contract if the other party causes a fundamental breach of the Contract.

12.2 Fundamental breaches of Contract include, but shall not be limited to the following:

(a) theProgress on pro rata basis with time and the progress has not been satisfactory by the Engineer / Client;
(b) the Contractor has become bankrupt or goes into liquidation other than for a reconstruction or amalgamation;
(c) the Engineer gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer;
(d) the Contractor does not maintain a security which is required;
(e) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in the Clause 7 of this agreement

12.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.

12.4 If the Contract is terminated the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

13.0 Payment upon Termination

13.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done less advance payments received up to the date of the issue of the certificate, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law.

13.2 If the Contract is terminated at the Employer's convenience, the Engineer shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law.

14.0 Dispute settlement

If over the works, any dispute arises between the two parties, relating to any aspects of this Agreement, the parties shall first attempt to settle the dispute through mutual and amicable consultation.

In the event of agreement not being reached, the matter will be referred for arbitration by a Sole Arbitrator not below the level of retired Superintending Engineer, PWD to be appointed by the first party. The Arbitration will be conducted in accordance with the Arbitration and Conciliation Act, 1996. The decision of the Arbitrator shall be final and binding on both the parties. The Arbitrator shall give his award/decision within 60 days of start of proceedings.

The Priced Bill of Quantities (Annexure 1), Format of Certificate (Annexure 2) and Specification and Drawings (Annexure 3) are attached.

Signed and delivered by Sri. _____ _____ for and on behalf of the Contractor
In the presence of the Witness:

i)
ii)

SIGNATURE

Signed and delivered by Sri _____ Deputy Executive Engineer/Executive Engineer/Superintending Engineer _____ of _____ for an on behalf of the Government.

In the presence of the Witness:

i)
ii)
SIGNATURE

Annexure I

BILL OF QUANTITIES

RFQ No: WBMIFMP/NCB/23-24/D3.6/Poshpur

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

Sl . No.	Description of Work	Qty.	Unit.	Estimated Cost		Amount
				In Figure (Rs.)	In Words	
1	Earth work in excavation of foundation trenches or drains, in all sorts of soil (including mixed soil but excluding laterite or sandstone) including removing, spreading or stacking the spoils within a lead of 75 m. as directed. The item includes necessary trimming the sides of trenches, levelling, dressing and ramming the bottom, bailing out water as required complete. (a) Depth of excavation not exceeding 1,500 mm.	14.140	%Cum.	14214.600	Rupees Fourteen Thousand Two Hundred Fourteen and Sixty Paisas Only	**2010.000**
2	Earth work in filling in foundation trenches or plinth with good earth, in layers not exceeding 150 mm. including watering and ramming etc. layer by layer complete. (Payment to be made on the basis of measurement of finished quantity of work) (a) With earth obtained from excavation of foundation.	4.710	%Cum.	9241.220	Rupees Nine Thousand Two Hundred Forty One and Twenty Two Paisas Only	**435.000**
3	A) Filling in foundation or plinth by silver sand in layers not exceeding 150 mm as directed and consolidating the same by thorough saturation with water, ramming complete including the cost of supply of sand. (payment to be made on measurement of finished quantity)	3.730	%Cum.	113439.100	Rupees One Lacs Thirteen Thousand Four Hundred Thirty Nine and Ten Paisas Only	**4231.000**
4	Single Brick Flat Soling of picked jhama bricks including ramming and dressing bed to proper level and filling joints with local sand.	105.310	Sq.M.	425.47	Rupees Four Hundred Twenty Five and Forty Seven Paisas Only	**44806.000**

5	Ordinary Cement concrete (mix 1:2:4) with graded stone chips (20 mm nominal size) excluding shuttering and reinforcement,if any, in ground floor as per relevant IS codes. (i) Pakur Variety.	13.490	Cu.M.	7664.48	Rupees Seven Thousand Six Hundred Sixty Four and Forty Eight Paisas Only	**103394.000**
6	Brick work with 1st class bricks in cement mortar (1:4)					
6.01	Brick work with 1st class bricks in cement mortar (1:4) (a) In foundation and plinth	4.960	Cu.M.	6545.56	Rupees Six Thousand Five Hundred Forty Five and Fifty Six Paisas Only	**32466.000**
6.02	Brick work with 1st class bricks in cement mortar (1:4) ((b) In superstructure, ground floor	7.510	Cu.M.	6811.330	Rupees Six Thousand Eight Hundred Eleven and Thirty Three Paisas Only	**51153.000**
6.03	i) upto 4th floor=Rs. 111.00 per sq.m per floor Brick work with 1st class bricks in cement mortar (1:4) ((c) In superstructure, First Floor	39.830	Cu.M.	6943.62	Rupees Six Thousand Nine Hundred Forty Three and Sixty Two Paisas Only	**276564.000**
6.04	Brick work with 1st class bricks in cement mortar (1:4) ((d) In superstructure, 2nd floor	8.880	Cu.M.	7075.910	Rupees Seven Thousand Seventy Five and Ninety One Paisas Only	**62834.000**
7	25 mm. thick damp proof with cement concrete (1:1.5:3) (with graded stone aggregate 10 mm. normal size) and painting the top surface with a coat of bitumen [VG.40] using 1.7 kg. persq.m. including heating the bitumen and cost and carriage of all materials complete. [Bitument to be supplied by the Agency]	2.190	Sqm	313.430	Rupees Three Hundred Thirteen and Forty Three Paisas Only	**686.000**

8	125 mm. thick brick work with 1st class bricks in cement mortar (1:4) in 1st floor.	115.530	Sqm	865.910	Rupees Eight Hundred Sixty Five and Ninety One Paisas Only	**100039.000**
9	Ordinary Cement concrete (mix 1:1.5:3) with graded stone chips (20 mm nominal size) excluding shuttering and reinforcement if any, in ground floor as per relevant IS codes. (i) Pakur Variety.	6.620	Cu.M.	8386.180	Rupees Eight Thousand Three Hundred Eighty Six and Eighteen Paisas Only	**55517.000**
9.01	Ordinary Cement concrete (mix 1:1.5:3) with graded stone chips (20 mm nominal size) excluding shuttering and reinforcement if any, in ground floor as per relevant IS codes. (i) Pakur Variety. 1st Floor	19.870	Cu.M.	8499.400	Rupees Eight Thousand Four Hundred Ninety Nine and Forty Paisas Only	**168883.000**
9.02	Ordinary Cement concrete (mix 1:1.5:3) with graded stone chips (20 mm nominal size) excluding shuttering and reinforcement if any, i ground floor as per relevant IS codes. (i) Pakur Variety.2nd floor	1.380	Cu.M.	8612.620	Rupees Eight Thousand Six Hundred Twelve and Sixty Two Paisas Only	**11885.000**
10	Neat cement punning about 1.5mm thick in wall, dado, window sill, floor etc. NOTE:Cement 0.152 cu.m per100 sq.m.	4.380	Sqm	39.020	Rupees Thirty Nine and Two Paisas Only	**171.000**

11	Supplying and laying true to line and level Double Charge Vitrified Tiles of approved brand conforming to IS 15622: 2006 (Group B I a) and tested as per IS 13630:2006 (relevant parts) [Non-modular sizes for tiles with Water Absorption (av.) ≤ 0.08 %] in floor, skirting etc. using polymerised adhesive of 6mm thick layer applied directly over finished artificial stone loor/Mosaic etc without any backing course and joints grouted with admixture of white epoxy grout materials of approved brand including spacer -2mm as directed and removal of wax coating of top surface of tiles with warm water and polishing the tiles using soft and dry cloth upto mirror finish complete including the cost of materials,labour and all other incidental charges complete as per direction of Engineerin- Charge. (Note: This work should not be executed without specific permission of Superintending Engineer)					
11.01	a) In Ground Floor:(size not less than 600mmX 600 mm X 9.5 mm thick)	46.230	Sq.M.	1866.360	Rupees One Thousand Eight Hundred Sixty Six and Thirty Six Paisas Only	**86282.000**

11.02	Supplying and laying true to line and level Double Charge Vitrified Tiles of approved brand conforming to IS 15622: 2006 (Group B I a) and tested as per IS 13630:2006 (relevant parts) [Non-modular sizes for tiles with Water Absorption (av.) ≤ 0.08 %] in floor, skirting etc. using polymerised adhesive of 6mm thick layer applied directly over finished artificial stone loor/Mosaic etc without any backing course and joints grouted with admixture of white epoxy grout materials of approved brand including spacer -2mm as directed and removal of wax coating of top surface of tiles with warm water and polishing the tiles using soft and dry cloth upto mirror finish complete including the cost of materials,labour and all other incidental charges complete as per direction of Engineer-in- Charge. (Note: This work should not be executed without specific permission of Superintending Engineer) a) In First Floor:(size not less than 600mmX 600 mm X 9.5 mm thick)	52.100	Sq.M.	1880.660	Rupees One Thousand Eight Hundred Eighty and Sixty Six Paisas Only	**97982.000**
12	Hire and labour charges for shuttering with centering and necessary staging upto 4 m using approved stout props and thick hard wood planks of approved thickness with required bracing for concrete slabs, beams and columns, lintels curved or straight including fitting, fixing and striking out after completion of works (upto roof of ground floor) (a) 25 mm to 30 mm thick wooden shuttering as per decision & direction of Engineer-In-Charge.	75.130	Sq.M.	398.060	Rupees Three Hundred Ninety Eight and Six Paisas Only	**29906.000**
12.01	Hire and labour charges for shuttering with centering and necessary staging upto 4 m using approved stout props and thick hard wood planks of approved thickness with required bracing for concrete slabs, beams and columns, lintels curved or straight including fitting, fixing and striking out after completion of works (upto roof of ground floor) For 1st floor (a) 25 mm to 30 mm thick wooden shuttering as per decision & direction of Engineer-In-Charge.	97.120	Sq.M.	419.510	Rupees Four Hundred Nineteen and Fifty One Paisas Only	**40743.000**

12.02	Hire and labour charges for shuttering with centering and necessary staging upto 4 m using approved stout props and thick hard wood planks of approved thickness with required bracing for concrete slabs, beams and columns, lintels curved or straight including fitting, fixing and striking out after completion of works (upto roof of ground floor) (a) 25 mm to 30 mm thick wooden shuttering as per decision & direction of Second floor.	17.960	Sq.M.	440.970	Rupees Four Hundred Forty and Ninety Seven Paisas Only	**7920.000**
13	Reinforcement for reinforced concrete work in all sorts of structures including distribution bars, stirrups, binders etc initial straightening and removal of loose rust (if necessary), cutting to requisite length, hooking and bending to correct shape, placing in proper position and binding with 16 gauge black annealed wire at every intersection, complete as per drawing and direction.(a) For works in foundation and upto roof of ground floor/upto 4 m (i) Tor steel/Mild Steel. II. JSW/JSPL/SHYAM/ SRMB/BMASL/ELECROSTEEL/SSL a) For works in foundation and upto roof of ground floor/upto 4 m	0.520	M.T	89217.140	Rupees Eighty Nine Thousand Two Hundred Seventeen and Fourteen Paisas Only	**46393.000**
13.01	Reinforcement for reinforced concrete work in all sorts of structures including distribution bars, stirrups, binders etc initial straightening and removal of loose rust (if necessary), cutting to requisite length, hooking and bending to correct shape, placing in proper position and binding with 16 gauge black annealed wire at every intersection, complete as per drawing and direction.(a) For works in foundation and upto roof of ground floor/upto 4 m (i) Tor steel/Mild Steel. II. JSW/JSPL/SHYAM/ SRMB/BMASL/ELECROSTEEL/SSL For First Floor	1.560	M.T	89217.140	Rupees Eighty Nine Thousand Two Hundred Seventeen and Fourteen Paisas Only	**139179.000**
13.02	Extra over the rate of ground floor/initial 4 m for each basement floor and each additional floor below/ above ground floor. For First Floor	15.620	Qntl	51.250	Rupees Fifty One and Twenty Five Paisas Only	**801.000**

13.03	Reinforcement for reinforced concrete work in all sorts of structures including distribution bars, stirrups, binders etc initial straightening and removal of loose rust (if necessary), cutting to requisite length, hooking and bending to correct shape, placing in proper position and binding with 16 gauge black annealed wire at every intersection, complete as per drawing and direction.(a) For works in foundation and upto roof of ground floor/upto 4 m (i) Tor steel/Mild Steel. II. JSW/JSPL/SHYAM/ SRMB/BMASL/ELECROSTEEL/SSL For Second Floor	0.011	M.T	89217.140	Rupees Eighty Nine Thousand Two Hundred Seventeen and Fourteen Paisas Only	**981.000**
13.04	Extra over the rate of ground floor/initial 4 m for each basement floor and each additional floor below/ above ground floor. For For Second Floor	1.100	Qntl	102.490	Rupees One Hundred Two and Forty Nine Paisas Only	**113.000**
14	Labour for Chipping of Concrete surface before taking up Plastering work.	113.790	Sq.M.	25.030	Rupees Twenty Five and Three Paisas Only	**2848.000**
15	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface]					
15.01	i) With 1:4 cement mortar (b) 15 mm thick plaster In Ground Floor.	229.170	Sq.M.	186.180	Rupees One Hundred Eighty Six and Eighteen Paisas Only	**42667.000**

15.02	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar (b) 15 mm thick plaster For First Floor Add Extra for each addl. floor over the rate for Gr.Floor a) upto 4th floor=Rs. 4.00 per sq.m per floor	173.390	Sq.M.	190.950	Rupees One Hundred Ninety and Ninety Five Paisas Only	**33109.000**
15.03	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar (b) 15 mm thick plaster For Second Floor	36.800	Sq.M.	195.720	Rupees One Hundred Ninety Five and Seventy Two Paisas Only	**7202.000**
15.04	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar a) 20 mm thick plaster in Ground Floor.	44.860	Sq.M.	214.640	Rupees Two Hundred Fourteen and Sixty Four Paisas Only	**9629.000**
15.05	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar a) 20 mm thick plaster in First Floor. Add Extra for each addl. floor over the rate for Gr.Floor a) upto 4th floor=Rs. 4.00 per sq.m per floor	215.660	Sq.M.	219.400	Rupees Two Hundred Nineteen and Forty Paisas Only	**47316.000**

15.06	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar a) 20 mm thick plaster in Second Floor.	31.970	Sq.M.	224.170	Rupees Two Hundred Twenty Four and Seventeen Paisas Only	**7167.000**
15.07	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar c) 10 mm thick plaster in Ground Floor.	36.950	Sq.M.	150.820	Rupees One Hundred Fifty and Eighty Two Paisas Only	**5573.000**
15.08	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar c) 10 mm thick plaster in First Floor.	110.100	Sq.M.	155.590	Rupees One Hundred Fifty Five and Fifty Nine Paisas Only	**17130.000**
15.09	Plaster (to wall, floor, ceiling etc.) with sand and cement mortar including rounding off or chamfering corners as directed and raking out joints including throating, nosing and drip course, scaffolding/staging where necessary (Ground floor).[Excluding cost of chipping over concrete surface] i) With 1:4 cement mortar c) 10 mm thick plaster in Second Floor.	14.150	Sq.M.	160.360	Rupees One Hundred Sixty and Thirty Six Paisas Only	**2269.000**
16	Supplying, fitting & fixing 1st quality Ceramic tiles in walls and floors to match with the existing work & 4 nos. of key stones (10mm) fixed with araldite at the back of each tile & finishing the joints with white cement mixed with colouring oxide if required to match the colour of tiles including roughening of concrete surface, if necessary or by synthetic adhesive & grout materials etc.					

16.01	B) Wall With Sand Cement Mortar (1:3) 15 mm thick & 2 mm thick cement slurry at back side of tiles using cement @ 2.91 Kg/Sq.m& joint filling using white cement slurry @ 0.20kg/Sq.m. (a) Area of each tile upto 0.09 Sq.m (i) Coloured decorative In Ground Floor.	15.000	Sq.M.	892.660	Rupees Eight Hundred Ninety Two and Sixty Six Paisas Only	**13390.000**
16.02	B) Wall With Sand Cement Mortar (1:3) 15 mm thick & 2 mm thick cement slurry at back side of tiles using cement @ 2.91 Kg/Sq.m& joint filling using white cement slurry @ 0.20kg/Sq.m. (a) Area of each tile upto 0.09 Sq.m (i) Coloured decorative In first Floor.	53.710	Sq.M.	898.620	Rupees Eight Hundred Ninety Eight and Sixty Two Paisas Only	**48265.000**
17	Supplying and laying true to line and level Anti-Skid, Full Body, Homogeneous & Granular finish Vitrified Tiles conforming to IS:15622-2006 & IS 4457-2007 and testing shall be made in accordance with IS:13630 [Non- modular sizes for tiles with Skid resistance > 0.5, Mohr's hardness > 5.0, Staining resistance: Class-1, Water Absorption: E < 0.5%], MOR > 35 N/sq.mm in Internal area of building e.g. Toilet Block, Passage, Corridor, Accessible Open Terrace etc. set in 20 mm sand cement mortar (1:4) and 2 mm thick cement slurry at back side of tiles using cement @ 2.91 Kg./Sqm or using Polymerised Adhesive (6 mm thick layer applied directly over finished artificial stone floor/ Mosaic etc without any backing course) laid after application slurry using 1.75 Kg of cement per Sqm below mortar only, joints grouted with admixture of white cement and colouring pigment to match with colour of tiles/ epoxy grout materials of approved make as directed and removal of wax coating of top surface of tiles with warm water and polishing the tiles using soft and dry cloth upto mirror finish complete including the cost of materials, labour and all other incidental charges complete true to the manufacturer's specification and direction of Engineer-in-Charge. (White cement, synthetic adhesive and grout material to be supplied by the contractor).a) In Ground Floor: Sizes-300 mm x300mm x10 mm with breaking strength > 1200 N In 1st floor Floor.	34.030	Sq.M.	1083.350	Rupees One Thousand Eighty Three and Thirty Five Paisas Only	**36866.000**

18	Supplying, fitting and fixing Marble Slab/tile of 15 to 18 mmthickness in floor, lobby, stair, landing & treads etc. over 20 mm (av.) thck base of Cement mortar (1:2) laid with white cement slurry @ 4.4 kg/Sq.m before placing marble & jointed with white cement slurry @ 2.0 kg/Sq.m with necessary pigments including grinding and Granite polishing as per direction of Engineering -in -Charge in Ground Floor. {White cement and Pigment to be supplied by the Agency] (a) With Makrana plain pink / Adranga Pink / GarbhGulabi / Udaypur pink / Udaypur Green / Black Bhaslana (i) Area of each Slab/tile upto 0.3 sq.m. Ground floor	61.680	Sq.M.	1738.840	Rupees One Thousand Seven Hundred Thirty Eight and Eighty Four Paisas Only	**107252.000**
19	Extra cost of labour for prefinished and premoulded Nosing to treads of steps, railing, window sill etc. of Marble Stone.	57.600	M.	307.480	Rupees Three Hundred Seven and Forty Eight Paisas Only	**17711.000**
20	Extra cost of labour for Marble Stone Floor in treads of Steps.	57.600	Sq.M.	269.350	Rupees Two Hundred Sixty Nine and Thirty Five Paisas Only	**15515.000**
21	Grinding to marble / mosaic floor including remaining stone,if necessary, after cutting with manual labour / machine,where necessary	61.680	Sq.M.	23.840	Rupees Twenty Three and Eighty Four Paisas Only	**1470.000**
22	Wood work in door and window frame fitted and fixed in position complete including a protective coat of painting at the contact surface of the frame exluding cost of concrete, Iron Butt Hinges and M.S clamps. (The quantum should be corretedupto three decimals). (d) Sal : Local.					
22.01	Ground Floor	0.320	Cu.M.	92568.300	Rupees Ninety Two Thousand Five Hundred Sixty Eight and Thirty Paisas Only	**29622.000**

22.02	Wood work in door and window frame fitted and fixed in position complete including a protective coat of painting at the contact surface of the frame exluding cost of concrete, Iron Butt Hinges and M.S clamps. (The quantum should be correteduptо three decimals). In 1st floor (d) Sal : Local.	0.120	Cu.M.	92806.660	Rupees Ninety Two Thousand Eight Hundred Six and Sixty Six Paisas Only	**11137.000**
22.03	Wood work in door and window frame fitted and fixed in position complete including a protective coat of painting at the contact surface of the frame exluding cost of concrete, Iron Butt Hinges and M.S clamps. (The quantum should be correteduptо three decimals). In 2nd floor (d) Sal : Local.	0.040	Cu.M.	93045.020	Rupees Ninety Three Thousand Forty Five and Two Paisas Only	**3722.000**
23	Panel shutters of door and window, as per design (each panel consisting of single plank without joint), including fitting and fixing the same in position but excluding the cost of hinge and other fittings. In First floor. 35mm thick shutters with 19mm thick panel of size 30 to 45 cm. (Single leaf) (a) Ordinary Teak Wood.					
23.01	Ground Floor	6.600	Sq.M.	5029.400	Rupees Five Thousand Twenty Nine and Forty Paisas Only	**33194.000**
23.02	Panel shutters of door and window, as per design (each panel consisting of single plank without joint), including fitting and fixing the same in position but excluding the cost of hinge and other fittings. In First floor. 35mm thick shutters with 19mm thick panel of size 30 to 45 cm. (Single leaf) (a) Ordinary Teak Wood.	6.600	Sq.M.	5063.960	Rupees Five Thousand Sixty Three and Ninety Six Paisas Only	**33422.000**
23.03	Panel shutters of door and window, as per design (each panel consisting of single plank without joint), including fitting and fixing the same in position but excluding the cost of hinge and other fittings. In Second floor. 35mm thick shutters with 19mm thick panel of size 30 to 45 cm. (Single leaf) (a) Ordinary Teak Wood.	2.200	Sq.M.	5029.400	Rupees Five Thousand Twenty Nine and Forty Paisas Only	**11065.000**

24	Supplying, fitting and fixing fibre reinforced polymer (FRP) Composite door frame as per approved section with glass fibre reinforced plastic moulded skins and a special sandwich core, so as to impart monolitaheic composite structure as per approved technology of Department of Science and Technology (DST) to safisfy IS: 4020 door testing performance criteria. (i) 66mm x 90mm	10.000	M.	592.320	Rupees Five Hundred Ninety Two and Thirty Two Paisas Only	**5923.000**
25	Supplying, fitting & fixing fibre reinforced polymer (FRP) Composite door shutters as per approved design with glass fibre reinforced plastic moulded skins and a special sandwich core, so as to impart monolitaheic composite structure as per approved technology of Department of Science and Technology (DST) to satisfy IS:4020 door testing performance criteria. In ground floor/ 1st Floor. (i) 32 mm thick.	3.360	Sq.M.	3292.940	Rupees Three Thousand Two Hundred Ninety Two and Ninety Four Paisas Only	**11064.000**
26	(a) M.S.or W.I. Ornamental grill of approved design joints continuously welded with M.S, W.I. Flats and bars of windows,railing etc. fitted and fixed with necessary screws and lugs in ground floor. (i) Grill weighing above 10 Kg./sq.mtr and up to 16 Kg./sq. mtr For First Floor.The weight of grill per sq.m. will be determined by taking the physical weight of fabricated grill and dividing the same by covered area of the same.N.B. No shop priming will be allowed to facilitate inspection of workmanship. Weight of grill is to be taken after final grinding and finishing the weld.					
26.01	Ground Floor	1.200	Qntl	11784.520	Rupees Eleven Thousand Seven Hundred Eighty Four and Fifty Two Paisas Only	**14141.000**

26.02	(a) M.S.or W.I. Ornamental grill of approved design joints continuously welded with M.S, W.I. Flats and bars of windows,railing etc. fitted and fixed with necessary screws and lugs in ground floor. (i) Grill weighing above 10 Kg./sq.mtr and up to 16 Kg./sq. mtr For First Floor.The weight of grill per sq.m. will be determined by taking the physical weight of fabricated grill and dividing the same by covered area of the same.N.B. No shop priming will be allowed to facilitate inspection of workmanship. Weight of grill is to be taken after final grinding and finishing the weld. 1st Floor	3.720	Qntl	11902.370	Rupees Eleven Thousand Nine Hundred Two and Thirty Seven Paisas Only	**44277.000**
26.03	(a) M.S.or W.I. Ornamental grill of approved design joints continuously welded with M.S, W.I. Flats and bars of windows,railing etc. fitted and fixed with necessary screws and lugs in ground floor. (i) Grill weighing above 10 Kg./sq.mtr and up to 16 Kg./sq. mtr For First Floor.The weight of grill per sq.m. will be determined by taking the physical weight of fabricated grill and dividing the same by covered area of the same.N.B. No shop priming will be allowed to facilitate inspection of workmanship. Weight of grill is to be taken after final grinding and finishing the weld. 2nd Floor	1.270	Qntl	12021.370	Rupees Twelve Thousand Twenty One and Thirty Seven Paisas Only	**15267.000**
27	Collapsible gate with 40mm x 40mm x 6mm Tee as top and bottom guide rail, 20mm x 10mm x 2mm vertical channels 100mm apart in fully stretched position 20mm x 5mm M.S. flats as collapsible bracings properly rivetted and washered including 38mm steel rollers including locking arrangements, fitted and fixed in position with lugs set in cement concrete and including cutting necessary holes, chasing etc. in walls, floors etc. and making good damages complete. In First floor.	2.730	Sq.M.	5212.090	Rupees Five Thousand Two Hundred Twelve and Nine Paisas Only	**14229.000**
28	ii) Brass hasp bolt of approved quality fitted and fixed complete (oxidised) with 16mm dia rod with centre bolt and round fitting.(b) 250mm long.	14	Each	711.500	Rupees Seven Hundred Eleven and Fifty Paisas Only	**9961.000**

29	Supplying, fitting and fixing M.S. clamps for door and window frame made of flat bent bar, end bifurcated with necessary screws etc. by cement concrete(1:2:4) as per direction. (Cost of concrete will be paid separately) (a) 40mm X 6mm, 250mm Length	84	Each	34.560	Rupees Thirty Four and Fifty Six Paisas Only	**2903.000**
30	Anodisedaluminium barrel / tower / socket bolt (full covered) of approved manufactured from extruded section conforming to I.S. 204/74 fitted and fixed with cadmium plated screws: (ix) 300mm long x 10mm dia. bolt.	24	Each	117.990	Rupees One Hundred Seventeen and Ninety Nine Paisas Only	**2832.000**
31	Anodisedaluminium butt hinges of approved quality manufactured from extruded section conforming to I.S. specification (I.S. 205/66) and fitted and fixed with cadmium plated screws: vii)100 x 75 x 4.0mm.	72	Each	110.840	Rupees One Hundred Ten and Eighty Four Paisas Only	**7980.000**
32	Anodisedaliminium D-type handle of approved quality manufactured from extruded section conforming to I.S. specification (I.S. 230/72) fitted and fixed complete: (a) With continuous plate base (Hexagonal/ Round rod) (v) 125 mm grip x 12 mm dia rod.	24	Each	122.760	Rupees One Hundred Twenty Two and Seventy Six Paisas Only	**2946.000**
33	(i) Door stopper.(Brass)	24	Each	139.440	Rupees One Hundred Thirty Nine and Forty Four Paisas Only	**3347.000**
34	Supplying profiles of required section made of Aluminium Alloy Extrusions conforming to IS: 732-1983 and IS: 1285- 1975; Annodized (with required film thickness and specified colour / natural) matt finished conforming to IS: 1868-1983 for fabrication of composit door, sliding & casement windows, partitions, formed of basic sections of any ISI embossed / certified make and brand as per direction of Engineer - In-Charge. (Payment will be made on finished length of the work). A) In 10-12 Micron thickness Annodizing film. I) Natural white					
34.01	b) 3- track sliding window i) Bottom frame	18.000	Metre	370.650	Rupees Three Hundred Seventy and Sixty Five Paisas Only	**6672.000**

34.02	ii) Top and side frame.	44.000	Metre	321.790	Rupees Three Hundred Twenty One and Seventy Nine Paisas Only	**14159.000**
35	Labour charge for fabrication and installation of composite door, window, partitions made from annodized extruded alloy aluminium sections for the following units:- (A) Glazed aluminium sliding windows made of extruded and annodized alloy aluminiumsectios, fabrications, including cutting to proper shape and size, drilling and aligning of window shutter frame fitted with in built locking arrangements, sliding rollers and other necessary fittings, fixture, adhesives and joineries along with extruded neoprine or EPDM gasketing in between window frame and masonry work (walls, column, beam.lintels etc.) as well as between glass and shutter frame for fixing glass and Polysulphide sealant and in between shutter and window frame where necessary including cutting to requisite size and fixing glass as per drawing, specification and direction of EIC. The rate includes the hire charge of all tools and plants, including all incidental charges, adhesive, joineries such as screw, cleat angle etc. but excluding the cost of extruded aluminium sections, glass, neoprene /EPDM gasket, locking arrangement and rollers.					
35.01	3/4 Track Sliding Window 1st Floor. Add Extra for each addl. floor over the rate for Gr.Floor a) upto 4th floor=Rs.12.00 per sq.m per floor	23.400	Sq.M.	1135.790	Rupees One Thousand One Hundred Thirty Five and Seventy Nine Paisas Only	**26577.000**
35.02	Fixed glazing. Ground Floor.	1.500	Sq.M.	915.300	Rupees Nine Hundred Fifteen and Thirty Paisas Only	**1373.000**
35.03	Fixed glazing. First Floor.	4.800	Sq.M.	929.600	Rupees Nine Hundred Twenty Nine and Sixty Paisas Only	**4462.000**
35.04	Fixed glazing. 2nd floor	4.800	Sq.M.	943.910	Rupees Nine Hundred Forty Three and Ninety One Paisas Only	**4531.000**

36	Supplying PVC rollers for sliding windows as per direction of Engineer in charge.	30	Each	16.690	Rupees Sixteen and Sixty Nine Paisas Only	**501.000**
37	Supplying maruti lock (100mm)	20	Pairs	54.820	Rupees Fifty Four and Eighty Two Paisas Only	**1096.000**
38	Supplying EPDM gusket of approved make and brand as per direction of Engineer in charge. i) For sliding windows b) 'U' shaped EPDM gasket for frames.	233.000	Metre	17.880	Rupees Seventeen and Eighty Eight Paisas Only	**4166.000**
39	Supplying bubble free float glass of approved make and brand conforming to IS: 2835-1987. ii) 4mm thick coloured / tinted / smoke glass.	34.280	Sq.M.	557.760	Rupees Five Hundred Fifty Seven and Seventy Six Paisas Only	**19120.000**
40	Rendering the Surface of walls and ceiling with White Cement base WATER PROOF wall putty of approved make & brand.(1.5 mm thick)	453.690	Sq.M.	145.400	Rupees One Hundred Forty Five and Forty Paisas Only	**65967.000**
41	Applying Interior grade Acrylic Primer of approved quality and brand on plastered or cencrete surface old or new surface to receive Distemper/ Acrylic emulsion paint including scraping and preparing the surface throughly, complete as per manufacturer's specification and as per direction of the EIC.[This item to be done under specific instruction of the Superintending Engineer]In Ground Floor: (b) Two Coat ii) Solvent based interior grade Acrylic Primer	725.650	%Sq.M.	5780.230	Rupees Five Thousand Seven Hundred Eighty and Twenty Three Paisas Only	**41944.000**
42	Applying Acrylic Emulsion Paint of approved make and brand on walls and ceiling including sand papering in intermediate coats including putty(to be done under specific instruction of Superintending Engineer) : (Two coats) Luxury quality.	725.650	Sq.M.	83.430	Rupees Eighty Three and Forty Three Paisas Only	**60541.000**
43	Applying Exterior grade Acrylic primer of approved quality and brand on plastered or cencrete surface old or new surface to receive decorative textured (matt finish) or smooth finish acrylic exterior emulsion paint including scraping and preparing the surface throughly, complete as per manufacturer's specification and as per direction of the EIC.[This item to be done under specific instruction of the Superintending Engineer] In Ground Floor: (b) Two Coats	517.670	%Sq.M.	5375.020	Rupees Five Thousand Three Hundred Seventy Five and Two Paisas Only	**27825.000**

43.01	Applying Exterior grade Acrylic primer of approved quality and brand on plastered or cencrete surface old or new surface to receive decorative textured (matt finish) or smooth finish acrylic exterior emulsion paint including scraping and preparing the surface throughly, complete as per manufacturer's specification and as per direction of the EIC. For first Floor: (b) Two Coats	173.390	%Sq.M.	5375.020	Rupees Five Thousand Three Hundred Seventy Five and Two Paisas Only	**9320.000**
43.02	Extra foreach Additional floor over the rate for 1st floor on items 42.01	173.390	%Sq.M.	84.620	Rupees Eighty Four and Sixty Two Paisas Only	**147.000**
43.03	Applying Exterior grade Acrylic primer of approved quality and brand on plastered or cencrete surface old or new surface to receive decorative textured (matt finish) or smooth finish acrylic exterior emulsion paint including scraping and preparing the surface throughly, complete as per manufacturer's specification and as per direction of the EIC.[This item to be done under specific instruction of the Superintending Engineer] For Second floor (b) Two Coats	36.800	%Sq.M.	5375.020	Rupees Five Thousand Three Hundred Seventy Five and Two Paisas Only	**1978.000**
43.04	Extra foreach Additional floor over the rate for 2nd floor on items 42.03	36.800	%Sq.M.	84.620	Rupees Eighty Four and Sixty Two Paisas Only	**31.000**
44	Protective and Decorative Acrylic exterior emulsion paint of approved quality, as per manufacturer's specification and as per direction of Engineer-in-Charge to be applied over acrylic primer as required. The rate includes cost of material, labour, scaffolding and all incidental charges but excluding the cost of primer.[This item to be done under specific instruction of the Superintending Engineer] In Ground floor (Two Coat) b) Premium 100% Acrylic Emulsion	517.670	Sq.M.	100.110	Rupees One Hundred and Eleven Paisas Only	**51824.000**
44.01	Protective and Decorative Acrylic exterior emulsion paint of approved quality, as per manufacturer's specification and as per direction of Engineer-in-Charge to be applied over acrylic primer as required. The rate includes cost of material, labour, scaffolding and all incidental charges but excluding the cost of primer. In 1st floor (Two Coat) b) Premium 100% Acrylic Emulsion For First floor	173.390	Sq.M.	100.110	Rupees One Hundred and Eleven Paisas Only	**17358.000**
44.02	Extra foreach Additional floor over the rate for ground floor on items 43.01	173.390	%Sq.M.	84.620	Rupees Eighty Four and Sixty Two Paisas Only	**147.000**

44.03	Protective and Decorative Acrylic exterior emulsion paint of approved quality, as per manufacturer's specification and as per direction of Engineer-in-Charge to be applied over acrylic primer as required. The rate includes cost of material, labour, scaffolding and all incidental charges but excluding the cost of primer. In 2nd floor (Two Coat) b) Premium 100% Acrylic Emulsion For second floor.	36.800	Sq.M.	100.110	Rupees One Hundred and Eleven Paisas Only	**3684.000**
44.04	Extra foreach Additional floor over the rate for ground floor on items 43.03	36.800	%Sq.M.	84.620	Rupees Eighty Four and Sixty Two Paisas Only	**31.000**
45	(a) Priming one coat on steel or other metal surface with synthetic oil bound primer of approved quality including smoothening surfaces by sand papering etc.	42.750	Sq.M.	34.560	Rupees Thirty Four and Fifty Six Paisas Only	**1477.000**
45.01	b) Priming one coat on timber or plastered surface with synthetic oil bound primer of approved quality including smoothening surfaces by sand papering etc.	60.480	Sq.M.	45.290	Rupees Forty Five and Twenty Nine Paisas Only	**2739.000**
46	A) Painting with best quality synthetic enamel paint of approved make and brand including smoothening surface by sand papering etc. including using of approved putty etc. on the surface, if necessary : With super gloss (hi-gloss) iv) Two coats (with any shade except white) a) On timber or plastered surface :	60.480	Sq.M.	96.540	Rupees Ninety Six and Fifty Four Paisas Only	**5839.000**
46.01	b) On steel or other metal surface : With super gloss (hi-gloss) - (iv) Two coats (with any shade except white)	42.750	Sq.M.	94.150	Rupees Ninety Four and Fifteen Paisas Only	**4025.000**
47	Supplying, fitting & fixing UPVC pipes A-Type and fittings conforming to IS:13592-1992 with all necessary clamps nails, including making holes in walls, floor etc. cutting trenches in any soil through masonry concrete structures etc if necessary and mending good damages including joining with jointing materails (Spun Yarn, Valamoid/Bitumen/M-Seal etc) complete.					
47.01	A) UPVC Pipes: ii) 110 mm. Dia.	24.500	Metre	299.140	Rupees Two Hundred Ninety Nine and Fourteen Paisas Only	**7329.000**

47.02	B) UPVC Fittings: a) Plain Tee (ii) 110 mm. Dia.	8	Nos	204.990	Rupees Two Hundred Four and Ninety Nine Paisas Only	**1640.000**
47.03	c) Bend 87.5 degree ii) 110 mm. Dia	8	Nos	190.690	Rupees One Hundred Ninety and Sixty Nine Paisas Only	**1526.000**
47.04	d) Shoe (ii) 110 mm. Dia.	16	Nos	132.290	Rupees One Hundred Thirty Two and Twenty Nine Paisas Only	**2117.000**
48	Supplying P.V.C. water storage tank of approved quality with closed top with lid (Black) - Multilayer(b) 1000 litre capacity	1	Each	6111.550	Rupees Six Thousand One Hundred Eleven and Fifty Five Paisas Only	**6112.000**
49	Labour for hoisting plastic water storage tank.(i) Upto 1500 litrecapacity.a) Upto 1st story from G.L.	1	Each	114.410	Rupees One Hundred Fourteen and Forty One Paisas Only	**114.000**
49.01	b) Extra for each additional story	1	Each	51.250	Rupees Fifty One and Twenty Five Paisas Only	**51.000**
50	Supplying, fitting and fixing Anglo-Indian W.C. in white glazed vitreous china ware of approved make complete in position with necessary bolts, nuts etc.					
50.01	(a) With 'P' trap (with vent)	2	Each	3699.350	Rupees Three Thousand Six Hundred Ninety Nine and Thirty Five Paisas Only	**7399.000**
51	Supplying, fitting and fixing 10 litre P.V.C. low-down cistern conforming to I.S. specification with P.V.C. fittings complete,C.I. brackets including two coats of painting to bracket etc.	2	Each	1209.680	Rupees One Thousand Two Hundred Nine and Sixty Eight Paisas Only	**2419.000**

52	Supplying, fitting and fixing Flat back urinal (half stall urinal) in white vitreous chinaware of approved make in position with brass screws on 75 mm X 75 mm X 75 mm wooden blocks complete.					
52.01	(i) 635 mm X 395 mm X 420 mm	2	Each	3419.270	Rupees Three Thousand Four Hundred Nineteen and Twenty Seven Paisas Only	**6839.000**
53	Providing and fixing of factory made uPVC Louver window (White Colour) (U value=1.9-1.3 W/m 2 K, flame resistant, self extinguishing, lead free) comprising of uPVC multi-chambered with wall thickness of 2.3mm (±0.2 mm) duly reinforced with 1.6 mm (±0.2 mm) thick G. I. Section made from roll forming process of required length (shape & size according to uPVC profile). Profile of frame & sash shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. Both vertical sides of the frame, adjustable louver mechanism having one lever shall be fitted with the provision of 4 mm glass. Window frame will be fixed to the wall with 100mm long and 8mm dia for fixing frame to finished wall, plastic packers, plastic caps and necessary stainless steel screws etc. Fasteners and after fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of required size, of approved quality complete in all respect as per as per approved drawing & direction of Engineer-in-Charge. (Note: Profile manufacturer & Window Manufacturer must be one & same, Only manufacturer Waranty is aceptable)					
53.01	b) Louver Window (Adjustable Louver Only) frame of size 67 x 62 mm both having wall thickness of 2.3 ± 0.2 mm	1.350	Sq.M.	8118.540	Rupees Eight Thousand One Hundred Eighteen and Fifty Four Paisas Only	**10960.000**

54	Supplying, fitting and fixing PVC pipes of approved make of Schedule 80 (medium duty) conforming to ASTMD - 1785 and threaded to match with GI Pipes as per IS : 1239 (Part - I). with all necessary accessories, specials viz. socket, bend, tee, union, cross, elbo, nipple, longscrew, reducing socket, reducing tee, short piece etc. fitted with holder bats clamps, including cutting pipes, making threads,fitting, fixing etc. complete in all respect including cost of all necessary fittings as required,jointing materials and two coats of painting with approved paint in any position above ground. (Payment will be made on the centre line measurements of total pipe line including all specials. No separate payment will be made for accesories, specials. Payment for painting will be made seperately)					
54.01	(a) For Exposed Work PVC Pipes (Dia) 20 mm Dia.	60.000	Metre	153.740	Rupees One Hundred Fifty Three and Seventy Four Paisas Only	**9224.000**
54.02	25 mm Dia.	54.000	Metre	210.950	Rupees Two Hundred Ten and Ninety Five Paisas Only	**11391.000**
55	Supplying, fitting and fixing white vitreous china best quality approved make wash basin with C.I. brackets on 75 mm X 75 mm wooden blocks, C.P. waste fittings of 32 mm dia., one approved quality brass C.P. pillar cock of 15 mm dia., C.P. chain with rubber plug of 30 mm dia., approved quality P.V.C. waste pipe with C.P. nut 32 mm dia., 900 mm long approved quality P.V.C. connection pipe with heavy brass C.P. nut including mending good all damages and painting the brackets with two coats of approved paint. (iii) 630 mm X 450 mm size	2	Each	3885.270	Rupees Three Thousand Eight Hundred Eighty Five and Twenty Seven Paisas Only	**7771.000**
56	Supplying, fitting and fixing pedestal of approved make for wash basin (white)	2	Each	1784.120	Rupees One Thousand Seven Hundred Eighty Four and Twelve Paisas Only	**3568.000**
57	Supplying,fitting and fixing approved brand P.V.C.CONNECTOR white flexible, with both ends coupling with heavy brass C.P. nut, 15 mm dia. (v) 900 mm long	8	Each	175.190	Rupees One Hundred Seventy Five and Nineteen Paisas Only	**1402.000**

58	Supplying,fitting and fixing approved brand 32 mm dia.P.V.C. waste pipe,with PVC coupling at one end fitted with necessary clamps.1050mm long	2	Each	108.450	Rupees One Hundred Eight and Forty Five Paisas Only	**217.000**
59	Supplying fitting and fixing bib cock or stop cock.					
59.01	(a) (ii) Chromium plated Bib Cock long body with wall flange with aerator (Equivalent to Code No. 512 & Model - Tropical/Sumpting Special of ESSCO or similar brand)	6	Each	785.400	Rupees Seven Hundred Eighty Five and Forty Paisas Only	**4712.000**
59.02	(b) (i) Chromium plated Stop Cock (Equivalent to Code No. 513(A) & 513(B) & Model - Tropical / Sumthing Special of ESSCO or similar	14	Each	587.560	Rupees Five Hundred Eighty Seven and Fifty Six Paisas Only	**8226.000**
60	Supplying, fitting and fixing shower of approved brand and make.					
60.01	b) Chromium plated Rose shower with revolving joint and 150 mm long shower arm (Equivalent to Code No. 5489 & Model - Florentine of Jaquar or similar brand).	2	Each	1682.820	Rupees One Thousand Six Hundred Eighty Two and Eighty Two Paisas Only	**3366.000**
60.02	(f) Hand Shower (Health Faucet) with 1mtr Fexible Tube with Wall Hook(Equivalent to Code No.573 & Model -ALLIED of Jaquar or similar).	3	Each	1490.940	Rupees One Thousand Four Hundred Ninety and Ninety Four Paisas Only	**4473.000**
61	Supplying, fitting and fixing urinal flush pipe fittings of approved brand. (b) C.P. urinal flush pipe fittings range of two	2	Each	1092.880	Rupees One Thousand Ninety Two and Eighty Eight Paisas Only	**2186.000**
62	Supplying, fitting and fixing best quality Indian make mirror 5.5 mm thick with silvering as per I.S.I. specifications supported on fibre glass frame of any colour, frame size 550 mm X 400 mm	2	Each	730.570	Rupees Seven Hundred Thirty and Fifty Seven Paisas Only	**1461.000**
63	Supplying, fitting and fixing glass shelf with aluminium guard rails. (a) Ordinary type with 5.5 mm sheet glass (ii) 600 mm X 125 mm	2	Each	572.060	Rupees Five Hundred Seventy Two and Six Paisas Only	**1144.000**
64	Supplying, fitting and fixing liquid soap container. (a) Cromium plated.	2	Each	468.380	Rupees Four Hundred Sixty Eight and Thirty Eight Paisas Only	**937.000**

65	Supplying, fitting and fixing soap holder. (a) PTMT(Prayag or equivalent)	4	Each	160.890	Rupees One Hundred Sixty and Eighty Nine Paisas Only	**644.000**
66	Supplying, fitting and fixing towel rail with two brackets. (a) C.P. over brass (ii) 25 mm dia. and 600 mm long	2	Each	512.470	Rupees Five Hundred Twelve and Forty Seven Paisas Only	**1025.000**
67	Supplying, fitting and fixing Black Stone slab used in Kitchen slab, alcove, wardrobe etc. laid and jointed with necessary adhesive Cement mortar (1:2) including grinding or polishing as per direction of Engineer-in - Charge . In Ground Floor. b) Slab thickness above 25 mm. and upto 37.50 mm.	15.150	Sq.M.	849.750	Rupees Eight Hundred Forty Nine and Seventy Five Paisas Only	**12874.000**
68	Supplying, fitting and fixing Stainless Steel railing consist of 38mm dia and 900mm height vertical balustrade at every two alternative steps, 50mm dia top rail, 3 (three) nos 19mm dia horizontal Strainless steel pipe and base/cover plate with Strainless Steel GRADE 304 containing 7.5% nickle (Interior Grade) Brushed/Mat finish, complete as per direction of the Engineer-in-charge. Weight of Strainless Steel railing per metre 6.5 Kg (approx)	14.200	Metre	9149.450	Rupees Nine Thousand One Hundred Forty Nine and Forty Five Paisas Only	**129922.000**
69	Providing and fixing of false ceiling with powder coated exposed G.I. grid suspension system (E-Grid U-1520 or equivalent load carrying capacity with mid span deflection not exceeding 1/360 span with hanger spacing of 1200mm c/c) consisting of Main Runner 3600 mm long, Cross Tee 1200 mm / 600 mm long and Wall Angle. The Wall Angle shall be fixed on PVC Dash Fasteners on the perimeter of the wall by steel screws with distance 300mm c/c. The Main Runners to be placed @ 1200 mm. The Cross Tee 1200mm will be inserted in the pre-cut slots of Main Runner at a regular interval of 600 mm to form a modular grid of 1200mm X 600mm. Additional Cross Tees of 600 mm shall be placed perpendicular to the Cross Tee 1200 mm long to finally form a grid of 600 mm X 600 mm. Grid of module size 600 mm X 600 mm shall be supported by 6 mm dia G.I. wire from purlins / soffit. 15mm thick OW Acoustic Board (Mineral Fiber Acoustic Ceiling Tiles) of approved patern and size 595mm X 595mm with NRC value > 0.65 should be placed in the Grid module to form a False Ceiling. All complete as per the drawing & directions of Engineer-in-charge. In ground floor.					

69.01	a) Acoustic False Ceiling (with 15mm thick OW Acoustic Board and E-Grid U1520).	45.660	Sq.M.	1617.270	Rupees One Thousand Six Hundred Seventeen and Twenty Seven Paisas Only	**73845.000**
70	Supplying & laying as per IRC-SP:063-2004 paver unit of any shade of approved quality as per relevant IS code, laid in pattern as directed in pavement, footpath, driveway (paver block only), etc including necessary underlay complete in all respect with all labour and material.[Border concrete if necessary to be paid separately]. Note: Sub-grade CBR should not be less than 5. (b) 50 mm thick interlocking designer concrete paver block M30 grade for non-traffic zone,buidingpremises,garden,parks,domestic drive as per IS: 15658- 2006(over 20-30 mm medium sand bed on 200mm thk bound gnaular /granular base course including cost of sand for sand bed but excluding cost of base course & subgrade preparation.) (ii) Coloured Decorative	480.000	Sq.M.	1338.390	Rupees One Thousand Three Hundred Thirty Eight and Thirty Nine Paisas Only	**642427.000**
71	Dismantling R.C. floor, roof, beams etc. including cutting rods and removing rubbish as directed within a lead of 75 m. including stacking of steel bars a) In ground floor including roof.	1.140	Cu.M.	2331.160	Rupees Two Thousand Three Hundred Thirty One and Sixteen Paisas Only	**2658.000**
72	Godrej make chair bak net Model: Oxbo high back (7501R)	6	Each	7940.000	Rupees Seven Thousand Nine Hundred Forty Only	**47640.000**
73	Supplying, fitting Fixing Table Work Table made of 25 mm prelaminated particle board with 2 mm PVC edge banding dim of 1500 W x 750 D x 740 H with same quality of Free-standing pedestal with adequate personal storage, Neat Wiring flow with cut-outs on both sides, all complete including cost of delivery at office as per satisfaction of Engineer-in-Charge.	3	Each	21658.420	Rupees Twenty One Thousand Six Hundred Fifty Eight and Forty Two Paisas Only	**64975.000**

74	Supplying, fitting Fixing Chair The seat made from 1.2mm.thk.hot pressed plywood and back injection moulded from black Co-polymer Polypropylene are upholstered with fabric and moulded Polyurethane foam together with seat and back covers.The back foam is designed with contoured lumber support for extra comfort.Size:Seat size:-45.0cm(W)X42.0cm(D)Back size:-39.0cm(W)x38.0cm(H).The seat and back covers are injection moulded in black Co-polymer Polypropylene.The fixed type mechanism is 360' revolving type without tilt.The frame is made up of Dia.2.64cm(1)x14bg.M.S.E.RW.tube which is black powder,all complete including cost of delivery at office as per satisfaction of Engineer-in-Charge.	10	Each	4218.370	Rupees Four Thousand Two Hundred Eighteen and Thirty Seven Paisas Only	**42184.000**
75	Supplying, fitting Fixing Almirah, Size-765mmx440mmx1270mm Height without leveler.Construction& Materials welded construction 0.5mm thik CRCA for shelf & 0.9mm thik CRCA for all other components.Locking 3 way locking maechanism with shooting bolt.Shelving height wise adjustable shelves 3 nos.Finish-Epoxy polyester powdercoated to the thickness of 501 micros(+/-)all complete including cost of delivery at office as per satisfaction of Engineer-in-Charge.	2	Each	17104.780	Rupees Seventeen Thousand One Hundred Four and Seventy Eight Paisas Only	**34210.000**

76	Construction of septic tank of different capacities as per approved drawing with 1st class brick work in cement mortar (1:4) including two 560 mm dia. R.C.C. manhole cover(heavy type)of approved make supplied, fitted and fixed in the 100mm thick R.C.C (1:1.5:3) top slab with necessary fittings, 20mm thick cement plaster (4 : 1) with neat cement finish to the internal surfaces and 15 mm thick cement plaster (4 : 1) to outside wall upto 200 mm below G.L floor finished with 25 mm thick grey artificial stone over 100 mm thick R.C.C(1:1.5:3) bottom slab including supplying, fitting and fixing all necessry specials, fittings, S.W. tees, C.I. foot rest etc. including excavation earth in all sorts of soil, shoring, bailing out and pumping out water as necessary, ramming, dressing the bed and fefilling the sides of the tanks with earth, removing spoils, filling up the chamber with clear water, removing foreign materials from the chamber and including constructing attached inspection pit as per approved drawing and connecting all necessary pipes, joints etc. with internal plaster work and artificial stone flooring is to be done with admixture of water proofing compound @ 0.5% by weight of cement with all costs of labour and materials. Note:- (i) Finished level of Septic Tank should be 400 mm. from Ground Level. (ii) Height of 50 mm. Ventilation pipe &Mosquito proof mesh, should be follwed as per IS:2470,Part- I.Payment will be made separetly on the basis of actual height based on relevant I.S.Code.(iv) For 50 users A) With Pakur variety. (SAIL/TATA/RINL)	1	Each	105556.530	Rupees One Lacs Five Thousand Five Hundred Fifty Six and Fifty Three Paisas Only	**105557.000**
77	Supplying & Fixing 40 mm dia 3.20 metre long Vertical Type service bracket for carrying 2 wires and an earth wire complete with Galv. clamp for stay, insulators etc., 7/14 SWG stranded Galv. (Hot Dip) wire for stay with 230x13 mm dia straining serews, 75x88 mm porcelain shackle insulators with Galv. (Hot Dip) strips etc. and painting	1	Set	1955.956	Rupees One Thousand Nine Hundred Fifty Five and Ninety Five Paisas Only	**1956.000**

78	Supplying and fixing polythene pipe complete with fittings as necy. under ceiling/beam, bound with 22 SWG GI binding wire incl. supplying and drawing 1x18 SWG GI Wire as fish wire inside the pipes and fittings and providing 50 mm dia disc of MS sheet (20 SWG) having colour paint at one face fastened at the load point end of the polythene pipe with fish wire (synchronizing with roof/beam casting work of building construction) 19mm dia 3mm thick Polythene Pipe	120.000	RM.	43.763	Rupees Forty Three and Seventy Six Paisas Only	**5252.000**
78.01	4.0 sqmm 'FR' stranded Copper wire	135.000	M.	38.540	Rupees Thirty Eight and Fifty Four Paisas Only	**5203.000**
78.02	6.0 sqmm 'FR' stranded Copper wire	165.000	M.	58.270	Rupees Fifty Eight and Twenty Seven Paisas Only	**9615.000**
78.03	10.0 sqmm 'FR' stranded Copper wire	150.000	M.	111.706	Rupees One Hundred Eleven and Seventy Paisas Only	**16756.000**
79	Supplying and fixing Sheet steel Main Switches on flat iron frame on wall, 60/63 A Standard 240V DP with fuse on L&N	2	Nos	3865.720	Rupees Three Thousand Eight Hundred Sixty Five and Seventy Two Paisas Only	**7731.000**
80	Supplying and fixing 240/415 V MCB of Breaking capacity 10kA & C characteristics on din rail of existing DBs and necessary connection, i) 40 A, DP, Legrand	3	Nos	1140.270	Rupees One Thousand One Hundred Forty and Twenty Seven Paisas Only	**3421.000**
80.01	ii) 6-32 A, SP, Legrand	12	Nos	230.970	Rupees Two Hundred Thirty and Ninety Seven Paisas Only	**2772.000**
81	Supplying and fixing 240/415 V MCB Isolator on din rail of existing DBs and necessary connection., 40A, DP, Legrand	15	Nos	424.260	Rupees Four Hundred Twenty Four and Twenty Six Paisas Only	**6364.000**

82	Supplying and fixing double-door SPN MCB Distribution Board with IP-42/43 protection, concealed in wall after cutting the wall & mending good the damages to original finish incl. Inter connection with suitable size of copper wire and neutral link & provision for earthing attachment. Legrand, 2+12 Way, Enclosure (607712)	15	No	2135.880	Rupees Two Thousand One Hundred Thirty Five and Eighty Eight Paisas Only	**32038.000**
83	Cutting channel of 40 mm x 40 mm size on masonry wall incl.S&F heavy gauge polythene pipe dia as stated below, by means of iron hooks and supplying and drawing 18 SWG GI Wire as fish wire incl. mending good damages to building works . 19 mm dia 3 mm thick polythene pipe without earth continuity wire	90.000	RM.	105.760	Rupees One Hundred Five and Seventy Six Paisas Only	**9518.000**
84	Wiring in 1.1 KV grade single core stranded 'FR' PVC insulated & unsheathed copper wire (Brand approved by EIC) of following sizes in 25mm PVC casing-capping (Precision make) incl. necy. PVC clips, fittings etc. (i) 2 x 36/0.3 (2.5 sqmm) + 1 x 22/0.3 (1.5 sqmm)	135.000	RM.	124.000	Rupees One Hundred Twenty Four Only	**16740.000**
84.01	(ii) 2 x 56/0.3 (4 sqmm) + 1 x 22/0.3 (1.5 sqmm)	160.000	RM.	149.520	Rupees One Hundred Forty Nine and Fifty Two Paisas Only	**23923.000**
85	Supplying & Fixing GI Modular Switch Board of the following sizes complete with three no. suitable size Copper bar with holes (for Ph, N & E) fixed on bakelite/Hard Rubber insulator over the MS welded chairs incl. top cover flushed in wall for housing the board after cutting the brick wall incl. making earthing attachment, painting and mending good damages to building works 12 Module	12	Set	635.770	Rupees Six Hundred Thirty Five and Seventy Seven Paisas Only	**7629.000**
86	Supplying & Fixing GI Modular Switch Board of the following sizes complete with top cover plate flushed in wall for housing the board after cutting the brick wall incl. making earthing attachment, painting and mending good damages to building works, 2 Module	10	Set	209.090	Rupees Two Hundred Nine and Nine Paisas Only	**2091.000**

87	Supply & Fixing 240 V 6 A Modular type switch (Brand approved by EIC) on existing GI Modular type switch board having top cover plate and making necessary connections as required.	16	Each	99.690	Rupees Ninety Nine and Sixty Nine Paisas Only	**1595.000**
88	Supply & Fixing 240 V 16 A Piano key type switch (Brand approved by EIC) on GI Modular type switch board having top cover plate and making necessary connections as required.	40	Each	144.660	Rupees One Hundred Forty Four and Sixty Six Paisas Only	**5786.000**
89	Supply & Fixing 240 V, 6A, 5 pin Modular type plug socket (Brand approved by EIC), without switch & plug top, on existing GI Modular type switch board with top cover plate and making necy. connections with PVC Cu wire and earth continuity wire etc.	16	Each	145.870	Rupees One Hundred Forty Five and Eighty Seven Paisas Only	**2334.000**
90	Supply & Fixing 240 V, 16 A, 3 pin Modular type plug socket (Brand approved by EIC), without plug top and switch, on existing GI Modular type switch board with top cover plate and making necy. connections with PVC Cu wire and earth continuity wire etc.	15	Each	196.930	Rupees One Hundred Ninety Six and Ninety Three Paisas Only	**2954.000**
91	Distribution wiring in 1.1 KV grade 2x22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire (Brand approved by EIC) in suitable size PVC casing-capping (Precision make) with 1x22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire for ECC, incl. necy. fittings etc. to light/fan/call bell point with Modular type switch (Brand approved by EIC) fixed on Modular GI / PVC switch board with top cover plate on wall incl. mending good damages to original finish. [PVC casingcapping and Switch board both on surface] Average run 6 mtr	20	Point	891.060	Rupees Eight Hundred Ninety One and Six Paisas Only	**17821.000**

91.01	Average run 8 mtr	10	Point	1068.540	Rupees One Thousand Sixty Eight and Fifty Four Paisas Only	**10685.000**
91.02	Average run 12 mtr	15	Point	1423.510	Rupees One Thousand Four Hundred Twenty Three and Fifty One Paisas Only	**21353.000**
92	Distribution Wiring in 1.1 KV grade 2x22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire (Brand approved by EIC) in suitable size PVC casing-capping (Precision make) with 1x22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire for ECC, incl. necy. fittings etc. with S & F 6A 5 pin Modular type plug socket and switch (Brand approved by EIC) fixed on 4 Module GI / PVC switch board with 3/4 Module top cover plate on wall incl. necy. connection making earthing attachment, painting and mending good damages to building works [PVC casing-capping and plug box both on surface] On Board	5	Point	262.580	Rupees Two Hundred Sixty Two and Fifty Eight Paisas Only	**1313.000**
93	Supplying of approved make high speed ceiling fan (ISI marked) of following sizes having double ball bearing complete with standard down rod, canopy, hanging shackle, Aluminium blades, without regulator, A.C. 230-250 volts 900mm/ 1050mm/ 1200mm i) Ceiling fan size 1200 mm sweep	7	Nos.	2737.560	Rupees Two Thousand Seven Hundred Thirty Seven and Fifty Six Paisas Only	**19163.000**

94	Supply & Fixing 240V, Modular Socket (2 Module) type fan regulator (Step type) (Brand approved by EIC) on existing Modular GI switch board with top cover plate incl. making necy. connections etc.	8	Each	470.450	Rupees Four Hundred Seventy and Forty Five Paisas Only	**3764.000**
95	Supplying of approved make wall fan oscillating type with base, blades, guard, speed regulator etc. AC 230- 250 volts. 400mm sweep	10	Nos.	4013.980	Rupees Four Thousand Thirteen and Ninety Eight Paisas Only	**40140.000**
96	Supply and fixing of philips Soft Glow Office compliant fully diKused recessed mounted 2'X2' false ceiling based LED light including connection by 1.5 sq mm cu wire. Make : Philips 36 Watt	20	Nos.	6327.270	Rupees Six Thousand Three Hundred Twenty Seven and Twenty Seven Paisas Only	**126545.000**
97	Fixing only fluorescent light fitting suspended 25 cm bellow the ceiling with 2 No. 20 mm dia EI conduit (14 SWG) supports incl. S&F EI conduit, ball socket/socket type ceiling plate and connecting the length of PVC insulated wire and painting etc. as required by 2x24/0.20 mm (1.5sqmm) flexible copper wire of 1.10 mt. length.	20	Each	260.150	Rupees Two Hundred Sixty and Fifteen Paisas Only	**5203.000**
98	Supply and fixing of greenline V2 street light (115 Wafl) complete with all accessories to be fixed /projected from the wall of the building or on pole incl. making holes/providing clamping arrangement &necy. GI reducer as required. S&F 40 mm GI pipe (ISI-Medium) quality 1.5 mts. average length having suitable bend S&F necy. length of 1.5 sqmm PVC insulated single core stranded annealed copper wire and making connections as required and mending good damages to wall incl. painting etc. Make : Philips, 115 wafl	4	Nos.	11064.670	Rupees Eleven Thousand Sixty Four and Sixty Seven Paisas Only	**44259.000**
99	Supplying & fixing earth busbar of galvanized (Hot Dip) MS flat 25 mm x 6 mm on wall having clearance of 6 mm from wall including providing drilled holes on the busbar complete with GI bolts, nuts, washers, spacing insulators etc. as required	8.000	Metre	189.640	Rupees One Hundred Eighty Nine and Sixty Four Paisas Only	**1517.000**

100	Connecting the equipments to earth busbar including S & F GI (Hot Dip) wire of size as below on wall/floor with staples buried inside wall/floor as required and making connection to equipments with bolts, nuts, washers, cable lugs etc. as required and mending good damages Solid G.I Wire No. 6 SWG	9.000	Metre	15.810	Rupees Fifteen and Eighty One Paisas Only	**142.000**
101	Earthing with 50 mm dia GI pipe 3.64 mm thick x 3.04 Mts. long and 1 x 4 SWG GI (Hot Dip) wire (4 Mts. long), 13 mm dia x 80 mm long GI bolts, double nuts, double washers incl. S & F 15 mm dia GI pipe protection (1 Mts. long) to be filled with bitumen partly under the ground level and partly above ground level driven to an average depth of 3.65 Mts. below the ground level as below: By ISI-Medium GI pipe	1	Set	1664.210	Rupees One Thousand Six Hundred Sixty Four and Twenty One Paisas Only	**1664.000**
102	Excavation of soil for installation of Earth Electrode and filling & ramming. For Soft Soil	1.000	Cu.M.	261.360	Rupees Two Hundred Sixty One and Thirty Six Paisas Only	**261.000**
103	Extra for providing masonery enclosure on the top of the earth electrode of overall size 86.36 cm x 86.36 cm x 46 cm deep (below Ground level) complete with cemented brick work(1:6) of 25 cm width duly plastered with cement morter (inside) CI hinged inspection cover of size 36.56 cm x 35.56 cm with locking arrangement, GI reducer including drilling of 46 nos. 12 mm dia holes on the GI pipe	1	Item	1112.300	Rupees One Thousand One Hundred Twelve and Thirty Paisas Only	**1112.000**
104	Extra for treatment of soil by using salt & charcoal or coke for plate electrode	1	Item	645.500	Rupees Six Hundred Forty Five and Fifty Paisas Only	**646.000**
105	Supplying of approved make exhaust fan heavy duty with mounting frame, blades AC 230-250. 225mm sweep RPM 900 / 1400 (9")	6	Each	2563.560	Rupees Two Thousand Five Hundred Sixty Three and Fifty Six Paisas Only	**15381.000**
106	Supply installation testing and commissioning of following capacity geyser 5 star rated storage water heater with advanced 3 level safety For 25L-capacity	2	Each	11618.860	Rupees Eleven Thousand Six Hundred Eighteen and Eighty Six Paisas Only	**23238.000**

107	Recontruction or mending good damages to the community structure and cultural resource properties including the development of Government land as plantation & beautification etc.as per direction of the Engineering-in-charge.	1	L.S.	300000.000	Rupees Three Lacs Only	**300000.000**
					Gross Total Estimated Cost :	**Rs.4477749.00**

We agree to execute the works in accordance with the approved drawings and technical specifications at ..... percentage above/below the estimated rates, i.e., for a total Contract Price of Rs. .....(amount in figures) (Rs. ..... amount in words).

Signature of Contractor

Annexure - 2

Format of certificate

Certified that the works up to ---------- stage (as defined in Clause 3.1 of the Agreement) in respect of construction of ---------- at ---------- have been executed satisfactorily in accordance with the terms and conditions of the agreement and as per approved drawings and technical specifications

Signature
Name & Designation

(Official address)

Place:

Date:

Office seal

1.0 Preamble to the BOQ

1.1 INTRODUCTION

The Bill of Quantities (BOQ) shall be read in conjunction with the Instructions to Bidders, Technical Specificationsand Drawings. The rates quoted shall be inclusive of cost of all materials, transportation and carriage of material upto works site, labour, plant and equipment, tools and tackles, safety gadgets, incidentals etc. as may be required for that particular item in the BOQ which is to be read in conjunction in the specification.

The quantities given in the Bill of Quantities are estimated and provisional and are given to provide a common basis for bidding. The basis of payment will be on the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices tendered in the priced Bill of Quantities. If such rates are not available in the Bill of Quantities, this will be treated as extra work and such rates and prices will be fixed by the Engineer / Project Manager as per the terms of the Contract.

Mode of measurement, if not specified elsewhere shall be followed as per available codes of practice published by the Bureau of Indian Standards (BIS).

The rates and prices tendered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the contract, include all temporary facilities, access, notices to maintain traffic prevailing in an accessible manner, as far as possible for similar flow existing and also including all construction of plant, labour, supervision, materials, erection, maintenance, insurance, overhead, profit, taxes and duties together with all general risk, liabilities and obligation set out or implied in the contract.

General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. The Bidder must refer to the relevant sections of the bid documents including specifications, data sheets and drawings before quoting rates in the Bill of Quantities.

The Deputy Team Leader of the Project Management Consultant (PMC) – WBMIFMP will be engaged as the Project Manager. For the purpose of this contract, the Project Manager or Engineer or Engineer – In – Charge will have the same meaning and connotation.

2.0 GENERAL

2.1 General Basis for Pricing,

2.1.1 The Bidder shall be deemed to have read and examined the Bid Documents as well as inspected the project site thoroughly to conceive the work in totality to quote against each item of work as given in the BOQ.

2.1.2 The Bidder shall be deemed to be fully conversant with the site conditions and the nature and complexity of the work to be undertaken and taking into account all eventualities which can arise before, during and after project execution.

2.1.3 It is to be expressly understood that the measured work is to be taken net (not withstanding any system or practice to the contrary) according to the actual quantities finished according to the drawings or as may be ordered from time to time by the Engineer and the cost calculated for the respective prices. Necessary

manpower will have to be provided by the Contractor during measurement of works and setting out alignment of the works, for which no extra payment will be made.

2.1.4 Unless otherwise stated, all items shall be measured as executed as per drawing and specification and no allowance will be made for wastage, working space, bulking or shrinkage, and the like.

2.1.5 The quoted rates and prices shall also be inclusive of communication system vehicles for movement at site etc. No extra cost against such items will be paid.

3.0 Miscellaneous

3.1 Temporary power connections, telephones, construction and drinking water shall be arranged by the Contractor at his own cost and shall be deemed to be included in their quoted rates. Alternative power arrangement shall be made by Contractor without any extra charge.

3.2 All underground and over ground utility items shall have to be suitably supported during the construction phase by the Contractor so that the existing utility services are not damaged. No extra payment will be made on this account.

3.3 The Contractor shall keep plumbers, technicians and electricians ready for repair/ shifting of existing underground/ over ground utilities and for crisis management.

3.4 During progress of work, convenient access to adjacent premises shall be made by the Contractor. No extra payment will be made on this account.

3.5 For speedy progress of work in case of exigency, Contractor may have to do work round the clock at the instance of the Engineer/Project Manager. Arrangement for lighting and other safety requirements shall have to be done for night working. No extra payment shall be made to the Contractor except the items provided in the BOQ.

3.6 The rates quoted by the Contractor shall, unless otherwise specified, also include compliance of/ supply of the following:

i) General works such as setting out, clearance of site before setting out and clearance of works after completion.

ii) A detailed programme for the construction and completion of the work.

iii) Samples of various materials proposed to be used on the work for conducting tests thereon as required as per the provisions of the Contract.

iv) Any other item of work which is not specially provided in the Bill of Quantities (BOQ) but which is necessary for complying with the provisions of the Contract.

v) All temporary works, formwork and false work.

vi) Arrangement of a laboratory with facilities for testing and testing of various items of works as specified in relevant clauses.

vii) Cost of in-built provisions for Quality Assurance.

viii) Cost of labour hutment, site office.

ix) For ITEM No 107 of BOQ, Detail estimate should be approved by the Project Management Consultant befor stating the execution.

3.8 Extra items of work – If during the progress of work any extra items need to be carried out, which in the opinion of the Engineer/ Project Manager is essentially required to be executed, then the extra item shall be analyzed as follows:

i) Derived from rates of similar items of works stated in the tendered offer

ii) In the event an extra item of work that cannot be derived from (i) above, the rates of extra / new items are to be analysed considering current market rates of all components including 8% overhead and 10% Contractor's profit and duly approved by the Project Manager.

iii) If not specifically indicated in the items themselves, the rates appearing in this schedule are inclusive of cost of all supply, carriage, handling, fitting, fixing, toll charges, ferry charges etc. and all other incidental works involved in any floor, at any level including all necessary jointing materials, scaffolding to any height, hire charges of tools and plants, and all helping materials.

Payments:

The Consultant shall submit all field data conductedat sites The payment will be made on the basis of duly accepted reports. Payment mode will be via ECS/NEFT through Govt.e-procurement system to the declared Bank Account Number of the Consultant.

Government of West Bengal
West Bengal Major Irrigation and Flood Management Project (WBMIFMP)

Terms of Reference (TOR)
for

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

RFQ No: **WBMIFMP/NCB/23-24/D3.6/Poshpur**

Background

The Government of India has received financing of USD 290 million from the International Bank for Reconstruction and Development (IBRD) and Asian Infrastructure Investment Bank (AIIB) towards the cost of the **West Bengal Major Irrigation and Flood Management Project (WBMIFMP)** and intends to apply a part of the proceeds toward eligible payments under the contracts for Civil works as well as Consultancy Services. The sub–the borrower is the Irrigation & Waterways Department, Government of West Bengal.

WBMIFMP aims to improve the existing irrigation network in the Damodar Valley Command Area (DVCA) within the State of West Bengal, optimize conjunctive and sustainable use of ground and surface water across the DVCA in different irrigation seasons, and reduce flooding in the Lower Damodar Sub-Basin (LDSB) in West Bengal.

The duration of the project as envisaged now is 5 (five) years. The Project is being executed by the Irrigation and Waterways Department (IWD), the Government of West Bengal (GoWB) located in Kolkata, and the State Project Management Unit (SPMU) is implementing agency/employer (SPMU, IWD). The support of the Project Management Consultant (PMC) will be at the PMU at various levels viz the State Project Management Unit (SPMU), the District Project Management Units (DPMUs), and the District Project Implementation Units (DPIUs) and is expected to fully compliment the PMU in the execution of the Project in all aspects under the overall control of the IWD at the PMU. The Consultant may note that the execution of the Project will be decentralized with District Units of IWD and the support will extend to the field units as well.

1.0 Overview of the Project

The Damodar River originates from the Chhotonagpur Plateau at Latehar District in Jharkhand and flows through the districts of Latehar, Hazaribagh in Jharkhand, and enters

Purulia District in West Bengal which is the lowermost riparian State in Damodar Basin. Five reservoirs have been built on the Damodar and its tributaries in Jharkhand to moderate floods in the lower basin area in West Bengal and for irrigation. These are operated by Damodar Valley Corporation (DVC). The Damodar River bifurcates into two main branches, i.e.Mundeswari and Lower Damodar (Amta Channel) near the border of Burdwan and Hooghly Districts, and both the channels traverse through the districts of Hooghly and Howrah, and ultimately meet River Hooghly, which debouches into Bay of Bengal.

2.0 Project Area:

The project area considering both irrigation and flood management aspects is as follows:

Irrigation Management:
Northern Boundary: River Ajoy at Parulia, Block Katwa-I, District Burdwan (Latitude 23°38′51″N).
Southern Boundary: Outfall of Nabinbabur Khal at Block Amta-I, District Howrah (Latitude 22°35′47″N).
Western Boundary: Durgapur Barrage on river Damodar at Block Barjora, District Bankura (Longitude 87°18′13″E).
Eastern Boundary: Howrah Burdwan Main Line of Eastern Railway at Nityanandapur, Block Balagarh, District Hooghly (Longitude 8825′17″E)

Flood Management:
Northern Boundary: Bifurcation point of river Damodar into Mundeswari River and Amta Channel at Beguahana, Block Jamalpur, District Burdwan (Latitude 23°08′8.34″N).
Southern Boundary: Outfall of Amta Channel in river Hooghly, Block Shyampur-I, District Howrah (Latitude 22º20′59.76″N).
Western Boundary: Ichhapur at Block Khanakul-I, District Hooghly (Longitude 87º 45′0.43″E).
Eastern Boundary: River Saraswati at Eklakhi, Block Chanditala-II, District Hooghly (Longitude 88º16′33.89″E).

The schematic drawing, brief project outlay, location, and other particulars are available on the website *www.wbiwd.gov.in* in the link **"**WBMIFMP**".**

3.0 Project Components

The project is structured under the following Components:
Component A: Irrigation Management - The component includes the following subcomponents: (i) Establishment of MIS, (ii) Improving the Quality-of-Service Delivery, (iii) Aquifer Management, and (iv) Capacity Strengthening.
Component B: Modernization of Irrigation Infrastructure - This component will invest in the modernization of irrigation infrastructure of the main (level 1), branch (level 2), distributary (level 3), and minor and sub-minor canals (level 4). Structural interventions on the canals include: desilting and reforming (restore shape and bank height) of selected canal sections across all canal levels; canal lining of unstable canal sections to ensure renewed canal section

stability and hydraulic capacity; rehabilitating existing damaged flow control structures to restore and/or improve function, including measures to address foundation scour, structural degradation and mechanical wear; improved irrigation management by real-time flow data collection through sensors and mobile app to serve as inputs in the decision support system and to perform need-based operation to ensure need-based and equitable distribution of canal water at the entry point of *chaks*; improving of outlet structures (fully closeable and lockable), further ensure need-based supply and to avoid water wastage; and improving weirs and drop structures and arrangement of tail regulation as needed to maintain operational head in canals; sub-surface pressurized pipe systems that will deliver water to faucets on each plot; and cross regulator construction.

Component C: Flood management - This Component will invest in structural measures to reduce flooding in the Project area. Structural measures will include investments to ensure that the flood flow discharge is more evenly shared between the Mundeswari and AmtaChannels. Increasing flood discharge capacity in Mundeswari requires dredging to restore/increase the low flow to moderate flood discharge capacity to reduce/limit peak discharge that will be shared in the Amta for all flood events.

Component D: Project Management - This component will strengthen the capacity of the Project Management Unit set up for management of the project, monitoring and evaluation (M&E) (including, inter alia, the areas of procurement and financial management) through the provision of inventories, consultant services, training, and financing of incremental operating costs. Intermediate results indicators include the number of Project monitoring reports submitted on time annually. This component will (i) finance the preparation of several technical studies.

4.0 Implementation Arrangements

Project Implementation Arrangement within the Govt. of West Bengal:

At the State level, a Technical Steering Committee (SLTSC) headed by the Chief Secretary, Govt. of West Bengal has been established and consists of the Heads of all concerned Departments. The SLTSC will review preparation and implementation progress, coordinate between Departments and provide guidance on policy matters

IWD Govt. of WB is responsible for project implementation. It has set up a State Project Management Unit (SPMU) headed by a Project Director (PD) / Chief Engineer of the IWD. The PD is supported by two Additional PDs / Superintending Engineer (SEs), 4 Deputy PDs / Executive Engineers (EEs), Accounts Officials and other support staff. Nodal officers from the Agriculture, Agri-Marketing, Fisheries, Horticulture & Food Processing Industries and Water Resources Investigation and Development Department (WRIDD) are members (Associated Departments) of the SPMU. At the district level, two District Project Management Units (DPMUs) have been established (one for Howrah and Hooghly, and one for Bankura and Burdwan) for coordination and monitoring which are headed by Additional Project Directors. The DPMUs are functional with a skeleton staffing structure. Other

implementing departments will also be represented in the DPMUs by concerned district-level officials. During project implementation, project components and sub-components execution will be overseen by the District Project Implementation Units (DPIUs) headed by the Deputy Project Directors/Executive Engineers in case of IWD and by other appropriate district level officers of associated departments. While the DPIUs of IWD will be full-time dedicated staff, such DPIUs of associated Departments will implement project components in addition to their own duties.

5.0 Sub-Project launched:

The Irrigation & Waterways Department has launched10civil works packages under component C for flood protection measures on Damodar Left Embankmen tand Damodar Right Dwarf Embankment, Upper Rampur Khal Left Embankment, Hurhura Khal Left Embankment, desiltation of Mundeswari River, desiltation of Madaria Khal and desiltation of Roner Khal. The said 10 civil works sub-project covers mainly Howrah and Hooghly and part of the Purba Bardhaman district.

6.0 Scope of the work:

The scope of the work is to carry out Infrastructure development of the following structures.

Construction of proposed 1st floor Building for Rest Shed over Single Storied Poshpur Sectional Office Building at Penro,Dist.- Howrah under WBMIFMP[D3.6].

Qualification Criteria:

Qualification Criteria that the Firms should fulfil include:

a) Should be a government registered firm/agency having worked on ADB/World Bank/JICA funded projects/Any Govt. Work for similar work.

b) The firm should have satisfactorily executed similar works, in the last FIVEyears since the date of submission of the bidding document. Similar work shall mean the Works for a Construction of Building Project for a Government Department/ PSU as Principal contractor.

c) **Copy of Work Orders, Schedule, and corresponding Completion Certificates of Works issued by the Tender Accepting / Executing Authority shall be appended.**

i. The Average Annual Construction Turnover (AACT) of the firm during the last FIVE financial years **(2018-19,2019-20, 2020-21,2021-22, 2022-23)**, ending 31st March of the previous financial year should be at least **Rs 45 Lack** .In this context, **copies of Income Tax Return for the last FIVE financial years (2018-19,2019-20, 2020-21,2021-22, 2022-23) shall be appended**.

ii. The bidder should not have incurred any loss (profit after tax should be positive) in more than two financial years during the last FIVEconsecutive financial years **(2018-19,2019-20,2020-21,2021-22, 2022-23)**for which Balance sheet, duly audited and certified by the Chartered Accountant must be furnished.

iii. Copies of TDS Certificates and Certificate of the CA, Income Tax Return for last Five years, PAN,GSTIN, Valid Trade license ofthefirm, etc. shall be appended.

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Rate quoted by the consultant should be inclusive of all, includes G.S.T., Cess etc. and other Taxes of the State or Central Government.

Specifications

The Works shall be executed in accordance with these Specifications which comprises the following Sections:

I.	Section A -	General Specifications (Building Works)
II.	Section B -	Technical Specifications (Building Works)
III.	Section C-	ESHS i.e. Environmental, Social (including Sexual Exploitation and abuse (SEA) and Gender Based Violence (GBV)), Health and Safety

SECTION A - G E N E R A L S P E C I F I C A T I O N S (BUILDING WORKS)

(INCLUDING MODES OF MEASUREMENT)

MATERIALS

GENERAL:

All materials to be used in works shall conform to Indian Standards Specification as published by B.I.S from time to time (and in the absence thereof as approved by the Engineer-in-Charge). Unless specifically mentioned otherwise the following modes of measurements shall be adopted. In general, the mode of measurement of the civil engineering works shall be guided by I.S.I. Code No.: 1200-1964 (Revised) for Indian Standard Method of measurement of Building work.

A-1: Bricks

All bricks shall be of approved quality of standard specifications, made of good brick earth, uniform deep red, cherry or copper colour, thoroughly burnt in kiln (machine made) without being vitrified, regular in shape and size, sound, hard, homogeneous in texture, true to shape and of standard dimension and shall be free from cracks, chips, flaws, stones or humps of any kind and shall not show appreciable signs of efflorescence either dry or subsequent to soaking in water. The size of bricks shall be 9¾‖x 4¾‖ x 2¾‖ (conventional). 190 x 90 x 90 mm (modular). The Bricks shall emit a clear ringing sound on being struck and have minimum crushing strength of 105 kg/sq.cm. All the bricks which absorb water more than 20% of their own dry weight after 24 hours immersion in cold water shall be rejected.

A-2 Coarse Aggregates for Cement Concrete Works:

Stone chips or stone ballast for cement concrete (plain or reinforced) shall be hard, of uniform and fine texture. free form faults or planes of weakness and free from weathered faces. The ballast or chips must be free from loam, clay or any surface coating, free from organic matter or other impurities and screened,

free of dust. Stone of black and hard variety as is generally available from quarries in Pakur areas will be normally used. Stone aggregates from other sources may also be used provided the same is found suitable in the opinion of the Engineer-in-Charge. The opinion of Engineer-in-Charge must be recorded in writing. The ballast or chips shall be obtained by breaking from large blocks and must be more or less cubicle in shape.

Size of Coarse Aggregates: For any of the following nominal sizes of graded coarse aggregates, grading shall be in conformity with the requirements laid down in the Indian Standards Specification IS: 383-1963 as shown below in Table 1.

TABLE – 1

IS. Sieve Designation	Percentage passing for graded aggregate of nominal size			
	40mm	20mm	16mm	12.5mm
	2	3	4	5
80 mm	100			
63 mm				
40 mm	95-100	100		
20 mm	30-70	95-100	100	100
16 mm			90-100	
12.5 mm.				90-100
10 mm.	10-35	25-55	30-70	40-85
4.75 mm.	0-5	0-10	0-10	0-10
2.36 mm.				

When coarse aggregates brought to the site is ungraded, single size coarse aggregates of different nominal sizes, conforming to the requirements vide Table II given below, shall be mixed at site with the other ingredients of concrete either directly in the mixture or on the platform in the proportion indicated in Table III below:

TABLE –II

IS. Sieve Designation	Percentage passing for single sized aggregate of nominal size					
	63mm	40mm	20mm	16mm	12.5mm	10 mm
1	2	3	4	5	6	7
80 mm	100					
63 mm	85-100	100				
40 mm	0-30	85- 100	100			
20 mm	0-5	0-20	85-100	100		
16 mm				85- 100	100	
12.5 mm.					85-100	100
10 mm.	0-5	0-5	0-20	0-30	0-45	85-100
4.75 mm.			0-5	0-5	0-10	0-20
2.36 mm.						0-5

TABLE – III

SI. No.	Cement concrete mix	Nominal size of aggregate	Parts of aggregate of size 50 mm.	Parts of aggregate of size 40 mm.	Parts of aggregate of size 20 mm	Parts of aggregate of size 12.5 mm	Parts of aggregate of size 10 mm.
1	2	3	4	5	6	7	8
1.	C.C1:6: 12	63mm	9		3		
2.	C.C.1:6:12	40mm		9	3		
3.	C.C.1:5:10	63mm	7½		2½		
4.	C.C. 1:5:10	40mm		7½	2½		
5.	C.C.1:4:8	63mm		6	2		
6.	C.C.I:4:8	40mm		6	2		
7.	CC. 1:3:6	63mm	4½		1½		
8.	CC. 1: 3 : 6	40mm		4½	1½		
9.	CC. 1:3:6	20mm			4½		1½
10.	C.C.1:2:4	40mm		2½	1		1½
11.	C.C.1:2:4	20 mm			3		1
12.	C.C.1:2:4	12.5mm				3	1
13.	C.C. 1:½:3	20 mm			2		1

Notes: The Proportions indicated in Table III above are by volume. These proportions may be varied somewhat by Engineer-in-Charge after making sieve analysis of the aggregates brought to the site, when considered necessary for obtaining better density and strength of concrete, void ratio in the tune 0-25

All-in-aggregates: If combined aggregates are available, they need not be separated into fine and coarse. But necessary adjustment may be made in the grading by the addition of single sized aggregates. The grading of the all-in-aggregate when analysed as described in IS: 2386 (Part I) shall be in accordance with Table IV.

TABLE - IV

I.S.Seive Designation	Percentage passing for all-in-aggregate	
	40mm Nominal size	20mm Nominal size
1	2	3
80 mm	100	
40 mm	95-100	100
20 mm	45-75	95-100
4.75 mm	25-45	30-50
600 micron	8-30	10-35
150 micron	0-6	0-6

i) Gravel, for use as coarse aggregates in cement concrete work must be hard, absolutely free from surface coating and on being broken, the fractured surface must indicate a uniform and fine texture free from laminations or planes or weakness. It shall be thoroughly washed and free from any foreign elements.

(iii) Jhama chips for cement concrete work shall be obtained by breaking good quality Jhama bats, must not be spongy or with any coating of foreign materials and should be homogeneous in texture. The chips shall be more or less cubicle in shape.

All coarse aggregates for concrete works must be well graded. These shall be screened for removal of dust and if so necessary in the opinion of the Engineer-in-Charge, shall he washed at the cost and expenses of the contractor.

A—3 Sand

All sand shall be clean sharp and free from clay, loam, organic or any other foreign matter, shall be obtained from approved source. The contractor shall get the sample of sand to be used in different kinds of works approved by the Engineer-in-Charge before using the same in work. Sand which in the opinion of the Engineer- in-Charge or his representative is dirty, must be washed to his satisfaction at the cost and expenses of the contractor.

(i) Sand for all cement concrete work must be coarse. The sand shall pass through a mesh, 4.75 mm. square measured in the clear. Sand shall not be used for concrete works if it contains more than 10% of

fine grains passing through a 76 mesh sieve as used for cement test, nor should the fineness modulus be less than 2.00 unless specific permission is obtained from the Engineer-in-Charge.
(ii) Medium sand may be used for cement mortar, for masonry, plaster etc. fineness modulus shall be between 2 and 1.8.

(iii) Sand filling in plinth or foundation where specified may be done with fine sand or Silver sand.

A—4 Cement:

No cement except those supplied by the department or approved by Engineer-in-Charge shall be used in work or brought to site by contractor. Cement bags must be stored in a water-tight shed having wooden floor or platforms raised at least 50 mm. from ground as approved by the Engineer-in-Charge. Cement which is partially set or which is lumpy or caked is to be treated as damaged and shall be removed from the site immediately.

For list of relevant IS Code for Cement to be used in work Page-B-64-65 of Volume-I & Clause 2.1.4 (Page-9) of Volume-III of Combined PWD Schedule and mandatory tests before use of Cement material into works are given in clause 3.0 (Page188,189 & 190) Volume-III of Combined PWD Schedule, may be seen.

A—5 Steel:

All steel shall be clean and free from loose mill scales, dust, loose rust and coats of paints, oil or other coatings. Any scale or loose rust shall be removed before use, even though the same may have been supplied by the Department without any claim for extra charge for the same. No steel excepting those supplied by the Department or approved by the Engineer-in-Charge shall be used in work or brought to site by the contractor.

For list of relevant IS Code for reinforcement in concrete page-B-66 of Volume-I & for structural steel clause 2.1.7.5 (Page-12) of Volume-III may be seen. Mandatory tests before use of steel materials into works are given in clause 2.0 Steel/ Iron (Page-185,186 & 187) Volume-III of Combined PWD Schedule, may be seen.

A-6 Timber:

All timber shall be of best quality well-seasoned and/or well-treated for preservation and protection against decay etc. It shall be uniform in substance, straight in fibre, free from large or dead knots, sap, flaws, sun- cracks, shakes or blemishes of any kind. Any insect damage or splits across the grain shall not be permissible. The colour of the timber shall be uniform throughout, firm and shining with a silky luster when planed and shall not emit dull sound when struck.

A-7 Glass:

All glasses shall be of the specified type, colour visibility and sound and shall be free from cracks, flaws. spick bubbles and blemishes and shall not weigh less than 7.4 kg/sqm unless otherwise specified.

A-8 Timber Doors, Windows etc. and their Fittings:

(i) Door and window work shall be carried out as per detailed drawings or as directed by the Engineer-in-Charge, specified timber shall be used, and it shall be sawn in the direction of the grains and be straight and square.

(ii) Fittings shall be of iron, brass, and aluminium or as specified. These shall be well made, reasonably smooth and free from sharp edges, corners, flaws and other defects. Screw holes shall be counter sunk to suit the head of specified wood screws. Iron fittings shall be finished bright or black enameled or copper oxidised. Brass fitting shall be finished bright or (brass) oxidised chromium plated (etc treated) & aluminium fittings shall be finished bright or anodised or as specified. Fittings shall be got approved by the Engineer-in-Charge before fixing. In case of renewal works, the new fitting shall, as far as possible, match with the existing ones. Screws shall be driven home with screw driver and not hammered in.

A-9 Fibre Reinforced Polymer (FRP) door shutter/frame:

The Polymer shall be either thermoplastic or thermo set resin, such as polyester, Isopolyester, Vinyl ester, epoxy or Phenolic base. The fibre moulded skins may be of glass or other synthetic (Carbon or aramid) or natural (jute or Coir) or other reinforcing materials.

The sandwich core to impart monolithic composite structures approved by Department of Science & Technology or similar competent Authority.

Testing: As per IS 4020 door testing performance criteria.

Frame without Core: Frames shall have intermittent stiffness for rigidity and will have provision for hinge fixing, including anchors.

Frame with Core: Such Composite frames will be filled with inner Core in addition to all the features mentioned for frame without Core.

A-10 Paint etc.:

All paints shall be delivered in strong containers, marked with the colour of the paint, brand, volume of paint content in litres and of the best quality of approved make and brand as approved by the Engineer-in-Charge. Under no circumstances shall the paint be diluted with Linseed oil or otherwise. Any paint or enamel although of approved brand, which so hardens in the container that it cannot be readily broken up

with a stirrer to a smooth uniform painting consistency, shall be rejected. Any paint or enamel too thick for proper brush application shall be rejected.

SECTION B - TECHNICAL SPECIFICATIONS (BUILDING WORKS)

EXECUTION

GENERAL: All works shall be carried out in proper manner. Items of works not covered by the following shall be carried out as per best practice according to directions of the Engineer-in-Charge and to his satisfaction. Unless otherwise specified in this section or in the description of item, the cost of all stages of works mentioned hereunder shall be deemed to have been included in the rates of items provided in the Schedule.

B—1 (a) Excavations of Foundation and Filling up Trenches:
(i) Foundation when excavated to the level shown in the drawing will be shown to the Engineer-in-Charge and if on account of bad ground or for any reason whatsoever he decides to go deeper with the foundation, the contractor shall excavate further to the depths required by the Engineer-in-Charge. In no case shall the foundation soling or concrete be laid prior to receiving orders to that effect from the Engineer-in-Charge or his authorised representative.
(ii) Excavating shall include throwing the excavated earth at least one metre or half the depth of excavation, whichever is more, clear of the edge.
(iii) The excavated areas around the foundation of structures are to be filled up properly to the required levels with earth obtained from excavation or other materials as directed, well rammed with water and consolidated in layers not exceeding 150 mm. at a time. The quantity for this item of work will be measured on the basis of quantity of excavation paid for less the volume occupied by the structure in foundation.
(b) Shoring:
(i) For loose earth and when the depth of excavation exceeds 3 metres, poling boards (vertical members) of 50 to 75 mm. in thickness and 175 to 225 mm. in width preferably of Sal-wood to be placed close together and to be driven about 300 mm. in ground below the bottom of the trench with intermediate sal-bullah piling of diameter not less than 100 mm. at the rate of 900 to 1000 mm. center to center to be placed in between the vertical surface of trench and the poling boards and double struts of sal-bullah of not less than 100 mm. in diameter between two wallings (horizontal member) of 250 mm. in width and 75 mm. in thickness held horizontally between them.
(ii) For medium clay and when the depth of excavation exceeds 2 metres but not exceeds 3 metres single struts will be provided and sal-bullah pilling may not be placed. Other requirements are to be satisfied as (i) above.

(iii) For stiff clay or dry clay and when the excavation is within 2 metres, vertical poling boards will be placed at the rate of 600 to 1000 mm. apart with or without walling pieces; but single or double strutting will be provided. Other requirements are to be satisfied as per (i) above.

B-2 Cement concrete Works (Plain or Reinforced):

(i) Shuttering and Staging: Wherever necessary, shuttering and staging must be provided. Unless otherwise stated no payment will be made for such shuttering or staging and the cost thereof will be deemed to have been covered by the rate for relevant finished item of work. Where payment for shuttering has been specified, the rate shall be deemed to cover the cost of the necessary staging as well. Payment, if any, for shuttering will be on the basis of surface area of shuttering in actual contact with concrete.

Shuttering may be of approved dressed timber true to line, not less than 25 mm. thick. Surface to be in contact with concrete are to be planed smooth except where otherwise stated. As an alternative, sufficiently rigid steel shuttering may be used. In every case, joints of the shuttering are to be such as to prevent the loss of liquid from concrete. In timber shuttering the joints must be perfectly closed and the entire shuttering surface shall be covered with polythene sheets of approved quality. In case of steel shuttering also the joints are to be similarly lined.

All shuttering and framing must adequately be stayed and braced to the satisfaction of the Engineer- in-Charge for properly supporting the concrete during the period of hardening. It shall be so constructed that it may be removed without shock or vibration to the concrete.

Before the concrete is placed, the shuttering shall, if considered necessary be coated with and approved preparation for preventing the adhesion of the concrete to the moulds, and it is to be of such a nature and so applied that the surface of the finished concrete is not stained. Care shall also be taken that such approved preparation shall be kept out of contact with the reinforcement.
In no circumstances shall forms be struck until the concrete reaches strength of at least twice the stress of which the concrete may be subjected at the time of striking.

Interior of all moulds and boxes must be thoroughly washed out with a hosepipe or otherwise so as to be perfectly clean and free from all extraneous matter prior to the deposition of concrete.

All form works shall be removed without shock or vibration. Before the form work is stripped, the concrete surface shall be exposed where necessary in order to ascertain that the concrete has hardened sufficiently. In normal weather and with ordinary cement, vertical or side shuttering may be removed after three days and the bottom shuttering of horizontal members after fourteen days in case of slabs and twenty-one days in case of beams and cantilevers etc. from the date of placing the last portion of the concrete in the structure. The above are the minimum and may be extended if found necessary. Before

stripping the shuttering of structural members, the contractor shall take prior per mission of the Engineer-in-Charge or his representative.

No plugs, bolts, ties, hold fasts or any other appliances whatsoever for the purpose of supporting the shuttering are to be fixed in the structure or placed in such a way that damage might result to the work in removing the same when the shuttering is struck.

(ii) Scaffolding: The scaffolding must be strong and rigid stiffened with necessary cross bracers and always decked and boarded on the sills with close boarded veiling and swings to prevent any injury to persons or materials. The contractor shall have to allow other traders to make reasonable use of his scaffolding as and when directed by the Engineer-in-Charge.

If for the interest of the work contractors have to erect scaffolding in other‘s properties including local bodies or corporation, the arrangement for the same including the cost of licensing fees etc. shall have to be borne by the contractor and the department should be kept free from any liability on this account.

(iii) Mixing, Placing and Compacting: The proportion specified is by volume in dry rodded condition of the different constituents.

Boxes of suitable sizes shall be used for measuring sand and aggregate. The unit of measurement for cement shall be bag of cement weighing 50 Kg. and this shall be taken as 0.035 cubic metre while measuring the aggregate, shaking, ramming or hammering shall not be done. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand allowances for bulkage be made. The aggregate in each batch of concrete are to be proportioned as to contain full bags of cement.

Normally all structural concrete shall be mixed in mixture machine in appropriate proportion, shall have to be vibrated with suitable vibrator. Mixing shall be continued until there is uniform distribution of the materials and the mass is uniform in colour and consistency, but in no case mixing shall be done for less than two minutes. The rates appearing in the Schedule of Rates against such items are inclusive of hire and operational charges of such appliances. For a particular job the Engineer-in- Charge may allow hand mixing and or hand tapping of concrete In case of hand mixing concrete, extra cement up to 10% over the standard requirement of cement for machine mix of particular mix shall have to be provided by the contractor at his own cost.

As the bulking of sand may vary from day to day and at different parts of the day on account of varying moisture content, frequent tests for bulking shall be carried out with the sand to be used and amount of bulking allowed for in the field mix so as to keep the actual proportion constant through- out.

Only such quantities as are required for immediate use are to be mixed at any one time. Sufficient water is to be added to obtain proper workability so that the mixture may flow readily round the reinforcement and into every part of the moulds. The workability shall be measured by the amount of slump.

The quantity of water to be used for each mix of 50 kg cement to give the required consistency shall not be more than 34 litres for 1:3:6 mix, 32 litres for 1:2:4 mix, 30 litres for 1:11/2:3 mix and 27 litres for 1:1:2 mix. In the case of vibrated concrete, the limit specified may be suitably reduced to avoid segregation.
Nominal Mix Concrete may be used for concrete of M20 or lower. The proportions of materials for nominal mix concrete shall be in accordance with the following table.

Proportions for Nominal Mix Concrete

Grad e of Concrete	Total Q uantity of D ry A ggregates b y M ass per 50 K g of C em ent, to be Taken as the Sum of the Individual M asses of fine and Coarse A ggregates. Kg. M ax	Proportion of Fine A ggregate to C oarse A ggregate (b y M ass)	Quantity of W ater per 50 Kg of Cem ent, K G., M ax
M 5	800	Generally, 1:2 but	60
M 7.5	625	subject to an upper	45
M 10	480	limit of	34
M 15	330	1: 11/2 and lower limit	32
M 20	250	of 1:21/2	30

Note: The proportion of the aggregates should be adjusted from upper limit to lower limit progressively as the grading of the aggregates becomes finer and the maxirnum size of coarse aggregate become larger. Graded coarse aggregate shall be used.

Example: For an average of fine aggregate (that is, Zone II). The proportions shall be
1: ½, 1:2 and 1:2½ for maximum size of aggregates 10 mm, 20 mm and 40 mm respectively.

The total water content in each batch of concrete shall always be kept constant as the amount previously determined by experiments. The quantity of water to be actually added may, therefore, vary depending on moisture content in the aggregates. In actual job, if the quantities of the ingredients remain constant, the amount of slump may be taken as a good guide indicating the total water content in the mixture. The consistency and consequently the water content of the concrete shall therefore be kept constant and checked from time to time as work proceeds, by means of standard slump test. The slump tests shall be carried out with concrete immediately after it has been mixed and before any initial set has commenced, the sample being taken preferably at the point where the concrete is being delivered for placing in the moulds.

The mould shall then be removed by rising vertically immediately after filling. The moulded concrete shall then be allowed to subside and the height of the specimen measured after coming to rest

The consistency shall be recorded in terms of millimeters of the subsidence of the specimen during the test, which is known as slump.

The following slumps shall be adopted for different works.

Sl. No	Type of Work	SLUMPS	
		When vibrator are used	When vibrators are not used
1.	Mass concrete in foundation footings, retaining walls and pavements	10 to 25 mm.	50 to 75 mm.
2	Mass concrete in RCC foundation, footing and retaining walls.	10 to 25 mm.	80 mm.
3.	Beams, slabs and columns simply reinforced	25 to 40 mm.	100 to 125 mm.
4.	Thin RCC section or section with congested steel	40 to 50 mm.	125 to 150 mm

I. S.: 456-2000 allows use of nominal mix of concrete upto grade M20 and may be allowed in works at the discretion of Engineer-in-Charge and will be guided by the provision of IS 456-2000. For grade of concrete above M20, design mix has to be adopted. For determination of mix proportion for design mix concrete, the target strength should be higher than the specified characteristic strength to ensure that characteristic strength is attained at 28 days at site. According to Explanatory Hand Book on IS 456-1978 (S.P. 24—1983):

Target Strength =Characteristic strength + 1.65 x standard deviation.

Standard deviation for different grades of concrete in absence of any test may be taken as per IS: 456 — 2000 as follows:

Grade of Concrete	Assumed Standard Deviation N/mm2
M 10	3.5
M 15	3.5
M 20	4.0
M 25	4.0

Once the target strength of cube moulds with specific mix design is obtained in the laboratory, it may be inferred that the corresponding characteristic strength of concrete, prepared with the materials used in the test mould(s) cured under identical condition as that of the test specimen, shall be obtained at site at 28 days.

The Explanatory Hand Book on IS: 456—1978 (S.P.-24-1983) provides an approximate formula for expressing the strength of concrete at age 't' (in days), (Clause 5.2.1, Page-20)
ft = [t/(a+bt)] x f28
where f28 is the strength at 28 days. ft = strength of concrete at any age
a& b are imperical constant
a = 4.7 and b =0.833
t= time in days

ACCEPTANCE CRITERIA:
The concrete shall be deemed to comply with the strength requirements when both the following conditions
are met:
(a) The mean strength determined from any group of four non overlapping consecutive test results complies with the appropriate limits, in Col. 2 of following table.

(b) Any individual test result complies with the appropriate limits in Col. 3 of following table.

Characteristic Compressive Strength Compliance Requirement

Specified Grade	Mean of the Group of 4 Non-Overlapping Consecutive Test Results in N/mm2	Individual Test Result in N/mm2
M 15	= fck + 0.825 x established standard deviation (rounded off to nearest 0.5 /mm2) Or f ck + 3 N/mm2 Whichever is greater	= fck – 3 N/mm2
M 20 or above	= fck + 0.825 x established standard deviation (rounded off to nearest 0.5 /mm2) Or f ck + 4 N/mm2 Whichever is greater	= fck – 4 N/mm2

Note: In the absence of established value of standard deviation, the values given in relevant Table may be assumed, and attempt should be made to obtain results of 30 samples as early as possible to establish value of standard deviation.
Concrete of each grade shall be assessed separately. Concrete shall be assessed daily for compliance.

Providing a proper construction joint; (iii) the reinforcement has been displaced beyond the tolerances specified; or (iv) construction to le ra n ce s have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction of the Engineer-in-Charge.

Frequency of sampling:

Sampling Procedure—a random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested; that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

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

Quantity of concrete in the Work, Cu.m.	Number of Samples
1-5 6-15 16-30 31-50 51 and above	1 2 3 4 4 Plus one additional sample for each additional 50m3 or part thereof

TEST SPECIFICATION—The test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the strength of concrete at 7 days or at the time of striking the form work, or to determine the duration of curing, or to check the testing error. Additional cubes may also be required for testing cubes cured by accelerated methods as described in IS:9013—1978. The specimen shall be tested as described in IS: 516-1959.

TEST STRENGTH OF SAMPLE—The test strength of the samples shall be the average of the strength of three specimens. The individual variation should not be more than ± 15 percent of the average.

Concrete shall be handled from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent the segregation or loss of the ingredients. It shall be deposited as nearly as practicable in the final position to avoid re-handling or flowing. Unless specially permitted by the Engineer- in-Charge, concrete shall not be dropped freely from a height of more than 2 metres. Before placing the concrete, the moulds should be cleaned of shavings, pieces of wood or other rubbish.

When placing the concrete the finer materials must be carefully worked against the moulds so that the faces of concrete shall be left perfectly smooth and free from honey-combing upon withdrawal of the moulds. Any defect in this respect must be dealt with by the contractor as directed by the Engineer-in-Charge without any extra charges thereof.

Depositing concrete under water shall not be allowed without specific permission from the Engineer-in-Charge. The method of concreting to be adopted in such cases shall have to be previously approved by him.

During placing and also immediately after deposition, the concrete shall be thoroughly compacted by ramming, spearing etc. until it has been made to penetrate and fill all the spaces between and around the steel rods, around embedded fixtures, and into the corners of formwork in such a manner as to ensure a solid mass entirely free from voids. If so directed by the Engineer-in-Charge, in addition to usual ramming, spearing etc. sufficient number and suitable type of vibrators may have to be used on important

jobs to enable working with homogeneity It is imperative that the work should be done quickly as well as efficiently and adequate numb of hands must therefore be employed to ensure this.

Concrete shall be placed and compacted in its final position before setting has commenced and shall not subsequently be disturbed.

Concreting shall be carried out continuously up to construction joints, the position and arrangement of which shall be predetermined by the Engineer-in-Charge or his representative. Any rest, pauses, such as for meal, shall also be subject to his approval. All concreting work should be so programmed as not to necessitate work at night. If for any reason this becomes imperative, the contractor shall obtain previous permission of the Engineer-in-Charge or representative and make proper lighting arrangements, at own cost, to his satisfaction.

(iv) Protection and Curing: The contractor shall adequately protect freshly laid concrete, about 1 to 2 hours after its laying from too rapid drying due to sunshine, drying winds etc. and also from rains or surface water and shocks. About 24 hours after laying of concrete, the surface shall be cured by flooding with water of minimum 25 mm. depth or by covering with wet absorbent materials. The curing shall be done for a minimum period of 7 days. Over the foundation concrete the masonry work may be started after 48 hours of its laying, but the curing of cement concrete shall be continued along with masonry work for a minimum period of 7 days.

In case of cement concrete used as sub-grade for flooring, the flooring may be commenced with 48 hours of the laying of sub-grade. In case it is not possible to do so due to exigencies of work. the subgrade shall be roughened with steel wire brush without disturbing the concrete, wetted with neat cement slurry at the rate of 1.75 kg of cement per square metre applied to the base before laying floor, and full rate of artificial stone flooring/mosaic will be paid with the specific orders of the Engineer-in-Charge. The curing to be continued along with top layer of flooring for a minimum period of 7 days.

(v) Construction Joints: All joints in slabs and other horizontal members are to be formed by inserting vertical boards against which the concrete deposited can be properly rammed. The position where such joints may be made will be indicated by the Engineer-in-Charge or his representative.

In the case of horizontal joint any excess mortar or laitance shall be moved from the surface after the concrete is deposited and before it has set.

When the work has to be commenced on a surface which has hardened, such surface shall be well roughened and all laitance removed; the surface shall then be swept clean, thoroughly wetted and covered with a thin layer of mortar composed of equal volumes of cement and sand. Such works shall be deemed to be covered by the rates for concrete.

(vi) Minimum Crushing Strength: For major RCC work, (where concrete is specified by strength) the mix should not be leaner than 1:11/ :3 so as to give ultimate crushing strength not less than 25 N/Sq. mm. at 28 days cured under field condition. The mix for the concrete is to be so adopted and the slump is to be so allowed as to give specified strength and proper workability at the existing site conditions. Contractor shall remain fully responsible for producing concrete of specified strength in the actual job and therefore cast at his own cost test specimens of 15 cm. Cube as already specified during work and cure the same in similar way as for laid concrete being tested for strength. Each set of test specimen shall be taken to cover the quantity of concrete laid on the job during the period from the time of taking the previous set of specimens and the quantity will be estimated by the Engineer-in-Charge from records maintained by him.

The interior surface of the mould and base plate shall be lightly oiled before the concrete is placed in the mould.

(a) Compacting—The test specimens shall be made as soon as practicable after mixing and in such a way as to produce full compaction of the concrete with neither segregation nor excessive laitance. The concrete shall be filled into the mould in layers approximately 5 cm deep. In placing each scoopful of concrete, the scoop shall be moved around the top edge of the mould as the concrete slides from it, in order to ensure a symmetrical distribution of the concrete within the mould. Each layer shall be compacted either by hand or by vibration. After the top layer has been compacted, the surface of the concrete shall be finished level with the top of the mould, using a trowel, and covered with a glass or metal plate to prevent evaporation.

Compacting by Hand - When compacting by hand, the standard tamping bar shall be used and the strokes of the bar shall be distributed in a uniform manner over the cross—section of the mould. The number of strokes per layer required to produce specified conditions will vary according to the type of concrete. For cubical specimens, in no case shall the concrete be subjected to less than 35 strokes per layer for 15 cm cubes or 25 strokes per layer for 10 cm cubes. For cylindrical specimens, the number of strokes shall not be less than 30 per layer. The strokes shall penetrate into the underlying layer and the bottom layer shall be rodded throughout its depth. Where voids are left by the tamping bar, the sides of the mould shall be tapped close the voids.

(b) Compacting by Vibrator - When the job concrete is placed by vibration and consistency of the concrete is such that the test specimens cannot be properly moulded by hand rodding as described under (a) above, the specimens shall be vibrated to give a compaction corresponding to that of the job concrete. The fresh concrete shall be placed in the mould in two layers, each approximately half the volume of mould. In placing each scoopful of concrete, the scoop shall be moved around the top edge of the mould as the concrete there slides from it, in order to ensure a symmetrical distribution of concrete within the mould. Either internal or external vibrator may be used. The vibration of each layer shall not be continued longer than what is necessary to secure the required density. Internal vibrators shall be of appropriate size and shall penetrate only the layer to be compacted. In compacting the first layer, the vibrators shall not be allowed to rest on the bottom of the mould. In placing the concrete for the top

layer, the mould shall be filled to the extent that there will be no mortar loss during vibration. After vibrating the second layer, enough concrete shall be added to bring the level above the top of the mould. The surface of the concrete shall then be struck off with a trowel and covered with a class or steel plate as specified under (a) above. The whole process of moulding shall be carried out in such a manner as to preclude the alternation of water cement ratio of the concrete by loss of water either by leakage from the bottom or overflow from the top of the mould.

Curing - The test specimens shall be stored on the site at a place free from vibration, under damp matting, sacks or other similar material for 24 hours ±½ hour from the time of adding the water to the other ingredients. The temperature of the place of storage shall be within the range of 220 to 320C. After the period of 24 hours, they shall be marked for later identification removed from the moulds and unless required for testing within 24 hours, stored in clean water at a temperature of 240 C to 300C until they are transported to the testing laboratory. They shall be sent to the testing laboratory well packed in damp sand, damp sacks, or other suitable material so as to arrive there in a damp condition not less than24 hours before the time of test. On arrival at the testing laboratory, the specimens shall be stored in water at a temperature of 270 ±20C until the time of rest, records of the daily maximum and minimum temperature shall be kept during the period of the specimens remain on the site and in the laboratory. After curing, the specimen suitably marked and properly wrapped shall be made over to the Engineer- in-Charge or his representative who will arrange to have them tested at 28 days from the date of casting. If there be any delay for any reason whatsoever the result of the test shall nevertheless be valid and will be applicable as per rules in each case for all test specimen's ns whatsoever. The contractor shall be responsible for proper packing of the specimens at his own cost, for safe and convenient transport of the same from the site to the testing laboratory. The cost of testing the test moulds and other charges including cost of carriage of the test moulds from the work site to the particular laboratory (both ways) and other incidental charges in this connection will have to be borne by contractor.

In case of concrete showing, on the result of the cube tests, strength less than that specified in (a) and (b) of the Acceptance Criteria but has a strength greater than (c) & (d) of the said Acceptance Criteria concrete may, at the discretion of the Engineer-in-Charge, be accepted as being structurally adequate without further testing.

If the concrete is deemed not to comply pursuant to (c) &. (d) of the Acceptance Criteria, the Structural adequacy of the parts affected may be investigated as per provision of I.S. 456-latest revision i.e. core test and/ or load test, as the case may be before rejection on the application of the Contractor with the undertaking to bear the cost of such tests. If the strength of concrete is such that it satisfies provisions made in relevant of 16.3.3 and/or sub-clause 16.5.3 of I.S. 456-1978, concrete in the member represented by such tests shall be considered acceptable but the Engineer-in-Charge shall have the full power to fix the rate of deduction @ Rs.200/- per cubic metre.

In case the test results do not satisfy the relevant requirement of the preceding paragraph, the volume of concrete so deficient shall be deemed to be un-acceptable and shall be removed from the structure and replaced by fresh concrete to specified strength and the contractor shall, in that case, have to carry out the

instruction of the Engineer-in-Charge irrespective of the amount of loss, inconvenience and difficulties involved.

The contractor shall remain liable to act/to carry out instructions under the provision of this clause, notwithstanding issuing of any certificate or the passing of any bills or accounts by the Engineer-in-Charge.

(vii) Rehabilitation of Concrete For rehabilitation of Concrete Structures the following essential steps are to be followed

(a) To remove the loose concrete/plaster until hard and sound surface is exposed. (b) To remove all rusts by wire brush or sand blasting.
(c) To apply two coats of cement based Polymer modified anti corrosive protective coating to exposed reinforcement (manufacture‘s specification is to be strictly followed).

(d) If diameter of bar is reduced by more than 25%, additional bar equivalent to 50% area of existing bar is to be added by lapping/welding as deemed fit by Design wing.

(e) (i) The exposed hard concrete surface is to be saturated with clean water and a bond coat of Cement slurry duly admixed with water resistant bonding agent.
O r
(ii) For concrete beam /column if found necessary by Engineer-in-Charge the surface may be treated by epoxy based reactive agent for jointing fresh concrete with old surface.

Note: In both cases manufacturer‘s specification is to be strictly followed. It is desirable that representative of the manufacturer supervises the special job and certify that the work is done as per specification.

(f) (i) For Slab / Chhaja / Weatherboard: To fill up the removed part of Concrete / fresh Concrete / Plaster admixed with the water resistant bonding agent as per Manufacturer‘s specification within the time the bond coat remains fresh or tacky. The admixed material shall have to be applied within 30 minutes of preparation or as specified in literature.

(ii) For Beams / Columns: To fill up the removed part of concrete with fresh concrete with water proofing plasticising admixture as per manufacturer‘s specification.

(g) To cure the concrete surface for 3 days.

B-3 1st Class Brickwork:

Cement mortar shall be prepared by mixing sand and cement in specified proportion. Sand shall be measured on the basis of its dry volume. In case of damp sand, its quantity shall be increased suitably to allow for bulkage.

Brick shall be laid in English bond. The brick shall be laid by layering method. A layer of mortar shall be spread on full width for suitable length of the lower courses. Each brick shall first be laid so as to project over the one below. Both at the end and at the side, then pressed into the mortar and shoved into final position so as to embed the brick and to fill its inside face fully with mortar. Cut bricks shall not be used except where necessary.

The walls shall be taken up true to plumb with plumb bob. The thickness of brick courses shall be kept uniform and for this purpose, wooden straight edge with graduations giving thickness of each brick course including joint shall be used. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. Vertical joints in alternate course shall come directly one over the other. A set of tools comprising wooden straight edge, mason‘s spirit level, square, half metre rule, line and pins, string and plumb shall be kept for every 3 masons for frequent checking during progress of work. Faces of walls found not in plumb shall be dismantled.

Both the faces of walls of thickness greater than 25 cm. shall be kept in proper plane. All the connected brickwork shall be carried out nearly at one level and no portion of the work shall be left more than 1 metre below the rest of the work. Where this is not possible, the work shall he racked according to bond (and not left toothed) at an angle not steeper than 45°

Bricks shall be so laid that all joints are quite full of mortar. The thickness of joints shall not exceed 10 mm. Bricks shall be laid with frogs upward except in the top course where frog shall be placed downward. The face joints shall be racked to a minimum depth of 15 mm. by racking tools daily during the progress of work when the mortar is still green, so as to provide key for plaster or pointing to be done. Where plastering or pointing is not required to be done, the joints shall he struck flush and finished at the time of laying.

The face of brickwork shall be cleaned the very day that brickwork is laid daily and all mortar droppings removed.

Green work shall be protected from rain by suitable covering. The brickwork shall be kept wet for a period of at least 7 days. The top of masonry work shall be left flooded at the close of the day.

Scaffolding shall be sound and strong and holes left in masonry work for supporting the scaffolding shall be filled and made good, before plastering.

B—4 Damp Proof Courses:

This shall be laid to specified thickness over walls for the full thickness of the super structure walls. The surface shall be leveled and prepared before laying the cement concrete. Edges of damp proof course shall be straight, even and vertical. Side shuttering shall consist of wooden form and shall be strong and properly fixed so that it does not get disturbed during compaction and the mortar does not leak through. The concrete mix shall be of workable consistency and shall be tamped thoroughly to make a dense mass. When the sides are removed, the surface should come out smooth without any honey-combing. The damp proof course shall be laid continuous and the surface shall be double chequered. Damp proof course shall be cured for at least seven days, after which it shall be allowed to dry. Water proofing materials of approved quality shall be added to concrete mixture in accordance with the manufacturer ‘s specifications starring the quantity for water proofing materials in litres or kg. per 50 kg. of cement and will be paid for separately. Similarly, polymer based paint used under damp proof course as per manufacturer ‘s specification shall also be paid separately.

B-5 Cement plaster:

The proportion of mortar of exterior or interior plaster shall be as specified in the items of work.

The plaster shall be of thickness as specified and the surface shall be similarly cured as for cement concrete. The moulding shall be carried out as shown in the drawing and shall be separately measured in overall length unless otherwise specified in the items. Interior corners and edges of openings if so directed by the Engineer-in-Charge shall be rounded off or chamfered with the same mortar for which no extra payment will be allowed. All cement concrete surface should be chipped off properly before taking up the plastering work.

B-6 Artificial Stone Floorings:

The artificial stone flooring shall be laid in panels of shape and size as directed. The casting of the panels will be so programmed as to prevent bonding of the freshly laid panel with adjacent panels.

Unless otherwise specified, the underlay shall be with graded stone chips 12 mm. down, the thickness of topping shall be of 3mm. thick and colouring pigment as may be required shall only be added with the topping. The topping and the underlay shall not be laid in one operation. After laying the _Underlay‘ the surface shall be left out to dry. The topping shall be laid only alter the underlay has sufficiently dried and initially set and after thoroughly brushing with hand wire brush and sweeping clean and after application of slurry. The topping shall be finished with an English trowel and a piece of clean dry linen. During all the stages, the required level shall be carefully observed and maintained. Suitable grading, where required, shall be provided in the flooring for water drainage as directed by the Engineer- in-Charge.

The corner between floor and wall shall be rounded off if so directed by the Engineer-in-Charge for which no separate payment shall be made. All cement concrete surface should be chipped off properly before taking up the flooring work.

B-7 Rain Water Pipes:

The rain water pipes shall be of the materials and of the sizes as specified. All rainwater pipes shall have suitable grating as directed at the inlet opening at roof and shall be fitted and fixed in proper position with necessary offsets, clamps, shoe, Y-junctions and other accessories as required and as directed by the Engineer-in- Charge. The pipes are to be fixed to walls in cement mortar (1: 4 with necessary clamps and nails, suitable teak wood blocks being fixed on the walls to receive the nails. Y- Junction shall be used at the top of the pipe and the vertical leg thereof shall be provided with a cowl. All joints are to be properly packed. In case the hole is made much larger than the size of the pipe, cement concrete (1:2:4) shall be used to fill the annular space. The pipes with fittings etc. are to be painted with 2 coats of paints as approved by the Engineer-in-Charge.

B-8 White Washing, Colour Washing:

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Preparation of surface: All surfaces for white washing, colour washing, painting shall be thoroughly brushed free from mortar droppings and foreign matter and prepared to the satisfaction of Engineer- in-Charge, before application of the treatment

Before white washing all the nails etc. have to be removed from the walls and all nail or other holes, small depressions or damages in plaster of wall surface shall be filled or repaired to original condition with lime paste.

Old surfaces spoiled by smoke and greasy shoots shall be sprinkled with surki and water and rubbed with brickbats or steel wire brushes or steel scrapers. The surface shall then the broomed to remove all dust and shall be washed with clean water.

Preparation of white wash: The white washing is to be done with 5 parts of stone lime and one part of shell lime with necessary gum (2 Kg. per Cu.M. of lime) using indigo as necessary and to be mixed as per standard practice.

Preparation of colour wash: Colour washing shall have a primer of white wash and shall be of shade as approved by the Engineer-in-Charge, sufficient quantity of colour wash enough for complete job shall be prepared in one operation to avoid any difference in shade.

Procedure and preparation of the surface shall be same as in white washing.

Application of white wash and colour wash: The operation for each coat shall consist of four consecutive strokes of the brush, one horizontally from right to left and the next from left to right and the third stroke

bottom to upward and the fourth from top to down ward before the previous stroke dries. Each coat shall be allowed to dry before the next coat applied. No portion of the surface shall be left out initially to be patched up later on. The brush shall be dipped in white wash or colour wash, pressed lightly against the wall of the container and then applied by lightly pressing against t h e surface with full swing of hand.

The white wash on ceiling should be done prior to that on walls.

Protective Measures: Surfaces of doors, windows, floors, articles of furniture, beams, burghas etc. and such other parts of the building not to be white or colour washed shall be protected from being splashed upon. Such surfaces shall be cleaned of white or colour wash splashes, if any

B -9 Dry Distempering:

Dry distemper of approved brand and manufacture shall be used. The shade shall be got approved from the Engineer-in-Charge before application of the distemper. The dry distemper shall be stirred slowly in clean water using 6 deciliters of water per kg. of distemper or as specified by the manufacturer. Warm water shall preferably be used. It shall be allowed to stand for at least 30 minutes (or if practicable over night) before use. The mixture shall be well stirred before and during use to maintain an even consistency. Distemper shall not be mixed in larger quantity than is actually required for one day‘s work.

Before new work is distempered, the surface shall be thoroughly brushed free from mortar droppings and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for at least two months, before applying distemper. In the case of old work, all loose pieces and scales shall be removed by sand papering. The surface shall be cleaned of all grease, dirt etc. Pitting in plaster shall be made good with plaster of paris mixed with dry distemper of the colour to be used. The surface shall then be rubbed down again with a fine grade Sand paper and made smooth. A coat of the distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is applied. The priming coat of whiting shall be applied and no white washing coat shall be used as a priming coat for distemper.

Whiting (ground white chalk) shall be dissolved in sufficient quantity of warm water and thoroughly stirred to form thin slurry which shall then be screened through a clean coarse cloth, Two kg. of gum and 0.4 kg. of copper sulphate dissolved separately in hot water be added for every Cu.m. of the slurry which shall then be diluted with water to the consistency of milk so as to make as wash ready for use. The treated surface shall be allowed to dry before distemper coat is given. In the case of new work, the treatment shall consist of a priming coat of whiting followed by the application of two or more coats of distemper till the surface shows an even colour. For old work the surface is to be prepared as described above and one or more coats of distemper shall be applied till the surface attains an even colour. The application of each coat shall be as follows: The entire surface shall be coated with the mixture uniformly, with proper distemper brushes (ordinary white wash brushes shall not be allowed) in horizontal strokes followed immediately by vertical ones which together shall constitute one coat. The

subsequent coats shall be applied only after the previous coat has dried. The finished surface shall be even and uniform and shall show no brush marks. Enough distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room, which cannot be completed the same day. After each day‘s work, the brushes shall be washed in hot water and hung down to dry. Old brushes which are dirty or caked with distemper shall not be used.

B-10 Painting:

All surfaces for painting shall be properly sand papered and cleaned and where necessary good quality putty shall be used to hide all holes, cracks, open joints etc. The rate for painting includes such work. Paint shall be applied with approved brushes and surfaces shall be sand papered after every coat. All work when completed shall present a smooth, clean solid and uniform surface, to the satisfaction of the Engineer-in-Charge.

(a) Primer: All surfaces for painting, if they are new, should have a coat of priming before application of the paint. Old surfaces where existing paints have been completely worn out owing to long use should also receive a coat of priming before application of fresh painting.
(i) Wood primer: Wood primer of approved brand and manufacture is to be applied on the wooden surface, which would be free from moisture and loose particles.
(ii) Steel Primer: For steel surface red oxide primer, zinc chromate primer of approved brand and manufacture and as per direction of the Engineer-in-Charge is to be applied on the surface. The surface should be made free of grease, rust, moisture and loose particles.
(iii) Acrylic Primer Coat (solvent based Primer) : Acrylic primer coat is to be used as base coat on wall finish of cement, lime or lime cement plaster surface before application of any wall coating e.g. distemper, oil based paints, synthetic enamel, acrylic emulsion etc. on them. Priming coat shall be preferably applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surface. New plaster patches in old work before applying distemper paints etc. should also be treated with acrylic primer. The surface shall then be allowed to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface. Any unevenness shall be made good by applying putty, made of plaster of paris mixed with water on the entire surface including filling up the undulation and then Sand papering the same after it is dry. The cement primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first, vertical strokes shall be applied immediately afterwards. The entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 48 hours before oil bound distemper or paint is applied.
(b) Synthetic Enamel Paint: Synthetic enamel paint of approved brand and manufacture and of the required shade shall be used for the top coat and an undercoat of shade to match the coat as recommended by the manufacturer shall be used. Undercoat of the specified paints of shade suited to the shade of the top coat shall be applied and allowed to dry overnight. It shall be rubbed next day with the fine grade of wet abrasive paper to ensure a smooth and even surface free from brush marks and all loose particles dusted off. Top coats of specified paint of the desired shade shall be applied after the undercoat

is thoroughly dry. Additional finishing coats shall be applied if found necessary to ensure properly uniform glossy surface.
(c) Aluminium Paint: Aluminium paint of approved brand and manufacture shall be used. The paint comes in compact dual containers with the paste and the medium separately. The two shall be mixed together to proper consistency before use. Each coat shall be allowed to dry for 24 hours and lightly rubbed down with fine grade sand paper and dusted before the next coat is applied. The finished surface shall present an even and uniform appearance. As aluminium paint is likely to settle in the container, care shall be taken to frequently stir the paint during use. The paint shall be applied and laid off quickly, as surface is otherwise not easily finished.

(d) Interior Acrylic Emulsion Paint: Acrylic emulsion paint are not suitable for application on external surface and surface which are liable to heavy condensation and are be used generally on internal surface. For plastered surfaces a cement priming coat is required before application of acrylic emulsion. Acrylic emulsion paint of approved brand and manufacture and of the required shade shall be used. The paint will be applied in the usual manner with brush 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 for 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 undercoat, which is applied on the absorbent surface. The quantity of thinner 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 present a uniform appearance.

Precautions: (i) Old brushes if they are to be used with emulsion paints should be completely dried of turpentine or oil paints by washing in warm soap water. Brushes should be quickly washed in water, immediately after use and kept immersed in water during break periods to prevent the paint from hardening on the brush.

(ii) In the preparation of walls for Acrylic emulsion painting, an oil base putty shall be used in filling cracks, holes etc.

(iii) Splashes in floor etc. shall be cleaned out without delay as they will be difficult remove after hardening.

(iv) Washing of surfaces treated with emulsion paints shall not be done within 3 to 4 weeks of application.

(e) Varnishing: Varnish for the undercoat shall be a flatting varnish of the same manufacture as the top coats. New wood work to be varnished shall be finished smooth with a carpenter‘s plane. Knots shall be cut to a slight depth. Cracks and holes shall be cleaned of dust. The knots, cracks etc. shall then be filled in with wood putty. The varnish shall be applied liberally with a full brush and spread evenly with short light strokes to avoid frothing. If the work is vertical the varnish shall be crossed and re-crossed and then laid off, the later being finished on the upstroke so that varnish, as it sets, flows down and eliminates

brush marks. The above process will constitute one coat. If the surface is horizontal, varnish shall be worked in every direction with light quick strokes and finished in one definite direction so that it will set without showing brush marks. Rubbing down and fatting the surface shall be done after each coat except the final coat with fine sand paper. The work shall be allowed to dry away from draughts and damp air. The finished surface shall then present a uniform appearance and fine glossy surface free from streaks, blisters etc. Any varnish left over in the small container shall not be poured back into the stock tin, as it will render the latter unfit for use. Special fine haired varnishing brush shall be used and not ordinary paint brushes. Brushes shall be well worn and perfectly clean.

(f) Oiling with Raw Linseed Oil: Raw linseed oil shall be lightly viscous but clear and of a yellowish colour with light brown tinge. Its specific gravity at a temperature of 300 C shall be between 0.293 and 0.298. 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 be of approved brand and manufacture. The wood work shall be cleaned of all smoke and water and completely dried. The oil shall be applied freely with brushes (not rags) and spread evenly and smooth until no more oil is absorbed. Each subsequent coat shall be applied after the previous coat is thoroughly dried and in any case not before 24 hours of application of the first coat. Work after completion shall not be patchy and sticky to the touch and shall present a uniform appearance.

(g) Wax Polishing: Wax polishing shall be done with material of approved brand and manufacture. Preparation of surface will be same as for varnishing. The polish shall be applied evenly with a clean, soft pad of cotton cloth is such a way that the surface is completely and fully covered. The surface is then 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 one hour or until the surface is dry. The final coat shall then be applied and rubbed for two hours (more if necessary) until the surface has assumed a uniform gloss and is dry, showing no sign of stickiness. The final polish depends largely on the amount of rubbing which should be continuous and with uniform pressure with frequently changes in the direction.

(h) French Polishing: Pure shellac varying from pale orange to lemon yellow colour, free from resin or dirt shall be dissolved in methylated spirit at the rate of 150 gm. of shellac to a litre of spirit. Suitable pigment shall be added to get required shade. The 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 size laid on while hot. Holes and indentations on the surface shall be stopped with glazier‘s putty. The surface shall then be given a coat of wood filler made by mixing whiting (ground chalk) in methylated spirit at the rate of 1.4 kg. of whiting per litre of spirit. The surface shall again be rubbed down perfectly smooth with glass paper and wiped clean. A pad of woolen cloth covered by a fine cloth shall be used to apply the polish. The pad shall be moistened with the polish and rubbed hard on the wood in a series of overlapping circles applying the mixture sparingly but uniformly over the entire area of an even level surface. A trace of linseed oil on the face of the pad facilitates this operation. The surface shall be allowed to dry and the remaining coats applied in the same way. To finish

off, the pad shall be covered with a fresh piece of clean fine cotton cloth, slightly damped with methylated spirit and rubbed lightly and quickly with circular motions. The finished surface shall have a uniform texture and high gloss.

B-11 Terrazzo Flooring: (Cast in situ): I.S. 2114-1962

(a) (i) The aggregates used in terrazzo topping shall be marble aggregates of required colour. Marble powder used in terrazzo shall pass through I.S. Sieve 30.
(ii) Aggregates for terrazzo under layer as well as the base concrete shall conform to the requirements of ordinary cement concrete.
(b) Cement used for floor finish work shall be ordinary cement or white cement of approved quality. (c) Pigments incorporated in terrazzo shall be of approved make & brand and of permanent colour
(d) The dividing strips may be copper, brass, aluminium, plastic, glass or similar materials. Metallic dividing strips shall have a protective coating of bitumen. The thickness of strip shall not be less than 1.5 mm. and width not less than 20 mm.
(e) (i) The base concrete shall be lean concrete of mix 1:5:10 of lime concrete and thickness shall be not less than 100 mm.

(ii) The cushioning layer shall preferably be lime concrete and thickness shall be no less than 75 mm.
(iii) The under layer shall be of cement concrete of1: 2: 4, size of coarse aggregates not exceeding 12 mm. The thickness of terrazzo topping shall be not less than the following, depending upon the grades and size of chips used.

Grade No.	Size of chips	Minimum thickness of topping
0	1 to 2 mm.	6 mm.
0	2 to 4 mm.	
1	4 to 7 mm	9 mm
2	7 to 10 mm	12 mm

(f) The mix for terrazzo topping shall consist of cement with or without pigments, marble powder, marble aggregates and water. The proportion of cement and marble powder shall be 3 parts of cement and one part of powder by WEIGHT. For every part of cement marble powder mix, the proportion of aggregates by VOLUME shall be as follows depending upon the size and grade of marble aggregates.

Size of aggregates	Proportion of aggregates to binder mix
For grades 00,0 and 1	13/4 parts
2	11/3 parts

(g) The Proportion of cement shall be inclusive of any pigments added to cement. The proportions pigments die mixed with ordinary cement or white cement to obtain different colour to the binder, shall be as specified in the following Table:

Colour	Pigment to be used	Proportion of pigment	Proportion of Ordinary Portland cement	Proportion of white cement
Red	Red oxide of iron	1	15 to 20	NIL
Black	Carbons black	1	25 to 40	NIL
Pink	Red oxide	1	NIL	100 to 400
Cream	Yellow oxide of iron	I	NIL	100 to 400
Yellow	Yellow oxide of iron	1	NIL	25 to 75
Light Green	Green Chromium	1	NIL	50 to 150
French Grey	—	NIL	1 to 2	1

(h) (i) Terrazzo topping shall be laid while the under layer is still plastic, but is hardened sufficiently, normally between 18 and 24 hrs. After the laying of the under layer, terrazzo topping may be laid. A cement slurry, preferably of the same colour as the topping shall be brushed on the surface immediately before laying is commenced. The terrazzo topping shall be compacted thoroughly by tamping or rolling and trowelled smooth. Excessive trowelling or rolling in early stages shall be avoided. The compaction shall ensure that air is cleared from the mix.

(ii) The surface shall be left dry for air curing for duration of 12 to 18 hrs. and then be cured by allowing water to stand in pools over it for a period of not less than 4 days.

(iii) Grinding and polishing may be done either by hand or by machine. The first and second grinding shall be done with carborundum stone of Grit size 60 and 80 respectively. After each grinding, the surface shall be washed clean and grouted with neat cement grout of the same colour (without marble powder) of cream like consistency and then shall be allowed to dry for
24 hours and wet cured for 4 days. The third grinding shall be done with carborundum stone of Grit size 120 to 150 and the surface shall then be washed clean and allowed to dry for 11 hours and wet cured for 4 days. The fourth grinding shall be done with carborundum stone of Grit size 320 to 400 and the surface shall then be washed clean and rubbed hard with felt and slightly moistened oxalic acid powder (5 gm of oxalic acid powder per sq.m. of floor area shall be adequate) and finally the surface shall be washed clean with dilute oxalic acid solution and dried.

B-12 Door, Window Frames and Shutters: (a) Wooden Section:

All doors, window frames must have plaster rabbit 12 mm x 12 mm. and rabbit for receiving shutter at least 15 mm deep. Wood work shall not be painted, oiled or otherwise treated before it has been approved by the Engineer-in-Charge. All portion of timber abutting against or embedded in masonry or concrete shall be painted with boiling coal-tar, before being placed in position. In place of coal-tar, use of approved wood primer shall be permitted. In case of door frames without sills, the vertical members shall be buried in floor 40 mm. deep. Where sills are provided, these sills shall be sunk in the floor to 40 mm. depth and shall rest on damp-proof course. Sills shall be provided, where so directed. The door frames without sills while being placed in position shall be provided with temporary wooden bracing or dry bricks well wedged between the styles at the sill level. These shall be retained to keep the frames from warping during construction. The frames shall also be protected from damages during construction. The shutters shall be so fixed that while closing, the left hand leaf of the shutter is closed first and the right hand leaf of shutter overlaps on the left hand leaf. The overlapping shall be minimum 20 mm. Solid wood panels shall be made out of one or more pieces of timber of not less than 125 mm. in width. In order to avoid warping, splitting and cracking, normally piece not exceeding 200 mm. in width should be used. When made from more than one piece, the pieces shall be joined with continuous tongued and grooved joints glued together and reinforced with metal dowels. The grains of the solid panel shall run along the longer dimension of the panel. The corners and edges of panels shall be finished as shown in drawings and these shall be feather tongued into styles and rails. Sash bars shall have mitered joints with styles. In measuring the width and thickness of styles and rails, a tolerance can be allowed up to 1 mm. Styles and rails shall be properly and accurately mortised and tenoned. Rails which are more than 180 mm. in width shall have two tenons. Styles and end rails of shutters shall be made out of one piece only. Lock and intermediate rails exceeding 200 mm. in width may be made out of one or more pieces of timber, but the width of each piece shall not be less than 75 mm. Where more than one piece of timber are used, they shall be joined with a continuous tongued and grooved joint glued together and reinforced with metal dowels at regular intervals not exceeding 200 mm. or pinned with not less than three 40 mm. rust proof pins of the lost heads type. Jointed pieces of timber shall belong to the same pieces. The tenons shall pass clear through styles. When assembling a leaf, styles shall be left projecting as a horn. The styles and rails shall have 12 mm. grooves in paneled portion for the panel to fit in. The joinery work shall be assembled and passed the Engineer-in-Charge and then the joints shall be pressed and secured by bamboo pins of about 6 mm. diameter. The horns of styles shall be sawn off.

Glass panes shall be fixed by wooden beading having mitered joints. A thin layer of putty shall be applied between glass panes and sash bars and also between glass panes and the beading. Fixing of glass panes with simple putty and beads shall not be permitted. Putty shall be prepared by mixing one-part white lead with three parts of finely powdered chalk and then adding boiled linseed oil to the mixture to form a stiff paste.

(A) Aluminum Sections.

(Specifications for different component will be as follows. Any approved/ISl marked Aluminum extruded sections.)

(A) Sliding Window:

(i) 2 Track Sliding Frame:

Bottom Member	4095	151.155
Top & Side Member	4096	151.15

Shutter:

Bottom &Top. Member	4148	151.161
Style Side	9777	151.152
Inter Lock	9778	151.15

(ii) 3-Track Sliding Frame:

Bottom Member	4097	151.157
Top & Side Member	4098	151.15

Shutter:

Bottom & Top. Member	4148	151.161
Style Side	9777	151.152
Inter lock	9778	151.15

(iii) 4 Track Sliding Frame :

Bottom Member	4121	151.67
Top & Side Member	4120	151.66

Shutter :

Bottom & Top. Member	4148	151.161
Style Side	9777	151.152
Inter lock	9778	151.153

Accessories: EPDM Gasket, Adhesive, Screw, Cleat Angle
Glass: clear bubble free float glass

(B) Casement Window:

(i) 40 series (40 mm depth).

Outer Frame

Peripheral members	4133	151.1
Mullion	9149	151.79
Shutter :		
Frame members	9148	151.81
Glazing Clip	4135	151.96
Cleat Angle. (Non-Anodized)	2081	151.167
(ii) 34 series (34 mm depth).		
Outer Frame		
Peripheral Member		
Mullion	9139	151.163
Shutter :		
Peripheral Member	2082	151.164
Mullion	9139	151.163
Shutter :		
Frame members	4124	151.165
Glazing Clip	4125	151.166
Cleat Angle. (Non-Anodized)	2081	151.167

Accessories: Stainless steel / Aluminium Functional, Hinge, EPDM Gasket-T & U Type, Adhesive, Screw, Glass

(C) Louvered Window: Outer

Frame

Top, Bottom & Side Member	9835	303.01

Louver

Light – 18G	1702
Medium – 16G	1702
Heavy – 14G	1702

(D) Fixed glazing on all tracks with member of all fixed glazing flushed on one side only

Frame

Top, Bottom & Side	9210	151.53
Mullion	9207	151.52
Glazing Clip	4660	151.17

Accessories: EPDM Gasket, Glass

(E) Fixed Partition -for height of clear opening more than 1.0 metre.

(i) Unsupported length (Vertical member) upto 1.5 m height

Members:

Side, Top & Bottom	9210	151.53
Intermediates	9207	151.52
Glazing Clip	4660	151.17

(ii) Unsupported length (Vertical Member) above 1.5 m height

Members:

Intermediates	9220	151.193
Glazing Clip	4660	151.17

(iii) Both ends restrained (with horizontal members or masonry walls / concrete members where the horizontal members can be screwed) for panels within 0.9 Sq.m.

Members:

Side, Top & Bottom	9210	151.53
Intermediates	9207	151.52
Glazing Clip	4660	151.17

(iv) Both ends restrained (with horizontal members or masonry walls / concrete members where the horizontal members can be screwed) for panels above 0.9 Sq.m

Members:

Side, Top & Bottom	9221	151.183
Intermediates	9220	151.193
Glazing Clip	4660	151.17

Accessories: EPDM Gasket, Glass / Board

F) Movable door shutters fully glazed, partly glazed Partly pre-laminated and rimless doors.

(i) Movable door

Door Frame, (Required only when there is masonry wall/concrete member).

Top Side member	9210	151.183

Shutter:

Top Rail	9201	151.261
Bottom Rail	9200	151.231
Lock Rail	9240	151.218
Door Vertical	9241	151.23
Glazing Clip	4660	151.17
Handle	5140	157.13

(ii) Rimless Door

Top & Bottom Rail	9206	151.51

Accessories:
1. Heavy duty floor spring & top pin assembly make: Garnish/Nita/Hardwyn or any approved make conforming to IS : 6315
2. EPDM Gasket
3. Wool Pile
4. Lock
5. Handle-Standard/Decorative/Acrylic.
6. Sundries: Adhesive, screw, Cleat Angle

B-13 Door, Window Clamps or holdfasts:

(a) Unless otherwise specified the clamps shall be fixed to outer side of the frame with screws. For the purpose of receiving clamps a recess of at least 12 mm. deep of suitable size shall be cut into the frame. After fixing the frame true to plumb with the clamps, the exposed face of the clamps shall he covered by a thin wooden covering fixed with screws.

(b) The side of the door, window frames which remains in contact with masonry shall invariably be painted with a protective coat of paint.

B-14 Schedule of Fittings:

(i) Fittings shall be of iron, aluminium or as specified. These shall be well made, reasonably smooth and free from edges, corners, flaws and other defects. Screw holes shall be counter sunk to suit the head of specified wood screws. All hinge pins shall be of steel and their riveted heads shall be well formed.

Iron fitting shall be finished bright or copper oxidised. Brass fittings shall be finished bright (brass), oxidised or chromium—plated (electro-plated) and aluminium fittings shall be finished bright or anodised or as specified. Fittings shall be got approved by the Engineer- in charge before fixing.

(ii) Screws used for fittings shall be of the same metal and finish as the fittings; however anodised brass screws or chromium brass screws shall be used for fixing aluminium fittings.

(iii) Fittings shall be fixed in proper position as shown in the drawings or as directed by the Engineer-in-Charge. These shall be truly vertical or horizontal as the case may be. Screws shall be driven home with screwdriver and not hammered in. Recesses shall be cut to exact size and depth for the counter -sinking of hinge.

B-15 Stone Masonry Block Walling:

(i) Considering ease in handling and other requirements, the nominal length and height of the block is kept 300 mm. and 150 mm. respectively with the widths as 200, 150 and 100 mm. respectively. The actual block dimensions are short by 10 mm. to accommodate mortar joint thickness. These blocks weigh from 9 to 18 kg each. The stone masonry blocks are made from large size stone pieces bound together with lean cement concrete mix 1:5:8

(cement, sand, stone aggregate 10 mm down). The stone piece sizes vary from 50 to 260 mm. To impart good workability and bond, the sand should be well graded and should have tiny particles (15 to
20%) passing I.S. sieve no. 300 micron and 5 to 15% passing I.S. sieve no 150 micron in area. Where fly ash is available, this may be used as substitute for the fine particles of sand, provided good workability and plasticity in such lean concrete is achieved to the desired extent and in such case of using of fly ash, lesser cost of production of masonry stone block may be achieved.

(ii) Stone masonry blocks are prepared in the following stages (a) Stone pieces are arranged in mould (b) concrete (1:5:8) is filled around stone pieces in first layer (c) Second layer of stone pieces is laid then (d) Concrete (1.5:8) is filled up to top.

Demoulding of such blocks follows soon after 3 to 7 minutes of its casting. The moulded blocks are cured by frequent sprinkling of water over the stacks for 2 weeks and are cured for another 2 weeks before laying them in wall.

For quality control, testing of two blocks out of every 500 blocks for compressive strength after providing proper capping as per test procedure laid down in I.S.-2185 of 1967, from (1:5:8) lean concrete stone masonry block (290 mm x 190 mm.) and thickness 140 mm is desired. Average ultimate crushing load for such block in tons is to be 38 and its average compressive strength thus stands at 69 kg/sq. cm.

(iii) The blocks are used both for load bearing and non-load bearing walls. Permissible stresses in the masonry are taken from the I.S. Code 1969 of 69 ―Structural safety of building - masonry walls‖.

As cutting of the these blocks is not recommenced all length of walls, openings, spaces between openings etc. shall be in multiple of 100 mm. and all height shall be multiple of course height

Wall thickness is decided based on the strength of the blocks and the load coming over it. The blocks should be dry at the time of laying in the masonry. If the climate is not dry, the blocks may be wetted on the surface only in order to reduce the suctioning of water from the mortar. For breaking of vertical joints in alternate course, smaller length blocks (depending upon the wall length) are used. The external surface is finished with designable pointing; the internal face may or may not be plastered.

B-16 PRECAUTION AND SEQUENCE OF OPERATION DURING DEMOLITION / DISMANTILING OF STRUCTURE

PROCEDURE FOR DEMOLITION:

Before beginning the actual demolition work, a careful study shall be made of the structure which is to be pulled down and also of all its surroundings to ascertain how far the stage by stage demolition will affect the safety of the adjoining structure. A definite plan of procedure for the demolition work, depending upon the manner in which the loads off the various

structural parts are supported, shall be prepared and approved by the Engineer-in-Charge and this shall be followed as closely as possible, in actual execution of the demolition work.

It should be ensured that the demolition operations do not, at any stage, endanger the safety of the adjoining buildings. Moreover, the nuisance effect of the demolishing work on the use of the adjacent buildings should be kept to the minimum.

No structure or part of the structure or any floor or temporary support or scaffold, side wall or any device or equipment shall be loaded in excess of the safe carrying capacity, in its then existing condition.

PRECAUTIONS PRIOR TO DEMOLITION:

1. On every demolition job, danger signs shall be posted all around the structure and all doors and openings giving access to the structure shall be kept barricaded or manned except during the actual passage of workmen or equipment. However, provisions shall be made for at least two independent exists for escape of workmen during any emergency.

During nights, red lights shall be placed on or about all the barricades.

2 All the necessary safety appliances shall be issued to the workers and their use explained. It shall be ensured that the workers are using all the safety appliances while at work.

3. The power on all electrical service lines shall be shut off and all such lines cut or disconnected at or outside the property line, before the demolition work is started. Prior to cutting of such lines, the necessary approval shall be obtained from the electrical authorities concerned. The only exception will be any power lines required for demolition work itself.

4. Water stream and other service lines shall be shut off and capped or otherwise controlled at or outside the building line, before demolition work is started.

SPECIAL MEASURES FOR PUBLIC:

1. Safety distances to ensure safety of public shall be clearly marked and prominently sign posted.
Every sidewalk or road adjacent to the work shall be closed or protected. All main roads, which are open to all, shall be kept open to the public clear and unobstructed at all times. Diversions for pedestrians shall be constructed, where necessary for safety.

2. If the structure to be demolished is more than two storied or 7.5 m high, measured from the side walk or street which cannot be closed or safely diverted, and the horizontal distance from the inside of the sidewalk to the structure is 4.5 m or less, a substantial sidewalk shed shall be constructed over the entire length of the sidewalk adjacent to the structure, of sufficient width with a view to accommodate the pedestrian traffic without causing congestion. The side walk shed shall be lighted sufficiently to ensure safety at all times.

The roof of sidewalk sheds shall be capable of sustaining a load of 73 N/mm2. Only in exceptional cases, say due to lack of other space, the storing of material on a sidewalk shed may be permitted in which case the shed shall be designed for a load of 146 N/mm2. Roof of sidewalk shed shall be designed taking into account the impact of the falling debris. By frequent removal of loads it shall be ensured that the maximum load, at any time, on the roof of work shed is not more than 6000 N/ mm2. The height of sidewalk shed shall be such as to give a minimum clearance of 2.4 m.

Sidewalk shed opening for loading purposes, shall be kept closed at all time except during actual loading operations.

The deck flooring of the sidewalk shed shall consist of plank of not less than 50 mm in thickness closely laid and deck made watertight. All members of the shed shall be adequately braced and connected to resist displacement of members or distortion of framework.

When the horizontal distance from the inside of the sidewalk to the structure is more than 4.5 m and less than 7.5 m, a sidewalk shed or fence with substantial railing shall be constructed on the inside of the sidewalk or roadway along the entire length of the demolition side of the property with movable bars as may be necessary for the proper execution of the work.

SPECIAL PRECAUTIONS DURING DEMOLITON:

- Prior to commencement of work, all material of fragile nature like glass shall be removed.

- All openings shall be boarded up.

- Dust shall be controlled by suitable means to prevent harm to workmen.

SEQUENCE OF DEMOLITION OPERATIONS:

1. The demolition work shall be proceeded with in such a way that

(a) it causes the least damage and nuisance to the adjoining building and the members of the public, and
(b) it satisfies all safety requirements to avoid any accidents.

2. All existing fixtures required during demolition operation shall be well protected with substantial covering to the entire satisfaction of the rules and regulations of the undertakings or they shall be temporarily relocated.

3. Before demolition work is started, glazed sash, glazed doors and windows etc. shall be removed. All fragile arid loose fixtures shall be removed. The lath and all loose plaster shall he stripped off throughout the entire building. This is advantageous because it reduces glass breakage and also eliminates a large amount of dust producing material before more substantial parts of the buildings are removed.

4 The demolition shall always proceed systematically storey by storey, in the descending order. All work in the upper floor shall be completed and approved by the Engineer-in-Charge prior to disturbance to any supporting member on the lower floor. Demolition of the structure in sections may be permitted in exceptional cases if proper precautions are ensured to prevent injuries to persons and damage to property.

DEMOLITION OF WALLS:

1. While walls of sections of masonry are being demolished, it shall be ensured that they are not allowed to fall as single mass upon the floors of the building that are being demolished so as to exceed the safe carrying capacity of the floors. Overloading of floors shall be prevented by removing the accumulating debris through chutes or by other means immediately. The floor shall be inspected by the Engineer-in- Charge before undertaking demolition work and if the same is found to be incapable to carry the load of the debris, necessary additional precautions shall be taken so as to prevent any possible unexpected collapse of the floor.

2. Walls shall be removed part by part. Stages shall be provided for the men to work on if the walls are less than one and a half brick thick and dangerous to work by standing over them.

DEMOLITION OF FLOOR:

1. Prior to removal of masonry or concrete floor adequate support centering shall be provided.

2. When floors are being removed, no workmen shall be allowed to work in the area, directly underneath and such area shall be barricaded to prevent access to it.

DEMOLITION OF CERTAIN SPECIAL TYPES AND ELEMENTS OF STRUCTURES:

1. ROOF TRUSSES:

a) If a building has a pitched roof, the structure should be removed to wall plate level by hand methods. Sufficient purlins and bracing should be retained to ensure stability of the remaining roof trusses while each individual truss is removed progressively.

(b) On no account should the bottom tie of roof trusses be cut until the principal rafters are prevented from making out ward movement.

2. HEAVY FLOOR BEAMS:

Heavy baulks of timber and steel beams should be supported before cutting at the extremities and should then be lowered gently to a safe working place.

3. BRICK ARCHES:

Expert advice should be obtained and, at all stages of the demolition, the closest supervision should be given by persons fully experienced and conversant in this type of work to ensure that the structure is stable at all times.

However, the following points may be kept in view.

(a) On no account should the restraining influence of the abutments be removed before the dead load of the spandrel fill and the arch rings are removed.

(b) A single span arch can be demolished by hand by cutting narrow segments progressively from each springing parallel to the span of the earth, until the width of the arch has been reduced to a minimum which can then be collapsed.

(c) Where deliberate collapse is feasible, the crown may be broken by the demolition ball method working progressively from edges to the centre.

(d) In multi-span arches, before individual arches are removed, lateral restraint should be provided at the springing level. Demolition may then proceed as for single span; where explosives are used it is preferable to ensure the collapse of the whole structure in one operation to avoid the chance of leaving unstable portion standing.

4. CANTILEVER (NOT PART OF A FRAMED STRUCTURE):

Canopies, cornices, staircases and balconies should be demolished or supported before tailing down load is removed.

5. IN-SITU REINFORCED CONCRETE:

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.

Demolition should be commenced by removing partition and external non-load bearing cladding.

(a) REINFORCED CONCRETE 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:

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 out in such a way as to allow it to be pulled down to the floor under control.

(c) REINFORCED CONCRETE WALLS:

These should be cut into strips and demolished as for columns.

(d) SUSPENDED FLOORS AND ROOFS:

The slab should be cut into strips parallel to the main reinforcement and demolished strip by strip. Where ribbed construction has been used, the principle of design and method of construction should be determined before demolition is commenced. Care should be taken not to cut the ribs inadvertently.

LOWERING, REMOVAL AND DISPOSAL OF MATERIALS:

Dismantled materials may be thrown to the ground only after taking adequate precautions. The material shall preferably be dumped inside the building. Normally such materials shall be lowered to the ground or to the top of the sidewalk shed, where provided, by means of ropes of suitable tackles.

MODES OF MEASUREMENTS

GENERAL: Unless specifically mentioned otherwise, the following modes of measurement shall be adopted.

C-1 Brick Walls:

(a) With Modular Bricks (190 mm x 90 mm x 90 mm) :

The thickness of brick wall made of Modular Bricks with one brick laid flat (with long side parallel to the length of the wall) shall be measured as 100 mm. One brick thick walls (with the length of the brick parallel to the thickness of the wall) shall be measured as 200 mm., one and half brick as 300 mm, two brick walls measured as 400 mm and so on.

(b) With Conventional Bricks (9¾"x 4¾" x 2¾") or (248 mm x 120 mm x 70 mm):

The thickness of brick wall made with one brick laid on edge (with the long side parallel to the length of the wall) shall be measured as 75 mm. Similarly, a wall made with one brick laid flat (with the long side parallel to the length of wall) shall be measured as 125 mm. 1 brick thick walls (with the length of brick parallel to the thickness of the wall) shall be measured as 250 mm, one and half brick walls (i.e. one brick along the length and one brick along the width) shall be measured as 375 mm., two brick thick walls measured as 500 mm. and so on.

(c) The width of lintels etc. covering the entire thickness of brick wall shall also be measured as equal to corresponding wall thickness.

(d) Net measurement of all walls will be taken after deduction of all opening etc. This applies to 125/
100 mm. thick and 75 mm. thick walls also. Parapets (upto 1060 mm. height) will be measured along with the brick work of the floor just below the roof and will be paid for at the same rate.

(e) No extra payment will be made for curved or chamfered work even though it may necessitate cutting of bricks. For small curves or chamfers the Engineer-in-Charge may, at his discretion allow measurement on the square (i.e. without deduction for the quantity removed for forming the small curve or chamfer).

C-2 Concrete Plain or Reinforced:

Finished net measurement will be taken after deduction of large holes, rebates etc. but without deduction for the volume of reinforcement, if any, in the concrete.

C-3 Reinforcement:
The measurement will be on the basis of calculated weight of reinforcement only (i.e. without considering the weight of tying wires) actually consumed in the finished work as per drawing and design or as per direction of the Engineer-in-Charge. If the length of any rod be more than that shown in the drawing but has been allowed to be used, the length will be taken as the length shown in the drawing. Hooks and laps as per standard practice will be measured and paid for.

C-4 Plaster, Lime punning, Plaster of Paris rendering:
For measurements of plaster (exterior or interior) deduction is to be made for door, window or opening of similar dimension and allowance is to be made for jambs, sills and soffits. Payment will be made on the basis of surface measurement of wall deducting one-third the measurement of such opening and without any separate measurement of jambs, sills and soffits. In case of large openings, exceeding three sq.m. however, as in the case of verandahs with columns, payment will be on actual measurements.

C-5 White Washing and Colour Washing:
(i) Payment will be made on the basis of surface measurement without any deduction for door, window or opening or similar dimension and without any separate measurement for jambs. sills and soffits of such openings.

(ii) For cement paint and oil painting to walls or concrete jellies or similar other works, method of measurements shall be the same as in plaster.

C-6 Painting:
(a) Measurement for painting work in doors and windows, grills, gratings, collapsible gates, corrugated roofing etc. shall be on the following basis. In all such cases the ―Area‖ shall be measured flat (and not girthed). For door and windows, no separate payment shall be made for the frames (chowkats), the ―Area‖ in such cases represents the area of the wall opening covered by the frames (including exposed surface of the frames). For grills, gratings etc. the area represents the area of the opening covered by outer frames.

(b) The area measured as above shall be multiplied by the factor given below and the works of painting shall be paid on the quantities thus arrived at:

Name of surface painted	Multiplying factor for painting one side only	Multiplying factor for painting both side only
(i) Timber doors, windows etc.	0.80	1.60
Fully glazed (or with glass substitute) Fully paneled or flush or	1.30	2.60
battened Fully venetian or fixed or louvered	1.80	3.60
Two third paneled one third glazed half paneled half glazed	1.14	2.28
Flushing joiner	1.00	2.00
One third paneled two third glazed	1.20	2.40
One third paneled two third venetian	0.75	1.50
(or fixed louvered)		
Half paneled half venetian (or fixed-louvered) Netted (without		
painting to the net with z-battens) Netted (with Painting to the net as	1.33	2.66
well with Z-battens)	1.55	3.10
Corrugated (i.e. with leaves of GI. sheets) (ii) (a) Corrugated iron	0.25	0.50
sheet roof	0.63	1.25
(b) Corrugated iron sheet wall including supporting frame	1.25	2.50
(iii) Corrugated asbestos sheet roof or wall	1.05	2.10
(iv) Trafford Asbestos sheet roof or wall	1.14	2.28
(v) Heavy type grating or grated doors (as in jails etc.)	1.20	2.40
for painting all over	1.10	2.20
(vi) Collapsible gate (all over) (vii) Steel windows (full glassed)		
(viii) Ledges & battened or ledged, battened and braced one		1.50
third glazed two third venetian (or fixed-louvered) two third glazed		1.50
one third venetian (or fixed-louvered)	0.50	1.00
(ix) Weather boarding (Supporting frame shall not be	1.13	2.25
Measured separately)	1.47	2.94
(x) Title & slate battening (over all measured without deduction	1.13	2.25
the open surface)		

Note as per IS: 1200 (Part XV)-1976/P-8

Note 1. The Height shall be taken from bottom of lowest rail, if palisades do not go below it or from lower end of palisades, if they project below lowest rail, upto top of palisades, but not upto top of standards, if they are higher than palisades.

Note 2. Where doors, windows etc. are of composite types other than those included in this table, different portions shall be measured separately with their appropriate coefficients, center of common rail being taken as the dividing line between the two portions.

Note 3. Measurement of painting of doors, windows, collapsible gates, rolling shutters etc as given in this table shall be deemed to include painting, if required of all iron fittings in the same shade.

Note 4 When two faces of a door, window etc. are to be treated with different specified finishes, measurable under separate items, edges of frames and shutters shall be treated with the or the other type of finish and measurement thereof shall be deemed to be included in the measurement of the face treated with that finish.

Note 5. In case shutters are fixed on both faces of a frame, measurement for the door frame and shutter on one face shall be taken on the manner already described, while the shutter on the other face shall be measured exclusive of the frame.

Note 6 . Where shutter is provided with clearance exceeding 15 cm. at top and/or at bottom, such openings shall be deducted from the overall measurement and relevant coefficients applied.

C-7 Metal, Chips, Boulders, Bats, Sand, Lime, Coal, Carried Earth etc. :

(a) Unless specifically mentioned otherwise in the description of the item itself, measurements for supply and / or carriage shall be taken in stacks and that as soon after the stacks are made as possible. The height and the shape and size of the stacks shall be as per direction of the Engineer- in-charge but in no case shall the height of the stacks be less than the minimum as indicated hereinafter.

Allowance for shrinkage and / or shrinkage shall be made as indicated hereinafter. The net quantity shall be arrived at after deducting these allowances from the measurement of fresh stacks and payment for supply or carriage shall be made on the net quantity thus derived. Quantity of any material shall always indicate such net quantity, unless specifically mentioned otherwise.

(b) If for any special reasons, as per provisions in any particular contract, final measurements have to be taken in wagons (before unloading at destination) no deduction for shrinkage and / or shrinkage shall be made.

For carried earth supplied by the contractor, the earth is to be first stacked at site for measurement and the earth utilised in the work after such stacks have been measured. The items of earthwork with such carried earth include the cost of such operation. The net quantity, for the purpose of payment, shall be derived after deducting allowances for shrinkage and/or shrinkage as specified below. In special circumstances, the Engineer-in-Charge may, at his sole discretion, take borrow- pit measurements for such carried earth, in which case no allowance for shrinkage and/or shrinkage is to be deducted.

Where earth is to be carried from any excavation, the measurement for carriage for excavated earth will be taken on the basis of earth excavated.

(c) For conversion of brick materials from one form to another 314 Nos. of bricks (conventional size) will be taken to produce 1 cu.m. of bats and 1.1 cu.m. of bats to produce 1 cu.m. of khoa or metal.

Unless specifically mentioned otherwise in any particular contract, 1025 kg..of steam coal shall be taken as equivalent no 1 cu.m. (When measured in very old and settled stacks or in wagons at destination or after deducting sinkage and/or shrinkage allowance when measured in fresh stacks). Similarly 1107 Kg. of slack coal shall be taken as equivalent to 1 cu.m.

(d) For consolidation of stone or jhama metal and similar works involving utilisation of materials already measured in stacks, the quantity of materials actually consumed in such works will be taken to be same as the recorded quantities (after due allowance for sinkage and/or shrinkage, where applicable) of the stack or stacks actually utilised in such works.

(e) Schedule showing minimum height of stacks and allowance to be deducted for sinkage and/or shrinkage when measured in fresh stacks.

Sl. No.	MATERIALS	Minimum height of stacks	Allowance to be deduced for sinkage and/or shrinkage
(a)	Stone metal, ballast, chips, shingles or gravel	32.5 cm	1/13
(b)	Stone boulders 15 cm. or above sizes	35 cm	1/7
(c)	Stone boulders below 15 cm. size	45 cm	1/9
(d)	Jhama bats or bricks bats	53 cm	1/7
(e)	Jhama metal, khoa or chips	34 cm	1/9
(f)	Sand	61 cm	1/8
(g)	Surki	61 cm	1/4
(h)	Lime	61 cm	1/4
(i)	Moorum	33.5 cm	1/13
(j)	Carried earth	34 cm	1/9
(k)	Rubbish (building or kiln)	34 cm	1/9
(l)	Steam coal or slack coal	61 cm	1/8
(m)	Cinder	61 cm	1/9

C-8 Carriage:

All items involving carriage, loading, unloading & stacking shall be in accordance with the provisions of the Schedule of Rates of Public Works (Roads) Department applicable at the material time within the jurisdiction of the circle.

C-9 Glazing:

All glazing shall be measured in square metres. Each pane of glass shall be measured to the nearest 0.5 cm. both width and height. Irregular or circular panes shall be measured as the smallest rectangular area from which the irregular or circular pane can be cut. Irregular panes shall be measured separately and described as irregular shapes measured square.

CHART FOR CONSUMPTION OF MATERIALS

Consumption of different materials of construction in the corresponding contract items of work shall be computed on the basis of the quantities shown in this table subject to a variation of plus/minus 5 (Five) per cent. For steel reinforcement, the variation may be permitted upto ±10%

N.B. : The statement is based on the following assumptions :

(i) That dry sand with necessary allowance for bulking is used and (ii) that the size of bricks used shall be 248 ×120× 70 mm or 9¾‖×4¾"×2¾" for conventional bricks and (190 ×90 × 90 mm) for modular bricks

Sl. No.	Description of Items	Unit	Name of Materials required	Quantity of Materials required	
1.	10 mm. cement plaster 1:2	% sq.m.	1. Cement 2. Sand	0.54 1.08	Cu.m. Cu.m
2.	-Do- 1:3	% sq.m.	1. Cement 2. Sand	0.40 1.20	Cu.m. Cu.m
3.	-Do- 1:4	% sq.m.	1. Cement 2. Sand	0.30 1.20	Cu.m. Cum.
4.	-Do- 1:6	% sq.m.	1. Cement 2. Sand	0.20 1.20	Cu.m. Cu.m
5.	15 mm cement plaster 1:2	% sq.m.	1. Cement 2. Sand	0.80 1.60	Cu.m. Cu.m
6.	-Do- 1:3	% sq.m.	1. Cement 2. Sand	0.60 1.80	Cu.m. Cu.m
7.	-Do- 1:4	% sq.m.	1. Cement 2. Sand	0.46 1.84	Cu.m. Cu.m
8.	-Do- 1:6	% sq.m.	1. Cement 2. Sand	0.30 1.80	Cu.m. Cu.m
9.	20 mm. cement plaster 1:3	% sq.m.	1. Cement 2. Sand	0.80 2.40	Cu.m. Cu.m
10.	-Do- 1:4	% sq.m.	1. Cement 2. Sand	0.60 2.40	Cu.m. Cu.m
11.	-Do- 1:6	% sq.m.	1. Cement 2. Sand	0.40 2.40	Cu.m. Cu.m
12.	25 mm. cement plaster 1:3	% sq.m.	1. Cement 2. Sand	0.884 2.65	Cu.m. Cu.m
13.	-Do- 1:4	% sq.m.	1. Cement 2. Sand	0.71 2.84	Cu.m. Cu.m

Sl. No.	Description of Items		Unit	Name of Materials required	Quantity of Materials required	
14.	25 mm. cement plaster	1:6	% sq.m.	1. Cement 2. Sand	0.472 cu.m. 2.84 cu.m	
15.	Cement flush / rule/ tuck pointing	1:3	% sq.m.	1. Cement 2. Sand	0.119 cu.m. 0.357 cu.m	
16.	-Do-	1:4	% sq.m.	1. Cement 2. Sand	0.091 cu.m. 0.366 cu.m	
17	Brick work in Cement mortar	1:2	cu.m.	1. Brick 2. Cement 3. Sand	389 0.15 0.30	Nos. cu.m. cu.m.
18	-Do-	1:3	cu.m.	1. Brick 2. Cement 3. Sand	389 0.107 0.33	Nos. cu.m. cu.m.
19	-Do-	1:4	cu.m.	1. Brick 2. Cement 3. Sand	389 0.083 0.33	Nos. cu.m. cu.m.

20	-Do-	1:5	cu.m.	1. Brick 2. Cement 3. Sand	389 0.066 0.33	Nos. cu.m. cu.m.
21	-Do-	1:6	cu.m.	1. Brick 2. Cement 3. Sand	389 0.055 0.33	Nos. cu.m. cu.m.
22	Brick work in composite mortar	1:1:6	cu.m.	1. Brick 2. Cement 3. Lime 4. Sand	389 0.0535 0.0535 0.33	Nos. cu.m. cu.m. cu.m.
23	Brick work in composite mortar	1:2:9	cu.m.	1. Brick 2. Cement 3. Lime 4. Sand	389 0.035 0.071 0.33	Nos. cu.m. cu.m. cu.m.
24	Brick work in cement mortar with modular/ fly ash brick	1:4	cu.m.	1. Brick 2. Cement 3. Sand	500 0.0805 0.322	Nos. cu.m. cu.m.

Sl. No.	Description of Items		Unit	Name of materials required	Quantity of materials required	
25	- Do -	1:6	cu.m.	1. Brick 2. Cement 3. Sand	500 0.0537 0.322	nos. cu.m. cu.m.
26	12.5 cm. thick Brick work	1:3	% sq.m.	1. Brick 2. Cement 3. Sand	4951 1.22 3.66	nos. cu.m. cu.m.
27	12.5 cm. thick Brick work	1:4	% sq.m.	1. Brick 2. Cement 3. Sand	4951 0.914 3.66	nos. cu.m. cu.m.
28	100 mm. thick brick work with modular / fly ash brick	1:4	% sq.m	1. Brick 2. Cement 3. Sand	5065 0.73 2.90	nos. cu.m. cu.m.
29.	75 mm thick brick work	1:3	% sq.m	1. Brick 2. Cement 3. Sand	3014 0.762 2.286	nos. cu.m. cu.m.
30.	75 mm thick brick work	1:4	% sq.m	1. Brick 2. Cement 3. Sand	3014 0.572 2.286	nos. cu.m. cu.m.
31.	Cement concrete with jhama chips	1:2:4	cu.m.	1. Jhama Chips (6 to 19 mm) 2. Sand 3. Cement	0.90 0.45	cu.m. cu.m.

32.	Cement concrete with jhama chips	1:2½:5	cu.m.	1. Jhama Chips (6 to 19 mm) 2. Sand 3. Cement	0.93 0.465	cu.m. cu.m.

Sl. No.	Description of Items		Unit	Name of materials required	Quantity of materials required	
33.	Cement concrete with jhama chips	1:3:6	cu.m.	1. Jhama Chips (6 to 19 mm) 2. Sand 3. Cement	0.93 0.48	cu.m. cu.m.
34.	- Do -	1:4:8	cu.m.	1. Jhama Chips (6 to 19 mm) 2. Sand 3. Cement	0.98 0.49 0.122	cu.m. cu.m. cu.m.
35.	Cement concrete with stone chips	1:2:4	cu.m.	1. Stone chips (6 to 20 mm.) 2.Sand 3.Cement	0.88 0.44 0.22	cu.m. cu.m. cu.m.
36.	- Do -	1:1½:3	cu.m.	1. Stone chips (6 to 20 mm.) 2.Sand 3.Cement	0.86 0.43 0.286	cu.m. cu.m. cu.m.
37.	- Do -	1: 2 ½ : 3	cu.m.	1. Stone chips (6 to 20 mm.) 2. Sand 3. Cement	0.92 0.46 0.18	cu.m. cu.m. cu.m.
38.	- Do -	1:3:6	cu.m.	1. Stone chips (6 to 20 mm.) 2.Sand 3.Cement	0.94 0.47 0.156	cu.m. cu.m. cu.m.
39.	- Do -	1:4:8	cu.m.	1. Stone chips (6 to 20 mm.) 2.Sand 3.Cement	0.96 0.48 0.12	cu.m. cu.m. cu.m.

Sl. No.	Description of Items		Unit	Name of materials required	Quantity of materials required	
40	25 mm artificial stone floor with jhama chips(which includes 3mm thick neat cement finish)(cement in the consumption chart is exclusive of cement required for slurry purpose)	1:2:4	% sq.m	1.Jhama chips (5 to 12 mm.) 2.Sand 3.Cement	2.268 1.140 0.872	cu.m. cu.m. cu.m.
41	20 mm artificial stone floor with jhama chips(which includes 3mm thick neat cement finish)(cement in the consumption chart is exclusive of cement required for slurry purpose)	1:2:4	% sq.m	1.Jhama chips (5 to 12 mm.) 2.Sand 3.Cement	1.716 0.858 0.73	cu.m. cu.m. cu.m.
42	25 mm artificial stone floor with stone chips(which includes 3mm thick neat cement finish)(cement in the consumption chart is exclusive of cement required for slurry purpose)	1:2:4	% sq.m	1.Stone chips (5 to 12 mm.) 2.Sand 3.Cement	2.23 1.12 0.855	cu.m. cu.m. cu.m.

Sl. No.	Description of Items		Unit	Name of materials required	Quantity of materials required	
43	20 mm artificial stone floor with stone chips(which includes 3mm thick neat cement finish)(cement in the consumption chart is exclusive of cement required for slurry purpose)	1:2:4	% sq.m	1.Stone chips (5 to 12 mm.) 2.Sand 3.Cement	1.676 0.838 0.70	cu.m. cu.m. cu.m.
44	35 mm artificial stone floor with stone chips (which includes 3mm thick neat cement finish) (cement in the consumption chart is exclusive of cement required for slurry purpose)	1:2:4	% sq.m	1.Stone chips (5 to 12 mm.) 2.Sand 3.Cement	3.11 1.56 1.075	cu.m. cu.m. cu.m.
45	35 mm artificial stone floor with jhama chips (which includes 3mm thick neat cement finish) (cement in the consumption chart is exclusive of cement required for slurry purpose)	1:2:4	% sq.m	1.Jhama chips (5 to 12 mm.) 2.Sand 3.Cement	3.43 1.72 1.17	cu.m. cu.m. cu.m.
46	7.5 cm lime terracing in roof with brick khoa, surki, lime (7:2:2) Including finishing		sq.m	1.Brick Khoa 2.Surki 3.Lime	0.075 0.021 0.021	cu.m. cu.m. cu.m.
47	10 cm lime terracing in roof with brick khoa, surki, lime (7:2:2) Including finishing		sq.m	1.Brick Khoa 2.Surki 3.Lime	0.10 0.029 0.029	cu.m. cu.m. cu.m.

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Sl. No.	Description of Items		Unit	Name of materials required	Quantity of materials required	
48	12.5 cm lime terracing in roof with brick khoa, surki, lime(7:2:2) Including finishing		sq.m	1. Brick Khoa 2.Surki 3.Lime	0.125 0.036 0.036	cu.m. cu.m. cu.m.
49	15 cm lime terracing in roof with brick khoa, surki, lime(7:2:2) Including finishing		sq.m	1. Brick Khoa 2.Surki 3.Lime	0.150 0.043 0.043	cu.m. cu.m. cu.m.
50	5 cm thick R. C. Slab with stone chips and with 0.8% reinforcement	1:2:4	% sq.m	1. Stone chips (6to 2 mm.) 2.Sand 3.Cement 4.Steel 5.Shuttering	4.47 2.23 1.12 322.60	cu.m. cu.m. cu.m. kg sq.m
51	7.5 cm thick R. C. Slab with stone chips and with 0.8% reinforcement	1:2:4	% sq.m	1. Stone chips (6to 20 mm.) 2.Sand 3.Cement 4.Steel 5.Shuttering	6.70 3.35 1.675 482.62	cu.m. cu.m. cu.m. kg sq.m
52	10 cm thick R. C. Slab with stone chips and with 0.8% reinforcement	1:2:4	% sq.m	1. Stone chips (6to 20mm.) 2.Sand 3.Cement 4.Steel 5.Shuttering	8.93 4.47 2.23 683.54	cu.m. cu.m. cu.m. kg sq.m
53	12.5 cm thick R. C. Slab with stone chips and with 0.8% reinforcement	1:2:4	% sq.m	1. Stone chips(6to20mm.) 2.Sand 3.Cement 4.Steel 5.Shuttering	11.18 5.59 2.80 787.44 100	cu.m. cu.m. cu.m. kg sq.m

Sl. No.	Description of Items		Unit	Name of materials required	Quantity of materials required	
54	15cm thick R. C. Slab with stone chips and with 0.8% reinforcement	1:2:4	% sq.m	1. Stone chips(6to20mm.) 2. Sand 3. Cement 4. Steel 5. Shuttering	13.4 6.7 3.35 955.08	cu.m. cu.m. cu.m. kg sq.m
55	Single Brick flat soling(conventional size)		sq.m	1.Brick	32	Nos
56	Brick on edge soling(conventional size)		sq.m	1.Brick	54	Nos
57	7.5 cm wide Brick-on edge edging (250 mm depth)		%.m	1.Brick	820	Nos
58	7.5 cm wide Brick-on edge edging (125 mm depth)		%m	1.Brick	410	Nos
59	35 mm thick (finished) terrazzo work, cast in situ(using c.c. 1:2:4 backing with stone chips 12mm down)floor 9mm thick terrazzo topping, laying and finished to 6mm thick after final grinding in ordinary grey colour(cement in consumption chart is exclusive of cement required for slurry@1.75 kg/sq.m)		% sq.m	1.Grey cement 2.Coarse Sand 3.Stone Chips 4.Marble Chips 5.Marble Powder	1.05 1.30 2.60 1420 0.126	cu.m. cu.m. cu.m. kg cu.m.
60	-DO- In black or red colour		% sq.m	1.Grey cement 2.Coarse Sand 3.Stone Chips 4.Marble Chips 5.Marble Powder 6.pigment	1.05 1.30 2.60 1420 0.126 40	cu.m. cu.m. cu.m. kg cu.m. kg
61	-DO- In Silver Grey		% sq.m	1.Grey cement 2.Coarse Sand 3.Stone Chips 4.White Cement 5.Marble Chips 6. Marble Powder	0.85 1.30 2.60 0.20 1420 0.126	cu.m. cu.m. cu.m. cu.m. kg cu.m.

Sl. No.	Description of Items	Unit	Name of materials required	Quantity of materials required	
62	-DO- In Pink, Green, Yellow, Light Green colour	% sq.m	1.Grey Cement 2.Coarse Sand 3.Stone Chips 4. White Cement 5.Marble Chips 6. Marble Powder 7.Pigment	0.65 1.30 2.60 0.40 1420 0.126 40	cu.m. cu.m. cu.m. cu.m kg. cu.m. kg
63	35 mm thick (finished) terrazzo work, cast in situ (using c.c1:2:4 backing with stone chips 12mm down)floor 12mm thick terrazzo topping, laying and finished to 9mm thick after final grinding in ordinary grey colour(cement in consumption chart is exclusive of cement required for slurry@1.75 kg/sq.m)	% sq.m	1.Grey cement 2.Coarse Sand 3.Stone Chips 4.Marble Chips 5.Marble Powder	1.146 1.16 2.32 1734 0.170	cu.m. cu.m. cu.m. kg cu.m
64	-DO- In black or red colour	% sq.m	1.Grey cement 2.Coarse Sand 3.Stone Chips 4.Marble Chips 5.Marble Powder 6.pigment	1.146 1.16 2.32 1734 0.170 57	cu.m. cu.m. cu.m. Kg Cu.m kg
65	-DO- In Silver colour	% sq.m	1.Grey cement 2.Coarse Sand 3.Stone Chips 4. White Cement 5.Marble Chips 6. Marble Powder	0.863 1.16 2.32 0.283 1734 0.170	cu.m. cu.m. cu.m. cu.m kg cu.m.
66	-DO- In Pink, Green, Yellow, Light Green	% sq.m	1.Grey cement 2.Coarse Sand 3.Stone Chips 4. White Cement 5.Marble Chips 6. Marble Powder 7.Pigment	0.58 1.16 2.32 0.566 1734 0.170 57	cu.m. cu.m. cu.m. cu.m kg. cu.m. Kg

Sl. No.	Description of items	Unit	Name of materials required	Quantity of materials required	
67	20 mm thick (finished) terrazzo work in floor with precast tiles set on 20 mm av. th. of lime / cement mortar 1:3 and sides with admixtures of pigment as and when necessary and white cement / grey cement in ordinary grey colour (cement in consumption chart is exclusive of cement required for slurry @ 1.75 Kg./m2)				
	(a) When sand cement mortar is used in bed	% sq.m	1.Grey cement 2.Coarse sand 3.Pigment	1.422 2.4 31	cu.m. cu.m. kg
	(b) When lime mortar is used in bed	% sq.m	1.Unslaked Lime 2.Surki 3.Grey Cement 4.Pigment	5.65 2.67 0.616 31	Quintals cu.m. cu.m. kg
68	-Do- In black and red colour				
	(a)when sand cement mortar is used in bed	% sq.m	1.Grey cement 2.Coarse sand 3.Pigment	1.422 2.4 31	cu.m. cu.m. kg
	(b) when lime mortar is used in bed	% sq.m	1.Unslaked Lime 2.Surki 3.Grey Cement 4.Pigment	5.65 2.67 0.616 31	Quintals cu.m. cu.m. kg
69	-Do- In Silver colour				
	(a)when sand cement mortar is used in bed	% sq.m	1.Grey cement 2.White cement 3.Coarse sand	1.268 0.154 2.4	cu.m. cu.m. cu.m.
	b) when lime mortar is used in bed	% sq.m	1.Unslaked Lime 2.Surki 3.Grey Cement 4. White cement	5.65 2.67 0.462 0.154	Quintals cu.m. cu.m. cu.m.

Sl. No.	Description of Items	Unit	Name of materials required	Quantity of materials required	
70	20 mm thick (finished) terrazzo work, in floor with precast tiles set on 20mm avg. thick of lime/cement mortar 1:3 and sides with admixtures of pigment as and when necessary and white cement /grey cement in Pink, Green, Yellow, Light Green colour				
	(a) when sand cement mortar is used in bed	% sq.m	1.Grey Cement 2.White Cement 3.Coarse sand 4.Pigment	1.114 0.308 2.4 31	cu.m. cu.m. cu.m. kg
	(b) when lime mortar is used in bed	% sq.m	1.Unslaked Lime 2.Surki 3.Grey Cement 4. White cement 5 Pigment	5.65 2.67 0.308 0.308 31	Quintals cu.m. cu.m. cu.m. kg
71(A)	Plaster with composite Mortar of cement, lime and sand with (1:2:9)				
	(a)35 mm thick	% sq.m	Cement	0.455	cu.m.
	(b)25 mm thick	% sq.m	Cement	0.325	cu.m.
	(c)20 mm thick	% sq.m	Cement	0.260	cu.m.
	(d)15 mm thick	% sq.m	Cement	0.200	cu.m.
71(B)	Plaster with composite Mortar of cement, lime and sand with (1:1:6)				
	(a)20 mm thick	% sq.m	Cement	0.390	cu.m.
	(b)15 mm thick	% sq.m	Cement	0.300	cu.m.
	(c)10 mm thick	% sq.m	Cement	0.198	cu.m.
72	Rubble Masonry in cement Mortar				
	(a) 1:6	cu.m.	1.Stone 2.Cement 3.Sand	1.25 0.065 0.385	cu.m. cu.m. cu.m.
	(b) 1:4	cu.m.	1.Stone 2.Cement 3.Sand	1.25 0.09 0.36	cu.m. cu.m. cu.m.

Sl. No.	Description of Items	Unit	Name of materials required	Quantity of materials required	
73	250 mm th. Masonary work with Autoclave aerated concrete blocks of size 625 mm x 250 mm x 125 mm in Cement Mortar (1:6)	cu.m.	1.Cement 2.Sand 3. Autoclave aerated concrete blocks	0.020 0.120 1.05	cu.m. cu.m. cu.m.
74	125 mm thick Autoclave aerated concrete blocks work with its size 625 mm x 250 mm x 125 mm in Cement Mortar (1:4).	% Sq.m	1.Cement 2.Sand 3. Autoclave aerated concrete blocks	0.25 1.00 12.80	cu.m. cu.m. cu.m.
75	100 mm thick Autoclave aerated concrete blocks work with its size 625 mm x 250 mm x 125 mm in Cement Mortar (1:4).	% Sq.m	1.Cement 2.Sand 3. Autoclave aerated concrete blocks	0.19 0.78 9.86	cu.m. cu.m. cu.m.
76	Ordinary Cement concrete (mix 1:2:4) with graded stone chips (6mm nominal size)	cu.m.	1. Stone chips 2.Cement 3.Sand	0.88 0.44 0.22	cu.m. cu.m. cu.m.
77	Masonry work with precast Hollow Concrete Block of size 300mm X 200mm X 150mm with cement mortar (6:1)	cu.m.	1.Cement 2.Sand 3. precast Hollow Concrete Block		cu.m. cu.m. cu.m.
78	100mm thick Masonry work with precast Hollow Concrete Block of size 400mm X 100mm X 150mm	% Sq.m	1.Cement 2.Sand 3. precast Hollow Concrete Block		Cu.m Cu.m Cu.m

INDIAN STANDARDS FOR BUILDING WORKS BUILDING CONSTRUCTION PRACTICE		
Sl. No	Specification for	Indian Standard No
1	Design of structural Timber (Fourth revision)	883 : 1994
2	Structural use of un-reinforced masonry (Third Revision)	1905 : 1987
3	Brick Work (First revision)	2212 : 1991
4	Construction of floor roof with joists and filler blocks: Part-I with hollow concrete filler block	6061 (Part 1) :1971
5	Construction of floor & roof with joists & filler block: Part 2 with hollow clay blocks joints and hollow clay filler block	6061 (Part 2) :1981
6	Construction of floor and roof with joists & filler blocks: Part 3 precast hollow clay block joints and hollow clay filler block	6061 (Part 3): 1981
7	Construction of floor roof with joists & filler blocks: Part 4 with hollow clay block slab panels	6061 (Part 4): 1981
8	Anti-termite measures in buildings part I constructional measures (First Revision)	6313 (Part 1): 1981
9	Anti-termite measures in buildings : Part 2 pre constructional chemical treatment measures (First Revision) (Amendment No.5)	6313 (Part 2) :1981
10	Antitermite measures in buildings Part 3 Existing buildings (First Revision) (Amendment No. 4)	6313 (Part 3): 1981
11	Installation of Joints in concrete pavements (First revision)	6509 : 1985
12	Construction of reinforced brick and R.B.C floor and roofs	10440 :1983
13	Setting out of buildings	11134 :1984
14	No fines cast in situ cement concrete	12727 :1989
15	Sand for masonary mortars (first revision)	2116 :1980
16	Polysulphide base joints sealants : Part 1 General requirements	11433 (Part 1) : 1985
17	Polysulphide base joints sealants : Part 2 General requirements Methods of test	11433 (Part 2) : 1986
18	Polysulphide based sealants: Part 1. General requirement	12118 (Part 1) : 1987
19	Polysulphide based sealants : Part 2 methods of test	12118 (Part 2) : 1987

BUILDING LIMES AND LIME PRODUCT		
Sl. No	Specification for	Indian Standard No
20	Field slaking of building lime & preparation of putty (2nd revision)	1653 : 1992

21	Preparation of use of lime puzzolona mixture concrete in Building & Roads (1st revision)	5817 : 1992
22	Method of field testing of building lime (1st revision)	1624 : 1986

CEMENT & CONCRETE

23	Plain & reinforced concrete (Fourth revision)	456 : 2000
24	Prestressed Concrete (first revision) (Amendment No 1)	1343 : 1980
25	Concrete structures for the storage of liquids: Part I general requirements (Amendment No 1)	3370 (Part 1) : 1965
26	Concrete structures for the storage of liquids: Part 2 Reinforced concrete structures (Amendment No-2)	3370 (Part 2) : 1967
27	Concrete structure for the storage of liquids: Part 3 Prestressed concrete structures (Amendment No I)	3370 (Part 3) : 1967
28	Concrete structures for the storage of liquids Part 4: Design table (Amendment No. 2)	3370 (Part 4) : 1967
29	Use of immersion vibrators for consolidating concrete (first revision)	3558 : 1983
30	Extreme Weather concreting: Recommended practice for hot weather concreting. (Amendment No. 1)	7861 (Part 1) 1975
31	Extreme Weather concreting: Recommended practice for hot weather concreting. (Amendment No. 1)	7861 (Part 2): 1981
32	Methods of non-destructive testing of concrete : Part 1 Ultrasonic pulse velocity	13311 (Part 1) : 1992
33	Methods of non-destructive testing of concrete: Part 2: Rebound hammer	13311 (Part 2) : 1992
34	Methods of Sampling & analysis of concrete	1199 : 1959
35	Recommended guidelines for concrete mix design	10262 : 1982
36	Concrete slump test apparatus	7320 : 1974
37	Ready mixed concrete (2nd revision)	4926 : 2003.
38	Artificial lightweight aggregates for concrete masonary units	9142 : 1979

CEMENT MATRIX PRODUCT		
Sl. No	Specification for	Indian Standard No
39	Construction of lightweight concrete block masonry	6042 : 1969
40	Concrete masonry units Part I Hollow and Solid concrete blocks (Second Revision) (Amendment No 1)	2185 :(Part 1) : 1979
41	Concrete masonry units Part 2 Hollow and Solid lightweight concrete blocks (first revision)	2185 : (Part 2) : 1983
42	Reinforced concrete fence posts (First Revision)	4996 : 1984

43	Precast concrete coping blocks (First Revision)	5751 : 1984
44	Precast concrete kerbs (first revision)	5758 : 1984
45	Precast reinforced concrete door & window frames (first revision)	6523 : 1983
46	Precast reinforced concrete plant guards	9375 :1979
47	Precast concrete septic tanks	9872 :1981
48	Precast concrete blocks for lintels and sills (Amendment No-I)	9893 :1981
49	Precast concrete manhole covers and frames: Part 1 Covers (Amendment No 3)	12592 (Part 1) : 1988
50	Precast concrete manhole covers and frames : Part 2 frames	12592 (Part 2) : 1991

CLAY PRODUCTS FOR BUILDING

Sl. No	Specification for	Indian Standard No
51	Common burnt clay building bricks (Fifth Revision)	1077 : 1992
52	Heavy duty burnt clay building bricks (Third Revision)	2180 : 1988
53	Burnt clay flat terracing tiles : Part 1 Machine made (Second	2690 (Part 1) : 1993
54	Rev.) Burnt clay flat terracing tiles : Part 2 Hand Made (Second Rev.)	2691 (Part II) : 1992
	Revision) Burnt clay facing bricks (Second Revision) Burnt clay	2691 : 1988
55	paving bricks (Second Revision	3583 : 1988
56		

CONCRETE REINFORCEMENT		
Sl. No	Specification for	Indian Standard No
57	Mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement Part 1 Mild Steel and medium tensile Steel bars (Third Revision)	432 (Part I) : 1982
58	Mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement Part 2 Hard Drawn Steel wire (Third Revision)	432 (Part II) : 1982

CONSTRUCTION MANAGEMENT		
Sl. No	Specification for	Indian Standard No
60	Unified nomenclature of workmen for civil engineering	10302 : 1982

DOOR, WINDOWS AND SHUTTERS		
Sl. No	Specification for	Indian Standard No
61	Aluminium doors, windows and ventilators.	1948 : 1961
62	Aluminium windows for industrial building (Amendment No.1)	1949 : 1961
63	Wooden flush doors shutters (Cellular and hollow core type) : Part 2Particle board and hard board face panels (Third revision)	2191 : (Part 2) : 1983
64	Wooden flush doors shutters (Solid core type) Part-1 Ply wood face	2202 (Part 1) : 1999
65	Wooden flush doors shutters (Solid core type) Part-2 particle board face panels and hard board (Third Revision)	2202 (Part 2) : 1983
66	Steel doors frames (Second Revision) (Amendment No.2)	4351 : 2003
67	Wooden side sliding doors	4962 : 1968
68	Collapsible gate	10521 : 1983

EARTHQUAKE ENGINEERING		
Sl. No.	Specification for	Indian Standard No.
69	Earthquake resistant design & construction of buildings (Second Revision) (Amendment No. 1)	4326 : 1993
70	Criteria for earthquake resistant design of structures (Fourth Revision) (Amendment No. 1)	1893 : 2002
71(a)	Improving earthquake resistant low strength masonry buildings – Guidelines (Amendment No. 1)	13828 : 1993
71(b)	Ductile detailing of reinforced concrete structure subjected to seismic forces	13920 : 1993

FIRE FIGHTING		
Sl. No	Specification for	Indian Standard No
72	Selection, installation and maintenance of automatic fire detection and alarm system (Second Revision)	2189 : 1988
73	Selection installation and maintenance of portable first aid fire extinguishers (Third Revision)	2190 : 1992
74	Installation and maintenance of internal fire hydrants and hose reels on premises (First Revision)	3844 : 1989
75	Selection, Operation and maintenance of special fire fighting appliances: Part:1 combined foam and crash tender	5896 (Part 1) : 1970

FIRE SAFETY		
Sl. No	Specification for	Indian Standard No
76	Fire Safety of building (General) : General Principles of fire grading & classification (First Revision)	1641 : 1988
77	Fire Safety of buildings (General): Details of construction (First Revision)	1642 : 1989
78	Fire safety of buildings (General) : Exposure hazard construction (First Revision)	1643 : 1988

FLOORING, WALL FINISHING & ROOFING		
Sl. No	Specification for	Indian Standard No
79	Chequered Cement concrete tiles specification	13801 : 1993
80	Magnesium oxychloride composition floors (Second Revision)	658 : 1982
81	Laying Bitumen mastic flooring (Second Revision)	1196 : 1978
82	Laying of rubber floors (First Revision)	1197 : 1970
83	Laying, fixing and maintenance of linoleum floor (First Revision)	1198 : 1982
84	Application of cement and cement lime plaster finishes (First Revision)	1661 : 1972
85	Laying in situ terrazzo floor finish (First Revision)	2114 : 1984
86	Application of lime plaster finish (First Revision)	2394 :1984
87	External rendered finishes	2402 :1963
88	Laying in-situ cement concrete flooring (First Revision)	2571 :1970
89	Use of silicate type chemical resistant mortars (First Revision)	4441 1980
90	White washing and colour washing	6278 1971
91	Laying of bitumen mastic flooring for industries handling LPG and other light hydrocarbon products	13074 : 1991
92	Bitumen mastic for flooring (Second Revision)	1195 : 1978
93	Cement concrete flooring Tiles(First Revision)	1237:1980
94	Sand for plaster(Second Revision)	1542:1992

FUNCTIONAL RQUIREMENT IN BUILDINGS		
SL. No.	Specification for	Indian Standard No
95	Sound Insulation of non-industrial buildings(Amendment No. 1)	1950:1962
96	Acoustical design of auditoriums and conference halls (Amendment No. 1)	2526:1963
97	Industrial ventilation of residential buildings(First revision)	3103:1975
98	Noise reduction in industrial buildings	3483:1965
99	Acoustics in buildings	9736:1981
100	Sound Insulation of building and of building elements: part 1 Airborne sound insulation in buildings and of building elements	11050(Part1):1984

101	Sound Insulation of building and of building elements: part 2 impact sound insulation in buildings and of building elements	11050(Part2):1984
102	Rating of Sound Insulation of building and of building elements: part 3 Airborne sound insulation of facade elements and facades	11050(Part3):1984
103	Buildings and facilities for the physically handicapped(first revision)	4963:1987
104	Orientation of buildings:Part1 Non-industrial buildings	7662(Part 1):1974

HILL AREA DEVELOPMENT ENGINEERING		
105	Retaining wall for hill area : Part 1 Selection type of wall	14458 (Part 1) : 1998
106	Retaining wall for hill area : Part 2 Design of retaining / breast walls	14458 (Part 2) : 1997
107	Retaining wall for hill area : Part 3 construction of dry stone walls	14458 (Part 3) : 1998
108	Land slide controls	14680 : 1999

HOUSING		
Sl.No	Specification for	Indian Standard No
109	Design and construction of floors and roofs with precast	13994:1994
110	Design and construction of floors and roofs with prefabricated brick panel	14142:1994
111	Construction of floor and roof with RC channel units	14215:1994
112	precast reinforced concrete planks and joists for flooring	13990:1994
113	prefabricated brick panel and partially precast concrete joists for flooring and roofing	14143:1994
114	precast reinforced concrete channel unit for construction	14201:1994
115	Precast L-panel units for roofing	14241:1994

METHODS OF MEASUREMENT OF WORKS OF CIVIL ENGINEERING		
Sl.No	Specification for	Indian Standard No
116	Measurements of building and civil engineering works: Part 1; Earthwork(fourth revision)	1200(part1):1992
117	Measurements of building and civil engineering works: Part 2 concrete(third revision)	1200(part2):1974
118	Measurements of building and civil engineering works: Part 3 brickwork(third revision)	1200(part3):1976
119	Measurements of building and civil engineering works: Part 4 Stone	1200(part4):1976
120	Measurements of building and civil engineering works: Part 5 form	1200(part5):1982
121	Measurements of building and civil engineering works: Part 6 Refractory work(second revision)	1200(part6):1974
122	Measurements of building and civil engineering works: Part 7 Hardware(Second revision) (Amendment no-2)	1200(part7):1972

123	Measurements of building and civil engineering works: Part 8 Steel	1200(part8):1993
124	Measurements of building and civil engineering works: Part 9 Roof	1200(part9):1973
125	Measurements of building and civil engineering works: Part 10 Ceiling & Lining(Second revision) (Amendment no-2)	1200(part10):1973
126	Measurements of building and civil engineering works: Part 11Paving,floor finishes, dado & skirting(Third revision) (Amendment no-1)	1200(part11):1977
127	Measurements of building and civil engineering works: Part 12 Plastering & Pointing (Third revision)	1200(part12):1976
128	Measurements of building and civil engineering works: Part 13 white washing, colour Washing, distempering & painting of building	1200(part13):1994
129	Measurements of building and civil engineering works: Part 14 Glazing (Third revision)	1200(part14):1984
130	Measurements of building and civil engineering works: Part 15 painting, polishing, varnishing etc. (fourth revision)	1200(part15):1987
131	Measurements of building and civil engineering works: Part 16 laying	1200(part16):1979
132	Measurements of building and civil engineering works: Part 18demolition & dismantling(third revision)	1200(part18):1974
133	Measurements of building and civil engineering works: Part 19 Water	1200(part19):1981
134	Measurements of building and civil engineering works: Part 21 Wood	1200(part 21):1973
135	Measurements of building and civil engineering works: Part 22 Materials	1200(part22):1982
136	Measurements of building and civil engineering works: Part 23 pilling(fourth revision)	1200(part23):1988
137	Measurements of building and civil engineering works: Part 24 Well	1200(part24):1983
138	Measurements of building and civil engineering works: Part 27 Earth	1200(part27):1992
139	Measurements of building and civil engineering works: Part 28 Sound	1200(part28):1992
140	Measurements of plinth, carpet & rentable area of buildings (first revision) (Amendment no-3)	3861:1975

PAINTING, VARNISHING AND ALLIED FINISHES		
Sl No	Specification for	Indian Standard No
141	Painting of ferrous metals in buildings: Part 1 Pretreatment(first revision)	1477(part1):1971
142	Painting of ferrous metals in buildings: Part 2 Painting (first revision)	1477(part2):1971
143	Finishing of wood & wood based materials: Part 1 operations and workmanship	2338(part1):1967
144	Finishing of wood & wood based materials: Part 2 Schedules	2338(part2):1967
145	Painting concrete, masonry and plastered surfaces :Part 1 operations and workmanship (first revision)	2395(part 1):1994
146	Painting concrete, masonry and plastered surfaces :Part 2 Schedules (first revision)	2395(part 2):1994

PUBLIC HEALTH ENGINEERING		
Sl No	Specification for	Indian Standard No
147	Basic requirement for water supply drainage and sanitation (Fourth revision)	1172:1993
148	Building drainage (Second revision)	1742:1983
149	Selection, installation and maintenance of sanitary appliances (Second revision)	2064:1983
150	Water supply in building(Second revision)	2065:1983
151	Installation of septic tanks: Part 1 design, criteria and construction (Second revision)	2470(part 1):1985
152	Installation of septic tanks: Part 2 secondary treatment	2470(part 2):1985
153	Laying of cast iron pipes (Second revision)	3114:1994
154	Ancillary structures in sewerage system: Part 1 Manholes (First revision)	4111(Part 1):1986
155	Ancillary structures in sewerage system: Part 2 flushing	4111(Part 2):1986
156	Laying of glazed stoneware pipes (First revision)	4127:1983
157	Sanitary pipe works above ground for buildings (First revision)	5329:1983
158	Plumbing in multistoried buildings: Part 1Water Supply	12183(part 1):1987
159	Drainage of building‘s basement	12251:1987
SAFETY IN CONSTRUCTION		
Sl No	Specification for	Indian Standard No
160	Steel tubular scaffolding:Part2 Safety regulations for Scaffolding	4014(part 2):1967
161	Preventive measures against hazards at work places: Part 1 falling material hazards prevention	13416(part 1):1992
162	Preventive measures against hazards at work places: Part 2 fall prevention	13416(part 2):1992
163	Preventive measures against hazards at work places: Part3 disposal of debris	13416(part 3):1994
164	Preventive measures against hazards at work places: Part4 timber structures	13416(part 4):1994
165	Preventive measures against hazards at work places: Part5 timber structures	13416(part 5):1994

STONES		
Sl. No	Specification for	Indian Standard No
166	Marble (blocks, slabs and titles)	1130:1969
167	Sandstone (slabs and titles)(First revision)	3622:1977

STRUCTURAL SAFETY

Sl. No	Specification for	Indian Standard No
168	Design loads (other than earthquake) for buildings and	875(part 1):1987
169	Design loads (other than earthquake) for buildings and	875(part 2):1987

STRUCTURAL SECTIONS

Sl. No	Specification for	Indian Standard No
170	Aluminium bulb angles Marine application (first revision)	6449:1987
171	Aluminium channels (first revision)	3921:1985
172	Aluminium equal leg angles (first revision)	3908:1986
173	Aluminium I-beam(first revision)	5384:1985
174	Aluminium T-bars for Marine application(first	6475:1987
175	Aluminium T sections (first revision)	6445:1985
176	Aluminium unequal leg angles (first revision)	3909:1986
177	Light Gauge structural steel sections (revised)	811:1987

TIMBER AND TIMBER STORES

Sl. No	Specification for	Indian Standard No
178	Door and Window shutters and frames	12896:1990
179	Furniture and cabinets	13662:1993
180	Bamboos for structural purposes	9096:1979
WATER PROOFING AND DAMP PROOFING		
Sl. No	Specification for	Indian Standard No
181	Lime concrete for a water proofed roof finish (second revision)	3036:1992
182	Application of bituminous mastic for water proofing of	4365:1967
183	Water proofing of underground water reservoirs and swimming pools (first revision)	6494:1988
184	Damp-proofing using bituminous mastic	7198:1974
185	Bituminous mastic for use in water proofing of roofs (first revision)	3037:1986
186	Silicon based water repellents	12027:1987

For overall guidance and reference latest edition of National Building Code of India, may be consulted.

Specifications (Sanitary & Plumbing Works)

The Works shall be executed in accordance with these Specifications which comprises the following Sections:

I. Section A - General Specifications (Sanitary & Plumbing Works)
II. Section B - Technical Specifications (Sanitary & Plumbing Works)

SECTION A - G E N E R A L C O N D I T I O N S (SANITARY & PLUMBING WORKS)
(Including Mode of Measurement)

If in connection with Sanitary & Plumbing Works etc. any item or items of work relating to Building works, Road works and Carriage crop up, the contactor shall if so directed, have to execute such items. In respect of such items the Schedule of Rates for Building Works, Road Works and Carriage for the current year including general conditions, general specifications etc. operative in the area will be applicable.

If not specifically indicated in the items themselves, the rates appearing in this schedule are inclusive of cost of all supply, carriage, handling, fitting, fixing, toll charges, ferry charges etc. and all other incidental works involved in any floor, at any level including all necessary jointing materials, scaffolding to any height, hire charges of tools and plants, and all helping materials.

All cutting holes, chases, trenches etc. at any place necessary in connection with works as per items in this schedule and subsequent mending damage as per original specification and as directed are included in the rates and shall not be paid extra unless otherwise expressly specified.

4. The contractor shall be responsible for the safe custody and proper maintenance in original condition of all sanitary and plumbing works till all works are completed and formally handed over to the Department.

5. Before application of rate, quantities of all items with metric unit must be calculated with correction 2 places of decimal when the rate is up to Rs. 100.00 and 3 places of decimal when the rate is above Rs. 100.00.

6. If not mentioned otherwise in the items themselves, all materials including fitting shall conform to standard laid down by the Bureau of Indian Standards and bear I.S.I. mark where such standardization has been made. All other materials must be of best quality conforming to the standard laid down by the I.S.I. and being approved by the Engineer-in-Charge.

7. Unless otherwise specifically mentioned in the items of this Schedule, all G.I. Pipes are to be normally of TATA make, all sanitary wares and faucets should be of Parry ware, Hindware, Neycer, CERA, Jaquar, Marc (1st Quality) or should bear I.S.I. certification marks and in cases where term "approved brand/approved make/approved quality" appears shall invariably mean "ISI marked material approved by Engineer-in- Charge.".

SECTION B - TECHNICAL S P E C I F I C A T I O N (SANITARY & PLUMBING WORKS)

EXECUTION

General -- All works shall be carried out in proper manner. Items of works not covered by the following shall be carried out as per direction of the Engineer-in-Charge and to his satisfaction. Unless otherwise specified in this Section or in the description of item the cost of all stages of works mentioned hereunder shall be deemed to have been included in the rates of items provided in the Schedule.

1. G.I. Tank:
Before acceptance of any G.I. Tank, proper scrutiny as to the thickness of the sheets should be made. Due check should also be made on each face of the tank by punching holes to be subsequently mended and hermetically sealed by the contractor without any extra charge.
2. Flushing Cistern:
Flushing Cistern of I.P.W.C. & E.P.W.C. will be 10 litre pull and let low down cistern types as specified. Flush pipes for urinals shall be made of G.I. Pipes of Polythene pipes with fittings or lead pipes as may be directed by the Engineer-in- Charge. Flushing cistern of urinals shall be of approve type. All flush pipes and cisterns shall have to be painted with 2 coats of paint of approved shade and brand over a coat of approved primer. The inlets of sanitary fittings and equipments to be connected with the adjacent distribution line (water supply) with requisite lengths and size of P.V.C. connection pipe is to be provided with necessary unions at both ends within the quoted rates of respective items.
3. Fittings for G.I. Pipes:
All G.I. Fittings will be of approved make. For installation of G.I. pipeline all fittings and specials as may be necessary shall have to be fitted and fixed to the line.
4. Joints:
The joints of pipes, fitting & accessories shall be made as specified and unless otherwise specified, no separate payment shall be allowed.
(i) G.I. Pipes fitting, valves and cocks with jute and white lead paint.
(ii) C.I. Soil pipes & fittings: The jointing shall have to be done by either of the two methods as specified:
(a) The half of the depth of the annular space between spigot and socket shall be packed with spun yarn and the remaining half to be filled up with molten lead well caulked with caulking tools.
(b) The half of the depth of the annular space between spigot and socket shall be packed with tarred gasket and the remaining half will be filled up three quarters with void and the top quarter with cement mortar (4:1) and shall be finished beveled at 45o.
(i) Stone Ware Pipes &Fittings : The half of the depth of the annular space between socket and spigot shall be packed with tarred gasket and the remaining half shall be filled up with Cement mortar (3:1) & shall be finished beveled at 45o.

(ii) C.I.. Water mainline: The jointing shall have to be done with Tyton joints as per manufacture's specifications.

5. Test of pipelines valves and cocks:
The pipelines, valves and cocks shall be tested at the contractor's expenses for which no extra payment shall be allowed. The available water supply sources may however be allowed to be utilized for testing but in absence of any such arrangement the contractor shall have to conduct the following tests.
(i) C.I. Water main pipe line: The pipe shall have to be tested at least for designed working pressure.
(ii) C.I. soil pipe line: Smoke test.

(iii) S.W. Pipe line: All sections between two inspection pits shall have to be tested separately. The funnel shall be at least 1.3 meter above the soffit of the S.W. pipe at the upper inspection pit.

Any defect or defects detected during testing shall be rectified at the contractor's expenses.

6. Septic Tank:

Construction of septic tank shall be done as per approved design. After completion of the tank, the tank shall have to be filled up with clear water after removing any foreign materials from the inside of the tank, if any. No separate payment shall be allowed on this account.

7. Painting:

All pipes (G.I., C.I. water main and soil) and fittings shall have to be painted outside with two coats of paint of approved brand and shade.

MODE OF MEASUREMENT

1. G.I., C.I. Water main & Soil, S.W. Pipe line:

All the pipe lines shall be measured in fitted condition along the central line of the exposed surface.

2. Strainer:

The strainer as used in the Tube-Well shall be measured in fitted condition along the central line of the exposed surface.

3. Boring of Tube-Well:

Boring for tube-wells always shall have to be done by the contractor's pipe. Generally, measurement of the boring will be taken on the basis of the finished length of the tube well from the ground line. If for some special reasons, boring depth is required to be more than the finished length of the tube-well previous permission of Engineer-in-Charge is to be taken to get the payment of extra boring in excess of the finished length

BANK GUARANTEE FOR ADVANCE PAYMENT

To: _____ *[name of Employer]*
_____ *[address of Employer]*
_____*[name of Contract]*

Gentlemen:

In accordance with the provisions of the Conditions of Contract, sub-clause 3.1 of the above-mentioned Contract, _____ *[name and address of Contractor]* (hereinafter called "the Contractor") shall deposit with _____-_____ *[name of Employer]* a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____ *[amount of guarantee]*[1] _____ *[in words]*.

We, the _____ *[bank or financial institution]*, as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ *[name of Employer]* on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding _____ [amount of guarantee][3] _____ *[in words]*.

We further agree that no change or addition to or other modification of the terms of the Contract or of Works to be performed there under or of any of the Contract documents which may be made between _____ *[name of Employer]* and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ *[name of Employer]* receives full repayment of the same amount from the Contractor.

Yours truly,

Signature and seal: _____
Name of Bank/Financial Institution: _____
Address: _____
Date: _____

[3] An amount shall be inserted by the bank or financial institution representing the amount of the Advance Payment, and denominated in Indian Rupees.

PERFORMANCE BANK GUARANTEE

(To be given from a nationalized or scheduled bank in India)

To: _____ *[name of Employer]*
_____ *[address of Employer]*

WHEREAS _____ *[name and address of Contractor]* (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ *[name of Contract and brief description of Works]* (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of _____ *[amount of guarantee]*[1]_____ *[in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ *[amount of guarantee]*[1] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until 28 days from the date of expiry of the Defects Liability Period.

Signature and seal of the guarantor _____

Name of Bank _____

Address _____

Date _____

Form of Bid Security - Bank Guarantee

[Guarantor letterhead or SWIFT identifier code]

Bank Guarantee No……. [Insert guarantee reference number]
Date……. [Insert date of issue of the guarantee]

WHEREAS, _____ [name of Bidder][4] (hereinafter called "the Applicant") has submitted his Bid dated _____ [date] or will submit his Bid for the construction of _____ [name of Contract] (hereinafter called "the Bid") under Request for Bids No……. [Insert number] (Hereinafter called "the RFB")

KNOW ALL PEOPLE by these presents that We _____ [name of bank] of _____ [name of country] having our registered office at _____ (hereinafter called "the Bank") are bound unto _____ [name of Employer] (hereinafter called "the Employer") in the sum of _____ [5]for which payment well and truly to be made to the said Employer the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 20____.

THE CONDITIONS of this obligation are:

1. If after Bid opening the Applicant (a) withdraws his bid during the period of Bid validity specified in the Letter of Bid,("the Bid Validity Period"); or (b) does not accept the correction of the Bid Price pursuant to ITB 36;

Or

2. If the Applicant having been notified of the acceptance of his bid

By the Employer during the period of Bid validity:

a fails or refuses to execute the Contract Agreement in accordance with the Instructions to Bidders, if required; or

[4]*Insert name of the Bidder, which in the case of a joint venture shall be (a) the name of the joint venture that submits the bid if the JV has been constituted into a legally enforceable JV, or (b) the names of all future members of the JV as named in the letter of intent to execute the JV Agreement submitted by the bidder along with its bid.*

[5]*The Applicant should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 19.1 of the Instructions to Bidders.*

b Fails or refuses to furnish the Performance Security, in accordance with the Instruction to Bidders.

we undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the four conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date _____ 26days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE _____ SIGNATUREOFTHEBANK _____

WITNESS _____ SEAL _____

_____

____ [Signature, Name, and address]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[26] *45 days after the end of the validity period of the Bid*