GOVERNMENT OF MIZORAM
MIZORAM HEALTH SYSTEMS STRENGTHENING PROJECT (MHSSP)

PROCUREMENT OF SMALL WORKS UNDER
NATIONAL OPEN COMPETITIVE PROCUREMENT

REQUEST FOR BIDS (RFB) NO: MHSSP/CW/RFB-2022/03

(One-Envelope Bidding Process with e-Procurement)

Name of Work: *Strengthening and upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram.*

Officer Inviting Bids: *Project Director, Mizoram Health Systems Strengthening Project. Health & Family Welfare Department, Government of Mizoram MG Road, Tuikhuahtlang, Aizawl, Mizoram*

Period of sale of bidding document	From 21.11.2022 – 05.01.2023
Time and Date of Pre-bid Meeting	11:00 AM, 6.12.2022
Last date and time of receipt of bids	12:00 Noon, 05.01.2023
Time and date of opening of bids	1:00 PM, 05.01.2023
Place of opening of bids	Office of the Project Director, MHSSP Office, 2nd Floor - Conference Room, MG Road Tuikhuahtlang, Aizawl, Mizoram

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GOVERNMENT OF MIZORAM
MIZORAM HEALTH SYSTEMS STRENGTHENING PROJECT (MHSSP)

REQUEST FOR BIDS (RFB)

E-Procurement Notice

(One-Envelope Bidding Process with e-Procurement)

NATIONAL OPEN COMPETITIVE PROCUREMENT FOR SMALL WORKS

Name of Project: Mizoram Health Systems Strengthening Project (MHSSP)
Loan No. : 9227-IN
RFB Reference No.:MHSSP/CW/RFB-2022/03
Date: 21.11.2022

To

_____
_____
_____
_____

Dear Sirs,

Subj.: Invitation for Quotation for Strengthening and upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram.

1. The Government of India has received a credit from the International Development Association / loan from the International Bank for Reconstruction & Development towards the cost of "**Mizoram Health Systems Strengthening Project (MHSSP)"** and intends to apply a part of the funds to cover eligible payments under the contracts for construction of works for subject work. Bidding is open to all bidders from eligible source countries as defined in the "Procurement Regulations for IPF Borrowers, July 2016, Revised November 2020("Procurement Regulations"). Bidders from India should, however, be registered with the Government of Mizoram or other State Governments /Government of India PWD in appropriate class, or State/Central Government Undertakings. **Bidders are advised to note the minimum qualification criteria specified in Clause 3 of the Instructions to Bidders to qualify for the award of the contract.** In addition, please refer to paragraphs 3.14 and 3.15 of the "Procurement Regulations" setting forth the World Bank's policy on conflict of interest.

2. **The Health and Family Welfare Department, Government of Mizoram** (Implementing Agency) invites online bids for the construction of works detailed in the table below. The bidders may submit bids for the works indicated therein.

3. Bidding documents are available online on https://mizoramtenders.gov.in (website) from 21.11.2022 to 05.01.2023 for a non-refundable fee as indicated in the table below, in the form of Demand Draft (DD) on any Scheduled/Nationalized bank located in India payable at Mizoram in favour **Mizoram Health Systems Strengthening Project** (The demand draft is to be submitted subsequently as per the procedure described in paragraph 7 below). The bidders would be responsible for ensuring that any addenda, Corrigendum, extension available on the website is also downloaded and incorporated. Interested bidders may obtain further information at the address given below during office hours or may request clarifications online through email to procurement@pmu.mzhssp.in.

4. Bids must be accompanied by a bid security of the amount specified for the work in the table below, drawn in favour of **Mizoram Health Systems Strengthening Project.** Bid security will have to be in any one of the forms as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid. Bids should be valid for 45 days after the deadline date specified for bid submission. Procedure for submission of bid security is described in Para 7 below.

5. A pre-bid meeting will be held on 06.12.2022 at 11:00 AM at the "**office of Project Director,** *Mizoram Health Systems Strengthening Project*, **Health & Family Welfare Department, MG Road, Tuikhuahtlang, Aizawl, Mizoram" and also by online (Meeting link is given below)** to clarify the issues and to answer questions on any matter that may be raised at that stage .

   Pre-Bid Meeting Link: https://meet.google.com/ybm-zkqv-pey

6. Bids must be submitted online on https://mizoramtenders.gov.in (website) on or before 12 noon, 05.01.2021 and will be publicly opened online on the same day at 1:00 PM, in the presence of the bidders who wish to attend. Any bid or modifications to bid (including discount) received outside e-procurement system will not be considered. Record of bid opening will be electronically shared with bidders. If the office happens to be closed on the date of opening of the bids as specified, the bids will be opened on the next working day at the same time and venue. The electronic bidding system would not allow any late submission of bids.

7. The Employer shall not be held liable for any delays due to system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, The Employer shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to this bid.

8. Other details can be seen in the bidding document.

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TABLE

Package No.	Name of work	Bid Security (Rs.)	Cost of document (Rs.)	Period of completion
1.MHSSP/ CW/ RFB-2022/03	Strengthening and upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram.	6.68 Lakhs	2,500	15 months

Signature
(Employer)

Name: Project Director
Address: Office of the Project Director
Mizoram Health Systems Strengthening Project
Health & Family Welfare Department,
Tuikhuahtlang, Aizawl, Mizoram
Pin code: 796001

Tel. No: 7005298129
Email: procurement@pmu.mzhssp.in

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Checklist for reference:

(This is only reference and ready recknor. The bidder is requested to provide all the relevant documents as stipulated in the bid document)

S. N.	Documents needed from the bidder
1	Registration of the bidder
	1. Bidder's legal name
	2. Bidder`s country of constitution
	3. Bidder`s year of constitution
	4. Bidder`s legal address in country of constitution
	5. Bidder`s authorized representative (name, address, telephone numbers, fax numbers, email address)
2	Experience Documentary Evidence as per Clause 3
3	1. Power of Attorney to sign the bid document
	2. Agreement with Sub Contractor (If applicable)
4	Letter of Bid as per performa in Section B
5	Technical Proposal Form as per performa in Section B
7	Code of Conduct: Environmental, Social, Health and Safety (ESHS) as per performa in Section B
8	Forms for Personnel as per performa in Section B
9	Resume of proposed personnel as per performa in Section B
	1. Project Manager
	2. Site Engineer
	3. Environmental, Health& Safety Engineer and others
10	Forms for Equipment
11	Bidder information Form as per performa in Section B Qualification Information
12	Historical Contract Non-Performance, Pending Litigation and Litigation History as per performa in Section B Qualification Information
13	Environmental, Social, Health, and Safety Performance Declaration as per performa in Section B Qualification Information
14	Historical Financial Performances The Bidder should also submit these details of for Sub Contractor as per performa in Section B Qualification Information
15	Form for Current Contract Commitments/Works in Progress as per performa in Section B Qualification Information
16	Bill of Quantities submitted online only
17	Format for evidence of access to or availability of cash flow as per performa Section B Qualification Information
18	Annual Construction turn over as per as per Clause 3
19	Balance sheet and Profit & Loss statement as per Clause 3
20	General construction experience form as per Clause 3
21	Similar construction experience as per Clause 3
24	Tender Document Fees
25	Bid security

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Instructions to Bidders

SECTION - A

1. Scope of Works

The Project Director, Mizoram Health Systems Strengthening Project (Employer) invites bids for the construction of works as detailed in the table given below through the e-procurement portal https://mizoramtenders.gov.in *(*

Package No.	Brief Description of the Works	Period of Completion
1.MHSSP/CW/RFB-2022/03	**Strengthening and upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram. (The work will be Strengthening and upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram. for Mizoram State Health Care Society (MSHCS. The works will include civil, electrical installation, plumbing etc.)**	**15 Months**

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

2. Qualification of the bidder: The bidder shall provide qualification information which shall include:-

1. total monetary value of construction works performed for each year of the last 3 years;
2. Report on his financial standing; and
3. Details of any litigation, current or during the last 3 years ending on last date of bid submission, in which the bidder is involved, the parties concerned and disputed amount or awards in each case.

3. To qualify for award of the contract the bidder:-

(a) should have satisfactorily completed as a prime contractor at least one Similar work of value not less than as mentioned below in the last three years ending on last date of bid submission;
Similar works means "Building Construction & maintenance work for Government Institutions/colleges.".

1 contract of minimum value = **Rs. 534 lakh 'OR'**
2 contracts, each of minimum value = **Rs. 334 lakh 'OR'**
3 contracts, each of minimum value =**Rs. 267 lakh**

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(b) should have achieved in at least one year an annual financial turnover (in civil engineering construction works of similar nature only) of value not less than Rs334 lakh in the last three years ending on last date of bid submission;

(c) should not have been debarred or suspended on the date of bid opening by the World Bank Group.

(f) no contract should have been suspended or terminated and/or performance security called by an employer(s) for reasons related to Environmental, Social (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), Health, or Safety (ESHS) requirements or safeguards in the past five years ending on last date of bid submission.

(g) availability of liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of not less than Rs 334 lakh.

3.1 Eligibility - Conflict of Interest*

Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder:

i. directly or indirectly controls, is controlled by or is under common control with another Bidder; or

ii. receives or has received any direct or indirect subsidy from another Bidder; or

iii. has the same legal representative as another Bidder; or

iv. has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

v. any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the Contract implementation;

vi. has a close business or family relationship with the concerned professional staff of the Borrower or of the project implementing agency.

(* for further details refer to paragraphs 3.14 and 3.15 of the "Procurement Regulations" setting forth the World Bank's policy on conflict of interest)

4. Bid Price

- The contract shall be for the whole works as described in drawings and technical specifications. Corrections, if any, can be carried out by editing the information before electronic submission on e-procurement portal.
- All duties, taxes and other levies payable by the contractor under the contract shall be included in the total price.
- The rates quoted by the bidder shall be fixed for the entire duration of the contract and shall not be subject to adjustment on any account.
- **FINANCIAL BID**: To be submitted through e-portal https://mizoramtenders.gov.in/ **only**. No hard copy is accepted. The Bidder shall fill on the e-procurement portal, the prices for the Works in conformity with the Bidding Documents.

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5. Submission of Bids

5.1 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 bid.

5.2 Each bidder shall submit only one bid. Bidders should not contact other competing bidders in matters relating to this bid.

5.3 The set of bidding document comprise of the following:

i. Layout Drawings of the works;
ii. Structural Details;
iii. Bill of Quantities;
iv. Technical Specifications;
v. Instructions to Bidders; and
vi. Draft Contract Agreement format which will be used for finalizing the agreement for this Contract.

5.4 Response of the Employer including a description of the inquiry, but without identifying its source, shall be uploaded on the e-procurement portal for information of all Bidders. It is the bidder's responsibility to check on the e- procurement portal, for any clarifications or amendments to the bidding documents.

5.5 The bid submitted by the bidder shall comprise the following:-

(a) Bid in the format given in Section B.
(b) Completed Bill of Quantities to be submitted **online only**;
(c) Qualification information form given in Section B duly completed.
(d) Bidder's confirmation 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[1]), that will apply to its employees and all subcontractors.
(e) Bid Security, in original form for the amount Rs 6.68 Lakhs in one of the following forms:

A. A bank guarantee issued by a Nationalized/Scheduled bank located in India in the form given in Section B; or

B. Certified cheque or Bank draft payable to Mizoram Health Systems Strengthening Project.

C. Fixed Deposit/Time Deposit certificates issued by a Nationalized/Scheduled Bank located in India for equivalent or higher values are acceptable provided it is pledged in favour of Mizoram Health Systems Strengthening Project and such pledging has been noted and suitably endorsed by the bank issuing the deposit certificate**.**

5.6 (a) The Letter of Bid and all documents listed in Clause 5.5, shall be prepared using the relevant forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the

[1] If considered necessary, the Employer may attach minimum requirements for ESHS Management Strategies and Implementation Plans and ESHS Code of Conduct. A sample guidance note is attached at the end of the document.

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information requested. For this purpose, the bidders shall fill up online, the forms that are available for online filling on the e-procurement portal. The rest of the forms shall be download by the bidders and filled up.

(b) Bids shall be submitted online on the e-procurement system specified in ITB Clause-1. Detailed guidelines for viewing bids and submission of online bids are given on the website. Any bidder can logon to this website and view the RFB and details of works for which bids are invited. However, every bidder has to enrol/register in the website and should have valid Digital Signature Certificate (DSC) in the form of smart card/e-token obtained from any authorised certifying agency for class of DSC in Class III of DSC. The bids submitted online should be signed electronically with a class III Digital Certificate to establish the identity of the Bidder submitting the bid online The bidder should register in the website using the relevant option available. Then the Digital Signature registration has to be done with the e-token, after logging into the website. The bidder can then login the website through the secured login by entering the password of the e-token & the user id/ password chosen during registration. After getting the bidding documents, the Bidder should go through them carefully and submit the specified documents, alongwith the bid, otherwise the bid will be rejected.

(c) The completed bid comprising of documents indicated in ITB 5.5, should be uploaded on the e-procurement portal along with scanned copies of requisite certificates and scanned copies of the bid security and demand drafts for cost of bid document and registration on e-procurement website. All documents are required to be signed digitally by the bidder. The system generates a unique bid identification number, time stamped as per server time, as the acknowledgement of bid submission.

(d) Any bid or modifications to bid (including discount) received outside e-procurement system will not be considered.

5.7 Bids must be uploaded online not later than the deadline for submission of bids specified in the RFB viz. time12 Noon, 5th January, 2023). A bidder may modify his bid any number of times by using the appropriate option for bid modification on the e-procurement portal, before the deadline for submission of bids. No additional payment towards the cost of bid document is required for bid modifications. A bidder may withdraw his bid by using the appropriate option for bid withdrawal, before the deadline for submission of bids. If a bid is withdrawn, re-submission of the bid is allowed.

5.8 The e-procurement system would not allow any late submission of bids after due date & time as per server time.

5.9 **Submission of Original Documents**: The bidders are required to submit the below mentioned to the office specified in the RFB, before the bid submission deadline, either by registered/speed post/courier or by hand, failing which such bids will be declared non-responsive, and shall be rejected.

(i) original demand drafts towards the cost of bid document and registration on e-procurement website (if not previously registered) (as per RFB) and hard copy to the employer's address on or before 12 noon, 05.01.2023 ;

(ii) original bid security in approved form,
(iii) **One Original Hard copy** of bids

6. Validity of Bid

Bid shall remain valid for a period not less than 90 days after the deadline date specified for submission. If a Bidder withdraws/modifies/substitutes its bid during the period of bid validity specified by the Bidder on the Letter of Bid, the Bid Security may be forfeited.

7. Online Public Opening of Bids

Bids received in the e-procurement system will be publicly opened online in the Office of the Project Director, Mizoram Health Systems Strengthening Project, Tuikhuatlang, MG Road, Aizawl, Mizoram (Employer), in the presence of bidders or their representatives who choose to attend, on the date and time specified in sub-clause 5.7 above. This could also be viewed by the bidders online.

8. **Information** relating to evaluation of bids and recommendations for the award of contract shall not be disclosed to bidders or any other persons not officially concerned with the process until the award to the successful bidder is announced.

9. Evaluation of Bids

9.1 Correction of Arithmetical Errors

Bids determined to be substantially responsive shall be checked for any arithmetic errors. Errors shall be corrected as follows:

(a) where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern;

(b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, unit rate as quoted shall govern; and

(c) the amount stated in the Bid shall be adjusted in accordance with the above procedure for the correction of errors

If the Bidder does not accept the corrected amount, the Bid shall be rejected, and the Bid Security may be forfeited.

9.2 The Employer will evaluate and compare the bids determined to be substantially responsive i.e. which

(a) meet the qualification criteria specified in clause 3 above;

(b) are properly signed; and

(c) conform to the terms and conditions, specifications and drawings without material deviations.

10. Award of contract

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The Employer will award the contract to the successful bidder whose bid has been determined to be the Most Advantageous Bid. This is the bid that meets the specified Qualification Criteria and has been determined to be (a) substantially responsive to the bidding document; and (b) the lowest evaluated cost.

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

10.2 The successful bidder will be notified of the award of contract by the Employer prior to expiration of the bid validity period.

10.3 The Bid security of unsuccessful bidders will be returned as promptly as possible upon the successful Bidder's signing the contract and furnishing the performance security pursuant to ITB 11.

11. Performance Security

Within 15 days of receiving letter of acceptance, the successful bidder shall deliver to the Project Director, Mizoram Health Systems Strengthening Project (Employer) the performance security and Environment & Social Security (either a bank guarantee or a bank draft in favour of the Mizoram Health Systems Strengthening Project) for an amount equivalent of 5% and 1 % respectively of the contract price. The Performance Security shall be valid until a date 28 days after the date of issue of the Certificate of Completion. Failure of the successful Bidder to furnish performance security and Environment & Social Security and sign the agreement within the period stipulated shall constitute sufficient grounds for annulment of award and forfeiture of the Bid Security, in which case the Employer may make the award to the Bidder offering the next Most Advantageous Bid or issue a new RFB.

12. Defects Liability:

The "Defects Liability Period" for the work is 1 (One) Year from the date of taking over possession. During this period, the contractor will be responsible for rectifying any defects in construction free of cost to the Employer.

13. Supply of all construction materials including cement and steel as per the specifications (ISI certification marked goods wherever available) shall be the responsibility of the contractor.

14. Fraud and Corruption

The World Bank requires compliance with the Bank's Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in the WBG's Sanctions Framework, as set forth in Section C. In further pursuance of this policy, bidders shall permit and shall cause their agents (whether declared or not), sub-contractors, sub-consultants, service providers, suppliers and their personnel, to permit the Bank to inspect all accounts, records and other documents relating to any initial selection

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process, prequalification process, bid submission, proposal submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Bank.

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SECTION - B

- **Format for Qualification Information.**
- **Format for Letter of Bid**
- **Environmental and Social (E&S) Performance Declaration**
- **Forms for Personnel- FORM PER 1**
- **Forms for Personnel- FORM PER 2**
- **Format of Letter of Acceptance.**
- **Draft Agreement form for Construction through Item rate Contract**

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QUALIFICATION INFORMATION

1 For Individual Bidders

1.1 Principal place of business: _____

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

1.2 Total value of Civil** Engineering construction work performed in the last three years (in Rs. Lakhs)

2019-2020 _____
2020-2021 _____
2021-2022 _____

1.3 Work performed as prime contractor (in the same name) on works of a similar nature over the last three years ending on last date of bid submission. Similar works means "Building Construction & maintenance work for Government Institutions/colleges."

Project Name	**Name of Employer**	**Description of work**	**Contract No.**	**Value of contract (Rs. Lakhs)**	**Date of issue of work order**	**Stipulated period of completion**	**Actual date of completion**	**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. Lakh)**	**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 Engineer concerned.
** Modify as appropriate.

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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 requirement 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.

Other party(ies)	Employer	Cause of dispute	Amount involved	Remarks showing present status

1.8 Key Personnel

The Bidder must demonstrate that it will have suitably qualified (and in adequate numbers) minimum Key Personnel, as described in the Table below, that are required to perform the Contract.

The Bidder shall provide details of the Key Personnel and such other Key Personnel that the Bidder considers appropriate, together with their academic qualifications and work experience. The Bidder shall complete the relevant Forms in Section IV, Bidding Forms.

The Contractor shall require the Employer's consent to substitute or replace the Key Personnel (reference the Particular Conditions of Contract 9.1).

Key Personnel

Item No.	Position/ specialization	Relevant academic qualifications	Minimum years of relevant work

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			experience
1	Construction Manager (1)	B E (Civil) / Diploma (Civil) Engineering	5/8 years
Suitable experts in the following specializations			
2	Site Engineer (1)	B E (Civil) / Diploma (Civil) Engineering	2/3 years
3	Environment, Health and Safety Engineer (1)	Graduate in Civil or Environmental Engineering with specialization and/or additional qualification in Occupational Health and Safety.	2 years
4	[*Social Specialist*]	Master's in Sociology/Anthropology/ Social work/ Social Science/ Social Development	3 years of monitoring and managing risks related to Social issues
5	Sexual Exploitation, Abuse and Harassment Expert *[Where a Project SEA risks are assessed to be substantial or high, Key Personnel shall include an expert(s) with relevant experience in addressing sexual exploitation, sexual abuse and sexual harassment cases]*	Degree in a field relevant to gender studies, social sciences, international relations or related field. Working experience in the field of gender and protection, with experience in SEA/SH and/or GBV prevention, risk mitigation .	3 years of monitoring and managing risks related to gender-based violence, relevant experience in addressing issues related to sexual exploitation, sexual abuse and sexual harassment
6	[*add others as appropriate*]		

* To be provided in format below (Key Personnel)

The Bidder must not have in his employment:

[i] the near relations (defined as first blood relations, and their spouses, of the bidder or the bidder's spouse) of persons of the following Government Departments.

……..
……..
…….….

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[ii] without Government permission, any person who retired as gazetted officer within the last two years.

[*Note:*

The managerial and technical competence of a contractor is largely related to the key personnel on site. The extent to which the Bidder should demonstrate having staff with extensive experience should be limited to those requiring critical operational or technical skills. The criteria should therefore refer to a limited number of such key personnel, for instance, the project or contract manager and others working under the project manager who will be responsible for major components (e.g. specialized in dredging, piling, earthworks, ES obligations, as required for each particular project). Criteria of acceptability should be based on:

(a) a minimum number of years of experience in a similar position; and

(b) a minimum number of years of experience and/or number of comparable projects carried out in a specified number of preceding years.]

1.9 Equipment

The Bidder must demonstrate that it will have access to the key Contractor's equipment listed hereafter per Lot:

No.	Equipment Type and Characteristics	Minimum Number/ Quantity required
1	Jack Hammer	1
2	Dump Truck	1
3	Concrete Vibrator	2
	Concrete grouting machine	2
	Concrete Mixer Machine with Weight Batcher (RM800 or equivalent)	1
	Builders Hoist	1
	Scaffolding	300 Sq. M
4	Any other equipment (contractor may add)	

[NOTE:

Based on the studies, carried out by the Project Manager the minimum suggested major equipment to attain the completion of works in accordance with the prescribed construction schedule is shown in the above list. The bidders should, however, undertake their own studies and furnish with their bid, a detailed construction planning and methodology supported with layout and necessary drawings and calculations (detailed) as stated in Section IV to allow the employee to review their proposals. The numbers, types and capacities of each plant/equipment

shall be shown in the proposals along with the cycle time for each operation for the given production capacity to match the requirements.]

1.10 Contract(s) suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental, Social (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), Health, or Safety (ESHS) performance during the last five years.

Contract(s) suspended or terminated by an Employer(s)			
Year	Contract Identification, Name and address of the Employer, and reasons for suspension or termination	Amount of suspended or terminated portion of contract (Rs)	Total Contract Amount (Rs)
Performance Security called by an employer(s)			
Year	Contract Identification, Name and address of the Employer, and reasons for calling of performance security		Total Contract Amount (Rs)

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LETTER OF BID

RFB No: …….
Date of Bid Submission: …….

To:

Subject : Construction of .....
.....

Sir,

We have no reservations to the Bidding Document, and offer to execute the Works referred above in accordance with the Conditions of Contract enclosed therewith at a total Fixed Contract Price of -

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

This bid and your written acceptance of it shall constitute a binding contract between us. We understand that you are not bound to accept the lowest or any bid you receive.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption.

We hereby confirm that this bid is valid for 45 days as required in Clause 6 of the Instructions to Bidders.

We meet the eligibility requirements and have no conflict of interest in accordance with ITB 3.1

We have not been currently debarred or suspended by the World Bank Group.

Yours faithfully,

Authorized Signature : Date signed: _____

Name & Title of Signatory : _____
Name of Bidder : _____
Address : _____

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

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Forms for Personnel

FORM PER 1 - Key Personnel Schedule

Bidders should provide the names and details of the suitably qualified Key Personnel to perform the Contract. The data on their experience should be supplied using the Form PER-2 below for each candidate.

Key Personnel

1.	**Title of position:**	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
2.	**Title of position:** *[Environmental Specialist]*	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
3.	**Title of position:** *[Health and Safety Specialist]*	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
4.	**Title of position:** *[Social Specialist]*	

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	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
5.	**Title of position: Sexual Exploitation, Abuse and Harassment Expert** *[Where a Project SEA risks are assessed to be substantial or high, Key Personnel shall include an expert with relevant experience in addressing sexual exploitation, sexual abuse and sexual harassment cases]*	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]
6.	**Title of position:**	
	Name of candidate	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g. attach high level Gantt chart*]

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FORM PER 2 - Key Personnel

Name of Bidder

Position [*#1*]: [*title of position from Form PER-1*]		
Personnel information	**Name:**	**Date of birth:**
	Address:	**E-mail:**
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency:*[language and levels of speaking, reading and writing skills]*	
details		
	Address of employer:	
	Telephone:	**Contact (manager / personnel officer):**
	Fax:	
	Job title:	**Years with present employer:**

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

Project	**Role**	**Duration of involvement [From - To]**	**Relevant experience**
[main project details]	*[role and responsibilities on the project]*	*[time in role]*	*[describe the experience relevant to this position]*

Declaration

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I, the undersigned Key Personnel, certify that to the best of my knowledge and belief, the information contained in this Form PER-2 correctly describes myself, my qualifications and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Bid:

Commitment	**Details**
Commitment to duration of contract:	*[insert period (start and end dates) for which this Key Personnel is available to work on this contract]*
Time commitment:	*[insert the number of days/week/months/ that this Key Personnel will be engaged]*

I understand that any misrepresentation or omission in this Form may:

i) be taken into consideration during Bid evaluation;

ii) result in my disqualification from participating in the Bid;

iii) result in my dismissal from the contract.

Name of Key Personnel: [*insert name*]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Bidder:

Signature: _____

Date: (day month year): _____

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Environmental and Social (E&S)

Performance Declaration

[The following table shall be filled by the Bidder]

Bidder's Name: _____*[insert full name]*
Date: _____*[insert day, month, year]*
Specialized Subcontractor's Name: _____*[insert full name]*
RFB No. and title: _____*[insert RFB number and title]*
Page _____*[insert page number]* of _____*[insert page number]* pages

Environmental and Social Performance Declaration in accordance with Section III, Qualification Criteria, and Requirements			
☐ **No suspension or termination of contract**: An employer has not suspended or terminated a contract and/or called the performance security for a contract for reasons related to Environmental & Social (ES) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5. ☐ **Declaration of suspension or termination of contract**: The following contract(s) has/have been suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental & Social (E&S) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5. Details are described below:			
Year	**Suspended or terminated portion of contract**	**Contract Identification**	**Total Contract Amount (Rs.)**
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s) e.g. for gender-based violence; sexual exploitation or sexual abuse breaches]*	*[insert amount]*
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s)]*	*[insert amount]*
...	...	*[list all applicable contracts]*	...

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Performance Security called by an employer(s) for reasons related to ES performance		
Year	Contract Identification	Total Contract Amount (Rs.)
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for calling of performance security: *[indicate main reason(s) e.g. for gender-based violence; sexual exploitation or sexual abuse breaches]*	*[insert amount]*

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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 Bid 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 5% 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 until a date 28 days after the date of issue of the Certificate of Completion i.e. upto _____. 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 Performance Security, contract for the above said work stands concluded.

Yours faithfully,

Authorized Signature
Name and title of Signatory

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Draft Agreement form for Construction through Item rate Contract

ARTICLES OF AGREEMENT

1. 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 _____ [2] (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. Cost of the Contract

The total cost of the works (hereinafter referred to as the "total cost") is Rs. ____ as reflected in Annexure - 1.

3. Payments under the contract:

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

3.1 The Employer shall make mobilization advance payment to the Contractor of the amounts equal to 5% of contract amount. The advance shall be repaid with percentage deductions from the interim payments, commencing with the next Interim Payment at the rate of 15 (fifteen) percent of the amounts of all Interim Payment Certificates until the advance has been repaid, always provided that the advance shall be completely repaid prior to the expiry of the original time for completion. The Guarantee shall remain effective until the advance payment has been repaid.

3.2 The Employer shall retain (Retention Money) 6% of the amount from each payment due to the Contractor subject to the maximum of 5% of final contract price. Half of the amount retained shall be repaid upon completion of the works, and other half shall be repaid when the Defects Liability Period has passed and the Engineer has certified that all Defects notified to the Contractor before the end of this period have been corrected. On completion of the whole works the Contractor may substitute the balance retention money with an "on demand" Bank guarantee.

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

2.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.

[2] In case of a firm insert 'complete address of the firm'. In case of an individual contractor insert identification like 'son of and resident of' etc.

2.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor. The value of work executed shall be determined by the Project Manager.
2.3 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed.
2.4 The value of work executed shall include the valuation of Variations and Compensation Events.
2.5 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.
2.6 The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate.

4. Notice by Contractor to Engineer

The second party, on the works reaching each stage of construction, shall 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 payments due to the contractor, issuing and valuing variations to the contract, awarding extension 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. Completion time

The works should be completed within15 months from the date of this Agreement as per the milestone provided in below table. In exceptional circumstances, the time period stated in this clause may be extended in writing by mutual consent of both the parties.

Milestone	**Description**	**Period of Completion from the start date**
1	Value of work to be completed 20% of the contract amount	3 months
2	Value of work to be completed 40% of the contract amount	6 months
3	Value of work to be completed 60% of the contract amount	9 months
4	Completion of contract in all respects	15 months

6. 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:

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

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

3. 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.

4. Payments due to the second party are delayed without reason.

5. 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 value of work in stipulated period of completion from the start date will render him liable to pay liquidated damages. @ Rs. 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 5 % of the contract amount.

8. 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 The first party shall supply 3 sets of drawings, specifications and guidelines to the second party for the proposed works.

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

8.4 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.

8.5 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.

8.6 The Engineer shall issue a Certificate of Completion of the Works on the request of the second party, and upon deciding that the whole of the Works is completed.

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8.7 The Concerned Authority shall verify and approve the particular area for stacking of scrap arises out of demolition/renovation activities identified by the second party for handing over of the scrap by the Contractor. The Concerned Authority shall provide valuation of scrap and conduct auction.

9. Duties and responsibilities of the second party

9.1 The second party shall:

1. take up the works and arrange for its completion within the time period stipulated in clause 5;

2. employ suitable skilled persons to carry out the works;

3. regularly supervise and monitor the progress of work;

4. abide by the technical suggestions/ direction of supervisory personnel including engineers etc. regarding building construction;

5. be responsible for bringing any discrepancy to the notice of the representative of the first party and seek necessary clarification;

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

7. keep the first party informed about the progress of work;

8. correct the notified defects within the length of time specified by the Engineer;

9. be responsible for all security and watch and ward arrangements at site till handing over of the works to the first party;

10. 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 from the start date to the end of defect liability period;

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

12. abide by the regulatory authority conditions (if any) attached to any permits or approvals for the project; and the ESHS Management Strategies and Implementation Plan and ESHS Code of Conduct, if any prescribed by the Employer;

13. abide by all labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authorities;

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14. abide by all enactments on environmental protection and rules made there under, regulations, notifications and by-laws of the Sate or Central Government, or local authorities;

15. be responsible for the safety of all activities on the Site.

16. Any scrap arise due to demolition/renovation activities at site, will be safely deposited at a place identified by the contractor which should be prior verified and approved by the Concerned Authority.

Following key actions will be in C&D W management in the scope of Contractor:

i. Earmarking & Geotagging of location for disposal of C&D Waste,
ii. 35-40% of the waste will be reused at site,
iii. Approvals for Location (from Civic authority & State PCB as per C&D Waste rules 2016) to dump the C&D waste,), in case
iv. Collection of C&D waste (workers wearing Mask & gloves)
v. Handling of C&D waste in a tarpaulin covered vehicle.
vi. At site periodic water sprinkling where demolition activity is in progress.
vii. Preferably disposal of C&D Waste will be (from site) after SUNSET.

10. Variations / Extra Items

The works shall be executed by the second party in accordance with the approved drawings and specifications. No variation in cost is acceptable. However, if the Engineer issues instructions for execution of extra items, the following procedure shall be followed:-

1. The second party shall provide the Engineer with a quotation for carrying out the extra items 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 extra items are ordered.

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

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

11. Securities

The Performance Security 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 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. 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) the contractor stops work for 28 days and the stoppage has not been authorized by the Engineer;

(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 engaged in Fraud and Corruption as defined in Section C, in competing for or in executing the Contract; and

(f) 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

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. 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,

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less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law.

14. 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 Chief Engineer / Superintending Engineer, (not connected in part or whole with this Project in his service) 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.

15. Fraud and Corruption

The World Bank requires compliance with the Bank's Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in the WBG's Sanctions Framework, as set forth in Section C. In further pursuance of this policy, the Contractor shall permit and shall cause its sub-contractors, sub-consultants, service providers, suppliers, agents personnel, to permit the Bank to inspect all accounts, records, and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the Bank.

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Annexure I

BILL OF QUANTITIES

The approximate quantities is indicated below to give an idea of the work which should be executed in accordance with the approved drawings and specifications to enable the bidder to estimate the total price. Bidders may, however, note that no variations in the total proposed cost is acceptable (except where extra items are ordered by the Engineer).

Note:

1. ***Item for which no rate or price has been entered in will not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities (refer: ITB Clause 14.2 and GCC Clause 45.4).***
2. ***Unit rates and prices shall be quoted by the bidder in Indian Rupees (refer: ITB Clause 14.1 and ITB Clause 15.1).***
3. ***Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by quantity, the unit rate quoted shall govern (refer: ITB Clause 31).***
4. ***Where there is a discrepancy between the rate in figures and words, the rates in words will govern (refer: [ITB Clause 31).***

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Price Schedule

Bill of Quantities

Strengthening and Upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram.

Sl No.	Description	Amount in INR (in figures)	Amount in INR (words)
1	Strengthening and upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram. (The work will be Strengthening and upgradation of Mizoram College of Nursing, Falkawn, Aizawl, Mizoram. for Mizoram State Health Care Society (MSHCS). The works will include civil, electrical installation, plumbing etc.		

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Works requirements for MCON, Aizawl

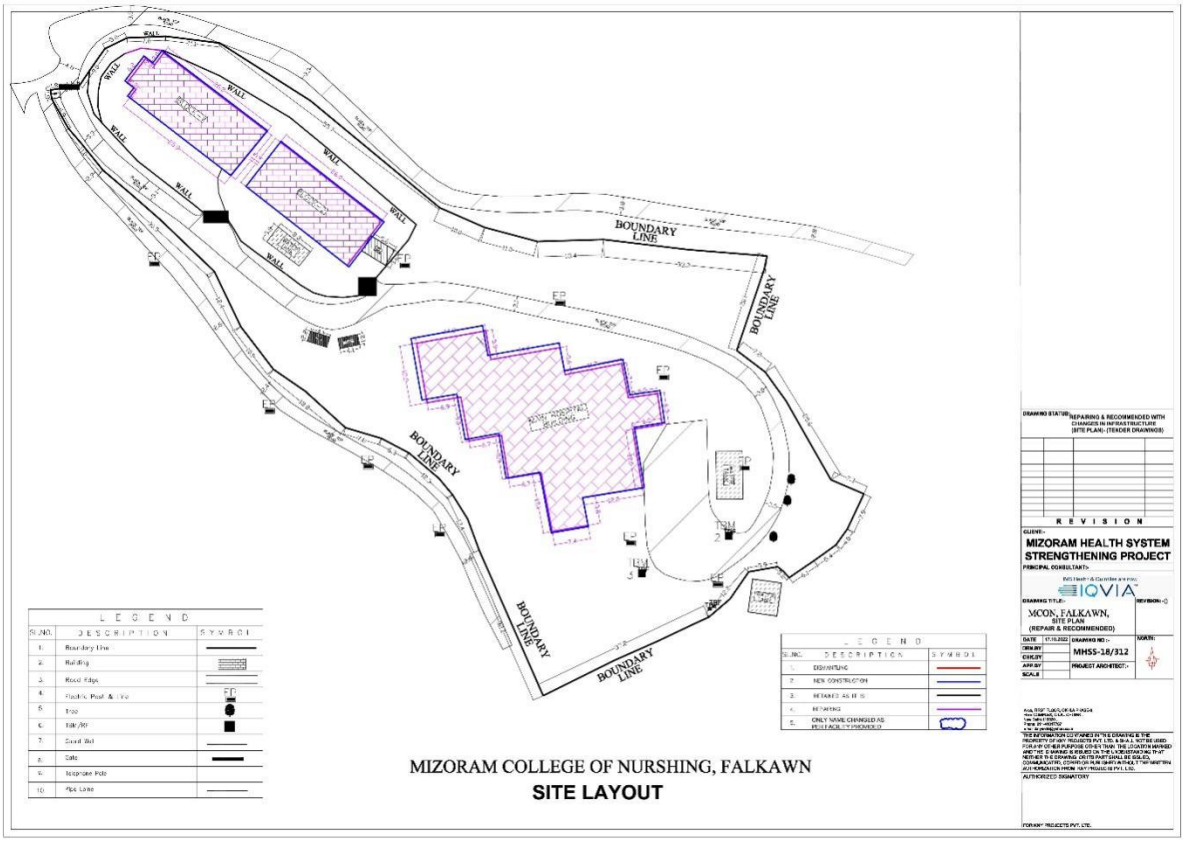
Mizoram College of Nursing campus is located in Falkawn and spread over 2.223 acres of land area. it was established in 2005 and offers a 4-year B.Sc. Nursing programme. MCON Aizawl is a Nursing College with annual intake of 30 students plus five students under PMSSS per year for B.Sc. Nursing and is spread in 3 building (1 Administrative building along with Classroom and Laboratories and 2 building allocated for Hostel. It is proposed to enhance the intake to 40 students for B. Sc. Nursing and also start post basic B. Sc Nursing and M. Sc. Nursing in the institution and to develop the same as a Centre of Excellence for training for the state of Mizoram.

The Mizoram College of Nursing campus consists of 7 buildings and their area statement is as under-

S.No	Block name	Ground Effected Area (Sq.M)	Remarks
1	Main Building (College Building)	1021.8	Building proposed to be repaired and renovated. Proposed new construction Basement-2 space utilized for boys hostel & lecture halls

2	Block-1	295.45	Building proposed to be repaired and renovated. vertical extension of additional one floor to be proposed
3	Block-2	312.51	Building proposed to be repaired and renovated. vertical extension of additional one floor to be proposed
4	Waiting shed-1	261.31	
5	Store	8.83	
6	Waiting shed-2	8.52	
7	DG Shed	20.12	
	Total	**1928.54**	

Layout:



Presently the in the college has following functional departments:

- Training Hall,
- Community Health Nursing Lab,
- Computer Lab,
- Common Room,
- Preclinical Lab,
- Principal Room, Office Room,
- Vice Principal Room,

- Faculty/HOD Rooms,
- Tutor Room,
- Library
- Examination Rooms,
- OBG & CHN Lab,
- Nursing Lab,
- Advanced Nursing Lab,
- Nutrition Lab,
- Lecture Hall1, 2, 3 and 4
- Multipurpose Hall,

The following departments are additionally proposed to be added after the renovation of work:

1. Skill lab

The following table presents the summary of repairs and renovation works to be undertaken in the seven existing buildings:

Building	Floor	Departments
Main Building	Basement 2	Cafeteria
	Basement 1	In service Training Hall, Community Health Nursing Lab, Computer Lab, Common Room, Preclinical Lab, Driver's room
	Ground Floor	Principal Room, Office Room, Record Room being used as a store, Vice Principal Room, Faculty/HOD Rooms, Tutor Room, Library
	First Floor	Examination Room, OBG & CHN Lab, Nursing Lab, Advanced Nursing Lab, Nutrition Lab, Lecture Hall1, 2, 3 and 4
	Second Floor	Multipurpose Hall, Terrace
Nursing Hostel Block 1	5	Warden Office, Visitor Room, Warden Residence, Kitchen, Dining Hall and rooms for students
Nursing Hostel Block 2	4	Warden Office, Visitor Room, Warden Residence, Kitchen, Dining Hall and rooms for students

The following buildings are to be newly constructed:

1	Hostel Block-1	300.66 Sq.m	additional floor is proposed to be constructed under the contract
2	Hostel Block-2	300.66 Sq.m	additional floor is proposed to be constructed under the contract
3	2-Lifts		Lift civil works are proposed to be constructed under the contract,

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Critical locations Photos:

plaster shed off floor top

proposed boys hostel area

Boys Hostel toilet

seepage at lecture hall-3

The works to be undertaken functional of building. Contractor coordinate to College principal and prepare a plan on the sequence of work to be done based on the College principal recommendations. The work to start only after shifting of equipment from room and to be signed off by concerned authority. That the area is ready for repair and renovation. During the construction activity to avoid safety reasons. The area where repair and renovations to be undertaken should sealed of completely caution tape and green cloth in the work premises and sign boards are to be provide mentioning the area of the work to caution the people to avoid those areas.

Proposed changes and repairs in the buildings under the Mizoram College of Nursing campus

Department	Proposed Changes	Drawing No.
Library	• Repair considered wherever required o Seepage o Crack repair and Plastering o Painting o Water proofing	Drawing no.18/205-208.

Department	Proposed Changes	Drawing No.
	○ windows	
Faculty Room	• Renovation considered ○ windows ○ Brick work and Plastering ○ Painting	Drawing no.18/303
OBG and CHN Lab, Nursing Skill Lab & Nutrition Lab	• Repair considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ Water proofing ○ Flooring	Drawing no.18/209-212, 18/314
Computer Lab	Repair considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ Water proofing ○ Flooring	Drawing no.18/201-204,
Community Health Nursing Lab	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ Water proofing ○ Flooring	Drawing no.18/201-204,18/301
Pre-clinical Lab	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ Water proofing ○ Flooring ○ Brick work	Drawing no.18/201-204,18/301
Lecture Halls and Additional Lecture halls (Common across all lecture halls)	• Repairing of cracks and seepages and painting needs to be done • Window panes need to be replaced • Shifting of wall from projection area to bring in line with beam wherever required • Repair & Renovation considered wherever required	Drawing no.18/209-212,18/302,18,304

Department	Proposed Changes	Drawing No.
	○ Seepage ○ Crack repair and Plastering ○ Painting ○ Water proofing ○ Flooring ○ Brick work	
Multipurpose Hall	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ Water proofing	Drawing no.18/213-216
Common room	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ water proofing ○ Brick work	Drawing no.18/201-204,18/301
Examination Hall	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ water proofing ○ brick work	Drawing no.18/209-212,18/304
Record Room	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ water proofing ○ brick work	Drawing no.18/205-208,18/303
Storage Room	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ water proofing	Drawing no.18/209-212.

Department	Proposed Changes	Drawing No.
In Service Training Hall	• Repair & Renovation considered wherever required o Seepage o Crack repair and Plastering o Painting	Drawing no.18/201-204.
Warden's Residence	• Repair & Renovation considered wherever required o Seepage o Crack repair and Plastering o Painting o water proofing o brick work o Flooring	Drawing no.18/217-219, 18/228, 18/305, 18/308
Hostel Rooms	• Repair & Renovation considered wherever required o Seepage o Crack repair and Plastering o Painting o water proofing o brick work o Flooring	Drawing no.18/220-227, 18/229-238, 18/309.
Kitchen and Dining Hall Block I	• Repair & Renovation considered wherever required o Seepage o Crack repair and Plastering o Painting o water proofing o brick work o Flooring	Drawing no.18/217-219, 18/305.
Kitchen and Dining Room of Hostel Block II	• Repair & Renovation considered wherever required o Seepage o Crack repair and Plastering o Painting o water proofing	Drawing no.18/228, 18/308.
Hostel Block B I	• Repair & Renovation considered wherever required o Seepage o Crack repair and Plastering	Drawing no.18/217-227, 18/305-307.

Department	Proposed Changes	Drawing No.
	○ Painting ○ water proofing ○ flooring ○ Additional floor proposed	
Hostel Block B II	• Repair & Renovation considered wherever required ○ Seepage ○ Crack repair and Plastering ○ Painting ○ water proofing ○ flooring ○ Additional floor proposed	Drawing no.18/228-238, 18/308-311
Basement II – Boys Hostel	**Boys hostel proposed in Basement II** • Construction of Common room/ visitor Room along with requisite furniture • Construction of 5 rooms with capacity to accommodate three students in each room along with requisite furniture • Construction of approach pathway from road to entrance of Boys Hostel and extending the same to the college entry	Drawing no.18/302.
Basement II – Post B.Sc lecture halls for 20 nos. intake (2 halls)	**Lecture halls for Post B.Sc proposed in Basement II** • Two lecture halls of 20 nos. capacity each to be proposed in existing common room • Table and chair for seating for 20 students in each classroom • Desk and chair for teacher • Podium • White Board • LED/LCD projector along with bracket • Computer	Drawing no.18/302.
Driver Room	Brick wall partition to separate room from Pre-clinical room.	Drawing no.18/201-204,18/301
Cafeteria	• Approach path to cafeteria with cement steps to be covered with nonskid paver tiles and handrail • Covered gazebo to be made with facility of benches and table for students to sit. • Railing to be constructed on mountain slope side	Drawing no.18/302.
Electrical	• New electrical inventories is proposed in	Drawing no.18/501-515.

Department	Proposed Changes	Drawing No.
	the Boq. that needs to be replaced with the damaged one • CCTV Camera is to be proposed for monitoring	

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Civil Works
(AS PER MPWD 2019)

S.NO	MPWD 2019	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	2.06	Earthwork in excavation over areas (exeeding 30cm in depth,1.5m in width as well as 10sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.				
	(a)	**Oridinary and Hard Soil**	*cum*	**163.81**		
2	2.07	Earthwork in excavation in foundation trenches or drains etc. (not exceeding 1.5m in width or 10sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5m including getting out excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres.				
	(b)	**Hard Soil (pick work)**	*cum*	**139.15**		
3	2.17	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	*cum*	**106.00**		
5	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:				
	(a)	1:2:4 (1 cement :2 course sand :4 stone aggregate 20mm nominal size)				
		Details of Cost for 1.00 Cum	cum	**19.96**		

MHSP

6	4.07	Providing and laying cement concrete in retaining wall, return walls, walls (any thickness) including pilasters, piers, columns,abutments, pillars, posts,plain window sills, sunken floors, etc. up to floor five level excluding the cost of centering, shuttering and finishing :				
	(a)	1 : 2: 4(1 cement :2course sand : 4 stone aggregate 20mm)	cum	**99.13**		
7	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in -				
		All work upto plinth level :				
8	(a)	***1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size)***	*cum*	**37.93**		
9	5.02	Reinforced cement concrete work in walls including attached pillasters, columns, pillers, posts, piers, abutments, return walls,retaining walls, struts, buttresses, string or lacing courses, fillets etc. upto floor five level excluding cost of centering shuttering etc complete.				
	(a)	1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size)	*cum*	**151.33**		
10	5.03	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement complete.				

MHSP

	(a)	*1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size)*	*cum*	**307.99**		
11	5.04	Reinforced cement concrete work in arches, archribs, domes,vaults, shells, folded plate and roofs having slope more than 15° up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement: 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size)	*cum*	**6.48**		
12	5.10	Centering and shuttering including strutting, propping, etc. and removal of form works in -				
	(a)	***Foundations, footings, bases of columns etc. for mass concrete.***	*sqm*	**85.95**		
	(b)	Walls including attached pillasters, buttresses, string courses, etc.	*sqm*	**629.16**		
	(c)	**Columns, pillars, piers, abutments, posts and struts.**	*sqm*	**733.44**		
	(d)	Lintels, beams, plinth beams, girders, bressumers and cantilevers, etc.	*sqm*	**1263.147**		
	(e)	Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj,etc.	*sqm*	**1291.482**		
13	5.18	Steel reinforcement for RCC work including straighthening, cutting, bending, placing in position and binding all complete.				
	(b)	**Thermo-Mechanically Treated bars of grade Fe-500 or more.**	kg	**87481.4**		
14	5.29	Extra for R.C.C. work above floor V level for each four floors	*cum*	**18.76**		

MHSP

		or part thereof.				
15	5.30	Extra for providing richer or leaner mixes respectively at all floor levels .				
	(a)	**Providing M-25 grade concrete instead of M-20 grade BMC/ RMC. (Note:- Cement content considered in M-25 is @ 330 kg/cum)**	*cum*	**126.269**		
16	6.01	First class brickwork in foundation and plinth in :				
	(c)	in cement mortar 1: 6 (1 cement : 6 coarse sand)	*cum*	**7.75**		
17	6.02	First class brickwork in superstructure above plinth level upto floor V level in:				
	(c)	in cement mortar 1: 6 (1 cement : 6 coarse sand)	*cum*	**72.96**		
18	6.06	Half brick masonry with first class brick in superstructure above plinth level upto floor V level.				
	b)	**in cement moratar 1:4 (1 cement : 4 coarse sand)**	*Sqm*	**1185.749**		
19	6.07	**Extra for providing and placing in position 2 nos 6mm dia. MS bars at every third course of half brick masonry.**	*Sqm*	**934.054**		
20	6.22	Providing and laying autoclaved aerated cement blocks masonry with 100 mm thick AAC blocks in super structure above plinth level up to floor V level in cement mortar 1:4 (1 cement : 4 coarse sand). The rate includes providing and placing in position 2 Nos 6 mm dia M.S. bars at every third course of masonry work.	*cum*	**157.56**		

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21	7.01	Regular coursed rubble masonry with hard stone in foundation upto one storey above and below ground level including curing, etc. complete.				
	(c)	in cement mortar 1: 6 (1 cement : 6 coarse sand)	*cum*	**241.12**		
22	8.02	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations, of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.				
	(d)	Granite (galaxy black)	*sqm*	**9.00**		
23	9.06	Providing Ist class local wood dressed in frames of chaukat for doors, windows, clerestory windows fixed in position.				
			cum	**2.45**		
24	9.11	Providing and fixing 1st class local wood *panelled* shutters for doors etc. including M.S. butt hinges with necessary screws, etc. complete.				
	(b)	**35 mm thick.**	*sqm*	**119.91**		

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25	9.55	Providing and fixing factory made PVC door frame made of PVC extruded section (Chaukhat) having overall dimension of 48x40 mm (tolerance + 1 mm) with wall thickness 2.0 mm + 0.2 mm, corners of the door frame to be mitred and joined by means of plastic/M.S. galvanished brackets and stainless steel screws. The hinge side vertical of the frames reinforced by galvanised M.S. tube of size 19x19 mm and 1 mm + 0.1 mm wall thickness and 3 Nos. stainless steel hinges fixed to the frame complete as per manufacturers specification and direction of Engineer-in-charge. (Sintex, Plasopan or equivalent) :	*Rmt*	**113.85**		
26	9.56	Factory made PVC door shutters made of styles and rails of a uPVC hollow section of size 59x24 mm and wall thickness 2 mm (± 0.2 mm) with inbuilt edging on both sides. The styles and rails mitred and joint at the corners by means of M.S. galvanised/ plastic brackets of size 75x220 mm having wall thickness 1.0 mm and stainless steel screws. The styles of the shutter reinforced by inserting galvanised M.S. tube of size 20x20 mm and 1 mm (± 0.1 mm) wall thickness. The lock rail made up of 'H' section, a uPVC hollow section of size 100x24 mm and 2 mm (± 0.2 mm) wall thickness, fixed to the shutter styles by means of plastic/galvanised M.S. 'U' cleats. The shutter frame filled with a uPVC multi-chambered single panel of size not less than 620 mm, having over all thickness of 20 mm and 1 mm (± 0.1 mm) wall thickness. The panels filled				

MHSP

		vertically and tie bar at two places by inserting horizontally 6 mm galvanised M.S. rod and fastened with nuts and washers, complete as per manufacturer's specification and direction of Engineer-in-charge. (For W.C. and bathroom door shutter) (Sintex, Plasopan or equivalent).				
	(b)	(b) 30mm thick shutter	*sqm*	**37.80**		
27	10.07	Structural steel work rivetted, bolted welded in built up sections, trusses and framed works, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (In Tees, R.S. Joists, Angles, Flats and Channels.)	*kg*	3228.852		
28	10.09	Supplying and fixing M.S. decorative railing consisting of top and bottom rails of 40mmx40mm square or circular section at distance of 788mm apart, 30mmx30mm square or circular section decorative intermediate balusters welded to top and bottom rails at 280mm apart. The base of balusters at 560mm apart welded with base plate of mmx3mm thick and fixed with cement grouting firmly to concrete section including steel priming ans steel	*sqm*	**81.40**		

MHSP

		painting complete etc.				
29	10.16	Steel work welded in built up sections/framed work including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
	(a)	In stringers, treads, landings etc. of stair-cases including use of chequered plates wherever required all complete	*kg*	**547.20**		
30	10.18	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete.	*sqm*	**137.88**		
31	11.02	Supplying of glass panes at site.				
	(a)	**4mm thick plate sheet glass**	*sqm*	**225.34**		
	(c)	**4mm thick frosted glass**	*sqm*	**3.24**		
32	11.03	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular and other sections of approved make conforming to IS: 733 and IS : 1285, anodised				
	(b)	**Anodised**	*sqm*	**321.06**		

MHSP

33	11.04	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of PVC / neoprene gasket required. (Glazing to be paid for separately)				
	(b)	**Anodised**	*sqm*	**232.09**		
34	11.06	Providing and fixing 12mm thick prelaminated three layer medium density (exterior grade) particle board Grade I, Type II conforming to IS : 12823 bonded with phenol formaldehyde synthetic resin, of approved brand and manufacture in paneling fixed in aluminium doors, windows shutters and partition frames with C.P. brass/ stainless steel screws etc. complete as per architectural drawings and directions of engineer-in-charge.				
	(a)	**Pre-laminated particle board with decorative lamination on one side and balancing lamination on other side.**	*Sqm*	**88.97**		
35	11.07	Providing and fixing double action hydraulic floor spring of approved brand and manufacture IS : 6315 marked, Hardwyn make (model 3000) or equivalent for doors including cost of cutting floors as required, embedding in floors and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge .				
	(a)	**With stainless steel cover plate**	*no*	**2**		

MHSP

36	11.11	Filling the gap in between aluminium frame & adjacent RCC/ Brick/ Stone work by providing weather silicon sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete. Upto 5mm depth and 5 mm width.				
			rm	**985**		
37	12.09	Chequerred precast cement concrete tiles 22 mm thick in footpath & courtyard, jointed with neat cement slurry mixed with pigment to match the shade of tiles, including rubbing and cleaning etc. complete, on 20 mm thick bed of cement mortar 1:4 (1 cement: 4 coarse sand).				
	(c)	**Dark shade using ordinary cement**	*Sqm*	**98.1**		
38	12.11	Providing and ceramic glazed floor tiles of size 300x300mm or more (thickness to be specified by the manufacturer) of 1st quality conforming to IS: 15622 of approved make in all colours,shades, except white, ivory, grey, fume red brown, laid on 20mm thick cement mortar 1 : 4 (1cement : 4 course sand) including pointing the joints with white cement and matching pigments etc. complete. as per designed colour.				
	(b)	Matt/Antiscratch	*Sqm*	**193.87**		
39	12.12	Providing & laying vitrified floor tiles in different sizes (thickness to be specified by the manufacture) with water absorption less than 0.08% and conforming to IS:15622,of approved make, in all colours and shades, laid on bed of 20mm				

MHSP

		thick cement mortar 1 : 4 (1cement:4course sand), including the joints with white cement and matching pigments etc.complete.as per design collours.				
	(b)	**Nano tech (Single charge)**	*sqm*	**51.16**		
	(c)	**Double charge**	*Sqm*	**980.41**		
40	12.13	Providing & laying vitrified tiles in different sizes (thickness to be specified by the manufacture) with water absorption less than 0.08% and conforming to IS:15622,of pproved make, in all colours and shades, in skirting/dado, riser of steps, laid with cement based high polymer modified quick set tile adhesive (water) based) conforming to IS:15477, in average 6mm thickness, including grouting of joints (Payment for grouting of joints to be made separately)				
	(b)	**Nano tech (Single charge)**	*sqm*	**5.28**		
	(c)	**Double charge**	*sqm*	**22.37**		
41	12.17	Grouting the jounts of flooring tiles having joints of 3 mm width using epoxy grout mix of 0.70 kg of organic coated filler of desired shade(0.10kg of hardener and 0.20 kg of resin per kg) grouting and finishing complete as per direction of Engineer-in-charge.	*sqm*	**358.82**		

MSSP

42	12.19	Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS : 15622 (thickness to e specified by the manufacaturer),of approved make, in all colours, shades wxcept burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12mm thick bed of cemunt mortar 1:3 (1cemeny :3 coarse sand) and jointing with cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	*sqm*	**314.33**		
43	14.37	Providing and fixing 150 mm bright finished brass floor door stopper with rubber cushion, screws, etc. to suite shutter thickness complete.	*no*	**56.00**		
44	14.46	Providing and fixing CP Brass Sliding Door Bolts (aldrops) bright finished with nuts and screws etc. complete.				
	(b)	250 x 16 mm	*no*	**56.00**		
45	14.47	Providing and fixing CP brass tower bolts (socket bolts) bright finished with necessary screws etc. complete.				
	(a)	250 mm	*no*	**112.00**		
46	14.48	Providing and fixing CP brass handles with necessary screws, etc. complete				
	(a)	250 mm	*no*	**112.00**		
47	14.50	Providing and fixing alluminium sliding door bolts (aldrops) anodised transparent or dyed to required colour or shade with nuts and screws etc. complete.				
	(b)	**250 x 16 mm**	*no*	**9.00**		

MIDSP

48	14.51	Providing and fixing Aluminium Tower Bolts (Socket Bolts) anodised transparent or dyed to required colour or shade with necessary screws etc. complete.				
	(c)	**150 mm**	*no*	**18.00**		
49	14.52	Providing and fixing alluminium handles anodised transparent or dyed to required colour or shade with necessary screws, etc. complete				
	(a)	**125 mm**	*no*	**18.00**		
50	15.17	Providing and fixing recessed ceiling with 12.5mm tapered Gypboard which includes providing and fixing G.I perimeter funnels with nylon sleeves and screws intermediate channels fixed to GI seat and steel expansion	*sqm*	**132.64**		
51	16.01	Providing corrugated G.S. sheet roofing fixed with polymer coated J or L hooks, bolts and nuts 8 mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (upto a pitch of 60 degrees) excluding the cost of purlins, rafters and trusses.				
	(a)	0.80 mm thick with zinc coating not less than 275gm/m²	*sqm*	**55.50**		
52	17.01	pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required:				
	(a)	**Orrisa pan with integral type foot rests**				

MHSP

	(i)	**White**	*No*	**17.00**		
53	17.04	Providing and fixing vitreous china pedestal type water closet (European type W.C. pan) with seat and lid, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever), conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required :				
	(i)	**White**	*No*	**4.00**		
54	17.10	Providing and fixing solid plastic Seat Cover and lid for pedestal type W.C. pan with C.P. brass hinges, rubber buffers, etc. complete.	*each*	**10.00**		
	(i)	**White**				
55	17.15	Providing and fixing Health faucet with flexible tube upto 1 metre long and holder of quality and make as approved by Engineer - in - charge..	*No*	**11.00**		
56	17.16	Providing and fixing White vitreous china wash basin Standard of Parryware/ Hindware/ Cera and equivalent make with R.S. or C.I. brackets, 15mm C.P. brass pillar taps, C.P. brass chain with rubber plugs, 32mm C.P. brass waste of standard pattern, 32mm C.P. brass traps and union complete including painting of fittings and brackets, cutting and making good the walls wherever required.				
	(a)	**Vitreous China Wash basin size 630x450 mm with single 15 mm C.P. brass pillar taps**				
	(i)	**White**	*no*	**31.00**		

MHSP

57	17.18	Providing and fixing CP Brass 32mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge.	*no*	**31.00**		
58	17.21	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS: 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required : (Hindware or equivalent)				
	(a)	**Single Sink 610x510 mm bowl depth 200mm**	*no*	**3.00**		
59	17.24	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing :	*no*	**24.00**		
60	17.28	Providing and fixing C.P. brass towel rail with two C.P. brass brackets to wooden cleats with C.P. brass screws.				
	(a)	750x20mm size	*no*	**14.00**		
61	17.32	Providing and fixing soap dish fixed with C.P. brass screws.	*no*	**14.00**		
62	17.33	Providing and fixing on wall face SWRPVC soil, waste and vent pipes including jointing with rubber lubricant/cement solvent complete.				
	(a)	110mm dia.	*rm*	**155.00**		
	(b)	75mm dia.	*rm*	**128.00**		
63	17.34	Providing and fixing SWRPVC plain bend of required degree (87.50°) including jointing with				

MHSP

		rubber lubricant/cement solvent complete.				
	(a)	110mm dia.	*no*	**91.00**		
	(b)	75mm dia.	*no*	**91.00**		
64	17.35	Providing and fixing SWRPVC plain bend of required degree (45°) including jointing with rubber lubricant/cement solvent complete.				
	(a)	110mm dia.	*no*	**57.00**		
	(b)	75mm dia.	*no*	**57.00**		
65	17.36	Providing and fixing SWRPVC bend with access door of required degree including jointing with rubber lubricant/cement solvent complete.				
	(a)	110mm dia SWRPVC bend with access door.	*no*	**19.00**		
	(b)	75mm dia SWRPVC bend with access door.	*no*	**19.00**		
66	17.37	Providing and fixing single equal SWRPVC plain junction of required degree (T-junction) .				
	(a)	110x110x110mm.	*no*	**57.00**		
	(b)	75x75x75mm.	*no*	**19.00**		
67	17.41	Providing and fixing **SWRPVC socket** including jointing with rubber lubricant/cement solvent.				
	(a)	110mm dia socket.	*no*	**133.00**		
	(b)	75 mm dia socket.	*no*	**95.00**		
68	17.44	Providing and fixing 125/110 S-trap SWRPVC including joining with rubber lubricant/ solvent cement.	*no*	**23.00**		

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69	17.45	Providing and fixing uPVC multi floor trap with floor trap grating including jointing with rubber lubricant/ solvent cement	*no*	**42.00**		
70	18.01	Providing and placing on terrace (at all floor levels**) polyethylene water storage tank**, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings				
	(a)	**Sintex or quivalent**	*litre*	**20000.00**		
71	18.14	Providing and fixing **ball valve (brass) of a**pproved quality, High or low pressure, with plastic floats complete :				
	(a)	**15 mm nominal bore**	*no*	**18.00**		
	(b)	**20mm nominal bore**	*no*	**18.00**		
72	18.07	Providing and **fixing brass bib cock** of approved quality.				
	(a)	**15mm nominal bore**	*no*	**22.00**		
73	18.16	Providing and fixing **15 mm nominal bore C.P. brass angle stop cock** for basin mixer and geyser points of approved quality conforming to IS:8931 .				
	(b)	**Class-II**	*no*	**54.00**		
74	18.29	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall				
	(a)	**15mm dia nominal bore.**	*rm*	**246.00**		

WHSP

	(b)	**20mm dia nominal bore.**	*rm*	**197.00**		
	(c)	**25mm dia nominal bore.**	*rm*	**136.00**		
75	18.32	Making connection of CPVC pipes distribution branch by providing and fixing **equal Tee** with jointing, testing complete including cutting and making good etc.				
	(a)	**15mm dia nominal bore.**	*no*	**88.00**		
	(b)	**20mm dia nominal bore.**	*no*	**84.00**		
	(c)	**25mm dia nominal bore.**	*no*	**20.00**		
76	18.36	Making connection of Astral CPVC pipes distribution branch by providing and fixing Elbow 90o with jointing, testing complete including cutting and making good etc.				
	(a)	**15mm dia**	*no*	**120.00**		
	(b)	**20mm dia**	*no*	**100.00**		
	(c)	**25mm dia nominal bore.**	*no*	**20.00**		
77	18.43	Making connection of Astral CPVC pipes distribution branch by providing and fixing **Female Adaptor (Brass)** with jointing, testing complete including cutting and making good etc.				
	(a)	**15mm dia**	*no*	**95.00**		
78	18.44	Making connection of Astral CPVC pipes distribution branch by providing and fixing **Socket/Coupling** with jointing, testing complete including cutting and making good etc.				
	(b)	**20mm dia.**	*no*	**50.00**		
	(c)	**25mm dia**	*no*	**40.00**		

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79	18.45	Making connection of Astral CPVC pipes distribution branch by providing and fixing **Reducer Coupling** with jointing, testing complete including cutting and making good etc.				
	(b)	**20 x 15mm**	*no*	**56.00**		
80	19.02	Applying double coated cement slurry with water proofing chemical (SUPER latex chemical) in proportion 1 : 4 :7 (1 latex : 4 water :7 cement) including cleaning the treated surfaces with brushes etc.@ 0.158kg/sqm .	*Sqm*	**2392.92**		
81	19.03	Providing and mixing water proofing chemical (PIDI PROOF POWDER chemical) in plain and reinforced cement concrete work 1 : 1.5 : 3 , @ 1.0 % by weight of cement	*cum*	**183.26**		
82	19.19	Extra for providing and mixing water proofing chemical (latex or equivalent chemical) @ 2kg per bag of cement in -				
	(b)	**12mm cement plaster 1 : 4** ***(1 cement : 4 fine sand).***	*sqm*	**1463.83**		
	(d)	**15mm cement plaster 1 : 4 (1 cement : 4 sand).**	*Sqm*	**1985.07**		
	(f)	20mm cement plaster 1 : 4 (1 cement : 4 sand).	*Sqm*	**143.21**		
83	20.08	12mm cement plaster 1 : 4 (1 cement : 4 fine sand).	*Sqm*	**4415.90**		
84	20.12	15mm cement plaster 1 : 4 (1 cement : 4 fine sand).	*Sqm*	**1889.60**		
85	20.24	20 mm cement plaster 1 : 4 (1 cement : 4 fine sand).	*Sqm*	**143.21**		
86	20.25	6mm cement plaster to ceiling 1 : 3 (1 cement : 3 fine sand)	*Sqm*	**1299.67**		

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87	20.47	**White washing with lime** to give an even shade : New work (three or more coats)	*Sqm*	**420.80**		
88	20.66	**Distempering with oil bound washable distemper of approved** brand and manufacture to give an even shade: New work (one or more coats)	*Sqm*	**1372.17**		
89	20.72	**Painting with synthetic enamel paint** of approved brand and manufacture in all shades on **new work** (two or more coats).				
	(a)	General quality	*Sqm*	**633.33**		
90	20.73	Wall painting with interior emulsion paint of approved brand and manufacture on new work (two or more coats) to give an even shade.				
	(b)	**Premium interior emulsion like Velvet touch Luxol silk etc.**	*Sqm*	**4430.15**		
91	20.75	**Finishing walls with exterior emulsion** of required shade on new work (three or more coats) to give an even shade.				
	(b)	**Premium exterior emulsion like weather shield, weathercote etc.**	*Sqm*	**1827.21**		
92	23.02	Removing dry or oil bound distemper, water proofing cement paint and the like by scrapping, sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete	*Sqm*	**1414.58**		
93	23.03	Repairs to plaster of thickness 12mm to 20mm in patches of area 2.5 sq. metres and under including cutting the patch in proper shape and preparing and plastering the surface of the walls				

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		complete including disposal of rubbish to the dumping ground within 50 metres lead :				
	(a)	**With cement mortar 1:3 (1 cement : 3 fine sand)**	*Sqm*	**4.50**		
94	23.05	Making the opening in brick masonry including dismantling in floor or walls by cutting masonry and making good the damages to walls, flooring and jambs complete, to match existing surface i/c disposal of mulba/ rubbish to the nearest municipal dumping ground, all complete as per direction of Engineer-in-Charge	*Sqm*	**15.39**		
95	23.40	White washing with lime to give an even shade :				
	(a)	**Old work (two or more coats)**	*Sqm*	**5549.31**		
96	23.44	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade : Old work (one or more coats)	*Sqm*	**346.86**		
97	23.52	Wall painting with interior emulsion paint of approved brand and manufacture on old work (one or more coats) to give an even shade.				
	(b)	**Premium interior emulsion like Velvet touch luxol silk etc.**	*Sqm*	**1059.50**		
98	23.53	Finishing walls with regular exterior emulsion of required shade on old work (three or more coats) to give an even shade.				
	(b)	Premium exterior emulsion like weathercote, weather shield etc.	*Sqm*	**3661.35**		
99	23.54	Painting with synthetic enamel paint of approved brand and manufacture of required colour				

MHSP

		to give an even shade : One or more coats on old work				
	(a)	**General quality**	*Sqm*	**217.56**		
100	23.69	Disconnecting damaged overhead/terrace PVC water storage tank of any size from water supply line and removing from the terrace including shifting at ground level as per direction of Engineer-in-charge	*No*	**12.00**		
101	24.01	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge.				
	(a)	Nominal concrete 1:3:6 Or richer mix .	*Cum*	**12.15**		
102	24.02	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer - in-charge.	*Cum*	**40.44**		
103	24.06	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead:				
	(a)	In cement mortar	*Cum*	**124.04**		
104	24.11	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete and stacking within 50 metres lead :				
	(a)	**Of area 3 sq. metres and below**	*No*	**15.00**		
105	24.22	Dismantling tile work in floors and roofs laid in cement mortar				

MHSP

		including stacking material within 50 metres lead.				
	(a)	**For thickness of tiles 10 mm to 25 mm**	*sqm*	**156.00**		
106	24.36	Dismantling wooden boardings in lining of walls and partitions, excluding supporting members but including stacking within 50 metres lead :				
	(c)	**Thickness above 25 mm upto 40 mm**	*sqm*	**121.82**		
107	24.43	Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground within 50 metres lead.	*sqm*	**619.81**		
108	24.46	Hacking of CC flooring including cleaning for surface etc. complete as per direction of the Engineer-in-Charge.	*sqm*	**1275.66**		
109	NSR	Note :- Transport charges (carriage) for dumping the building waste at near by dumping yard/zone. Disposal of approx 7000 cft (building waste generated) around 5 Km from MCon in 18 trip i.e. 200 cft /Trip	*No*	**35.00**		
110	NSR	Providing & Inserting 12mm dia galvanised steel ionjection nipple in honeycomb area and along the crackline including drilling of holes required diameter (20mm to 30mm) upto a depth of 30mm to 80mm at required spacing and making the holes and cracks dust free by blowing compressed air , sealing the distance between injection nipple with the adhesive chemical of approved make and allow it to cure completely.	*Nos.*	**717.88**		

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111	NSR	Injection approved grout (SIKADUR- 55LP)or equivalent in proportion recommended by the manufacturer into cracks/hony-comb area of concrete/masonry by suitable gun/pump at requird pressure including cutting of nippales				
		NOTE: This quantity may vary and depend upon the site concrete quality and seepages/cracks found during the execution	*Kg*	**191.43**		
112	NSR	Providing and fixing factory made solid **Wood Polymer Composite (WPC)** single extruded Door Frame section of size with encapsulation of 8MM rigid layer on all the six surfaces. The door frame will have a rebat of 32MM. Door Frame section of 63.5x100 MM .The two Vertical members are to be joined together with the horizontal member using 8x75 MM long MS Star full thread screws to be used with reverse forward speed control hand drilling machine. The ready/assembled door frame is fixed to the wall using hold fast or bolt fasteners. A minimum of 4 No.s of screws to be provided for each vertical member & minimum 2no.s for horizontal member	*Rmt*	**41.40**		
113	NSR	Providing and fixing 28 -30 MM thick solid **Wood Polymer Composite(WPC)** single extruded door shutter with 3MM top and bottom rigid layer with an overall density of 750kg/Cum. It will be fixed to the frame using 3 inch /4 inch hinges. A minimum of 4 hinges will be required for fixing the door with the frame	*Sqm*	**16.38**		

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114	NSR	Diluting and injecting chemical emulsion for Pre-construction Anti-Termite Treatment with Chlorpyriphos/Lindane emulsifiable chemical 20% with 1% concentration.	*Sqm*	**219.57**		
115	NSR	Providing Diluting and injecting chemical emulsion for existing windows and doors post construction Anti-Termite Treatment Chlorpyriphos 20% EC. (Note: Spray Treatment: Spray will be applied on all windows and doors. Chemical will be injected inside the cracks of windows and doors at the wall junction.)				
	(a)	Doors / Windows	*NO*	**30.00**		
	(b)	Providing and supply Service cost for Diluting and injecting chemical emulsion for Effected Floor areas	*Sqm*	**400.00**		
116	NSR	Chipping of unsound/weak concrete material from slabs, beams, columns etc. with manual Chisel and/ or by standard power driven percussion type or of approved make ncluding tapering of all edges, making square shoulders of cavities including cleaning the exposed concrete surface and reinforcement with wire brushes etc. and disposal of debris for all lead and lifts all complete as per direction of Engineer-In-Charge				
		25 mm average thickness	*sqm*	**100.00**		
117	NSR	Providing, mixing and applying bonding coat of approved adhesive on chipped portion of RCC as per specifications and direction of Engineer-In-charge				

HSP

		complete in all respect.				
		Epoxy bonding adhesive having coverage 2.20 sqm/kg of approved make	*sqm*	**100.00**		
118	NSR	Providing, mixing and applying SBR polymer (of approved make) modified Cement mortar in proportion of 1:4 (1 cement: 4 graded coarse sand with polymer minimum 2% by wt. of cement used) as per specifications and directions of Engineer-in-charge. Note: Measurement and payment: The pre-measurement of thickness shall be done just after the surface preparation is completed and Payment under this item shall be made only after proper wet curing has been done and surface has been satisfactorily evaluated by sounding / tapping with a blunt metal instrument and/or the 75mm size cube crushing strength at the end of 28 days to be not less than 30 N/Sqmm2).				
		12 mm average thickness.	*sqm*	**100.00**		
119	NSR	Cost of drilling 200mm dia bore well by DTH Rig & lowering of assembly MS/UPVC casing &strainer pipes, electric welding of joints etc for bore well	*rmt*	**250.00**		
120	NSR	Cost of development of bore well by truck mounted air compressor 1100cfm	*no's*	**1.00**		
121	NSR	Providing and installation ISI UPVC casing pipe 200mm dia for borewell	*rmt*	**8.00**		

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122	NSR	Supply, testing installation of 5HP, 3ph electric submersible pump set complete with all accessories for borewell	*nos*	**1.00**		
123	NSR	Providing Transportation charge for bore well	*Lump-sum*	**1.00**		
124	NSR	Providing and installation Inner/filter casing pipe 125 mm dia for bore well	*rmt*	**50.00**		

ELECTRICAL

(AS PER MPWD 2016)

S. NO	MPWD 2016	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
A						
1	C:01:02	Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per IS:694 (1990) and Life shield- Halogen Free Flame Retardant (HFFR) 1100 voltage graded copper flexible wire stranded copper running inside PVC casing & capping (Gr-I) 20x12mm fixed, surface on the wall/ceiling /floor as per convenience including junction box having required numbers of ways from DB to the light plug/socket 5/6A point etc. as required				
	C:01:02 (A)	Light plug Point Very Short Point (modular)	EACH	105		
	C:01:02 (B)	Short Point (modular)-	EACH	24		
2	C:01:03	Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per IS:694 1990) and Life shield- Halogen Free Flame Retardant (HFFR) 1100 voltage graded copper flexible wire stranded copper running inside PVC casing & capping (Gr-I) 30x12mm fixed, surface on the wall/ceiling /floor as per convenience including junction box having required				

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		numbers of ways from DB to the power plug/socket 15/16A point etc. as required				
	C:01:03 (A)	Power plug Point 15/16 A Very Short Point (modular)	EACH	15		
3	C:01:04	Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per IS:694 (1990) and Life shield- Halogen Free Flame Retardant (HFFR) 1100 voltage graded copper flexible wire stranded copper running inside PVC casing & capping (Gr-I) 30x12mm fixed, surface on the wall/ceiling /floor as per convenience including junction box having required numbers of ways from DB to the power plug/socket 20/32A point etc. as required :-				
	C:01:04 (A	Power plug Point 20/32 A Very Short Point (modular)	EACH	12		
4	C:01:06	Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per IS:694 (1990) and Life shield- Halogen Free Flame Retardant (HFFR)/FR 1100 voltage graded copper flexible wire stranded copper running inside PVC Casing & capping (Grade-I) of all available sizes diameter fixed, surface on the wall/ceiling/floor as per convenience including junction box having required numbers of ways from Main to Sub-Main/DB/Sub-Main/DB to SDB/SDB/Switch boards/SDB to switch boards as required:-				
	C:01:06 (B)	2X 4 Sqmm copper conductor/cable + 1x 4.0 Sqmm earth wire	rm	177		
5	1:05:00	Supplying and fixing of PVC boards of the following sizes on surface including necessary switches,				

MHSP

		plug/socket and fan regulators etc. with necessary painting if necessary				
	I:05:02	2 S	EACH	40		
	I:05:08	2 S + 1 SOC +1 R	EACH	36		
	I:05:11	1 S + 1 SOC	EACH	55		
	I:05:30	4 S+ 2R + 1 Soc	EACH	8		
	I:03:40	1S + 1 Soc 25/16A	EACH	15		
6	F:11:00	Supplying and drawing the following sizes of PVC insulated standard copper conductor 1.5 sqmm as per IS:694 (1977) and Flame Retardant Low smoke & Halogen (FRLS&H) in the existing surface/recess, PVC/steel conduit/PVC casing & capping as required:-				
	F:11:03	3 x 1.5 sq. mm	METRE	150		
	F:13:03	3 x 4 sq. mm	METRE	90		
7	N:03:00	Supplying,fitting,&fixing of 4-Ways MCB DB single door in sheet steel,Phosphatised powderpainted MCB DBs with Bus Bar, Neutral link,earth bar and din rail conforms to IS:13032, IS:8623, BS:5486240 Volts 50 Hz, on surface/recess including inter-connection,painting etc, as required.				
	O:03:19	6-ways (4+18)MCB DB TP&N DD metallic door	EACH	20		
	O:03:20	8-ways (8+24)MCB DB TP&N DD metallic door	EACH	9		
8	O:01:00	Supplying,fitting and fixing of different rating and numbers of ways Distribution Board with bakeliteFused fitting (TP&N) with fused links,415 Volts,50Hz AC on surface/recess completedwith interconnection, painting etc, as required.				

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	O:01:04	32Amps' 4-ways DB TP&N	EACH	5		
	O:01:05	32Amps' 6-ways DB TP&N	EACH	9		
9	N:01:00	Supplying and fixing of all types and rating MCBs, RCCBs, ELCBs etc, 240/415 Volts 50 Hz AC supply in the existing MCB DB complete with connections, testing & commissioningetc in completed				
ii.	N:01:01	5 to 32 Amps ,SP, MCB B- series	EACH	152		
i.	N:01:04	6-32 Amps,DP, MCB B- series	EACH	15		
ii.	N:01:45	40 Amps' FP, RX3 Bi-connect lower terminals MCB Isolator	Each	11		
iv.	N:01:46	63 Amps' FP, RX3 Bi-connect lower terminals MCB Isolator	Each	3		
10	Q:01:01	Earthing with G.I Earth Pipe 4.5 Mtr long and 40mm dia' including accessories and providing masonery enclosure with cover plate having locking arrangment and water pipe,etc. (but without charcoal or coke and salt) complete as required	SET	9		
11	Q:01:03	Extra for using salt and charcoal for pipe earth electrode as required	Each	9		
12	Q:01:05	Earthing with G.I Earth plate 600mmx600mmx6mm thick including accessories andproviding masonery enclosure with cover plate having locking arrangment and water pipe,etc. (but without charcoal or coke and salt) complete as required	set	4		
13	Q:01:09	Extra for using salt and charcoal for G.I or Copper Plate electrode as required		4		
14	Q:01:44	Providing and laying of earth connection from earth electrode with 6 SWG G.I Wire and n15mm dia' G.I Pipe from earth electrode as required. (6 SWG G.I Wire)	RM	50		

MESP

15	Q:01:48	Providing and fixing of 6 SWG G.I Wire on surface or in recess for loop earthing etc. asrequired	RM	30		
16	Q:01:40	Supplying& Laying of 25mmx5mm G.I Strip at .50m below ground level for conductor earth electrode, including soldering etc. as required. (25mmx5mm G.I Strip (1.0 Kg/M))	mtr	8		
17	J:01:39	Installation of Exhaust fan up-to 450 mm Sweeps in the existing opening, includingmaking holes to suit the size of the above Exhaust fan, and making good the damage,Connection,testing and commissioning etc, as required.	Each	42		
18	MPWD	Supply of Exhaust fan 300mm sweeps ISI marked (Usha/Havells/Polar/Gromton/Bajaj)	Each	42		
19	525	PVC Surface mounting box for switch/socket 5 Gang (4S+1 Soc) Anchor/Pressfit/Cona/Leader	Each	5		
20	526	PVC Surface mounting box for switch/socket 6 Gang (5S+1Soc) Anchor/Pressfit/Cona/Leader	Each	2		
21	527	PVC Surface mounting box for switch/socket 4 Gang double (2S+2Soc) Anchor/Pressfit/Cona/Leader	Each	30		
22	745	Modular Switch 6Amps On-Off	Each	188		
23	762	Modular Socket 6Amps 3+2 or universal	Each	33		
24	763	Modular 16/6Amp 3+3 Socket	Each	2		
25	675	Modular square Switch 20 A SP 1 Way 1 M	Each	90		

MHSP

26	N:06:00	Supplying and fixing of different ratings three/four poles Automatic Transfer Switch (ATS)(conforms to IEC:60947-1 three/ four pole AC-31A 50Hz, 415V Automatic/Manual with inbuilttime delay with enclosure for Change over Switch in the Existing Panel Board/ Distribution Boardsto be incorporated with required AC Voltages including required;- Testing,calibrating,& commissioning etc, as				
	N:06:01	100 Amps Four Poles ATS	EACH	1		
27	E:01:00	Rewiring for light point/fan point/exhaust fan point/calling bell point with 1.5 Sqmm of PVC insulated standard copper conductor 1.5 sqmm as per IS:694 (1977) and Life shields Halogen Free Flame Retardant (HFFR) in the existing surface/recess, PVC/steel conduit/PVC casing & capping as required				
	E:01:01	VERY SHORT POINT	per point	188		
28	J:02:05	Installation of Air Conditioner Split Type 1.5/2.0 in the existing wall including fixing the Hook in the wall by standard size of sleeve Nuts and bolts or Stnadard Screw for the above Air Conditioner Split type 1.5/2.0 TR, and making good the damage, connection, testing and commissioning etc, as required	EACH	12		
29	MPWD	4KVA Automatic Stabilizer with built-in high cut, Buzzer & Timer :Input:50VA-280V & Output:210V-240V (Venus/Indo/V-Guard/CARE)	EACH	12		
30	J:01:36	Installation, testing & commissioning of ceiling fan and regulator, including wiring the downrod of standard length (upto 30cm) with 2X1.5 sqmm PVC insulated copper conductor single corecable etc, as required	EACH	40		

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31	MPWD	Supply of Ceiling fan 5 star rated Fusion 5* (Metallic beige-brown/pearl ivory-Gold) 1200mm sweeps (Havells/Usha/Polar/Gromton/Bajaj)	EACH	40		
	(B)					
32	NSR	Supplying of 1.5 Ton split Airconditioners(Excluding 4 KVA stabilizer) suitable or operation on AC supply single phase 50 Hz 230V with heremetically sealed conformer with air cooled condenser motor capacitor start run capacitors relay and over load protector internal unit with one indoor and one outdoor unit the condenser unit will be placed outside the room on the terrace to avoid noise (Make :- Carrier/ Volta/LG/Samsung/Hitachi & equivalent)	EACH	12		
33	NSR	Supply, installation, testing and commissioning of 5.5KVA - 192V Online UPS, Transformer Based Rating in VA, Watts 5.5KVA, 4.4 Kilo Watts Battery Module External Battery Module No's of Battery Required Sixteen Batteries - 4 No's Battery Type SMF - VRLA DC Voltage 192V (Make:- Microtek i-MAXX & equivalent)	Each	1		

MHSP

CCTV

S.NO	Reference	Description	Unit	Qty	Rate	Amount
A.		**CCTV (ANALOG VIDEO SURVEILLANCE) SYSTEM**				
1	NS	Supply, installation, testing and commissioning of 2.4 Mega Pixel (HD Quality), Bullet Camera, IR Impulse/Hikvision/Tyco/Pelco/Honeywell/ CP Plus	No.	17		
2	NS	Supply, installation, testing and commissioning of 2.4 Mega Pixel (HD Quality), Dome Camera, IR Impulse/Hikvision/Tyco/Pelco/Honeywell/	No.	39		

		CP Plus				
3	NS	Supply, installation, testing and commissioning of 32 channel DVR. with Hard Disck, for 30 days recording Impulse/Hikvision/Tyco/Pelco/Honeywell/ /CP Plus	No.	2		
4	NS	Supply, installation, testing and commissioning two video outputs & 32" totally flat colour LCD monitor Panasonic/LG/Samsung	No.	2		
5	NS	Supply installation testing and commissioning of Cat 3+1 CCTV Copper Cable Polycab/D-Link/Kalinga/Havells/Legrand	RM	2000		
6	NS	Supply installation commisioning and testing of 1 TB Hard Disck, for 30 days recording	No.	5		
7	NS	Supply installation testing and commissioning of 10 Channel power supply Reputed Make	No.	7		
9	NS	Supply installation testing and commissioning of BNC Connectors/Power Connectors etc. Consumable itesms Reputed Make	Lot	1		

PA and EPABX

(AS PER MPWD 2016)

S. NO	MPWD 2016	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
	NSR					
A	**PA SYSTEM**					
1	NSR	Supply of 250 watt ,AC 220-240 V, amplifier with all necessary cable as required (Ahuja SSA-160 or equivalent)	EACH	2		

2	NSR	Supply of Paging Microphone (Corded)	EA CH	4		
3	NSR	Supply of Microphone (Corded Mic) (Ahuja/Sony/or Equivalent)	EA CH	4		
4	NSR	Supply of Microphone (Cordless Mic) (Ahuja/Sony/or Equivalent)	EA CH	2		
5	NSR	Supply of Speaker (Box) 40 watt (Ahuja/Sony/or Equivalent)	EA CH	8		
6	NSR	Horn speaker 60 watt (Ahuja/Sony/or Equivalent)	EA CH	4		
7	NSR	1 sq. mm double core connecting wire (copper)	RM	100		
B	**EPBAX SYSTEM**					
8	NSR	Supply installation testing and commissioning of Star model 100 lines EPABX Compact 832 Technology Microcontroller based stored programme control techniques CMOS cross point switching Longitudinal balance 60db Extn. Loop resistance 600 ohms Insertion Loss a) Extn. to Extn. Less than 2 db at 1 Khz b) Extn. to P&T line Less than 1 db at 1 Khz Dial Speed 10 +- 0.5 PPS Cross talk attenuation Not less than -70 db Break ratio 33:66 Input Power 230 VC +- 10% 50 Hz Cabling Single pair Ambient conditions 0 to 45° C, 95% RH (Non condensing) UPS Inbuilt (without batteries)	EA CH	1		
	NSR	Land line telephone corded complete all acessories as per BEETAL M59/ or eqivalent white/black/blue color	EA CH	40		
	NSR	operator Console	EA CH	1		

MPSP

9	C:04:08	Wiring in Parallel system with PVC Insulated Telephone cables for indoor applications confirming to TEC specification G/WIR06/02 running inside PVC Casing & Capping pipe Grade-II 20mm dia' fixed, surface in the wall/ceiling/floor as per convenience including junction box having required numbers of ways Main to Sub-Main/DB, Sub-main/DB to SDB/Switch boards/SDB to switch boards as required:-				
	C:04:08 (D)	0.5mm Four pairs un armoured Telephone cable Indoor type	RM	285		
	C:04:08 (E)	0.5mm Five pairs un armoured Telephone cable Indoor type	RM	350		
	C:04:08 (F)	0.5mm ten pairs un armoured Telephone cable Indoor type	RM	480		
	C:04:08 (G)	0.5mm Twenty pairs un armoured Telephone cable Indoor type	RM	445		
	O:08:04	Telephone & EPABX Junction Boxes 20 Pairs with Krone connector	EACH	2		
	O:08:03	Telephone & EPABX Junction Boxes 20 Pairs with connector	EACH	1		
	O:08:07	Telephone & EPABX Junction Boxes 50 Pair with connector	EACH	2		
	O:08:08	Telephone & EPABX Junction Boxes 50 Pairs with Krone connector	EACH	1		
	O:08:10	Telephone & EPABX Junction Boxes 100 Pairs with Krone connector	EACH	1		

We agree to execute the works in accordance with the approved drawings and technical specifications at a total fixed contract price of Rs.....……..... (amount in figures) (Rs..... amount in words).

Signature of Contractor

MHSR

Annexure - 2

Format of certificate

Certified that the works upto ---------- level in respect of construction of ---------- at ---------- have been executed in accordance with the approved drawings and technical specifications.

Signature
Name & Designation
(Official address)

Place:
Date:

Office seal

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Annexure-3

Technical Specifications

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DETAILED TECHNICAL SPECIFICATIONS

CIVIL WORKS

1. CEMENT:

1.1 The cement used shall be one of the following types:
i) Ordinary Portland cement conforming to IS:269 – 1976
ii) Portland Pozzolana cement conforming to IS: 1489

1.2 Whenever possible all cements of each type shall be obtained from one constant source throughout the contract. Cement of different types shall not be mixed one with the other. Different brands of cements, or the same brand of cement from different sources, shall not be used without prior notification and approval.

1.3 The cement shall be supplied either packed in bags or in silos installed for the purpose of supply. Packed cement shall be delivered to the site in original sealed bags which shall be labelled with the weight, date of manufacture, name of manufacturer, brand and type. A Cement received in torn bags shall not be used.

1.4 All cement shall be fresh when delivered and at ambient atmospheric temperature. In fair faced elements, the cement used in the concrete for any complete element shall be from a single consignment. All cement for exposed concrete shall be from the same approved source and uniform in colour.

A. **AGGREGATES:**
Aggregates from natural sources shall be in accordance with IS: 383. The contractor shall test aggregate at site in accordance with IS 2386. The contractor shall allow for and provide all necessary apparatus for carrying out such tests and for supplying test records to the consultant agency.

B. The contractor shall ensure that aggregates are free from iron pyrites and impurities which may cause discoloration.

C. FINE AGGRAGATE:

i) All aggregate shall comply to IS: 2386 Part-II. The fine aggregate shall be pit sand stone dust or other approved sand. It shall be free from clay, loam, harmful chemical impurities. It shall be clean, sharp, strong, and angular and composed of hard siliceous materials.

ii) Fine sand shall be within the limits of Grading Zone IV of relevant IS code, as given in Table I. When the grading falls outside the percentage limits given for sieves other than 600 micron, 300 micron and 150 micron (I.S.) sieves but not more than 5 percent, it shall be regarded as falling within this zone. The 5 percent shall be summation of excess on all other services

TABLE – I : FINE AGGREGATE

IS SIEVE	**PERCENTAGE PASSING FOR GRADING**			
	Zone - I	**Zone - II**	**Zone - III**	**Zone - IV**
10mm	100	100	100	100
4.75mm	90-100	90-100	90-100	95-100
2.36mm	60-95	75-100	85-100	95-100
1.18mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	35-60	80-100
300 micron	5-20	8-30	8-30	20-65

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150 micron	0-10	0-10	0-10	0-15

iii) The maximum quantity of silt as determined by the method prescribed in I.S.2386 Part II shall not exceed 8 percent. Stone dust shall be obtained by crushing hard stone and the grading as determined by the method prescribed in IS:2386 Part-II. It shall be within the limits above for the sieves other than 600 micron (I.S.) Sieves should not be more than 5 percent and for 150 micron sieve should not be more than 20 percent.

D. COARSE AGGREGATE:

i) For reinforced concrete work coarse aggregate shall be crushed stone, river shingle or approved pit gravel having nominal maximum size of 20 mm and down as approved by Engineer-in-charge.

ii) Coarse aggregate obtained from crushed or broken stone shall be angular, hard, strong, dense, durable, clean and free from soft, friable, thin flat, elongated or flaky pieces.

iii) River shingle or pit gravel shall be rounded sound, hard, clean, nonporous, suitably graded in size with or without broken fragments and free from flat particles of shale, clay silt, loam and other impurities.

iv) Except where it can be shown to the satisfaction of the Engineer-in-charge, supply of properly graded aggregate of uniform quality can be maintained over the period of the works, the grading of aggregate shall be controlled by obtaining the coarse aggregate in different sizes and blending them in correct proportions as and when required.

2. STEEL:

3.1 STEEL REINFORCEMENT:

i) Steel reinforcing bars shall be TMT conforming to IS :14786-1979 or IS : 1139-1966 (Grade Fe 415) or mild steel bars conforming to Grade I of IS : 432 (Part I) – 1966

ii) For checking nominal mass, tensile strength, band test, re-band- test etc. specimen of sufficient length shall be cut from each size of the bar at random at frequency not less than that specified below:-

Size of Bar	For consignment below100 tonnes	For consignment over 100 tonnes
Under10mmdia	One sample for each 25 tonnes or part there of	One sample for each 40 tonnes or part there of.
10mm-16mmdia.	One sample for each 35 tonnes or part there of	One sample for each 45 tonnes or part there of.
Over16mmdia	One sample for each 45 tonnes or part there of	One sample for each 50 tonnes or part there of.

iii) Steel brought to site and steel remaining unused shall not be moved from site without the written permission of the Engineer-in-charge.

iv) The use of cold twisted bars is not permitted.

3.2 BINDING WIRE:

Reinforcement binding wire shall be best black annealed mild steel wire, approximately 1.6 mm in diameter.

3.3 BAR SIZES:

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Bar size of various components of building shall be as the following or as conformed by the engineer-in-charge.

i)	Column footing	-	20mm diameter.
ii)	Plinth Beams	-	16mm diameter.
iii)	Main Beams	-	16mm diameter.
iv)	Columns	-	20mm diameter.
v)	Lintel Beams	-	12mm diameter.
vi)	Chajjas	-	8mm diameter.
vii)	Staircase slab	-	16mm diameter.
viii)	Slabs	-	10mm diameter.
ix)	Stirrups&Ties	-	8mm diameter.

3.4 STRUCTURAL STEEL:

All finished rolled steel sections shall be of wieldable quality in accordance with latest edition of IS 226 and shall be approved by the Engineer-in-charge.

3. WATER:

A. Water used in the works shall be potable water and free from deleterious materials. water used for mixing and curing concrete as well as for cooling and/or washing aggregate shall be fresh and clean, free from injurious amounts of oil, salts, acids, alkali, other chemicals and organic matter.

B. Water shall be from the source approved by the Engineer-in-charge and shall be in accordance with clause 4.3 of IS: 456.

C. Before starting any concreting work and wherever the source of water changes, the water shall be tested for its chemical and other impurities to ascertain its suitability for use in concrete for approval of the Engineer-in-charge. No water shall be used until tested and found satisfactory. Cost of all such tests shall be borne by the contractor.

4. STORAGE:

All goods and products covered by these specifications shall be procured well in advance and stored as specified below:

A. CEMENT:

i) Cement shall be stored on raised floor in dry weather proof and draught free but well ventilated shed.

ii) Cement bags shall be stacked at least 60 cm away from external walls and in stacks of not more than ten bags to avoid lumping under pressure.

iii) Cement stored during monsoons or cement expected to be in store for more than eight weeks shall be completely enclosed in 500 gauge polythene sheet so arranged that the flap closes on the top stack. The contractor shall ensure that protective polythene sheet is not damaged at any time during use.

iv) Cement of different types shall be stored in separate sheds or separate compartment of a shed. If different types of cement are mixed, the Engineer-in-charge will have the discretion to reject all the cement/concrete concerned.

v) Consignment of cement shall be used in order of delivery. A record shall be kept of the batch numbers of cement deliveries in such a form that the part of the works in which the cement is used can be readily identified.

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vi) The contractor shall be responsible for the storage of cement at the site and no claim will be entertained in the event of any damage occurring to cement due to faulty storage by the contractors or on account of his negligence.

vii) If cement is stored on site for a period longer than eight weeks it shall be tested to the satisfaction of the Engineer-in-charge before it is used in the works.

viii) Cement which has so deteriorated in quality that it no longer conforms in all respects to the requirements of this specification will be condemned by the Engineer-in-charge - and shall not be used in the works. The contractor shall immediately remove from the site all cement which has been so condemned.

B. AGGREGATE:

iv) Aggregates shall be stored as per 18:4082: 1977 on a suitable well drained raft of concrete, timber, metal or other approved material. The storage of aggregate on the ground will not be permitted.

v) Each size of aggregate shall be stored separately in such a manner as to prevent spillage and mixing of one aggregate with an adjacent aggregate. The dividing wells of any bins shall be of sufficient height and the aggregate shall be so deposited that a distance of 300mm shall left between the top of the division wall and any part of the aggregate stack

vi) When stack piling, the aggregate shall not form pyramids resulting in segregation of different size particles. The stacks shall be regular and of a height not exceeding two meters.

C. STEEL:

i) Reinforcement for structures shall be handled and stored in a manner that will prevent bending out of the desired shape and any accumulation of dirt, oil and paint. When placed in the works it shall be free from dirt, oil, grease, paint, mill scale and loose or thick rust.

ii) It shall be stored in such a way as to avoid distortion and to prevent deterioration and corrosion. Steel reinforcement, shall be stored clear of the ground, on rack or otherwise supported, covered in bundles indicating the type, number, size, length, diameter and date of delivery to the site of the bars or fabric reinforcement as per relevant I.S. 226 and as Directed by the Engineer-in-charge.

5. CONCRETE MIX PROPORTIONS:

Cement concrete used in the works shall be either of the two categories given below.

A. All cement concrete not designated by strength shall be treated as ordinary concrete of nominal mix as specified. The aggregates and cement shall be as specified. The aggregates and cement shall be measured by volume. Mixing water shall be measured in graduated litre cans.

B. Controlled Concrete

ii) All cement concrete designated by strength shall be treated as controlled concrete. The aggregates and cement shall be measured by weight in approved weight batching equipment. Mixing water shall be measured in graduated litre cans. In case cement is supplied packed in bags one or more complete bags of cement shall used for each batch of concrete where concrete mixers are allowed to be used.

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iii) The controlled concrete shall meet with the strength requirement laid down IS : 516 – 1959.

iv) The contractor shall be responsible for designing mixes of the specified performance to suit the degree of workability and strength. Required for the various parts of the works.

v) Alternative mixes may be designed by the contractor for use in both thin and narrow section and thick sections. Special mixes using finer aggregates may be designed by him for infilling pockets and narrow spaces and for regions of congested reinforcement.

vi) The maximum water cement ratio for all grade of ordinary concrete shall not be more than 0.5.

6. STRENGTH OF CONCRETE:

The compressive strength on work tests for different nominal mixes is given in following Table:-

Concrete Mix	Compressive strength (kg/sq.cm)	
	7 days	28 days
1:1:5:3	140	210
1:2:4	106	158
1:1:2	175	265

7. WATER CEMENT RATIO:

i) The quantity of water added to the cement and aggregate during mixing shall be such as to produce a concrete having sufficient workability to enable it to be properly compacted to be worked into the corners of the shuttering and around reinforcement.

ii) Due amount shall be taken of the variation of moisture content, within any consignment of aggregate and any variations due to watering, exposure to rain or drying weather. The contractor shall carry out regular moisture content tests in accordance the Engineer-in-charge and results submitted to him.

iii) In case of ordinary concrete the maximum value of water cement ratio shall be 0.50 and in the case of controlled concrete the water cement ratio is determined by the mix design.

iv) The contractor shall exercise particularly tight control on the water content for fairfaced concrete the colour of which is sensitive to small variations of water in the mix.

v) When a suitable water cement ratio has been determined and agreed by the Engineer-in-charge, it shall be maintained throughout the corresponding part of works. Approved tests shall be undertaken periodically by the contractor to satisfy the Engineer-in-charge of the maintenance of the consistency. However the amount of water added to a mix other than for fair faced concrete may be reduced below the agreed design amount with the consent of the Engineer-in-charge if the contractor is able to demonstrate that such a reduction is consistent with producing concrete of the required workability and characteristic strength.

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vi) The contractor shall frequently test the concrete for slump cone test. The slump at the actual location of placing as measured in accordance with the methods laid down is IS:1199 shall be as per IS.456.2000.

8. CONCERTE MIXING:

i) All concrete in the correct proportion of ingredients approved by the CONSULTANT whether ordinary or controlled, shall be mixed in an approved mixer for the minimum time necessary to ensure adequate quality and uniform distribution of the materials. The cement and aggregates shall normally be first mixed dry until all particles of aggregate are coated with cement after which the water shall be added.

ii) Allowance shall be made for the moisture content of the aggregate when calculating the amount of water to be added for each mix.

iii) The temperature of the aggregate, water and cement when added to the mixer shall be such that the temperature of the concrete at the time of placement is less than 40^{o} C.

iv) Materials for concrete shall be deposited into the drum while it is in rotation. Mixers shall not be loaded beyond their rated capacity and each batch shall be completely discharged from the drum before recharging takes place.

v) Facilities shall be provided to spray the mixer drum with cool water between batches and on the completion of concreting the drum shall be washed down. The surface of the mixer drum shall be maintained in a clean condition at all times

vi) Re-tampering and/or mixing of concrete which has partially hardened and set will not be permitted under any circumstances.

9. CONCRETE TRANSPORTING:

i) The period between mixing the concrete and placing it in the final position shall be kept to a minimum and the delivery of concrete shall be co-ordinate with the rate of placement to avoid delays in delivery and placement.

ii) Concrete shall be handled from the place of mixing to the place of final deposit by methods, which prevent segregation, loss of ingredients and contamination and maintain the required workability

iii) Should any segregation have occurred in any batches arriving at the place of deposition, such batches shall be rejected and shall not be allowed to use

iv) Where concrete is conveyed by chutes, the chutes shall be made of metal or fitted with metal linings. The approval of the Engineer-in-charge shall be obtained for the use of chutes more than 3 meters long.

v) All plant and equipment used in the transportation of concrete shall be thoroughly cleaned before and after each working period and at all changes of concrete mixes.

vi) All major concreting shall be done by concrete pump. A concrete pump of capacity 38- 40m^3/hr. shall be installed for the purpose and necessary approval for the concrete pump delivery system with adequate boom length, pipe line and associated items shall be obtained before installation of the concrete pump. There shall also have the provision of an approved standby system in case of any eventualities for transporting the concrete.

10. PREPARATON BEFORE CONCRETING

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i) The inside surface of the forms against which concrete is to be placed shall be clean and free from dried or hardened spattering or coatings of concrete. The forms shall be well wetted before placing concrete.

ii) When the work has to be resumed on a surface which has hardened, such surface shall be roughened. It shall then be swept clean, thoroughly wetted and covered with 12mm layer of freshly mixed mortar composed of cement and sand (in the same ratio as the cement and sand in the concrete mix) immediately before placing of concrete

iii) Concrete shall be handled from the place of mixing to the place of final deposit by methods which prevent segregation, loss of ingredients and contamination and maintain the required workability.

11. PLACING:

i) Concreting of any portion of the works shall be done only in the presence of the representatives of the Engineer-in-charge.

ii) Concreting shall be carried out continuously between construction, contraction or expansion joints as agreed with Engineer-in-charge. The contractor shall closely follow the sequence of concreting where such is specified in the drawings. If concreting is interrupted before reaching the predetermined joint an approved construction joint shall be provided after obtaining necessary approval from Engineer-in-charge.

iii) Immediately before placing of concrete for columns and walls, the reinforcement within and the old concrete at the bottom of the formwork shall be given a coating of cement sand mortar of the identical materials and proportions to be used in the subsequent concrete, to prevent the loss of fine material from the initial concrete pour.

iv) Concrete shall be deposited as nearly as is practicable to its final position and shall not be dumped in a large quantity at any point to be run or worked along the formwork manually or with vibrators. Concrete shall not be deposited at a faster rate than it can be placed and compacted.

v) Concrete shall be thoroughly worked into the forms so that they are entirely filled; reinforcing bars adequately and tightly surrounded and entrained air released from the mass of concrete. Placing shall be carried out with the use of vibrators in a manner directed by the Engineer-in-charge.

vi) For members having thickness more than 300 mm, the concrete shall be placed in layers not greater than 300 mm thickness and thoroughly compacted before succeeding layers are placed. Concrete of thickness less than 300mm shall be placed in single operation to the full thickness of slabs, beams and similar members. No concrete shall be placed on concrete which has set sufficiently to cause the formation of planes of weakness and where there is likely to occur due to unforeseen circumstances.

12. COMPACTION:

i) Each layer of concrete whilst being deposited shall be compacted by approved methods to form a dense material with all surface free from honey combing, air holes or other blemishes. The contractor shall use mechanical vibration for all concrete and shall take care that internal vibrators shall not be brought into

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contact with the reinforcement or their formwork. An adequate number of vibrators shall be used to ensure that compaction of concrete is achieved within 10 minutes of placing. Particular attention shall be given to the compaction of concrete around the water bars to ensure that no voids or p areas are left.

ii) Compacting shall cease as soon as excess water appears on the face of concrete. Any water accumulating on the surface of newly placed concrete shall be removed by approved methods and no further concrete shall be placed thereon until such water has been removed.

iii) Notwithstanding the requirements regarding mix design, should it be found that the proportion of water in the mix is such the laitance forms before compaction (i.e. completion of expulsion of that air) is complete; the quantity of water in the mix shall be reduced. If required, approved admixture / plasticizer could be used to achieve necessary workability. Whenever either of the aforesaid procedures are to be adopted, an additional set of 6 cubes for testing at 7 or 28 days shall be made from the changed mix. The time elapsed between the discharge of the concrete from the mixer and the completion of compaction shall not exceed 30 minutes. A sufficient number of spare vibrators shall be kept readily accessible to the place of deposition of concrete to assure adequate vibration in case of breakdown of those in use.

13. FINISHES:

i) All concrete surfaces shall have a good, dense finish. Except for slabs the face of concrete for which from work is not provided shall be smoothed with a steel or wooden trowel to provide a finish equal to that face where formwork is provided.

ii) The top surfaces of all floor and roof slabs specified as smooth shall be levelled and trawled before the concrete sets to a smooth finish at the levels of falls shown on the drawings. The trawling shall be done at such a time and in such a manner than an excess of mortar is not brought to the surface of concrete nor the aggregate displaced. The top surfaces of concrete slabs specified to receive an integral finish shall be uniformly roughened by deep hacking before the finish is laid.

iii) Immediately after striking the formwork and removing any superficial water, honeycombed areas in normal unfinished concrete shall be inspected by the Engineer-in-charge and where directed the contractor shall immediately make good at his own expense such honeycombing in accordance to the instruction and guide line of Engineer-in-charge whilst the concrete is still green. All air holes shall be similarly filled in.

iv) The contractor shall be responsible for providing an adequate key in concrete where plastering or rendering is specified to be applied. Hacking of the concrete surface immediately after striking the formwork will be permitted.

v) The faces of all fair faced concrete shall be of even colour throughout, free from air bubbles, cracks, honeycombing or other blemishes and will be inspected by the Engineer-in-charge immediately after the formwork has been struck. Such faces shall not be rubbed down after striking the formwork to remove fins, excrescences or any similar imperfections without the prior permission of the Engineer-in-charge.

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vi) Concrete surface finishes shall be according to the requirements and all instructions by the Engineer-in-charge with regard to the method of achieving such finishes shall be implemented.

14. CURING AND PROTECTION:

i) Walking on concrete shall not be permitted for at least 24 hours after it has been placed in position or for such additional length of time as the Engineer-in-charge may direct.

ii) Immediately after compaction and completion of any surface finishes, the concrete shall be protected from the evaporation of moisture by means of polythene sheeting, wet Hessian or other similar material kept soaked by spraying. As soon as the concrete has attained a degree of hardening sufficient to withstand surface damage, moist curing shall be implemented and maintained for a period of at least 15 days after casting.

iii) Method of curing and their duration shall be such that the concrete will have satisfactory durability and strength and members will suffer a minimum distortion, be free from excessive efflorescence and will not cause, by its shrinkage, undue cracking in the works.

iv) The top surfaces of slabs and other horizontal surfaces shall be cured by impounding water in cement mortar bunds. Steeply sloping and vertical formed surfaces shall be kept completely and continuously moist prior to and during the striking of formwork by applying water to the top surfaces and allowing it to pass down between the formwork and the concrete.

v) The Contractor shall give careful consideration to the curing methods and conditions for fair faced concrete. Components which are specified to have exposed concrete finish shall receive the same curing treatment. Moreover water used for curing shall be clean so as not to discolour the concrete.

vi) All fair-faced concrete shall be protected from damage from the time of striking the formwork. All edges and surfaces of such concrete shall be protected from' chipping using notched timber or aluminium corner pieces or other suitable covers which shall be maintained in place until the completion of the works.

15. CRACKS:

i) If any cracks develop in the reinforced cement concrete construction which in the opinion of the Engineer-in-charge may be detrimental to the strength of the construction, the contractor at his own expense shall test the structural element in question. If under these test loads the cracks shall develop further the contractor at his own expense shall dismantle the construction, cart away the debris, replace the construction and carryout all consequential work there to at no extra cost. If the cracks are not detrimental to the stability of the construction in the opinion of the Engineer-in-charge the contractor at his own expense shall grout the cracks with pneumatically applied mortar or epoxy grout or by other specified treatment as directed by the Engineer-in-charge at his own expense and risk he shall also made good al other building work such as plaster, moulding, surface finish of floors, roofs, ceiling etc. which in the opinion of the Engineer-in-charge have suffered damage either in appearance or stability owing to such cracks.

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ii) The repair work shall be carried out to the satisfaction of the Engineer-in-charge. The decision of the Engineer-in-Charge as to the extent of the liability of the contractor in the above matter shall be final and binding on the contractor.

16. LOAD TESTING ON COMPLETED STRUCTURES:

i) During the period of construction or within the defect liability period the Engineer-in-Charge may at his discretion order the load testing of any completed structure or any part thereof if he has reasonable doubts about the adequacy of the strength of such structure for any the following reasons:
   a) Results of compressive strength on concrete test cubs.
   b) Premature removal of formwork.
   c) Inadequate curing of concrete.
   d) Over loading during the construction of the structure or part thereof.
   e) Carrying out concreting of any portion without prior approval of the Engineer-in-Charge.
   f) Honey combed or damaged concrete which in the opinion of the Engineer-in-Charge is particularly weak and will affect the stability of the structure to carry the design load, more so in important or critical areas of the structure.
   g) Any other circumstances attributable to alleged negligence of the contractor which in the opinion of the Engineer-in-Charge result in the structure or any part thereof being of less than the expected strength.

ii) All the loading tests shall be carried out by the contractor strictly in accordance with the instructions of the Engineer-in-Charge. Such tests should be carried out only after expiry of minimum 28 days or such longer period as directed by the Engineer-in-Charge.

iii) The structure should be subjected to a super imposed load equal to 1.25 times the specified superimposed load assumed in the design. This load shall be maintained for a period of 24 hours before removal. During the test, struts strong enough to take the whole load shall be placed in position leaving a gap under the members as directed.

iv) The deflection due to the superimposed load shall be recorded by sufficient number of approved deflect meters capable of reading up to 1/500 of a cm and located suitably under the structure as directed by the Engineer-in-Charge. If within 24 hours of the removal of the superimposed load, the structures do not recover at least 75% of the deflection under the superimposed load, the test loading shall be repeated after a lapse of 72 hours. If the recovery after the second test is less than 80% of the maximum deflection shown during the second test, the structure shall be considered to have failed to pass the test and shall be deemed to be unacceptable.

v) In such cases the part of the work concerned shall be taken down or cut out and reconstructed to comply with the specifications. Other remedial measures may be taken to make the structure secure at the discretion of the Engineer-in-Charge. Moreover, such remedial measures shall be carried out to the complete satisfaction of the Engineer-in-Charge.

vi) All costs involved in carrying out the tests and other incidental expense thereto shall be borne by the contractor regardless of the result of the tests. The

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Contractor shall take down or cut out and reconstruct the defective work or shall make the remedial measures instructed at his own cost.

vii) In addition to the above load tests, non destructive test methods such as core test and ultrasonic pulse velocity test shall be carried out by the Contractor at his own expense if so desired by the Engineer-in-Charge. Such tests shall be carried out by an agency approved by the Engineer-in-Charge and shall be done under expert's guidance using only recommended testing equipment. The acceptance criteria for these tests shall be in accordance to IS:1959 and IS:456-1978.

17. MASONRY WORK – BRICK WORK:

i) Bricks shall be sound, hard, well-burnt, uniform in size, shape and colour, homogeneous in texture, giving a metallic ringing sound, free from flaws, cracks, holes, lumps or grit and arises should be square, straight and sharply defined. They shall not break when struck against each other and dropped flat from a height of 1 m to the ground. They shall conform to IS 1077 giving classes of common burnt clay bricks.

ii) Bricks shall be as specified and detailed in BOQ. It shall have to be approved prior to procurement. Bricks shall be obtained from an approved source and shall be of uniform colour, size, shape. Bricks shall have smooth rectangular faces with sharp straight right angle edges. Maximum absorption shall not be more than 20% of its dry weight on immersion in water for 24 hours. Minimum crushing strength shall be 35 kg/sq. cm.

iii) Bricks of approved quality and quantity shall have to be procured by the contractor at the desired time. No delay or extra cost due to nonavailability shall be accepted. The contractor is obliged to carry out the work as specified. It shall be the responsibility of the contractor to procure sufficient quantities of bricks and stack them at site or elsewhere to avoid delays.

iv) **Mortars** : Cement for masonry shall be prepared in accordance with IS 2250 code of practice for preparation and use of masonry mortars.

v) **Cement** : Cement used shall be :-
a) Ordinary Portland cement conforming to IS:269 – 1976
b) Portland Pozzolana cement conforming to IS: 1489
It shall be received in bags of 50 kg (or in bulk carriers in case of storage in silos) and each batch shall be accompanied with test certificate of the factory. Also it shall be tested before use to ascertain its strength, setting time, etc. In case cement has been stored for over 6 months from date of manufacturer or for any reasons the stored cement shows signs of deterioration or contamination, it shall be tested as per the direction of the Engineer-in-charge prior to use in the works.

vi) **Water :** Water used for masonry shall be potable conforming to IS, clean and free from injurious amounts of deleterious materials.

vii) **Fine Aggregates :** Sand shall conform to IS 2116 specification for sand for masonry mortars. Only river sand shall be used.

18. DEFECTIVE CONCRETE WORK:

If the results of load test or core test on any concrete structure found unsatisfactory or unacceptable, the concrete work and the structure shall be removed and redone by the contractor at his own risk and cost as instructed by Engineer-in-Charge.

19. SUPERVISION:

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All concreting work shall be done under strict supervision of the qualified and experienced representatives of the Contractor as well as those of the Engineer-in-Charge. The contractor's supervisor who are in-charge of concreting work shall be skilled in this class of work and shall personally superintend all the concreting operations.

20. QUALITY CONTROL:

The Engineer-in-Charge T reserves the right to make changes in the mix proportions including increasing the cement content or/and a change in the Contractor's control procedure, should the quality control during process of the work prove to be inadequate in CONSULTANT's opinion and the contractor shall carry out the same at no extra cost to the corporation. All the concrete work shall be true to level, plumb and square within the acceptable tolerance. The corners, edges and arises in all cases shall be unbroken and finished properly and carefully.

21. WOOD WORK:

i) All the timber members shall be well seasoned by any proper natural or artificial method of seasoning. The preparation of timber for joinery is to commence simultaneously with the construction of superstructure and should be completed well before fixing at site, and shall be stacked at site for observation against bending, warping etc. and for regular inspection. It should be stacked in a proper manner. As a special case, if the contractor agrees to do so, required fund shall be released to the contractor for procurement of material as certified by the Engineer-in-charge.

ii) All timber member and joinery, in touch with masonry or concrete, shall be applied with wood preservative as approved by the Engineer-in-charge and the rate quoted shall be inclusive of the same. All rough frame work, framing for false ceiling and partition or panelling shall also be treated similarly.

iii) All joinery, preferably, shall be tongue and groove joint and the thickness of each shall not be less than 6mm. All the joints shall be glued and pinned together with wooden pegs and the pegs shall engage all tongues.

iv) In mortice and tenon joints all tenons shall not be less than 12mm. Thick and shall be the full width of the member. Tenons shall be glued into the mortices. Through tenons shall be pinned with wooden dowels of not less than 6mm. Dia. or with non-ferrous metal dowels. Through tenons shall be wedged if the mortices are tapered.

v) Whether mentioned or not in the B.O.Q., all exposed faces of timber shall receive a primer coat of red oxide or similar approved primer. Quoted rates shall be inclusive of the same.

22. ALUMINIUM WORK:

i) Aluminium sections used for fixed/openable windows, ventilators, partitions, frame work & doors etc. shall be suitable for use to meet architectural designs to relevant works and shall be subject to approval of the Engineer-in-Charge for technical, structural, functional and visual considerations.

ii) Chemical and mechanical properties of sections shall comply with requirements given in IS 733-1983, Specification for wrought aluminium and aluminium alloys bars, rods and sections, IS 737-1986, Specification for wrought aluminium and aluminium alloys sheet and strip for general engineering purposes and IS 1285-

2002, Specification for wrought aluminium and aluminium alloys extruded round tube and hollow sections for general engineering purposes.

iii) The permissible dimensional tolerances of the extruded sections shall be as per IS 6477 and shall be such as not to impair the proper and smooth functioning/operation and appearance of door and windows.

iv) The powder used for powder coating shall be Epoxy/polyester powder of make approved by the Engineer-in-Charge. The contractor shall give detailed programme for powder coating in advance, to facilitate the inspection by Engineer-in-Charge or his authorized representative.

v) It is mandatory that all aluminium members shall be wrapped with self adhesive non-staining PVC tape, approved by Engineer-in-Charge.

23. PAINTS SYSTEM:

i) All paints for the protection of steelwork shall be of the best available quality and specifications suitable for the purpose and in any case shall not fall below the minimum standards laid down in IS 1477.

ii) Where the specifications, method or extent of application of any other paint scheme approved for the work varies from those described, the recommendations and instructions of manufacturers shall be followed.

iii) Before application of paint, it is to be ensured that the surface is dried completely and shall be cleaned with hard brush to remove all loose particles and dust etc

iv) Priming coat to be applied wherever applicable, irrespective of whether it is mentioned in the specification of item or not.

v) At least three coats painting (Including priming coat) shall be done, brush applied paint shall be applied at least one coat in horizontal and the other in vertical direction.

vi) If the colour is not uniform or any mark of patch or impression of brush is visible, it shall be removed and if required, more coats shall be applied by the contractor at his own cost.

24. FORM WORK:

i) Form work shall include all temporary or permanent forms of moulds required for forming the concrete which is cast-in-situ together with all temporary construction required for their support.

ii) Formwork shall be of rigid construction true to shape and dimensions. It shall be strong enough to withstand the dead and live loads and forces caused by ramming and vibrations of concrete and other incidental loads, imposed upon it during and after casting of concrete. It shall be made sufficient rigid by using adequate number of ties and braces. Screw jack or hard board wedges, were required shall be provided to make up any settlement in the form work either before or during the placing of concrete.

iii) Forms shall be so constructed as to be removable in sections in the designed sequence without damaging the surface of concrete or disturbing other sections. All form work should be easy to strip after concreting and form work must be erected with this consideration in mind. Care shall be taken to see that no pieces remain keyed into the concrete. Details of formwork shall be properly designed by the Contractor and relevant drawings together with calculations for strength

and deflection shall be submitted to the Engineer-in-Charge. for approval before commencement of formwork erection.

iv) The completed formwork shall be inspected by the Engineer-in-Charge on receipt of information in this regard from the Contractor, before the reinforcement bars are placed in position. Minimum 2 complete sets of approved set of form work system for the total area in the typical floor shall always be available in usable condition.

v) Formwork surface in contact with concrete (sheathing) shall be hard wood section approved by the Engineer-in-Charge.

vi) All joints in boards for such formwork shall be carefully designed, no repair on the form finish concrete will be accepted.

vii) There shall not be any visible patches, strains for effloresce in the fair faced concrete.

viii) Use of ties shall be minimum.

ix) The surfaces of timber formwork that would come in contact with concrete shall be coated with soap solution, raw linseed oil, or form oil of approved material to prevent adhesion of concrete to formwork.

x) The formwork shall be so removed as not to cause any damage to concrete due to shock or vibration. In a slab and beam construction, sides of beam shall be stripped first, then the under sides of slab and lastly the underside of the beam.

25. BENDING SCHEDULE:

The Contractor shall be responsible for preparing, checking all bar bending schedules against the drawing and obtain approval from Engineer-in-Charge. before cutting and bending and fixing of steel commences. Contractor shall get satisfied that the steel can' be fixed according to the drawing and also can be transported to the Site. The contractor shall remove from site at his own risk and cost any steel reinforcement bar fixed in position without obtaining prior approval of bar bending schedule from Engineer-in-Charge.

26.1 Bending and Cutting of Reinforcing Steel Bars

Preferably, bars of full length shall be used, overlapping of bars, where necessary, shall be done in accordance with the drawings or as directed by Engineer-in-Charge and as specified in IS:456-1978.

Wherever facility is available, welding of bars shall be resorted to in lieu of overlap. The location and type of welding shall be as approved by the Engineer-in-Charge as shall be done in accordance to IS: 2751-1966.

26.2 Placing in Position

Reinforcement bars shall be placed in position as shown in the drawings. The bars crossing one another shall be tied together at every intersection with two strands of annealed steel wire 0.90 to 1.6 mm thickness twisted tight to make the skeleton of the steel work rigid so that the reinforcement does not get displaced during the deposition of concrete. The concrete cover shall not be less than that specified in the drawings. Tuck welding shall also be permitted in lieu of binding with steel wire if approved by Engineer-in-Charge.

26.3 Approval of Reinforcement:

The Contractor must obtain the approval of the Engineer-in-Charge to the reinforcement fixed in position, before any concrete is deposited on the shutters.

26. CONCRETING:

i) The concrete, which will flow sluggishly into the forms and around the reinforcement without any segregation shall be determined by slump tests. The slump to be used shall be minimum required for proper concreting and compaction depending upon the concentration of reinforcement structural member to be connected.

ii) Concreting shall be commenced only after the Engineer-in-Charge has inspected the centering, shuttering and reinforcement as placed and passed the same. Shuttering shall be clean and free from all dirt, saw dust, pieces of wood, or other foreign material, and shall be treated as described hereinbefore.

iii) The concrete shall be deposited in its final position in a manner to preclude segregation of ingredients. In deep trenches and footings, concrete shall be laced through chutes as directed by the Engineer-in-Charge In case of columns and walls, the shuttering shall be so adjusted that the vertical drop of concrete is hot more than 1.5 meters at a time.

iv) During cold weather, concreting shall not be done when the temperature falls below 4.5 ^{0}C. The concrete placed shall be protected against frost by suitable covering. Concrete damaged by frost shall be removed and work redone at contractor's risk & cost. During hot weather, precaution shall be taken to see that the temperature of wet concrete does not exceed 38 ^{0}C. No concrete shall be laid within half an hour of the closing time of the day, unless permitted by the Engineer-in-Charge. It is necessary that the time between mixing and placing of concrete shall not exceed 30 minutes so that the initial setting process is not interfered with.

v) Concrete shall be compacted into a dense mass immediately after placing, by means of mechanical vibrators designed for continuous operations. The layers of concrete shall be so placed that the bottom layer does not finally set before the top layer is placed.

vi) Concreting shall be carried out continuously up to the construction joints, the position and details of which shall be as directed by the Engineer-in-Charge. Such joints shall be Page 24 of 246 kept to the minimum and shall not be located in valleys. The joints shall be kept at places where the shear force is the minimum and these shall be straight and at right angles to the direction of main reinforcement.

vii) When stopping the concrete on a vertical plane in slabs and beams and any other R.C.C. work an approved stop-board shall be placed with necessary slots for reinforcement bars or any other obstruction to pass the bars freely without bending. The. Construction joints shall be keyed by providing a triangular or trapezoidal fillet nailed on the stop-board. Inclined or feather joints shall not be permitted. Any concrete flowing through- -the joints of stop-board shall be removed soon after the initial set. When concrete is stopped on a horizontal plane, the surface shall be roughened and cleaned after the initial set.

viii) When the work has to be resumed, the joint shall be thoroughly cleaned with wire brush and loose particles removed. A coat of neat cement slurry at the rate of 2.75 kg of cement per square meter shall then be applied on the roughened surface before fresh concrete is laid.

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ix) Expansion joints shall be provided as shown in the structural drawings or as directed by the Engineer-in-Charge. The filling of these joints with bitumen filler, bitumen felt or any such material with the provision of copper or brass plate, etc.

x) After the concrete has begun to harden i.e. about 1 to 2 hours after its laying, it shall be protected from quick drying with moist gunny bags, sand or any other materials approved by the Engineer-in-Charge. After 24 hours of laying of concrete, the surface shall be cured by flooding with water of minimum 25mm depth, or by covering with west absorbent material. The curing shall be done for a minimum period of 15 days.

xi) For all slabs the top surface shall be furnished even and smooth with wooden trowel, before the concrete begins to set. Where so specified, the surfaces shall be given a linear deeply scratched surface by a steel broom or other approved tool while the concrete is still green to receive the specified finish on top.

xii) Immediately on removal of forms, the R.C.C. work shall be examined by the Engineer-in-Charge before any defects are made good.

27. CEILING SYSTEM:

i) Aluminium frame consisting of battens 50x25mm fixed over plugs embedded in wall conforming IS 733-1983.

ii) Plaster of Paris (Gypsum anhydrous) ceiling tiles of thickness 12mm should be used.

iii) Gypsum plaster shall conform to IS 2547 (Part 1). By product gypsum conforming to the requirements of IS 12679 shall also be used for the preparation of plaster.

28. ROOFING

Trapezoidal Polyester Coated Galvanised Steel Sheets of 0.50 mm thick conforming IS 277: 2003 on steel work in built up trusses of steel conforming IS:226 shall be used.

29. EARTHWORK

30.1 GENERAL:

Excavation may be involved in all types of soils including rock, saturated soil, sub-soil water or running sand. It may also include pumping or bailing out of water.

The contractor shall furnish all tools, plant instruments, qualified supervisory personnel, labour, materials, any temporary works, consumables and anything else necessary, for completion of the work in accordance with the Employer's requirements, whether or not such items are specifically stated herein.

The contractor shall survey the site before excavation and set out all lines and establish levels for various works such as grading, basement, foundations, plinth filling, roads, drains etc. Such survey shall be carried out by taking accurate cross sections of the area perpendicular to established reference/grid lines at 10 m and 30 m intervals or nearer in case of buildings and roads and pipe lines works respectively.

The excavation shall be carried out to correct lines and levels. This shall also include, where required, proper shoring to maintain excavations and also the furnishing, erecting and maintaining of substantial barricades around excavated areas and warning lamps at night.

Excavated material shall be dumped in regular heaps, bunds, riprap with regular slopes and levelling the same so as to provide natural drainage. Rock/soil excavated shall be stacked properly as approved by the Engineer-in-charge. As a rule, all softer material shall be laid along the centre of heaps, the harder and more weather resisting materials forming the casing on the sides and the top.

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Topsoil shall be stock piled separately for later use.

30.2 EXCAVATION

Excavation for permanent work shall be taken out to such widths, lengths, depths and profiles as are shown on the approved drawings or such other lines and grades as may be agreed with the Engineer-in-charge. Rough excavation shall be carried out to a depth of 150 mm above the final level. The balance shall be excavated with special care. Soft pockets shall be removed below the final level and extra excavation filled up with material as approved by the Engineer-in-charge. The final excavation should be carried out just prior to laying the blinding course.

All excavations shall be to the minimum dimensions required for safety and ease of working. Prior approval of the Engineer-in-charge shall be obtained by the contractor in each individual case, for the method proposed for the excavation, including dimensions, side slopes, dewatering, disposal, etc. This approval, shall not in any way relieve the Bidder of his responsibility for any consequent loss or damage. The excavation must be carried out in the most expeditious and efficient manner. Side slopes shall be as steep as will stand safely for the actual soil conditions encountered. Every precaution shall be taken to prevent slips. If slips occur, the slipped material shall be removed and the slope shall be dressed to a modified stable slope.

All loose boulders, detached rocks partially and other loose material which might move there with not directly in the excavation but so close to the area to be excavated as to be liable, in the opinion of Engineer-in-charge, to fall or otherwise endanger the workmen, equipment, or the work shall be stripped off and removed from the area of the excavation. The method used shall be such as not to render unstable or unsafe the portion, which was originally sound and safe.

Any material not requiring removal in order to complete the permanent works, but which, in the opinion of Engineer-in-charge, is likely to become loose or unstable later, shall also be promptly and satisfactorily removed.

30.3 FILLING AND BACK FILLING:

All fill material shall be subject to the Engineer-in-charge's approval. If any material is rejected by Engineer-in-charge, the Bidder shall remove the same forthwith from the site. Surplus fill material shall be deposited/disposed off as directed by Engineer-in-charge after the fill work is completed.

No earth fill shall commence until surface water discharges and streams have been properly intercepted or otherwise dealt with other approval of the Engineer-in-charge.

NOTE: For any item not covered in the above list, the contractor shall get the samples approved from the authorized representative of Engineer-in-charge before the supply is made.

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SECTION – 2.0

DETAILED TECHNICAL SPECIFICATION – REPAIR WORKS

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1.0 REPAIRS TO BUILDINGS

LIST OF BUREAU OF INDIAN STANDARD CODES

S. No.	*BIS. No.*	*Subject*
1.	IS 419	Specifications for Putty for use in Window Frames
2.	IS 14900	Specifications for Transparent Float Glass

1.1 REPAIRS TO PLASTER

1.1.0 The work includes cutting the patch and preparing the wall surface. Patches of 2.50 square meters and less in area shall be measured under item of 'Repairs to Plaster' .

1.1.1 Scaffolding

Scaffolding as required for the proper execution of the work shall be erected. If work can be done safely with the ladder will be permitted in place of scaffolding.

1.1.2 Cutting

The mortar of the patch, where the existing plaster has cracked, crumbled or sounds hollow when gently tapped on the surface, shall be removed. The patch shall be cut out to a square or rectangular shape at position marked on the wall as directed by the Engineer-in-Charge or his authorized representative. The edges shall be slightly under cut to provide a neat joint.

1.1.3 Preparation of Surface

The masonry joints which become exposed after removal of old plaster shall be raked out to a minimum depth of 10 mm in the case of brick work and 20 mm in the case of stonework. The raking shall be carried out uniformly with a raking tool and not with a basuli, and loose mortar dusted off. The surface shall then be thoroughly washed with water and kept wet till plastering is commenced.

In case of concrete surfaces, the same shall be thoroughly scrubbed with wire brushes after the plaster had been cut out and pock marked as directed by engineer-in-charge. The surface shall be washed and cleaned and kept wet till plastering is commenced.

1.1.4 Application of Plaster

Mortar of specified mix with the specified sand shall be used. The method of application shall be as described for single coat plaster work of the specified mix. The surface shall be finished even and flush and matching with the old surrounding plaster. All roundings necessary at junctions of walls, ceilings etc. shall be carried out in a tidy manner as specified.

All dismantled mortar & rubbish etc. shall be disposed off within 24 hours from its dismantling promptly as directed by the Engineer-in-Charge.

1.1.5 Protective Measure

Doors, windows, floors, articles of furniture etc. and such other parts of the building shall be protected from being splashed upon. Splashing and droppings, if any, shall be removed by the contractor at his own cost and the surface cleaned. Damages, if any, to furniture or fittings and fixtures shall be recoverable from the contractor.

1.1.6 Curing

Curing shall be done as per plaster work with special reference to the particular type of plaster mix as described.

1.1.7 Finishing

After the plaster is thoroughly cured and dried the surface shall be whitewashed or colour washed to suit the existing finishing as required unless specified.

1.1.8 Measurements

Length and breadth shall be measured correct to a cm. The area shall be calculated in square meter correct to two places of decimal. Patches below 0.05 square meter in area

shall not be measured for payment.

Pre- measurements of the patches to be plastered shall be recorded after the old plaster has been cut and wall surface prepared.

1.1.9 Rate

The rate includes the cost of all the materials and labour involved in all the operations described above including lead as described in the item for disposal of old dismantled plaster /material.

1.2 FIXING DOOR, WINDOW OR CLERESTORY WINDOW CHOWKHATS IN EXISTING OPENING

1.2.1 Making Holes

1.2.1.1 In case of door frames without sills, holes 40 mm deep shall be made in the floor for fixing the lower end of verticals of the frames. For doors with sills, the sill plates shall be partly fixed in the floor so that they project above the floor to the height as directed by the Engineer-in-Charge.

1.2.1.2 For embedding hold fasts of doors, windows or clerestory windows, the requisite number of holes at the correct positions shall be cut out in the masonry. The size of the holes shall be such that the chowkhats with the hold-fasts can be conveniently erected in position. Where necessary, masonry shall be chipped uniformly to facilitate easy insertion of the frame in the opening.

1.2.1.3 Special care shall be taken when holes are made in load bearing pillars or wall portions separated by openings to ensure that beams etc. supported by them are properly propped up. In such portions cutting holes shall be done on one side at a time. The sides of the holes shall be truly parallel and perpendicular to the plane of the wall. Due care shall be taken, not to disturb the adjoining masonry and the masonry under the bearings of lintels and arches etc. spanning the opening. The holes shall then be cleaned of all dust, mortar and brick bats or stone pieces and thoroughly wetted.

1.2.2 Fixing

The sides of chowkhats of door, window or clerestory window abutting against or to be embedded in masonry shall be painted with two coats of coal tar before being placed in position. The chowkhats shall than be inserted in position with their hold-fasts bolted tight. The chowkhats shall than be adjusted to proper line and plumb and secured in position by temporary bracing which shall not be disturbed or removed until the hold fasts are embedded in the masonry and the concrete block has set. The concrete to be used for embedding hold- fasts shall be cement concrete 1:3:6 mix (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size).

The minimum size of concrete block in which the hold-fasts will be embedded shall be 30 x 10 x 15 cm for 35 cm long holdfasts. The concrete of the block shall completely fill the hole made in the masonry for the purpose. The chase cut in the floor shall be cut square and construction joint shall be provided filled in with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate
20 mm nominal size) and rendered smooth at the top and finished to match the existing type of floor.

1.2.3 Finishing

After the surface surrounding the hold-fasts has sufficiently dried it shall be cleaned of dust etc. and wetted. It shall then be plastered with cement mortar 1:4 (1 cement : 4 fine sand) flush and matching with the surrounding plaster work. In case of exposed brick work, stone work, the finishing shall be done to match the surrounding. Any other portion of the wall opening, if damaged, shall be repaired in similar way.

After the cement plaster patches have been thoroughly cured and dried, they shall either be white washed or colour washed as required unless otherwise specified. All malba and debris obtained from cutting etc. shall be disposed off to the nearest dumping ground

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promptly as directed by Engineer- in-Charge.

1.2.4 Measurements

The chowkhats of doors, window and clerestory windows shall be enumerated separately.

1.2.5 Rate

The rate shall apply irrespective of the size of the chowkhat upto a maximum area of opening 3.75 square meters for doors, 2.5 square meters for windows and 1.2 square meters for clerestory windows. The rate is inclusive of labour and materials involved in all the operations described above, excluding (a) cost of chowkhats and (b) cost of supplying and fixing the hold-fasts including C.C. block and bolts.

1.3 FIXING CHOWKHATS IN EXISTING OPENING IN BRICKS / RCC WALL WITH DASH FASTNERS

1.3.1 In case of door frames without sills, holes 40 mm deep shall be made in the floor for fixing the lower end of verticals of the frames. For doors with sills, the sill plates shall be partly fixed in the floor so that they project above the floor to the height as directed by the Engineer-in-Charge.

1.3.1.1 For fixing dash fasteners /chemical fasteners of doors, windows or clerestory windows, the requisite number of holes at the correct positions shall be in the masonry/RCC wall. The size of holes shall be such that the fasteners can be conveniently placed in position. Where necessary, masonry shall be chipped uniformly to facilitate easy insertion of the frame in the opening.

1.3.1.2 Special care shall be taken when holes are made in load bearing pillars or wall portions separated by openings to ensure that beams etc. supported by them are properly propped up. In such portions cutting holes shall be done on one side at a time. The sides of the holes shall be truly parallel and perpendicular to the plane of the wall. Due care shall be taken, not to disturb the adjoining masonry and the masonry under the bearings of the lintels and arches etc. spanning the opening. The holes shall then be cleaned of all dust, mortar and brick bats or stone pieces and thoroughly wetted.

1.3.2 Fixing

The sides of chowkhats of door, window or clerestory window abutting against or to be embedded in masonry shall be painted with two coats of coal tar before being placed in position. The chowkhats shall then be inserted in position tight. The chowkhats shall then be adjusted to proper line and plumb and secured in position by temporary bracing which shall not be disturbed or removed until the fasteners are embedded in the masonry /RCC wall.

1.3.3 Finishing

After the surface surrounding the hold-fasts has sufficiently dried it shall be cleaned of dust etc. and wetted. It shall then be plastered with cement mortar 1:4 (1 cement: 4 fine sand) flush and matching with the surrounding plaster work. In case of exposed brick work, stone work, the finishing shall be done to match the surrounding. Any other portion of the wall opening, if damaged, shall be repaired in similar way.

After the cement plaster patches have been thoroughly cured and have dried, they shall either be white washed or colour washed as required unless otherwise specified. All malba and debris obtained from cutting etc. shall be disposed off to the nearest dumping ground.

1.3.4 Measurements

The chowkhats of doors, window and clerestory windows shall be enumerated separately.

1.3.5 Rate

The rate shall apply irrespective of the size of the chowkhat upto a maximum area of opening 3.75 square meters for doors, 2.5 square meters for windows and 1.2 square meters for clerestory windows. The rate is inclusive of labour and materials involved in all

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the operations described above, including cost of dash fasteners chemical fasteners but excluding cost of chowkhat.

1.4 MAKING OPENING IN THE MASONRY CONSTRUCTION AND FIXING CHOWKHATS FOR DOORS, WINDOWS, AND CLERESTORY WINDOWS

1.4.0 Before making opening it is necessary to examine that the wall exclusive of opening is adequate to take the load coming on the structure. All the structural members supported on the walls which have direct bearing over the area in which opening is to be made, shall be properly supported with props to relieve the load from masonry wall till the lintel over the opening is strong enough to take the load. Care should also be taken not to disturb the adjoining masonry.

All precautions as explained in Chapter 2.0 (Demolition and Dismantling) should be followed in case of dismantling the external walls. The portion to be dismantled may be clearly marked on both sides of the wall. Dismantling shall be carried out from top to bottom within the marked area. The sides of the opening shall be as far as possible, parallel and perpendicular to the plane of wall.

1.4.1 Making Opening

1.4.1.1 The openings for fixing door/window frames shall be to the extent of accommodating the hold fast. The hold fasts shall be fixed in cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 stone aggregate 20 mm nominal size) or in masonry as required. Where only opening is to be made in the masonry, the width of the opening shall be such that the sides of the masonry can be built true to line and plumb and such masonry built shall conform to the specifications of the particular type of masonry in which the opening is made with particular reference to size of corner stones etc. In order to get continuity with old masonry, proper key shall be provided. The height of the opening shall be such that it can accommodate the required depth of the RCC lintel also.

1.4.1.2 The sides of opening in masonry shall be cleaned of all dust, mortar, brick bats/loose stones, chips etc. and the surface left rough and thoroughly wetted.

1.4.1.3 The lintel shall be invariably cast first in the opening made for the purpose. One side of the shuttering shall be kept open in the beginning till the concrete is laid. The shuttering shall then be fixed for half of the opening and concreting completed.

1.4.1.4 Curing of lintel casted shall be done for a minimum period of 7 days.

1.4.1.5 Precast RCC lintel or R.S. Joist may also be used if directed by the Engineer-in-Charge.

1.4.2 Fixing Chowkhats

Fixing of chowkhats shall be done as specified in 1.2.2.

1.4.3 Finishing

1.4.3.1 After the surface of the sides of masonry opening and lintel are sufficiently dry and set, it shall be cleaned free of dust, loose mortar etc. and wetted thoroughly. It shall then be plastered or pointed as required flush with the surrounding masonry work. Any other portion of the wall if damaged shall be finished in similar manner.

1.4.3.2 After the cement plaster/pointing has been thoroughly cured and have dried the surface shall be either white or colour washed/painted as required. The surface of the wall which is spoiled due to splashing of mortar shall be cleaned forthwith.

1.4.4 Measurements

The openings made for doors, windows, clerestory windows shall be measured correct to cms and area shall be calculated in square meters correct to two places of decimal.

1.4.5 Rate

The rate shall apply per sqm of opening. The rate is inclusive of labour and material involved in all the operations described above.

Cost of Chowkhats, cost of CC blocks, cost of supplying the hold-fasts bolts, cost of R.C.C lintel or R.S. Joist which shall be paid for separately.

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1.5 RENEWING FLOATING GLASS PANES WITH PUTTY AND NAILS

1.5.1 Removing Broken Glass Panes

Old putty shall be raked out with hack knife. The brad (small nails without head) and pieces of broken glass shall be removed from the rebates of the sash bars. The pieces of glass panes as found useful shall be handed over to the Engineer-in-Charge of the work. No glass shall be inserted in frames until they have been primed and prepared for painting so that the wood may not draw oil out of the putty.

1.5.2 Floating Glass Panes

The floating glass panes shall conform to specifications described in IS 14900.

1.5.3 Fixing

The floating glass panes shall be so cut that it fits slightly loose in the frame and as specified in A&B of IS 14900. A thin layer of Putty conforming to IS 419 shall be prepared by mixing one part of white lead with three parts of finely powdered chalk and then adding the boiled linseed oil to the mixture to form a stiff paste and adding varnish to the paste @ 1 liter of varnish to 18 kg. of paste. The putty so prepared in the form of a stiff paste shall be drawn along the inner edge of the rebate, for bedding the back of the glass panes. The glass pane shall then be put in position, pressed home against the thin layer of the putty, and secured in rebate by new brads. The brads shall not be spaced more than 7.5 cm from each corner and not more than 15 cm apart. The putty shall then be applied in the rebate uniformly, sloping from the inner edge of the rebate. In doing this care shall be taken to keep the putty a little within the inner edge of the rebate and surplus putty removed so that none of it is seen through the glass from the inside. The putty so filled in the rebates shall be leveled smooth and finished in a straight line. When dried the putty shall be covered with a coat of paint of approved quality and shade to match the existing finish of joinery work.

The floating glass panes shall be cleaned with methylated spirit. All splashing or droppings of washing and paints shall be removed. All rubbish and unserviceable materials shall be disposed of to the dumping ground promptly as per the direction of Engineer-in-Charge.

Thickness and Tolerance of Floating Glass

Thickness	Tolerance
4 mm	± 0.3 mm
5 mm	± 0.3 mm
6 mm	± 0.3 mm

Note: Frosted glass panes should be replaced with frosted glass panes. These shall be fixed with frosted face on the inside.

1.5.4 Measurements

Length and breadth of glass panes shall be measured correct to a cm. The area of the glass panes as fixed shall be calculated in square meter correct to two places of decimal.

1.5.5 Rate

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

1.6 RENEWING FLOATING GLASS PANES WITH WOODEN FILLETS

1.6.1 Removing Broken Glass Panes

The specifications shall be the same as in para 1.5.1 except that the wooden fillets including nails shall be taken out carefully.

1.6.2 Glazing

The specifications for glass panes and their fixing shall be the same as per IS 14900. The fillet shall either be fixed flush or projected uniformly to match with the existing work by

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means of nails (brads).
The new fillet provided shall be painted or finished otherwise to match with the existing finish of the joinery work.
The glass panes shall be cleaned with methylated spirit of all sorts of splashing and droppings of wash and paints.
All rubbish and unserviceable materials shall be disposed of in the dumping ground promptly as per the direction of Engineer-in-Charge.
1.6.3 Measurements
Length and breadth of glass panes shall be measured correct to a cm. The area of the glass panes as fixed shall be calculated in square meter correct to two places of decimal. The new wooden fillets fixed shall be measured in running meters correct to a cm.
1.6.4 Rate
The rates shall include the cost of labour and material involved in all the operations described above except that the cost of new wooden fillets used in the work and their finishing shall be paid for separately.
1.7 RENEWING FLOATING GLASS PANES AND REFIXING EXISTING WOODEN FILLETS
The specifications shall be same as described in 1.6 above.
1.8 PROVIDING NEW WOODEN FILLETS
1.8.1 The fillets shall be of wood, as specified in the item of work, these shall be cut and planed smooth to the required shape and dimensions.
1.8.2 Fixing
The specifications for glass panes and their fixing shall be the same. The fillet shall either be fixed flush or projected uniformly to match the existing work.
The fillet shall be painted or finished otherwise to match with the existing finish of the joinery work.
The glass panes shall be cleaned with methylated spirit of all sorts of splashing and dropping of wash and paints.
1.8.3 Measurements
The fillets shall be measured in running meters. The lengths shall be measured correct to a cm.
1.8.4 Rate
The rate shall include the cost of all labour and materials involved in all the operations described above. The rate shall also include the cost of removal of worn out fillets, when these are met with in old work. The rate shall vary according to the class of wood used.
1.9 RENEWAL OF OLD PUTTY OF GLASS PANES
1.9.1 The old putty shall be removed as specified in 1.5.1 and new putty fixed as specified in 1.5.3.
1.9.2 Measurements
The work shall be measured in running meters. The length along the rebate shall be measured correct to a cm.
1.9.3 Rate
The rate shall include the cost of labour and materials involved in all the operations described above.
1.10 REFIXING OLD GLASS PANES WITH PUTTY AND NAILS
1.10.1 Specification same as described in 1.5 above. Except for the glass panes, old glass panes will be used for which nothing extra will be paid.
1.11 FIXING OLD GLASS PANES WITH WOODEN FILLETS
1.11.1 Specifications same as described in para no. 1.6 above except for the glass panes. Old glass panes will be used for which nothing extra shall be paid.
1.12 FIXING FAN CLAMPS IN EXISTING R.C.C. SLABS

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1.12.1 The fan clamps to be fixed in an existing R.C.C. slab. These shall be made of 16 mm dia M.S. bar.

1.12.2 Fixing

A 15 x 7.5 cm size chase shall be cut from the ceiling to expose the reinforcement and upto 2.5 cm clear round the reinforcement bar as directed. This shall be done without any damage to adjoining portion of the ceiling.

The two arms at the ends of the clamps shall be passed through the space over the reinforcement bar from the bottom of the slab. Then the two arms shall be bent down about 1.5 cm by means of a crow bar. The clamp shall be held in position and chase in the ceiling filled with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size). The ceiling shall then be finished to match the existing surface and properly cured.

The exposed portion of the clamp shall be given two or more coats of paint including one priming coat of shade as directed by the Engineer-in-Charge.

1.12.3 Measurements and Rate

Clamps shall be counted in numbers. The rate per fan clamp shall include the cost of labour and materials involved in all the operations described above. The rate shall apply irrespective of the thickness of the slab.

1.13 RENEWING WOODEN BATTENS /BEAMS IN ROOFS

1.13.1 Dismantling Wooden Battens / Beams

Dismantling shall be done as described in para 2.1 of dismantling and demolishing. Proper scaffolding shall be erected and got inspected by Engineer-in -Charge. Propping and bracing as directed should be done adequately and members required to be dismantled should be removed carefully including nails/bolts etc. and dismantling of masonry wall. The dismantled members should not be thrown or dropped but lowered with ropes carefully and stacked properly.

1.13.2 Relaying of Wooden Battens

The wooden battens/beams of required section and size should be placed at proper interval and surface of the wooden batten/beams shall be painted with oil type wood preservative of approved brand and manufacture and as per the direction of Engineer-in-Charge.

1.13.3 All serviceable material shall be stacked properly and all the unserviceable material shall be deposited with the Engineer-in-Charge.

1.13.4 Measurement

The work shall be measured in cubic meters. The length, breadth and depth shall be measured correct to a cm.

1.13.5 Rate

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

1.14 PANELLED GLAZED OR PANELLED AND GLAZED SHUTTERS

1.14.0 Pannelled or glazed shutters for doors, windows, ventilators and cupboards shall be constructed in the form of timber frame work of stiles and rails with panel inserts of timber, plywood, block board, veneered particle board, fibre board wire gauze or sheet glass. The shutters may be single or multipanelled, as shown in the drawings or as directed by the Engineer-in-Charge. Timber for frame work, material for panel inserts and thickness of shutters shall be as specified. All members of the shutters shall be straight without any warp or bow and shall have smooth well planed face at right angles to each other.

Any warp or bow shall not exceed 1.5 mm. The right angle for the shutter shall be checked by measuring the diagonals and the difference between the two diagonals should not be more than ± 3 mm.

1.14.1 Frame Work

1.14.1.1 Timber for stiles and rails shall be of the same species and shall be sawn in the directions of grains. Sawing shall be truly straight and square. The timber shall be planed smooth and accurate to the required dimensions. The stiles and rails shall be joined to each other by plain or haunched mortise and tenon joints and the rails shall be inserted 25 mm short of the width of the stiles. The bottom rails shall have double tenon joints and for other rails single tenon joints shall be provided. The lock rails of door shutter shall have its center line at a height of 800 mm from the bottom of the shutters unless otherwise specified. The thickness of each tenon shall be approximately one- third the finished thickness of the members and the width of each tenon shall not exceed three times its thickness.

1.14.1.2 Gluing of Joints : The contact surfaces of tenon and mortise shall be treated, before putting together, with bulk type synthetic resin adhesive conforming to IS 851 suitable for construction in wood or synthetic resin adhesive (Phenolic and amino plastic) conforming to IS 848 or polyvinyl acetate dispersion based adhesive conforming to IS 4835 and pinned with 10 mm dia hardwood dowels or bamboo pins or star shaped metal pins; after the frames are put together and pressed in position by means of press.

1.14.1.3 Stiles and bottom rail shall be made out of one piece of timber only. Intermediate rail exceeding 200 mm in width may be out of one or more pieces of timber. The width of each piece shall be not less than 75 mm. Where more than one piece of timber is used for rails, 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.

TABLE 1.1

Dimensions of Components of Frame Work

Sl. No.	Description	Width Mm	Thickness mm
A. DOOR SHUTTERS			
(a)	Stile, top and	100	35 or 40
(b)	Lock rail	150	35 or 40
(c)	Bottom rail	200	35 or 40
(d)	Muntin	100	35 or 40
(e)	Glazing bar	40	35 or 40
B. WINDOW, VENTILATOR & CUPBOARD SHUTTERS			
(a)	Stile, top and	80	20, 25 or 30
(b)	Bottom rail	80	20, 25 or 30
(c)	Muntin	60	20, 25 or 30
(d)	Glazing bar	40	20, 25 or 30

1.14.2 Muntin and glazing bars where required shall be stubtenoned to the maximum depth which the size of the member would permit or to a depth of 25 mm whichever is less. Unless otherwise specified the finished dimensions of the components of frame work of shutters shall be as given in Table 1.1. The tolerance on width of styles and rail shall be ± 3 mm. The tolerance in thickness will be ± 1 mm. The thickness of all components of frame work shall be the same as the thickness of the shutter. Tolerance on over all dimensions of the shutter shall be ± 3 mm.

1.14.3 Rebating

The shutters shall be single-leaf or double leaved as shown in the drawings or as directed by the Engineer-in-Charge. In case of double leaved shutters, the meeting of the stiles shall be rebated by one-third the thickness of the shutter. The rebating shall be either

splayed or square type.

1.14.4 Panelling

The panel inserts shall be either framed into the grooves or housed in the rebate of stiles and rails. Timber, plywood, hard board and particle board panels shall be fixed only with grooves. The depth of the groove shall be 12 mm and its width shall accommodate the panel inserts such that the faces are closely fitted to the sides of the groove. Panel inserts shall be framed into the grooves of stiles and rails to the full depth of the groove leaving on space of 1.5 mm. Width and depth of the rebate shall be equal to half the thickness of stiles and rails. Glass panels, asbestos panels wire gauze panels and panel inserts of cupboard shutters shall be housed in the rebates of stiles and rails.

1.14.4.1 Timber Panels : Timber panels shall be preferably made of timber of large width; the minimum width and thickness of the panel shall be 150 mm, and 15 mm respectively. When made from more than one piece, the pieces shall be jointed with a continuous tongued and grooved joint glued together and reinforced with headless nails at regular intervals not exceeding 100 mm. Depth and thickness of such joint shall be equal to one-third of thickness of panel. The panels shall be designed such that no single panel exceeds 0.5 square meter in area. The grains of timber panels shall run along the longer dimensions of the panels. All panels shall be of the same species of timber unless otherwise specified.

1.14.4.2 Plywood Panels : Plywood boards used for panelling of shutters shall be BWP type or grade as specified in IS Code 303. Each panels shall be a single piece of thickness, 9 mm for two or more panel construction and 12 mm for single panel construction unless otherwise specified.

1.14.4.3 Block Board Panels : Block board used for panelling of shutters shall be Grade I (Exterior Grade) bonded with BWP Type Synthetic resin adhesives as specified in IS 710. Each panel shall be a single piece of thickness 12 mm unless otherwise specified.

1.14.4.4 Veneered Particle Board Panels: Veneered Particle board used for panelling of shutters shall be Exterior Grade bonded with BWP type synthetic resin adhesive as specified in IS 848. Each panel shall be a single piece of thickness 12 mm unless otherwise specified.

1.14.4.5 Fibre Board Panels : Fibre board used for panelling of shutters shall be Exterior Grade bonded with BWP type synthetic resin adhesive as specified in IS 848. Each fibre board panel shall be a single piece of thickness 10 mm unless otherwise specified.

1.14.4.6 Glass Panels : Glass panelling (Glazing) shall be done with float sheet glass as per IS 14900. Glazing in the shutters of doors, windows and ventilators of bath, WC and Lavatories shall be provided with frosted glass the weight of which shall be not less than 10 kg/sqm. Frosted glass panes shall be fixed with frosted face on the inside. Glass panels shall be fixed by providing a thin layer of putty conforming to IS 419 applied between glass pane and all along the length of the rebate and also between glass panes and wooden beading.

1.14.4.7 Putty can be prepared by mixing one part of white lead with three parts of finely powdered chalk and then adding boiled linseed oil to the mixture to form a stiff paste and adding varnish to the paste at the rate of 1 liter of varnish to 18 kg of paste. Fixing of glass panes without beading shall not be permitted. Glazing shall be done after the shutters have been primed and prepared for painting, so that wood may not draw oil out of putty.

1.14.4.8 Finish : Panels of shutters shall be flat and well sanded to a smooth and level surface.

1.14.5 Beading

Beadings in panelled shutter shall be provided where specified in architectural drawings or directed by the Engineer-in -Charge. Each length of beading shall be single piece. Joints at the corners shall be mitred and exposed edges shall be rounded. Beading shall be fixed

with headless nails at 75 mm intervals. For external shutters, the beading shall be fixed on the outside face.

1.14.6 Machine/Factory made Shutters

Machine made shutters, where specified, shall be procured from an approved factory. For machine made shutters, operations like sawing, planning, making tongue and tenons, cutting grooves, mortises and rebates, drilling holes and pressing of joints shall be done by suitable machines. Machines made shutters shall be brought to the site fully assembled but without any priming coat. Panel inserts of sheet glass and wire gauze may, however, be fixed at site.

1.14.7 Fixing of Shutters

For side hung shutters of height upto 1.2 m, each leaf shall be hung on two hinges at quarter points and for shutter of height more than 1.2 m, each leaf shall be hung on three hinges one at the centre and the other two at 200 mm from the top and bottom of the shutters. Top hung and bottom hung shutters shall be hung on two hinges fixed at quarter points of top rail or bottom rail. Centre hung shutter shall be suspended on a suitable pivot in the centre of the frame. Size and type of hinges and pivots be as specified. Flap of hinges shall be neatly counter sunk into the recesses cut to the exact dimensions of flap. Screws for fixing the hinges shall be screwed in with screw driver and not hammered in. Unless otherwise specified, shutters of height more than 1.2 m shall be hung on butt hinges of size 100 mm and for all other shutters of lesser height butt hinges of size 75 mm shall be used. For shutter of more than 40 mm thickness butt hinges of size 125 × 90 × 4 mm shall be used. Continuous (piano) hinges shall be used for fixing cup-board shutters where specified.

1.14.8 Fittings

Fittings shall be provided as per schedule of fittings decided by Engineer-in- Charge. Cost of providing and fixing shutter shall include cost of hinges and necessary screws for fixing the same. All other fittings shall be paid for separately. The fittings shall conform to specifications as per the relevant IS Code. Where the fittings are stipulated to be supplied by the department free of cost, screws for fixing these fittings shall be provided by contractor and nothing extra shall be paid for the same.

1.14.9 Wooden Cleats and Blocks

Wooden cleats and blocks shall be fixed to doors and windows as directed by Engineer-in-Charge, as per size and shape approved by him. These are included in the cost of providing and fixing the shutters.

1.14.10 Measurements

Framework and panelling shall be measured separately.

1.14.10.1 Frame Work of Shutters : The overall length and width of the framework of the shutters shall be measured nearest to a cm in fixed position (overlaps not to be measured in case of double leaved shutters) and the area calculated in square meters correct to two places of decimeter. No deduction shall be made to form panel openings or louvers. No extra payments shall be made for shape, joints and labour involved in all operations described above.

1.14.10.2. For panelling of each type or for glazed panel length and width of opening for panels inserts or glazed panels shall be measured correct to a cm before fixing the beading and the area shall be calculated to the nearest 0.01 sq.m. The portions of the panel insert or glazed panel inside the grooves or rebates shall not be measured for payment.

1.14.11 Rate

Rate includes the cost of materials and labour involved in all the operations described above. The frame work and panelling of each type or glazed panels shall be paid separately. The rate for frame work includes the cost of butt hinges and necessary screws as specified in 1.14.7. However, extra shall be paid for providing moulded beading where

specified. Nothing extra shall be paid for plain beading as stated in 1.14.5 when specified in drawing.

1.15 FITTINGS

1.15.0 Fitting shall be of mild steel brass, aluminium or as specified. Some mild steel fittings may have components of cast iron. These shall be well made, reasonably smooth, and free from sharp edges and corners, flaws and other defects. Screw holes shall be counter sunk to suit the head of specified wood screws. These shall be of the following types according to the material used.

Mild Steel Fittings These shall be bright satin finish black stone enamelled or copper oxidised (black finish), nickel chromium plated or as specified.

Brass Fittings These shall be finished bright satin finish or nickel chromium plated or copper oxidised or as specified.

Aluminium Fittings These shall be anodised to natural matt finish or dyed anodic coating not less than grade AC 10 of IS 1868.

The fittings generally used for different type of doors and windows. The fittings to be actually provided in a particular work shall, however, be decided by the Engineer-in-Charge.

Screws used for fittings shall be of the same metal, and finish as the fittings. However, chromium plated brass screws or stainless steel screws shall be used for fixing aluminium fittings. These shall be of the size as indicated in respective figures.

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 screw driver and not hammered in. Recesses shall be cut to the exact size and depth for the counter sunking of hinges.

1.15.1 Butt Hinges

(a) Cast brass butt hinges light/ordinary or heavy.

1.15.1.1 Cast Brass Butt Hinges : These shall be light/ordinary or heavy as specified. These shall be well made and shall be free from flaws and defects of all kinds. These shall be finished bright or chromium plated or oxidised or as specified. These shall generally conform to IS 205.

Hinge Pin : Hinge pin shall be made of brass or of phosphor bronze. The hinge pins shall be firmly rivetted and shall be properly finished. The movement of the hinge pin shall be free, easy and square and shall not have any play or shake.

Knuckles : The number of knuckles in each hinge shall not be less than five. The number of knuckles in case of sizes less than 40 mm shall be three. The sides of the knuckles shall be straight and at right angle to the flap. The movement of the hinge pin shall be free and easy and working shall not have any play or shake.

Screw Holes : The screw holes shall be clean and counter sunk and of the specified size for different types and size of hinges. The size of the holes shall be such that when it is counter sunk it shall be able to accommodate the full depth of counter sunk head of wood screw specified.

1.15.1.2 Sampling and Criteria for Conformity: The number of butt hinges to be selected from a lot shall depend on the size of lot. Butt hinges for testing shall be taken at random from at least 10 per cent of the package subject to a minimum of three, equal number of hinges being selected from each package. All butt hinges selected from the lot shall be checked for dimensional and tolerance requirements. Defects in manufacture and finish shall also be checked. A lot shall be considered conforming to the requirements of this specification if the number of defective hinges among those tested does not exceed the corresponding number given in Table 1.2.

TABLE 1.2

Lot size	Sample size	Permissible No. of defective hinges
Upto 200	15	0
201 to 300	20	1
301 to 500	30	2
501 to 800	40	2
801 and above	55	3

Note: Any hinge which fails to satisfy the requirements of any one or more of the characteristics shall be considered as defective hinge.

1.15.2 Spring hinges: (Single or double acting)

1.15.2.1 These shall be single acting when the shutter is to open on one side only or double acting when the shutter opens on both sides. These shall be made of M.S. or brass as specified, and shall generally conform to IS 453.

Hinges shall work smoothly and shall hold the door shutter truly vertical in closed position.

Each double-acting spring hinge shall withstand the following tests which shall be carried out after fixing it to a swing door in the normal manner.

When the door is pushed through 90° and released 2000 times on each side in quick succession the hinge shall show no sign of damage or any appreciable deterioration of the components during or on completion of the test.

The door shall require a force of 2.0 ± 0.5 kg for 100 mm hinges and 3.0 ± 0.5 kg for 125 mm and 150 mm hinges at a distance of 4.5 cm from the hinge pin to move the door through 90º.

The size of spring hinge shall be taken as the length of the plate.

1.15.2.2 These shall be of the following type :

Mild Steel : The cylindrical casing shall be made either from M.S. sheet of 1.60 mm thickness, lap jointed and brazed, welded and riveted, or from solid drawn tube of thickness, pressed to from the two casing. It shall be stove enameled black or copper oxidized or as specified.

Cast Brass: The cylindrical casing shall be made either from brass sheet of 1.60 mm thickness, lap jointed and brazed, or from solid drawn brass tube of not less than 1.60 mm thickness. It shall be satin, bright nickle — plated or copper oxidized or as specified.

1.15.2.3 Sampling: The number of spring hinges shall be selected from the lot and this number shall depend on the size of the lot and shall be in accordance with Table 1.3.

TABLE 1.3

Lot size	Sample size	Permissible No. of defective spring
1 to 25	3	0
26 to 50	6	0
51 to 100	12	0
101 to 200	15	0
201 to 300	20	1
301 to 500	30	2
501 to 800	40	2
801 and above	55	3

1.15.3 Flush Bolts

1.15.3.1 These should generally conform to IS 5187. These shall be of cast brass, cast aluminium alloy or extruded aluminium alloy as specified. Only one material shall be

MHSP

used in the manufacture of all the components of flush bolts except spring which shall be of phosphor bronze or steel strip.
When the rod is completely in its maximum bolting position it shall be retained in that position by the spring. The length of the bolt shall be such that, when the bolt is pulled down, the top of the bolt shall be flush with the top of the lip face. The top of the bolt shall be given a taper of 45° to enable easy pull or push.
1.15.3.2 Brass flush bolts shall be satin or bright polished. Alternatively they may be nickel or chromium plated as specified in IS 4827 or copper oxidised in accordance with IS 1378. Aluminium flush bolts shall be anodised and the quality of the anodised finish shall not be less than grade AC 15 of IS 1868.
Note : The working of flush bolts is found satisfactory only in case of shutters made of high quality timber like teakwood properly seasoned and when there is no warping due to changes in weather Brass flush bolts which give a more satisfactory performance are costly and uses scarce materials. Hence use of flush bolts is to be discouraged.
1.15.4 Floor Door Stopper
1.15.4.1 The floor door stopper shall conform to IS 1823. This shall be made of cast brass of overall size as specified and shall have rubber cushion. The shape and pattern of stopper shall be approved by the Engineer-in-Charge. It shall be of brass finished bright, chromium plated or oxidised or as specified. The size of floor stopper shall be determined by the length of its plate. It shall be well made and shall have four counter sunk holes for fixing the door stoppers to the floor by means of wood screws. The body or housing of the door stopper shall be cast in one piece and it shall be fixed to the cover plate by means of brass or mild steel screws and cover plate shall be of casting or of sheet metal. The spring shall be fixed firmly to the pin. Tongue which would be pressed while closing or opening of the door shall be connected to the lower part by means of copper pin. On the extreme end a rubber piece shall be attached to absorb shock. All parts of the door stopper shall be of good workmanship and finish, burrs and sharp edges removed. It shall be free from surface and casting defects. Aluminium stopper shall be anodised and anodic film shall not be less than grade AC-10 of IS 1868.
1.15.4.2 Sampling and Criteria for Conformity: It shall be same as specified in Table 1.4.
TABLE 1.4 Requirements for Rubber

Particulars	Requirements	Testing procedure
Relative density Max	1.3	IS 3400 (Part IX)
Hardness	60 ± 5	IS 3400 (Part II)
Change in initial hardness ageing for 24	+5	IS 3400 (Part II)

1.15.5 Hanging Rubber Door Stopper
1.15.5.1 These shall be of cast brass, finished bright, chromium plated or as specified. Aluminium stopper shall be anodised and the anodic coating shall not be less than grade AC-10 of IS:1868. The size and pattern of the door stopper shall be approved by the Engineer-in-Charge. The size shall be determined by its length.
1.15.6 Casement Brass Stays (Straight Peg Type)
1.15.6.1 These shall be made of mild steel, cast brass, aluminium (extruded section) or plastic (Polypropylene) as specified. Mild steel casement stays shall be a copper oxidised (black finish) or as specified. Cast brass stays shall be finished bright or chromium plated or as specified. Aluminium stays shall be anodised and the anodic coating shall not be less than grade AC-10 of IS 1868. Aluminium and M.S. stays shall be made from channel section. The stays shall not weigh less than that indicated below:
200 mm 0.24 kg each

MPSP

250 mm	0.28 kg each
300 mm	0.33 kg each

1.15.6.2 The shape and pattern of the stays shall be approved by the Engineer-in-Charge. The size of stays shall be determined by its length as shown in the plate. The plastic (Polypropylene) stays shall conform to IS 6318.

1.15.7 Fan Light Pivots

1.15.7.1 These shall generally conform to IS 1837. These shall be of mild steel or cast brass or Aluminium or as specified. The brass, fan light pivots shall be finished bright, chromium plated or as specified. M.S. fan light pivot shall be copper oxidized (black finish) or as specified. The base and socket plate of M.S. fan light pivots shall be made from minimum 3.0 mm M.S. sheet and the pivot shall be of round M.S. bar of minimum 10 mm diameter projecting out by minimum 12 mm length and firmly rivetted to the base plate.

1.15.7.2. The base and socket plate of cast brass fan light pivots shall be made from minimum 3.0 mm thick brass plate and the projected pivot shall not be less than 12 mm diameter and 12 mm length, cast in single piece with the base plate.

1.16 PAINTING READY MIXED PAINT OVER G.S. SHEETS

1.16.0 Ready mixed paint, suitable for painting over G.S. sheets, of approved brand and manufacture and of the required shade shall be used. New or weathered G.S. sheets shall be painted with a priming coat of one coat of redoxide zinc chromate paint. Primer shall be applied before fixing sheets in place.

1.16.1 Preparation of Surface

1.16.1.1 Painting New Surface: The painting of new G.S. sheets shall not usually be done till the sheets have weathered for about a year. When new sheets are to be painted before they have weathered they shall be treated with a mordant solution prepared by mixing 38 gm of copper acetate in a liter of soft water or 13 gm hydrochloric acid in a solution of 13 gm each of copper chloride, copper nitrate and ammonium chloride dissolved in a liter of soft water. This quantity of solution is sufficient for about 235 sqm. to 280 sqm of area and is applied for ensuring proper adhesion of paint. The painting with the mordant solution will be paid for separately.

Before painting on new or weathered G.S. sheets, rust patches shall be completely cleaned with coarse emery paper and brush. All grease marks shall also be removed and the surface washed and dried and rusted surface shall be touched with ready mixed paint of red lead.

1.16.1.2 Painting Old Surface : If the old paint is firm and sound, it shall be cleaned of grease, smoke etc. The surface shall then be rubbed down with sand paper and dusted. Rusty patches shall be cleaned up and touched with red lead.

1.16.2 Application

The number of coats to be applied shall be as in the description of item. In the case of C.G.S. sheets, the crowns of the corrugations shall be painted first and when these get dried the general coat shall be given to ensure uniform finish over the entire surface without the crowns showing signs of thinning.

The second or additional coats shall be applied when the previous coat has dried.

1.17 PAINTING WITH ENAMEL PAINT

1.17.1 Enamel Paint (conforming to IS 2933) of approved brand and manufacture and of the required colour shall be used.

For the under coat, the paint of same quality but of shade to suit that of the top coat shall be used.

1.17.2 Preparation of surface and application shall be as specified fewer than as (conforming to IS 2933) for painting on new surfaces or old surfaces, as the case may be.

1.18 REPAIR TO PLASTER IN PATCHES.

MESP

The repair to plaster of thickness 12mm to 20mm in patches of area upto 2.5 sqm shall be done with white cement polymer modified self-curing mortar. Before applying the mortar cutting the patch in proper regular (square/ rectangle) shape, racking out joints and preparing the wall to receive the plaster shall be done. The payment shall be made in area of patches measured in sqm.

1.18.1 Measurements

Patch repair shall be measured in sqm.

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

1.19 REPLACEMENT OF OLD DAMAGED W.C. SEATS

The execution/operation of the item is as under:

Dismantling and taking out the old WC seat and "S" or "P" trap at site complete with all operations including all necessary materials, labour and disposal of dismantled material i/c malba, debris etc. including lead upto dumping ground.

Providing "S" or "P" trap and water closet squatting pan (Indian type) of approved brand of good quality.

Fixing the W.C. with trap in position along with trap by making all arrangement of connecting it to the flushing cistern. Thereafter the gap left in the filled up portion is to be leveled by cement concrete 1:5:10 and floor tiles of same shade are also to be provided over it to match the floor of the toilet.

1.19.1 Measurement & Rate

The measurements and payment of replaced W.C Seats shall be made on each basis

1.20 CUTTING HOLES OF REQUIRED SIZE IN BRICK MASONRY WALL

Cutting holes of required size in brick masonry wall for fixing of exhaust fan including providing and fixing 300mm dia PVC pipe conforming BIS-12818 and making good the same etc. complete. The hole shall be cut with cutting tool by marking hole all-round the circle with the help of power drill machine so that the adjoining wall should not get damaged.

1.20.1 Measurement & Rate

The measurements and payment of cutting holes and finishing etc. shall be made on each basis

1.21 DISMANTLING W.C. PAN OF ALL SIZES

Dismantling W.C. Pan of all sizes including disposal of dismantled materials i/c malba all complete as per directions of Engineer-in-Charge. The W.C. seat is taken out along with trap and the area is to be cleaned off all dust and rubbish etc. Thereafter the hole left in the flooring is to be leveled by cement concrete 1:5:10 and floor tiles of same shade are also to be provided over it to match the floor of the toilet room.

1.21.1 Measurement & Rate

The measurements and payment of dismantling W.C. Pan of all sizes shall be made on each basis.

1.22 HACKING OF CC FLOORING

Hacking the CC flooring including cleaning the surface etc. complete as per direction of the Engineer-in- Charge. The hacking of CC flooring is done with chisel and hammer to make the top surface of flooring rough before laying tile/ marble/granite flooring etc. The hacking should be at least 10 nos. in 30x30cm area of the floor.

1.22.1 Measurement & Rate

The measurements and payment of hacking of CC flooring shall be made on sqm.

1.23 DISMANTLING 15 TO 40MM DIA G.I. PIPE

Dismantling 15 to 40mm dia G.I. pipe including stacking of dismantled pipes (within 50 meters lead) as per direction of Engineer-in-Charge. The pipe dismantling is done from tap point to main line. The 15mm dia is to be dismantled first and thereafter the

dismantling/taking out the pipe shall proceed towards bigger dia pipe at the last. The pipe is removed from its joints/sockets/T-section gently with pipe wrench/tool so that the old pipe is not getting damaged and the same can be reused where required. The old dismantle pipe will be stacked dia wise and connected fittings are also to be stored properly for reuse.

1.23.1 Measurement & Rate

The measurements and payment of Dismantling G.I. pipe shall be made on meter.

1.24 TAKING OUT EXISTING WOODEN DOOR SHUTTER AND RE-FIXING THE SAME AFTER REPAIRS

Taking out existing wooden door shutter, repair by de-screwing hinges etc. and re-fixing the repaired door shutters to existing door frames, including replacement of hinges with screws etc. as required, all complete as per the direction of the Engineer-in-charge. The old shutter is to be taken out by removing the screws from the hinges by screw driver/screw fixing equipment (electric driven). Thereafter, the damaged part of the shutters such as styles/ panels/veneering etc. is replaced with new one and the door shutter is prepared for re-fixing to the door frame. During re-fixing the position of hinges if required may be shifted for proper anchorage with 50mm stainless steel screw with cross head. The re-fixing with butt hinges by means of screws is done with the help of electric driven screw driving equipment. The whole door including chokhat is to be re-painted with required colour to match the door and shutter with the same shade.

1.24.1 Measurement & Rate

The measurements and payment shall be made on each basis.

OIL EMULSION (OIL BOUND) WASHABLE DISTEMPERING (ON OLD SURFACE)

Materials

Oil emulsion (Oil Bound) washable distemper (IS 428) of approved brand and manufacture shall be used. The primers where used as on old work (surface) shall be cement primer or distemper primer as described in the item. These shall be of the same manufacture as distemper. The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer. Only sufficient quantity of distemper required for day's work shall be prepared.

The distemper and primer shall be brought by the contractor in sealed tins in sufficient quantities at a time to suffice for a fortnight's work, and the same shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty tins shall not be removed from the site of work, till this item of work has been completed and passed by the Engineer-in-Charge.

Preparation of the Surface

For work on the old surface shall be thoroughly cleaned of dust, old white or colour wash by washing and scrubbing. 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 undulations and then sand papering the same after it is dry. 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/wall putty mixed with 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 patched surface shall be allowed to dry thoroughly before the regular coat of distemper is applied.

Application

Priming Coat: The priming coat shall be with distemper primer or cement primer, as required in the description of the item.

Oil bound distemper is not recommended to be applied, within six months of the completion of wall plaster. However, newly plastered surfaces if required to be

distempered before a period of six months shall be given a coat of alkali resistant priming Paint conforming to IS 109 and allowed to dry for at least 48 hours before distempering is commenced.
Distemper Coat: For old work, after the primer coat has dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out the priming coat. All loose particles shall be dusted off after rubbing. One coat of distemper properly diluted with thinner (water or other liquid as stipulated by the manufacturer) shall be applied with brushes in horizontal strokes followed immediately by vertical ones which together constitute one coat. The subsequent coats shall be applied in the same way. Two or more coats of distemper as are found necessary shall be applied over the primer coat to obtain an even shade. A time interval of at least 24 hours shall be allowed between successive coats to permit proper drying of the preceding coat.
15 cm double bristled distemper brushes shall be used. After each days work, brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.
Measurement: Length and breadth shall be measured correct to a cm. and area shall be calculated in sqm correct to two places of decimals.
Rate
The rate shall include the cost of all labour and materials involved in all the above operations (including priming coat) described above.
EXTERIOR PAINTING ON WALL (ON OLD SURFACE)
Material
The paint shall be (Textured exterior paint/Acrylic smooth exterior paint/premium acrylic smooth exterior paint) of approved brand and manufacture.
This paint shall be brought to the site of work by the contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of work has been completed and permission obtained from the Engineer-in-Charge.
Preparation of Surface
For old work, the surface shall be thoroughly cleaned off all mortar dropping, dirt dust, algae, fungus or moth, grease and other foreign matter of brushing and washing, pitting in plaster shall make good, surface imperfections such as cracks, holes etc. should be repaired using white cement. The prepared surface shall have received the approval of the Engineer in charge after inspection before painting is commenced.
Application
Base coat of water proofing cement paint
Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its container, when applying also the paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform. Dilution ratio of paint with potable water can be altered taking into consideration the nature of surface climate and as per recommended dilution given by manufacturer. In all cases, the manufacturer's instructions & directions of the Engineer-in-charge shall be followed meticulously.
The lids of paint drums shall be kept tightly closed when not in use as by exposure to atmosphere the paint may thicken and also be kept safe from dust.
Paint shall be applied with a brush on the cleaned and smooth surface. Horizontal strokes shall be given, First and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.

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Measurement: Length and breadth shall be measured correct to a cm. and area shall be calculated in sqm correct to two places of decimals.
Rate
The rate shall include the cost of all labour and materials involved in all the above operations (including priming coat) described above.
PAINTING SYNTHETIC ENAMEL PAINT OVER STEEL WORK (ON OLD SURFACE)
Synthetic enamel
Paint, suitable for painting over Steel work, of approved brand and manufacture and of the required shade shall be used. Old or weathered steel work shall be painted with a priming coat of one coat of red oxide zinc chromate Paint. Primer shall be applied before fixing sheets in place. Two or more coat of paint has to be applied as per requirement.
Preparation of Surface
Painting Old Surface: The painting of old steel work shall not usually be done till they have weathered for about a year. When old surface are to be painted before they have weathered they shall be treated with a mordant solution prepared by mixing 38 gm of copper acetate in a liter of soft water or 13 gm hydrochloric acid in a solution of 13 gm each of copper chloride, copper nitrate and ammonium chloride dissolved in a liter of soft water. This quantity of solution is sufficient for about 235 sqm. to 280 sqm of area and is applied for ensuring proper adhesion of Paint.
Before painting on old or weathered steel surface, rust patches shall be completely cleaned with coarse emery paper and brush. All grease marks shall also be removed and the surface washed and dried and rusted surface shall be touched with synthetic enamel paint of approved brand, manufacturer and shade.
Measurement:
Measurement of surface shall be taken in sqm.
Rate
Rates shall include cost of all labour and materials involved in all the operations described above.

2.0 DISMANTLING AND DEMOLISHING

LIST OF BUREAU OF INDIAN STANDARD CODES

S. No.	*BIS. No.*	*Subject*
1.	IS 1200 (Pt - XVIII)	Method of Measurements of Building and Civil Engineering Works (Part -XVIII) Demolition and Dismantling
2.	IS 4130	Demolition of Buildings

TERMINOLOGY

Deconstruction – Means a selective demolition in which salvage, reuse and recycling of demolished structure is maximized. The term 'Dismantling' implies carefully separating the parts without damage and removing. This may consist of dismantling one or more parts of the building as specified or shown on the drawings.
Demolition: The term 'Demolition' implies breaking up. This shall consist of demolishing whole or part of work either manually or using mechanical force (various equipment) or by implosion using explosion, including all relevant items as specified or shown on the drawings.

2.1 GENERAL

This chapter relates to buildings only.
2.1.1 Precautions
2.1.1.1 All materials obtained from dismantling or demolition shall be the property of the

Government unless otherwise specified and shall be kept in safe custody until they are handed over to the Engineer-in- Charge/ authorized representative.

2.1.1.2 The demolition shall always be well planned before hand and shall generally be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Engineer-in-Charge before starting the work.

Due care shall be taken to maintain the safety measures prescribed in IS 4130 and construction and demolition waste management rules 2016 shall be followed.

2.1.1.3 Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property. Wherever specified, temporary enclosures or partitions and necessary scaffolding with suitable double scaffolding and proper cloth covering shall also be provided, as directed by the Engineer-in-Charge. It shall be ensured that no dust is generated while demolishing. Demolition Rules – 2016 shall be followed.

2.1.1.4 Necessary steps shall be taken to keep noise and dust nuisance to the minimum. All work needs to be done under the direction of Engineer-in-Charge. Helmets, goggle, safety belts etc., should be used whenever required and as directed by the Engineer-in-Charge. The demolition work shall be proceeded with in such a way that it causes the least damage and nuisance to the adjoining building and the public. Barricading shall be provided as per NGT guidelines.

2.1.1.5 Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully removed first. Chisels and cutters may be used carefully as directed. The dismantled articles shall be removed manually or otherwise, lowered to the ground (and not thrown) and then properly stacked as directed by the Engineer-in-Charge.

2.1.1.6 Where existing fixing is done by nails, screws, bolts, rivets, etc., dismantling shall be done by taking out the fixing with proper tools and not by tearing or ripping off.

2.1.1.7 Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Engineer-in-Charge within a lead of 50 meters. All unserviceable materials, rubbish etc. shall be disposed off at authorized locations by urban local bodies as directed by the Engineer-in-Charge.

2.1.1.8 The contractor shall maintain/disconnect existing services, whether temporary or permanent, wherever required by the Engineer-in-Charge

2.1.1.9 No demolition work should be carried out at night especially when the building or structure to be demolished is in an inhabited area.

2.1.1.10 Appropriate screens shall be placed where necessary to prevent injuries due to falling pieces.

2.1.1.11 Water spray shall be used to reduce dust while tearing down plaster from brick work.

2.1.1.12 Safety belts shall be used by labourers while working at higher level to prevent falling from the structure. Wherever, possible mechanized working platform shall be used.

2.1.1.13 First-aid equipment shall be made available at all demolition works of any magnitude.

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

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

2.2.1.1 Temporary bracing should be added, where necessary, to maintain stability. The end frame opposite to the end where dismantling is commenced, or a convenient

intermediate frame should be independently and securely guyed in both directions before work starts.
2.2.1.2 On no account should the bottom tie of roof trusses be cut until the principal rafters are prevented from making outward movement.
2.2.3 Heavy Floor Beams Heavy bulks of timber and steel beams should be supported before cutting at the extremities and should then be lowered to a safe working place.
2.2.6 Cantilevers (Not part of a Framed Structure)
A cantilever type of construction depends for its stability on the super imposed structure. Canopies, cornices, staircases and balconies should be demolished or supported before the tailing down load is removed.
2.2.7 In-situ Reinforced Concrete
2.2.7.1 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.
2.2.7.2 Attention should be paid to the principles of the structural design to determine which parts of the structure depend on each other to maintain overall stability.
2.2.7.3 Demolition should be commenced by removing partitions and external non-load bearing cladding. It should be noted that in some buildings the frame may rely on the panel walls for stability.
2.2.7.4 Where hard demolition methods are to be used, the following procedures should be used.
Reinforced Concrete Beams: For beams, a supporting rope should be attached of preferably at two or three locations 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.
Reinforced Concrete Columns: For columns, the reinforcement should be exposed at the base after restraining wire guy ropes have been placed round the member at the top. The reinforcement should then be cut in such a way as to allow the column to be pulled down to the floor under control.
Reinforced Concrete Walls Reinforced concrete walls should be cut into strips and demolished as for columns

2.3 MEASUREMENTS

2.3.1 All work shall be measured net in the decimal system, as fixed in its place, subject to the following limits, unless otherwise stated hereinafter.
(a) Dimensions shall be measured correct to a cm.
(b) Areas shall be worked out in sqm correct to two places of decimal.
(c) Cubical contents shall be worked out to the nearest 0.01 cum.
2.3.2 Parts of work required to be dismantled and those required to be demolished shall be measured separately.
2.3.3 Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed.
2.3.4 Specifications for deduction for voids, openings etc. shall be on the same basis as that adopted for new construction of the work.
2.3.5 Roofs
Roof coverings generally including battens boarding, mats, bamboo jaffari or other subsidiary supports shall be measured in square meters
Ridges, hips and valleys shall be girthed and included with the roof area. Corrugated or semi corrugated surfaces shall be measured flat and not girthed.
R.B. or R.C.C. roofs shall be measured in cum.
Supporting members, such as rafters, purlins, beams joists, trusses etc. of wood shall be

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measured in cubic meters and steel or iron sections, in kilograms.

2.3.6 Ceiling

The stripping of ceilings shall be measured in square meters.

Dismantling of supporting joists, beams, etc. shall be measured in cubic meters.

2.3.7 Flooring and Paving's

Dismantling of floors (except concrete and brick floors) shall be measured in square meters. Supports such as joints, beams etc. if any shall be measured cubic meters.

Concrete and bricks paving shall be measured in cubic meters.

2.3.8 Concrete and Brick Roofs and Suspended Floors

Demolition of floors and roofs of concrete or brick shall be measured in cubic meters. Beams cantilevers or other subsidiary supports of similar materials, shall be included in the item. In measuring thickness of roofs provided with water proofing treatments with bitumen felts, the thickness of water proofing treatment shall be ignored

2.3.9 Walls and Piers

Taking down walls and independent piers or columns of brick, stone or concrete shall be measured, in cubic meters. All copings, corbels, cornices and other projections shall be included with the wall measurements.

In measuring thickness of plastered walls, the thickness of plaster shall be ignored.

Ashlar face stones, dressed stone work, pre-cast concrete articles, etc. if required to be taken down intact shall be so stated and measured separately in cubic meters.

Cleaning bricks stacking for measurements including all extra handling and removal and disposing off the rubbish as stated shall be enumerated in thousands of cleaned bricks.

Cleaning stone obtained from demolished/dismantling stone masonry of any description including ashlar facing dressed stone work, stone slabs or flagging and pre-cast concrete blocks including all extra handling and disposing off the rubbish as stated shall be measured in cubic meters of cleaned stone.

Honeycomb works or cavity walls of bricks stone or concrete shall be measured as solid.

2.3.10 Reinforced Concrete and Brick Work

Reinforced concrete structures and reinforced brick roofs and walls shall be measured in cubic meters and if reinforcement is required to be salvaged, it shall be so stated.

Where reinforcement is required to be separated, scraped and cleaned, the work shall be measured separately in quintal of salvaged steel.

2.3.11 Partitions, Trellis Work etc.

Partitions or light walls, of lath and plaster, trellis work, expanded metal, thin concrete or terracotta slabs and other similar materials including frame work if any shall be measured in square meters stating the overall thickness.

2.3.12 Wood Work

All wood work including karries average 40 sq cm or over in section, shall be measured in cubic meters, while that under 40 sq cm in section, in running meters. Ballies shall be measured in running meters.

Boarding including wooden chajjas and sun shades along with supports shall be measured in square meters in its plane.

2.3.13 Steel and Iron Work

All steel and iron work shall be measured in kilograms. The weight shall be computed from standard tables unless the actual weight can readily be determined.

Riveted work, where rivets are required to be cut, shall be measured separately.

Marking of structural steel required to be re-erected shall be measured separately.

In framed steel items, the weight or any covering material or filling such as iron sheets and expanded metal shall be included in the weight of the main article unless such covering is not ordered to be taken out separately.

2.3.14 Doors and Windows

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Dismantling of doors, windows, clerestory windows, ventilators etc. (wood or metal) whether done separately or along with removal of wall by making recess in the wall shall be enumerated. Those exceeding 3 sqm each in area shall be measured separately. The item shall include removal of chowkhats architraves, holdfasts and other attachments. If only shutters are to be taken out it shall be measured separately.

2.3.15 Pipes and Sewer Lines

Water pipe lines including rain water pipes with clamps and specials, sewer lines (salt glazed ware or concrete) etc. shall be described by their diameter and length measured in running meters inclusive of joints.

If the joints, special and fittings etc. are required to be separated, it shall be so stated and enumerated.

Manholes and inspection chambers shall be enumerated stating the size and depth of manhole/inspection chamber. They shall be classified into different groups depending upon the depth, in unit of half and one meter depth. The depth of the manhole shall be the distance between the top of manhole cover and invert level of the drain.

Ventilating shafts, gully traps, flushing cisterns and other appurtenant items of work shall be enumerated.

2.3.16 Posts or Struts

Posts or struts (wood, steel or RCC) section including taking out embedded portion shall be measured in running meters.

2.3.17 Fencing Wire Mesh

Wire mesh fencing of any type with frame shall be measured in square meters.

2.3.18 Glazing

Taking out any portion of serviceable glass except polished plate, from old sashes, skylights, etc. (any thickness, weight or size) raking out old putty, etc. shall be measured in square meters. Irregular circular panes shall be measured as rectangle or square enveloping the same. The width and height being measured correct to the nearest 0.5 cm.

2.4 Rates

The rate shall include the cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable material properly and disposing off unserviceable material within a distance of 50 meters. The rate shall also include for temporary shoring for the safety of portions not required to be pulled down, or of adjoining property, and providing temporary enclosures or partitions, where considered necessary

3.0 Methods of Repairs and Waterproofing

extent possible while adhering to the recommendations above.

3.1 Dampness on interior walls above the floor and skirting Levels

3.1(A) MODERATE DAMPNESS

a) Start by removing loose plaster from damaged areas and re-plaster using an integral waterproofing compound.
b) On damp patches without efflorescence, apply waterproofing coating directly on the repaired plaster level.
c) Allow to cure.
d) Start painting based on recommended painting procedure.

3.1(B) EFFLORESCENCE

Where interior walls are severely affected by efflorescence it is important to first stop its effect.

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.
c) Apply waterproofing coating directly on the bricks.
d) Re-plaster this area using integral waterproofing compound.

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f) Finish with painting.

3.2 LEAKS FROM ADJOINING WET AREAS KITCHEN / BATHROOM:

Leaks from adjoining wet areas like kitchens and bathrooms. Leaks from wet areas like kitchens and bathrooms arise from faults in plumbing pipes, AC pipes, sanitary fittings or the wearing away of joints between tiles.

3.2(A) MODERATE DAMPNESS

a) Identify and plug the source of the leak with the help of an experienced plumber.
b) Refill the joints between the tiles with Epoxy Grout.
c) For damp patches on the walls, remove loose plaster from the damaged areas and re-plaster this area using an integral waterproofing compound.
d) Apply waterproofing coating directly on the repaired plaster level.
e) Allow to cure.
f) Paint as per recommended painting

3.2(B) EFFLORESCENCE

Identify and plug the leakage as described previously. For interior walls severely affected by efflorescence:

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.
c) Apply waterproofing coating directly on the bricks.
d) Re-plaster using integral water proofing compound.
e) Finish with painting.

3.3 Mid-level damp patches on interior walls

Leaks from wet areas like kitchens and bathrooms arise from faults in plumbing pipes, AC pipes, sanitary fittings or the wearing a way of joints between tiles.

3.3(A) MODERATE DAMPNESS

a) Identify and plug the source of the leak with the help of an experienced plumber.
b) Refill the joints between the tiles with Epoxy Grout.
c) For damp patches on the walls, remove loose plaster from the damaged areas and re-plaster this area using an integral waterproofing compound.
d) Apply waterproofing coating directly on the repaired plaster level.
e) Allow to cure.
f) Paint as per recommended painting produce.

3.3(B) SEVERE EFFLORESCENCE

Identify and plug the leakage as described previously. For interior walls severely affected by efflorescence:

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.
c) Apply acrylic polymer-modified cementitious high performance waterproofing coating directly on the bricks.
d) Re-plaster using water proofing compound material.
e) Finish with painting

3.4 RAINWATER INGRESS FROM DEFECTS IN EXTERIOR WALLS

These waterproofing issues occur from cracks and weakened joints in the exterior walls, paint degradation, or poor maintenance, which results in rainwater seeping into the walls and causing dampness or seepage.

3.4(A) MODERATE DAMPNESS

a) Start by identifying cracks in the exterior walls and repair them with Crack Seal/SmartCare Exterior Crack Filler.
b) Follow this by applying any exterior emulsion coating.
c) For damp patches on the interior walls, remove loose plaster from the damaged areas and re-plaster using an integral waterproofing compound.

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d) Apply waterproofing coating directly on the repaired plaster level.
e) Allow to cure.
f) Paint as per the recommended painting procedure.

3.4(B) EFFLORESCENCE

Treat exterior walls as previously described. For interior walls severely affected by efflorescence, it is important to first stop its effect:

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.
c) Apply waterproofing coating directly on the bricks.
d) Re-plaster this area using water proofing compound.
e) Finish with painting.

3.5 Dampness in interior walls around window frames

Gaps or joints between window frames and walls can result in rainwater travelling into the walls and causing damp patches.

3.5(A) MODERATE DAMPNESS

a) Start by identifying cracks in the exterior walls and repair them with Crack Seal / Exterior Crack Filler.
b) Where there are gaps between the window frames and walls, fill these with Akrylmax or Universal Sealants.
c) Apply any exterior emulsion coating.
d) For damp patches in the interior walls, remove loose plaster from the damaged areas and re-plaster using, an integral waterproofing compound.
e) Apply waterproofing coating directly on the repaired plaster level.
f) Allow to cure.
g) Paint as per the recommended painting procedure.

3.5(B) SEVERE EFFLORESCENCE

Treat exterior walls as described previously. For interior walls severely affected by efflorescence, it is important to first stop its effect:

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.
c) Apply waterproofing coating directly on the bricks.
d) Re-plaster using water proofing compound.
e) Finish with painting.

3.6 RAIN WATER SEEPAGE FROM DEFECTS IN EXTERIOR WALLS

These waterproofing issues occur when there are cracks and weakened joints in the exterior walls, paint degradation, or poor maintenance, which results in rainwater seeping into the walls and causing dampness or seepage.

3.6(A) MODERATE DAMPNESS

a) Start by identifying cracks in the exterior walls and repair them with Crack Seal/ SmartCare Exterior Crack Filler.
b) Then apply any exterior emulsion coating.
c) For damp patches in the interior walls, remove loose plaster from the damaged areas and re-plaster using, an integral waterproofing compound.
d) Apply waterproofing coating directly on the repaired plaster level.
e) Allow to cure.
f) Paint as per the recommended painting procedure.

3.7(B) EFFLORESCENCE

Treat exterior walls as described previously. For interior walls severely affected by efflorescence, it is important to first stop its effect:

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.

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c) Apply waterproofing coating directly on the bricks.
d) Re-plaster using water proofing compound.
e) Finish with painting.

3.8 Interior ceiling patches

LEAKS IN THE KITCHEN OR BATHROOM FROM THE FLOOR OR BUILDING ABOVE

Dampness or seepage in ceilings occur through leaks from wet areas like kitchens and bathrooms from the floor above. These failures arise from faults in plumbing pipes, AC pipes, sanitary fittings, or the wearing away of joints between tiles.

3.8(A) MODERATE DAMPNESS

a) Identify and plug the source of the leak in the floor above with the help of an experienced plumber, as this will prevent the problem from recurring.
b) For best results and to prevent this problem from recurring, re-waterproofing of washrooms or kitchens should be done using Waterproofing Membrane.
c) In all wet areas like washrooms and kitchens, the tiling/flooring should be checked for soundness. If there are any open joints between the tiles, refill with Epoxy Grout.
d) Repair or re-plaster as needed, integral waterproofing compound. Re-paint the ceilings as per the recommended painting system.

3.9 LEAKS FROM TERRACE

Leaks from terraces occur from cracks in the terrace slab, blockage in the drainage pipes, waterlogging because of improper drainage, or from active leaks in water tanks.

3.9(A) FOR CRACKS IN TERRACE SLAB

a) Check the drainage pipes on the terrace for any blockage or clogging.
b) Check the terrace slab for cracks and soundness. All cracks up to 3 mm width can be filled with Crack Seal; wider cracks up to 10 mm can be filled with Textured Crack Filler. In case of bigger, loose cracks, repair with cement-sand-mortar, treated with Multi-Purpose Polymer.
c) Re-waterproof and envelop the entire terrace and parapet walls with waterproofing coating.

3.9(B) FOR CEMENTITIOUS TANKS

a) Inspect the tank interior and exteriors for any cracks. Repair these as described earlier.
b) Waterproof the tank interior using Epoxy waterproofing coating, meant for waterproofing cementitious water tanks.

3.10 Interior walls affected by efflorescence

HIGH SALT CONTENT IN GROUND WATER & BRICKS

Migration of salt to the walls where it forms a white powdery coating is called efflorescence. It occurs when there is high salt content in ground water or masonry bricks. Salt migrates to the surface of the walls due to the presence of active water or water vapor caused by leakages or rising ground water. When the water evaporates, it leaves behind salts which de-bond the plaster making it weak and chalky. All subsequent paint films over the plaster don't last.

3.10(A) MODERATE DAMPNESS

a) For interior walls severely affected by efflorescence, remove all the loose plaster up till the brick level.
b) This system only works if applied on the bricks, since efflorescence originates at the brick level.
c) Apply 2 coats waterproofing coating directly on the bricks.
d) Re-plaster with integral waterproofing liquid.
e) Finish with painting as per the recommended painting procedure.

3.11 Dampness in exterior Walls

LEAKS FROM ADJOINING WET AREAS LIKE THE KITCHEN OR BATHROOMS

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(INSIDE THE BUILDING)
Dampness in exterior walls can be traced to adjoining wet areas like kitchens and bathrooms (inside the house) because of faults in plumbing pipes, AC pipes, sanitary fittings, or the wearing a way of joints between tiles.

3.11(A) FOR CRACKS UPTO 3 MM

a) Identify and plug the source of the leak in the adjoining washroom/ kitchen with the help of an experienced plumber.
b) Refill the joints between the tiles with Epoxy Grout.
c) For damp patches in the walls, remove loose plaster from the damaged areas and re-plaster using an integral waterproofing compound.
d) Apply waterproofing coating directly on the repaired plaster level.
e) Allow to cure.

3.11(B) EFFLORESCENCE

Identify and plug the leakage as previously described. For exteriors walls severely affected by efflorescence:

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.
c) Apply waterproofing coating directly on the bricks.
d) Re-plaster using integral waterproofing compound.
e) Finish with painting.

3.12 LEAKAGES

3.12(A) Active leaks in interior walls

LEAKS FROM WET AREAS LIKE KITCHENS OR BATHROOMS

Leaks from adjoining wet areas like kitchens and bathrooms arise from faults in plumbing pipes, AC pipes, sanitary fittings or the wearing away of joints between tiles.

3.12(B) MODERATE DAMPNESS

a) Identify and plug the actual source of the leak in the plumbing pipes. It is recommended that an experienced plumber inspect the pipes and fitting to ascertain the real cause.
b) All existing gaps between tiles should be filled Epoxy Grout.
c) Repair the damaged walls or re-plaster using an integral waterproofing compound.
d) Where there are damp patches, apply waterproofing coating directly on the repaired plaster level.
e) Allow to cure.
f) Paint as per the recommended painting procedure.

3.12(C) EFFLORESCENCE

a) Remove all loose plaster up to the brick level from the affected area.
b) Remove all loose material with the help of a wire brush.
c) Apply waterproofing coating directly on the bricks.
d) Re-plaster using integral waterproofing compound material.
e) Finish with painting.

3.13 Active leaks in interior ceilings

LEAKS FROM TERRACE OR ROOF ABOVE

Leaks from cracks in the terrace slab, blockage in the drainage pipes, waterlogging due to improper drainage on the terrace floor or leaks from water tanks.

3.13(A) FOR LEAKS FROM TERRACE

a) Check the drainage pipes on the terrace for any blockage or clogging.
b) Check the terrace slab for cracks, holes and overall soundness. All cracks up to 3 mm width can be filled with Crack Seal; wider cracks up to 10 mm can be filled with Crack Filler.
c) In case of bigger, loose cracks, repair with cement-sand-mortar treated with Multi-

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Purpose Polymer.

d) Re-waterproof and envelop the entire terrace and parapet walls with A Damp Proof waterproofing coating.

3.13(B) FOR CEMENTITIOUS CRACKS

a) Inspect the tank interior and exteriors for any cracks. Repair these as previously described.

b) Waterproof the tank interior using Epoxy waterproofing coating, meant for waterproofing cementitious water tanks.

3.14 Active leaks in exterior walls

LEAKS FROM KITCHENS OR BATHROOMS

Leaks in exterior walls occur from adjoining wet areas like kitchens and bathrooms (inside the house) from faults in plumbing pipes, AC pipes, sanitary
fittings, or the wearing away of joints between tiles.

ACTIVE LEAKS

a) Identify and plug the source of the leak in the adjoining washroom/kitchen with the help of an experienced plumber.

b) Refill the joints between the tiles with Epoxy Grout.

c) Where there are damp patches on the walls, remove loose plaster from the damaged areas and re-plaster using an integral waterproofing compound.

d) Apply waterproofing coating directly on the repaired plaster level.

e) Allow to cure.

3.15 Interior Wall Cracks

CRACK IN WALLS ON MASONRY OR POP SURFACES

Cracks in interior walls are caused due to movements in the structure, changes in temperate and moisture, and because of deficiencies in the cement and sand ratio at the time of construction.

3.15(A) MODERATE DAMPNESS

a) Check the plaster for soundness and bonding. If the plaster is damaged, re-plaster the surface using integral waterproofing compound material. Allow to cure.

b) All existing cracks up to 3 mm width can be filled with Crack Seal. For bigger, loose cracks, repair with cement-sand-mortar treated with Multi-purpose Polymer.

c) To prevent cracks from reappearing on the entire wall surface, use crack treatment solution, which provides edge-to-edge protection.

d) In case of any dampness- related issue, refer the section on interior dampness or leaks.

3.16 Exterior Wall Cracks

CRACKS IN WALLS ON MASONRY SURFACES

Cracks can come in all shapes and sizes. However, most fractures in your walls will allow water to slowly seep into the house and possibly cause dampness.

3.16(A) FOR TERRACE SLAB CRACKS

a) Check the plaster for soundness and bonding. If the plaster is damaged, re-plaster the surface using integral waterproofing compound material. Allow to cure.

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b) All existing cracks up to 3 mm width can be filled with Crack Seal. For cracks greater than 3 mm width, use Crack Filler. For bigger, loose cracks, repair using cement-sand-mortar treated with Multi-Purpose Polymer.
c) For any dampness-related issues, refer the section on exterior dampness or leaks.

All above operations to be done in order and as per the manufacturer's specification to the complete satisfaction of the Engineer-In-Charge.

Approved Makes: PIDILITE/SICA/FOSROC/Asian paint smart care/BASF or equivalent.

4.0 Methodology for Anti -Termite Treatment:

Anti -Termite treatment shall covers measures for the total eradication and control of termites in building. The chemicals as well as procedure shall conform to Indian Standard code of practice for Anti termite measures in buildings (lS 6313 part 3).

4.1 Mode of treatment: Anti-Termite treatment shall be done for building with RCC foundations or with load bearing walled foundations. The principle of the treatment is to create a continuous chemical barrier Zone below and around the building/structure. The stages of treatment is mentioned below:-

(i) Soil Treatment: The application of chemicals (toxicant) to the soil adjacent to and under a building to form a chemical barrier which is lethal or repellent to termites.

(ii) Wood Treatment: The application of chemical termiticides to woodwork and wood-based materials to eliminate existing termite infestation and to make it resistant to termite attack for the future.

(iii) Treatment along /outside of foundations: The soil in contact with the external wall of the building shall be treated with chemical emulsion at the rate of 7.5 l/m^2 of the vertical surface of the substructure to a depth of 300 mm. To facilitate this treatment a shallow channel shall be excavated along and close to the wall at 1.75 liters per running metre of the channel. Rodding with 12 mm diameter mild steel rods at'150mm apart shall be done in the channel if necessary for uniform dispersal of the chemical to 300 mm depth from the ground level. The balance chemical of 0.5 litre per running metre shall then be used to treat the backfill earth as it is returned to the channel directing the spray toward the wall surface. lf there is a concrete or masonry apron around the building, approximately 12 mm diameter holes shall be drilled as close as possible to the plinth wall at 300 mm apart, deep enough to reach the soil below, and the chemical emulsion pumped into these holes to sodk the soil below at a rate of 2.25 litres per linear metre.

(iv) Treatment at points of contact of woodwork: AII existing woodwork in the building which is in contact with the floor or walls and which is in contact with the floor or walls and which is infested by termites, shall be treated by spraying at the points of contacts with the adjoining masonry with the chemical emulsion of concentration by drilling 6 mm holes at a downward angle of about 45" at the junction of woodwork and masonry and squirting chemical emulsion into these holes till refusal or to a maximum of half a litre per hole. The treated holes shall than be sealed.

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(v) Treatment of soil under floor: The points where the termites are likely to seek entry through the floor are the cracks at the following locations:-

a) At the junction of the floor and walls as a result of shrinkage of the concrete.

b) At construction joints in a concrete floor, cast in sections; and expansion joints in the floor.

Chemical treatment should be provided within the plinth area of the ground floor of the structure wherever such cracks are noticed, by drilling vertically 12 mm holes at the junction of floor and walls, constructional and expansion joints mentioned above at 300 mm interval to reach the soil below. Chemical emulsion shall be squirted into these holes using a hand operated pressure pump until refusal or to a maximum of one litre per hole. The holes shall be sealed. Ln general, the idea is to change the soil below the floor at the locations of cracks with toxicants so that termites in the soil are denied access through such cracks and openings in the floor.

4.2 CHEMICALS: Any one of the following chemicals conforming to relevant Indian Standard in water emulsion maybe used for the soil treatment in order to protect a building from termite attack.

Chemical	Indian Standard	Concentration by weight %
Chlorpyrifos 20 EC	IS 8944	1.0
Lindane 20 EC	IS 632	1.0

(i) Anti-Termite Treatment on wood work: - Providing, diluting & injecting chemical emulsion for POST CONSTRUCTIONAL anti-termite treatment at points of contact of wood work by chemical emulsion Chlorpyriphos/Lindane (in oil or kerosene based solution) @ 0.5 ltrs. per hole by drilling 6 mm holes at downward angle of 45 degree at 150 mm centre to centre and sealing the same.

(ii) Anti-Termite Treatment on below concrete or masonry: - Providing, diluting & injecting chemical emulsion for POST CONSTRUCTIONAL anti-termite treatment: Along external wall below concrete or masonry apron using chemical emulsion @ 2.25 ltr. Per linear meter including plugging holes etc. With Chlorpyriphos / Lindane E.C.20o/o with '1% concentration.

Precaution: The chemicals described in this tender are insecticides with a persistent action and is to be regarded as highly poisonous. These chemicals can have an adverse effect upon health when absorbed through the skin, inhaled as vapours or spray-mists, or swallowed. Persons carrying out chemical should know the precautions and exercise due care when handling the chemical whether in concentrate or in diluted form. The use of the chemical should be avoided where there is any risk of wells or other water supplies becoming contaminated.

5. Repairs of reinforced concrete members with corrosion

The procedure to be followed for repair where corrosion has taken place or where reinforcement is visible in the columns, staircase, beams and slab is discussed below:

a) All loose concrete at location of cracks or spalling must be removed to expose the corroded steel from all sides. Depth of concrete of at least 20 mm beyond the reinforcement in the vicinity of rusted steel must be removed by cutting to open-up

and expose the rebar completely. If required, jacking of the beams and slabs must be carried out in the vicinity of the element to be repaired to remove as much load as possible from the members to be repaired.

b) The reinforcement must be cleaned of any loose matter, dust, rust or other materials that may be sticking to it using sand blasting followed by wire brushing.
c) An anti-corrosive coating must be applied to the reinforcement to slow down further corrosion. If a significant (more than 10%) reduction in the cross-section area of the steel is observed, lapping with a reinforcing bar of the same size and type must be carried out. The lap length must be at least the development length of the bar being lapped.
d) It is expected that the existing grade of reinforcement in the structure will differ depending on the age of the structure. A steel wire-mesh can also be used for the purpose. An anti-corrosive coating, preferably of the cathodic type must be used on these bars or mesh to prevent their corrosion.
e) Repair mortar must then be applied from the bottom of the concrete elements using the spray gun or hand trowel, in thin layers.
f) Wet process must be used for repair mortar to ensure proper strength.
g) In all cases the clear cover from all reinforcement must be ensured to be at least 25 mm in the case of slabs, 30 mm in the case of beams and staircases and 40 mm in case of column. Synthetic fibers may be required to reduce rebound and sagging of the sprayed concrete.
h) All repair mortar applied must be suitably cured to ensure adequate strength attainment. Curing compounds may be used for locations where wet curing is difficult. The uniformity of the curing compound layer has to be ensured. If further layers of repair mortar are to be applied after the application of curing compounds, the curing compound layer should not interfere with the bond between successive layers.
i) It must be ensured that all components of the repair mortar, including the admixtures, are free of chlorides. If set accelerators are used in the repair mortar, it should be especially ensured that they are chloride-free.
j) The jacking can be removed after sufficient strength is gained by the repair mortar, as specified by the manufacturer of the repair mortar.

*Based on assessment of the damage to the structural member, decision to use repair mortar or Micro concrete shall be taken by Engineer-in-charge

The special precautions and instructions provided by the manufacturers of the chemical products used in the jacketing process must be followed to the greatest

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Form of Bid Security - Bank Guarantee

[Guarantor letterhead or SWIFT identifier code]

Bid Guarantee No…….*[insert guarantee reference number]*
Date…….*[insert date of issue of the guarantee]*

WHEREAS, _____ *[name of Bidder]*[3] (hereinafter called "the Bidder") 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 _____[4] 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 Bidder (a) withdraws his bid during the period of Bid validity specified in the Letter of Bid, or any extension thereto provided by the Bidder; or (b) does not accept the correction of the Bid Price pursuant to ITB 9.1;

or

(2) If the Bidder 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 Form of Agreement in accordance with the Instructions to Bidders, if required; or
   (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.

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[3] *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 alongwith its bid.*

[4] *The Guarantor 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 5.5 of the Instructions to Bidders.*

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This Guarantee will remain in force up to and including the date _____[5] days 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 _____ SIGNATURE OF THE BANK _____

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.

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[5] *45 days after the end of the validity period of the Bid.*

Performance Security - Bank Guarantee

[Guarantor letterhead or SWIFT identifier code]

Performance Guarantee No…….*[insert guarantee reference number]*
Date…….*[insert date of issue of the guarantee]*

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[6]]* _____ *[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]* 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 thereunder 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 …… (i.e.) 28 days after the date of issue of the Certificate of Completion, and any demand for payment under it must be received by us at this office on or before that date.

Signature and seal of the guarantor _____
Name of Bank _____

[6] *An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract and denominated in Indian Rupees.*

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Address _____
Date _____

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Advance Payment Security

Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Advance Payment Guarantee No…….*[insert guarantee reference number]*
Date…….*[insert date of issue of the guarantee]*

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

Gentlemen:

In accordance with the provisions of the Articles of Agreement, Sub-clause 3 ("Advance Payment") 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*[7]*]* _____ *[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] _____ *[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 thereunder 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. Consequently any demand for payment under this guarantee must be received by us at this office on or before that date.

Yours truly,

Signature and seal: _____

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

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Name of Bank: _____
Address: _____
Date: _____

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

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Retention Money Security

Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

_____ *[Bank's name and address of issuing branch or office]*

Beneficiary: _____ *[Name and Address of Employer]*

Date: _____

RETENTION MONEY GUARANTEE NO.: _____

We have been informed that _____ *[name of contractor]* (hereinafter called "the Contractor") has entered into Contract No. _____ *[reference number of the contract]* dated _____ with you, for the execution of _____ *[name of contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of _____ *[insert* the second half of the Retention Money*]* is to be made against a Retention Money guarantee.

At the request of the contractor, we _____ *[name of Bank]* hereby irrevocably undertake to pay you the sum or sums not exceeding in total an amount of _____ *[amount in Rupees]* (_____) *[amount in words[8]]* upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract without cavil or argument.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number _____ at _____ *[name and address of Bank]*.

This guarantee shall expire, at the latest, 21 days after the date when the Employer has received a copy of the Defects Liability Certificate issued by the Engineer. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

_____

[Signature(s) and seal of the guarantor]

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

[8] *The Guarantor shall insert an amount representing the amount of the second half of the Retention Money.*

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Section C. Fraud and Corruption

(Text in this Section shall not be modified)

1. Purpose

a. The Bank's Anti-Corruption Guidelines and this annex apply with respect to procurement under Bank Investment Project Financing operations.

2. Requirements

2.1 The Bank requires that Borrowers (including beneficiaries of Bank financing); bidders (applicants/proposers), consultants, contractors and suppliers; any sub-contractors, sub-consultants, service providers or suppliers; any agents (whether declared or not); and any of their personnel, observe the highest standard of ethics during the procurement process, selection and contract execution of Bank-financed contracts, and refrain from Fraud and Corruption.

2.2 To this end, the Bank:

1. Defines, for the purposes of this provision, the terms set forth below as follows:

1. "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
2. "fraudulent practice" is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;
3. "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
4. "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
5. "obstructive practice" is:

1. deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
2. acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 2.2 e. below.

2. Rejects a proposal for award if the Bank determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or

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indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

3. In addition to the legal remedies set out in the relevant Legal Agreement, may take other appropriate actions, including declaring misprocurement, if the Bank determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement process, selection and/or execution of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

4. Pursuant to the Bank's Anti- Corruption Guidelines and in accordance with the Bank's prevailing sanctions policies and procedures, may sanction a firm or individual, either indefinitely or for a stated period of time, including by publicly declaring such firm or individual ineligible (i) to be awarded or otherwise benefit from a Bank-financed contract, financially or in any other manner;9 (ii) to be a nominated10 sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract; and (iii) to receive the proceeds of any loan made by the Bank or otherwise to participate further in the preparation or implementation of any Bank-financed project;

5. Requires that a clause be included in bidding/request for proposals documents and in contracts financed by a Bank loan, requiring (i) bidders (applicants/proposers), consultants, contractors, and suppliers, and their sub-contractors, sub-consultants, service providers, suppliers, agents personnel, permit the Bank to inspect[11] all accounts, records and other documents relating to the procurement process, selection and/ or contract execution, and to have them audited by auditors appointed by the Bank.

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9 For the avoidance of doubt, a sanctioned party's ineligibility to be awarded a contract shall include, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and bidding, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.

10 A nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider (different names are used depending on the particular bidding document) is one which has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.

11 Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Bank or persons appointed by the Bank to address specific matters related to investigations/audits, such as evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.