BIDDING DOCUMENT

FOR

THE PROCUREMENT OF

Budhiganga Municipality Building 1st Floor Construction

Sealed Quotation

Issued by:

Budhiganga Municipality, Bajura

Budhiganga Municipality, Bajura
Bajura
Bajura
Sudoor Pachism Province
Nepal

Sealed Quotation Number	BM/BAJURA/SQ/W/01/2077-78
Issued On	29-01-2021

Abbreviations

BD	Bidding Document
BF	Bidding Forms
BDS	Bid Data Sheet
BOQ	Bill of Quantities
COF	Contract Forms
DP	Development Partners
DoLI	Department of Local Infrastructure
ELI	Eligibility
EQC	Evaluation and Qualification Criteria
EXP	Experience
FIN	Financial
FY	Fiscal Year
GCC	General Conditions of Contract
GoN	Government of Nepal
ICC	International Chamber of Commerce
ITB	Instructions to Bidders
JV	Joint Venture
LIT	Litigation
MoU	Memorandum of Understanding
NCB	National Competitive Bidding
PAN	Permanent Account Number
PPA	Public Procurement Act
PPMO	Public Procurement Monitoring Office
PPR	Public Procurement Regulations
PL	Profit & Loss
SBD	Standard Bidding Document
SCC	Special Conditions of Contract
TS	Technical Specifications
VAT	Value Added Tax
WRQ	Works Requirement

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Invitation for Sealed Quotation

Name of the Office:Budhiganga Municipality, Bajura

Address of the Office:
Budhiganga Municipality, Bajura
Bajura
Bajura
Sudoor Pachism Province
Nepal

Sealed Quotation No:BM/BAJURA/SQ/W/01/2077-78

Date of second Publication : 29-01-2021

1. The Budhiganga Municipality, Bajura invites sealed quotations from registered contractors for the construction of Municipality Building 1st Floor Construction.

2. The Estimated amount for the works is(in NRs.): 1,771,468.65 (Exclusive of VAT and Contingencies)

3. Eligible Bidders may obtain further information and inspect the Sealed quotation Forms at the office of Budhiganga Municipality, Bajura at Budhiganga Municipality, Bajura
Bajura
Bajura
Sudoor Pachism Province
Nepal or by reaching out to them at Telephone 9858422845 or by dropping a mail at ito.budhigangamun7@gmail.com [or may visit PPMO website www.bolpatra.gov.np.]

4. Sealed Quotation Forms may be purchased by eligible Bidders on the submission of a written application and upon payment of a non-refundable fee of 1000.0 NRs.

Or

Bidder who chooses to submit their bid electronically shall deposit the cost of bidding document in the account specified below:

Name of the Bank:	Siddhartha Bank Ltd.
Name of the Office:	Budhiganga Municipality, Bajura
Office Code no:	801076903
Office Account no:	03115263439
Rajaswa (revenue) Shirshak no:	03115263439

5. Sealed bids must be submitted to the above office by hand or through e-GP system i.e www.bopatra.gov.np/egp on or before 12-02-2021 12:00 hours . Bids received after this deadline will be rejected.

6. Sealed Quotations shall be opened in the presence of Bidders' representatives who choose to attend at 12-02-2021 13:00 hours at the office of Budhiganga Municipality, Bajura, Bids must be valid for a period of 45 days after bid opening and must be accompanied by a bid security amounting to a minimum of NRs.50000 which shall be valid for 30 days beyond the validity period of the bid i.e 75 days.

7. If the last date of purchasing and /or submission falls on a government holiday, then the next working day shall be considered as the last date. In such case the validity period of the bid security shall remain the same as specified for the original last date of bid submission.
[Note : As mentioned in clause 49ka of PPR 2064 clause 49ka ,add more relevant information as per required]

Section - II
Instruction to Bidders

Section I. Instruction to Bidders(ITB)

1. Scope of Works	1.1 The Employer stated in the BDS for the construction of works as detailed in attached specifications, drawings and the bill of quantities provided herein. The name of *Employer, name of project and contract identification number of Contracts* are **provided in the BDS**.
2. Eligible Bidder	2.1 This Invitation for Bids is open to all registered contractors with eligibility criteria specified in section III Eligibility Criteria. A bidder declared blacklisted and ineligible by the GoN, Public Procurement Monitoring Office (PPMO) and/or the DP in case of DP funded project, shall be ineligible to bid for a contract during the period of time determined by the GoN, PPMO and/or the DP. 2.2 In case of a natural person or firm/institution/company which is already declared blacklisted and ineligible by the GoN, any other new or existing firm/institution/company owned partially or fully by such Natural person or Owner or Board of director of blacklisted firm/institution/company; shall not be eligible bidder. 2.3 Firms shall be excluded if the corruption case is being filed to Court against the Natural Person or Board of Director of the firm/institution /company or any partner of JV, such Natural Person or Board of Director of the firm/institution /company or any partner of JV shall not be eligible to participate in procurement process till the concerned Court has not issued the decision of clearance against the Corruption Charges
3. One Bid per Bidder	3.1 Each Bidder shall submit only one quotation. A Bidder who submits more than one quotation shall cause all the quotations with the Bidder's participation to be disqualified.
4. Cost of Bidding	4.1 The Bidder shall bear all costs associated with the preparation and submission of his bid and the Employer shall in no case be liable for those costs.
5. Site Visit	5.1 The Bidder at his own cost, responsibility and risk may visit the site of the works and acquire all necessary information for preparing the bid and entering into a contract for construction of the works.
6. Content of Quotation Form	6.1 The Quotation Form comprise the documents listed below: Section I: Instructions to Bidders Section II: Bid Data Sheet Section III : Eligibility Criteria Section IV: Bidding Forms Section V: Works Requirements Section VI: Bill of Quantities Section VII: General Conditions of Contract (GCC) Section VIII: Special Conditions of Contract (SCC) Section IX: Contract Forms

7. Clarification	7.1 A prospective Bidder may obtain clarification on the Quotation Form from the Employer on or before 5 days prior to the deadline for submission of quotation.
8. Language of Bid	81. All documents relating to the bid shall be in English /Nepali.
9. Documents Comprising Bid	The bid by the Bidder shall comprise the following: • Letter of Bid • Eligibility Information/Document • Bid Security and • Priced Bill of Quantities
10. Bid Prices	10.1 The contract shall be for the whole works described in scope of works based on the priced Bill of Quantities submitted by the Bidder. The Bidder shall fill in rates and prices for all items of the works in Nepali Rupees. Items for which no rate or price is entered shall be deemed covered by the other rates and prices in the Bill of Quantities and shall not be paid separately by the Employer. All duties, taxes and other levies payable by the contractor under the contract shall be included in the rates, prices and total Bid Price submitted by the Bidder.
11. Bid Validity	11.1 Bids shall remain valid for the period **specified in the BDS** after the bid submission deadline date prescribed by the Employer. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.
12. Bid Security	12.1 The Bidder shall furnish as part of its bid, in original form, a bid security **as specified in the BDS.** In case of e-submission of bid, the Bidder shall upload scanned copy of Bid security letter at the time of electronic submission of the bid. The Bidder accepts that the scanned copy of the Bid security shall, for all purposes, be equal to the original. The details of original Bid Security and the scanned copy submitted with e-bid should be the same otherwise the bid shall be non-responsive. 12.2 The bid security shall be, at the Bidder's option, in any of the following forms: (a) an unconditional bank guarantee from Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law or; (b) a cash deposit voucher in the Employer's Account as specified in BDS. In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section III (Bidding Forms) or in another Form acceptable to the employer. The form must include the complete name of the Bidder. The bid security shall be valid for minimum thirty (30) days beyond the original validity period of the bid 12.3 Any bid not accompanied by an enforceable and substantially compliant bid security shall be rejected by the Employer as nonresponsive. In case of e-Submission, if the scanned copy of an acceptable Bid Security letter is not uploaded with the electronic Bid then Bid shall be rejected. 12.4 The bid security shall be forfeited if: (a) a Bidder requests for withdrawal during the period of bid validity specified by the Bidder on the Letter of Bid, after bid submission deadline. (b)a Bidder changes the prices or substance of the bid while providing information; (c) a Bidder involves in fraud and corruption pursuant to clause 27; (d) the successful Bidder fails to:

	(i) furnish a performance security in accordance with clause 25 and 26; (ii) sign the Contract in accordance within the period stipulated in Letter of Acceptance; or (iii) accept the correction of arithmetical errors pursuant to clause 21.1
13. Format and Signing of Bids	13.1 The bid shall be typed or written in indelible ink and shall be signed by an authorized person. Any entries or amendments including alternations, additions or corrections made shall be initialed by the same authorized person.
14. Sealing and Marking of Bids	14.1 Bidders may submit their bids by hand copy or by electronically. When so **specified in the BDS**, bidders shall have the option of submitting their bids electronically. Procedures for submission, sealing and marking are as follows: (a) Bidders submitting bids by hand copy: The Bidder shall submit his bid in sealed envelopes. The envelope shall be addressed to the Employer specified in the Invitation for Quotation and shall bear the name and identification number of the quotation. (b) Bidders submitting Bids electronically shall follow the electronic bid submission procedure **specified in the BDS**
15. Deadline for Submission of Bids	15.1 Bids shall be delivered to the Employer at the address no later than the time and date **specified in BDS.**
16. Late Bids	16.1 Any bid received by the Employer after the deadline shall not be accepted and shall be returned unopened to the Bidder upon request.
17.Modification And Withdrawal of Bids	17.1 Bids once submitted shall not be withdrawn or modified.
18. Bid Opening	18.1 The Employer shall open the bids in the presence of the Bidders' representatives who choose to attend at the time and in the place **as specified in the BDS**. The Employer shall prepare and provide minutes of the bid opening including the information disclosed to those present.
19. Process to be Confidential	19.1 Information relating to the examination, evaluation and comparison of bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any efforts by the Bidder to influence the Employer in the bid evaluation, bid comparison or contract award decisions may result in rejection of Bidder's bid.
20.Examination of Bids	201. Prior to the detailed evaluation of Bids, the Employer shall determine whether each bid (a) meets the eligibility criteria defined in Clause 2; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the Bidding documents.
21. Evaluation and Comparison of Bids	21.1 In evaluating the Bids, the Employer shall determine for each bid the evaluated Bid Price by adjusting any corrections for errors. Bids shall be checked by the Employer for any arithmetic errors. Errors shall be corrected by the Employer as follows:

	(a) only for unit price Contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected; (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and (c) If there is a discrepancy between the bid price in the Summary of Bill of Quantities and the bid amount in item (c) of the Letter of Bid, the bid price in the Summary of Bill of Quantities will prevail and the bid amount in item (c) of the Letter of Bid will be corrected. (d) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) ,(b) and (c) above. 21.2 In case of e-submission of bid, upon notification from the employer, the bidder shall also submit the original of documents comprising the bid as per ITB 9 for verification of submitted documents for acceptance of the e-submitted bid. If a Bidder does not provide original of document of its bid by the date and time set in the Employer's request for clarification, its bid may be rejected. 21.3 If the Bidder that submitted the lowest evaluated bid does not accept the correction of errors, its bid shall be disqualified and its bid security shall be forfeited. 21.4 If the corruption case is being filed to Court against the Natural Person or Board of Director of the firm/institution /company or any partner of JV, such Natural Person or Board of Director of the firm/institution /company or any partner of JV such bidder's bid shall be excluded during the evaluation.
22. Award of Contract	22.1 The Employer shall decide the award of the contract to the Bidder whose bid is within the approved estimate and who has offered the lowest evaluated Bid Price within bid validity period provided that such Bidder has been determined to be eligible in accordance with the provisions of Clauses 2. 22.2 if the bid for an Unit Rate Contract, which results in the lowest Evaluated Bid Price is seriously unbalanced or front loaded **or extremely low** in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analysis, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder as **mentioned in BDS** to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract **or may consider the bid as non-responsive**.
23. Employer's Right to Accept any Bid and to Reject any or all Bids	23.1 The Employer reserves the right to accept or reject any bid or to cancel the bidding process and reject all bids, at any time prior to the award of the contract, without assigning any reasons whatsoever and without thereby incurring any liability to the affected Bidder or Bidders.
24. Notification of Award and	24.1 The Bidder whose bid is accepted and all other participating bidders shall be notified of the award by the Employer.

Signing of Agreement	24.2 The notification (hereafter called the "Letter of Acceptance") to the successful Bidder shall state the sum that the Employer shall pay the Bidder in consideration of the execution, completion, and maintenance of the works as described by the contract. Within 7 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver the Performance Security pursuant Clause 25and sign the Agreement. 24.3 Inability of the Bidder to make an Agreement within the above stated period shall result in cancellation of the Contract Award and forfeiture of the Bidder's Bid Security, upon which the Contract shall then be awarded to the next successive successful Bidder.
25.Performance Security	251. Within seven (7) days of the receipt of Letter of Acceptance from the Employer, the successful Bidder shall furnish the performance security as under mentioned from Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law in Nepal in accordance with the conditions of Contract using Sample Form for the Performance Security included in Section IX (Contract Forms), or another form acceptable to the Employer. i) If bid price of the bidder selected for acceptance is up to 15 (fifteen) percent below the approved cost estimate, the performance security amount shall be 5 (five) percent of the bid price. ii) For the bid price of the bidder selected for acceptance is more than 15 (fifteen) percent below of the cost estimate, the performance security amount shall be determined as follows: **Performance Security Amount =** **[(0.85 x Cost Estimate – Bid Price) x 0.5] + 5%of Bid Price.** The Bid Price and Cost Estimate shall be inclusive of Value Added Tax.
26.Additional Securities	26.1 The Bidder may be required to provide additional Performance Security if the Employer determines that the rate quoted by the Bidder in the Bill of Quantities, front loaded or unbalanced. In such case, the Employer shall instruct the Bidder to provide additional 8% security for signing of the Contract Agreement. Bidder's failure to do provide additional security shall result in forfeiture of the Bid Security and award of the Contract to the next lowest evaluated Bidder.
27.Corrupt or Fraudulent Practices	27.1 The Employer shall reject a bid for award if it determines that the Bidder recommended for award of contract has engaged in corrupt or fraudulent practices in competing for the contract in question.
28.Conduct of Bidders	28.1The Bidder shall be responsible to fulfill his obligations as per the requirement of the Contract Agreement, Bidding documents, GoN's Procurement Act and Regulations. 28.2 The Bidder shall not carry out or cause to carry out the following acts with an intention to influence the implementation of the procurement process or the procurement agreement : a) give or propose improper inducement directly or indirectly, b) distortion or misrepresentation of facts c) engaging or being involved in corrupt or fraudulent practice d) Interference in participation of other prospective bidders. e) coercion or threatening directly or indirectly to cause harm to the person or the property of any person to be involved in the procurement proceedings,

	f) collusive practice among bidders before or after submission of bids for distribution of works among bidders or fixing artificial/uncompetitive bid price with an intention to deprive the Employer the benefit of open competitive bid price.. g) contacting the Employer with an intention to influence the Employer with regards to the bid or interference of any kind in examination and evaluation of the bids during the period after opening of bids up to the notification of award of contract
29.Blacklisting Bidder	29.1 Without prejudice to any other right of the Employer under this Contract, GoN, Public Procurement Monitoring Office may blacklist a bidder for his conduct up to three years on the following grounds and seriousness of the act committed by the bidder: a) if it is proved that the bidder committed acts pursuant to the Sub-Clause 28.2, b) if it is proved later that the bidder/contractor had committed substantial defect in implementation of the contract or had not substantially fulfilled his obligations under the contract or the completed work is not of the specified quality as per the contract , c) if convicted by a court of law in a criminal offence which disqualifies the bidder from participating in the contract. d) if it is proved that the contract agreement signed by the bidder was based on false or misrepresentation of bidder's qualification information, 29.2 A firm declared blacklisted and ineligible by the GON shall be ineligible to bid for a contract during the period of time determined by the PPMO.
30. Provision of PPA and PPR	If any provision of this document is inconsistent with Public Procurement Act (PPA), 2063 or Public Procurement Regulations (PPR), 2064, the provision of this documents shall be void to the extent of such inconsistency and the provision of PPA and PPR shall prevail.

Section - II
Bid Data Sheet

Bid Data Sheet

ITB 1	The scope of work is : WORKS SEALED QUOTATION
ITB 1	The number of the Invitation for Bids is : BM/BAJURA/SQ/W/01/2077-78
ITB 1	The Employer is : Budhiganga Municipality, Bajura
ITB 11	The bid validity period shall be: 45 days.
ITB 12.1	The Bidder shall furnish a bid security, from 'A' class commercial bank with a minimum of 50000, which shall be valid for 30 days beyond the validity period of the bid.
ITB 12.2	Cash Deposit Account for Bid Security : Bank Name: Siddhartha Bank Ltd. Bank Address: Phalasain , Kuldevmandu Bajura Account Name: Budhiganga Municipality Account Number: 03115110332
ITB 14.1	Bidders shall have the option of submitting their bids electronically. Electronic submission procedure shall be : i. The bidder is required to register in the e-GP systemhttps://www.bolpatra.gov.np/egpfollowing the procedure specified in e-GP guideline. ii. Interested bidders may either purchase the bidding document from the employer's office as specified in the Invitation for Bid (IFB) or bidders may download the IFB and bidding document from e-GP system. iii. The registered bidders need to maintain their profile data required during preparation of bids. iv. In order to submit their bids electronically the cost of the bidding document shall be deposited in the account specified in IFB. In addition, electronic scanned copy (.pdf format) of the bank deposit voucher/cash receipt should also be submitted along with the bid. v. The bidder can prepare their bids using data and documents maintained in bidder’s profile and forms/format provided in bidding document by Employer. The bidder may submit bids as a single entity. vi. Bidders should update their profile data and documents required during preparation and submission of their bids. The required forms and documents shall be part of technical bids. 1. Letter of Bid (Mandatory) 2. Bid Security/Bank Guarantee (Mandatory) 3. Company registration (Mandatory) 4. VAT registration (Mandatory) 5. Tax clearances certificate or evidence of tax return submission (Mandatory) 6. Power of Attorney of Bid signatory (Mandatory) 7. Completed BoQ (Mandatory) 8. Bank Voucher for cost of bid document (Mandatory) 9. Additional documents specified in Bidding Document (If required) Note : The documents specified as “Mandatory” should be included in e-submission. vii. After providing all the details and documents, bid response documents will be generated from the system. Bidders are advised to download and verify the response documents prior to bid submission. viii. For verifying the authentic user, the system will send one time password in the registered email address of the bidder. System will validate the OTP and allow bidder to submit their bid. ix. Once bid is submitted, bidders won’t able to modify/withdrawal their bid. x. The Bidder / Bid shall meet the following requirements and conditions for e-submission of bids : The e-submitted bids must be readable through PDF reader. The facility for submission of bid electronically through e-submission is to promote transparency, non-discrimination, equality of access, and open competition in the bidding process. The Bidders are fully responsible to use the e-submission facility properly in e-GP system as per specified procedures and in no case the Employer shall be held liable for Bidder's inability to use this facility. When a bidder submits electronic bid through the PPMO e-GP portal, it is assumed that the bidder has prepared the bid by studying and examining the complete set of the Bidding documents including specifications, drawings and conditions of contract.
ITB 15	The deadline for Sealed Quotation submission is:12-02-2021 12:00 Address:Budhiganga Municipality, Bajura Bajura Bajura Sudoor Pachism Province Nepal

ITB 18	The bid opening shall take place at : Address :Budhiganga Municipality, Bajura Bajura Sudurpaschim Province Nepal Date and Time:12-02-2021 13:00 a) e-GP system allows to download the bid response document only after bid opening date and time are met. Simultaneous login of two members of the opening committee is required for bid opening. b)The Employer shall conduct the opening of bid at the address on the same date and time as specified in bidding document in the presence of Bidders' representatives who choose to attend

Section - III
Eligibility Criteria

Eligibility Requirements
All Bidders shall submit following documents as pre- requisites for eligibility:

1 Firm/Company Registration Certificate

2 Business Registration Certificate (License)

3 PAN/VAT Registration Certificate

4 Tax Clearance Certificate/ Extension Letter/Tax return submission evidence for the F/Y 2076/77

5 Power of Attorney

6 Letter of Bid

7 insert addition document if required

Notes to Bidders :

The information to be filled in by Bidders in the following pages shall be used for purposes of eligibility as provided for in Clause 2of the Instructions to Bidders. This information shall not be incorporated in the Contract. Attach additional pages as necessary.

Section - IV
Bidding Forms

Letter of Bid

The Bidder must accomplish the Letter of Bid in its letterhead clearly showing the Bidder's complete name and address.

Date: ……
Name of the contract: ……
Invitation for Bid No.: ……

To: ……

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents.
(b) We offer to execute in conformity with the Bidding Documents the following Works:
(c) The total price of our Bid, excluding any discounts offered in item (d) below is:……
(d) The discounts offered and the methodology for their application are:……
(e) Our bid shall be valid for a period of 45 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
(f) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document;
(g) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed;
(h) We declare that, we have not been black listed and no conflict of interest in the proposed procurement proceedings and we have not been punished for an offense relating to the concerned profession or business.
(i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and
(j) If awarded the contract, the person named below shall act as Contractor's Representative:
(k) We agree to permit the Employer/DP or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by the Employer.

Name: ……

In the capacity of ……

Signed ……

Duly authorized to sign the Bid for and on behalf of ……

Date ……

Bid Security

Bank Guarantee

Bank's Name, and Address of Issuing Branch or Office
(On Letter head of the Commercial bank or any Financial Institution eligible to issue Bank Guarantee as per prevailing Law)

Beneficiary: ..... name and address of Employer…….
Date:……
Bid Security No.:.....

We have been informed that . ……. .[***insert name of the Bidder***] (hereinafter called "the Bidder") intends to submit its bid (hereinafter called "the Bid") to you for the execution of …….. name of Contract …… under Invitation for Quotations No. …… ("the IFQ").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we……. . name of Bank. ……hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of. . ……..amount in figures …… (. ……..amount in words ……) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or
(b) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the performance security, in accordance with the ITB.
(c) is involved in fraud and corruption in accordance with the ITB

This guarantee will remain in force up to and including the date ……number……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 letter than the above date.

This Bank guarantee shall not be withdrawn or released merely upon return of the original guarantee by the Bidder unless notified by you for the release of the guarantee.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

. . .Bank's seal and authorized signature(s) . . .

Note:

The bid security of ……. has been counter guaranteed by the Bank ……..on ……. ……. …… (Applicable for Bid Security of Foreign Banks).

Section - V
Works Requirements

Scope of Work

Specifications

Notes on the Specifications

A set of precise and clear specifications is a prerequisite for Bidders to respond realistically and competitively to the requirements of the Employer without qualifying or conditioning their Bids.The specifications must be drafted to permit the widest possible competition and, at the sametime,present a clear statement of the required standards of workmanship, materials, and performance of the goods and services to be procured. Only if this is done will the objectives of economy, efficiency and fairness in procurement be realized, responsiveness of Bids be ensured, and the subsequent task of bid evaluation facilitated. The specifications should require that all goods and materials to be incorporated in the Works be new, unused, of the most recent or current models, and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

Samples of specifications from previous similar projects are useful in this respect. The use of metric units is encouraged by the Funding Agency in case of funding assisted projects. Most specifications are normally written specially by the Employer or Project Manager to suit the Contract Works in hand. The available standard specification of works of Ministry of Physical Infrastructure and Transport, DoLIDAR and Other line Ministries can be adopted for respective civil construction works.

There are considerable advantages in standardizing General Specifications for repetitive Works in recognized public sectors, such as highways, urban housing, irrigation, and water supply, in the same country or region where similar conditions prevail. The General Specifications should cover all classes of workmanship, materials, and equipment commonly involved in construction, however it may not necessarily be adequate to be used in a particular Works Contract and may necessitate preparation of Particular (Special) Specifications to amend and or supplement the provision of the General Specifications to meet the requirement of the particular Works.

Care must be taken in drafting specifications to ensure that they are not restrictive. In the specification of standards for goods, materials, and workmanship, recognized international standards should be used as much as possible. Where other particular standards are used, whether national standards of Nepal or other standards, the specifications should state that goods, materials, and workmanship that meet other authoritative standards, and which ensure substantially equal or higher quality than the standards mentioned, will also be acceptable.

Employers should decide whether technical solutions to specified parts of the Works are to be permitted. Alternatives are appropriate in cases where obvious (and potentially less costly) alternatives are possible to the technical solutions indicated in the Procurement Documents for certain elements of the Works, taking into consideration the comparative specialized advantage of potential bidders. For example:

The Employer should provide a description of the selected parts of the Works with appropriate references to Drawings, Specifications, Bill of Quantities, and Design or Performance criteria, stating that the alternative solutions if applicable shall be at least structurally and functionally equivalent to the basic design parameters and specifications.

Such alternative solutions shall be accompanied by all information necessary for a complete evaluation by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology, and other relevant details.

Sample Clause: Equivalency of Standards and Codes Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national, or relate to a particular country or region other authoritative standards that ensure a substantially equal or higher quality than the standards and codes specified will be accepted subject to the Project Manager's prior review and written consent. Differences between the standards specified and the proposed alternative standards shall be fully described in writing by the Contractor and submitted to the Project Manager at least 30 days prior to the date when the Contractor desires the Project Manager's consent. In the event the Project Manager determines that such proposed deviations do not ensure substantially equal or higher quality, the Contractor shall comply with the standards specified in the documents.
These Notes for Preparing Specifications are intended only as information for the Employer or the person drafting the Procurement Documents. They should not be included in the final documents.

Specifications

A. CIVIL WORKS

1. INTRODUCTION

a. The work shall be carried out according to the specifications whether specifically mentioned in it or not. No extra in any form shall be paid unless it is definitely stated as an item in the bill of quantities. Whenever the specifications are not given or ambiguous, the relevant Indian Standard and further amendments or decision of the Engineer shall be considered as final and binding.

b. The civil works shall be carried out simultaneously with the electrical, plumbing, sanitary and other services and in cooperation with the Contractors if any, of the above services. The work shall be carried on till it is completed satisfactorily. The Contractor shall keep the other Contractors informed well in advance of the program of the work so that the proposed work is not hindered. The Contractor shall further cooperate with other Contractors if any, in respect of any facilities required by them e.g., making holes in shuttering for pipes, electric conduits, fan hooks etc. However, nothing extra shall be admissible to him for such reasonable assistance and facilities afforded to other Contractors and the Contractor shall be deemed to have taken these factors into consideration while quoting his rates.

c. The work shall be related to the drawings, which the Contractor is presumed to have studied. Nothing extra will be paid for any item on its shape, location or other difficult circumstances, even if the schedule makes no distinction as long as the item is shown in the drawings.

d. The sources of materials if stated in the specifications are for guidance only and are those from which materials may generally be available. However, materials not conforming to specifications shall be rejected even if they come from the stated sources. The Contractor should satisfy himself that sufficient quantity of materials of acceptable specification is available from the stated or other sources.

e. The requirements of specifications under 2, General 3, Materials shall be fulfilled by the Contractor without extra charge including transportation and all taxes involved i.e. the item rates quoted shall be deemed to have taken these into account.

f. "Engineer" shall mean the Consultant and his authorized Representative.

2. GENERAL

2.1 SIGN BOARD

A signboard of size 1.5m * 2.0m shall be made and put at an approved place on the site. This board shall be painted in approved color with the text mentioned in the tender document. This shall be provided the Contractor‟s own expense.

2.2 DRAWINGS, INSTRUCTIONS AND MEASUREMENTS

All the Works shall be done according to the drawings and instructions of the Engineer and the Contractor shall arrange to test materials and/or soundness and sufficiency. If after any such test and in the opinion of the Engineer any work or portion of work is found to be defective or unsound the Contractor shall pull down and re-execute the same at his own cost. Defective materials shall be removed from the site within 24 hours of the written instruction by the Engineer.

2.3 CLEARING THE SITE

The site described and shown on the plans plus 6m all round the building shall be cleared of all obstructions, loose stones and materials, filling material, garbage and rubbish of all kinds as well as brush-wood up to a depth of 500mm. All holes or hollows whether originally existing or produced shall be well rammed and leveled off as directed. Also the Contractor shall dress the site 6m all round the building after completion, maximum cutting or filling being 300mm. No extra shall be paid for this, unless specified otherwise.

2.4 TREES

No trees shall be cut without the permission of the Engineer. If trees have to be cut, this shall form an extra item. For the purpose of the specification a tree shall be defined as that having girth at 1000 mm. from the ground not less than 300 mm.

2.5 MEASURING MATERIALS

Materials requiring measuring shall be measured separately in boxes of appropriate sizes or weighed as instructed by the Engineer before being mixed.

2.6 TEMPORARY PROTECTION

All trenches, walls, newly laid concrete or other work requiring protection from weather or accidental injury shall be protected by means of tarpaulin or in other approved way so as to keep the work immune from damage. Nothing extra shall be paid for on this matter.

2.7 QUALITY OF WORK

Materials, tools and plants and workmanship shall be the best of several kinds obtainable in the market and as approved by the Engineer.

2.8 LEAVE CLEAN

On completion, all works must be cleaned down, rubbish removed and the works and land cleaned of surplus materials, debris and other accumulations and everything shall be left clean and in orderly condition by the Contractor.

2.9 SAMPLES

Sample of materials required shall be submitted by the Contractor for the approval of the Engineer and after such approval these samples shall be deposited at secure place instructed by the Engineer. The Contractor will acquire the materials as per these approved samples.

2.10 PROVISIONAL ITEMS

All provisional items in the schedule shall be carried out at the discretion of the Engineer, and shall form part of the contract. In case, the provisional items are carried out by the Contractor, the rates shall be settled as for extra items as stated in the conditions of contract.

2.11 STORAGE

Safe, dry and properly covered storage place for all materials shall be provided by the Contractor, particularly for cement. The capacity of the cement storage godown shall be sufficient enough so that the works could be continued without interruption. Materials shall not be stored on footpath, road and area of people and vehicular movement. Material storage godowns shall be in accordance with the approval of the Engineer.

2.12 TESTS

The Contractor shall at his own cost arrange and carry out the tests of materials to be used in the Works or any other tests deemed necessary by the Engineer. Apart from the tests conducted in the site the Engineer may instruct to get some of the tests done in a recognized and well-established laboratory. The costs for the tests will be born by the contractor.

2.13 Water Supply & Power Supply

The contractor shall make his own arrangement for the supply of water, including potable water, for the purpose of the contract. The quality of the water shall be as per the approval of the engineer and suitable for the purpose for which it is intended.

Wastewater shall be disposed off clear of the site to the satisfaction of the Engineer so as to cause no damage or nuisance to the environment and the surrounding areas. The contractor shall make his own arrangements for the supply of electric power for the purposes of the Contract.

2.14 Medical Arrangements

The contractor shall make arrangements for treatment on the site of casualties and sick persons in first-aid units or in such other wards as may be necessary in accordance with the appropriate regulations.

Notwithstanding the minimum requirements prescribed above, the Contractor shall be responsible for the adequacy of all the arrangements made as per the provisions of the Contract.

2.15 Latrines

The Contractor shall provide throughout the period of construction of the Works and shall maintain and clean suitable and sufficient latrines for use by his employees; he shall ensure that his employees do not foul the site but make proper use of the latrines.

2.16 Notice of operations

The contractor shall give full and complete written notice of all important operations including setting out, to the Engineer, sufficiently in advance to enable the Engineer to make such arrangements as the Engineer may consider necessary for inspection and for any other purpose. The Contractor shall not start any important operation without the written approval of the Engineer.

2.17 Survey and Datum for Levels

Prior to the start of the Works the Contractor will receive from the Employer a list of Project Beach Marks and their values reference on the site.

Thereafter, the Contractor shall establish all setting out necessary for the performance of the work, to the approval of the Engineer including levels of the original ground surface at the Site and final surveys of the completed works for the final measurement. Levels shall close within 2.4 mm times the square root of the length of the circuit in km.

Ground levels shall be taken jointly by the contractor and the Engineer's Representative both prior to commencing and after completion of earthworks.

Where cross-sections are ordered these shall be at 10m intervals or at such other spacing as may be ordered by the Engineer on Site. The location of the first cross-section shall be approved by the Engineer and each cross section shall extend a minimum distance of 10 m beyond the limits of the new works.

Form the center-line and grades established, the Contractor shall furnish and place all additional stakes, templates and bench marks necessary for marking and maintaining points, lines and sections for layout of the Works.

2.18 Supply of Fuel Oils

The Contractor shall be responsible for arranging and ensuring that adequate supplies of high speed diesel oil, motor spirit, kerosene, lubricants and other petroleum products are available at all times to meet his requirements for the purposes of or in connection with the Contract. The Contractor's particular attention is drawn to this requirement as from time to time shortages and interruptions in the supply of fuel oils, etc. occur in the region.

2.19 Assistance To Engineer

2.19.1 General Assistance

The Contractor shall supply such assistance and plant as may be required in performing operations in connection with the execution, examination, inspection and measurement of the Works including the installation and surveying of bench marks and survey stations and marks wherever and whenever the Engineer shall deem necessary.

2.19.2 Scaffolding, etc. for Inspection

The Contractor shall provide safe access, when requested, by means of scaffolding, slings, etc. for the Engineer to inspect at close quarters those portions of the Works not safely accessible by other means.

2.19.3 Site Office, Equipment etc.

The Contractor shall maintain at its own cost a site office. The Contractor shall supply and maintain survey equipment as leveling and theodolite, etc. whenever required by the Engineer for the sole purpose of the project.

3. MATERIALS

The materials supplied and used in the Works shall comply with the requirements of these Specifications. They shall be new, except as may be provided elsewhere in the Contract or permitted by the Engineer in writing. The materials shall be manufactured, handled and used in a workmanlike manner to ensure

completed work in accordance with the Contract. Where an Indian Standard is specified, the latest version of the standard quoted shall be considered to apply.

3.1 INSPECTION AND ACCEPTANCE OF MATERIALS

Final inspection and acceptance of materials will be made only at the site of the work. The Engineer reserves the right to sample, inspect and test materials throughout the duration of the work, and to reject any materials which are found to be unsatisfactory at the time of use. A preliminary inspection of materials may be made at the source for the convenience of the Contractor, but the presence of the Engineer at the source shall not relieve the Contractor of the responsibility of furnishing materials, which comply with these Specifications. The Engineer shall have free access at all times to plants, quarries, place of manufacture etc. for the materials required for works.

3.2 SAMPLES AND TESTS

The Contractor shall submit samples of all materials for the approval of the Engineer at least ten days prior to commencement of Works. The Contractor shall give immediate notification of the placing of orders for shipping of materials to permit testing, he shall furnish without charge all samples required and he shall afford such facilities as the Engineer requires for collecting and forwarding such samples. The Contractor shall not incorporate into the work the materials represented by the samples until the tests have been made and the materials are found to comply with the requirements of the Specifications, except that any materials which have a satisfactory record of compliance with the Specifications may, at the discretion of the Engineer, be used until the tests are completed.

If the material fails the tests, no further use thereof shall be made until the Contractor has taken steps satisfactory to the Engineer to correct the deficiencies. When required by the Engineer preliminary samples of the character and quantity prescribed shall be submitted by the Contractor for examination and shall be tested in accordance with the methods referred to in this Specification. Only the materials actually delivered at site will be considered and their acceptance or rejection will be based on the results of the tests and inspections prescribed in these Specifications.

3.3 DEFECTIVE MATERIALS

All materials, which do not conform to the requirements of the Contract, will be rejected whether in place or not. They shall be removed immediately from the site unless otherwise permitted by the Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used in the work unless approval in writing has been given by the Engineer. Upon failure of the Contractor to comply promptly with any instruction of the Engineer regarding removal and replacement of rejected material the cost of such materials thereof shall be deducted from any moneys due to the Contractor.

3.4 TRADE NAMES AND ALTERNATIVES

For convenience in designation in the Contract, certain articles or materials to be incorporated in the work may be designated under a trade name or the name of a manufacturer and his catalogue information. The use of an alternative article or material, which is of equal or better quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements.

a) The burden of proof as to the quality and suitability of alternatives shall be upon the Contractor and he shall furnish all necessary information required by the Engineer. The Engineer shall be the

sole judge as to the quality and suitability of all alternative articles or materials and his decision shall be final and binding.

a) Whenever the specifications permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of such substitute material will be made until the request for substitution is made in writing by the Contractor. This shall be accompanied by complete data as to the equality of the material or article proposed. Such request shall be made at least before two weeks to permit approval without delaying the work.

4. CONTRACT DOCUMENTS

The Contractor is bound to execute and realize the Project Works covered under these Contract Documents. These contract Documents to cover the said work shall along with that is normally understood therein comprise of :

(a) Tender Documents.
(b) Working Drawings.
(c) All site instructions made in the site order book or log book by the Engineer.
(d) All instructions given to the contractor by the Engineer shall have form of sketches, directions along with requests for additional data, shop drawings, measurements details etc. from the Contractor related to this work in writing.
(e) All shop drawings & samples approved by the Engineer.
(f) All manufacture's specifications, data brochures information etc. approved by the Engineer.
(g) All aspects of work checked & approved by the Engineer either on, or off, the project site.
(h) All sample, guidelines that the Engineer shall instruct the Contractor to follow. In particular covering all Works where the Contractor shall follow the existing designs, decoration, methods of construction, finishes proportions, elevations etc. of the existing building.

5. EARTHWORK

Earthwork in excavation shall be carried out in trenches, raft foundation etc. in soil including dressing of sides, ramming of bottom, lift up to 3.0 m, stacking of excavated materials at least 4m.clear from the edge of excavation. It will be then returning the stacked soil in 0.15m layers when required in plinth, under floors, sides of foundation, laying and depositing the layer by properly watering and ramming and then disposing off all surplus excavated soil as directed within 50 m distance from the edge of the building. It shall be paid in m^3.

5.1 EXCAVATIONS

The foundation shall be dug to the dimensions shown on the drawings and to a depth at which in the opinion of the Engineer stratum of good hard soil is found.

The excavation shall be carefully dug out to the levels, shapes and dimensions as shown on the drawings or as directed by the Engineer. Should any of the excavation be taken down below the specified levels, the Contractor shall fill such excavation at his own expense with cement concrete (1:3:6) well rammed in position until it is brought up to the proper levels; filling in with excavated materials will not be allowed for this purpose. No extra charge will be paid. Excavated earth shall be stacked at least 4m away from the

edge of the foundation. The Contractor, at his own cost, shall dispose off all surplus excavated soil as directed by the Engineer.

If foundations are made broader or longer than shown on drawing or directed, the extra length and/or breadth shall be filled in with earth rammed hard after the foundations are built by the Contractor at his own cost.

The Contractor shall at his own expense and without extra charge, make provision for all extra excavation in slope, pumping, dredging or bailing out water and these trenches shall be kept free from water while the foundation work is in progress.

The Contractor shall also at his own cost remove portions of boulders or rocks and the remains of the old dismantled structures to make the bottom of the trench horizontal and level. The holes thus made good by filling them with (1:3:6) Cement Concrete if the holes happen to go below the required foundation depth. Nothing extra shall be admissible separately in the Bill of Quantities. The trench rafts shall be inspected by the Engineer before the concrete is laid therein and the trench level shall be recorded. The filling of side of excess trench excavations shall be done in not more than 0.15m layers. Each layer shall be watered and rammed hard before adding the next layer. Such fillings shall be brought up to the ground level without extra charge and shall form part of the item of excavation.

5.2 TIMBERING OF FOUNDATIONS

When foundations are to be taken deep, the sides of the trenches shall be protected by erecting timber shoring and structuring. Timbering shall be close or open depending on the nature of the soil and work. The arrangement of timbering, sizes and spacing of members shall be as directed by the Engineer. Nothing extra on this account shall be admissible which require special treatment for the purpose of excavation, it shall be deemed to be excavation in soil. Ordinary pebbles or canker shall be taken as soil for which nothing extra shall be paid.

5.3 SHORING AND PROTECTION

Where necessary to do shoring, the Contractor shall be responsible for the design of shoring for proper excavation. The design and shop-drawing of shoring must be approved by the Engineer. Shoring shall be of sufficient strength to resist side pressure ensuring safety from slips, prevent damage to work and property and injury to persons. It shall be removed as directed after all the items for which it is required are completed.

Near towns and all frequented places, foundation pits, well pits and similar excavation shall be securely fenced and red lights used at night. This should be in the charge of watchmen to avoid accidents. Adequate protective measures shall be taken to see that the foundation excavations do not affect or damage adjoining structures. All measures required for the safety of the excavation, the people working in and near the foundation trenches, property and the people in the vicinity shall be taken by the Contractor. The Contractor shall be entirely responsible for any injury to life and damage to property caused by his negligence or accidents due to his constructional operations. No extra shall be paid in this connection unless otherwise specified.

5.4 DE-WATERING

The Contractor shall not be paid extra for bailing out or pumping out of all water which may accumulate in the excavation during the progress of the work either from seepage, springs, rain or any other source, unless otherwise specified in the Contract.

Pumping water from any foundation enclosure or trenches shall be generally in such a manner as to preclude the possibility of any damage to the foundation trenches, concrete or masonry or any adjacent structures. The excavation shall be kept free from water (I) during inspection and measurement, (ii) when concrete and / or masonry is in progress and till they come above the natural water level and (iii) till the Engineers considers it necessary.

5.5 TRIMMING AND LEVELING

The bottom of all foundation should be trimmed and leveled in accordance with the drawings. Bottom of the foundation shall be rammed and watered if dry before concrete is deposited.

5.6 DISPOSAL

Disposal of the surplus earth shall be done as directed by the Engineer. Nothing extra shall be paid for such disposal made unless otherwise specified in the Contract.

5.7 MEASUREMENT

Measurement shall be made correct up to 1 cm. and be the product of the length and width of the lowest step of the footings according to the drawings or the Engineer's instructions and the depth measured vertically. Where the ground is not level, average depth shall be taken. Rate shall be inclusive of all the Works described above.

5.8 ADDITIONAL LIFT

Extra payment shall be made for the extra lift involved beyond 3m up to 7 m, under this item.

5.8.1 Measurement

Measurement shall be the exact length, breadth and depth.

5.9 SITE CLEARANCE BY REMOVAL OF GRASS, SHRUBS ETC.

The maximum depth of excavation shall be 0.5 m, 6m around the building shall be dressed and leveled properly. The surplus excavated material shall be disposed of as directed. Any trees or hedges shall be measured and paid separately. The payment shall be made in square meter.

5.9.1 Measurement

The quantity of site cleared shall be the product of length and breadth actually cleared.

5.10 Filling In Plinth

Filling in plinth shall be done in 0.15m layers under floors including watering, ramming, and consolidation and dressing complete. It shall be paid in cubic meter.

5.10.1 Materials

The earth for filling shall be approved by the Engineer prior to filling. The filling work shall be done with earth/sand in 0.15m layers, each layer being watered and rammed thoroughly. It shall include excavation of earth/sand, transportation, screening if necessary, filling and all the cost of labor etc. complete.

5.10.2 Measurement

The measurement shall be taken for the consolidated thickness of earth/sand and paid in cubic meter. Pit or stack measurement shall not be done. Quantity of earth fill under this item shall be arrived at by calculation i.e. sum total of earth filling required in foundation trenches, over raft, under floors or any other filling less than the total quantity involved in foundation excavation.

1. CONCRETE WORK

6.1 PROVIDING AND LAYING CEMENT CONCRETE

M10 grade cement concrete approximately (1:3:6) (1 cement: 3 sand : 6 stone aggregate 20 mm. and down gauge), M15 grade concrete approx. 1:2:4 (1 cement : 2 sand : 4 stone aggregate 40 mm. and down gauge) and M20 grade concrete approx. 1:1.5:3 (1 cement : 1.5 sand : 3 stone aggregate 20 mm. and down gauge) excluding the cost of form-work & reinforcement complete as required. It shall be paid in m^3.

6.1.1 Materials

Cement, sand and stone aggregate shall conform to the specifications as under Reinforced Cement Concrete Works.

6.1.2 Mixing

All proportions of materials shall be by weight or by volume if agreed by the Engineer. Mixing shall be done in a mechanical mixer as per specifications of Reinforced cement concrete work. However, in special cases, hand mixing may be allowed by the Engineer when the following procedure shall be adopted.

Materials shall be accurately gauged in boxes or weighed and thoroughly mixed on a water tight platform of adequate size, being turned over at least thrice till the color is uniform and then twice when wet. Water shall be added gradually and not more than necessary to sufficiently wet the materials. Only that much concrete shall be mixed which can be used within half an hour.

Each stack shall however be not larger than consuming one bag of 50 kg of cement. All such stacks shall be placed distinct from each other. In case hand mixing is allowed, the Contractor shall put in 10% more cement than specified without extra charges.

6.1.3 Laying

Concrete shall be laid in horizontal layers of not more than 0.15m thick and gently rammed.

6.1.4 Curing

After laying, the concrete shall be kept wet for seven days. If cast in hot weather, it shall be covered with gunny bags which shall be kept constantly wet. Other work on concrete shall not start until 3 days after laying of concrete.

6.1.5 Measurement

Measurement shall be in cubic meter of exact length, breadth and depth. This shall be exclusive of any form-work required to complete the item. Rate shall include all materials and labor.

6.2 PROVIDING AND LAYING DAMP PROOF COURSE

Providing and laying damp proof course 40 mm. thick in cement concrete M15 approx. 1:2:4 (1 Cement: 2 sand: 4 stone aggregate 20mm. and down gauge) with approved water proofing compound 2% by weight of cement including form work all complete as required. It shall be paid in sq. m.

It shall consist of 40 mm. thick cement concrete M15 approximately 1:2:4 (1 Cement: 2 sand : 4 stone aggregate 20mm. and down gauge) mixed with approved water proofing compound smooth and true to levels and laid as per specifications of plain cement concrete in general. The water proofing compound shall be well mixed before water is added. Appropriate form-work shall be done as required.

6.2.1 Measurement

Measurement shall be in square meter of the concrete area laid. Rate shall be inclusive of all materials and labor and required for work.

6.3 RCC WORKS

6.3.1 General

All R.C.C. work shall be carried out in strict accordance with these specifications, IS Specifications and the working drawings. Any discrepancies in the dimensions on the drawings or any points not clear to the Contractor shall brought to the notice of the Engineer and clarified in advance before proceeding with the work.

The Contractor shall allow for all wastage in all materials. He shall also allow for all tests of concrete materials unless issued by the Employer. No R.C. concrete work shall be cast in the absence of the Engineer. The Contractor shall personally check that both the form-work and reinforcement have been correctly placed and fixed. He shall satisfy himself that all work preparatory to casting is completely ready for inspection and approval and for this purpose at least 24 hours prior notice shall be given to the Engineer by the Contractor.

6.3.2 Materials

The materials used in the Works shall be of the qualities and kinds specified. Materials shall be delivered to the Works at least 30 days before it is required for use in work. Delivery shall be made sufficiently in advance of constructional requirements to enable samples to be selected, tested and approved by the Engineer. No material shall be used in the Works until approved. Materials failing to comply with the approved samples and specification shall be removed within 24 hours of the instruction of the Engineer from the site at the Contractor's cost.

6.3.2.1 **Water**

Water used in mixing concrete shall be free from injurious amounts of oils, acids alkalis, organic material or other deleterious substances. It should be as clean as drinking water.

6.3.2.2 **Cement**

The cement shall be ordinary Portland cement of approved brand and manufacture and shall comply in all respects with the IS 269- 1967 for ordinary Portland Cement. It shall be delivered on the site in packages

with an unbroken seal fixed by the makers and plainly marked with the names of Brand and the Manufacture. It shall be stored in a dry place, in regular piles not exceeding ten bags high and in such a manner that it will be efficiently protected from moisture and contamination. Set cement should immediately be removed from the work and replaced by the Contractor at his own expense. If described tests shall be made by taking samples of cement from stores or elsewhere from the Works the selection of samples and procedure for testing shall comply with appropriate IS code.

6.3.2.3 **Aggregate**

All aggregates shall conform to IS 383-1970. Aggregates shall as far as possible, be derived from a source that normally produces aggregate satisfactory for concrete, and if requested by the Engineer the Contractor shall supply evidence to this effect. If he is instructed to do so, the Contractor shall supply samples of the aggregate for the purpose of making preliminary concrete test cubes as hereinafter specified.

Aggregate shall consist of naturally occurring sand and gravel or stone crushed or uncrushed, or a combination thereof. They shall be hard, strong, dense, durable, clean and free from veins and adherent coating. As far as possible, flaky and elongated pieces should be avoided.

Aggregate shall not contain any harmful materials, such as iron pyrites, coal, mica, shale or similar laminated materials, clay, alkali, soft fragments, sea shells, organic impurities etc. in such quantity as to affect the strength or durability of the concrete or in addition to the above for reinforced concrete. Aggregate, which are chemically reactive with the alkalis of cement are harmful, as cracking of concrete may take place.

a) Fine Aggregates

The fine aggregate shall be natural sand or sand derived by crushing suitable gravel or stone and shall be free from coagulated lumps. Sand derived from a stone unsuitable for coarse aggregate shall not be used. The fine aggregate shall conform to the requirements of IS. 383-1970. Fine aggregate shall not contain more than 3% of material removable by decantation test, nor more than 1% removable by dry tube. The total of coal, clay lumps, shale, soft fragments and other deleterious substance shall not be more than 5%.

The percentage of clay lumps shall be determined by examining the various fractions that remain after the material has been tested for grading. Any particulars that can be broken with fingers shall be classified as clay lumps and the total percentage of clay lumps shall be determined on the basis of the total original weight of the sample. The fine aggregate shall be well graded from fine to coarse and shall meet the gradation requirements. Blending will be permitted in order to meet the gradation requirements for the fine aggregate.

b) Coarse Aggregate

The coarse aggregate shall be crushed stone. The pieces of aggregate shall be angular. Friable, flaky and laminated pieces and Mica shall only be present in such quantities as not to affect adversely the strength and durability of the concrete as ascertained by tests on concrete cubes. After twenty four hours immersion in water, a previous dried sample shall not have gained in weight more than 5% and not more than 10% if it is to be used in plain concrete or elsewhere as described. The coarse aggregate shall conform to the requirements of IS. 383-1970.The

percentage of wear at 500 revolutions of Los Angeles Rattler Test shall not be more than 50%.
The coarse aggregate shall meet the gradation of 2.

6.3.3 Measurement and Proportioning of Concrete Materials

The aggregate shall be measured by weight or by volume if approved by the Engineer in a gauge box of correct and approved size based on the weight of the material or by other approved accurate means. The gauge box or other container shall be filled with the aggregate without compacting to a predetermined uniform depth, accurate allowance being made for bulking due to moisture content of the fine aggregate.

The cement shall be measured by weight, one or more complete bags containing 50 kg being used for a single batch of concrete and as the size of the mixer shall permit this to be done.

The normal proportions of cement and aggregate shall comply with the quantities specified below of the concrete described for each part of the work. The specified quantities shall be altered if instructed after examination of the aggregate materials in samples or in bulk in order to obtain the densest concrete with approved materials. Any such alterations within the range of 1 part of fine aggregate to 1 1/2 parts of coarse aggregate and 1 part of fine aggregate to 2 1/2 parts of coarse aggregate shall be made without any alteration in the rate of Bill of Quantities.

6.3.4 Properties of Concrete

6.3.4.1 **Concrete Proportions**

The minimum cement content of mix shall be as below:

Grade	Minimum cement content in Kg/cu.m.
M 15	320
M 20	400
M 25	610

The quantity of water used shall be varied to suit the moisture content of the aggregate, and shall be just sufficient to produce a dense concrete, consistent with practical workability

6.3.4.2 **Concrete Grade and Strength**

The compressive strength (cube strength) for Portland cement concrete shall be in accordance with IS. 456 –1964 and shall not be less than that shown in the following table:

Grade	Preliminary Test at 7 days:	Works Test at 28 days :
M 15	105 kg/cm2	150 kg/cm2
M 20	140 "	200 "
M 25	175 "	250 "
M 30	210 "	300 "

6.3.5 Control of Concrete

6.3.5.1 **Preliminary tests**

The Contractor shall be called upon to submit representative samples of materials to be used for concrete in order that they may be tested at a laboratory and the suitability of materials established. All expense in connection with the above materials, tests shall be born by the Contractor.

6.3.5.2 **Works Cube Tests**

During the progress of the work 15 cm. cubes shall be made as per IS. 456-1964 as necessary and tested in accordance with IS. 516-1959.

6.3.5.3 **Measurement of Consistency**

The consistency shall be determined by making trial mixes with dried aggregates. The consistency of the trial mixes of approved consistency shall be measured as instructed.

The slump of approved trial mix shall be measured and this slump shall not be exceeded throughout all batches of concrete made from the same materials mixed in the same proportions as the trial mixes. In no case, however, shall the slump exceed 50mm. for concrete in slabs, or exceed 25 mm for concrete consolidated by mechanical vibration. The slump test shall be done at the commencement of each grade of concrete placing and such other times as instructed.

The apparatus used for the slump test shall be standard cone. When cone is filled it shall be raised vertically clear of the concrete and the measurement of the slump shall be taken. Care shall be taken to prevent vibration of the sample being tested. If the Engineer requires the use of other means for testing the consistency of the concrete it shall be done as instructed without any extra charge.

6.3.6 Concrete Mixing

The cement and aggregates shall be thoroughly mixed together in the specified proportions in a batch type mechanical mixer. All the cement and aggregates constituting a batch is mixed till the mix is of uniform color. The mixing time in no case shall be less than one minute, If the drum rotates at lower speeds, the minimum period shall be increased inversely proportional to speed. The period of mixing shall be measured from time when all the materials including water are put in the drum. The entire contents of the drum shall be discharged before materials for the succeeding batch are fed into the drum. Materials spilled from the skip or other container shall not be used. No partly set or frozen concrete shall be used in the work. Partly set concrete shall not be remixed with the addition of cement or aggregate.

6.3.7 Distribution of Concrete

The concrete shall be distributed from the mixers to the position of placing by approved means that do not cause separation or segregation or otherwise impair the quality of the concrete.

6.3.8 Preparation for placing concrete

Before the concrete is placed the shuttering shall be trued - up and any water accumulated therein shall be removed. All saw dust, ships, nails, and other debris shall be washed out or otherwise removed from within the formwork. The reinforcement shall then be inspected for accuracy of fixing. Immediately before placing the concrete the formwork shall, except in frosty weather, be well wetted and inspection opening closed.

6.3.9 Placing concrete

The interval between adding the water to the dry mix and completion of the concrete placing operation shall not exceed 30 minutes nor, when an approved admixture that accelerates the initial setting of the cement be used, exceed ten minutes.

Except where otherwise approved for slabs and large sections concrete shall be placed in the formwork by shovels or other approved implements and shall not be dropped from height nor handled in a manner to

cause separation or segregation. Accumulations of hardened concrete dropping on the reinforcement shall be avoided.

Each layer of concrete while being placed shall be consolidated by approved methods of ramming, tamping, or mechanical vibrations to form a dense surface free honeycombing and tolerably free from water marks and air holes or other blemishes.

The concrete shall be tamped against the face of the formwork so as to produce dense fair surface. The number and type of mechanical vibrations shall be approved before consolidating by vibration. Placing and consolidation of concrete shall be done in such a manner as not to disturb concrete already placed, and reinforcement projecting from concrete already placed shall not be vibrated or jarred. For reinforced concrete walls each other layer of concrete placed shall be properly consolidated by approved methods of mechanical vibrations produced by internal or external mechanical vibration.

Any water accumulating on the surface of the newly placed concrete shall be removed by approved means and no further concrete shall be placed thereon until such water be removed. No fresh concrete shall be brought into contact with the concrete containing cement of different type. Unless otherwise approved or instructed, concrete shall be placed in a single operation to the full depth of slabs, beams, and members similar to these and shall be placed in horizontal layers not exceeding 0.90m deep in walls, columns until completion of the of the work as specified. At the completion of a specified or approved part of the construction, joints of the form and in the position herein after specified shall be made. If a temporary cessation of concrete placing is unavoidable a construction joint shall likewise be made.

6.3.10 Placing concrete in extreme weather

Work shall be done according to Clause 20.1 of IS. 456-200.

6.3.11 Vibration

6.3.11.1 **Appearance**

The concrete that is to be compacted by vibration should appear anything from earth dry to slightly glistening. The mix should have the appearance of lacking in fines.

6.3.11.2 **Placing**

Segregation is likely to take place when the concrete is tipped into the formwork and this should be avoided. The concrete mix should not contain surplus water and sand which will develop segregation under influence of vibrator compaction. The distribution of new concrete should be uniform for the whole section and the surface kept horizontal for the whole section all the time thus ensuring the movement of concrete is downward only. Vibrators shall not be used as a spreading or distributing agent.

The vibrators shall be of rotary out of balance immersion type or the electro-magnetic type and operate at a frequency of not less than 4,000 cycles per minute. The vibration shall be of such a power input as to produce an acceleration of 1 to 3 m/sec in the mass of the compacted concrete. The vibrators shall be provided for continuous operation.

6.3.11.3 **Disposition of Vibrators**

Internal vibrators shall be disposed within the mix, when placed, so as to maintain the whole of the concrete under treatment in adequate state of agitation such that de-aeration and effective compaction may be achieved at a rate commensurate with the supply of concrete from the mixers. Insertion of vibrators at about 450 mm center is considered sufficient.

6.3.11.4 **Period of Vibration**

Vibration shall continue during the whole period occupied by placing the concrete, the vibration being adjusted so that the center of vibration approximates to center of the mass being compacted at the time of placing. The concrete should not be over vibrated and the period of insertion of internal vibration should be about 15 seconds at any point.

6.3.11.5 **Compactness**

The concrete shall be considered fully compacted when the mortar fills the spaces between the coarse aggregate so as to form a glistening and even surface except for slight irregularities where the coarse aggregate breaks this smooth surface. When this condition has been attained the vibrators shall be withdrawn slowly.

The vibrator must not be placed against the steel or the formwork. The minimum distance shall be 8 mm. The compactor must be placed in such a position that formwork, reinforcement and recently laid concrete may be subjected to the minimum amount of vibration.

6.3.12 Construction Joints

Construction joints shall be made in the positions hereinafter specified or elsewhere as approved. Such joints shall be truly vertical or horizontal as the case may be, except that in an inclined or curved members the joint shall be strictly at right angles to the axis of the member.

Construction joints shall be made horizontally at the top of the foundations and horizontally 8 mm. below the lowest beam soffit at the head of columns. Concrete in the ribs and slabs of small T or L beams shall be placed in one operation, but, for large beams concrete in the rib up to a level 2.5 mm. below the slab soffit shall be placed first. Concrete in haunches or splays on the beams or braces and concrete in the head of adjoining portion of the columns shall be placed at the same time as that in the slab. Construction joints in the length of a beam shall be avoided where practicable, but where joints are unavoidable they shall be made as previously approved by the Engineer. Construction joints in slabs shall be made parallel to the main reinforcement, they shall be made at a place previously approved by the Engineer.

Before placing new concrete against concrete already set, face of the old concrete shall be cleaned and scum removed. The face shall be roughened and any loose aggregate removed there from. Immediately before placing the new concrete the face of the old concrete shall be thoroughly wetted and a coating of neat cement grout applied. The new concrete shall be well rammed against the prepared face before the grout sets. Construction joints will not be paid separately.

6.3.13 Protection and Curing of Concrete

Immediately after placing or finishing, concrete surface not covered by forms shall be protected from loss of surface moisture for at least seven days when the average daily temperature is at least 21 SYMBOL 176 \f "Symbol" c, where Portland cement has been used. Protection from loss of surface water shall be done by any of the following methods where applicable to the type of work involved:

a) By water covering.
b) By covering of surface with water - impervious paper.
c) By application of approved impervious membrane.

Surface from which forms have been removed before the curing period has elapsed shall be protected as specified for surfaces not covered by forms. Membrane cutting shall not be used on surfaces required to receive additional concrete or concrete fill, nor on cement finish coats that are to receive dust or hardening treatments, nor during hot weather.

Water curing shall be performed by keeping the concrete surface wet by ponding, by continuous spraying or by covering the surface with an approved water- saturated covering such as 2.5 mm. of sand or sawdust, or by one or more layers of burlap. The exposed concrete surfaces shall be saturated with water throughout the full stipulated curing period, they shall be kept sufficiently wetted with clean water to reduce cracks and to prevent joints from opening in the forms.

The impervious membrane curing compound shall be an approved non bituminous, colorless, liquid, sealing compound in atomized form so as to preserve the natural color of the concrete. The curing compound shall be applied as soon as surface water has disappeared from concrete surfaces with approved pressure spraying equipment in accordance with the manufacturer's directions and in sufficient thickness to form an effective water seal. No compounds shall be used which will adversely affect the subsequent installation of finished flooring.

Joints of sheet membrane used for curing shall be lapped at least 150 mm. and sealed with water proof tape as recommended by the manufacturer. Polyethylene sheet shall be considered the water-impervious paper for purposes of interpretation of this item. No liquid curing compound may be used without specific written approval of the Engineer regarding type, manufacturer, location and extent of use and application procedures.

6.3.14 Finishes

The concrete surface shall in general be smooth enough. However, immediately after stripping form work, minor defects and honey combed areas shall be patched and holes filled before the concrete is thoroughly dry, patch areas shall be chipped away to 2.5 mm. depth, with regular edges perpendicular to the surface. Area to be patched shall be thoroughly wet including the areas at least 150mm. wide entirely surrounding them, just prior to placing the patching mortar. Mortar shall be of the same material and portions as used for the concrete, without coarse aggregate.

A sufficient quantity of white cement shall be substituted for part of the ordinary cement so that the patching mortar, when dry, will match the surrounding concrete. Water in the mix shall be kept to a minimum and mortar shall be re-tempered without adding during which time it shall be mixed to prevent setting. The mortar shall be thoroughly compacted into place, screened so as to leave the patch slightly higher than surrounding surfaces, left undisturbed for one to two hours to permit initial shrinkage and finished to match the adjoining work.

Where patches exceed 2.5mm depth, they shall be trimmed and wet as specified, after which the opening shall be filled to within 2.5 mm. of the surface. After sufficient shrinkage time has elapsed, the patching shall proceed as described above. Patches shall be kept wet for five days. Tie holes left by the withdrawal of rods, or holes left by removal of ends of ties shall be filled solidly with mortar. For holes passing entirely force mortar through the wall, starting at the back face, shall be used. When hole is completely filled, excess mortar shall be struck off with a cloth flush with the surface.

Holes not passing entirely through walls shall be filled solidly with mortar. Any excess mortar shall be struck off with a cloth on the wall surface. The surface of non-shuttered faces concrete work other than slabs shall be smoothed with a wooden float (or if approved with a steel trowel) to give a finish equal to that of the rubbed down shuttered faces. Concealed concrete faces shall be left as it is except that honeycombed surfaces shall be made good.

The top faces of slabs not intended to be surfaced shall be leveled and floated to a smooth finish at the levels or falls shown on the drawings or elsewhere. The floating shall not be executed to the extent of

bringing excess fine material to the surface. Ribbed surfaces of slabs shall, where instructed, be formed at the time of taming and leveling.

Indentation in slab or stair surfaces shall be formed by approved materials giving depth and patterns as instructed. The top faces of slabs intended to be covered with screed, granolithic or similar surface shall be left with a spade finish. The soffits of slabs and faces of walls intended to be rendered shall be roughened by approved means to form a key. Concrete surfaces to take finishes other than those specifically referred to herein shall be prepared in an approved manner to suit the finish as instructed.

6.3.15 Test of Structure

The Engineer shall instruct that a loading test be deemed necessary for one or more of the following reasons:

a) The site - made concrete test cubes failing to attain the specified strength.
b) Over - loading during construction of the Works or part thereof.
c) Shuttering being prematurely removed.
d) Concrete improperly cured.
e) Any other circumstances attributable to alleged negligence on the part of the Contractor, which in the opinion of the Engineer may result in the Works or part thereof being less than the expected strength.
f) Any reason other than the foregoing. If the loading test to be made solely or in part for the reasons from (a) to (e) the test shall be made at the Contractor's own cost.

If the test to be made for the reason (f) the Contractor shall make the test and shall be reimbursed for all cost relating thereof irrespective of the result of the test.

For the purpose of a loading test on floors, roofs and similar structures and their supports, the test load shall be equivalent to 1 and 2/3 times the superimposed load for which the Works or part thereof to be tested has been designed. The test load shall not be applied within 90 days (or 28 days if rapid hardening Portland cement be used) of the placing of the concrete in the part of the Works to be tested. This shall not be supported during the test by shuttering or other non-permanent support. Measures shall be taken to ensure that in the event of a failure under the test temporary support of the loaded member shall be immediately available. The test shall proceed strictly as instructed.

For the loading test on floors, roofs or similar structures the result shall be deemed satisfactory if upon removal of the test load the residual deflection does not exceed one-quarter of the maximum deflection after 24 hours loading. If the residual deflection exceeds this amount the test loading shall be repeated, and the result shall be deemed to be satisfactory if the residual deflection after removal of the second test load does not exceed one-quarter of the maximum deflection occurring during the second test.

If the result of the loading test is not satisfactory the Engineer shall instruct that part of the Works concerned shall be taken down or removed and reconstructed to comply with the specification, or that such other remedial measures shall be taken as to make the Works secure. If the test is instructed to be made for one or more of the reason (a) to (e) as herein before specified, the Contractor shall take down, remove and reconstruct the defective work or shall take remedial measures instructed at his own cost.

6.3.16 Measurement

In calculating the contents of any R.C.C. member, for measurement proposes the dimensions adopted shall be structural concrete members exclusive of any finish,

a) Raft slabs and beams: It shall be measured in cum. of work done as per drawing. Measurement shall be done for the raft concrete below the column junction to the raft slab/beam. Nothing extra shall be paid for any odd size or shapes.

b) Beams: Measurement shall be between R.C.C. columns or resting on walls cubic meter of the work done as shown on the drawing. The depth shall be taken from the bottom of the rib to the top of the slab or chajja if any. Lintels when connected to main RCC structure shall be measured as beams.

c) Columns: These shall be measured in cu. m. of work done according to the drawings from top of the footing or raft slab to the top of slab in case of ground floor and from top of slab to the top of slab for all other floors. Unless specified otherwise nothing extra shall be admissible for any odd size and for any special section and shape of column i.e. square, rectangular, round, elliptical etc. and laid at any angle as may be shown on drawings.

d) Walls: These shall be measured from end of slab / column / beam, termed wall. It shall be paid in cubic meter excluding the finish.

e) Lintels: All lintels spanning over independent openings unrelated to main RCC structure shall be measured under lintels, in cubic meter of the work done according to drawing. Width of the lintels shall be taken according to wall thickness specified unless set-back or projected from wall as shown on the drawing. Unless otherwise described or shown on the drawings, bearing over the openings shall be depth of the lintel or 150 mm. whichever is higher.

f) Stairs: These shall be measured in cu.m of the concrete work done as per drawing. Unless specified otherwise nothing extra shall be admissible for steps laid in any shape or not straight in plan.

g) Folded Staircase: The folded staircase shall be measured excluding the vertical main column. It shall be measured for step of any shape size and paid in cubic meter excluding the finish.

h) Fins and Louvers: The RCC fins or louvers as provided shall be measured and paid in cubic meter. Nothing extra shall be allowed due to its shape, location or size.

i) Facia and parapets: These shall be measured in cu. m. of the concrete work done as per design, drawing, excluding of finishing. For sills all projections up to 100mm beyond the wall on either side shall be made without any extra charge and these shall be inclusive of forming any pattern of drip mould.

j) Mullions: The RCC mullions shall be measured for all slab, walls etc. forming the water tank. Nothing extra shall be allowed for its shape, size and location. It shall be paid in cubic meter of the concrete work.

k) Water tank: These shall be measured in cu. m. of the propping, shuttering and finishing the top and facing surface smooth with neat cement slurry complete but excluding the cost of reinforcement. It shall be paid in cu. m.

6.3.17 Miscellaneous Concrete Works

a) Cement concrete M150 in window sill including formwork & neat cement plaster in 1: 3 (1 cement : 3 sand) complete.

Cement concrete M150 shall conform to as in 6.3.4. The window-sill will be of specified thickness and size, shall be pre-cast or cast in situ with all the necessary formwork complete. The exposed underside and the top and facing shall be plastered neatly with cement mortar 1: 3: (1

cement : 3 sand). The grooved drip course shall be provided. The concrete shall be laid in slope as required as per drawing or as directed.

Measurement: It shall be measured in cubic meter of the work done. The rate shall include all materials labor complete. It shall be paid in cu. m.

b) Providing and fixing pre-cast R.C.C. Jali including formwork and reinforcement as per drawing complete. It shall be paid in m^2.

The concrete work for pre-cast jali shall be of M150 grade with hard graded stone aggregate 20mm. and down gauge. The jali shall be smoothly finished conforming to the drawing. It shall include all the reinforcement, formwork, finishing with plaster etc. The Engineer prior to commencement of work shall approve workmanship and finish.

Measurement: It shall be measured in square meter and the rate shall include all material and labour complete.

6.3.18 Reinforcement

6.3.18.1 **Supplying and Fixing Tor Steel or Thermex TMT Bars**

Thermex TMT / Tor steel Reinforcement bars conforming to IS. 1786-2008 or IS. 1139-1966 shall be used in RCC works. This item shall consist of supplying and fixing Tor steel bars including bending, binding with 16 gauge black wire, placing in position including the cost of binding wire, as per drawing. This shall be paid in kg.

6.3.18.2 **Mild Steel Reinforcement**

Grade 1 M.S. reinforcing bars shall conform to IS. 432-1966 in RCC work. This item shall consist of supplying and fixing MS bars including bending, binding with 16 gauge black wire, placing in position including the cost of binding wire as per drawing. This shall be paid in kg.

Reinforcement shall be free from pitting due to corrosion, loose rust, mill scale, paint , oil, grease, adhering earth, ice or other materials that may impair the bond between the concrete and the reinforcement or that may in the opinion of the Engineer cause corrosion of the reinforcement.

6.3.18.3 **Bar Reinforcement**

Bar reinforcement described as "mild steel" shall be plain round hot rolled steel bars. Bar reinforcement described as "Tor steel" shall be hot rolled deformed bars or cold twisted steel bars. With respect to manufacture, quality, physical properties and related requirements, reinforcement of the fore-going descriptions shall comply with appropriate parts of IS. Standards Nos. 423-1966, 1139-1966 and IS. 1786-2008 for mild steel and Tor steel respectively.

6.3.18.4 **Certificates and Tests for Reinforcement**

For each consignment of reinforcement bars used in the Works the Contractor shall supply manufacturer's test certificate giving the ultimate strength, yield stress and elongation and the result of the cold bend test for each type and each size of bar. Tests for the purpose of obtaining the information shall confirm to relevant IS standard. After the delivery of the reinforcement bars at site if it is found that the Manufacturer's Test Certificate for the lot is not available, or on inspection by the Engineer, the reinforcement bars thus supplied are found rusted/corroded the contractor will collect as many samples as required by the Engineer and get them tested on his own cost in an independent laboratory.

6.3.18.5 **Dimensions of Reinforcement**

The size of reinforcement bar described on the working drawings or elsewhere shall be the minimum and the rolling margin and other tolerance shall be wholly above this size. The length of a reinforcement bar shall be not less than the length on the drawing or elsewhere and shall not be more than 50 mm. in excess of that length. Bar bending schedule shall be prepared by the Contractor and submitted for approval of the Engineer. Such schedules shall be prepared based on reinforcement details, prior to the execution of the work. Nothing extra shall be paid for this.

6.3.18.6 **Bending Reinforcement**

Reinforcement bars shall be bent by approved means producing a gradual and even motion. Bars shall comply with the dimensions described in the drawings. Overall dimensions or internal dimensions of bending or the like shall be within a tolerance of 30 mm. Any discrepancies or inaccuracies found by the Contractor in the drawings or other documents shall be immediately reported to the Engineer whose interpretation and requirements relating there to shall be accepted. The internal radius of bends shall be not less than twice the size of the bars unless described to the contrary on the bending lists or elsewhere in the drawing. Hooks and other end anchorage bends for mild steel shall be bent to an internal radius of twice the diameter of the bar. This internal radius of the bends of corner binders or stirrups or links shall be half.

6.3.18.7 **Fixing Reinforcement**

Reinforcement shall be accurately fixed by approved means maintained in the position described. Bars intended to be in contact shall be securely wired together at all such points with 16 gauge soft G.I tying wire. Binders, stirrups and links shall tightly embrace the bars with which they are intended to be in contact and shall be securely wired or, if approved, spot welded thereto.

Reinforcement shall be lapped, joined or spliced only at the positions described. Splices and like found to be necessary elsewhere shall be formed only if and as instructed. Lapping shall be provided as shown in the drawing and as permitted. Where practicable bars in each member shall be assembled and fixed in the form of a rigid cage or skeleton before placing in the moulds or formwork.

Immediately before concreting the reinforcement shall be checked for position, cleanliness, freedom from rust or retarding liquid. Measure shall be taken to ensure that reinforcement remains correctly in position with required cover during the placing and consolidating of the concrete.

Reinforcement projecting from work being concreted or already concreted shall not be bent from its correct position for any reason unless approved and shall be protected from deformation for future extensions and also shall be thoroughly coated with cement grout wash or encased in concrete or otherwise protected from corrosion as instructed.

6.3.18.8 **Cover of Concrete and Spacing of Bars**

Unless otherwise described, the clear cover of concrete to the reinforcement shall be as follows:

a) Horizontal, vertical or inclined slabs: 15 mm or the size of the main bars whichever is greater.
b) Lintels: 20 mm or the size of the main bars whichever is greater.
c) Beams: 25 mm or the size of the main bars whichever is greater. 15 mm minimum for binders.

Columns: For all columns having any diameter of reinforcement, the clear cover shall be 40 mm or the size of the main bars whichever is greater. 15 mm. minimum for rectangular binders or links or helical binding,.

6.3.18.9 **Measurement**

For the purpose of ascertaining payments due to the Contractor the basis of measurements of bars or wire reinforcement used in the Works shall be the calculated weight in kg. which shall be computed from the sizes and lengths of the bars or wires described on the working drawings or elsewhere. No allowance in the weight shall be made for cutting to waste, rolling margin, extra length or other tolerances. Nothing extra, whatsoever shall be admissible on bars 12 mm and below rolled, the Contractor is deemed to have taken this factor into consideration and quoted accordingly in the tender.

The Contractor's rate for unit weight of bars shall be deemed to include all allowances omitted in calculating the weight and for any other tolerances, for providing tying wire, spacer bars, and cover blocks as specified hereinafter, for carriage and handling, for bending hooking, cranking and for fixing and maintaining in the correct position in the Works. Standard laps of the lengths as shown in the drawing or as instructed at site shall be admissible. Standard hooks (9 times the diameter for each hook for mild steel) shall be added to the finished length to arrive at the length of the bar for cutting and measurement. No hooks are required for ribbed or Tor steel.

6.3.19 Formwork

Centering and shuttering including nailing, propping, strutting, wedging etc. and removal of forms including applying form oil to shuttering. It shall be paid in square meter.

6.3.19.1 **Design**

Formwork shall be designed and constructed in such a manner that concrete can be properly placed and thoroughly compacted without any movement in the formwork. Formwork shall be firmly supported and adequately strutted, braced, or tied. It shall be capable of adjustment to the lines and dimensions of the finished concrete and it shall be sufficiently strong to resist without distortion, the pressure of concrete during its placing and compaction, and other loads to which it may be subjected. It shall not be liable to suffer distortion under the influence of the weather.

When concrete is to be vibrated, special care shall be taken to ensure that the formwork will remain stable and the joints tight. The safety and adequacy of centering and shuttering shall be the sole responsibility of the Contractor. The Contractor shall, if required, supply to the Engineer shop drawings and calculations for the formwork, he proposes to use.

6.3.19.2 **Deflection and Camber**

The Contractor shall make allowance for any settlement or deflection of the formwork that is likely to arise during Construction, so that the hardened concrete conforms accurately to the specified line and level. The Contractor shall also make allowance in the formwork for any camber specified by the Engineer to allow for the elastic deflection of structural members and deflection due to creep of the concrete. In the absence of any specified camber, the soffit of all beams and slabs shall be given a camber equal to 1/ 240 of the span length to ensure that the structure has the prescribed shape after removal of the forms.

6.3.19.3 **Supports**

Formwork shall be constructed in such a way that the formwork to the sides of members can be removed without disturbing the soffit formwork or its supports. Props and supports shall be designed to allow the formwork to be adjusted accurately to line and level and to be erected and removed in an approved sequence without injury to the concrete. Supports shall be erected on sufficiently strong base to avoid

injury to any portion of the structure by its settlement. Props and bracing shall be provided for the temporary support of composite construction where separately specified.

6.3.19.4 **Joints and Edges**

All joints in the formwork shall be close-fitted to prevent leakage of cement slurry from the concrete. At construction joints formwork shall be tightly secured against previously cast or hardened concrete to prevent the formation of stepping or ridges in the concrete. Formwork shall be constructed to provide straight and true angles, arises or edges. Where chamfers are shown to provide a smooth and continuous accurate alignment at sides and provide a clean line at construction joints in the concrete they shall be fixed with their joints either vertical or horizontal, unless otherwise specified.

6.3.19.5 **Sundries**

Formwork shall be provided to the top surface of concrete where the slope or the nature of the work requires it. Provision shall be made for forming holes and chases for services and for building in pipes, conduits and other fixings, as shown on the drawings. The material and position of any ties passing through the concrete shall be to the Engineer's approval. Except where corrosion of a metal tie is unimportant it shall be possible to remove a tie so that no part of it remaining embedded in the concrete shall be near to the finished surface of the concrete than the specified thickness of cover to the reinforcement. Any holes left after the removal of ties shall be filled with concrete or mortar of approved composition.

6.3.19.6 **Cleaning and Treatment of Formwork**

Space to be occupied by concrete shall be free from all rubbish, chipping, shaving, sawdust, dirt and tying wire etc., before concrete in placed. The formwork to be in contact with the concrete shall be cleaned and treated with suitable non-staining form oil or other approved material. Care shall be taken that oil or composition is kept away from contact with the reinforcement or with concrete at any construction joints. Surface retarding agents shall not be used except with the permission of the Engineer. Formwork shall be thoroughly cleaned after each use. Damaged or distorted formwork shall not be used.

6.3.19.7 **Striking or Removal of Formwork**

All formwork shall be removed without shock or vibration that might damage the concrete. Before the soffit and props are removed the surface of the concrete shall be exposed where necessary in order to ensure that the concrete has hardened sufficiently. In no circumstances shall formwork be struck off until the concrete reaches a cube strength of at least three times the stress to which the concrete may be subjected at the time of striking.

The formwork to vertical surfaces such as walls, columns and sides of beams may be removed after 24 hours in normal weather conditions although care must be taken to avoid damage to the concrete, especially to arises and features. In cold weather a longer period may be necessary before striking. Suitable curing methods should immediately follow the removal of the formwork. The following minimum times shall elapse before removal of formwork:

a) Walls, column, vertical sides of beams - 24 hours

b) Slabs and beams: -28 days

6.3.19.8 **Type of Formwork**

The times given for the removal of props are based on the assumption that the total live plus dead weight to be supported at the time of removal is not more than one half the total design load. For horizontal members where the loading is a higher proportion of the total design load these times may need to be increased.

6.3.19.9 **Measurement**

Measurement for payment shall be done of the area on which centering shuttering has been done. It shall include the application of the form oil and removal of the formwork as well.

6.4. GENERAL NOTES FOR CONCRETE WORK

6.4.1 GENERAL

a. Read structural drawings in conjunction with Architectural, Mechanical and Electrical drawings. Report any discrepancies to the Engineer prior to fabrication or construction. Any conflict between specifications and drawing shall be likewise reported.
b. Contractor shall be responsible for checking field dimensions and site conditions.
c. Unless otherwise indicated all construction joints shall be roughened joints with 5mm minimum Amplitude.
d. No measurement shall be directly taken from the print only written dimensions shall be followed.

6.4.2 FOUNDATION

a. Foundations shall be on undisturbed soil.
b. Soil bearing capacities shall be verified in the field. Notify Engineer immediately of any soft pockets or other adverse soil conditions encountered.
c. The line of slope between adjacent excavations for footings or along stepped footing shall not exceed a rise of 1 in a run of 2.
d. Placing of foundation concrete shall be done as soon as excavations have been completed and approved by the Engineer.

6.4.3 BACKFILLING

a. Backfilling to foundation wall shall be done simultaneously on both sides.
b. Backfilling shall be done in layers of not more than 150 mm., each layers being properly compacted to at least 95 % modified proctor density.

6.4.4 CONCRETE AND REINFORCING STEEL

a. Cast-in-situ concrete shall have minimum 28 days compressive cube strength as specified in the Specifications. Minimum cylinder strength shall be 85 % of cube strength.
b. Reinforcing steel shall be new hot rolled deformed bars having minimum yield strength of 500 N/mm2 and conforming to is 1786:2008 or is 1139: 1966 marked.
c. Minimum reinforcing laps shall be in accordance with IS – 456:2000 and as specified on structural drawings.
d. Cover to reinforcing steel shall be in accordance with IS - 456; 2000and as specified in structural drawings.
e. Welded wire mesh for reinforcement shall conform to IS - 4948; 1974.
f. Provide corner bars to match horizontal reinforcing steel in walls and footings.

g. Provide dowels to walls and piers, to match vertical bars in walls and piers, unless otherwise indicated.

h. Plumbing slots, holes around pipes, ducts or other items, which pass through concrete slab or wall shall be filled and patched to the same depths as the slab or wall.

i. Unless otherwise indicated, all horizontal and vertical construction joints shall be roughened joints with 5 mm. minimum Amplitude.

j. Slabs on grid shall be cast in panels bounded by column grid lines in a checkered board pattern allow at least 48 hours between casting of adjacent panels.

k. In the slabs on grade, welded wire fabric of equivalent area may be used in lieu of reinforcing bars, reinforcing steel shall be 35 mm. clear from the top of slab.

l. Hanging devices for piping shall be provided at the time of casting, breaking out concrete for hanging from reinforcing bars will not be permitted.

7. BRICKWORK

7.1 More than One Brick Thick

Brick work with first class chimney burnt bricks in foundation, plinth and superstructure in specified cement sand mortar including scaffolding wherever necessary. It shall be paid in cu. m.

7.1.1 Bricks

The bricks shall be chimney burnt hand cast bricks of first class quality. These shall be of quality approved by the Engineer, free from grit and other impurities such as lime, iron and other deleterious salts. These shall be well burnt, sound, hard with sharp edges and shall emit ringing sound when struck with a mallet. These shall be of uniform size.

7.1.2 Mortar

Cement mortar shall be mixed in proportion of materials as indicated. The ingredients shall be accurately measured by volume and shall be well and evenly mixed together in a mechanical pan mixer. Too much water shall not be used. River sand shall be used unless otherwise specified. If hand-mixing is allowed, it shall be done in brick tanks. The gauged materials shall be put in the tank and mixed dry thoroughly. Water in required quantity will then be added and the whole mix will be mixed again until it is homogeneous and of uniform color.

7.1.3 Workmanship

All the bricks shall be thoroughly soaked in water (preferably 12 hours) before use till the bubbles cease to come up. The bricks shall be laid in cement mortar bed in proper band. When bonding, the brickwork must be set back in every course, the vertical toothing shall not be accepted. The courses shall be truly horizontal and the work strictly in plumb. The mortar joints shall be broken vertically. All the joints shall be raked out to a depth of 6mm to receive setting beds and / or for pointing work where required.

The walls are to be carried up in a uniform manner with level courses, no one portion being built up more than 14 single courses per day. The top of the walls shall be well wetted before the work recommences. There shall be smooth mortared surface to receive any structural slab, beam, lintel etc. on the brick courses. The brickwork shall be thoroughly cleaned off on completion.

7.1.4 Measurements

The measurements of work shall be the product of the length height and thickness. Deductions for doors, windows and other openings including lintels shall be made to arrive at the net quantity of work. Nothing shall be paid extra for forming such openings. However, no deductions shall be made for openings of areas less than 0.1 sq. m overall and for bearing of lintels, beams, girders and hold fast blocks but nothing extra like formwork shall be paid for embedding these. Similarly no deductions shall be made for chimney flue left in the walls, but nothing extra shall be allowed for rendering for flue opening as specified. Brickwork as covering to RCC structures and in continuation of the main wall shall be measured in thickness of quarter brick unit. Unless otherwise specified nothing extra shall be admissible for cutting shape other than straight or any cutting necessary for shaping the walls to the structural design. Rate shall be inclusive of all necessary scaffolding, watering, cutting of bricks, curing, materials and labor.

7.2 Half brick thick

First class chimney made half brick masonry shall be in cement mortar 1: 4 (1cement: 4 sand).

7.2.1 Laying of Brick

It shall be laid in stretcher course as for brickwork specification.

7.2.2 Mortar

Mortar mix shall be as stated in the drawings and BOQ as per specification Clause No. 7.1.2

7.2.3 Measurement

Measurement shall be done in square meter of the wall inclusive of the reinforcement. Deduction shall be made as for brickwork stated in item no. 7.1.4.

7.3 EXPOSED BRICKWORK

Exposed brickwork shall be paid in cum.

This will be done as per specification of brickwork of item used for facing ensuring regular and clean faces. Brick, which are broken, chipped, wrinkled or having irregular edges or corners shall not be used. If instructed by the Engineer the exposed face of every brick shall be rubbed clear without extra charge. Wooden fillets 10 mm thick and 12 mm wide shall be used to clean any mortar that comes on the surface of the bricks and will also be used to maintain a regular thickness of joints.

The surface shall be rubbed down with brushes or bricks if necessary and thoroughly washed. No mortar shall be allowed to stick to the exposed brick surface and shall be cleaned to Engineer's satisfaction with horizontal and vertical joints even and true to straight line. A sample of workmanship shall be got approved prior to the execution of the work and kept for future comparison.

Measurement: It shall be measured total area of the exposed brick work done in cubic meter.

7.4 BRICK BONDAGE

Providing and laying brick bondage in cement sand mortar 1:3 (1 cement ; 3 sand) around doors, windows etc. It shall be paid in running meters. It shall be laid as per brickwork. Mortar shall be as specified. Extra shall not be paid for setback or projection of the brickwork. Measurement: It shall be measured in running meter of the work done.

7.5 Quarter brick thick Brick Work

Providing and laying quarter brick thick brick work in cement mortar 1:3 (1cement: 3 sand). It shall be paid in sq. m.

Bricks shall be cut quarter brick thick to size as required and shall be provided to the faces of RCC structure for exposed brickwork with cement mortar 1:3 and shall be complete prior to casting the RCC work. Necessary formwork shall be provided for the brickwork.

Measurement: It shall be measured in the net area of work involved and paid in square meter.

7.6 Brick on Edge Soling

Providing and laying chimney made dry bricks on edge soling as directed. The brick shall conform to as described in item 7.1.1. The base on which bricks are to be laid on edge shall be leveled to slope as required and compacted properly. The bricks on edge shall be laid true to line slope and pattern as required. The line, level etc. shall be checked by pegging. The brick shall be closely packed with sand for compaction. The workmanship shall be to the approval of the Engineer.

Measurement : The measurement shall be the net area in square meter, a product of length and breadth and the rate shall be for all the material and labor.

7.7 brick flat soling

Providing and laying chimney made dry flat brick soling as directed. The work shall be paid in sq.m.

Same as in item 7.6 except the bricks shall be laid flat instead of on edge.

8. DOORS AND WINDOWS

8.1 Solid Core Flush Door Shutters

Providing and fixing in position 38 mm. thick factory made, solid core hot pressed flush door shutters single or double leaf fixed with 3 nos. of 150 mm. steel butt hinges to each shutter.

a) Shutter made of 4mm thick commercial plywood on both faces of shutter with shutter frames and core as specified and shown in the drawing. It shall be paid in sq. m.

b) Shutter made of 4 mm. thick teak plywood on both faces of shutter with shutter frames and core as specified and shown in drawing. It shall be paid on sq. m.

8.1.1 Shutters

The shutters shall conform to the relevant specification for the type and grade to IS 2202-1973. The flush door shutters as specified shall be manufactured in a reputed factory. Samples shall be produced for the approval of the Engineer.

8.1.2 Construction

The limping cum frame (style and rail) shall be 50mm wide of required thickness. There shall be three numbers of horizontal wooden spacers of 100mm width with one in middle. Lock block of 50mm wide shall be provided vertically on both sides between the wooden spacers. Wooden batten shall also be provided. The shutter shall be as per the drawing.

8.1.3 Timber

The shutter frames shall be of Sal, Sesham or any other hardwood variety of approved qualities.

8.1.4 Plywood

It shall be commercial plywood quality for commercial ply shutter facing and shall be teak ply wood ply quality of matching veins for the teak ply face, as approved by the Engineer.

8.1.5 Bonding Medium

Liquid phenol formaldehyde synthetic rosin shall be the bonding medium.

8.1.6 Finish

There shall be no clear joint junction of the plywood on the finish side. Shutters having chipped ply, cracked or other defective workmanship shall be rejected. The door shutters shall be hung in position with 3 nos.150 mm. MS. butt hinges.

8.1.7 Measurements

It shall be measured in net area of overall shutter. The rate shall be inclusive of providing and fixing the shutter with 3 nos. of hinges per shutter including all labour and material.

8.2 Sal Timber Paneled Door Shutter

Providing and fixing in position 40 mm. thick sal timber door shutter single or double leaf fixed with 3 nos. of 150 mm. steel butt hinge to each shutter.

a) Fully paneled door shutter as per drawing. It shall be paid in sq. m.
b) Partly louvered and partly paneled as per drawing. It shall be paid in sq. m.
c) Fly wire mesh door shutter with 50 mm. mesh expanded metal. It shall be paid in sq. m.
d) Partly paneled and partly glazed as per drawing excluding the cost of glazing. It shall be paid in sq. m.
e) Fully glazed door shutter excluding the cost of glazing. It shall be paid in sq.m.

8.2.1 Paneled Shutter

The shutter may be paneled single or double, leaf that shall be as per drawing or the direction of the Engineer. The styles shall be continuous from top to bottom. The top, frieze, munitions or mullion shall be jointed to the styles and the rails. The thickness of the styles and rails shall be 40 mm and widths shall be as shown in the drawing or as directed by the Engineer.

The timber panels shall be 12 mm. thick or as instructed by the Engineer. 20mm deep groove shall be made on all the inside faces of the styles and rails to receive panels. Before fixing the panels in the grooves of styles, rails etc. paste of white zinc shall be applied on the panel for proper adhesion.

All junctions of styles to rails or to munitions etc. shall be treated with white zinc before fixing to the shutter frame work. 3 nos. of 150 mm. steel butt hinges shall be fixed with screws at proper places as shown on drawing or directed by the Engineer. The finished shutter shall be dressed and smoothly finished.

8.2.2 Fully glazed or partly glazed

These shall be as paneled shutter but instead of panels, glasses of various size, thickness, type, color etc. as required shall be provided.

The glass shall be of best quality free from specks, bubbles, smokes veins air holes, blisters and other defects. The glass shall be of uniform thickness. The kind of glass supplied by the Contractor shall be as mentioned in the item or as shown in the drawing.

8.2.3 Louvers

The timber louvers shall be 12 mm. thick of the size and fixing as shown in the drawing. Vertical slots if required shall be provided as per instruction of the Engineer.

8.2.4 Construction

The item shall be carried out in conformity with IS 1003 Part I-1966 for door shutters. Construction, workmanship and finished dimension of the components shall be as shown in the drawing. When ventilator is included it shall be provided by having one piece posts for door or window and ventilator extending the frame on the top to the head to the required extent. The shutters shall be of finished dimensions with ornamental moldings or as directed by the Engineer for the particular type but adjusted for the absence of rebates in the frames and shutters by reducing the glaze. The clearance between the finished shutter and the door-frame and between the shutters themselves shall not exceed 3 mm unless otherwise specified in the drawing. The fixing and size of the hinges shall be as specified by cutting the necessary recess corresponding to the thickness and width of the hinge flaps in the sides of the shutter style and the door-frame.

8.2.5 Measurement

The measurement of the door shutter shall be taken in its net area of the full length and breadth from rebates. Tolerance in length and breadth shall be 6mm and 3mm. in thickness. The rate shall include cost of materials and labor.

8.3 Glazing

Providing and fixing glass in door, clerestory, window ventilator shutter with putty or putty and timber bead as shown in the Drawing.

8.3.1 Material

Putty shall be glazing putty in sealed tins. The glass of specified thickness and type shall be provided of approved make and shade. The glass shall be free from shacks, bubbles, air holes, veins blisters or any other defects. It shall be of uniform thickness. Samples shall be approved prior to use.

8.3.2 Workmanship

All windows shall have glazing fixed on outside face or as shown on drawings with wooden beads and putty. The glass shall be cut to size to fit slightly loose. The beads shall be of sal timber as shown in the drawing. First a thin layer of putty is pressed along the rebate then the glass is pressed over which another layer of putty is laid and then wooden bead pressed and fixed with panel pins. The panel pins shall be spaced not more than 500 mm. apart.

In the case of metal window glazing, a thin layer of putty is placed in the sash rebate, glass is then pressed into the putty to a solid bearing and glazing clips provided. There shall be minimum 44 glazing clips per square metre of glass. After fixing the glazing clips the glass is pressed with another layer of putty and excess putty if any cut to a level edge finish with putty knife. The putty glazing clips must be drilled prior to installation of the window shutter. Cracked, scratched glass shall be rejected. Rubber channels can also be used in place of putty.

8.3.3 Measurement

It shall be measured in square meter of the glass provided inclusive of rubber channel, wooden bead and putty. The rate shall include for providing rubber channel, putty, wooden beads, glass, panel pins etc. and labor complete.

8.4 Aluminium sheet fixing to shutter

Providing and fixing 18gauge aluminum sheet in door shutter as per drawing. The shutter shall be made as per the relevant item and specification. The aluminum sheet shall be fixed on the shutter with anodized screws of 25mm long. The aluminum sheet shall be of specified thickness. The sheet shall be fixed neatly.
Measurement: It shall be measured for provided size only. Rate shall include for providing sheets, screws and labor complete.

8.5 Toughened door

Providing & fixing 12mm thick. Frameless Toughened glass door shutter of approved brand and fitting as per drawing. Glass shall be fixed in SS channel at top and bottom and shall be fixed neatly. The handle shall be 450 mm long and of Stainless Steel only.
Measurement: It shall be measured for provided size only. Rate shall include for providing door, fitting and labor complete.

8.6 Fixtures and fittings

Providing and fixing in position fixtures and fastening in the door, window, clerestory window and ventilator shutters as per specification and drawings.
All fixtures and fastenings to be used shall be approved by the Engineer and shall be fixed as per drawing. They shall be new, tough and strong of best quality and workmanship. The size shape, design and finish shall be as shown on drawings or directed by the Engineer. Samples shall be submitted for approval to the Engineer and they shall be kept safely for comparison while fixing these fixtures at place.
All fixtures shall be fixed to the joinery in a secure and efficient manner. Any of the fixtures damaged during fixing shall be removed and new ones fixed in their place and the surface of the joinery made good where affected at the Contractor's expenses. When the type is not mentioned on the drawing or items, it shall be as directed by the Engineer.
The fastening and fixtures shall be provided as per the fastening and fixture schedule. A pair of 230mm long hook and eye shall be fixed to the ventilator frame and the shutter as directed. If the drawing specify different types of fixtures the work shall be carried out according to drawing. If the ventilator is swing type then hooks and eyes can be dispensed with. The ventilator shall swing about a central horizontal axis.
A hook and one brass ring with screws will be attached as per drawings or as directed by the Engineer and a good quality of window hemp cord of adequate length for convenient operation of the ventilator shall be

provided. A two-pronged brass hook shall be embedded in the wall at the height above floor level for tying the cord. All the fixtures shall be fixed as shown on the drawings or as directed by the Engineer. The fixtures and fastenings shall be fitted prior to the application of finishes, removed during the finishing operation and reset after completion of the finish. Metal knobs and handles shall be protected by the wrappers of the tough paper or cloth and maintained in place till acceptance of the work. Upon completion of the work the Contractor shall in the presence of the Engineer show that all the fixtures and fastening work freely and properly.

8.7 Carved Door and Window Shutters

Providing and fixing seasoned dressed pattern sal timber Carved door and window shutters inclusive of Carved frame made of specified size, pattern and section as shown in the drawing. It shall be paid in sq. metre. Quality, kind, colour, moisture content, stacking, procurement, construction and sawing of timber shall be as mentioned in item 8.1.1.

a) Carving

Before Carved doors or windows being manufactured, the Contractor shall produce shop drawings of the same and get approval from the Engineer. The Contractor then shall make the sample of the same and show to the Engineer for his perusal, comments and approval. Any deviation from the shop drawings thereby approved by the engineer shall be straightaway rejected.

While making shop drawings as above mentioned, the Contractor shall seek the advice from the Engineer so as to reflect the true requirement of the Engineer's design.

b) Measurement

The measurement of the Carved shutter including frames shall be taken in its net area a product of width and height and worked out correct up to two decimal places in Square metre. Total tolerance of 3mm is admissible in section of dressed timber.

8.8 ALUMINIUM door AND WINDOWS

Door shall be single panel swing door of aluminum section (102*45*1.50mm) .It shall be naturally anodized or black anodized / powder coated. It shall have 5 mm clear glass .The work shall be done neatly

Measurement: It shall be measured in sq m for provided size only. Rate shall include for providing door, fitting and labor complete.

Windows shall be two or three panel sliding window of aluminum section (87*56*1.20mm) .It shall be naturally anodized or black anodized / powder coated. It shall have 5 mm clear glass .The work shall be done neatly

Measurement: It shall be measured in sq m for provided size only. Rate shall include for providing door, fitting and labor complete.

9. FLOORING

9.1 Plain cement concrete

Providing and laying 38 mm. thick plain cement concrete 1: 2: 4 (1 cement: 2 sand: 4 stone aggregate 20 mm. and down gauge). It shall be paid in cu. m.

9.1.1 Preparation of Base

Before laying the cement concrete, base shall be cleared of all loose earth, rubbish and other foreign matter. If necessary the base shall be packed, chipped and cleaned with wire brushes. Clean base shall then be wetted with water thoroughly, but no water pool shall be allowed. Necessary slope shall be given in base itself.

9.1.2 Proportion

The proportion shall be 1 cement: 2 sand: 4 stone aggregate 20 mm. and down gauge by volume as specified in the schedule. Grading of aggregate shall be as per reinforced concrete specification.

9.1.3 Placing

The floors shall be laid to specify thickness in panels of uniform size not exceeding 1.5 sq. m. (one side not exceeding 1.5 m). These shall be laid in alternate panels on different days if no glass stripes are provided. The edge of the panels shall be protected by flat bars of iron or wood, their depth equal to that of flooring. When glass strips are provided all the panels of the flooring can be cast in one operation.

9.1.4 Finishing

Compact first with wood float. The blows shall be fairly heavy but as consolidation takes place, light rapid strokes shall be given. Beating shall continue till all hollows in concrete are filled with mortar cream. Then the surface shall be troweled till the moisture disappears. The surface shall be checked with straight edge. Immediately after troweling a well-mixed neat cement slurry mixed integrally with hardening liquid 2 ltr. to 50 Kg. of cement shall be sprinkled in a uniform layer at the rate of 20 Kg. per 10 sq. m. The slurry shall be toweled smooth with a steel float trowels and continue this operation till the surface shall be without float mark or air holes. The hardening liquid shall be "hardcrete" or other approved make and brand. The finish surface shall be cured for 7 days. Sample of workmanship shall be got approved prior to work.

9.1.5 Measurement

Measurement shall be in Sq. m. of the work done. Nothing shall be admissible for slope, small area, corners and work in any shape. No deduction shall however be made for protruding or independent columns occurring in the floor, door-frame embedded in floor or any other part, when the area involved does not exceed 0.1sq. m. Rate shall include materials and labour, complete including 4mm thick glass dividing strips, if any to be provided.

9.2 SCREEDING WORKS

Providing and laying of 38 mm or 25 mm thick plain cement concrete 1: 2: 4 (1 cement: 2 sand: 4 stone ships) or 1:1.5:3 (1 cement,1.5 sand ,3 stone ships) as specified. It shall be paid in sq. m

9.2.1 Preparation of Base

Before laying the cement concrete, base shall be cleared of all loose earth, rubbish and other foreign matter. If necessary the base shall be packed, chipped and cleaned with wire brushes. Clean base shall then be wetted with water thoroughly, but no water pool shall be allowed. Necessary slope shall be given in base itself.

9.2.2 Proportion

The proportion shall be by volume as specified in the schedule. Grading of aggregate shall be as per reinforced concrete specification.

9.2.3 Placing

The floors shall be laid to specified thickness in panels of uniform size not exceeding 1.5 sq. m. (one side not exceeding 1.5 m) These shall be laid in alternate panels on different days if no glass stripes are provided. The edge of the panels shall be protected by flat bars of iron or wood, their depth equal to that of flooring. When glass strips are provided all the panels of the flooring can be cast in one operation.

9.2.4 Finishing

Compact first with wood float. The blows shall be fairly heavy but as consolidation takes place, light rapid strokes shall be given. Beating shall continue till all hollows in concrete are filled with mortar cream. Then the surface shall be troweled till the moisture disappears. The surface shall be checked with straight edge. Immediately after troweling a well-mixed neat cement slurry mixed integrally with hardening liquid 2 ltr. to 50 Kg. of cement shall be sprinkled in a uniform layer at the rate of 20 Kg. per 10 sq. m. The slurry shall be toweled smooth with a steel float trowels and continue this operation till the surface shall be without float mark or air holes. The hardening liquid shall be "hardcrete" or other approved make and brand. The finish surface shall be cured for 7 days. Sample of workmanship shall be got approved prior to work.

9.2.5 Measurement

Measurement shall be in Sq. m. of the work done. Nothing shall be admissible for slope, small area, corners and work in any shape. No deduction shall however be made for protruding or independent columns occurring in the floor, door-frame embedded in floor or any other part, when the area involved does not exceed 0.1sq. m. Rate shall include materials and labour, complete including 4mm thick glass dividing strips, if any to be provided.

9.3 Skirting

Providing and laying 20 mm. thick cement plaster skirting up to 150 mm. height with cement mortar 1: 3 (1 cement : 3 sand) finished with a floating coat of neat cement and hardening liquid. It shall be paid in rm. The thickness of the skirting shall be governed by the thickness of internal plaster. The receiving surface shall be prepared similar to that for the plastering on walls.

9.3.1 Mortar

Mortar shall be 1cement: 3 sand well mixed and applied as per cement plaster. When the surface becomes even it shall be uniformly covered with a coat of neat cement (6 mm. thick finished smooth) mixed integrally with the hardening liquid (2 litres to 50 Kg. of cement). The corners, angles, junctions shall be truly vertical and or horizontal. Rounding of corners and junctions as required shall be done without any extra charge. The finished surface shall be cured for 7 days. Samples of workmanship shall be got approved prior to execution of work.

9.3.2 Measurement

It shall be in R. m. of the work done and rate shall include material and labour complete.

9.4 DADO

Providing and laying 20 mm. thick cement plaster dado made up to 1.5 m. height with cement mortar 1: 3 (1 cement: 3 sand) finished with a floating coat of neat cement and hardening liquid. It shall be paid in sq. m. The work shall be carried out as in 9.2.

Measurement: It shall be in square metre of the work and rate shall include material and labour complete.

9.5 MARBLE FLOORING

Marble stone floor shall be used for specified areas. The marble slabs shall be of selected quality, hard, sound, dense, and homogeneous in texture free from cracks, decay, weathering and flaws as approved by the Engineer.

The thickness of the marble slab shall be 16mm and shall be machine cut to required dimensions. The bedding mortar for the marble slab shall be minimum 15mm thick 1:3 cement: sand mortar. Before laying marble floor it is essential that a level surface is required. The joints shall be as fine as possible. The flooring shall be cured for a minimum period of seven days. Slight unevenness at the meeting of edges of marble slabs shall be removed by chiselling. The surface shall be ground evenly with machine fitted with finest grade grinding stones. Then oxalic acid shall be dusted over the surface sprinkled with water and rubbed hard with pad and woolen rags to give smooth and shining finished surface.

Measurement: It shall be done in square metre of the area done. Rate shall be for all the works including all labour and materials complete.

9.6 CERAMIC TILE FLOORING

Ceramic tile flooring shall be laid in proper slope for draining wash water, and finished with white cement slurry including grinding and polishing all complete. It is to be paid in sq.m.

9.6.1 Material

a) Ceramic Tiles: Minimum 8 mm glazed or non-glazed of approved size, colour and pattern shall be procured from the reputed manufacturer approved by the Engineer.

b) Cement, sand mortar (1:4) as specified for plaster works.

9.6.2 Laying

The finished base shall be made rough and shall be well watered. The tiles shall be laid in 15 mm thick cement mortar as specified above. During the process of laying a proper slope for draining wash water shall be provided as per drawing and instructions of the Engineer. Tiles shall be properly soaked in water prior to laying.

The joints shall be maintained uniformly as shown on drawing and instructed by the Engineer. The surface shall be checked frequently with spirit level and metallic straight edge to have true surface. The tiles shall be laid with close fine joints filled with white or colour cement as approved.

9.6.3 Measurement: It shall be done in square metre of the area done. Rate shall be for all the works including all labour and materials complete.

1. FINISHING

10.1 PLASTERING WALLS AND COLUMNS

Plastering the walls with 20 mm. thick cement plaster in 1:4 (1 cement: 4 sand) 50 % coarse sand + 50% fine sand. It shall be paid in sq. m.

For columns upto 4‟ height it shall be plastered with 1:4 but shall be done using cement hardening chemical

10.1.1 Materials

Cement shall conform to as specified under cement concrete work. Sand shall conform to as specified under cement concrete work and 50 % fine sand shall be mixed.

The cement mortar shall be in 1:4 (1 cement: 4 sand) as shown on drawing by volume. The ingredients shall be accurately gauged and be well and evenly mixed together in a mechanical pan mixture, care being taken not to add more water than is required. No mortar that has begun to set shall be used. If hand mixing is allowed, then it shall be done in brick tanks. The gauged material shall be put in the tank and mixed dry. Water will then be added and the whole mixed again until it is homogeneous and of uniform color. Not more than one bag of cement shall be mixed at one time which can be consumed within half an hour of its mixing.

The joints in the brick-work shall be raked out to a depth of 20 mm. minimum and the surface watered and cleaned of all dust and dirt. Concrete surfaces shall be properly racked to get adequate key. Tip (makers) shall be provided on the surface for proper thickness and obtaining the finished plaster surface in plumb.

The finished surface shall be minimum average 20 mm. thick. The surface shall be finished at once by being rubbed over with trowel till the cement appears on the surface. All corner, angles and junctions shall be truly vertical and horizontal as the case may be and carefully and neatly finished. Rounding of corners and junctions as required and directed shall be without extra charge. The finished plaster shall be cured for 7 days and protected against damage. Sample of workmanship shall be approved prior to commencement of work.

10.1.2 Measurement

It shall be done in square meter of the surface over which the plaster has been done. The thickness of the plaster shall not be taken into account except for independent columns where the measurement shall be of finished surface allowing 20 mm. over the designed dimensions. Opening shall be deducted in full and jambs and soffits shall be allowed. Each opening less than 1 sq. m. shall neither be deducted nor extra be paid for jambs, soffits or the sides of such opening. The rate shall include rounding of all corners, junctions, making grooves and forming drip course wherever required materials, scaffolding and curing. Unless otherwise specified nothing extra shall be allowed for plaster on independent columns and beams, any short width or on curved surfaces and difficult location.

2.PAINTING

11.1 APPLYING PRIMING COAT OF APPROVED BRAND

The primers shall be in seal tins. These shall be of British Paints (India) Ltd., Jonson & Nicholson or Snowcem (India) Ltd. or equivalent as approved by the Engineer.

11.1.1 Preparation

All surfaces shall be papered by sand-paper rubbing and cleaned properly. The surface for cement plaster shall be patched up with the thick paste of the same primer and smoothed after drying.

In case of timber having knots and nails holes, they should be filled with stopping and knotting materials. The knotting material shall consist of pure shellac dissolved in Methylated spirit. For stopping, Russian talc or putty shall be used. The stopping shall consist of two parts of whiting (powdered chalk) , One part of white lead mixed together in double boiled linseed oil and well kneaded. The surface thus kneaded shall be allowed to dry up and then sand papered, or a ready made approved putty may be used. In case of metal, derusting shall be done and properly cleaned after sand papering.

11.1.2 Application

After preparing the surface, the priming coat shall be applied with hair-brushes and as per manufacturer's printed instructions.

11.2 Water Proof outside Painting

Painting the plastered surface with water-proofing Exterior acrylic paint of approved brand and of colour with three coats to give an even and uniform shade. It shall be paid in sq. m.

11.2.1 Materials

Water proofing cement shall be of Berzer, Asian Paints or any other equivalent brand approved by the Engineer in sealed tins.

11.2.2 Application

Before painting is commenced on surface, all dirt and foreign matter shall be completely removed. The surface shall be wetted by sprinkling water with a fine spray. The surface shall be sprayed several times with a few minutes‟ intervals between each spraying to allow the moisture to soak into the surface. A vertical stroke with another horizontal stroke shall be termed one coat. Paint solution to be applied to the surface with hair brushes in a number of coats to get uniform finish. After the first coat of the paint has hardened, It shall be cured with water at least for 24 hours before the second coat is applied. Similarly required number of coats shall be given to get an even and uniform shade. It shall be kept damp at least for seven days. The Engineer prior to commencement of work shall approve sample of workmanship.

11.2.3 Measurement

Measurement shall be in square metre of the actual covered area. Nothing extra shall be allowed for painting any rough surface. Rate shall include all materials, tools, labour as well as scaffolding all complete. Measurement shall be done in square metre. The measurements shall be as follows:

	Description of Work	How measured	Multiplying Factor
i)	Panelled or Framed	Measured flat	1 for each side
ii)	Flush doors	-do-	1 for each side
iii)	Fully glazed or wire	-do-	½ for each side

iv) Part panelled or part glazed or gauged	-do-	1 for each side
v) Fully ventilated or louvered	-do-	1½ for each side
vi) Trellis or Jeffri	Measured flat overall	2 for painting all over
vii) Railing with guard bars, balusters, gratings	-do-	1 for painting all over
viii) Gates, open palisade fencing including standard braces, rails stays	The height shall be taken from the lower end of the palisade up to the top of the palisade but not to the top of the standards if they are higher.	1 for painting all over

Nothing extra shall be paid for short width and surface of any shape, size. This shall include for two or more coats inclusive of materials, scaffolding and labour complete.

11.3 Enamel Painting

Painting three coats with synthetic enamel paint of approved brand and color to give an even and uniform shade. It shall be paid in sq. m.

11.3.1 Materials

Paints shall be of British Paints India LTD, Jenson & Nicholson India or any other equivalent brand approved by the Engineer in sealed tins.

11.3.2 Preparation of surface

All surfaces shall be thoroughly planed and sand papered. Knotting and stopping as required shall be attended.

11.3.3 Application

After preparing the surface and after the priming coat has been applied a top-coat shall be applied. Another coat shall be applied after the previous coat is dry. Care should be taken that dust or other foreign materials do not settle, they will disfigure the various coats.

The same brand of materials will be used for various coats. The paints shall be used and applied as per manufacturer's printed instruction. The paint shall be applied with bristle brushes and not horse hair ones. The paints shall be applied in the thinnest possible layers with parallel drawings. No flowing down shall be allowed. Painting to false ceiling and acoustic tile, soft board etc. shall be done by spray painting only. Sample of workmanship shall be approved by the Engineer prior to commencement of work.

11.3.4 Measurement

It shall be done as per specification of item 11.1.3. The rate shall include for three coats inclusive of materials, labour, scaffolding all complete.

11.4 SILK EMULSION PAINTING

Silk emulsion paint of the make and shade approved by the Employer/ Engineer shall be used. The paint shall generally be used only on plastered surface and on priming coat if needed.

11.4.1 Preparation of surface

The surface shall be thoroughly cleaned of dust, etc. by washing and scrubbing and shall then be allowed to dry for at least 48 hours. It shall then be prepared 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.

11.4.2 Application

Two or more coats of emulsion paint as stipulated in the item shall be applied in the usual manner with brushes and with the interval of minimum three hours between consecutive coats. The thinner of emulsion shall be done with water as per manufacturer's instructions. The finished surface shall present a wet velvety smooth finish. If necessary, more coats shall be applied till the entire surface presents a uniform appearance. The precautions to be observed in painting walls with emulsion paints are: (a) oil base putties shall not be used in filling cracks, holes, etc. while preparing the surface (b) Slashes on floors etc. shall be cleaned immediately as they will be difficult to remove after hardening surfaces treated with emulsion paints shall not be washed within 3 to 4 weeks of application.

11.4.3 Measurement

Measurement shall be done in square metre of the work done. No deduction for the openings such as doors, windows etc. shall be made. No extra payment will be made for jambs, sills and soffits. If the work is done on both sides the opening from one side only shall be deducted but not added for jambs sills and soffits. Nothing extra shall be admissible for work in ceilings, short widths or surfaces of any shape.

11.5 COLOR WASHING

Color washing on the plastered surface with three coats to give an even and uniform shade. It shall be paid in sq. m. The work shall be done as in 11.4 except that approved color in required proportion shall be mixed with the lime solution to obtain the shade.

Measurement; Same as 11.4.3

11.6 Glazed Ceramic (Porcelain) Tiles

Providing and laying white/coloured glazed ceramic tiles of approved manufacturer and of approved colour, size in cement mortar 1:4 as per instructions and specifications all complete. This shall be paid in sq. m.

11.6.1 Materials

Glazed ceramic tiles shall be of approved colour and make. These shall be of specified size approved by the Engineer.

11.6.2 General

Prior to installing any tile, the Contractor shall inspect surfaces and conditions in areas to receive tile work and shall notify the Engineer of any serious defects or conditions that will interfere with or prevent a satisfactory tile installation and shall co-ordinate with other trades of work.

11.6.3 Installing the Tile

The surface shall be brushed, cleaned and wetted. Glazed tile shall be soaked completely by immersing in clean water at least 30 minutes and drained. No free moisture shall be allowed to remain on the backs of the tiles at the time of setting. Tiles shall be installed by applying a skim coat of plastic mix of 1:3 (1 cement: 3 sand) cement mortar of maximum 15 mm thick.

Tiles will be firmly pressed to the cement mortar applied on the wall so that the back of the tile is completely in touch with the mortar. Joints in the tile work shall be accurately aligned with horizontal joints level and vertical joints in plumb. Uniform joints of 1.5mm shall be maintained or as directed by the Engineer by aligning spacer lugs on tile edges if tiles are so manufactured or by use of wetted strings. Tiles shall be laid out in such a way that no tile is less than half size course. Where tile must be cut at edges or penetrated the cut edges shall be carefully filed and neatly ground. Chipped, cracked or broken tiles shall not be used and all defective work shall be replaced and repaired to the satisfaction of the Engineer at the Contractor's expense. After tiles have been set firm and strings from set tiles removed tiles shall be dampened and joints grouted full with a plastic mix of white cement by trowel, brush or finger application. During grouting all excess grout shall be cleaned off the tile surface with damp cloth or sponge.

All tile work finishing shall be adequately protected from damage during the progress of construction till completion and any damage shall be repaired to the satisfaction of the Engineer at the Contractor's expense. Upon completion prior to final inspection and acceptance, the Contractor shall clean all tile work. Acids or other agents liable to damage the work shall be avoided. If tile surface shows mass scratches, cracks or other imperfections that cannot be removed by cleaning; the contractor shall remove the defective material and replace with new material at no additional expense. Sample of workmanship shall be approved prior to execution of work.

11.6.4 Measurement

The measurement shall be done in square meter of the work done including the setting mortar. Rate shall be for the material and labour complete.

11.7 STONE TEXTURE TILES FOR CLADDING

Providing and laying decorative stone texture tiles of approved manufacturer and of approved, size in cement mortar 1:4 as per instructions and specifications all complete. This shall be paid in sq.m.

11.7.1 Materials

Decorative stone texture tiles shall be of approved and make. These shall be of specified size approved by the Engineer.

11.7.2 General

Prior to installing any tile, the Contractor shall inspect surfaces and conditions in areas to receive tile work and shall notify the Engineer of any serious defects or conditions that will interfere with or prevent a satisfactory tile installation and shall co-ordinate with other trades of work.

11.7.3 Installing the Tile

The surface shall be brushed, cleaned and wetted. Glazed tile shall be soaked completely by immersing in clean water at least 30 minutes and drained. No free moisture shall be allowed to remain on the backs

of the tiles at the time of setting. Tiles shall be installed by applying a skim coat of plastic mix of 1:3 (1 cement: 3 sand) cement mortar of maximum 15 mm thick.

Tiles will be firmly pressed to the cement mortar applied on the wall so that the back of the tile is completely in touch with the mortar. Joints in the tile work shall be accurately aligned with horizontal joints level and vertical joints in plumb. Uniform joints of 1.5mm shall be maintained or as directed by the Engineer by aligning spacer lugs on tile edges if tiles are so manufactured or by use of wetted strings. Tiles shall be laid out in such a way that no tile is less than half size course. Where tile must be cut at edges or penetrated the cut edges shall be carefully filed and neatly ground. Chipped, cracked or broken tiles shall not be used and all defective work shall be replaced and repaired to the satisfaction of the Engineer at the Contractor's expense. After tiles have been set firm and strings from set tiles removed tiles shall be dampened and joints grouted full with a plastic mix of white cement by trowel, brush or finger application. During grouting all excess grout shall be cleaned off the tile surface with damp cloth or sponge.

All tile work finishing shall be adequately protected from damage during the progress of construction till completion and any damage shall be repaired to the satisfaction of the Engineer at the Contractor's expense. Upon completion prior to final inspection and acceptance, the Contractor shall clean all tile work. Acids or other agents liable to damage the work shall be avoided. If tile surface shows mass scratches, cracks or other imperfections that cannot be removed by cleaning; the contractor shall remove the defective material and replace with new material at no additional expense. Sample of workmanship shall be approved prior to execution of work.

11.8 GRANITE FLOORING

Providing 15 mm thick Mirror Finished Granite on toilet counters(Basins) with cement sand mortar (1:4) in proper slope including, cutting hole for the wash basin, double moulding in periphery & inside hole, grinding & polishing to smooth glazed surface all complete as per drawings, & instructions of Site Engineer/Consultant.

11.8.1 Measurement

It shall be measured in square metre of the finished work. Rate shall include the formwork, raking of joints, pointing, materials and labour complete.

12. MISCELLANEOUS

12.1 50 Mm Thick INTERLOCKING CONCRETE BLOCK on floor

Providing 50 mm. thick Heavy Duty Interlocking Concrete block on floor around the walkways and around the building over 55mm stone dust. It shall be paid in sq. m.

12.1.1 Measurement

It shall be measured in square metre of the finished work. Rate shall include the formwork, raking of joints, pointing, materials and labour complete.

12.2 STAINLESS STEEL RAILING WORK.

Supplying, fitting and fixing of Stainless steel in hand railing (in Staircase/Void , terrace etc.) .

- Handrail should be of 2” dia. 16 Gauge (1.5mm) thick Stainless steel.
- Balustrade should be used of size 1½".
- 2" dia. pipe post (at the start) and stainless steel 1" dia. pipe in 3 rows in stair case with all the necessary fittings like caps, flanges, bracket, U, tee etc as per approved design.

using 2" dia. handrail of 16 guage (1.5mm) thick circular pipe with Balustrade of size dia. , and specification, etc. required for the complete in all respect.

12.2.1 Measurement

It shall be measured in square metre of the finished work. Rate shall include the Fabrication, buffing, polishing cost, conveyance, taxes of all materials, T&P, materials and labour complete.

12.3 WATER PROOFING WORKS

Providing & applying of two component acrylic polymer modified cementations flexible membrane system) on RCC rooftop, terrace, sloped roof & sunken slabs of bathrooms etc. filling SBR Latex modified mortar or equivalent on junction between floor & parapet wall area, with "V" shape groove cutting all complete as per instruction of Site Engineer/Consultant.(Min. 10 Years of Warranty) Dr Fixit/Sikka/Basf or equivalent)

12.3.1 Measurement

It shall be measured in square metre of the finished work. Rate shall include the Cost of materials , conveyance, taxes of all materials, and labour complete.

12.4 MS CATCH DRAIN

Providing & fixing of MS Catch Drain.

- For framing angle of 38x38x4 mm & 25x3mm at 25mmc/c spacing along the length of catch drain should be used.
- The two coats of Enamel paint over Two coat of red oxide paint should be applied.
- Finishing sould be Neat and clean.

12.4.1 Measurement

It shall be measured in Kg. of the Materials used to finish Completely. Rate shall include the Fabrication, buffing, polishing cost, and conveyance, taxes of all materials, T&P, materials and labour complete.

12.5 STEEL SPIRAL STAIR CASE

Supplying and fixing of spiral staircase.

- The Central Post of the steel spiral staircase should be of 100 mm diameter Black Tube of 16 Gauge.
- 2” dia handrail of MS steel pipe should be used.
- 2 nos of 1.25”x1.25” Square MS pipe in each steps of stair case should be provided.
- The average width of the staircase should be of 8” in size.
- 3 mm thick steel strip should be used in step in flat orientation.
- 2 coat of enamel painting should be done ove red oxide coat.

12.6 LIFT

Supplying, installation, commission of 8 person capacity lift.

12.6.1 General Requirement

The Contractor shall attend the fault call, inspect, service, repair, maintain, modify, test and examine the lift to keep the lift in proper state of repair and in safe working order. All materials, equipment and appliances shall be originated from the original or reputed manufacturers.

The elevator should have capacity of 8 persons‟ (or greater than 544 kg) With automatic rescue devices – S/S Hair line Finish. For the height of 25 meter (approximately).

Maintenance Period for the lift shall be of 12 months from the date of commissioning and handling over the same. All maintenance work should be Well planned coordinated , Equipped with sufficient staff of same. The maintenance work shall comprise the supply of materials and labor necessary for carrying out the following work to the lift as listed on the equipment schedule and those subsequently added under the cover of variation orders:

1. Preventive and planned routine maintenance of the lift.
2. Attending emergency and fault call out service.
3. Comprehensive maintenance and repair of the modification, alternation addition to the lifts.

12.6.2 Measurement

It shall be measured in nos. of the finish work. Rate shall include the necessary scaffolding , installation all complete, and maintenance for period of 12 months.

B. SANITARY, PLUMBING AND WATER SUPPLY WORKS

1. SANITARY, PLUMBING AND WATER SUPPLY WORKS

1.1 SCOPE

This Specification covers the construction of internal and external water supply, soil, waste, vent and rain water system, installation of toilet fixtures.

1.2 REFERENCE DOCUMENT

The work specified in this section shall be in accordance with the following standards, or approved equal, except as they are modified and supplemented herein:

Code	Subject
IS:778 - 1964	Specification for gunmetal gate, globe and check valves for water, steam and oil only.
IS:780E - 1966	Specification for sluice valves for various purposes.
IS: 781E - 1959	Specification for sand cast brass screw down bib taps and stop taps for water services.
IS:1171 - 1963	Basic requirement of water supply, drainage and sanitation.
IS:1239 - 1968	Specification for M. S. or G. I. Pipes and fittings.
IS:1703 - 1962	Specification for cast iron manhole covers and frames intended for use in drainage work.
IS:1742 - 1960	Code of practice for building drainage.
IS:2065 - 1963	Code of practice for water supply in building.
IS:771 - 1958	Specification for vitreous china sanitary ware.
IS:4985	Specification for UPVC pipe

IS:5382 Specification for rubber seal ring.

ASTM : D 2846 Specification for CPVC pipes

1.3 RELATED WORK

The Contractor shall become familiar with other Divisions of the specifications affecting work of this trade.

1.4 GENERAL REQUIREMENT

The scope of work covered by this Chapter shall be deemed to comprise the furnishing and installation of all cold and hot water supply pipe work, soil, waste, rain and vent pipe work, vitreous china sanitary ware, CP fixtures etc as shown on plans and as specified. It shall also include the supply of the appertaining materials and parts, scaffolding, off loading on site and all operations in connection with civil works, unless otherwise specified in the Bills of Quantities.

Materials and parts, which the Contractor shall supply and install, shall be new and unused. They shall comply with the regulations regarding quality and dimensions. Materials and parts that are not standardised shall be used only with the approval of the Engineer.

The materials shall be protected from rain and inclement weather all to the satisfaction of the Engineer. The cost of covering materials shall be deemed to be included in the unit prices for the brickwork and masonry.

1.5 SAMPLES/SUBMITTALS

Representative samples to be used shall be submitted to the Engineer and his approval taken before bulk purchase. The samples shall be kept with the Engineer for future reference and comparison. All materials supplied shall conform to these approved samples in all respects.

1.6 BASIC MATERIALS AND METHOD

All materials provided for the contract will be in strict accordance with the latest version of the applicable Indian Standards. All manufacturer's data, specifications and relative information together with samples will be submitted to the Engineer or Site In-charge for approval prior to being purchased, otherwise at the contractor's own risk.

1.7 MATERIALS TRADE NAMES VARIATIONS

Tenders shall be based upon complete installations. Products required which are not shown or mentioned, or not specified herein as to manufacturer; quality, etc. shall be furnished of the highest quality. Materials shall be new and free from all defects. All materials, apparatus or equipment called for on the plans or in the specifications by trade names, or the name of a particular manufacturer, or by catalogue reference are the materials, apparatus, or equipment which should be allowed for in the Tender, or qualification submitted at the time of Tender submission.

1.8 REGULATIONS

The work shall be carried out in accordance with all rules, regulations, by-laws and requirements of all authorities having jurisdiction. All changes and alterations required by an authorized inspector of any authority having jurisdiction should be carried out at no cost to the Owner.

1.9 DRAWINGS AND SPECIFICATIONS

These specifications shall be considered as an integral part of the drawings, which accompany them. Neither the plans nor the specifications shall be used alone. Any item or subject omitted from one, but which is mentioned or reasonably implied in the other shall be considered as properly and sufficiently specified and therefore must be supplied by the contractor. Misinterpretation of any requirements of either the drawings or specifications shall not relieve the contractor of his responsibility for properly

completing his work. The contractor shall apply to the Engineer or Site In-charge for any explanation, which he may require in regard to the meaning and intent of any clause in the specification and contract. He shall be held responsible for any errors or losses consequent upon failure to obtain such explanation. The contractor shall consult with the Engineer or Site In-charge to obtain detail drawings or instructions for exact location of equipment as work progresses, before installing fitting or equipment and will be responsible for coordination with all other work trades including finishes. Drawings show general location and routes to be followed by pipes, ducts, etc. where not shown, or shown diagrammatically, the contractor shall install them in accordance with best trade practices.

1.10 SHOP DRAWINGS

The contractor shall submit to the Engineer or Site In-charge all shop and setting out drawings or diagrams necessary in order to make clear the work intended or to show its relation to adjacent work of other trades. The contractor shall make any changes in such drawings or diagrams, which the Engineer or Site In-charge may require, consistent with the contract. Details of shop drawings submitted for approval shall show clearly the relations of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made by the contractor and noted on the drawings before being submitted for approval.

1.11 AS BUILT DRAWINGS

Three months prior to the end of the Defects Liability Period, the Contractor shall submit As Built Drawings based on AUTOCAD printout and corresponding digital files as per Division 1 – General Requirements.

1.12 MAINTENANCE MANUAL

1.12.1 The Contractor shall submit a draft outline of the proposed format and contents within 30 days after the issuance of the virtual completion certificate by the Engineer. The submitted manual will conform to the approved outline.

1.12.2 The Manual shall be contained in a black three ring loose-leaf binder and be subdivided into sections according to the various divisions of this specification. Material shall be fully indexed, with a typed contents page located at the front of the Manual. Tabbed sheets shall be used to subdivide the contents as required. All material shall be neatly and legibly presented. Photocopies will be used only if original documents are not available.

1.12.3 All materials shall be clearly labeled according to manufacturer, manufacturer‟s reference, source, location of use, and quantity.

1.12.4 Include in the Maintenance Manual a list of all materials submitted indicating quantities, source, manufacturer, manufacturer‟s reference(s), and location of use. Also include printed manufacturer or supplier‟s instructions on use, application, and maintenance of all products and materials.

1.13 CUTTING AND PATCHING

Openings not indicated on the Engineering or Structural drawings, which are required for bringing equipment into the building or for other temporary or permanent service, shall be approved by the Engineer or Site In-charge. The contractor will provide maintain and restore these openings and shall pay for their provision and restoration. Ample notice shall be given of size and location of such openings. The contractor shall ensure that he does not undertake any cutting that may impair the strength of the building. No holes, except expansion bolts and small screws may be drilled into the structure without obtaining prior approval. Persons, skilled in the trades, shall do all cutting and patching work in a neat and workman like manner.

1.14 PAINTING

All equipment supplied under this specification shall be delivered to the site with a factory applied prime coat of paint unless noted otherwise. All supports and hangers shall receive a prime coat of paint. Painting where required for pipe, duct services, equipment identification, including stenciling shall be carried out by a paint tradesman under this division in accordance with the workmanship and material specification. All factory prime-coated or finish coated equipment shall be touched up or repainted if equipment is marred during shipment or installation.

1.15 EXPANSION AND CONTRACTION

Unless shown otherwise, the contractor shall be responsible for measures to control the thermal movement of piping and apparatus. Piping shall be erected in such manners that strain and weight does not come directly upon connections, joints or apparatus. Where possible, the effect shall be obtained by providing changes in direction and loops in pipe runs, supplemented by the necessary guides, anchors and limit stops.

1.16 PIPE SLEEVES

An adequate number of sleeves (pipe inserts) of mild steel shall be provided where pipes pass through concrete, masonry and similar work. The pipe inserts shall have a flange welded in the center around its circumference, in order to provide water tight and secure fixing into the structure. The sizes of the pipe sleeves (pipe inserts) shall be as per the drawings supplied and / or as given below.

1.16.1 Sleeves through Exterior Walls below Grade

i. Sleeves in exterior foundation walls below grade shall project 25 mm beyond the outside surface of the wall and be flush with the inside surface.

ii. The annular space between the sleeve and the pipe shall be caulked with un-tarred oakum and sealed with approved caulking compound. The sealing shall be 25 mm deep from each side. The pipe and sleeve surfaces shall be cleaned to enable good bonding. Allow 24 hours for setting of the compound. The contractor shall adhere strictly to the manufacturer's recommendation.

1.16.2 Sleeves through Interior Wall, Floor and Ceilings

i. Sleeves through interior masonry walls and partitions shall be set flush with finished wall surfaces.

ii. Sleeves through floors in finished areas shall terminate 25 mm above the finished floor.

iii. Sleeves through floors in service area (e.g., mechanical rooms) shall terminate 50 mm above the finished floor.

iv. The annular space between sleeves and pipes shall be packed with Silicon Rubber. In Machine Room, the packing shall be finished at both ends of the sleeve with 6 mm deep caulking compound. In other areas the finishing may be on the room side only.

v. Pipe insulation shall be carried full thickness through pipe sleeves. Unless otherwise specified elsewhere, the sleeves size shall be as follows:

Out Side (OD) Diameter of Pipe (If Insulated, OD of Insulation)	Sleeve Size (Nominal Bore of the Pipe for Sleeve)
OD 20 mm to OD 32 mm	NB 2" (50 mm)
OD 33 mm to OD 75 mm	NB 4" (100 mm)
OD 76 mm to OD 125 mm	NB 6" (150 mm)

1.17 CLEAN UP

The contractor shall clean all exposed metal surfaces from grease, dirt or other foreign materials. Chrome plated and polished work shall be left bright and clean. All openings in pipes and fixtures shall be properly capped and plugged during construction. Fixtures and equipment shall be properly protected from damage during the construction period and shall be cleaned in accordance with the manufacturer's instructions.

1.18 SANITARY FIXTURES, RUNS, PIPES

(i) The recommended positions of the sanitary fixtures, runs of all piping etc. as shown in the layout drawing will be adhered to as far as possible or as far as practicable.

(ii) Should there be any discrepancy or incomplete description, ambiguity or omission in the drawings and other documents, whether original or supplementary forming the Agreement, completion or maintenance of the installation, the Contractor shall immediately on discovering the same, draw the attention of the Engineer to this.

(iii) Prior to the installation of all fittings, pumps, traps, etc. The finial position shall be ascertained from the Engineer.

1.19 PROPRIETARY OF MATERIALS

Where proprietary of materials are specified hereafter, the Contractor may propose the use of similar materials of other manufacture but of equal quality for approval by the Engineer. Should the price of alternate materials proposed be lower in price, the Contractor shall a revise schedule of price for the particular item along with his proposal for the use of alternate material in lieu of the one specified.

All materials and goods, where specified to be obtained from a particular manufacturer or supplier, are to be used or fixed strictly in accordance with their instructions.

1.20 PACKAGING

The Contractor is to provide special packaging according to standard practices to project materials or parts of materials from damage, and his rates will be deemed to include for all such protection.

1.21 SPECIFIED MATERIALS

The source of materials stated in the Specifications are those from which materials are generally available. However, materials not conforming Specifications shall be rejected even if they come from the stated sources. The Contractor should satisfy himself that sufficient quantity of material of acceptable Specification is available from the stated or other sources.

1.22 STANDARDS

All materials, Workmanship and components shall where applicable and unless otherwise stated in the Agreement or comply with Indian standard or code of practice in use. The Indian Standards referred to here are:

Indian Standards (I.S.), Published by Bureau of Indian Standard, India.

Should there be any discrepancy or incomplete description, ambiguity or omission in the drawings and other documents; whether original or supplementary forming the Agreement, completion or maintenance of the installation, the Contractor shall immediately on discovering the same draw the attention of the Engineer to this. The Works shall be carried out according to this Specification whether specifically mentioned elsewhere or not. No extra in any form will be paid unless it is

definitely stated as it is in the Bill of Quantities. Whenever the Specifications are not given or when the Specification is ambiguous, the relevant Indian standards or British Standards and further amendments will be considered as final and binding.

1.23 QUANTITIES

The Works shall be related to the drawings which the Agreement is presumed to have studied. Nothing extra will be paid for any items because of its shape, locations or other difficult circumstances, even if the schedule makes no distinction, as long as the item is shown in the drawings. The quantities given in this schedule are provisional. The Contractor will be paid for the actual quantity of Works executed as measured at Site and priced at the rates in the schedule. The Engineer reserves the right to increase or decrease any of the quantities or to totally omit any item or Works. Any claim by the Contractor on these accounts will not be entertained.

1.24 EXCAVATION FOR PIPE LINES

In excavating trenches for pipe lines, slight rails shall be erected, before excavation is commenced, at every 100 meters and at all change of direction or gradient. The sight rail shall consist of a board, not less than 10 centimeters deep, with the top edge planed true and straight. This shall be supported by a stout wooden post at each end, and its top edge accurately fixed to a definite and, as far as practicable, uniform height above the level of the pipe to be laid. The centre line of the pipe shall be denoted on each rail thereon, and the rail on one side of the centre line painted rail, and on the other side white. The depth of the excavation and the level of the pipe invert shall be checked by means of boning rods of appropriate length. The boning rods used are to be accurately made to the various lengths required, the lower and being provided with a shoe of sufficient projection to rest on the centre of the invert of the last pipe laid.

The excavation shall be carried out to the lines and levels shown on the plans or as ordered by the Engineer, and shall be deep enough to permit a minimum cover as specified hereunder.

Pipe	Minimum Cover in mm
	Normal Ground
Galvanized Iron	600
CPVC	600
PVC/ DWV	600
RCC Hume	900

The Contractor shall be responsible for and shall at his own cost, make up all subsidence or slips whether arising from its nature of the materials in embankments, from the nature of the ground or from any cause whatsoever. The Contractor shall, his own expense keep the whole of the Working Site dry and from water and construct such temporary water courses and drain as may be surface of the Works. The Contractor shall include in his rates the cost of providing all tools, machinery and all temporary Works such as staging, struts, shoring, planks and poling boards and their removal on the completion of the Works and the cost of pumping and trenches. Whenever pumping is necessary, the whole Works shall be executed as quickly as possible, due care being taken to avoid excessive pumping, which may cause settlement of surrounding land and property.

Any trench or excavation which may have been taken to a great depth than necessary shall be filled into the required level with suitable material approved by the Engineer and rammed solid with watering at the Contractor's expense.

Special care shall be taken provide a solid even bed for the barrel of the pipe, and the floor of the trench shall be properly shaped to received the socket it and the barrels of the pipes. Where lock is met within the trenches, the excavation shall be taken to a depth of 15 cm of selected filling (approved by the Project Engineer) placed on the rock and consolidated to form a firm even bed for the pipe where required, socket holes shall be cut in the rock. In narrow trenches, socket holes shall be cut in the rock. In narrow trenches, the width of the excavation shall be increased. The sides of trenches shall be allowed a slope not exceeding 1 to 12, the width at the bottom being at least 30 cm wider than the socket of the pipe, so as to allow room for ramming the refilled materials under and at the sides of the pipe.

1.25 RE-FILLING

No refilling shall be carried out until the construction Works has been tested and approved. The re-filling on the top and around the sewers shall be done with great care and in such a manner as will obtain the greatest amount of compactness and solidity possible. For that purpose, the earth shall be laid and rammed in regular layers not more than 230mm (9") thick up to the surface and also watered and rammed at each layer. The top soil shall be carefully replaced to match the existing.

1.26 DISPOSAL OF SURPLUS SOIL

The contractor shall, at his own costs and charges, provide places for disposal of all surplus materials not required to be used on the works. As each trench is refilled the surplus soil shall be immediately removed, the surface properly restored and roadways and sides left clear.

1.27 TESTING OF PIPES LINES

CPVC Water Supply Pipes

After each section of the pipeline has been laid and jointed and anchorage's built in for the bends, the pipeline shall be tested in lengths of 2 kilometers or less as directed by the Project Engineer, by and at the expense of the Contractor. Before testing, the trench shall be partially backfield except at the joints. The accessories nodded viz. Test pump, pressure gauge, end pieces including connecting valves and piping etc., for carrying cut the hydraulic tests shall be provided by the Contractor's. The Contractor shall provide the supply of necessary labour and water for testing at his expense, the cost of this shall be included in the unit rate for lying and jointing of pipes. The pipes and joints found to be defective during the test shall be replaced and or reduce by the Contractor and the related labour cost be met by the Contractor.

The two tests that shall be carried out are -

(i) Pressure test: a pressure of at least double the maximum Working pressure, pipes and joints shall be absolutely watertight under the test.

(ii) Leakage test (to be conducted after the satisfactory completion of the pressure test) at a pressure to be specified by the Engineer for a duration of two hours. Unless otherwise specified the leakage test pressure shall be the lower or ½ times the maximum static pressure that will be experienced by the pressure after installation.

Where any section of the main is provided with concrete thrust blocks or anchorages, the pressure test shall not be made until at least five days have elapsed after the concrete was caste.

The procedure to be followed are as follows:

(i) Pressure Test:

- Each valved section of the pipe shall be slowly filled with water and all air shall be expelled from the pipe through hydrants and blow-offs. If these are not available are not available at high places, necessary tapping may be made at points or highest elevation before the test is made and plugs inserted after the tests have been completed.
- If the trench has been partially back-filled the specified pressure based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the poi in a manner satisfactory to the Engineer. The duration of the test shall not be less than 24 cm.
- All exposed pipes, fittings, valves and joints should be carefully examined. Any cracked or defective pipe, fitting and value discovered in consequence of this pressure test shall be removed and replaced by sound material and the test shall to repeat. All joints showing visible leaks shall also be recalled or redone until tight.

(ii) Leakage Test:

- Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof, necessary to maintain the specified leakage test pressure.

The pipe installation will not be accepted until the leakage is less than the number of cm3/h as

determined by the formula-

$$q1 = \frac{N\ D\ P}{3.3}$$

Where,

q1 = the allowable leakage in cm^3/h.

N = number of joints in the length of the pipeline.

D = diameter in mm, and

P = the average test pressure during the leakage

1.28 SANITARY AND SEWER PIPES

1.28.1 Gully Traps

Gully traps shall be as per the drawing supplied.

Gully traps shall be fixed in cement concrete 1:5:10 and a brick masonry chamber 300 mm x 300 mm inside in cement mortar 1:5 with 150 mm x 150 mm grating inside and 300 mm x 300 mm CI sealed cover and frame weighing not less than 7.3 kg to be constructed as per standard drawings.

1.28.2 Sewer Drainage and Site Drainage

The work covered under this section comprises of the supply and installation of the following:

a. Night Soil and Waste Water drainage system complete
b. Strom Water drainage system complete

Pipes for these works shall be as follows:

a. Pipes up to OD 110 mm size should be of PVC / DWV Pipe having working pressure of 4.0 and 6.0 kgf per sq cm and carried out as described herein.

b. Pipes over OD 110 mm and up to OD 250 mm should be of PVC / DWV and carried out as described herein.

1.28.3 Manholes and Grease Trap Collection Chambers

Manholes and Chambers shall be constructed as shown in Detail Drawings, and where shown on Site Services layout. Materials shall be of not less than 225 mm Brickwork, cast-in-place concrete, or pre cast concrete. Concrete shall be M: 20 strength. All brickwork shall be plastered in cement, sand (1:2). Gratings, lids and castings in general shall be in Cast Iron in accordance with IS 5961 and built in or fixed as detailed.

All manholes designated to be constructed shall be as specified in the Schedule of Quantities.

All manholes shall be supported on a base of cement concrete of such thickness and mix as given in the Schedule of Quantities or shown on the drawings.

Where not specified, manholes shall be constructed as follows:

Maximum Depth in mm	Internal Dimensions of Manhole Chamber
Up to 450 mm	450 mm x 450 mm
Over 450 mm and Up to 600 mm	600 mm x 600 mm
Over 600 mm and Up to 1200 mm	Dia 900 mm or 900 mm x 900 mm
Over 1200 mm and Up to 3000 mm	Dia 1200 mm or 900 x 1200 mm

All manholes shall be provided with cement concrete benching in 1:2:4 mix. The benching shall have a slope of 100 mm towards the channel. The depth of the channel shall be the full diameter of the pipe. Benching shall be finished with a floating coat of neat cement.

The manhole chamber covers and frames shall comply with the following ratings:

Manhole Cover	Out Side Size of Frame	Inside Size of Frame	Weight in Kg
Light	27" x 27"	24 " x 24" or Ø 500 mm	78.5 kg
Heavy	27" x 27"	24 " x 24" or Ø 600 mm	216 kg

All manholes shall be plastered with 12 mm thick cement mortar 1:3 (1 cement & 3 coarse sand) and finished inside with a floating coat of neat cement. Manholes shall be plastered outside as above cut with rough plaster.

All manholes shall be provided with cast iron covers and frames and embedded in reinforced cement concrete slab weight of cover and frame thickness of slab shall be as specified in the Bill of Quantities or given above.

1.28.4 Making Connections

Contractor shall connect the new sewer line to the existing manhole by cutting the walls, benching and restoring them to the original condition. A new channel shall be cut in the benching of the existing manhole for the new connections; contractor shall remove all sewage and water if encountered in making the connection without additional cost.

Section - VII
Drawings

Note:

1. It is customary to bind the drawings in a separate volume, which is often larger than other volumes of the contract documents. The size will be dictated by the scale of the drawings, which must not be reduced to the extent that details are reduced illegible.

2. A simplified map showing the location of the Site in relation to the local geography, indicating major roads, posts, airports, and railroads, is helpful.

3. The construction drawings, even if not fully developed, must show sufficient details to enable bidders to understand the type and complexity of the work involved and the price the Bill of Quantities.

Drawings

Drawings as provided by the Budhiganga Municipality Office

Section - VIII
Bill of Quantities

Notes for Unit Rate Contracts:

Objectives

The objectives of the Bill of Quantities are

(a) To provide sufficient information on the quantities of Works to be performed to enable Bids to be prepared efficiently and accurately; and

(b) When a Contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bill of Quantities should be as simple and brief as possible.

Content

The Bill of Quantities should be divided generally into the following sections:

(a) Preamble;

(b) Work Items (grouped into parts);

(c) Day works Schedule;

d) Provisional Sums; and

(d) Summary.

Preamble

The Preamble should indicate the inclusiveness of the unit prices, and should state the methods of measurement which have been adopted in the preparation of the Bill of Quantities and which are to be used for the measurement of any part of the works.

Work Items

The items in the Bill of Quantities should be grouped into sections to distinguish between those parts of the Works which by nature, location, access, timing, or any other special characteristics may give rise to different methods of construction, or phasing of the Works, or considerations of cost. General items common to all parts of the works may be grouped as a separate section in the Bill of Quantities.

Day work Schedule

A Day work Schedule should be included only if the probability of unforeseen work, outside the items included in the Bill of Quantities, is high. To facilitate checking by the Employer of the realism of rates quoted by the Bidders, the Day work Schedule should normally comprise the following:

(a) A list of the various classes of labour, materials, and Constructional Plant for which basic day work rates or prices are to be inserted by the Bidder, together with a statement of the conditions under which the Contractor will be paid for work executed on a day work basis.

(b) Nominal quantities for each item of Day work, to be priced by each Bidder at Day work rates as bid. The rate to be entered by the Bidder against each basic Day work item should include the Contractor's profit, overheads, supervision, and other charges.

Provisional Sums

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the Contract Data should state the manner in which they will be used, and under whose authority (usually the Project Manager's).

Summary

The Summary should contain a tabulation of the separate parts of the Bill of Quantities carried forward, with provisional sums for Day work, for physical (quantity) contingencies, and for price contingencies (upward price adjustment) where applicable.

These Notes for Preparing Specifications are intended only as information for the Employer or the person drafting the Bidding documents. They should not be included in the final documents.

Preamble of Bill of Quantities

A. General

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, Technical Specifications, and Drawings.

2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Project Manager and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Project Manager may fix within the terms of the Contract.

3. For any item for which measurement is based on records made before or during construction the records shall be prepared and agreed between the Engineer and the Contractor. Should the Contractor carry out such work without the prior agreement of the Engineer, the Engineer may request the Contractor to carry out investigations to confirm the extent of the work and the quantity of work certified for payment shall be solely at the Engineer's discretion. The cost of any such investigation shall be borne by the Contractor.

4. The rates and prices bid in the priced Bill of Quantities shall, except as otherwise provided under the Contract, include all construction equipment, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.

5. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.

6. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.

7. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities. The Specification Clause references where given in the item description of the Bills of Quantities are for the convenience of bidders and generally refer to the principal relevant-specification clause but do not necessarily represent the whole of the specification requirements for the work required within the item. The presence of a Specification clause reference shall not in any way reduce the Bidders obligation to complete work in accordance with all the requirements of the Specification.

8. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Project Manager in accordance with the Conditions of Contract.

9. The method of measurement of completed work for payment shall be in accordance with the Specifications.

10. The abbreviations and symbols used in this Bill of Quantities are:
    [Insert as applicable]

B. Day work Schedule

a) General

1. Work shall not be executed on a day work basis except by written order of the Project Manager. Bidders shall enter basic rates for day work items in the Schedules. These rates shall apply to any quantity of day work ordered by the Project Manager. Nominal quantities have been indicated against each item of day work, and the extended total for day work shall, be carried forward as a Provisional Sum to the Summary Total Bid Amount. Unless otherwise adjusted, payments for day work shall be subject to price adjustment in accordance with the provisions in the Conditions of Contract.

b) Day work Labour

1. In calculating payments due to the Contractor for the execution of day works, the hours for labour will be reckoned from the time of arrival of the labour at the job site to execute the particular item of day work to the time of departure from the job site, but excluding meal breaks and rest periods. Only the time of classes of labour directly doing work ordered by the Project Manager and are competent to perform such work will be measured. The time of gangers (charge hands) actually doing work with the gangs will also be measured but not the time of foremen or other supervisory personnel.
2. The Contractor shall be entitled to payment in respect of the total time that labour is employed on day work, calculated at the basis rates entered by it in the " SCHEDULE OF DAY WORK RATES: 1. LABOUR ". The rates for labour shall be deemed to cover all costs to the Contractor including (but not limited to) i) the amount of wages paid to such labour, transportation time, overtime, subsistence allowances, ii) any sums paid to or on behalf of such labour for social benefits in accordance with Nepal law, iii) Contractor's profit, overheads, superintendence, liabilities and insurance and iv) charges incidental to the foregoing.

c) Day work Equipment

1. The Contractor shall be entitled to payments in respect of Constructional Plant already on site and employed on day work at the basis rental rates entered by him in the “SCHEDULE OF DAY WORK RATES:2 EQUIPMENT ”. The said rates shall be deemed to include due and complete allowance for depreciation, interest, indemnity and insurance, repairs, maintenance, supplies, fuel, lubricant, and other consumables and all overhead, profit and administrative costs related to the use of such equipment. The cost of drivers, operators and assistants also shall be included in the rate of the equipment and no separately payment shall be made for it.
2. In calculating the payment due to the Contractor for Constructional Plant employed on day work, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Project Manager, the travelling time from the part of the Site where the Construction Plant was located when ordered by the Project Manager to be employed on day work and the time for return journey there to shall be included for payment.

d) Day work Materials

1. The Contractor shall be entitled to payment in respect of materials used for day work (except for materials for which the cost is included in the percentage addition to labour costs as detailed heretofore), at the rates entered by him in the "SCHEDULE OF DAY WORK RATES: 3 MATERIALS" and shall be deemed to include overhead charges and profit as follows;
   (i) the rates for materials shall be calculated on the basis of the invoiced price, freight, insurance, handling expenses, damage, losses, etc. and shall provide for delivery to store for stockpiling at the Site.
   (ii) the cost of hauling materials for use on work ordered to be carried out as day work, from the store or stockpile on the Site to the place where it is to be used also shall be include in the same rate.

Provisional Sums

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic

supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the SCC should state the manner in which they will be used, and under whose authority (usually the Project Manager's).

The estimated cost of specialized work to be carried out, or of special goods to be supplied, by other contractors should be indicated in the relevant part of the Bill of Quantities as a particular provisional sum with an appropriate brief description. A separate procurement procedure is normally carried out by the Employer to select such specialized contractors. To provide an element of competition among the Bidders in respect of any facilities, amenities, attendance, etc., to be provided by the successful Bidder as prime Contractor for the use and convenience of the specialist contractors, each related provisional sum should be followed by an item in the Bill of Quantities inviting the Bidder to quote a sum for such amenities, facilities, attendance, etc.

Bill of Quantities

1 Provisional Sum

Procument Item Details

Sl. No.	Item Description	Unit	Quantity	Unit Rate (NPR)	Amount (NPR)
1	Insurance, Quality Control Test (Cube Test for Beam ,Column, Slab, Mortar Test), Information Board, Site Management	PS	1.0	15000.0	15,000.00

2 Construction work

Procument Item Details

Sl. No.	Item Description	Unit	Quantity	Bidder's Rate (NPR)	Bidder's Rate (in words)	Total Amount (NPR)
1	Stone soling work in foundation and floors with supplying of approved quality of stone laying, ramming and levelling including filling in the joints with sand as per design, drawing and specification.	cum	2.25			
2	Providing, laying and curing stone rubble masonry in foundation, super structure, compound wall in 1:6 cement sand mortar in perfect line level finish including, racking the joints and curing the work all complete.	cum	68.01			
3	Providing, laying, compacting and curing plain cement concrete M15 (1:2:4) using ordinary portlnd cement(OPC) in flooring and top of wall with cement, sand and well graded crushed stone aggregate finishing to approved level, lines and dimensions all complete as per drawings, specifications and instruction of the site engineer.	cum	0.75			
4	Providing, mixing with mixer machine, laying , compacting with vibrator and curing plain cement concrete M20 (1:1.5:3) using ordinary portland cement(OPC) for foundation, coloumn, slab, beams, tie beam Lintel Sill and all kinds of R. C.C. works with cement sand and crushed stone aggregate 20mm down finishing to approved level lines and dimensions all complete as per drawings, specifications and instruction of the site engineer.	cum	25.49			
5	Providing Reinforcement bars (Grade 415 or above) work including straightening, cleaning, cutting, bending, binding with 20 SWG annealed wire & fixing in position as per drawing, bar bending schedule for raft foundation column, beam, wall, stair, slab in all R.C.C. works as per specification, drawing & instruction of site engineer.	kg	2,401.06			
6	12-19mm waterproof plywood and wooden prop formwork for all	sqm	204.09			

Procument Item Details						
Sl. No.	**Item Description**	**Unit**	**Quantity**	**Bidder's Rate (NPR)**	**Bidder's Rate (in words)**	**Total Amount (NPR)**
	works necessary propping, scaffoldong, staging, supporting inclusive of wedging and cutting holes for utilization work till the support is full unyielding nett for Column/Slab/Beam etc. complete work.					
7	Providing, laying & curing 20mm cement sand (1:3) Plastering on walls and ceiling to perfect plumb, lines & level including raking the mortar joints and wetting the masonry surface all complete as per design drawings, specifications and instruction of the site engineer all complete	sqm	470.94			
8	Making and fixing Panneld Shutter (Dilla Khapa) work by local seasoned wood all complete as per design drawings, specifications and instruction of the site engineer all complete	Sqm	22.48			
9	Making and fixing Frame (CHAUKHAT) work by local seasoned wood all complete as per design drawings, specifications and instruction of the site engineer all complete	cum	0.65			
10	Supplying and painting two coat of ready made enamel paint of approved quality and colour with one coat of primer painting over porperly cleaned wooden surface all complete. And Colouring with two coat distemper paint with one coat primer to give uniform colouring after rendering the surface all complete.	sqm	470.94			
Total of Procument Items						
Total Item Price						
VAT						
Grand Total						

Section - IV
General Conditions of Contract

Section VII. General Conditions of Contract (GCC)

1. General Provisions	
1.1 Definitions	In the Contract as defined below, the words and expressions defined shall have the following meanings assigned to them, except where the context requires otherwise:
The Contract	1.1.1 "**Contract**" means the Agreement signed between the Employer and the contractor and the other documents listed in the Special Conditions of Contract (SCC). 1.1.2 "**Specification**" means the document as listed in the SCC, and any variation to such document. 1.1.3 "**Drawings**" means the Employer's drawings of the Works as listed in the SCC, and any variation to such drawings. 1.1.4 "**Bill of Quantities**" means the priced and completed bill of quantities forming part of the Tender. 1.1.5 "**Bid or Quotation**" means the contractor's priced offer to the Employer for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Acceptance. 1.1.6 "**Letter of Acceptance**" means the formal acceptance by the Employer of the **bid** or Tender.
Persons	1.1.7 "**Employer**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the contractor) any assignee. 1.1.8 "**Contractor**" means the person named in the Agreement and the legal successors in title to this person, but not (except with the consent of the Employer) any assignee. 1.1.9 "**Party**" means either Employer or the contractor.
Date, Times and Periods	1.1.10 "**Commencement Date**" means the date stated in the SCC after the date the Agreement comes into effect or any other date agreed between the Parties. 1.1.11 "**Day**" means a calendar day.

	1.1.12 "**Time for Completion**" means the time for completing the Works as stated in the SCC (or as extended under Sub-Clause 6.3), calculated from the Commencement Date.
Money and Payments	1.1.13 "**Cost**" means all expenditure properly incurred (or to be incurred) by the contractor, whether on or off the Site, including overheads and similar charges, but does not include profit. 1.1.14 "**Contract Price**" means the sum stated in the Letter of Acceptance as payable to the contractor and adjusted with any Variation Orders and Other Adjustments upon completion of the works and the remedying of any defects therein in accordance with the provisions of the Contract. 1.1.15 "**Retention Money**" means the aggregate of all monies retained by the Employer pursuant to Sub-Clause 10.3
Other Definitions	1.1.16 "**Contractor's Equipment**" means all apparatus, machinery, vehicles, facilities and other things required for the execution of the Works but does not include Materials or Plant. 1.1.17 "**Country**" means Nepal. 1.1.18 "**Employer's Liabilities**" means those matters listed in Sub-Clause 5.1. 1.1.19 "**Materials**" means things of all kinds (other than Plant) intended to form or forming part of the permanent work. 1.1.20 "**Plant**" means the machinery and apparatus intended to form or forming part of the Permanent Works. 1.1.21 "**Site**" means the places provided by the Employer where the Works are to be executed, and any other places specified in the Contract as forming part of the Site. 1.1.22 "**Variation**" means any change which is a result of unforeseen circumstances that arise as a result of instruction by the Employer/ Engineer under Sub-Clause 9.1. 1.1.23 "**Works**" means all the work and design (if any) to be performed by the contractor including temporary work and any Variation. 1.1.24 "**Permanent Works**" means the permanent works to be executed (Including Plant) in accordance with the Contract. 1.1.25 "**Temporary Works**" means all temporary works of every kind (other than contractor's Equipment) required in or about the execution and completion of the Works and the remedying of any defects therein.
1.2 Interpretation	Words importing persons or parties shall include firms and organisations. Words importing singular or one gender shall include plural or the other gender where the context requires.
1.3 Priority of Documents	The documents forming the Contract shall to be taken as mutually explanatory of one another. If an ambiguity or discrepancy is found in the documents, the Employer shall issue any necessary instructions to the contractor, and the priority of the documents shall be in accordance with the order as **listed in the SCC**.
1.4 Law	The law of the Contract is stated in the Law of Nepal.

1.5Communications	Where provision is made for the giving or issue of any notice, instruction, or other communication by any person, unless otherwise specified such communication shall be written in the language stated in the SCC as shall not be unreasonably withheld or delayed. If a notice given pursuant to Sub Clause 1.5 fails to be delivered due to failure to trace the address of the party then the notice shall be published as public notice in a National daily newspaper and when the notice is so published then the notice shall be considered to be delivered to the concerned party.
1.6 Statutory Obligations	The contractor shall comply with the laws of Nepal where activities are performed. The contractor shall give all notices and pay all fees and other charges in respect of the Works.
2. The Employer	
2.1 Provision of Site	The Employer shall provide the Site and right of access thereto at the times stated in the SCC.
2.2 Permits and Licenses	The Employer shall, if requested by the contractor, assist him in applying for permits, licences or approvals which are required for the Works.
2.3 Employer's Instructions	The contractor shall comply with all instructions given by the Employer in respect of the Works including the suspension of all or part of the Works.
2.4 Approvals	No approval or consent or absence of comment by the Employer or the Employer's representative shall affect the contractor's obligations.
3. Employer's Representatives	
3.1 Authorised Person	One of the Employer's personnel shall have authority to act for him. This authorised person shall be as stated in the SCC, or as otherwise notified by the Employer to the contractor.
3.2 Employer's Representative	The Employer may also appoint a firm or individual to carry out certain duties. The appointee may be named in the SCC, or notified by the Employer to the contractor from time to time. The Employer shall notify the contractor of the delegated duties and authority of this Employer's representative.
4. The Contractor	
4.1 General Obligations	The contractor shall carry out the Works properly and in accordance with the Contract. The contractor shall provide all supervision, labour, Materials, Plant and contractor's Equipment which may be required. All Materials and Plant on Site shall be deemed to be the property of the Employer. During continuance of the of the contract, the contractor and his sub-contractors shall abide at all times by all labour laws, including child labour related enactments, and rules made there under. A child who has not attained the age of fourteen years shall not be employed in any work as a labourer.

4.2	**Contractor's Representative**	The contractor shall submit to the Employer for consent the name and particulars of the person authorised to receive instructions on behalf of the contractor.
4.3	**Subcontracting**	The contractor shall not subcontract the Works.
4.4	**Performance Security**	As **stated in the SCC**, the Contractor shall deliver to the Employer no later than the date specified in the Letter of Acceptance.
5.	**Employer's Liabilities**	
5.1	**Employer's Liabilities**	In this Contract, Employer's Liabilities mean: a. war, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country, b. rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country, c. riot, commotion or disorder by persons other than the contractor's personnel and other employees, affecting the Site and/or the Works. d. use or occupation by the Employer of any part of the Works, except as may be specified in the Contract, e. design of any part of the Works by the Employer's personnel or by others for whom the Employer is responsible, f. any operation of the forces of nature affecting the Site and/or the Works, which was unforeseeable or against which an experienced contractor could not reasonably have been expected to take precautions g. a suspension under Sub-Clause 2.3 unless it is attributable to the contractor's failure, h. any failure of the Employer, i. physical obstructions or physical conditions, other than climatic conditions, encountered on the Site during the performance of the Works, which obstructions or conditions were not reasonably foreseeable by an experienced contractor and which the contractor immediately notified to the Employer, j. any delay or disruption caused by any Variation, k. any change to the law of the Contract after the date of the contractor's offer as stated in the Agreement, l. losses arising out of the Employer's right to have the permanent work executed on, over, under, in or through any land, and to occupy this land for the permanent work, and m. damage which is an unavoidable result of the contractor's obligations to execute the Works and to remedy any defects.
6.	**Time for Completion**	
6.1	**Execution of the Works**	The contractor shall commence the Works on the Commencement Date and shall proceed expeditiously and without delay and shall complete the Works within the Time for Completion.
6.2	**Programme**	The contractor shall submit to the Employer a programme for the Works within the time stated in the SCC

6.3	**Extension of Time**	The contractor shall be entitled to an extension to the Time for Completion if he is or shall be delayed by any of the Employer's Liabilities. The contractor shall submit an application to the Employer for extension of time, stating the causes for delay, 21 days before the expiry of the Contract completion date. On receipt of an application from the contractor, within 21 days , the Employer shall consider all supporting details provided by the contractor and shall decide extend the Time for Completion as appropriate.
6.4	**Liquidated Damages for Delay**	If the contractor fails to complete the Works within the Time for Completion, the contractor's liability to the Employer for such failure shall be to pay the amount stated in the SCC for each day for which he fails to complete the Works.
7.	**Taking-Over**	
7.1	**Completion**	The contractor may notify the Employer when he considers that the Works are complete. In addition to the other provisions, before acceptance of the completed works, Employer shall verify and assure that such works are within the set objective, quality and appropriate to operate and use.
7.2	**Taking-Over Notice**	The Employer shall notify the Contractor when he considers that the Contractor has completed the Works stating the date accordingly. Alternatively, the Employer may notify the Contractor that the Works, although not fully complete, are ready for taking over, stating the date accordingly. The Employer shall take over the Works upon the issue of this notice. The Contractor shall promptly complete any outstanding work and, subject to Clause 8, clear the Site.
8.	**Remedying Defects**	
8.1	**Remedying Defects**	The Employer may at any time prior to the expiry of the period stated in the SCC, notify the Contractor of any defects or outstanding work. The Contractor shall remedy at no cost to the Employer any defects due to the Contractor's design, materials, plant or workmanship not being in accordance with the Contract. Failure to remedy any defects or complete outstanding work within a reasonable time of the Employer's notice shall entitle the Employer to carry out all necessary work at the Contractor's cost.
8.2	**Uncovering and Testing**	The Employer may give instruction as to the uncovering and/or testing of any work. Unless as a result of any uncovering and/or testing it is established that the contractor's design, materials, plant or workmanship are not in accordance with the Contract, the Contractor shall be paid for such uncovering and/or testing as a Variation in accordance with Sub-Clause 9.2.
9.	**Variations and Claims**	
9.1	**Right to Vary**	The Employer may instruct Variations.

9.2 Valuation of Variations	Variations shall be valued as follows: a. where appropriate, at rates in the Contract, or b. in the absence of appropriate rates, the rates in the Contract shall be used as the basis for valuation or c. at appropriate new rates, as may be agreed or which the Employer considers appropriate.
9.4 Right to Claim	If the contractor incurs cost as a result of any of the Employer's Liabilities, the contractor shall be entitled to the amount of such cost. If as a result of any of the Employer's Liabilities, it is necessary to change the Works, this shall be dealt with as a Variation.
9.5 Variation and Claim Procedure	The contractor shall submit the Employer an itemised make-up of the value of Variations and claims within 7 days of the instruction or of the event giving rise to the claim. The Employer shall check and if possible agree the value. In the absence of agreement, the Employer shall determine the value.
10. Contract Price and Payment	
10.1 Valuation of the Works	The Contract Bill of Quantities and the approved Variation quantities shall be used to calculate the valuation of the works completed .The Contractor shall be paid for the quantity of work done at the rate in the Bill of Quantities or rate agreed pursuant to clause 9.2 for varied works.
10.2 Payments Certificates	The Contractor shall submit to the Employer monthly statements of the estimated value of the works completed less the cumulative amount certified previously. The Employer shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor
10.3 Payments	The Employer shall pay to the contractor the amount certified less retention at the rate stated in the SCC within 30 days of the date of each certificate.
10.4 Payment of Retention	One half of the retention shall be repaid by the Employer to the contractor within 30 days upon expiry of Defects Liability Period and the Employer has certified that the notified defects have been corrected. The remainder of the retention shall be paid by the Employer to the contractor within 7 days after submission of evidence document from the concerned Internal Revenue Office that the contractor has submitted his Income Returns
10.5 Advance Payment	10.5.1 The Employer shall make advance payment to the Contractor of the amounts stated in the SCC in two equal installments by the date stated in the SCC, against provision by the Contractor of an unconditional bank guarantee from Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law in Nepal in a form acceptable to the Employer in amounts equal to the advance payment. The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.

	10.5.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager. 10.5.3 The advance payment shall be repaid by deducting proportionate amounts, as stated in SCC, from payments otherwise due Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.
10.6 Local Taxation & Value Added Tax	a. The prices quoted by the Contractor shall include all taxes that may be levied in accordance to the laws and regulations in being in Nepal. b. The Contractor shall pay VAT in the concerned VAT office within time frame specified in VAT regulation.
11. Termination of Contract and Payment	11.1 The Employer may terminate the Contract at any time if the contractor; a. does not commence the work as per the Contract, b. abandons the work without completing, c. fails to achieve progress as per the Contract. 11.2 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. 11.3 Fundamental breaches of Contract shall include, but shall not be limited to, the following : (a) The Contractor uses the advance payment for matters other than the contractual obligations, (b) the Contractor stops work for 30 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager; (c) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 30 days; (d) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation. (e) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 90 days of the date of the Project Manager's certificate; (f) the Project Manager 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 Project Manager; (g) The Contractor fails to update the Program as per the contract and demonstrate acceleration of the works within a reasonable period of time determined by the Project Manager; (h) the Contractor does not maintain a Security, which is required; (i) the Contractor has delayed the completion of the Works by the number of

	days for which the maximum amount of liquidated damages can be paid, **as defined in the SCC 6.4** ; and (j) If the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract. 11.5 Notwithstanding the above, the Employer may terminate the Contract for convenience. 11.6 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.
	11.7 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer. 11.8 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, 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. 11.9 If the Contract is terminated because of fundamental breach of Contract or for any other fault by the Contractor, the performance security shall be forfeited by the Employer. In such case, amount to complete the remaining works as per the Contract shall be recovered from the Contractor as Government dues.
12. Risk and Responsibility	
12.1 Contractor's Care of the Works	The contractor shall take full responsibility for the care of the Works from the Commencement Date until the date of the Employer's notice under Sub-Clause 7.2. Responsibility shall then pass to the Employer. If any loss or damage occurs to the Works during the above period, the contractor shall rectify such loss or damage so that the Works conform to the Contract.
12.2 Force Majeure	If a Party is or shall be prevented from performing any of its obligations by Force Majeure, the Party affected shall notify the other Party immediately. If necessary, the contractor shall suspend the execution of the Works and, to the extent agreed with the Employer, demobilise the contractor's Equipment. If the event continues for a period of 90 days, either Party may then give notice of termination which shall take effect 30 days after the giving of the notice. After termination, the contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site, adjusted by the following: a. any sums to which the contractor is entitled under Sub-Clause 9.4,

	b. the Cost of his suspension and demobilisation, c. any sums to which the Employer is entitled. The net balance due shall be paid or repaid within 30 days of the notice of termination.
13. Resolution of Disputes	
13.2 Amicable Settlement	The Employer and the Contractor shall attempt to settle amicably by direct negotiation any disagreement or dispute arising between them under or in connection with the Contract.
14.Conduct of Bidders	14.1 The Bidder shall be responsible to fulfill his obligations as per the requirement of the Contract Agreement, Bidding documents, GoN's Procurement Act and Regulations. 14.2 The Bidder shall not carry out or cause to carry out the following acts with an intention to influence the implementation of the procurement process or the procurement agreement : a) give or propose improper inducement directly or indirectly, b) distortion or misrepresentation of facts c) engaging or being involved in corrupt or fraudulent practice d) interference in participation of other prospective bidders. e) coercion or threatening directly or indirectly to cause harm to the person or the property of any person to be involved in the procurement proceedings, f) collusive practice among bidders before or after submission of bids for distribution of works among bidders or fixing artificial/uncompetitive bid price with an intention to deprive the Employer the benefit of open competitive bid price.. g) contacting the Employer with an intention to influence the Employer with regards to the bid or interference of any kind in examination and evaluation of the bids during the period after opening of bids up to the notification of award of contract
15. Blacklisting Bidder	15.1 Without prejudice to any other right of the Employer under this Contract, GoN, Public Procurement Monitoring Office may blacklist a bidder for his conduct up to three years on the following grounds and seriousness of the act committed by the bidder: a) if it is proved that the bidder committed acts pursuant to the Sub - Clause 14.2, b) if it is proved later that the bidder/contractor had committed substantial defect in implementation of the contract or had not substantially fulfilled his obligations under the contract or the completed work is not of the specified quality as per the contract , c) if convicted by a court of law in a criminal offence which disqualifies the bidder from participating in the contract. d) if it is proved that the contract agreement signed by the bidder was

	based on false or misrepresentation of bidder's qualification information, **e) other acts mentioned in the Bidding Data** 15.2 A firm declared blacklisted and ineligible by the GON shall be ineligible to bid for a contract during the period of time determined by the PPMO.
16. Provision of PPA and PPR	If any provision of this document are inconsistent with Public Procurement Act (PPA), 2063 or Public Procurement Regulations (PPR), 2064, the provision of this documents shall be void to the extent of such inconsistency and the provision of PPA and PPR shall prevail.

Section - V
Special Conditions of Contract

Section VIII - Special Conditions of Contract (SCC)

This SCC forms part of the Agreement
[Note: with the exception of the items for which the Purchaser's requirements have been inserted, the Bidder shall complete the following information before submitting his Sealed Quotation.]

1.1.1	Documents forming the Contract listed in the order of priority: 1. The Agreement 2. Special Conditions of Contract 3. General Conditions of Contract 4. The Technical Specifications 5. The Drawings 6. The Bill of Quantities
1.1.12	The indented completion date for the works shall be 2 months from aggrement date .
1.5	The language of the contract is ENGLISH/NEPALI.
2.1	The Site Possession Date(s) shall be: 7 days from aggregement date
3.1	The Authorised person is : Prem Maharjan
3.2	Name and Address of Employer's representative is : Prem Maharjan, Bajura Bajura Sudoor Pachism Province
4.4	The Performance Security amount is: : 5% i) If bid price of the bidder selected for acceptance is up to 15 (fifteen) percent below the approved cost estimate, the performance security amount shall be 5 (five) percent of the bid price. ii) For the bid price of the bidder selected for acceptance is more than 15 (fifteen) percent below of the cost estimate, the performance security amount shall be determined as follows: Performance Security Amount = [(0.85 x Cost Estimate –Bid Price) x 0.5] + 5% of Bid Price. The Bid Price and Cost Estimate shall be inclusive of Value Added Tax
6.2	Time for the submission of programme : 15 days.
6.4	Liquidated Damages for Delay is 0.05% of the Contract Price per day up to a maximum of 10% of sum stated in the Agreement.
8.1	Period for notifying defects is 365 days calculated from the date stated in the notice under Sub-Clause 7.2.
10.5.1	The Advance Payments shall NOT be applicable
10.5.3	Deductions from Payment Certificates will commence in the first certificate in which the Value of works executed exceeds 30% of the Contract Price. Deduction will be at the rate of 10% of the respective Monthly Interim Payment Certificate until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the end of 80 % of the approved contract price.

Section - IX
Contract Forms

Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

Letter of Acceptance

[on letterhead paper of the Employer]

Date: ……..

To: ……. name and address of the Contractor ……..

Subject: ……. Notification of Award

This is to notify that your Quotation dated ……..date ……..for execution of the……..name of the contract and identification number, as given in the SCC …….. for the Contract price of Nepalese Rupees [insert amount in figures and words in Nepalese Rupees], as corrected in accordance with the Instructions to Bidders is hereby accepted in accordance with the Instruction to Bidders.

You are hereby instructed to contact this office to sign the formal contract agreement within 7 days with Performance Security of ……..[specify the performance security amount computed as per ITB 22.2 and 25.1] consisting of a Bank Guarantee in the format included in Section IX (Contract Forms) of this Bidding Document.

The Employer shall forfeit the bid security, in case you fail to furnish the Performance Security and to sign the contract within specified period.

Authorized Signature: ……..

Name and Title of Signatory: ……

Contract Agreement

THIS AGREEMENT made the .....day of …….. between…….. name of the Employer …….. (hereinafter "the Employer"), of the one part, and ……name of the Contractor ……(hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as …….. name of the Contract .....should be executed by the Contractor, and has accepted a Quotation by the Contractor for the execution and completion of these Works and the remedying of any defects in the sum of NRs ……..[insert amount of contract price in words and figures including taxes] (hereinafter "the Contract Price").

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement.
   (a) the Letter of Acceptance;
   (b) the Letter of Bid;
   (c) the Addenda Nos ..... insert addenda numbers if any ……
   (d) the Special Conditions of Contract;
   (e) the General Conditions of Contract;
   (f) Bills of Quantities (BOQ);
   (g) the Specification;
   (h) the Drawings;
   (i) the Activity Schedules; and
   (j).....[***Specify if there are any other document***]
3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of Nepal on the day, month and year indicated above.

Signed by …….
for and on behalf the Contractor in the presence of

Witness, Name Signature, Address, Date

Signed by……..
for and on behalf of the Employer in the presence of

Witness, Name, Signature, Address, Date

Performance Security

Bank's Name, and Address of Issuing Branch or Office
(On Letter head of the Commercial bank or any Financial Institution eligible to issue Bank Guarantee as per prevailing Law)

…… ***Bank's Name, and Address of Issuing Branch or Office*** ……Beneficiary: …… Name and Address of Employer ……
Date: ……

Performance Guarantee No.:……

We have been informed that … … ***[insert name of the Contractor]*** (hereinafter called "the Contractor") has been notified by you to sign the Contract No. …… ***[insert reference number of the Contract]*** for the execution of ……. ***[insert name of contract and brief description of Works]*** (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we… …… . ***[insert name of the Bank]*** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ……***[insert name of the currency and amount in figures*] (… ……. insert amount in words)*** such sum being payable in Nepalese Rupees, 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(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the……..Day of …… **, and any demand for payment under it must be received by us at this office on or before that date.

……
Seal of Bank and Signature(s)

Note:
All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

* The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract in Nepalese Rupees.

** Insert the date thirty days after the date specified for the Defect Liability Period. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee".

Advance Payment Security

Bank's Name, and Address of Issuing Branch or Office

(On Letter head of the Commercial bank or any Financial Institution eligible to issue Bank Guarantee as per prevailing Law)

…….. Bank's Name, and Address of Issuing Branch or Office.....

Beneficiary: ……***Name and address of employer***

Date : ……

Advance Payment Guarantee No……..

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

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum…… name of the currency and amount in figures****…(…. amount in words …..)*** is to be made against an advance payment guarantee.

At the request of the Contractor, we... ..... . ***name of the Bank*** …… hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of……name of the currency and amount in figures****……(…… amount in words … ….. .)***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 because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty (80) percent of the Contract Price has been certified for payment, or on the ..... day of .....**, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

……

Seal of Bank and Signature(s)

Note:

All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

*The Guarantor shall insert an amount representing the amount of the advance payment in Nepalese Rupees of the advance payment as specified in the Contract.

** Insert the date Thirty days after the expected completion date. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months], in response to the Employer's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee".