BIDDING DOCUMENT

for

THE PROCUREMENT OF

Construction of District Education Office Building

National Competitive Bidding (NCB)
Single Stage Two Envelope

Contract ID: Bldg / 01/073/074

Issued on: 21-04-2017 10:00

IFB No: Bldg / 01/073/074

Employer: District Education Office, Banke

Country: Nepal
Abbreviations

BD .................................................. Bidding Document
BDF .................................................. Bidding Forms
BDS .................................................. Bid Data Sheet
BOQ .................................................. Bill of Quantities
COF .................................................. Contract Forms
DP .................................................... Development Partners
DoLIDAR ........................................... Department of Local Infrastructure Development and Agricultural Roads
DUDBC ............................................. Department of Urban Development and Building Construction
ELI ................................................... Eligibility
EQC .................................................. Evaluation and Qualification Criteria
EXP .................................................. Experience
FIN .................................................. Financial
GCC .................................................. General Conditions of Contract
GoN .................................................. Government of Nepal
ICC .................................................. International Chamber of Commerce
IFB .................................................. Invitation for Bids
ITH .................................................. Instructions to Bidders
JV .................................................... Joint Venture
LIT .................................................. Litigation
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 Requirements
# Table of Contents

Section 1. Instruction to Bidders .......................... 6  
Section 2. Bid Data Sheet .................................. 28  
Section 3. Evaluation Criteria .............................. 32  
Section 4. Bidding Forms .................................. 36  
Section 5. Eligible Countries .............................. 77  
Section 6. Employer's Requirements ....................... 79  
Section 7. General Conditions of Contract ............... 261  
Section 8. Special Conditions of Contract ............... 291  
Section 9. Contract Forms ................................ 295  
Section 10. Additional Document ......................... 302  
Section 11. Annexure 1 ................................... 304
Invitation for Bid

District Education Office

Banke

Invitation for Bids for the Bldg/01/073/074

Contract Identification No: Bldg/01/073/074

Date of publication: 2074/01/8

1. **District Education Office** invites sealed bids or electronic bids from eligible bidders for the **construction of District Education Office Building** under National Competitive Bidding – Two Envelope Bidding procedures.

Only eligible bidders with the following key qualifications should participate in this bidding:

Minimum Average Annual Construction Turnover of the best 3 years within the last 10 years: **NRs.1,60,29,875.00 Without VAT**

Minimum Work experience of similar size and nature: **2,24,46,730.00 without VAT**

2. Eligible Bidders may obtain further information and inspect the Bidding Documents at the office of **District Education Office, Banke, Phone no. 081-520129, Email Id:deobanke@gmail.com**

or may visit PPMO website [www.bolpatra.gov.np/egp](http://www.bolpatra.gov.np/egp)

3. A complete set of Bidding Documents may be purchased from the **District Education Office, Banke** by eligible Bidders on the submission of a written application, along with the copy of company/firm registration certificate, and upon payment of a non-refundable fee of **Rs. 5000 till 2074/02/7**. If so requested, the Bidding Documents can also be sent by post/courier services upon payment of additional cost of NRs. 5000. However, the Employer will not be responsible for delay or non-delivery of the documents so sent.

Bidder who chooses to submit their bid electronically may purchase the hard copy of the bidding documents as mentioned above or may down load the bidding documents for e-submission from PPMO’s Web Site [www.bolpatra.gov.np/egp](http://www.bolpatra.gov.np/egp). Bidders, submitting their bid electronically, should deposit the cost (as specified above) of bidding document in the Project’s Rajaswa(revenue) account as specified below and the scanned copy (pdf format) of the Bank deposit voucher shall be uploaded by the bidder at the time of electronic submission of the bids. Information to deposit the cost of bidding document in Bank:

Name of the Bank: Nepal Rastra Bank, Banke
Name of Office: District Education Office
Office Code no.: 62-350-1
Office Account no.: 2101200-001-002-524
Rajaswa (revenue) Shirshak no.: 14227

4. Pre-bid meeting shall be held at **District Education Office, Banke** at **1:00PM on 2074/01/28**

5. Sealed or electronic bids must be submitted to the office **District Education Office, Banke** by hand/courier or through PPMO website [www.bolpatra.gov.np/egp](http://www.bolpatra.gov.np/egp). On or before **12:00 Noon on 2074/02/8**, Bids received after this deadline will be rejected.
6. The bids will be opened in the presence of Bidders' representatives who choose to attend at **2:00PM**
at the office of **District Education Office, Banke**. Bids must be valid for a period of **90**
(ninety) **Days** after bid opening and must be accompanied by a bid security or scanned copy of the
bid security in pdf format in case of e-bid, amounting to a minimum of **[insert amount 11,32,367.00]**
which shall be valid for 30 days beyond the validity period of the bid.

Information to deposit the bid amount in bank:

Name of the Bank: Nepal Rastra Bank, Banke
Name of Office: District Education Office
**Dharauti Khata no.**
2101200-001-002-
524

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.

8. The Employer reserve the right to accept or reject wholly or partly any or all the bids without
assigning reason whatever.

9. Bidder who chooses to submit the bid by E-Bidding System must submit the original copies (Hard
copies) of mandatory document to District Education Office, Banke, with in **the Seven** days of last
date of bid submission. Non submission of the hard copy by the bidders with in the specified time
shall be considered as non responsive and may cause forfeiture of bid security.

District Education Officer, Banke
Section 1
Instruction to Bidders
Section 1 - Instructions to Bidders

Table of Clauses

A. General

1. Scope of Bid
2. Source of Funds
3. Fraud and Corruption
4. Eligible Bidders
5. Eligible Materials, Equipment, and Services

B. Contents of Bidding Document

6. Sections of Bidding Document
7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting
8. Amendment of Bidding Document

C. Preparation of Bids

9. Cost of Bidding
10. Language of Bid
11. Documents Comprising the Bid
12. Letters of Bid and Schedules
13. Alternative Bids
14. Bid Prices and Discounts
15. Currencies of Bid and Payment
16. Documents Comprising the Technical Proposal
17. Documents Establishing the Qualifications of the Bidder
18. Period of Validity of Bids
20. Format and Signing of Bid

D. Submission and Opening of Bids

21. Sealing and Marking of Bids
22. Deadline for Submission of Bids
23. Late Bids
24. Withdrawal, Substitution, and Modification of Bids
25. Bid Opening

E. Evaluation and Comparison of Bids

26. Confidentiality
27. Clarification of Bids
28. Deviations, Reservations, and Omissions
29. Examination of Technical Bids
30. Responsiveness of Technical Bid
Section 1 - Instructions to Bidders

31. Nonmaterial Nonconformities .................................................................1-18
32. Qualification of the Bidder .....................................................................1-18
33. Correction of Arithmetical Errors ............................................................1-18
34. Conversion to Single Currency ...............................................................1-19
35. Margin of Preference .............................................................................1-19
36. Evaluation of Price Bids .........................................................................1-19
37. Comparison of Bids ................................................................................1-20
38. Employer’s Right to Accept Any Bid, and to Reject Any or All Bids ......1-20

F. Award of Contract ......................................................................................1-20

39. Award Criteria .......................................................................................1-20
40. Notification of Award .............................................................................1-20
41. Signing of Contract ................................................................................1-20
42. Performance Security .............................................................................1-21
Section 1 - Instructions to Bidders

A. General

1. Scope of Bid

1.1 In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Employer, as indicated in the BDS, issues this Bidding Document for the procurement of the Works as specified in Section 6 (Employer’s Requirements). The name, identification, and number of contracts of this bidding are provided in the BDS.

1.2 Throughout this Bidding Document,

(a) the term “in writing” means communicated in written form and delivered against receipt;

(b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and

(c) “day” means calendar day.

2. Source of Funds

2.1 The Borrower or Recipient (hereinafter called “Borrower”) indicated in the BDS has applied for or received financing (hereinafter called “funds”) from the Asian Development Bank (hereinafter called “ADB”) toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.

2.2 Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called “Financing Agreement”), and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.

3. Fraud and Corruption

3.1 ADB’s Anticorruption Policy requires Borrowers (including beneficiaries of ADB-financed activity), as well as Bidders, Suppliers, and Contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, ADB

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) “corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

(ii) “fraudulent practice” means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) “coercive practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the
actions of a party;

(iv) “collusive practice” means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;

(v) “obstructive practice” means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an ADB investigation; (b) making false statements to investigators in order to materially impede an ADB investigation; (c) failing to comply with requests to provide information, documents or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (e) materially impeding ADB’s contractual rights of audit or access to information; and

(vi) “integrity violation” is any act which violates ADB’s Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB’s Anticorruption Policy, including failure to adhere to the highest ethical standard.

(b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation;

(d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB’s Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate in ADB-financed, administered, or supported activities or to benefit from an ADB-financed, administered, or supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and

---

1 Whether as a Contractor, Nominated Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document). A Nominated Subcontractor is one that either has been: (i) included by the Bidder in its prequalification application or bid because it brings specific and critical experience and know-how that are accounted for in the evaluation of the bidder’s prequalification application or the bid; or (ii) appointed by the Employer.
Section 1 - Instructions to Bidders

1-5

(e) will have the right to require that a provision be included in bidding documents and in contracts financed by ADB, requiring Bidders, suppliers, and contractors to permit ADB or its representative to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

3.2 Furthermore, Bidders shall be aware of the provisions of GCC 28.3 and 73.2 (i).

4. Eligible Bidders

4.1 A Bidder may be a natural person, private entity, or government-owned enterprise subject to ITB 4.5 – or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture. In the case of a Joint Venture:

(a) all partners shall be jointly and severally liable; and

(b) the Joint Venture shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.

4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if any of, including but not limited to, the following apply:

(a) they have controlling shareholders in common; or

(b) they receive or have received any direct or indirect subsidy from any of them; or

(c) they have the same legal representative for purposes of this bid; or

(d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

(e) a Bidder participates in more than one bid in this bidding process, either individually or as a partner in a joint venture, except for alternative offers permitted under ITB 13 of the Bidding Document. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of 4.3 (a) - (d) above, this does not limit the participation of a Bidder as a Subcontractor in another Bid or of a firm as a
Subcontractor in more than one Bid; or

(f) a Bidder or any affiliated entity, participated as a Consultant in the preparation of the design or technical specifications of the works that are the subject of the Bid; or

(g) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the contract.

4.4 A firm shall not be eligible to participate in any procurement activities under an ADB-financed, administered, or supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporary suspended or debarred firm will be rejected.

4.5 Government-owned enterprises in the Employer’s country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) are not a dependent agency of the Employer.

4.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

4.7 Firms shall be excluded if by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower’s country prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.

4.8 In case a prequalification process has been conducted prior to the bidding process, this bidding is open only to prequalified Bidders.

5. Eligible Materials, Equipment and Services

5.1 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 above and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer’s request, Bidders may be required to provide evidence of the origin of materials, equipment, and services.

5.2 For purposes of ITB 5.1 above, “origin” means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

B. Contents of Bidding Document

6. Sections of Bidding Document

6.1 The Bidding Document consist of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with
any addenda issued in accordance with ITB 8.

PART I  Bidding Procedures
Section 1 - Instructions to Bidders (ITB)
Section 2 - Bid Data Sheet (BDS)
Section 3 - Evaluation and Qualification Criteria (EQC)
Section 4 - Bidding Forms (BDF)
Section 5 - Eligible Countries (ELC)

PART II  Requirements
Section 6 – Employer’s Requirements (ERQ)

PART III  Conditions of Contract and Contract Forms
Section 7 - General Conditions of Contract (GCC)
Section 8 - Particular Conditions of Contract (PCC)
Section 9 - Contract Forms (COF)

Annex-1: Provisions Considered for Single-Stage-Two-Envelope-Procedure for Government of Nepal Funded Procurement (between NRs. 20 million to NRs. 1 billion)

6.2 The Invitation for Bids (IFB) issued by the Employer is not part of the Bidding Document.

6.3 The Employer is not responsible for the completeness of the Bidding Document and their Addenda, if they were not obtained directly from the source stated by the Employer in the IFB.

6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.

7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting

7.1 A prospective Bidder requiring any clarification on the Bidding Document shall contact the Employer in writing at the Employer’s address indicated in the BDS or raise his inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received prior to the deadline for submission of bids, within a period given in the BDS. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 22.2.

7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself, on its own risk and responsibility, all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder’s own expense.

7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the
Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

7.4 The Bidder’s designated representative is invited to attend a pre-bid meeting, if provided for in the BDS. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than 1 week before the meeting.

7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.

7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

8. Amendment of Bidding Document

8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Document by issuing addenda.

8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.

8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for the submission of Bids, pursuant to ITB 22.2.

C. Preparation of Bids

9. Cost of Bidding

9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. Language of Bid

10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. Documents

11.1 The Bid shall comprise two envelopes submitted simultaneously, one
Comprising the Bid
called the Technical Bid containing the documents listed in ITB 11.2 and the other the Price Bid containing the documents listed in ITB 11.3, both envelopes enclosed together in an outer single envelope.

11.2 The Technical Bid shall comprise the following:
(a) Letter of Technical Bid;
(b) Bid Security or Bid-Securing Declaration, in accordance with ITB 19;
(c) alternative Bids, at Bidder’s option and if permissible, in accordance with ITB 13;
(d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2;
(e) documentary evidence in accordance with ITB 17, establishing the Bidder’s qualifications to perform the contract;
(f) Technical Proposal in accordance with ITB 16;
(g) Any other document required in the BDS.

11.3 The Price Bid shall comprise the following:
(a) Letter of Price Bid;
(b) completed Price Schedules, in accordance with ITB 12 and ITB 14, or as stipulated in the BDS;
(c) alternative price Bids, at Bidder’s option and if permissible, in accordance with ITB 13;
(d) Any other document required in the BDS.

11.4 In addition to the requirements under ITB 11.2, Bids submitted by a Joint Venture shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement.

12. Letters of Bid and Schedules
12.1 The Letters of Technical Bid and Price Bid, and the Schedules, and all documents listed under Clause 11, shall be prepared using the relevant forms furnished in Section 4 (Bidding Forms). The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested and as required in the BDS.

13. Alternative Bids
13.1 Unless otherwise indicated in the BDS, alternative Bids shall not be considered.

13.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the BDS, as will the method of evaluating different times for completion.

13.3 When specified in the BDS pursuant to ITB 13.1, and subject to ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding Document must first price the Employer’s design as described in the Bidding Document and shall further provide all information necessary for a complete evaluation of the alternative
by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.

13.4 When specified in the BDS, Bidders are permitted to submit alternative technical solutions for specified parts of the Works. Such parts will be identified in the BDS and described in Section 6 (Employer’s Requirements). The method for their evaluation will be stipulated in Section 3 (Evaluation and Qualification Criteria).

14. Bid Prices and Discounts

14.1 The prices and discounts quoted by the Bidder in the Letter of Price Bid and in the Schedules shall conform to the requirements specified below.

14.2 The Bidder shall submit a bid for the whole of the works described in ITB 1.1 by filling in prices for all items of the Works, as identified in Section 4 (Bidding Forms). In case of admeasurement contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities.

14.3 The price to be quoted in the Letter of Price Bid shall be the total price of the Bid, excluding any discounts offered. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.

14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Price Bid, in accordance with ITB 12.1.

14.5 Unless otherwise provided in the BDS and the Conditions of Contract, the prices quoted by the Bidder shall be fixed. If the prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, the Bidder shall furnish the indexes and weightings for the price adjustment formulas in the Table(s) of Adjustment Data in Section 4 (Bidding Forms) and the Employer may require the Bidder to justify its proposed indexes and weightings.

14.6 If so indicated in ITB 1.1, bids are being invited for individual contracts or for any combination of contracts (packages). Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB 14.4, provided the Bids for all contracts are submitted and opened at the same time.

14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.</td>
<td><strong>Currencies of Bid and Payment</strong> 15.1 The currency(ies) of the Bid and payment shall be as specified in the BDS. 15.2 Bidders may be required by the Employer to justify, to the Employer’s satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the prices shown in the appropriate form(s) of Section 4, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.</td>
</tr>
<tr>
<td>16.</td>
<td><strong>Documents Comprising the Technical Proposal</strong> 16.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule, and any other information as stipulated in Section 4 (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders’ proposal to meet the work requirements and the completion time.</td>
</tr>
<tr>
<td>17.</td>
<td><strong>Documents Establishing the Qualifications of the Bidder</strong> 17.1 To establish its qualifications to perform the Contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding information sheets included in Section 4 (Bidding Forms). 17.2 Domestic Bidders, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility in accordance with ITB 35.</td>
</tr>
<tr>
<td>18.</td>
<td><strong>Period of Validity of Bids</strong> 18.1 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. 18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended 28 days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its Bid.</td>
</tr>
<tr>
<td>19.</td>
<td><strong>Bid Security/Bid-Securing Declaration</strong> 19.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS. 19.2 If a Bid-Securing Declaration is required pursuant to ITB 19.1, it shall use the form included in Section 4 (Bidding Forms). The Employer will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if the Bid-Securing Declaration is executed. 19.3 If a bid security is specified pursuant to ITB 19.1, the bid security shall be, at the Bidder’s option, in any of the following forms: (a) an unconditional bank guarantee, (b) an irrevocable letter of credit, or</td>
</tr>
</tbody>
</table>
(c) a cashier's or certified check,
all from a reputable bank from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section 4 (Bidding Forms) or another form acceptable to the Employer. The form must include the complete name of the Bidder. The bid security shall be valid for 28 days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.

19.4 Unless otherwise specified in the BDS, any Bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 19.1, shall be rejected by the Employer as nonresponsive.

19.5 If a bid security is specified pursuant to ITB 19.1, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the performance security pursuant to ITB 42.

19.6 If a bid security is specified pursuant to ITB 19.1, the bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.

19.7 The bid security may be forfeited or the Bid-Securing Declaration executed
(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, except as provided in ITB 18.2; or
(b) if the successful Bidder fails to
   (i) sign the Contract in accordance with ITB 41;
   (ii) furnish a performance security in accordance with ITB 42;
   (iii) accept arithmetical corrections in accordance with ITB 33; or
   (iv) furnish a domestic preference security, if applicable, in accordance with ITB 42.

19.8 The bid security or the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security or the Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1.

20. Format and Signing of Bid

20.1 The Bidder shall prepare one original set of the Technical Bid and one original of the Price Bid comprising the Bid as described in ITB 11 and clearly mark it “ORIGINAL - TECHNICAL BID” and “ORIGINAL - PRICE BID.” Alternative Bids, if permitted in accordance with ITB 13, shall be clearly marked “ALTERNATIVE.” In addition, the Bidder shall submit copies of the Bid in the number specified in the BDS, and clearly mark each of them “COPY.” In the event of any discrepancy
between the original and the copies, the original shall prevail.

20.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for unamended printed literature, shall be signed or initialed by the person signing the Bid. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Employer shall request the Bidder to submit an acceptable authorization within the number of days as specified in the BDS. Failure to provide an acceptable authorization within the prescribed period of receiving such a request shall cause the rejection of the Bid.

20.3 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

D. Submission and Opening of Bids

21. Sealing and Marking of Bids

21.1 Bidders may always submit their Bids by mail or by hand. 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 mail or by hand shall enclose the original of the Technical Bid, the original of the Price Bid, and each copy of the Technical Bid and each copy of the Price Bid, in separate sealed envelopes, duly marking the envelopes as “ORIGINAL - TECHNICAL BID,” “ORIGINAL - PRICE BID,” and “COPY NO… - TECHNICAL BID,” and “COPY NO.... - PRICE BID.” These envelopes, the first containing the originals and the others containing copies, shall then be enclosed in one single envelope per set. If permitted in accordance with ITB 13, alternative Bids shall be similarly sealed, marked and included in the sets. The rest of the procedure shall be in accordance with ITB 21.2 and ITB 21.3.

(b) Bidders submitting Bids electronically shall follow the electronic bid submission procedures specified in the BDS.

21.2 The inner and outer envelopes shall

(a) bear the name and address of the Bidder;
(b) be addressed to the Employer as provided in BDS 22.1; and
(c) bear the specific identification of this bidding process indicated in the BDS 1.1.

21.3 The outer envelopes and the inner envelopes containing the Technical Bid shall bear a warning not to open before the time and date for the opening of Technical Bid, in accordance with ITB 25.1.

21.4 The inner envelopes containing the Price Bid shall bear a warning not
to open until advised by the Employer in accordance with ITB 25.7.

21.5 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

22. **Deadline for Submission of Bids**

22.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the BDS.

22.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

23. **Late Bids**

23.1 The Employer shall not consider any Bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.

24. **Withdrawal, Substitution, and Modification of Bids**

24.1 A Bidder may withdraw, substitute, or modify its Bid – Technical or Price – after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be

(a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWAL,” “SUBSTITUTION,” “MODIFICATION;” and

(b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

24.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid or any extension thereof.

25. **Bid Opening**

25.1 The Employer shall open the Technical Bids in public at the address, on the date, and time specified in the BDS in the presence of Bidders’ designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 21.1, shall be as specified in the BDS. The Price Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening. If the Technical Bid and Price Bid are submitted together in one envelope, the Employer may reject the entire Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.
25.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening.

25.3 Second, outer envelopes marked “SUBSTITUTION” shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 25.1. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

25.4 Next, outer envelopes marked “MODIFICATION” shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original and Modification, will remain unopened in accordance with ITB 25.1.

25.5 All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:
(a) the name of the Bidder;
(b) whether there is a modification or substitution;
(c) the presence of a bid security or a Bid-Securing Declaration, if required; and
(d) any other details as the Employer may consider appropriate.

Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Technical Bid are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with ITB 23.1.

25.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum, the name of the Bidder and whether there is a withdrawal, substitution, or modification; alternative proposals; and the presence or absence of a bid security or a Bid-Securing Declaration, if one was required. The Bidders’ representatives who are present shall be requested to sign the record. The omission of a Bidder’s signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.

25.7 At the end of the evaluation of the Technical Bids, the Employer will invite bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to
attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice for the opening of Price Bids.

25.8 The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially nonresponsive to the requirements of the Bidding Document and return their Price Bids unopened.

25.9 The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, in the presence of Bidders’ representatives who choose to attend at the address, on the date, and time specified by the Employer. The Bidder’s representatives who are present shall be requested to sign a register evidencing their attendance.

25.10 All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded:
(a) the name of the Bidder;
(b) whether there is a modification or substitution;
(c) the Bid Prices, including any discounts and alternative offers; and
(d) any other details as the Employer may consider appropriate.
Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Price Bid and Schedules are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Price Bids.

25.11 The Employer shall prepare a record of the opening of Price Bids that shall include, as a minimum, the name of the Bidder, the Bid Price (per lot if applicable), any discounts, and alternative offers. The Bidders’ representatives who are present shall be requested to sign the record. The omission of a Bidder’s signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.

E. Evaluation and Comparison of Bids

26. Confidentiality

26.1 Information relating to the examination, evaluation, comparison, and postqualification of Bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.

26.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.

26.3 Notwithstanding ITB 26.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any
matter related to the bidding process, it may do so in writing.

27. Clarification of Bids

27.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bids, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer’s request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Price Bids, in accordance with ITB 33.

27.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer’s request for clarification, its Bid may be rejected.

28. Deviations, Reservations, and Omissions

28.1 During the evaluation of bids, the following definitions apply:

(a) “Deviation” is a departure from the requirements specified in the Bidding Document;

(b) “Reservation” is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and

(c) “Omission” is the failure to submit part or all of the information or documentation required in the Bidding Document.

29. Examination of Technical Bids

29.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted.

29.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the offer shall be rejected.

(a) Letter of Technical Bid;

(b) written confirmation of authorization to commit the Bidder;

(c) Bid Security or Bid-Securing Declaration, if applicable; and

(d) Technical Proposal in accordance with ITB 16.

30. Responsiveness of Technical Bid

30.1 The Employer’s determination of a Bid’s responsiveness is to be based on the contents of the Bid itself, as defined in ITB 11.

30.2 A substantially responsive Technical Bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,

(a) if accepted, would:

(i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or

(ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer’s rights or the Bidder’s obligations under the proposed Contract; or
(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.

30.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of Section 6 (Employer’s Requirements) have been met without any material deviation, reservation, or omission.

30.4 If a Bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

31. Nonmaterial Nonconformities

31.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid that do not constitute a material deviation, reservation, or omission.

31.2 Provided that a Technical Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

31.3 Provided that a Technical Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the method indicated in Section 3 (Evaluation and Qualification Criteria).

32. Qualification of the Bidder

32.1 The Employer shall determine to its satisfaction during the evaluation of Technical Bids whether Bidders meet the qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).

32.2 The determination shall be based upon an examination of the documentary evidence of the Bidder’s qualifications submitted by the Bidder, pursuant to ITB 17.1.

32.3 An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder’s Price Bid. A negative determination shall result into the disqualification of the Bid, in which event the Employer shall return the unopened Price Bid to the Bidder.

33. Correction of Arithmetical Errors

33.1 During the evaluation of Price Bids, the Employer shall correct arithmetical errors on the following basis:

(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.

(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 Price Bid, the bid price in the Summary of Bill of Quantities will prevail and the bid amount in item (c) of the Letter of Price 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.

33.2 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 may be forfeited or its Bid-Securing Declaration executed.

34. Conversion to Single Currency

34.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS.

35. Margin of Preference

35.1 Unless otherwise specified in the BDS, a margin of preference shall not apply.

36. Evaluation of Price Bids

36.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.

36.2 To evaluate the Price Bid, the Employer shall consider the following:

(a) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurement contracts, or Schedule of Prices for lump sum contracts, but including Daywork items, where priced competitively;

(b) price adjustment for correction of arithmetic errors in accordance with ITB 33.1;

(c) price adjustment due to discounts offered in accordance with ITB 14.4;

(d) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 34;

(e) adjustment for nonconformities in accordance with ITB 31.3; and

(f) application of all the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria).

36.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.

36.4 If this Bidding Document allows Bidders to quote separate prices for different contracts, and to award multiple contracts to a single Bidder, the methodology to determine the lowest evaluated price of the
contract combinations, including any discounts offered in the Letter of Price Bid, is specified in Section 3 (Evaluation and Qualification Criteria).

36.5 If the Bid for an admeasurement contract, which results in the lowest Evaluated Bid Price, is seriously unbalanced, front loaded or substantially below updated estimates in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses 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 analyses, 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 to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

37. Comparison of Bids

37.1 The Employer shall compare all substantially responsive Bids to determine the lowest evaluated Bid, in accordance with ITB 36.2.

38. Employer’s Right to Accept Any Bid, and to Reject Any or All Bids

38.1 The Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

F. Award of Contract

39. Award Criteria

39.1 The Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

40. Notification of Award

40.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted.

40.2 At the same time, the Employer shall also notify all other Bidders of the results of the bidding. The Employer will publish in an English language newspaper or well-known freely accessible website the results identifying the bid and lot numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. After publication of the award, unsuccessful Bidders may request in writing to the Employer for a debriefing seeking explanations on the grounds on which their Bids were not selected. The Employer shall promptly respond in writing to any unsuccessful Bidder who, after publication of contract award, requests a debriefing.

40.3 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

41. Signing of

41.1 Promptly after notification, the Employer shall send the successful
Section 1 - Instructions to Bidders

**Contract**

Bidder the Contract Agreement.

41.2 Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

**42. Performance Security**

42.1 Within 28 days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, subject to ITB 36.5, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Employer.

42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

42.3 The above provision shall also apply to the furnishing of a domestic preference security, if so required.

**43. Provision of PPA and PPR (Applicable in case of GoN funded projects)**

43.1 If any provision of this document are inconsistent with Public Procurement Act (PPA), 2063 or Public Procurement Regulations (PPR), 2064, and their amendments, the provision of this documents shall be void to the extent of such inconsistency and the provision of PPA and PPR shall prevail.
Section 2
Bid Data Sheet
A. General

ITB 1.1 The number of the Invitation for Bids is: Bldg / 01/073/074

ITB 1.1 The employer is: District Education Office, Banke

ITB 1.1 The name of the bidding process is: Works NCB Single Stage Two Envelope

The identification number of the bidding process is: Bldg / 01/073/074

ITB 2.2 The borrower is: Nepal

The name of the project is: Construction of District Education Office Building

B. Contents of Bidding Documents

ITB 7.1 For clarification purposes only, the Employer's address is:

Attention: Bhanu bhakta Neupane creator

Address: Banke

Telephone: 9849055410

Fax:

Email Address: bbneupane2017@gmail.com

Requests for clarification should be received by the Employer no later than:

ITB 7.4 A Pre-bid meeting shall take place.

Date and Time: 11-05-2017 11:00

Place: District Education Office, Banke

Banke

Nepalgunj, Banke

Nepal

ITB 7.4 A site visit shall not be organized by the employer.

C. Preparation of Bids

ITB 10.1 The language of the bid is English

ITB 11.2 (g) The Bidder shall submit with its Technical Bid the following additional documents:

<table>
<thead>
<tr>
<th>SL No</th>
<th>Document Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
</tr>
</tbody>
</table>

ITB 11.3 (b) In accordance with ITB 12 and ITB 14, the following schedules shall be submitted with the bid, including the priced Bill of Quantities for admeasurement contracts and Activity Schedule for lump sum contracts:

<table>
<thead>
<tr>
<th>SL No</th>
<th>Document Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
</tr>
</tbody>
</table>

ITB 11.3 (d) The Bidder shall submit with its Price Bid the following additional documents:
<table>
<thead>
<tr>
<th>SL No</th>
<th>Document Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ITB 12.1 The units and rates in figures entered into the Bill of Quantities and Daywork Schedule should be typewritten or if written by hand, must be in print form. Bill of Quantities and Daywork Schedule not presented accordingly may be considered non-responsive.</td>
</tr>
<tr>
<td></td>
<td>ITB 13.1 Alternative bids are not permitted.</td>
</tr>
<tr>
<td></td>
<td>ITB 13.2 Alternative times for completion are not permitted.</td>
</tr>
<tr>
<td></td>
<td>ITB 13.4 Alternative technical solutions shall be permitted for the following parts of the Works: None.</td>
</tr>
<tr>
<td></td>
<td>ITB 14.5 The prices quoted by the Bidder shall not be subject to adjustment during the performance of the Contract.</td>
</tr>
<tr>
<td></td>
<td>ITB 15.1 The prices shall be quoted by the bidder and shall be paid in: Nepali Rupees</td>
</tr>
<tr>
<td></td>
<td>ITB 18.1 The bid validity period shall be 120 days.</td>
</tr>
<tr>
<td></td>
<td>ITB 19.1 The Bidder shall furnish a bid security in the amount of: 1132367 NPR or equivalent.</td>
</tr>
<tr>
<td></td>
<td>ITB 19.2 The ineligibility period will be: Not Applicable</td>
</tr>
<tr>
<td></td>
<td>ITB 19.4 Any bid not accompanied by an irrevocable and callable bid security shall be rejected by the Employer as nonresponsive. However, if a bidder submits a bid security that deviates in form, amount and/or period of validity, the Employer shall request the Bidder to submit a compliant bid security within 0 days of receiving such a request. Failure to provide a compliant bid security within the prescribed period of receiving such a request shall cause the rejection of the Bid.</td>
</tr>
<tr>
<td></td>
<td>ITB 20.1 In addition to the original Bid, the number of copies is: 0</td>
</tr>
<tr>
<td></td>
<td>ITB 20.2 The written confirmation of authorization to sign on behalf of the Bidder shall consist of: [insert the name and description of the documentation required to demonstrate the authority of the signatory to sign the bid. Employer may wish to consider the following language: &quot;An organizational document, board resolution or its equivalent, or power of attorney specifying the representative's authority to sign the Bid on behalf of, and to legally bind, the Bidder. If the Bidder is an intended or an existing joint venture, the power of attorney should be signed by all partners and specify the authority of the named representative of the Joint Venture to sign on behalf of, and legally bind, the intended or existing Joint Venture. If the Joint Venture has not yet been formed, also include evidence from all proposed Joint Venture partners of their intent to enter into a Joint Venture in the event of a contract award in accordance with ITB 11.2.&quot;]</td>
</tr>
<tr>
<td></td>
<td>ITB 20.2 The Bidder shall submit an acceptable authorization within 0 days.</td>
</tr>
<tr>
<td></td>
<td>D. Submission and Opening of Bids</td>
</tr>
<tr>
<td>ITB 21.1</td>
<td>Bidders have the option of submitting their Bids electronically.</td>
</tr>
<tr>
<td>ITB 21.1 (b)</td>
<td>If bidders shall have the option of submitting their Bids electronically, the electronic bidding submission procedures shall be: As per Annex 1</td>
</tr>
<tr>
<td>ITB 25.1</td>
<td>The opening of the Technical bid shall take place at:</td>
</tr>
<tr>
<td></td>
<td>Address: District Education Office, Banke</td>
</tr>
<tr>
<td></td>
<td>Banke</td>
</tr>
<tr>
<td></td>
<td>Nepalgunj, Banke</td>
</tr>
<tr>
<td></td>
<td>Nepal</td>
</tr>
<tr>
<td></td>
<td>Date and Time: 22-05-2017 14:00</td>
</tr>
<tr>
<td></td>
<td>The specific bid opening procedures shall be: As per Annex 1</td>
</tr>
<tr>
<td>ITB 25.5</td>
<td>The Letter of Technical Bid shall be initialed by 3 representatives of the Employer attending the Bid opening.</td>
</tr>
<tr>
<td>ITB 25.10</td>
<td>The Letter of Price Bid and Schedules shall be initialed by 3 representatives of the Employer attending the Bid opening.</td>
</tr>
</tbody>
</table>

**E. Evaluation and Comparison of Bids**

| ITB 34.1 | Not Applicable |
Section 3
Evaluation and Qualification Criteria
1. Evaluation Criteria

1.1 Adequacy of Technical Proposal

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Criteria Title</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adequacy of Technical Proposal</td>
<td>Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity, to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section V (Works Requirements)</td>
</tr>
</tbody>
</table>

1.2 Completion Time

Not Applicable

1.3 Technical Alternatives

Not Applicable

1.4 Quantifiable Non-conformities and Omissions

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Criteria Title</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quantifiable Non-conformities and Omissions</td>
<td>The evaluated amount of quantifiable nonconformities, errors and/or omissions shall be determined by ascertaining the price of such effect on an equal basis by adjusting the same to the quoted price of the bid. A bid having minor deviations and having no material deviation to cause any serious effect upon the scope, quality, characteristics, terms and conditions, performance or any other requirements stated in the bidding documents and acceptable to the Employer can be considered to be substantially responsive</td>
</tr>
</tbody>
</table>

1.5 Domestic Preference

Not Applicable

2. Qualifications Criteria

It is the legal entity or entities comprising the Bidder, and not the Bidder’s parent companies, subsidiaries, or affiliates, that must satisfy the qualification criteria described below.

2.1 Eligibility

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Criteria Title</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nationality</td>
<td>Nationality in accordance with ITB Subclause 4.2. Single entity must meet requirements. In case of joint ventures, each partner must meet requirement. Document required: Forms ELI 1; ELI 2 with attachments</td>
</tr>
<tr>
<td>2</td>
<td>Conflict of Interest</td>
<td>No conflicts of interest in accordance with ITB Subclause 4.3. Single entity must meet requirements. In case of joint ventures, each partner must meet requirement. Document required: Letter of Technical Bid</td>
</tr>
<tr>
<td>3</td>
<td>Government-Owned Enterprise</td>
<td>Bidder required to meet conditions of ITB Subclause 4.5. Single entity must meet requirements. In case of joint ventures, each partner must meet requirement. Document required: Forms ELI 1; ELI 2 with attachments</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Criteria Title</td>
<td>Criteria Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>United Nations Eligibility</td>
<td>Not having been excluded by an act of compliance with a UN Security Council resolution in accordance with ITB Subclause 4.7. Single entity must meet requirements. In case of joint ventures, each partner must meet requirement. Document required: Letter of Technical Bid</td>
</tr>
</tbody>
</table>

### 2.2 Pending Litigation and Arbitration

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Criteria Title</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pending Litigation and Arbitration</td>
<td>All pending litigation and arbitration, if any, shall be treated as resolved against the Bidder and so shall in total not represent more than <strong>50</strong> percent of the Bidder's net worth calculated as the difference between total assets and total liabilities. In case of single entities, must meet requirement by itself or as partner to past or existing Joint Venture. In case of joint ventures, each partner must meet requirement by itself or as partner to past or existing Joint Venture. Document required: Form LIT-1</td>
</tr>
</tbody>
</table>

### 2.3 Financial Situation

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Criteria Title</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Historical Financial Performance</td>
<td>Submission of audited balance sheets and income statements, for the last five years to demonstrate the current soundness of the Bidder's financial position. As a minimum, a Bidder's net worth calculated as the difference between total assets and total liabilities should be positive. Single entity must meet requirements. Each partner of a joint venture must meet requirements. Document required: Forms FIN 1 with attachment</td>
</tr>
<tr>
<td>2</td>
<td>Average Annual Construction Turnover</td>
<td>Minimum average annual construction turnover of NRS 36029875 calculated as total certified payments received for construction contracts in progress or completed, within best three years out of last ten years. Single entity must meet requirements. In case of joint venture, all partners combined must meet requirements and each partner must meet 25% of the requirement and one partner must meet 40% of the requirement. Document required: Form FIN -2</td>
</tr>
</tbody>
</table>
### 2.4 Construction Experience

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Criteria Title</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contracts of Similar Size and Nature</td>
<td>Participation as Prime contractor, management contractor, or subcontractor, in at least 1 contracts within the last ten (10) years, each with a value of at least NRS 22446730 that have been successfully or are substantially completed and that are similar to the proposed works. The similarity shall be based on the physical size, complexity, methods, technology or other characteristics as described in Section V, Works Requirements. Single entity must meet requirements. In case of joint venture, all partners combined must meet requirement. and nature. Document required: Form EXP-1</td>
</tr>
<tr>
<td>2</td>
<td>Construction Experience in Key Activities</td>
<td>For the above or other contracts executed during the period stipulated in 2.4.2(a) above, a minimum construction experience in the f</td>
</tr>
<tr>
<td>3</td>
<td>General Construction Experience</td>
<td>Experience under construction contracts in the role of contractor, subcontractor, or management contractor for at least the last five years prior to the applications submission deadline. Single entity must meet requirements. In case of joint venture, each partner must meet requirements. Document required: Form EXP - 1</td>
</tr>
</tbody>
</table>
Section 4
Bidding Forms
# Section 4 - Bidding Forms

## Table of Forms

<table>
<thead>
<tr>
<th>Form</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter of Technical Bid</td>
<td>4-2</td>
</tr>
<tr>
<td>Letter of Price Bid</td>
<td>4-4</td>
</tr>
<tr>
<td>Bid Security</td>
<td>4-6</td>
</tr>
<tr>
<td>Bid-Securing Declaration</td>
<td>4-7</td>
</tr>
<tr>
<td>Technical Proposal</td>
<td>4-8</td>
</tr>
<tr>
<td>Personnel</td>
<td>4-8</td>
</tr>
<tr>
<td>Form PER – 1: Proposed Personnel</td>
<td>4-8</td>
</tr>
<tr>
<td>Form PER – 2: Resume of Proposed Personnel</td>
<td>4-9</td>
</tr>
<tr>
<td>Equipment</td>
<td>4-10</td>
</tr>
<tr>
<td>Site Organization</td>
<td>4-11</td>
</tr>
<tr>
<td>Method Statement</td>
<td>4-11</td>
</tr>
<tr>
<td>Mobilization Schedule</td>
<td>4-11</td>
</tr>
<tr>
<td>Construction Schedule</td>
<td>4-11</td>
</tr>
<tr>
<td>Bidder’s Qualification</td>
<td>4-12</td>
</tr>
<tr>
<td>Form ELI - 1: Bidder’s Information Sheet</td>
<td>4-13</td>
</tr>
<tr>
<td>Form ELI - 2: Joint Venture Information Sheet</td>
<td>4-14</td>
</tr>
<tr>
<td>Form LIT - 1: Pending Litigation and Arbitration</td>
<td>4-15</td>
</tr>
<tr>
<td>Form FIN - 1: Historical Financial Performance</td>
<td>4-16</td>
</tr>
<tr>
<td>Form FIN - 2: Average Annual Construction Turnover</td>
<td>4-17</td>
</tr>
<tr>
<td>Form FIN - 3: Availability of Financial Resources</td>
<td>4-18</td>
</tr>
<tr>
<td>Form FIN - 4: Financial Requirement for Current Contract Commitments</td>
<td>4-19</td>
</tr>
<tr>
<td>Form FIN - 5: Compliance Check of Financial Resources</td>
<td>4-20</td>
</tr>
<tr>
<td>Form EXP - 1: Contracts of Similar Size and Nature</td>
<td>4-21</td>
</tr>
<tr>
<td>Form EXP - 2: Construction Experience in Key Activities</td>
<td>4-22</td>
</tr>
<tr>
<td>Schedules</td>
<td>4-23</td>
</tr>
<tr>
<td>Schedule of Payment Currencies</td>
<td>4-23</td>
</tr>
<tr>
<td>Tables of Adjustment Data</td>
<td>4-24</td>
</tr>
<tr>
<td>Activity Schedule</td>
<td>4-25</td>
</tr>
<tr>
<td>Bill of Quantities</td>
<td>4-26</td>
</tr>
</tbody>
</table>
Letter of Technical Bid

Note: The bidder must accomplish the Letter of Technical Bid on its letterhead clearly showing the bidder's complete name and address.

Date: ........................................
ICB/NCB No.: ........................................
Invitation for Bid No.: ........................................

To: ..........................................................................................................................

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.

(b) We offer to execute in conformity with the Bidding Documents the following Works: _________

(c) Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of . . . . 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.

(d) Our firm, including any Subcontractors or Suppliers for any part of the Contract, have nationalities from eligible countries in accordance with ITB 4.2.

(e) We, including any Subcontractors or Suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3.

(f) We are not participating, as a Bidder in more than one Bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers submitted in accordance with ITB 13.

(g) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by ADB, under the Employer’s country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council.
We are not a government-owned enterprise] / [We are a government-owned enterprise but meet the requirements of ITB 4.5].

We agree to permit ADB 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 ADB.

If our Bid is accepted, we commit to mobilizing key equipment and personnel in accordance with the requirements set forth in Section 6 (Employer’s Requirements) and our technical proposal, or as otherwise agreed with the Employer.

Name ..............................................................................................................................
In the capacity of ..............................................................................................................
Signed .............................................................................................................................
Duly authorized to sign the Bid for and on behalf of ......................................................
Date .................................................................................................................................

1 Use one of the two options as appropriate.
Letter of Price Bid

Note

The bidder must accomplish the Letter of Price Bid on its letterhead clearly showing the bidder’s complete name and address.

Date: ..........................................
ICB/NCB No.: ..................................
Invitation for Bid No.: ..................................

To:.................................................................................................................................

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.

(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:

   [amount of foreign currency in words], [amount in figures], and [amount of local currency in words], [amount in figures]

   The total bid price from the Summary of Bill of Quantities for admeasurement contracts or Activity Schedule for lump sum contracts should be entered by the bidder inside this box. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the bid.

(d) The discounts offered and the methodology for their application are as follows:

(e) Our Bid shall be valid for a period of . . . . 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 Documents.
(g) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract:  

<table>
<thead>
<tr>
<th>Name of Recipient</th>
<th>Address</th>
<th>Reason</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(h) 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.

(i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(j) We agree to permit ADB 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 ADB.

Name ........................................................................................................................................
In the capacity of ........................................................................................................................
Signed ........................................................................................................................................
Duly authorized to sign the Bid for and on behalf of ............................................................... 
Date ........................................................................................................................................

---

1 If none has been paid or is to be paid, indicate "None".
Bid Security

Bank Guarantee

Bank’s name, and address of issuing branch or office

Beneficiary: ............................................. Name and address of employer .............................................

Date: .............................................

Bid Security No.: .............................................

We have been informed that . . . . name of the bidder . . . . (hereinafter called “the Bidder”) has submitted to you its bid dated . . . . (hereinafter called “the Bid”) for the execution of . . . . name of contract . . . . under Invitation for Bids No. . . . . (“the IFB”).

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) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Letter of Technical Bid and Letter of Price Bid; or

(b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter “the ITB”); or

(c) 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, or (iii) fails or refuses to furnish the domestic preference security, if required.

This guarantee will expire (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the Performance Security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy your notification to the Bidder of the name of the successful Bidder, or (ii) 28 days after the expiration of the Bidder’s bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.2

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

--- Note ---

In case of a joint venture, the bid security must be in the name of all partners to the joint venture that submits the bid.

---

1. All italicized text is for use in preparing this form and shall be deleted from the final document.
2. Or 758 as applicable.
Bid-Securing Declaration

Date: [insert date (as day, month and year)]

Bid No.: [insert number of bidding process]

Alternative No.: [insert identification No if this is a bid for an alternative]

To: [insert complete name of employer]

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with the Borrower for the period of time of [insert the number of months or years indicated in ITB 19.2 of the BDS] starting on the date that we receive a notification from the Employer, if we are in breach of our obligation(s) under the bid conditions, because we

(a) have withdrawn our Bid during the period of bid validity specified in the Letter of Technical Bid and Letter of Price Bid; or

(b) do not accept the correction of errors in accordance with the Instruction to Bidders (hereinafter “the ITB”); or

(c) having been notified of the acceptance of our Bid by the Employer during the period of bid validity, (i) fail or refuse to execute the Contract, if required, (ii) fail or refuse to furnish the Performance Security, in accordance with the ITB, or (iii) fail or refuse to furnish the Domestic Preference Security, if required.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) 28 days after the expiration of our Bid.

Signed: [insert signature of person whose name and capacity are shown]

In the capacity of [insert legal capacity of person signing the Bid-Securing Declaration]

Name: [insert complete name of person signing the Bid-Securing Declaration]

Duly authorized to sign the bid for and on behalf of: [insert complete name of bidder]

Dated on ____________ day of __________________, _______

Corporate Seal [where appropriate]

[Note] In case of a joint venture, the Bid-Securing Declaration must be in the name of all partners to the joint venture that submits the bid.
Technical Proposal

Personnel

Form PER – 1: Proposed Personnel
Bidder should provide the details of the proposed personnel and their experience record in the relevant Information Forms below for each candidate:

<table>
<thead>
<tr>
<th></th>
<th>Title of position*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

*As listed in Section 6 (Employer’s Requirements).*
Form PER – 2: Resume of Proposed Personnel

The Bidder shall provide all the information requested below. Use one form for each position.

<table>
<thead>
<tr>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personnel information</th>
<th>Name</th>
<th>Date of birth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Professional qualifications | | |
|----------------------------| | |

<table>
<thead>
<tr>
<th>Present employment</th>
<th>Name of employer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address of employer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telephone</th>
<th>Contact (manager / personnel officer)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fax</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job title</th>
<th>Years with present employer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Company / Project / Position / Relevant Technical and Management Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Equipment

Form EQU: Equipment

The Bidder shall provide adequate information and details to demonstrate clearly that it has the capability to meet the equipment requirements indicated in Section 6 (Employer’s Requirements), using the Forms below. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

<table>
<thead>
<tr>
<th>Item of Equipment</th>
<th>Information</th>
<th>Model and power rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Info</td>
<td>Name of manufacturer</td>
<td>Model and power rating</td>
</tr>
<tr>
<td></td>
<td>Capacity</td>
<td>Year of manufacture</td>
</tr>
<tr>
<td>Current Status</td>
<td>Current location</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Details of current commitments</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Indicate source of the equipment</td>
<td>Owner</td>
</tr>
<tr>
<td></td>
<td>Owned</td>
<td>Rented</td>
</tr>
</tbody>
</table>

Omit the following information for equipment owned by the Bidder.

<table>
<thead>
<tr>
<th>Owner</th>
<th>Name of owner</th>
<th>Address of owner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agreements</th>
<th>Details of rental / lease / manufacture agreements specific to the project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Site Organization

Method Statement

Mobilization Schedule

Construction Schedule
Bidders Qualification

To establish its qualifications to perform the contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.
Form ELI - 1: Bidder’s Information Sheet

<table>
<thead>
<tr>
<th>Bidder’s Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidder’s legal name</td>
</tr>
<tr>
<td>In case of Joint Venture, legal name of each partner</td>
</tr>
<tr>
<td>Bidder’s country of constitution</td>
</tr>
<tr>
<td>Bidder’s year of constitution</td>
</tr>
<tr>
<td>Bidder’s legal address in country of constitution</td>
</tr>
<tr>
<td>Bidder’s authorized representative (name, address, telephone numbers, fax numbers, e-mail address)</td>
</tr>
</tbody>
</table>

**Attached are copies of the following documents.**

- 1. In case of single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2.
- 2. Authorization to represent the firm or Joint Venture named above, in accordance with ITB 20.2.
- 3. In case of Joint Venture, letter of intent to form Joint Venture or Joint Venture agreement, in accordance with ITB 4.1.
- 4. In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5.
Form ELI - 2: Joint Venture Information Sheet

Each member of the Joint Venture and Specialist Subcontractor must fill out this form separately.

<table>
<thead>
<tr>
<th>Joint Venture / Specialist Subcontractor Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidder’s legal name</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Joint Venture Partner’s or Specialist Subcontractor’s</td>
</tr>
<tr>
<td>legal name</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Joint Venture Partner’s or Specialist Subcontractor’s</td>
</tr>
<tr>
<td>country of constitution</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Joint Venture Partner’s or Specialist Subcontractor’s</td>
</tr>
<tr>
<td>year of constitution</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Joint Venture Partner’s or Specialist Subcontractor’s</td>
</tr>
<tr>
<td>legal address in country of constitution</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Joint Venture Partner’s or Specialist Subcontractor’s</td>
</tr>
<tr>
<td>authorized representative information</td>
</tr>
<tr>
<td>(name, address, telephone numbers, fax numbers, e-mail</td>
</tr>
<tr>
<td>address)</td>
</tr>
</tbody>
</table>

Attached are copies of the following documents.

- 1. Articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2.
- 2. Authorization to represent the firm named above, in accordance with ITB 20.2.
- 3. In the case of government-owned enterprise, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5.

Specialist Subcontractor is a specialist enterprise engaged for highly specialized processes that cannot be provided by the main Contractor.
Form LIT – 1: Pending Litigation and Arbitration

Each Bidder must fill out this form if so required under Criterion 2.2 of Section 3 (Evaluation and Qualification Criteria) to describe any pending litigation or arbitration formally commenced against it.

In case of joint ventures, each Joint Venture Partner must fill out this form separately, and provide the Joint Venture Partner name below:

Joint Venture Partner: ____________________

<table>
<thead>
<tr>
<th>Year</th>
<th>Matter in Dispute</th>
<th>Value of Pending Claim in US$ Equivalent</th>
<th>Value of Pending Claim as a Percentage of Net Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Note** -

*This form shall only be included if Criterion 2.2 of Section 3 (Evaluation and Qualification Criteria) is applicable.*
Form FIN - 1: Historical Financial Performance

Each Bidder must fill out this form.

In case of joint ventures, each Joint Venture Partner must fill out this form separately, and provide the Joint Venture Partner name below:

Joint Venture Partner: ___________________

<table>
<thead>
<tr>
<th>Financial Data for Previous ___ Years [US$ Equivalent]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1:</td>
</tr>
</tbody>
</table>

Information from Balance Sheet

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets (TA)</td>
<td></td>
</tr>
<tr>
<td>Total Liabilities (TL)</td>
<td></td>
</tr>
<tr>
<td>Net Worth = TA – TL</td>
<td></td>
</tr>
<tr>
<td>Current Assets (CA)</td>
<td></td>
</tr>
<tr>
<td>Current Liabilities (CL)</td>
<td></td>
</tr>
<tr>
<td>Working Capital = CA - CL</td>
<td></td>
</tr>
</tbody>
</table>

Most Recent Working Capital | To be obtained for most recent year and carried forward to FIN-3 Line 1; in case of Joint Ventures, to the corresponding Joint Venture Partner’s FIN-3.

Information from Income Statement

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenues</td>
<td></td>
</tr>
<tr>
<td>Profits Before Taxes</td>
<td></td>
</tr>
<tr>
<td>Profits After Taxes</td>
<td></td>
</tr>
</tbody>
</table>

Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last ___ years, as indicated above, complying with the following conditions.

- Unless otherwise required by Section 3 of the Bidding Document, all such documents reflect the financial situation of legal entity or entities comprising the Bidder and not the Bidder’s parent companies, subsidiaries, or affiliates.
- Historical financial statements must be audited by a certified accountant.
- Historical financial statements must be complete, including all notes to the financial statements.
- Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).
Form FIN - 2: Average Annual Construction Turnover

Each Bidder must fill out this form.

The information supplied should be the Annual Turnover of the Bidder or each member of a Joint Venture in terms of the amounts billed to clients for each year for work in progress or completed, converted to US Dollars at the specified exchange rate.

In case of joint ventures, each Joint Venture Partner must fill out this form separately, and provide the Joint Venture Partner name below:

Joint Venture Partner: ___________________

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount Currency</th>
<th>Exchange Rate</th>
<th>US$ Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average Annual Construction Turnover
Form FIN – 3: Availability of Financial Resources

Bidder must demonstrate sufficient financial resources, usually comprising of Working Capital supplemented by credit line statements or overdraft facilities and others to meet the Bidder’s financial requirements for

(a) its current contract commitments, and

(b) the subject contract.

In case of joint ventures, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner name below:

Joint Venture Partner: ___________________

<table>
<thead>
<tr>
<th>No.</th>
<th>Source of financing</th>
<th>Amount (US$ equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Working Capital (to be taken from FIN-1)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Credit Line&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Other Financial Resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Available Financial Resources</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> To be substantiated by a letter from the bank issuing the line of credit.
Form FIN- 4: Financial Resources Requirement

Bidders (or each Joint Venture partner) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

In case of joint ventures, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner name below:

Joint Venture Partner: ___________________

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Contract</th>
<th>Employer’s Contact (Address, Tel, Fax)</th>
<th>Contract Completion Date</th>
<th>Outstanding Contract Value (X)</th>
<th>Remaining Contract Period in months (Y)</th>
<th>Monthly Financial Resources Requirement (X / Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Monthly Financial Requirements for Current Contract Commitments: US$ ……………………..
Form FIN - 5: Compliance Check of Financial Resources (Criterion 2.3.3 of Section 3)

Form FIN-5A: For Single Entities

<table>
<thead>
<tr>
<th>For Single Entities:</th>
<th>Total Available Financial Resources from FIN-3 (C)</th>
<th>Total Monthly Requirement for Current Contract Commitments (CCC) from FIN-4 (D)</th>
<th>Available Financial Resources net of CCC (C-D)</th>
<th>≥</th>
<th>Requirementa</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Name of Bidder)</td>
<td>____________________________</td>
<td>____________________________</td>
<td>____________________________</td>
<td>≥</td>
<td>100% of Requirement from Section 3 - 2.3.3(b)</td>
</tr>
</tbody>
</table>

Form FIN-5B: For Joint Ventures

<table>
<thead>
<tr>
<th>For Joint Ventures:</th>
<th>Total Available Financial Resources from FIN-3 (C)</th>
<th>Total Monthly Requirement for Current Contract Commitments (CCC) from FIN-4 (D)</th>
<th>Available Financial Resources net of CCC (C-D)</th>
<th>≥</th>
<th>Requirementa</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Partner:</td>
<td></td>
<td></td>
<td></td>
<td>≥</td>
<td>B(%) of Requirement</td>
</tr>
<tr>
<td>(Name of Partner)</td>
<td>____________________________</td>
<td>____________________________</td>
<td>____________________________</td>
<td>≥</td>
<td>____________________</td>
</tr>
<tr>
<td>Each (Other) Partner:</td>
<td></td>
<td></td>
<td></td>
<td>≥</td>
<td>A(%) of Requirement</td>
</tr>
<tr>
<td>(Name of Partner 1)</td>
<td>____________________________</td>
<td>____________________________</td>
<td>____________________________</td>
<td>≥</td>
<td>____________________</td>
</tr>
<tr>
<td>(Name of Partner 2)</td>
<td>____________________________</td>
<td>____________________________</td>
<td>____________________________</td>
<td>≥</td>
<td>____________________</td>
</tr>
<tr>
<td>(Name of Partner 3)</td>
<td>____________________________</td>
<td>____________________________</td>
<td>____________________________</td>
<td>≥</td>
<td>____________________</td>
</tr>
</tbody>
</table>

All partners combined

Σ (C-D)b = ____________________________

≥

100% of Requirement from Section 3 - 2.3.3(b)

Note

Form FIN - 5 is made available for use by the bidder as a self-assessment tool, and by the employer as evaluation work sheet, to determine compliance with financial resources.

a Requirement for the subject contract is defined in Criterion 2.3.3(b) of Section 3. Value A is the required percentage of the subject contract, which each partner must meet; and value B is the required percentage of the subject contract, which one partner must meet. A and B values are defined in Criterion 2.3.3 of Section 3 (Evaluation and Qualification Criteria).

b Σ (C - D) = sum of available financial resources net of current contract commitments (CCC) for all partners.
Form EXP – 1: Contracts of Similar Size and Nature

Fill up one (1) form per contract.

<table>
<thead>
<tr>
<th>Contract of Similar Size and Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contract No</strong> . . . . of . . . .</td>
</tr>
<tr>
<td><strong>Award Date</strong></td>
</tr>
<tr>
<td><strong>Total Contract Amount</strong></td>
</tr>
<tr>
<td>If partner in a Joint Venture or subcontractor, specify participation of total contract amount</td>
</tr>
<tr>
<td><strong>Employer’s Name</strong></td>
</tr>
<tr>
<td><strong>Telephone/Fax Number</strong></td>
</tr>
</tbody>
</table>

**Description of the similarity in accordance with Criterion 2.4.1 of Section 3**
Form EXP - 2: Construction Experience in Key Activities

Fill up one (1) form per contract.

<table>
<thead>
<tr>
<th>Contract No . . . . . . . . . .</th>
<th>Contract Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award Date</td>
<td>Completion Date</td>
</tr>
<tr>
<td>Total Contract Amount</td>
<td>US$</td>
</tr>
<tr>
<td>If partner in a Joint Venture or subcontractor, specify participation of total contract amount</td>
<td>Percent of Total</td>
</tr>
<tr>
<td>Employer’s Name</td>
<td>Address</td>
</tr>
<tr>
<td></td>
<td>Telephone Number</td>
</tr>
<tr>
<td></td>
<td>Fax Number</td>
</tr>
<tr>
<td></td>
<td>E-mail</td>
</tr>
</tbody>
</table>

**Description of the key activities in accordance with Criterion 2.4.2 of Section 3**
Schedule of Payment Currencies

For .................................. insert name of Section of the Works ........................................

Separate tables may be required if the various sections of the Works (or of the Bill of Quantities) will have substantially different foreign and local currency requirements. In such a case, the Employer should prepare separate tables for each Section of the Works.

<table>
<thead>
<tr>
<th>Name of Payment Currency</th>
<th>Amount of Currency</th>
<th>Rate of Exchange to Local Currency</th>
<th>Local Currency Equivalent $C = A x B$</th>
<th>Percentage of Net Bid Price (NBP) $\frac{100xC}{NBP}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Currency</td>
<td></td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Currency #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Currency #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Currency #3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Bid Price</td>
<td></td>
<td></td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td>Provisional Sums</td>
<td></td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Expressed in Local</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BID PRICE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note**

The rates of exchange shall be the selling rates 28 days prior to the deadline for submission of bids published by the source specified in BDS 15.
Price Adjustment : Table A - Local Currency

NA
Activity Schedule

[Schedules of Prices – Lump Sum Contract]

The Employer shall indicate the list of major activities comprising the works and the number of measurement units consistent with the description of works, drawings, and specifications in Section 6 (Employer’s Requirements). Each work item shall be described in sufficient detail to provide clear guidance to Bidders with respect to the type of works, their scope and complexity, and compliance with the required standards.

Bidders are required to enter the prices against each work item on a lump sum basis. Work items against which no lump sum price is entered by the Bidder will not be paid by the Employer when executed and shall be deemed covered by other work items against which the lump sum prices were entered. The sum of prices entered against each work item will represent the total bid price.

The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the Activity Schedule, and where no Items are provided, the cost shall be deemed to be distributed among the Amounts for the related Items of Work.
Bill of Quantities
[Admeasurement Contract]
**Bill of Quantities**

**Preamble**

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular 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 Engineer 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 Engineer may fix within the terms of the Contract.

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

4. 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 covered by other rates and prices entered in the Bill of Quantities. The units and rates in figures entered into the Bill of Quantities should be typewritten or if written by hand, must be in print form. Bill of Quantities not presented accordingly may be considered nonresponsive.

5. 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.

6. General directions and descriptions of work and materials are not necessarily repeated or 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.

7. 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 Engineer in accordance with the Conditions of Contract.

8. The method of measurement of completed work for payment shall be in accordance with [insert the name of a standard reference guide, or full details of the methods to be used. The method of measurement should be spelled out precisely in the Preamble to the Bill of Quantities, describing for example the allowances (if any) for timbering in excavation, etc. Many national standard reference guides have been prepared on the subject, and one such guide is the Civil Engineering Standard Method of Measurement of the Institution of Civil Engineers in the United Kingdom.]

9. Arithmetic errors will be corrected by the Employer as follows:

   (a) 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.

(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.

10. Rock is defined as all materials that, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and that cannot be extracted by ripping with a tractor of at least 150 brake horsepower with a single, rear-mounted, heavy-duty ripper.
### Bill of Quantities

#### 1 Provisional Sum

<table>
<thead>
<tr>
<th>SL. No</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Rate (NPR)</th>
<th>Amount (NPR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&quot;Provide Insurance to permanent works and construction equipments and against to work force and engineer's staffs all complete&quot;</td>
<td>LS</td>
<td>1.00</td>
<td>200,000.00</td>
<td>200,000.00</td>
</tr>
<tr>
<td>2</td>
<td>Insurance Premium for Third Party liability personal</td>
<td>LS</td>
<td>1.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
</tr>
<tr>
<td>3</td>
<td>&quot;Provide Laboratory test facilities for materials and concrete cube tests for the period of contract as per specification and instruction of site incharge&quot;</td>
<td>LS</td>
<td>1.00</td>
<td>100,000.00</td>
<td>100,000.00</td>
</tr>
<tr>
<td>4</td>
<td>&quot;Provide and maintain all the lights, guards, fencing netting warning signs project sign board and watching for the protection of the works for the safety and convinces of the public or other as per contract specification and instruction of site engineer&quot;</td>
<td>LS</td>
<td>1.00</td>
<td>25,000.00</td>
<td>25,000.00</td>
</tr>
<tr>
<td>5</td>
<td>&quot;Preparation of As Built. Drawings after completion of the works all complete&quot;</td>
<td>LS</td>
<td>1.00</td>
<td>20,000.00</td>
<td>20,000.00</td>
</tr>
</tbody>
</table>

#### 2 Construction work

**2.1 Works for complete or part construction and civil engineering work**

**2.1.1 Building construction work**

<table>
<thead>
<tr>
<th>SL. No</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Bidder's Rate (NPR)</th>
<th>Bidder's Rate (in words)</th>
<th>Total Amount (NPR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Site clearance before and after completion of work including desposing the remaining construction materials &amp; plants &amp; making the site in working condition all complete as per drawing and specification.</td>
<td>LS</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Earthwork in excavation in Boulder mixed and hard soil in site levelling including dumping, stacking or filling to the lower level ground etc all for site development</td>
<td>m3</td>
<td>517.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Earth filling in 150 mm thick layer, watering, ramming including supply of filling materials all complete as per drawing and specification.</td>
<td>m3</td>
<td>367.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Flat dry brick soling in foundation and floor including sand filling in joints, leveling, ramming etc. all complete</td>
<td>m2</td>
<td>553.95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Supplying and laying of one layer of 500 gauge Polythene sheet on prepared surface</td>
<td>m2</td>
<td>173.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate (NPR)</td>
<td>Bidder's Rate (in words)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>-------</td>
<td>------------------</td>
<td>------</td>
<td>----------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>6</td>
<td>First class local chimney made brick work in cement sand mortar (1:6) in foundation in perfect line and level including wetting the brick, packing the joints and curing all types of works as per specification and instruction by Engineer</td>
<td>m3</td>
<td>45.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>First class local chimney made brick work in cement sand mortar (1:4) in superstructure in perfect line and level including wetting the brick, packing the joints and curing all types of works as per specification and instruction by Engineer</td>
<td>m3</td>
<td>242.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Plain cement concrete (PCC) M10, (1:3:6) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixer, compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m3</td>
<td>22.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Plain cement concrete (PCC) M15, (1:2:4) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixer, compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m3</td>
<td>3.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Plain cement Concrete (PCC) in 1:1.5:3 ratio (M20) for RCC works in column, beam, slab etc. with approved quality of cement, sand and stone aggregate including mixing, laying, compacting and curing etc all complete as per design, drawing and specification.</td>
<td>m3</td>
<td>315.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Steel reinforcement bar of Fe 415/500 grade including straightening, cleaning, cutting, bending, placing in position and binding with annealed binding wire all complete as per design, drawing and specification.</td>
<td>ton</td>
<td>41.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Formwork, shuttering, centering with plywood and wooden post necessary propping, scaffolding, staging, supporting and removal etc all complete in perfect line and level as per design, drawing and specification.</td>
<td>m2</td>
<td>2892.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate(NPR)</td>
<td>Bidder's Rate (in words)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>-------------------</td>
<td>--------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>13</td>
<td>12.5mm thick cement sand plaster in (1:3) ratio on Ceiling with good finish including supplying of approved quality of cement &amp; sand, chipping the concrete surface, wetting the surfaces &amp; curing the work all complete as per the design, drawing and specification.</td>
<td>m2</td>
<td>762.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>12.5mm thick cement sand plaster in (1:4) ratio on wall with good finish including supplying of approved quality of cement &amp; sand, racking the joint, chipping the concrete surface, wetting of surfaces &amp; curing the work all complete as per the design, drawing and specification.</td>
<td>m2</td>
<td>16.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Skirting work on walls with proper finishing, line and level all complete</td>
<td>rm</td>
<td>731.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Supplying and fixing seasoned Sal wood Chaukhat (125mmx100mm) size as per drawings, specifications and instructions of site engineers all complete</td>
<td>m3</td>
<td>4.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Supplying and fixing of flush doors with seasoned Sal wood frame (1.07m * 1.982 m), 38 mm thick water proof plywood grooved and properly fixed as per drawings, hinges 3x6&quot;, screws, Locking 12&quot; heavy, handle grip 6&quot; aluminium, cheskini 6&quot;, aluminium etc. specifications and instructions of site engineers all complete</td>
<td>m2</td>
<td>74.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Supplying and fixing 4 mm thick glass glazed fixed glazed shutter ( above doors with wooden listy</td>
<td>m2</td>
<td>98.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Supplying and laying of 38mm thick PCC (1:2:4) with 20mm down aggregates all complete within room area</td>
<td>m2</td>
<td>180.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Supplying and laying of glazed or non glazed tiles in cement sand mortar (1:4) ratio with Boarder approved colour on wall and floor all complete</td>
<td>m2</td>
<td>37.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>25mm th. Mosaic flooring with 19mm th. Cement plaster in (1:2) base course and 6mm marble chips white cement(1:1) surface course including rubbing and polishing all complete as per drawing and specification.</td>
<td>m2</td>
<td>214.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Supplying and laying of good quality marble in cement sand mortar (1:2) ratio with approved colour on floors, skirting and walls all complete.</td>
<td>m2</td>
<td>27.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate(NPR)</td>
<td>Bidder's Rate (in words)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>-------</td>
<td>------------------</td>
<td>------</td>
<td>----------</td>
<td>-------------------</td>
<td>---------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>23</td>
<td>3 mm thick cement sand punning on floor, skirting, dado etc, including mixing laying and rubbing with steel trowel to a hard, smooth and shining surface and curing all complete as per drawing and specification.</td>
<td>m2</td>
<td>650.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Two coats of water proof cement paint painting work (Distemper) in inner faces of building, within walls, floors, ceilings etc of approved brand and color as per instruction of site engineer</td>
<td>m2</td>
<td>661.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Two coats of weather proof (Apex) paint painting work outer faces of building, within walls, floors, ceilings etc of approved brand as per instruction of site engineer</td>
<td>m2</td>
<td>942.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Two coats of enamel Paint within doors / windows surfaces of approved color as per instructions</td>
<td>m2</td>
<td>165.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Supplying and fixing 3x20mm size M.S. grill with aluminium paints as per design and instruction all complete.</td>
<td>m2</td>
<td>94.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Making and fitting fixing of stainless steel pipe railing with 38mm dia, stainless steel pipe handrail 2 row 25mm dia. stainless steel pipe in between handrail and floor and 38mm dia. stainless steel pipe for vertical post @ 2m. c/c including welding, cutting all complete</td>
<td>m2</td>
<td>9.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>SANITARY WORK (6% of civil work)</td>
<td>job</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>ELECTRICAL WORK (8% of civil work)</td>
<td>job</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>(SEPTIC TANK) E/W in excavation for preparation of site and foundation work all complete (Boulder mix soil)</td>
<td>m3</td>
<td>40.99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Flat dry brick soling in foundation and floor including sand filling in joints, leveling, ramming etc. all complete</td>
<td>m2</td>
<td>17.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Plain cement concret PCC M10, (1:3:6) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38mm gauge including mixing with mixter machin &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m3</td>
<td>1.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate (in words)</td>
<td>Bidder's Rate (NPR)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>--------</td>
<td>------------------</td>
<td>------</td>
<td>----------</td>
<td>--------------------------</td>
<td>---------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>34</td>
<td>Plain cement Concrete (PCC) in 1:1.5:3 ratio (M20) for RCC works in column, beam, slab etc. with approved quality of cement, sand and stone aggregate including mixing, laying, compacting and curing etc all complete as per design, drawing and specification.</td>
<td>m3</td>
<td>8.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Steel reinforcement bar of Fe 415/500 grade including straightening, cleaning, cutting, bending, placing in position and binding with annealed binding wire all complete as per design, drawing and specification.</td>
<td>ton</td>
<td>0.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Formwork, shuttering, centering with plywood and wooden post necessary propping, scaffolding, staging, supporting and removal etc all complete in perfect line and level as per design, drawing and specification.</td>
<td>m2</td>
<td>94.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>3 mm thick cement sand punning on floor, skirting, dado etc, including mixing laying and rubbing with steel trowel to a hard, smooth and shining surface and curing all complete as per drawing and specification.</td>
<td>m2</td>
<td>53.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Earth back filling with ordinary soil in each 15 cm thick layers and compaction with sprinkling water</td>
<td>m3</td>
<td>8.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Supplying, fabrication and fitting of heavy duty CI 560 mm dia. manhole cover all complete as per drawings, specifications and approval of Engineer.</td>
<td>nos</td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>(SOAK PIT) E/W in excavation for preparation of site and foundation work all complete (Boulder mix soil)</td>
<td>m3</td>
<td>30.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Brick bats filling</td>
<td>m3</td>
<td>15.45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Honey Combed wall</td>
<td>m3</td>
<td>12.46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Plain cement concrete PCC M15, (1:2:4) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38mm gauge including mixing with mixer machine &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m3</td>
<td>1.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate(NPR)</td>
<td>Bidder's Rate (in words)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>--------------------</td>
<td>--------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>44</td>
<td>Steel reinforcement bar of Fe 415/500 grade including straightening, cleaning, cutting, bending, placing in position and binding with annealed binding wire all complete as per design, drawing and specification.</td>
<td>ton</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Formwork, shuttering, centering with plywood and wooden post necessary propping, scaffolding, staging, supporting and removal etc all complete in perfect line and level as per design, drawing and specification.</td>
<td>m²</td>
<td>20.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Supplying, fabrication and fitting of heavy duty CI 560 mm dia. manhole cover all complete as per drawings, specifications and approval of Engineer.</td>
<td>no</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>(Footpath) Eathwork in excavation for foundation, drain and trenches in all type of soil and ground condition including shoring, struting, bracing, sheeting and safe disposal and all relevant lift etc, as per specification, all complete, (905)</td>
<td>Cum</td>
<td>3.45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Back filling in layers with suitable common soil in foundation pits, trenches, roadway, etc, including compaction and watering etc. complete, all relevant lead (SS 908)</td>
<td>Cum</td>
<td>9.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Providing, laying, spreading, watering, levelling and compaction of crusher run subbase grading as per table 12.4 of standard specification all relevant lead (1201)</td>
<td>Cum</td>
<td>9.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Concrete Block (9&quot;x9&quot;x6&quot;)</td>
<td>num</td>
<td>434.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Providing and Laying of 60mm thick cement concrete (M20/20) interlocking block over 50 mm thick stone dust, all complete (1402)</td>
<td>Sqm</td>
<td>127.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Furniture Cost (10% of building cost)</td>
<td>LS</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>(GUARD HOUSE) Site clearance before and after completion of work including desposing the remaining construction materials &amp; plants &amp; making the site in working condition all complete as per drawing and specification.</td>
<td>job</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>E/W in excavation for preparation of site and foundation work all complete (Boulder mix soil)</td>
<td>m³</td>
<td>26.37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate (NPR)</td>
<td>Total Amount (NPR)</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>---------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Earth Work in Filling</td>
<td>m³</td>
<td>10.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>Brick soling work with sand packing, levelling and ramming with water spray all complete</td>
<td>m³</td>
<td>5.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>First class local chimney made brick work in cement sand mortar (1:4) in foundation &amp; superstructure in perfect line and level including wetting the brick, packing the joints and curing all types of works as per specification and instruction by Engineer</td>
<td>m³</td>
<td>24.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Plain cement concrete PCC M10, (1:3:6) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixing machine &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m³</td>
<td>2.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Plain cement concrete PCC M20, (1:1.5:3) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixing machine &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m³</td>
<td>8.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>38 mm thick PCC (1:2:4) with 20 mm down aggregates all complete within room area</td>
<td>m²</td>
<td>11.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Tor / TMT Reinforcement work for R.C.C work including supply, straightening, cutting, bending, binding and laying of different diameter steel rod in all types of R.C.C work as per design, drawing, specification and instruction all complete work</td>
<td>ton</td>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Supplying and fixing plywood formworks in perfect line and level with timber props, levelling, centring, fixing, strapping all complete as per design and drawings</td>
<td>m²</td>
<td>107.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Supplying and fixing seasoned Sal wood Chaukhat (125 mm x 75 mm) size as per drawings, specifications and instructions of site engineers all complete</td>
<td>m³</td>
<td>0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate(NPR)</td>
<td>Bidder's Rate (in words)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>-------------------</td>
<td>-------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>64</td>
<td>Supplying and fixing of flush doors with seasoned Sal wood frame (65mm x35mm size), 19 mm thick water proof plywood grooved and properly fixed as per drawings, hinges 3x6&quot;, screws, Locking 12&quot; heavy, handle grip 6&quot; aluminium, cheskini 6&quot;, aluminium etc. specifications and instructions of site engineers all complete</td>
<td>m²</td>
<td>8.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>12.5 mm thick (1:4) c/s plaster within walls, floors, drains etc. with proper levelling, curing all complete</td>
<td>m²</td>
<td>176.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>12.5 mm thick (1:3) c/s plaster within ceiling type surfaces etc. with proper levelling, curing all complete</td>
<td>m²</td>
<td>11.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Cement punning work (1:1) c/s, mixing with color pigments of approved color and patterned, proper mixing, levelling, curing etc. with instructions of site engineer</td>
<td>m²</td>
<td>11.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Two coats of weather proof (Apex) paint painting work outer faces of building, within walls, floors, ceilings etc of approved brand as per instruction of site engineer</td>
<td>m²</td>
<td>179.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Two coats of enamel Paint within doors / windows surfaces of approved color as per instructions</td>
<td>m²</td>
<td>8.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>1% of electric works</td>
<td>LS</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>(GARRAGE) Site clearance before and after completion of work including desposing the remaining construction materials &amp; plants &amp; making the site in working condition all complete as per drawing and specification.</td>
<td>job</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>E/W in excavation for preparation of site and foundation work all complete (Boulder mix soil)</td>
<td>m³</td>
<td>64.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Earth Work in Filling</td>
<td>m³</td>
<td>54.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Brick soling work with sand packing , levelling and ramming with water spray all complete</td>
<td>m³</td>
<td>13.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>First class local chimney made brick work in cement sand mortar(1:4) in foundation &amp; superstructure in perfect line and level including wetting the brick, packing the joints and curing all types of works as per specification and instruction by Engineer</td>
<td>m³</td>
<td>27.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate (NPR)</td>
<td>Total Amount (NPR)</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>---------------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Plain cement concret PCC M10, (1:3:6) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixtere machin &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m³</td>
<td>6.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>Plain cement concret PCC M20, (1:1.5:3) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixtere machin &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m³</td>
<td>22.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>38mm thick PCC (1:2:4) with 20 mm down aggregates all complete within room area</td>
<td>m²</td>
<td>48.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>Tor / TMT Reinforcement work for R.C.C work including supply, straightening, cutting, bending, binding and laying of different diameter steel rod in all types of R.C.C work as per design, drawing, specification and instruction all complete work</td>
<td>ton</td>
<td>2.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>Supplying and fixing plywood formworks in perfect line and level with timber props, levelling, centring, fixing, strapping all complete as per design and drawings</td>
<td>m²</td>
<td>304.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Supplying and fixing seasoned Sal wood Chaukhat (125mmx75mm) size as per drawings, specifications and instructions of site engineers all complete</td>
<td>m³</td>
<td>0.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>Supplying and fixing of glazed glasses specifications and instructions of site engineers all complete</td>
<td>m²</td>
<td>15.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>83</td>
<td>12.5 mm thick (1:4) c/s plaster within walls, floors, drains etc. with proper levelling, curing all complete</td>
<td>m²</td>
<td>99.81</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>12.5 mm thick (1:3) c/s plaster within ceiling type surfaces etc. with proper levelling, curing all complete</td>
<td>m²</td>
<td>48.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>Cement punning work (1:1) c/s, mixing with color pigments of approved color and patterned, proper mixing, levelling, curing etc. with instructions of site engineer</td>
<td>m²</td>
<td>48.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate (in words)</td>
<td>Bidder's Rate (NPR)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>--------------------------</td>
<td>---------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>86</td>
<td>Two coats of white cement paint in inner faces of building, within walls, floors, ceilings etc of approved brand as per instruction of site engineer</td>
<td>m²</td>
<td>92.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>Two coats of enamel Paint within doors / windows surfaces of approved color as per instructions</td>
<td>m²</td>
<td>0.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>1% of electric works</td>
<td>LS</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>Gate</td>
<td>no</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>(Pavement) Earthwork in excavation for foundation, drain and trenches in all type of soil and ground condition including shoring, struting, bracing, sheeting and safe disposal and all relevant lift etc, as per specification, all complete, (905)</td>
<td>m³</td>
<td>74.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>Providing and laying flat one 1st class brick soling all complete. (1403)</td>
<td>m²</td>
<td>496.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>Back filling in layers with suitable common soil in foundation pits, trenches, roadway, etc, including compaction and watering etc. complete, all relevant lead (SS 908)</td>
<td>m³</td>
<td>37.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>Providing, laying, spreading, watering, levelling and compaction of crusher run subbase grading as per table 12.4 of standard specification all relevant lead (1201)</td>
<td>m³</td>
<td>49.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>Providing and Laying of 60mm thick cement concrete (M20/20) intrlocking block over 50 mm thick stone dust, all complete (1402)</td>
<td>m²</td>
<td>496.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>(Toilet) Site clearance before and after completion of work including disposing the remaining construction materials &amp; plants &amp; making the site in working condition all complete as per drawing and specification.</td>
<td>Job</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>E/W in excavation for preparation of site and foundation work all complete (Boulder mix soil)</td>
<td>m³</td>
<td>34.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>Earth Work in Filling</td>
<td>m³</td>
<td>12.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Brick soling work with sand packing , levelling and ramming with water spray all complete</td>
<td>m³</td>
<td>8.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate(NPR)</td>
<td>Bidder's Rate (in words)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>-------------------</td>
<td>--------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>99</td>
<td>First class local chimney made brick work in cement sand mortar(1:4) in foundation &amp; superstructure in perfect line and level including wetting the brick, packing the joints and curing all types of works as per specification and instruction by Engineer</td>
<td>m³</td>
<td>10.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Plain cement concret PCC M10, (1:3:6) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixtere machin &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m³</td>
<td>2.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>Plain cement concret PCC M20, (1:1.5:3) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38 mm gauge including mixing with mixtere machin &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m³</td>
<td>10.37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>38 mm thick PCC (1:2:4) with 20 mm down aggregates all complete within room area</td>
<td>m²</td>
<td>8.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Tor / TMT Reinforcement work for R.C.C work including supply, straightening, cutting, bending, binding and laying of different diameter steel rod in all types of R.C.C work as per design, drawing, specification and instruction all complete work</td>
<td>ton</td>
<td>1.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>Supplying and fixing plywood formworks in perfect line and level with timber props, levelling, centring, fixing, strapping all complete as per design and drawings</td>
<td>m²</td>
<td>75.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>Supplying and fixing seasoned Sal wood Chaukhat (125 mm x 75 mm) size as per drawings, specifications and instructions of site engineers all complete</td>
<td>m³</td>
<td>0.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>Supplying and fixing of flush doors with seasoned Sal wood frame (65 mm x 35 mm size), 19 mm thick water proof plywood grooved and properly fixed as per drawings, hinges 3x6&quot;, screws, Locking 12&quot; heavy, handle grip 6&quot; aluminium, cheskin 6&quot;, aluminium etc. specifications and instructions of site engineers all complete</td>
<td>m²</td>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SL. No</td>
<td>Item Description</td>
<td>Unit</td>
<td>Quantity</td>
<td>Bidder's Rate (NPR)</td>
<td>Bidder's Rate (in words)</td>
<td>Total Amount (NPR)</td>
</tr>
<tr>
<td>--------</td>
<td>------------------</td>
<td>------</td>
<td>----------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>107</td>
<td>12.5 mm thick (1:4) c/s plaster within walls, floors, drains etc. with proper levelling, curing all complete</td>
<td>m²</td>
<td>218.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>12.5 mm thick (1:3) c/s plaster within ceiling type surfaces etc. with proper levelling, curing all complete</td>
<td>m²</td>
<td>8.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>Cement punning work (1:1) c/s, mixing with color pigments of approved color and patterned, proper mixing, levelling, curing etc. with instructions of site engineer</td>
<td>m²</td>
<td>8.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>Two coats of weather proof (Apex) paint painting work outer faces of building, within walls, floors, ceilings etc of approved brand as per instruction of site engineer</td>
<td>m²</td>
<td>227.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Two coats of enamel Paint within doors / windows surfaces of approved color as per instructions</td>
<td>m²</td>
<td>9.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>2% of electric works</td>
<td>LS</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>(Boundary Wall) E/W in excavation for preparation of site and foundation work all complete (Boulder mix soil)</td>
<td>m³</td>
<td>196.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>Earth Work in Filling</td>
<td>m³</td>
<td>98.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Plain cement concret PCC M10, (1:3:6) work in foundation and floors with cement, sand and crushed aggregate of 10 mm to 38mm gauge including mixing with mixer machine &amp; compaction by vibrator, laying in line &amp; level with curing all type of works complete as per specification &amp; instruction</td>
<td>m²</td>
<td>21.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>Flat dry brick soling in foundation and floor including sand filling in joints, leveling, ramming etc. all complete</td>
<td>m²</td>
<td>28.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>First class local chimney made brick work in cement sand mortar (1:6) in foundation in perfect line and level including wetting the brick, packing the joints and curing all types of works as per specification and instruction by Engineer</td>
<td>m³</td>
<td>228.71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>Fenching wire</td>
<td>rm</td>
<td>844.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>U-hook for barbed wire</td>
<td>no.</td>
<td>213.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>Fenching rod (1.2m long)</td>
<td>no.</td>
<td>71.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 5
Eligible Countries
ELIGIBLE COUNTRIES

Nepal.
Section 6
Employer's Requirements
CIVIL SPECIFICATION

TABLE OF CONTENTS

1 SITE CLEARANCE & PREPARATION ................................................................. 81
  1.1 SCOPE ........................................................................................................ 81
  1.2 MEASUREMENT ....................................................................................... 81
2 EARTHWORK IN EXCAVATION ................................................................. 81
  2.1 SCOPE ........................................................................................................ 81
  2.2 CLASSIFICATION OF SOIL ......................................................................... 81
  2.3 EXCAVATION ............................................................................................ 81
  2.4 TIMBERING OF FOUNDATION ................................................................ 82
  2.5 DE-WATERING .......................................................................................... 82
  2.6 TRIMMING AND LEVELLING ................................................................... 83
  2.7 DISPOSAL ................................................................................................ 83
3 FILLING WORKS ........................................................................................... 83
  3.1 EARTHFILLING (EXCAVATED EARTH / BORROWED EARTH) ............... 83
  3.1.1 Scope .................................................................................................... 83
  3.1.2 Material and workmanship .................................................................... 83
  3.1.3 Measurement ........................................................................................ 83
  3.2 SAND FILLING .......................................................................................... 83
  3.2.1 Scope .................................................................................................... 83
  3.2.2 Material and workmanship .................................................................... 83
  3.2.3 Measurement ........................................................................................ 83
4 PLAIN CEMENT CONCRETE (PCC FOR RCC) ........................................ 84
  4.1 SCOPE ........................................................................................................ 84
  4.2 MATERIAL ................................................................................................ 84
    4.2.1 Aggregates: ......................................................................................... 84
    4.2.2 Storage of Aggregates .......................................................................... 84
    4.2.3 Water .................................................................................................. 85
    4.2.4 Cement ................................................................................................ 85
    4.2.5 Admixture ............................................................................................ 85
  4.3 GRADES OF CONCRETE .......................................................................... 87
    4.3.1 General ................................................................................................ 87
  4.4 STRENGTH REQUIREMENT ..................................................................... 89
  4.5 WORKABILITY .......................................................................................... 90
  4.6 LOAD TEST ................................................................................................ 90
  4.7 WORKMANSHIP ....................................................................................... 91
    4.7.1 General ................................................................................................ 91
    4.7.2 Mixing of Concrete ............................................................................... 91
4.7.3 Conveying Concrete ...............................................................92
4.7.4 Placing Concrete ..................................................................93
4.7.5 Construction Joints ..............................................................93
4.7.6 Protection and Curing of Concrete ........................................93
4.7.7 Control Tests on Concrete ....................................................93
4.7.8 Exposed Surface ...................................................................93
4.7.9 Expansion & Isolation Joints etc. ............................................94
4.7.10 Waterproofing Joints ...........................................................94
4.7.11 Water Proofing Admixture ..................................................95
4.7.12 Other Admixture in Concrete ...............................................95
4.7.13 Measurement and Rates ......................................................95
4.8 REINFORCEMENT .................................................................95
4.8.1 Reinforcement Bar ...............................................................95
4.8.2 Certificate and tests for reinforcement bars .............................96
4.8.3 Dimensions of reinforcement bars .........................................96
4.8.4 Bending of reinforcement bars ..............................................96
4.8.5 Fixing reinforcement bars ....................................................96
4.8.6 Cover of Concrete and Spacing of bars .................................97
4.8.7 Measurement .......................................................................97
4.9 FORMWORK ...........................................................................97
4.9.1 Design ................................................................................98
4.9.2 Deflection and camber .........................................................98
4.9.3 Supports ...........................................................................98
4.9.4 Joints and edges ................................................................99
4.9.5 Sundries ............................................................................99
4.9.6 Cleaning and treatment of formwork ......................................99
4.9.7 Striking or removal of formwork ..........................................99
4.9.8 Time of Formwork ...............................................................99
4.9.9 Removal of Formworks .......................................................100
4.9.10 Tolerance ..........................................................................101
4.9.11 Re-use of formworks ........................................................101
4.9.12 Classification ...................................................................101
4.9.13 Ornament .........................................................................101
4.9.14 Rate ................................................................................101
4.9.15 Measurement ...................................................................101
5 PLAIN CEMENT CONCRETE WORK ......................................102
5.1 PLAIN CEMENT CONCRETE WORK IN FOUNDATION ..........102
5.1.1 Scope ..............................................................................102
5.1.2 Materials .........................................................................102
5.1.3 Proportion .........................................................................102
10.4.1 Scope ........................................................................................................... 130
10.4.2 Materials ..................................................................................................... 130
10.4.3 Preparation of Surface and Application ....................................................... 131
10.4.4 Measurement ............................................................................................... 131
10.5 BRICK KOBA FLOORING ............................................................................. 132
10.5.1 Scope .......................................................................................................... 132
10.5.2 Materials .................................................................................................... 132
10.5.3 Proportion ................................................................................................... 132
10.5.4 Laying ......................................................................................................... 132
10.5.5 Curing ......................................................................................................... 132
10.5.6 Finish ......................................................................................................... 133
11 GENERAL SPECIFICATION FOR CARPENTRY & JOINERY WORKS ........... 133
11.1 SAMPLES AND SHOP DRAWINGS ................................................................ 133
11.2.1 Workmanship ............................................................................................. 133
11.2.2 Joinery Materials ....................................................................................... 133
11.2.3 Installation .................................................................................................. 134
11.2.4 Wood Frames for Internal Doors ............................................................... 134
11.2.5 Interior Door Shutters ................................................................................ 134
11.2.6 Block Boards, Ply Boards ......................................................................... 135
11.2.7 Preservative Treatment ............................................................................. 135
11.2.8 Built – In – Joinery .................................................................................... 135
11.2.9 Protection of Work .................................................................................... 135
12 STEEL WORKS ................................................................................................. 136
12.1 MATERIALS ................................................................................................... 136
12.1.1 Steel ............................................................................................................ 136
12.1.2 Electrodes .................................................................................................. 136
12.2 FAN CLAMPS ............................................................................................... 136
12.2.1 Fixing .......................................................................................................... 136
12.2.2 Rate ............................................................................................................ 137
13 MISCELLANEOUS WORK ................................................................................. 137
13.1 ALUMINIUM WINDOW SHUTTER .............................................................. 137
13.1.1 General ....................................................................................................... 137
13.1.2 Materials ................................................................................................... 137
13.1.3 Manufacture ............................................................................................... 137
13.1.4 Finish and Protection ................................................................................. 137
13.1.5 Workshop Drawings .................................................................................. 137
13.1.6 Fixing and Strength of Main Members ...................................................... 137
13.1.7 Expansion .................................................................................................. 138
13.1.8 Flashing ..................................................................................................... 138
13.1.9 Weather seals ............................................................................................ 138
13.1.10 Measurement ................................................................. 138
13.2 EARTH COMPACTION ............................................................ 138
13.2.1 Watering, Drying and Mixing ............................................. 138
13.2.2 Compaction ...................................................................... 139
13.3 POLYETHELENE MEMBRANE .............................................. 139
13.3.1 Scope .............................................................................. 139
13.3.2 Materials ........................................................................... 139
13.3.3 Laying .............................................................................. 139
13.3.4 Measurement .................................................................... 139
13.4 GENERAL NOTES ................................................................. 140
A. GENERAL .............................................................................. 140
B. FOUNDATIONS ........................................................................ 140
C. BACKFILLING ........................................................................ 140
D. CONCRETE AND REINFORCING STEEL .................................. 140
13.5 LIST OF APPROVED MAKE OF MATERIALS (FOR CIVIL WORKS) ........................................... 141
Technical Specification of Civil Works

1 SITE CLEARANCE & PREPARATION

1.1 Scope

The site and ground in the immediate neighborhood shall be cleared of all jungle and root, cutting trees and uprooting, removing away bushes, remains of old buildings, brick bats, useless dumped materials, removing loose earth and concrete pieces (if any). It shall be removal of grass, shrubs etc., maximum depth cleared of all grass, shrubs etc. The maximum depth of excavation shall be 0.3m. A distance of 6 meter around the building shall be dressed and levelled properly with outward slope of 1 in 100. The surplus excavated material shall be disposed as directed.

1.2 Measurement

The measurement unit shall be taken in Lump Sum for above works, and payment shall be done in the amount as quoted in approved bill of quantity, as per instruction of engineer, all complete.

2 EARTHWORK IN EXCAVATION

2.1 Scope

Earthwork in excavation in foundation trenches, raft foundation etc. in soil including dressing of sides, ramming of bottom, lift up to 2.5m, stacking of excavated materials at least 4m clear off the edge of excavation and then returning the stacked soil in 0.15m layer when required in plinth, under floor, sides of foundation, laying and depositing the layer by watering and ramming and then disposing of all surplus excavated soil as directed within a lead of 30m.

2.2 Classification of Soil

All soils shall be taken as ordinary soil; unless hard rock or old masonry or concrete or block kankar or running sand which requires special treatment for the purpose of excavation are met with when an additional item shall be formed. Ordinary pebbles or kankar shall be taken under ordinary soil for which nothing extra will be paid.

2.3 Excavation

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

The excavation shall be carefully done up to the levels, as per shapes and dimensions as shown or figured in the Drawings or as directed by the Engineer. Should any of the excavation be taken below the specified levels, the Contractor shall fill such excavation at his own expense with concrete 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 from the edge of foundation.

The Contractor shall dispose off all surplus excavated soil at his own cost as directed by the Engineer.
without additional cost.
If foundations are made broader or longer than given dimension, the extra length and breadth shall be filled in after the foundations are built with earth rammed and compacted, at the Contractor’s expense.
The Contractor shall at his own expense, make provision for all extra excavation in slope, pumping, dredging or bailing out water from the trenches and keep free of water during the laying of foundation works.

Technical Specification of Civil Works

The Contractor shall also at his own cost remove such portions of boulders or rocks and the remains of the old dismantled structures as are required to make the bottom of the trench horizontal and level, nothing extra shall be admissible separately in the Bill of Quantities. The trenches rafts shall be inspected by the Engineer, before the concrete is laid therein, when the trench level shall be recorded. The filling in of side of trench excavations can 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.

2.4 Timbering of foundation
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, and it shall be deemed to be included in excavation in soil. Ordinary pebbles shall be taken under soil for which nothing extra shall be paid.

2.5 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 and shall be removed after their purpose is served. 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 works are in progress and till they come above the natural water level and (iii) till the Engineer considers that the mortar is sufficiently set.
2.6 Trimming and Leveling

The bottom of all foundation should be trimmed and levelled in accordance with the Drawings. Bottom of the foundation shall be rammed and watered before concrete is deposited.

2.7 Disposal

Disposal of the surplus earth shall be done within site area as directed by the Engineer. Nothing extra shall be paid for such disposal made.

2.8 Measurement

It shall be measured correct up to 1cm and be the product of the exact 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.

3 FILLING WORKS

3.1 EARTHFILLING (EXCAVATED EARTH / BORROWED EARTH)

3.1.1 Scope

Filling in plinth floor with materials brought from outside in 0.20m layer compacted to 0.15m layer under floors including watering, ramming, consolidation and dressing, all complete

3.1.2 Material and workmanship

The earth for filling shall be brought from outside the site within a lead of 30m, to be approved by the Engineer prior to filling. If the earth from within the site were of unsuitable quality, earth shall be brought from outside the site, which shall be measured in compacted volume and paid as an item under borrowed earth/soil.

The work shall be done with laying earth in 0.20m layer by layer respectively compacted in 0.15m layer, each layer being watered and rammed thoroughly. It shall include excavation, watering, compaction of earth with transportation, screening, if necessary, filling and all the cost labor etc., all complete.

3.1.3 Measurement

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

3.2 SAND FILLING

3.2.1 Scope

Filling in plinth floor with river or mine sand brought from outside in 0.15m layers under floors including ramming, consolidation, and dressing, all complete.

3.2.2 Material and workmanship

The sand for filling shall be brought from outside the site shall be approved by the Engineer prior to filling. The sand for filling shall be either pit sand or river sand. The work shall be done with sand in 0.15m layers, each layer being rammed thoroughly. It shall include excavation of sand, transportation, screening, if necessary, filling and all the cost of labour etc., all complete.

3.2.3 Measurement

The measurement shall be taken for the consolidated thickness of sand and paid in cubic meter.
4 PLAIN CEMENT CONCRETE (PCC FOR RCC)

4.1 Scope

This specification deals with the cement concrete, plain or reinforced for general use of specified proportion. NBC 110-2050 (latest revision) to be complied with unless permitted otherwise hereinafter.

4.2 Material

4.2.1 Aggregates:

Aggregates for the concrete shall be obtained from an approved source, shall confirm with the requirements of NBC 101/2060 (latest revision) specification for coarse and fine aggregates from machine crushed Stone. For fine aggregates any of the Grading Zones 1, 2 and 3 will be accepted except Grading Zone 4. Aggregates shall have water absorption not exceeding two percent when tested in accordance with IS 2386 (latest revision).

Sampling and testing of aggregates shall be carried out in accordance with the requirements of the appropriate section of IS 2386. The Contractor shall satisfy the Engineer that the aggregates to be supplied will not give to an alkali reaction with the cement.

Before work on preliminary and trial mixes of concrete is commenced, the Contractor shall submit for approval of samples of fifty kilograms in weight of each aggregate which he proposes to use, the samples when approved by the Engineer shall remain preserved at the site for reference

4.2.2 Storage of Aggregates

The contractor shall provide means of storing the aggregates at each point where the concrete is made such that (a) each nominal size of coarse aggregate and the fine aggregate shall be kept separated at all times (b) contamination of the aggregates by the ground or other foreign matter shall be effectively prevented at all times and (c) each heap of aggregate shall be capable of drainage freely.

The Contractor shall ensure that the graded coarse aggregates are tipped, stored and removed from the store in manner that does not cause segregation.

Wet fine aggregate shall not be used until, in the opinion of the Engineer, it has drained to a constant and uniform moisture content, unless the Contractor measures the moisture content of the fine aggregate continuously and adjusts the amount of fine aggregate and the added water in each batch of concrete mixed to allow for the water contained in the fine aggregate. If necessary to meet the requirements of this clause, the Contractor shall protect the heaps of fine aggregate against adverse weather.

The Contractor shall make available to the Engineer such samples of the aggregate, as he requires. Such samples shall be collected at the point of discharge of the aggregate to the batching plant. If any such sample doesn’t confirm with the specification, the aggregate it represents shall be promptly removed from the site and the Contractor shall carry out such modifications to the storage arrangements as may be necessary to secure compliance with the specification.
4.2.3 Water

Water for concrete shall be clean and free from injurious amounts of oils, acids, salts, sugars, organic materials or other substances that may be deleterious to concrete or steel. Whenever required to do so by the Engineer, the Contractor shall take samples of the water being used or which it is proposed to be used for mixing concrete and test them for quality. The details of test shall be as per the recommendations in the IS: 3025-1964 (latest revision).

Permissible limits, maximum for Solids

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>200mg/l</td>
</tr>
<tr>
<td>Inorganic</td>
<td>3000mg/l</td>
</tr>
<tr>
<td>Sulphates</td>
<td>500mg/l</td>
</tr>
<tr>
<td>Chlorides</td>
<td>2000mg/l for PCC works and 1000mg/l for RCC works</td>
</tr>
<tr>
<td>Suspended matter</td>
<td>2000mg/l</td>
</tr>
</tbody>
</table>

4.2.4 Cement

The cement shall be ordinary Portland cement of approved brand and manufacture and shall comply in all respects with the NS 49/2041 – latest revision. It shall be delivered on the site in packages with an unbroken seal fixed by the makers and plainly marked with the name of brand and date of 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, and that the consignments can be used up in the order in which they are received. Set cement shall be immediately removed from the work and replaced by the Contractor at his own expense. If desired, 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.

4.2.5 Admixture

Admixture shall mean material added to the concrete materials during mixing for the purpose of altering the properties of the concrete mix. If the Contractor wishes to use admixtures, otherwise than as expressly ordered by the Engineer, he shall first obtain the Engineer’s written permission. The methods of use and the quantities of admixture used shall be subject to the Engineer’s approval, which or otherwise shall in no way limit the Contractor’s obligations under the Contract to produce concrete with the specified strength and workability. The engineer may order not to use any admixtures, if required.

Table Ia: IS and BS grading requirements for Coarse Aggregate

<table>
<thead>
<tr>
<th>IS Sieve</th>
<th>Percentage passing for single sized aggregate of nominal size</th>
<th>Percentage passing for graded aggregate of nominal size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation</td>
<td>63m</td>
<td>40m</td>
</tr>
<tr>
<td>IS Sieve Designation</td>
<td>Grading Zone I</td>
<td>Grading Zone II</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>10mm</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4.74mm</td>
<td>90-100</td>
<td>90-100</td>
</tr>
<tr>
<td>2.36mm</td>
<td>60-95</td>
<td>75-100</td>
</tr>
<tr>
<td>1.18mm</td>
<td>30-70</td>
<td>55-90</td>
</tr>
<tr>
<td>600 micron</td>
<td>15-34</td>
<td>35-59</td>
</tr>
<tr>
<td>300 micron</td>
<td>5-20</td>
<td>8-30</td>
</tr>
<tr>
<td>150 micron</td>
<td>0-10</td>
<td>0-10</td>
</tr>
</tbody>
</table>
4.3 Grade of Concrete

4.3.1 General

Structural concrete shall be either ordinary or controlled and in grades designated as M150 (M15 in SI unit), M200 (M20 in SI unit) and M250 (M25 in SI unit), as specified in NBC 110-1994 (2060BS) – latest revision.

Ordinary Concrete:

Ordinary concrete is recommended only when accurate control is impracticable and not necessary. However, if ordinary concrete is allowed by the Engineer, it shall be used only in the concrete of Grades M150, M200 and M250. Ordinary concrete does not require preparation of trial mixes.

Concrete mix proportion for ordinary concrete shall be as per NBC 110-1994 (latest revision) and as follows:

Table II: Mix Proportion (By Weight) Expected to Give Degrees of Workability with Different Water Cement Ratios and Specified Strength

<table>
<thead>
<tr>
<th>Workability</th>
<th>Water Cement Ratio</th>
<th>Compressive Strength in 28 days kg/cm²</th>
<th>Ratio by Weight of Cement to Gravel Aggregate</th>
<th>Ratio by Weight of Cement to Crushed Stone Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low Slump 0-25mm</td>
<td>0.4</td>
<td>360</td>
<td>1:4.8</td>
<td>1:5.3</td>
</tr>
<tr>
<td>0.5</td>
<td>290</td>
<td>1:7.2</td>
<td>1:7.7</td>
<td>1:6.5</td>
</tr>
<tr>
<td>0.6</td>
<td>220</td>
<td>1:8.5</td>
<td>1:8.6</td>
<td>1:7.8</td>
</tr>
<tr>
<td>0.7</td>
<td>160</td>
<td>1:9.0</td>
<td>1:9.0</td>
<td>1:8.7</td>
</tr>
<tr>
<td>Very low Slump 25-35mm</td>
<td>0.4</td>
<td>360</td>
<td>1:3.9</td>
<td>1:4.5</td>
</tr>
<tr>
<td>0.5</td>
<td>290</td>
<td>1:5.5</td>
<td>1:6.7</td>
<td>1:5.0</td>
</tr>
<tr>
<td>0.7</td>
<td>160</td>
<td>1:8.0</td>
<td>1:8.5</td>
<td>1:7.4</td>
</tr>
</tbody>
</table>
Table III: The minimum cement content for each grade of concrete (based on HMG Norms)

<table>
<thead>
<tr>
<th>Grade of concrete</th>
<th>Minimum cement content per cum. Of finished concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>M15</td>
<td>320kg</td>
</tr>
<tr>
<td>M20</td>
<td>400kg</td>
</tr>
<tr>
<td>M25</td>
<td>610kg</td>
</tr>
</tbody>
</table>

At least four trial batches are to be made at site during casting and six test cylinders/cubes taken for each batch noting the slump on each mix. These cylinders/cubes shall be tested in a testing laboratory approved by the Engineer at 7 days and others at 28 days for obtaining the unlimited compressive strength. The test reports shall be submitted to the Engineer. The cost of the mix design and testing shall be borne by the Contractor.

On the basis of the above test reports, proportion of mix by weight and water – cement ratio will be approved by the Engineer; the proportions so decided for different grades of concrete shall be adhered to during all concreting operations. If, however, at any time, the Engineer feels that the quality of the materials being used, has been changed from those used for preliminary mix design, the Contractor shall have to run similar trial mixes design, and the Contractor shall ascertain the mix proportion and water – cement ratio for obtaining the desired strength and consistency. It will be within the competency of the Engineer to reduce the number of trial batches and the number of test specimens mentioned above.

The mixes once approved must not be varied without prior approval of the Engineer.

In designing the mix proportions of concrete, the quantity of both cement and aggregate shall be determined by weight. The Engineer may allow the quantity of aggregates to be determined by equivalent volume basis after the relationship between the weight and volume is well established by trial and the same shall be verified frequently.

Water shall be either measured by volume in calibrated tanks or weighted.

All measuring equipment shall be maintained in a clean and serviceable condition and their accuracy periodically checked.
To keep the water – cement ratio to the designed value, allowance shall be made for the moisture content in both fine and coarse aggregates and determination of the same shall be made as frequently as directed by the Engineer. The determination of moisture contents shall be according to IS:2386 (part III) –(latest revision)
4.4 Strength Requirement

Where ordinary Portland cements confirming to NS 49/2041 (latest revision): Ordinary Portland Cement /IS: 269 – latest revision is used, the compressive strength requirements for various grades of concrete shall be as shown in Table – IV and shall apply to both controlled concrete and ordinary concrete.

The acceptance of strength of concrete shall be as per clause of “Sample size and Acceptance Criteria” of IS-456 (latest revision)/NBC 110-1994 – latest revision subject to the stipulations and/or modifications stated elsewhere in this specification.

Concrete work found unsuitable shall have to be dismantled and replacement to be done as per specification by the Contractor. No payment for the dismantled concrete, the relevant formwork and reinforcement embedded fixtures, etc. shall be made. In course of dismantling, if any damage is done to the embedded items or adjacent structures, the same shall be made good free of charge by the Contractor to the satisfaction of the Engineer.

Compressive strengths for different grades of concrete as specified in Table – IV shall always refer to the strength of cylinder based on test conducted on 15cm diameter and 30cm high or the strength of cube based on test conducted on 15cm x 15cm x 15cm cube. Other requirements of concrete strength as may be desired by the Engineer shall be in accordance with NBC 110-1994/IS 456 (latest revision).

In exceptional circumstances, the Engineer may accept a concrete of lower strength than specified and which is otherwise unacceptable according to the “Acceptance Criteria” of NBC 110-1994/IS 456 – (latest revision), provided the strength is never less than 80% of the specified strength. All concrete having strength less than 80% of that specified shall always be rejected. Payment for concrete of lower strength than specified or approved by the Engineer shall always be made at a reduced rate on pro – rata basis to the strength obtained.

Table IV: Strength Requirement of Concrete

<table>
<thead>
<tr>
<th>Grade of Concrete (SI unit)</th>
<th>Compressive strength of 15cm diameter and 30cm high cylinder or 15cm cube at 28 days after mixing, conducting in accordance with NBC 110-1994 – latest revision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preliminary test kg/cm²</td>
</tr>
<tr>
<td>M15</td>
<td>200</td>
</tr>
<tr>
<td>M20</td>
<td>260</td>
</tr>
<tr>
<td>M25</td>
<td>320</td>
</tr>
</tbody>
</table>

With permission of the Engineer, for any of these above mentioned grades of concrete shall also be increased proportionately to keep the ratio of water to cement same as adopted in trial mix design for each grade of concrete. No extra payment for the additional cement will be made.
### 4.5 Workability

The workability of the concrete shall be checked at frequent intervals by slump test. Where facilities exist and if required by the Engineer, alternatively, the compacting factor test in accordance with IS: 1199 / NBC 101-1994 (latest revisions), shall be carried out. The degree of workability necessary to allow the concrete to be well consolidated and to be worked into the corners of formworks and around on the type and nature of structure and shall be based on experience and tests within the preferred limits of consistency as specified in Table below for various types of structures.

<table>
<thead>
<tr>
<th>Degree of Workability</th>
<th>Slump in mm</th>
<th>Use for which concrete is suitable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Low</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Medium</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>High</td>
<td>100</td>
<td>150</td>
</tr>
</tbody>
</table>

Note: However, the slump to be obtained for work in progress shall be as per direction of the Engineer.

### 4.6 Load Test

Load test of structural members may be required by the Engineer when the strength of job control cylinders/cubes falls below the required strength and is not acceptable as per “Acceptance Criteria” of NBC 110-1994 – (latest revision). If the load testing is decided by the Engineer, the member under consideration shall be subjected to a superimposed load equal to one and quarter (1¼) times the specified superimposed load used for design and this load shall be maintained for a period of 24 hours before removal. The detailed procedure of the test is to be decided by the Engineer. If the member shows evident failure, such changes as are necessary to make the structure adequately strong shall be made free of cost. If on the other hand the failure becomes evident, the Engineer under special circumstances (with the approval of the designer), can retain the portion of the structure under test, provided suitable modification for strengthening and/or dispersion of design load is feasible. Cost of such modification of dispersion of load shall be borne by the Contractor. The entire cost of load testing shall be borne by the Contractor. If a portion of the structure is found to be unacceptable, it shall be dismantled and replaced by a fresh structure as per specification. The cost of dismantling and the cost of concrete, formwork and reinforcement involved in the dismantled portion shall not be paid to the Contractor. If in the course of dismantling, any damage is done to the embedded items and or other adjacent structures, the same shall be made good free of charge by the Contractor to the satisfaction of Engineer.
4.7 Workmanship

4.7.1 General

All workmanship shall be according to the latest and best possible standards.

4.7.2 Mixing of Concrete

The proportion of fine and coarse aggregate, cement and water shall be as determined by the preliminary tests or according to fixed proportions in case of ordinary concrete and shall always be approved by the Engineer. The quantities of fine and coarse aggregates shall be determined by weight. The water shall be measured accurately after giving proper allowance for surface water present in the aggregates for which regular check shall be made by the contractor. Due allowance shall be made for bulking in case of volume batching in accordance with IS: 2386 (Part III) – latest revision.

Concrete shall be always mixed in a mechanical mixer unless specifically approved by the Engineer for concrete to be used in unimportant structure. The water shall not be poured into the drum of the mixer until all the cement and aggregates constituting the batch are already in the drum and mixed for at least one minute. Mixing of each batch shall be continued until there is uniformity in colour and consistency, but in no case shall mixing be done for less than two minutes and at least forty revolutions after all the materials and water are in the drum. When absorbent aggregates are used or when the mix is very dry, the mixing time shall be extended as may be directed by the Engineer. Mixer shall not be loaded above their rated capacity as this prevents thorough mixing.

The entire contents of the drum shall be discharged before the ingredient for the next batches are fed into the drum. No partly set or remixed or excessively wet concrete shall be used and it shall be immediately removed from site.

Each time the work stops, the mixer shall be thoroughly cleaned and when the next mixing commences, the first mix shall have 10% additional cement at no extra cost to the Employer to allow for loss in the drum.

When hand mixing is permitted by the Engineer for concrete to be used in unimportant structures, it shall be carried out on a watertight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. In case of hand mixing, extra cement @ 10% shall be added to each batch with no extra cost to the employer. However, the engineer may not allow the hand mixing for concrete at all.

4.7.3 Conveying Concrete

Concrete shall be handled and conveyed from the place of mixing to the place of final deposit as rapidly as practicable by approved means before the initial setting of the cement starts. Concrete should be conveyed in such a way as will prevent segregation or loss of any of the ingredients. If segregation does occur during transport, the concrete shall be remixed. During the very hot or cold weather, if directed by the Engineer, concrete shall be transported in deep containers, which will reduce the rate of loss of water, by evaporation and loss of heat. Conveying equipment for concrete shall be well maintained and thoroughly cleaned before commencement of concrete mixing. Such equipment shall be kept free from set concrete.
4.7.4 Placing Concrete
Formwork and reinforcement shall be approved in writing by the Engineer prior to placing of concrete. Concrete shall be placed in its final position without segregation. The formworks shall be well wetted and all shavings, dirt and water that may have collected at the bottom shall be removed before concrete is placed. The interval between adding the water to the dry materials in the mixer and the completion of the final placing inclusive of compaction of the concrete shall be not more than initial setting time of the cement, normally 30 minutes for ordinary Portland cement. The concrete shall be well placed in the formwork by means approved by the Engineer and shall not be dropped from a height or handled in a manner, which may cause segregation. Any drop above 180cm shall have to be approved by the Engineer. Once the concrete is placed, it shall not be disturbed. After the concrete has been placed, it shall be spread and thoroughly compacted by approved mechanical vibration to a maximum subsidence without segregation and thoroughly worked around reinforcement or other embedded fixtures into the concrete form and shape. Vibration shall not be used for pushing and shoveling on concrete. Vibration must be operated by experienced men and over vibration shall not be permitted. Hand tamping in some cases may be allowed subject to the approval of the Engineer.

No concrete shall be placed in open, while it rains. If there has been any sign of separation of cement and sand by washing, the concrete shall be entirely removed immediately. Suitable precautions shall be permitted on freshly laid concrete. Slabs, beams and similar members shall be poured in one operation normally. Bleeding of under layer, if any, shall be effectively removed. Moulding, drip coarse, etc. shall be poured as shown on the drawing or as directed by the Engineer. Holes shall be provided and bolts sleeve, anchors fastenings or other fixtures shall be embedded in concrete as shown on the approved drawings or as directed by the Engineer. Any deviation from the drawing shall be set right by the Contractor at his own expenses as instructed by the Engineer.

4.7.5 Construction Joints
When the work is to be interrupted, the concrete shall be rebated at the joint to such shape and size as may be required by the Engineer or as shown on the drawing. All vertical construction joints shall be made step boards, which are rigidly fixed and slotted to allow for the passage of the reinforcing steel. If desired by the Engineer, keys and/or dowel bars shall be provided at the construction joints. In the case of water retaining structure water stops of approved materials shall be provided if so specified in the drawings or desired by the Engineer. Construction joints shall be provided in positions as described, the joints shall be in accordance with the followings;
In a column, the joints shall be formed about 75mm below the lowest soffit of the beams forming into it.

Concrete in a beam shall be placed throughout without a joint, but if the provision of a joint is unavoidable, the joint shall be vertical at the middle of the span. A joint in suspended floor slab shall be vertical at the middle of the span at right angle to the principal reinforcement. The locations of construction joint shall be planned by the Contractor well in advance of pouring and will have to be approved by the Engineer.

Before fresh concrete is placed, the cement skin of the partially hardened concrete shall be thoroughly removed and surface made rough by hacking, sand blasting, water jetting, air jetting or any other method as directed by the Engineer. The rough surface shall be thoroughly wetted for about two hours and shall be dried and coated with 1:1 freshly mixed cement sand slurry before placing the new concrete. The new concrete shall be worked against the prepared surface before the slurry sets. Special care must always be taken to see that the first layer of concrete placed after a construction joint is cold. Joints during pour shall be treated with 1:1 freshly made cement sand slurry only after removing all loose materials.
4.7.6 Protection and Curing of Concrete

Newly placed concrete shall be protected by approved means from rain, sun and wind. As the concrete has hardened sufficiently for the surface to be marked, it shall be covered either with sand, Hessian, canvas or similar materials and kept continuously wet for at least fourteen days after final setting. This period may be extended at the discretion of the Engineer.

4.7.7 Control Tests on Concrete

Six test cylinders/cubes for each type of work shall be taken by the Contractor for each 8 hours or less of concreting. If the value of concrete poured is less than 20m³ on any day per mixing plant, the Engineer may exempt or reduce the number of test cylinders/cubes. The samples of concrete shall be tested in approved laboratory in presence of the Engineer and the test results shall be submitted in triplicate to the Engineer. The Contractor shall carry out the sampling and testing according to the provisions of this specification at his own cost. No payment shall be made for the concrete used in specimens.

To control the consistency of concrete from every mixing plant, slump tests shall be carried out by the Contractor free of charge every two hours or as directed by the Engineer. The amount of mixing water shall not be changed without prior approval of the Engineer. Slumps corresponding to the test cylinders shall be recorded for reference. The Engineer if he so desires may order special tests to be carried out on cement, sand or coarse aggregate, water, reinforcing steel, or traverse tests in accordance with NBC or I.S. recommendations. If the materials tested are found to be suitable for the intended use, the cost of these special tests shall be borne by the employer. If the material is found to be not suitable for the intended use the cost of these special tests shall be borne by the Contractor. Further, during the progress of the work if the Engineer has doubt about the quality of any material in use he can instruct suspension of its use till the material is proved acceptable by test. Any consequent loss arising out of the suspension shall be borne by the Contractor.

4.7.8 Exposed Surface

Interior

Imperfect surface, where strength is not required shall be patched and rubbed smooth with carborundum stone, immediately after the formwork is stripped off, fins and projections shall be removed and the concrete surface affected thereby shall be rubbed smooth to the satisfaction of the Engineer.

Anchor Bolts, Anchors, Openings, Sleeves, Insets and Other Built – in Fixtures

The Contractor shall leave all openings, grooves, chases etc. in concrete work as shown on the drawings or as specified by the Engineer. He shall build into concrete work all the materials noted below and shall embed and secure the same as and when required. The material is required to be supplied by the Contractor, shall be of best quality available of approved manufacture and shall be up to the satisfaction of the Engineer.

Material to be embedded

i) Inserts, hangers, opening frames, manholes, covers, floor clips, sleeves and conduits.

ii) Anchor bolts and plates for machinery, equipment and for structural steel work
iii) Dowels bars, etc. for concrete work falling under scope of future works.

iv) Lugs or plugs for door and window frames occurring in concrete work

v) Flashing and jointing in concrete work

vi) Any other built – in fixtures as may be required

Correct location, exact alignment, etc. of all these shall be entirely the responsibility of the Contractor.

4.7.9 Expansion & Isolation Joints etc.

Expansion Joints and Isolation Joints: Expansion joints in concrete structures shall be provided at specified places as indicated on the drawings. The materials and types of joints shall be as specified below. In case of liquid retaining structures, additional precaution shall be taken to prevent leakage of liquids as may be specified on the drawings or as directed by the Engineer. The Engineer may demand test certificates for the materials and/or get them tested.

Bitumen Boards: Bitumen impregnated fiber of approved manufacture as per NBC / IS: 1838 – latest revision shall be used as fillers for expansion joints. It must be durable and waterproof. At the exposed end, the joint shall be sealed with approved sealing compound to a depth of 25mm after application of an approved primer. The sealing compound and the primer shall be applied as specified by the manufacturer.

Bitumen Compound: The gap for expansion joints shall be thoroughly cleaned and the bitumen compound laid as per manufacture specifications. The compound to be used shall be of approved manufacture and shall conform to the requirement of NBC / IS: 1834 – latest revision.

Separation Joints: Strong and tough alkathene sheet or equivalent of about 1mm in thickness as approved by the Engineer shall be used. It shall be stuck by an approved sticker to the cleaned surface of the already set concrete to cover it fully. Fresh concrete shall be laid against the sheet, care being taken not to damage the sheet in any way.

Rubber Pad: Hard foundation quality rubber pads of required thickness and shape are to be placed below machine or other foundations where required as shown on the drawings or as directed by the Engineer. The rubber shall be of best quality of approved manufacturer, durable, capable of absorbing vibration and must be chemically inert continue unbroken in contact with moist or dry earth under normal conditions.

4.7.10 Waterproofing Joints

The materials shall conform to the respective NBC or IS Code – latest revision, where applicable. The Engineer’s approval to the materials shall be obtained by the Contractor before procurement. If desired by the Engineer, test certificates for the materials shall be submitted by the Contractor. The materials shall be of best quality available indigenously, fresh and thoroughly clean.
4.7.11 Water Proofing Admixture
In Concrete: The admixture shall be of right variety and procured freshly. The admixture shall be approved by the Engineer. The method of application and other details shall exactly conform to the manufacturer specification. The concrete shall have the services of the manufacturer supervision at no extra expense to the Employer to supervise the work if desired by the Engineer. In plaster: The concrete surface to be plastered shall be hacked to the Engineer’s satisfaction. The plaster shall be made of cement and sand as approved by the Engineer. If desired by the Engineer, the Contractor shall have the work supervised by the manufacture supervisor at no extra cost to the employer.

4.7.12 Other Admixture in Concrete
The engineer, may or may not in his discretion, allow the Contractor to use any admixture in the concrete.
No payment shall be made extra over the price on concrete for these admixture, whatsoever.

4.7.13 Measurement and Rates
The measurement shall be done in cubic meter calculated as per the drawing. The rates for items shall include cost of all materials consumed in the work at all levels, hire charges of materials, tools and plant, cost of labour, insurance, all transport, services, accommodations, supervision, storage, protection etc. all complete.

4.8 REINFORCEMENT
Scope:
Supplying and fixing Torsteel deformed steel (Grade Fe415) reinforcement in RCC work including bending, binding with wire, placing in position including the cost of binding wire, as per Drawing, specification and instruction of engineer .......................................................... Kg/MT.
Supplying and fixing TMT deformed steel (Grade Fe500) reinforcement in RCC work including bending, binding with wire, placing in position including the cost of binding wire, as per Drawing, specification and instruction of engineer
................................................................................................................ Kg/MT.

4.8.1 Reinforcement Bar
Bar reinforcement described, as “Deformed Steel” shall be hot rolled deformed bars and cold twisted, shall conform to NS 191-2046. The standard “TMT” bars shall mean thermo mechanically treated, conforming to NS 501-2058. With respect to manufacture, quality, physical properties and related requirements, reinforcement bar of the fore – going description shall comply with appropriate parts of NS 191-2046/NS 501-2058/IS 1786 and IS Standards Nos. 432 – 1966 (latest revision), 139 – 1966 (latest revision) and 1786 – 1966 (latest revision) for TMT bars, Mild Steel and Deformed Steel respectively.
Reinforcement bar 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 or cement grout shall not be permitted.
Bars Recommended are as follows:
torsteel Bars Fe 415 grade: for non structural members, slab and staircase or as per drawings.
TMT Bars Fe 500 grade: for foundation footings, Beams and columns or as per drawings.
4.8.2 Certificate and tests for reinforcement bars

For each consignment of reinforcement bars used in the Works, the Contractor shall, if required, supply a 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 conform to relevant NBC 101-1994 / IS code.

The Engineer shall select as many test pieces as he deems necessary where the reinforcement bars are supplied for which the makers test sheet or other records are not available, or where in the opinion of the engineer, materials have been subject to corrosion or other bad effect and the Contractor shall supply and deliver the test pieces free of cost without reimbursement and pay the cost of preparing and testing them as well.

4.8.3 Dimensions of reinforcement bars

The size of reinforcement bars 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 that the length on the Drawing or elsewhere and shall not be more than 50mm. 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.

4.8.4 Bending of reinforcement bars

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 of bend or internal dimensions of bending or the like shall be within a tolerance of 30mm. 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 diameter 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. Bars which have been bent shall not be straightened or re-bend for incorporation in the works without the prior approval of the Engineer.

4.8.5 Fixing reinforcement bars

Reinforcement bars shall be accurately fixed and by approved means and maintained in the position described. Bars intended to be in contact shall be securely wired together at all such points with 16 gauge soft iron 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 should be formed only if and as instructed. Lapping shall be provided as shown in the Drawings 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. Lap length should not be less than development length.
Immediate before concreting, the reinforcement shall be checked for position, cleanliness, and freedom from rust or retarding liquid. Measures 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 nor correct its position for any reason unless approved and shall be protected from deformation in future. Extensions shall be thoroughly coated with cement grout wash or encased in concrete or otherwise protected from corrosion as instructed.

4.8.6 Cover of Concrete and Spacing of bars

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

- **Horizontal, vertical, stair slab**, inclined slabs or Lintel band: 15mm or the size of the bars whichever is greater
- **Short Lintel**: 20mm or the size of the bar whichever is greater
- **Beams**: 25mm or the size of the main bars whichever is greater. Binders and the like 15mm minimum.
- **Columns**: 40mm or the size of the main bars whichever is greater. Rectangular binders or links or helical binding, 15mm minimum.
- **Footing**: 50mm minimum.

4.8.7 Measurement

For the purpose of ascertaining payments due to the Contractor, the basis of measurements of reinforcement bars used in the works shall be calculated by weight in kg (or MT), which shall be computed from the size and lengths of the bars (not binding 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 tolerance. 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 reinforcement shall be deemed to include all allowances omitted in calculating the weight and for any other tolerances, and for providing tying wire, spacer bars, chairs and cover blocks as specified hereinafter for carriage and handling, for bending hooking, cranking and for fixing and maintaining in 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 (8 times the diameter for each hook for mild steel, deformed steel) shall be added to the finished length to arrive at the length of the bar for cutting and measurement.
4.9 FORMWORK

4.9.1 Design
Formwork shall be designed and constructed so that concrete can be properly placed and thoroughly compacted. Formwork shall be firmly supported and adequately strutted, braced, or tied. The formwork shall be needed for normal, ornamental or ribbed slab, cornices, etc. as per design. 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 drawings and calculations for the formwork he proposes to use.

Material
Material used for formwork in various parts of the structure shall be as follows:

<table>
<thead>
<tr>
<th>Part</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations</td>
<td>Wood / 19mm thick waterproof Ply</td>
</tr>
<tr>
<td>Board Beams, Cornice and Slab</td>
<td>Standard Metal or PVC or 19mm waterproof Ply Board and MS pipe props with threads for variable height</td>
</tr>
<tr>
<td>Curved Shape Beams and ribbed Slabs, including all RCC works</td>
<td>Standard Metal or PVC or 19mm waterproof Ply Board cut in strips, and MS pipe props with threads for variable height</td>
</tr>
</tbody>
</table>

All formworks shall be built watertight and of materials of sufficient strength to hold the concrete without bulging between supports.
All formworks shall conform accurately to the shape lines and dimensions shown on the Contract Drawings, account being taken of camber where required. All formworks shall be securely braced to maintain their true position and form.
All formworks shall be checked frequently during the pouring operations and until removed so that they may be driven up if any settlement occurs.

4.9.2 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 creeping 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.

4.9.3 Supports
Formwork shall be constructed so that the formwork to the side’s members can be removed without distributing 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 carried to construction, which is sufficiently strong to afford the necessary support without injury to any portion of the structure. This may mean in some cases that it is carried down to the foundations or other suitable base. Steel props and bracing shall be provided for the temporary support of composite construction where separately specified.
4.9.4 Joints and edges

All joints in the formwork shall be close fitting to prevent leakage of grout 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 chambers are shown on to provide a smooth and continuous accurate alignment at sides and provide a clean line at construction joints in the concrete these shall be fixed with their joints either vertical or horizontal, unless otherwise specified.

4.9.5 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, ducts, voids and chases for civil, sanitary, electrical services and for building in pipes, conduits, lifts 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 nearer to the finished surface of the concrete that 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.

4.9.6 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 is 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.

4.9.7 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 circumferences shall formwork be struck off until the concrete reaches 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 arise 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.

4.9.8 Time 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 loads. For horizontal members where the loading is higher proportion of the total design load these may need to be increased.
4.9.9 Removal of Formworks

The Contractor shall record on the drawing or in some approved manner, the date on which the concrete is placed in each part of the work and the date on which the formwork is removed there from and have this record checked and countersigned by the Engineer. The Contractor shall be responsible for the safe removal of the formwork but the Engineer may delay the time of removal if he considers it necessary. Any work showing signs of damage through original removal of formwork or loading shall be entirely reconstructed without any extra cost of the employer.

Formworks for various types of structural component shall not be removed before the minimum periods specified below, which shall also be subjected to the approval of the Engineer.

<table>
<thead>
<tr>
<th>Ordinary Portland Cement Concrete</th>
<th>Rapid Hardening Portland Cement Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp (°C)</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>20 -</td>
</tr>
<tr>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Part of Structure</td>
<td>Days</td>
</tr>
<tr>
<td>a. Coturnn &amp; Walls</td>
<td>1</td>
</tr>
<tr>
<td>b. Beam</td>
<td>2</td>
</tr>
<tr>
<td>Sides, cornice</td>
<td></td>
</tr>
<tr>
<td>c. Slabs 125 mm</td>
<td>7</td>
</tr>
<tr>
<td>d. Slab below 125 mm</td>
<td>14</td>
</tr>
<tr>
<td>e. Soffit of main beam</td>
<td>21</td>
</tr>
</tbody>
</table>

Before removing any formwork the Contractor must notify the Engineer well in advance to enable him to inspect the concrete if he so desires.
4.9.10 Tolerance

The formwork shall be so made as to produce a finished concrete true to shape, lines, levels, plumb and dimensions as shown on the Drawings subject to the following tolerance unless otherwise specified elsewhere in this Specification or Drawings or directed by the Engineer.

<table>
<thead>
<tr>
<th>a. Sectional dimension</th>
<th>-5mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Plumb</td>
<td>1 in 1000 of height</td>
</tr>
<tr>
<td>c. Levels</td>
<td>3mm before any deflection has taken place</td>
</tr>
</tbody>
</table>

4.9.11 Re-use of formworks

Before re-use, all formworks shall be thoroughly scraped, cleaned, joints etc. examined and when necessary repaired and inside surface treated as specified here above. Formwork shall not be used/reused, if declared unfit or unserviceable by the Engineer.

4.9.12 Classification

Ordinary exterior grade plywood of good quality shall be used for formwork. Where an especially good finish is required and shall be made mostly of approved brand of heavy quality plywood to produce a perfectly level, uniform and smooth surface. Re-use only may be permitted after special inspection and approval by the Engineer. He may also permit utilization of used plywood for the “ordinary” class.

4.9.13 Ornament

These shall be used where ornamental and curved surface are required and shall be of selected best quality well seasoned timber which can be shaped as required. Generally, the “ordinary” class formwork shall be used elsewhere unless otherwise directed by the Engineer.

4.9.14 Rate

Rate shall include for all necessary material and labour to execute the formwork.

4.9.15 Measurement

Measurement for payment shall be done of the area on which centering shuttering has been carried out. Rate shall include centering and shuttering including propping, strutting etc. and removal of formworks including applying form oil to shuttering shall be measured in sqm.
5 PLAIN CEMENT CONCRETE WORK

5.1 PLAIN CEMENT CONCRETE WORK IN FOUNDATION

5.1.1 Scope

This Section covers Plain cement concrete in foundation of walls and RCC footings with cement, sand and aggregates including mixing, laying, finishing to approved level, lines and dimensions, curing, including centering, shuttering, all complete.

i) M 10 (1:3:6) in below foundation footing, ..................Cubic Meter

ii) M 15 (1:2:4) in plinth level floor, .................. Square Meter

5.1.2 Materials

i) Aggregate: Broken hard stone as specified under the schedule of maximum size of 38mm in specification item clause 4.2.1.

ii) Cement: Portland cement as specified under specification item clause 4.2.4

iii) Sand: as per as specified under specification item clause 4.2.1.

5.1.3 Proportion


ii) M 10 (1:3:6): 1 part cement, 3 parts sand and 6 parts aggregate.

5.1.4 Measurements

Measurement shall be in cubic meter of exact length, breath and thickness for PCC below footings and in square meter for PCC in plinth level floor. Rates shall include all materials, mixing, laying, shuttering and curing, all complete.

6 BRICKWORK

6.1 BRICK WORK IN FOUNDATION AND SUPER STRUCTURE.

6.1.1 Scope

This Section covers the furnishing of all labour, materials, equipment and construction of chimney made brick works for foundation, plinth and superstructure, all complete in accordance with the Drawing details, specifications and instruction of engineer.

6.1.2 Material

Chimney made Bricks

The Brick shall be first class chimney made bricks of quality approved by the Engineer and free from grit and other impurities such as lime, iron and other deleterious salts, conforming NS 1 2035 / IS code (latest revision). These shall be well burnt, sound, and hard with sharp edges and shall emit ringing sound when struck with a mallet. These shall be of uniform size.

The size of the bricks shall be 22.9cm x 11.2cm x 5.5cm unless otherwise specified, with a tolerance of ± 3mm in each direction. The compressive strength should be 3.5N/mm². The bricks shall be provided with frogs.
6.1.3 Samples

Samples of each type of brick taken at random from the load shall be deposited with the Engineer for his approval before being used in the work. All subsequent deliveries shall be up to the standard of the sample approved.

6.1.4 Mortar

Cement mortar shall be of proportions specified for each type of work as specified in the drawings. It shall be composed of Ordinary Portland Cement and Sand. The ingredients shall be accurately gauged by measure and shall be well and evenly mixed together in mechanical mixer, care being taken not to add more water that is required. No mortar that has begun to set shall be used, unless otherwise specified. Mortar shall comply with NBC 202-1994-latest revision or 2250-1980 latest revision; Code of Practice for preparation and use of masonry mortar. Compressive strength for mortar (1:4) and (1:6) shall be respectively 7.5N/mm² and 3.0 N/mm².

6.1.5 Cement

Portland cement conforming to NS 49/2041 – latest revision shall be used, unless otherwise specified. Cement shall be fresh when delivered at site.

6.1.6 Sand

Sand shall be clean, neither too fine nor too coarse and shall fall within the grading zone III to IV given in table of IS: 382. The silt content of sand shall not exceed 5% by volume.

6.1.7 Water

Water used for mixing mortar shall be in accordance with of NBC 110-2050. Water shall be clean and free from oil, waste, acid or other organic matter in solution or suspension. Water shall be from approved source. Storage for the water shall be of sufficient size and as directed by the Engineer.

6.1.8 Additives

Additives like waterproofing compounds shall be of the approved type from reputed manufacture. These shall be used strictly in accordance with the manufacturer’s specifications and instruction of Engineer.

6.1.9 Soaking of Bricks

All bricks shall be thoroughly soaked before use, in specially prepared vats, tubes or tanks for not less than two hours and until air bubbles stop being given off. The soaked bricks shall be kept on wooden planks or platforms to avoid earth being smeared on them.

6.1.10 Mortar Mixing

Mixing of mortar shall be done in a mechanical mixer. The ingredients shall be accurately gauged by measure and shall be well and evenly mixed together in mechanical mixer, care being taken not to add more water that is required. Hand mixing shall be resorted to only when specifically permitted by the Engineer. If hand-mixing is allowed, the operation shall be carried out on a clear watertight platform with the gauged materials and ten percent extra cement. Cement and sand shall be mixed dry thoroughly and then water shall be added gradually. Wet mixing shall be continued till mortar of the consistency of a stiff paste and uniform colour is obtained.
Only the quantity of mortar, which can be used up within 30 minutes of its mixing, shall be prepared at a time. Mortar shall be used as soon as possible after mixing and before it has begun to set and in any case within 30 minutes after the water is added to the dry mixture. Mortar left unused for more that 30 minutes after mixing shall be rejected and removed from the site of work.

6.1.11 Laying Brickwork

The brick shall be built in English bond with upwards facing frog in case of 230mm thick brickwork (for chimney made and fair faced machine made bricks both).

The brick shall be built in running stretcher bond with upwards facing frog in case of half brick wall.

Each brick shall be set with bed and vertical joints filled thoroughly with mortar. Selected bricks shall be used for the exposed brickwork. The walls shall be taken up truly plumb. All courses shall be laid truly horizontal and vertical joints shall be truly vertical. Vertical joints in alternate course shall come directly over the other. The thickness of brick courses shall be kept uniform and for this purpose wooden straight edge with graduation giving thickness of each brick course including joint shall be used. Necessary tools comprising of wooden straight edge, masons sprit level, square, foot rule, plumb, line and pins etc. shall be frequently and fully used by the masons to ensure that the walls are taken up true to plumb, line and levels.

Both the faces of walls of thickness greater than 23cm shall be kept in proper plane. All the connected brickwork shall be carried up nearly at one level and no partition of work shall be raised more than one meter above the rest of the work. Any dislodged brick shall be removed and reset in fresh mortar.

Before commencing any brickwork, the Contractor shall confer with other trades to ensure that all pipes, conduits, drains, sleeves, bolts, hangers, or any other materials necessary to be installed in the brickwork at the time it is built, have been fixed or provided for.

6.1.12 Joints

Bricks shall be laid that all joints are full of mortar. The thickness of joints shall be not more than 10mm. The face joints shall be raked to a minimum depth of 7mm by a raking tool during the progress of the work when the mortar is still green, so as to provide proper key for the plaster or pointing to be done. Where plastering pointing is not to be done, the joints shall be struck flush and finished at the time of laying. The face of brickwork shall be kept cleaned and mortar dropping removed.

6.1.13 Openings

Openings in brickwork for air conditioning ducts, exhaust fans, grills pipes etc. shall be provided at the time of laying brickwork without any extra cost. After installation of piping, conduits, grills, etc. all openings left around pipes, conduits, grills etc. shall be checked and caulked with cement mortar to render the whole work vermin proof and tidily finished. The rates quoted are deemed to be inclusive of closing such pre determined openings including erection and dismantling of scaffolding if required, the placing of inserts, collars, grills etc. to be paid separately under respective items.
6.1.14 Curing

All fresh brickwork shall be protected from the effects of sun, rain, etc. by suitable covering. All brickwork shall be kept constantly moist on all the faces for at least ten days.

6.1.15 Scaffolding

Unless otherwise instructed by the Engineer double scaffolding having two sets of vertical supports shall be provided for all building work. The supports shall be sound, strong and tied together with horizontal pieces over which the scaffolding planks shall be fixed. The Contractor shall be responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

6.1.16 Putlog Holes

The putlog holes (if inevitable for scaffolding) which provide resting space for horizontal members shall not be left in masonry under one meter in width or immediately near the skew backs of arches. The holes left in the masonry work for supporting the scaffolding shall be filled with bricks filled with mortar to fit the size of opening with proper beds and joints.

6.1.17 Reinforced in Brickwork

All brickwork shall be reinforced with Torsteel or equivalent reinforcement both horizontally and vertically, as per drawing and instruction of engineer. The reinforcement cleaned of rust and loose flakes with a wire brush, shall be embedded thoroughly in cement mortar at every fourth course. It shall be cast in or securely fixed to adjoining columns or walls, in a manner approved by the Engineer.

6.1.18 Measurements

The measurement of brickwork both 230mm (above 230mm, if any) and 115mm thick shall be the product of the length, height and thickness i.e. in cubic meter for chimney made and fair faced machine made brickwork.

Deduction 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 areas less than 0.1 sqm. overall, bearing of lintels, beams, girders and hold fasts blocks but nothing extra like form work 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 openings as specified. 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, vertical & horizontal reinforcement within brickwork, materials and labour.
6.2 CHIMNEY MADE FIRST CLASS BRICKS LAID DRY ON FLAT SOLING

6.2.1 Scope:
Providing and laying brick on flat soling, all complete.

6.2.2 Material
The bricks shall conform to as per specified under clause 7.1.2 of Civil Works.

6.2.3 Workmanship:
The brick shall be laid over 50mm thick compacted sand. Brick shall be laid dry brick on flat, as directed by engineer. Each brick shall be laid separately and tamped firmly in place in the sand bed. Joints between bricks shall be filled with dry sand. On completion the surface shall be true to line and level with no part deviating from true line and level by more than 20mm. No mud on sand filling shall be allowed when level is not maintained in excavation.

6.2.4 Measurement:
It shall be done in square meter of the area done, which includes sand bed. Rate shall be for material and labor, all complete.

7 DOORS AND WINDOWS

7.1 FRAMES

7.1.1 Scope
Providing and fixing seasoned dressed Sal wood unless otherwise specified, wooden frames in doors, windows, clear story windows and ventilators made of specified size and section as shown in the drawing.

7.1.2 Materials
Timber:
Quality: Timber shall generally conform to NS 112-1994. The other items related to doors and windows of wood and aluminum shall conform to NS 101-1994 or latest revision. The timber to be used for the work shall be from the heart entirely removed. It shall be uniform in substance, straight in fiber, free from large, loose, dead or cluster knot, flaws, shakes, warp, cup spring, twist, bends and defects of any kind. It should be spongy, flaky or brushy condition, sap wood and borer holes.

All the timber shall be seasoned and free from decay, harmful fungi and insect attacks and from any other damage of harmful nature which will affect the strength, durability, appearance or its usefulness for the purpose for which it is required.

Kind: The timber shall be best quality timber as specified in the item. The samples of the approved timber to be used shall be deposited in the office of Engineer for the purpose of comparison

Color: The Color shall be uniform as far as possible, the darkness of color amongst color species of timber being generally a sign of strength and durability.
Moisture Content: The moisture content for timber shall not exceed 12 percent of dry weight of timber and shall weigh 56.0 lb per cft.

Stacking: As soon as the foundation of building are laid all necessary timber, scantling shall be brought to the site and stacked as laid down in IS 401 - 1967 till required. Timber for the work shall not be brought to the site of work until the sample and approved by the Engineer who may reject the defective timber/timber works. Any effort like plugging, painting, using any adhesive or resinous material to hide defect shall render the pieces, reject able by the Engineer. Timber presented for inspection shall clean and free from dust, mud, paint or other material, which may conceal the defects. Cut-off ends for protection can be done after inspection with raw linseed oil or any other materials approved by the Engineer. No timber be painted, tarred or oiled primed without the previous permission of the Engineer.

Sawing: All Scantling shall be sawn in straight lines, planes and of uniform thickness with full measurement from end to end and shall be sawn in the direction of the grain. They shall be sawn with such sufficient margin as to secure specified dimensions, lines and planes after being brought and dressed. Any timber rejected shall at once be removed from the site.

7.1.3 Construction

When ventilator is provided above the door, full length, of the vertical post shall be provided. Joints in the frame vertical style or horizontal rail shall not be allowed .The unrelated edges of the frame in the opening shall be rounded or beaded uniformly.

The rebate and the plaster key grooves shall be provided as shown in the drawing. Vertical part of the frame shall be embedded at least 30 mm in the masonry or concrete or flooring. Hold fasts shall be provide as specified and any adjustment of spacing necessary shall be erected in position and held in plumb with proper supports from both sides and built in masonry as it is being built.

The Work shall be as per the drawing .the timber shall be properly planned wrought and dressed in a workmanship manner.

All joinery work shall be securely mortised and tanned and glued with best quality waterproof glue. All sections and dimensions are to be as shown on drawings. For all joinery work, use of nails shall not be permitted. Wood screws of appropriate size and of approved make shall be used. Wherever practicable, means of fastening the various parts together shall be concealed. All work (both carpentry and joinery) shall be to the dimensions shown on the drawings.

The rate of woodwork shall include the cost of all sawing, planning, joining, bolts, nails, spikes, keys wedges, pins, screw etc. necessary for the framing and fixing. Joints and portions inserted in masonry or floor shall be allowed for in the measurement. Plugging in of holes for hold fasts shall be done in neat manner. Any defects observed after installation shall be rejected.

Sample of workmanship shall be submitted for approval.

7.1.4 Measurement

The measurement of the timber frame shall be taken in its net and section and worked out correct up to two of decimal in cubic meter. Total tolerance of 3mm is admissible in section of dressed timber
2 HOLDFAST

7.2.1 Mild Steel Flat Holdfast

Scope

Providing and fixing 20mm x 6mm mild steel flat holdfast total 300 mm long as per drawing and fixed to frames with screw, embedded in concrete 1:2:4 (1 cement: 2 sand: 4 stone aggregate, 20mm and down gauge) block of 300mm x 100mm x 100mm.

These shall be of 20mm x 6mm and 300mm long MS flat one end split and fish tailed for anchorage and the other bent up for fixing as per the drawings. Holdfast shall be fixed to the door or window frames with 40 mm MS screws. The MS flat of the holdfast shall be fitted to the frame in the recess of required size and thickness.

There shall be 2 such holdfasts on each side of the frame for frames up to 1.25m height (four in all) and 3 on each side for frames beyond 1.25m height. The holdfasts shall be as shown on the drawing with minor adjustments for brick/stone Masonry. It shall be fixed as the work proceed not latter.

Measurement

It shall not be measured separately. Its rate shall be included in rate of frame with providing and fixing hinge in concrete block with necessary formwork.

7.2.2 Mild Steel holdfast for RCC Column

Scope

Providing and fixing standard holdfasts as shown in the drawing or as instructed by the engineer.

Material and Workmanship

The mild steel holdfasts for RCC columns shall be made of 12 mm. diameter rod fishtailed at one end and threaded at the other. The split length shall be 25 mm. and threading shall be at least 50 mm. where a nut for 12 mm. diameter shall be provided. It shall be total 175 mm. long. The MS bolt holdfast as shown in the drawing shall be provided in the RCC column structure at required places as the casting progresses. In absence of RCC column the MS bolt holdfast shall be provided in a concrete block of 300x100x100mm.

The timber frame shall be fitted with MS bolt holdfast through square holes provided at required places in the frame. The nut shall then be tightened properly. Care shall be taken that the threaded bolt is at least 12 mm. inside exposed frame face. Plugging of the bolt hole in the frame shall be done with timber matching the graining of the timber. The finished surface shall be smooth and matching after plugging the bolt hole.

Measurement

It shall not be measured separately. The rate of frames shall be inclusive of the bolt, nut, and concrete block with formwork. Nothing extra shall be paid for making holes in the frame and plugging with timber smoothly.
7.3 FLUSH DOOR SHUTTER

7.3.1 Scope
Providing and fixing in position 38 mm. thick factory made solid core flush door shutters single leaf fixed with 3 nos. of 100 mm. steel butt hinges to each shutter, with necessary accessories, all complete.

☐ Shutter made of 38mm. thick solid core flush door with both side teak (BST) finished with 12mm thick wooden (sal) bead border in single leaf fixed with 3 nos. of 100mm steel butt hinges, 2 nos. of 150mm Aluminum tower bolt, one standard mortise lock, one butterfly type door stopper and as shown in the Drawing and instruction of engineer, all complete.......................................................... sq.m.

7.3.2 Material for Shutter
Solid Core Flush Door Shutter It shall be of commercial solid core flush door shutter (BST/OST), as per drawing and as approved by the Engineer. The shutters shall conform to the relevant specification for the type and grade to IS 2202 (latest revision) for wooden flush door shutters – solid core type.
Bonding Medium: Liquid phenol formaldehyde synthetic resin shall be the bonding medium.
The flush door shutters as specified shall be manufactured by a reputed brand name such as Duroply, Suryaply, or equivalent brand. The Indian Plywood manufacturing Co. Ltd., Bombay or equivalent having hot press and all modern equipment. Samples shall be produced to Engineer for approval.

7.3.3 Workmanship/Finish
There shall be no clear joint junction of the plywood on the finished side. Chipped ply, cracked or other defective workmanship shall be rejected. The door shutters shall be hung in position with 3 nos. 100 mm. steel butt hinges. It shall be fitted with two numbers of 150mm Aluminum tower bolt and butterfly type door stopper of butterfly type, a set of (chrome plated/ powder coated) mortise lock.

The BST shutter shall be fitted with hydraulic door closer, where required.

7.3.4 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 steel hinges, two tower bolts per shutter leaf. Different rates will be paid for door shutter with door closer and a hydraulic door closer.

7.4 GLASS

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

a) Clear glass 3mm. thick (wooden window).............................................sq.m
b) Clear glass 5mm thick (aluminum window).............................. sq.m
c) Tinted glass 5mm. thick (aluminum window) ......................... sq. m.
d) Tinted glass 6mm. thick................................................................. sq. m.
e) Wired glass 6mm. thick .................................................................sq. m.
f) Frosted glass 4mm. thick ......................................................... sq. m.
g) Frosted glass 6mm. thick................................................................. sq. m.
h) Patterned glass 6mm. thick .........................................................sq. m.
7.4.2 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 uniform thickness. Samples shall be approved prior to use and shall conform to NBC 101-1994 (IS: 2553-latest revision for safety glass & IS: 2835-latest revision for flat transparent sheet glass).

7.4.3 Workmanship

All windows shall have glazing fixed outside and as shown on the 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 the 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 dips provided. There shall be minimum 4 glazing clips per square feet of glass. After fixing the glazing clips the glass is placed, puttied and cut to a level edge finish with putty knife. The putty glazing dips must be drilled prior to installation of the window shutter. Cracked, scratched glass shall be rejected.

7.4.4 Measurement

It shall be measured in square meter of the glass provided inclusive of bead and putty. The rate shall include for providing putty, wooden beads, glass, panel pins etc. and labor complete. This measurement shall be taken for only fixed wooden window frame. Measurement of glazing in Aluminum window and wooden shutter shall not be taken.

7.5 FIXTURES AND FASTENINGS

7.5.1 Scope

Providing and fixing in position best quality, standard fixtures and fastening in the door, window, clerestory window and ventilator shutters as per specification scope, drawings, approval and instruction of engineer.

a) Mortise lock chromium plated .................................................each
b) Tower bolt 150 mm. aluminum .............................................each
c) Tower bolt 100 mm. aluminum .............................................each
d) Door stopper rubber type chromium plated (butterfly)..............each
e) Handle 150 mm. chromium plated........................................each
f) Handle 100 mm. chromium plated........................................each
g) Aldrop 300 mm. aluminum .................................................each
h) Aldrop 250 mm. aluminum ..................................................each
7.5.2 Workmanship

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 drawing or as directed by Engineer. Sample shall be submitted for approval the Engineer for comparison.

All fixtures shall fixed-to the jointing 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 Contractors expense. 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 230 mm long hooks and eyes shall be fixed to the ventilator frame and the shutter as directed. If the Drawing specifies different types of fixtures the work shall be carried out according to the Drawing.

If the ventilator is swing type then hooks and eyes can be dispensed with. The ventilator shall swing about a central horizontal axis on a pair of such center, chat hook, one brass ring with screws attached as per the 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.

7.5.3 Measurement

They shall not be measured separately. Rate of the shutters (plain and craved) shall include cost of material and labor required for fixtures and fastenings. No extra rate whatsoever will be paid for these items.

8 Finishing Work.

8.1 PLASTERING WORKS

8.1.1 Scope

This Section covers the furnishing of all labor, materials, scaffolding, equipment, tools, plants and incidentals, necessary and required for the completion of all plaster work, all complete in accordance with the detail shown on the Drawing and these Specifications or as directed by the Engineer.

(i) 12.5mm Thick Plastering work in 1:4 CM (1 cement: 4 Sand) 50% Coarse Sand +50% Fine Sand) on ceiling, walls of fair side brickwork/RCC soffits..............Sq m
8.1.2 General

Plaster as herein specified shall be applied to all internal and external surfaces where called for. All plasterwork shall be executed by skilled workmen in a workmanlike manner and shall be of the best workmanship and in strict accordance with the dimensions on drawings subject to the approval of the Engineer.

The primary requirement of plasterwork shall be to provide dense, smooth and hard enclosure and devoid of any cracks on the interior and/or exterior.

8.1.3 Mortar

The mortar of the specified mix shall be used. Mortar shall be prepared as specified under “Brickwork”. It shall be made in small quantities, as required and applied within 15 minutes of adding water to the plaster mix.

Cement: Cement shall be as per specification under “Concrete Work”

Water: Water shall be as per specification under “Concrete Work”

Sand: for plaster work normally clean coarse sand shall be used. However, if specified in the item of work, coarse sand conforming to the specifications under “Concrete Work” with 50% fine sand shall be used.

8.1.4 Scaffolding

Double scaffolding having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed. The Contractor shall get the scaffolding approved from the Engineer well in advance.

8.1.5 Chasing and Breakage

All fixing of door and window frames, chasing, installation of conduits, inserts, boxes etc. shall be completed before any plastering work is commenced on a surface. No chasing or cutting of plaster shall be permitted normally. However, if the same is felt unavoidable at places, written permission shall be obtained from the Engineer before cutting any such plaster. Broken corners shall be cut back out less than 150mm on both sides and patched with plaster of Paris as directed. All corners shall be round to a radius of 8mm or as directed by the Engineer.

8.1.6 Preparation

Masonry and concrete surface, which call for application of plaster, shall be clean, free from dust and loose mortar. Efflorescence if any shall be removed by brushing and scraping. For masonry surfaces the joints shall be raked out properly, while the concrete surfaces shall be
roughened by wire brushing and hacking to provide the key, thereby ensuring proper bond to the satisfaction of the Engineer. The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced.

8.1.7 Chicken Wire Mesh

Galvanized chicken mesh (24 gauge, 12mm size) shall be provided at junctions of brick masonry and concrete members, to be plastered, and other locations as called for, properly stretched and nailed with galvanized nails, equal thickness of plaster on both sides of the mesh. The width of the mesh shall be as approved by the Engineer. The chicken mesh wherever specified, shall be fixed in place before plastering.

8.1.8 Samples

Samples of each type of plaster shall be prepared well in advance of undertaking mass work for the approval of the Engineer.

8.1.9 Water Proofing Compound & additives

The waterproofing compound or plaster additive of approved brand shall be used in proportions as per manufacturer’s specifications, if necessary, if allowed and approved by engineer.

8.1.10 Application

Ceiling plaster shall be completed before commencement of wall plaster. Plastering shall be started from the top and worked down towards the floor. To ensure even thickness and true surface, plaster about 15 x 15cm shall be first applied, horizontally and vertically, at not more that 2 meters intervals over the entire surface to be plastered to serve as gauges. The surfaces of these gauges areas shall be finished truly in plane of the finished plastered surface. The mortar shall be laid in between the gauges with a trowel ensuring thorough filling of joints. The mortar shall be applied uniformly slightly more than the thickness specified across the gauges, with small upward and sideways movements at a time. Finally the surface shall be finished off true with trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive to welling or over working the float shall be avoided.

All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully and neatly finished. Rounding or chamfering corners, arises, junctions, etc. where required shall be done without any extra payment. Such rounding shall be carried out with proper templates to the sizes required. No portion of the surface shall be left out to be patched up later on.

In suspending work at the end of the day, the plaster shall be left, cut clean to line both horizontally and vertically. When recommencing the plastering, the edge of the old work shall be scraped, cleaned and wetted with cement slurry before is applied to the adjacent areas, to enable the two to be properly joint together. Plastering work shall be closed at the end of the day on the body of the surface and not nearer than 15cm to any corners or arises.
It shall not be closed on the body of the features such as pilasters, bands and cornices, nor at the corners or arises. Horizontal joints in plasterwork shall not also occur on parapet tops and copings, as these invariably lead to leakage.

8.1.11 Grooves

Wherever directed all joints between concrete and brick masonry besides other locations as called for shall be expressed by a groove cut in plaster at no extra cost.

8.1.12 Bands

Wherever directed the plaster bands shall be provided by way of additional plaster thickness as specified. The surface of first layer shall be scratched/roughened with wire brush in the portion where additional thickness is to be applied. The surface shall be cured for a minimum of 48 hours. The clean cement slurry shall be applied by brush before applying second coat of desired finish such as smooth, sand faced, stucco, pebble dash etc. the band edges shall be toweled finished and shall be in absolute line, level and plumb. The band edges shall be sharp and shall not be chamfered unless directed.

8.1.13 Finish

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

8.1.14 Curing

Curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered. The plaster shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages.

8.1.15 Pre-function

Any cracks, which appear in the surface, and all portions, which sound hollow when tapped or are found to be soft or otherwise defective, shall be cut out in rectangular shape and redone as directed by the Engineer.

8.1.16 Floating Coat of Neat Cement

Where finishing with a floating coat of neat cement is specified in the item of work, specifications for this item of work shall be same as described above except for the additional floating coat, which shall be carried out as below. When the plaster has been brought to a true surface with the wooden straight edge, it shall be uniformly treated over its entire area with a paste of neat cement and rubbed smooth, so that the whole surface is covered with neat cement coating. The quantity of cement applied for floating coat shall be 1 kg per sq.m. Smooth finishing shall be completed with trowel immediately and in no case later than half an hour of adding water to the plaster mix.
8.1.17 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. 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. No extra payment for extra lift.

8.2 38 MM THICK PCC/SCREED ON FLOOR

8.2.1 Scope

Providing and laying 38mm thick PCC/Screed screeding with 1:2:4 (cement, sand, 12mm aggregate) mix on proper slope after scraping, cleaning and watering old surface as per drawing and instruction of the Engineer.

8.2.2 Materials

- **Cement**: Portland cement as per specification under “Concrete Work”.
- **Sand**: Coarse Sand as per specification under “Concrete Work”.
- **Aggregate**: Coarse Sand as per specification under “Concrete Work”.

8.2.3 Preparation Surface

The Surface shall be cleared of all loose rubbish, and other foreign matter. If necessary the surface shall be cleaned with wire brushes. Cleaned surface shall then be wetted with water thoroughly, but no water pool shall be allowed.

8.2.4 Mixing

Cement sand mortar shall be prepared by mixing the ingredients dry by measuring with boxes to have the required proportion. First cement and sand shall be mixed dry in specified proportion and then mixed by adding water slowly and gradually and mixed thoroughly to have a uniform mix.

8.2.5 Placing and Finishing

The uniform mix of cement, sand, aggregate in 1:2:4 shall be laid to specified thickness. Proper slope for draining wash water shall be provided as per instruction as specified. It shall be compacted 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 mortar are filled with mortar paste. Then the surface shall be trawled till the moisture disappears. Test the surface with straight edge. The surface must be uniform in color.
8.2.6 Measurement

Measurement shall be in square meter of exact length and breadth of the floor. Rate shall include materials, mixing, laying, curing, finishing and labor etc. all complete.

8.3 CEMENT SAND PUNNING

8.3.1 Scope

Cement sand punning on floor, skirting, dado, etc. wetting the surface, mixing, laying and rubbing with steel trowel to a hard, smooth and shining surface and curing for a quality finish net all complete, in square meter.

i) 3mm thick cement sand punning (1:1)

8.3.2 Materials

i) Cement Portland cement as per specification under “Concrete Work”

ii) Sand River sand as per specification under “Plastering Work” clause 10.1.3

8.3.3 Mix Proportion - the Mix Proportion shall be one part cement and one part sand.

8.3.4 Mixing in specified proportion as per specification of mortar mixing Clause 7.1.11.

8.3.5 Punning Application

Before applying cement sand punning, the first work should be swept clean of any dust or loose particles. The average thickness of punning shall not be less than 3 mm. The pattern of the surface should be as per instruction of the Engineer. The coat shall be finished by rubbing with a steel trowel and any depression shall be filled in and rubbed to a shining surface. All corners and edges shall be rounded. The Contractor shall prepare a sample square meter of the punning as per instruction of the Engineer until the quality, texture and finish required is obtained and approved by the Engineer, after which all punning executed shall confirm with the respective approved sample. All punning shall be finished smooth, even and truly level and as per instructions of the Engineer. The punning shall be kept wet for 7 days.

8.3.6 Measurement

The measurement shall be taken in square meter for the finished surface. The rate shall include all the materials and labor, all complete.
9 PAINTING WORK

9.1 General

9.1.1 Extent and Intent
The Contractor shall supply all materials, labor, tools, ladders, scaffolding and other equipment necessary for the completion and protection of all painting work. Painting, as herein specified shall be applied to all surfaces requiring painting throughout the interior and exterior of the buildings as given in the schedule of finishes or elsewhere. The painting shall be carried out by a specialist sub-contractor or as instructed and approved by the Engineer. Care is to be taken that all surfaces to be painted are thoroughly cleaned and dry. The painting materials shall conform to NS 101-1994.

9.1.2 Storage
Storage of materials to be used on the job shall be only in a single place approved by the Engineer. Such storage place shall not be located within any of the buildings included in the Contract.

9.1.3 Materials
Materials used in the work shall be of manufacture approved by the Engineer. Ready mixed paints, varnishes, enamel, lacquers, stains, paste fillers, distempers and other materials must be delivered to the job site in the original containers, with the seals unbroken and labels intact. Each container shall give the manufacturer’s name, type of paint, color of paint and instruction for reducing. Thinning shall be done as instructed by the Engineer. The rejected materials shall be immediately from the building premises.

9.1.4 Color
All colors, as provided in the color schedule, shall be approved by the Engineer. The Contractor shall mix manufacturer’s colors as per Engineer’s requirements and shall prepare painted samples of the colors selected and submit it for approval by the Engineer. No work is to be proceeded until the Engineer has given his approval, preferably in writing, of the color samples.

9.1.5 Commencement of Work
Painting shall not be started until the surfaces to be painted are in condition fit to receive painting and so certified by the Engineer. Painting work shall be taken in hand only after all other Contractor’s work is completed. Building where painting work is to be commenced shall be thoroughly swept and cleaned up before commencement of painting.

9.1.6 Scaffolding
Only double scaffolding having two sets of vertical supports shall be provided for all painting work. The supports shall be tied together with horizontal pieces over which the scaffolding planks shall be fixed.
All the vertical and horizontal members of the scaffolding shall be placed sufficiently away from the surfaces to be painted to ensure proper and uninterrupted application.
9.1.7 Workmanship

The workmanship shall be of the very best; all materials evenly spread and smoothly flowed using good quality tools, brushes, etc., as required. Only skilled painters shall be employed. A properly qualified foreman shall be constantly on the job whilst the work is proceeding. All surfaces to be painted shall be cleaned free of all loose dirt and dust before painting is started. All work where a coat of paint or primer has been applied must be inspected and approved by the engineer, before application of the succeeding specified coat. Each undercoat shall be distinct shade of the approved colour. The painted surface shall present uniform appearance and glossy finish, free from steaks, blisters etc.

Before painting, remove hardware, accessories, plates and similar items or provide suitable protection to all such items. Upon completion of each space, replace all fixtures removed. Remove doors if necessary to paint bottom edge. Use only skilled mechanics for the removal and replacement of above items.

9.1.8 Concealed surfaces

All interior and exterior trim, door frames, doors, shelving, cabinet work shall be thoroughly and carefully back painted as all surfaces and edges, which will be concealed when installed. Such surfaces shall be cleaned, dried, sanded and properly prepared to receive the paint. Top, bottom and edges of doors shall be finished same as the rest of the door.

9.1.9 Protect and Clean

Contractor shall protect not only his own work at all times, but shall also protect all adjacent work and materials by suitable covering during progress of his work. Upon completion of his work, he shall remove all paint and varnish spots from floors, glass and other surfaces. Any defaced surfaces shall be cleaned and the original finish restored. He shall remove from the premises all rubbish and accumulated material and shall leave the work in clean, orderly and acceptable conditions.

9.1.10 Preparation of Surfaces

**Wood:** Sand paper to smooth even surface and then dust off and wipe clean, touch up all knots and pit pockets with shellac on interior wood. After priming coat has been applied thoroughly fill all nails moles, irregularities and cracks. Use plaster wood filler for stained or natural finish and putty glazier putty or wood for painted work.

**Plaster Work:** Fill all holes, cracks and abrasions with plaster of Paris, properly prepared and applied and smoothed off to match adjoining surfaces. Do not use sand paper on plaster surfaces. Plaster shall be allowed to dry for at least 12 (twelve) weeks before the application of paint.
Steel and Iron: All surfaces shall be washed with mineral spirits to remove any dirt or grease before applying paint. Where rust or scale is present, it shall be wire brushed and sand papered clean. All cleaned surfaces shall be given one coat of approved phosphate before prime coat in accordance with the manufacturer’s instructions. Shop coats of paint that have become marred shall be cleaned off, wire brushed, and spot primer over the affected areas.

Galvanized Metal: Galvanized metal, when new, shall be thoroughly cleaned with naphtha and treated with a moderate solution prepared by mixing 38gms of copper acetate in a liter of soft water or 39 gm of copper nitrate and 13 gm ammonium chloride in a liter of soft water, prepared in a wooden container and applied with a brush. Allow to dry thoroughly and brush off before applying paint.

9.1.11 Application

The paint shall be continuously stirred in the container so that its consistency is kept uniform throughout.

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

Where so stipulated, the painting shall be carried out using spray machines suited for the nature and location of the work to be carried out. Only skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding suitable thinner. Spraying shall be carried out only in dry conditions. No exterior painting shall be done in damp foggy or rainy weather. Surface to be painted shall be clean, dry, smooth, and adequately protected from dampness. Each coat shall be applied in sufficient quantity to obtain complete coverage, shall be well brushed and evenly worked out over the entire surface and into all corners, angles and crevices allowed to thoroughly dry. Second coat shall be of suitable shade to match final colour, and shall be approved by the Engineer before final coat is started. Allow at least 48 hours drying time between coats for interior and 7 days for exterior work, and if in the judgement of the Engineer more time is required it shall be allowed. Finished surfaces shall be protected from dampness and dust until completely dry. Finished work shall be uniform, of approved colour, smooth and free for runs, sags, defective brushing and clogging. Make edges of paints adjoining other materials of colours sharp and clean, without overlapping.

In order to achieve superior finished surface, putty paste fillers shall be used on all surfaces to be painted, to fill pores, dents, etc. The putty/paste fillers shall be of approved quality and manufacture and shall be applied to the surface with a knife or other sharp edged tools after the priming coat as well as after each undercoat. The surface, after filling with
putty/paste filler, shall be rubbed down with fine sand paper and dusted off before the application of the subsequent coat.

Paste wood filler, when set shall be wiped across the grains of the wood. Then shall be let the grain to secure a clean surface. Surface to be stained shall be covered with a uniform coat of stain wiped off if required. Finish: The painted surfaces shall present uniform appearance and semi – glass finish free from steaks, blisters etc.

9.2 PRIME COAT

9.2.1 Scope

Applying priming coat of approved brand (Cement primer, Wood primer or Metal primer)

9.2.2 Material

The primers shall be in sealed tins. These shall be of SKK (Japanese), Berger Brand, Johnson and Nicholson Ltd., Snowcem (India) Ltd., or equivalent as approved by the Engineer.

9.2.3 Preparation of Surface

In case of cement plaster all holes, cracks and abrasion shall be fill with plaster of Paris, properly prepared and applied and smoothed off to match adjoining surfaces. The surface for cement plaster shall be patched up with thick paste of the same primer and smoothed after drying. Any loose or uneven areas or any major cracks or defects in the concrete or plaster back ground shall be cut out and made good and the repairs allowed to dry thoroughly. Any efflorescence shall be removed by dry brushing.

In case of timber all surfaces shall be sand papered and cleaned. Surface of timber having knots and nail 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 (powder chalk), one part of white lead mixed together in double boiled linseed oil and well kneaded. The surface thus treated shall be allowed to dry up and then sand papered or readymade approved putty may be used.

All metal surfaces shall be thoroughly cleaned and papered. In case of surface having welds, the joints shall be properly filed and smoothened. De-rusting shall be done and properly cleaned after sand papering. If required, Putting of approved make shall be used to fill any joints.

9.2.4 Application

After preparing the surface, the priming coat shall be applied with hairbrushes and as per manufacture's printed instructions.
9.3 DRY DISTEMPER

9.3.1 Scope

Painting the Plastered Surface with Washable Distemper of approved brand and colour with two or more coats to give an even and uniform Shade. The paints used shall be suitable for internal use and its appearance should not fade with time. Paints shall adhere to any type of surface finish.

9.3.2 Materials

Dry distemper of required colour as approved by the Engineer shall be used, conform to IS: 427-latest revision. Before application of the distemper the shade shall be approved by the Engineer. The paint (SKK-Japanese, Nerolac, Berger or equivalent) shall be water based washable distemper as per NS, IS specification.

9.3.3 Preparation of Paint

The dry distemper powder shall be stirred slowly in clean water using 0.6 litre of water per kg of distemper or as specified by the manufacturer. Warm water shall preferably be used. It shall be allowed to stand for at least 30 minutes (or if practicable overnight) before used. The mixture shall be well stirred before and during use to maintain an even consistency.

Distemper shall not be mixed in larger quantity than is actually required for one day’s work.

9.3.4 Preparation of Surface

Before new work is distempered, the surface shall be thoroughly brushed free from mortar dropping and other foreign matter and sand papered smooth. New plaster surfaces shall be allowed to dry for at least six weeks before applying distemper.

Pitting in plaster shall be made good with plaster of Paris mixed with the colour to be used. The surface shall then be rubbed down again with fine grade sandpaper and made smooth. A coat of distemper shall be applied over the patches. The patched surface shall be allowed to dry thoroughly before the regular coat of distemper is applied.

9.3.5 Application

For new work, the treatment shall consist of a priming coat of whiting followed by the application of two or more coats of distemper till the surface shows and even colour. For each coat, the entire

Surface shall be coated with the mixture uniformly with proper distemper brushes in horizontal strokes followed immediately by vertical ones, which together shall constitute one coat.

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

Plastered, POP surface (paint shall be prepared with sand papering), putting, and two coats of primer. The paint is applied in two coats of washable distemper with roller or brush. The surface should be properly cleaned and treated with water based primer as per manufacturer’s specifications. Rectification of defects in plaster/POP with broken edges should be done by using a proper colour putty, paste as per manufactures specifications.

The surface on which paint is applied shall become hard dry in 16 hours. The necessary single / multistage scaffoldings required for the work shall be provided as detailed out under coatings. The equipment, roller or brush used on the work should be immediately washed with water to facilitate future use.

9.3.6 Measurement

Measurement shall be in square meters of the actual covered area of the paints. Nothing extra shall be allowed for painting any rough surface e.g. external sand - faced plaster or work in short width or surface in any shape. The rate shall include for two or more coats inclusive of materials, labor, scaffolding all complete.

9.4 WATERPROOFING CEMENT PAINT

9.4.1 Scope

Painting the Plastered Surface with Water Proofing Cement Paint of approved brand and of colour with two or more Coats to give an even and Uniform Shade.

9.4.2 Material

Cement paint of required colour and of Snowcem India Ltd., or equivalent brand or manufacturer conforming to IS: 5410 - latest revision, approved by the engineer in sealed tins, shall be used. Before application of the cement paint the shade shall be approved the Engineer.

9.4.3 Preparation of Paint

Cement paint shall be mixed with water in two stages. The first stage shall comprise of 2 parts of cement paint and one part of water stirred thoroughly and allowed to stand for 5 minutes. Care shall be taken to add the cement paint gradually to the water and not vice versa. The second stage shall comprise of adding further one part of water to the mix and stirring thoroughly to obtain a liquid of workable and uniform consistency. In all cases the manufacturer’s instructions shall be followed meticulously.
Cement paint shall be mixed in such quantities as can be used up within an hour of its mixing as otherwise the mixture will set and thicken affecting flow and finish. The lids of cement paint shall be kept tightly closed when not in use, as by exposure to atmosphere the cement paint rapidly becomes air set due to its hygroscopic qualities.

**9.4.4 Preparation of Surface**

Before painting is commenced on surface, all dirt and foreign matter shall be completely removed. All holes, cracks and abrasion shall be fill with plaster of Paris, properly prepared and applied and smoothed off to match adjoining surfaces. Any loose or uneven areas or any major cracks or defects in the concrete or plaster back ground shall be cut out and made good and the repairs allowed to dry thoroughly. Any efflorescence shall be removed by dry brushing.

The surface shall be wetted by sprinkling of water with fine spray. The surface shall be sprayed several times with a few minutes interval between each spraying to allow the moisture to soak into the surface.

**9.4.5 Application**

A vertical stroke with another horizontal stroke shall be termed one coat. Paint solution shall be applied to the surface with hair brushed/roller 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. Sample of workmanship shall be approved by the Engineer prior to commencement of work.

**9.4.6 Measurement**

Measurement shall be in square meters of the actual covered area of the paint. Nothing extra shall be allowed for painting any rough surface e.g. external sand-faced plaster or work in short width or surface in any shape. The rate shall include for two or more coats inclusive of materials, labor, scaffolding all complete.

**9.5 SYNTHETIC ENAMEL PAINTS ON WOOD**

**9.5.1 Scope**

Painting on wood two or more coats with synthetic enamel paint of approved brand and colour to give an even and uniform shade

**9.5.2 Materials**

The primer and paint shall be of British Paints India Ltd., Johnson and Nicholson, India or equivalent brand approved by the Engineer, in sealed tins.
9.5.3 Preparation of Surface

The Surface shall be prepared and priming coat shall be applied as per clause 9.1.10

9.5.4 Application

After preparing and after the priming coat has been applied a topcoat 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 or otherwise disfigure the various coats. The same brand of materials will be used for various coats. The paint shall be used and applied as per manufacture’s printed instruction. The paints 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 materials such as thermo Cole, perforated acoustic tile, soft board etc. shall be done by spray painting only. The Engineer prior to commencement of work shall approve sample of workmanship.

9.5.5 Measurement

Measurement shall be in square meters of the actual covered area. Nothing extra shall be allowed for painting any rough surface e.g. external sand - faced plaster or work in short width or surface in any shape. The measurement shall be as follows:

<table>
<thead>
<tr>
<th>SN</th>
<th>Description of Work</th>
<th>Measurement Method</th>
<th>Overlapping Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Paneled or Framed</td>
<td>Measured flat (not girthed) end of frame to frame</td>
<td>1.5 for each side</td>
</tr>
<tr>
<td>ii)</td>
<td>Licked &amp; Battened</td>
<td>do -</td>
<td>1(1/8) for each side.</td>
</tr>
<tr>
<td>iii)</td>
<td>Flush</td>
<td>do -</td>
<td>1 for each side</td>
</tr>
<tr>
<td>iv)</td>
<td>Fully glazed or gauged</td>
<td>do -</td>
<td>0.5 for each side</td>
</tr>
<tr>
<td>v)</td>
<td>Part paneled and part</td>
<td>do -</td>
<td>1 for each side</td>
</tr>
<tr>
<td>vi)</td>
<td>Fully ventilated or Louvered</td>
<td>do</td>
<td>- 1.5 for each side.</td>
</tr>
<tr>
<td>vii)</td>
<td>Boarding with covered fillet and match boarding</td>
<td>do -</td>
<td>1.5 for each side</td>
</tr>
<tr>
<td>viii)</td>
<td>Gates and open palisade fencing including standard braces, rails, stays</td>
<td>The height shall be taken from lower the lower end of the palisade up to the top of the palisade but not to the standards if they are higher.</td>
<td>1 for Painting all over</td>
</tr>
<tr>
<td>ix)</td>
<td>Carved or enriched work</td>
<td>Measured flat</td>
<td>1.5 for each face</td>
</tr>
</tbody>
</table>

The rate shall include for two or more coats inclusive of materials, labor, scaffolding, all complete.
9.6 ENAMEL PAINTING ON METAL SURFACE

9.6.1 Scope

Painting on metal surface with enamel (readymade) pint of approved colour in two coats over one coat of primer, in properly sanded surface for high class finish all complete, in m².

9.6.2 Material Primers and paints: primers and paints shall be of approved quality and of approved manufacture like Asian Paints, Nerolac, Jensolin, Berger or Equivalent. These materials shall be ready mixed and in sealed thin with required quantity stock at site.

9.6.3 Preparation of surface

The Surface shall be prepared and priming coat shall be applied as per clause 9.2.3

9.6.4 Application:

As per clause 9.1.11

9.6.5 Measurement:

As per clause 9.5.5

9.7 CHOPRA (FRENCH) WOOD POLISH

9.7.1 Scope

Providing and polishing the wooden surfaces to give a high gloss finish with Chopra (French) polish, including sandpapering, all complete.

9.7.2 Materials

Chopra (French) polish (Kushmi or Lakh Brand) as approved by ISI and the engineer.

9.7.3 Preparation of Surface

All surfaces shall be thoroughly planed and sand papered from rough to fine sandpaper. Surfaces having knots and holes shall be filled with readymade/site made approved putty.

9.7.4 Preparation & Application

The Chopra polish shall be made by mixing Chopra granules, thinner and spirit. The Chopra polish of approved quality shall be applied with smooth cotton cloth with firm rubbing and spread evenly. The cloth shall be of good quality and perfectly cleaned. Chopra wood finish shall be reapplied at least three times, after sandpapering with finer sand paper to get the final finish & best result.

9.7.5 Measurement :-The measurement shall be in square meters of the finished work. The rate shall include all the materials and labor, all complete.
10 FLOORING AND PAVING

10.1 MARBLE STONE FLOORING

10.1.1 Scope

16 mm. thick marble stone in floors, wall, dado, skirting, etc. laid over cement sand mortar of 1:2 mix, in proper slope for draining water, including mixing, laying, grinding and polishing to smooth finished glazed floor surface, as per instruction of Engineer, all complete, in m².

10.1.2 Materials

i) Cement: Portland cement as per specification under clause 4.2.4

ii) Sand: as per as specified under specification item clause 4.2.1 and 4.2.2.

iii) Marble stone: Marble shall be of good quality having smooth, hard surface, regular in shape, size and of uniform thickness, of good appearance, and of sharp and square edges. It shall be free from cracks and other defects. Marble stone, with minimum size of 600mm x 600mm, may be from Godavari Marble factory (polished of minimum size 600mmx600mm) or Rajasthani (Indian) Marble equivalent conforming to IS 1130 – latest Revision or BS specification or as approved by the engineer. The colour shall be as per the instruction of engine or drawings. Sample of marble stone to be used shall be submitted to the Project manager and his approval should be taken before the bulk purchase. All the marble stone supplied shall conform to the approved sample in all respect.

10.1.3 Proportion

Base Course: 1 part cement; 2 parts sand and mixing shall be done as per civil specification clause 6.1.10.

10.1.4 Dressing

Each marble stone slab shall be machine cut to required size and shape as specified in the drawing and as instructed by engineer. All angles and edges of the marble slabs shall be true and square and free from chippings and the surface shall be true and plane. The thickness of the stone shall be as specified in the drawing. No tolerance shall be allowed for thickness.

For flooring, the marble slabs shall be machine cut with good finish at edges and corners. The contractor shall ensure that no chisel marks are visible on the surface of the stone before fixing. Marbles with chisel marks or broken edges shall be rejected.
10.1.5 Laying

The base shall be made rough and watered and given a cement wash and then the mortar shall be laid in 20 mm. thick layers as per instruction of Engineer. After laying mortar, it should be levelled with wooden floats. Proper slope for draining wash water shall be provided as per instruction of the Engineer. And over this, marble stone should be laid; the joints should not be more than 3 mm. The joints should be painted with white cement slurry.

10.1.6 Curing

After about two hours of laying, the surface shall be covered with wet bags and kept wet and left undisturbed for two days.

10.1.7 Finish

Finally, when the surface is absolutely dry, oxalic acid powder shall be rubbed well on the surface with grinding machine with water, and this operation shall be repeated until the surface becomes perfectly smooth and glossy. The surface shall be rubbed with wax to give a glazing surface. White cement or colour cement shall be used in joint to have the required colour as per specified or as per instruction of Engineer. Care shall be taken that the floor is not left slippery and that ordinary wax is not used under any circumstances.

If required by the Engineer, the grinding and polishing shall be done by grinding machine in 3 operations, first grinding with machine fitted with coarse Carborundum stone, second grinding with medium grade Carborundum stone and final grinding with fine grade Carborundum stone.

10.1.8 Measurement

Measurement shall be in square meter of exact length and breadth (length and height in dado) of the floor. Rate shall include materials, mixing, laying, curing, finishing, grinding, polishing and labour etc., all complete.

10.2 GRANITE STONE FLOORING

10.2.1 Scope

Providing and laying 19mm. thick polished granite in floors, lift wall, dado, skirting, kitchen/pantry top etc. laid over 20mm thick cement sand mix of 1:2 in level, plumb, or proper slope for draining water, including mixing, laying, grinding and polishing to smooth finished surface, as per drawing, instruction of engineer, all complete, in m2.
10.2.2 Materials

i) **Cement**: Portland cement as per specification under clause 4.2.4

ii) **Sand**: as per as specified under specification item clause 4.2.1 and 4.2.2.

iii) **Granite**: Granite shall be of good quality, 19mm thick with +2mm or –2mm, having smooth, hard polished surface, regular in shape, size and of uniform thickness, of good appearance, and of sharp and square edges. It shall be free from cracks and other defects. Granite stone shall conforming to IS 1130–latest Revision or BS specification and as approved by the engineer. The colour and size shall be as per the instruction of the engineer and drawing. Sample of granite stone to be used shall be submitted to the engineer and his approval should be taken before the bulk purchase. All the granite stone supplied shall conform to the approved sample in all respect.

10.2.3 Proportion

Base Course: 1 part cement; 4 parts sand and mixing as per the specification clause 6.1.10

10.2.4 Dressing

Each granite stone slab shall be machine cut to required size and shape as specified in the drawings. All angles and edges of the granite slabs shall be true and square and free from chippings and the surface shall be true and plane. The thickness of the stone shall be as specified in the drawings. No tolerance shall be allowed for thickness.

The granite slabs shall be mirror polished. All granite stones shall be brought pre-polished to the site. The contractor shall prepare samples and obtain approval of the Engineers before proceeding with the work.

The contractor shall ensure that no chisel marks are visible on the surface of the stone before fixing. Stones with chisel marks or broken edges shall be rejected.

10.2.5 Laying

The base shall be made rough and watered and given a cement wash and then the mortar shall be laid in 19-20 mm. thick layers as per instruction of Engineer. After laying mortar, it should be leveled with wooden floats. Proper slope for draining wash water shall be provided as per instruction of the Engineer. And over this, granite stone should be laid; the joints should not be more than 1.5 mm. The joints should be painted with approved colored cement slurry.

10.2.6 Curing

After about 2 hours of laying, the surface shall be covered with wet bags and kept wet and left undisturbed for 2 days.
10.2.7 Finish

Finally, when the surface is absolutely dry, the surface shall be rubbed with wax to give a glazing surface, as per instruction of Engineer. Care shall be taken that the floor is not left slippery and that ordinary wax is not used under any circumstances.

10.2.8 Measurement

Measurement shall be in square meter of exact length and breadth of the floor. Rate shall include materials, mixing, laying, curing, finishing and labor etc. all complete.

10.3 PLAIN CEMENT CONCRETE IN FLOORING

10.3.1 Scope

Plain cement concrete M15 (1:2:4) flooring with cement, sand and stone ballast, including laying in panels (the side of the panels shall be bounded with teak wood batten or flat iron bars of same size and fixed with weak mortar or with nails or hooks), providing proper slope for draining wash water, all complete, in sqm.

i) 75mm thick PCC M15 (1:2:4) flooring,

10.3.2 Materials

i) Cement: Portland cement as per specification under “Concrete Work”

ii) Sand: Sand as per specification under “Concrete Work”

iii) Aggregate: broken stones 20mm maximum size graded down, or as per specification under “Concrete Work”

10.3.3 Preparation of Sub-grade

The sub-grade shall be cleared of all loose earth, rubbish, and other foreign matter. If necessary the sub-grade shall be cleaned with wire brushes. Cleaned sub-grade shall then be wetted with water thoroughly, but no water pool shall be allowed. Necessary slope shall be given in the sub-grade itself. If the sub-grade is of lean concrete the flooring shall be commenced within 48 hours.

10.3.4 Proportion

1 part cement; 2 parts sand and 4 parts of stone aggregate by volume. The stone aggregate shall be 20mm maximum size graded down or as specified in the schedule. Grading of aggregate shall be as per reinforced concrete specification.

10.3.5 Placing

The floors shall be laid to specified thickness in panels of uniform size not exceeding 1 m² (one side not exceeding 1.2m). They shall be laid in alternate panels on different days. The edges of the panels shall be protected by flat bars or iron or teak wood batten fixed with
weak mortar or with nails or hooks, their depth being equal to that of flooring. Proper slope for draining wash water shall be provided as per instruction as specified.

10.3.6 Finishing

It shall be compacted 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 paste. Then the surface shall be troweled till the moisture disappears. The surface shall be checked with straight edge. The surface must be uniform in colour. Immediately after troweling, well mixed neat cement slurry mixed integrally with hardening liquid 2 ltr. To 50kg of cement shall be sprinkled in a uniform layer at the rate of 2.2 kg. persq.m. The cement slurry shall be troweled smooth with a steel float several times till approved finish is achieved. The surface shall be without the float marks or air holes. Sample of workmanship shall be got to approved prior to work.

10.3.7 Curing

The curing shall be done for a minimum period of Seven days. Curing shall not be commenced until the top layer has hardened. Covering with empty cement gunnies shall be avoided, as the color is likely to be bleached with the remnants of cement matter from the bags.

10.3.8 Measurement

It shall be measured in square meter measured from wall to wall exclusive of any finishing or as per instructions of Engineer.

Unless otherwise stated in the schedule of quantities, nothing extra shall be admissible for small areas and corners and work in any shape. No deductions shall however, be made for protruding or independent columns occurring in the floors, door frames embedded in floor or any other part out when the area does not exceed 0.1 m² for each. However nothing extra shall be allowed for the cutting involved at such places.

10.4 GLAZED OR NON GLAZED CERAMIC TILE FLOORING

10.4.1 Scope

Providing and laying Tiles Bedded in 12mm thick Cement Plaster 1:4 (1 Cement:4 Sand) on Floors and Walls, finished with white Cement Slurry at Joints as per drawing.

a) Glazed Ceramic Tiles

b) Non Glazed Ceramic Tiles

10.4.2 Materials

The tile material for Glazed/Non-glazed Ceramic tiles (Somany, Kajaria or equivalent make), shall confirm to IS:779-1961 (respective IS standards) or Equivalent approved by the Engineer. The tiles shall be of approved colour, size and shape and shall be laid to the
pattern approved by the Engineer. The tiles shall be of uniform colour, true to size and shape and free from cracks, twists, uneven edges, crazing and other defects. The size and thickness of the tiles shall be as specified.

Prior to installing any tile, the Contractor shall inspect surface 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 coordinate with other traders of work.

10.4.3 Preparation of Surface and Application

The surface shall be brushed, cleaned and wetted. Glazed tile shall be soaked, completely immersed in clean water at least 30 minutes and drained. Individual tile that exhibits drying along edge shall be soaked and drained. No free moisture shall be allowed to remain on the backs of tile at the time of setting. Tiles shall be installed by applying a skim coat of a plastic mix of 1:4 (1 cement: 4 sand) cement mortar maximum 12mm thick on wall and tile and firmly pressing tile into the wall to true plane and position.

Joints in the tile work shall be accurately aligned with horizontal joints level and vertical joints plumb. Joints shall be maintained uniformly at 1mm width or as directed 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 less than half size occurs. Where tile must be cut at edges or penetrated the cut edges shall be carefully filed and neatly ground. Chipped, cracked or broken tile 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 white with a synthetic, waterproof tile grout using a nozzle and plunger. During grouting all excess grout shall be cleaned off the tile surface with damp cloth or sponge. The finished floor surface shall be true to required levels.

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 agents liable to damage the work shall be avoided. If tile surface show mass scratches, crack or other imperfections, which cannot be removed by cleaning; the Contractor shall remove the defective material and replace with new material at no additional expense. Sample of workmanship and tile grout proposed (silicone) shall be approved prior to execution of work.
10.4.4 Measurement

The measurement shall be done in length and breadth square meters of the work done including the setting mortar. The rate shall be for the material and labor, all complete.

10.5 BRICK KOBA FLOORING

10.5.1 Scope

Providing and laying brick clay tiles in floors, terraces etc. laid over 20mm thick cement sand mix of 1:2 in level, plumb, or proper slope for draining water, including mixing, laying, grinding and polishing to smooth finished surface, as per drawing, instruction of engineer, all complete, in m².

10.5.2 Materials

i) Cement: Portland cement as per specification under clause 4.2.4

ii) Sand: as per as specified under specification item clause 4.2.1 and 4.2.2.

iii) Brick Clay tiles: Brick Clay Tiles shall be of good quality, 12mm thick with +2mm or – 2mm, having smooth, hard polished surface, regular in shape, size and of uniform thickness, of good appearance, and of sharp and square edges. It shall be free from cracks and other defects. Floor Clay Tiles shall conforming to IS 2690-1993 latest Revision or BS specification and as approved by the engineer. The colour and size shall be as per the instruction of the engineer and drawing. Sample of brick clay tiles to be used shall be submitted to the engineer and his approval should be taken before the bulk purchase. All the tiles supplied shall conform to the approved sample in all respect.

10.5.3 Proportion

Base Course: 1 part cement; 4 parts sand and mixing as per the specification clause 6.1.10

10.5.4 Laying

The base shall be made rough and watered and given a cement wash and then the mortar shall be laid in 19-20 mm. thick layers as per instruction of Engineer. After laying mortar, it should be leveled with wooden floats. Proper slope for draining wash water shall be provided as per instruction of the Engineer. And over this, brick koba tile should be laid; the joints should not be more than 1.5 mm. The joints should be painted with approved colored cement slurry.

10.5.5 Curing

After about 2 hours of laying, the surface shall be covered with wet bags and kept wet and left undisturbed for 2 days.
10.5.6 Finish

Finally, when the surface is absolutely dry, the surface shall be rubbed with wax to give a glazing surface, as per instruction of Engineer. Care shall be taken that the floor is not left slippery and that ordinary wax is not used under any circumstances.

10.5.7 Measurement

Measurement shall be in square meter of exact length and breadth of the floor. Rate shall include materials, mixing, laying, curing, finishing and labor etc. all complete.

11 GENERAL SPECIFICATION FOR CARPENTRY & JOINERY WORKS

It is intended to include in this part of specifications, all kind of carpentry and joinery work in connection with doors, glazing, partitions, paneling, cabinets and items of woodwork called for in the drawings.

11.1 Samples and Shop Drawings

The Contractor shall, before proceeding with the work, submit to the Engineer, for his approval, complete samples of the various materials including hardware and fastening devices and shop drawings and large-scale details covering all joinery work.

11.2 Rough Carpentry

All framing and other concealed wood members shall be of specified quality of timber as shown on drawings and as per the directions of the Engineer. It shall be seasoned to a moisture content of not less than 10% or more than 15% wood of greater moisture content shall not be used in any part of the building.

11.2.1 Workmanship

All carpentry work shall be done by skilled workmen using proper tools. All joints shall as far as possible, be mortised, tenoned and glued with best quality waterproof glue. Where mortise and tenon joints are not possible, the joints shall be securely nailed or screwed as called for, with the longest nails or screws that may be used without splitting the wood, or adequate joints cannot be formed by nailing, the members shall be done with neatness as approved and directed by the consultant. Cross bracing, solid blocking and bracing shall be provided according to the practice.

11.2.2 Joinery Materials

Finished woodwork and joinery including frames for doors shall be straight grained, best quality Shisham wood unless noted otherwise, free form knots and other blemishes and imperfections. All woodwork and joinery shall be seasoned to not less than 10% or more than 12.5% moisture content.
All joinery work shall be securely mortised and tenoned and glued with best quality waterproof glue. All sections and dimensions are to be as shown on drawings. For all joinery work, use of nails shall not be permitted. Wood screws of appropriate size and of approved make shall be used. Wherever practicable, means of fastening the various parts together shall be concealed. All work (both carpentry and joinery) shall be to the dimensions shown on the drawings.

All interior wood finish doors and cabinet work shall be smoothly treated and sanded in the building after erection until all defects are entirely removed. Any materials showing splits saw, sand paper or other defacing marks or defects shall be rejected. All exposed wood and plywood shall be approved by the Engineer before fabrication.

11.2.3 Installation

Doors, partitions and cabinet work shall be installed in position after the plastering in the section for which it is intended is sufficiently dry. All interior doors, partitions, glazing, cabinet work and other fixed woodwork shall be properly installed, level, plumb and true.

But joints shall be avoided wherever possible. If unavoidable, the joint shall be bevelled. All exterior angles shall be mitred. Adjoining interior wood members shall match and harmonize.

11.2.4 Wood Frames for Internal Doors

Wooden frames for internal doors, wherever called for shall be of best and selected quality sishum wood as specified in the schedule of items, properly seasoned as described for joinery and free from knots, cracks and other defects. It shall have uniform colour and straight grains.

The frame member shall be of one piece and shall conform to the dimensions and profile shown on the drawings. All rebates, rounding, moulding etc. shall be accurately made as per details. The frame shall be placed smooth according to the correct dimensions called for.

All joints shall be simple, neat and strong. All mortise and tenon joints shall fit in fully and accurately without wedging or filling and shall be neatly fabricated and assembled.

The frame work shall be fixed to the supports through mild steel holdfasts or rawl bolts or other means as called for in the drawings.

11.2.5 Interior Door Shutters

Interior wood door shutters, unless otherwise noted or specified, shall be of sal wood frame with 4mm thick tick ply fixed on both sides unless otherwise specified. The shutters shall conform to Indian standard specification BIS: 2202 (Part I). Shutters shall be obtained from the manufacturers, approved by the Engineer.
Shutters shall be ordered on the manufacturer to sizes as called for and shall be provided with first class Teak wood edging glued and nailed on all the edges of the shutter, as shown on drawings.

11.2.6 Block Boards, Ply Boards

Ply board shall be of approved quality and obtained from the manufacturers, as per list of approved makes, unless otherwise specified. All block boards and ply shall be commercial grade ply veneered on both faces.

Samples of flush doors and boards etc. to be used in the work shall conform to the approved sample in all respects.

11.2.7 Preservative Treatment

The following treatment shall be applicable to all rough oil type wood preservative of specified quality and approved make conforming to BIS: 216 shall be used.

Painting shall be done after the surface to be painted is made free from dirt, dust, any foreign matter and all rough spots sand-paper and cleaned. The surface must be perfectly dry before painting is commenced.

In addition to above, all portions of timber in joinery work abutting against or embedded in masonry or concrete shall be painted with boiling coal tar before being placed in position.

All wood work in contact with masonry shall be painted with approved asphalt or bitumen paint before placing. Care shall be taken to keep exposed surfaces clear from tar etc. tar felt shall be used to isolate wood from masonry wherever practicable. All concealed wood members in partitions; cabinet work etc. shall be treated fully and liberally with solignum before placing in position.

11.2.8 Built – In – Joinery

Where Joinery work is specified to be built in, it shall be the responsibility of the contractor to ensure that the joinery works are set to plumb and true and shall not be damaged or displaced by subsequent operations. The contractor shall also provide and secure suitable anchors or other fixings as per drawings and details.

11.2.9 Protection of Work

The contractor shall be responsible for the temporary doors and closing in openings necessary for the protection of the work during progress. He shall also provide and maintain any other temporary covering required for the protection of finished woodwork that may be damaged during the progress of the work if left unprotected.
12 Steel Works

12.1 Materials

12.1.1 Steel

All finished steel shall be well and cleanly rolled to the dimensions and weight specified by BIS subject to permissible tolerances as per IS: 1852 – 1985. The finished material shall be reasonably free from cracks, surface floors, laminations, rough and imperfect edges and all other harmful defects. Steel sections, shall be free from excessive rust, scaling and pitting and shall be well protected. The decision of the Engineer regarding rejecting any steel section on account of any of above defects shall be final and binding.

The ordinary steel designated as ST: 32-0 conforming to IS: 1977 – 1975 shall be used for Doors, Window frames, Window bars, Grills, Steel Gates, Hand railing, Builders Hardware, Fencing Post, Tie bars etc.

12.1.2 Electrodes

The electrodes required for metal or welding shall be covered electrodes and shall conform to IS: 814 – 1991

12.2 FAN CLAMPS

12.2.1 Fixing

Holes for inserting the fan clamps in the positions shown in the drawing or as instructed by the Engineer shall be made in the shuttering after the latter has been fixed in position. After steel reinforcement is tied, fan clamps shall be fixed with their loops truly vertical and at the correct depth from the underside of the slab or beam. The hooked arms and the loop shall be tied to the reinforcement, either directly or through cut pieces of MS bars with annealed steel wire 1.6mm or 1.00mm thick. The clamp shall neither be disturbed out of position during concreting nor shall they be bent out of shape when shuttering of slabs or beams is removed.

The exposed portion of loops of the clamp shall be given two or more coats of paint, including priming coat, of approved steel primer as ordered by the Engineer.
12.2.2 Rate

No extra will be paid for fan clamp.

13. Miscellaneous Work

13.1 ALUMINIUM WINDOW SHUTTER

13.1.1 General

The aluminum work as scheduled and detailed shall be fabricated as per the Drawings. Fabricated aluminum work covered by this specification shall be supplied and installed by the well-known local aluminum fabricators as approved by the Engineer.

Before placing any orders the Contractor shall state the name of the window manufacturer he has selected from the list of approved manufacturers. The nominated manufacturer shall not be changed without prior approval of the Engineer.

13.1.2 Materials

Extruded aluminum components shall be manufactured from aluminum alloy B 6063 – T5. It should be brown coloured anodized and Agrani Aluminum Nepal or equivalent. The section of the aluminum frame shall be 101mmx45mmx1.5mm.

The lining to louver panels shall be 1.0 mm thick sheet aluminum anodized as specified. Hardware and hinges shall be as approved by the Engineer.

13.1.3 Manufacture

Aluminum work shall be fabricated in accordance with the prevalent practice among the local Manufacturer and as per the Drawings showing jointing details, hardware and extrusion profiles.

It will be the aluminum fabricator responsibility to ensure that all fabricated aluminum work is carried out in accordance with the Drawings.

13.1.4 Finish and Protection

Fabricated aluminum work shall be caustic etched, anodized and sealed as required by AS K 182 and finished with two coats of an approved lacquer. All components shall be anodized 0.02 mm. thick.

13.1.5 Workshop Drawings

The contractor shall arrange for the preparation of complete workshop drawings of all fabricated aluminum work and shall submit same to the Engineer for approval.

13.1.6 Fixing and Strength of Main Members

Main members shall be of such strength that a wind pressure of 1.16 kPa shall cause a deflection of not more that 1/240 of the span of the member. No permanent deflection shall result from such conditions of loading.
Fixing to members shall be such that the above loading shall be generated in the members without sufficient stress to cause failure or movement to be evident at any joint.

The aluminum fabricator shall take full responsibility that all fabricated aluminum work

Load bearing brackets shall be manufactured from 40 X 6 mm mild steel bent to shape, hot dipped galvanized, bitumen coated only on surfaces coming in contact with aluminum and spaced at not more than 500 mm centers.

Load bearing brackets shall be fabricated and fixed as shown on the drawings.

13.1.7 Expansion

Provision for vertical and horizontal expansion must be fully detailed on the aluminum fabrications workshop drawings. Vertical and horizontal expansion joints shall be so designed as to cover all weather conditions likely to be encountered on the site.

13.1.8 Flashing

All flashings required to be built in as the work proceeds shall be supplied by the Contractor and built in by the trade concerned. All other flashings as detailed on the Drawings shall be supplied and fixed in position by the aluminum fabricator.

13.1.9 Weather seals

Approved pile weather seals shall be metal backed, siliconised, of the size called for on the relevant Public Works Department Drawings.

13.1.10 Measurement

It shall be done in square meter of the area done. Rate shall be for all labor and materials, accessories, all complete.

13.2 EARTH COMPACTION

13.2.1 Watering, Drying and Mixing

Any water required before fill material is compacted shall be added in successive applications by means of water tankers fitted with sprinkler bars or by means of pressure distributors capable of spraying the water evenly and uniformly over the area concerned. The water shall be thoroughly mixed with the material to be compacted by means of motor grader or other suitable equipment such as mechanical compactor. Mixing shall continue until the required amount of water has been added and a uniform mixture is obtained. The amount of water to be added shall be sufficient to bring the material to the optimum moisture content (OMC) plus and minus 2%.

Should the material be too wet in its dug condition due to rain or any other cause, then it shall be harrowed and allowed to dry out to moisture content confirming to the above requirement before compaction proceeds.
13.2.2 Compaction

All materials used in the work shall be compacted according to this clause. No uncompacted materials will be allowed to be placed anywhere in the works.

Operation: Compaction shall be carried out in continuous operations covering the full width of the layer concerned and the length of any section of a layer being compacted shall, wherever possible, not be less than 150m nor more than that can be compacted in a day’s work. Compaction shall cover the entire area and in no case windrows will be allowed. The types of compaction equipment, use and the frequency of rolling shall be such as to ensure the achievement of specified densities without damaging lower layers or structures. During compaction the layer shall be maintained to the required shape and cross section and all holes, ruts and lamination removed.

Compaction test: Compaction tests shall be executed with all different fill materials in the areas of final fills, at the beginning of compaction works and in irregular intervals as compaction proceeds on request from the Engineer. Compaction test shall be made to define method of operation (number of passes of roller, thickness of layers, water contents etc.). All costs related to compaction tests shall be included in the Contractor’s rate.

Measurement: It shall not be paid extra, the rate for watering and compaction shall be included in earth filling works. Nothing extra shall be paid for this, whatsoever.

13.3 POLYETHYLENE MEMBRANE

13.3.1 Scope

One layer polyethylene membrane of 500 gauge of approved quality as per drawing, specification and instruction of engineer, all complete.

13.3.2 Materials

The polyethylene membrane shall be of 500 gauge and best quality, free from holes and damages of any kind.

13.3.3 Laying

The sheets shall be laid carefully over prepared surface. There shall be a lap of 15 cm minimum to ensure effective cut off for moisture movement. Any sheets damaged during the process of laying shall be replaced immediately. The lap joints shall be painted with best quality bitumen.

13.3.4 Measurement

Measurement shall be in square meter of exact length and breath of finished surface rate shall include the overlaps, labor etc. all complete.
13.4 GENERAL NOTES

A. General

1. Structural drawings are to be read in conjunction with Consultants’ Architectural, Sanitation and Electrical drawings. Report any discrepancies are to be recorded to the Engineer prior to fabrication or construction. Any conflict between specifications and drawing shall be likewise reported.
2. Contractor shall be responsible for checking field dimensions and site conditions.
3. Unless otherwise indicated all construction joints shall be roughened joints with 5mm Amplitude minimum.
4. No measurement shall be directly taken from the print. Only written dimensions shall be followed.

B. Foundations

1. Foundations shall be on undisturbed soil.
2. Soil bearing capacities shall be verified in the field. Engineer is to be notified immediately of any soft pockets or other adverse soil conditions encountered.
3. 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.
4. Placing of foundation concrete shall be done as soon as excavations have been completed and approved by the Engineer.

C. Backfilling

1. Backfilling to foundation shall be done simultaneously on both sides.
2. Backfilling shall be done in layers of not more than 150 mm, each layer being properly compacted to at least 95% Modified Proctor Density.

D. Concrete and Reinforcing Steel

1. Cast-in-situ concrete shall have minimum 28 days compressive cube strength of 10 N/mm² unless otherwise specified in the Specifications. Minimum cylinder strength shall be 85% of cube strength.
2. Reinforcing steel shall be new hot rolled deformed (Torsteel) bars having a minimum yield strength of 415 N/mm² and TMT bars Fe500 conforming to NS 501-2058NS 191-2046 marked.
3. Minimum reinforcing laps shall be in accordance with IS 456 – 1978 (latest revision) and as specified on structural drawings.
4. Cover to reinforcing steel shall be in accordance with IS 456 – 1978 (latest revision) and as specified in structural drawings.
5. Welded wire mesh for reinforcement shall conform to IS 4948 – 1974 (latest revision).
6. Corner bars shall be provided to match horizontal reinforcing steel in walls and footings.
7. Dowels shall be provided to walls and piers, to match vertical bars in walls and piers, unless otherwise indicated.
8. 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.
9. Unless otherwise indicated, all horizontal and vertical construction joints shall be roughened joints with 5mm minimum amplitude.

10. Slabs on grade shall be cast in panels bounded by column guidelines in a checkboard pattern. At least 48 hours shall elapse for casting of adjacent panels.

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

12. Hanging devices for piping shall be embedded during casting. Breading out concrete for hanging from reinforcing bars will not be permitted.

13.5 LIST OF APPROVED MAKE OF MATERIALS (FOR CIVIL WORKS)

Specifications brands names of materials (refer materials, whichever are applicable for the scope of work) and finishes approved by the Engineer are listed below. However approved equivalent materials and finishes of any other specialized firms may be used, in case it is established that the brands specified below are not available in the market and subject to approval of the alternate brand by the Engineer.

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>MATERIALS</th>
<th>APPROVED MAKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Reinforcement Steel</td>
<td>Himallron, Hama Iron, PanchaKanya,</td>
</tr>
<tr>
<td>2.</td>
<td>Structural Steel Sections</td>
<td>Tata, Sail, Ru·tor</td>
</tr>
<tr>
<td>3.</td>
<td>Shuttering Plywood</td>
<td>Anchor, Kltply, Duroply,Sagun, Surya</td>
</tr>
<tr>
<td>4.</td>
<td>Portland Cement (Grade - 43/53)</td>
<td>I&amp;T, Udaypur, Hetauda</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jaypee,Prism</td>
</tr>
<tr>
<td>5.</td>
<td>White Cement</td>
<td>J.K. White, Birla white</td>
</tr>
<tr>
<td>6.</td>
<td>Aluminium Glazing</td>
<td>Modí float glass</td>
</tr>
<tr>
<td>7.</td>
<td>Anodised Aluminium Hardware (Heavy Duty)</td>
<td>Agrani, Eele, Everite, Sigma</td>
</tr>
<tr>
<td>8.</td>
<td>locks</td>
<td>GodreJ, Harrison, Plaza, Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chi nese lock</td>
</tr>
<tr>
<td>9.</td>
<td>Door Closer</td>
<td>Everite, Ooorking</td>
</tr>
<tr>
<td>10.</td>
<td>Block Board Commercial Veneered</td>
<td>Sitapur, Duro, National, Kit woodcraft,</td>
</tr>
<tr>
<td>No.</td>
<td>Material</td>
<td>Brands/Manufacturers</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>11.</td>
<td>Float Glass</td>
<td>Suryaply, Duroply</td>
</tr>
<tr>
<td>12.</td>
<td>Wire Mesh</td>
<td>Asahi Float, Modi Float</td>
</tr>
<tr>
<td>13.</td>
<td>Synthetic Enamel Paint</td>
<td>Sterling Enterprises, Trimurty Welded</td>
</tr>
<tr>
<td>14.</td>
<td>Water Proof Cement Paint</td>
<td>J &amp; N &amp; Berger, Shalimar,</td>
</tr>
<tr>
<td>15.</td>
<td>Glazed Ceramic Tiles</td>
<td>Snowcem, Aslan Paint, Berger, Nerolac</td>
</tr>
<tr>
<td>16.</td>
<td>Unglazed Ceramic Tiles</td>
<td>BELL, KA2ARIA, Johnson, Sornany</td>
</tr>
<tr>
<td>17.</td>
<td>Marble Chips</td>
<td>BELL, KA2ARIA, Johnson, Sornanv</td>
</tr>
<tr>
<td>18.</td>
<td>Waterproofing Compound</td>
<td>Godawari (Nepali), Rajasthan (Indian),</td>
</tr>
<tr>
<td>19.</td>
<td>Waterproof Cement</td>
<td>Sika, MC, Roff, Clco, Accoproof</td>
</tr>
<tr>
<td>20.</td>
<td>Granite</td>
<td>Super Snowcem, Asian, Bird</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indian</td>
</tr>
</tbody>
</table>
# Sanitary Specification

## Table of Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 GENERAL</td>
<td>145</td>
</tr>
<tr>
<td>1.1 Scope</td>
<td>145</td>
</tr>
<tr>
<td>1.2 General</td>
<td>145</td>
</tr>
<tr>
<td>1.3 Basic Materials and Method</td>
<td>146</td>
</tr>
<tr>
<td>1.4 Materials Trade Names Variations</td>
<td>146</td>
</tr>
<tr>
<td>1.5 Regulations</td>
<td>146</td>
</tr>
<tr>
<td>1.6 Drawings and Specifications</td>
<td>146</td>
</tr>
<tr>
<td>1.7 As Built Record</td>
<td>147</td>
</tr>
<tr>
<td>1.8 Cutting and Patching:</td>
<td>147</td>
</tr>
<tr>
<td>1.9 Painting</td>
<td>147</td>
</tr>
<tr>
<td>1.10 Expansion and Contraction</td>
<td>148</td>
</tr>
<tr>
<td>1.11 Clean Up</td>
<td>148</td>
</tr>
<tr>
<td>1.12 Pressure Testing</td>
<td>148</td>
</tr>
<tr>
<td>2.0 SOIL, WASTE, VENT AND RAIN WATER PIPES</td>
<td>149</td>
</tr>
<tr>
<td>2.1 Material</td>
<td>149</td>
</tr>
<tr>
<td>2.1.1 UPVC Pipes</td>
<td>149</td>
</tr>
<tr>
<td>2.1.2 Clamps</td>
<td>149</td>
</tr>
<tr>
<td>2.1.3 Waste Pipe from Appliances</td>
<td>150</td>
</tr>
<tr>
<td>2.2 Traps</td>
<td>150</td>
</tr>
<tr>
<td>2.2.1 Floor Traps</td>
<td>150</td>
</tr>
<tr>
<td>2.3 Fixing</td>
<td>150</td>
</tr>
<tr>
<td>2.3.1 Jointing</td>
<td>150</td>
</tr>
<tr>
<td>2.3.2 Clean OUIS</td>
<td>151</td>
</tr>
<tr>
<td>2.3.3 Cement concrete</td>
<td>151</td>
</tr>
<tr>
<td>2.3.4 Painting</td>
<td>151</td>
</tr>
<tr>
<td>2.3.5 Cutting and Making Good</td>
<td>151</td>
</tr>
<tr>
<td>2.4 Testing</td>
<td>151</td>
</tr>
<tr>
<td>2.5 Measurement</td>
<td>151</td>
</tr>
<tr>
<td>3.0 SANITARY-WARES</td>
<td>152</td>
</tr>
<tr>
<td>3.1 Scope</td>
<td>152</td>
</tr>
<tr>
<td>3.2 General Requirements</td>
<td>152</td>
</tr>
<tr>
<td>3.3 Orissa Type Pan or IPWC commode &amp; Cistern</td>
<td>153</td>
</tr>
<tr>
<td>3.3.1 Flushing Cistern</td>
<td>153</td>
</tr>
<tr>
<td>3.3.2 Flush Pipe</td>
<td>153</td>
</tr>
<tr>
<td>3.3.3 Plastic or Lead Connection</td>
<td>154</td>
</tr>
<tr>
<td>3.3.4 Slop Cock</td>
<td>154</td>
</tr>
<tr>
<td>3.3.5 Fixing</td>
<td>154</td>
</tr>
<tr>
<td>3.4 Mixing Fittings</td>
<td>154</td>
</tr>
<tr>
<td>3.4.1 Angle Valve</td>
<td>154</td>
</tr>
<tr>
<td>3.5 Urinals</td>
<td>154</td>
</tr>
<tr>
<td>3.6 Wash Basin</td>
<td>155</td>
</tr>
<tr>
<td>3.7 Sinks</td>
<td>155</td>
</tr>
<tr>
<td>3.8 Fixing</td>
<td>155</td>
</tr>
<tr>
<td>3.9 Towel Ra</td>
<td>155</td>
</tr>
<tr>
<td>3.10 Toilet Paper Holders</td>
<td>155</td>
</tr>
<tr>
<td>3.10 Fixing</td>
<td>155</td>
</tr>
<tr>
<td>3.11 Soap Dish</td>
<td>156</td>
</tr>
<tr>
<td>3.11.1 Fixing</td>
<td>156</td>
</tr>
</tbody>
</table>
3.13 ShowerSet. ........................................................................................................... 156
3.14 Accessories ......................................................................................................... 156
3.15 Measurement ........................................................................................................ 156
4.0 WATER SUPPLY WORKS INSIDE BUILDING ...................................................... 157
4.1 Scope .................................................................................................................. 157
4.2 General Requirement .......................................................................................... 157
4.3 GI Pipes, Fittings & Valves ................................................................................. 157
4.4 Clamps ................................................................................................................ 157
4.5 Unions ............................................................................................................... 158
4.6 Flanges ............................................................................................................. 158
4.7 Trenches .......................................................................................................... 158
4.8 Pipe Protection ................................................................................................. 158
4.9 Valves ............................................................................................................. 158
4.10 Air Valves ....................................................................................................... 158
4.11 Scour Valves. " ............................................................................................... 158
4.12 Valves ........................................................................................................... 159
4.13 Brass Fittings ................................................................................................. 159
4.14 Ball Cocks .................................................................................................... 159
4.15 Manhole Frames & Cover for Water Tanks ................................................... 159
4.16 Testing .......................................................................................................... 159
4.17 Measurement .................................................................................................. 160
5.0 PIPE INSULATION .............................................................................................. 160
5.1 Pipe Insulation: ............................................................................................... 160
5.2 Insulation Materials: ....................................................................................... 160
5.3 Insulation Application ...................................................................................... 160
5.4 Protection of Insulation ................................................................................... 160
6.0 STORAGE TANKs .................................................................................................. 161
6.1 General .......................................................................................................... 161
6.2 RCC Storage Tanks ......................................................................................... 161
6.3 Plastic tanks .................................................................................................... 161
6.4 Support for Overhead Water Storage Tanks .................................................. 161
7.0 PLUMBING FIXTURE ............................................................................................ 161
7.1 Liquid Heat Transfer ....................................................................................... 162
8.0 SOLAR WATER HEATER ................................................................................. 162
8.1 Genera ......................................................................................................... 162
8.2 Measurement: ................................................................................................ 162
9.0 TESTING AND COMMISSIONING ................................................................... 163
9.1 Testing and Commissioning: ........................................................................... 163
9.2 Water Piping: .................................................................................................. 164
9.3 Disinfection ..................................................................................................... 164
9.4 Commissioning and Testing .......................................................................... 164
1.0 GENERAL

1.1 Scope
The Contractor shall furnish all materials, labor and related items necessary to complete the work indicated on the Drawings and Specified herein.

1.2 General
Unless specifically mentioned otherwise, all the applicable codes and standards published by the Nepal Bureau of Standard (NS) and Indian Standard Institution and its subsequent revision and all other Standards which may be published by them before construction work starts, shall govern in respect of design, workmanship, quality and properties or materials and method of testing. Some of these available Standards are listed below.

<table>
<thead>
<tr>
<th>Standard/Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBC: 208 - 2003</td>
<td>Sanitary and Plumbing Design Requirements</td>
</tr>
<tr>
<td>IS: 458 - 1971</td>
<td>Specification for Cement Concrete Pipes with and without Reinforcement</td>
</tr>
<tr>
<td>IS: 778 - 1964</td>
<td>Specification for Gun Metal Gate, Globe and Check Valves for Water, Steam and Oil only</td>
</tr>
<tr>
<td>IS: 781 - 1984</td>
<td>Specification for cast Copper Alloy Screw Down Bib Taps and Stop Valves for Water Services</td>
</tr>
<tr>
<td>IS: 781E - 1959</td>
<td>Specification for Sand Cast Brass Screw down Bib Taps and Stop Taps for Water Services</td>
</tr>
<tr>
<td>IS: 1171 - 1963</td>
<td>Basic Requirement of Water Supply, Drainage and Sanitation</td>
</tr>
<tr>
<td>IS: 1742 - 1983</td>
<td>Code of Practice for Building, Drainage</td>
</tr>
<tr>
<td>IS: 2064 - 1962</td>
<td>Code of Practice for Selection, Installation and Maintenance of Sanitary Appliances</td>
</tr>
<tr>
<td>IS: 2065 - 1983</td>
<td>Code of Practice for Water Supply in Bunding</td>
</tr>
<tr>
<td>IS: 2373 - 1963</td>
<td>Specification for Water Meters (Bulk type)</td>
</tr>
<tr>
<td>IS: 2470 - 1985</td>
<td>Code of Practice for Installation of Septic Tanks</td>
</tr>
<tr>
<td>IS: 2556 - 1967</td>
<td>Specification for Vitreous Sanitary Appliances (Vitreous China)</td>
</tr>
<tr>
<td>IS: 5329 - 1969</td>
<td>Code of Practice for Sanitary Pipe Work Above Ground for Building</td>
</tr>
</tbody>
</table>
The Contractor will submit all samples to the Engineer for approval, together with Manufacturer's literature and installation instructions and obtain his full approval before placing any material orders or commencing the works.

In cases where materials are not available in Metric Measurements (as referred to) the nearest size Imperial units shall be provided, with prior approval of the Engineer, at no extra cost to the contract.

1.3 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 for approval prior to being purchased, otherwise at the Contractor's own risk.

1.4 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 (commercial standard).

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.

1.5 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 shall be carried out at no cost to the employer.

1.6 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 by 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 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 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.

1.7 As Built Record
The Contractor shall request a complete set of drawings, (white) from the Engineer and use these for "As Built" records.
"As Built" records shall be retained in the site office and kept up to date daily in regard to changes in actual installation from the Plans and Specifications. Alterations to duct work, piping services, etc. shall be noted and the revised arrangement drawn in accurately, complete with dimensions from column lines. Every precaution shall be taken to protect the Drawings from damage and loss.
The" As Built" records shall be made available to the Engineer upon request and made available at each site meeting. After no further alteration can be expected and the Contract is nearing completion, the records shall be submitted for final approval.
The Contractor shall include on "As Built" records the dimensions location of all buried piping and valves, and during construction plainly mark location of exterior services and valves to prevent damage to these until the Project is completed.

1.8 Cutting and Patching:
Openings not indicated on the Architectural 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. 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.
All cutting and patching work shall be done in a neat and workman like manner by mechanics skilled in the trades.

1.9 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.
1.10 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 a manner that strain and weight does not come upon cast connections 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.

1.11 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.

1.12 Pressure Testing General
i. These clauses shall apply to all piping systems including the plumbing and drainage systems, which shall also be governed by the applicable requirements of the IS specifications.
ii. The Contractor shall notify the Engineer 24 hours in advance of all test.
iii. Tests of piping system or protection thereof shall include all apparatus forming part of the complete systems, except where such apparatus is factory tested prior to installation in the systems.
iv. All tests shall be performed before the application of pipe covering or before being concealed.
v. Except where otherwise noted, test pressure shall be twice the maximum working pressure of the systems, or 0.5 N/mm², whichever is greater. Test fluid shall be water, unless otherwise indicated. All defects found shall be rectified by removing and remarking the particular section. Caulking of thread, hammering and welding of leak joint shall not be allowed.
vi. Piping systems may be tested in whole or in part. Each system to be tested shall be suitably isolated from existing or new systems using temporary blanks between flanges, thickness of blanks shall be approved by the Engineer or caps. Where necessary for testing purposes, a pair of flanges shall be installed in the piping system for the installation of blanks. Tests shall not be performed against a closed valve.
vii. All drains, vents, safety or relief valves and other pressure sensitive devices shall be removed prior to testing, and the openings capped or plugged. It is not permissible to plug or seal safety or relief valves. Air shall be removed from all high points to the satisfaction of the Engineer before flushing vent openings.
viii. Temporary blanks or caps shall be removed when testing has been satisfactorily completed and drains, vents, safety or relief valves etc. replaced.
ix. At least four hours shall elapse after erection before any welded or brazed line is subjected to test pressure.

x. When test pressure is attained, the test pump or compressor shall be disconnected and the connection capped. The test pressure gauge shall be left in the system.

xi. At least four hours shall elapse after test pressure is applied before the system is inspected for leaks. All joints, glands, connections etc. shall be carefully inspected for leaks and tightened as necessary.

Test pressure shall be maintained without loss for a period of 24 hours.

xii. Joints or connections which continue to leak after tightening shall be completely dismantled, checked, cleaned (replace if necessary), reassemble and retested. Opening, caulking or hemp shall not be used for leaking joints.

xiii. All water shall be drained from system following testing to prevent damage.

xiv. During testing, precautions shall be taken to prevent injury to persons or property as a result of sudden rupture of a piping system.

2.0 SOIL, WASTE, VENT AND RAIN WATER PIPES

2.1 Material:

2.1.1 UPVC Pipes

All Soil, waste, vent and rain water pipes shall be unplastisized rigid Poly Vinyl Chloride (uPVC) pipes conforming to IS: 4989-1958. Pipes shall be of following specifications:

<table>
<thead>
<tr>
<th>Normal diameter</th>
<th>Outside diameter</th>
<th>Wall thickness min/max in mm</th>
<th>Working pressure kgf/cm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 mm</td>
<td>90 mm</td>
<td>3.1 / 3.7</td>
<td>4</td>
</tr>
<tr>
<td>100 mm</td>
<td>110 mm</td>
<td>3.7 / 4.3</td>
<td>4</td>
</tr>
</tbody>
</table>

Pipes shall be of colour specified by the Engineer. Fitting for uPVC pipes shall include couplings, tees, bends, elbows, unions, reducers, nipples and plugs. Outlets of suitable diameter for connection to the appliance shall be provided. Contractor shall use pipes and fittings of matching specifications. Fittings shall be of the required degree of curvature with or without access door. Access door shall be screw type with neoprene gaskets as shall be approved by the Engineer.

2.1.2 Clamps:

GI/UPVC/CPVC/PPR pipes in shafts and other locations shall be supported by MS clamps of design approved or the standard clamps for the respective pipe as per the manufacturer or as directed by the Engineer. Pipes at ceiling level shall be supported on structural clamps fabricated on MS structural brackets or Full threaded GI rods can be anchored in ceilings for support. Pipes in typical shafts shall be supported on slotted angles/channels as specified elsewhere.
2.1.3 Waste Pipe from Appliances
Waste pipe from appliances e.g. wash basins, sinks, urinals, bath tubs, water coolers shall be of uPVC pipes with proprietary fixtures & fittings of the approved make conforming to all relevant ISS & also to IS 4984-1978. All pipes shall be fixed in gradient towards the out-falls of drain.

2.2 Traps
2.2.1 Floor Traps
Floor traps shall be HDPE pre-molded or UPVC Remolded; proprietary fixtures deep seal with an effective seal of 50mm. the trap and waste pipes shall be set in cement concrete blocks firmly supported on the structural floor. The blocks shall be in 1:2:4 mix (1 cement, 2 coarse sand, and 4 stone aggregate 20 mm nominal size) and extended to 40mm below finished floor level. Contractor shall provide all necessary shuttering and centering for the blocks. Size of the block shall be 30 x 30cm of the required depth. Urinal traps shall be HDPE pre-molded or UPVC premolded, proprietary y trap fixtures with or without vent and set in cement concrete block as directed without extra charge.

Bathroom traps and connections shall ensure free and silent flow of discharging water. Where specified contractor shall provide a special type HDPE pre-molded proprietary y inlet hopper without or with one, two or three inlet sockets to receive converging waste pipes. Joint between waste and hopper inlet sockets shall be screw fixed using neoprene washers. Hopper shall be connected to a trap with at least a 50mm seal (hopper and traps shall be paid for separately). Floor trap inlets, hoppers and the traps shall be set in cement concrete blocks as directed without extra charge.

Floor and urinal traps shall be provided with 100-150mm square or round CP/stainless steel grating, with rim of approved design and shape. Minimum thickness shall be 6mm or as specified in the bill of quantities. Kitchen grating shall be 150mm x 25mm thick cast iron grating with 20 x 30 x 5mm angle iron frame as directed by the Engineer. These shall be painted with anticorrosive paint and enamel painted to an approved color.

2.3 Fixing
All vertical pipes shall be fixed truly vertical. Branch pipes shall be connected to the stack at the same angle as that of the fittings. A heel rest bend supported on concrete block shall be provided at the feet of the stack. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl (terminal guard).

Horizontal pipes laid to the correct slopes running along ceilings shall be fixed on structurally adjustable clamps of special design shown on the drawings or as per details shown on the drawings or as directed. Horizontal pipes shall be laid to uniform slope and the clamps adjusted to the proper levels so that the pipes fully rest on them. The Contractor shall provide all sleeves, openings, hangers, inserts during the construction. He shall provide all necessary information to the building contractor for making such provision in the structure as necessary and as required. 2.3.1 Jointing
All joints to be caulked with well terrel gasketing and Solvent as per specification and instruction of Engineer. Fixing of uPVC pipes shall be done in the best workmanship.

2.3.2 Clean Outs
The contractor shall provide HDPE or UPVC proprietary clean-out plugs as required. Clean-out plugs shall be threaded and provided with keyholes for opening. Clean-out plugs shall be fixed to the pipe with a screw fixed collar internally splayed and fitted with neoprene gaskets.

2.3.3 Cement Concrete
Soil and waste pipes under floor in sunken slabs and in wall chases (when cut specially for the pipe) shall be encased in cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 stone aggregate), 75 mm bed and all round. When pipes are running well above the structural slab, the encased pipe shall be supported with suitable cement concrete pillars of 150 mm x 150 mm of required height at interval of 1800 mm. Rate for concrete around pipes shall be inclusive of pillars support, shuttering and centering.

2.3.4 Painting
Pipe fittings and clamps in exposed positions shall be painted with three or more coats of ready mix oil paint of approved make, quality and shade.

2.3.5 Cutting and Making Good
Pipes shall be fixed and tested as building work proceeds. Contractor shall provide all necessary holes, chases in structural members as building work proceeds. Wherever holes are cut or left originally they shall be made good with cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 stone aggregate) and the surface restored as in original condition. No additional payment shall be made for cutting and making good holes.

2.4 Testing
Before use at site, all pipes shall be tested by filling up with water for at least 10 minutes. After filling, pipes shall be struck with a hammer and inspected for blow holes and cracks. All defective pipes shall be rejected and removed from the site within 48 hours. Pipes with minor sweating shall be accepted at the discretion of the Engineer. Pipes shall be tested after installation, by filling up the stack with water. All opening and connection shall be suitably plugged. However the total head in the stack shall not exceed 3m.
Alternatively, the Contractor may test all soil and waste stacks by a smoke testing machine. Smoke shall be pumped into the stack after plugging all inlets and connections. The stack shall then be observed for leakages and all defective pipes and fittings removed or repaired as directed by Engineer.

2.5 Measurement
General
Rates for all items quoted shall be inclusive of all work and items given in the above mentioned specifications and Bill of Quantities and applicable for the work under floor, in shafts or at ceiling level at all heights and depths. All rates are inclusive of preparing timber block-outs in RCC and chasing masonry work and making good the same. All rates are inclusive of pre-testing and on site testing of all the installations and materials prior to commissioning to the satisfaction of the Engineer.

Pipes (Unit of measurement:
Linear meter to the nearest centimeter) Complete installation of uPVC pipes include supply of pipes and necessary fittings such as Tees, Bends (with or without door), single and double Y (with or without door), Reducers, Crosses, Couplers, Solvent cement, NC putting, rubber, rings, clip etc. It also includes trench excavation in any type of soil and backfilling with proper compaction, chasing in wall or floor and repair to original finish, laying and jointing and pressure testing.

**Measurement**

Measurement for uPVC Pipes will be made per running meter of complete installation.

**Measurement**

Unit of measurement shall be the number of pieces. Floor and urinal traps, traps gratings, hoppers, clean-outs, plugs shall be measured by numbers and shall include all items described in the relevant specifications. Bolt welding shall be by number of complete pipe joints.

**Pipes Specials**

PVC pipe specials e.g. bend, tee, Y-joint etc shall be measured by numbers. Rate shall be for plain or reducers used wherever required as per the site condition.

**Measurement U**

Unit of measurement shall be the number of pieces. Floor and urinal traps, traps gratings, hoppers, clean-outs, plugs shall be measured by numbers and shall include all items described in the relevant specifications. Bolt welding shall be by number of complete pipe joints.

### 3.0 SANITARY-WARES

### 3.1 Scope

Work under this section shall consist of furnishing all labor materials necessary and required to completely install all sanitary fixtures, chromium plated fittings and accessories required by the drawings and specified hereinafter or given in the schedule of quantities. Without restricting to the generality of the foregoing the sanitary fixtures shall include all sanitary fixtures, CP fittings and accessories, etc, necessary and required for the buildings. Whether specifically mentioned or not, all fixtures and appliances shall be provided with all fixing devices, nuts, bolts, screws, hangers as required. All exposed pipes within toilets and near fixtures shall be chromium-plated brass or copper unless otherwise specified. All hot water pipes shall be lagged & properly insulated from the hot water storage tanks to the hot water taps & outlets.

### 3.2 General Requirements

Sanitary fixtures shall be of the best quality approved by the Engineer. Wherever particular makes are mentioned, the choice of selection shall remain with him. All fixtures and fittings shall be provided with all such accessories as are required to complete the item in working condition whether specifically mentioned in the schedule of quantities, specifications or drawings or not. All fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per Engineer/interior designer's requirements. Wherever necessary, the fittings shall be centered to dimensions and pattern desired. Fixing screws shall be half round head chromium plated brass screws with CP washers wherever required as per directions of Engineer. All fittings and fixtures shall be fixed in a neat workmanlike manner true to level at heights shown on drawings and in accordance with the manufacturer's recommendations. Care shall be taken to fix all inlet
and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor.

3.3 Orissa Type Pan or IPWC commode & Cistern

Pan or Commode shall be of white vitreous china first class quality, double symphonic close `P' or `S' trap coupled with cistern with fittings, brackets. The W.C. pan/Commode and cistern shall be free from cracks, crazes, and blisters and shall have smooth surfaces.

3.3.1 Flushing Cistern

Flushing Cistern shall be of white vitreous china first class quality with push/pull handle of 10 lit capacities. Cistern shall have mosquito proof cover ball valve with copper float, lever and siphon complete with necessary unions etc. for inlet outlet and overflow connections. Cistern shall be fixed on rolled cantilever bracket, which shall be firmly embedded in the wall by making holes of required sizes. Brackets shall be grouted in holes with cement mortar 1:2 (1 cement: 2 fine sand). The wall used for making holes shall be made good to original condition.

3.3.2 Flush Pipe:

Cistern shall have 32 mm. dia. outlets for flush pipe connected to W.C. pan. Flush pipe shall be of chromium plated. Vertical drop of flush pipe shall be embedded in the wall with a long bend from outlet of cistern. Horizontal piece shall be laid under floor. The chase of embedding shall be made good with cement concrete 1:2:4 mix. Jointing between C.P. flush pipe and W.C. pan shall be made with white lead, yerr, and water proofing compound or any other suitable method. The joint shall be absolutely leak proof.
3.3.3 Plastic or Lead Connection
Cistern shall be connected with a lead/plastic. Connection pipe shall be of 450mm Length with brass unions at the ends. One end shall be connected to cistern inlet and the other to distribution line with a stopcock in between for control of flow.

3.3.4 Stop Cock:
Stop Cock shall be of C.P. brass.

3.3.5 Fixing:
The W.C. pan or commode shall be laid in floor slope towards the pan in a workman like manner care being taken not to damage the pan in the process of fixing. If damaged in any way, it shall be replaced at no cost to the Employer. The pan shall be fixed on a proper base of cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 stone ballast 20mm. nominal size) taking care that cushion is uniform and even without having any hollows between the concrete base and pan. Joining between the pan and finished floor shall be neatly done and no hair cracks shall be visible. Joining between the outlet of pan and HCl neat cement yarn, linseed oil, white trap shall be made with lead and water proofing compound and made leak proof.

3.4 Mixing Fittings :
Mixing fittings shall be C.P. brass of approved quality with modern head for hot and cold for spray and rim with diverter.

3.4.1 Angle Valve :
Angle valve shall be of 12.7mm dia. C.P. brass with 12.7mm. dia. C.P copper supply pipe of 304.8mm length with nuts and washers. The connection between angle valve and supply line laid in chase shall be made in a manner so that the union is flush with finished face of the wall and no threaded portion of the angle valve or supply line is visible.

3.5 Urinals
Urinals shall be lipped type half stall white glazed vitreous china of size 610 x 400 x 380 mm size. Half stall urinals shall be provided with 15 mm dia. spreader, 32 mm dia. CP domical waste and CP cast brass bottle trap with pipe and wall flange, and shall be fixed to wall by one CI bracket and two CI wall clips complete as recommended by manufacturer's directives with approval by Engineer. Half stall urinals shall be fixed with CP brass screws. Flush pipes shall be GI pipes concealed in wall chase but with chromium-plated bends at inlets and outlets wherever they are visible. Urinals may be flushed with flush valves, if given in the schedule of quantities and as described in the item. Waste pipes for urinals shall be any of the following:

a) G.I. pipes
b) Rigid PVC
Waste pipes shall be concealed by chasing into the walls as directed by the Engineer. Specifications for waste pipes shall be same as given in the relevant section of this specification. Urinal partition shall be white glazed porcelain of size 680 x 300 mm (division plate).

3.6 Wash Basin
Wash basins shall be white glazed vitreous china size, shape and type specified in the schedule of quantities, as shall be approved by the Engineer. Each basin shall be with RS or CI brackets and clip-sand the basin securely fixed to wall. Placing of basin over the brackets without secure fixing shall not be accepted. They shall be provided & fixed in place early so that the built up vanity may be installed in sufficient time to comply with completion dates. Each basin shall be provided 32mm dia. C.P. Waste Coupling with C.P. Chain and Rubber plug, 32mm dia. C.P. P or S trap, 15mm dia. C.P. Bib-cock, pipe connector etc. fittings as given in the schedule of quantities. Each basin shall be provided with mixing fitting or pillar tap as specified in the Bill of Quantities and/or as approved by the Engineer. Basins shall be fixed at proper heights as shown on drawings. If heights are not specified, the rim level shall be 79cms or as directed by the Engineer.

3.7 Sink
Sinks shall be stainless steel as specified in the schedule of quantities. Each sink shall be provided with RS or CI brackets and clips and securely fixed. Counter top sinks shall be fixed with suitable angle iron clips or brackets as recommended by the manufacturer. Each sink shall be provided with 32 mm dia. C.P. waste coupling with C.P. chain rubber plug, 32 mm dia. bottle trap with clean out hole and plug, 15 mm dia. C.P. Sink cock. Fixing shall be done as directed by the Engineer and shall be coordinated with the Interior Fit-out Program. Supply fittings for the sinks shall be fittings or CP taps as specified in the Bill of Quantities.

3.8 Fixing:
The sink shall be laid in wall in a workman like manner care being taken not to damage the sink in the process of fixing. If damaged in any way, it shall be replaced at no cost to the Employer. The sink shall be fixed on a proper base of cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 stone ballast 20mm. nominal size) taking care that cushion is uniform and even without having any hollows between the concrete base and sink. Joining between the sink and wall shall be neatly done and no hair cracks shall be visible. Joining between the outlets of sink shall be made leak proof.

3.9 Towel Rail
Towel Rail shall be of C.P. brass heavy quality of size 15mm X 600mm.

3.9.1 Fixing
Brackets shall be fixed to wall by means of C.P. brass screws to wooden plugs or crawl plugs or dash fasteners firmly embedded in the wall or as directed by the Engineer.

3.10 Toilet Paper Holders
Toilet Paper Holders shall be white vitreous china or CP and of size as specified in Bill of Quantity.
These shall be fitted in recess in masonry on 80mm thick cushion of cement concrete 1:2:4 and jointing to the masonry with white cement or with approved materials to match with dado work.

3.11 Soap Dish:
Soap Dish shall be of white vitreous china or CP Fancy type of size as specified in Bill of Quantity.

3.11.1 Fixing
These shall be fitted in recess in masonry on 80mm thick cushion of cement concrete 1:2:4 and jointing to the masonry with white cement or with approved materials to match with dado work.

3.12 Mirrors
Mirrors shall be electro-coated copper 5.5mm thick of guaranteed quality and reputed make. The size shall be as specified in the Bill of quantities & the drawings. The image shall be clear and without waviness at all angles of vision. Mirrors shall be provided with plastic frame fixed with CP brass semi-round headed concealed screws and cup washers or CP brass clamps as specified or instructed by the Engineer.

3.13 Shower Set
Shower set shall comprise of one or two CP brass stopcocks, concealed as specified in the Bill of Quantities. Each shower set shall be provided with bathtub spout hot and cold with CP Telephonic shower of approved quality to be approved by the Engineer or as specified in the Bill of Quantities or detailed as per the drawings. Concealed stopcocks shall be so fixed to allow for tiled or other finishes as keeping the wall flange clear off the finished wall. Wall embedded in the finishing shall not be accepted flanges.

3.14 Accessories
The Contractor shall install all chromium plated and porcelain accessories as shown on the drawings in compliance to the manufacturer’s specifications directed by the Engineer, and given in the Bill of Quantities. All CP accessories shall be fixed with CP brass half round head screws and cut washer in wall with raw plugs and shall include cutting and making good as directed by him. Porcelain accessories shall be fixed in walls and set in cement mortar 1:2 mix (1 part cement and 2 part fine sand) and fixed in relation to the tiling work.

3.15 Measurement
Unit of measurement shall be based on the number of fixture. Rate for providing and fixing of sanitary fixtures, accessories, urinal partitions shall include all items, and operations stated in the respective specifications and Bill of Quantities, and nothing extra is payable. Rates for all items under specifications above shall be inclusive of cutting holes and chases and making good the same, CP screws, nuts, bolts and any fixing arrangement required and recommended by manufacturers, testing and commissioning.

4.0 WATER SUPPLY WORKS INSIDE BUILDING
4.1 Scope
Work under this section consists of furnishing all labour, materials, equipment and appliances necessary and required to completely install the water supply system as required by the drawings, specified hereinafter and given in the schedule of quantities. Without restricting to the generality of the foregoing, the water supply system shall include the following:

- Connecting the mains supply to the designed tanks as per the drawings.
- Control valve, masonry chambers and other appurtenances.
- Connections to all plumbing fixtures, pantries and overhead tanks.
- Excavation and refilling of pipe trenches.
- Pipe protection and painting

4.2 General Requirements
All materials shall be new of the best quality conforming to specifications. All works executed shall be to the satisfaction of the Engineer. Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workman like manner. Short or long bends shall be used on all main pipelines as far as possible. Use of elbows shall be restricted for short connections. As far as possible all bends shall be formed by means of hydraulic pipe bending machine for pipes up to 65mm dia. If HDPE or PVC pipes are used then methods approved by the manufacturer shall be used. Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages, etc. Pipes shall be securely levelled to the required slopes & fixed to walls and ceilings by suitable clamps at intervals specified. Valves and other appurtenances shall be located to provide easy accessibility for operation, maintenance and repairs.

4.3 GI Pipes, Fittings & Valves All pipes inside the building and where specified, outside the building shall be galvanized steel tubes conforming to IS 1239-1979 of class specified. When class is not specified they shall be of medium class. Fittings shall be malleable iron galvanized fittings of approved make. All fittings shall have manufacturer's trademark stamped on it. Fittings of GI pipes shall include couplings, bends, tees, nipples, reducers, unions, and bushes. Fittings shall be IS 1979 (part I to X) 1975. Pipes and fittings shall be joined with screwed fittings. Care shall be taken to remove butt from end of pipe after cutting by a round file. Genuine red lead with grumet and a few strands of fine hemp shall be applied and seal tape shall be used for C.P fittings and gate valves. All pipes shall be fixed in accordance with layout and alignment shown on drawings. Care shall be taken to avoid air pockets. GI pipes inside toilets shall be fixed in wall chases well above the floor. No pipes shall be run inside a sunken floor unless specifically instructed. Pipes shall be run under ceilings or floors and other areas as shown on drawings.

4.4 Clamps
GI pipes in shafts and other locations shall be supported by MS clamps of design approved by Engineer. Pipes at ceiling level shall be supported on structural clamps fabricated on MS structural brackets as described in relevant sections of this specification. Pipes in typical shafts shall be supported on slotted angles/channels as specified.

4.5 Unions
The Contractor shall provide adequate numbers of unions/flanges on all pipes to enable dismantling later. Unions shall be provided near each gunmetal valve, stop cocks or check valves and on straight runs as necessary at appropriate locations and required and/or directed by the Engineer.

4.6 Flanges
Flanged connections shall also be provided on all equipment connections as necessary and required or as directed by the Engineer. Connections shall be made by the correct number and size of bolt-sand made with 3mm thick insertion rubber washers. Where hot water or steam connections are made insertion gasket shall be of 1.5mm thick compressed fiber gaskets approved by the Architect. Bolt hole diameter for flange shall conform to match the specification for CI sluice valve to IS 780.

4.7 Trenches All GI pipes below ground level shall be laid in trenches and shall have a minimum cover of 60cms. Excavation for trenches shall be done as specified in subsequent pages of this documents but the width and depth of the trenches shall be as follows:

<table>
<thead>
<tr>
<th>Dia. of pipes</th>
<th>Width of trenches</th>
<th>Depth of trenches</th>
</tr>
</thead>
<tbody>
<tr>
<td>15mm to 50mm</td>
<td>30cms</td>
<td>75cms</td>
</tr>
<tr>
<td>65mm to 100mm</td>
<td>45cms</td>
<td>100cms</td>
</tr>
</tbody>
</table>

Where specified all GI pipes in trenches shall be protected with fine sand 15cms allround before filling in the trenches.

4.8 Pipe Protection
Where specified in the schedule of quantities all pipes in chase or below ground shall be protected against corrosion by applying two coats of bitumen paint, wrapping with polythene tape and finishing with one more coat of bitumen paint.

4.9 Valves
Valves 65mm dia and below shall be heavy gunmetal full-way valves or globe valves conforming to IS 778-1971 class I. Valves shall be tested at the manufacturers with test results and their name stamped on it. The Engineer shall approve all valves before they are allowed to be used in the works.

4.10 Air Valves
Air valves shall be provided in all high points in the system to prevent air locks, as shown on the drawings or directed by the Engineer. Air valves shall be gunmetal or CI of size as specified in the Bill of Quantities. Each air valve shall be provided with an isolation gunmetal full-way valve for size 65mm dia and below and CI double flanged valve 80mm dia and above.

4.11 Scour Valves
Scour valves shall be provided at all low points in the system as shown on drawings or directed by Engineer. Valves shall be gunmetal full-way valves for sizes 65mm dia and below and CI double flanged valves 80mm dia and above.

4.12 Valves
Valves shall be heavy gunmetal full way gate valves or non return valves conforming to I.S. 778-
1964 (Class – I) valves shall be tested at manufacturer’s works to 21 kg/sq.cm and shall have manufacturer’s name stamped on it. All valves shall be approved by the Engineer before they are allowed to be used on work.

4.13 Brass Fittings
All brass stop cocks and bib cocks shall be heavy type bright finished with renewable leather washers conforming to I.S. 781-1967. The weight shall be as follows:

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Stop Cocks (kg)</th>
<th>Bib Cocks (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>20</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>25</td>
<td>1.30</td>
<td>1.25</td>
</tr>
</tbody>
</table>

4.14 Ball Cocks
Ball cocks used for storage tanks shall be high or low pressure ball cocks with brass lever rods and polythene ball floats. The ball floats shall conform to Indian Standard which shall be hammer tested.

4.15 Manhole Frames & Cover for Water Tanks
Each tank shall be provided with adequate number of lockable type manhole frames and covers fabricated from MS sheet or standard cast iron tank covers as specified in Bill of Quantities. Manhole covers shall be of sizes shown on drawings and shall be approved by the Engineer.

Concrete tanks:
☐ The Contractor shall provide puddle flanges fabricated from MS/GI pipes of required sizes and lengths and welded to 5mm MS plates. All puddle flanges must be fixed in true alignment and level and shall be back welded to the reinforcement to prevent movement during concreting.
☐ The Contractor shall make connection of pipelines laid and fixed by him to concrete, masonry or steel tanks as required at site. No additional payment shall be allowed for making connections.

4.16 Testing
4.16.1 Testing
a. All pipes fittings and valves shall be tested by hydrostatic pressure as follows:
   - For medium class pipes 7.0 kg/sq.m
   - For heavy class pipes 10.5 kg/sq.m
   Pressure shall be maintained for a period of at least two hours without appreciable drop in the pressure after fixing at site.

b. In addition to the testing carried out during the construction the Contractor shall test the entire installation after connections to the overhead tanks or pumping systems or mains. He shall rectify all leakages, and shall replace all defective materials in the system at his own expense without any extra money.
c. After commissioning of the water supply system, the Contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. The valves which do not operate effectively shall be replaced by new ones at his cost and tested as above.

4.17 Measurements
G.I. pipes above ground shall be measured per running meter (to the nearest cm) and the rate
shall be inclusive of all fittings including unions, H.B. Clamps, cutting chases and hooks in wall and floors and making good the same and testing of pipes and fittings.

G.I. pipes below ground shall be measured per running meter and the rate shall be inclusive of all fittings including unions, excavation for trenches refilling and disposal of surplus earth and testing. Gunmetal valves, non return valves, ball cocks, foot valves, stop cocks, bib cocks, shall be measured by number.

For Painting for pipes with enamel or black bituminous paint, no separate payment shall be admissible.

Protection to pipes with polythene tape shall not be measured separately.

5.0 PIPE INSULATION

5.1 Pipe Insulation:
All domestic water supply lines shall be insulated with 25 mm thick standard fibreglass type pipe insulation. The insulation shall have fire retarding jacket, where directed, or in compliance with the standards.

5.2 Insulation Materials: Insulation material shall be glass-wool, resin-bonded fiberglass or approved equal. The thermal conductivity of the insulation material shall not exceed 0.285 K Cal/(hrsq.m/cm) or 0.27 Btu/(hr-sq.ft/in) at 32 °C mean temperature. The density shall not be less than 24 kg/cu m (1.5 lb/cu ft). Insulation shall be of 25 mm thick premoulded tubular type.

Bonding of insulation material shall be with a cold-setting compound. Adhesives used for setting the insulation shall be non-inflammable vapor-proof adhesive.

5.3 Insulation Application:
All insulation shall be applied strictly as per manufacturer recommendations by specialist skilled workmen trained in the trade. Before applying insulation, all pipe work and fittings shall be brushed clean, all dust, dirt and oil removed. Each length of piping to be insulated shall be tested for its performance requirements. Only such pipe lengths which are free from defect shall be insulated. After testing the pipe lengths shall be dried out. All pipes shall be painted with one coat of zinc-chromate primer followed by two coats of bituminous paint before applying insulation. Premoulded insulation shall be encased in GI chicken mesh held firmly in position by 20 gauge spiral. Polythene sheets shall then be wrapped on the insulation over its entire length with adequate overlaps at all joints.

All insulation on ducts and piping shall be continuous and full thickness and as specified where passing through walls, floors, partitions and pipe sleeves.

5.4 Protection of Insulation:
Where insulation is liable to be damaged, it shall be adequately protected as desired by the Engineer. The protection shall consist of a 20 mm thick cement plaster (1 cement: 6 coarse washed sand) applied continuously over the GI Wire mesh on the pipe. The plaster shall be finished smooth to receive painting and other finishes.

6.0 STORAGE TANKS

6.1 General
The Contractor shall provide and install Storage tanks in accordance with the Detailed Drawings
and as specified in Bill of Quantities and in the location shown on the Plans.
The Contractor shall provide inlets, outlets, and overflow pipes, socket for float level switch and
inter connection. The overflow and vent pipes shall be provided with a mosquito proof brass net.
The vent pipes of size mentioned shall be provided with bends and pieces of pipes facing
downward. The holes in the tanks for the inlets, outlets, overflows, etc. shall be made as per the
manufacturer's specifications.

6.2 RCC Storage Tanks
RCC storage tanks shall be constructed as per the Drawings. The Contractor shall provide puddle
flanges fabricated from GI pipes of required sizes and welded to 300 x 300 x 6 mm MS plate. All
puddle flanges must be fixed in true alignment and level and shall be tack welded to the
reinforcement bar to prevent movement during construction.
The Contractor shall make connections of pipe lines laid and fixed by him to existing concrete,
masonry or steel tanks as required at site. No additional payment shall be allowed for making
connection.

6.3 Plastic tanks
The tanks shall be vertical or horizontal type as required and of One Piece Moulded (without any
seam, joints or weld) High Density Polyethylene. The tank shall be provided with a manhole of size
400 mm in diameter. The tanks shall be of 'SINTEX' of Sinter Plast Containers (India) or equivalent.
Contractor shall provide inlets, outlets, and overflow pipes, socket for float level switch and inter
connection. The overflow and vent pipes shall be provided with a mosquito proof brass net. The
vent pipes of size mentioned shall be provided with bends and pieces of pipes facing downward.
The holes in the tanks for the inlets, outlets, overflows, etc. shall be made as per the manufacturer's
specifications. All outlets connections shall be at least one size higher than the pipe connections and shall be
connected to the pipes by reducers (no reducing bushes will be accepted).

6.4 Support for Overhead Water Storage Tanks
The tanks where required shall be on the roof top over an elevated RCC platform or on RSJ or
other structural members as shown on the Drawing. The tanks shall be put in such a manner that
the bottoms of all the tanks have a sufficient bearing. The Contractor shall provide all supporting
and fixing devices (such as mild steel ring around the tanks with anchoring members) necessary to
fix the tanks and fitting securely in position as per the manufacturer's Specifications. The fixing
devices shall be rigidly anchored into the building structure. All the devices shall be rust proof and
shall be so fixed that they do not present any unsightly look.

7.0 PLUMBING FIXTURES

7.1 Liquid Heat Transfer
Electric Water Heater Water heater shall be complete packaged unit with insulated heavy gauge
factory painted metal casing under the sink type as shown on the Drawings. Electric heaters shall
have glass lining with magnesium anode rod, ceramic heating element, antimixing baffle (to avoid quick mixing of cold and hot water) and nylon bushes in order to avoid electrolysis problems.

Electrical heaters shall be provided with double safety thermostat and safety valve. Electric heaters shall be furnished with cord and plug for connection to grounded sockets. Size as indicated on Drawings.

**Plumbing Fixtures**

Plumbing fixtures shall be free from flaws and blemishes and shall have a clear smooth surface. Fixtures shall be white in colour unless stated otherwise. Visible parts such as trim, supplies, traps, etc. shall be heavy chrome plated brass.

Each fixture shall be provided with a trap and with loose key compression stops in addition to a valve or faucet on the fixture.

Each fixture shall be piped up with domestic hot water as applicable and cold water, waste and vent in accordance with the schedule.

**Chrome Plated (CP) Brass Fittings**

All mixers, fittings, bib cocks, etc. shall be of the best quality heavy pattern of approved make.

All CP fittings shall be fixed in a neat workmanlike manner and shall not carry tool mark and scratches. All valves shall carry identical CP handles (Knobs) approved by the Engineer.

**8.0 SOLAR WATER HEATER**

**8.1 General Requirement**

Each solar water heater shall be 1.6 sq.m absorber collector with integral insulated hot water tank of 200 litres capacity. The collector plate will be of 15 dia GI pipes running vertically collector plate will be of 15mm dia G.I pipes manifold at the bottom, at 90 mm c/c, welded to 25mm dia G.I pipe manifold at bottom, the 15 mm dia G.I pipes supply fittings and wired on to corrugation of 1830 X 830 corrugated G.I sheet. The collector surface shall be painted with 1 coat of red lead primer and two coats of blackboard matt black paint. The under side of collector plate (where it rest on 50mm fibre glass wool) shall be painted with 1 coat of red lead primer and two coats of white enamel.

Single glazing cover shall be 5.6 mm clear glass with the fully weatherproofed 25mm, air gap between the glass and collector surface. There shall be 50mm deep fiberglass wool insulated beneath and around the side edges of the collector plate. A 25mm drain pipe shall be provided with plug or end cap at the lowest part of the solar panel.

The top end of the G.I pipes running vertically shall enter and be welded to a 90 litre hot water tank lying across the top and of the solar panel, this tank, if of oxyacetylene gas welded joint, is to be of gauge thinner than 18 SWG. If of arc welded, the tank shall not be of gauge thinner than the 18 SWG. The tank shall be painted with the 1 coat of red lead primer and 2 coats of white enamel.

There shall be a vent pipe of 15mm dia rising from the central topmost portion of the insulated hot water tank, from which the hot water supply is also drawn off the vent pipe rises from the tank.

The hot water shall be insulated with 75mm thick fiberglass wood all around and the whole solar panel plug insulated hot water tank encased in a weather proof box of 26 BWG G.I sheet (unpainted).

Minimum vertical distance between the bottom of cold water storage tank and top of the solar panel /hot water storage shall be 600mm. The whole solar collector tank system shall be mounted on
stout framework of GI pipes or MS Angles at 45° to the horizontal and facing south, clear of any shadowed areas throughout the year. The frame shall be fitted with foot rest plates 150mm X 150mm & sat on Tow elf pads in order to avoid damage to the both roof deck finish and to the absorbed set.

A material used in the construction of the solar heater shall be clean, free from dust, rust, oil, or other blemishes. Welded joint should be thoroughly tapped and brushed free of welding scale, residue etc. The solar water unit is to be able to withstand a pressure maximum of 1 kg/cm² (10m vertical head) the system shall be pressure tested and flushed before installation, and shall be pressure tested again after installation to the satisfaction of Engineer.

8.2 Measurement:
Unit of measurement shall be based on the number . Rate for providing and fixing of solar heater and electric water heater shall include all items, and operations stated in the respective specifications and Bill of Quantities, and nothing extra is payable.

9.0 TESTING AND COMMISSIONING

9.1 Testing and Commissioning:
Piping shall not be buried, concealed or insulated before being properly tested.

The tests shall be carried out in accordance with the requirements of all authorities having jurisdiction.

Storm waste and sanitary drainage systems within the building shall conform the following:

The tightness of joints and the soundness of piping shall be tested in the presence of the Engineer. After drains and roof leaders have been placed in position and branches installed, but before the fixtures have been set and connected or the main drain has been connected permanently to the sewer.

The test shall be carried out in the following manner. Openings and pipe ends throughout the work shall be securely closed by means of approved plugs and the entire system, including rising stacks, rain- water leaders, branches to the fixtures and all horizontal mains and drains shall be filled with water up to the top of the highest opening. This water shall stand at the same level for not less than two hours. Another test shall be made of the entire plumbing system after the fixtures have been set and the main sewers connected to the drains. This test shall consist of turning the water into all pipes, fixtures and traps in order that any imperfect material or workmanship may be detected.

Where it is impossible to test the whole system at any time, it may be divided into parts. A smoke test shall also be made and any other test required by the Engineer. Any leaks discovered shall be made tight while the system is under pressure. If this is impossible, the pipe, etc. shall be removed and refitted and the test reapplied until satisfactory results have been obtained.

9.2 Water Piping:
Water piping shall be tested at 10.5 kg per sq. cm pressure for a period of not less than 24 hours. The pressure must remain constant for the period and the leaks, if any, shall be made tight while the system is under pressure. If this is impossible, the joint shall be re-made and the test reapplied until satisfactory results have been obtained.

9.3 Disinfection
Before being placed in service, all sanitary water piping shall be thoroughly flushed and chlorinated by the application of a chlorinating agent which shall calcium or sodium hypochloride obtained from an approved manufacturer. The chlorinating solution shall have a chlorine dosage of 50 ppm and shall be injected into the system at one end through a cock or tapped connection. All valves and accessories on the system shall be operated to ensure treatment of entire system. The solution shall be retained in the system for a period of at least 24 hours. At the end of this period the water shall be flushed from the line at its extremities until the water at these points is of the same quality as the source of supply.

9.4 Commissioning and Testing

Before commissioning and testing of fixtures, the Contractor shall ensure that all soil and waste stacks and drainage system are connected to the respective manholes and the out fall. He shall also ensure that the water supply system ahs been commissioned and tested. Fixtures shall be cleaned and all debris and dirt removed. All stickers, labels, etc. shall be removed with hot water.

Cold water shall be let in each fixture individually. The fixtures shall then be observed for any leakage or drip at inlet and outlet connection. The rate of flow for each fixture shall be adjusted by control valves. All defective part shall be replaced and retested.

After commissioning of the cold water system, water heaters shall be charged with hot water. After expelling all air in the system by allowing the water to flow through the tap for some time, the heaters shall be switched on. Each heater shall be observed for any leakages and its thermostatically controlled operations. If necessary, thermostats shall be reset and any leakage or defects in the heater repaired or replaced.

On satisfactory testing and commissioning of the fixtures, the Contractor shall clean all fixtures and accessories by a suitable detergent and hand over the bath room in absolutely clean and usable conditions.

The Contractor shall remove all debris, dirt and surplus materials caused by the work. The system shall be left complete and ready for use.

Make of Equipment and Approved Manufacturers

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Manufactures / Brand Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part - I Sanitary Plumbing Installation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Sanitary Fixture and Faucets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Vitreous China Sanitary ware</td>
<td>a. Parryware</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Hindustan Sanitary ware</td>
</tr>
</tbody>
</table>
2. C.P. brass Faucets, Wastes, Traps etc.  
   c. Cera or Approved Equivalent  
      a. Jaquar  
      b. ARK  
      c. GEM or Approved Equivalent  
         a. GEM  
         b. Jaquar or Approved Equivalent  
         a. Zoloto  
         b. RB or Approved Equivalent  

3. C.P. Flush Valves for W. C.s  
   a. GEM  
   b. Jaquar or Approved Equivalent  

4. C. P. Angle Valves (Ball Valve Type)  
   a. Zoloto  
   b. RB or Approved Equivalent  

5. C. P. Bathroom Accessories(toilet paper Holder, Glass shelf, Towel Rod, Soap Tray etc)  
   a. GEM  
   b. Jaquar  
   c. ESS ESS or Approved Equivalent  

6. C. P. Wastes, Spreaders, Urinal Flush Pipe a. Lotus  
   b. Orient  
   c. ESS ESS or Approved Equivalent  

B. Pipes and Fittings  
2. UPVC Soil, Waste & Vent Pipes and Fittings  
   a. Supreme  
   b. Prince  
   c. Finolex  
   d. Panchakanya or Approved Equivalent  
      a. Hipco  
      b. Jindal, Hissar or Approved Equivalent  
      a. R’ Brand  
      b. Unik Brand  
      a. Sun or Approved Equivalent  
         a. Local of approved quality  

3. G.I. Pipes  
   a. Hipco  
   b. Jindal, Hissar or Approved Equivalent  

4. G. I. Fittings  
   a. R’ Brand  
   b. Unik Brand  
   c. Sun or Approved Equivalent  

5. RCC Pipes  

11. Grattings strainers Cleanouts etc.  
   a. Neer’ Brand (Sage Metals)  
   or Approved Equivalent  

C. Insulation  
1. Synthetic Polymeric Rubber Compound insulation  
   a. Superlon  
   b. Aeroflex or Approved Equivalent  

2. Pre-formed Mineral Wool Pipe Sections or Approved Equivalent  
   a. Rockloyd  
   b. UP-Twiga or Approved Equivalent  

D. Valves  
1. Gunmetal Gate Valves, Non-return Valves, Float Valves  
   Zoloto  
   a. Sant or Approved Equivalent  
   b. RB, Italy  
   c. Zoloto  
   d. Sant or Approved Equivalent  
   a. Bugatti, Italy  
   b. CIM, Italy or Approved Equivalent  

3. C. P. Angle Valves (Ball Valves Type)  

E. Manhole Covers Grattings etc.  

Procurement of Works | 116
1. C. Manhole Covers
   a. Nepal Dhalaut Pvt. Ltd
2. Level Controllers
   a. Femack or Approved Equivalent
2.6 Mains and Sub-mains PVC Insulated Armoured Cables

2.6.1 Laid Underground ........................................... 172
2.6.2 Cables Run Over Horizontal or Vertical Surface........
2.6.3 Laid in Ready Trench ...................................................
2.6.4 Jointing ........................................................................
2.6.5 Overhead Distribution Line .................................................. 179
2.7 Wiring Cable Run Under Defined Conditions: ................
2.7.1 Multi-Core Cable ......................................................... 180
2.7.2 Provision for Maximum Load ................................. 180

1.1 Power Supply ........................................................................ 173
1.1.1 LT Power Supply ....................................................... 173
1.1.2 HT Power Supply ................................................................. 173
1.2 Feeder Pillar ............................................................ 173
1.2.1 General ............................................................................ 173
1.2.2 Construction ............................................................... 173
1.2.3 Switch Fuses ..................................................................... 174
1.2.4 Miniature Circuit Breaker (MCB) .......................... 174
1.2.5 Moulded Case Circuit Breaker (MCCB) ....................... 174
1.2.6 Busbars .............................................................................. 175
1.3 Fusing And Spare Fuses .................................................. 175
1.4 Grounding (Earthing) ...................................................... 175
1.4.1 General ............................................................................ 175
1.4.2 Earthing Set ...................................................................... 175
1.4.3 Provisions .......................................................................... 176
1.4.4 Lightning Protection System .............................................. 176
1.4.5 Electrical Equipment Protection .......................... 176
1.4.6 Building Protection ......................................................... 177
1.4.7 House Service Clamp ...................................................... 177
1.5 Cutting, Patching and Repairing .................................. 177
1.6 Equipment Protection ...................................................... 171
1.7 Inserts And Sleeves ............................................................... 171
1.8 Cleaning ........................................................................ 171
1.9 Operation ...................................................................... 171
1.10 Guarantee ...................................................................... 172
1.11 Equipment Connections ................................................ 172
1.12 Safety and Disconnect Switches ....................................... 172

1.13 Codes, Rules, and Regulations .......................... 172
2.0 Technical Specifications ................................................. 173
2.1 Power Supply ................................................................. 173
2.1.1 LT Power Supply ................................................................. 173
2.1.2 HT Power Supply ................................................................. 173
2.2 Feeder Pillar ................................................................. 173
2.2.1 General ............................................................................. 173
2.2.2 Construction ............................................................... 173
2.2.3 Switch Fuses ..................................................................... 174
2.2.4 Miniature Circuit Breaker (MCB) .................................. 174
2.2.5 Moulded Case Circuit Breaker (MCCB) ....................... 174
2.2.6 Busbars .............................................................................. 175
2.3 Fusing And Spare Fuses .................................................. 175
2.4 Grounding (Earthing) ...................................................... 175
2.4.1 General ............................................................................ 175
2.4.2 Earthing Set ...................................................................... 175
2.4.3 Provisions .......................................................................... 176
2.4.4 Lightning Protection System .............................................. 176
2.4.5 Electrical Equipment Protection .......................... 176
2.4.6 Building Protection ......................................................... 177
2.4.7 House Service Clamp ...................................................... 177
2.5 Mains and Sub-mains PVC Insulated Armoured Cables .... 177
2.6 Cable Laying / Overhead Distribution ....................... 177
2.6.1 Laid Underground ........................................... 172
2.6.2 Cables Run Over Horizontal or Vertical Surface........
2.6.3 Laid in Ready Trench ...................................................
2.6.4 Jointing ........................................................................
2.6.5 Overhead Distribution Line .................................................. 179
2.7 Wiring Cable Run Under Defined Conditions: ................
2.7.1 Multi-Core Cable ......................................................... 180
2.7.2 Provision for Maximum Load ................................. 180

1.13 Codes, Rules, and Regulations .......................... 172
2.0 Technical Specifications ................................................. 173
2.1 Power Supply ................................................................. 173
2.1.1 LT Power Supply ................................................................. 173
2.1.2 HT Power Supply ................................................................. 173
2.2 Feeder Pillar ................................................................. 173
2.2.1 General ............................................................................. 173
2.2.2 Construction ............................................................... 173
2.2.3 Switch Fuses ..................................................................... 174
2.2.4 Miniature Circuit Breaker (MCB) .................................. 174
2.2.5 Moulded Case Circuit Breaker (MCCB) ....................... 174
2.2.6 Busbars .............................................................................. 175
2.3 Fusing And Spare Fuses .................................................. 175
2.4 Grounding (Earthing) ...................................................... 175
2.4.1 General ............................................................................ 175
2.4.2 Earthing Set ...................................................................... 175
2.4.3 Provisions .......................................................................... 176
2.4.4 Lightning Protection System .............................................. 176
2.4.5 Electrical Equipment Protection .......................... 176
2.4.6 Building Protection ......................................................... 177
2.4.7 House Service Clamp ...................................................... 177
2.5 Mains and Sub-mains PVC Insulated Armoured Cables .... 177
2.6 Cable Laying / Overhead Distribution ....................... 177
2.6.1 Laid Underground ........................................... 172
2.6.2 Cables Run Over Horizontal or Vertical Surface........
2.6.3 Laid in Ready Trench ...................................................
2.6.4 Jointing ........................................................................
2.6.5 Overhead Distribution Line .................................................. 179
2.7 Wiring Cable Run Under Defined Conditions: ................
2.7.1 Multi-Core Cable ......................................................... 180
2.7.2 Provision for Maximum Load ................................. 180
ELECTRICAL SYSTEM WORKS

1.0 GENERAL SPECIFICATIONS

1.1 Scope

The works covered shall include furnishing all labour, materials, equipment and services in connection with the complete work, as indicated. The Contractor shall consult drawings, bill of quantities, and specifications all together, which gives the total scope of the work.

1.2 Rates

i) The rates given in the electrical installation scheme are all inclusive of labour and materials required for breaking brick work, concrete work, earth work in excavation etc., as and where required for carrying out the implementation of the complete electrical installation scheme.

ii) The rates given in the electrical installation scheme are all inclusive of any labour and materials required for reinstating general civil works with all finishes and trench filling in the exterior inclusive of levelling to approved level and distribution or removal of surplus soil, or according to specifications.

iii) The rates are also inclusive of painting work of all exposed parts of the installation consisting of one or two coats of anti-corrosive paints on any metal part plus 2 or more coats of approved finishing / paint in colours to be instructed by the Consultants.

iv) The rate quoted in the tender shall include all charges for scaffoldings, centring materials, water and electricity charges, tools and equipment, sheds for material, transferring all materials from place of availability to the site of work, etc. The tender rates shall also include Contractor’s temporary establishment and services he may require for the successful completion of the work. The rates shall be inclusive of sales tax, or any other fees or duty levied by any government or public bodies.

1.3 Quantities

The calculations made by the Bidder should be based upon probable quantities of the several items of work which are furnished for the Bidder’s convenience in schedule of probable quantities, but it must be clearly understood that the schedule of quantities is liable to alteration by omission, deletion or addition at the discretion of the Consultants without vitiating the contract and the contract is not a lump sum contract, and neither the probable any way assure the Bidder or guarantee that the said probable quantities are correct or that the quantity of work would correspond there to.
1.4 Drawings

i) It is the intent of the specifications, along with bill of quantities and accompanying drawings to provide a complete workable facility. The drawings, specifications and bill of quantities are complimentary and what is called for by one shall be as bidding as if called for by all. Items shown on the drawings or bill of quantities are not necessarily included in the specification.

ii) The drawings provided are design drawings and generally are diagrammatic. They do not show offsets, bends, elbows, or junction boxes which may be required for the installation in the space provided. The Contractor shall follow the drawings as closely as is practicable to do so and shall install bends, offsets, junction boxes, pull boxes, etc. where required, by local conditions from measurements taken at the building, subject to approval and without additional cost.

iii) The contract drawings shall serve as working drawings for the general layout of lighting, outlets, cables, and various items of equipment. The Contractor shall prepare and submit for approval [up to 5 sets or as required] detailed shop drawings of all installations not detailed on the drawings provided. Any change or amendment made during installation or erection shall be noted in the working drawing. The preparation and submission of detailed as built in drawings after completion of the works, shall be the responsibility of the Contractor. The submission of the final as built in drawing is obligatory prior to the issuance of the Completion Certificate.

Shop drawings shall include, but are not limited to:

- Control system
- Conduit layouts with location of junction boxes and number of wires
- External and internal cables pipes, anchors, supports, loops, building entrances
- Electrical distribution boards, wire or cable ways, etc.,
- Lighting fixture catalogue sheets for all fixtures to be installed, with fixture type indicated for each item.

iv) Submit for approval, manufacturers detailed shop drawings, specifications and data sheets for all equipment.
1.5 Cutting, Patching and Repairing
Cutting, patching and repairing required for the proper installation and completion of the work including plastering, masonry work, concrete work, carpentry work and painting shall be performed by skilled craftsmen in their respective trades. Holes which are cut over size shall be filled, so that the equipment fit tightly.

1.6 Equipment Protection
Keep all cables and conduit opening closed by means of plugs or cover to prevent entrance of foreign matters. Protect all cables, conduits, raceways, fixtures, equipment or apparatus. Any such item damaged prior to final acceptance of the work shall be restored to its original condition or replaced at no extra cost to the client.

1.7 Inserts And Sleeves
Layout inserts and sleeves necessary to complete the work in advance of pouring of slabs or construction of walls. Cost of cutting or patching made necessary as a result of this operation shall be at no extra cost.

1.8 Cleaning
i) All electrical fixtures shall be cleaned of stamping and markings [except those required by codes], iron cuttings and other foreign materials.
ii) Electrical switch boards, receptacles, equipment shall be vacuum cleaned of dust and debris.
iii) Painted surface which have been scratched or marred shall be cleaned of rust or other foreign matters and painted with matching colour of industrial enamel.

1.9 Operation
The Contractor shall instruct thoroughly the Owner or his representative in the efficient operation of the entire system.
1.10 Guarantee
The Contractor shall make good the following guarantee requirements within one year following date of final acceptance without additional cost to the Owner:-

i) All work and apparatus shall be so built and installed as to deliver its full rated capacity at the efficiency for which it was designed.

ii) All work and apparatus shall be free from defects of material or workmanship. Any defective material due to defective manufacture, or bad workmanship, or wrong installation shall be replaced free of cost during this period.

iii) The entire electrical and mechanical apparatus shall operate at full ratings without objectionable noise or vibration.

1.11 Equipment Connections
Provide electrical connections as required to all equipment like light fixtures, fans, outlets etc., include all incidental wiring, materials, devices, and labour necessary for a finished working installation.

1.12 Safety and Disconnect Switches
Provide safety and disconnect switches as per IS / BS specifications of quick-make, quick break type, suitably rated and having electrical characteristics as required for the load served. Provide cover, interlock for switches and install required disconnect switches as per the code, whether or not specifically shown.

1.13 Codes, Rules, and Regulations
Unless otherwise specified, electrical equipments, materials and workmanship shall conform to the applicable current standard rules, and BS specifications. All products shall bear the mark of Indian/British Standards Institutions and acceptable to Regional Fire Insurance Council. The following Indian Standard specification will apply to the equipments to be used under this contract.

a) Switch fuse units on cubicle switch boards-IS 4047-1967
b) Switch fuse units on Industrial boards-IS 4046-1967
c) Switch gear busbars - IS 375-1963
d) HRC fuse links-IS 2208-1962
e) Distribution fuse boards-IS 2675-1966
f) Enclosure for low voltage switch gear-IS 2147-1962
g) PVC power cables-IS 1554-1964; IS: 694-1977; IS: 3961(Part V) –1968 h) Switch socket outlets-IS 4615-1968
2.0 TECHNICAL SPECIFICATIONS

2.1 Power Supply

2.1.1 LT Power Supply

The electrical power system shall be of AC three phase/ single phase with 400/231 volts, 50 Hz system. The three phase systems shall be 3-phase 4-wire with neutral solidly earthed.

2.1.2 HT Power Supply

The high voltage power supply shall be of AC three phase 11 or 33 KV, 50 Hz with neutral solidly earthed system.

2.2 Feeder Pillar

2.2.1 General

The ratings and no of outgoing feeders of feeder pillars shall be as detailed in the bill of quantities and drawing.

2.2.2 Construction

The feeder pillars shall be of robust construction for outdoor pad mounting with enclosure made of strong sheet steel, painted inside and outside with one coat of red oxide of lead primer and two coats of foliage green paint. They shall be provided with two doors hinged with internal type brass hinges and standard wedge type locks. The feeder pillar shall be of dust and vermin proof type construction. Suitable cable termination and cable gland arrangement as specified shall be provided for both incoming and outgoing cables. The feeder pillar for indoor use, however, shall be self-standing sheet steel enclosure with two coats of grey painting over one coat of red oxide paint.
2.2.3 Switch
Fuses The incoming and outgoing switch fuses shall of rating and type as indicated in the drawing or bill of quantities. The switches shall be quick make and break design with double break per pole. The switch pole shall be silver plated and housed in high quality insulating material. The switch handle shall be of robust design, convenient to handle and shall meet all safety requirements. The outgoing feeders shall be protected by means of HRC fuses or MCB or MCCB of rating as specified in the drawing or bill of quantities.

2.2.4 Miniature Circuit Breaker (MCB)
The MCB shall be equipped with silver layered contacts with adequate arc extinguishing chamber to cater short circuit current up to 9 KA or as specified in the B. Q. The MCB shall be equipped with tamper proof closely calibrated thermal bimetallic strip for overload protection and short circuit magnetic coil with quick tripping mechanism. The MCB must be able to clear the fault within 5 mili seconds. The TP and DP MCBs shall be provided with the mechanical inter-link with the individual poles.

2.2.5 Moulded Case Circuit Breaker (MCCB)
The current ratings of the frame and protection of the MCCB shall be in accordance with the drawing or BQ. They shall be equipped with quick make, quick break and trip free mechanism, which should not be possible to be held in closed position under fault condition. The housing of MCCB shall be of high quality heat resisting insulating material. The terminals shall be of adequate sizes to receive link or cable shoes used for ALCOND cables. The terminals shall be equipped with insulating barriers to avoid inter-phase arcing. The operating handle shall give definite trip indication by positioning the operating handle in between ON and OFF positions. The resetting of trip mechanism shall be done by pushing the handle to OFF position prior to reclosing. The MCCB shall be equipped with silver alloy contacts with wipe action movement during operation. The contacts shall be provided with individual arc chutes to draw away the arc from the contact tips to quench the arc. The MCCB shall be equipped with bi-metallic strip for overload protection with inverse characteristic and magnetic coil for short circuit protection. The MCCB shall be suitable to interrupt short circuit fault current range of 10 to 35 KA according to the rating as stated in the BQ. The tripping time of the breaker shall not exceed 20 mili seconds.
2.2.6 Busbars
The busbars shall of high conductivity copper busbars of sufficient cross sectional area so that a current density of 325 amp. per sq. cm is not exceeded at normal current rating and supported on non-hygroscopic insulating plate or blocks. The neutral busbar and earth bus cross sections shall not be less than 50% and 25% respectively of the phase busbar cross section. The copper used for the busbars shall be of highest purity with impurity contents less than 0.1%. The density of copper busbars must be 8.89 at 20°C and the temperature coefficient of resistance at constant mass must be 0.00393.

2.3 Fusing And Spare Fuses
(a) Fuses in main distribution, sub-distribution panels, sub-distribution boards, and feeder pillar shall be of the current type with minimum rupturing capacity of 35MVA at 400 volts and of standard rating as per IS & BS specifications.
(b) Keep one set of three spare fuses for each fused switch board or panel board and for each size and type of fuse as specified on the site at the time of connection of equipment. Should any of such fuses be used before completion of the project, immediately replace so that at the completion of work, a complete inventory of one set of three spare fuses as per above are delivered to the Owner.

2.4 Grounding (Earthen)
2.4.1 General
The grounded neutral of the secondary distribution system shall be supplemented by an equipment grounding system to safeguard equipment and personnel properly. Equipment grounding system shall be incorporated to all metallic enclosures, cabinets and other conductive items in close proximity with electrical circuits and shall operate continuously at ground potential and shall provide a low impedance path for possible ground fault currents. The system shall comply with IS & BS specifications.

2.4.2 Earthing Set
The earthing set as per IS & BS should consist of the following or as detailed in the bill of quantities.

a) 1 no. 60 cm x 60 cm x 0.3 cm - copper plate
b) 1 no. 19 mm dia. G.I. pipe of appropriate length and accessories for watering as detailed in the BQ.
c) Brick masonry work with cover as detailed in BQ.
d) Test links for schedule testing.
e) Charcoal and salt filling as detailed in BQ.
f) 25 mm x 3mm or 37 mm x 6 mm copper strips or bare copper wire of appropriate gauge, as the case may be, as stated in the BQ.

2.4.3 Provisions

Separate earthing station with complete earthing set as mentioned above shall be provided for each of the following:

- a) Feeder Pillars, Main switch board, distribution boards, transformer body, etc.
- b) Lightning Arresters for high voltage equipment.
- c) Lightning protection of the building
- d) Transformer neutral
- e) Generator neutral

NOTE: The armour of the armoured cable shall be used as additional earthing conductor as far as practicable. The interconnection of earth stations shall be done as far as practicable to reduce the earth resistance of the earth grid, and these inter-connection shall be done under ground only. The size of the inter-connecting conductor shall be not smaller than SWG 8 copper wire. The earth resistance shall, in no case exceed 6 ohm. During the connection and the burial of the earth stations the presence and the approval of the representative from the client is obligatory.

2.4.4 Lightning Protection System

In order to protect the high voltage electrical equipment, and the personnel against atmospheric lightning surges the incoming over-head lines and the metallic parts of the building should be effectively earthed with minimum impedance, to discharge the surge prior to reaching surge voltage to the equipment or personnel to be protected.

2.4.5 Electrical Equipment Protection

The high voltage power cable connecting the end of incoming over-head line, distribution transformer connected directly to the over-head line or other end of the under ground cable and high voltage switch-gears are to be protected against lightning surge voltage by means of lightning arresters with non-linear characteristics. These arresters will have to be install nearest to the equipments to be protected, at the beginning end of insulated cable, or transformer connection. The arrester will be effective only if good earth with minimum impedance is connected. The nearest earth terminal shall be connected to the lightning arresters. Care must be taken to see that the copper wire or strip used to connect the earth station shall be as straight as possible without any loop and no metallic pipe shall
be used as mechanical protection to the earth conductor. If there is a need to protect any portion of the earth connecting lead against mechanical damage non metallic pipe may be used.

2.4.6 Building Protection

The most effective way of protection of building against lightning surge is to install lightning rods with pointed tips erected at the highest points of the building. The number of lightning rods and their distribution depends upon the height and roof area of the building. All the lightning rods shall be interconnected and connected to the nearest earth station by means of down copper conductors of appropriate section. The down conductors shall be as short and straight as possible avoiding unnecessary bends and loops to reduce the impedance to the lightning surge. The down conductor strip shall be clamped to the vertical wall by means of saddle at an interval of one metre using brass screws.

2.4.7 House Service Clamp

The service clamp containing shackle insulators of required numbers, as detailed in the drawing and the bill of quantities shall be grouted on the building wall at a convenient place for house service line. The service cable after tapping the overhead distribution line shall be hooked to the service clamp before entering the house for connecting to main switch board.

2.5 Mains and Sub-mains PVC Insulated Armoured Cables

These shall conform to Latest IS/BS/CMS Specifications and shall be of plain circular/sector shaped stranded aluminium/Copper conductor with size and colour as mentioned in the Bill of Quantities.

2.6 Cable Laying / Overhead Distribution

2.6.1 Laid Underground

Where cables are laid underground they shall be laid in a trench to a depth of 70cm [minimum] in the case of LT power cables and 90 cm (minimum) in the case of HT cable from the ground level. Care shall be taken to avoid interference with underground structures i.e. water pipes, sewerage lines etc. Any telephone lines or other cables coming on the way shall be properly shielded as directed by the site engineer. After the excavation of the trench to a specified depth and the width of the trench governed by the no of cables to be buried and the convenience of the digging the cable/cables shall be laid at the bottom of the trench. The bricks on edges shall be laid along the cable on either sides. The brick canal so formed shall be filled with chemically inert sand and top of the bricks on edges
shall be bridged across by the brick. The completed brick structure shall looks like a sand filled inverted brick canal. The road crossing shall be avoided as far as practicable. The cast iron pipe protection for the cable shall replace the brick protection across the road crossing. After cable pulling through the cast iron conduit they shall be plugged on either end.

### 2.6.2 Cables Run Over Horizontal or Vertical Surface

Wherever cables are to run along wall surface of either the building or electrical duct or on the ceiling, these shall be fixed with cleats. Cleats shall consist of moulded insulated materials divided in two halves and secured to suitable racks made of angle iron or flat steel of suitable approved section. The securing shall be by means of studs and nuts with locknuts and washers. For PVC armoured cables, aluminium or G.I. Claw type Clamps may be used. The rates quoted shall include supply and installation of all fixing materials specified above. In the case of single core power cables three single core cables shall be installed in triangular formation to vertical surface of wall or open cable trench or buried under ground, the cables touching each other throughout and the distance between the wall surface and the nearest cable being 25 mm. Alternatively, three single core cables shall be laid in triangular formation and laid on non-metalic floor, the cable touching each other and floor throughout.
2.6.3 Laid in Ready Trench

This will mean laying of cable in ready prepared trenches directly on trench floor, or the racks provided on the wall of the trench depending upon number of cables to be laid.

Minimum bending radius shall be twelve times the overall cable diameter in case of PILCSTAS and XLPEISWAS cables and six times for PVC armoured cables if not otherwise recommended by the Consultant.

The lengths of cables given in the schedule of quantities are only approximate. The successful bidder is required to measure out the actual lengths needed before laying.

Straight through joints will not generally be permitted.

2.6.4 Jointing

Cable jointing shall be carried out by skilled jointers with expert supervision. The Contractor shall use the best jointing materials and the necessary cable compound and all jointing sweating, basting, wiping and filling in of compound shall be done in an approved manner. In case of aluminum conductor cable special care should be taken for its marked difference from copper conductor cable and crimping method only shall be used for jointing aluminum conductors. Prior to crimping of the aluminum cable to cable lugs of appropriate sizes petroleum jelly shall be applied around the conductors.

2.6.5 Overhead Distribution Line

The low voltage overhead distribution line shall be installed over wood poles / pre-stressed concrete pole / steel tubular poles as specified in the drawing or bill of quantities.

The sizes of the supports to be used depend according to span, number of conductors and sizes of the conductors to be carried and shall be detailed in the bill of quantity. For LT distribution line the ACSR conductor sizes and their number in each span shall be as detailed in the drawing. The conductors shall be mounted on shackle insulators fixed to the poles by means of D-iron and bolts.

Suitable straps and shackle insulator shall be used for teeing.

The arrangement of conductors in vertical plane from top to bottom shall be in the following order.

First conductor - A phase
Second conductor - B phase
Third conductor - C phase
Fourth conductor - Neutral
Fifth conductor - Street light switched conductor

2.7 Wiring Cable Run Under Defined Conditions:

2.7.1 Multi-Core Cable
Cables of all types other than single-core cables are installed singly, fixed to the vertical surface of a wall or open cable trench, the distance between the surface of the cable and the wall being 25mm [1 inch] in every distance.

2.7.2 Provision for Maximum Load
All conductors, switches and accessories shall be of such size as to be capable of carrying, without their respective ratings being exceeded, maximum current which will normally flow through them.

2.7.3 Selection Of Size Of Conductor
The sizes of conductors of circuits shall be so selected that the drop in voltage from consumers' terminals in a public supply to any and every point on the installation does not exceed three percent of voltage at the consumer’s terminals when the conductors are carrying the maximum current under the normal conditions of service.

If the cable size is increased to avoid voltage drop in the circuit, the rating of the cable shall be the current which the circuit is designed to carry. In each circuit or sub-circuit every cable shall have a current rating not less than that of the current rating of the respective protection gear.

2.7.4 Cable Ends
Stranded Conductors having a nominal cross-sectional area exceeding 6 sq. mm shall always be provided with cable lugs and crimping method suitably applied.

When a stranded conductor having a nominal cross-sectional area less than 6 sq. mm is not provided with cable socket, all strands at the exposed end of the cable shall be soldered together. No oxide grease shall be provided on the exposed end conductor after soldering.

In any system of wiring, no bare or twist joints shall be made at intermediate points in the through run of cables unless the length +of a final sub-circuit, sub-main or main is more than the length of the standard coil as given by the manufacturer of the cable. If any joint shall be made through proper cut-outs or through proper junction boxes they shall be easily accessible for inspection.
2.7.5 Passing

Through Walls and Floors Where conductors pass through walls, one of the following methods shall be employed. Care shall be taken to see that wire pass freely through protective pipe or box and that wire pass through in a straight line without any twist or cross in wires on either ends of such holes.

a) A metal box extending through the whole thickness of the wall and casings or conductors shall be carried so as to allow 1.3 cm air space on three sides of the casing or conductor.

b) The conductor shall be carried either in a rigid steel conduit conforming to accepted standards or a rigid or semi-rigid non-metallic conduit conforming to accepted standards.

2.8 LT Switch Gears

2.8.1 Main Switch Board

The main switch board shall be in door type, totally enclosed, metal clad front standing and shall be dust and vermin proof. The design shall be fixed on a modular construction, the fused switch/MCCB/MCB feeder units being arranged in multi-tier formation in horizontal/vertical panels, fed from horizontal/vertical busbars. The ratings of each feeder and their order including other ancillary gears to be equipped with will be as detailed in the bill of quantity.

i) All cabling and maintenance shall be carried out from front and the unit shall be extensible feeder control units arranged in individual compartments with hinged doors. All feeder control units shall be front operated and shall be interlocked with the hinged door. Adjoining surface of doors and covers shall be gasketed.

ii) Busbars shall be of high conductivity copper bar of sufficient cross sectional area so that a current density of 325 amp. per sq.cm is not exceeded at normal current rating and supported on non-hygroscopic insulator. The neutral busbar cross section shall be not less than 50% of the phase busbars.
iii) Clamp type terminals for copper cables may be provided for feeders up to 30 amp. For feeder of higher rating suitable cable lugs shall be used.

iv) The feeder control units ratings shall be as specified in the drawing or bill of quantity, switches shall be of quick make and break design with double break per pole. Switch contacts shall be silver plated and housed in suitable insulator. The feeder control operating handle shall be mounted on the front cover.

2.8.2 Distribution Board
Distribution board shall consist of fused switch/MCCB/MCB of ratings as detailed in the drawing or bill of quantities. It should be factory assembled, flush mounted type, of mild steel cabinets, having dead front with hinged door, flush locks, and a typewritten card directory on the door identifying each circuit. The DB box shall be finished with grey enamel paint on all sides. Branch circuit breakers used for various circuits shall be mounted in a group at the suitable location of the board. The outgoing circuit breakers shall be quick make and break type equipped with overload thermal and short circuit magnetic tripping protection.

Mounting: The board shall be mounted with the top of the cabinet 5 feet, 6 inches above the finished floor unless otherwise noted in the drawings. The cabinet shall be plumb and square with the wall of the structure.

2.9 Feeder Wires and Cables

2.9.1 Standards
All wires and cable for feeder circuits shall be as per latest IS/BS/CMA specifications.

2.9.2 Wire And Cable Protection
Suitably protect wires and cables from weather and damage during storage and handling; item shall be in first class condition when installed.

2.9.3 Wire and Cable Installation
i) Conductors shall be of soft drawn annealed copper with PVC insulation and outer coverings as required.

ii) Conductors sizes shall be standard metric or British wire gauze. Conductors shall be stranded and shall have colour coded phase wires. Neutral used for 230V circuits shall have a distinguished colour tracer. Cables installed in conduits shall be single core un-armoured and colour coded as per IEE wire size, insulation, and manufacturer's name shall be permanently marked on conductor jacket.
iii) Conductors installed in wiring channels of continuous row fixtures, and raceway between junction box and recessed fixtures shall be asbestos covered and have 90 degrees insulation. No reduction in branch circuit conductor size below the respective circuit protection rating in wiring channels will be allowed.

iv) Circuit conductors shall extend to the outlets shown. Circuiting basically shall be as shown in the drawings provided. An arrow indicating to distribution board is a complete circuit i.e. consisting of - one phase conductor, one neutral conductor and one earthing conductor wires with colour codes, in a suitable conduit and wire sizes of all should be same as per the outlets loading. Request for deviations in methods of circuiting and conduit branch circuit distribution shall be submitted in shop drawings form for approval.

2.10 Wirings

2.10.1 General

Wiring of final circuits for lights, convenience outlets, fans, call bell, etc., shall be carried out by distributions and looping system as shown in the drawings. The size of phase wires shall not be less than 1.5 sq. mm. copper conductor PVC insulated cables drawn in suitable conduit. The number of points controlled per circuit and the number of wires in a conduit shall be as per I.E.E. Rules.

2.10.2 Ratings of Outlets

For purpose of determining the size of the sub-mains and controlling switches, the ratings of outlets shall be as follows, unless otherwise specified.

(i) Light, fan points and 5/6 amp. convenience outlets : 100 watts

   ii) Convenience outlets 10 amp. : 750 watts

   iii) Convenience outlets 15 / 16 amp. : 1000 watts

2.10.3 Wiring

The size of the conductors used for phase wiring shall be as detailed in the drawing and BQ. As a general guide-line the conductor sizes of feeder cables shall be as follows:

i) 5 /6 amp. rating  1.5 sq. mm  Cu. PVC cable

ii) 10 amp. rating  2.5 sq. mm  Cu. PVC cable

iii) 15 / 16 amp. rating  4.0 sq. mm  Cu. PVC cable

iv) The conductor size of earth wire shall be not less than 50 % of the respective phase wires.
2.11 Conduiting

i) All wiring shall be drawn inside PVC (HDP) conduits and in concealed/surface manner, unless otherwise shown. The diameter of the conduits shown in the drawing are all internal diameters. The smallest size of the conduit used shall be 16 mm dia. and 2 mm thick. Thus the overall diameter of the smallest size conduit shall be 20 mm. The size of the conduit to be used in any section depends upon the number and sizes of the cable to be drawn in that particular section. As a general rule the sum total area of the cables shall not exceed 60 % of the internal sectional area of the conduit.

ii) Where no size is shown for conduit for the conductors indicated, use the minimum codepermitted size. Provide sizes in excess of code requirements where more bends are encountered.

iii) Protect conduits from entry of foreign materials during construction, replace conduits containing any foreign materials that can not be removed, clean out conduit containing water before conductors pulled in.

v) Conduits shall run in a direct line with long sweep bends and offsets. Metallic Conduits shall be continuous and secured to boxes with glands termination to maintain electrical continuity.

vi) Conduits Crossing Over Expansion Joints: Provide minimum 30 cm length flexible conduit at the point of crossing building expansion joints. Extra conduits and cables shall be provided at the expansion joints for minimum 15 cm deviation.

vii) Except in specific locations, use standard conduit fittings. Use code sized pull boxes, unless otherwise specifically approved for use on conduit fittings [at locations only where a pull box size inhibited by space limitations].

viii) All fastening devices and supports for electrical equipment, fixtures, panels, outlets, conduits and cabinets shall be capable of supporting not less than 4 times the ultimate weight of the object or objects fastened or supported thereby.

ix) Provide pull boxes as required to limit the number of bends in any conduit racing to not more than three 90 degrees bends; use 18 gauze galvanised sheet steel boxes of required size with removable covers and install with accessibility to cover up after work is completed.

x) Conduits in ceiling bottom, in case of false ceiling, shall be fixed in group or individual with galvanised trapeze or cradle or saddle as the case may be and non-ferrous fixing hardware as approved.
2.12 Outlets
i) Outlet boxes shall be of 18 gauze galvanised steel in size as required to accommodate all wires, fittings, and devices. Flush outlet boxes serving receptacle shall be equipped with a grounding screw. These shall be as listed herein below for the various outlets.

2.12.1 Wall Boxes
Wall switch and receptacle box shall be not less than 75 mm square and not less than 37 mm deep. Prior to grouting of the wall boxes the proper size shall be confirmed to receive type and number of light switch / MCB/ outlet.

2.12.2 Wall Bracket and Ceiling Boxes
Boxes for lighting fixtures outlets at wall bracket and ceiling surface mounted locations shall be not less than 62.5 mm dia. and of appropriate depth.

2.12.3 Junction Boxes
Junction Boxes for branch circuits shall be not less than 100 mm square and not less than 30 mm deep. The junction box shall be suitable to receive 19 mm dia. (Min.) conduit.

2.12.4 Outlet Mounting
Boxes shall be securely fastened in place in wall or ceiling; provide with plaster rings if required.

2.13 Wiring Devices
The following list of wiring devices identifies the most common items with the grade of device as required. All lighting switches and receptacles shall be, as far as possible, of same manufacturer and have identical physical appearance.

i) Light switches with ivory finish, shall be of single pole, one way, two way.

2.13.1 Outlet Receptacles
Receptacle mounted in rooms shall have ivory or white finish as per approved submitted sample. Receptacle mounted in kitchen and bathroom or service areas shall be metallic with aluminium neat finish.

2.13.2 Finish Plates
Plates shall be plain finish perspex painting to match the skirting or wall as directed.

2.14 Mounting Heights
Mounting heights of all devices such as switches receptacles, wall bracket lights, etc. shall be approved before embedding of the boxes in the masonry. In general, mounting heights to bottom of 7 devices shall be as indicated herein below, unless otherwise specified in the drawings:-
i) Outlet receptacles: Centred in skirting mounted horizontally 300 mm from finished floor level [FFL].

ii) Light switches: 1370 mm from FFL.

iii) Wall brackets: As instructed or otherwise 2300 mm from FFL.

iv) Dressing Table Lights: 1370 mm from FFL.

v) Dressing Table Light switch: 810 mm from FFL.

vi) Dressing Table Sockets: 810 mm from FFL.

2.15 Lighting Fixtures and Lamps

i) Provide fixtures on ceilings carefully aligned and levelled. Adequacy of support system and alignment shall be as approved.

ii) Take care to properly install recessed fixtures including adequate provisions of light-leakproof installation.

iii) Provide all light outlets with a fixture. Where outlet symbols on drawings do not have a type of designation, provide a fixture for such location the same are those used in similar or like locations.

iv) All fluorescent fixtures shall be of switch start type, cool day light, unless specifically indicated otherwise under schedule "fixture types".

v) Provide lamps for all fixtures, of first quality, and appropriate and as approved for the use intended. Incandescent lamps shall be rated 230 - 250 volt, except where otherwise indicated.

vi) Fluorescent ballasts shall be high power factor [HPF] 230/250V rated, copper wire wound, epoxy encapsulated. Ballasts deemed excessively noisy by the Consultant shall be replaced, without any additional cost.

vii) Fixture diameters and sizes shall be as specified in Bill of Quantities or as approved.

viii) Leave fixtures clean at the time of final completion of work; every item shall be in proper working order. Protect fixtures as required from dirt, dust, paint, debris, etc.

ix) Provides all fluorescent fixtures with power factor improvement capacitors.

x) Verify, ceiling construction, recessing depth, and other constructional details prior to installation. Provide plaster frame for all fixtures recessed in plaster ceilings.
2.16 Completion Tests

After completion of the electrical installation work, the following tests will be carried out on both the High Voltage and Low Voltage sides before the installation work is made operational.

i) Tests related to all statutory regulations of the local supply authorities e.g. Nepal Electricity Authority.

ii) Make tests as per IS/BS specifications and IEE code of practice to demonstrate that all equipment, accessories and connection thereto have been properly installed, and the complete facility operates with its intended purpose and as per contract document.

iii) Tests related to the specification and instructions of the manufacturers of the equipment being installed.

iv) The insulation resistance of low voltage system and high voltage system shall be measured separately to insure sufficient insulation resistance of each system between the line conductor and earth prior to test charging. In the case of high voltage system insulation resistance is measured by applying 500 volt dc supply. After the successful testing with 500 volt pressure further test voltage of 2500 volt dc shall be applied and the resulting insulation resistance shall be measured. In the case of low voltage system neutral conductor shall be isolated from earth prior to supplying 500 volt dc test voltage to all phases with all light switches and feeder switches closed, and insulation resistance shall be measured. The insulation resistance value of each feeder shall be such that it should not be less than 50 divided by the number of points connected to that particular feeder. The insulation resistance of the whole installation, however, shall not be less than one mega ohm.

v) Prior to performing test on the completed works the consultant shall be notified in advance. The contractor shall arrange all the instruments required for testing at his own cost.

vi) The consultant may direct to perform additional test other than the scheduled tests to confirm the quality of materials used and workmanship of completed works.

vii) Should any defects discovered or arise during testing the contractor shall promptly correct those defects including any modification, if necessary, to avoid such premature defects arising in the future, and get test certificate from the consultant prior to final approval of the completed works.
2.17 Other Specifications [In Brief]

i) The originality in manufacture of all lighting fixtures shall be certified by the manufacturer, or the authorised dealers of the manufacturer.

ii) When quoting for various items listed in the Bill of Quantities specific mention must be made of what make of goods will be supplied/installed. All quoted items should be products of reputable/recognised manufacturers.

iii) All the DBs will have an in-comer isolator or fuse switch or MCB or MCCB as detailed in the BQ and drawings. The sheet steel wall mounting DB will have hinged and lockable door.

iv) All control units including DBs will have continuous earth connection to the main earth connector with SWG-8 copper wire or copper tape of appropriate sizes as detailed in the BQ.

v) Earthing will be as per ISI 3046 [1966]. Maximum earth resistance shall not exceed 6 ohm.

vi) All main supply cables to switch board/DB shall be rated at 1100 volts while other circuit cables shall be rated at 600 volts.

vii) All supply cables shall be colour coded with Red, Yellow and Blue for each of the 3 phases. Neutral wire shall be Black while the earth wire shall be Green.

viii) All switchgears, distribution boards and control panels shall be properly labelled, numbered and provided with circuit drawings to facilitate easy maintenance, repair and checking as required by the Consultant.

2.18 General Notes

i) All types of work given in the Schedule of Quantities shall be executed strictly in accordance with the relevant drawings and specifications read in conjunction with the appropriate ISI Code.

ii) The Contractor has to supply the materials as per the respective specifications. Some brand names have been listed, wherever appropriate for the general guidance to the Contractor. These brand names have been used merely to describe the nature of the desired materials and not used to endorse or indicate a preference for a particular product or manufacturer. Goods which have similar characteristics and provide performance and quality at least equal to those specified and conforming to IS standards are acceptable.

iii) Before ordering the materials to the site, the Contractor shall submit to the Consultant for approval the shop drawings giving all details, dimensions etc. of the following items:
- Main Switch Boards
- Distribution Boards
- Isolators & Starters
- Wiring Diagram, where necessary.
- HT and LT over-head line configuration

iv) Drawings and samples of all electrical apparatus and their accessories shall be submitted by the Contractor for approval of the Consultant.

iv) The recommended positions of the lighting points, control switches, socket outlets, distribution boards and switchgear will be adhered to as far as possible. Should there by any discrepancy, ambiguity or omission in the drawings or documents, the final position shall be ascertained by the Contractors from the Consultant prior to the installation.

v) The Contractor guarantees, by his acceptance of the Contract, that all electrical installation work completed will be free from any and all defects and that all electrical apparatus and their accessories will function according to their capacities and characteristics specified and that, if during a period of one year from the date of completion, any defect in workmanship, material or performance should occur, it will be repaired, replaced, or otherwise corrected to the satisfaction of the Consultant, within a reasonable period. On the event of default on this guarantee by the Contractor, the Owner may have the defects corrected as required, and charge the cost to the Contractor.

vi) The Defects Liability Period shall mean twelve calendar months after the Site Engineer in consultation with the consultant has issued the Contractor the "Certificate of Completion" of the whole work. This "Certificate of Completion" shall be issued to the Contractor after the whole work has been completed and necessary tests as per IS code of practice have been carried out to the satisfaction of the Site Engineer, Consultant, Electrical Inspector from the Nepal Electricity Authority or any other concerned authority. The work shall not be deemed to have been completed until the above certificate has been obtained by the Contractor.

3.1 APPROVED BRAND OF MAKES/MANUFACTURERS

Some bill of Quantities items may not be specified with the approved brands, makes or manufacture. In general, these shall comply with grade/category of the installation, under consideration. The brands shall be selected only after the final confirmation of the Architect and Electrical engineer. Equipment supply and the Installation works shall confirm to the relevant standard, ISI, BS, NBC and the latest code of practice.
### 3.1.1 LUMINARIES LIGHT FIXTURES

<table>
<thead>
<tr>
<th>Type</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTL/INCADESCENT/CFL</td>
<td>HIER, Philips, Bajaj, GE or equivalent</td>
</tr>
<tr>
<td>OUTDOOR POLE MOUNTING</td>
<td>HIER, Philips, Bajaj, GE or equivalent</td>
</tr>
</tbody>
</table>

### 3.1.2 FTL/CFL/GLS/PL

<table>
<thead>
<tr>
<th>Type</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCASEDENT</td>
<td>HIER, Philips, Bajaj or equivalent</td>
</tr>
<tr>
<td>FTL</td>
<td>HIER, Philips, Bajaj or equivalent</td>
</tr>
<tr>
<td>PL/GLS/CFL</td>
<td>HIER, Philips, Bajaj or equivalent</td>
</tr>
<tr>
<td>HALOGEN/MH/MV, SV</td>
<td>HIER, Philips, Bajaj or equivalent</td>
</tr>
</tbody>
</table>

### 3.1.3 SWITCH/SOCKET

<table>
<thead>
<tr>
<th>Type</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 multi pin 6/16 A</td>
<td>CPL, Orange, Dyna</td>
</tr>
<tr>
<td>3 universal pin 13 A</td>
<td>CPL, Orange, Dyna</td>
</tr>
<tr>
<td>Gang switches</td>
<td>CPL, Orange, Dyna</td>
</tr>
<tr>
<td>TEL/DATA Outlets</td>
<td>CPL, Orange, Dyna</td>
</tr>
</tbody>
</table>

### 3.1.4 DISTRIBUTION BOARD

<table>
<thead>
<tr>
<th>Type</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPB/MDB</td>
<td>Himalaya, Hyonjan, MK</td>
</tr>
<tr>
<td>FDB/SDB</td>
<td>Himalaya, Hyonjan, MK</td>
</tr>
</tbody>
</table>

### 3.1.5 CIRCUIT BREAKERS

<table>
<thead>
<tr>
<th>Type</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCB</td>
<td>SCHNEIDER, LEGRAND, GE</td>
</tr>
<tr>
<td>MCCB</td>
<td>SCHNEIDER, LEGRAND, GE</td>
</tr>
</tbody>
</table>

### 3.1.6 CABLE/WIRE

<table>
<thead>
<tr>
<th>Type</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/A, ARM</td>
<td>Pioneer, Litmus, Trishakti</td>
</tr>
<tr>
<td>Wire</td>
<td>Pioneer, Litmus, Trishakti</td>
</tr>
</tbody>
</table>

### 3.1.7 OTHERS

As per prior Approval by Designer/Consultant
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Item</th>
<th>Size</th>
<th>Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>Window</td>
<td>900 x 1800</td>
<td>3</td>
</tr>
<tr>
<td>W</td>
<td>Window</td>
<td>1200 x 1800</td>
<td>3</td>
</tr>
<tr>
<td>W1</td>
<td>Window</td>
<td>2700 x 1350</td>
<td>1</td>
</tr>
<tr>
<td>W2</td>
<td>Window</td>
<td>2400 x 1350</td>
<td>8</td>
</tr>
<tr>
<td>W3</td>
<td>Window</td>
<td>2400 x 1350</td>
<td>3</td>
</tr>
<tr>
<td>W4</td>
<td>Window</td>
<td>1800 x 1350</td>
<td>3</td>
</tr>
<tr>
<td>W5</td>
<td>Window</td>
<td>900 x 1350</td>
<td>3</td>
</tr>
<tr>
<td>V1</td>
<td>Ventilation</td>
<td>600 x 600</td>
<td>3</td>
</tr>
<tr>
<td>D1</td>
<td>Door</td>
<td>750 x 2000</td>
<td>1</td>
</tr>
<tr>
<td>D2</td>
<td>Door</td>
<td>750 x 2000</td>
<td>11</td>
</tr>
<tr>
<td>D3</td>
<td>Door</td>
<td>1000 x 2100</td>
<td>23</td>
</tr>
<tr>
<td>DW</td>
<td>Door/Window</td>
<td>1500 x 2100</td>
<td>2</td>
</tr>
<tr>
<td>DW2</td>
<td>Door/Window</td>
<td>1500 x 2100</td>
<td>2</td>
</tr>
</tbody>
</table>

**Notation:**
- +7050mm (sill level)
- +2250mm (lintel level)
- +5400mm (lintel level)
- +3900mm (sill level)
- +3150mm (first floor level)
- +6300 (second floor level)
- +8550mm (lintel level)
- +9465 (terrace level)
- +10515 (parapet level)
GROUND FLOOR PLAN

TELEPHONE POINT
TOP FLOOR PLAN

CLIENT:
PROJET:
CONSULTANT:

Drawn By:
Designed By:
Checked By:
Approved By:

SHEET NO:
Scale:

DISTRICT EDUCATION OFFICE
NATIONAL LEVEL
NATIONAL LEVEL

CONSULTANT:

DETAILED A/E DESIGN OF DEO BUILDING

ELECTRICAL DRAWING OF TOP FLOOR PLAN
# Sheet Title:

## Structural Drawing of Column/Slab (Garage)

### Column Plan (Garage)

<table>
<thead>
<tr>
<th>Column Schedule</th>
<th>Column Schedule</th>
<th>Column Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STOREY</strong></td>
<td><strong>STOREY</strong></td>
<td><strong>STOREY</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COLUMN C</strong></td>
<td><strong>COLUMN C</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COLUMN F</strong></td>
<td><strong>COLUMN F</strong></td>
</tr>
<tr>
<td></td>
<td><strong>COLUMN I</strong></td>
<td><strong>COLUMN I</strong></td>
</tr>
<tr>
<td></td>
<td><strong>T &amp; B (H/4)</strong></td>
<td><strong>T &amp; B (H/4)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>MID (H/2)</strong></td>
<td><strong>MID (H/2)</strong></td>
</tr>
<tr>
<td><strong>GRADE</strong></td>
<td><strong>GRADE</strong></td>
<td><strong>GRADE</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
<tr>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
<td><strong>STIRRUPS</strong></td>
</tr>
</tbody>
</table>

### Column Schedule

- **COLUMN C**:
  - **GRADE**: M 25
  - **STIRRUPS**: 8Ø @ 4" c/c, 8Ø @ 150 c/c
  - **STIRRUPS**: 4-12mmØ, 4-16mmØ

- **COLUMN F**:
  - **GRADE**: M 25
  - **STIRRUPS**: 8Ø @ 4" c/c, 8Ø @ 150 c/c
  - **STIRRUPS**: 4-12mmØ, 4-16mmØ

- **COLUMN I**:
  - **GRADE**: M 25
  - **STIRRUPS**: 8Ø @ 4" c/c, 8Ø @ 150 c/c
  - **STIRRUPS**: 4-12mmØ, 4-16mmØ

### Reinforcement Details of Slab

- **NOTE**: ALL BARS ARE DRAWN UP TO TOP.

- **Bottom & Top Bar Details along x- and y- directions.**

### Scale:

1" = 8'-0"
ANCHORAGE OF BEAM BARS IN AN EXTERNAL JOINT

80 or 10Ø minimum hook length (whichever is greater)

DETAIL A- 135° HOOK DETAIL FOR STIRRUPS & TIES

SCALE = NTS

Min. 10Ø lateral tie

DUCTILE DETAILING OF REINFORCED CONCRETE

INTERNAL RADIUS OF BEND

U-SHAPED STIRRUPS & TIES

TYP. LONGITUDINAL COLUMN DETAIL

Drawn By:

B

DISTRICT EDUCATION OFFICE

SHEET NO

Designed By:

DIGICON Engineering Consult Pvt. Ltd

CLIENT:

Date:

Checked By:

Approved By:

Scale:

CONSULTANT:

SHEET TITLE:

1:50, 1:25

DETAILED A/E DESIGN OF DEO BUILDING

PROJECT:

NEPALGUNJ, BANKE

KUPONDOLE, LALITPUR

Phone: 01-5554028

GENERAL DETAILS

EXTERNAL JOINT

ANCHORAGE OF BEAM BARS IN AN

Db = Bar Diameter

Ld = Development Length

Ld + 10 Db

Column Bar

Beam Bar

FOR STIRRUPS & TIES DETAIL A-135° HOOK DETAIL

INTERNAL RADIUS

U-SHAPED STIRRUPS & TIES

TYP. LONGITUDINAL COLUMN DETAIL
3) Minimum cover required for structural members

2) Grade of steel - Fe 500

- Shear wall - M25
- Slab - M20
- Foundation - M20
- Beam - M20
- Column - M25

1) Grade of concrete to be used

**Note:**

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Minimum Bar (mm)</th>
<th>Grade of Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>8</td>
<td>M25</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>M25</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>M25</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>M25</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td>M25</td>
</tr>
<tr>
<td>35</td>
<td>35</td>
<td>M25</td>
</tr>
<tr>
<td>40</td>
<td>40</td>
<td>M25</td>
</tr>
<tr>
<td>45</td>
<td>45</td>
<td>M25</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>M25</td>
</tr>
<tr>
<td>55</td>
<td>55</td>
<td>M25</td>
</tr>
<tr>
<td>STOREY</td>
<td>COLUMN C1</td>
<td>COLUMN C2</td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>FIRST</td>
<td>8Ø @ 4&quot; c/c</td>
<td>8Ø @ 4&quot; c/c</td>
</tr>
<tr>
<td>SECOND</td>
<td>M 25</td>
<td>M 25</td>
</tr>
<tr>
<td>THIRD</td>
<td>8Ø @ 4&quot; c/c</td>
<td>8Ø @ 4&quot; c/c</td>
</tr>
<tr>
<td></td>
<td>M 25</td>
<td>M 25</td>
</tr>
</tbody>
</table>

STIRRUPS

- T & B (H/4)
- MID (H/2)

GRADE

- 4-16mmØ
- 6-16mmØ
- 4-20mmØ
- 6-20mmØ
- 4-25mmØ
NOTE

ALL THE BARS ARE 8mmØ @150 c/c
STAIR CASE PLAN

RISE = 150
TREAD = 300

UPSTAIR CASE PLAN

RISE = 150
TREAD = 300

REINFORCEMENT DETAIL OF FIRST FLIGHT

REINFORCEMENT DETAIL OF SECOND FLIGHT

RISER = 150
TREAD = 300

DRAWN BY:

ST.

DISTRICT EDUCATION OFFICE

SHEET NO.

CONSULTANT:

DIGICON Engineering Consult Pvt. Ltd

CLIENT:

P. hone:

11-12-2017

DRAFTED BY:

CHECKED BY:

APPROVED BY:

SCALE:

1:50, 1:25

PROJECT:

NEPALGUNJ, BANKE

KUPONDOLE, LALITPUR

PROJEC:

NEPALGUNJ, BANKE

1/12/2017

REINFORCEMENT DETAIL OF STAIRCASE
Band Details

Band Detail at A

Option I

Option II

Sectional Plan at B-B

Detail at A

C/C spacing

No. of legs

Diameter of Bars

Grade of Rebar

1000

0

300

600

mili meters

Drawn By:

ST

19

Designed By:

DIGICON Engineering Consult Pvt Ltd

CLIENT:

Date:

Checked By:

Approved By:

Scale:

1:50, 1:25

CONSULTANT:

SHEET TITLE:

DETAILED A/E DESIGN OF DEO BUILDING

PROJECT:

NEPALGUNJ, BANKE

NEPALGUNJ, BANKE

KUPONDOLE, LALITPUR

Phone: 01-5554028

1/12/2017
COLUMN PLAN (TOILET)

REINFORCEMENT DETAILS OF SLAB
NOTE: ALL BARS ARE 8mmØ @ 6" c/c

T & B (H/4)
STIRRUPS
MID (H/2)
GRADE

FIRST STOREY
8Ø @ 4" c/c
8Ø @ 6" c/c
M 25

725 300
625 300
575 300
725 725

FOOTING PLAN (F1)
7-12mmØ
1500
300
300
300
300
300
300
1650

FOOTING PLAN (F2)
7-12mmØ
1650
300
300
300
300
300
300
1650

G. LVL. 1660
200
300
Ld
PLINTH LVL. 230x230
Plinth Beam 75mm TH. P.C.C (1:3:6)
Flat Brick Soling
Compaction Earth

75 Thk. P.C.C (1:3:6)
G.L
600
600

DETAIL OF TOE WALL
PLINTH LVL.
230
230
2-12mmØ TH.
8mmØ @150 c/c
2-12mmØ TH.
1500
330
330
8-12mmØ
1500

UPPER TIEBEAM DETAIL
230
230
8mmØ @100 c/c
2-12mmØ TH.
2-12mmØ TH.

BAND DETAIL
2.13mmØ
8mmØ @ 100 c/c

DRAWN BY:
ST
28

DESIGNED BY:
DIGICON Engineering Consult Pvt. Ltd

CLIENT:
NEPALGUNJ, BANKE
KUPONDOLE, LALITPUR

PHONE: 01-5554028

CONSULTANT:

SHEET NO
DATE: 11/07/2017
SCATE: 1"=8'-0"
Personnel Requirements
Equipment Requirements
Section 7
General Conditions of Contract
Section 7 - General Conditions of Contract

[Name of Employer]

[Name of Contract]
# Table of Clauses

## A. General

<table>
<thead>
<tr>
<th>Clause</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Definitions</td>
<td>7-4</td>
</tr>
<tr>
<td>2. Interpretation</td>
<td>7-6</td>
</tr>
<tr>
<td>3. Language and Law</td>
<td>7-7</td>
</tr>
<tr>
<td>4. Contract Agreement</td>
<td>7-7</td>
</tr>
<tr>
<td>5. Assignment</td>
<td>7-7</td>
</tr>
<tr>
<td>6. Care and Supply of Documents</td>
<td>7-7</td>
</tr>
<tr>
<td>7. Confidential Details</td>
<td>7-7</td>
</tr>
<tr>
<td>8. Compliance with Laws</td>
<td>7-8</td>
</tr>
<tr>
<td>9. Joint and Several Liability</td>
<td>7-8</td>
</tr>
<tr>
<td>10. Project Manager’s Decisions</td>
<td>7-9</td>
</tr>
<tr>
<td>11. Delegation</td>
<td>7-9</td>
</tr>
<tr>
<td>12. Communications</td>
<td>7-9</td>
</tr>
<tr>
<td>13. Subcontracting</td>
<td>7-9</td>
</tr>
<tr>
<td>14. Other Contractors</td>
<td>7-9</td>
</tr>
<tr>
<td>15. Personnel and Equipment</td>
<td>7-9</td>
</tr>
<tr>
<td>16. Employer’s and Contractor’s Risks</td>
<td>7-9</td>
</tr>
<tr>
<td>17. Employer’s Risks</td>
<td>7-9</td>
</tr>
<tr>
<td>18. Contractor’s Risks</td>
<td>7-10</td>
</tr>
<tr>
<td>19. Insurance</td>
<td>7-10</td>
</tr>
<tr>
<td>20. Site Investigation Reports</td>
<td>7-11</td>
</tr>
<tr>
<td>21. Contractor to Construct the Works</td>
<td>7-11</td>
</tr>
<tr>
<td>22. The Works to Be Completed by the Intended Completion Date</td>
<td>7-11</td>
</tr>
<tr>
<td>23. Designs by Contractor and Approval by the Project Manager</td>
<td>7-11</td>
</tr>
<tr>
<td>24. Safety</td>
<td>7-11</td>
</tr>
<tr>
<td>25. Discoveries</td>
<td>7-11</td>
</tr>
<tr>
<td>26. Possession of the Site</td>
<td>7-11</td>
</tr>
<tr>
<td>27. Access to the Site</td>
<td>7-12</td>
</tr>
<tr>
<td>28. Instructions, Inspections, and Audits</td>
<td>7-12</td>
</tr>
<tr>
<td>29. Appointment of the Adjudicator</td>
<td>7-12</td>
</tr>
<tr>
<td>30. Procedure for Disputes</td>
<td>7-12</td>
</tr>
</tbody>
</table>

## B. Staff and Labor

<table>
<thead>
<tr>
<th>Clause</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>31. Forced Labor</td>
<td>7-13</td>
</tr>
<tr>
<td>32. Child Labor</td>
<td>7-13</td>
</tr>
<tr>
<td>33. Workers’ Organizations</td>
<td>7-13</td>
</tr>
<tr>
<td>34. Nondiscrimination and Equal Opportunity</td>
<td>7-13</td>
</tr>
</tbody>
</table>

## C. Time Control

<table>
<thead>
<tr>
<th>Clause</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>35. Program</td>
<td>7-14</td>
</tr>
<tr>
<td>36. Extension of the Intended Completion Date</td>
<td>7-14</td>
</tr>
<tr>
<td>37. Acceleration</td>
<td>7-14</td>
</tr>
<tr>
<td>38. Delays Ordered by the Project Manager</td>
<td>7-14</td>
</tr>
<tr>
<td>39. Management Meetings</td>
<td>7-15</td>
</tr>
<tr>
<td>40. Early Warning</td>
<td>7-15</td>
</tr>
</tbody>
</table>
D. Quality Control ........................................................................................................... 7-15
41. Identifying Defects ........................................................................................................ 7-15
42. Tests .............................................................................................................................. 7-15
43. Correction of Defects ..................................................................................................... 7-15
44. Uncorrected Defects ..................................................................................................... 7-15

E. Cost Control ..................................................................................................................... 7-16
45. Contract Price ................................................................................................................ 7-16
46. Changes in the Contract Price ....................................................................................... 7-16
47. Variations ....................................................................................................................... 7-16
48. Cash Flow Forecasts ...................................................................................................... 7-17
49. Payment Certificates ..................................................................................................... 7-17
50. Payments ....................................................................................................................... 7-17
51. Compensation Events ................................................................................................. 7-18
52. Tax .................................................................................................................................. 7-19
53. Currencies ..................................................................................................................... 7-19
54. Price Adjustment ........................................................................................................... 7-19
55. Retention ....................................................................................................................... 7-20
56. Liquidated Damages ....................................................................................................... 7-20
57. Bonus ............................................................................................................................. 7-20
58. Advance Payment ........................................................................................................... 7-20
59. Securities ....................................................................................................................... 7-21
60. Dayworks ........................................................................................................................ 7-21
61. Cost of Repairs .............................................................................................................. 7-21

F. Force Majeure .................................................................................................................... 7-21
62. Definition of Force Majeure ........................................................................................... 7-21
63. Notice of Force Majeure ............................................................................................... 7-22
64. Duty to Minimize Delay ............................................................................................... 7-22
65. Consequences of Force Majeure .................................................................................. 7-22
66. Force Majeure Affecting Subcontractor....................................................................... 7-23
67. Optional Termination, Payment, and Release ............................................................... 7-23
68. Release from Performance ............................................................................................ 7-23

G. Finishing the Contract .................................................................................................... 7-24
69. Completion ..................................................................................................................... 7-24
70. Taking Over .................................................................................................................... 7-24
71. Final Account ................................................................................................................ 7-24
72. Operating and Maintenance Manuals .......................................................................... 7-24
73. Termination .................................................................................................................... 7-24
74. Fraud and Corruption ................................................................................................. 7-25
75. Payment upon Termination ......................................................................................... 7-27
76. Property ........................................................................................................................ 7-27
77. Release from Performance ........................................................................................... 7-27
78. Suspension of ADB Loan or Credit .............................................................................. 7-27
79. Eligibility ........................................................................................................................ 7-27
Section 7. General Conditions of Contract

Single-Stage: Two-Envelope Procurement of Works-Small Contract Bidding Document for ____________
General Conditions of Contract

A. General

1. Definitions

1.1 Boldface type is used to identify defined terms.

(a) The **Accepted Contract Amount** means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

(b) The **Activity Schedule** is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events.

(c) The **Adjudicator** is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GCC 29.1 [Appointment of Adjudicator] hereunder.

(d) **Bank** means the financing institutions named in the Particular Conditions of Contract (PCC).

(e) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.

(f) **Compensation Events** are those defined in GCC 51.1 [Compensation Events] hereunder.

(g) The **Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC 69.1 [Completion].

(h) The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC 2.3 below.

(i) The **Contractor** is the party whose Bid to carry out the Works has been accepted by the Employer.

(j) The **Contractor’s Bid** is the completed bidding document submitted by the Contractor to the Employer.

(k) The **Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.

(l) **Days** are calendar days; months are calendar months.

(m) **Dayworks** are varied work inputs subject to payment on a time basis for the Contractor’s employees and Equipment, in addition to payments for associated Materials and Plant.

(n) A **Defect** is any part of the Works not completed in accordance with the Contract.

(o) The **Defects Liability Certificate** is the certificate issued by the Project Manager upon correction of defects by the Contractor.
The **Defects Liability Period** is the period calculated from the Completion Date where the Contractor remains responsible for remedying defects.

**Drawings** include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

The **Employer** is the party who employs the Contractor to carry out the Works, as specified in the **PCC**.

**Equipment** is the Contractor’s machinery and vehicles brought temporarily to the Site to construct the Works.

**Force Majeure** means an exceptional event or circumstance: which is beyond a Party’s control; which such Party could not reasonably have provided against before entering into the Contract; which, having arisen, such Party could not reasonably have avoided or overcome; and, which is not substantially attributable to the other Party.

In writing or written means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

The **Initial Contract Price** is the Contract Price listed in the Employer’s Letter of Acceptance.

The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the **PCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

**Letter of Acceptance** means the formal acceptance by the Employer of the Bid and denotes the formation of the Contract at the date of acceptance.

**Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.

**Party** means the Employer or the Contractor, as the context requires.

**PCC** means Particular Conditions of Contract.

**Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

The **Project Manager** is the person named in the **PCC** (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

**Retention Money** means the aggregate of all monies retained by the Employer pursuant to GCC 55.1 [Retention].

**Schedules** means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Tender, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.
The Site is the area defined as such in the PCC.

Site Investigation Reports are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.

Specification means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

The Start Date is given in the PCC. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.

A Subcontractor is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

Temporary Works are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

A Variation is an instruction given by the Project Manager which varies the Works.

The Works are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the PCC.

2. Interpretation

2.1 In interpreting these GCC, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.

2.2 If sectional completion is specified in the PCC, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract shall be interpreted in the following order of priority:

(a) Contract Agreement,
(b) Letter of Acceptance,
(c) Letter of Bid,
(d) Particular Conditions of Contract,
(e) the List of Eligible Countries that was specified in Section 5 of the bidding document,
(f) General Conditions of Contract,
(g) Specifications,
(h) Drawings,
(i) Completed Activity Schedules or Bill of Quantities, and
3. **Language and Law**

   **3.1** The language of the Contract and the law governing the Contract are stated in the PCC.

   **3.2** Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Employer’s country when

   (a) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower’s Country prohibits any import of goods from, or any payments to, a particular country, person, or entity. Where the borrower’s country prohibits payments to a particular firm or for particular goods by such an act of compliance, that firm may be excluded.

4. **Contract Agreement**

   **4.1** The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless the Particular Conditions establish otherwise. The Contract Agreement shall be based upon the attached Contract forms in Section 8. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.

5. **Assignment**

   **5.1** Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party

   (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party; and

   (b) may, as security in favor of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.

6. **Care and Supply of Documents**

   **6.1** The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.

   **6.2** Each of the Contractor’s Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor’s Documents.

   **6.3** The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor’s Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer’s Personnel shall have the right of access to all these documents at all reasonable times.

   **6.4** If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.

7. **Confidential Details**

   **7.1** The Contractor’s and the Employer’s Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor’s compliance with the Contract and allow

   (j) any other document listed in the PCC as forming part of the Contract.
its proper implementation.

7.2 Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

7.3 Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this Clause.

8. Compliance with Laws

8.1 The Contractor shall, in performing the Contract, comply with applicable Laws.

8.2 Unless otherwise stated in the Particular Conditions,

(a) the Employer shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer’s Country or country where the Site is located] which (i) such authorities or undertakings require the Employer to obtain in the Employer’s name, and (ii) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract;

(b) the Contractor shall acquire and pay for all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the [Employer’s Country or country where the Site is located] which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor’s and Subcontractor’s personnel and entry permits for all imported Contractor’s Equipment. The Contractor shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Employer under Subclause 8.2(a) hereof and that are necessary for the performance of the Contract. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Employer or its personnel, including the Subcontractors and their personnel, but without prejudice to Subclause 8.1 hereof.

9. Joint and Several Liability

9.1 If the Contractor is a joint venture of two or more persons, all such persons shall be jointly and severally liable to the Employer for the fulfillment of the provisions of the Contract, and shall designate one of such persons to act as a leader with authority to bind the joint venture.
The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.

**10. Project Manager’s Decisions**

10.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.

**11. Delegation**

11.1 The Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.

**12. Communications**

12.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

**13. Subcontracting**

13.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor’s obligations.

**14. Other Contractors**

14.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as referred to in the PCC. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

**15. Personnel and Equipment**

15.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid to carry out the functions stated in the Schedule or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.

15.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor’s staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within 7 days and has no further connection with the work in the Contract.

15.3 If the Employer, Project Manager, or Contractor determines, that any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or other prohibited practices during the execution of the Works, then that employee shall be removed in accordance with Clause 15.2 above.

**16. Employer’s and Contractor’s Risks**

16.1 The Employer carries the risks which this Contract states are Employer’s risks, and the Contractor carries the risks which this Contract states are Contractor’s risks.

**17. Employer’s Risks**

17.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer’s risks:

(a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to
Section 7. General Conditions of Contract

17.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer’s risk except loss or damage due to

(a) a Defect which existed on the Completion Date,

(b) an event occurring before the Completion Date, which was not itself an Employer’s risk, or

(c) the activities of the Contractor on the Site after the Completion Date.

18. Contractor’s Risks

18.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer’s risks, are Contractor’s risks.

19. Insurance

19.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the PCC for the following events, which are due to the Contractor’s risks:

(a) loss of or damage to the Works, Plant, and Materials;

(b) loss of or damage to Equipment;

(c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and

(d) personal injury or death.

19.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager’s approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

19.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance, which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

19.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.
19.5 Both parties shall comply with any conditions of the insurance policies.

<table>
<thead>
<tr>
<th>20. Site Investigation Reports</th>
<th>20.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the PCC, supplemented by any information available to the Contractor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Contractor to Construct the Works</td>
<td>21.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.</td>
</tr>
<tr>
<td>22. The Works to Be Completed by the Intended Completion Date</td>
<td>22.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.</td>
</tr>
</tbody>
</table>
| 23. Designs by Contractor and Approval by the Project Manager | 23.1 The Contractor shall carry out design to the extent specified in the PCC. The Contractor shall promptly submit to the Employer all designs prepared by him. Within 14 days of receipt, the Employer shall notify any comments. The Contractor shall not construct any element of the permanent work designed by him within 14 days after the design has been submitted to the Employer or where the design for that element has been rejected. Design that has been rejected shall be promptly amended and resubmitted. The Contractor shall resubmit all designs commented on, taking these comments into account as necessary.  

23.2 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them if they comply with the Specifications and Drawings. |
| 23.3 The Contractor shall be responsible for design of Temporary Works. |
| 23.4 The Project Manager’s approval shall not alter the Contractor’s responsibility for design of the Temporary Works. |
| 23.5 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required. |
| 23.6 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use. |

24. Safety

24.1 The Contractor shall be responsible for the safety of all activities on the Site.

25. Discoveries

25.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager’s instructions for dealing with them.

26. Possession of the Site

26.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the PCC, the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.
27. Access to the Site

27.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

28. Instructions, Inspections, and Audits

28.1 The Contractor shall carry out all instructions of the Project Manager, which comply with the applicable laws where the Site is located.

28.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and subconsultants to keep accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.

28.3 The Contractor shall permit ADB to inspect the Contractor's accounts, records, and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by ADB. The Contractor shall maintain all documents and records related to the Contract for a period of three (3) years after completion of the Works. The Contractor shall provide any documents necessary for the investigation of allegations of fraud, collusion, coercion, or corruption and require its employees or agents with knowledge of the Contract to respond to questions from ADB.

29. Appointment of the Adjudicator

29.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the PCC, to appoint the Adjudicator within 14 days of receipt of such request.

29.2 Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority at the request of either party, within 14 days of receipt of such request.

30. Procedure for Disputes

30.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager's decision.

30.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

30.3 The Adjudicator shall be paid by the hour at the rate specified in the PCC, together with reimbursable expenses of the types specified in the PCC, and the cost shall be divided equally between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.
30.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the PCC.

B. Staff and Labor

31. Forced Labor
31.1 The Contractor shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor–contracting arrangements.

32. Child Labor
32.1 The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where national laws have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.

33. Workers’ Organizations
33.1 In countries where national law recognizes workers’ rights to form and to join workers’ organizations of their choosing without interference and to bargain collectively, the Contractor shall comply with national law. Where national law substantially restricts workers’ organizations, the Contractor shall enable alternative means for the Contractor’s Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where national law is silent, the Contractor shall not discourage the Contractor’s Personnel from forming or joining workers’ organizations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor’s Personnel who participate, or seek to participate, in such organizations and bargain collectively. The Contractor shall engage with such workers representatives. Worker organizations are expected to fairly represent the workers in the workforce.

34. Nondiscrimination and Equal Opportunity
34.1 The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where national law provides for non-discrimination in employment, the Contractor shall comply with national law. When national laws are silent on nondiscrimination in employment, the Contractor shall meet this Subclause’s requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.
C. Time Control

35. Program

35.1 Within the time stated in the PCC, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.

35.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

35.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the PCC. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the PCC from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.

35.4 The Project Manager’s approval of the Program shall not alter the Contractor’s obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

36. Extension of the Intended Completion Date

36.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.

36.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

37. Acceleration

37.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.

37.2 If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.

38. Delays Ordered by the Project Manager

38.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.
### Management Meetings

39.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

39.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

### Early Warning

40.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

40.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

### Quality Control

#### Identifying Defects

41.1 The Project Manager shall check the Contractor’s work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor’s responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

#### Tests

42.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

#### Correction of Defects

43.1 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the PCC. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

43.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager’s notice.

#### Uncorrected Defects

44.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager’s notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.
E. Cost Control

45. Contract Price

45.1 In the case of an admeasurement contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

45.2 In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for Materials on Site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.

46. Changes in the Contract Price

46.1 In the case of an admeasurement contract:

(a) If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25%, provided the change exceeds 1% of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.

(b) The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15%, except with the prior approval of the Employer.

(c) If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

46.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor’s own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

47. Variations

47.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Contractor.

47.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

47.3 If the Contractor’s quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager’s own forecast of the effects of the Variation on the Contractor’s costs.

47.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.
47.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

47.6 In the case of an admeasurement contract, if the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in GCC 46.1 [Changes in the Contract Price] or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.

48. Cash Flow Forecasts

48.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

49. Payment Certificates

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

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

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

49.4 The value of work executed shall comprise,

(a) in the case of an admeasurement contract, the value of the quantities of work in the Bill of Quantities that have been completed; or

(b) in the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.

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

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

50. Payments

50.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing interest rate.
rate of interest for commercial borrowing for each of the currencies in which payments are made.

50.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

50.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.

50.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

51. Compensation Events

51.1 The following shall be Compensation Events:

(a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC 26.1 [Possession of the Site].

(b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.

(c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.

(d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.

(e) The Project Manager unreasonably does not approve a subcontract to be let.

(f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to Bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.

(g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.

(h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.

(i) The advance payment is delayed.

(j) The effects on the Contractor of any of the Employer’s Risks.

(k) The Project Manager unreasonably delays issuing a Certificate of Completion.

51.2 If a Compensation Event would cause additional cost or would prevent
the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

51.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor’s forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor’s forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager’s own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

51.4 The Contractor shall not be entitled to compensation to the extent that the Employer’s interests are adversely affected by the Contractor’s not having given early warning or not having cooperated with the Project Manager.

52. Tax

52.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC 54.1 [Price Adjustment].

53. Currencies

53.1 Where payments are made in currencies other than the currency of the Employer’s country specified in the PCC, the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Contractor’s Bid.

54. Price Adjustment

54.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the PCC. If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency:

\[
P_c = A_c + B_c \frac{Imc}{Ioc}
\]

where:

- \(P_c\) is the adjustment factor for the portion of the Contract Price payable in a specific currency “c.”
- \(A_c\) and \(B_c\) are coefficients\(^1\) specified in the PCC, representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency “c,” and

\(^1\) The sum of the two coefficients \(A_c\) and \(B_c\) should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulas for all currencies, since coefficient \(A_c\), for the nonadjustable portion of the payments, is a very approximate figure (usually 0.10 – 0.20) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency is added to the Contract Price.
54.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

55. Retention

55.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the PCC until Completion of the whole of the Works.

55.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 69.1 [Completion], half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an “on demand” bank guarantee.

56. Liquidated Damages

56.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the PCC for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the PCC. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor’s liabilities.

56.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC 50.1 [Payments].

57. Bonus

57.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day stated in the PCC for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

58. Advance Payment

58.1 The Employer shall make advance payment to the Contractor of the amounts stated in the PCC by the date stated in the PCC, against provision by the Contractor of an unconditional bank guarantee in a form and by a bank acceptable to the Employer in amounts and currencies 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.

Imc is a consolidated index prevailing at the end of the month being invoiced and Ioc is the same consolidated index prevailing 28 days before Bid opening for inputs payable; both in the specific currency “c.”
58.2 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.

58.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the 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.

59. Securities

59.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the PCC, by a bank acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a bank guarantee.

60. Dayworks

60.1 If applicable, the Dayworks rates in the Contractor’s Bid shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

60.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within 2 days of the work being done.

60.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

61. Cost of Repairs

61.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor’s cost if the loss or damage arises from the Contractor’s acts or omissions.

F. Force Majeure

62. Definition of Force Majeure

62.1 In this Clause, “Force Majeure” means an exceptional event or circumstance,

(a) which is beyond a Party’s control;

(b) which such Party could not reasonably have provided against before entering into the Contract;

(c) which, having arisen, such Party could not reasonably have avoided or overcome; and

(d) which is not substantially attributable to the other Party.
62.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

(a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies;
(b) rebellion, terrorism, sabotage by persons other than the Contractor’s Personnel, revolution, insurrection, military or usurped power, or civil war;
(c) riot, commotion, disorder, strike or lockout by persons other than the Contractor’s Personnel;
(d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor’s use of such munitions, explosives, radiation or radio-activity; and
(e) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

63. Notice of Force Majeure

63.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

63.2 The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.

63.3 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

64. Duty to Minimize Delay

64.1 Each Party shall at all times use all reasonable endeavours to minimize any delay in the performance of the Contract as a result of Force Majeure.

64.2 A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

65. Consequences of Force Majeure

65.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to GCC Subclause 30.1 [Procedure for Disputes] to

(a) an extension of time for any such delay, if completion is or will be delayed, under GCC Subclause 36 [Extension of the Intended Completion Date]; and

(b) if the event or circumstance is of the kind described in subparagraphs (a) to (d) of GCC Subclause 62.2 [Definition of Force Majeure].
Section 7. General Conditions of Contract

65.2 After receiving this notice, the Project Manager shall proceed in accordance with GCC Subclause 10 [Project Manager’s Decisions] to agree or determine these matters.

66. Force Majeure Affecting Subcontractor

66.1 If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor’s nonperformance or entitle him to relief under this Clause.

67. Optional Termination, Payment and Release

67.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under GCC Subclause 63 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with GCC Subclause 73.5 [Termination].

67.2 Upon such termination, the Project Manager shall determine the value of the work done and issue a Payment Certificate, which shall include

(a) the amounts payable for any work carried out for which a price is stated in the Contract;

(b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer’s disposal;

(c) other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;

(d) the Cost of removal of Temporary Works and Contractor’s Equipment from the Site and the return of these items to the Contractor’s works in his country (or to any other destination at no greater cost); and

(e) the Cost of repatriation of the Contractor’s staff and labor employed wholly in connection with the Works at the date of termination.

68. Release from Performance

68.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises, which makes it impossible or unlawful for either or both Parties to fulfill its or their contractual obligations or which, under the law governing the Contract, entitles the
Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance,

(a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract; and

(b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under GCC Subclause 67 [Optional Termination, Payment and Release] if the Contract had been terminated under GCC Subclause 67.

G. Finishing the Contract

69. Completion 69.1 The Contractor shall request the Project Manager to issue a certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the work is completed.

70. Taking Over 70.1 The Employer shall take over the Site and the Works within 7 days of the Project Manager’s issuing a certificate of Completion.

71. Final Account 71.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor’s account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

72. Operating and Maintenance Manuals 72.1 If “as built” Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the PCC.

72.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the PCC pursuant to GCC 72.1, or they do not receive the Project Manager’s approval, the Project Manager shall withhold the amount stated in the PCC from payments due to the Contractor.

73. Termination 73.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

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

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager;

(b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn
73. When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC 73.2 above, the Project Manager shall decide whether the breach is fundamental or not.

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

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

74. Fraud and Corruption

74.1 ADB’s Anticorruption Policy requires that Borrowers (including beneficiaries of ADB-financed activity), as well as Contractors, Subcontractors, Manufacturers, and Consultants under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the ADB

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) “corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
(ii) “fraudulent practice” means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) “coercive practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(iv) “collusive practice” means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;

(v) “obstructive practice” means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an ADB investigation; (b) making false statements to investigators in order to materially impede an ADB investigation; (c) failing to comply with requests to provide information, documents or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or (e) materially impeding ADB’s contractual rights of audit or access to information; and

(vi) “integrity violation” is any act which violates ADB’s Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB’s Anticorruption Policy, including failure to adhere to the highest ethical standard.

(b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation; and

(d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB’s Anticorruption Policy and Integrity Principles and Guidelines (both as amended from time to time), including declaring ineligible, either indefinitely or for a
stated period of time, to participate\(^2\) in ADB-financed, administered, or supported activities or to benefit from an ADB-financed, administered, or supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations.

75. Payment upon Termination

75.1 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 and less the percentage to apply to the value of the work not completed, as indicated in the PCC. 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.

75.2 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.

76. Property

76.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor’s default.

77. Release from Performance

77.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterward to which a commitment was made.

78. Suspension of ADB Loan or Credit

78.1 In the event that ADB suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made,

(a) the Employer is obligated to notify the Contractor, with copy to the Project Manager, of such suspension within 7 days of having received ADB’s suspension notice.

(b) if the Contractor has not received sums due it within the 28 days for payment provided for in GCC 50.1 [Payments], the Contractor may immediately issue a 14-day termination notice.

\(^2\) Whether as a Contractor, Nominated Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document). A Nominated Subcontractor is one which either has been: (i) included by the Bidder in its prequalification application or bid because it brings specific and critical experience and know-how that are accounted for in the evaluation of the Bidder’s prequalification application or the bid; or (ii) appointed by the Employer.
79. Eligibility

79.1 The Contractor shall have the nationality of an eligible country as specified in Section 5 [Eligible Countries] of the bidding document. The Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

79.2 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries as specified in Section 5 [Eligible Countries] of the bidding document and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment, and services.

79.3 For purposes of GCC 79.2, “origin” means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.
Section 8
Particular Conditions of Contract
# A. General

<table>
<thead>
<tr>
<th>GCC 1.1 (d)</th>
<th>The financing institutions is/are: Asian Development Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCC 1.1 (r)</td>
<td>The employer is: District Education Office, Banke</td>
</tr>
<tr>
<td>GCC 1.1 (w)</td>
<td>The Intended Completion Date for the whole of the Works shall be: 2 Years from the date of agreement.</td>
</tr>
<tr>
<td>GCC 1.1 (cc)</td>
<td>The project manager is: District Education Office, Banke</td>
</tr>
<tr>
<td>GCC 1.1 (ff)</td>
<td>The site is located at District Education Office, Banke and is defined in drawings No. 1</td>
</tr>
<tr>
<td>GCC 1.1 (ii)</td>
<td>The start date shall be: 18-06-2017</td>
</tr>
<tr>
<td>GCC 1.1 (mm)</td>
<td>The Works consist of: Construction of RCC Building for District education Office (Up to Second and half Floor)</td>
</tr>
<tr>
<td>GCC 2.2</td>
<td>Sectional Completions are: NA</td>
</tr>
<tr>
<td>GCC 2.3 (j)</td>
<td>The following documents also form part of the Contract:</td>
</tr>
<tr>
<td>1) NA</td>
<td></td>
</tr>
<tr>
<td>GCC 3.1</td>
<td>The language of the contract is: English</td>
</tr>
<tr>
<td>GCC 11.1</td>
<td>The Project Manager may delegate any of his duties and responsibilities.</td>
</tr>
<tr>
<td>GCC 14.1</td>
<td>Schedule of other contractors: NA</td>
</tr>
</tbody>
</table>

| GCC 19.1 | The minimum insurance amounts and deductibles shall be: The minimum insurance amounts and deductibles shall be: |
| 1. | The minimum cover for loss of or damage to the Works, Plant and Materials is: 11.5% of the Contract Amount. |
| 2. | The maximum deductible for insurance of the Works and of Plant and Materials is: 0.5 lakhs |
| 3. | The minimum cover for loss or damage to Equipment is: Full Replacement |
| 4. | The maximum deductible for insurance of Equipment is: 0.5 lakhs |
| 5. | The minimum for insurance of other property is: 5 lakhs with unlimited number of occurrences |
| 6. | The maximum deductible for insurance of other property is: 0.25 lakhs |
| 7. | The minimum cover for personal injury or death insurance |
| i. | for the Contractor’s employees is that specified in the Labor act of Nepal and |
| ii. | for other people is: [insert amount] with an unlimited number of occurrences |

| GCC 20.1 | Site investigation reports are: NA |
| GCC 23.1 | The following shall be designed by the Contractor: Temporary Works to execute permanent works |
| GCC 26.1 | The site Possession Date(s) shall be: NA |
| GCC 29.1 | Appointing Authority for the Adjudicator: NEPCA |
| GCC 30.3 | The Adjudicator shall be paid by the hour at the rate of: 3000NPR |
| GCC 30.4 | Institution whose arbitration procedures shall be used: Contracts with domestic contractors: |
| | Arbitration shall be conducted in accordance with the laws of the Employer's country. |
C. Time Control

GCC 35.1 The Contractor shall submit for approval a Program for the Works within 15 days from the date of the Letter of Acceptance.

GCC 35.3 The period between Program updates is 30 days.

The amount to be withheld for late submission of an updated Program is 0NPR

D. Quality Control

GCC 43.1 The Defects Liability Period is: 365 days.

E. Cost Control

GCC 53.1 The currency of the Employer’s country is: NPR

GCC 54.1 The Contract is not subject to price adjustment in accordance with GCC Clause 54, and the following information regarding coefficients does not apply.

The coefficients and indexes for adjustment of prices in local and international currencies shall be as specified in the Table(s) of Adjustment Data submitted together with the Letter of Bid.

GCC 55.1 The proportion of payments retained is 0.05%

GCC 56.1 The liquidated damages for the whole of the Works are 0% per day.

The maximum amount of liquidated damages for the whole of the Works is 10% of the final Contract Price.

GCC 57.1 The Bonus for the whole of the Works is 0% of the final Contract Price per day. The maximum amount of Bonus for the whole of the Works is 0% of the final Contract Price.

GCC 58.1 The Advance Payments shall be 20.00% and shall be paid to the Contractor no later than 30. In installment basis after 30 days

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Installment</th>
<th>Percentage</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1st</td>
<td>10.0</td>
<td>submission of the acceptable</td>
</tr>
<tr>
<td>2</td>
<td>2nd</td>
<td>10.0</td>
<td>Mobilization at site and</td>
</tr>
</tbody>
</table>

GCC 58.3 Repayment of the Advance Payments shall be: 0% from each payment certificate.

GCC 59.1 The Performance Security amount is :0 NPR

GCC 59.1 (a) AS per PPA and PPR

G. Finishing the Contract

GCC 72.1 The date by which operating and maintenance manuals are required is NA

The date by which “as built” drawings are required is one month after the each work.

GCC 72.2 The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required in GCC 72.1 is 0NPR

GCC 73.2 (h) The maximum number of days is 200 days

GCC 75.1 The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is 0 %
| GCC 75.1 (a) | As per PPA and PPR |
Section 9
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.

Table of Forms

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter of Acceptance</td>
</tr>
<tr>
<td>Contract Agreement</td>
</tr>
<tr>
<td>Performance Security</td>
</tr>
<tr>
<td>Advance Payment Security</td>
</tr>
</tbody>
</table>
Letter of Acceptance

..... on letterhead paper of the employer ..... 

..... date, ..... 

To: ............ name and address of the contractor ............ 

Subject: ............ Notification of Award Contract No. ............ 

This is to notify you that your Bid dated . . . date . . . for execution of the . . . name of the contract and identification number, as given in the Bid Data Sheet . . . for the Accepted Contract Amount of the equivalent of . . . amount in numbers and words and name of currency . . ., as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency. 

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose the Performance Security Form included in Section 9 (Contract Forms) of the Bidding Document. 

[Choose one of the following statements:]

We accept that ______________________ [insert the name of adjudicator proposed by the bidder] be appointed as the Adjudicator. 

[or]

We do not accept that ______________________ [insert the name of the adjudicator proposed by the bidder] be appointed as the Adjudicator, and by sending a copy of this Letter of Acceptance to ______________________ [insert name of the appointing authority], the Appointing Authority, we are hereby requesting such Authority to appoint the Adjudicator in accordance with GCC 29.1. 

Authorized Signature: ............................................................................................................................

Name and Title of Signatory: ...................................................................................................................

Name of Agency: ....................................................................................................................................

Attachment: Contract Agreement
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 Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

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. This Agreement shall prevail over all other Contract documents.
   (a) the Contract Agreement,
   (b) the Letter of Acceptance,
   (c) the Letters of Technical Bid and Price Bid,
   (d) the Particular Conditions of Contract,
   (e) the List of Eligible Countries that was specified in Section 5 of the bidding document,
   (f) the General Conditions of Contract,
   (g) the Specification,
   (h) the Drawings,
   (i) the Completed Activity Schedules or Bill of Quantities, and
   (j) any other documents shall be added here.\(^1\)

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 . . . . . . name of the borrowing country, . . . . . on the day, month and year indicated above.

---
\(^1\) Tables of Adjustment Data may be added if the contract provides for price adjustment (see GCC 54.1).
Signed by ................................................................. Signed
by .................................................................
for and on behalf of the Employer for and on behalf the Contractor

in the presence of: in the presence of:

Witness, Name, Signature, Address, Date Witness, Name, Signature, Address, Date
Performance Security

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 . . . . . name of the contractor, . . . . (hereinafter called “the Contractor”) has entered into Contract No. . . . . . reference number of the contract, . . . . dated . . . . . with you, for the execution of . . . . . name of contract and brief description of works, . . . . (hereinafter called “the Contract”).

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

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, . . . . ) such sum being payable in the types and proportions of currencies in which the Contract Price is payable, 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 . . . . . . . . . . . . . . 3, and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded. 4

.................................................................
Seal of Bank and Signature(s)

- Note to Bidder -

If the institution issuing the performance security is located outside the country of the employer, it shall have a correspondent financial institution located in the country of the employer to make it enforceable.

---

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

2 The guarantor shall insert an amount representing the percentage of the contract price specified in the contract and denominated either in the currency(ies) of the contract or a freely convertible currency acceptable to the employer. If the bank issuing the performance security is located outside the country of the employer, it shall have a correspondent financial institution located in the country of the employer.

3 Insert the date 28 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 [6 months] [1 year], 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.”

4 Or the same or similar to this clause specified in the Uniform Rules for Demand Guarantees, ICC Publication No. 758 where applicable.
Advance Payment Security

Bank’s name, and address of issuing branch or office1

Beneficiary: ................................................... Name and address of employer .................................................................
Date: ..................................................................................................................................................................................
Advance Payment Guarantee No.: ........................................................................................................................................

We have been informed that . . . . name of the contractor. . . . . (hereinafter called “the Contractor”) has entered into Contract No. . . . . reference number of the contract. . . . . dated . . . . . . . with you, for the execution of . . . . name of contract and brief description of works. . . . . (hereinafter called “the Contract”).

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum . . . . . . . name of the currency and amount in figures 2 . . . . . . ( . . . . 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 3 . . . . . . ( . . . . 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.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number . . . . contractor’s account number . . . . at . . . . name and address of the bank. . . . .

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 percent (80%) of the Contract Price has been certified for payment, or on the . . . day of . . . . . . . . . . . .4, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458 (or ICC Publication No. 758 as applicable).

..........................................................

Seal of Bank and Signature(s)

--- Note to Bidder ---

If the institution issuing the advance payment security is located outside the country of the employer, it shall have a correspondent financial institution located in the country of the employer to make it enforceable.

--- Footnotes ---

1 All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.
2 The guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the employer.
3 Footnote 2.
4 Insert the expected expiration date of the time for completion. 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 6 months[1 year]. 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.’
Procedure for bid submission and Opening in e-GP (Single Stage Two Envelope)

A. Procedure for submission in e-GP

Bidders shall follow the electronic bid submission procedures specified below:

i. The bidder is required to register in the e-GP system [https://www.bolpatra.gov.np/egp](https://www.bolpatra.gov.np/egp) following the procedure specified in e-GP guideline.

ii. Interested 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 the cost of the bidding document can be deposited as 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 technical and price 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 or as a joint venture. The bidder submitting bid in joint venture shall have to upload joint venture agreement along with partner(s) Bolpatra ID provided during bidder’s registration.

vi. Bidders (all partners in case of JV) should update their profile data and documents required during preparation and submission of their bids.

vii. In case of bid submission in JV, the consent of the partners shall be obtained through the confirmation link sent to the registered email address and the partners shall have to acknowledge their confirmation.

The required forms and documents shall be part of technical bids.

<table>
<thead>
<tr>
<th>No.</th>
<th>Document</th>
<th>Requirement</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Letter of Technical Bid</td>
<td>Mandatory</td>
<td>PDF</td>
</tr>
<tr>
<td>2.</td>
<td>Bid Security/Bank Guarantee</td>
<td>Mandatory</td>
<td>PDF</td>
</tr>
<tr>
<td>3.</td>
<td>Company registration</td>
<td>Mandatory</td>
<td>PDF</td>
</tr>
<tr>
<td>4.</td>
<td>Business License</td>
<td>Mandatory</td>
<td>PDF</td>
</tr>
<tr>
<td>5.</td>
<td>VAT registration</td>
<td>Mandatory for domestic bidders</td>
<td>PDF</td>
</tr>
<tr>
<td>6.</td>
<td>Tax clearances certificate or evidence of tax return submission</td>
<td>Mandatory for domestic bidders</td>
<td>PDF</td>
</tr>
<tr>
<td>7.</td>
<td>Power of Attorney of Bid signatory</td>
<td>Mandatory</td>
<td>PDF</td>
</tr>
<tr>
<td>8.</td>
<td>Bank Voucher for cost of bid document</td>
<td>Mandatory</td>
<td>PDF</td>
</tr>
<tr>
<td>9.</td>
<td>Joint venture agreement</td>
<td>Mandatory in case of JV Bids Only</td>
<td>PDF</td>
</tr>
<tr>
<td>10.</td>
<td>Qualification Documents</td>
<td>Mandatory</td>
<td>Using profile data (financial details, contract details etc.) and Technical Proposal</td>
</tr>
<tr>
<td>11.</td>
<td>Additional documents specified in ITB 11.2 (g)</td>
<td>If applicable</td>
<td>PDF</td>
</tr>
</tbody>
</table>

The required forms and documents shall be part of price bids.
<table>
<thead>
<tr>
<th>No.</th>
<th>Document</th>
<th>Requirement</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Letter of Price Bid</td>
<td>Mandatory</td>
<td>PDF</td>
</tr>
<tr>
<td>2.</td>
<td>BoQ</td>
<td>Mandatory</td>
<td>Online Forms</td>
</tr>
<tr>
<td>3.</td>
<td>Price Adjustment Table</td>
<td>If applicable</td>
<td>Online Forms</td>
</tr>
<tr>
<td>4.</td>
<td>Additional Documents specified in ITB 11.3 (d)</td>
<td>If applicable</td>
<td>PDF</td>
</tr>
</tbody>
</table>

Note: The documents specified as “Mandatory” should be included in e-submission and non-submission of the documents shall be considered as non-responsive bid.

viii. After providing all the details and documents, two separate bid response documents i.e. technical bid and price bid will be generated from the system. Bidders are advised to download and verify the response documents prior to bid submission.

ix. 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.

x. Electronically submitted bids can be modified and/or withdrawn through system. The bidder may modify their bids multiple times online within bid submission date and time specified in e-GP system.

xi. The Bidder/Bid shall meet the following requirements and conditions for e-submission of bids; 
   aa) The e-submitted bids must be readable through PDF reader.
   bb) 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.
   cc) 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.

B. Procedure for Opening

Technical Bid Opening

i) e-GP system allows to download the technical bids only after technical bid opening date and time are met. Simultaneous login of two members of the opening committee is required for bid opening.

ii) The Employer shall conduct the opening of technical 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

iii) The e-GP does not allow to open the bids marked by “WITHDRAWAL”.

Price Bid Opening

The e-GP system sends the email notification for price bids opening to all bidder(s) who have submitted substantially responsive technical bids and are qualified for opening of price bids. The Employer shall conduct the opening of Price Bids in the presence of Bidders’ representatives who choose to attend at the address, on the date, and time specified by the Employer. Simultaneous login of two members of the opening committee is required for price bid opening.
Annex-1: Provisions Considered for Single-Stage-Two-Envelope-Procedure for Government of Nepal Funded Procurement (between NRs. 20 million to NRs. 1 billion)

**Section 1- Instructions to Bidders**

<table>
<thead>
<tr>
<th>SN</th>
<th>Clause No.</th>
<th>Existing Content (ADB’s Provision)</th>
<th>Replaced by (GoN Provision)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ITB 2.1</td>
<td>The Borrower or Recipient (hereinafter called “Borrower”) indicated in the BDS has applied for or received financing (hereinafter called “funds”) from the Asian Development Bank (hereinafter called “ADB”) toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.</td>
<td><strong>GoN Funded:</strong> In accordance with its annual program and budget, approved by the GoN, the implementing agency indicated in the BDS plans to apply a portion of the allocated budget to eligible payments under the contract(s) for which this Bidding Document is issued. Or <strong>Public Entities’ own Resource Funded:</strong> In accordance with its annual program and budget, approved by the public entity, the implementing agency indicated in the BDS plans to apply a portion of the allocated budget to eligible payments under the contract(s) for which this Bidding Document is issued. Or <strong>DP Funded:</strong> The GoN has applied for or received financing (hereinafter called “funds”) from the Development Partner (hereinafter called “the DP”) indicated in the BDS toward the cost of the project named in the BDS. The GoN intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.</td>
</tr>
<tr>
<td>2.</td>
<td>ITB 2.2</td>
<td>Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called “Financing Agreement”), and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.</td>
<td><strong>Applyable for DP Funded Project Only</strong> DP Funded: Payment by the DP will be made only at the request of the GoN and upon approval by the DP in accordance with the terms and conditions of the financing agreement between the GoN and the DP (hereinafter called the “Loan/Grant Agreement”), and will be subject in all respects to the terms and conditions of that Loan/Grant Agreement. No party other than the GoN shall derive any rights from the Loan Agreement or have any claim to the funds.</td>
</tr>
<tr>
<td>3.</td>
<td>ITB 3</td>
<td>ADB’s Anticorruption Policy requires Borrowers (including beneficiaries of ADB-financed activity), as well as Bidders, Suppliers, and Contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, ADB (v) “obstructive practice” means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an ADB investigation; (b) making false statements to investigators in order to materially impede an ADB investigation; (c) failing to comply with requests to</td>
<td><strong>Replace By:</strong> 3.1 The Government of Nepal (GoN) requires that the Procuring Entities as well as bidders, suppliers and contractors and their subcontractors under GoN/DP-financed contracts, shall adhere to the highest standard of ethics during the procurement and execution of such contracts. In this context, the Employer; (a) defines, for the purposes of this provision, the terms set forth below as follows: (i) “corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party; (ii) “fraudulent practice” means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or</td>
</tr>
</tbody>
</table>
provide information, documents or records in connection with an Office of Anticorruption and Integrity (OAI) investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (e) materially impeding ADB’s contractual rights of audit or access to information; and (vi) “integrity violation” is any act which violates ADB’s Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB’s Anticorruption Policy, including failure to adhere to the highest ethical standard.

3.2 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 in corrupt or fraudulent practice or involving in such act,
(d) interference in participation of other competing 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,

attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) “coercive practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(iv) “obstructive practice” means:

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a GoN/DP investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

(bb) acts intended to materially impede the exercise of the GoN’s/DP’s inspection and audit rights provided for under sub-clause 3.5 below.

(b) will reject bid(s) if it determines that the bidder has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
practices or other integrity violations; and
(e) will have the right to require
that a provision be included in
bidding documents and in
contracts financed by ADB,
requiring Bidders, suppliers,
and contractors to permit ADB
or its representative to inspect
their accounts and records and
other documents relating to the
bid submission and contract
performance and to have them
audited by auditors appointed
by ADB.

(g) contacting the Employer with an intention to
influence the Employer with regards to the
bids or interference of any kind in
examination and evaluation of the bids
during the period from the time of opening
of the bids until the notification of award of
contract.

3.3 PPMO, on the recommendation of the
Procuring Entity may blacklist a Bidder for a
period of one (1) to three (3) years for its
conduct including on the following grounds and
seriousness of the act committed by the bidder:
(a) if convicted by a court of law in a criminal
offence which disqualifies the Bidder from
participating in the contract,
(b) if it is established that the contract
agreement signed by the Bidder was
based on false or misrepresentation of
Bidder’s qualification information,
(c) if it at any time determines that the firm has,
directly or through an agent, engaged in
corrupt, fraudulent, collusive, coercive,
or obstructive practices in competing for,
or in executing, a GoN/DP-financed
contract.
(d) if the Successful Bidder fails to sign the
Contract.

3.4 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.

3.5 The Contractor shall permit the GoN/DP to
inspect the Contractor’s accounts and records
relating to the performance of the Contractor
and to have them audited by auditors
appointed by the GoN/DP, if so required by
the GoN/DP.

3.6 DP Funded: In pursuance of the fraud and
corruption policy, the DP.
(a) will reject a proposal if it determines that
the bidder recommended for award has
directly or through an agent, engaged in
corrupt, fraudulent, collusive, coercive,
or obstructive practices in competing for the
contract in question;
(b) will cancel the portion of the loan/ credit/
grant allocated to a contract if it
determines at any time that
representative(s) of the GoN or of a
beneficiary of the fund engaged in corrupt,
fraudulent, collusive, or coercive practices
during the procurement or the execution of
that contract, without the GoN having
taken timely and appropriate action.
<table>
<thead>
<tr>
<th></th>
<th>ITB 4.3</th>
<th>A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ITB 4.4</td>
<td>A firm shall not be eligible to participate in any procurement activities under an ADB-financed, administered, or supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporary suspended or debarred firm will be rejected.</td>
</tr>
<tr>
<td></td>
<td>ITB 4.7</td>
<td>Firms shall be excluded if by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.</td>
</tr>
<tr>
<td></td>
<td>ITB 7.5</td>
<td>The Bidder is requested to submit any questions in writing, to reach the Employer not later than 1 week before the meeting.</td>
</tr>
</tbody>
</table>
|   | ITB 14.3 | The price to be quoted in the Letter of Price Bid shall be the total price of the Bid, excluding any discounts offered. Absence of the total bid price in the
<table>
<thead>
<tr>
<th>Section</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. ITB14.7</td>
<td>Letter of Price Bid may result in the rejection of the Bid. The word &quot;28 days&quot; is replaced by &quot;30 days&quot;.</td>
</tr>
<tr>
<td>10. ITB 15.2</td>
<td>All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder. Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the prices shown in the appropriate form(s) of Section 4, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders. In case of GoN Funded project: Foreign Currency is not applicable.</td>
</tr>
<tr>
<td>11. ITB 18.2</td>
<td>In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended 28 days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its Bid. The word &quot;28 days&quot; is replaced by &quot;30 days&quot;.</td>
</tr>
<tr>
<td>12. ITB19.1</td>
<td>Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS. In case of GoN funded project, word “Bid Securing Declaration” is removed.</td>
</tr>
<tr>
<td>13. ITB19.2</td>
<td>If a Bid-Securing Declaration is required pursuant to ITB 19.1, it shall use the form included in Section 4 (Bidding Forms). The Employer will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if the Bid-Securing Declaration is executed. Not applicable for GoN funded projects.</td>
</tr>
<tr>
<td>14. ITB 19.3</td>
<td>If a bid security is specified pursuant to ITB 19.1, the bid security shall be, at the Bidder’s option, in any of the following forms: (a) an unconditional bank guarantee, (b) an irrevocable letter of credit, or (c) a cashier’s or certified check, all from a reputable bank from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section 4 (Bidding Replace “all from a reputable bank from an eligible countries” by “A Class commercial bank of Nepal”.</td>
</tr>
</tbody>
</table>
15. **ITB 19.4** Unless otherwise specified in the BDS, any Bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 19.1, shall be rejected by the Employer as nonresponsive.

In case of GoN funded project, word “Bid Securing Declaration” is removed.

16. **ITB 19.8** The bid security or the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security or the Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1.

In case of GoN funded project, word “Bid Securing Declaration” is removed.

17. **ITB 20.2** The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for unamended printed literature, shall be signed or initialed by the person signing the bid. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Employer shall request the Bidder to submit an acceptable authorization within the number of days as specified in the BDS. Failure to provide an acceptable authorization within the prescribed period of receiving such a request shall cause the rejection of the Bid.

The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for unamended printed literature, shall be signed or initialed by the person signing the bid.

18. **ITB 24.1** A Bidder may withdraw, substitute, or modify its Bid – Technical or Price – after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be

24.1 A Bidder may withdraw, or modify its bid after it has been submitted through e-submission. Procedures for withdrawal or modification of submitted bids are as follows:

(i) E-submitted bids.

   a) Bidder may submit modification or withdrawal prior to the deadline prescribed for submission of bid through e-GP system by using the forms and instructions provided by the system. Once a Bid is
(a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWAL,” “SUBSTITUTION,” “MODIFICATION;” and
(b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

24.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid or any extension thereof.

24.4 No bid may be withdrawn if the bid has already been modified.

24.5 Request for withdrawal or modification must be made through the same medium of submission. Request for withdrawal or modifications through different medium shall not be considered.

24.6 The following provisions apply for withdrawal or modification of the Bids:

(i) In case of bids submitted in hard copy no bid shall be withdrawn or modified in the interval between 24 hours prior to the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

(ii) In case of e-submitted bids no bids shall be withdrawn or modified in the interval between deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

19. ITB25.3 Second, outer envelopes marked “SUBSTITUTION” shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 25.1. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

20. ITB25.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum, the name of the Bidder and whether there is a withdrawal, substitution, or modification; alternative proposals; and the presence or absence of a bid security or a Bid-withdrawal, bidder will not be able to submit another bid response for the same bid.

Not applicable for GoN funded projects.
<table>
<thead>
<tr>
<th>Section</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securing Declaration, if one was required. The Bidders’ representatives who are present shall be requested to sign the record. The omission of a Bidder’s signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.</td>
<td>present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids on time, and posted online when electronic bidding is permitted.</td>
</tr>
<tr>
<td>ITB25.10(b)</td>
<td>whether there is a modification or substitution Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Price Bid and Schedules are to be initialed by at least three representatives of the Employer attending the bid opening. No Bid shall be rejected at the opening of Price Bids.</td>
</tr>
<tr>
<td>ITB29.2(c)</td>
<td>Bid Security or Bid-Securing Declaration, if applicable; and In case of GoN funded project, word “Substitution” is removed.</td>
</tr>
<tr>
<td>ITB34.1</td>
<td>For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS. Not applicable for GoN funded projects.</td>
</tr>
<tr>
<td>ITB 36.5</td>
<td>If the Bid for an admeasurement contract, which results in the lowest Evaluated Bid Price, is seriously unbalanced, front loaded or substantially below updated estimates in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses 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 analyses, 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 by 8% to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.</td>
</tr>
<tr>
<td>ITB41.2</td>
<td>Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer. The Employer and the successful Bidder shall sign the Contract Agreement within the period 15 days of the receipt of LOA from the employer.</td>
</tr>
<tr>
<td>ITB42.1</td>
<td>Within 28 days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, subject to ITB 36.5, using for that purpose the Performance Security Form included in Within Fifteen (15) days of the receipt of Letter of Acceptance from the Employer, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, as specified below from A class Commercial Bank using Sample Form for the Performance Security included in</td>
</tr>
</tbody>
</table>
Section 9 (Contract Forms), or another form acceptable to the Employer. The performance security issued by any foreign Bank outside Nepal must be counter guaranteed by an "A" class commercial Bank in Nepal.

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:

\[
\text{Performance Security Amount} = [ (0.85 \times \text{Cost Estimate} - \text{Bid Price}) \times 0.5] + 5\% \text{ of Bid Price.}
\]

The Bid Price and Cost Estimate shall be inclusive of Value Added Tax.

27. ITB42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

Section 2- Bid Data Sheet (BDS)

<table>
<thead>
<tr>
<th>SN</th>
<th>Clause No.</th>
<th>Existing Content (ADB’s Provision)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ITB 2.1</td>
<td>The Borrower is: ---------------</td>
</tr>
<tr>
<td>3</td>
<td>ITB19.4</td>
<td>Any bid not accompanied by an irrevocable and callable bid security shall be rejected by the Employer as nonresponsive. However, if a bidder submits a bid security that deviates in form, amount and/or period of validity, the Employer shall request the Bidder to submit a compliant bid security within . . . . . . . . . . days of receiving such a request. Failure to provide a compliant bid security within the prescribed period of receiving such a request shall cause the rejection of the Bid.</td>
</tr>
<tr>
<td>4</td>
<td>ITB20.2</td>
<td>The Bidder shall submit an acceptable authorization within ____________ days.</td>
</tr>
</tbody>
</table>

Replaced by (GoN Provision)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“The Borrower” is Replaced by “Employer”</td>
</tr>
<tr>
<td></td>
<td>Any bid not accompanied by an irrevocable and callable bid security shall be rejected by the Employer as nonresponsive.</td>
</tr>
<tr>
<td></td>
<td>Not applicable for GoN funded projects.</td>
</tr>
</tbody>
</table>
### Section 3 - Evaluation and Qualification Criteria (EQC)

<table>
<thead>
<tr>
<th>SN</th>
<th>Clause No.</th>
<th>Existing Content (ADB’s Provision)</th>
<th>Replaced by (GoN Provision)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.1.3 ADB Eligibility</td>
<td>Not having been declared ineligible by ADB, as described in ITB Subclause 4.4.</td>
<td>Not applicable for GoN funded projects.</td>
</tr>
<tr>
<td>2</td>
<td>2.4 Construction Experience</td>
<td>General Experience is not found</td>
<td>Add General Experience Form as follows:</td>
</tr>
</tbody>
</table>

**For General Experience**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Compliance Requirements</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement</td>
<td>Single Entity</td>
<td>Joint Venture</td>
</tr>
<tr>
<td>All Partners Combined</td>
<td>Each Partner</td>
<td>One Partner</td>
</tr>
</tbody>
</table>

**2.4.1 General Construction Experience**

| Experience under construction contracts in the role of contractor, subcontractor, or management contractor for at least the last ...... (1)..... years prior to the applications submission deadline. | must meet requirement | not applicable | must meet requirement | not applicable | Form EXP - 1 |

### Section 4 - Bidding Forms

<table>
<thead>
<tr>
<th>SN</th>
<th>Clause No.</th>
<th>Existing Content (ADB’s Provision)</th>
<th>Replaced by (GoN Provision)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Letter of Technical Bid</td>
<td>(g) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by ADB, under the Employer’s country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council. (i) We agree to permit ADB 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 ADB.</td>
<td>(g) In case of GoN fund projects remove word “ by ADB” (i) In case of GoN fund projects replace “ADB” by “Employer/DP”</td>
</tr>
<tr>
<td>2</td>
<td>Letter of Price Bid</td>
<td>(j) We agree to permit ADB 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 ADB.</td>
<td>In case of GoN fund projects replace “ADB” by “Employer/DP”</td>
</tr>
<tr>
<td>3</td>
<td>Bid Security Declaration</td>
<td>Additional template for bid security declaration</td>
<td>Not applicable for GoN funded projects.</td>
</tr>
<tr>
<td>4</td>
<td>Form FIN-5</td>
<td>Additional Compliance Check of Financial Resources is available</td>
<td>Not applicable for GoN funded projects.</td>
</tr>
<tr>
<td>5</td>
<td>Form Exp-1</td>
<td>No General Experience Form found</td>
<td>Add “General Experience Form” as follows if General Experience is asked.</td>
</tr>
</tbody>
</table>
Form EXP - 1: General Construction Experience

Each Bidder or member of a JV must fill in this form.

<table>
<thead>
<tr>
<th>Starting Month Year</th>
<th>Ending Month Year</th>
<th>Year</th>
<th>Contract Identification and Name and Address of Employer Brief Description of the Works Executed by the Bidder</th>
<th>Role of Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6 Schedules
Schedule of Payments found which is applicable for ICB only
Not applicable for GoN funded projects.

7 Personnel and equipment
Personnel and equipment section missing
Add Personnel and Equipment forms as follows:
# Personnel

**Form PER - 1: Proposed Personnel**

Bidders should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions listed in Section III (Evaluation and Qualification Criteria). The data on their experience should be supplied using the Form below for each candidate.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Position</th>
<th>Academic Qualification</th>
<th>Total Work Experience [Years]</th>
<th>Experience in Similar Works [years]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Form PER - 2: Resume of Proposed Personnel**

The Bidder shall provide all the information requested below. Fields with asterisk (*) shall be used for evaluation.

<table>
<thead>
<tr>
<th>Position*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Information</td>
</tr>
<tr>
<td>Professional qualifications</td>
</tr>
<tr>
<td>Present employment</td>
</tr>
<tr>
<td>Address of employer</td>
</tr>
<tr>
<td>Telephone</td>
</tr>
<tr>
<td>Fax</td>
</tr>
<tr>
<td>Job title</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>From*</th>
<th>To*</th>
<th>Company, Project, Position and Relevant Technical and Management Experience*</th>
</tr>
</thead>
</table>
Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III (Evaluation and Qualification Criteria). A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder. The Bidder shall provide all the information requested below, to the extent possible. Fields with asterisk (*) shall be used for evaluation.

For the equipment under Bidder’s ownership

<table>
<thead>
<tr>
<th>No.</th>
<th>Equipment Type and Characteristics</th>
<th>Total Nos. of Equipment under Bidder’s Ownership</th>
<th>No. of Equipment engaged/proposed for ongoing/committed contracts</th>
<th>Nos. of Equipment proposed for this contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the Equipment to be leased/hired

<table>
<thead>
<tr>
<th>No.</th>
<th>Equipment Type and Characteristics</th>
<th>Total Nos. of Equipment under the ownership of lease/hire provider</th>
<th>No. of Equipment engaged/committed for other works</th>
<th>Nos. of Equipment proposed to be leased/hired for this contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Type of Equipment*

<table>
<thead>
<tr>
<th>Equipment Information</th>
<th>Name of manufacturer</th>
<th>Model and power rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Capacity* Year of manufacture

Current Status

<table>
<thead>
<tr>
<th>Current location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Details of current commitments

Source

<table>
<thead>
<tr>
<th>Indicate source of the equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owned</td>
</tr>
</tbody>
</table>

Owner

<table>
<thead>
<tr>
<th>Name of owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of owner</td>
</tr>
<tr>
<td>Contact name and title</td>
</tr>
<tr>
<td>email</td>
</tr>
</tbody>
</table>

Agreements

<table>
<thead>
<tr>
<th>Details of rental / lease / manufacture agreements specific to the project</th>
</tr>
</thead>
</table>
### Section 6- Employer's Requirement

<table>
<thead>
<tr>
<th>SN</th>
<th>Clause No.</th>
<th>Existing Content (ADB’s Provision)</th>
<th>Replaced by (GoN Provision)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Personnel and Equipment</td>
<td>Additional section for Personnel and equipment found</td>
<td>Not applicable for GoN funded projects. (Already incorporated in Section 4)</td>
</tr>
</tbody>
</table>

### Section 7- General Condition of Contract (GCC)

<table>
<thead>
<tr>
<th>SN</th>
<th>Clause No.</th>
<th>Existing Content (ADB’s Provision)</th>
<th>Replaced by (GoN Provision)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GCC 3.2 Language and Law</td>
<td>Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Employer’s country when a) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower’s Country prohibits any import of goods from, or any payments to, a particular country, person, or entity. Where the borrower’s country prohibits payments to a particular firm or for particular goods by such an act of compliance, that firm may be excluded.</td>
<td>Not Applicable for GoN Funded Projects.</td>
</tr>
<tr>
<td>2</td>
<td>GCC 4.1 Contract Agreement</td>
<td>The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless the Particular Conditions establish otherwise. The Contract Agreement shall be based upon the attached Contract forms in Section 8. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer</td>
<td>As per ITB 41.2</td>
</tr>
<tr>
<td>3</td>
<td>GCC 28.3 Instructions, Inspections, and Audits</td>
<td>The Contractor shall permit ADB to inspect the Contractor’s accounts, records, and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by ADB. The Contractor shall maintain all documents and records related to the Contract for a period of three (3) years after completion of the Works. The Contractor shall provide any documents necessary for the investigation of allegations of fraud, collusion, coercion, or corruption and require its employees or agents with knowledge of the Contract to respond to questions from ADB.</td>
<td>The word “ADB” replaced by “GoN/DP and/or persons appointed by GoN/DP”</td>
</tr>
<tr>
<td>4</td>
<td>GCC 29.1 and 29. 2 Appointment of the Adjudicator</td>
<td>The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer’s issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the PCC, to appoint the Adjudicator within 14 days of receipt of such request. Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator</td>
<td>Not applicable for GoN funded projects.</td>
</tr>
<tr>
<td>5</td>
<td>GCC 30</td>
<td>Procedure for Disputes</td>
<td>30.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager’s decision. 30.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute. 30.3 The Adjudicator shall be paid by the hour at the rate specified in the PCC, together with reimbursable expenses of the types specified in the PCC, and the cost shall be divided equally between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator’s written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator’s decision shall be final and binding.</td>
</tr>
<tr>
<td>6</td>
<td>GCC 36.2</td>
<td>Extension of the Intended Completion Date</td>
<td>The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.</td>
</tr>
<tr>
<td>7</td>
<td>GCC 46.1(a)</td>
<td>Changes in the Contract Price</td>
<td>If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25%, provided the change exceeds 1% of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.</td>
</tr>
<tr>
<td>8</td>
<td>GCC 46.1(b)</td>
<td></td>
<td>The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15%, except with the prior approval of the Employer.</td>
</tr>
<tr>
<td>9</td>
<td>GCC 50.1</td>
<td>Payments</td>
<td>Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on</td>
</tr>
<tr>
<td></td>
<td>the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 GCC 52.1 Tax The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC 54.1 [Price Adjustment].</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 GCC 59.1 Securities The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the PCC, by a bank acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a bank guarantee.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 GCC 71.1 Final Account The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 GCC 73 Termination 73.1 In no case, the contractor shall terminate the contract unilaterally, without duly notifying the Employer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>73.2 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</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
c. fails to achieve progress as per the Contract.

73.3 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

73.4 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 does not maintain a Security, which is required; and

(h) 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.

(i) If the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing
the Contract, pursuant to GCC 74.1.

73.5 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC 73.2 above, the Project Manager shall decide whether the breach is fundamental or not.

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

73.7 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.

74.1 If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 15 days' notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site.

74.2 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed in accordance with Clause 15. For the purposes of this Sub-Clause:

(i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party.

(ii) “fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to
(v) “obstructive practice” is
   (aa) deliberately destroying,
        falsifying, altering or
        concealing of evidence
        material to the investigation or
        making false statements to
        investigators in order to
        materially impede a
        investigation into allegations of
        a corrupt, fraudulent, coercive
        or collusive practice; and/or
        threatening, harassing or
        intimidating any party to
        prevent it from disclosing its
        knowledge of matters relevant
        to the investigation or from
        pursuing the investigation; or
        (bb) acts intended to materially
        impede the exercise of the
        GON’s/DP’s inspection and
        audit rights provided.

<table>
<thead>
<tr>
<th></th>
<th>GCC 75</th>
<th>Payment upon Termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td>The sub-clause provision has been added: 75.3 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.</td>
</tr>
</tbody>
</table>

| 16 | GCC 78. | Suspension of ADB Loan or Credit | Not Applicable for GoN funded project |
Section 9- Contract Forms

<table>
<thead>
<tr>
<th>SN</th>
<th>Clause No.</th>
<th>Existing Content (ADB's Provision)</th>
<th>Replaced by (GoN Provision)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LOI</td>
<td>Not in ADB SBD</td>
<td>Following Form is Added</td>
</tr>
</tbody>
</table>

Letter of Intent

[on letterhead paper of the Employer]

Date: ... …………………

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

Subject: .............................................................. Issuance of letter of intent to award the contract ...........

This is to notify you that, it is our intention to award the contract ... ........................................... [insert date] ................................for execution of the ... .......................................................... [insert name of the contract and identification number, as given in the Contract Data/SCC] to you as your bid price .......................................... [insert amount in figures and words in Nepalese Rupees] as corrected and modified in accordance with the Instructions to Bidders is hereby selected as substantially responsive lowest evaluated bid.

Authorized Signature: ………………………………

Name: ... ……………………………………………

Title: ……………………………………………….

CC: [Insert name and address of all other Bidders, who submitted the bid]

[Notes on Letter of Intent

The issuance of Letter of Intent is the information of the selection of the bid of the successful bidder by the Employer and for providing information to other unsuccessful bidders who participated in the bid as regards to the outcome of the procurement process. This standard form of Letter of Intent to Award should be filled in and sent to the successful Bidder only after evaluation and selection of substantially responsible lowest evaluated bid.]
Letter of Acceptance
[on letterhead paper of the Employer]

Date: ………………………

To: .......................................................................

Subject: ........................................................... . Notification of Award

This is to notify that your Bid dated …………………………date ………………………for execution of the……………………name of the contract and identification number, as given in the Contract Data/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 15 days with Performance Security of NRs. ………. in accordance with the Conditions of Contract consisting of a Bank Guarantee using for that purpose the Performance security Format included in Section 9 (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: …………………………..